

1A, 100V - 600V Super Fast Surface Mount Rectifier

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Low power loss, high efficiency
- Low profile package
- 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: 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: 0.029g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
I_F	1	A
V_{RRM}	100 - 600	V
I_{FSM}	30	A
T_{JMAX}	150	°C
Package	Thin SMA	
Configuration	Single die	



Thin SMA



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	ES1BAL	ES1DAL	ES1GAL	ES1JAL	UNIT
Marking code on the device		ES1BAL	ES1DAL	ES1GAL	ES1JAL	
Repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Reverse voltage, total rms value	$V_{R(RMS)}$	70	140	280	420	V
Forward current	I_F	1				A
Surge peak forward current single half sine wave superimposed on rated load	$t = 8.3\text{ms}$	30				A
	$t = 1.0\text{ms}$	60				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	$R_{\theta JL}$	28	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	67	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	20	°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⁾	ES1BAL ES1DAL	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$	V_F	0.80	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		0.85	0.95	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.58	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.71	0.81	V
	ES1GAL	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$		0.86	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		0.93	1.30	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.69	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.77	0.89	V
	ES1JAL	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$		1.04	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		1.15	1.70	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.80	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.93	1.06	V
Reverse current @ rated V_R ⁽²⁾		$T_J = 25^\circ\text{C}$	I_R	-	1	μA
		$T_J = 125^\circ\text{C}$		-	20	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	ES1BAL ES1DAL	1MHz, $V_R = 4.0\text{V}$	C_J	18	-	pF
	ES1GAL			16	-	pF
	ES1JAL			15	-	pF

Notes:

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

ORDERING INFORMATION		
ORDERING CODE⁽¹⁾	PACKAGE	PACKING
ES1xAL	Thin SMA	14,000 / Tape & Reel

Notes:

1. "x" defines voltage from 100V(ES1BAL) to 600V(ES1JAL)

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

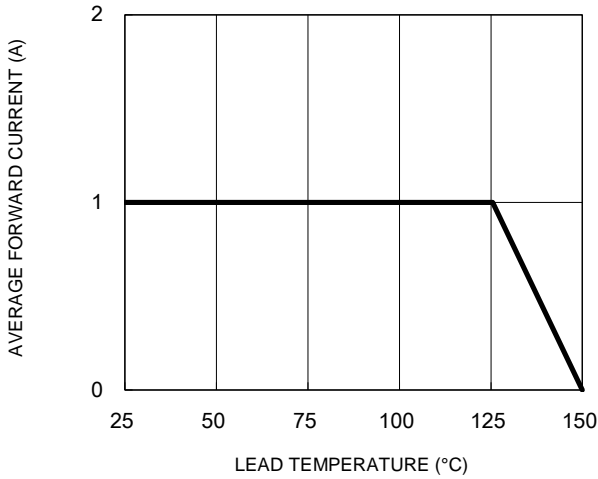


Fig.2 Typical Junction Capacitance

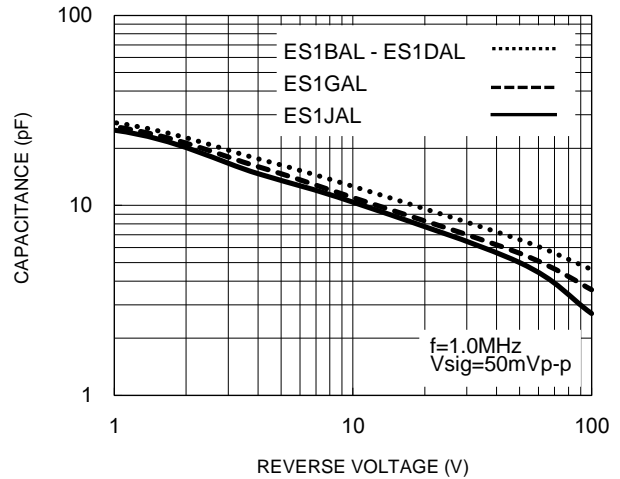


Fig.3 Typical Reverse Characteristics

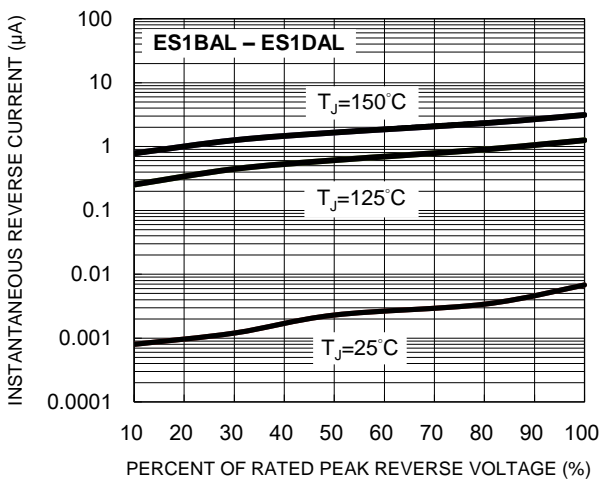


Fig.4 Typical Forward Characteristics

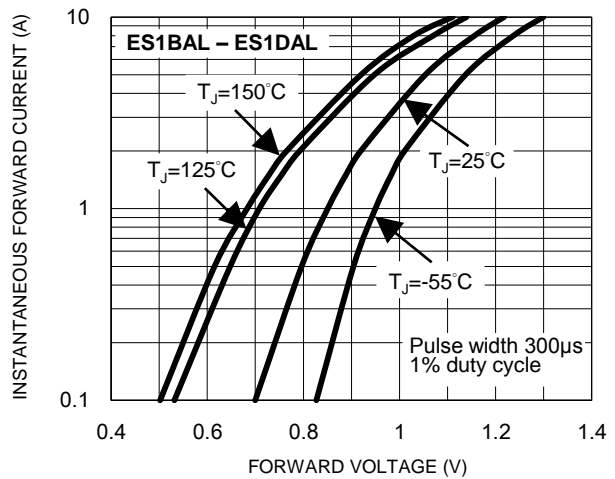


Fig.5 Typical Reverse Characteristics

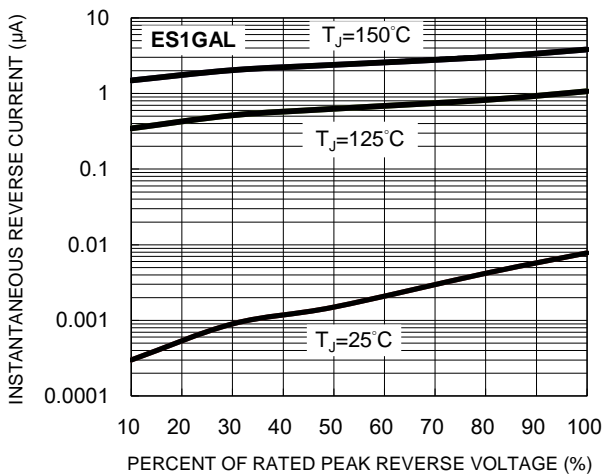
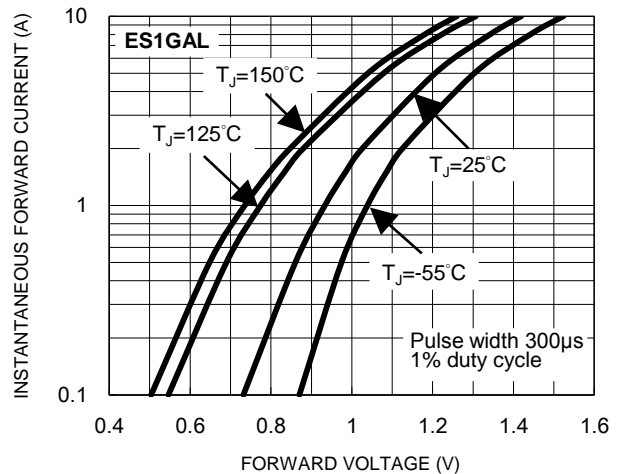


Fig.6 Typical Forward Characteristics



CHARACTERISTICS CURVES

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

Fig.7 Typical Reverse Characteristics

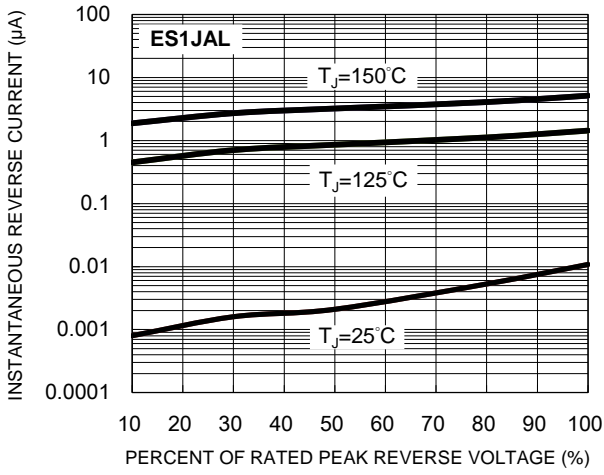


Fig.8 Typical Forward Characteristics

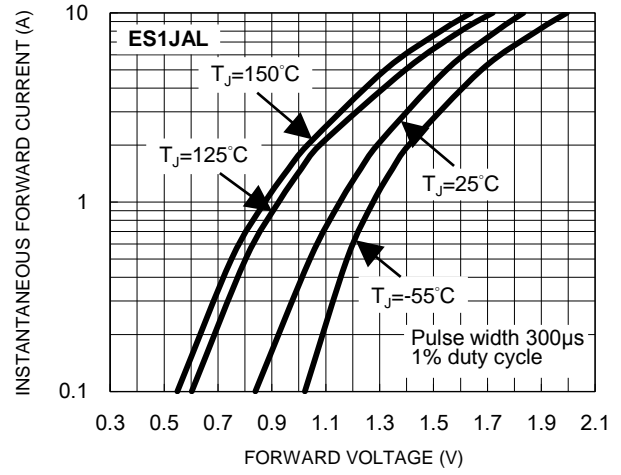
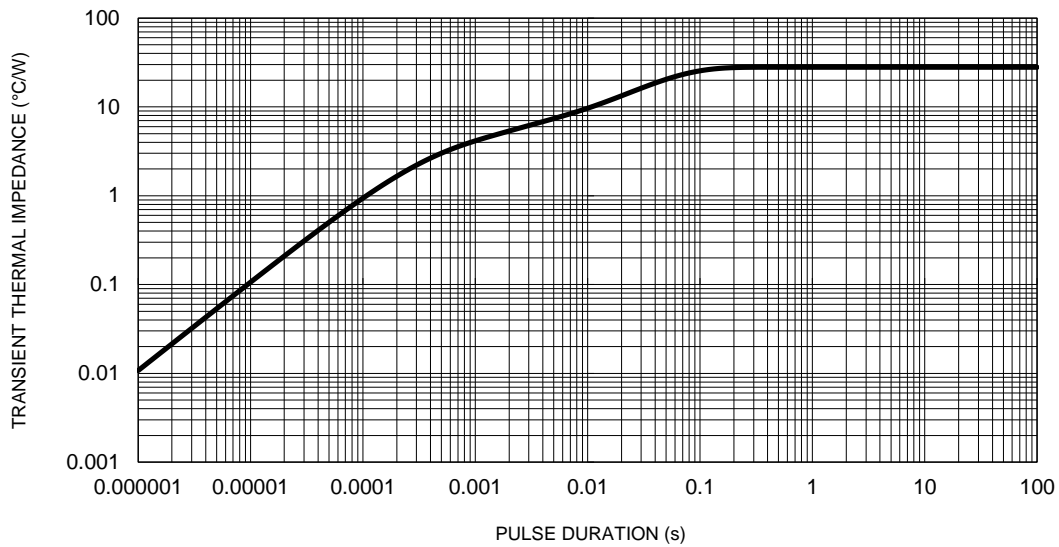
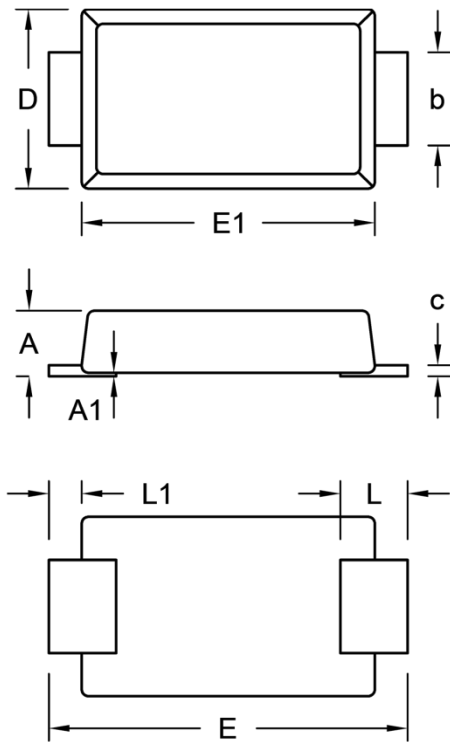


Fig.9 Typical Transient Thermal Impedance



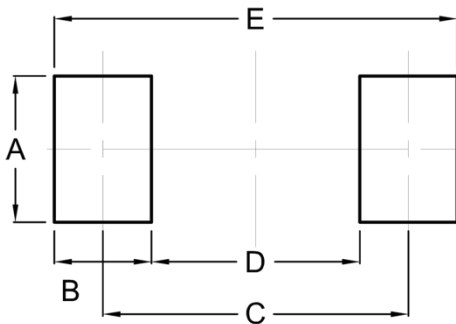
PACKAGE OUTLINE DIMENSIONS

Thin SMA



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	0.90	1.00	0.035	0.039
A1	0.00	0.10	0.000	0.004
b	1.25	1.45	0.049	0.057
c	0.10	0.22	0.004	0.009
D	2.50	2.70	0.098	0.106
E	5.05	5.35	0.199	0.211
E1	4.15	4.35	0.163	0.171
L	0.75	1.20	0.030	0.047
L1	0.30	0.60	0.012	0.024

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	2.10	0.083
B	1.40	0.055
C	4.40	0.173
D	3.00	0.118
E	5.80	0.228

MARKING DIAGRAM



P/N = Marking Code
 YW = Date Code
 F = Factory Code

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