

3A, 400V - 600V ESD Capability Rectifier

FEATURES

- AEC-Q101 qualified
- High ESD capability
- Glass passivated chip junction
- Low forward voltage drop
- Ideal for automated placement
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free

APPLICATIONS

- General purpose
- Polarity protection

MECHANICAL DATA

- Case: Thin SMA
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.030g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
I_F	3	A
V_{RRM}	400 - 600	V
I_{FSM}	50	A
$T_{J\ MAX}$	175	°C
Package	Thin SMA	
Configuration	Single die	



Thin SMA



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)				
PARAMETER	SYMBOL	TSD3GALH	TSD3JALH	UNIT
Marking code on the device		D3GAL	D3JAL	
Repetitive peak reverse voltage	V_{RRM}	400	600	V
Reverse voltage, total rms value	$V_{R(RMS)}$	280	420	V
Forward current	I_F	3		A
Surge peak forward current single half sine-wave superimposed on rated load	$t = 8.3\text{ms}$	50		A
	$t = 1.0\text{ms}$	145		
Junction temperature	T_J	-40 to +175		°C
Storage temperature	T_{STG}	-55 to +175		°C

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\theta JL}$	15	$^{\circ}\text{C}/\text{W}$
Junction-to-ambient thermal resistance	$R_{\theta JA}$	70	$^{\circ}\text{C}/\text{W}$
Junction-to-case thermal resistance	$R_{\theta JC}$	15	$^{\circ}\text{C}/\text{W}$

Thermal Performance Note: Units mounted on PCB (5mm x 5mm Cu pad test board)

ELECTRICAL SPECIFICATIONS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)					
PARAMETER	CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage ⁽¹⁾	$I_F = 1.5\text{A}, T_J = 25^{\circ}\text{C}$	V_F	0.90	-	V
	$I_F = 3.0\text{A}, T_J = 25^{\circ}\text{C}$		0.96	1.1	V
	$I_F = 1.5\text{A}, T_J = 125^{\circ}\text{C}$		0.78	-	V
	$I_F = 3.0\text{A}, T_J = 125^{\circ}\text{C}$		0.85	-	V
Reverse current @ rated V_R ⁽²⁾	$T_J = 25^{\circ}\text{C}$	I_R	-	1	μA
	$T_J = 125^{\circ}\text{C}$		6	-	μA
Junction capacitance	1MHz, $V_R = 4.0\text{V}$	C_J	18	-	pF

Notes:

1. Pulse test with $PW = 0.3\text{ms}$
2. Pulse test with $PW = 30\text{ms}$

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)					
STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE
AEC-Q101-001	Human body mode	$C=100\text{pF}, R=1.5\text{k}\Omega$	V_c	H3B	$\geq 8\text{kV}$
IEC 61000-4-2	Contact mode	$C=150\text{pF}, R=330\Omega$		x	$\geq 10\text{kV}$
	Air-discharge mode	$C=150\text{pF}, R=330\Omega$		4	$\geq 15\text{kV}$
ISO 10605	Contact mode	$C=330\text{pF}, R=330\Omega$		L4	$\geq 15\text{kV}$

ORDERING INFORMATION		
ORDERING CODE⁽¹⁾	PACKAGE	PACKING
TSD3xALH	Thin SMA	14,000/ Tape & Reel

Notes:

1. "x" defines voltage from 400V(TSD3GALH) to 600V(TSD3JALH)

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 Forward Current Derating Curve

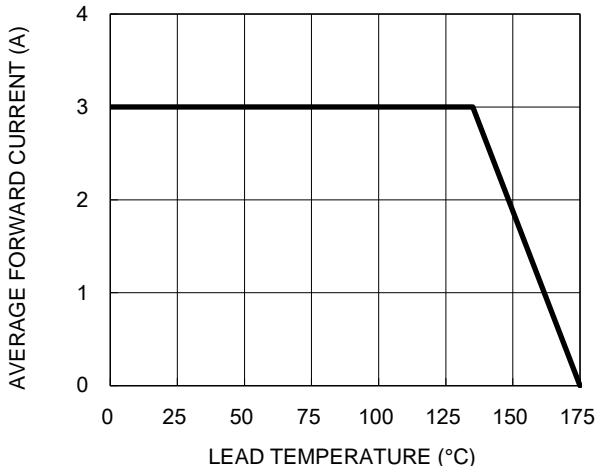


Fig.2 Typical Junction Capacitance

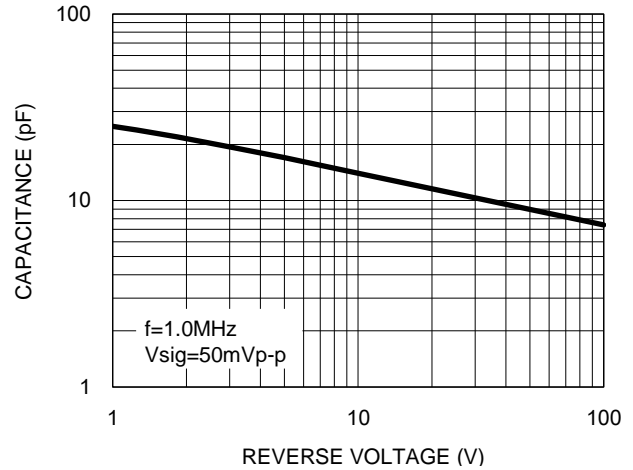


Fig.3 Typical Reverse Characteristics

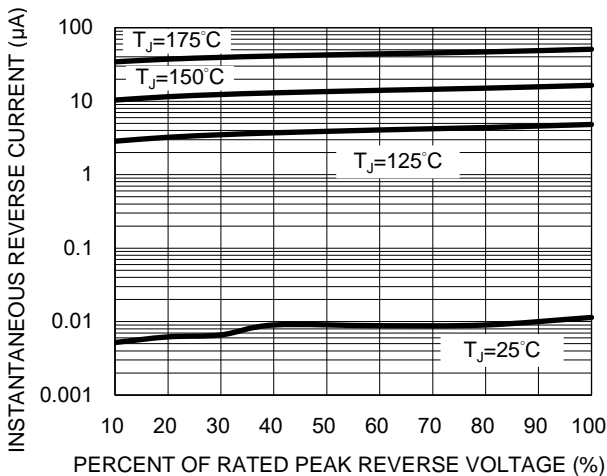


Fig.4 Typical Forward Characteristics

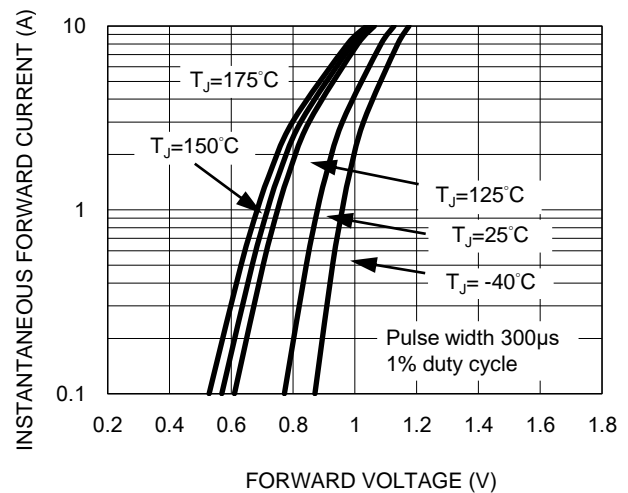
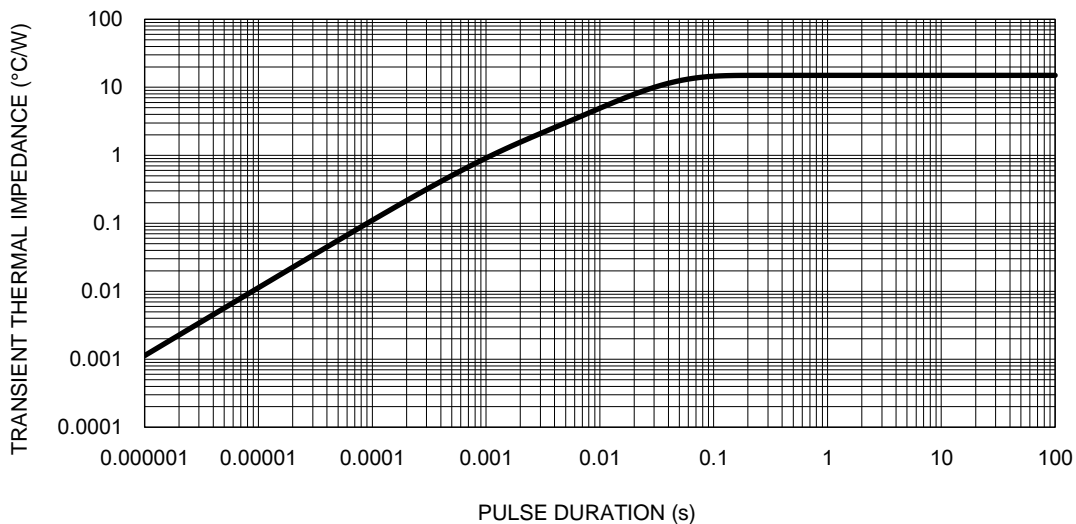
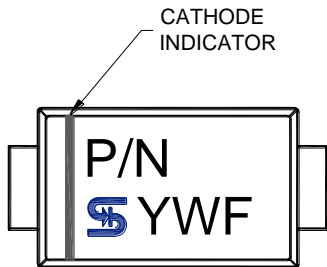
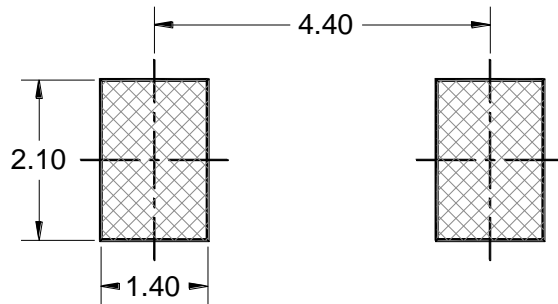
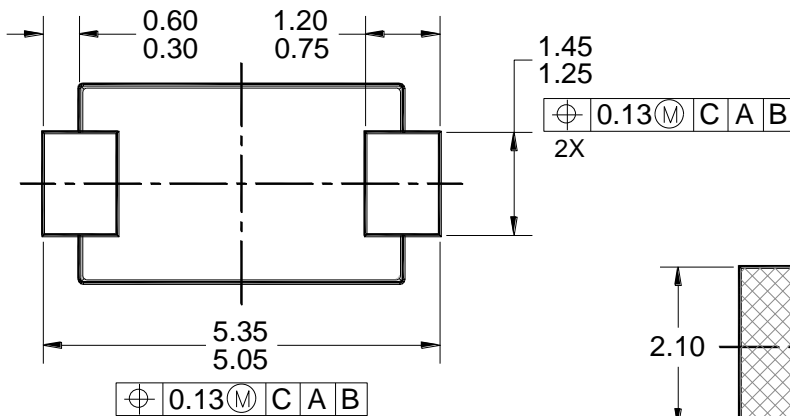
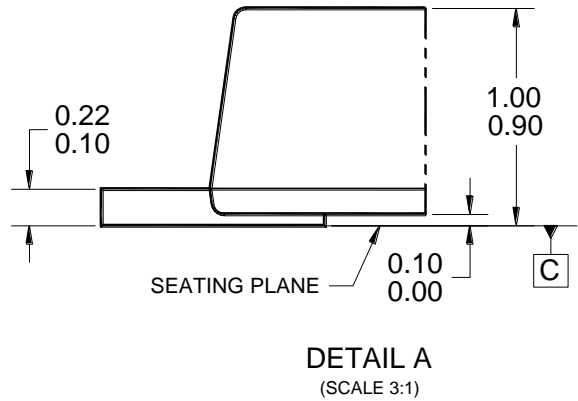
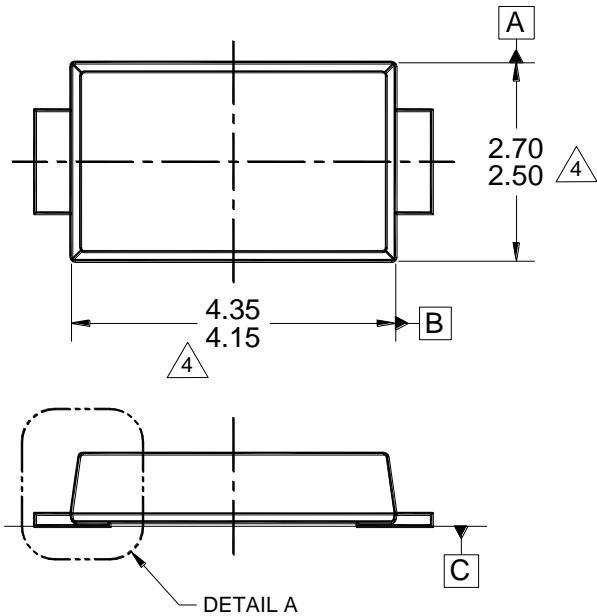


Fig.5 Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS

Thin SMA



MARKING DIAGRAM

P/N = MARKING CODE
YWF = DATE CODE
F = FACTORY CODE

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
3. PACKAGE OUTLINE REFERENCE: JEDEC DO-221, VARIATION AC, ISSUE B.
4. $\triangle 4$ MODIFIED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH.
5. SUGGESTED PAD LAYOUT IS FOR REFERENCE PURPOSE ONLY.
6. DWG NO. REF: HQ2SD07-TSMA-074 REV A.

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