Product/Process Change Notice - PCN 24_0009 Rev. C

Analog Devices, Inc. One Analog Way, Wilmington, MA 01887, USA

This notice is to inform you of a change that will be made to certain ADI products (see Appendix A) that you may have purchased in the last 2 years. An acceptance or concern response should be submitted to ADI promptly. Any requests for samples of changed material or additional information must be made within 30 days of the notification. In accordance with JEDEC Standard 046, customers should acknowledge receipt of the PCN within 30 days of the PCN delivery. ADI contact information is listed below. Note: Revised fields are indicated by a red field name. See Appendix B for revision history.

Lack of acknowledgment of the PCN within 30 days constitutes acceptance of the change. After the acknowledgment, a lack of additional requests within 90 days constitutes acceptance of the change.

Note: Revised fields are indicated by a red field name. See Appendix B for revision history.

PCN Title:	Qualification of Alternative Wafer Fab for TSMC 0.18um Mixed Signal CMOS Process
Publication Date:	16-Dec-2024
Effectivity Date:	20-Mar-2025 *(the earliest date that a customer could expect to receive changed material)*
Revision Description:	Remove parts. Add updated Qualification Results.

Description Of Change:

Analog Device is adding Analog Devices Beaverton OR, USA (ADBN) as an alternate Wafer Fab site to TSMC Taiwan for 0.18um Mixed Signal CMOS Process.

Reason For Change:

This change will ensure manufacturing agility and continuity of supply.

Impact of the change (positive or negative) on fit, form, function & reliability:

There is no impact to form, fit, function or reliability.

Product Identification: *(this section will describe how to identify the changed material)*

ADI maintains traceability internally to manufacturing location site via marking on the device.

Summary of Supporting Information:

Qualification has been performed per Industry Standard Test Methods. See attached Qualification Results.

Supporting Documents:

Attachment 1: Type: Delta Qualification Matrix

ADI_PCN_24_0009_Rev_C_PCN-Delta-Qualification-Matrix-ZVEI-5_0_16 Correction May2024.xlsm

Attachment 2: Type: Qualification Results Summary

ADI_PCN_24_0009_Rev_C_Qualification Results.pdf

Note: If applicable, the device material declaration will be updated due to material change.

ADI Contact Information:

For questions on this PCN, please send an email to the regional contacts below or contact your local ADI sales representatives.

Americas:	Europe:	Japan:	Korea:	Rest of Asia:
PCN_Americas@analog.com	PCN_Europe@analog.com	PCN_Japan@analog.com	PCN_Korea@analog.com	PCN_ROA@analog.com

Appendix A - Affected ADI Models:

Existing Parts - Product Family / Model Number (168)

AD8283 / AD8283WBCPZ	AD8283 / AD8283WBCPZ-RL	AD8285 / AD8285WBCPZ	AD8285 / AD8285WBCPZ-RL	AD9212 / AD9212ABCPZ-40
AD9212 / AD9212ABCPZ-65	AD9222 / AD80418BCPZ-65	AD9222 / AD9222ABCPZ-40	AD9222 / AD9222ABCPZ-50	AD9222 / AD9222ABCPZ-65
AD9222 / AD9222ABCPZRL7-50	AD9252 / AD9252ABCPZ-50	AD9252 / AD9252ABCPZRL7-50	AD9253 / AD9253BCPZ-105	AD9253 / AD9253BCPZ-125
AD9253 / AD9253BCPZ-80	AD9253 / AD9253BCPZRL7-105	AD9253 / AD9253BCPZRL7-125	AD9253 / AD9253BCPZRL7-80	AD9255 / AD9255BCPZ-105
AD9255 / AD9255BCPZ-125	AD9255 / AD9255BCPZ-80	AD9255 / AD9255BCPZRL7-105	AD9255 / AD9255BCPZRL7-125	AD9255 / AD9255BCPZRL7-80
AD9257 / AD9257BCPZ-40	AD9257 / AD9257BCPZ-65	AD9257 / AD9257BCPZRL7-40	AD9257 / AD9257BCPZRL7-65	AD9265 / AD89025BCPZ
AD9265 / AD89025BCPZRL7	AD9265 / AD9265BCPZ-105	AD9265 / AD9265BCPZ-125	AD9265 / AD9265BCPZ-80	AD9265 / AD9265BCPZRL7-105
AD9265 / AD9265BCPZRL7-125	AD9265 / AD9265BCPZRL7-80	AD9608 / AD9608BCPZ-105	AD9608 / AD9608BCPZ-125	AD9608 / AD9608BCPZRL7-105
AD9608 / AD9608BCPZRL7-125	AD9609 / AD9609BCPZ-20	AD9609 / AD9609BCPZ-40	AD9609 / AD9609BCPZ-65	AD9609 / AD9609BCPZ-80
AD9609 / AD9609BCPZRL7-20	AD9609 / AD9609BCPZRL7-40	AD9609 / AD9609BCPZRL7-65	AD9609 / AD9609BCPZRL7-80	AD9628 / AD9628BCPZ-105
AD9628 / AD9628BCPZ-125	AD9628 / AD9628BCPZRL7-105	AD9628 / AD9628BCPZRL7-125	AD9629 / AD9629BCPZ-20	AD9629 / AD9629BCPZ-40
AD9629 / AD9629BCPZ-65	AD9629 / AD9629BCPZ-80	AD9629 / AD9629BCPZRL7-20	AD9629 / AD9629BCPZRL7-40	AD9629 / AD9629BCPZRL7-65
AD9629 / AD9629BCPZRL7-80	AD9633 / AD9633BCPZ-105	AD9633 / AD9633BCPZ-125	AD9633 / AD9633BCPZ-80	AD9633 / AD9633BCPZRL7-105
AD9633 / AD9633BCPZRL7-125	AD9633 / AD9633BCPZRL7-80	AD9635 / AD9635BCPZ-125	AD9635 / AD9635BCPZ-80	AD9635 / AD9635BCPZRL7-125
AD9635 / AD9635BCPZRL7-80	AD9637 / AD9637BCPZ-40	AD9637 / AD9637BCPZ-80	AD9637 / AD9637BCPZRL7-40	AD9637 / AD9637BCPZRL7-80
AD9645 / AD9645BCPZ-125	AD9645 / AD9645BCPZ-80	AD9645 / AD9645BCPZRL7-125	AD9645 / AD9645BCPZRL7-80	AD9648 / AD9648BCPZ-105
AD9648 / AD9648BCPZ-125	AD9648 / AD9648BCPZRL7-105	AD9648 / AD9648BCPZRL7-125	AD9649 / AD9649BCPZ-20	AD9649 / AD9649BCPZ-40
AD9649 / AD9649BCPZ-65	AD9649 / AD9649BCPZ-80	AD9649 / AD9649BCPZRL7-20	AD9649 / AD9649BCPZRL7-40	AD9649 / AD9649BCPZRL7-65
AD9649 / AD9649BCPZRL7-80	AD9704 / AD9704BCPZ	AD9704 / AD9704BCPZRL7	AD9705 / AD9705BCPZ	AD9705 / AD9705BCPZRL7
AD9706 / AD9706BCPZ	AD9706 / AD9706BCPZRL7	AD9707 / AD9707BCPZ	AD9707 / AD9707BCPZRL7	AD9714 / AD9714BCPZ
AD9714 / AD9714BCPZRL7	AD9715 / AD9715BCPZ	AD9715 / AD9715BCPZRL7	AD9716 / AD9716BCPZ	AD9716 / AD9716BCPZRL7
AD9717 / AD9717BCPZ	AD9717 / AD9717BCPZRL7	AD9911 / AD9911BCPZ	AD9911 / AD9911BCPZ-REEL7	AD9958 / AD9958BCPZ
AD9958 / AD9958BCPZ-REEL7	AD9959 / AD9959BCPZ	AD9959 / AD9959BCPZ-REEL7	ADA4355 / ADA4355ABCZ	ADAU1361 / ADAU1361BCPZ
ADAU1361 / ADAU1361BCPZ-R7	ADAU1361 / ADAU1361BCPZ-RL	ADAU1401 / AD71073YSTZ-RL	ADAU1401 / ADAU1401YSTZ	ADAU1401 / ADAU1401YSTZ-RL
ADAU1701 / ADAU1701JSTZ	ADAU1701 / ADAU1701JSTZ-RL	ADAU1702 / ADAU1702JSTZ	ADAU1702 / ADAU1702JSTZ-RL	ADAU1761 / ADAU1761BCPZ
ADAU1761 / ADAU1761BCPZ-R7	ADAU1761 / ADAU1761BCPZ-RL	ADCLK846 / ADCLK846BCPZ	ADCLK846 / ADCLK846BCPZ-REEL7	ADCLK854 / ADCLK854BCPZ
ADCLK854 / ADCLK854BCPZ-REEL7	ADDR9501 / ADDR9501BCPZ	ADDR9501 / ADDR9501BCPZRL	ADDR9501 / ADW15001YCPZ	ADDR9501 / ADW15001YCPZRL
ADE9000 / ADE9000ACPZ	ADE9000 / ADE9000ACPZ-RL	ADE9000A / ADE9000AACPZ	ADE9000A / ADE9000AACPZ-RL	ADE9039 / ADE9039ACPZ
ADE9039 / ADE9039ACPZ-RL	ADE9078 / ADE9078ACPZ	ADE9078 / ADE9078ACPZ-RL	ADE9153A / ADE9153AACPZ	ADE9153A / ADE9153AACPZ-RL
ADE9153B / ADE9153BACPZ	ADE9153B / ADE9153BACPZ-RL	ADE9430 / ADE9430ACPZ	ADE9430 / ADE9430ACPZ-RL	ADF7023 / AD57/005Z-0RL
ADF7023 / ADF7023BCPZ	ADF7023 / ADF7023BCPZ-RL	ADF7023-J / ADF7023-JBCPZ	ADF7023-J / ADF7023-JBCPZ-RL	ADF7024 / ADF7024BCPZ
ADF7024 / ADF7024BCPZ-RL	ADV7180 / ADV7180WBCPZ	ADV7180 / ADV7180WBCPZ-REEL	ADV7343 / ADV7343WBSTZ	ADV7343 / ADV7343WBSTZ-RL
ADV7390 / ADV7390WBCPZ	ADV7390 / ADV7390WBCPZ-RL	ADV7391 / ADV7391WBCPZ	ADV7391 / ADV7391WBCPZ-RL	ADV7392 / ADV7392WBCPZ
ADV7392 / ADV7392WBCPZ-REEL	ADV7393 / ADV7393WBCPZ	ADV7393 / ADV7393WBCPZ-REEL		

Appendix A - Affected ADI Models::

Removed Parts On All Revisions - Product Family / Model Number (30)

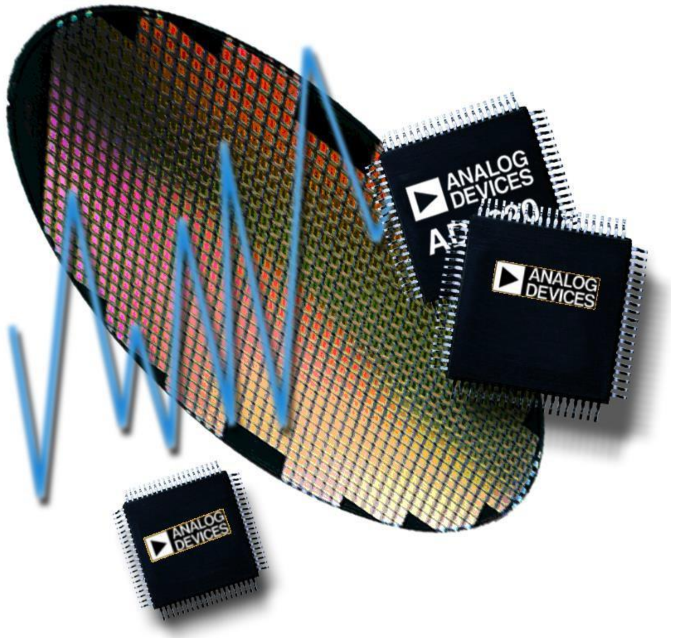
ADA8282 / ADA8282WBCPZ	ADA8282 / ADA8282WBCPZ-R7	ADAR7251 / ADAR7251WBCSZ	ADAR7251 / ADAR7251WBCSZ-RL	ADV7180 / ADV7180BCP32Z
ADV7180 / ADV7180BCP32Z-RL	ADV7180 / ADV7180BCPZ	ADV7180 / ADV7180BCPZ-REEL	ADV7180 / ADV7180BST48Z	ADV7180 / ADV7180BST48Z-RL
ADV7180 / ADV7180BSTZ	ADV7180 / ADV7180BSTZ-REEL	ADV7180 / ADV7180KCP32Z	ADV7180 / ADV7180KCP32Z-RL	ADV7180 / ADV7180KST48Z
ADV7180 / ADV7180KST48Z-RL	ADV7180 / ADV7180WBCP32Z	ADV7180 / ADV7180WBCP32Z-RL	ADV7180 / ADV7180WBST48Z	ADV7180 / ADV7180WBST48Z-RL
ADV7180 / ADV7180WBSTZ	ADV7180 / ADV7180WBSTZ-REEL	ADV7180 / ADW10003-0REEL	ADV7180 / ADW10004-0REEL	ADV7180 / ADW10006Z-0
ADV7180 / ADW10007Z-0REEL	ADV7180 / ADW10008Z-0REEL	ADV7180 / ADW10013Z-0	ADV7180 / ADW10013Z-0RL	ADV7340 / ADV7340BSTZ

Appendix B - Revision History:

Rev	Publish Date	Effectivity Date	Rev Description
Rev. -	01-Feb-2024	05-May-2024	Initial Release.
Rev. A	01-May-2024	03-Aug-2024	Add Parts. Adding completed qualification report.
Rev. B	13-May-2024	15-Aug-2024	Correction to Delta Qualification Matrix. Add parts. Remove parts.
Rev. C	16-Dec-2024	20-Mar-2025	Remove parts. Add updated Qualification Results.

Analog Devices, Inc. PCN Material Report (Proprietary Information)

Existing Material		Material Added		Material Removed	
GENERICNUMBER	MATERIALNUMBER	GENERICNUMBER	MATERIALNUMBER	GENERICNUMBER	MATERIALNUMBER
				ADA8282	ADA8282WBCPZ
				ADA8282	ADA8282WBCPZ-R7
				ADAR7251	ADAR7251WBCSZ
				ADAR7251	ADAR7251WBCSZ-RL



Reliability Report

Report Title: Qualification of 0.18µm Mixed Mode CMOS Wafer Fabrication at ADI Beaverton Fab

Report Number: 21963

Revision: C

Date: 15 November 2024

Summary

This report documents the reliability qualification requirements for the release of the 0.18µm Mixed Mode 1.8V/3.3V CMOS Wafer Fabrication Process in Analog Devices Beaverton, Oregon (ADBN) Wafer Fabrication Facility.

The products listed below were selected to qualify the technology being released.

- The AD8283 product is a 6-channel low noise preamplifier (LNA) with a programmable gain amplifier (PGA) and anti-aliasing filter (AAF) plus one direct-to-ADC channel, all integrated with a single 14-bit analog-to-digital converter (ADC), packaged in a 72 lead LFCSP. The AD8283 is qualified to AEC-Q100 Grade 2.

- The ADV7392 product is 10-Bit SD/HD Video Encoder packaged in a 40 lead LFCSP and is qualified to AEC-Q100 Grade 2.

- The ADDR9501 product is a complete satellite digital audio radio services (SDARS) RF front-end solution, providing a complete 12.5 MHz SDARS frequency translation to a baseband signal using a single RF branch. The ADDR9501 is packaged in a 48 lead LFCSP and is qualified to AEC-Q100 Grade 2.

AECQ100 Qualification Test Methods and Summary

AEC Test Group	AEC Stress Test Name	Abbreviation	AEC Test#	Reference
Group A ACCELERATED ENVIRONMENT STRESS TESTS	Preconditioning	PC	A1	Table 2, and Table 4
	Temperature Humidity Bias or Biased-HAST	THB or HAST	A2	
	Autoclave or Unbiased HAST or Temperature Humidity (without Bias)	AC, UHST, or TH	A3	
	Temperature Cycle	TC	A4	
	Power Temperature Cycling	PTC	A5	
	High Temperature Storage Life	HTSL	A6	
Group B ACCELERATED LIFETIME SIMULATION TESTS	High Temperature Operating Life	HTOL	B1	Table 2, and Table 4
	Early Life Failure Rate	ELFR	B2	
	NVM Endurance, Data Retention, and Operational Life	EDR	B3	
Group C PACKAGE ASSEMBLY INTEGRITY TESTS	Wire Bond Shear	WBS	C1	• Test C2 (and C1 for Cu Wire) are shown in Table 4. • Tests C3-6 are qualified and controlled with inline monitors and may be viewed on-site at Analog Devices.
	Wire Bond Pull Strength	WBP	C2	
	Solderability	SD	C3	
	Physical Dimensions	PD	C4	
	Solder Ball Shear	SBS	C5	
	Lead Integrity	LI	C6	
Group D DIE FABRICATION RELIABILITY TESTS	Electromigration	EM	D1	Die Fabrication Reliability data may be viewed on-site at Analog Devices.
	Time Dependent Dielectric Breakdown	TDDB	D2	
	Hot Carrier Injection	HCI	D3	
	Negative Bias Temperature Instability	BTI	D4	
	Stress Migration	SM	D5	
Group E ELECTRICAL VERIFICATION TESTS	Pre- and Post-Stress Electrical Test	TEST	E1	Table 5 and Table 6
	Electrostatic Discharge Human Body Model	HBM	E2	
	Electrostatic Discharge Charged Device Model	CDM	E3	
	Latch-Up	LU	E4	
	Electrical Distributions	ED	E5	• For Tests E5, E6 and E7, ADI New Product Yield Analysis Testing Guidelines meet AEC Q100 requirements. • Results for Tests E7-E11 are available as applicable on a case by case basis. • Test E12 results may be viewed on-site at Analog Devices
	Fault Grading	FG	E6	
	Characterization	CHAR	E7	
	Electromagnetic Compatibility	EMC	E9	
	Short Circuit Characterization	SC	E10	
	Soft Error Rate	SER	E11	
	Lead (Pb) Free	LF	E12	
Group F DEFECT SCREENING TESTS	Process Average Test	PAT	F1	ADI New Product Yield Analysis Testing Guidelines meet AECQ100 Requirements.
	Statistical Bin/Yield Analysis	SBA	F2	
Group G CAVITY PACKAGE INTEGRITY TESTS	Mechanical Shock	MS	G1	< Applicable only for Cavity-Packages>
	Variable Frequency Vibration	VFV	G2	
	Constant Acceleration	CA	G3	
	Gross/Fine Leak	GFL	G4	
	Package Drop	DROP	G5	
	Lid Torque	LT	G6	
	Die Shear	DS	G7	
	Internal Water Vapor	IWV	G8	

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics- 0.18µm CMOS at ADBN

Product Characteristics	Product(s) to be Qualified		
Generic/Root Part #	AD8283	ADV7392	ADDR9501
Die Id	ND01	ND03	ND04
Die Size (mm)	7.00 x 7.00	2.57 x 3.05	3.67 x 4.54
Wafer Fabrication Site	ADBN	ADBN	ADBN
Wafer Fabrication Process	0.18µm CMOS	0.18µm CMOS	0.18µm CMOS
Die Substrate	Si	Si	Si
Metallization / # Layers	AlCu / 5	AlCu / 5	AlCu / 6
Polyimide	Yes	No	Yes
Passivation	SiO_2/SiN	SiO_2/SiN	SiO_2/SiN

Die/Fab Test Results

Table 2: Die/Fab Test Results – 0.18µm CMOS at ADBN

Return

Test Name	AEC #	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS	eTest Temp
Early Life Failure Rate (ELFR)	B2	AEC Q100-008	T_A=125°C, 48 Hours	AD8283	J90090.1	0/810	RH
					J91522.1	0/810	RH
					J91669.4	0/810	RH
			T_A=105°C, 48	ADV7392	J91084.5	1/810[2]	RH
					J90861.1	1/810[2]	RH
High Temperature Operating Life (HTOL)	B1	JESD22-A108	125°C‹Tj‹135°C, Biased, 1000 Hours	AD8283	J90090.1	0/77	RCH
					J91522.1	0/77	RCH
					J91669.4	1/77[2]	RCH
			125°C<Tj<135°C, Biased, 500 Hours, Ta=125°C	ADV7392	J91084.5	0/77	RCH
					J90861.1	0/77	RCH
					J90912.1	0/77	RCH
			125°C‹Tj‹135°C, Biased, 1000 Hours	ADDR9501	J90227.3	0/77	RCH
					J90830.1	0/77	RCH
					J90914.1	0/77	RCH
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	A2	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	AD8283	J90090.1	1/77[2]	RH
					J91522.1	0/77	RH
					J91669.4	0/77	RH
			130°C, 85%RH 33.3 psia, biased, 96 Hours	ADV7392	J91084.5	0/77	RH
					J90861.1	0/77	RH
					J90912.1	0/77	RH
			130°C, 85%RH 33.3 psia, biased, 96 Hours	ADDR9501	J90227.3	0/77	RH
					J90830.1	0/77	RH
					J90914.1	0/77	RH

[1] These samples were subjected to preconditioning at MSL 3 with 3x reflow peak temp of 260°C prior to the start of the stress test.

[2] These failures are attributed to silicon defects. See 8D Report 264269.

Table 3: Package/Assembly Product Characteristics

Product Characteristics	Product(s) to be Qualified		
Generic/Root Part #	AD8283	ADV7392	ADDR9501
Package	72-LFCSP	40-LFCSP	48-LFCSP
Body Size (mm)	10.00 x 10.00 x 0.85	6.00 x 6.00 x 0.75	7.00 x 7.00 x 0.85
Assembly Location	STATS (STA)	AMKOR (AP3)	AMKOR (AP1)
MSL/Peak Reflow Temperature(°C)	3 / 260°C	3 / 260°C	3 / 260°C
Mold Compound	Sumitomo G700E	Sumitomo G700	Sumitomo G700
Die Attach/Underfill/TIM	Ablestik 3230	Ablestik 3230	Ablestik 3230
Leadframe Material	Copper	Copper	Copper
Lead Finish	Sn	Sn	Sn
Wire Bond Material/Diameter (mils)	Gold / 1.00	Gold / 1.00	Gold / 1.00

Table 4: Package/Assembly Test Results

Test Name	AEC#	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS	eTest Temp
Preconditioning	A1	J-STD-020	MSL-3	ADV7392	J91084.5	0/15	R
					J90861.1	0/15	R
					J90912.1	0/15	R
				AD8283	J90090.1	0/15	R
					J91522.1	0/15	R
					J91669.4	0/15	R
				ADDR9501	J90227.3	0/15	R
					J90830.1	0/15	R
					J90914.1	0/15	R
High Temperature Storage Life (HTSL)	A6	JESD22-A103	+150°C, 500 Hours	ADV7392	J91084.5	0/45	RH
			+150°C, 1000 Hours	AD8283	J90090.1	0/45	RH
				ADDR9501	J90227.3	0/45	RH
Temperature Cycling (TC)[1]	A4	JESD22-A104	-55°C/+125°C, 1000 Cycles	ADV7392	J91084.5	0/77	RH
					J90861.1	0/77	RH
					J90912.1	0/77	RH
				AD8283	J90090.1	0/77	RH
					J91522.1	0/77	RH
					J91669.4	0/77	RH
				ADDR9501	J90227.3	0/77	RH
					J90830.1	0/77	RH
					J90914.1	0/77	RH
Unbiased HAST (UHST)[1]	A3	JESD22-A118	+130°C, 85%RH 33.3 psia, 96 Hours	ADV7392	J91084.5	0/77	R
					J90861.1	0/77	R
					J90912.1	1/77[2]	R
				AD8283	J90090.1	0/77	R
					J91522.1	0/77	R
					J91669.4	0/77	R
				ADDR9501	J90227.3	0/77	R
					J90830.1	0/77	R
					J90914.1	0/77	R
Post-TCT WBP	C2	MIL-STD883 Method 2011	3gF	ADV7392	J91084.5	0/5	N/A
				AD8283	J90090.1	0/5	N/A
				ADDR9501	J90227.3	0/5	N/A

[1] These samples were subjected to preconditioning at MSL 3 with 3x reflow peak temp of 260°C prior to the start of the stress test.

[2] These failures are attributed to silicon defects. See 8D Report 264269

ESD and Latch-Up Test Results

Table 5: ESD Test Results

Return

ESD Model	Generic/Root Part #	Package	ESD Test Spec	RC Network	Highest Pass Level	Class	eTest
FICDM	ADV7392	40-LFCSP	JS-002	1Ω, Cpkg	±500V	C2	RH
	AD8283	72-LFCSP			±450V[1]	C1	RH
	ADDR9501	48-LFCSP			±750V	C2	RH
HBM	ADV7392	40-LFCSP	JS-001	1.5kΩ, 100pF	±2000V	1C	RH
	AD8283	72-LFCSP			±2000V	1C	RH
	ADDR9501	48-LFCSP			±2000V	1C	RH

1. Control Material Passes Same Threshold

Table 6: Latch Up Test Results

Return

LU Test Spec	Generic/Root Part #	Passing Current	Passing Over-Voltage	Temperature (T_A)	Class	eTest
JESD78	ADV7392	+100mA, -100mA	+2.84V/+5.2V/+5.45V	+105°C	II	RH
	AD8283	+100mA, -100mA	+2.85V, +5.1V	125°C	II	RH
	ADDR9501	+100mA, -100mA	+2.85V, +5.1V	+85°C	II	RH

Approvals

Reliability Engineer: Denis Belisle

DeltaQualificationMatrix

General

Short product and technology cycles as well as new environmental regulations frequently result in process and material changes of components, printed circuit boards, assembly techniques and circuit layout which have to be evaluated. The ZVEI "Guideline for Customer Notifications of Product and /or Process Changes (PCN) of Electronic Components specified for Automotive Applications” describes an appropriate methodology for dealing with changed electronic components. The qualification matrices in this guideline are recommendations for how to assess typical changes of electronic components. These recommendations promote an open risk-based discussion between supplier and customer regarding qualifications.
The DeltaQualificationMatrices were developed by the Industry Task Force Team "PCN DeltaQualificationMatrix" together with component experts from the ZVEI Working Group "PCN-Methodology". Actual content represents state-of-the-art technology and does not claim to be comprehensive. Deviation from proposed guideline should be mutually agreed as customer specific requirements have to be considered.

DeltaQualificationMatrix Application (completion by component manufacturer)

a) This table has to be used for changes only. The matrices are not applicable for new product, special qualifications (for instance for encapsulation of module) or Information Notes.
b) If a change is not listed in this table, the qualification plan has to be defined and agreed between customer and supplier.
c) The matrix for Active Components requires the user to choose between integrated circuits AEC-Q100 and discrete semiconductors AEC-Q101 (cell D4).
For Passive Components AEC-Q200 is used. For Optoelectronic Components the AEC-Q102 is used.
For Multi-Chip-Modules the AEC-Q104 is used. For MEMS the AEC-Q103 is used.
d) All changes as listed in the PCN have to be marked by a cross (x) in column B and will appear colored. The relevant reliability tests are then shown in "Tests, which should be considered for the appropriate process change".
e) In "Tests, which should be considered for the appropriate process change after selection of condition table" is for modification of the found relevant tests under consideration of the weight of change.
Related table “Conditions” has to be assessed per proposed letters with an (x).
f) In "Suppliers performed tests" the component manufacturer documents the planned and performed tests.
g) In case of deviations from tests, which should be considered this should be notified and commented by the component manufacturer in the area "Reason for exception of tests".
Test results in form of generic data (G) are allowed when notified and justified.

Evaluation Levels are categorized as follows

"C: Component level": The evaluation of a change at component has to be done by the component manufacturer at the component only. Generic data from other relevant evaluations can be used.

"B: Board level": The intended change described in the PCN may influence handling/processability/manufacturability of the component at the customer. Therefore, additional evaluation by the customer may be necessary.

"A: Application level": The intended change described in the PCN may influence the properties of the application (e.g. ECU). In addition to the evaluation under C or B the influence of the change in the application is evaluated by suitable investigations by the customer. It has to be considered whether the application / assembly requirements are already sufficiently safeguarded by other qualifications (application-specific risk assessment).

" *: **Not relevant for qualification matrix":** Changes which fulfill neither A,B nor C definitions

Infomation Notes

Changes indicated as “I” shall not be marked in the DeQuMa. For those changes the Information Note sheet shall be used. As the DeQuMa is desired for PCN only, a marking of “I”-changes would automatically influence evaluation level and test effort.

Important Notes

- To use the matrices in the right form the ZVEI working group provides a Tutorial on its homepage (ZVEI-Tutorial)
- ID number: is a unique identification number for each indicated change defined in the ZVEI PCN DeltaQualificationMatrices. The same ID number is used in the PCN Form sheet to identify the change.
- Tests identified by the matrix have **to be considered** and checked if they are necessary to assess the specific change. Test modifications or generic data have to be justified in detail.
- "Further applicable conditions", comments and notes need attention, as they provide important hints and limitations.
- In order to use all functions in EXCEL, macros have to be allowed.

Form provided by ZVEI - Revision 5.0 - December 2021

History of DeQuMa

Version	Remarks
2.0	Revised by ZVEI PCN Methodology Workgroup in March 2015
2.1	Released March 2015
2.1.1	Active Components - delete write protection in comments
2.2	Solved problems with some ActiveX configurations
2.2.2	Solved Problems in Active Components
2.2.3	Solved Problems ActiveX, Active Components SEM-DE-02 (Design changes in routing) error fixed
2.2.4	Minor fixes
3.0	General Revision by ZVEI PCN Methodology Workgroup in June 2016 Changes are indicated by underlining in the read only version named Changes_DeQuMa_rev3_vs_rev2.xlsx
3.0.4	Expert Release
3.0.5	Fixing of macro bugs
3.1	Final Release (orthographic and punctuation corrections)
4.0	General Revision by ZVEI PCN Methodology Workgroup in July 2019. Muliti Chip Modules newly added to DeQuMa LED Components now based on the AEC Q102 Further Changes see separate ~~PDF's~~ Excel-File, where changes are indicated by underlining
4.1	LED worksheet: Content of columns had been swapped due to rearrangement and omission of columns.
5.0	General Revision by ZVEI PCN Methodology Workgroup in October 2021. Add MEMS pressure sensor

Worked on: (Name, Function)	Denis Belisle
Signature:	Denis Belisle
Date:	30-Apr-24
PCN number:	24_0009
For integrated circuits or discrete semiconductors select below:	AEC-Q100 Revision H

Form provided by ZVEI - Revision 5.0 - December 2021

Mark change with an "x"

Assessment of impact regarding following aspects
- contractual agreements
- technical interface of handling/processability/manufacturability of customer
- form, fit, function, quality performance, reliability

	ID	Type of change	Potential impact? No	Potential impact? Yes	Understanding of semiconductors experts	Examples to explain	Evaluation level A / B / C A: Application level B: Boardlevel C: Component level *: Not relevant for qualification matrix	Further applicable conditions
		ANY						
		DATA SHEET						
		DESIGN						
		PROCESS - WAFER PRODUCTION						
x	SEM-PW-13	Move all or parts of production to a different wafer fab site.	P	P	Wafer fab transition with additional changes (described above). Includes transfer as well as additional site.	e.g. dual source / fab strategy	A	Check if any other type of process change is applicable due to the transfer
		BARE DIE (Wafer process changes not covered in this section shall be handled according to section "PROCESS - WAFER PRODUCTION")						
		PROCESS - ASSEMBLY						
		PACKING/SHIPPING						
		EQUIPMENT						
		TEST FLOW						
		Q-GATE						
		Tests, which should be considered for the appropriate process change.					A	
		Tests, which should be considered for the appropriate process change after selection of condition table.						
		Suppliers performed tests (mark with an 'X' for done or 'G' for generic)						
		Reason for exception of tests and/or usage of generic data:						

Device evaluation

MATERIAL PERFORMANCE TEST RESULTS (on the basis of AEC-Q100 Revision H)
includes integrated circuits (e.g. ASICs, µ-Controller, memories, voltage regulators, smart power devices, logic devices, analog

additional to AEC-Q10x

	Line evaluation (can be evaluated by data or audit/on site check)	AEC-Q100 Revision H	Check of specification (for raw material only)	Temperature Humidity Bias or biased HAST THB A2	Autoclave or Unbiased HAST AC A3	Temperature Cycling TC A4	Power Temperature Cycling PTC A5	High Temperature Storage Life HTSL A6	High Temperature Operating Life HTOL B1	Early Life Failure Rate ELFR B2	NVM Endurance, Data Retention, and Operational Life EDR B3	Wire Bond Shear WBS C1	Wire Bond Pull WBP C2	Solderability SD C3	Physical Dimensions PD C4	Solder Ball Shear SBS C5	Lead Integrity LI C6	Electromigration EM D1	Time Depending Dielectric Breakdown TDDB D2	Hot Carrier Injection HCI D3	Negative Bias Temperature Instability NBTI D4	Stress Migration SM D5	Electronic Discharge Human Body Model HBM E2	Electronic Discharge Charged Device Model CDM E3	Latch up LU E4	Electrical Distribution ED E5	Characterisation CHAR E7	Electromagnetic Compatibility EMC E9	Short Circuit Characterization SC E10	Soft Error Rate SER E11	Lead free LF E12	Hermetic Package Test MECH G1-4	Package Drop DROP G5	Lid Torque LT G6	Die Shear DS G7	Internal Water Vapor IWV G8	Whisker test (IEC 60068-T2-82, JEDEC JESD201)	Parameter-Analysis: Comparison of current with changed device characterization, electrical distribution	For Cu Wire Products: Consider AEC-Q006	Remarks
SEM-PW-13	●	●	-	●	●	●	M	-	●	●	J	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●	-	-	-	-	-	H	-	-	H	-	-	●	●	AEC-Q100: "For broad changes that involve multiple attributes (e.g., site, materials, processes), refer to section A1.3 of this appendix and section 2.3 of Q100, which allows for the selection of worst-case test vehicles to cover all the possible permutations."
Tests, which should be considered for the appropriate process change.	●	●	-	●	●	●	M	-	●	●	J	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●	-	-	-	-	-	H	-	-	H	-	-	●	●	
Tests, which should be considered for the appropriate process change after selection of condition table.	●	●	-	●	●	●	M	-	●	●	J	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●	-	-	-	-	-	H	-	-	H	-	-	●	●	
Suppliers performed tests (mark with an 'X' for done or 'G' for generic)				x		x		x	x	x		x	x					x	x	x	x		x	x	x	x														
Reason for exception of tests and/or usage of generic data:																																								

–	Not required.
I	Information Note required.
P	PCN required.

A letter or "●" indicates that performance of that stress test should be considered for the appropriate process change.
A @ recommended additionally by ZVEI

	CONDITIONS	No
A	Only for peripheral routing	
B	For symbol rework, new cure time, temp	
C	If bond to leadfinger	
D	Design rule change	
E	Thickness only	
F	MEMS element only	
H	Hermetic only	
J	EPROM or EEPROM	
L	Lead free	
M	For devices requiring PTC	
N	Passivation and gate oxide	
P	Passivation and interlevel dielectric	
Q	Wire diameter decrease	
T	Only for Solder Ball SMD	
#	Only from non-100% burned-in parts	
*	For "burn in" changes IOL or ELFR recommended	

=> Please mark 'NO' with 'x', default is 'YES'

Worked on: (Name, Function)	Max Mustermann
Signature:	
Date:	
PCN number:	

Mark change with an "x"

Assessment of impact regarding following aspects
- contractual agreements
- technical interface of handling/processability/manufacturability of customer
- form, fit, function, quality performance, reliability

Device evaluation

MATERIAL PERFORMANCEE TEST RESULTS (on the basis of AEC-Q102 Revision A - April 6, 2020)

Selection of component	ID	Type of change	Potential impact? No	Potential impact? Yes	Understanding of semiconductors experts	Examples to explain	Evaluation level A / B / C (A: Application level, B: Board level, C: Component level, *: Not relevant for qualification matrix)	Further applicable conditions	AEC-Q102 Revision A	Check of specification (for raw material only)
LED		**LIGHT EMITTING DIODE (LED)**								
LED		**ANY**								
LED	OEC-LED-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change i applicable but the change affects agreed technical contractual agreements		*		•	-
LED	OEC-LED-AN-02	Any change with impact on technical interface or processability/manufacturability of customer, which is not covered in the matrix below	P	P	See processability on board level technical interface means component terminals		B	Check if **OEC-LED-DS-01** is affected Processability should be assessed.	•	-
LED		**DATA SHEET**								
LED	OEC-LED-DS-01	Change of data sheet parameters/electrical specification (min./max./typ. values) and/or Pulse/DC specification	P	P	Change of application relevant information (e.g. maximum pulse current) due to a technical product or process change.	e.g. change of die substrate material. e.g. change of MSL	A		•	-
LED	OEC-LED-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behaviorwhich was not specified before or whichis different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required	e.g. Errata e.g. change of typ. values due to new information about component behavior e.g. improved statistics. e.g. reduction of max. allowed forward voltage due to improved statistics.	A		•	-
LED	OEC-LED-DS-03	Specification of additional parameters	I	P	**I:** Definition of an additional parameter which was not specified before **P:** If there is a risk on supply chain where at least one additional other PCN-relevant change category will apply	I: e.g.: adding new tested parameter I: e.g.: additional temperature coefficient parameter	A		•	-
LED		**DESIGN**								
LED	OEC-LED-DE-01	Design changes in epitaxy.	P	P	Any device relevant changes in design / layout of epitaxial layers **Not included:** Changes within design rules and design specification without affecting specified functions, parameters and reliability.	e.g. change of barrier thickness	C	**A:** change from Double hetero to Quantum wells --> **OEC-LED-DS-01** (spectrum is affected)	•	-
LED	OEC-LED-DE-02	Design changes in routing/layout.	P	P	Any change in chip design / layout. Provide information if design/layout change is optical or electrical. **Not included:** Changes within design rules and design specification without affecting specified functions, parameters and reliability.	e.g. reduction of bond pad size e.g. number / arrangement of micro prisms / via holes	C	**A:** change in layout of current spreader --> **OEC-LED-DS-01** (radiation pattern changes) **A:** change in Ag mirror --> **OEC-LED-DS-01** (Popt, radiation pattern changes)	•	-
LED	OEC-LED-DE-03	Die shrink	P	P	Shrink of active area. **Not included:** sawing street/kerf/scribe line	Typical shrink of die.	A	Please check if change in process technology (**OEC-LED-PW-08**) is also affected.	•	-
LED	OEC-LED-DE-04	LED package (except leadframe)	P	P	any change in housing thickness any change in form or dimensions	e.g. change of dimensions e.g. change of x, y, or z dimension of the package	B	Check if **OEC-LED-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	•	-
LED	OEC-LED-DE-05	Design of leadframe	P	P	any change of leadframe / submount dimensions any change of outer dimensions	e.g. change in leadframe / submount dimensions in x,y, or z direction e.g. change in wirebond looping e.g. change inner design of the leadfeame not affecting the e/o performance & reliability of the device	B	Check if **OEC-LED-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case looping of wirebond is affected.	•	•
LED		**PROCESS - WAFER PRODUCTION**								
LED	OEC-LED-PW-01	New / change of wafer substrate or carrier material	P	P	New wafer substrate material.	e.g. different wafer material to currently released material (change from Sapphire to Silicon)	C	Check if **OEC-LED-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	•	•
LED	OEC-LED-PW-02	Wafer diameter	P	P	change of wafer diameter resulting in equipment and process changes	e.g. 4" to 6"	C	Typically this type of change affects other changes i.e equipment/process technology - they need to be identified in addition	•	•
LED	OEC-LED-PW-03	New final wafer thickness	P	P	Change in final wafer thickness	e.g. change in final chip/die thickness	C	Check if **OEC-LED-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	•	-
LED	OEC-LED-PW-04	Change of electrically active doping/implantation element	P	P	Change in electrically active doping / implantation element resulting in a new technology.	e.g. change from Be to C as dopant	C		•	C
LED	OEC-LED-PW-05	Change of stacking	P	P	change in layer sequence or thickness	e.g. change of isolation layer thickness between n- and p-material	A	customer application needs to be checked due to potential system voltage differences	•	-
LED	OEC-LED-PW-06	New / change of metallization (specifically chip frontside)	P	P	Change in metallization of bondpads, material, layer thickness	e.g. change in bond pad metallization thickness	C	**A:** In case of change to Aluminium metallization	•	M
LED	OEC-LED-PW-07	New / change of metallization (specifically chip backside)	P	P	Change of bottom layer of die (between die and leadframe/carrier). Change in process, material, or dimensions necessary.	e.g. change from Au to Au/Ge	C		•	M
LED	OEC-LED-PW-08	Change in process technique (e.g. significant process changes like lithography, etch, oxide deposition, die back surface preparation/backgrind, ...)	--	P	Change from wet to dry etching, change from horizontal to vertical oven for oxidation, change from contact litho into stepper litho, ...	e.g. change from wet etch to dry etch e.g. change from laser cutting (sawing) to plasma cutting (sawing) e.g. change from contact litho to stepper litho	C	**B:** change from CVD dep to sputter dep for backside/frontside metallization. In case of new equipment please check if **OEC-LED-PA-14** is also affected.	•	-
LED	OEC-LED-PW-09	Process Integrity: Tuning within specification	--	P	Variation within process specification	e.g. process control	C		•	-
LED	OEC-LED-PW-10	Change of material supplier with no impact on agreed specifications	--	P	Change of wafer supplier. Change of supplier for chemicals needed for wafer production.	**P:** e.g. change of wafer supplier.	C	Change of wafer supplier please check if **OEC-LED-PW-01** is affected.	•	-
LED	OEC-LED-PW-11	Change of specified wafer process sequence (deletion and/or additional process step)	--	P	Any change which is not covered by another type of change. Risk is to be assessed.	e.g. additional cleaning process in wafer production	C		•	-
LED	OEC-LED-PW-12	Change in die coating or passivaton	P	P	Change in material, thickness, and process for coating and passivation	e.g. change from SiO2 to SiN3	C		•	P
LED	OEC-LED-W-13	New wafer production location or transfer of wafer production to a different not previously released location/site/subcontractor	P	P	New wafer propduction location or transfer of wafer production with possible additional changes.		C	**A** or **B:** Impact on other type of changes described under PROCESS - WAFER PRODUCTION and EQUIPMENT categories of this DeQuMa	•	-
LED		**BARE DIE DELIVERIES (Wafer process changes not covered in this section shall be handled according to section "Process - Wafer Production")**								
LED	OEC-LED-BD-01	New / change of front side metallization	P	P	Change in bondpads, material, pad pitch, surface changes, layer thickness	e.g. change from Au to Au alloy e.g. change in over pad metalization	B	**A:** In case of chip-on-board technology	-	M
LED	OEC-LED-BD-02	New / change of backside metallization	P	P	Change of bottom layer of die (between die and leadframe/carrier). Change in process, material, or dimensions.	e.g. change from Au to Au alloy	B	Check if **OEC-LED-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case of chip-on-board technology	-	M
LED	OEC-LED-BD-03	Change of wafer setup or number of dies on wafer.	I	P	Needed information for pick & place machine. **I:** only additional number of chips **P:** change in spacing between chips and form of wafer	e.g. information change for pick & place machine.	B	**A:** In case of chip-on-board technology	-	-
LED	OEC-LED-BD-04	New final wafer thickness	P	P	Changes in final Chip height (including carrier); very rare and usually combined with a material change (change of carrier material)	e.g. change on converter thickness	B	Check if **OEC-LED-DS-01** is also affected. **A:** In case of chip-on-board technology	-	P
LED	OEC-LED-BD-05	Change in die coating or passivation	P	P	Change in material, thickness, and process for coating and passivation	e.g. change from SiO2 to SiN3	B	Check if **OEC-LED-DS-01** is also affected. **A:** In case of chip-on-board technology	-	P
LED		**PROCESS - ASSEMBLY**								
LED	OEC-LED-PA-01	Change of leadframe/submount base material	P	P	New leadframe/submount material (new in composition)	e.g. change from copper alloy to bare copper	B	Check if **OEC-LED-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	•	•
LED	OEC-LED-PA-02	Change of leadframe/submount finishing material (internal)	P	P	Change of surface material of die attach pad and second bond area (e.g. influence in adhesion to mold compound, wedge bond reliability)	e.g. change from Ag flash to NiPd protection layer e.g. change from Ag spot to Au spot	A		•	•
LED	OEC-LED-PA-03	Change of lead and heat slug plating material/plating thickness (external)	P	P	Change in material and process technique for final pin termination (e.g. pure tin). Herein package, processability and reliability on board level can be verified by generic data. Classification depends on impact of change	e.g. change in heat slug stack e.g. change from Sn into Ni/Pd/Au e.g. change of layer thickness	B		•	M
LED	OEC-LED-PA-04	Bump Material / Metall System (internal)	P	P	Stack die or die to substrate	e.g. change to Pb-free material	A		•	•
LED	OEC-LED-PA-05	Die attach material	P	P	Change of die attach material (e.g. soft solder, epoxy, etc). Thermal managment must be respected.	e.g. change of Ag glue to Au glue;	B	**A:** In case Rth is changing	•	•
LED	OEC-LED-PA-06	Change of wire bonding	P	P	Material, diameter, change in bonding diagram and / or change in process resulting in a new technology.	e.g. change from Au to Cu material e.g. change from 25µm to 23µm diameter e.g. change from single to double bond e.g. change from stitch bond to stitch on ball bond.	A		•	•
LED	OEC-LED-PA-07	Change in material for sub-components (excluding LED chip & LED package related items) with impact on agreed specifications	P	P	Change of sub-component supplier using different technology/materials **Note:** Jump start test at OEMs might be necessary	e.g. using a different ESD-diode in technology and material than previously	A	Check if **OEC-LED-DS-01** is also affected.	•	-
LED	OEC-LED-PA-08	Die Overcoat / Underfill	--	P	Supporting layers for complex packages like flip chip. --: No change in product integrity P: change can influence the integrity of final product	P: e.g. change of underfill with change of thermal resistance	B	Check if **OEC-LED-DS-01** is also affected.	•	P
LED	OEC-LED-PA-09	Change of mold compound/encapsulation/sealing material	P	P	Change of mold compound, encapsulation, or sealing material might be affected optical function in case of package related effect (e.g. browning). Component assembly and board coating has to be assessed. MSL might be changed.	e.g. PPA mold compound	A	Check if **OEC-LED-DS-01** is also affected.	•	•
LED	OEC-LED-PA-10	Change of conversion material	P	P	Change of material class.	e.g. change from granats to nitrides	C	Check if **OEC-LED-DS-01** is affected for optical/photometric parameters	•	•
LED	OEC-LED-PA-11	Change of direct supplier for converter material	--	P	New supplier with same material specification		C		•	•
LED	OEC-LED-PA-12	Change of converter process technology	I	P	new technology for converter production **I:** no influence on e/o performance of product **P:** in case of impact on product integrity	e.g. change from volume conversion to layer conversion; e.g. change from stamping to printing of layer	C	Check if any change in electro-optical characteristics results in change of data sheet **OEC-LED-DS-01**	•	-
LED	OEC-LED-PA-13	Change of product marking	I	P	Marking on device. **I:** change in appearance; readability not affected **P:** change of content or change of appearance of data	e.g. marking of cathode;	B		•	-
LED	OEC-LED-PA-14	Change in process technique (e.g., die attach, molding, plating, trim and form, ...)	P	P	Any change in assembly process technique	e.g. change die attached from gluing to soldering;	B	**A** or **B:** Please check if **EQUIPMENT** and other type of changes of material (**OEC-LED-PA-04/05/07/08/09/10**) are affected. If the process change is covered in a separate change ID only this is applicable.	•	-
LED	OEC-LED-PA-15	Process Integrity: Tuning within specification	--	P	Variation within process specification	e.g. process control	C		•	-
LED	OEC-LED-PA-16	Change of direct material supplier with no impact on specification	--	P	Change of suppliers e.g. for lead frames, wire material, die attach, electronical components ...	Change of suppliers e.g. for lead frames, wire material, ESD-diode ...	C	Assumption that change material specification remains unchanged. Otherwise see change of material	•	•
LED	OEC-LED-PA-17	Change of specified assembly process sequence (additional and/or deletion of process step)	I	P	Addition or deletion of a process step in assembly process sequence with potentially significant impact on the product performance **I:** no influence on product integrity **P:** influence on product integrity expected	e.g. additional or deletion plasma cleaning process	C	Single case assessment necessary to identify possible interactions or risk.	•	-
LED	OEC-LED-PA-18	New assembly location or transfer of assembly to a different not previously released location/site/subcontractor	P	P	Assembly transfer or relocation. Includes transfer as well as additional site.	e.g. dual source / fab strategy	C	**A** or **B:** Impact on other type of changes described under **PROCESS ASSEMBLY** and **EQUIPMENT OEC-LED-EQ-01**	•	-
LED		**PACKING/SHIPPING**								
LED	OEC-LED-PS-01	Outer Packing/shipping specification change	I	P	dimension changes indirect product packing I: small changes in dimension or appearance P: number of reels in the packing are changing	e.g. pizza box	*		•	-
LED	OEC-LED-PS-02	Dry pack requirement change	I	P	(I): Relaxation of dry pack requirements (P): Tightening of dry pack requirements	**(I):** MSL 3 → MSL 1 **(P):** MSL 1 → MSL 3	B	Check if **OEC-LED-DS-01** is also affected.	•	-
LED	OEC-LED-PS-03	Inner Packing/shipping specification change	P	P	dimension change of direct product packing	e.g. SMT pocket in tape changes	B		•	P
LED	OEC-LED-PS-04	Change of labelling	I	P	Change of labelling also on reel. I: additional information no change of previous information P: change in content of previous information	(I) e.g. additional information (RoHS stamp) (P) e.g. change of customer specific information	B	Check if **OEC-LED-DS-01** is also affected.	•	-
LED		**EQUIPMENT**								
LED	OEC-LED-EQ-01	Production from a new equipment/tool which uses a different basic technology	P	P	Change in process technique which is not already covered above. **Note:** Major changes affecting the product not covered by the table require also a PCN.	e.g change from single wafer to batch process e.g. over pad metallisation e.g. dambar cutting (mechanical to laser cutting)	B	Check if **LED-DS-01** is also affected. Corrosion stability should be assessed.	•	-
LED	OEC-LED-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool) without change of process.	--	P	PCN required for dedicated equipment for sensitive component production. **(--):** If change does not influence the ingetrity of the final product **(P):** If impact on product integrity is anticipated.	e.g. change from single site to multi site handler. **(--):** e.g. extension of existing equipment pool, already qualified. **(P):** e.g. extension of dedicated equipment in case basic technology still need to be proven.	C		•	-
LED	OEC-LED-EQ-03	Change in final test equipment type that uses a different technology	I	P	Change of tester platform (e.g. major test program changes , new tester interface, ...). **I:** product specification is not affected **P:** product specification is affected	e.g. change in test method from cd to lumen	C	**B:** In case of bare die delivery	•	-
LED		**TEST FLOW**								
LED	OEC-LED-TF-01	Move of all or part of electrical wafer test and/or final test to a different location/site/subcontractor	P	P	Tester transfer or relocation.	e.g. Dual source strategy	C	**B:** In case of bare die delivery	•	-
LED		**Q-GATE**								
LED	OEC-LED-QG-01	Change of the test coverage/testing process flow used by the supplier to ensure data sheet compliance (e.g. elimination/addition of electrical measurement/test flow block; relaxation/enhancement of monitoring procedure or sampling)	--	P	e.g. test flow block, reduction from three temperature measurements to two temperature measurements, change in burn in / run in process. **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. test implemented without customer requirement **(P):** e.g. reduction from three temperature measurements to two temperature measurements e.g. change in burn in / run in process.	C		•	-
LASER DIODE		**LASER DIODE (LD)**								
LASER DIODE		**ANY**								
LASER DIODE	OEC-LAS-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change if applicable but the change affects agreed technical contractual agreements.		*		•	-
LASER DIODE	OEC-LAS-AN-02	Any change with impact on technical interface or processability/manufacturabilty of customer, which is not covered in the matrix below	P	P	See processability on board level technical interface means component terminals		B	Check if **OEC-LAS-DS-01** is affected Processability should be assessed.	•	-
LASER DIODE		**DATA SHEET**								
LASER DIODE	OEC-LAS-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and/or Pulse/DC specification	P	P	Change of application relevant information (e.g. maximum pulse current) due to a technical product or process change.	e.g. change of die substrate material. e.g. change of resonator cavity length e.g. change of MSL	A		•	-
LASER DIODE	OEC-LAS-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required	e.g. Errata e.g. change of typ. values due to new information about component behavior e.g. improved statistics. e.g. reduction of max. allowed forward voltage due to improved statistics.	A		•	-
LASER DIODE	OEC-LAS-DS-03	Specification of additional parameters	I	P	**I:** Definition of an additional parameter which was not specified before **P:** If there is a risk on supply chain where at least one additional other PCN-relevant change category will apply.	I: e.g.: adding new tested parameter I: e.g.: additional temperature coefficient parameter	A		•	-
LASER DIODE		**DESIGN**								
LASER DIODE	OEC-LAS-DE-01	Design changes in epitaxy.	P	P	Any device relevant changes in design / layout of epitaxial layers **Not included:** Changes within design rules and design specification without affecting specified functions, parameters and reliability.	e.g. change of barrier thickness e.g change of waveguide layers	C	**A:** In case of LiDAR application is affected	•	-
LASER DIODE	OEC-LAS-DE-02	Design changes in routing/layout.	P	P	Any change in chip design / layout. Provide information if design/layout change is optical or electrical. **Not included:** Changes within design rules and design specification without affecting specified functions, parameters and reliability.	e.g. change in layout of current spreader; thickness of current spreader e.g. reduction of bond pad size e.g. set-back of bond pad from laser facet e.g. change of heat spreader dimension and positioning of laser die	C	**A:** In case of LiDAR application is affected	•	-
LASER DIODE	OEC-LAS-DE-03	Die shrink	P	P	Shrink of active area. **Not included:** sawing street/kerf/scribe line	Typical shrink of die.	A	Please check if change in process technology (**OEC-LAS-PW-08**) is also affected	•	-
LASER DIODE	OEC-LAS-DE-04	Laser package (except leadframe)	P	P	any change in housing thickness any change in form or dimensions	e.g. change of dimensions e.g. change of x, y, or z dimension of the package	B	Check if **OEC-LAS-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case of LiDAR appliaction is affected.	•	-
LASER DIODE	OEC-LAS-DE-05	Design of leadframe	P	P	any change of leadframe / submount dimensions any change of outer dimensions	e.g. change in leadframe / carrier dimensions in x,y, or z direction e.g. change in wirebond looping e.g. change inner design of the leadfeame not affecting the e/o performance & reliability of the device	B	Check if **OEC-LAS-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case looping of wirebond is affected.	•	•
LASER DIODE		**PROCESS - WAFER PRODUCTION**								
LASER DIODE	OEC-LAS-PW-01	New / change of wafer substrate or carrier material	P	P	New wafer substrate material.	e.g. different wafer material to currently released material (change from Sapphire to Silicon) e.g. different orientation of epitaxial substrate	C	Check if **OEC-LAS-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case of LiDAR application is affected	•	•
LASER DIODE	OEC-LAS-PW-02	Wafer diameter	P	P	change of wafer diameter resulting in equipment and process changes	e.g. 4" to 6"	C	Typically this type of change affects other changes i.e equipment/process technology - they need to be identified in addition	•	•
LASER DIODE	OEC-LAS-PW-03	New final wafer thickness	P	P	Change in final wafer thickness	e.g. change in final chip/die thickness	C	Check if **OEC-LAS-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	•	-
LASER DIODE	OEC-LAS-PW-04	Change of electrically active doping/implantation element	P	P	Change in electrically active doping / implantation element resulting in a new technology.	e.g. change from Be to C as dopant	C		•	C
LASER DIODE	OEC-LAS-PW-05	Change of stacking	P	P	change in layer sequence or thickness	e.g. change of isolation layer thickness between n- and p-material	A	For LiDAR: Typical change of electrical or optical parameters within specification needs to be evaluated on application level.	•	-
LASER DIODE	OEC-LAS-PW-06	New / change of metallization (specifically chip frontside)	P	P	Change in metallization of bondpads, material, layer thickness	e.g. change in bond pad metallization thickness	C		•	M
LASER DIODE	OEC-LAS-PW-07	New / change of metallization (specifically chip backside)	P	P	Change of bottom layer of die (between die and leadframe/carrier). Change in process, material, or dimensions necessary.	e.g. change from Au to Au/Ge	C		•	M
LASER DIODE	OEC-LAS-PW-08	Change in process technique (e.g. significant process changes like lithography, etch, oxide deposition, die back surface preparation/backgrind, ...)	--	P	Change from wet to dry etching, change from horizontal to vertical oven for oxidation, change from contact litho into stepper litho, ...	e.g. change from wet etch to dry etch e.g. change from laser cutting (sawing) to plasma cutting (sawing) e.g. change from contact litho to stepper litho	C	**B:** change from CVD dep to sputter dep for backside/frontside metallization. In case of new equipment please check if **OEC-LAS-PA-17** is also affected.	•	-
LASER DIODE	OEC-LAS-PW-09	Process Integrity: Tuning within specification	--	P	Variation within process specification	e.g. process control	C		•	-
LASER DIODE	OEC-LAS-PW-10	Change of material supplier with no impact on agreed specifications	--	P	Change of wafer supplier. Change of supplier for chemicals needed for wafer production.	P: e.g. change of wafer supplier.	C	Change of wafer supplier please check if **OEC-LAS-PW-01** is affected	•	-
LASER DIODE	OEC-LAS-PW-11	Change of specified wafer process sequence (deletion and/or additional process step)	--	P	Any change which is not covered by another type of change. Risk is to be assessed.	e.g. additional cleaning process in wafer production	C		•	-
LASER DIODE	OEC-LAS-PW-12	New / change of facet passivation	--	P	Change of material, thickness, process and stacking for AR/HR mirror coating	e.g. reduction of AR reflectivity by reducing no of stacks e.g. change from SiO2 to SiN3	C	Check if **OEC-LAS-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	•	-
LASER DIODE	OEC-LAS-PW-13	Change in die coating or passivation	P	P	Change in material, thickness, and process for coating and passivation	e.g. change from SiO2 to SiN3	C		•	P
LASER DIODE	OEC-LAS-PW-14	New wafer production location or transfer of wafer production to a different not previously released location/site/subcontractor	P	P	New wafer propduction location or transfer of wafer production with possible additional changes.		C	**A** or **B:** Impact on other type of changes described under PROCESS - WAFER PRODUCTION and EQUIPMENT categories of this DeQuMa	•	-
LASER DIODE		**BARE DIE DELIVERIES (Wafer process changes not covered in this section shall be handled according to section "Process - Wafer Production")**								
LASER DIODE	OEC-LAS-BD-01	New / change of front side metallization	P	P	Change in bondpads, material, pad pitch, surface changes, layer thickness	e.g. change from Au to Au alloy e.g. change in over pad metalization	B	**A:** In case of chip-on-board technology	-	M
LASER DIODE	OEC-LAS-BD-02	New / change of backside metallization	P	P	Change of bottom layer of die (between die and leadframe/carrier). Change in process, material, or dimensions.	e.g. change from Au to Au alloy	B	Check if **OEC-LAS-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case of chip-on-board technology	-	M
LASER DIODE	OEC-LAS-BD-03	Change of wafer setup or number of dies on wafer.	I	P	Needed information for pick & place machine. **I:** only additional number of chips **P:** change in spacing between chips and form of wafer	e.g. information change for pick & place machine.	B	**A:** In case of chip-on-board technology	-	-
LASER DIODE	OEC-LAS-BD-04	New final wafer thickness	P	P	Changes in final Chip height (including carrier); very rare and usually combined with a material change (change of carrier material)		B	Check if **OEC-LAS-DS-01** is also affected. **A:** In case of chip-on-board technology	-	P
LASER DIODE	OEC-LAS-BD-05	Change in die coating or passivation	P	P	Change in material, thickness, and process for coating and passivation	e.g. change from SiO2 to SiN3	B	Check if **OEC-LAS-DS-01** is also affected. **A:** In case of chip-on-board technology	-	P
LASER DIODE		**PROCESS - ASSEMBLY**								
LASER DIODE	OEC-LAS-PA-01	Change of leadframe/submount base material	P	P	New leadframe/submount material (new in composition)	e.g. change from copper alloy to bare copper e.g. change from SiC to AlN	B	Check if **OEC-LAS-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	•	•
LASER DIODE	OEC-LAS-PA-02	Change of leadframe/submount finishing material (internal)	P	P	Change of surface material of die attach pad and second bond area (e.g. influence in adhesion to mold compound, wedge bond reliability)	e.g. change from Ag flash to NiPd protection layer e.g. change from Ag spot to Au spot e.g. change from NiPd to NiPdAu	A		•	•
LASER DIODE	OEC-LAS-PA-03	Change of lead and heat slug plating material/plating thickness (external)	P	P	Change in material and process technique for final pin termination (e.g. pure tin). Herein package, processability and reliability on board level can be verified by generic data. Classification depends on impact of change	e.g. change in heat slug stack e.g. change from Sn into Ni/Pd/Au e.g. change of layer thickness	B		•	M
LASER DIODE	OEC-LAS-PA-04	Bump Material / Metal System (internal)	P	P	Stack die or die to substrate	e.g. change to Pb-free material	A		•	•
LASER DIODE	OEC-LAS-PA-05	Die attach material	P	P	Change of die attach material (e.g. soft solder, epoxy, etc). Thermal management must be respected.	e.g. Au glue to AuSn soldering	B	**A:** In case Rth is changing	•	•
LASER DIODE	OEC-LAS-PA-06	Change of wire bonding	P	P	Material, diameter, change in bonding diagram and / or change in process resulting in a new technology.	e.g. change from Au to Cu material e.g. change from 25µm to 23µm diameter e.g. change from single to double bond e.g. change from stich bond to stich on ball bond.	A		•	•
LASER DIODE	OEC-LAS-PA-07	Change in material for sub-components (excluding Laser chip & Laser package related items) with impact on agreed specifications	P	P	Change of sub-component supplier using different technology/materials **Note:** Jump start test at OEMs might be necessary	e.g. using a different ESD- or photodiode in technology and material than previously	A	Check if **OEC-LAS-DS-01** is also affected.	•	-
LASER DIODE	OEC-LAS-PA-08	Die Overcoat / Underfill	--	P	Supporting layers for complex packages like flip chip. --: No change in product integrity P: change can influence the integrity of final product	P: e.g. change of underfill with change of thermal resistance	B	Check if **OEC-LAS-DS-01** is also affected.	•	P
LASER DIODE	OEC-LAS-PA-09	Change of mold compound/encapsulation/sealing material	P	P	Change of mold compound, encapsulation, or sealing material might be affected optical function in case of package related effect (e.g. browning). Component assembly and board coating has to be assessed. MSL might be changed.	e.g. PPA mold compound	A	Check if **OEC-LAS-DS-01** is also affected.	•	•
LASER DIODE	OEC-LAS-PA-10	Change of conversion material	P	P	Change of material class.	e.g. change from granats to nitrides	A	Check if **OEC-LAS-DS-01** is affected for optical/photometric parameters	•	•
LASER DIODE	OEC-LAS-PA-11	Change of direct supplier for converter material	--	P	New supplier with same material specification		A		•	•
LASER DIODE	OEC-LAS-PA-12	Change of converter process technology	I	P	new technology for converter production **I:** no influence on e/o performance of product **P:** in case of impact on product integrity	e.g. change from volume conversion to layer conversion; e.g. change from stamping to printing of layer e.g. change converter attach technology	A	Check if any change in electro-optical characteristics results in change of data sheet **OEC-LAS-DS-01**	•	-
LASER DIODE	OEC-LAS-PA-13	Change of assembly of additional internal components (e.g. lenses)	--	P	Change in assembly process for internal components P: in case of impact on product integrity	e.g. change from soldering to gluing process	C	Check if any change in electro-optical characteristics results in change of data sheet **OEC-LAS-DS-01**	•	-

LASER DIODE	OEC-LAS-PA-14	Change of material and / or supplier of additional internal components	--	P	Change of supplier using different technology/materials P: in case of impact on product integrity	e.g. change of lens material, optic properties e.g. change of submount material	C	Check if any change in electro-optical characteristics results in change of data sheet **OEC-LAS-DS-01**	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
LASER DIODE	OEC-LAS-PA-15	Generation of hermeticity	P	P	new technology for hermeticity	e.g. change of welding process for metal cans e.g. change of gluing of transmissive window	C	Check if any change in electro-optical characteristics results in change of data sheet **OEC-LAS-DS-01** **B:** In case processability is affected (e.g. laser soldering)	-	•	-	-	-	4	-	4	4	-	-	-	-	-	-	-	-	-	4	-	-	-	4	4	-	-		4	4	4	4	-	
LASER DIODE	OEC-LAS-PA-16	Change of product marking	I	P	Marking on device. **I:** change in appearance; readability not affected **P:** change of content or change of appearance of data matrix code	e.g. marking of cathode;	B		-	•	-	-	-	-	-	O	-	-	-	-	-	-	-	-	-	-	T	-	T	-	-	-	-	-	-	-	-	-	-	-	
LASER DIODE	OEC-LAS-PA-17	Change in process technique (e.g., die attach, molding, plating, trim and form, ...)	P	P	Any change in assembly process technique	e.g. change die attached from gluing to soldering;	B	**A** or **B:** Please check if **EQUIPMENT** and other type of changes of material (**OEC-LAS-PA-04/05/07/08/09/10**) are affected If the process change is covered in a separate change ID only this is applicable.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
LASER DIODE	OEC-LAS-PA-18	Process Integrity: Tuning within specification	--	P	Variation within process specification	e.g. process control	C		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LASER DIODE	OEC-LAS-PA-19	Change of direct material supplier with no impact on specification	--	P	Change of suppliers e.g. for lead frames, wire material, die attach, electronical components ...	Change of suppliers e.g. for lead frames, wire material, ESD-diode ...	C	Assumption that change material specification remains unchanged. Otherwise see change of material.	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	See change of material.
LASER DIODE	OEC-LAS-PA-20	Change of specified assembly process sequence (additional and/or deletion of process step)	I	P	Addition or deletion of a process step in assembly process sequence with potentially significant impact on the product performance **I:** no influence on product integrity **P:** influence on product integrity expected	e.g. additional or deletion plasma cleaning process	C	Single case assessment necessary to identify possible interactions or risk.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
LASER DIODE	OEC-LAS-PA-21	New assembly location or transfer of assembly to a different not previously released location/site/subcontractor	P	P	Assembly transfer or relocation. Includes transfer as well as additional site.	e.g. dual source / fab strategy	C	**A** or **B:** Impact on other type of changes described under **PROCESS ASSEMBLY** and **EQUIPMENT OEC-LAS-EQ-01** **A:** In case LiDAR application is affected	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
LASER DIODE		PACKING/SHIPPING																																							
LASER DIODE	OEC-LAS-PS-01	Outer Packing/shipping specification change	I	P	dimension changes indirect product packing **I:** small changes in dimension or appearance **P:** number of reels in the packing are changing	e.g. pizza box	*		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LASER DIODE	OEC-LAS-PS-02	Dry pack requirement change	I	P	**(I):** Relaxation of dry pack requirements **(P):** Tightening of dry pack requirements	**(I):** MSL 3 → MSL 1 **(P):** MSL 1 → MSL 3	B	Check if **OEC-LAS-DS-01** is also affected.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LASER DIODE	OEC-LAS-PS-03	Inner Packing/shipping specification change	P	P	dimension change of direct product packing	e.g. SMT pocket in tape changes e.g. change of tube/tray layout	B		-	•	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	-	-	-	-	P	P	-	-	-	-	-	
LASER DIODE	OEC-LAS-PS-04	Change of labelling	I	P	Change of labelling also on reel. **I:** additional information no change of previous information **P:** change in content of previous information	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B	Check if **OEC-LAS-DS-01** is also affected.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LASER DIODE		EQUIPMENT																																							
LASER DIODE	OEC-LAS-EQ-01	Production from a new equipment/tool which uses a different basic technology	P	P	Change in process technique which is not already covered above. **Note:** Major changes affecting the product not covered by the table require also a PCN.	e.g. change from single wafer to batch process e.g. over pad metalisation e.g. dambar cutting (mechanical to laser cutting)	B	Check if **OEC-LAS-DS-01** is also affected. Corrosion stability should be assessed. **A:** In case LiDAR application is affected.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
LASER DIODE	OEC-LAS-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool) without change of process.	--	P	PCN required for dedicated equipment for sensitive component production. **(--):** If change does not influence the ingetrity of the final product **(P):** If impact on product integrity is anticipated.	e.g. change from single site to multi site handler. **(--):** e.g. extension of existing equipment pool, already qualified. **(P):** e.g. extension of dedicated equipment in case basic technology still need to be proven.	C		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
LASER DIODE	OEC-LAS-EQ-03	Change in final test equipment type that uses a different technology	I	P	Change of tester platform (e.g. major test program changes , new tester interface, ...). **I:** product specification is not affected **P:** product specification is affected	e.g. change in test method from cd to lumen e.g. change of nearfield measurement (LiDAR)	B		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	-	-	-	-	•	•	-	-	-	-	•	Gage R&R / delta correlation
LASER DIODE		TEST FLOW																																							
LASER DIODE	OEC-LAS-TF-01	Move of all or part of electrical wafer test and/or final test to a different location/site/subcontractor	P	P	Tester transfer or relocation.	e.g. Dual source strategy	C		•	•	-	•	-	B	-	•	B	-	-	B	-	B	B	B	-	-	•	-	T	-	-	-	-	•	•	-	-	-	-	•	Gage R&R / delta correlation; additional specification check B should be considered for Wafer testing
LASER DIODE		Q-GATE																																							
LASER DIODE	OEC-LAS-QG-01	Change of the test coverage/testing process flow used by the supplier to ensure data sheet compliance (e.g. elimination/addition of electrical measurement/test flow block; relaxation/enhancement of monitoring procedure or sampling)	--	P	e.g. test flow block, reduction from three temperature measurements to two temperature measurements, change in burn in / run in process. **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. test implemented without customer requirement **(P):** e.g. reduction from three temperature measurements to two temperature measurements e.g. change in burn in / run in process.	C	**A:** In case LiDAR application is affected	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	
PD		PHOTO DIODE / PHOTO TRANSISTOR (PD)																																							
PD		ANY																																							
PD	OEC-PD-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change if applicable but the change affects agreed technical contractual agreements.		*		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PD	OEC-PD-AN-02	Any change with impact on technical interface or processability/manufacturability of customer, which is not covered in the matrix below	P	P	See processability on board level technical interface means component terminals		B	Check if **OEC-PD-DS-01** is affected Processability should be assessed.	-	•	-	-	-	-	-	T	-	-	-	-	-	-	-	-	-	-	S,T	-	-	-	-	-	-	-	-	-	-	-	-	-	
PD		DATA SHEET																																							
PD	OEC-PD-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and/or Pulse/DC specification	P	P	Change of application relevant information (e.g. maximum pulse current) due to a technical product or process change.	e.g. change of die substrate material. e.g. PD: change of doping level (sensitivity) e.g. change of MSL	A		-	•	-	-	E	-	-	E	-	E	-	-	-	-	-	-	-	-	S	E	-	-	-	-	-	E	E	-	-	-	-	E	
PD	OEC-PD-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required	e.g. Errata e.g. change of typ. values due to new information about component behavior e.g. improved statistics. e.g. reduction of max. allowed forward voltage due to improved statistics	A		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PD	OEC-PD-DS-03	Specification of additional parameters	I	P	**I:** Definition of an additional parameter which was not specified before **P:** If there is a risk on supply chain where at least one additional other PCN-relevant change category will apply.	I: e.g.: adding new tested parameter I: e.g.: additional temperature coefficient parameter	A		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	Formalism since this is not a product change, only additional information Classification: C
PD		DESIGN																																							
PD	OEC-PD-DE-01	Design changes in epitaxy.	P	P	Any device relevant changes in design / layout of epitaxial layers **Not included:** Changes within design rules and design specification without affecting specified functions, parameters and reliability	e.g. change of barrier thickness e.g. change of doping profile / layer thickness	C	**A:** In case of Avalanche Photodiode (APD) and Single-Photon Avalanche Diode (SPAD)	-	•	-	-	•	-	•	-	-	•	-	-	-	-	-	-	-	H	-	-	-	-	-	-	-	•	•	-	-	-	-	•	
PD	OEC-PD-DE-02	Design changes in routing/layout.	P	P	Any change in chip design / layout. Provide information if design/layout change is optical or electrical. **Not included:** Changes within design rules and design specification without affecting specified functions, parameters and reliability.	e.g. reduction of bond pad size e.g. change in pixel size and fill factor	C	**A:** Change of optical characteristics	-	•	-	-	•	-	•	•	-	•	-	-	-	B	B	D,M	-	M	•	-	-	-	M	M	•	-	-	-	-	-	-	•	TR might be considered for complex die bond technologies
PD	OEC-PD-DE-03	Die shrink	P	P	Shrink of active area. **Not included:** sawing street/kerf/scribe line	Typical shrink of die.	A	Please check if change in process technology (**OEC-PD-PW-08**) is also affected.	-	•	-	-	•	-	•	•	-	•	-	-	-	B	B	•	-	-	•	•	-	-	-	-	-	•	•	-	-	-	-	•	
PD	OEC-PD-DE-04	PD package (except leadframe)	P	P	any change in housing thickness any change in form or dimensions	e.g. change of dimensions e.g. change of x, y, or z dimension of the package	B	Check if **OEC-PD-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case of LiDAR appliaction is affected.	-	•	-	-	•	-	•	•	-	•	-	-	•	B	B	D	-	D	•	L	T	-	D	D	•	-	-	5	5	5	4	•	
PD	OEC-PD-DE-05	Design of leadframe	P	P	any change of leadframe / submount dimensions any change of outer dimensions	e.g. change in leadframe / carrier dimensions in x,y, or z direction e.g. change inner design of the leadfeame not affecting the e/o performance & reliability of the device	B	Check if **OEC-PD-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	-	•	•	-	•	-	•	•	-	•	-	-	•	B	B	D	-	-	•	•	T	2	-	-	•	•	•	5	5	5	4	•	
PD		PROCESS - WAFER PRODUCTION																																							
PD	OEC-PD-PW-01	New / change of wafer substrate or carrier material	P	P	New wafer substrate material.	e.g. different wafer material to currently released material (change from Sapphire to Silicon)	C	Check if **OEC-PD-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case of LiDAR application is affected.	-	•	•	-	P	-	•	P	-	•	-	-	-	-	-	•	-	P	•	•	-	-	P	P	P	P	P	-	-	-	-	•	
PD	OEC-PD-PW-02	Wafer diameter	P	P	change of wafer diameter resulting in equipment and process changes	e.g. 4" to 6"	C	Typically this type of change affects other changes i.e equipment/process technology - they need to be identified in addition	•	•	•	-	•	-	-	-	-	•	-	-	-	-	-	-	-	-	•	•	-	-	-	-	-	P	P	-	-	-	-	•	
PD	OEC-PD-PW-03	New final wafer thickness	P	P	Change in final wafer thickness	e.g. change in final chip/die thickness	C	Check if **OEC-PD-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	-	•	-	-	P	-	•	•	-	•	-	-	-	B	B	•	-	-	-	•	-	-	-	-	•	P	P	-	-	-	-	•	
PD	OEC-PD-PW-04	Change of electrically active doping/implantation element	P	P	Change in electrically active doping / implantation element resulting in a new technology.	e.g. change from Be to C as dopant	C		-	•	C	-	C	-	C	-	-	•	-	-	-	-	-	-	-	-	-	•	-	-	-	-	-	•	•	-	-	-	-	•	
PD	OEC-PD-PW-05	Change of stacking	P	P	change in layer sequence or thickness	e.g. change of isolation layer thickness between n- and p-material e.g. change of micro lens layer	A		-	•	-	-	•	-	•	F	-	•	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	•	•	-	-	-	-	•	
PD	OEC-PD-PW-06	New / change of metallization (specifically chip frontside)	P	P	Change in metallization of bondpads, material, layer thickness	e.g. change in bond pad metallization thickness	C	**A:** In case of change to Aluminium metallization	-	•	M	-	•	-	•	•	-	•	-	-	-	•	•	-	-	M	-	-	-	-	M	M	D,M	M,B	M,B	-	-	-	-	•	
PD	OEC-PD-PW-07	New / change of metallization (specifically chip backside)	P	P	Change of bottom layer of die (between die and leadframe/carrier). Change in process, material, or dimensions necessary.	e.g. change from Au to Au/Ge	C		-	•	M	-	•	-	•	•	-	•	-	-	-	-	-	•	-	D,M	•	D,M	-	-	D,M	D,M	D,M	D,M	D,M	-	-	-	-	•	
PD	OEC-PD-PW-08	Change in process technique (e.g. significant process changes like lithography, etch, oxide deposition, die back surface preparation/backgrind, ...)	--	P	Change from wet to dry etching, change from horizontal to vertical oven for oxidation, change from contact litho into stepper litho, ...	e.g. change from wet etch to dry etch e.g. change from laser cutting (sawing) to plasma cutting (sawing) e.g. change from contact litho to stepper litho	C	**B:** change from CVD dep to sputter dep for backside/frontside metallization. In case of new equipment please check if **OEC-PD-PA-15** is also affected.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
PD	OEC-PD-PW-09	Process Integrity: Tuning within specification	--	P	Variation within process specification	e.g. process control	C		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PD	OEC-PD-PW-10	Change of material supplier with no impact on agreed specifications	--	P	Change of wafer supplier. Change of supplier for chemicals needed for wafer production.	P: e.g. change of wafer supplier.	C	Change of wafer supplier please check if **OEC-PD-PW-01** is	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
PD	OEC-PD-PW-11	Change of specified wafer process sequence (deletion and/or additional process step)	--	P	Any change which is not covered by another type of change. Risk is to be assessed.	e.g. additional cleaning process in wafer production	C		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change. PPAP has to be updated.
PD	OEC-PD-PW-12	Change in die coating or passivation	P	P	Change in material, thickness, and process for coating and passivation	e.g. change from SiO_2 to SiN_3 e.g. change of anti-reflective coating e.g. change of micro lens layer (Avalanche Photodiode (APD) / Single-Photon Avalanche Diode (SPAD))	C	**B:** In case optical characteristics of anti-reflectice coating (ARC) are changed	-	•	P	-	•	-	P	•	-	•	-	-	-	P	P	-	-	P	-	-	-	-	P	P	P	P	P	-	-	-	-	•	
PD	OEC-PD-PW-13	New wafer production location or transfer of wafer production to a different not previously released location/site/subcontractor	P	P	New wafer propduction location or transfer of wafer production with possible additional changes.		C	**A** or **B:** Impact on other type of changes described under PROCESS - WAFER PRODUCTION and EQUIPMENT categories of this DeQuMa **A:** In case of LiDAR application is affected.	•	•	-	-	•	-	-	•	-	•	-	-	-	•	•	•	-	-	•	J	-	-	-	-	-	•	•	-	-	-	-	•	
PD		BARE DIE DELIVERIES (Wafer process changes not covered in this section shall be handled according to section "Process - Wafer Production")																																							
PD	OEC-PD-BD-01	New / change of front side metallization	P	P	Change in bondpads, material, pad pitch, surface changes, layer thickness	e.g. change from Au to Au alloy e.g. change in over pad metallization	B	**A:** In case of chip-on-board technology	-	-	M	-	•	-	•	•	-	•	-	-	-	•	•	-	-	•	-	•	-	-	•	•	-	M,B	M,B	-	-	-	-	-	Reasonable package type for reliability testing to be aligned between supplier and customer
PD	OEC-PD-BD-02	New / change of backside metallization	P	P	Change of bottom layer of die (between die and leadframe/carrier). Change in process, material, or dimensions.	e.g. change from Au to Au alloy	B	Check if **OEC-PD-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case of chip-on-board technology	-	-	M	-	•	-	•	•	-	•	-	-	-	-	-	•	•	•	•	•	-	-	•	•	•	D,M	D,M	-	-	-	-	-	Customer application needs to be checked due to potential system voltage differences Reasonable package type for reliability testing to be aligned between supplier and customer
PD	OEC-PD-BD-03	Change of wafer setup or number of dies on wafer.	I	P	Needed information for pick & place machine. **I:** only additional number of chips **P:** change in spacing between chips and form of wafer	e.g. information change for pick & place machine.	B	**A:** In case of chip-on-board technology	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Reasonable package type for reliability testing to be aligned between supplier and customer
PD	OEC-PD-BD-04	New final wafer thickness	P	P	Changes in final Chip height (including carrier); very rare and usually combined with a material change (change of carrier material)		B	Check if **OEC-PD-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case of chip-on-board technology	-	-	P	-	P	-	•	•	-	•	-	-	•	B	B	•	-	-	•	•	-	-	-	-	P	P	P	-	-	-	-	•	Reasonable package type for reliability testing to be aligned between supplier and customer
PD	OEC-PD-BD-05	Change in die coating or passivation	P	P	Change in material, thickness, and process for coating and passivation	e.g. change from SiO_2 to SiN_3 e.g. change anti-reflective coating e.g. change of micro lens layer (APD, SPAD)	B	Check if **OEC-PD-DS-01** is affected which leads to a change of the electrooptic parameters or distributions. **A:** In case of chip-on-board technology	-	-	P	-	•	-	P	•	-	•	-	-	-	P	P	-	-	P	•	-	-	-	P	P	P	P	P	-	-	-	-	•	Reasonable package type for reliability testing to be aligned between supplier and customer
PD		PROCESS - ASSEMBLY																																							
PD	OEC-PD-PA-01	Change of leadframe/submount base material	P	P	New leadframe/submount material (new in composition)	e.g. change from copper alloy to bare copper	B	Check if **OEC-PD-DS-01** is affected which leads to a change of the electrooptic parameters or distributions.	-	•	•	-	•	-	-	•	-	P	-	-	-	•	•	•	3	A	•	P,1	•	P	A	A	•	-	-	-	-	-	-	-	Explanation should be provided in case H2S test is not applicable Regarding applicable materials please refer to the Whisker standard.
PD	OEC-PD-PA-02	Change of leadframe/submount finishing material (internal)	P	P	Change of surface material of die attach pad and second bond area (e.g. influence in adhesion to mold compound, wedge bond reliability)	e.g. change from Ag flash to NiPd protection layer e.g. change from Ag spot to Au spot	A		-	•	•	-	•	-	-	•	-	P	-	-	-	•	•	•	-	A	•	P,1	•	-	A	A	@P	-	-	-	-	-	-	-	H2S test should be considered for automotive exterior applications. explanation should be provided in case H2S test is not applicable
PD	OEC-PD-PA-03	Change of lead and heat slug plating material/plating thickness (external)	P	P	Change in material and process technique for final pin termination (e.g. pure tin). Herein package, processability and reliability on board level can be verified by generic data. Classification depends on impact of change	e.g. change in heat slug stack e.g. change from Sn into Ni/Pd/Au e.g. change of layer thickness	B		-	•	M	-	K	-	-	•	-	P	-	-	1	-	-	-	-	A	•	P,1	•	K	A	A	-	-	-	-	-	-	-	-	Explanation should be provided in case H2S test is not applicable Regarding applicable materials please refer to the Whisker standard.
PD	OEC-PD-PA-04	Bump Material / Metal System (internal)	P	P	Stack die or die to substrate	e.g. change to Pb-free material	A		-	•	•	-	•	-	•	•	-	•	-	-	-	-	-	•	-	W	•	•	-	-	W	W	•	-	-	-	-	-	-	-	
PD	OEC-PD-PA-05	Die attach material	P	P	Change of die attach material (e.g. soft solder, epoxy, etc). Thermal management must be respected	e.g. change of Ag glue to Au glue;	B		-	•	•	-	•	-	•	•	-	•	-	-	-	-	-	•	-	N	•	•	-	-	Q	Q	•	-	-	N	N	N	-	-	
PD	OEC-PD-PA-06	Change of wire bonding	P	P	Material, diameter, change in bonding diagram and / or change in process resulting in a new technology.	e.g. change from Au to Cu material e.g. change from 25µm to 23µm diameter e.g. change from single to double bond e.g. change from stich bond to stich on ball bond.	A		-	•	•	-	P,D	-	•	•	-	•	-	-	-	•	•	-	-	-	•	-	-	-	P,D	P,D	-	-	-	D,@P	D,@P	D,@P	-	-	Site audit for material change with impact on bondprocess (e.g. from Au to Cu) recommended.
PD	OEC-PD-PA-07	Change in material for subcomponents (excluding photodiode/transistor chip & package related items) with impact on agreed specifications	P	P	Change of sub-component supplier using different technology/materials	e.g. using different NTC diode in technology and material than previously	A	Check if **OEC-PD-DS-01** is also affected.	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
PD	OEC-PD-PA-08	Die Overcoat / Underfill	--	P	Supporting layers for complex packages like flip chip. --: No change in product integrity P: change can influence the integrity of final product	P: e.g. change of underfill with change of thermal resistance	B	Check if **OEC-PD-DS-01** is also affected.	-	•	P	-	P,@•	-	•	•	-	•	-	-	-	-	-	U	-	-	•	U	-	-	P	P	•	-	-	P	P	P	-	-	
PD	OEC-PD-PA-09	Change of mold compound/encapsulation/sealing material	P	P	Change of mold compound, encapsulation, or sealing material might be affected optical function in case of package related effect (e.g. browning). Component assembly and board coating has to be assessed. MSL might be changed.	e.g. PPA mold compound	A	Check if **OEC-PD-DS-01** is also affected.	-	•	•	-	•	-	•	-	-	•	-	-	D	-	-	-	3	P	•	P	T	-	P	P	•	-	-	D,@P	D,@P	D,@P	4	-	
PD	OEC-PD-PA-10	Change of product marking	I	P	Marking on device. **I:** change in appearance; readability not affected **P:** change of content or change of appearance of data matrix code	e.g. marking of cathode;	B		-	•	-	-	-	-	-	O	-	-	-	-	-	-	-	-	-	-	T	-	T	-	-	-	-	-	-	-	-	-	-	-	
PD	OEC-PD-PA-11	Change in process technique (e.g., die attach, molding, plating, trim and form, ...)	P	P	Any change in assembly process technique	e.g. change die attached from gluing to soldering;	B	**A** or **B:** Please check if **EQUIPMENT** and other type of changes of material (**OEC-PD-PA-04/05/07/08/09**) are affected. If the process change is covered in a separate change ID only this is applicable.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
PD	OEC-PD-PA-12	Process Integrity: Tuning within specification	--	P	Variation within process specification	e.g. process control	C		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PD	OEC-PD-PA-13	Change of direct material supplier with no impact on specification	--	P	Change of suppliers e.g. for lead frames, wire material, die attach, electronical components ...	Change of suppliers e.g. for lead frames, wire material, ESD-diode ...	C	Assumption that change material specification remains unchanged. Otherwise see change of material.	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	See change of material.
PD	OEC-PD-PA-14	Change of specified assembly process sequence (additional and/or deletion of process step)	I	P	Addition or deletion of a process step in assembly process sequence with potentially significant impact on the product performance **I:** no influence on product integrity **P:** influence on product integrity expected	e.g. additional or deletion plasma cleaning process	C	Single case assessment necessary to identify possible interactions or risk.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
PD	OEC-PD-PA-15	New assembly location or transfer of assembly to a different not previously released location/site/subcontractor	P	P	Assembly transfer or relocation. Includes transfer as well as additional site.	e.g. dual source / fab strategy	C	**A** or **B:** Impact on other type of changes described under **PROCESS ASSEMBLY** and **EQUIPMENT OEC-PD-EQ-01** A: In case LiDAR application is affected	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
PD		PACKING/SHIPPING																																							
PD	OEC-PD-PS-01	Outer Packing/shipping specification change	I	P	dimension changes indirect product packing **I:** small changes in dimension or appearance **P:** number of reels in the packing are changing	e.g. pizza box	*		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PD	OEC-PD-PS-02	Drypack requirement change	I	P	**(I):** Relaxation of dry pack requirements **(P):** Tightening of dry pack requirements	**(I):** MSL 3 à MSL 1 **(P):** MSL 1 à MSL 3	B	Check if **OEC-PD-DS-01** is also affected.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PD	OEC-PD-PS-03	Inner Packing/shipping specification change	P	P	dimension change of direct product packing	e.g. SMT pocket in tape changes	B		-	•	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	-	-	-	-	P	P	-	-	-	-	-	
PD	OEC-PD-PS-04	Change of labelling	I	P	Change of labelling also on reel. **I:** additional information no change of previous information **P:** change in content of previous information	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B	Check if **OEC-PD-DS-01** is also affected.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PD		EQUIPMENT																																							
PD	OEC-PD-EQ-01	Production from a new equipment/tool which uses a different basic technology	P	P	Change in process technique which is not already covered above. **Note:** Major changes affecting the product not covered by the table require also a PCN.	e.g. change from single wafer to batch process e.g. over pad metalisation e.g. dambar cutting (mechanical to laser cutting)	B	Check if **OEC-PD-DS-01** is also affected. Corrosion stability should be assessed.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
PD	OEC-PD-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool) without change of process.	--	P	PCN required for dedicated equipment for sensitive component production. **(--):** If change does not influence the ingetrity of the final product **(P):** If impact on product integrity is anticipated.	e.g. change from single site to multi site handler. **(--):** e.g. extension of existing equipment pool, already qualified. **(P):** e.g. extension of dedicated equipment in case basic technology still need to be proven.	C		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Qualification effort depends on type of change.
PD	OEC-PD-EQ-03	Change in final test equipment type that uses a different technology	I	P	Change of tester platform (e.g. major test program changes , new tester interface, ...). I: product specification is not affected P: product specification is affected	e.g. change illumination methods / spectrum	B		-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	-	-	-	-	•	•	-	-	-	-	•	Gage R&R / delta correlation
PD		TEST FLOW																																							
PD	OEC-PD-TF-01	Move of all or part of electrical wafer test and/or final test to a different location/site/subcontractor	P	P	Tester transfer or relocation.	e.g. Dual source strategy	C	**B:** In case of bare die delivery	•	•	-	-	•	-	B	•	-	B	-	-	-	B	B	B	-	-	•	-	T	-	-	-	-	•	•	-	-	-	-	•	Gage R&R / delta correlation; additional specification check B should be considered for Wafer testing
PD		Q-GATE																																							
PD	OEC-PD-QG-01	Change of the test coverage/testing process flow used by the supplier to ensure data sheet compliance (e.g. elimination/addition of electrical measurement/test flow block; relaxation/enhancement of monitoring procedure or sampling)	--	P	e.g. test flow block, reduction from three temperature measurements to two temperature measurements, change in burn in / run in process. **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. test implemented without customer requirement **(P):** e.g. reduction from three temperature measurements to two temperature measurements e.g. change in burn in / run in process.	C	**A:** In case LiDAR application is affected	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	

Tests, which should be considered for the appropriate process change.			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tests, which should be considered for the appropriate process change after selection of condition table.			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Suppliers performed tests (mark with an 'X' for done or 'G' for generic)																																		
Reason for exception of tests and/or usage of generic data:																																		

--	Not required.
I	Information Note required.
P	PCN required.

A letter or "•" indicates that performance of that stress test should be considered for the appropriate process change.
A @ recommended additionally by ZVEI

	CONDITIONS	No
A	Not for Au plated devices applicable (Au intended to fail for this test)	
B	Only if Bondarea/Wirebond is changed/affected	
C	Only if doped/implantation material is changed	
D	Only if Dimensions are changing	
E	Only if min/max Values are changing	
F	Sequence change only	
H	Non Epoxy Coated Devices only	
J	Only for chip technology using wafer bonding	
K	Not for Au plated devices	
L	Only if Leadframe/Substrate Dimensions are changed	
M	Only if metal composition is changed including sequence	
N	Only for glued chips	
O	Only if process is changing	
P	Only if material properties are changed	
Q	Only if glue components are changing	
R	Only if marking technology changes	
S	Only if Floor Life is affected	
T	Only if Board Reliability is affected	
U	Only if underfill is affected	
V	Only for non hermetic devices	
W	Only if risk of corrosion is increasing	
Y	Only for laser technology	
Z	Only if converting technology changes	
1	Only if data sheet parameters are affected	
2	Only if outer dimensions are critical	
3	Only for leaded parts	
4	Only for hermetic parts	
5	Only for uncoated parts	
6	Only for IR pulse lamp	

=> Please mark 'NO' with 'x', default is 'YES'

Worked on: (Name, Function)	Max Mustermann
Signature:	
Date:	
PCN number:	

Mark change with an "x"

Form provided by ZVEI - Revision 5.0 - December 2021

Assessment of impact regarding following aspects
- contractual agreements
- technical interface of handling/processability/manufacturability of customer
- form, fit, function, quality performance, reliability

Device evaluation

MATERIAL PERFORMANCE TEST RESULTS (on the basis of AEC-Q103 Revision 2)
includes integrated circuits (e.g. ASICs, µ-Controller, memories, voltage regulators, smart power devices, logic devices, analog devices,...)

ID	Type of change	Potential impact? No	Potential impact? Yes	Understanding of semiconductors experts	Examples to explain	Evaluation level A / B / C (A: Application level, B: Boardlevel, C: Component level, *: Not relevant for qualification matrix)	Further applicable conditions	Line evaluation (can be evaluated by data or audit/on site check)	AEC-Q103 Revision 2	Remarks
	ANY									
MEMS-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements		*		-	-	
MEMS-AN-02	Any change with impact on processability/manufacturability at customer, which is not covered in the matrix below.	P	P	Any change which is not covered in the matrix below, but risk assessment at customer is recommended.		B		-	-	
	DATA SHEET									
MEMS-DS-01	Change of data sheet parameters/electrical specification (min./max./typ. values) and/or AC/DC specification	P	P	Update of data sheet because of technical change of the product.	e.g. recommendations for pull-up/pull-down or NC pins, MSL	A		-	-	
MEMS-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!	e.g. Errata	A		-	-	
MEMS-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** Definition of new parameter which was not documented before. **(P):** Not known as single change. Only in combination with other changes.	**(I):** e.g. adding new tested parameter.	A		-	-	
	DESIGN									
MEMS-DE-01	Design changes in active elements. ^{1})	P	P	Any device relevant changes in design / layout of elements with effect on data sheet ^{1}) **Not included:** Modification to adjust product parameter within specified process window and design rules.	e.g. change of ESD structure e.g. add / remove a transistor in layout	A	Please check if data sheet is affected **(MEMS-DS-01)**.	-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-DE-02	Design changes in routing . ^{2})	P	P	Any change of wiring between elements in chip design / layout with effect on data sheet. ^{2}) **Not included:** Modification to adjust product parameter within specified design rules.	e.g. mask changes in metal fix for corrective action (based on external 8D report)	C	**A:** Impact on EMC behavior cannot be evaluated / excluded on component level. **A:** If impact on electrical function is not excluded on component level. Please check if data sheet is affected **(MEMS-DS-01).**	-	●	
MEMS-DE-03	MEMS (pressure Sensing Element) Design Change	P	P	Dimensional change affecting electrical parameter (e.g. Sensitivity).	e.g. Numbers on membrane cells, change of partioning / segmentation of sensor device element; changes of lateral height of cavity >1% (lateral cavity dimension)	A	Please check if data sheet is affected **(MEMS-DS-01).**		●	
	PROCESS - WAFER PRODUCTION									
MEMS-PW-01	New / change of wafer substrate material	P	P	New wafer material.	e.g. different wafer material to currently released material (like change from EPI material into non-EPI material)	C		-	-	
MEMS-PW-02	New wafer diameter	P	P	Change of wafer diameter resulting in equipment and process changes.		C	Impact on changes in **MEMS-PW-09** and/or **MEMS-EQ-01**.	●	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PW-03	New final wafer thickness (including pressure sensor membrane)	P	P	Change in Wafer thickness	e.g. change in final die thickness	C		-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PW-04	Change of electrically active doping/implantation element	P	P	Change in electrically active doping / implantation element resulting in a new technology.		A		-	●	HTOL referencing to PrHTOL with technical justification
MEMS-PW-05	Change of gate material / dielectrics	P	P	Change of gate material and / or gate dielectric material.		A		-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PW-06	New / change of backside operation (grinding / metallization)	P	P	Change of bottom layer of die (between die and leadframe). Change in process, material, or dimensions necessary. Alternative see MEMS-PW-09	e. g. change from Cr/NiV/Au to Cr/NiV/Ag	C		-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PW-07	New / change of metallization / vias / contacts	P	P	Change in metallization of bondpads, material, layer thickness specifically for chip frontside and internal layers.	e. g. change from AlSiCu to AlCu e. g. change in over pad metallization	C		-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PW-08	New / change of passivation or die coating (without bare die)	P	P	Change of top layer on die (between mold compound and die).	e. g. addition of polyimide	C	Change of intrinsic mechanical stress might influence electrical function.	-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PW-09	Change in process technology not covered by any other type of change	--	P	**(--):** If the change in process technology does not influence the integrity of the final product. **(P):** If the change in process technology can influence the integrity of the final product.	**(--):** e.g. change from wet to dry etching, e. g. change from horizontal to vertical oven for oxidation **(P):** e.g. change of layer thickness	A	Please also check changes described under **EQUIPMENT.** Please check if change is described by specific type of change in this matrix.	●	-	
MEMS-PW-10	Process integrity: tuning within specification	--	P	Variation within process specification **(--):** If tuning within process specification does not influence the integrity of the final product. **(P):** If remaining risk on product specification is anticipated.	**(--):** e.g. process control	C	Please check if **DATA SHEET** is affected. Please check if **MEMS-PW-09** is affected.	-	-	
MEMS-PW-11	Change of wafer supplier.	--	P	**(--):** If no remaining risk in supply chain exist **(P):** If the change of wafer supplier can influence the integrity of the final product.	**(--):** e.g. change of wafer supplier with same material composition. e.g. same material composition and does not influence electrical behavior. **(P):** e.g. new supplier with impact on substrate material and / or electrical behavior.	C	Not on component, tested on test structure (typical for IC). Interaction on component level for discrete components expected. In case of SOI substrate HF properties have to be qualified. Please check if **MEMS-PW-01** and **MEMS-DS-01** is affected.	-	-	
MEMS-PW-12	Change of specified wafer process sequence (deletion and/or additional process step)	--	P	Any change which is not covered by another type of change. Risk is to be assessed. **(--):** No Risk for Supply chain. **(P):** Risk for Supply chain (influence on product integrity)	**(--):** e.g. change of cleaning process in wafer production **(P):** e.g. additional sinker implantation after standard implantation (to protect circuit against interference impulses).	C		-	-	
MEMS-PW-13	Move all or parts of production to a different wafer fab site.	P	P	Wafer fab transition with additional changes (described above). Includes transfer as well as additional site.	e.g. dual source / fab strategy	A	Check if any other type of process change is applicable due to the transfer	●	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PW-14	Lithography	--	P	Change in process technique for lithographic process and material **(--):** If the change in process technology does not influence the integrity of the final product. **(P):** If the change in process technology can influence the integrity of the final product.	**(--):** e.g. exchange of defect mask **(P):** e.g. change from E-beam process to X-ray process e.g. change from contact into projection mode	C	Please also check changes described under **EQUIPMENT**.	-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PW-15	Oxide / Interlayer Dielectric	--	P	Change in process technique for oxide / interlayer dielectric process **(--):** If the change in process technology does not influence the integrity of the final product. **(P):** If the change in process technology can influence the integrity of the final product.		A	Please also check changes described under **EQUIPMENT**.	-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PW-16	MEMS (pressure Sensing Element) specific process	--	P	Any change in MEMS Pressure Sensor Technologies. Impact is to be assessed. **(--):** No impact for Supply chain. **(P): Potential impact on product integrity**	**(P)** MEMS Pressure Sensor device technologies: - Polysilicon surface micro-machines - Single crystal silicon Deep Reactive Ion Etching (DRIE) - Bulk micro-machined - Capping processes (Glas frit; Eutectic bonding; Fusion bonding; Anodic bonding)				●	
	BARE DIE									
MEMS-BD-01	New final wafer thickness	P	P	Change in final wafer thickness.	Change in final chip/die thickness	A		-	-	#PS1 - Pressure HTOL is recommended and might replace #B1 HTOL NBTI was removed in deviation from the AEC-Q100 Matrix because there it is a
MEMS-BD-02	Change of top metallization or bond pad stack	P	P	Change in bondpads (incl. stack below), material, pad pitch, surface changes, layer thickness	e. g. change from AlSiCu to AlCu e. g. change in over pad metallization	B		-	-	#B1 HTOL is recommended; #PS1 Pressure HTOL only if Sensitivity is affected by the change
MEMS-BD-03	New / change of backside metallization	P	P	Change of bottom layer of die (between die and leadframe). Change in process, material, or dimensions.	e. g. change from Cr/NiV/Au to Cr/NiV/Ag	A		-	-	#B1 HTOL is recommended; #PS1 Pressure HTOL only if Sensitivity is affected by the change
MEMS-BD-04	Change of wafer setup or number of possible good dies on wafer.	I	P	Needed information for pick & place machine. **(I):** amount of possible good dies on wafer **(P):** influence on wafer setup and wafer mapping	**(I):** e.g. change from 350 to 240 good dies on wafer **(P):** e.g. information change for pick & place machine	B		-	-	
MEMS-BD-05	Change of optical appearance of wafer edge region (like imide coverage or edge exclusion)	I	P	Selection of dies in wafer edge region which have full electrical functionality. **(I):** in case of wafer edge is affected only **(P):** in case of single die is affected	**(I):** e.g. appearance of wafer edge (rounded instead of square)	B		-	-	
MEMS-BD-06	Die scribe or separation	I	P	Needed information for sawing and pick & place machine. **(I):** If the change in sawing process does not influence the integrity of the final product. **(P):** in case if product is delivered on unsawn wafer	**(I):** e.g. if product is delivered as known good die (in tape and reel) **(P):** e.g. information change for pick & place machine. e.g. information change for sawing machine.	B	Please check if **MEMS-BD-04** is affected.	-	-	
MEMS-BD-07	Die Preparation / Clean	--	P	Change in process technique for die preparation / cleaning **(--):** If the change in process does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. change of cleaning time. **(P):** e.g. change in cleaning procedure after sawing	B	Please check if **MEMS-BD-06** is affected.	-	-	
MEMS-BD-08	New / change of passivation or die coating	P	P	Change of top layer on die.	e.g. Passivation thickness	B		-	-	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
	WAFER BUMPING									
MEMS-WB-01	Redistribution Layer								●	Stress tests column AB /AC / AD are not described in AEC Q103-002 and therefore not worked out in DeQuMa tab MEMS pressure sensor
MEMS-WB-02	Under Bump Material								●	Stress tests column AB /AC / AD are not described in AEC Q103-002 and therefore not worked out in DeQuMa tab MEMS pressure sensor
MEMS-WB-03	Bump Material / Metal System (internal)								●	Stress tests column AB /AC / AD are not described in AEC Q103-002 and therefore not worked out in DeQuMa tab MEMS pressure sensor
MEMS-WB-04	Bump Site Transfer								●	Stress tests column AB /AC / AD are not described in AEC Q103-002 and therefore not worked out in DeQuMa tab MEMS pressure sensor
	PROCESS - ASSEMBLY									
MEMS-PA-01	New Package	P	P	Change in dimensions of existing package.	e. g. changes in package dimensions (further development).	B		-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PA-02	Change of leadframe base material	P	P	New leadframe material in new composition.	e. g. change from alloy42 to copper e. g. change between two different copper alloys	B		-	●	TC may be referencing to B_PPrTC with technical justification
MEMS-PA-03	Change in leadframe dimensions	P	P	Change in leadframe dimensions which has impact to the specified electrical parameter acc. data sheet or specification (e.g. heat sink, pin dimensions, die paddle size, ...) **Not included:** Variation within specification.	e. g. change in lead frame geometry	B	ESD investigations are only necessary if internal ground and power supply connection of leadframe is affected. **A:** If impact on EMC behavior cannot be evaluated / excluded on component level.	-	●	Recommended to check if ESD CDM is applicable; e.g. Changes of leadframe thickness.
MEMS-PA-04	Change of lead frame finishing material / area (internal)	P	P	Change of surface material of die attach pad and second bond area (e.g. influence in adhesion to mold compound, wedge bond reliability)	e. g. change from Ag flash to NiP protection layer e. g. change from Ag spot to Au spot e. g. increase of silver plating area	C		-	●	
MEMS-PA-05	Change of lead and heat slug plating material/plating thickness (external)	P	P	Change in material and / or process resulting in a new technology (e.g. pure tin).	e.g. change in heat slug stack e.g. change from Sn into Ni/Pd/Au e.g. change of layer thickness	B		-	●	
MEMS-PA-06	Bump Material / Metal System (internal)	P	P	Stack die or die to substrate (flip chip)	e. g. change to Pb-free material e. g. change of copper pillars	C		-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PA-07	Die attach material	P	P	Change of die attach material	e.g. Change of Material composition (glue or filler material)	C	**A:** If impact on EMC behavior cannot be evaluated / excluded on component level (if die attach has impact on electrical conductivity).	-	●	Consider if TC or B_PPrTC is applicable. Is die attach influencing the pressure sensor parameter, then B_PPrTC should be considered.
MEMS-PA-08	Change of wire bonding	P	P	Material, diameter, change in bonding diagram and / or change in process resulting in a new technology.	e.g. change from Au to Cu material e.g. change from 25µm to 23µm diameter e.g. change from single to double bond e.g. change from stich bond to stich on ball bond.	C	**A:** In case of bond diagram change and EMC cannot be evaluated on component level. Please also check changes described under **MEMS-EQ-01**.	●	●	B_PPrTC maybe referencing to TC with technical justification
MEMS-PA-09	Substrate / Interposer	P	P	Change of BGA substrate	e.g. changes in routing	B	**A:** Impact on EMC behavior cannot be evaluated / excluded on component level. **A:** If impact on electrical function is not excluded on component level.	-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PA-10	Die Overcoat / Underfill	--	P	Supporting layers for complex packages like flip chip and / or change in process resulting in a new technology. **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. change of dispensing speed **(P):** e.g. change of material (thickness or curing characteristics)	C		-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PA-11	Change of mold compound / encapsulation material	P	P	Change of mold compound / encapsulation material.	e.g. change to green mold compound e.g. change of filler particles	C	**B:** for wave soldered devices	-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
MEMS-PA-12	Change of hermetic sealing	P	P	Affected areas are material and process of hermetic (e.g. ceramic) packages, capped die and sealed devices (e.g. pressure sensors)	e.g. change of sealing material for RoHS	B	**A:** impact on EMC behavior cannot be evaluated / excluded on component level (if encapsulation / sealing has impact on electrical conductivity).	-	●	
MEMS-PA-13	Change of product marking	I	P	Change of marking on device and / or change in process resulting in a new technology.. **(I):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(I):** e.g. change of appearance (additional marking) **(P):** e.g. change from inked marking to laser marking e.g. marking of pin 1	B		-	●	
MEMS-PA-14	Change in process technology (e.g. trim and form, leadframe preparation ....)	--	P	**(--):** If the change in process technology does not influence the integrity of the final product. **(P):** If the change in process technology can influence the integrity of the final product.	**(P):** e.g. change from punched to sawn QFN	B	Please also check changes described under **MEMS-EQ-01**. Please check if change is described by specific type of change in this matrix.	-	-	
MEMS-PA-15	Process integrity: tuning within specification	--	P	Variation within process specification **(--):** If tuning within process specification does not influence the integrity of the final product. **(P):** If impact on product specification is anticipated	**(--):** e.g. process control	C		-	-	
MEMS-PA-16	Change of direct material supplier	--	P	Change of suppliers for direct materials which are used in assembly process (BOM). **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. change of wire material supplier. **(P):** e.g. additional leadframe supplier with specific leadframe manufacturing technology	C	Please check if material is changed!	-	-	
MEMS-PA-17	Change of specified assembly process sequence (deletion and/or additional process step)	--	P	**(--):** no influence in final product integrity or specified sequence **(P):** influence in final product integrity or specified sequence	**(--):** e.g. additional cleaning step e.g. deletion of optical inspection **(P):** e.g. change lead finishing pre trim & form to post trim & form	C		-	-	
MEMS-PA-18	Move all or parts of production to a different assembly site.	P	P	Assembly transfer or relocation. Includes transfer as well as additional site.	e.g. dual source / plant strategy	C	**A** or **B**: impact on other type of changes described under **PROCESS ASSEMBLY** and **MEMS-EQ-01**. Check if any other type of process change is applicable due to the transfer	●	●	It is recommended to check which of specific pressure related stress tests might be applicable. E.g. If device has been previously qualified prior AEC Q103 release date.
MEMS-PA-19	Die scribe or separation	--	P	Separation process from single wafer to dies. **(--):** If the change in process does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. change of kerf width **(P):** e.g. change from sawing to laser cut	C		-	●	TC may be referencing to B_PPrTC with technical justification
MEMS-PA-20	Die Preparation / Clean	--	P	Change in process technique for die preparation / cleaning **(--):** If the change in process does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. change of cleaning time. **(P):** e.g. Change of roughness of pads or die backside if impact on Die Shear or WBS/WBP **(P):** e.g. Different cleaning method (rinsing to spraying)	C		-	●	
MEMS-PA-21	Molding / Encapsulation process	--	P	Change in process technique for molding / encapsulation. **(--):** If the change in process does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. tuning within process specification (P): e.g. Influence on inner cavity structure/roughness	C		-	●	HTOL and TC may be referencing to PrHTOL and B_PPrTC with technical justification
	PACKING/SHIPPING									
MEMS-PS-01	Packing/shipping specification change	P	P	Packing/shipping specification change.		*		-	-	
MEMS-PS-02	Dry pack requirements change	I	P	(I) relaxation of dry pack requirements (P): tightening of dry pack requirements	(I) MSL 3 --> MSL 1 (P) MSL 1 --> MSL 3	B	Please check, if datasheet changes as well (MEMS-DS-01 or MEMS-DS-02)	-	-	
MEMS-PS-03	Change of carrier (tray, reel)	P	P	(P): Change of carrier (tray, reel)		B		-	-	
MEMS-PS-04	Change of labelling	I	P	Change of labelling also on reel. **(I):** Change of material label without impact on barcode/ data matrix code **(P):** Changes of material label information which affects data processing at customer.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of defined nomenclature for data processing	B		-	-	
	EQUIPMENT									
MEMS-EQ-01	Production from a new equipment/tool which uses a different basic technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above.	e.g. Dambar / tie bar cutting (mechanical to laser cutting) e.g. Change from PVD to galvanic process (pad metallization)	A		-	-	
MEMS-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool) without change of process.	--	P	PCN required for dedicated equipment for sensitive component production. **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. extension of existing equipment pool **(P):** e.g. extension of dedicated equipment in case basic technology still need to be proven	C		-	-	
MEMS-EQ-03	Change in final test equipment type leading to a different test concept.	P	P	Change of tester platform with differences in HW or SW that makes a change in test concept necessary (only in case of bare die: final test means wafer test).	(P): e.g. Different method to calculate trim values	C		-	-	
	TEST FLOW									
MEMS-TF-01	Move of all or part of electrical wafer test and/or final test to a different test site.	P	P	Tester transfer or relocation. Check impact on MEMS-AN-01 Includes transfer as well as additional site.	Dual source strategy	C	Check if any other type of process change is applicable due to the transfer	●	-	
	Q-GATE									
MEMS-QG-01	Change of the test coverage/testing process flow used by the supplier to ensure data sheet compliance (e.g. elimination/addition of electrical measurement/test flow block; relaxation/enhancement of monitoring procedure or sampling)	--	P	e.g. test flow block, reduction from three temperature measurements to two temperature measurements, change in burn in / run in process. **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. test implemented without customer requirement **(P):** e.g. reduction from three temperature measurements to two temperature measurements e.g. change in burn in / run in process.	C		●	-	

Test columns (Material performance test results), with the additional columns:

Check of specification (for raw material only)	Temperature Humidity Bias or biased HAST	Autoclave or Unbiased HAST	Temperature Cycling	Power Temperature Cycling	High Temperature Storage Life	High Temperature Operating Life	Early Life Failure Rate	NVM Endurance, Data Retention, and Operational Life	Wire Bond Shear	Wire Bond Pull	Solderability	Physical Dimensions	Solder Ball Shear	Lead Integrity	Bump Shear	Die Pull / Peeling	Lid Pull	Electromigration	Time Depending Dielectric Breakdown	Hot Carrier Injection	Negative Bias Temperature Instability	Stress Migration	Electronic Discharge Human Body Model	Electronic Discharge Charged Device Model	Latch up	Electrical Distribution	Characterisation	Electromagnetic Compatibility	Short Circuit Characterization	Soft Error Rate	Lead free	Mechanical Series	Package Drop	Lid Torque	Die Shear	Internal Water Vapor	Pressure & high temp operating life	Biased Pulsed Pressure Temp Cycling	Pressure & low Temp operating Life	Condesing Humidity with Sulphur	Corrosive Atmosphere	Chemical Resistance	Burst Pressure	Proof Pressure	Salt Immersion	Dust	Internal Visual Inspection	Die Shear	Whisker test (IEC 60068-2-82, JEDEC JESD201) (additional to AEC-Q10x)	Parameter Analysis: Comparison of current with changed device characterization, electrical distribution (additional to AEC-Q10x)	for Cu Wire Products consider AEC-Q006
	THB	AC	TC	PTC	HTSL	HTOL	ELFR	EDR	WBS	WBP	SD	PD	SBS	LI	BST	DPT	LPT	EM	TDDB	HCI	NBTI	SM	HBM	CDM	LU	ED	CHAR	EMC	SC	SER	LF	MECH	DROP	LT	DS	IWV	PrHTOL	B_PPrTC	PrLTOL	CHS	CAtm	CR	BPr	PPr	SIT	DST	IV	DIS			
	A2	A3	A4	A5	A6	B1	B2	B3	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5	E2	E3	E4	E5	E7	E9	E10	E11	E12	G1-3	G5	G6	G7	G8	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS1	PS1	PS1			

Tests, which should be considered for the appropriate process change.

Tests, which should be considered for the appropriate process change after selection of condition table.

Suppliers performed tests (mark with an 'X' for done or 'G' for generic)

Reason for exception of tests and/or usage of generic data:

--	Not required.
I	Information Note required.
P	PCN required.

A letter or "●" indicates that performance of that stress test should be considered for the appropriate process change.
A @ recommended additionally by ZVEI

CONDITIONS		No
A	Only for peripheral routing	
B	For symbol rework, new cure time, temp	
C	If bond to leadfinger	
D	Design rule change	
E	Thickness only	
F	MEMS element only	
G	Only from non-100% burned-in parts	
H	Hermetic only	
J	EPROM or EEPROM	
K	Passivation only	
L	For Pb free devices only	
M	For devices requiring BTC	
N	Passivation and gate oxide	
Q	Wire diameter decrease	
S	MEMS Pressure Sensors	
T	For Solder Ball SMD only	

=> Please mark 'NO' with 'x', default is 'YES'

Worked on: (Name, Function)	Max Mustermann
Signature:	
Date:	
PCN number:	

Form provided by ZVEI - Revision 5.0 - December 2021

Mark change with an "x"

Assessment of impact regarding following aspects
- contractual agreements
- technical interface of handling/processability/manufacturability of customer
- form, fit, function, quality performance, reliability

ID	Type of change	Potential impact? No	Potential impact? Yes	Understanding of semiconductors experts	Examples to explain	Evaluation level A / B / C (A: Application level, B: Boardlevel, C: Component level, *: Not relevant for qualification matrix)	Further applicable conditions	Remarks
	ANY							
MCM-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements		*		
MCM-AN-02	Any change with impact on processability/manufacturability at customer, which is not covered in the matrix below.	P	P	Any change which is not covered in the matrix below, but risk assessment at customer is recommended.		B		
	DATA SHEET							
MCM-DS-01	Change of data sheet parameters/electrical specification (min./max./typ. values) and/or AC/DC specification	P	P	Update of data sheet because of technical change of the product.	e.g. recommendations for pull-up/pull-down or NC pins, MSL	A		
MCM-DS-02	Correction of data sheet / errata	I	I	No technical change of product, process or test. New description of behaviour which was not specified before or which is different from initial specification. Please indicate clearly, that Info note contains this type of change! Assessment in application required!	e.g. Errata	A		
MCM-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** Definition of new parameter which was not documented before. **(P):** Not known as single change. Only in combination with other changes.	**(I):** e.g. adding new tested parameter.	A		
	DESIGN							
MCM-DE-01	Firmware modification	I	P	Integrated software by design or memory as defined by supplier. **(I)**: Firmware modification or update without effect of functional performance at the customer (bug fix). **(P)**: Firmware modification or update with effect of functional or reliability performance at the customer.	**(I)**: e.g. addition of Firmware opportunities **(P)**: e.g. bug fix with impact on functional performance	A		
MCM-DE-02	Change that adds or subtracts sub-components from the module BOM	P	P		e.g. addition of passive elements in filter circuit	A		
MCM-DE-03	Substrate change affecting module schematic (Changes to the internal dimensions and / or schematics)	P	P	Design change and routing Change in substrate, leadframe dimensions which has impact to the specified electrical parameter acc. data sheet or specification (e.g. heat sink, pin dimensions, die paddle size, ...) Not included: Variation within specification.		A	if the number of layer will be changed see also PA-09	
	PROCESS - ASSEMBLY - MATERIALS							
MCM-PA-01	Replacement of any sub-component by a Non-AEC qualified sub-component	P	P	Change from an AEC Qualified sub-component to a Non-AEC Qualified sub-component or Change from a Non-AEC Qualified sub-component to another Non-AEC Qualified sub-component		A		
MCM-PA-02	Replacement of any sub-component by an AEC qualified sub-component	P	P	Change from one AEC Qualified sub-component to another AEC Qualified sub-component Change from a Non-AEC Qualified sub-component to an AEC Qualified sub-component e.g. with impact on electrical robustness (ESD, latch up, ...) electrical functionality, test coverage		A	Requires additional evidence that new sub-component is AEC qualified	
MCM-PA-03	Replacement of any sub-component by an AEC qualified sub-component Critical characteristics of sub-component are **not** affected	I	P	Critical characteristics are those which have the greatest effect on form, fit, function, yield, and/or reliability. Use of SPC controls and 100% testing are common.		C	Requires additional evidence that new sub-component is AEC qualified	
MCM-PA-04	Change within a sub-component that has been requalified Critical characteristics of sub-component are affected	P	P	Critical characteristics are those which have the greatest effect on form, fit, function, yield, and/or reliability. Use of SPC controls and 100% testing are common.		A	Requires additional use of the appropriate ZVEI DeQuMa (e.g. active, passive component) for qualification of the changed sub-component	
MCM-PA-05	Change within a sub-component that has been requalified Critical characteristics of sub-component are **not** affected	I	P	Critical characteristics are those which have the greatest effect on form, fit, function, yield, and/or reliability. Use of SPC controls and 100% testing are common.		C	Requires additional use of the appropriate ZVEI DeQuMa (e.g. active, passive component) for qualification of the changed sub-component	
MCM-PA-07	Change to the processes used in module assembly (e.g., pick & place, die attach, bonding, reflow, encapsulation, singulation, die overcoat, underfill, die preparation, die clean)	-	P	(--): If the change in process technology does not influence the integrity of the final product. (P): If the change in process technology can influence the integrity of the final product.	**(--):** e.g. tuning within process specification	C		
MCM-PA-08	Process integrity: tuning within specification	-	P	Variation within process specification **(--):** If tuning within process specification does not influence the integrity of the final product. **(P):** If impact on product specification is anticipated.	**(--):** e.g. process control	C		
MCM-PA-09	Change to materials used in module assembly (e.g., adhesive, underfill, encapsulate, solder, epoxy, bump material, die attach material, bond wire, die overcoat, substrate, leadframe base material)	P	P	Change of used material (e.g. bump material, die attach material, soft solder, epoxy, etc.) Change of bond wire material, diameter, change in bonding diagram	e.g. Stack die or die to substrate (flip chip) e. g. change to Pb-free material e. g. change of copper pillars e.g. change from Sn into Ni/Pd/Au e.g. in number of layers or thickness of the substrate	C	If routing is affected see also DE-03 **B**: impact on thermomechanical stress caused by mismatch of mold compound, interconnecting technology and carrier is anticipated **B**: external lead finishing material is affected	
MCM-PA-10	Change of direct material supplier	-	P	Change of suppliers for direct materials which are used in assembly process (BOM). **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. change of wire material supplier. **(P):** e.g. change to new mold compound supplier e.g. additional leadframe supplier with specific leadframe manufacturing technology e.g. additional or new substrate supplier	C	Please check if material is changed!	See change of material.
MCM-PA-11	Change to assembly location (Move all or parts of production to a different assembly site)	P	P	Assembly transfer or relocation Includes transfer as well as additional site	e.g. dual source / fab strategy	C	**A** or **B**: impact on other type of changes described under PROCESS ASSEMBLY and SEM-EQ-01. In case of Cu wire product please consider AEC-Q006.	Whisker tests have to be done on monitoring basis! AEC-Q100: "For broad changes that involve multiple attributes (e.g., site, materials, processes), refer to section A1.3 of this appendix and section 2.3 of Q100, which allows for the selection of worst-case test vehicles to cover all the possible permutations."
MCM-PA-12	Change of product marking	I	P	Change of marking on device and / or change in process resulting in a new technology.. **(I):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(I):** e.g. change of appearance (additional marking) **(P):** e.g. change from inked marking to laser marking e.g. marking of pin 1	B		
	PACKING/SHIPPING							
MCM-PS-01	Packing/shipping specification change	P	P	Packing/shipping specification change.		*		
MCM-PS-02	Dry pack requirements change	I	P	**(I)**: Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	**(I)**: MSL 3 → MSL 1 **(P)**: MSL 1 → MSL 3	B	Please check if data sheet is affected (MCM-DS-01 or MCM-DS-02).	
MCM-PS-03	Change of carrier (tray, reel)	P	P	Change of carrier (tray, reel)		B		
MCM-PS-04	Change of labelling	I	P	Change of labelling also on reel. **(I):** Change of material label without impact on barcode. **(P):** Changes of material label information which affects data processing at customer.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of defined nomenclature for data processing	B		
	EQUIPMENT							
MCM-EQ-01	Production from a new equipment/tool which uses a different basic technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique.	Check which other type of change is applicaple due to this equipment change.	A	Check which other type of change is applicaple due to this equipment change.	
MCM-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool) without change of process.	-	P	PCN required for dedicated equipment for sensitive component production. **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. extension of existing equipment pool **(P):** e.g. extension of dedicated equipment in case basic technology still need to be proven	C		
MCM-EQ-03	Change to testing platform (Change in final test equipment type leading to a different test concept)	P	P	Change of tester platform with differences in HW or SW that makes a change in test concept necessary	e. g. change tester equipment from LTX to Teradyne	C		Gage R&R / delta correlation
	TEST FLOW							
MCM-TF-01	Change to testing location (Move of all or part of the final test to a different test site)	P	P	Tester transfer or relocation. Check impact on MCM-AN-01 Includes transfer as well as additional site	Dual source strategy	C		Gage R&R / delta correlation
	Q-GATE							
MCM-QG-01	Change of the test coverage/testing process flow used by the supplier to ensure data sheet compliance (e.g. elimination/addition of electrical measurement/test flow block; relaxation/enhancement of monitoring procedure or sampling)	-	P	e.g. test flow block, reduction from three temperature measurements to two temperature measurements, change in burn in / run in process. **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. test implemented without customer requirement **(P):** e.g. reduction from three temperature measurements to two temperature measurements e.g. change in burn in / run in process.	C		Parameter Analysis: Delta correlation * For "burn in" changes ELFR recommended In case of introduction of new test flow steps consider assessment of influence on product reliability.

Device evaluation

MATERIAL PERFORMANCE TEST RESULTS on the basis of AEC-Q104 Revision -September 14, 2017 | additional to AEC-Q10x

ID	Line evaluation (can be evaluated by data or audit/on site check)	AEC-Q104 Revision September 14, 2017	Check of specification (for raw material and sub-component)	Temperature Humidity Bias or biased HAST THB A2	Autoclave or Unbiased HAST AC A3	Temperature Cycling TC A4	Power Temperature Cycling PTC A5	High Temperature Storage Life HTSL A6	High Temperature Operating Life HTOL B1	Early Life Failure Rate ELFR B2	NVM Endurance, Data Retention, and Operational Life EDR B3	Wire Bond Shear WBS C1	Wire Bond Pull WBP C2	Solderability SD C3	Physical Dimensions PD C4	Solder Ball Shear SBS C5	Lead Integrity LI C6	X-ray / CSAM XRAY C7	Electronic Discharge Human Body Model HBM E2	Electronic Discharge Charged Device Model CDM E3	Latch up LU E4	Electrical Distribution ED E5	Fault Grading FG E6	Characterisation CHAR E7	Electromagnetic Compatibility EMC E8	Soft Error Rate SER E9	Hermetic Package Test MECH G1-4	Package Drop DROP G5	Lid Torque LT G6	Die Shear DS G7	Internal Water Vapor WV G8	Board Level Reliability BLR H1	Low Temperature Storage Life LTSL H2	StartUp and Temperature Steps STEP H3	MCM Drop Test MCM DROP H4	Destructive Physical Analysis DPA H5	X-ray XRAY H6	Acoustic Microscopy AM H7	Whisker test (IEC 60068-T2-82, JEDEC JESD201)	Parameter Analysis: Comparison of current with changed device characterization, electrical distribution
ANY																																								
MCM-AN-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-AN-02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DATA SHEET																																								
MCM-DS-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-DS-02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-DS-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DESIGN																																								
MCM-DE-01	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-DE-02	-	●	●	@●	●	●	@●	@●	●	●	-	-	-	-	-	-	-	-	●	●	●	●	●	●	●	M	@●,D	-	-	@F	-	-	-	-	-	-	-	-	-	●
MCM-DE-03	-	●	●	@●	●	●	@K	-	●	●	-	@●	@●	-	-	-	-	-	●	●	●	●	●	●	●	M	-	-	-	-	-	-	-	-	-	@●	-	-	-	●
PROCESS - ASSEMBLY - MATERIALS																																								
MCM-PA-01	-	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-	-	-	●	●	●	●	●	●	●	M	@●,D	@●	-	@F	-	-	-	-	-	@●	@●	@●	-	●
MCM-PA-02	-	●	●	-	-	-	-	-	●	-	●	-	-	-	-	-	-	-	●	●	●	●	●	●	●	M	@●,D	@●	-	@F	-	-	-	-	-	@●	@●	@●	-	●
MCM-PA-03	-	●	●	-	-	-	-	-	@●	-	@●	-	-	-	-	-	-	-	@●	@●	@●	@●	@●	●	●	@M	@●,D	@●	-	@F	-	-	-	-	-	@●	@●	@●	-	●
MCM-PA-04	-	●	●	-	-	-	-	-	●	-	●	-	-	-	-	-	-	-	●	●	●	●	●	●	●	M	@●,D	-	-	@F	-	-	-	-	-	-	-	-	-	●
MCM-PA-05	-	●	●	-	-	-	-	-	@●	-	@●	-	-	-	-	-	-	-	@●	@●	@●	●	@●	@●	●	@M	@●,D	-	-	@F	-	-	-	-	-	-	-	-	-	●
MCM-PA-07	-	●	-	●	-	●	@K	-	@A	-	-	●	●	-	●	●	-	●	-	-	-	@H	-	@●	-	-	-	-	-	-	-	-	-	-	-	@●	-	-	-	●
MCM-PA-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-PA-09	-	●	●	●	-	●	@K	@●	@E	@E	-	●	●	●	●	●	●	-	-	-	-	●	-	@●	-	-	-	-	-	-	-	-	-	-	-	@●	-	-	-	●
MCM-PA-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-PA-11	●	●	-	●	●	●	@K	-	●	●	-	●	●	●	●	@T	●	-	-	-	-	●	-	@●	-	-	-	-	-	-	-	-	-	-		@●		-	@●	●
MCM-PA-12	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PACKING/SHIPPING																																								
MCM-PS-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-PS-02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-PS-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-PS-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUIPMENT																																								
MCM-EQ-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●
MCM-EQ-02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCM-EQ-03	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●
TEST FLOW																																								
MCM-TF-01	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●
Q-GATE																																								
MCM-QG-01	●	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	●	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●
Tests, which should be considered for the appropriate process change.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tests, which should be considered for the appropriate process change after selection of condition table.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Suppliers performed tests (mark with an 'X' for done or 'G' for generic)																																								

Reason for exception of tests and/or usage of generic data:

--	Not required.
I	Information Note required.
P	PCN required.

A letter or "●" indicates that performance of that stress test should be considered for the appropriate process change.
A @ recommended additionally by ZVEI.

	CONDITIONS	No
A	die preparation and/or die clean	☐
B	For symbol rework, new cure time, temp	☐
C	If bond to leadfinger (requirement in Q100)	☐
D	G1 - G3; no G4	☐
E	only for bare die and change of mold compound	☐
F	bare die sub-component only	☐
H	processes for material in direct contact with die surfaces	☐
K	For devices requiring PTC (requirement in Q100)	☐
M	Applicable for subcomponents with > 1M SRAM or DRAM per AEC-Q100	☐
T	Only for Solder Ball SMD (requirement in Q100)	☐
*	For "burn in" changes IOL or ELFR recommended	☐

=> Please mark 'NO' with 'x', default is 'YES'

Worked on: (Name, Function)	Max Mustermann
Signature:	
Date:	
PCN number:	

Mark change with an "x"

Form provided by ZVEI - Revision 5.0 - December 2021

Assessment of impact regarding following aspects
- contractual agreements
- technical interface of handling/processability/manufacturability of customer
- form, fit, function, quality performance, reliability

Device evaluation

MATERIAL PERFORMANCE TEST RESULTS (on the basis of AEC-Q200 Revision D) | additional to AEC-Q200

Selection of component	ID	Type of change	Potential impact? No	Potential impact? Yes	Understanding of component experts	Examples to explain	Evaluation level A / B / C A: Application level B: Boardlevel C: Componentlevel *: Not relevant for qualification matrix	Further applicable conditions	Line evaluation (can be evaluated by data or audit/on site check)	AEC-Q200 Revision D	Check of specification (for raw material only)	High Temp Exposure (Storage) 3	Temperature Cycling 4	Destructive Physical Analysis 5	Moisture Resistance 6	Biased Humidity 7	Operational Life 8	External Visual 9	Physical Dimension 10	Terminal Strength (Leaded) 11	Resistance to Solvents 12	Mechanical Shock 13	Vibration 14	Resistance to Soldering Heat 15	Thermal Shock 16	Electrostatic Discharge (ESD) 17	Solderability 18	Electrical Characterization 19	Flammability 20	Board Flex 21	Terminal Strength (SMD) 22	Beam Load Test 23	Flame Retardance 24	Rotation Life 25	Surge Voltage 27	Salt Spray 29	Electrical Transient Conduction 30	Shear Strength 31	Fault Current Durability 32	End-of-Life Mode Verification 33	Jump Start Endurance 34	Load Dump Endurance 35	Whisker Test (IEC 60068-T2-82, JEDEC JESD201)	Parameter-Analysis: Comparison of current with changed device characterization, electrical distribution	Remarks
NETWORKS & RESISTORS		**NETWORKS & RESISTORS**																																											
NETWORKS & RESISTORS		**ANY**																																											
NETWORKS & RESISTORS	PAS-RES-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation.	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-AN-02	Any change with impact on processability/manufacturabiliy at customer, which is not covered in the matrix below.	P	P		Technical interface means component terminals.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	-	
NETWORKS & RESISTORS		**DATA SHEET**																																											
NETWORKS & RESISTORS	PAS-RES-DS-01	Change of data sheet parameters/electrical specification (min./max./typ. values) and / or AC/DC specification	P	P	Change of application relevant information **Not included:** Editorial changes.	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!!	e.g. data sheet correction because of new information about component behavior	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** no influence **(P):** Risk assessment depending on change for each application to provide evidence of additional parametes (stat. evaluation)	e.g. adding new (tested) parameter.	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS		**MATERIAL**																																											
NETWORKS & RESISTORS	PAS-RES-MA-01	Change of material composition - Ink/Wire material of Resistor element	P	P	Change of Ink / Wire material	e.g. resistor paste, NiCr, resistor wire, bulk metals	C		-	•	•	•	•	-	-	-	•	-	-	W	-	-	-	-	•	F	-	B	-	•	•	-	R	-	-	-	-	-	-	-	-	-	-	@•	
NETWORKS & RESISTORS	PAS-RES-MA-02	Change of material composition - Ink/Wire material of Terminal element	P	P	Change of Ink / Wire material	e.g. AgPd paste, Ag paste, lead wire , NiCr for side termination	B		-	•	•	•	•	-	-	-	•	-	-	W	-	-	-	-	•	F	-	B	-	•	•	-	R	-	-	-	-	-	-	-	-	-	-	@•	
NETWORKS & RESISTORS	PAS-RES-MA-03	Change of material composition - Package/ Mold	P	P	Change of Package	e.g. for chip res.: final coating, epoxy	B	Consider potential change of CTE of material	-	•	•	•	•	-	•	•	-	•	•	•	•	-	•	-	•	•	-	-	•	•	•	-	R	-	-	-	-	-	-	-	-	-	-	-	Check whether AOI at tier 1 can be affected
NETWORKS & RESISTORS	PAS-RES-MA-04	Change of material composition - Passivation	P	P	Change of Passivation /Inner protection	e.g. change of glass	C	**B**: in case geometric changes of resisitor design due risk of electro chemical reaction (e.g. corrosion, electro migration)	-	•	•	•	•	-	•	•	•	-	-	-	•	-	-	-	•	-	-	-	•	-	-	-	R	-	-	N	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-MA-05	Change of material composition - Substrate material	P	P	Change of substrate material substrate material class (Al_2O_3, etc.) will not be changed, only dopands will be		C		-	•	•	-	•	-	•	•	•	-	-	•	-	-	-	•	•	-	•	B	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	@•	
NETWORKS & RESISTORS	PAS-RES-MA-06	Change of supplier of material	-	P	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	C		-	•	•	-	•	-	•	-	-	-	•	•	•	-	-	•	•	•	-	B	•	-	-	-	R	-	-	N	-	-	-	-	-	-	-	@•	Assumption material specification remains unchanged. Otherwise see change of material.
NETWORKS & RESISTORS		**DESIGN**																																											
NETWORKS & RESISTORS	PAS-RES-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure	I	P	Change of package		B		-	•	-	•	•	-	•	•	-	•	•	•	•	-	•	•	•	•	•	-	•	•	•	-	R	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-DE-02	Changes of inner construction - Passivation	-	P	Change of passivation/Inner protection	e.g. change of glass, laquer, epoxy, ...	C	**B**: in case geometric changes of resisitor design due risk of electro chemical reaction (e.g. corrosion, electro migration)	-	•	-	•	•	-	•	•	•	-	-	-	•	-	-	-	•	-	-	-	•	-	-	-	R	-	-	N	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS		**PROCESS**																																											
NETWORKS & RESISTORS	PAS-RES-PR-01	Changes in process technology or manufacturing methods - Ink Fire	-	P	Change of ink fire process	e.g. change of firing profile e.g. change from normal atmospher to nitrogen atmospher	C		•	•	-	-	•	-	-	-	•	-	-	R	-	-	-	-	-	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
NETWORKS & RESISTORS	PAS-RES-PR-02	Changes in process technology or manufacturing methods - Ink Print	-	P	Change of ink print process		C		•	•	-	•	•	-	-	-	•	-	-	R	-	-	-	-	•	-	-	B	-	R	R	-	R	-	-	-	-	-	-	-	-	-	-	@•	
NETWORKS & RESISTORS	PAS-RES-PR-03	Changes in process technology or manufacturing methods - Trim	-	P	Change of trim process	e.g. change from mill trimming to laser trimming	C		•	•	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
NETWORKS & RESISTORS	PAS-RES-PR-04	Changes in process technology or manufacturing methods - Lead Form	-	P	Change of lead form process	e.g. change from bending to punching	B		•	•	-	-	-	-	-	•	-	•	•	•	-	-	-	-	-	-	•	B	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	@•	
NETWORKS & RESISTORS	PAS-RES-PR-05	Changes in process technology or manufacturing methods - Termination Attach	-	P	Change of termination attach process	e.g. chip resistors: electroplating process e.g. welding of leads for through put devices.	B		•	•	-	-	-	-	-	•	-	-	-	•	-	•	-	•	-	-	-	B	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	@•	
NETWORKS & RESISTORS	PAS-RES-PR-06	Changes in process technology or manufacturing methods - Marking	-	P	Change of marking process	e.g. change from tampon printing to laser marking	B		•	•	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-PR-07	Changes in process technology or manufacturing methods - Molding	-	P	Change of molding process		B		•	•	-	•	•	-	•	•	-	•	•	•	•	-	•	-	•	•	-	-	•	•	•	-	R	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-PR-08	Process integrity: tuning within specification	-	P	Variation within process specification.	e.g. process control	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS		**PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS**																																											
NETWORKS & RESISTORS	PAS-RES-PN-01	Packing / shipping specification change (loosening of tolerances)	P	P	Change of packing specification.	e.g. number of pieces on reel.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-PN-02	Dry pack requirements change	I	P	Change of dry pack requirements. **(I):** Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	e.g. change in dry pack assurance (HIC, MBB) **(I)**: MSL 3 --> MSL 1 **(P)**: MSL 1 --> MSL 3	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-PN-03	Change of carrier (tray, reel)	P	P	Change of carrier	e.g. change by material e.g. change by geometry.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS		**PACKING / SHIPPING - VISUAL INSPECTION**																																											
NETWORKS & RESISTORS	PAS-RES-PV-01	Change of labelling	I	P	Change of labelling, also on reel.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-PV-02	Change of product marking	I	P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS	PAS-RES-PV-03	Change of packing/shipping specification	P	P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NETWORKS & RESISTORS		**LOGISTICS / CAPACITY / TESTING - EQUIPMEMENT**																																											
NETWORKS & RESISTORS	PAS-RES-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above. **Note:** Changes affecting the product not covered by the table require also a PCN.	e.g. new equipment supplier with different process concept	C		•	•	-	-	•	-	•	-	•	-	-	-	-	-	-	-	•	•	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Test effort depends on final risk assessment. Performance test according to affected process change.
NETWORKS & RESISTORS	PAS-RES-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P	PCN required for dedicated equipment for sensitive component production.	e.g. additional equipment to increase production capacity e.g. replacement of same equipment	C		•	•	-	-	•	-	•	-	•	-	-	-	-	-	-	-	•	•	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Test effort depends on final risk assessment. Performance test according to affected process change.
NETWORKS & RESISTORS	PAS-RES-EQ-03	Change in final test equipment type that uses a different technology	P	P	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Gage R&R / delta correlation
NETWORKS & RESISTORS		**LOGISTICS / CAPACITY / TESTING - PROCESS FLOW**																																											
NETWORKS & RESISTORS	PAS-RES-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P	P	Change of manufacturing site. Includes transfer as well as additional site. **Note**: Reorganization inside one plant/site is not affected!	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source / fab strategy	B		•	•	-	•	•	-	•	•	•	•	•	•	•	-	-	•	•	•	-	B	-	•	•	-	R	-	-	N	-	-	-	-	-	-	@•	@•	
NETWORKS & RESISTORS	PAS-RES-PF-02	Elimination or addition of a manufacturing process step	-	P	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Characterisation depends on impact of production flow.
NETWORKS & RESISTORS		**LOGISTICS / CAPACITY / TESTING - Q-GATE**																																											
NETWORKS & RESISTORS	PAS-RES-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of monitoring procedure or sampling)	-	P	Change of test coverage.	e.g. change from 100% to sample inspection e. g. test flow block, reduction from three to two temperature measurements e.g. change in burn in/run in process.	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R (electr. funct.): test coverage. R (reliability) only for change in burn in process.
INDUCTORS		**INDUCTORS**																																											
INDUCTORS		**ANY**																																											
INDUCTORS	PAS-IND-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation.	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-AN-02	Any change with impact on processability/manufacturabiliy at customer, which is not covered in the matrix below.	P	P		Technical interface means component terminals.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	-	
INDUCTORS		**DATASHEET**																																											
INDUCTORS	PAS-IND-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and / or AC/DC specification	P	P	Change of application relevant information **Not included:** Editorial changes.	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!!	e.g. data sheet correction because of new information about component behavior	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** no influence **(P):** Risk assessment depending on change for each application to provide evidence of additional parametes (stat. evaluation)	e.g. adding new (tested) parameter.	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS		**MATERIAL**																																											
INDUCTORS	PAS-IND-MA-01	Change of material composition - Bobbin Material	P	P	Material without magnetic function ("Spulenkörper") typically made by plastic material	e.g. change from Thermoset to Thermoplastic	B	**A:** in case the thermal or mechanical stability of bobbin is negatively affected	-	•	•	•	•	-	-	•	•	•	@•	-	-	•	-	-	•	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-MA-02	Change of material composition - Core Material	P	P	Change of core material, which is material with magnetic function	e.g. change from NiZn into MnZn	A		-	•	•	@•	•	-	-	-	•	•	-	-	-	•	-	-	•	-	-	B	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
INDUCTORS	PAS-IND-MA-03	Change of material composition - Insulation Material	P	P	Change of insulation material	e.g. wire insulation, insulation tapes, ... e.g. change from Polyurethane to Polyamide	C	Consider also if **PAS-IND-DE-05** is affected **A**: in case of HV components (rated voltage >= 100V) (final judgemend by tier 1, if used in HV application)	-	•	•	•	•	-	-	•	•	•	-	-	•	-	-	•	•	A	-	B	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-MA-04	Change of material composition - Lead Material	P	P	Change of lead material	e.g. change from tin coverd to non-coverd lead material	B		-	•	-	-	-	-	-	-	•	•	-	•	-	-	•	•	-	-	•	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	@•	-	
INDUCTORS	PAS-IND-MA-05	Change of material composition - Mold Compound	P	P	Change of mold compound material	e.g. change to green mold	B		-	•	•	•	•	-	•	•	•	•	-	-	•	•	-	-	•	-	-	B	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Electrical function affected if mechanical stress distribution changes. AOI, wave soldering and board coating has to be assessed. MSL might change.
INDUCTORS	PAS-IND-MA-06	Change of material composition - Solder Material	P	P	Change of solder material at internal connection.	e.g. change of SnAgCu composition	B		-	•	•	-	•	-	-	-	-	•	-	•	-	•	•	@•	•	-	•	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	@•	-	
INDUCTORS	PAS-IND-MA-07	Change of material composition - Wire / Foil Material	P	P	Wire for wound inductors. Foil for multilayer inductors (inner electrode).	e.g. change of Cu composition	B	**A**: in case of wire wound inductors, where the wire is not 100% fixed by mold or epoxy within the inductor	-	•	•	@•	-	-	•	•	•	•	-	-	-	-	@•	-	-	•	-	B	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	@•	
INDUCTORS	PAS-IND-MA-08	Change of material composition - Glue	P	P	Foil for multilayer inductors (inner electrode).	e.g. change from glue A into glue B	C		-	•	•	-	@•	-	-	@•	-	@•	-	-	-	-	@•	@•	-	-	@•	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Considere in case of core-core glue the air gap.
INDUCTORS	PAS-IND-MA-09	Change of supplier of material	-	P	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	C		-	•	•	-	•	-	•	@•	-	•	•	•	-	-	-	-	•	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Assumption material specification remains unchanged. Otherwise see change of material.
INDUCTORS	PAS-IND-MA-10	Change of material composition - Potting Material	P	P	Change of potting material	e.g. change from epoxy resin to silicon	C	**A**: If influence on other connections on PCB or laquer expected.	-	-	•	-	@•	-	-	@•	-	@•	@•	-	-	-	@•	@•	-	-	@•	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
INDUCTORS		**DESIGN**																																											
INDUCTORS	PAS-IND-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Bobbin	I	P	Material without magnetic function ("Spulenkörper") typically made by plastic material	e.g. construction / dimension change of bobbin	B		-	•	-	-	•	-	-	-	-	•	•	-	-	•	-	-	•	•	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
INDUCTORS	PAS-IND-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead/Terminals	I	P	Change of lead/terminals	e.g. Change of lead or terminal design (shape, dimension, ...)	A		-	•	-	-	-	-	-	-	-	•	•	•	-	-	•	•	-	•	•	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	@•	@•	Effect regarding EMC relevant for high frequency only.
INDUCTORS	PAS-IND-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension structure - Mold	I	P	Change of mold	e.g. new mold material with different color	B		-	•	-	-	•	-	•	@•	-	•	•	-	•	•	-	-	•	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Parameter Analysis only for components where mold material has magnetic function
INDUCTORS	PAS-IND-DE-04	Changes of inner construction - Core Construction	-	P	Change of core construction, which is material with magnetic function	e.g. change from drum core & shield core into pot core & cover plate core	A		-	•	-	-	•	-	-	-	-	•	•	-	-	•	•	-	•	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
INDUCTORS	PAS-IND-DE-05	Changes of inner construction - Insulation System	-	P	Change of insulation system An electrical insulation system (EIS) is comprised of a unique combination of materials that have been verified for chemical compatibility when used at certain maximum temperatures. (see www.UL.com)	e.g. wire insulation, insulation tapes, mold, potting, ...	C	**A**: in case of HV components (rated voltage >= 100V) (final judgement by tier 1, if used in HV application)	-	•	-	@•	-	-	-	•	•	•	•	-	•	-	-	•	-	A	-	B	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-DE-06	Changes of inner construction - Wire / Foil Construction	-	P	Change of wire / foil dimensions	e.g. change from round cross section to rectangular cross section e.g. from single wire to litz wire	B		-	•	-	-	•	-	-	-	-	•	•	-	-	-	@•	-	•	-	-	B	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	@•	
INDUCTORS	PAS-IND-DE-07	Changes of termination, surface finish, shape, color, appearance or dimension structure - Potting Material	I	P	Change of potting dimension	e.g. change of potting (filling) height	C	If data sheet is affected **(PAS-IND-DS-01)**	-	-	-	-	@•	-	-	-	-	@•	@•	-	-	-	@•	@•	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
INDUCTORS		**PROCESS**																																											
INDUCTORS	PAS-IND-PR-01	Changes in process technology or manufacturing methods - Insulation Strip	-	P	(Mechanical) removal of insulation.	e.g. change from mechanical removal to laser removal	B		•	•	-	-	@•	-	•	-	-	•	-	-	•	-	@•	•	-	-	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Mechanical damage of wire, impact on solderability in case of stripping process is affecting soldering area.
INDUCTORS	PAS-IND-PR-02	Changes in process technology or manufacturing methods - Lead Prep. / Plating	-	P	Change of lead prep. / plating	e.g. change from hot dip tinning to electroplating	B		•	•	-	-	•	-	-	-	-	•	-	•	-	-	•	•	•	-	•	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	@•	-	Influence regarding reliability of solder joint.
INDUCTORS	PAS-IND-PR-03	Changes in process technology or manufacturing methods - Terminal Attach	-	P	Connection of wire terminal and / or connection of termination to core/bobbin.	e.g. change from manual winding to semi-automtic winding (winding of wire on terminal)	C		•	•	-	-	•	-	•	@•	-	•	-	•	-	•	•	A	•	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	-	Increase of contact resistance.
INDUCTORS	PAS-IND-PR-04	Changes in process technology or manufacturing methods - Marking	-	P	Change of marking process	e.g. change from ink marking to laser marking	B		•	•	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-PR-05	Changes in process technology or manufacturing methods - Molding	-	P	Change of molding process	e.g. change from one component molding to two component molding (other technology needed)	B		•	•	-	•	•	-	-	•	•	•	•	-	•	•	-	-	•	-	-	B	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-PR-06	Changes in process technology or manufacturing methods - Soldering Internal Connections	-	P	Change of soldering internal connection	e.g. change from hot tip tinning to resistance welding	C	**B**: in case solder connection is used as solder connection to PCB.	•	•	-	-	•	-	-	-	-	•	-	•	-	-	•	-	•	-	•	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-PR-07	Changes in process technology or manufacturing methods - Winding Insulation	-	P	Change of winding - insulation	e.g. change from manual to automatic process	B		•	•	-	@•	-	-	-	•	•	@•	-	-	•	-	-	•	-	A	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-PR-08	Changes in process technology or manufacturing methods - Winding Wire	-	P	Change of winding - wire	e.g. change from semi-automatic winding to full automatic winding	C		•	•	-	@•	-	-	•	-	•	•	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
INDUCTORS	PAS-IND-PR-09	Process integrity: tuning within specification	-	P	Variation within process specification.	e.g. process control	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-PR-10	Changes in process technology or manufacturing methods - Potting	-	P	Change of potting process	e.g. change from manual potting process to automatic potting process	C		•	-	-	-	@•	-	-	@•	-	@•	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS		**PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS**																																											
INDUCTORS	PAS-IND-PN-01	Packing / shipping specification change (loosening of tolerances)	P	P	Change of packing specification.	e.g. number of pieces on reel.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-PN-02	Dry pack requirements change	I	P	Change of dry pack requirements. **(I):** Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	e.g. change in dry pack assurance (HIC, MBB) **(I)**: MSL 3 --> MSL 1 **(P)**: MSL 1 --> MSL 3	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-PN-03	Change of carrier (tray, reel)	P	P	Change of carrier	e.g. change by material e.g. change by geometry.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS		**PACKING / SHIPPING - VISUAL INSPECTION**																																											
INDUCTORS	PAS-IND-PV-01	Change of labelling	I	P	Change of labelling, also on reel.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-PV-02	Change of product marking	I	P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS	PAS-IND-PV-03	Change of packing/shipping specification	P	P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDUCTORS		**LOGISTICS / CAPACITY / TESTING - EQUIPMEMENT**																																											
INDUCTORS	PAS-IND-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above. **Note:** Changes affecting the product not covered by the table require also a PCN.	e.g. introduction of potting process	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Test effort depends on final risk assessment. Performance test according to affected process change.
INDUCTORS	PAS-IND-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P	PCN required for dedicated equipment for sensitive component production.	e.g. duplication of existing winding machine	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Test effort depends on final risk assessment. Performance test according to affected process change.
INDUCTORS	PAS-IND-EQ-03	Change in final test equipment type that uses a different technology	P	P	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Gage R&R / delta correlation
INDUCTORS		**LOGISTICS / CAPACITY / TESTING - PROCESS FLOW**																																											
INDUCTORS	PAS-IND-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P	P	Change of manufacturing site. Includes transfer as well as additional site. **Note**: Reorganization inside one plant/site is not affected!	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source / fab strategy	B		•	•	-	•	•	-	•	@•	•	@•	-	•	-	-	-	•	•	-	-	B	-	-	•	-	-	-	-	-	-	-	-	-	-	-	@•	@•	
INDUCTORS	PAS-IND-PF-02	Elimination or addition of a manufacturing process step	-	P	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Characterisation depends on impact of production flow.
INDUCTORS	PAS-IND-PF-03	Elimination of final electrical measurement / test flow block	I	P	Reduction of final testing. PCN required for dedicated final test reductions for sensitive parameters.	e. g. elimination of High-voltage measurement	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Characterisation depends on impact of final test flow.
INDUCTORS		**LOGISTICS / CAPACITY / TESTING - Q-GATE**																																											
INDUCTORS	PAS-IND-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of monitoring procedure or sampling)	-	P	Change of test coverage.	e.g. change from 100% to sample inspection e. g. test flow block, reduction from three to two temperature measurements e.g. change in burn in/run in process.	C		-	•	-	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R (electr. funct.): test coverage. R (reliability) only for change in burn in process.
CERAMIC / TANTALUM		**CERAMIC / TANTALUM**																																											
CERAMIC / TANTALUM		**ANY**																																											
CERAMIC / TANTALUM	PAS-CER-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation.	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-AN-02	Any change with impact on processability/manufacturabiliy at customer, which is not covered in the matrix below.	P	P		Technical interface means component terminals.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	-	
CERAMIC / TANTALUM		**DATASHEET**																																											
CERAMIC / TANTALUM	PAS-CER-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and / or AC/DC specification	P	P	Change of application relevant information **Not included:** Editorial changes.	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

CERAMIC / TANTALUM	PAS-CER-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!!	e.g. data sheet correction because of new information about component behavior	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** no influence **(P):** Risk assessment depending on change for each application to provide evidence of additional parametes (stat. evaluation)	e.g. adding new (tested) parameter.	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM		**MATERIAL**																																											
CERAMIC / TANTALUM	PAS-CER-MA-01	Change of material composition - Ceramic Binder	P	P	Binder material (ceramic)		C		-	•	•	-	•	•	-	-	-	-	-	-	-	-	•	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-MA-02	Change of material composition - Tantalum Binder	P	P	Binder material (tantal)	e.g. change from wax 1 to wax 2	C		-	•	•	-	•	•	-	-	-	-	-	-	-	-	•	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-MA-03	Change of material composition - Dielectric	P	P	Dielectric change (ceramic only) ceramic material class (BaTiO3, CaZrO3, etc.) will not be changed, only dopands will be changed	e.g. change from ceramic A into ceramic B	C		-	•	•	•	•	•	-	•	•	-	-	•	•	•	•	-	•	•	-	B	-	C	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-MA-04	Change of material composition - Electrode Attach	P	P	Electrode attach (only tantal, glue, carbon, Ag)	e.g. change of Ag particle size in conductive adhesive	C		-	•	•	•	•	-	-	-	•	-	-	-	-	-	-	C	•	-	-	B	-	C	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-MA-05	Change of material composition - Electrode Material	P	P	Electrode Material (only ceramic, inner elctrode)	e.g. change from spehric to flake shape (Ni paste)	C		-	•	•	•	•	•	-	•	•	-	-	•	•	-	•	-	•	•	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-MA-06	Change of material composition - Encapsulation	P	P	Encapsulation	e.g. change from epoxy1 into epoxy2	C	Consider effect on usage on coated PBA (printed board assembly) **B**: in case component is used in coated PBA (printed board assembly)	-	•	•	-	•	-	•	•	-	•	•	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Check whether AOI at Tier 1 can be affected
CERAMIC / TANTALUM	PAS-CER-MA-07	Change of material composition - Lead material / Termination	P	P	Lead material / Termination All changes outside ceramic/tantal body	e.g. change from SnPb to pure Sn e.g. change of soft termination material e.g. change of any galvanic layer	B		-	•	•	-	•	•	-	-	•	•	-	•	-	-	•	•	-	-	•	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-MA-08	Change of supplier of material	-	P	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	C		-	•	•	•	•	•	•	•	•	-	-	•	•	•	•	•	•	•	•	B	-	•	•	C	-	-	-	-	-	-	-	-	-	-	-	@•	Assumption material specification remains unchanged. Otherwise see change of material.
CERAMIC / TANTALUM		**DESIGN**																																											
CERAMIC / TANTALUM	PAS-CER-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead Diameter	I	P	Change of lead diameter (for soldered THT components)	e.g. change from 0.8mm into 0.6mm	A		-	•	-	-	•	-	•	•	•	•	•	•	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination Area	I	P	Change of Termination area	e.g. change in width of termination from 0.1 - 0.3 mm into 0.2 - 0.4 mm	B		-	•	-	•	-	-	•	-	-	•	•	-	-	-	•	-	-	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension structure - Terminal Interface	I	P	Terminal interface	e.g. additional layer in termination	B		-	•	-	•	•	•	•	•	•	-	-	•	-	•	•	•	-	-	-	B	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-DE-04	Changes of inner construction - Electrode Thickness	-	P	Electrode thickness (ceramic only)	e.g. Ni layer change from 2.5µm into 3.5µm	C		-	•	-	•	•	•	-	-	•	-	•	-	-	•	•	-	•	•	-	B	-	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
CERAMIC / TANTALUM	PAS-CER-DE-05	Changes of inner construction - Layer Thickness	-	P	Layer thickness (dielectric thickness)	e.g. Ceramic layer thickness changes from 3µm into 5µm.	C		-	•	-	•	•	•	-	•	•	-	•	•	-	•	-	-	•	•	-	B	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-DE-06	Changes of inner construction - Number of Layers	-	P	Number of layers (ceramic only). Allways in combination with PAS-CER-DE-05.	see also layer thickness	C		-	•	-	-	C	C	-	C	C	-	C	-	-	C	-	-	C	C	-	B,C	-	@C	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM		**PROCESS**																																											
CERAMIC / TANTALUM	PAS-CER-PR-01	Changes in process technology or manufacturing methods - Dicing	-	P	Change of dicing	e.g. change from cutting to sawing	C		•	•	-	•	•	-	•	•	-	•	•	-	•	•	-	-	-	-	-	B	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PR-02	Changes in process technology or manufacturing methods - Electrode apply	-	P	Electrode apply (dielectric layer process)	e.g. change from wet to dry process	C		•	•	-	C	-	-	-	C	-	-	-	-	-	-	-	C	C	C	-	B,C	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PR-03	Changes in process technology or manufacturing methods - Firing	-	P	Change of firing profile	e.g. seperation of decarbonization and firing profile.	C		•	•	-	-	•	•	-	-	•	-	-	-	-	-	-	-	•	•	-	B	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PR-04	Changes in process technology or manufacturing methods - Lamination	-	P	Change of lamination / press techinque	e.g. stamp press to isostatic press	C		•	•	-	-	-	•	-	•	-	-	-	-	-	-	-	•	•	-	-	B	-	•	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PR-05	Changes in process technology or manufacturing methods - Particle Size	-	P	Change of powder particle size. Allways in combination with PAS-CER-MA-03.	e.g. change D50 from 0.5µm into 0.4µm	C		•	•	-	-	•	-	-	•	-	-	-	-	-	-	-	•	-	•	-	B	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PR-06	Changes in process technology or manufacturing methods - Screening/Printing	-	P	Change of screening / printing	e.g. change from screen printing into offset printing	C		•	•	-	-	-	-	-	-	C	-	-	-	-	C	-	-	-	C	-	B,C	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PR-07	Changes in process technology or manufacturing methods - Termination	-	P	Change for termination preparation like plating or apply of termination base layer.	e.g. change in plating technology (final termination) e.g. change from dip in paste to platimg (apply)	B		•	•	-	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-	•	B	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PR-08	Process integrity: tuning within specification	-	P	Variation within process specification.	e.g. process control	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM		**PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS**																																											
CERAMIC / TANTALUM	PAS-CER-PN-01	Packing / shipping specification change (loosening of tolerances)	P	P	Change of packing specification.	e.g. number of pieces on reel.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PN-02	Dry pack requirements change	I	P	Change of dry pack requirements. **(I):** Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	e.g. change in dry pack assurance (HIC, MBB) **(I):** MSL 3 --> MSL 1 **(P)**: MSL 1 --> MSL 3	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PN-03	Change of carrier (tray, reel)	P	P	Change of carrier	e.g. change by material e.g. change by geometry.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM		**PACKING / SHIPPING - VISUAL INSPECTION**																																											
CERAMIC / TANTALUM	PAS-CER-PV-01	Change of labelling	I	P	Change of labelling, also on reel.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PV-02	Change of product marking	I	P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM	PAS-CER-PV-03	Change of packing/shipping specification	P	P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CERAMIC / TANTALUM		**LOGISTICS / CAPACITY / TESTING - EQUIPMEMENT**																																											
CERAMIC / TANTALUM	PAS-CER-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above. **Note:** Changes affecting the product not covered by the table require also a PCN.	e.g. change from wet to dry technology.	C		•	•	-	-	•	-	•	•	•	-	•	A	-	-	•	-	-	•	•	B	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	@•	Test effort depends on final risk assessment. Performance test according to affected process change.
CERAMIC / TANTALUM	PAS-CER-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P	PCN required for dedicated equipment for sensitive component production.	e.g. elimination of manual handling processes	C		•	•	-	-	•	-	•	•	•	-	•	A	-	-	•	-	-	•	•	B	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	@•	Test effort depends on final risk assessment. Performance test according to affected process change.
CERAMIC / TANTALUM	PAS-CER-EQ-03	Change in final test equipment type that uses a different technology	P	P	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Gage R&R / delta correlation
CERAMIC / TANTALUM		**LOGISTICS / CAPACITY / TESTING - PROCESS FLOW**																																											
CERAMIC / TANTALUM	PAS-CER-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P	P	Change of manufacturing site. Includes transfer as well as additional site. **Note**: Reorganization inside one plant/site is not affected!	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source / fab strategy	B		•	•	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	B	-	•	•	C	-	-	-	-	-	-	-	-	-	-	-	@•	@•	
CERAMIC / TANTALUM	PAS-CER-PF-02	Elimination or addition of a manufacturing process step	-	P	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Characterisation depends on impact of production flow.
CERAMIC / TANTALUM		**LOGISTICS / CAPACITY / TESTING - Q-GATE**																																											
CERAMIC / TANTALUM	PAS-CER-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of monitoring procedure or sampling)	-	P	Change of test coverage.	e.g. change from 100% to sample inspection e. g. test flow block, reduction from three to two temperature measurements e.g. change in burn in/run in process.	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R (electr. funct.): test coverage. R (reliability) only for change in burn in process.
Film capacitors		**FILM CAPACITORS**																																											
Film capacitors		**ANY**																																											
Film capacitors	PAS-FLM-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements	Not relevant for technical evaluation.	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-AN-02	Any change with impact on processability/manufacturabiliy at customer, which is not covered in the matrix below.	P	P		Technical interface means component terminals.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	-	
Film capacitors		**DATASHEET**																																											
Film capacitors	PAS-FLM-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and / or AC/DC specification	P	P	Change of application relevant information **Not included:** Editorial changes.	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!!	e.g. data sheet correction because of new information about component behavior	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** no influence **(P):** Risk assessment depending on change for each application to provide evidence of additional parametes (stat. evaluation)	e.g. adding new (tested) parameter.	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors		**MATERIAL**																																											
Film capacitors	PAS-FLM-MA-01	Change of material composition - Sealing Compound	P	P	Typicaly change within epoxy **or** PU sealing without effect to mechanical properties. **Note:** Change from epoxy sealing into PU sealing (both direction) will lead to generate a new product.	e.g. change of epoxy or PU composition	C	**A**: in combination with **PAS-FLM-DS-01** or if change of sealing compound with effect to mechanical properties. **A**:: in case of high voltage components (rated voltage >= 100V) (final judgement by tier 1, if used in HV application)	-	•	•	•	•	-	•	•	•	•	•	@•	•	•	•	-	•	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Consider vibration in application
Film capacitors	PAS-FLM-MA-02	Change of material composition - Package	P	P	Change material of package	Change material of package, e.g. change from PBT to PPS e.g. change of glas fiber ratio	B		-	•	•	-	•	-	-	•	•	•	•	•	@•	•	•	-	-	-	•	-	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Consider AOI and processability
Film capacitors	PAS-FLM-MA-03	Change of material composition - Lead/Termination	P	P	Change of Lead/Termination **Note:** If change of lead frame material leads to an ESR change, than change of data sheet (PAS-FLM-DS-01) has to be respected.	e.g. change of basis material from Cu to Fe e.g. change of finishing from SnPb to Sn	B	**A**: in combination with **PAS-FLM-DS-01**	-	•	•	-	-	-	•	-	-	-	•	•	-	•	-	•	-	-	•	B	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	@•	-	Change of base material: Consider ESR, high frequency parameter
Film capacitors	PAS-FLM-MA-04	Change of material composition - Metal Spray (Schoop)	P	P	Change of Metal Spray (Schoop): Use different material for metal spray process for boxed and naked types	e.g. from Zn to Al	C	**B**: for naked SMD	-	•	•	-	@•	-	@•	-	@•	-	-	@•	-	@•	@•	-	-	-	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Consider ESR. Solderability Test for naked SMD components.
Film capacitors	PAS-FLM-MA-05	Change of material composition - Film	P	P	Change of film material for boxed and naked types	e.g. change of additives (<1%) of film composition (same raw material)	C	**B**: for naked SMD	-	•	•	-	@•	-	-	@•	@•	@•	@•	-	-	-	-	@•	-	-	-	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
Film capacitors	PAS-FLM-MA-06	Change of material composition - Metal Foil	P	P	Change of metal foil for inner electrode	e.g. change from Al to Al-Zn alloy	C		-	•	•	-	@•	-	-	@•	@•	@•	-	-	-	-	-	-	-	-	-	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
Film capacitors	PAS-FLM-MA-07	Change of supplier of material	-	P	Change to a new or additional material supplier at component manufacturer which are described above.	e.g. for 2nd source purpose	C	Check if other **PAS-FLM-MA** is affected	-	•	•	•	•	-	•	-	•	-	-	•	•	-	•	•	•	-	•	-	•	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Assumption material specification remains unchanged. Otherwise see change of material.
Film capacitors		**DESIGN**																																											
Film capacitors	PAS-FLM-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead Diameter / Thickness	I	P	Change of lead diameter thickness (for soldered THT components)	e.g. change lead diameter from 0.5 to 0.4 mm e.g. change of thickness of terminal	A		-	•	-	-	@•	-	-	-	-	@•	@•	@•	-	@•	@•	-	-	-	-	@B	-	@•	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination Area	I	P	Changes of termination area are changes which are affecting the area for connection of component and PCB	e.g. change of termination layer thickness e.g. change in termination dimensions / shape	B		-	•	-	-	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	-	-	@•	@•	-	-	-	-	-	-	-	-	-	-	-	@•	-	
Film capacitors	PAS-FLM-DE-03	Changes of inner construction - Inner Connection	-	P	Change of inner connection	e.g. change from soldered connection to welded connection	C		-	•	-	-	@•	-	-	-	@•	@•	-	@•	-	@•	@•	@•	-	-	-	@•	-	@•	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-DE-04	Changes of termination, surface finish, shape, color, appearance or dimension structure - Appearance	I	P	Change of appearance. **(I):** Change in appaerance without impact on product integrity. **(P):** Change in appaerance with impact on product integrity. **Note:** Marking on device is defined as seperate change (PAS-FLM-PV-02).	e.g. change or adding of color on component	B	Check if **MATERIAL** is affected.	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-DE-05	Changes of inner construction - Film/Foil	-	P	Change of film or foil design	e.g. change to a different foil supplier.	C	**A**: in combination with **PAS-FLM-DS-01**	-	•	-	-	•	-	-	@•	•	-	-	-	-	-	-	-	-	•	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
Film capacitors	PAS-FLM-DE-06	Changes of inner construction - Insulation System	-	P	Change of inner insulation to protect winding element against housing.	e.g. change of potting material e.g. change of number of inner insulation layers (depending of insulation material thickness)	C		-	•	-	-	•	-	-	-	•	-	-	-	-	-	-	-	-	•	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	
Film capacitors	PAS-FLM-DE-07	Changes of termination, surface finish, shape, color, appearance or dimension structure - Package	I	P	Change of packaging	e.g. change of dimension or shape e.g. change of surface	B		-	•	-	-	@•	-	@•	-	-	@•	@•	-	@•	@•	@•	-	-	-	-	-	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors		**PROCESS**																																											
Film capacitors	PAS-FLM-PR-01	Changes in process technology or manufacturing methods - Package	-	P	Change of resin filling or hardening process (relevant for boxed types only)	e.g. change in resin filling process (mixing, sequences, potting, ...) e.g. change in hardening process (temperature, time, ...)	C		•	•	-	•	•	-	-	•	•	•	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-PR-02	Changes in process technology or manufacturing methods - Terminal Attach	-	P	Change Terminal Attach Process to winding element for boxed and nacked types	e.g. spraying and / or galvanic process, e.g. welding / soldering	C	**B**: for naked SMD	•	•	-	-	•	-	•	-	•	-	-	•	•	-	-	-	-	-	-	B	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Consider ESR. Solderability Test for naked SMD components.
Film capacitors	PAS-FLM-PR-03	Changes in process technology or manufacturing methods - Winding	-	P	Change of winding, flattening or tempering process	e.g. change of tempering temperature	C		•	•	-	•	-	-	-	@•	•	-	-	-	-	-	-	-	-	•	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-PR-04	Process integrity: tuning within specification	-	P	Variation within process specification.	e.g. process control	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors		**PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS**																																											
Film capacitors	PAS-FLM-PN-01	Packing / shipping specification change (loosening of tolerances)	P	P	Change of packing specification.	e.g. number of pieces on reel.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-PN-02	Dry pack requirements change	I	P	Change of dry pack requirements. **(I)**: Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	e.g. change in dry pack assurance (HIC, MBB) **(I)**: MSL 3 --> MSL 1 **(P)**: MSL 1 --> MSL 3	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-PN-03	Change of carrier (tray, reel)	P	P	Change of carrier	e.g. change by material e.g. change by geometry.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors		**PACKING / SHIPPING - VISUAL INSPECTION**																																											
Film capacitors	PAS-FLM-PV-01	Change of labelling	I	P	Change of labelling, also on reel.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-PV-02	Change of product marking	I	P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors	PAS-FLM-PV-03	Change of packing/shipping specification	P	P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Film capacitors		**LOGISTICS / CAPACITY / TESTING - EQUIPEMEMENT**																																											
Film capacitors	PAS-FLM-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above. **Note:** Changes affecting the product not covered by the table require also a PCN.	e.g. implementation of new machines	C		•	•	-	-	•	-	•	@•	•	@•	@•	•	-	-	-	-	•	•	-	B	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Test effort depends on final risk assessment. Performance test according to affected process change.
Film capacitors	PAS-FLM-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P	PCN required for dedicated equipment for sensitive component production.	e.g. extension of existing machine capacity	C		•	•	-	-	•	-	•	@•	•	@•	@•	•	-	-	-	-	•	•	-	B	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Test effort depends on final risk assessment. Performance test according to affected process change.
Film capacitors	PAS-FLM-EQ-03	Change in final test equipment type that uses a different technology	P	P	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Gage R&R / delta correlation
Film capacitors		**LOGISTICS / CAPACITY / TESTING - PROCESS FLOW**																																											
Film capacitors	PAS-FLM-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P	P	Change of manufacturing site. Includes transfer as well as additional site. **Note**: Reorganization inside one plant/site is not affected!	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source / fab strategy	B		•	•	-	•	•	-	•	•	•	•	•	•	•	•	•	•	•	•	•	B	•	•	•	-	-	-	-	-	-	-	-	-	-	-	-	@•	@•	
Film capacitors	PAS-FLM-PF-02	Elimination or addition of a manufacturing process step	-	P	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	C		•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	Characterisation depends on impact of production flow.
Film capacitors		**LOGISTICS / CAPACITY / TESTING - Q-GATE**																																											
Film capacitors	PAS-FLM-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of monitoring procedure or sampling)	-	P	Change of test coverage.	e.g. change from 100% to sample inspection e.g. test flow block, reduction from three to two temperature measurements e.g. change in burn in/run in process.	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R (electr. funct.): test coverage. R (reliability) only for change in burn in process.
QUARTZ CRYSTAL / SAW		**QUARTZ CRYSTAL / SAW**																																											
QUARTZ CRYSTAL / SAW		**ANY**																																											
QUARTZ CRYSTAL / SAW	PAS-QUA-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements	Not relevant for technical evaluation.	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-AN-02	Any change with impact on processability/manufacturabiliy at customer, which is not covered in the matrix below.	P	P		Technical interface means component terminals.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@•	-	
QUARTZ CRYSTAL / SAW		**DATASHEET**																																											
QUARTZ CRYSTAL / SAW	PAS-QUA-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and / or AC/DC specification	P	P	Change of application relevant information **Not included:** Editorial changes.	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!!	e.g. data sheet correction because of new information about component behavior	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** no influence **(P):** Risk assessment depending on change for each application to provide evidence of additional parametes (stat. evaluation)	e.g. adding new (tested) parameter.	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW		**MATERIAL**																																											
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-01	Change of material composition - Quartz Blank	P	P	A change of Quartz Blank is a very rare case. Mainly for SAW-Filter		A		-	•	•	•	•	-	-	-	•	-	-	-	-	•	•	-	•	-	-	B	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-02	Change of material composition - Base	P	P	Changing of the material of the base.	e.g. change from ceramic to epoxy	A		-	•	•	-	•	-	@•	•	-	•	•	-	•	•	•	@•	@•	-	-	-	@•	•	•	-	-	-	-	-	-	@•	-	-	-	-	-	-	-	C0 may be influenced Temperature expansion coefficient may change
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-03	Change of material composition - Lead / Termination	P	P	Change of Lead/Termination	e.g. change of plating finish. (eg:Au, AgPd,Sn)	B		-	•	•	-	•	-	-	-	-	•	•	•	•	-	•	•	-	-	•	B	-	•	•	-	-	-	-	@•	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-04	Change of material composition - Sealing	P	P	Change of Glass Seal	e.g. change to lead free glass	B		-	•	•	•	•	@•	•	•	•	•	-	•	•	•	•	•	•	-	-	B	-	•	•	-	-	-	-	@•	-	-	-	-	-	-	-	-	-	X-Ray inspection may be influenced when sealing is containing Pb
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-05	Change of material composition - Can / Cap	P	P	Changing of the material of the can/cap	e.g. change from metal to ceramic material	A		-	•	•	@•	•	-	@•	•	@•	•	•	-	•	•	•	@•	@•	-	-	@B	-	•	-	-	-	-	-	@•	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-06	Change of material composition - Blank Support	P	P	Change of Blank Support	e.g. change of glue (Silicone to Epoxy) e.g. change metal holders (old types)	C		-	•	•	@•	•	-	@Y	@Y	•	-	-	-	-	•	•	@•	•	-	-	B	-	•	-	-	-	-	-	@Y	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-07	Change of material composition - Overmold	P	P	Change of Overmold	e.g. change to green mold compound e.g. change of filler particles	B		-	•	•	•	•	@•	•	@•	@•	•	•	-	•	•	•	•	•	-	-	@B	•	•	•	-	-	-	-	@•	-	-	-	-	-	-	-	-	-	Electrical function affected in case of mechanical stress distribution change. AOI, wave soldering and board coating has to be assessed. MSL might be changed.
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-08	Change of material composition - Case Sealing	P	P	Change of Case Sealing. Change of material for seam welding Relevant for components with ceramic base and metall cap.	e.g. change from solder paste to adhesive glue	C		-	•	•	•	•	-	@Y	•	-	•	-	-	•	•	•	•	•	-	-	B	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Impedance my be influenced.
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-09	Change of material composition - Electrode	P	P	Change of Electrode material on crystal blank.	e.g. change from Au to Ag	C		-	•	•	•	•	-	@Y	@Y	•	-	-	-	@Y	-	•	@•	•	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-10	Change of material composition - Insulator	P	P	Change of Insulator. Only for leaded types Not relevant for typical SMD.	e.g. Insulating plate under crystal e.g. Glass sealing for leads	B		-	•	•	•	•	@•	•	-	@•	•	•	-	•	-	•	•	•	-	-	B	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-11	Change of material composition - Marking	P	P	Change of marking material	e.g. change of ink e.g. chemical to environmental friendly	B		-	•	•	-	-	-	-	-	-	@•	-	-	@•	-	-	@•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AOI check necessary!
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-12	Change of supplier of material	-	P	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	C		-	•	•	-	•	-	•	-	•	•	•	•	•	•	•	-	•	-	•	B	•	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Assumption material specification remains unchanged. Otherwise see change of material.
QUARTZ CRYSTAL / SAW		**DESIGN**																																											

QUARTZ CRYSTAL / SAW	PAS-QUA-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Base	I	P	Change of Base design	e.g. due to miniaturization purpose.	B		
QUARTZ CRYSTAL / SAW	PAS-QUA-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead / Termination	I	P	Change of Lead/Termination design. Change geometry or terminal pad or lead form	e.g. change lead design to improve reliability.	B		C0 may be influenced Reliabiliy of solder joints may be affected
QUARTZ CRYSTAL / SAW	PAS-QUA-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension structure - Can / Cap	I	P	Change of Can/Cap design	e.g. due to miniaturization purpose.	A		
QUARTZ CRYSTAL / SAW	PAS-QUA-DE-04	Changes of termination, surface finish, shape, color, appearance or dimension structure - Package	I	P	Change of Package (Molded). Change the design of the package. Not relevant for typical SMD.	e.g. change from welded device to glued device (case sealing)	B		Electrical function affected in case of mechanical stress distribution change. AOI, wave soldering and board coating has to be assessed. MSL might be changed.
QUARTZ CRYSTAL / SAW	PAS-QUA-DE-05	Changes of termination, surface finish, shape, color, appearance or dimension structure - Insulator	I	P	Change of Insulator design. Only for leaded types (old technology) Not relevant for typical SMD.		B		
QUARTZ CRYSTAL / SAW	PAS-QUA-DE-06	Changes of inner construction - Quartz Blank	-	P	Change of Quartz Blank design	e.g. change dimension of blank, add phase, electrode design, ...	C		
QUARTZ CRYSTAL / SAW	PAS-QUA-DE-07	Changes of inner construction - Blank Support	-	P	Change of Blank Support design	e.g. change design of glue shape e.g. change design of metall supporter	C		
QUARTZ CRYSTAL / SAW		**PROCESS**							
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-01	Changes in process technology or manufacturing methods - Quartz Blank	-	P	Change of Quartz Blank process	e.g. change of cutting or lapping technology	C		
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-02	Changes in process technology or manufacturing methods - Blank Etching / Cleaning	-	P	Change of Blank Etch/Clean process Using different / new technology	e.g. change from liquid etching to plasma etching	C		
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-03	Changes in process technology or manufacturing methods - Electrode Formation	-	P	Change of Electrode Formation process	e.g. change from evaporation to sputtering	C		
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-04	Changes in process technology or manufacturing methods - Trimming	-	P	Change of Auto Trim process (Method of final frequency tuning)	e.g. change from evaporation to ion beam	C		
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-05	Changes in process technology or manufacturing methods - Bonding / Annealing	-	P	Change of Blank bonding / annealing process. Change of method how apply conductive material to base or blank		C		
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-06	Changes in process technology or manufacturing methods - Can / Cap Attaching	-	P	Change of Cap/Can attaching process	e.g. change of the sealing process e.g. change from batch oven to reflow oven	C		
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-07	Changes in process technology or manufacturing methods - Molding	-	P	Change of Overmolding process. Not relevant for typical SMD.	e.g. change of overmold process parameter	C		
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-08	Changes in process technology or manufacturing methods - Marking	-	P	Change of Marking process	e.g. change from inked marking to laser marking e.g. marking of pin 1 e.g. change of appearance (additional marking)	B		AOI check necessary!
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-09	Changes in process technology or manufacturing methods - Aging	-	P	Change of Aging process. Typically no aging done on quartz crystals.	If aging is done: e.g. change of times or temperatures	C		
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-10	Process integrity: tuning within specification	-	P	Variation within process specification.	e.g. process control	C		
QUARTZ CRYSTAL / SAW		**PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS**							
QUARTZ CRYSTAL / SAW	PAS-QUA-PN-01	Packing / shipping specification change (loosening of tolerances)	P	P	Change of packing specification.	e.g. number of pieces on reel.	B		
QUARTZ CRYSTAL / SAW	PAS-QUA-PN-02	Dry pack requirements change	I	P	Change of dry pack requirements. **(I)**: Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	e.g. change in dry pack assurance (HIC, MBB) **(I)**: MSL 3 --> MSL 1 **(P)**: MSL 1 --> MSL 3	B		
QUARTZ CRYSTAL / SAW	PAS-QUA-PN-03	Change of carrier (tray, reel)	P	P	Change of carrier	e.g. change by material e.g. change by geometry.	B		
QUARTZ CRYSTAL / SAW		**PACKING / SHIPPING - VISUAL INSPECTION**							
QUARTZ CRYSTAL / SAW	PAS-QUA-PV-01	Change of labelling	I	P	Change of labelling, also on reel.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B		
QUARTZ CRYSTAL / SAW	PAS-QUA-PV-02	Change of product marking	I	P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	B		
QUARTZ CRYSTAL / SAW	PAS-QUA-PV-03	Change of packing/shipping specification	P	P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification	*		
QUARTZ CRYSTAL / SAW		**LOGISTICS / CAPACITY / TESTING - EQUIPMEMENT**							
QUARTZ CRYSTAL / SAW	PAS-QUA-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above. **Note:** Changes affecting the product not covered by the table require also a PCN.	e. g. new equipment supplier with different process concept	C		Test effort depends on final risk assessment. Performance test according to affected process change.
QUARTZ CRYSTAL / SAW	PAS-QUA-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P	PCN required for dedicated equipment for sensitive component production.	e.g. additional equipment to increase production capacity e.g. replacement of same equipment	C		Test effort depends on final risk assessment. Performance test according to affected process change.
QUARTZ CRYSTAL / SAW	PAS-QUA-EQ-03	Change in final test equipment type that uses a different technology	P	P	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	C		Gage R&R / delta correlation
QUARTZ CRYSTAL / SAW		**LOGISTICS / CAPACITY / TESTING - PROCESS FLOW**							
QUARTZ CRYSTAL / SAW	PAS-QUA-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P	P	Change of manufacturing site. Includes transfer as well as additional site. **Note**: Reorganization inside one plant/site is not affected!	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source / fab strategy	B		
QUARTZ CRYSTAL / SAW	PAS-QUA-PF-02	Elimination or addition of a manufacturing process step	-	P	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	C		Characterisation depends on impact of production flow.
QUARTZ CRYSTAL / SAW		**LOGISTICS / CAPACITY / TESTING - Q-GATE**							
QUARTZ CRYSTAL / SAW	PAS-QUA-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of monitoring procedure or sampling)	-	P	Change of test coverage.	e.g. change from 100% to sample inspection e. g. test flow block, reduction from three to two temperature measurements e.g. change in burn in/run in process.	C		R (electr. funct.): test coverage. R (reliability) only for change in burn in process.
Al-Cap		**ALUMIUM ELECTROLYTIC CAPACITORS**							
Al-Cap		**ANY**							
Al-Cap	PAS-ALU-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation.	*		
Al-Cap	PAS-ALU-AN-02	Any change with impact on processability/manufacturabiliy at customer, which is not covered in the matrix below.	P	P		Technical interface means component terminals. See *processability on board level.*	B		
Al-Cap		**DATASHEET**							
Al-Cap	PAS-ALU-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and / or AC/DC specification	P	P	Change of application relevant information **Not included:** Editorial changes.	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	
Al-Cap	PAS-ALU-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!!	e.g. data sheet correction because of new information about component behavior	A		
Al-Cap	PAS-ALU-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** no influence **(P):** Risk assessment depending on change for each application to provide evidence of additional parametes (stat. evaluation)	e.g. adding new (tested) parameter.	A		
Al-Cap		**MATERIAL**							
Al-Cap	PAS-ALU-MA-01	Change of material composition - Housing	P	P	Change of housing	e.g. change Al alloy for housing	C	Consider effect on surface tension, mechanical robustness or thermal properties **B:** only if a cap holder holds the capacitor body by pressing.	
Al-Cap	PAS-ALU-MA-02	Change of material composition - Sealing	P	P	Change of sealing	e.g. change of rubber compound e.g. change of sealing disc material (axial, Snap in)	C	**B**: in case of external surface of sealing is changed. (Consider gluing, laquering, coating of PCB, nano coating, washing, ...)	
Al-Cap	PAS-ALU-MA-03	Change of material composition - External Insulation	P	P	Change of external insulation / sleeving	e.g. change from PVC into PET e.g. change of color	C	**B**: Only for glued capacitors.	Biased Humidity test can be done without applying voltage.
Al-Cap	PAS-ALU-MA-04	Change of material composition - Lead / Termination	P	P	Change of lead or outer termination.	e.g. change of lead from iron into copper e.g. change of lead finish from tin/lead into tin	B	**A:** in case of change of lead material (consider vibration, valid only when the al caps are not additionally fixed in the application)	
Al-Cap	PAS-ALU-MA-05	Change of material composition - Internal Insulation / Paper	P	P	Change of paper type / internal insulation	e.g. change of paper thickness 50 µm to 40µm	C	**A:** Only if impedance increase (delta characterization). Check if datasheet is affected (**PAS-ALU-DS-01**).	
Al-Cap	PAS-ALU-MA-06	Change of material composition - Electrolyte	P	P	Change of electrolyte	e.g. change in formulation	C	**A:** Only if impedance increase (delta characterization). Check if datasheet is affected (**PAS-ALU-DS-01**).	
Al-Cap	PAS-ALU-MA-07	Change of material composition - Tape Material	P	P	Change of closing tape material	e.g. change of glue or basis material	C		
Al-Cap	PAS-ALU-MA-08	Change of material composition - Base Plate	P	P	Change of base plate material	e.g. change of used plastic material	B		
Al-Cap	PAS-ALU-MA-09	Change of supplier of material	-	P	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	C		Test effort depends on final risk assessment. Performance test according to affected material. Assumption material specification remains unchanged. Otherwise see change of material.
Al-Cap		**DESIGN**							
Al-Cap	PAS-ALU-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Wire Diameter	I	P	Change of wire diameter	e.g. change from 0.8 into 0.6 mm wire diameter.	A		
Al-Cap	PAS-ALU-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination	I	P	Change of termination appearance For welded Al capacitors only.	e.g. change from matt tin into bright tin.	B		
Al-Cap	PAS-ALU-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension structure - Appearance	I	P	Change of appearance **Note:** Marking on device is defined as seperate change (PAS-ALU-PV-02).	e.g. change of color/appearance e.g. change of safety vent shape	B		
Al-Cap	PAS-ALU-DE-04	Changes of termination, surface finish, shape, color, appearance or dimension structure - Rubber Sealing	I	P	Change of rubber sealing stand-off shape (for radial)	e.g. change of profile / design	A		
Al-Cap	PAS-ALU-DE-05	Changes of inner construction - Aluminum Foil	-	P	Change of Al foil width	e.g. change of width	C		
Al-Cap	PAS-ALU-DE-06	Changes of inner construction - Seperator	-	P	Change of seperator width	e.g. change of width	C		
Al-Cap	PAS-ALU-DE-07	Changes of inner construction - Seperator Density	-	P	Change of seperator density	e.g. change of seperator density/resistivity	C		
Al-Cap	PAS-ALU-DE-08	Changes of inner construction - Inner Connection	-	P	Change of inner connection	e.g. change of shape/dimension	C		Terminal Strength (11) not for axial components without paddle tabs.
Al-Cap	PAS-ALU-DE-09	Changes of inner construction - Closing Tape	-	P	Change of closing tape	e.g. change of dimension	C		
Al-Cap	PAS-ALU-DE-10	Changes of inner construction - Foil	-	P	Change of foil type	e.g. change of etching level e.g. change of thickness	C		
Al-Cap		**PROCESS**							
Al-Cap	PAS-ALU-PR-01	Changes in process technology or manufacturing methods - Terminal Attach	-	P	Change of terminal attach process	e.g. change of stitching / welding layout	C		Terminal Strength (11) and Vibration (14) not for axial components without paddle tabs.
Al-Cap	PAS-ALU-PR-02	Changes in process technology or manufacturing methods - Winding	-	P	Change of winding process	e.g. change of material disposition (order of paper/foil)	C		
Al-Cap	PAS-ALU-PR-03	Changes in process technology or manufacturing methods - Impregnation	-	P	Change of impregantion	e.g. change of bulk process into individual impregnation	C		Surge voltage test for high voltage components only.
Al-Cap	PAS-ALU-PR-04	Changes in process technology or manufacturing methods - Assembly	-	P	Change of assembly process	e.g. change of sealing method e.g. change of assembly process sequence	C		R: Depends on process change
Al-Cap	PAS-ALU-PR-05	Changes in process technology or manufacturing methods - Aging / Testing	-	P	Change of aging/testing process	e.g. change of timing, voltage or temperature of process	C		R: Depends on process change
Al-Cap	PAS-ALU-PR-06	Changes in process technology or manufacturing methods - Trim & Form Leaded	-	P	Change of trim & form process (leaded)	e.g. change of tooling shape or bending procedure	B		Solderability may be influenced
Al-Cap	PAS-ALU-PR-07	Changes in process technology or manufacturing methods - Trim & Form SMD	-	P	Change of trim & form process (SMD)	e.g. change of tooling shape or bending procedure	B		Solderability may be influenced
Al-Cap	PAS-ALU-PR-08	Process integrity: tuning within specification	-	P	Variation within process specification.	e.g. process control	C		
Al-Cap		**PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS**							
Al-Cap	PAS-ALU-PN-01	Packing / shipping specification change (loosening of tolerances)	P	P	Change of packing specification.	e.g. number of pieces on reel.	B		
Al-Cap	PAS-ALU-PN-02	Dry pack requirements change	I	P	Change of dry pack requirements. **(I)**: Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	e.g. change in dry pack assurance (HIC, MBB) **(I)**: MSL 3 --> MSL 1 **(P)**: MSL 1 --> MSL 3	B		
Al-Cap	PAS-ALU-PN-03	Change of carrier (tray, reel)	P	P	Change of carrier	e.g. change by material e.g. change by geometry.	B		
Al-Cap		**PACKING / SHIPPING - VISUAL INSPECTION**							
Al-Cap	PAS-ALU-PV-01	Change of labelling	I	P	Change of labelling, also on reel.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B		
Al-Cap	PAS-ALU-PV-02	Change of product marking	I	P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	B		
Al-Cap	PAS-ALU-PV-03	Change of packing/shipping specification	P	P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification	*		
Al-Cap		**LOGISTICS / CAPACITY / TESTING - EQUIPEMEMENT**							
Al-Cap	PAS-ALU-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above. **Note:** Changes affecting the product not covered by the table require also a PCN.	e. g. new equipment supplier with different process concept	C		Test effort depends on final risk assessment. Performance test according to affected process change.
Al-Cap	PAS-ALU-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P	PCN required for dedicated equipment for sensitive component production.	e.g. additional equipment to increase production capacity e.g. replacement of same equipment	C		Test effort depends on final risk assessment. Performance test according to affected process change.
Al-Cap	PAS-ALU-EQ-03	Change in final test equipment type that uses a different technology	P	P	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	C		Gage R&R / delta correlation
Al-Cap		**LOGISTICS / CAPACITY / TESTING - PROCESS FLOW**							
Al-Cap	PAS-ALU-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P	P	Change of manufacturing site. Includes transfer as well as additional site. **Note**: Reorganization inside one plant/site is not affected!	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source / fab strategy	B		
Al-Cap	PAS-ALU-PF-02	Elimination or addition of a manufacturing process step	-	P	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	C		Characterisation depends on impact of production flow.
Al-Cap	PAS-ALU-PF-03	Elimination of final electrical measurement / test flow block	I	P	Reduction of final testing. PCN required for dedicated final test reductions for sensitive parameters.	e.g. elemination of additional impedance control	C		Characterisation depends on impact of final test flow.
Al-Cap		**LOGISTICS / CAPACITY / TESTING - Q-GATE**							
Al-Cap	PAS-ALU-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of monitoring procedure or sampling)	-	P	Change of test coverage.	e.g. change from 100% to sample inspection e. g. test flow block, reduction from three to two temperature measurements e.g. change in burn in/run in process.	C		R (electr. funct.): test coverage. R (reliability) only for change in burn in process.
NTC		**NTC**							
NTC		**ANY**							
NTC	PAS-NTC-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation.	*		
NTC	PAS-NTC-AN-02	Any change with impact on processability/manufacturabiliy at customer, which is not covered in the matrix below.	P	P		Technical interface means component terminals.	B		
NTC		**DATASHEET**							
NTC	PAS-NTC-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and / or AC/DC specification	P	P	Change of application relevant information **Not included:** Editorial changes.	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	
NTC	PAS-NTC-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!!	e.g. data sheet correction because of new information about component behavior	A		
NTC	PAS-NTC-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** no influence **(P):** Risk assessment depending on change for each application to provide evidence of additional parametes (stat. evaluation)	e.g. adding new (tested) parameter.	A		
NTC		**MATERIAL**							
NTC	PAS-NTC-MA-01	Change of material composition - Ceramic Binder	P	P	Change of Binder Material to bind ceramics.		C		
NTC	PAS-NTC-MA-02	Change of material composition - Ceramic	P	P	Change of ceramic composition ceramic material class will not be changed, only dopands will be changed	e.g. changes in additives amount	C		Parameter analyse only necessary if an anticipated impact on electrical performance. S = SMD device only
NTC	PAS-NTC-MA-03	Change of material composition - Inner Electrode	P	P	Change of inner electrode material (ink material). Valid in case of multilayer structures only.	e.g. change from AgPt material to AgPd material	C		
NTC	PAS-NTC-MA-04	Change of material composition - Encapsulation	P	P	Change of encapsulation material.	e.g. change of coating e.g. change of additives in an insulation.	B	**A:** Risk assessment on application level, if interaction with other material expected. Consider explicity usage where NTC is not mounted on PCB.	Parameter analyse only necessary if an anticipated impact on electrical performance.
NTC	PAS-NTC-MA-05	Change of material composition - Lead material / Termination	P	P	Change of lead or outer termination. Change of lead (finish) material, termination material or attachment material.	e.g. change from SnPb to pure Sn	B	Risk assessment needed to evaluate compatibility of soldering process.	
NTC	PAS-NTC-MA-06	Change of supplier of material	-	P	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	C		Assumption material specification remains unchanged. Otherwise see change of material.
NTC		**DESIGN**							
NTC	PAS-NTC-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead Diameter	I	P	Change of lead diameter (for soldered THT components)	e.g. change lead diameter from 0.5 to 0.4 mm	A		
NTC	PAS-NTC-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination Area	I	P	Change of termination area	e.g. change of termination layer thickness e.g. change in termination dimensions	B		SMD components only!
NTC	PAS-NTC-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension structure - Internal Connection	I	P	Change of inner connection	e.g. change from soldered connection to welded connection	C		
NTC	PAS-NTC-DE-04	Changes of termination, surface finish, shape, color, appearance or dimension structure - Appearance	I	P	Change of appearance. **Note:** Marking on device is defined as seperate change (PAS-FLM-PV-02).	e.g. change or adding of color on component Mainly in combination with other changes!	B		
NTC	PAS-NTC-DE-05	Changes of inner construction - Electrode	-	P	Change of electrode layer thickness or geometry. For multi-layer technology only.	e.g. change of electrode design	C		
NTC	PAS-NTC-DE-06	Changes of inner construction - Layer Thickness	-	P	Change of ceramic layer thickness. For multi-layer technology only.	e.g. change from 1.5µm into 1.0µm	C		
NTC	PAS-NTC-DE-07	Changes of inner construction - Number of Layers	-	P	Change of number of ceramic or electrode layers. For multi-layer technology only. Allways in combination with PAS-NTC-DE-06.	see also layer thickness	C		
NTC		**PROCESS**							
NTC	PAS-NTC-PR-01	Changes in process technology or manufacturing methods - Lamination	-	P	Change of lamination / press technique technology	e.g. stamp press to isostatic press	C		
NTC	PAS-NTC-PR-02	Changes in process technology or manufacturing methods - Firing	-	P	Change of firing / sintering profile	e.g. temperature and / or time and / or atmosphere. e.g. from tunnel to batch kiln.	C		
NTC	PAS-NTC-PR-03	Changes in process technology or manufacturing methods - Dicing	-	P	Change of dicing / slicing	e.g. change from cutting to sawing	C		

NTC	PAS-NTC-PR-04	Changes in process technology or manufacturing methods - Termination	-	P	Change for termination preparation like plating or apply of termination base layer.	e.g. change in plating technology (final termination) e.g. change from dip in paste to platimg (apply)	B		●	●	-	-	-	-	●	●	●	-	-	●	-	●	-	-	-	●	●	B	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	@●	
NTC	PAS-NTC-PR-05	Changes in process technology or manufacturing methods - Electrode apply	-	P	Change of electrode apply. For multi layer technology only.	e.g. change of inner electrode lay down method.	C		●	●	-	@●	-	-	-	@●	-	-	-	-	-	-	-	@●	@●	@●	-	@B	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
NTC	PAS-NTC-PR-06	Changes in process technology or manufacturing methods - Assembly	-	P	Change in assembly process for leaded or encapsulated devices.	e.g. soldering method for lead attach to element or coating / encapsulation process	B		●	●	-	●	●	-	-	-	-	●	●	-	●	-	●	●	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NTC	PAS-NTC-PR-07	Process integrity: tuning within specification	-	P	Variation within process specification.	e.g. process control	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NTC		PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS																																											
NTC	PAS-NTC-PN-01	Packing / shipping specification change (loosening of tolerances)	P	P	Change of packing specification.	e.g. number of pieces on reel.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NTC	PAS-NTC-PN-02	Dry pack requirements change	I	P	Change of dry pack requirements. **(I)**: Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	e.g. change in dry pack assurance (HIC, MBB) **(I)**: MSL 3 --> MSL 1 **(P)**: MSL 1 --> MSL 3	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NTC	PAS-NTC-PN-03	Change of carrier (tray, reel)	P	P	Change of carrier	e.g. change by material e.g. change by geometry.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NTC		PACKING / SHIPPING - VISUAL INSPECTION																																											
NTC	PAS-NTC-PV-01	Change of labelling	I	P	Change of labelling, also on reel.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NTC	PAS-NTC-PV-02	Change of product marking	I	P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NTC	PAS-NTC-PV-03	Change of packing/shipping specification	P	P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NTC		LOGISTICS / CAPACITY / TESTING - EQUIPEMEMENT																																											
NTC	PAS-NTC-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above. **Note:** Changes affecting the product not covered by the table require also a PCN.	e. g. change from wet to dry technology.	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Test effort depends on final risk assessment. Performance test according to affected process change.
NTC	PAS-NTC-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P	PCN required for dedicated equipment for sensitive component production.	e.g. elimination of manual handling processes	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Test effort depends on final risk assessment. Performance test according to affected process change.
NTC	PAS-NTC-EQ-03	Change in final test equipment type that uses a different technology	P	P	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Gage R&R / delta correlation
NTC		LOGISTICS / CAPACITY / TESTING - PROCESS FLOW																																											
NTC	PAS-NTC-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P	P	Change of manufacturing site. Includes transfer as well as additional site. **Note**: Reorganization inside one plant/site is not affected!	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source / fab strategy	B		●	●	-	●	●	-	●	-	●	●	●	●	-	●	●	●	●	●	●	B	●	●	●	-	-	-	-	-	-	-	-	-	-	-	@●	@●	
NTC	PAS-NTC-PF-02	Elimination or addition of a manufacturing process step	-	P	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Characterisation depends on impact of production flow.
NTC		LOGISTICS / CAPACITY / TESTING - Q-GATE																																											
NTC	PAS-NTC-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of monitoring procedure or sampling)	-	P	Change of test coverage.	e.g. change from 100% to sample inspection e. g. test flow block, reduction from three to two temperature measurements e.g. change in burn in/run in process.	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Characterisation depends on impact of test coverage. R (electr. funct.): test coverage. R (reliability) only for change in burn in process.
PTC		PTC																																											
PTC		ANY																																											
PTC	PAS-PTC-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation.	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-AN-02	Any change with impact on processability/manufacturabiliy at customer, which is not covered in the matrix below.	P	P		Technical interface means component terminals. See *processability on board level.*	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	-	
PTC		DATASHEET																																											
PTC	PAS-PTC-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and / or AC/DC specification	P	P	Change of application relevant information **Not included:** Editorial changes.	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!!	e.g. data sheet correction because of new information about component behavior	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** no influence **(P):** Risk assessment depending on change for each application to provide evidence of additional parametes (stat. evaluation)	e.g. adding new (tested) parameter.	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC		MATERIAL																																											
PTC	PAS-PTC-MA-01	Change of material composition - Ceramic Binder	P	P	Change of Binder Material to bind ceramics.		C		-	●	●	-	-	-	-	-	-	-	-	-	-	@●	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-MA-02	Change of material composition - Ceramic	P	P	Change of ceramic composition ceramic material class will not be changed, only dopands will be changed	e.g. changes in additives amount	C		-	●	●	-	-	-	-	-	-	-	-	-	-	●	-	●	●	-	●	@B	●	@S	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Parameter analyse only necessary if an anticipated impact on electrical performance. S = SMD device only
PTC	PAS-PTC-MA-03	Change of material composition - Polymer	P	P	Change of polymer composition		C		-	-	●	@●	@●	-	@●	@●	@●	-	-	-	@●	-	-	@●	-	-	-	@B	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
PTC	PAS-PTC-MA-04	Change of material composition - Encapsulation	P	P	Change of encapsulation material.	e.g. change of coating e.g. change of additives in an insulation.	B	**A:** Risk assessment on application level, if interaction with other material expected. Consider explicity usage where PTC is not mounted on PCB.	-	●	●	●	●	-	●	@●	-	-	-	-	-	-	-	@●	●	-	-	@B	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Parameter analyse only necessary if an anticipated impact on electrical performance.
PTC	PAS-PTC-MA-05	Change of material composition - Lead material / Termination	P	P	Change of lead (finish) material, termination material or attachment material.	e.g. change from SnPb to pure Sn	B	Risk assessment needed to evaluate compatibility of soldering process.	-	●	●	-	-	-	@●	@●	@●	-	-	@●	-	@●	-	-	-	@●	@●	@B	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-MA-06	Change of supplier of material	-	P	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	C		-	●	●	-	●	-	●	-	●	-	-	●	●	-	-	●	●	-	●	B	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	@●	Assumption material specification remains unchanged. Otherwise see change of material.
PTC		DESIGN																																											
PTC	PAS-PTC-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead Diameter	I	P	Change of lead diameter (for soldered THT components)	e.g. change lead diameter from 0.5 to 0.4 mm	A		-	●	-	-	-	-	@●	-	-	@●	@●	@●	-	-	-	-	-	-	-	@B	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	@●	
PTC	PAS-PTC-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination Area	I	P	Change of termination area	e.g. change of termination layer thickness e.g. change in termination dimensions	B		-	●	-	-	-	-	@●	-	-	@●	@●	-	-	-	-	-	-	-	@●	@B	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	@●	SMD components only!
PTC	PAS-PTC-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension structure - Internal Connection	I	P	Change of inner connection	e.g. change from soldered connection to welded connection	C		-	●	-	-	-	-	@●	@●	@●	-	-	@●	-	@●	-	-	-	@●	@●	@B	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	@●	
PTC	PAS-PTC-DE-04	Changes of termination, surface finish, shape, color, appearance or dimension structure - Appearance	I	P	Change of appearance. **Note:** Marking on device is defined as seperate change (PAS-PTC-PV-02).	e.g. change or adding of color on component Mainly in combination with other changes!	B		-	●	-	-	-	-	-	-	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-DE-05	Changes of inner construction - Electrode	-	P	Change of electrode layer thickness or geometry.	e.g. change of electrode design	C		-	●	-	-	@●	@●	-	-	-	-	@●	-	-	-	-	@●	@●	-	-	-	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	@●	
PTC	PAS-PTC-DE-06	Changes of inner construction - Layer Thickness	-	P	Change of ceramic layer thickness. For multi-layer technology only.	e.g. change from 1.5µm into 1.0µm	C		-	●	-	-	@●	@●	-	-	-	-	@●	-	-	-	-	@●	@●	-	-	-	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-DE-07	Changes of inner construction - Number of Layers	-	P	Change of number of ceramic or electrode layers. For multi-layer technology only. Allways in combination with PAS-PTC-DE-06.	see also layer thickness	C		-	●	-	-	@●	@●	-	-	-	-	@●	-	-	-	-	@●	@●	-	-	-	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC		PROCESS																																											
PTC	PAS-PTC-PR-01	Changes in process technology or manufacturing methods - Lamination	-	P	Change of lamination / press technique technology	e.g. stamp press to isostatic press	C		●	●	-	-	-	@●	-	@●	-	-	-	-	-	-	-	@●	@●	-	-	@B	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
PTC	PAS-PTC-PR-02	Changes in process technology or manufacturing methods - Firing	-	P	Change of firing / sintering profile	e.g. temperature and / or time and / or atmosphere. e.g. from tunnel to batch kiln.	C		●	●	-	-	@●	@●	-	-	@●	-	@●	-	-	-	-	-	@●	@●	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
PTC	PAS-PTC-PR-03	Changes in process technology or manufacturing methods - Dicing	-	P	Change of dicing / slicing	e.g. change from cutting to sawing	C		●	●	-	@●	@●	-	@●	@●	-	@●	@●	-	@●	@●	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
PTC	PAS-PTC-PR-04	Changes in process technology or manufacturing methods - Termination	-	P	Change for termination preparation like plating or apply of termination base layer.	e.g. change in plating technology (final termination) e.g. change from dip in paste to platimg (apply)	B		●	●	-	-	-	-	●	●	●	-	-	●	-	●	-	-	-	●	●	B	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	@●	
PTC	PAS-PTC-PR-05	Changes in process technology or manufacturing methods - Electrode apply	-	P	Change of electrode apply. For multi layer technology only.	e.g. change of inner electrode lay down method.	C		●	●	-	@●	-	-	-	@●	-	-	-	-	-	-	-	@●	@●	@●	-	@B	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
PTC	PAS-PTC-PR-06	Changes in process technology or manufacturing methods - Assembly	-	P	Change in assembly process for leaded or encapsulated devices.	e.g. soldering method for lead attach to element or coating / encapsulation process	B		●	●	-	●	●	-	-	-	-	●	●	-	●	-	●	●	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-PR-07	Process integrity: tuning within specification	-	P	Variation within process specification.	e.g. process control	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC		PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS																																											
PTC	PAS-PTC-PN-01	Packing / shipping specification change (loosening of tolerances)	P	P	Change of packing specification.	e.g. number of pieces on reel.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-PN-02	Dry pack requirements change	I	P	Change of dry pack requirements. **(I)**: Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	e.g. change in dry pack assurance (HIC, MBB) **(I)**: MSL 3 --> MSL 1 **(P)**: MSL 1 --> MSL 3	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-PN-03	Change of carrier (tray, reel)	P	P	Change of carrier	e.g. change by material e.g. change by geometry.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC		PACKING / SHIPPING - VISUAL INSPECTION																																											
PTC	PAS-PTC-PV-01	Change of labelling	I	P	Change of labelling, also on reel.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-PV-02	Change of product marking	I	P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC	PAS-PTC-PV-03	Change of packing/shipping specification	P	P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PTC		LOGISTICS / CAPACITY / TESTING - EQUIPEMEMENT																																											
PTC	PAS-PTC-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above. **Note:** Changes affecting the product not covered by the table require also a PCN.	e. g. change from wet to dry technology.	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Test effort depends on final risk assessment. Performance test according to affected process change.
PTC	PAS-PTC-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P	PCN required for dedicated equipment for sensitive component production.	e.g. elimination of manual handling processes	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Test effort depends on final risk assessment. Performance test according to affected process change.
PTC	PAS-PTC-EQ-03	Change in final test equipment type that uses a different technology	P	P	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Gage R&R / delta correlation
PTC		LOGISTICS / CAPACITY / TESTING - PROCESS FLOW																																											
PTC	PAS-PTC-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P	P	Change of manufacturing site. Includes transfer as well as additional site. **Note**: Reorganization inside one plant/site is not affected!	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source / fab strategy	B		●	●	-	●	●	-	●	-	●	●	●	●	-	●	●	●	●	●	●	B	●	●	●	-	-	-	-	-	-	-	-	-	-	-	@●	@●	
PTC	PAS-PTC-PF-02	Elimination or addition of a manufacturing process step	-	P	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Characterisation depends on impact of production flow.
PTC		LOGISTICS / CAPACITY / TESTING - Q-GATE																																											
PTC	PAS-PTC-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of monitoring procedure or sampling)	-	P	Change of test coverage.	e.g. change from 100% to sample inspection e. g. test flow block, reduction from three to two temperature measurements e.g. change in burn in/run in process.	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Characterisation depends on impact of test coverage. R (electr. funct.): test coverage. R (reliability) only for change in burn in process.
VDR		VDR																																											
VDR		ANY																																											
VDR	PAS-VDR-AN-01	Any change with impact on agreed upon technical contractual agreements	P	P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation.	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-AN-02	Any change with impact on processability/manufacturabiliy at customer, which is not covered in the matrix below.	P	P		Technical interface means component terminals. See *processability on board level.*	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	-	
VDR		DATASHEET																																											
VDR	PAS-VDR-DS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and / or AC/DC specification	P	P	Change of application relevant information **Not included:** Editorial changes.	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-DS-02	Correction of data sheet or issue of errata	I	I	No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonote contains this type of change! Assessment in application required!!	e.g. data sheet correction because of new information about component behavior	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-DS-03	Specification of additional parameters	I	P	Description of a new not previously covered parameter. No technical change of the product. **(I):** no influence **(P):** Risk assessment depending on change for each application to provide evidence of additional parametes (stat. evaluation)	e.g. adding new (tested) parameter.	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR		MATERIAL																																											
VDR	PAS-VDR-MA-01	Change of material composition - Ceramic Binder	P	P	Change of Binder Material to bind ceramics.		C		-	●	●	-	-	-	-	-	-	-	-	-	-	@●	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-MA-02	Change of material composition - Ceramic	P	P	Change of ceramic composition ceramic material class (ZnO, etc.) will not be changed, only dopands will be changed	e.g. changes in additives amount	C		-	●	●	-	-	-	-	-	-	-	-	-	-	@●	-	@●	@●	-	@●	@B	@●	@S	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
VDR	PAS-VDR-MA-03	Change of material composition - Electrode	P	P	Change of inner electrode material. Valid in case of multilayer structures only.	e.g. change from AgPt material to AgPd material	C		-	●	●	@●	@●	-	-	@●	@●	-	-	-	-	-	-	-	-	@●	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
VDR	PAS-VDR-MA-04	Change of material composition - Encapsulation	P	P	Change of encapsulation material.	e.g. change of coating e.g. change of additives in an insulation.	B	**A:** Risk assessment on application level, if interaction with other material expected.	-	●	●	@●	@●	-	@●	@●	-	-	-	-	-	-	-	@●	@●	-	-	@B	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
VDR	PAS-VDR-MA-05	Change of material composition - Lead material / Termination	P	P	Change of lead (finish) material, termination material or attachment material.	e.g. change from SnPb to pure Sn	B	Risk assessment needed to evaluate compatibility of soldering process.	-	●	●	-	-	-	@●	@●	@●	-	-	@●	-	@●	-	-	-	@●	@●	@B	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-MA-06	Change of supplier of material	-	P	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	C		-	●	●	●	●	-	●	-	●	-	-	●	-	-	●	●	-	●	●	B	-	●	●	-	-	-	-	-	●	-	-	-	-	-	-	@●	Assumption material specification remains unchanged. Otherwise see change of material.
VDR		DESIGN																																											
VDR	PAS-VDR-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead Diameter	I	P	Change of lead diameter (for soldered THT components)	e.g. change lead diameter from 0.8 to 0.6 mm	A		-	●	-	-	-	-	@●	-	-	@●	@●	@●	-	-	-	-	-	-	-	@B	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	@●	
VDR	PAS-VDR-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination Area	I	P	Change of termination area	e.g. change of termination layer thickness e.g. change in termination dimensions	B		-	●	-	-	-	-	@●	-	-	@●	@●	-	-	-	-	-	-	-	@●	@B	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	@●	SMD components only!
VDR	PAS-VDR-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension structure - Internal Connection	I	P	Change of inner connection	e.g. change from soldered connection to welded connection	C		-	●	-	-	-	-	@●	@●	@●	-	-	@●	-	@●	-	-	-	@●	@●	@B	-	@●	@●	-	-	-	-	-	-	-	-	-	-	-	-	@●	
VDR	PAS-VDR-DE-04	Changes of termination, surface finish, shape, color, appearance or dimension structure - Appearance	I	P	Change of appearance. **Note:** Marking on device is defined as seperate change (PAS-VDR-PV-02).	e.g. change or adding of color on component Mainly in combination with other changes!	B		-	●	-	-	-	-	-	-	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-DE-05	Changes of inner construction - Electrode	-	P	Change of electrode layer thickness or geometry.	e.g. change of electrode design	C		-	●	-	-	@●	@●	●	-	●	-	@●	-	-	-	-	@●	@●	-	-	B	-	●	●	-	-	-	-	-	●	-	-	-	-	-	-	@●	
VDR	PAS-VDR-DE-06	Changes of inner construction - Layer Thickness	-	P	Change of ceramic layer thickness. For multi-layer technology only.	e.g. change from 1.5µm into 1.0µm	C		-	●	-	-	@●	@●	●	-	●	-	@●	-	-	-	-	@●	@●	-	-	B	-	●	●	-	-	-	-	-	●	-	-	-	-	-	-	@●	
VDR	PAS-VDR-DE-07	Changes of inner construction - Number of Layers	-	P	Change of number of ceramic or electrode layers. For multi-layer technology only. Allways in combination with PAS-VDR-DE-06.	see also layer thickness	C		-	●	-	-	●	@●	●	-	●	-	@●	-	-	-	●	@●	●	-	-	-	-	@●	@●	-	-	-	-	-	●	-	-	-	-	-	-	@●	
VDR	PAS-VDR-DE-08	Changes of inner construction - Grain size	-	P	Change of grain size. Grain size is a result of process and / or material change.	e. g. change of grain size.	C		-	●	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	@●	
VDR	PAS-VDR-DE-09	Changes of inner construction - Grain boundary size	-	P	Change of grain boundary size. Grain boundary size is a result of process and / or material change.	e.g. change of grain boundary size.	C		-	●	-	-	-	-	●	-	●	-	-	-	-	-	-	-	-	●	-	B	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	@●	
VDR		PROCESS																																											
VDR	PAS-VDR-PR-01	Changes in process technology or manufacturing methods - Lamination	-	P	Change of lamination / press technique method	e.g. stamp press or isostatic press	C		●	●	-	-	-	@●	-	@●	-	-	-	-	-	-	-	@●	@●	-	-	@B	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
VDR	PAS-VDR-PR-02	Changes in process technology or manufacturing methods - Firing	-	P	Change of firing / sintering profile	e.g. temperature and / or time and / or atmosphere. e.g. from tunnel to batch kiln.	C		●	●	-	●	●	@●	●	-	●	-	@●	-	-	-	-	-	●	●	-	B	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	@●	
VDR	PAS-VDR-PR-03	Changes in process technology or manufacturing methods - Dicing	-	P	Change of dicing	e.g. change from cutting to sawing	C		●	●	-	@●	●	-	@●	●	-	●	●	-	@●	@●	-	-	●	-	-	B	-	●	●	-	-	-	-	-	●	-	-	-	-	-	-	@●	
VDR	PAS-VDR-PR-04	Changes in process technology or manufacturing methods - Termination	-	P	Change for termination preparation like plating or apply of termination base layer.	e.g. change in plating technology (final termination) e.g. change from dip in paste to platimg (apply)	B		●	●	-	●	●	-	-	-	●	-	●	●	-	-	@●	●	●	-	●	B	-	●	●	-	-	-	-	-	●	-	-	-	-	-	-	@●	
VDR	PAS-VDR-PR-05	Changes in process technology or manufacturing methods - Electrode apply	-	P	Change of electrode apply. For multi layer technology only.	e.g. change of inner electrode lay down method.	C		●	●	-	@●	-	-	-	@●	-	-	-	-	-	-	-	@●	@●	@●	-	@B	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	
VDR	PAS-VDR-PR-06	Changes in process technology or manufacturing methods - Assembly	-	P	Change in assembly process for leaded or encapsulated devices.	e.g. soldering method for lead attach to element or coating / encapsulation process	B		●	●	-	@●	@●	-	-	-	-	@●	@●	-	@●	-	@●	@●	-	-	@●	-	@●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-PR-07	Process integrity: tuning within specification	-	P	Variation within process specification.	e.g. process control	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR		PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS																																											
VDR	PAS-VDR-PN-01	Packing / shipping specification change (loosening of tolerances)	P	P	Change of packing specification.	e.g. number of pieces on reel.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-PN-02	Dry pack requirements change	I	P	Change of dry pack requirements. **(I)**: Relaxation of dry pack requirements **(P)**: Tightening of dry pack requirements	e.g. change in dry pack assurance (HIC, MBB) **(I)**: MSL 3 --> MSL 1 **(P)**: MSL 1 --> MSL 3	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-PN-03	Change of carrier (tray, reel)	P	P	Change of carrier	e.g. change by material e.g. change by geometry.	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR		PACKING / SHIPPING - VISUAL INSPECTION																																											
VDR	PAS-VDR-PV-01	Change of labelling	I	P	Change of labelling, also on reel.	**(I)** e.g. additional information (RoHS stamp) **(P)** e.g. change of customer specific information	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-PV-02	Change of product marking	I	P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR	PAS-VDR-PV-03	Change of packing/shipping specification	P	P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification	*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VDR		LOGISTICS / CAPACITY / TESTING - EQUIPEMEMENT																																											
VDR	PAS-VDR-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	P	P	Change in process technique which is not already covered above. **Note:** Changes affecting the product not covered by the table require also a PCN.	e. g. change from wet to dry technology.	C		●	●	-	-	●	-	●	-	●	-	-	●	-	-	●	-	-	●	-	B	-	-	-	-	-	-	@●	-	●	-	-	-	-	-	-	@●	Test effort depends on final risk assessment. Performance test according to affected process change.
VDR	PAS-VDR-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P	PCN required for dedicated equipment for sensitive component production.	e.g. elimination of manual handling processes	C		●	●	-	-	●	-	●	-	●	-	-	●	-	-	●	-	-	●	-	B	-	-	-	-	-	-	@●	-	●	-	-	-	-	-	-	@●	Test effort depends on final risk assessment. Performance test according to affected process change.
VDR	PAS-VDR-EQ-03	Change in final test equipment type that uses a different technology	P	P	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Gage R&R / delta correlation
VDR		LOGISTICS / CAPACITY / TESTING - PROCESS FLOW																																											
VDR	PAS-VDR-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P	P	Change of manufacturing site. Includes transfer as well as additional site. **Note**: Reorganization inside one plant/site is not affected!	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source / fab strategy	B		●	●	-	●	●	-	●	●	●	●	●	●	-	●	●	●	●	●	●	B	-	●	●	@●	-	-	-	-	●	-	-	-	-	-	@●	@●	
VDR	PAS-VDR-PF-02	Elimination or addition of a manufacturing process step	-	P	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	C		●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	@●	Characterisation depends on impact of production flow.
VDR		LOGISTICS / CAPACITY / TESTING - Q-GATE																																											
VDR	PAS-VDR-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of monitoring procedure or sampling)	-	P	Change of test coverage.	e.g. change from 100% to sample inspection e.g. test flow block, reduction from three to two temperature measurements e.g. change in burn in/run in process.	C		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R (electr. funct.): test coverage. R (reliability) only for change in burn in process.

Tests, which should be considered for the appropriate process change.		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tests, which should be considered for the appropriate process change after selection of condition table.		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Suppliers performed tests (mark with an 'X' for done or 'G' for generic)																																						
Reason for exception of tests and/or usage of generic data:																																						

–	Not required
I	Information Note required
P	PCN required

A letter or "●" indicates that performance of that stress test should be considered for the appropriate process change.
A "@" is recommended additionally by ZVEI

	CONDITIONS	**No**
A	Termination equipment only	
C	Ceramics only	
B	Comparative data (unchanged vs. changed) required	
E	Capacitive trimmers only	
F	Film products only	
N	Networks only	
R	Resistors only	
S	SMD components only	
W	Wirewound products only	
Y	Component not hermitically sealed	
Note 1:	For parts marked with ink only. Laser and stamp marked parts shall be exempt.	

=> Please mark 'NO' with 'x', default is 'YES'