

## 1A, 50V - 1000V High Efficient Surface Mount Rectifier

### FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Low profile package
- Low power loss, high efficiency
- Fast switching for high efficiency
- 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: SOD-123FL
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Polarity: Indicated by cathode band
- Weight: 0.019g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$I_F$	1	A
$V_{RRM}$	50 - 1000	V
$I_{FSM}$	30	A
$T_{JMAX}$	150	°C
Package	SOD-123FL	
Configuration	Single die	



SOD-123FL



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)										
PARAMETER	SYMBOL	HS1A FL	HS1B FL	HS1D FL	HS1F FL	HS1G FL	HS1J FL	HS1K FL	HS1M FL	UNIT
Marking code on the device		HAF	HBF	HDF	HFF	HGF	HJF	HKF	HMF	
Repetitive peak reverse voltage	$V_{RRM}$	50	100	200	300	400	600	800	1000	V
Reverse voltage, total rms value	$V_{R(RMS)}$	35	70	140	210	280	420	560	700	V
Forward current	$I_F$	1								A
Surge peak forward current, 8.3ms single half sine-wave superimposed on rated load	$I_{FSM}$	30								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	$R_{\theta JL}$	17	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	85	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	19	°C/W

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

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
<b>PARAMETER</b>		<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
Forward voltage <sup>(1)</sup>	HS1AFL HS1BFL HS1DFL HS1FFL	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$	$V_F$	0.82	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		0.89	0.95	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.67	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.75	0.81	V
	HS1GFL	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$	$V_F$	0.93	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		1.01	1.30	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.74	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		0.85	1.10	V
	HS1JFL HS1KFL HS1MFL	$I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$	$V_F$	1.21	-	V
		$I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$		1.36	1.70	V
		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$		0.94	-	V
		$I_F = 1.0\text{A}, T_J = 125^\circ\text{C}$		1.10	1.38	V
Reverse current @ rated $V_R$ <sup>(2)</sup>		$T_J = 25^\circ\text{C}$	$I_R$	-	5	$\mu\text{A}$
		$T_J = 125^\circ\text{C}$		-	150	$\mu\text{A}$
Junction capacitance	HS1AFL HS1BFL HS1DFL HS1FFL HS1GFL	1MHz, $V_R = 4.0\text{V}$	$C_J$	11	-	pF
	HS1JFL HS1KFL HS1MFL			6	-	pF
Reverse recovery time	HS1AFL HS1BFL HS1DFL HS1FFL HS1GFL	$I_F = 0.5\text{A}, I_R = 1.0\text{A}$ $I_{rr} = 0.25\text{A}$	$t_{rr}$	-	50	ns
	HS1JFL HS1KFL HS1MFL			-	75	ns

**Notes:**

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

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE</b> <sup>(1)</sup>	<b>PACKAGE</b>	<b>PACKING</b>
HS1xFL	SOD-123FL	10,000 / Tape & Reel

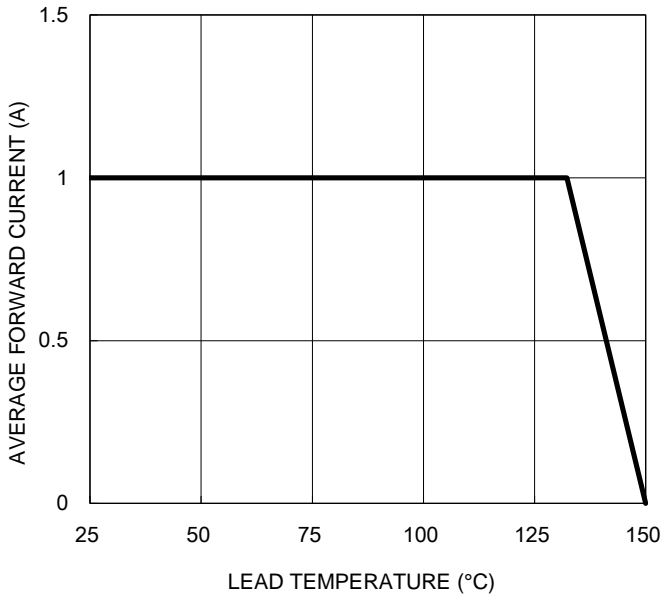
**Notes:**

1. "x" defines voltage from 50V(HS1AFL) to 1000V(HS1MFL)

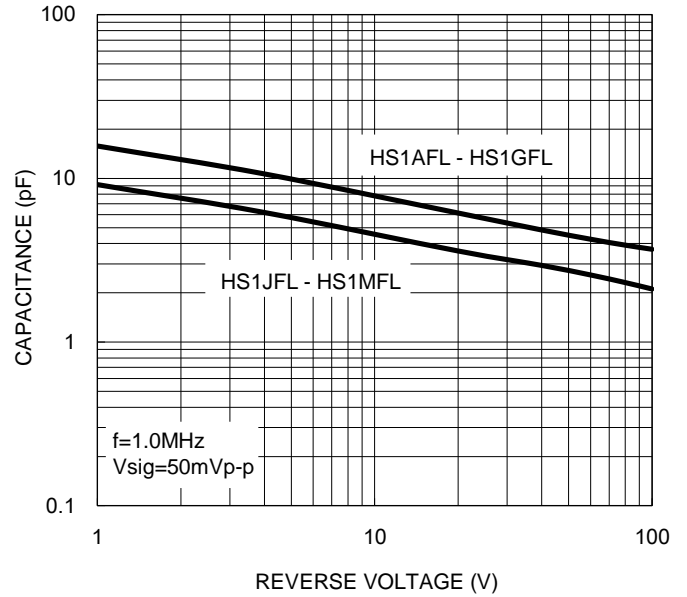
**CHARACTERISTICS CURVES**

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

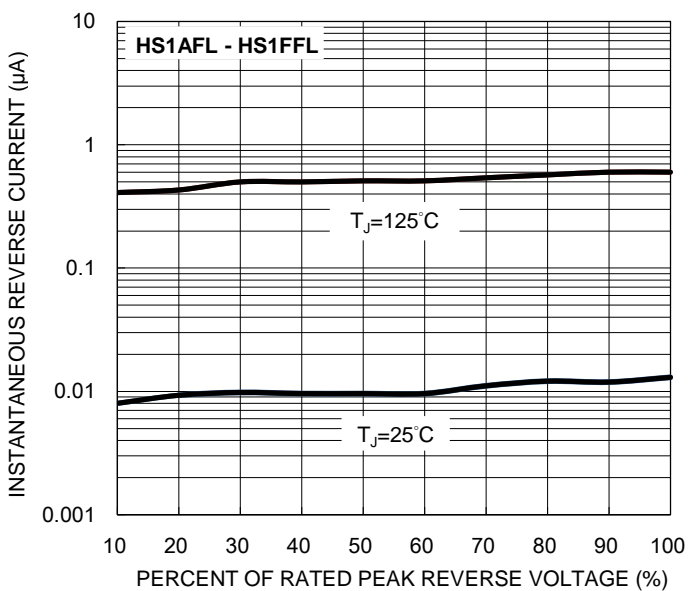
**Fig.1 Forward Current Derating Curve**



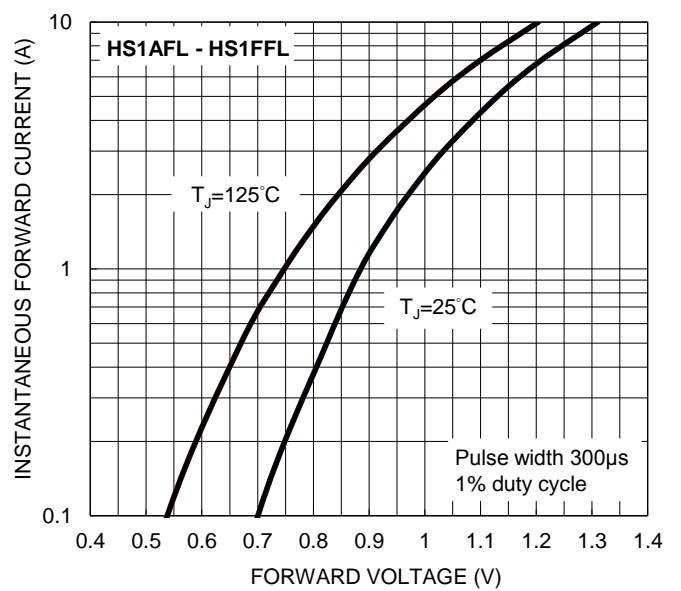
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**



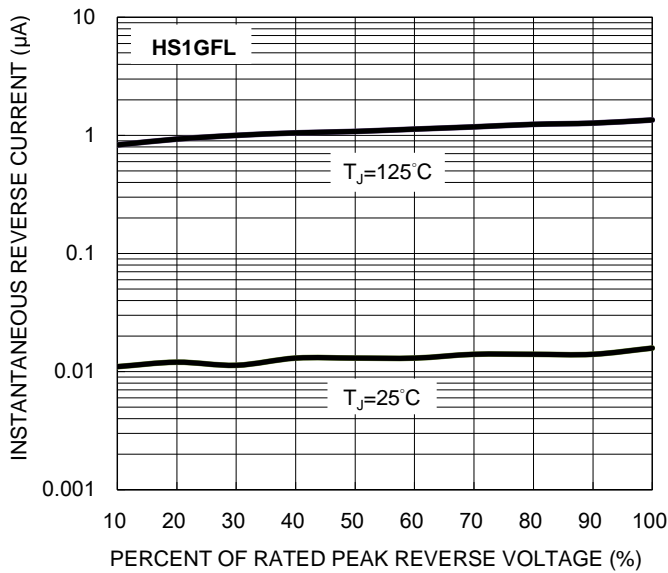
**Fig.4 Typical Forward Characteristics**



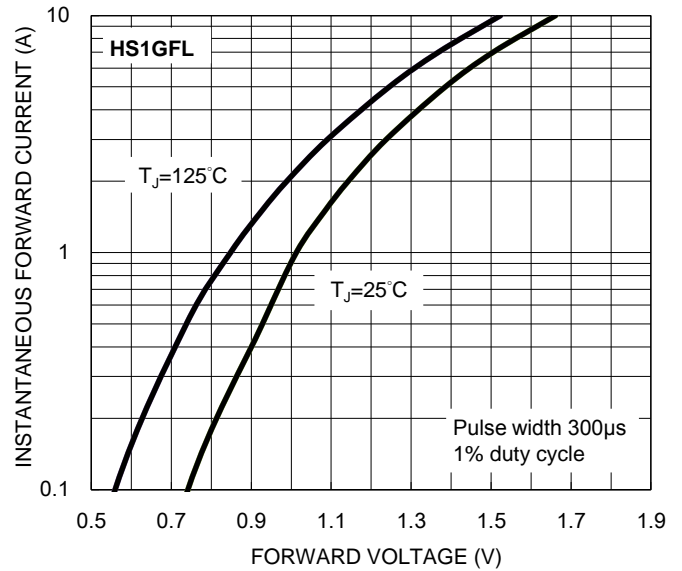
**CHARACTERISTICS CURVES**

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

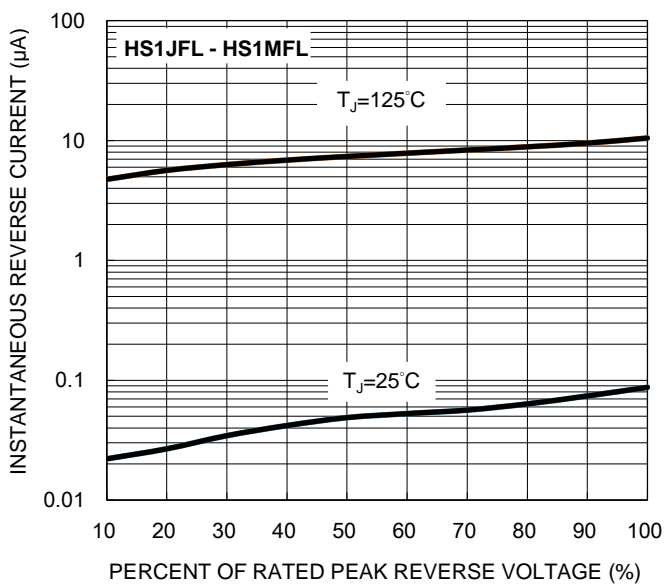
**Fig.5 Typical Reverse Characteristics**



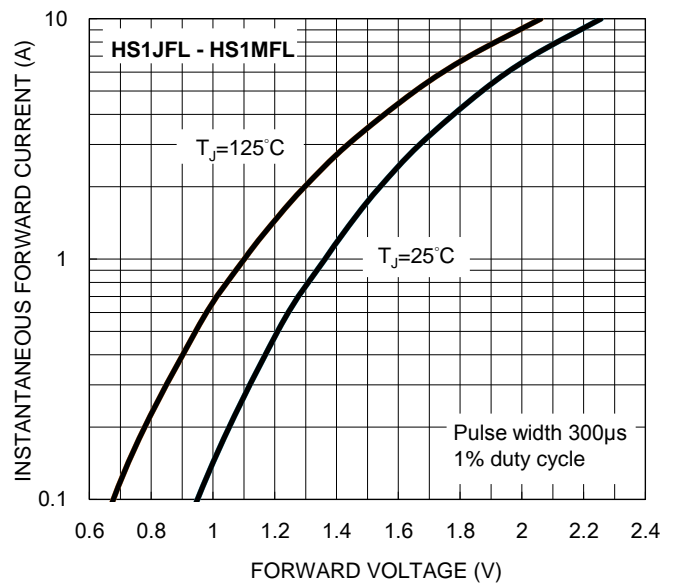
**Fig.6 Typical Forward Characteristics**



**Fig.7 Typical Reverse Characteristics**

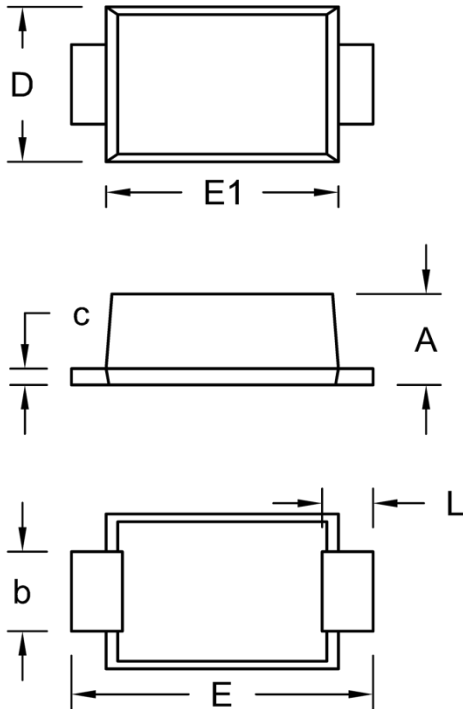


**Fig.8 Typical Forward Characteristics**



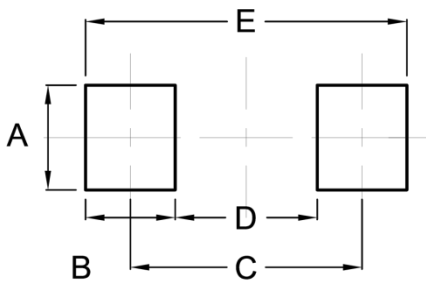
**PACKAGE OUTLINE DIMENSIONS**

SOD-123FL



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	0.88	1.35	0.035	0.053
b	0.80	1.15	0.031	0.045
c	0.10	0.30	0.004	0.012
D	1.70	2.10	0.067	0.083
E	3.45	3.95	0.136	0.156
E1	2.60	3.10	0.102	0.122
L	0.30	0.90	0.012	0.035

**SUGGESTED PAD LAYOUT**



Symbol	Unit (mm)	Unit (inch)
A	1.40	0.055
B	1.20	0.047
C	3.10	0.122
D	1.90	0.075
E	4.30	0.169

**MARKING DIAGRAM**



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

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