



Product/process change notification: PDP/25/15491

Transfer of Front-End manufacturing and EWS from ST Tours (France) to ST Singapore and Additional Back-End manufacturing plant (subcontractor) for TVS Protection

PDP Group
Discrete & Filter Division

Issue date: 23-Jul-2025

Final issue date: 14-Aug-2026 (Final PCN at qualification completion)

Product family	Technology	Package
PROTECTION	TVS	SMD

Description of the change

Following Corporate **PCI 15383 (Early Notification)**, about Company reshaping program, please be informed that Front-End manufacturing line and EWS for TVS Protection devices will be transferred from ST Tours (France) to ST Singapore and new Back-End manufacturing plant will be qualified in Malaysia.

Change summary:

	Former	New
Wafer manufacturing location	6" ST Tours (France)	6" ST Singapore
EWS location	ST Tours (France)	ST Singapore
Back-End manufacturing location	Subcontractors in China	Subcontractors in China Subcontractor in Malaysia

Marking and traceability:

Traceability of the change will be ensured by an internal codification (Finished Good/Type) printed on the carton box label.

Commercial part number/Order code	Former Finished Good/Type	New Finished Good/Type
SM15T33CA SMBJ40A-TR	SM15T33CAH/NR SMBJ40AH-TR/NR	Starting by   SM15T33CA/K  SMBJ40A-TR/K

Affected product			
SM15T10CA	SM6T68A	SMAJ15CA-TR	SMBJ26A-TR
SM15T12A	SM6T68CA	SMAJ18A-TR	SMBJ26CA-TR
SM15T12CA	SM6T6V8A	SMAJ18CA-TR	SMBJ28A-TR
SM15T15A	SM6T6V8CA	SMAJ20A-TR	SMBJ28CA-TR
SM15T15CA	SM6T7V5A	SMAJ24A-TR	SMBJ30A-TR
SM15T18A	SM6T7V5CA	SMAJ24CA-TR	SMBJ30CA-TR
SM15T18CA	SMA6J10A-TR	SMAJ26A-TR	SMBJ33A-TR
SM15T22A	SMA6J10CA-TR	SMAJ26CA-TR	SMBJ33CA-TR
SM15T22CA	SMA6J12A-TR	SMAJ28A-TR	SMBJ36CA-TR
SM15T24A	SMA6J12CA-TR	SMAJ28CA-TR	SMBJ40A-TR
SM15T24CA	SMA6J13A-TR	SMAJ30A-TR	SMBJ40CA-TR
SM15T27A	SMA6J13CA-TR	SMAJ30CA-TR	SMBJ48A-TR
SM15T30A	SMA6J15A-TR	SMAJ33A-TR	SMBJ48CA-TR
SM15T30CA	SMA6J15CA-TR	SMAJ33CA-TR	SMBJ5.0A-TR
SM15T33A	SMA6J18A-TR	SMAJ40A-TR	SMBJ5.0CA-TR
SM15T33CA	SMA6J18CA-TR	SMAJ40CA-TR	SMBJ58A-TR
SM15T36A	SMA6J20A-TR	SMAJ43A-TR	SMBJ58CA-TR
SM15T36CA	SMA6J20CA-TR	SMAJ43CA-TR	SMBJ6.0A-TR
SM15T39A	SMA6J24A-TR	SMAJ48A-TR	SMBJ6.0CA-TR
SM15T39CA	SMA6J24CA-TR	SMAJ48CA-TR	SMBJ6.5A-TR
SM15T68A	SMA6J26A-TR	SMAJ5.0A-TR	SMBJ6.5CA-TR
SM15T68CA	SMA6J26CA-TR	SMAJ5.0CA-TR	SMBJ64A-TR
SM15T6V8A	SMA6J28A-TR	SMAJ58A-TR	SMBJ64CA-TR
SM15T6V8CA	SMA6J28CA-TR	SMAJ58CA-TR	SMBJ70A-TR
SM15T7V5A	SMA6J33A-TR	SMAJ6.0A-TR	SMBJ70CA-TR
SM6T10A	SMA6J33CA-TR	SMAJ6.0CA-TR	SMBJ8.5CA-TR
SM6T10CA	SMA6J40A-TR	SMAJ6.5A-TR	SMCJ12A-TR
SM6T12A	SMA6J40CA-TR	SMAJ6.5CA-TR	SMCJ13CA-TR
SM6T12CA	SMA6J48A-TR	SMAJ70A-TR	SMCJ15A-TR
SM6T15A	SMA6J48CA-TR	SMAJ70CA-TR	SMCJ15CA-TR
SM6T15CA	SMA6J5.0A-TR	SMAJ8.5CA-TR	SMCJ18CA-TR
SM6T18A	SMA6J5.0CA-TR	SMBJ10A-TR	SMCJ20A-TR
SM6T18CA	SMA6J58A-TR	SMBJ10CA-TR	SMCJ22A-TR
SM6T22A	SMA6J58CA-TR	SMBJ12A-TR	SMCJ24CA-TR
SM6T22CA	SMA6J6.0A-TR	SMBJ12CA-TR	SMCJ26A-TR
SM6T24A	SMA6J6.0CA-TR	SMBJ13A-TR	SMCJ28A-TR
SM6T24CA	SMA6J6.5A-TR	SMBJ13CA-TR	SMCJ30A-TR
SM6T27A	SMA6J6.5CA-TR	SMBJ15A-TR	SMCJ30CA-TR
SM6T27CA	SMA6J70A-TR	SMBJ15CA-TR	SMCJ33A-TR
SM6T30A	SMA6J70CA-TR	SMBJ16A-TR	SMCJ33CA-TR
SM6T30CA	SMA6J8.5A-TR	SMBJ18A-TR	SMCJ40A-TR
SM6T33A	SMA6J8.5CA-TR	SMBJ18CA-TR	SMCJ40CA-TR
SM6T33CA	SMAJ10CA-TR	SMBJ20A-TR	SMCJ48CA-TR
SM6T36A	SMAJ12A-TR	SMBJ20CA-TR	SMCJ5.0A-TR
SM6T36CA	SMAJ12CA-TR	SMBJ22A-TR	SMCJ5.0CA-TR
SM6T39A	SMAJ13A-TR	SMBJ22CA-TR	SMCJ6.0A-TR
SM6T39CA	SMAJ13CA-TR	SMBJ24A-TR	SMCJ70CA-TR
SM6T56CA	SMAJ15A-TR	SMBJ24CA-TR	SMCJ85CA-TR

Specific devices not expressly listed in this table are included in this change.

Reason

ST manufacturing reshaping program - Corporate PCI - Early Notification.

Date of implementation

First shipments forecast: Jan-2027

Impact of the change	
Form	Not impacted
Fit	Not impacted
Function	Not impacted
Reliability	Not impacted
Processibility	Not impacted

Qualification of the change (plan)
Qualification will be performed according to JESD47 and AECQ-101.

Disposition of former products
Delivery of current products will be done until stock depletion.
Current Finished Good Last Order Date: Jul-2026
<i>Orders received after the expiration of the current Finished Good Last Order Date should be treated as orders for the new, modified Finished Good as outlined in this PCN.</i>

Qualification results
Qualification report including qualification results will be available at qualification completion.
Qualification completion: August-2026

Sampling plan
Qualification samples will be available on demand (through Sales), starting from Aug-2026 .
For sample(s) request, please inform FSE (Field Sales Engineer) to insert corresponding Non-Standard Samples Order (a single Commercial Product for each request) with PCN reference as additional information.

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Qualification Report

Additional Back-end manufacturing plant for TVS Protection in Malaysia subcontractor

General Information		Locations	
Product Line	<i>Protection</i>	Wafer Fab	<i>ST Tours ST Singapore</i>
Product Description	<i>TVS - Transil</i>	Assembly Plant	<i>Subcontractor – Malaysia (990F)</i>
Product Perimeter	<i>Refer to the list of the involved products §3.1</i>	Reliability Lab	<i>ST TOURS – FRANCE</i>
Product Group	<i>APMS</i>	Reliability Assessment	<i>PASS</i>
Product Division	<i>Discrete & Filter</i>		
Packages	<i>SMA, SMB, SMC</i>		

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comments
0.1	05-03-2026	11	Christophe GOIN	Timothée PINGAULT	Preliminary report: Qualification plan
1.0	14-08-2026	16	Christophe GOIN	Julien Michelon Digitally signed by Julien Michelon Date: 2026.08.14 14:51:11 +02'00'	Initial release

Note: This report is a summary of the qualification trials performed in good faith by STMicroelectronics in order to evaluate the potential risks during the product life using a set of defined test methods.
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1 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
AEC-Q101 Rev.E (for Automotive products)	Failure Mechanism Based Stress Test Qualification for Discrete Semiconductors in Automotive Applications
AEC-Q005	Pb-Free Test Requirements
AEC-Q006	Qualification Requirements for Components Using Copper (Cu) Wire Interconnections
JESD 47	Stress-Test-Driven Qualification of Integrated Circuits
JESD 94	Application specific qualification using knowledge based test methodology
JESD 22	Reliability test methods for packaged devices
MIL-STD-750C	Test method for semiconductor devices

2 GLOSSARY

DBT	Dead Bug Test
DPA	Destructive Physical Analysis
ESD	Electro-Static Discharge
EV	External Visual
H3TRB	High Humidity High Temperature Reverse Bias
HTRB	High Temperature Reverse Bias
MSL	Moisture Sensitivity Level
PC	Preconditioning
PD	Physical Dimensions
PV	Parametric Verification
RS	Repetitive Surges
RSH	Resistance to Soldering Heat
SS	Sample Size
TC	Temperature Cycling
TR	Thermal Resistance
SD	Solderability test
UHAST	Unbiased Highly Accelerated Stress Test
TW/WG	Tin Whiskers / Whiskers Growth

3 RELIABILITY EVALUATION OVERVIEW

3.1 Objectives

The objective of this report is to qualify an additional Back-end (subcontractor in Malaysia) for TVS Protection, following PCN shared about company reshaping program:

PCN ID	PCN Title
15489	Transfer of Front-End manufacturing and EWS from ST Tours (France) to ST Singapore and Additional Back-End manufacturing plant (subcontractor) for automotive grade TVS Protection
15491	Transfer of Front-End manufacturing and EWS from ST Tours (France) to ST Singapore and Additional Back-End manufacturing plant (subcontractor) for TVS Protection

Tables of the products involved:

Commercial Product (Automotive grade)			
SM15T10AY	SM30T21CAY	SM4T35AY	SM6T56CAY
SM15T10CAY	SM30T23AY	SM4T35CAY	SM6T68AY
SM15T12AY	SM30T23CAY	SM4T39AY	SM6T68CAY
SM15T12CAY	SM30T26AY	SM4T39CAY	SM6T6V8AY
SM15T15AY	SM30T26CAY	SM4T47AY	SM6T6V8CAY
SM15T15CAY	SM30T28AY	SM4T47CAY	SM6T75AY
SM15T18AY	SM30T28CAY	SM4T50AY	SM6T75CAY
SM15T18CAY	SM30T30AY	SM4T50CAY	SM6T7V5AY
SM15T22AY	SM30T30CAY	SM4T56AY	SM6T7V5CAY
SM15T22CAY	SM30T33AY	SM4T56CAY	SM6T82AY
SM15T24AY	SM30T33CAY	SM4T68AY	SM6T82CAY
SM15T24CAY	SM30T35AY	SM4T68CAY	SMA6T10AY
SM15T27AY	SM30T35CAY	SM4T6V7AY	SMA6T10CAY
SM15T27CAY	SM30T39AY	SM4T6V7CAY	SMA6T12AY
SM15T30AY	SM30T39CAY	SM4T7V6AY	SMA6T12CAY
SM15T30CAY	SM30T42AY	SM4T7V6CAY	SMA6T14AY
SM15T33AY	SM30T42CAY	SM4T82AY	SMA6T14CAY
SM15T33CAY	SM30T47AY	SM4T82CAY	SMA6T15AY
SM15T36AY	SM30T47CAY	SM6T10AY	SMA6T15CAY
SM15T36CAY	SM30T56AY	SM6T10CAY	SMA6T18AY
SM15T39AY	SM30T56CAY	SM6T12AY	SMA6T18CAY
SM15T39CAY	SM30T6.8AY	SM6T12CAY	SMA6T22AY
SM15T47AY	SM30T6.8CAY	SM6T15AY	SMA6T22CAY
SM15T47CAY	SM30T7.5AY	SM6T15CAY	SMA6T24AY
SM15T56AY	SM30T7.5CAY	SM6T16V5AY	SMA6T24CAY
SM15T56CAY	SM4T10AY	SM6T16V5CAY	SMA6T28AY
SM15T68AY	SM4T10CAY	SM6T18AY	SMA6T28CAY
SM15T68CAY	SM4T12AY	SM6T18CAY	SMA6T30AY
SM15T6V8AY	SM4T12CAY	SM6T22AY	SMA6T30CAY
SM15T6V8CAY	SM4T14AY	SM6T22CAY	SMA6T33AY
SM15T75AY	SM4T14CAY	SM6T24AY	SMA6T33CAY
SM15T75CAY	SM4T15AY	SM6T24CAY	SMA6T36AY
SM15T7V5AY	SM4T15CAY	SM6T27AY	SMA6T36CAY
SM15T7V5CAY	SM4T18AY	SM6T27CAY	SMA6T39AY
SM15T82AY	SM4T18CAY	SM6T30AY	SMA6T39CAY
SM15T82CAY	SM4T21AY	SM6T30CAY	SMA6T47AY
SM30T10AY	SM4T21CAY	SM6T33AY	SMA6T47CAY
SM30T10CAY	SM4T23AY	SM6T33CAY	SMA6T56AY
SM30T12AY	SM4T23CAY	SM6T36AY	SMA6T56CAY
SM30T12CAY	SM4T26AY	SM6T36CAY	SMA6T68AY
SM30T15AY	SM4T26CAY	SM6T39AY	SMA6T68CAY
SM30T15CAY	SM4T28AY	SM6T39CAY	SMA6T6V7AY
SM30T18AY	SM4T28CAY	SM6T42AY	SMA6T6V7CAY
SM30T18CAY	SM4T30AY	SM6T42CAY	SMA6T7V6AY
SM30T19AY	SM4T30CAY	SM6T47AY	SMA6T7V6CAY
SM30T19CAY	SM4T33AY	SM6T47CAY	SMA6T82AY
SM30T21AY	SM4T33CAY	SM6T56AY	SMA6T82CAY

Commercial Product			
SM15T10CA	SM6T68A	SMAJ15CA-TR	SMBJ26A-TR
SM15T12A	SM6T68CA	SMAJ18A-TR	SMBJ26CA-TR
SM15T12CA	SM6T6V8A	SMAJ18CA-TR	SMBJ28A-TR
SM15T15A	SM6T6V8CA	SMAJ20A-TR	SMBJ28CA-TR
SM15T15CA	SM6T7V5A	SMAJ24A-TR	SMBJ30A-TR
SM15T18A	SM6T7V5CA	SMAJ24CA-TR	SMBJ30CA-TR
SM15T18CA	SMA6J10A-TR	SMAJ26A-TR	SMBJ33A-TR
SM15T22A	SMA6J10CA-TR	SMAJ26CA-TR	SMBJ33CA-TR
SM15T22CA	SMA6J12A-TR	SMAJ28A-TR	SMBJ36CA-TR
SM15T24A	SMA6J12CA-TR	SMAJ28CA-TR	SMBJ40A-TR
SM15T24CA	SMA6J13A-TR	SMAJ30A-TR	SMBJ40CA-TR
SM15T27A	SMA6J13CA-TR	SMAJ30CA-TR	SMBJ48A-TR
SM15T30A	SMA6J15A-TR	SMAJ33A-TR	SMBJ48CA-TR
SM15T30CA	SMA6J15CA-TR	SMAJ33CA-TR	SMBJ5.0A-TR
SM15T33A	SMA6J18A-TR	SMAJ40A-TR	SMBJ5.0CA-TR
SM15T33CA	SMA6J18CA-TR	SMAJ40CA-TR	SMBJ58A-TR
SM15T36A	SMA6J20A-TR	SMAJ43A-TR	SMBJ58CA-TR
SM15T36CA	SMA6J20CA-TR	SMAJ43CA-TR	SMBJ6.0A-TR
SM15T39A	SMA6J24A-TR	SMAJ48A-TR	SMBJ6.0CA-TR
SM15T39CA	SMA6J24CA-TR	SMAJ48CA-TR	SMBJ6.5A-TR
SM15T68A	SMA6J26A-TR	SMAJ5.0A-TR	SMBJ6.5CA-TR
SM15T68CA	SMA6J26CA-TR	SMAJ5.0CA-TR	SMBJ64A-TR
SM15T6V8A	SMA6J28A-TR	SMAJ58A-TR	SMBJ64CA-TR
SM15T6V8CA	SMA6J28CA-TR	SMAJ58CA-TR	SMBJ70A-TR
SM15T7V5A	SMA6J33A-TR	SMAJ6.0A-TR	SMBJ70CA-TR
SM6T10A	SMA6J33CA-TR	SMAJ6.0CA-TR	SMBJ8.5CA-TR
SM6T10CA	SMA6J40A-TR	SMAJ6.5A-TR	SMCJ12A-TR
SM6T12A	SMA6J40CA-TR	SMAJ6.5CA-TR	SMCJ13CA-TR
SM6T12CA	SMA6J48A-TR	SMAJ70A-TR	SMCJ15A-TR
SM6T15A	SMA6J48CA-TR	SMAJ70CA-TR	SMCJ15CA-TR
SM6T15CA	SMA6J5.0A-TR	SMAJ8.5CA-TR	SMCJ18CA-TR
SM6T18A	SMA6J5.0CA-TR	SMBJ10A-TR	SMCJ20A-TR
SM6T18CA	SMA6J58A-TR	SMBJ10CA-TR	SMCJ22A-TR
SM6T22A	SMA6J58CA-TR	SMBJ12A-TR	SMCJ24CA-TR
SM6T22CA	SMA6J6.0A-TR	SMBJ12CA-TR	SMCJ26A-TR
SM6T24A	SMA6J6.0CA-TR	SMBJ13A-TR	SMCJ28A-TR
SM6T24CA	SMA6J6.5A-TR	SMBJ13CA-TR	SMCJ30A-TR
SM6T27A	SMA6J6.5CA-TR	SMBJ15A-TR	SMCJ30CA-TR
SM6T27CA	SMA6J70A-TR	SMBJ15CA-TR	SMCJ33A-TR
SM6T30A	SMA6J70CA-TR	SMBJ16A-TR	SMCJ33CA-TR
SM6T30CA	SMA6J8.5A-TR	SMBJ18A-TR	SMCJ40A-TR
SM6T33A	SMA6J8.5CA-TR	SMBJ18CA-TR	SMCJ40CA-TR
SM6T33CA	SMAJ10CA-TR	SMBJ20A-TR	SMCJ48CA-TR
SM6T36A	SMAJ12A-TR	SMBJ20CA-TR	SMCJ5.0A-TR
SM6T36CA	SMAJ12CA-TR	SMBJ22A-TR	SMCJ5.0CA-TR
SM6T39A	SMAJ13A-TR	SMBJ22CA-TR	SMCJ6.0A-TR
SM6T39CA	SMAJ13CA-TR	SMBJ24A-TR	SMCJ70CA-TR
SM6T56CA	SMAJ15A-TR	SMBJ24CA-TR	SMCJ85CA-TR

The reliability test methodology used follows the JESD47: « Stress Test driven Qualification Methodology » and AEC-Q101 Rev.E.

The reliability tests ensuing are:

- TC to ensure the mechanical robustness of the products.
- HTRB to evaluate the risk of contamination from the resin and the assembly process versus the die layout sensitivity.
- H3TRB, UHASt to check the robustness to corrosion and the good package hermeticity.
- RSH to check compatibility of package with customer assembly.
- Repetitive surges to verify robustness of device submitted to rated Ipp (as per data sheet).
- Solderability to check compatibility of package with customer assembly.
- WG to check lead-finishing quality.

For some tests, similarity methodology is used. See 5.1 “comments” for more details about similarities.

Qualification plan conducted following ZVEI matrix as follow:

	ZVEI DEFAULT	ZVEI WITH CONDITIONS	ST SELECTED	REASON FOR EXCEPTION OF TESTS
AEC-Q101 Revision E	•	•	X	
Highly Accelerated Stress Test	•	•	X	
High Humidity High Temp. Reverse Bias	•	•	X	
High Temperature High Humidity Bias	•	•	X	
Unbiased Highly Accelerated Stress Test	•	•	X	
Autoclave	•	•	X	
Temperature Cycle	•	•	X	
Temperature Cycling Hot Test	•	•		Not applicable to TVS (Required for MOSFETs parts with internal bond wire sizes 5 mil diameter and less)
TC Delamination Test	•	•		
Wire Bond Integrity	•	•		Not required for Transient Voltage Suppressor (TVS) parts according AEC-Q101 rev. E
Intermittent Operational Life	•	•		
Power and Temperature Cycle	•	•		
High Temperature Reverse Bias	•	•	X	
AC blocking voltage	•	•	X	
Steady State Operational	•	•	X	
High Temp. Gate Bias	•	•		Required for MOS & IGBT parts only.
Destruct. Phy. Analysis	•	•	X	
Wire Bond Strength	•	•		Applicable to products using wire bonding. Not applicable to products using clip attach technology
Wire Bond Shear	•	•		Applicable to products using wire bonding. Not applicable to products using clip attach technology
Die Shear	•	•		Not Applicable to parts with solder paste die attach
Thermal Resistance	•	•		Not applicable for protection devices
Dielectric Integrity	•	•		Required for MOS & IGBT parts only.
Parametric Verification	•	•	X	
ESD Characterization	E	-		Not required for Transient Voltage Suppressor (TVS) parts according AEC-Q101 rev. E
Unclamp.Induct.Switch	M	-		Power MOS and internally clamped IGBTs only
Notes / Remarks	A,I,P,R,S	A	X	
Parameter-Analysis: Comparison of current with changed device characterization, electrical distribution	•	•	X	
For Cu Wire Products: Consider AEC-Q006	•	•		

3.2 Conclusion

Reliability tests have shown that the devices behave correctly against environmental tests (no failure). Moreover, the stability of electrical parameters during the accelerated tests demonstrates the robustness of the products and safe operation, which is consequently expected during their lifetime.

Based on the following results, the qualification of an additional Back-end (subcontractor in Malaysia) for TVS Protection is conform to AECQ101 rev E.

4 DEVICE CHARACTERISTICS

4.1 Device description

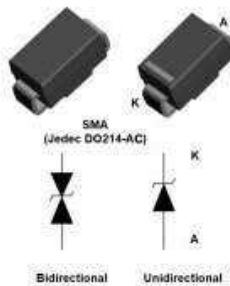
Refer to product datasheets. Example here below:



SMA6TY

Datasheet

Automotive 600 W TVS in SMA



Features

- AEC-Q101 qualified
- Peak pulse power:
 - 600 W (10/1000 μ s) and 4 kW (8/20 μ s)
- Stand-off voltage range: from 5 V to 70 V
- Unidirectional and bidirectional types
- Low leakage current:
 - 0.2 μ A at 25 °C and 1 μ A at 85 °C
- Operating T_J max: 150 °C
- JEDEC registered package outline
- Lead finishing: matte tin plating

Complies with the following standards

- UL94, V0
- J-STD-020 MSL level 1
- J-STD-002, JESD 22-B102 E3 and MIL-STD-750, method 2026
- JESD-201 class 2 whisker test
- IPC7531 footprint and JEDEC registered package outline
- IEC 61000-4-4 level 4
 - 4 k V
- ISO 10605, IEC 61000-4-2, C = 150 pF, R = 330 Ω exceeds level 4:
 - 30 kV (air discharge)
 - 30 kV (contact discharge)
- ISO 10605, C = 330 pF, R = 330 Ω exceeds level 4:
 - 30 kV (air discharge)
 - 30 kV (contact discharge)
- ISO 7637-2 (not applicable to parts with V_{RM} lower than battery voltage)
 - Pulse 1: $V_S = -150$ V
 - Pulse 2a: $V_S = +112$ V
 - Pulse 3a: $V_S = -220$ V
 - Pulse 3b: $V_S = +150$ V

Description

The SMA6TY Transil series has been designed to protect sensitive automotive circuits against surges defined in ISO 7637-2 and against electrostatic discharges according to ISO 10605.

The planar technology makes this device compatible with high-end circuits where low leakage current and high junction temperature are required to provide reliability and stability over time. SMA6TY are packaged in SMA.

Product status link	
SMA6TY	SMA6T6V7AY,
	SMA6T6V7CAY,
	SMA6T7V6AY,
	SMA6T7V6CAY,
	SMA6T10AY, SMA6T10CAY,
	SMA6T12AY, SMA6T12CAY,
	SMA6T14AY, SMA6T14CAY,
	SMA6T15AY, SMA6T15CAY,
	SMA6T18AY, SMA6T18CAY,
	SMA6T22AY, SMA6T22CAY,
	SMA6T24AY, SMA6T24CAY,
	SMA6T28AY, SMA6T28CAY,
	SMA6T30AY, SMA6T30CAY,
	SMA6T33AY, SMA6T33CAY,
	SMA6T36AY, SMA6T36CAY,
	SMA6T39AY, SMA6T39CAY,
	SMA6T47AY, SMA6T47CAY,
	SMA6T56AY, SMA6T56CAY,
	SMA6T68AY, SMA6T68CAY,
	SMA6T82AY, SMA6T82CAY

4.2 Construction Note

	SMA6Txxx(Y) / SM4Txxx(Y) / SMA(6)Jxxx
Wafer/Die fab. information	
Wafer fab manufacturing location	STMicroelectronics Tours – France STMicroelectronics Singapore
Technology / Process family	TVS - Transil
Wafer Testing (EWS) information	
Electrical testing manufacturing location	STMicroelectronics Tours – France STMicroelectronics Singapore
Assembly information	
Assembly site	Subcontractor 990F - Malaysia
Package description	SMA
Molding compound	ECOPACK molding compound
Final testing information	
Testing location	Subcontractor 990F - Malaysia

	SM6Txxx(Y) / SMBJxxx
Wafer/Die fab. information	
Wafer fab manufacturing location	STMicroelectronics Tours – France STMicroelectronics Singapore
Technology / Process family	TVS - Transil
Wafer Testing (EWS) information	
Electrical testing manufacturing location	STMicroelectronics Tours – France STMicroelectronics Singapore
Assembly information	
Assembly site	Subcontractor 990F - Malaysia
Package description	SMB
Molding compound	ECOPACK molding compound
Final testing information	
Testing location	Subcontractor 990F - Malaysia

	SM15Txxx(Y) / SM30Txxx(Y) / SMCJxxx
Wafer/Die fab. information	
Wafer fab manufacturing location	STMicroelectronics Tours – France STMicroelectronics Singapore
Technology / Process family	TVS - Transil
Wafer Testing (EWS) information	
Electrical testing manufacturing location	STMicroelectronics Tours – France STMicroelectronics Singapore
Assembly information	
Assembly site	Subcontractor 990F - Malaysia
Package description	SMC
Molding compound	ECOPACK molding compound
Final testing information	
Testing location	Subcontractor 990F - Malaysia

5 TESTS PLAN AND RESULTS SUMMARY

5.1 Test vehicles

Lot #	Part Number	Package	Assy plant Location	Comments
L1	SMA6T33AY	SMA	Subcontractor Malaysia (990F)	Qualification lot
L2	SMA6T68AY	SMA	Subcontractor Malaysia (990F)	Qualification lot
L3	SMA6T6V7AY	SMA	Subcontractor Malaysia (990F)	Qualification lot
L4	SM4T56AY (L7 RER)	SMA	Subcontractor Malaysia (990F)	Qualification lot
L5	SM30T33AY (L1 RER)	SMC	Subcontractor Malaysia (990F)	Qualification lot
L6	SM15T33CAY (L2 RER)	SMC	Subcontractor Malaysia (990F)	Qualification lot
L7	SM15T33CAY (L3 RER)	SMC	Subcontractor Malaysia (990F)	Qualification lot
L8	SM15T33CAY (L4 RER)	SMC	Subcontractor Malaysia (990F)	Qualification lot
L9	Dummy product	SMA	Subcontractor Malaysia (990F)	Qualification lot for whiskers

5.2 Test plan

Stress	Abrv	Reference	Lot	SS	Comments	Test plan
Pre and Post-Stress Electrical Test	TEST	User specification or supplier's standard Specification	All qualification parts tested per the requirements of the appropriate device specification.			X
Pre-conditioning	PC	J-STD-020 JESD22-A113	All qualification parts tested per the requirements of the appropriate device specification.			X
MSL research	MSL	J-STD-020	L3 L7	60		X
External Visual	EV	JESD22B-101	All qualification parts tested per the requirements of the appropriate device specification.		Done during Assembly → Test & Finish inspection	X
Parametric Verification	PV	User specification	Refer to paragraph 6.1 in Annexes			X
High Temperature Reverse Bias	HTRB	MIL-STD-750-1 M1038 Method A (for diodes, rectifiers and Zeners)	L1 L2 L3 L4 L5 L6 L7 L8	8*77		X
AC blocking voltage	ACBV	MIL-STD-750-1 M1040 Test condition A			Required for Thyristor only. Alternative to HTRB	
High Temperature Forward Bias	HTFB	JESD22 A-108			Not required, applicable only to LEDs Alternative to HTRB	
High Temperature Operating Life	HTOL				Covered by HTRB or ACSV	
Steady State Operational	SSOP	MIL-STD-750-1 M1038 Test condition B			Required for Voltage Regulator (Zener) only.	
High Temperature Gate Bias	HTGB	JESD 22A-108			Required for Power MOSFET – IGBT only.	
High Temperature Storage Life	HTSL	JESD22 A-103			Covered by HTRB	

Stress	Abrv	Reference	Lot	SS	Comments	Test plan
Temperature Humidity Storage	THS	JESD22 A-118			Covered by H3TRB	
Temperature Cycling	TC	JESD22A-104	L1 L2 L3 L4 L5 L6 L7	7*77		X
Temperature Cycling Hot Test	TCHT	JESD22A-104			Required for Power MOSFET – IGBT only.	
Temperature Cycling Delamination Test	TCDT	JESD22A-104 J-STD-035			Required for Power MOSFET – IGBT only. Alternative to TCHT	
Wire Bond Integrity	WBI	MIL-STD-750 Method 2037			For dissimilar metal bonding systems only	
Unbiased Highly Accelerated Stress Test	UHASt	JESD22A-118 or A101	L1 L2 L3 L4 L5 L6 L7 L8	8*77		X
Autoclave	AC	JESD22A-102			Alternative to UHASt	
Highly Accelerated Stress Test	HAST	JESD22A-110			Covered by H3TRB (same failure mechanisms activation).	
High Humidity High Temperature Reverse Bias	H3TRB	JESD22A-101	L1 L2 L3 L4 L6 L7 L8	7*77		X
High Temperature High Humidity Bias	HTHb	JED22A-101			Not required, LED only	
Intermittent Operational Life / Thermal Fatigue	IOL	MIL-STD-750 Method 1037			For power devices. Not required for Transient Voltage Suppressor (TVS) parts	
Power and Temperature Cycle	PTC	JED22A-105			For power devices. Not required for Transient Voltage Suppressor (TVS) parts Perform PTC if $\Delta T_j > 100^\circ\text{C}$ cannot be achieved with IOL Alternative to IOL	
ESD Characterization	ESD HBM	AEC Q101-001 and 005				
ESD Characterization	ESD CDM	AEC Q101-001 and 005				
Destructive Physical Analysis	DPA	AEC-Q101-004 Section 4	L2 L6	4*2		X
Physical Dimension	PD	JESD22B-100	2 lots	60		X
Terminal Strength	TS	MIL-STD-750 Method 2036			Required for leaded parts only	
Resistance to Solvents	RTS	JESD22B-107			Not applicable for Laser Marking	
Constant Acceleration	CA	MIL-STD-750 Method 2006			Required for hermetic packaged parts only.	
Vibration Variable Frequency	VVF	JESD22B-103			Required for hermetic packaged parts only.	
Mechanical Shock	MS	JESD22 B-104			Required for hermetic packaged parts only.	
Hermeticity	HER	JESD22A-109			Required for hermetic packaged parts only.	
Resistance to Solder Heat	RSH	JESD22 A-111 (SMD) B-106 (PTH)	L3 L5	2*30		X
Solderability	SD	J-STD-002 JESD22B102	L1	30		X

Stress	Abrv	Reference	Lot	SS	Comments	Test plan
Thermal Resistance	TR	JESD24-3, 24-4, 24-6 as appropriate			Required in case of process change. Not applicable to protection device as no limit specified in the datasheet	
Wire Bond Strength	WBS	MIL-STD-750 Method 2037			Covered during workability trials	
Bond Shear	BS	AEC-Q101-003			Covered during workability trials	
Die Shear	DS	MIL-STD-750 Method 2017			Not Applicable to parts with solder paste die attach	
Unclamped Inductive Switching	UIS	AEC-Q101-004 section 2			Required for Power MOS and internally clamped IGBTs only	
Dielectric Integrity	DI	AEC-Q101-004 section 3			Required for Power MOSFET – IGBT only.	
Short Circuit Reliability Characterization	SCR	AEC-Q101-006			Required for smart power parts only	
Whisker Growth Evaluation	WG	AEC-Q005 JESD201	1 lot	90	Following AEC-Q005	X
Early Life Failure Rate	ELFR	JESD74			Recommended for new techno development in case of identified failure mechanism	
Functional Test (in rush, di/dt,...)	FT	Internal specification				
Repetitive Surge	RS	Internal specification	L1 L2 L3 L4 L5 L6 L8	7*20	IPP=DataSheet vlaue Pulse delay=0.01ms Time between surge=60s 50 surges	X

5.3 Results summary

Test	PC	Std ref.	Conditions	Duration	SS	Failure/SS									
						SMA6T33AY	SMA6T68AY	SMA6T6V7AY	SM4T56AY	SM30T33AY	SM15T33CAY	SM15T33CAY	SM15T33CAY	SM15T33CAY	SMA package
						L1	L2	L3	L4	L5	L6	L7	L8	L9	
Pre- and Post-Electrical Test		ST datasheet	Ir, Vf,parameters following product datasheet	-	2570	0/2570									
		JESD22 A-113	Drying 24hrs; 125°C Storage 168hrs; 85°C;85%RH IR reflow 3 times	-	1834	0/1834									
External Visual		JESD22 B-101		All qualification parts submitted for testing passed External & Visual inspection during manufacturing process											
Parametric Verification		ST datasheet	Over part temperature range	Refer to paragraph 6.1 in Annexes											
MSL1 research	N	JESD22-A113	MSL=1; Reflow=3 Temperature=85°C Humidity (HR)=85%	-	60	-	-	0/30	-	-	-	0/30	-	-	
HTRB	N	MIL-STD-750-1 M1038 Method A	Tj=Tj max VR= VRRM	1Khrs	616	0/77	0/77	0/77	0/77	0/77	0/77	0/77	0/77	-	
TC	Y	JESD22 A-104	-55/+150°C 2cy/h	1Kcy	539	0/77	0/77	0/77	0/77	0/77	0/77	0/77	-	-	
UHAST	Y	JESD22 A-118	130°C; 85% RH 2.3bar	96hrs	616	0/77	0/77	0/77	0/77	0/77	0/77	0/77	-	-	
H3TRB	Y	JESD22 A-101	85°C; 85% RH VR=80% VRRM (100V max)	1Khrs	539	0/77	0/77	0/77	0/77	-	0/77	0/77	-	-	
DPA	Y	AEC-Q101-004	After TC 1Kcy	-	4	-	0/2	-	-	-	0/2	-	-	-	
			After H3TRB 1Khrs	-	4	-	0/2	-	-	-	0/2	-	-	-	
RSH	N	JESD22 A-111	THS 85%RH / 85°C 168hrs Dipping 260°C-10s	-	60	-	-	0/30	-	0/30	-	-	-	-	
RS	Y	ADCS0060282 (ST internal)	IPP=DataSheet vlaue Pulse delay=0.01ms Time between surge=60s	50surges	140	0/20	0/20	0/20	0/20	0/20	0/20	-	0/20	-	
SD	N	J-STD-002 JESD22B-102	Wet ageing SnAgCu bath 245°C	Visual Inspection	30	0/15	-	-	-	-	-	-	-	-	
			Dry ageing SnAgCu bath 245°C			0/15	-	-	-	-	-	-	-	-	
WG			Pb free reflow TC -55°C/85°C	1500cy	9	-	-	-	-	-	-	-	-	0/9	
			Pb free reflow THS 55°C / RH = 85%	4Khrs	9	-	-	-	-	-	-	-	-	0/9	
	N	AEC-Q005 JESD201	No reflow THS 30°C / RH = 60%	4Khrs	9	-	-	-	-	-	-	-	-	0/9	
			SnPb reflow TC -55°C/85°C 10 min	1500cy	9	-	-	-	-	-	-	-	-	0/9	
			SnPb reflow THS 55°C / RH = 85%	4Khrs	9	-	-	-	-	-	-	-	-	0/9	

6 ANNEXES

6.1 Parametric Verification

SMA6T33AY:

TEST	IRM	IRM	IRM	VBR	VBR	VBR	VCL 8/20us	RD	VCL 10/1000us	RD	ALPHA T
EQUIPMENT	TSA_491	TSA_491	TSA_491	TSA_491	TSA_491	TSA_491	ARETI	Calculation	3KVMW_G	Calculation	Calculation
Condition 1	-40°C	25°C	85°C	-40°C	25°C	85°C	25°C	25°C	25°C	25°C	IR=1mA
Condition 2	VRM=28.2V	VRM=28.2V	VRM=28.2V	IR=1mA	IR=1mA	IR=1mA	IPP=68A	IF1=34A	IPP=13.4A	IF1=6.5A	TJ1=25°C
Condition 3							TP=20us	IF2=68A	TD=1000us	IF2=13.1A	TJ2=150°C
Condition 4							TR=8us		TR=10us		
Min. Datasheet					31.4V						
Typ. Datasheet					33V						
Max. Datasheet		0.2uA	1uA		34.7V		59V	0.357Ohm	45.7V	0.84Ohm	9.81E-4/°C
UNIT	nA	nA	nA	V	V	V	V	Ohm	V	Ohm	1E-4/°C
N	10	30	30	10	30	30	30	30	30	30	30
Min	1,955	2,255	3,304	30,580	32,430	34,260	42,780	0,151	39,820	0,506	8,412
Max	3,033	3,589	5,252	31,290	33,270	35,120	49,190	0,334	41,170	0,582	8,742
Avg	2,460	2,869	4,180	30,954	32,795	34,634	43,718	0,164	40,303	0,534	8,588

6.2 Physical Dimensions

2.1 SMA package information

Figure 17. SMA package outline

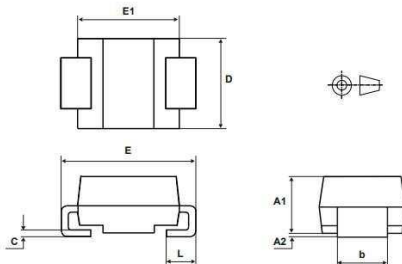


Table 3. SMA package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.074	0.097
A2	0.05	0.20	0.001	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.40	0.005	0.016
D	2.25	2.90	0.088	0.115
E	4.80	5.35	0.188	0.211
E1	3.95	4.60	0.155	0.182
L	0.75	1.50	0.029	0.060

Results in mm										
DIMENSION	A	A2	b (left)	b (right)	c	D	E	E1	L (left)	L (right)
Min (mm)	1,90	0,05	1,25	1,25	0,15	2,25	4,80	3,95	0,75	0,75
Typ (mm)										
Max (mm)	2,45	0,20	1,65	1,65	0,40	2,90	5,35	4,60	1,50	1,50
1	2,192	0,090	1,456	1,457	0,278	2,598	5,118	4,305	1,179	1,170
2	2,187	0,107	1,458	1,447	0,273	2,591	5,114	4,314	1,173	1,178
3	2,199	0,093	1,457	1,460	0,277	2,594	5,105	4,311	1,207	1,151
4	2,202	0,118	1,456	1,460	0,270	2,592	5,135	4,304	1,115	1,198
5	2,195	0,113	1,460	1,455	0,269	2,593	5,124	4,323	1,141	1,191
6	2,202	0,095	1,454	1,460	0,277	2,592	5,140	4,308	1,171	1,131
7	2,201	0,086	1,454	1,455	0,269	2,594	5,123	4,301	1,197	1,152
8	2,203	0,111	1,454	1,457	0,269	2,590	5,121	4,334	1,148	1,192
9	2,192	0,097	1,454	1,459	0,274	2,598	5,135	4,301	1,165	1,146
10	2,195	0,098	1,453	1,431	0,276	2,592	5,122	4,305	1,170	1,168
11	2,209	0,098	1,463	1,465	0,273	2,591	5,126	4,311	1,223	1,122
12	2,203	0,099	1,460	1,428	0,271	2,592	5,114	4,313	1,188	1,145
13	2,199	0,101	1,453	1,463	0,271	2,590	5,119	4,295	1,148	1,200
14	2,193	0,102	1,458	1,457	0,275	2,596	5,140	4,306	1,154	1,157
15	2,196	0,094	1,462	1,461	0,274	2,590	5,129	4,304	1,175	1,161
16	2,191	0,121	1,457	1,460	0,273	2,595	5,139	4,301	1,173	1,145
17	2,195	0,116	1,460	1,456	0,278	2,601	5,151	4,299	1,158	1,135
18	2,197	0,105	1,455	1,456	0,268	2,593	5,143	4,310	1,176	1,133
19	2,203	0,094	1,456	1,432	0,279	2,593	5,125	4,312	1,191	1,138
20	2,199	0,111	1,460	1,461	0,273	2,592	5,138	4,313	1,131	1,183
21	2,193	0,093	1,456	1,461	0,274	2,591	5,128	4,302	1,171	1,162
22	2,204	0,088	1,465	1,465	0,277	2,595	5,133	4,308	1,199	1,127
23	2,207	0,097	1,455	1,461	0,274	2,593	5,134	4,310	1,215	1,098
24	2,198	0,089	1,456	1,458	0,273	2,594	5,104	4,309	1,145	1,212
25	2,204	0,088	1,457	1,462	0,275	2,588	5,140	4,317	1,219	1,102
26	2,202	0,100	1,455	1,459	0,278	2,595	5,135	4,303	1,159	1,156
27	2,197	0,082	1,456	1,460	0,272	2,589	5,131	4,312	1,180	1,144
28	2,205	0,096	1,458	1,456	0,273	2,592	5,119	4,311	1,147	1,194
29	2,191	0,100	1,457	1,468	0,271	2,590	5,117	4,301	1,186	1,163
30	2,198	0,090	1,456	1,462	0,274	2,590	5,128	4,306	1,171	1,161
Average	2,1984	0,0990667	1,4569533	1,4563067	0,2735733	2,5927567	5,1276333	4,30838	1,1724867	1,15705
MIN	2,187	0,082	1,4526	1,4276	0,268	2,5879	5,1038	4,2952	1,1154	1,0984
MAX	2,209	0,121	1,4654	1,468	0,2789	2,6009	5,1509	4,3343	1,2227	1,2117

2.1 SMC package information

Figure 23. SMC package outline

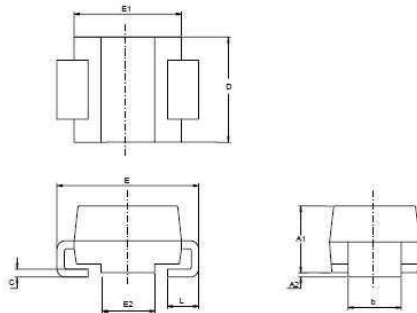


Table 3. SMC package mechanical data

Ref.	Dimensions			
	Millimeters		Inches ⁽¹⁾	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.098
A2	0.05	0.20	0.002	0.008
b	2.90	3.20	0.114	0.126
c	0.15	0.40	0.006	0.016
D	5.55	6.25	0.218	0.246
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
L	0.75	1.50	0.030	0.060

Results in mm									
DIMENSION	A1	A2	b	c	D	E	E1	E2	L
Min (mm)	1,90	0,05	2,90	0,15	5,55	7,75	6,60	4,40	0,75
Typ (mm)									
Max (mm)	2,45	0,20	3,20	0,40	6,25	8,15	7,15	4,70	1,50
1	2,201	0,131	3,019	0,269	5,817	7,923	6,892	4,421	1,281
2	2,189	0,099	3,023	0,271	5,826	7,924	6,903	4,417	1,278
3	2,174	0,110	3,031	0,277	5,817	7,923	6,901	4,421	1,275
4	2,185	0,113	3,046	0,278	5,813	7,916	6,896	4,417	1,302
5	2,198	0,105	3,053	0,269	5,816	7,906	6,911	4,422	1,320
6	2,184	0,114	3,028	0,272	5,824	7,913	6,901	4,429	1,321
7	2,209	0,122	3,041	0,281	5,826	7,922	6,897	4,423	1,302
8	2,183	0,112	3,027	0,279	5,817	7,916	6,894	4,431	1,291
9	2,191	0,097	3,028	0,283	5,820	7,916	6,912	4,419	1,301
10	2,180	0,099	3,013	0,277	5,824	7,928	6,898	4,425	1,283
11	2,185	0,100	3,039	0,279	5,815	7,909	6,894	4,421	1,289
12	2,179	0,106	3,022	0,274	5,816	7,914	6,898	4,431	1,294
13	2,183	0,107	3,038	0,269	5,816	7,916	6,918	4,435	1,312
14	2,189	0,103	3,044	0,276	5,817	7,907	6,905	4,421	1,274
15	2,171	0,105	3,039	0,277	5,822	7,911	6,895	4,420	1,295
16	2,178	0,114	3,039	0,280	5,815	7,910	6,921	4,420	1,299
17	2,182	0,120	3,053	0,278	5,818	7,914	6,902	4,420	1,299
18	2,171	0,118	3,030	0,276	5,818	7,928	6,889	4,422	1,279
19	2,180	0,111	3,039	0,279	5,818	7,908	6,890	4,417	1,319
20	2,179	0,109	3,042	0,276	5,818	7,918	6,916	4,424	1,294
21	2,177	0,112	3,027	0,277	5,821	7,910	6,915	4,424	1,290
22	2,198	0,116	3,021	0,283	5,820	7,909	6,898	4,421	1,265
23	2,180	0,105	3,022	0,278	5,818	7,913	6,891	4,421	1,301
24	2,176	0,115	3,029	0,274	5,815	7,928	6,918	4,428	1,287
25	2,183	0,085	3,039	0,275	5,821	7,912	6,890	4,425	1,295
26	2,181	0,117	3,033	0,276	5,814	7,919	6,900	4,423	1,284
27	2,173	0,105	3,049	0,272	5,815	7,921	6,898	4,428	1,293
28	2,190	0,104	3,015	0,275	5,819	7,920	6,894	4,427	1,298
29	2,189	0,114	3,049	0,282	5,819	7,933	6,899	4,423	1,283
30	2,179	0,103	3,054	0,278	5,816	7,923	6,898	4,420	1,311
Average	2,184	0,109	3,034	0,276	5,818	7,917	6,901	4,423	1,294
MIN	2,171	0,085	3,013	0,269	5,813	7,906	6,889	4,417	1,265
MAX	2,209	0,131	3,054	0,283	5,826	7,933	6,921	4,435	1,321

6.3 Tests description

Test name	Description	Purpose
Die Oriented		
HTRB High Temperature Reverse Bias / HTFB High Temperature Forward Bias	The device is stressed in static configuration, trying to satisfy as much as possible the following conditions: - Low power dissipation - Max. supply voltage compatible with diffusion process and internal circuitry limitations. Forward: device is forward biased with a current fixed and adjusted to reach the targeted junction temperature	To determine the effects of bias conditions and temperature on solid state devices over time. It simulates the devices' operating condition in an accelerated way. To maximize the electrical field across either reverse-biased junctions or dielectric layers, in order to investigate the failure modes linked to mobile contamination, oxide ageing, layout sensitivity to surface effects. To assess active area and contacts integrity
Package Oriented		
H3TRB High Humidity High Temperature Reverse Bias	The device is biased in static configuration minimizing its internal power dissipation, and stored at controlled conditions of ambient temperature and relative humidity.	To evaluate the package moisture resistance with electrical field applied, both electrolytic and galvanic corrosion are put in evidence.
TC Temperature Cycling	The device is submitted to cycled temperature excursions, between a hot and a cold chamber in air atmosphere.	To investigate failure modes related to the thermo-mechanical stress induced by the different thermal expansion of the materials interacting in the die-package system. Typical failure modes are linked to metal displacement, dielectric cracking, molding compound delamination, wire-bonds failure, die-attach layer degradation.
UHAST Unbiased Highly Accelerated Stress Test	The device is stored in saturated steam, at fixed and controlled conditions of pressure and temperature.	To investigate corrosion phenomena affecting die or package materials, related to chemical contamination and package hermeticity.
DPA Destructive Physical Analysis	Specific construction analysis on random parts that have successfully completed THB or TC.	To investigate on reliability stresses impact on delamination, corrosion and product construction integrity.
RSH Resistance to Solder Heat	Package is dipped by the leads in a solder bath after initial wet ageing (for SMDs only). Assessment by electrical test + no external crack	To simulate wave soldering process and verify that package will not be thermally damaged during this step.
SD Solderability	The purpose of this test method is to provide a referee condition for the evaluation of the solderability of terminations (including leads up to 0.125 inch in diameter) that will be assembled using tin lead eutectic solder.	This evaluation is made on the basis of the ability of these terminations to be wetted and to produce a suitable fillet when coated by tin lead eutectic solder. These procedures will test whether the packaging materials and processes used during the manufacturing operations process produce a component that can be successfully soldered to the next level assembly using tin lead eutectic solder. A preconditioning test is included in this test method, which degrades the termination finish to provide a guard band against marginal finish.
DBT Dead Bug Test	To evaluate the wettability of the package leads. Good indicator to determine the bad solderability behavior	Components are glued up-side down on a substrate. Pins are wetted with a moderately activated flux. Then run once through the reflow oven with leadfree temperature profile. Visual inspection is performed with suitable tool.
RS Repetitive Surges	The device is submitted to a reverse current peak: Ipp, which depends of the current holding of the product.	To evaluate the holding of the component to a high electrical field. Short circuit or hot point is expected as failure mechanism.
TW/WG Whiskers Growth	Forced growing of Tin Whiskers by various kind of environmental stress: temperature, moisture and temperature cycling.	To ensure no risk of electrical short due to Tin Whisker growth.