

1A, 200V - 600V Super Fast 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
- Freewheeling application

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 - 600	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	ES1DF-T	ES1GF-T	ES1JF-T	UNIT
Marking code on the device		ES1DF	ES1GF	ES1JF	
Repetitive peak reverse voltage	V_{RRM}	200	400	600	V
Reverse voltage, total rms value	$V_{R(RMS)}$	140	280	420	V
Forward current	I_F	1			A
Surge peak forward current single half sine-wave superimposed on rated load	$t = 8.3\text{ms}$	I_{FSM}	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

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	TYP	UNIT
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)

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER		CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage ⁽¹⁾	ES1DF-T	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$	V_F	0.80	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		0.87	0.95	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.65	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.73	0.84	V
	ES1GF-T	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$		0.93	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		1.04	1.25	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.72	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.85	1.03	V
	ES1JF-T	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$		1.12	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		1.30	1.70	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.85	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		1.03	1.26	V
Reverse current @ rated V_R ⁽²⁾		$T_J = 25^\circ\text{C}$	I_R	-	5	μA
		$T_J = 125^\circ\text{C}$		-	100	μA
Reverse recovery time		$I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$	t_{rr}	-	35	ns
Junction capacitance	ES1DF-T	1MHz, $V_R = 4.0\text{V}$	C_J	20	-	pF
	ES1GF-T			11	-	pF
	ES1JF-T			7	-	pF

Notes:

1. Pulse test with PW = 0.3ms
2. Pulse test with PW = 30ms

ORDERING INFORMATION		
ORDERING CODE⁽¹⁾	PACKAGE	PACKING
ES1xF-T	SMAF	7,500 / Tape & Reel

Notes:

1. "x" defines voltage from 200V (ES1DF-T) to 600V (ES1JF-T)

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

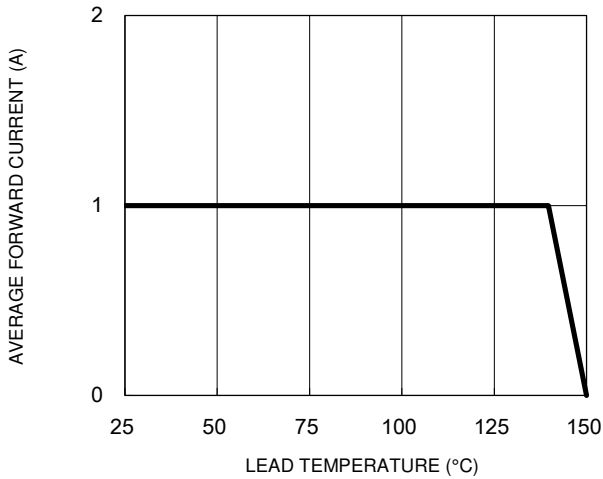


Fig.2 Typical Junction Capacitance

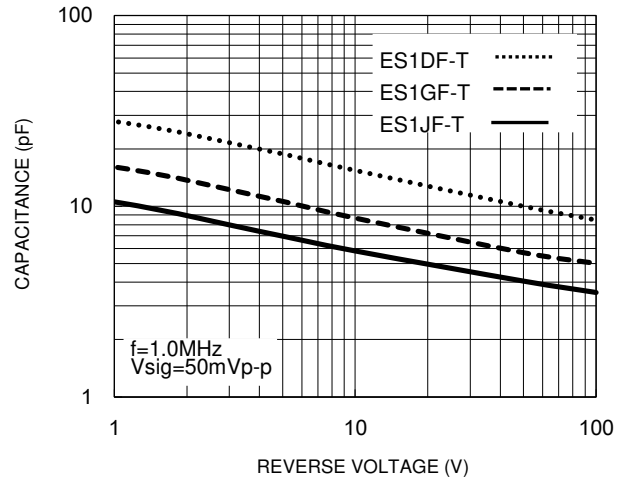


Fig.3 Typical Reverse Characteristics

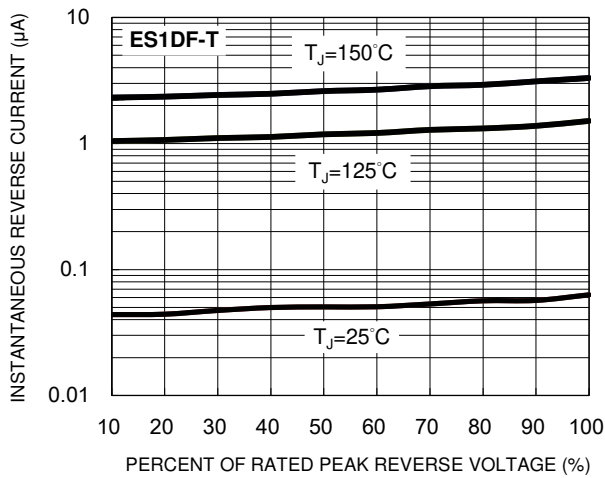


Fig.4 Typical Forward Characteristics

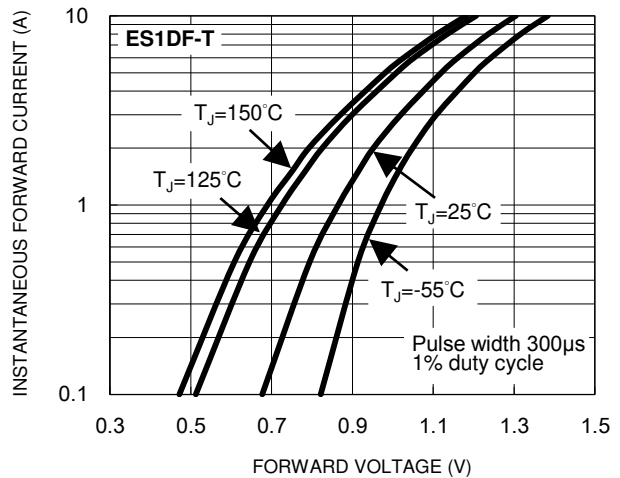


Fig.5 Typical Reverse Characteristics

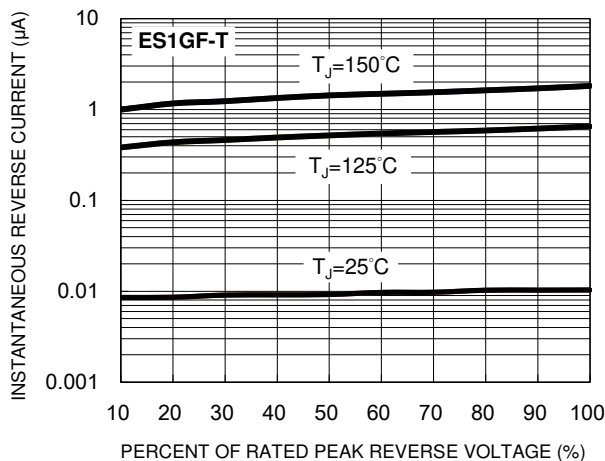
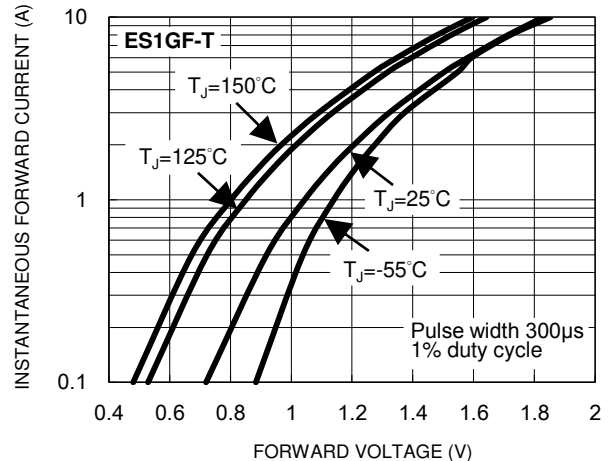


Fig.6 Typical Forward Characteristics



CHARACTERISTICS CURVES

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

Fig.7 Typical Reverse Characteristics

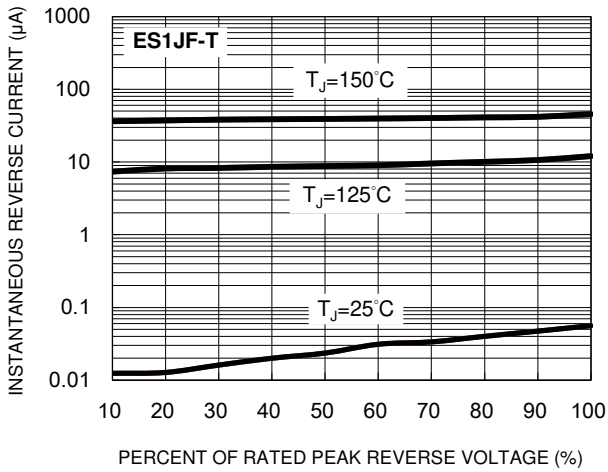


Fig.8 Typical Forward Characteristics

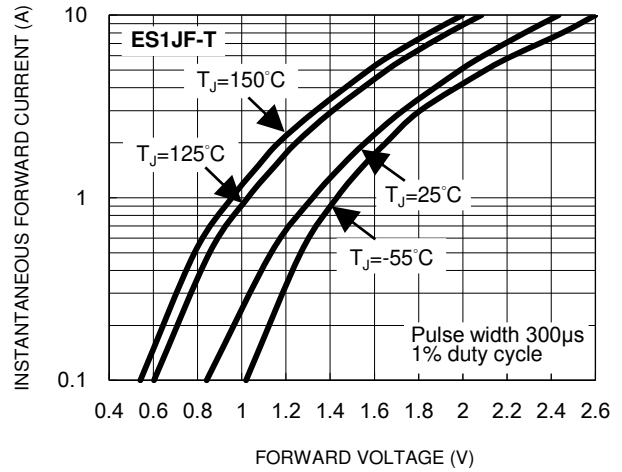
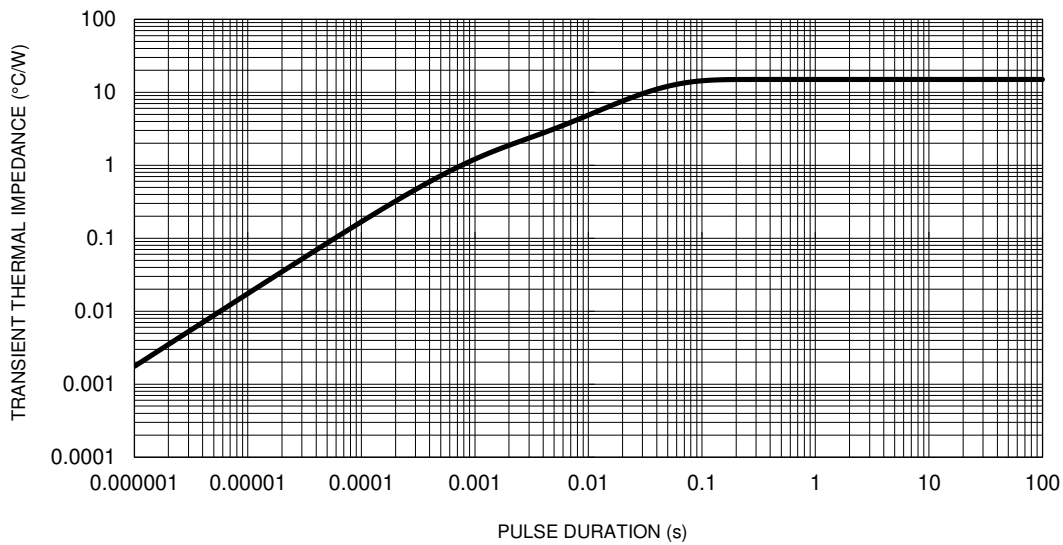
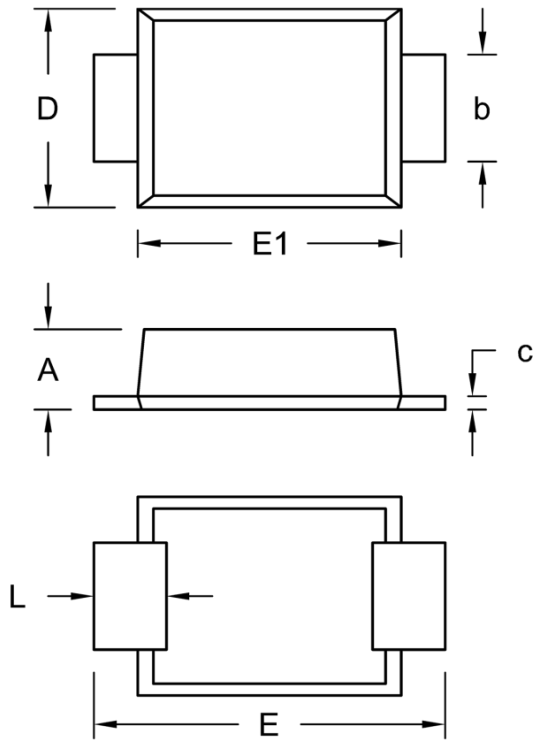


Fig.9 Typical Transient Thermal Impedance



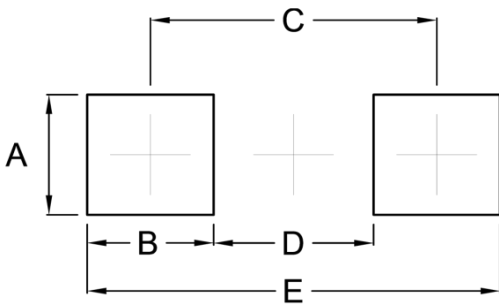
PACKAGE OUTLINE DIMENSIONS

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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