

## 1A, 200V-1000V High Efficient Surface Mount Rectifiers

### FEATURES

- Glass passivated junction chip
- Ideal for automated placement
- Low power loss, high efficiency
- Fast switching for 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
$V_{RRM}$	200 - 1000	V
$I_{FSM}$	35	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	HS1DFS	HS1GFS	HS1JFS	HS1KFS	HS1MFS	UNIT
Marking code on the device		HS1DFS	HS1GFS	HS1JFS	HS1KFS	HS1MFS	
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	$I_{F(AV)}$	1					A
Surge peak forward current, single half sine-wave superimposed on rated load per diode	8.3ms at $T_A = 25^\circ\text{C}$	$I_{FSM}$	35				A
	1.0ms at $T_A = 25^\circ\text{C}$		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	$R_{\theta JL}$	29	$^{\circ}C/W$
Junction-to-ambient thermal resistance	$R_{\theta JA}$	51	$^{\circ}C/W$
Junction-to-case thermal resistance	$R_{\theta JC}$	22	$^{\circ}C/W$

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

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^{\circ}C$ unless otherwise noted)						
<b>PARAMETER</b>		<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
Forward voltage per diode <sup>(1)</sup>	HS1DFS	$I_F = 0.5A, T_J = 25^{\circ}C$	$V_F$	0.80	-	V
		$I_F = 1.0A, T_J = 25^{\circ}C$		0.85	1.00	V
		$I_F = 0.5A, T_J = 125^{\circ}C$		0.65	-	V
		$I_F = 1.0A, T_J = 125^{\circ}C$		0.71	0.80	V
	HS1GFS	$I_F = 0.5A, T_J = 25^{\circ}C$		0.84	-	V
		$I_F = 1.0A, T_J = 25^{\circ}C$		0.91	1.30	V
		$I_F = 0.5A, T_J = 125^{\circ}C$		0.68	-	V
		$I_F = 1.0A, T_J = 125^{\circ}C$		0.76	0.86	V
	HS1JFS	$I_F = 0.5A, T_J = 25^{\circ}C$		0.92	-	V
		$I_F = 1.0A, T_J = 25^{\circ}C$		1.02	1.70	V
		$I_F = 0.5A, T_J = 125^{\circ}C$		0.73	-	V
		$I_F = 1.0A, T_J = 125^{\circ}C$		0.83	1.02	V
	HS1KFS HS1MFS	$I_F = 0.5A, T_J = 25^{\circ}C$		1.32	-	V
		$I_F = 1.0A, T_J = 25^{\circ}C$		1.49	1.70	V
		$I_F = 0.5A, T_J = 125^{\circ}C$		0.98	-	V
		$I_F = 1.0A, T_J = 125^{\circ}C$		1.16	1.39	V
Reverse current @ rated $V_R$ per diode <sup>(2)</sup>		$T_J = 25^{\circ}C$	$I_R$	-	1	$\mu A$
		$T_J = 125^{\circ}C$		-	35	$\mu A$
Reverse recovery time	HS1DFS HS1GFS	$I_F = 0.5A, I_R = 1.0A,$ $I_{rr} = 0.25A$	$t_{rr}$	-	50	ns
	HS1JFS HS1KFS HS1MFS			-	75	ns
Junction capacitance per diode	HS1DFS	1 MHz, $V_R = 4.0V$	$C_J$	20	-	pF
	HS1GFS			17	-	pF
	HS1JFS			13	-	pF
	HS1KFS HS1MFS			8	-	pF

**Notes:**

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

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE<sup>(1)</sup></b>	<b>PACKAGE</b>	<b>PACKING</b>
HS1xFS M3G	SOD-128	3,500 / 7" reel
HS1xFS M2G	SOD-128	14,000 / 13" reel

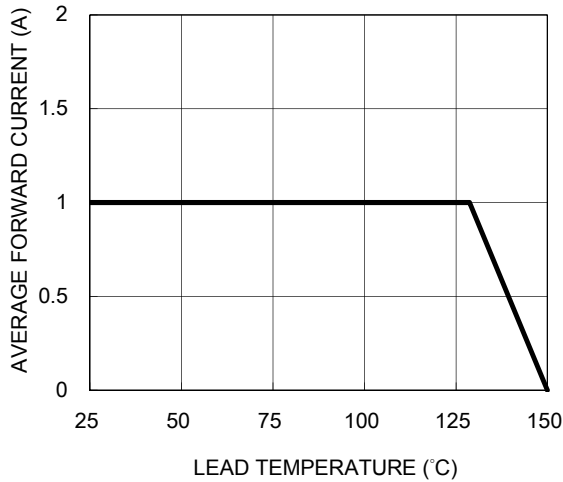
**Notes:**

(1) "x" defines voltage from 200V(HS1DFS) to 1000V(HS1MFS)

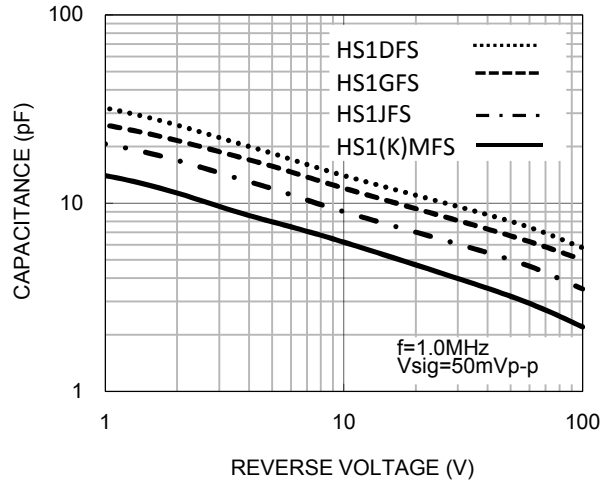
**CHARACTERISTICS CURVES**

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

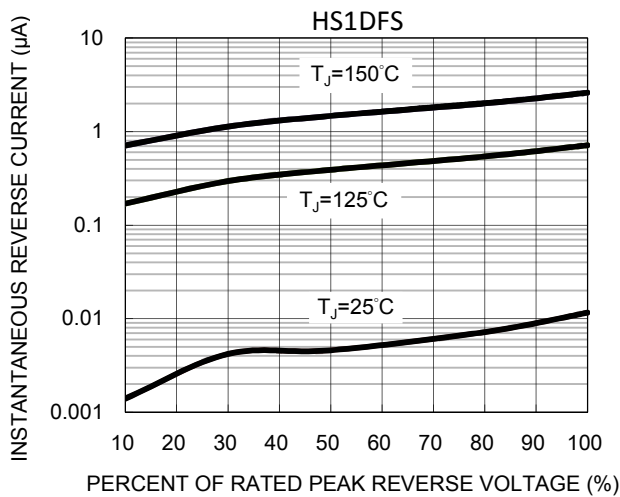
**Fig.1 Forward Current Derating Curve**



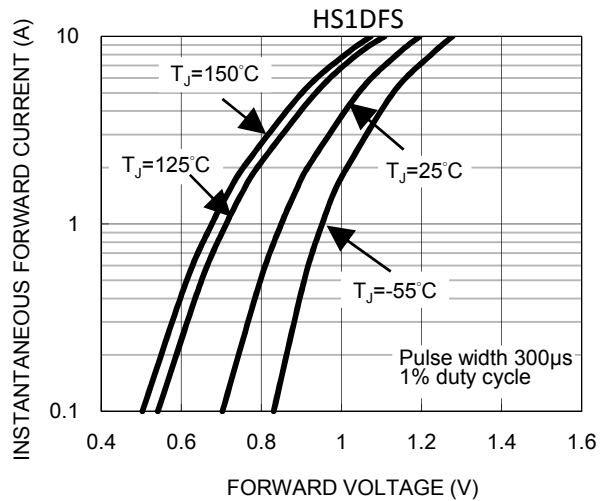
**Fig.2 Typical Junction Capacitance**



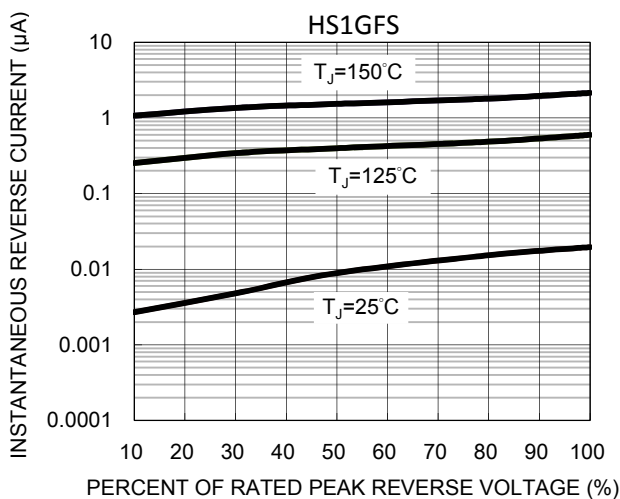
**Fig.3 Typical Reverse Characteristics**



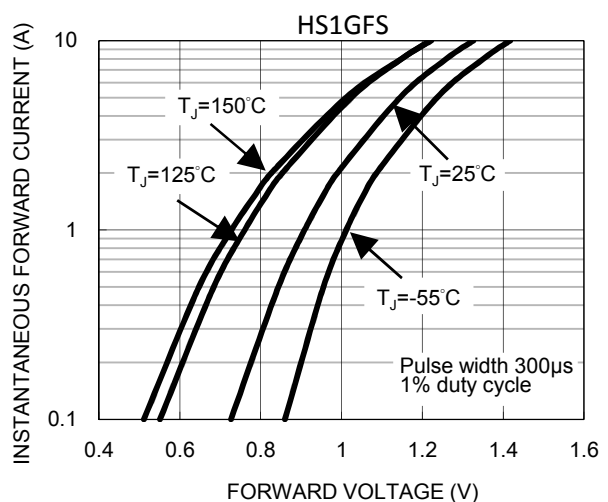
**Fig.4 Typical Forward Characteristics**



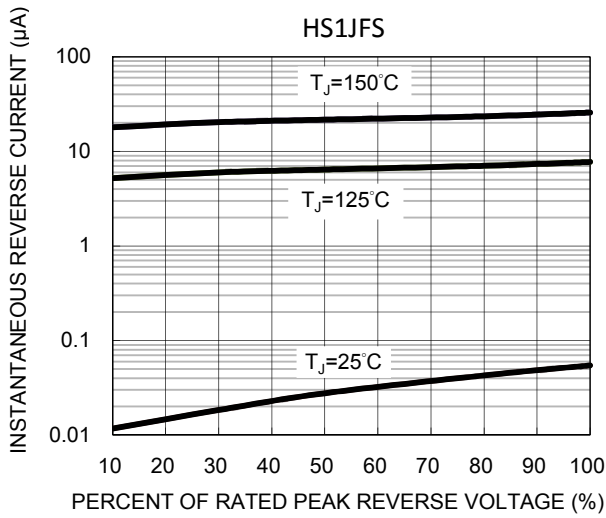
**Fig.5 Typical Reverse Characteristics**



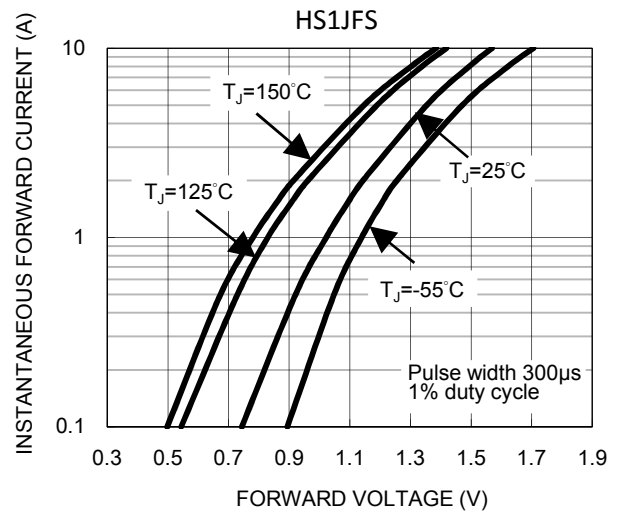
**Fig.6 Typical Forward Characteristics**



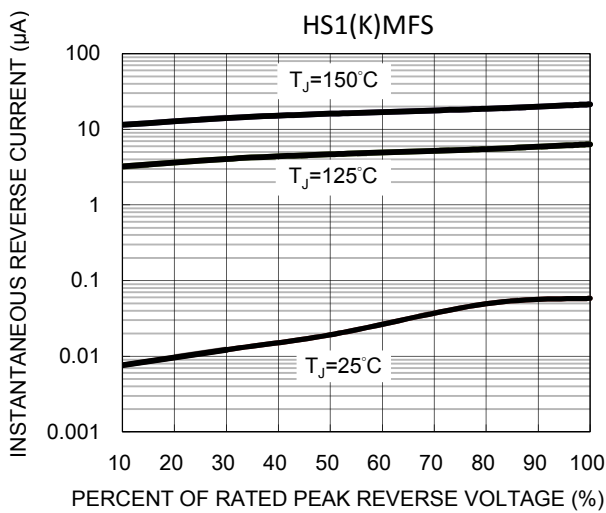
**Fig.7 Typical Reverse Characteristics**



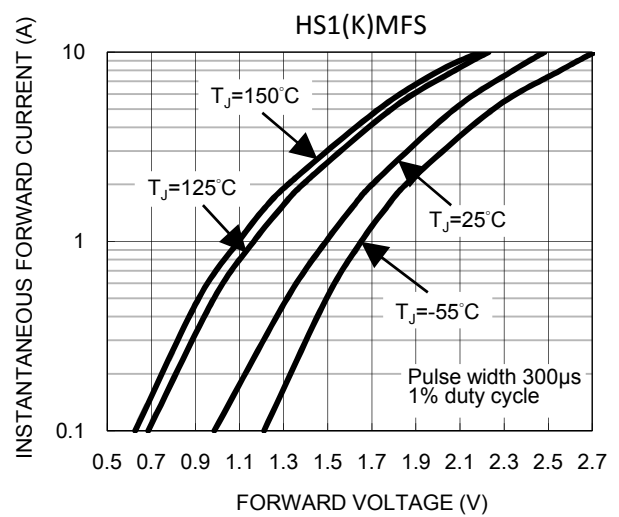
**Fig.8 Typical Forward Characteristics**



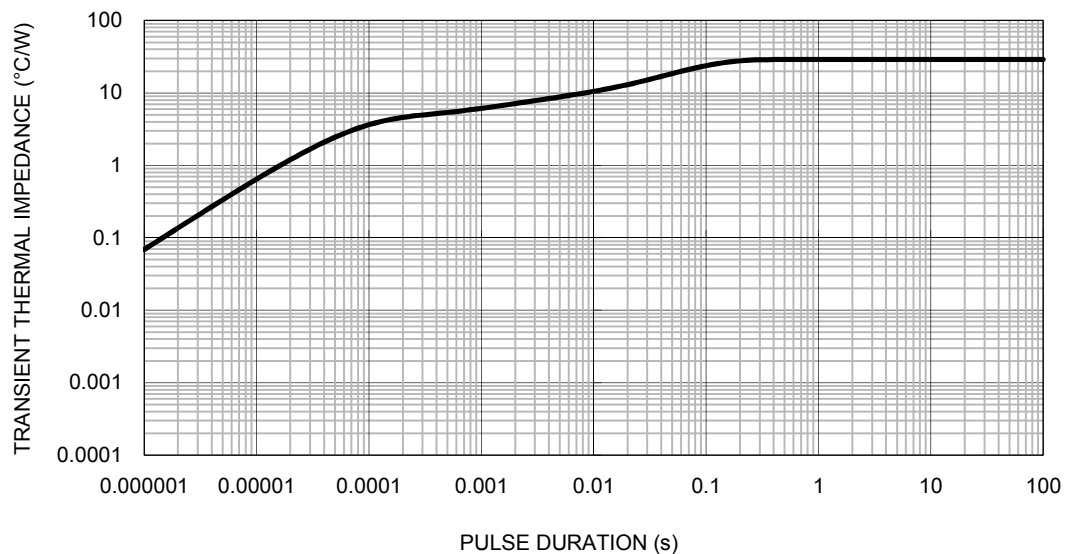
**Fig.9 Typical Reverse Characteristics**



**Fig.10 Typical Forward Characteristics**

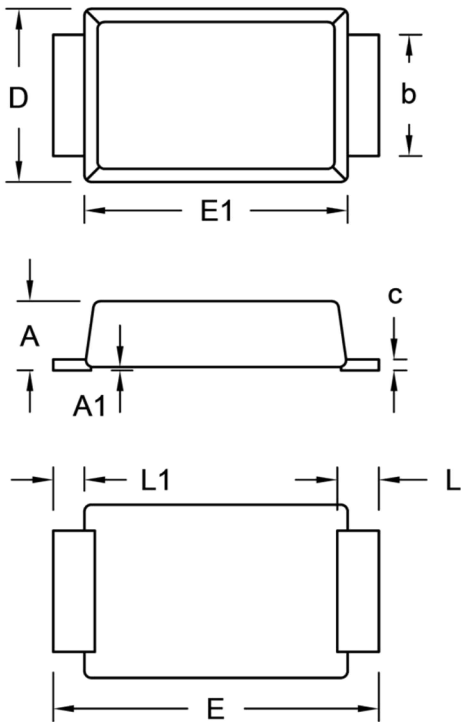


**Fig.11 Typical Transient Thermal Impedance**



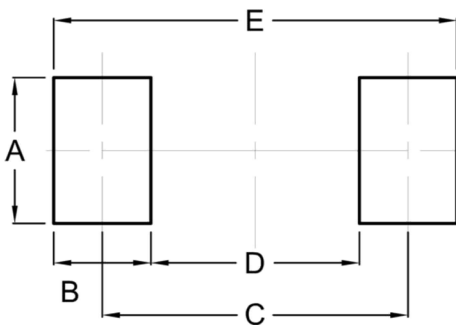
**PACKAGE OUTLINE DIMENSIONS**

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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