

## 1A, 200V - 1000V Fast Recovery Surface Mount Rectifier

### FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Low reverse leakage
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- DC to DC converter
- Switching mode converters and inverters
- General purpose

### 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: 0.035g (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	
Configuration	Single die	



SMAF



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)							
PARAMETER	SYMBOL	RS1DF-T	RS1GF-T	RS1JF-T	RS1KF-T	RS1MF-T	UNIT
Marking code on the device		RS1DF	RS1GF	RS1JF	RS1KF	RS1MF	
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
Forward current	$I_F$	1					A
Surge peak forward current single half sine-wave superimposed on rated load	$t = 8.3\text{ms}$	30					A
	$t = 1.0\text{ms}$	90					A
Junction temperature	$T_J$	-55 to +150					°C
Storage temperature	$T_{STG}$	-55 to +150					°C

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

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

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
<b>PARAMETER</b>		<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
Forward voltage <sup>(1)</sup>	RS1DF-T RS1GF-T	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$	$V_F$	0.93	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		1.00	1.30	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.76	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.85	1.00	V
	RS1JF-T	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$		0.92	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		1.00	1.30	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.75	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.84	1.07	V
	RS1KF-T RS1MF-T	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$		0.98	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		1.06	1.30	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.83	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.92	1.23	V
Reverse current @ rated $V_R$ <sup>(2)</sup>		$T_J = 25^\circ\text{C}$	$I_R$	-	5	$\mu\text{A}$
		$T_J = 125^\circ\text{C}$		-	200	$\mu\text{A}$
Reverse recovery time	RS1DF-T RS1GF-T	$I_F = 0.5\text{A}, I_R = 1.0\text{A}$ $I_{rr} = 0.25\text{A}$	$t_{rr}$	-	150	ns
	RS1JF-T			-	250	ns
	RS1KF-T RS1MF-T			-	500	ns
Junction capacitance	RS1DF-T RS1GF-T RS1JF-T	1MHz, $V_R = 4.0\text{V}$	$C_J$	9	-	pF
	RS1KF-T RS1MF-T			8	-	pF

**Notes:**

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

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE</b> <sup>(1)</sup>	<b>PACKAGE</b>	<b>PACKING</b>
RS1xF-T	SMAF	7,500 / Tape & Reel

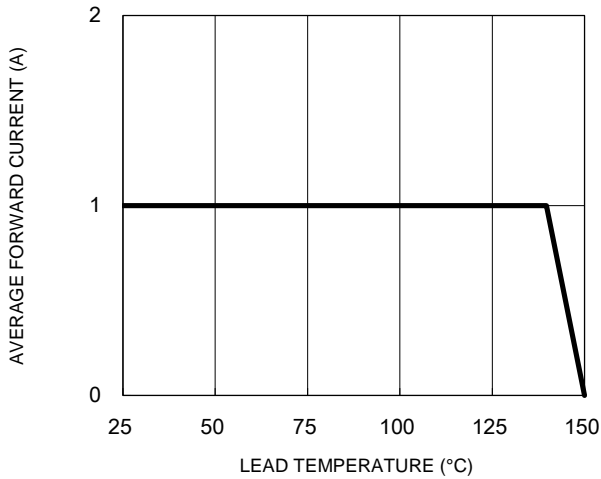
**Notes:**

1. "x" defines voltage from 200V (RS1DF-T) to 1000V (RS1MF-T)

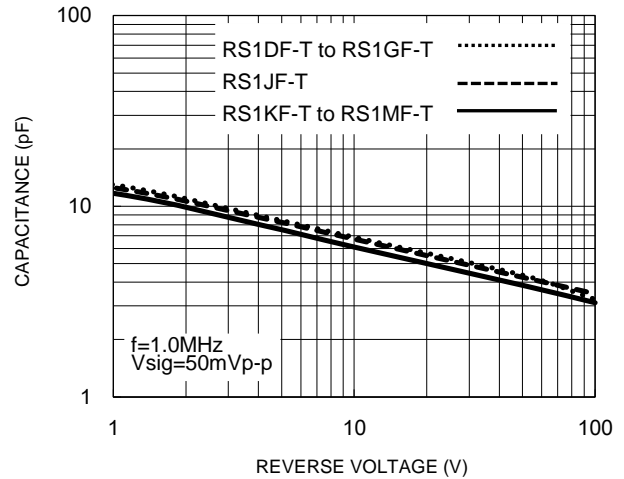
**CHARACTERISTICS CURVES**

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

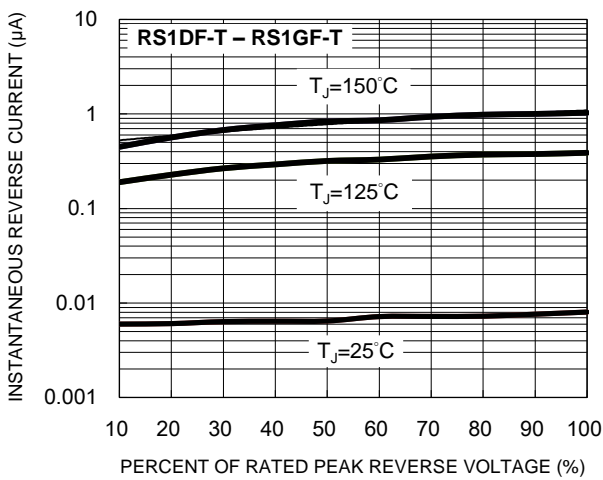
**Fig.1 Forward Current Derating Curve**



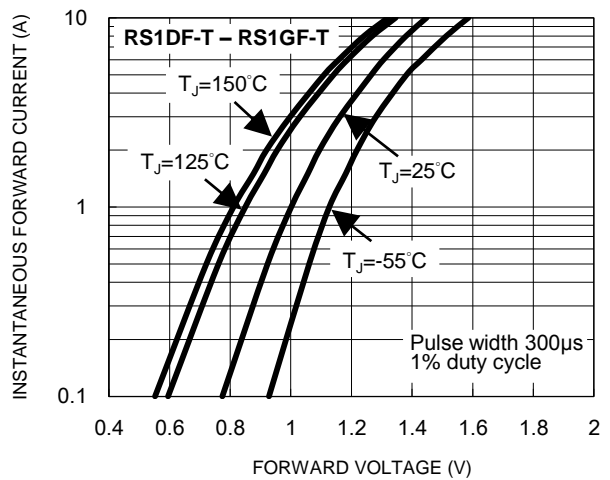
**Fig.2 Typical Junction Capacitance**



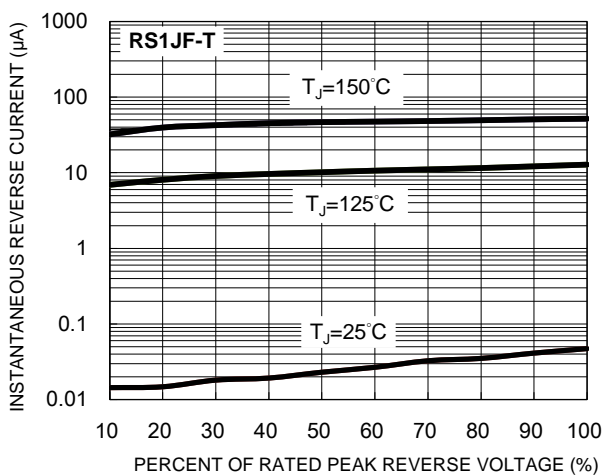
**Fig.3 Typical Reverse Characteristics**



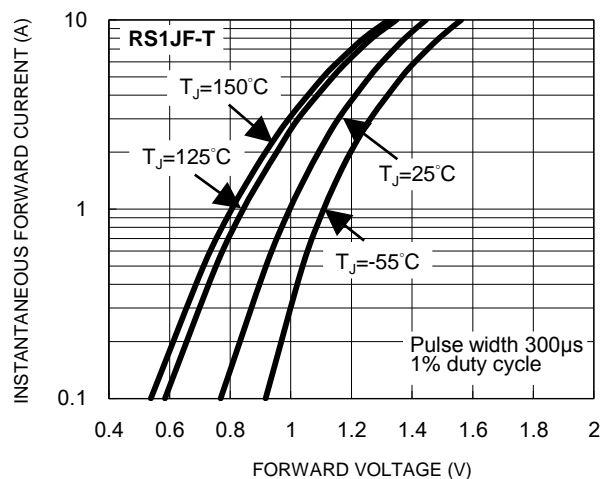
**Fig.4 Typical Forward Characteristics**



**Fig.5 Typical Reverse Characteristics**



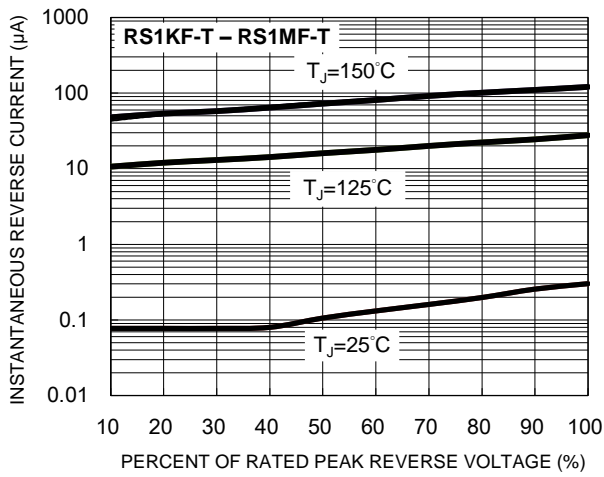
**Fig.6 Typical Forward Characteristics**



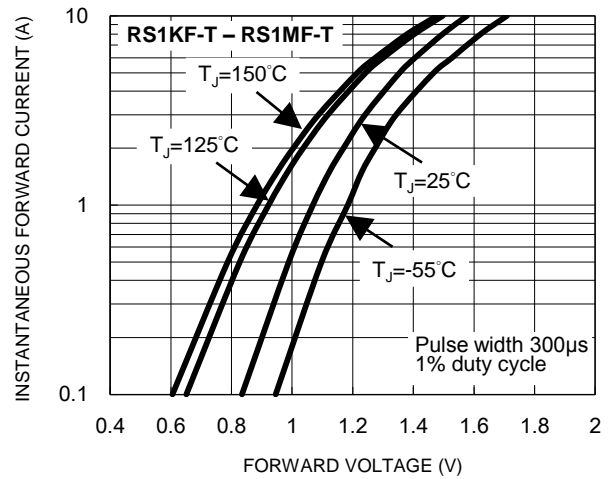
**CHARACTERISTICS CURVES**

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

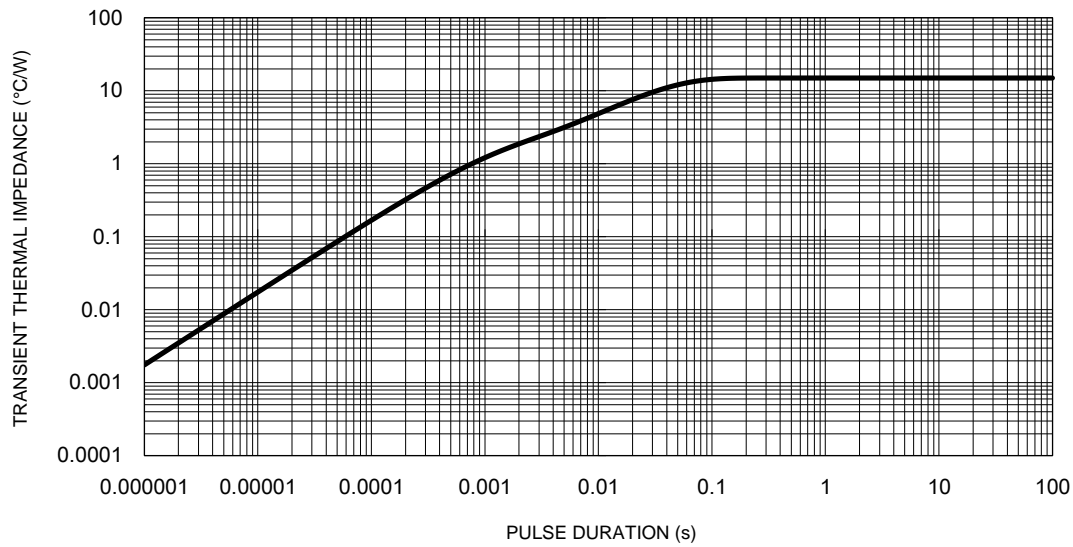
**Fig.7 Typical Reverse Characteristics**



**Fig.8 Typical Forward Characteristics**

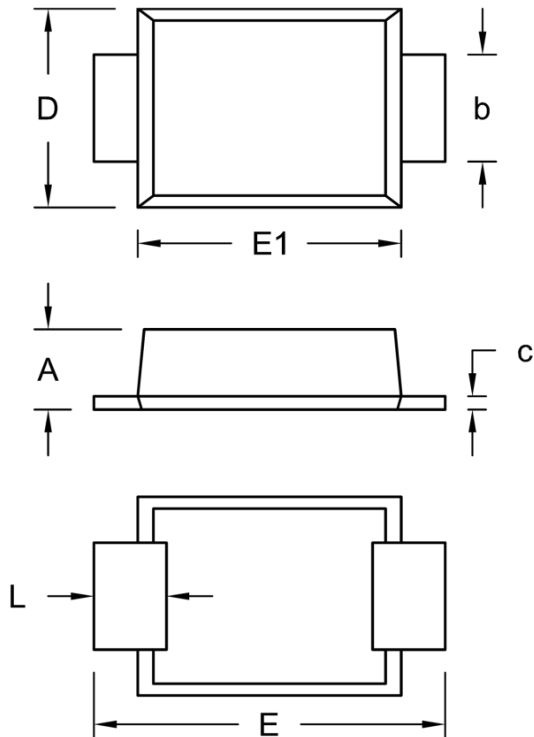


**Fig.9 Typical Transient Thermal Impedance**



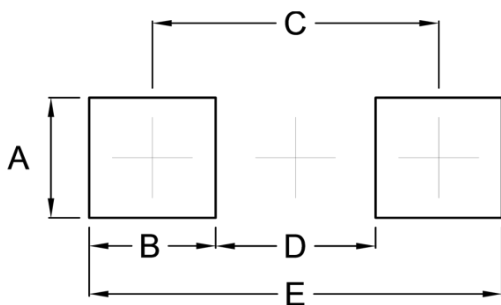
**PACKAGE OUTLINE DIMENSIONS**

**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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