

# SOD151-SH thru SOD157-SH

## Surface Mount Glass Passivated Junction Rectifiers

### Reverse Voltage 50 to 1000V Forward Current 1.5A

#### FEATURES

- \* Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- \* High temperature metallurgically bonded construction
- \* Cavity-free glass passivated junction
- \* Capable of meeting environmental standards of MIL-S-19500
- \* 1.5 A operation at  $T_A=75^{\circ}\text{C}$  with no thermal runaway
- \* Typical IR less than  $1.0\mu\text{A}$
- \* High temperature soldering guaranteed:  $260^{\circ}\text{C}/10$  seconds

#### Mechanical Data

**Case:** JEDEC SOD123-FL/MINI SMA, molded plastic over glass DIE

**Terminals:** Tin Plated, solderable per MIL-STD-750, Method 2026

**Polarity:** Color band denotes cathode end

**Mounting Position:** Any

**Weight:** 0.0155 g

**Handling precaution:** None

#### Electrical Characteristic

##### 1. Maximum & Thermal Characteristics Ratings at $25^{\circ}\text{C}$ ambient temperature unless otherwise specified.

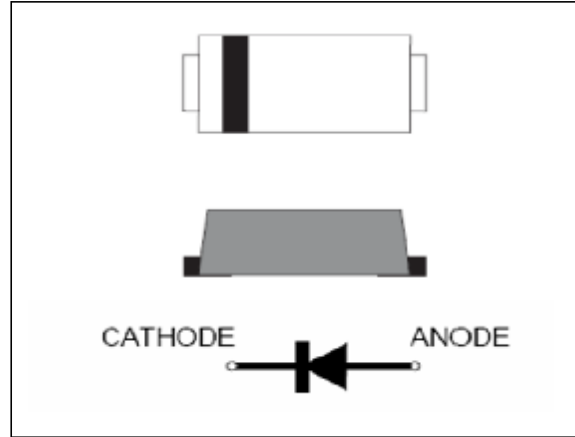
Parameter Symbol	symbol	SOD 151-SH	SOD 152-SH	SOD 153-SH	SOD 154-SH	SOD 155-SH	SOD 156-SH	SOD 157-SH	Unit
Device marking code		B1	B2	B3	B4	B5	B6	B7	
Maximum repetitive peak reverse voltage	$V_{RRM}$	50	100	200	400	600	800	1000	V
Maximum RMS voltage	$V_{RMS}$	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	$V_{DC}$	50	100	200	400	600	800	1000	V
Maximum average forward rectified current lead length at $T_A = 75^{\circ}\text{C}$ (Note 1)	$I_{F(AV)}$	1.5							A
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	$I_{FSM}$	60							A
Typical thermal resistance (Note 1)	$R_{\theta JA}$ $R_{\theta JC}$	110 40							$^{\circ}\text{C}/\text{W}$
Operating junction temperature range	$T_J$	-55 to +150							$^{\circ}\text{C}$
storage temperature range	$T_{STG}$	-65 to +175							$^{\circ}\text{C}$

##### Electrical Characteristics Ratings at $25^{\circ}\text{C}$ ambient temperature unless otherwise specified.

Parameter Symbol	symbol	SOD 151-SH	SOD 152-SH	SOD 153-SH	SOD 154-SH	SOD 155-SH	SOD 156-SH	SOD 157-SH	Unit
Maximum instantaneous forward voltage at 1.5A	$V_F$	1.1							V
Maximum DC reverse current $T_J = 25^{\circ}\text{C}$ at rated DC blocking voltage $T_J = 125^{\circ}\text{C}$	IR	5.0 50							$\mu\text{A}$
Typical junction capacitance at 4.0V, 1MHz	$C_J$	15.0							PF

NOTES:

1.  $8.0\text{mm}^2$  (.013mm thick) land areas



We declare that the material of product is Halogen free (green epoxy compound)

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### 2. Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

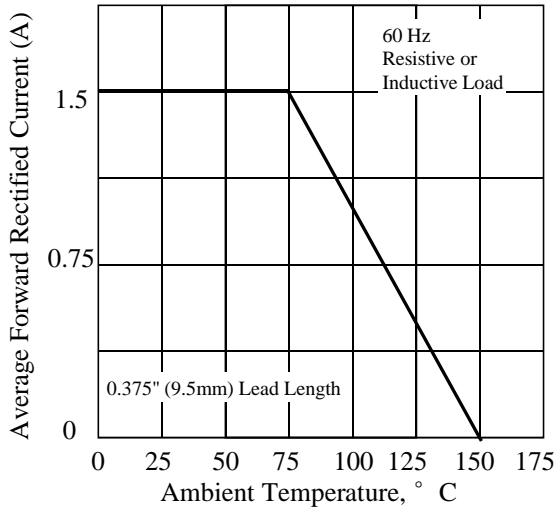


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

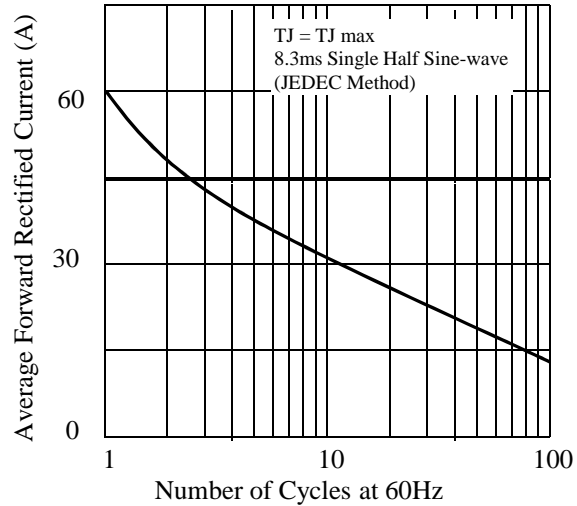


Fig 3. - Typical Instantaneous Forward Characteristics

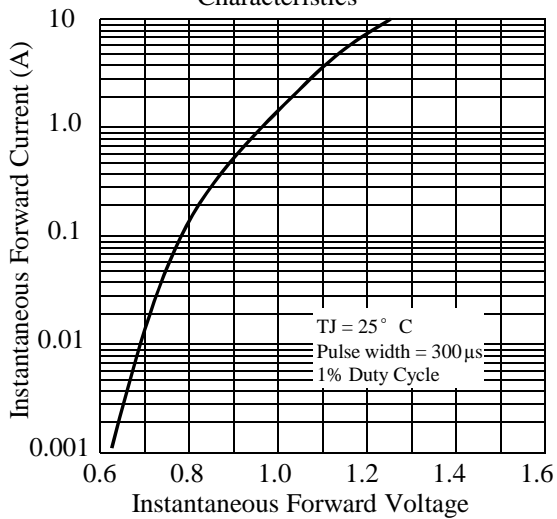


Fig 4. - Typical Reverse Characteristics

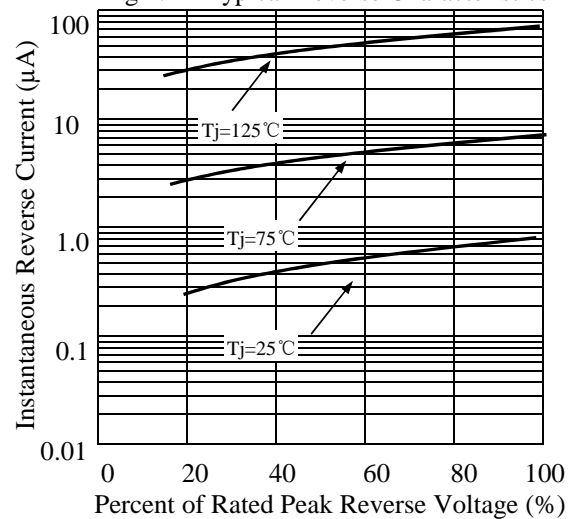


Fig 5. - typical transient thermal impedance

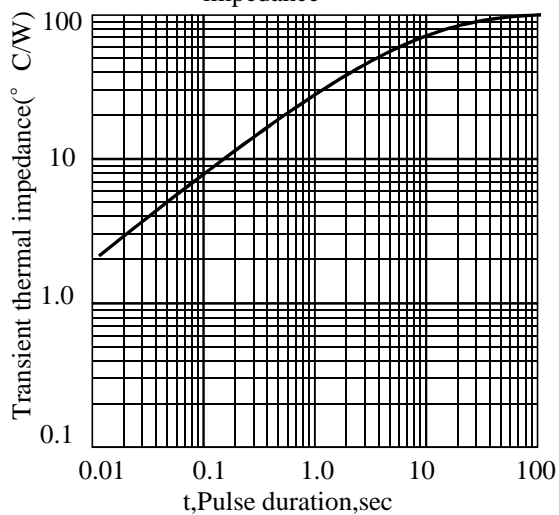
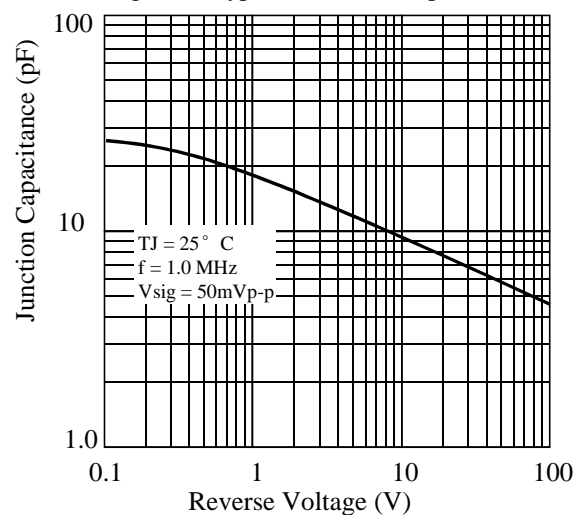


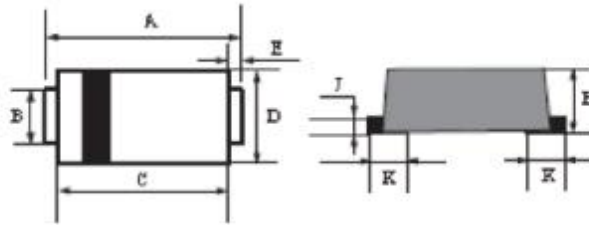
Fig 6. - Typical Junction Capacitance



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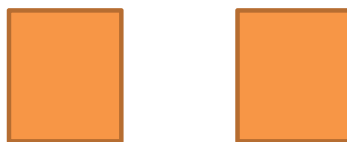
### 3. dimension:

SOD123-FL



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	3.5	3.9	0.138	0.159
B	0.75	0.95	0.029	0.037
C	2.6	3.0	0.103	0.119
D	1.6	2.0	0.063	0.079
E	0.45Typ		0.018Typ	
H	0.9	1.2	0.036	0.047
J	0.12	0.22	0.005	0.009
K	0.8Typ		0.032Typ	

Suggested solder pad layout

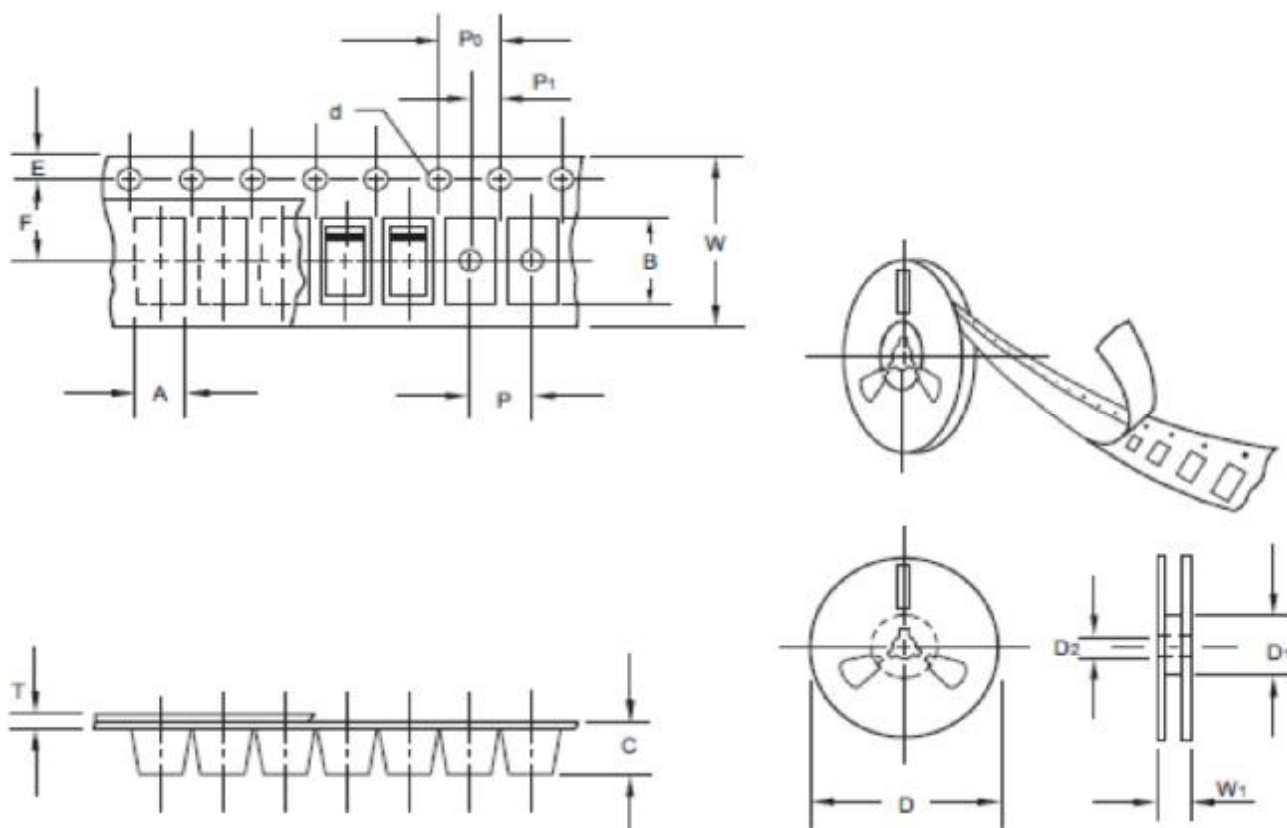


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD123-FL	0.044(1.10)	0.040(1.00)	0.079(2.00)

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### 4.Packing information



Unit : mm

Item	Symbol	tolerance	SOD123-FL
Carrier width	A	0.1	2.00
Carrier length	B	0.1	3.85
Carrier depth	C	0.1	1.10
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	62.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	11.40

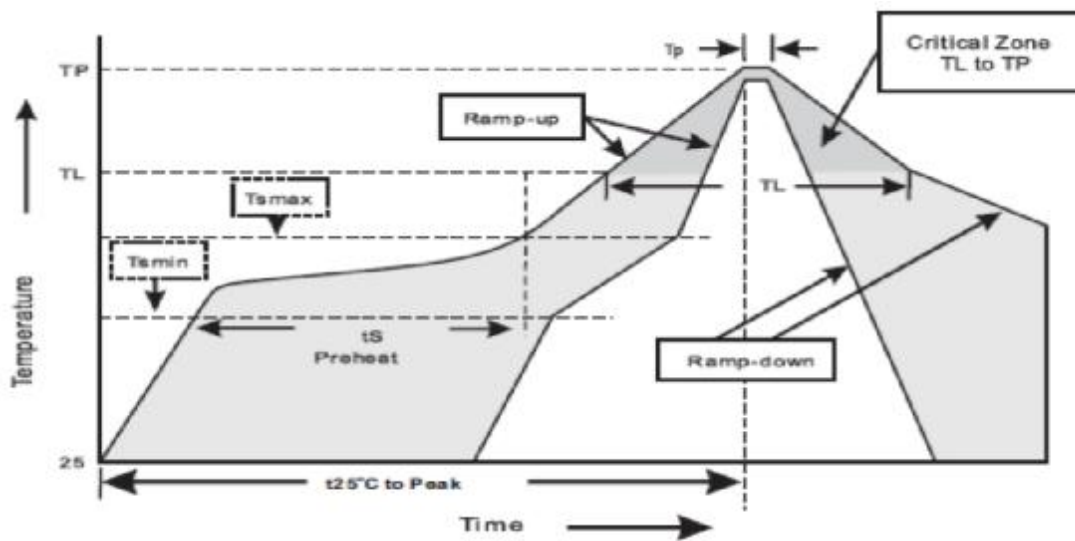
## SOD151-SH thru SOD157-SH

Reel packing

PACKAGE	REEL SIZE	REEL (PCS)	COMPONENT SPACING (mm)	BOX (pcs)	INNER BOX (mm)	REEL DIA. (mm)	CARTON SIZE (mm)	CARTON (PCS)	APPROX. GROSS WEIGHT (kg)
SOD123-FL	7"	3,000	4.0	30,000	183*183*123	178	382*262*387	240,000	8.7

### 5.Suggested thermal profile for soldering process

1. Storage environment : Temperature=5~40°C Humidity=55±25%
2. Reflow soldering of surface-mount device



3. Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate( $T_L$ to $T_P$ )	<3°C/sec
Preheat	
- Temperature Min( $T_{min}$ )	150°C
- Temperature Max( $T_{max}$ )	200°C
- Time(min to max)( $t_s$ )	60~120sec
$T_{max}$ to $T_L$	
- Ramp-up Rate	<3sec
Time maintained above:	
- Temperature ( $T_L$ )	217°C
- Time( $t_L$ )	60-260sec
Peak Temperature( $T_P$ )	255 -0/+5°C
Time within 5°C of actual Peak Temperature( $T_P$ )	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

## SOD151-SH thru SOD157-SH

### 6.High reliability test capabilities

Item Test	Condition	Reference
Solder Resistance	at 260±5°C for 10±2sec immerse body into solder 1/16" ± 1/32"	MIL-STD-750D METHOD-2031
Solderability	at 245±5°C for 5 sec	MIL-STD-202F METHOD-208
High Temperature Reverse Bias	V <sub>R</sub> =80% rate at T <sub>J</sub> =150°C for 168hrs	MIL-STD-750D METHOD-1038
Forward Operation Life	Rated average rectifier current T <sub>A</sub> =25°C for 500hrs	MIL-STD-750D METHOD-1027
Intermittent Operation Life	T <sub>A</sub> =25°C , I <sub>F</sub> =I <sub>o</sub> On state:power on for 5 min. Off state:power off for 5 min. on and off for 500 cycles	MIL-STD-750D METHOD-1036
Pressure Cooker	15P <sub>SIG</sub> at T <sub>A</sub> =121°C for 4hrs	JESD22-A102
Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. Total 10 cycles	MIL-STD-750D METHOD-1051
Thermal Shock	0°C for 5min. Rise to 100°C for 5min. Total 10 cycles	MIL-STD-750D METHOD-1056
Forward Surge	8.3ms single half sine-wave superimposed on rated load,one surge	MIL-STD-750D METHOD-4066-2
Humidity	at T <sub>A</sub> =85°C , R <sub>H</sub> =85% for 1000hrs	MIL-STD-750D METHOD-1021
High Temperature Storage Life	at 175°C for 1000hrs	MIL-STD-750D METHOD-1031

## SOD151-SH thru SOD157-SH

### 7. Update Record

版次	更新记录	更新作者	更新日期
1	第一版	周杰	2012.12.05
2	因为所有SOD123系列均为无卤塑料，所以取消印字下划线	周杰	2013.01.04
3	将封装SOD-123S修正为SOD123-FL	周杰	2013.03.20