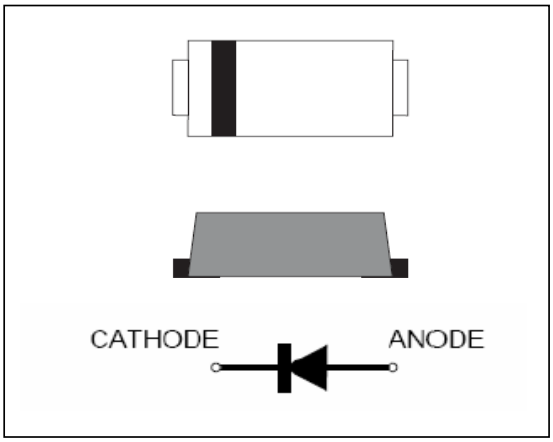
SOD4001-SH thru SOD4007-SH

Surface Mount Glass Passivated Junction Rectifiers

Reverse Voltage 50 to 1000V Forward Current 1.0A

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
* 1.0 A operation at TA=75°C with no thermal runaway
* Typical IR less than 1.0μA
* High temperature soldering guaranteed: 260°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 precautin:None

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

Electrical Characteristic

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

Parameter Symbol	symbol	SOD 4001-SH	SOD 4002-SH	SOD 4003-SH	SOD 4004-SH	SOD 4005-SH	SOD 4006-SH	SOD 4007-SH	Unit
Device marking code		A1	A2	A3	A4	A5	A6	A7	
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_C = 75°C(Note 1)	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30							A
reverse surger current(20mS)	I_{RSM}	18							mA
Typical thermal resistance (Note 1)	$R\theta J_A$	110							°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	SOD 4001-SH	SOD 4002-SH	SOD 4003-SH	SOD 4004-SH	SOD 4005-SH	SOD 4006-SH	SOD 4007-SH	Unit
Maximum instantaneous forward voltage at 1.0A	V_F	1.1							V
Maximum DC reverse current TJ= 25°C at rated DC blocking voltage TJ = 125°C	IR	5.0 50							μA
Typical junction capacitance at 4.0V, 1MHz	C_J	15.0							PF

NOTES:

1. 8.0mm2 (.013mm thick) land areas

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SOD4001-SH thru SOD4007-SH

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

Fig. 1 – Forward Current Derating Curve

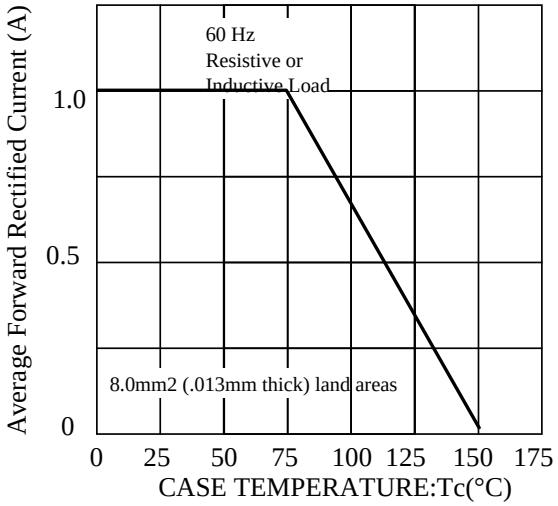


Fig. 2 – Maximum Non-repetitive Peak Forward Surge Current

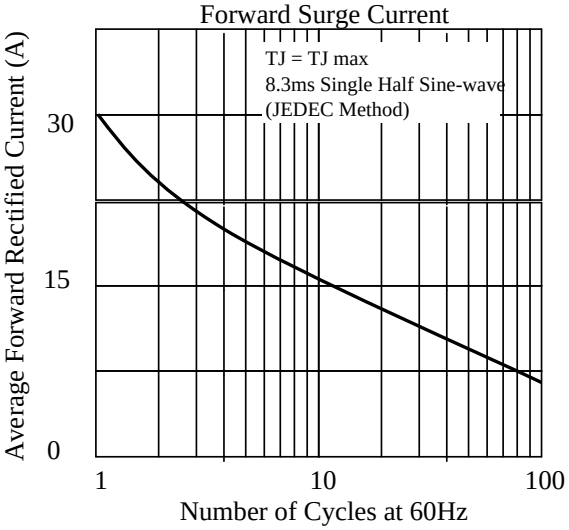


Fig 3. – Typical Instantaneous Forward Characteristics

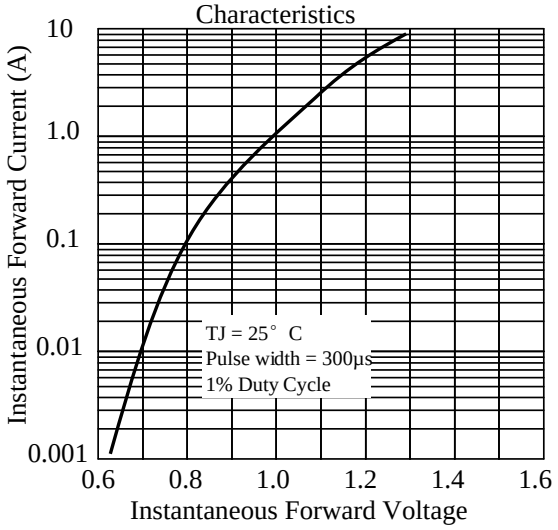


Fig 4. – Typical Reverse Characteristics

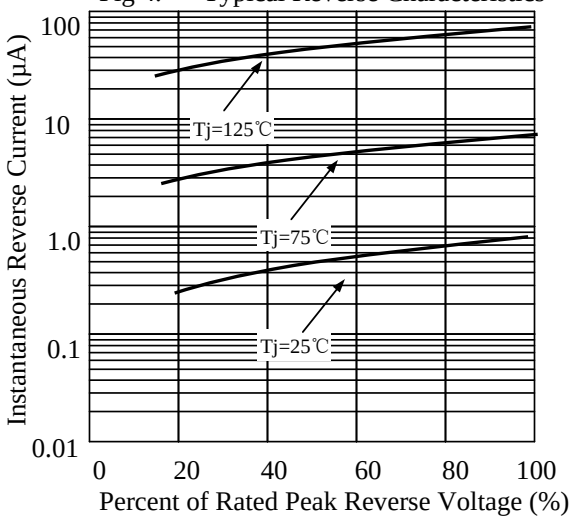


Fig 5. – typical transient thermal impedance

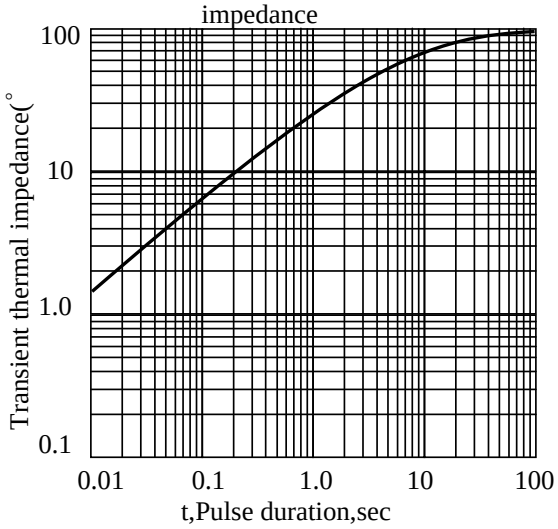
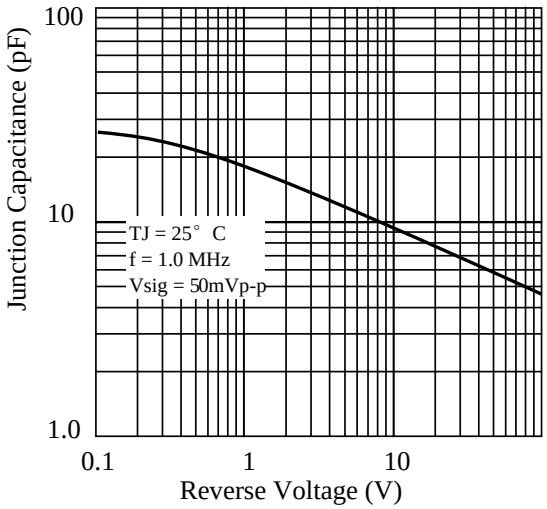


Fig 6. – Typical Junction Capacitance



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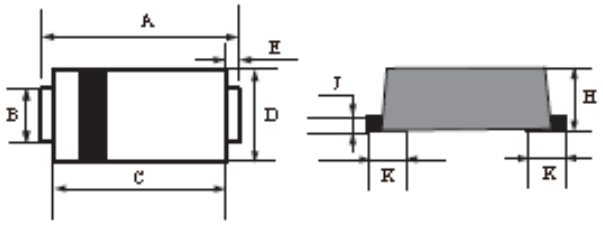
SOD4001-SH thru SOD4007-SH

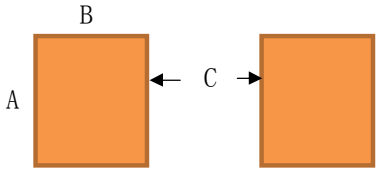
3. dimension:

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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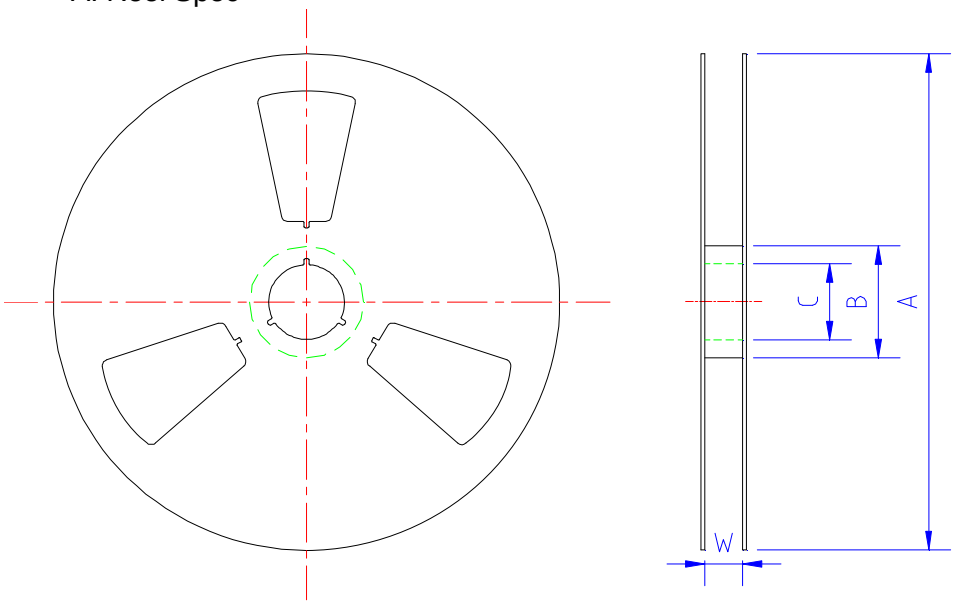
5.1 、SMD Packing Reel Spec & Packing Quantity

5.1.1 Reel Packing

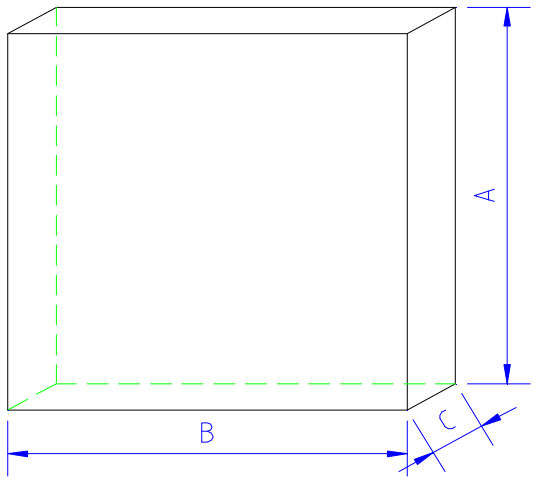
A. Reel Spec



unit：mm

SPEC	A	B	C	W	Quantity/Reel
SMA 7" reel	177.0±2.0	54.0±0.5	13.0±0.5	13.2±0.2	2K
SMA13" reel	330.0±2.0	75.0±0.5	13.0±0.5	13.2±0.2	5K
SMA-FL13" reel	330.0±2.0	75.0±0.5	13.0±0.5	13.2±0.2	5K
TO277 13" reel	330.0±2.0	75.0±0.5	13.0±0.5	13.2±0.2	5K
SOD123FL 7" reel	177.0±2.0	50.0±0.5	13.0±0.5	9.4±1.5	3K
SOD323HE 7" reel	177.0±2.0	50.0±0.5	13.0±0.5	9.4±1.5	3K
SMB-FL 13" reel	330.0±2.0	75.0±0.5	13.0±0.5	13.2±0.2	5K

B. 13" reel packing box



unit：mm

	A	B	C
size	335±5.0	335±2.0	40±1.0

as per above packing

Spec	Q'ty/Box
SMA13" reel	10K
TO277 13" reel	10K
SMB-FL 13" reel	10K

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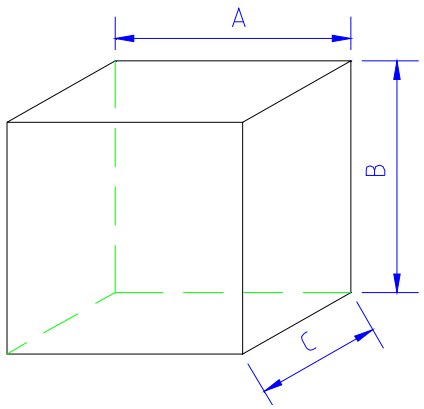
C. 7" reel packing box



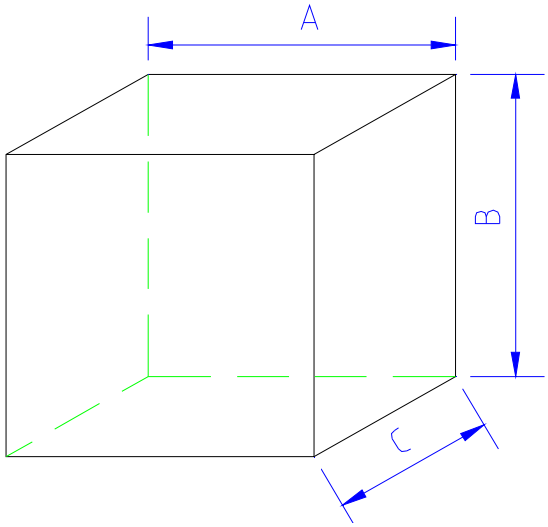
unit：mm

	A	B	C
SMA/SMA-FL	188±2.0	188±2.0	138±2.0
SOD123FL SOD323HE	186±2.0	139±2.0	185±2.0

as per above packing

	Q'ty/Box
SMA/SMA-FL	16K
SOD123FL	30K
SOD323HE	30K

D. reel packing carton



unit：mm

	A	B	C
size	350±2.0	340±2.0	350±2.0

as per above packing

Spec	Q'ty/Carton
SMA/SMA-FL 7" reel	80K
SMA13"reel	80K
SMA-FL13"reel	80K
TO277 13" reel	80K
SMB-FL 13" reel	80K

unit：mm

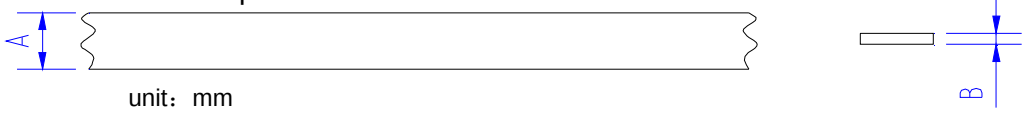
	A	B	C
SOD123FL SOD323HE	455±2.0	400±2.0	410±2.0

as per above packing

Spec	Q'ty/Carton
SOD123-FL 7" reel	360K
SOD323HE 7" reel	360K

5.1.2 Tape Spec

A. Cover Tape



unit：mm

	A	B
SMA /SMA-FL SMB-FL /TO277	9.5±0.10	0.062±0.007
SOD123FL SOD323HE	5.4±0.10	

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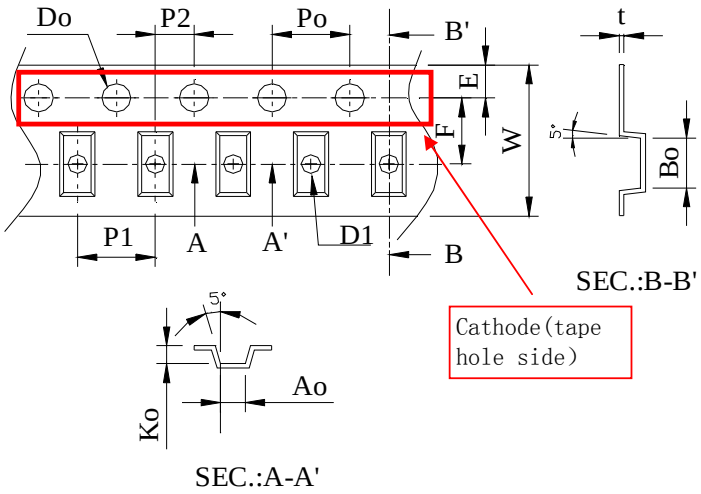
B. Carrier Tape



Item	SOD323HE	SOD123FL	SMA	SMA-FL	SMB-FL	TO277
W	8±0.3	8±0.3	12±0.3	12±0.3	12±0.3	12±0.3
P1	4±0.1	4±0.1	4±0.1	4±0.1	8±0.1	8±0.1
E	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1
F	3.5±.05	3.5±.05	5.5±.05	5.5±.05	5.5±0.05	5.5±.05
D0	1.55±0.05	1.55±0.05	1.55±0.05	1.55±0.05	1.55±0.05	1.55±0.05
D1	1.1±0.1	1.1±0.1	1.5±0.1	1.5±0.1	1.55±0.05	1.5±0.1
P0	4±0.1	4±0.1	4±0.1	4±0.1	4±0.1	4±0.1
P2	2±0.05	2±0.05	2±0.05	2±0.05	2±0.05	2±0.05
10P0	40±0.2	40±0.2	40±0.2	40±0.2	40±0.2	40±0.2
A0	1.45±0.1	1.95±0.1	2.79±0.1	2.83±0.1	3.8±0.1	4.3±0.1
B0	2.75±0.1	3.95±0.1	5.33±0.1	4.75±0.1	5.75±0.1	6.8±0.1
K0	0.80±0.1	1.30±0.1	2.36±0.1	1.42±0.1	1.4±0.1	1.35±0.1
T	0.25±0.05	0.25±0.05	0.25±0.05	0.25±0.05	0.25±0.05	0.25±0.05

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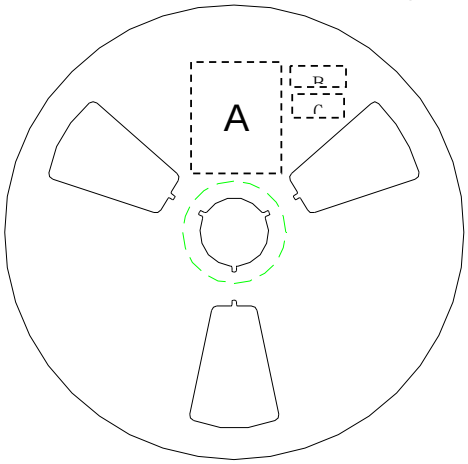
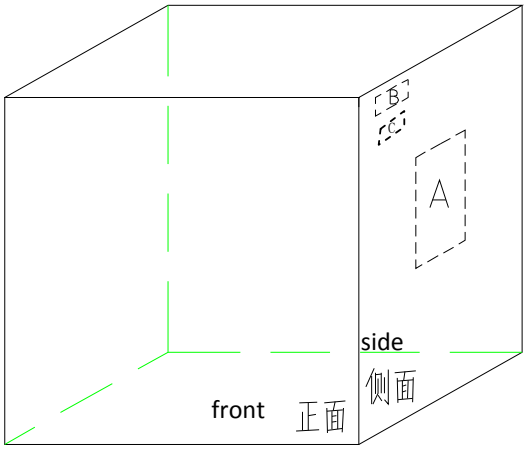
5.2、SMD Power Diode General Packing Spec

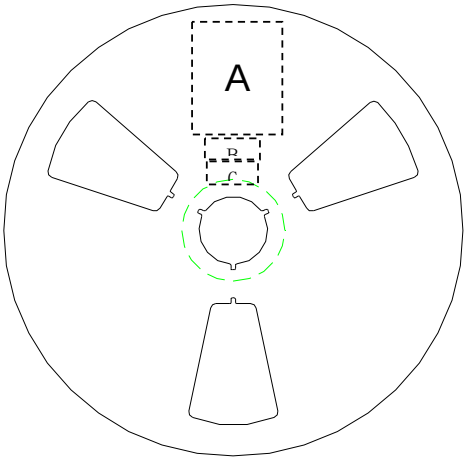
A. 7" reel all labels will be at cathode side of reel ;

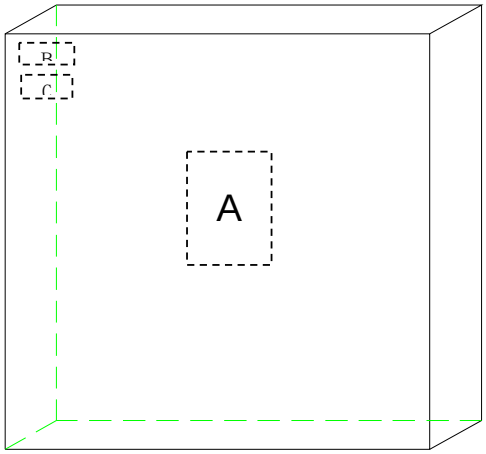




A:LRC label; B:Environment Label C:Halide free label

B. 13" reel





A:LRC label; B:Environment Labe C:Halide free label

C.Tape lead: face anode side of the reel,upper side is the tape lead position. All labels are at cathode side of the reel.

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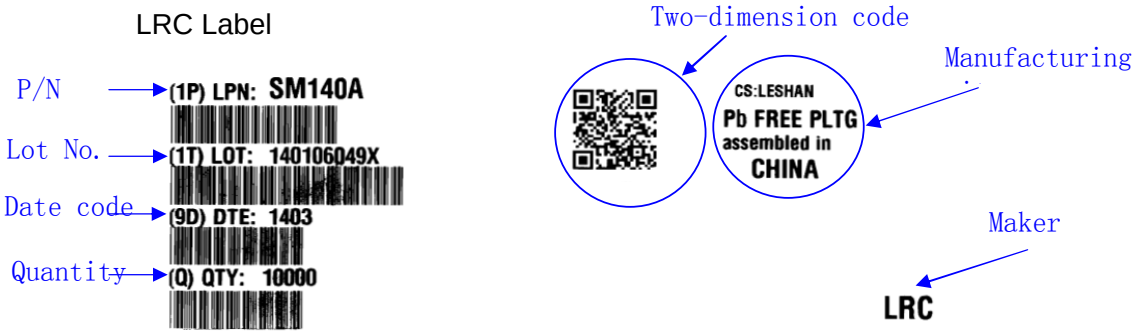
C. Label Content：

LRC Label



lot: 140106049X: 140106---2014/1/6；049----lot number:49；X：product code

Environment Label

Halide-free Label

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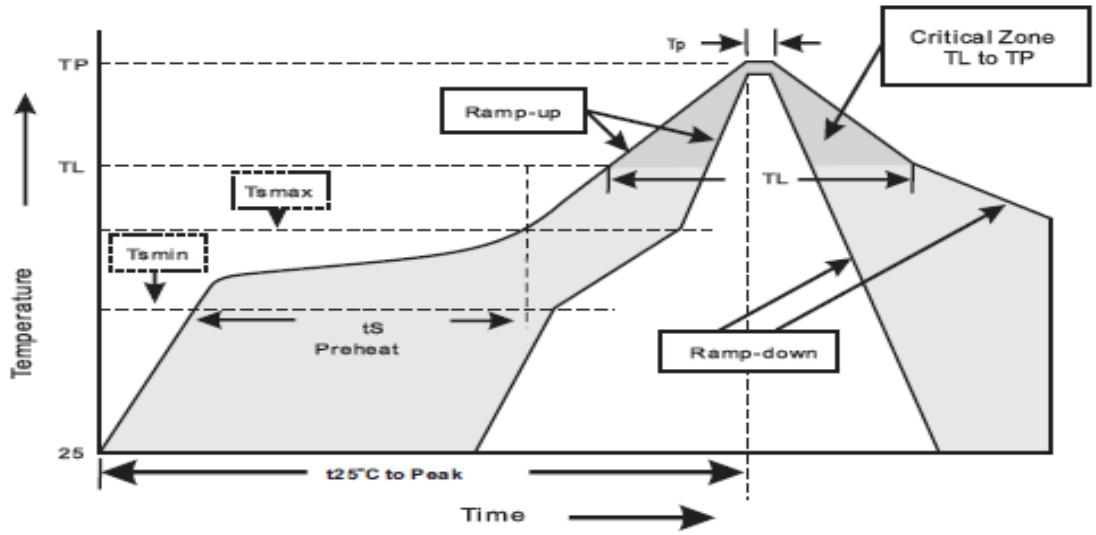
SOD4001-SH thru SOD4007-SH

Reel packing

PACKAGE	REEL SIZE	REEL (PCS)	COMPONENT SPACING (mm)	BOX (pcs)	INNER BOX (mm)	REEL DIA. (mm)	CARTON SIZE (mm)	CARTON (PCS)	APPOX. 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℃ 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℃/sec
Preheat - Temperature Min(Tsmin) - Temperature Max(Tsmax) - Time(min to max)(t_s)	 150℃ 200℃ 60~120sec
Tsmax to T_L - Ramp-up Rate	 <3sec
Time maintained above: - Temperature (T_L) - Time(t_L)	 217℃ 60-260sec
Peak Temperature(T_P)	255 -0/+5℃
Time within 5℃ of actual Peak Temperature(T_P)	10~30sec
Ramp-down Rate	<6℃/sec
Time 25℃ to Peak Temperature	<6minutes

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SOD4001-SH thru SOD4007-SH

6.High reliability test capabilities

Item Test	Condition	Reference
Solder Resistance	at 260±5℃ for 10±2sec immerse body into solder 1/16" ± 1/32"	MIL-STD-750D METHOD-2031
Solderability	at 245±5℃ for 5 sec	MIL-STD-202F METHOD-208
High Temperature Reverse Bias	V_R=80% rate at T_j=150℃ for 168hrs	MIL-STD-750D METHOD-1038
Forward Operation Life	Rated average rectifier current T_A=25℃ for 500hrs	MIL-STD-750D METHOD-1027
Intermittent Operation Life	T_A=25℃，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_{SIG} at T_A=121℃ for 4hrs	JESD22-A102
Temperature Cycling	-55℃ to +125℃ dwelled for 30 min. and transferred for 5min. Total 10 cycles	MIL-STD-750D METHOD-1051
Thermal Shock	0℃ for 5min. Rise to 100℃ 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℃，R_H=85% for 1000hrs	MIL-STD-750D METHOD-1021
High Temperature Storage Life	at 175℃ for 1000hrs	MIL-STD-750D METHOD-1031

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SOD4001-SH thru SOD4007-SH

7. Update Record

版次	更新记录	更新作者	更新日期
1	第一版	周杰	2012.06.11
2	管体高度由0.8~1.0mm修正为0.8~1.2mm；引脚厚度由0.18~0.22mm调整为0.12~22mm;	周杰	2012.12.05
3	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
4	将封装SOD-123S修正为SOD123-FL	周杰	2013.03.20
5	修正热阻，由75修正为110℃/W.	周杰	2013.05.29

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