

1A, 200V-1000V High Efficient Surface Mount Rectifier

FEATURES

- Glass passivated junction chip
- Ideal for automated placement
- Low reverse leakage
- Moisture sensitivity level: level 1, per J-STD-020
- Compliant to RoHS directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

APPLICATIONS

- Switch Mode Power Supply
- Inverters and Converters
- Free Wheeling diodes

MECHANICAL DATA

- Case: SMAF
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.035 g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
I_F	1	A
V_{RRM}	200-1000	V
I_{FSM}	30	A
T_{JMAX}	150	°C
Package	SMAF	



SMAF



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

PARAMETER	SYMBOL	HS1D F-T	HS1G F-T	HS1J F-T	HS1K F-T	HS1M F-T	UNIT
Marking code on the device		HS1DF	HS1GF	HS1JF	HS1KF	HS1MF	
Repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Reverse voltage, total rms value	$V_{R(RMS)}$	140	280	420	560	700	V
DC blocking voltage	V_{DC}	200	400	600	800	1000	V
Forward current	I_F	1					A
Surge peak forward current single half sine-wave superimposed on rated load	8.3 ms at $T_A = 25^\circ\text{C}$	30					A
	1.0 ms at $T_A = 25^\circ\text{C}$	90					A
Junction temperature	T_J	-55 to +150					°C
Storage temperature	T_{STG}	-55 to +150					°C

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\theta JL}$	15	$^{\circ}\text{C/W}$
Junction-to-ambient thermal resistance	$R_{\theta JA}$	89	$^{\circ}\text{C/W}$
Junction-to-case thermal resistance	$R_{\theta JC}$	22	$^{\circ}\text{C/W}$

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⁾	HS1DF-T	$I_F = 0.5\text{A}, T_J = 25^{\circ}\text{C}$	V_F	0.80	-	V
		$I_F = 1\text{A}, T_J = 25^{\circ}\text{C}$		0.86	1.0	V
		$I_F = 0.5\text{A}, T_J = 125^{\circ}\text{C}$		0.65	-	V
		$I_F = 1\text{A}, T_J = 125^{\circ}\text{C}$		0.73	0.82	V
	HS1GF-T	$I_F = 0.5\text{A}, T_J = 25^{\circ}\text{C}$		0.87	-	V
		$I_F = 1\text{A}, T_J = 25^{\circ}\text{C}$		0.95	1.4	V
		$I_F = 0.5\text{A}, T_J = 125^{\circ}\text{C}$		0.70	-	V
		$I_F = 1\text{A}, T_J = 125^{\circ}\text{C}$		0.79	0.94	V
	HS1JF-T HS1KF-T HS1MF-T	$I_F = 0.5\text{A}, T_J = 25^{\circ}\text{C}$		1.12	-	V
		$I_F = 1\text{A}, T_J = 25^{\circ}\text{C}$		1.23	1.7	V
		$I_F = 0.5\text{A}, T_J = 125^{\circ}\text{C}$		0.90	-	V
		$I_F = 1\text{A}, T_J = 125^{\circ}\text{C}$		1.02	1.27	V
Reverse current @ rated V_R ⁽²⁾		$T_J = 25^{\circ}\text{C}$	I_R	-	5	μA
		$T_J = 125^{\circ}\text{C}$		-	125	μA
Reverse recovery time		$I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$	t_{rr}	-	50	ns
				-	75	ns
Junction capacitance		1 MHz, $V_R = 4.0\text{V}$	C_J	19	-	pF
				11	-	pF
				8	-	pF

Notes:

- (1) Pulse test with $PW = 0.3\text{ ms}$
- (2) Pulse test with $PW = 30\text{ ms}$

ORDERING INFORMATION		
ORDERING CODE	PACKAGE	PACKING
HS1XF-T R3G ⁽¹⁾	SMAF	1,800 / 7" Plastic reel
HS1XF-T M2G ⁽¹⁾	SMAF	7,500 / 13" Plastic reel
HS1XF-T R2G ⁽¹⁾	SMAF	7,500 / 13" Paper reel

Notes:

- (1) "X" defines voltage from 200V(HS1DF-T) to 1000V(HS1MF-T)

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

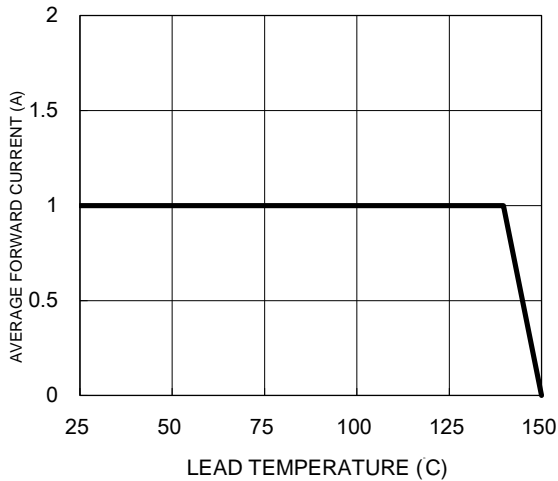


Fig.2 Typical Junction Capacitance

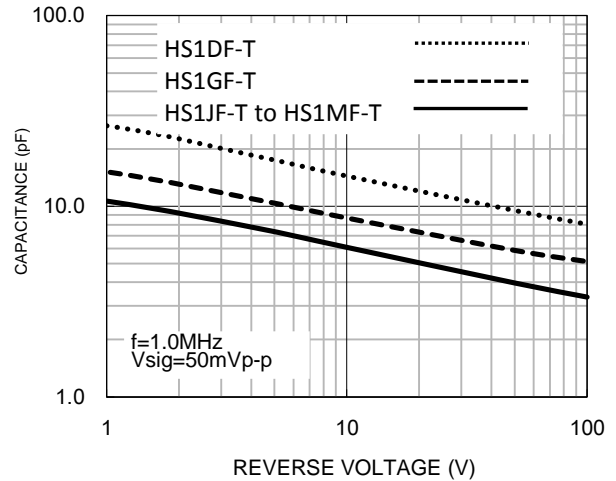


Fig.3 Typical Reverse Characteristics

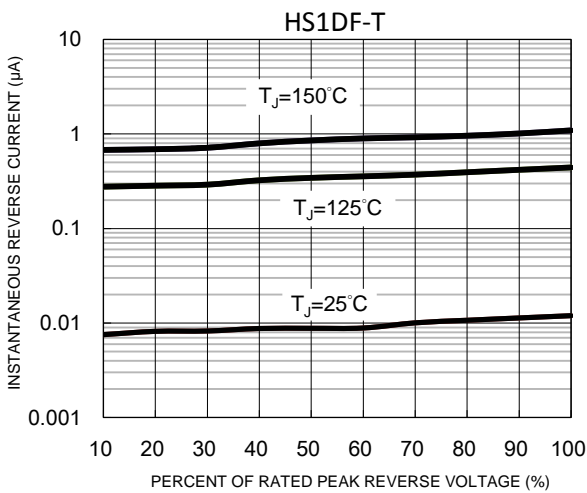


Fig.4 Typical Forward Characteristics

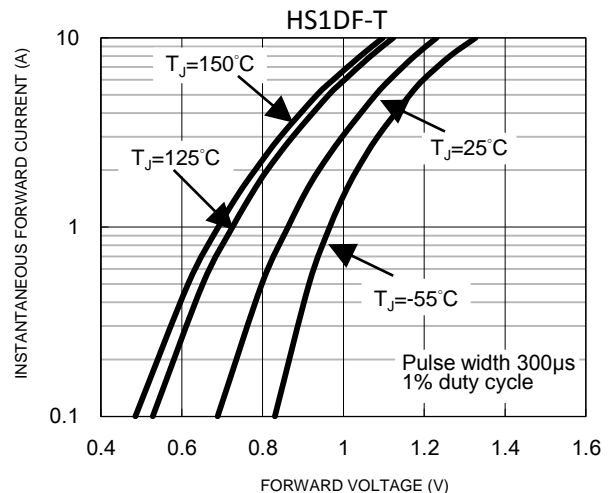


Fig.5 Typical Reverse Characteristics

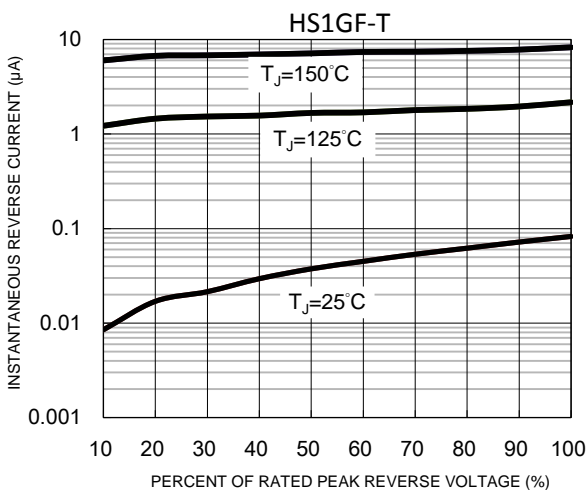


Fig.6 Typical Forward Characteristics

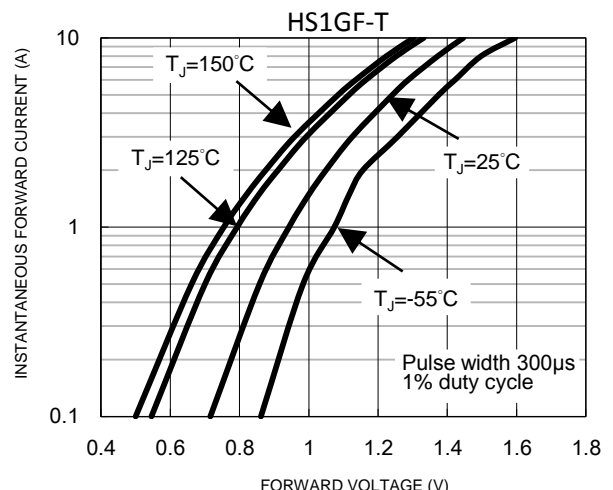


Fig.7 Typical Reverse Characteristics

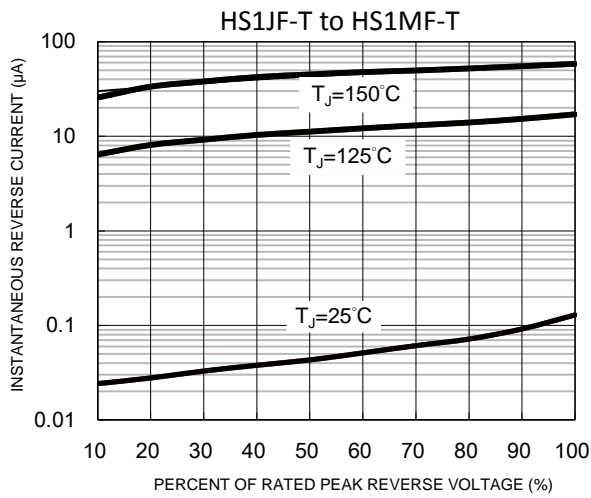


Fig.8 Typical Forward Characteristics

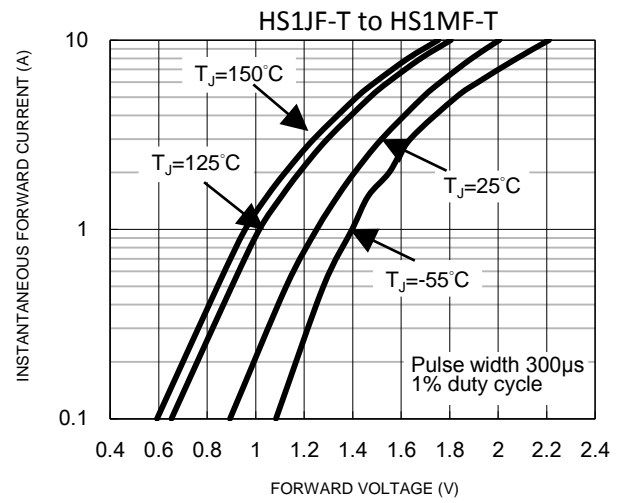
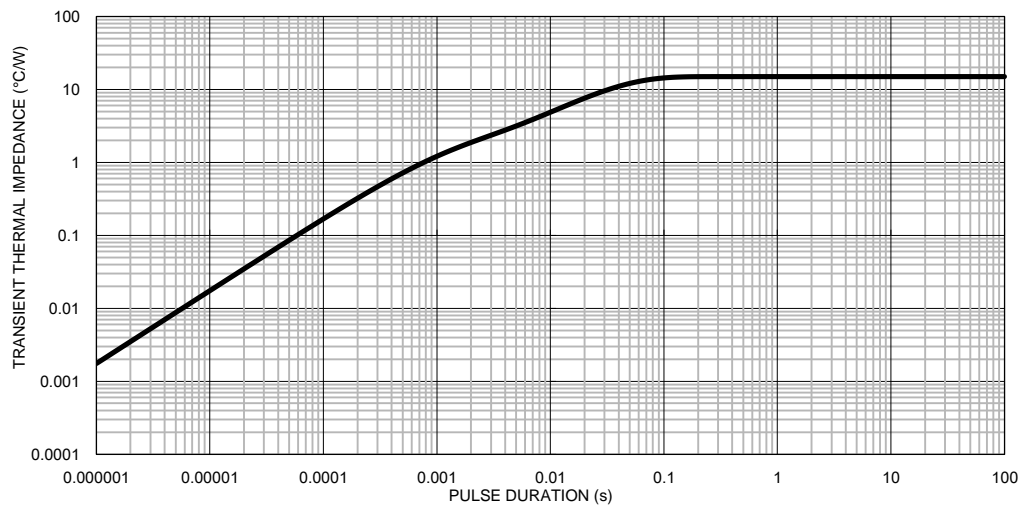
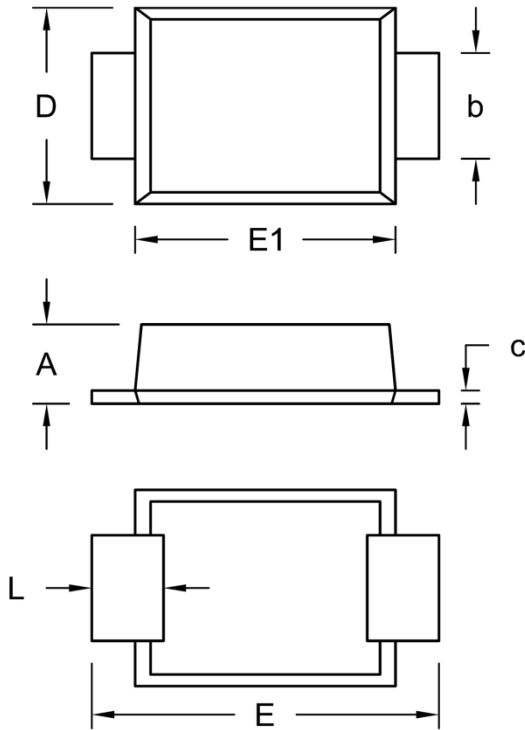


Fig.9 Typical Transient Thermal Impedance



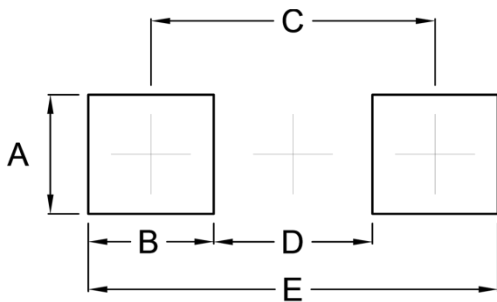
PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

SMAF



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	1.00	1.10	0.039	0.043
b	1.30	1.50	0.051	0.059
c	0.10	0.25	0.004	0.010
D	2.40	2.80	0.094	0.110
E	4.40	4.80	0.173	0.189
E1	3.25	3.65	0.128	0.144
L	0.70	1.20	0.028	0.047

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	1.57	0.062
B	1.66	0.065
C	3.76	0.148
D	2.10	0.083
E	5.42	0.213

MARKING DIAGRAM



- P/N = Marking Code
- G = Green Compound
- YW = Date Code
- F = Factory Code

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