

### Schottky Barrier Rectifiers

Reverse Voltage 20 to 200V Forward Current 1.0A

**(Pb)** Lead(Pb)-Free

#### FEATURES

- \* Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- \* Low power loss,high efficiency
- \* For use in low voltage high frequency inverters, free wheeling,and polarity protection applications
- \* Guardring for over voltage protection
- \* High temperature soldering guaranteed: 260°C/10 seconds at terminals

#### Mechanical Data

**Case:** SOD-123FL/MINI SMA  
molded plastic over sky die

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

**Polarity:** Color band denotes cathode end

**Mounting Position:** Any

**Weight:** 0.0155g

**Handling precautin:**None

#### 1.Electrical Characteristic

**Maximum & Thermal Characteristics Ratings at 25°C ambient temperature unless otherwise specified.**

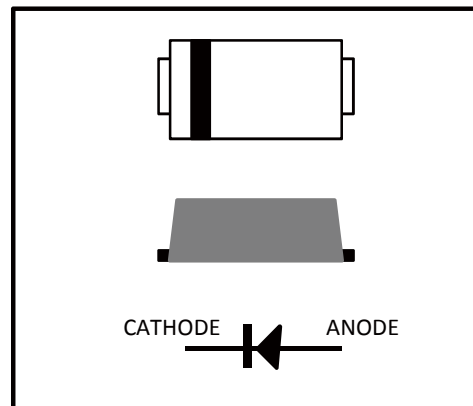
Parameter Symbol	symbol	B120F	B130F	B140F	B145F	B150F	B160F	B180F	B1100F	B1150F	B1200F	Unit	
device marking code		12	13	14	145	15	16	18	110	115	120		
Maximum repetitive peak reverse voltage	$V_{RRM}$	20	30	40	45	50	60	80	100	150	200	V	
Maximum RMS voltage	$V_{RMS}$	14	21	28	31.5	35	42	56	70	105	140	V	
Maximum DC blocking voltage	$V_{DC}$	20	30	40	45	50	60	80	100	150	200	V	
Maximum average forward rectified current at TC = 75°C	$I_{F(AV)}$	1.0										A	
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	$I_{FSM}$	30										A	
Typical thermal resistance (Note 1)	$R_{\theta JA}$ $R_{\theta JC}$	110 40											°C/W
Operating junction temperature range	$T_J$	-55 to +150										°C	
storage temperature range	$T_{STG}$	-65 to +175										°C	

**Electrical Characteristics Ratings at 25°C ambient temperature unless otherwise specified.**

Parameter Symbol	symbol	B120F	B130F	B140F	B145F	B150F	B160F	B180F	B1100F	B1150F	B1200F	Unit	
Maximum instantaneous forward voltage at(IF = 0.1 A, T <sub>J</sub> = 25°C) (IF = 0.7 A, T <sub>J</sub> = 25°C) (IF = 1.0 A, T <sub>J</sub> = 25°C)	$V_F$	- - 0.5	0.35 0.45 0.50	- - 0.55	- - 0.7	- - 0.7	- - 0.7	- - 0.85	- - 0.90	- - 0.92	- - 0.92	V	
Maximum DC reverse current at rated DC blocking voltage TA = 25°C Tj = 125°C	$I_R$	0.5 10											mA
Typical junction capacitance at 4.0V, 1MHz	$C_J$	160										PF	

NOTES:

1. 8.0mm<sup>2</sup> (.013mm thick) land areas



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

## 2. Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted )

Fig. 1 - Forward Current Derating Curve

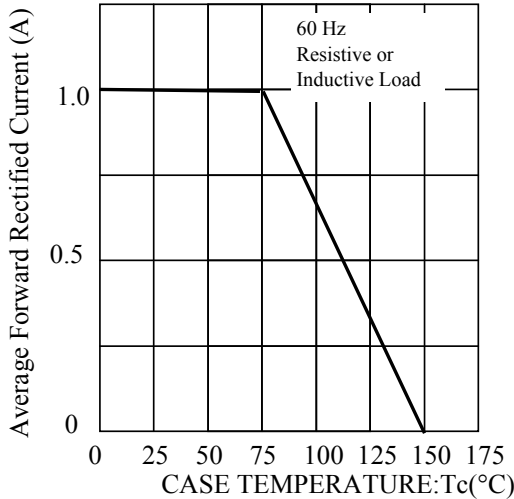


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

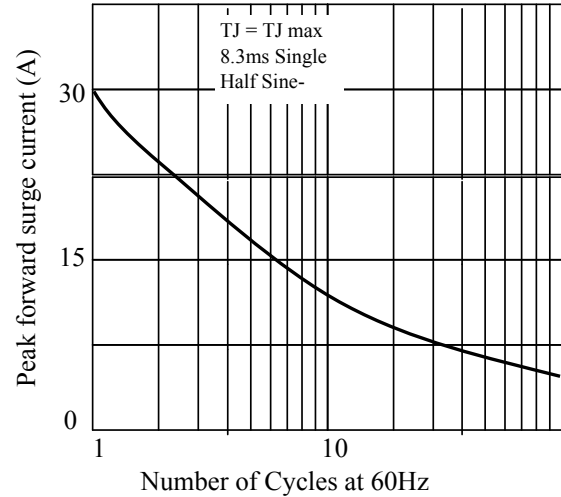


Fig 3. - Typical Instantaneous Forward Characteristics

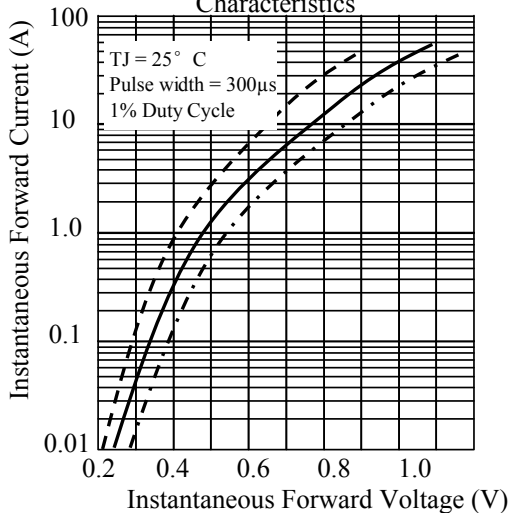


Fig 4. - Typical Reverse Characteristics

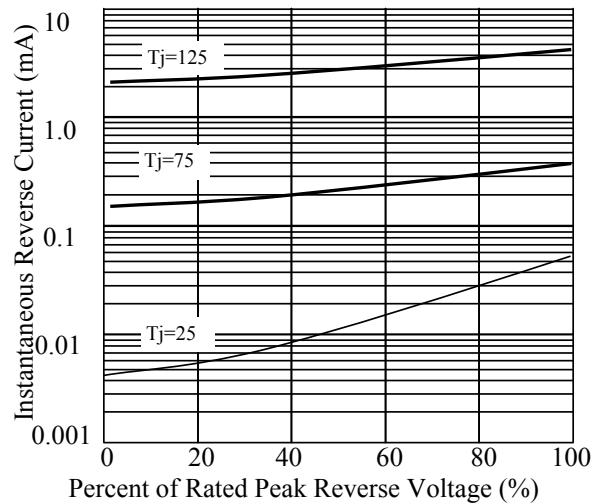


Fig 5. - typical transient thermal impedance

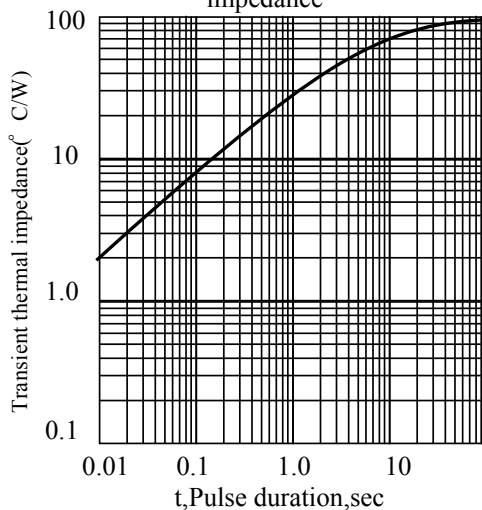
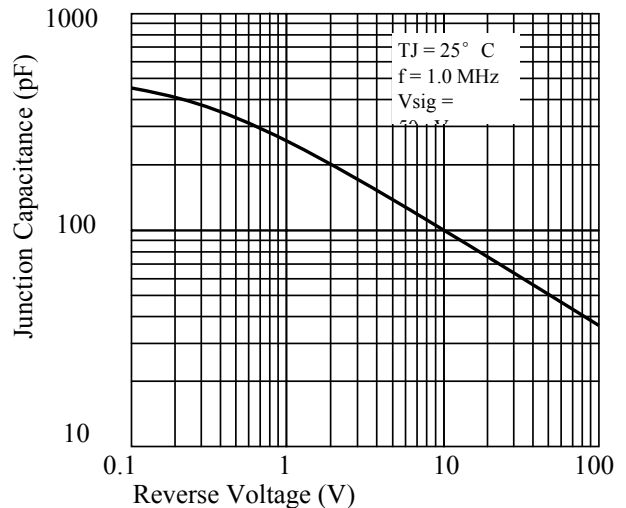
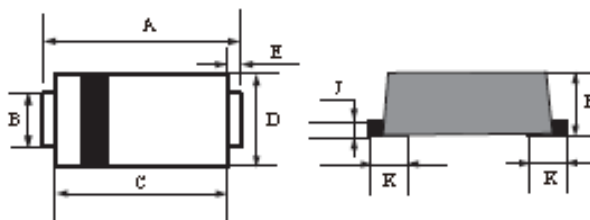


Fig 6. - Typical Junction Capacitance



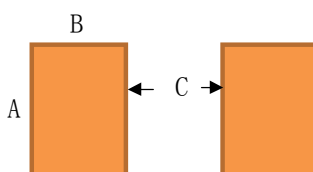
### 3. dimension:

SOD-123FL



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	

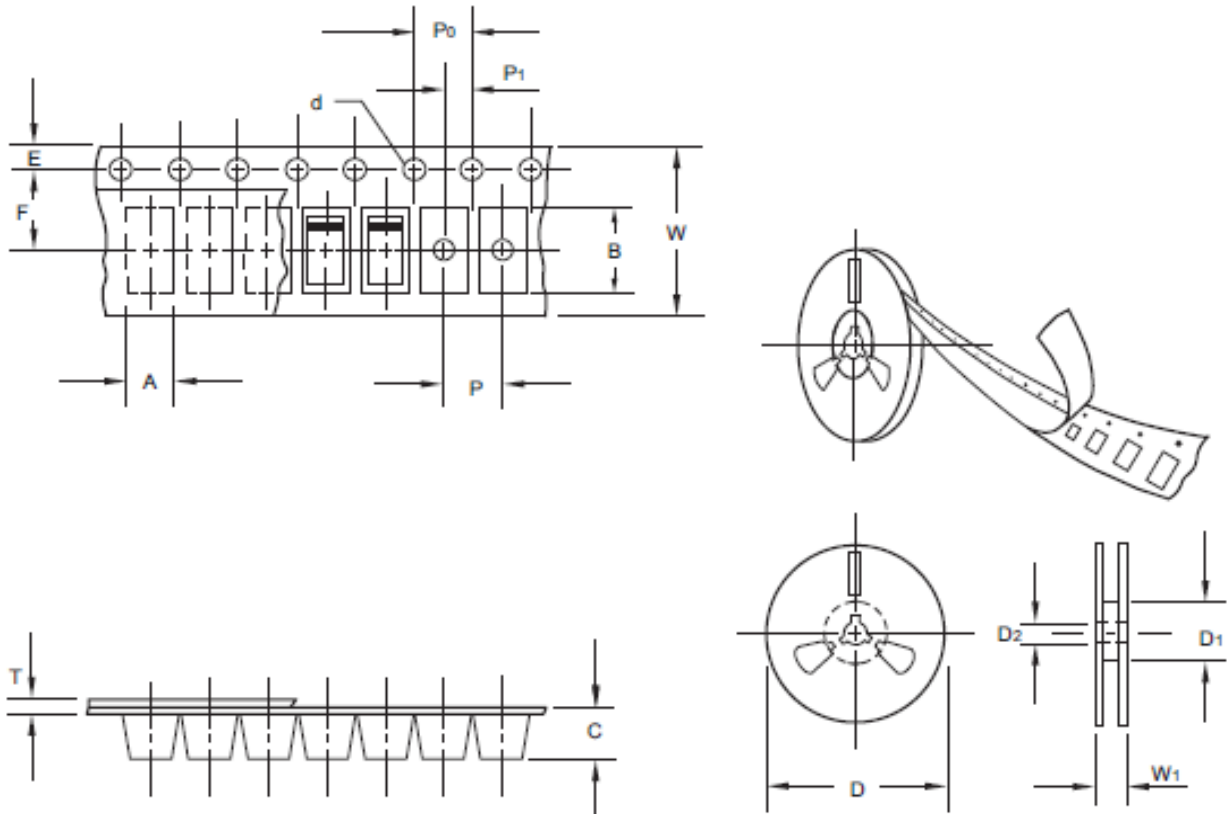
Suggested solder pad layout



Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-123FL	0.044(1.10)	0.040(1.00)	0.079(2.00)

## 4.Packing information

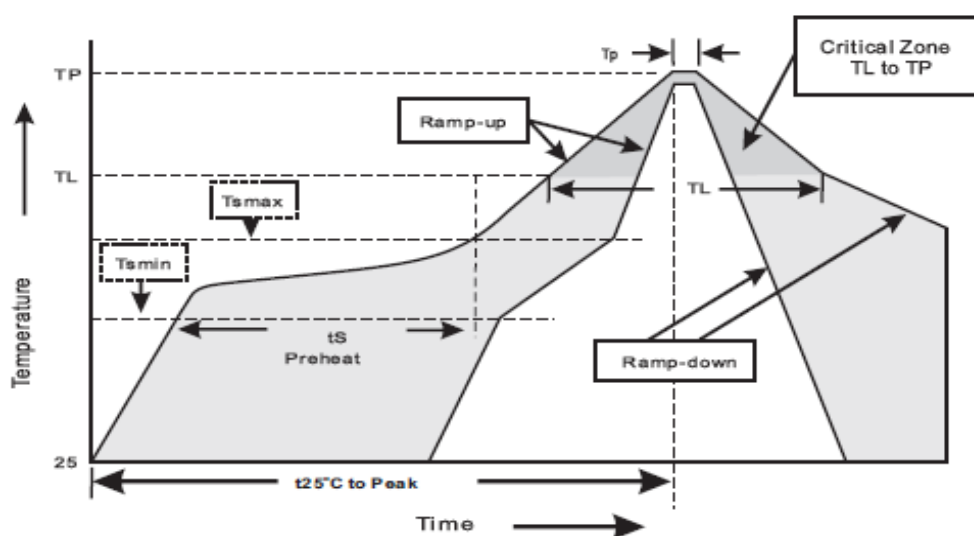


Unit : mm

Item	Symbol	tolerance	SOD-123FL
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
Spocket 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

## 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 <sub>L</sub> to T <sub>P</sub> )	<3°C/sec
Preheat	
- Temperature Min(T <sub>smmin</sub> )	150°C
- Temperature Max(T <sub>smmax</sub> )	200°C
- Time(min to max)(t <sub>s</sub> )	60~120sec
T <sub>smmax</sub> to T <sub>L</sub>	
- Ramp-up Rate	<3sec
Time maintained above:	
- Temperature (T <sub>L</sub> )	217°C
- Time(t <sub>L</sub> )	60-260sec
Peak Temperature(T <sub>P</sub> )	255 -0/+5°C
Time within 5°C of actual Peak Temperature(T <sub>P</sub> )	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

**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	$V_R=80\%$ rate at $T_j=150^\circ\text{C}$ for 168hr	MIL-STD-750D METHOD-1038
Forward Operation Life	Rated average rectifier current $T_A=25^\circ\text{C}$ for 500hrs	MIL-STD-750D METHOD-1027
Intermittent Operation Life	$T_A=25^\circ\text{C}$ , $I_F=I_o$ 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 $T_A=121^\circ\text{C}$ 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 $T_A=85^\circ\text{C}$ , $RH=85\%$ for 1000hrs	MIL-STD-750D METHOD-1021
High Temperature Storage Life	at 175°C for 1000hrs	MIL-STD-750D METHOD-1031