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

FEATURES

- Glass passivated junction chip
- Ideal for automated placement
- Low power loss, high efficiency
- Low profile package
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

APPLICATIONS

- Freewheeling application
- Switching mode converters and inverters, computer and telecommunication.

MECHANICAL DATA

- Case: Thin SMA
- Molding compound meets UL 94V-0 flammability rating
- Moisture sensitivity level: level 1, per J-STD-020
- Terminal: Pure tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.029 g (approximately)

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
$I_{F(AV)}$	1	A
V_{RRM}	100-600	V
I_{FSM}	30	A
$T_{J\ MAX}$	150	°C
Package	Thin SMA	
Configuration	Single Die	

Pb-Free RoHS COMPLIANT HALOGEN FREE

Thin SMA

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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		$I_{F(AV)}$	1				A
Surge peak forward current single half sine-wave superimposed on rated load per diode	8.3ms at T_A = 25°C	I_{FSM}	30				A
	1.0ms at T_A = 25°C		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°C unless otherwise noted)

PARAMETER		CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage per diode (1)	ES1BAL ES1DAL	I_F = 0.5A, T_J = 25°C	V_F	0.80	-	V
		I_F = 1.0A, T_J = 25°C		0.85	0.95	V
		I_F = 0.5A, T_J = 125°C		0.58	-	V
		I_F = 1.0A, T_J = 125°C		0.71	0.81	V
	ES1GAL	I_F = 0.5A, T_J = 25°C		0.86	-	V
		I_F = 1.0A, T_J = 25°C		0.93	1.30	V
		I_F = 0.5A, T_J = 125°C		0.69	-	V
		I_F = 1.0A, T_J = 125°C		0.77	0.89	V
	ES1JAL	I_F = 0.5A, T_J = 25°C		1.04	-	V
		I_F = 1.0A, T_J = 25°C		1.15	1.70	V
		I_F = 0.5A, T_J = 125°C		0.80	-	V
		I_F = 1.0A, T_J = 125°C		0.93	1.06	V
Reverse current @ rated V_R per diode (2)		T_J = 25°C	I_R	-	1	μA
		T_J = 125°C		-	20	μA
Reverse recovery time		I_F=0.5A,I_R=1.0A, Irr=0.25A	t_{rr}	-	35	ns
Junction capacitance per diode	ES1BAL ES1DAL	1 MHz, V_R=4.0V	C_J	18	-	pF
	ES1GAL			16	-	pF
	ES1JAL			15	-	pF

Notes:

(1) Pulse test with PW=0.3 ms

(2) Pulse test with PW=30 ms

ORDERING INFORMATION

ORDERING CODE(1)	PACKAGE	PACKING
ES1xAL M3G	Thin SMA	3,500 / 7” reel
ES1xAL M2G	Thin SMA	14,000 / 13” reel

Notes:

(1) “x” defines voltage from 100V(ES1BAL) to 600V(ES1JAL)

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Forward Current Derating Curve

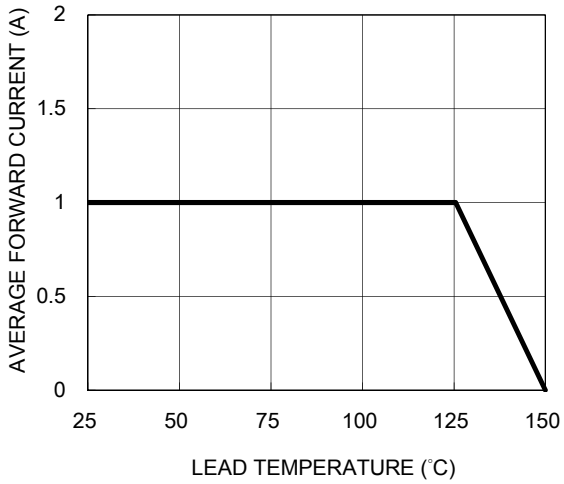


Fig.2 Typical Junction Capacitance

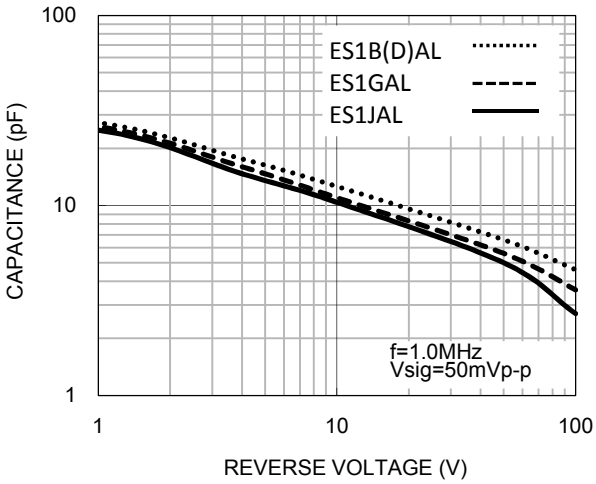


Fig.3 Typical Reverse Characteristics

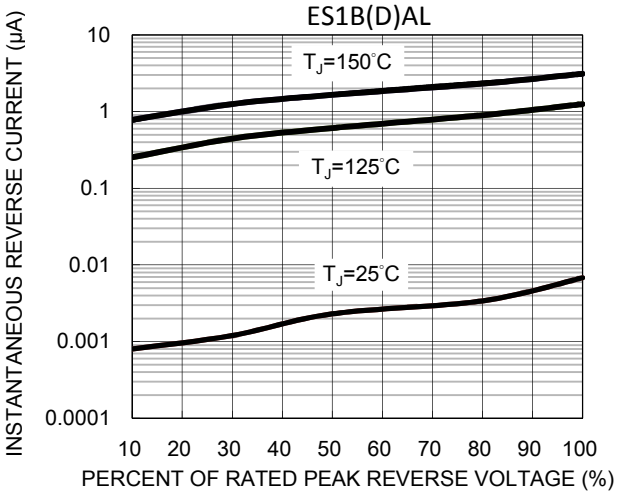


Fig.4 Typical Forward Characteristics

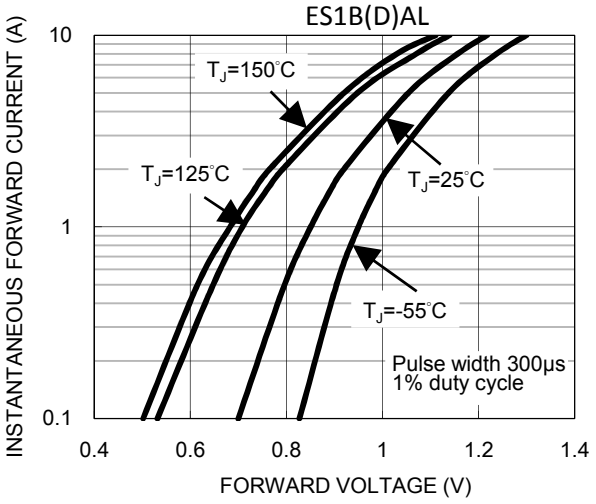


Fig.5 Typical Reverse Characteristics

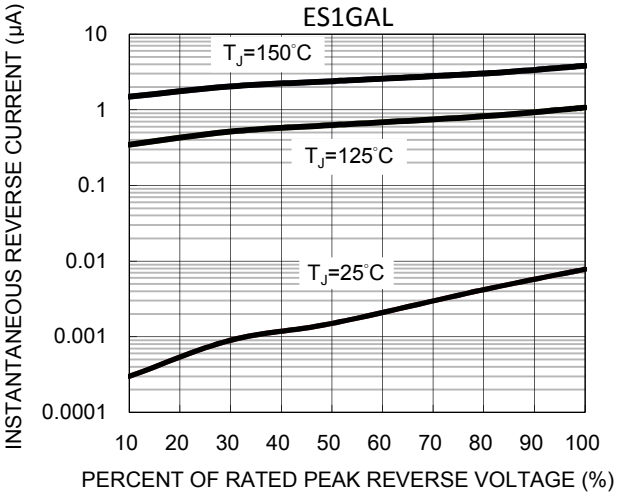


Fig.6 Typical Forward Characteristics

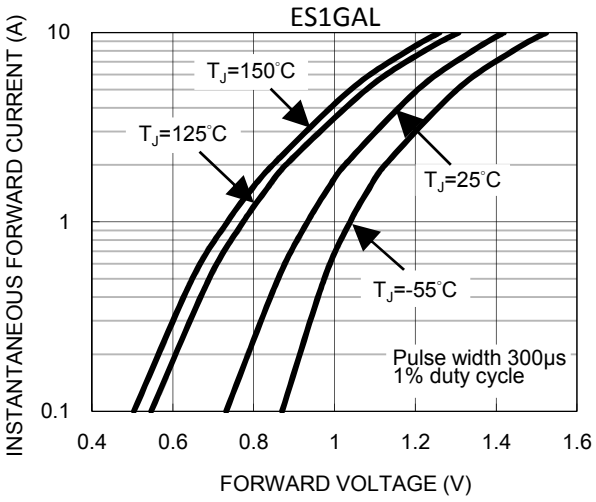


Fig.7 Typical Reverse Characteristics

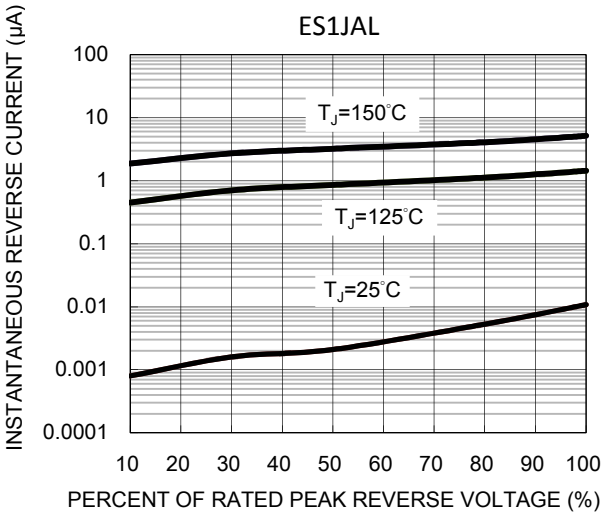


Fig.8 Typical Forward Characteristics

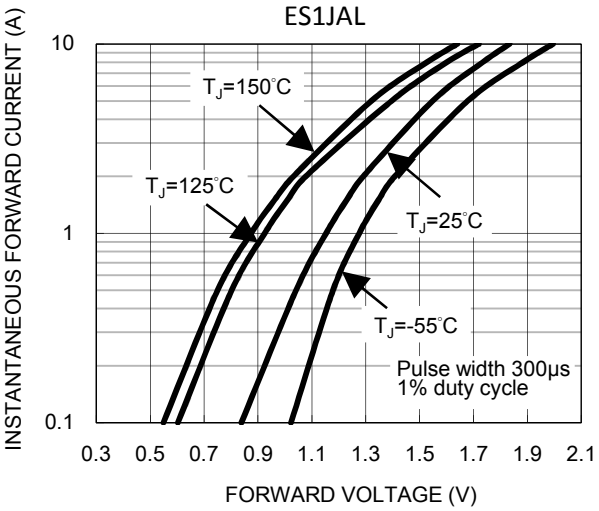
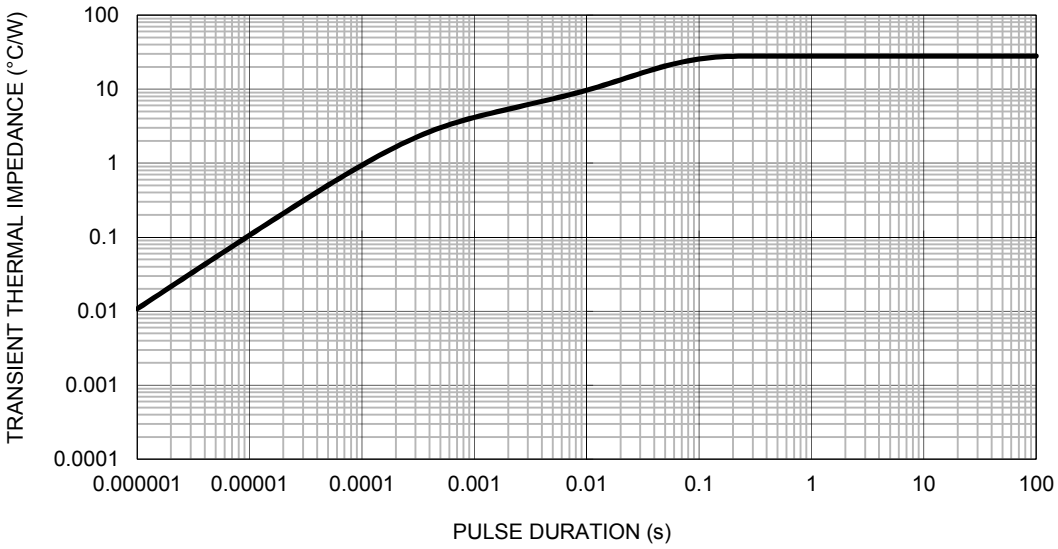
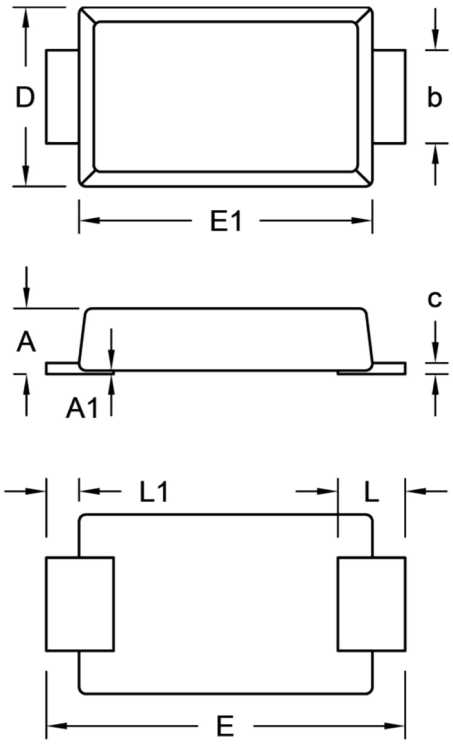


Fig.9 Typical Transient Thermal Impedance



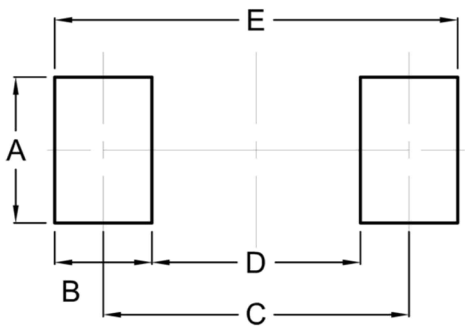
PACKAGE OUTLINE DIMENSIONS

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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