

## 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: SOD-128
- 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: 0.028 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	SOD-128	
Configuration	Single Die	



SOD-128

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)							
PARAMETER	SYMBOL	ES1BFS	ES1DFS	ES1GFS	ES1JFS	UNIT	
Marking code on the device		ES1BFS	ES1DFS	ES1GFS	ES1JFS		
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 $T_A = 25^\circ\text{C}$	$I_{FSM}$				30	A
	1.0ms at $T_A = 25^\circ\text{C}$					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 ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER		CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage per diode <sup>(1)</sup>	ES1BFS ES1DFS	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$	$V_F$	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
	ES1GFS	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$		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
	ES1JFS	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$		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 $V_R$ per diode <sup>(2)</sup>		$T_J = 25^\circ\text{C}$	$I_R$	-	1	$\mu\text{A}$
		$T_J = 125^\circ\text{C}$		-	20	$\mu\text{A}$
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 per diode	ES1BFS ES1DFS	1 MHz, $V_R=4.0\text{V}$	$C_J$	18	-	pF
	ES1GFS			16	-	pF
	ES1JFS			15	-	pF

**Notes:**

- (1) Pulse test with PW=0.3 ms
- (2) Pulse test with PW=30 ms

ORDERING INFORMATION		
ORDERING CODE <sup>(1)</sup>	PACKAGE	PACKING
ES1xFS M3G	SOD-128	3,500 / 7" reel
ES1xFS M2G	SOD-128	14,000 / 13" reel

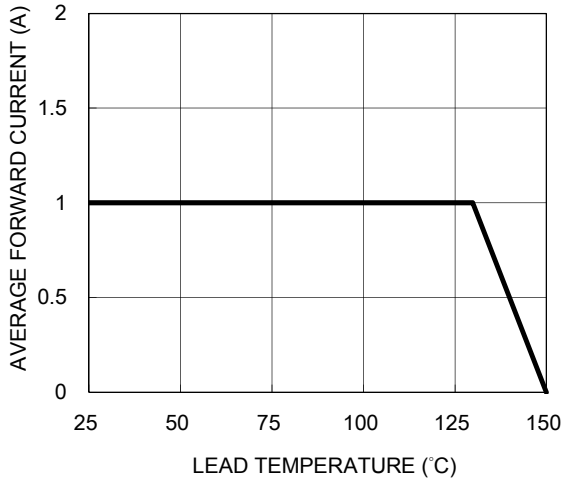
**Notes:**

- (1) "x" defines voltage from 100V(ES1BFS) to 600V(ES1JFS)

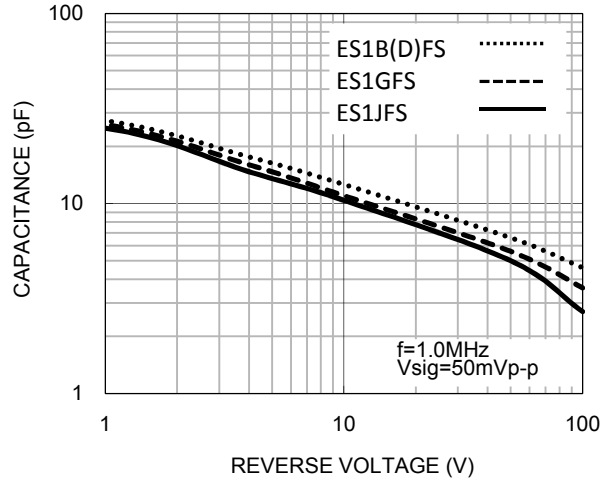
**CHARACTERISTICS CURVES**

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

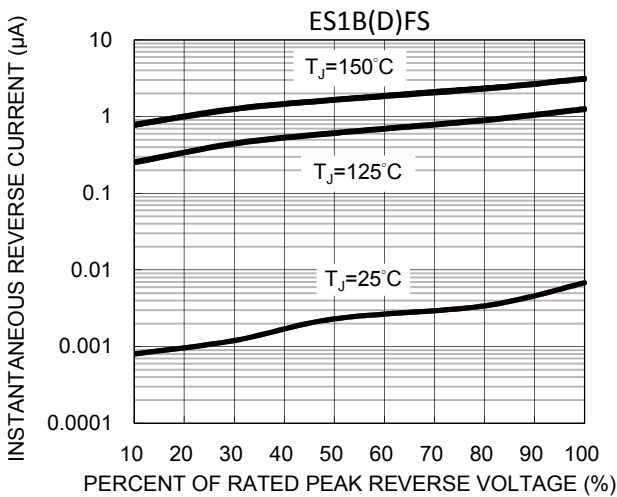
**Fig.1 Forward Current Derating Curve**



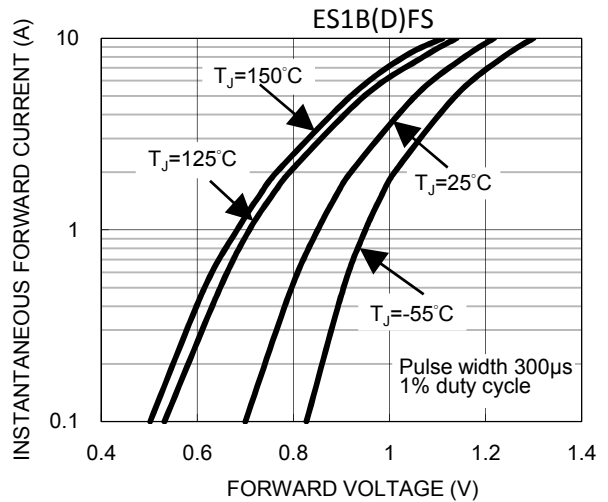
**Fig.2 Typical Junction Capacitance**



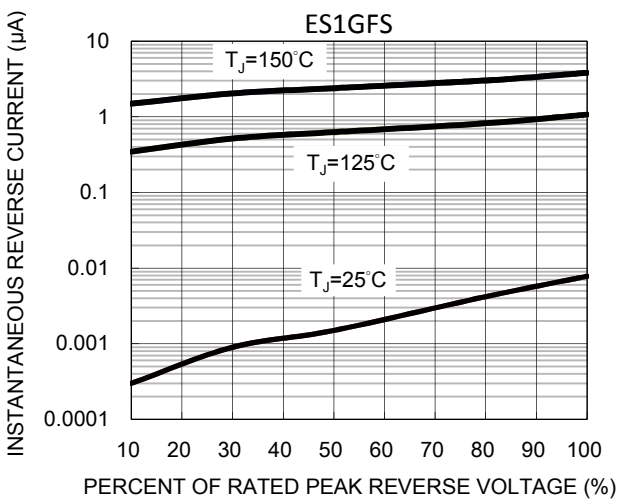
**Fig.3 Typical Reverse Characteristics**



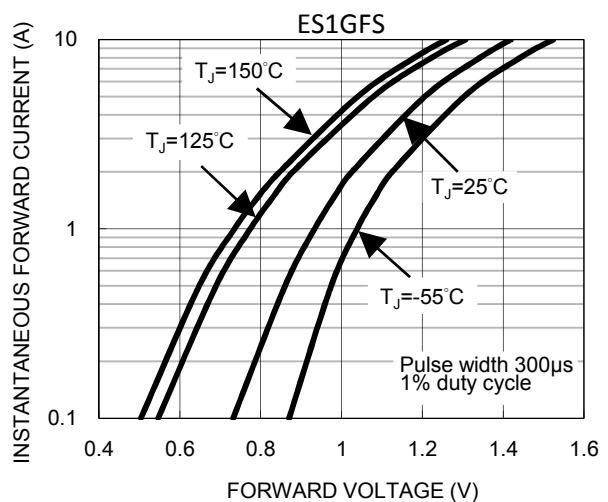
**Fig.4 Typical Forward Characteristics**



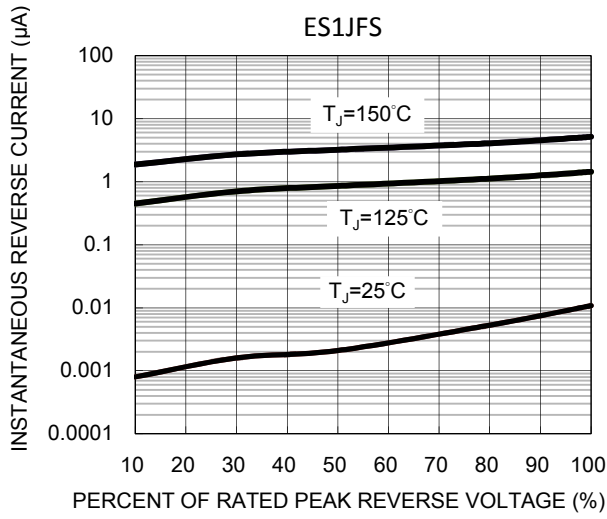
**Fig.5 Typical Reverse Characteristics**



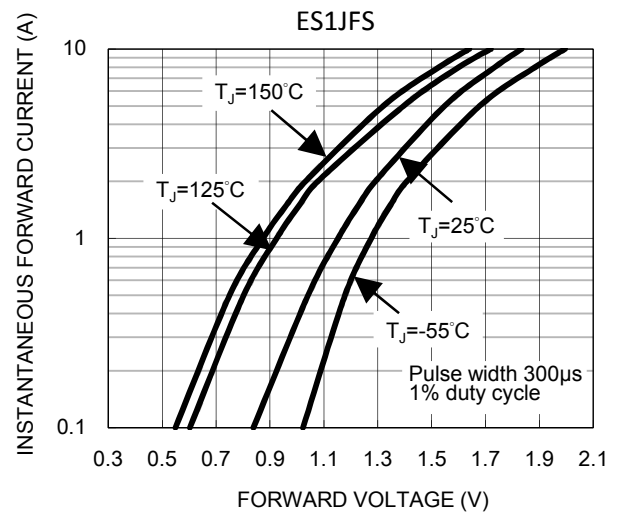
**Fig.6 Typical Forward Characteristics**



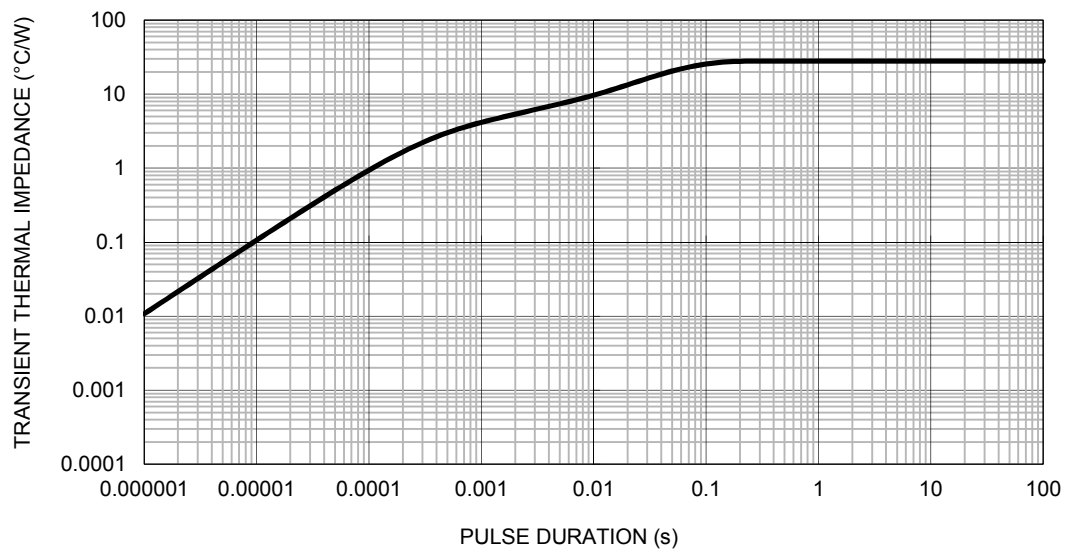
**Fig.7 Typical Reverse Characteristics**



**Fig.8 Typical Forward Characteristics**

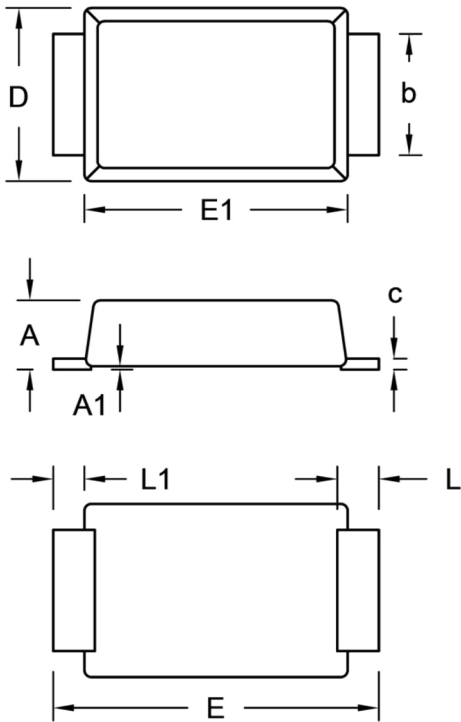


**Fig.9 Typical Transient Thermal Impedance**



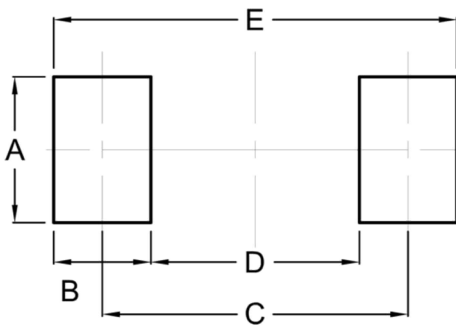
**PACKAGE OUTLINE DIMENSIONS**

SOD-128



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	0.90	1.10	0.035	0.043
A1	0.00	0.10	0.000	0.004
b	1.60	1.90	0.063	0.075
c	0.10	0.22	0.004	0.009
D	2.30	2.70	0.091	0.106
E	4.40	5.00	0.173	0.197
E1	3.60	4.00	0.142	0.157
L	0.40	0.80	0.016	0.031
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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