

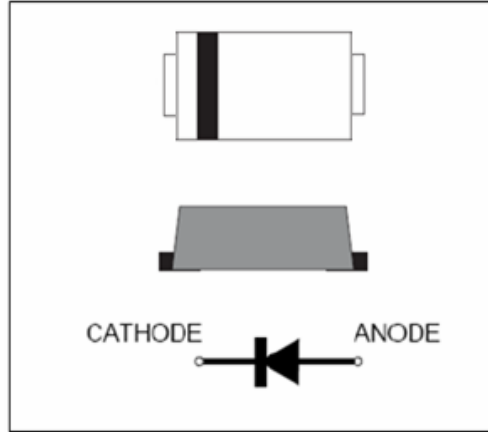
# LMBR120FT1G thru LMBR1200FT1G

## Schottky Barrier Rectifiers

Reverse Voltage 20 to 200V Forward Current 1.0A

### 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



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

### Mechanical Data

**Case:** SOD123-FL/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:** 0.0155 g

**Handling precautin**None

### 1.Electrical Characteristic

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

Parameter Symbol	symbol	LMBR 120 FT1G	LMBR 130 FT1G	LMBR 140 FT1G	LMBR 145 FT1G	LMBR 150 FT1G	LMBR 160 FT1G	LMBR 180 FT1G	LMBR 1100 FT1G	LMBR 1150 FT1G	LMBR 1200 FT1G	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 $T_C = 75^\circ C$	$I_{F(AV)}$	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											$^\circ C/W$
Operating junction temperature range	$T_J$	-55 to +150										$^\circ C$	
storage temperature range	$T_{STG}$	-65 to +175										$^\circ C$	

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

Parameter Symbol	symbol	LMBR 120 FT1G	LMBR 130 FT1G	LMBR 140 FT1G	LMBR 145 FT1G	LMBR 150 FT1G	LMBR 160 FT1G	LMBR 180 FT1G	LMBR 1100 FT1G	LMBR 1150 FT1G	LMBR 1200 FT1G	Unit	
Maximum instantaneous forward voltage at ( $I_F = 0.1 A, T_J = 25^\circ C$ ) ( $I_F = 0.7 A, T_J = 25^\circ C$ ) ( $I_F = 1.0 A, T_J = 25^\circ C$ )	$V_F$	- - 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 $T_A = 25^\circ C$ $T_j = 125^\circ C$	$I_R$	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

# LMBR120FT1G thru LMBR1200FT1G

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

Fig. 1 - Forward Current Derating Curve

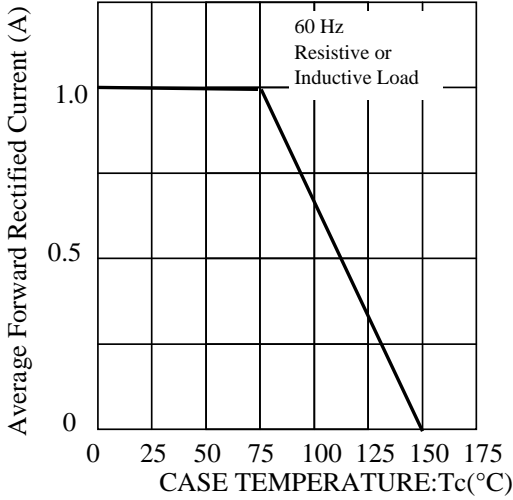


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

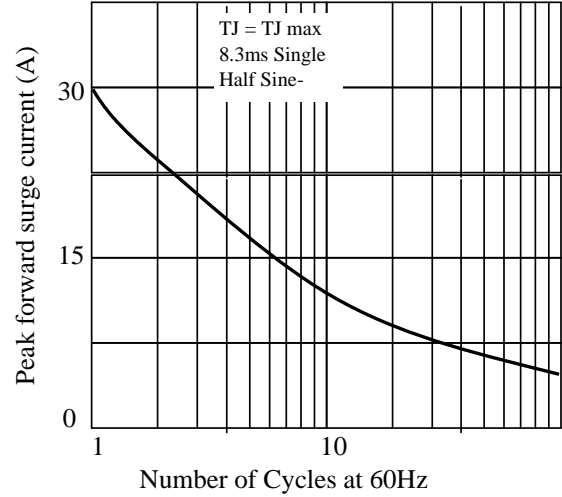


Fig 3. - Typical Instantaneous Forward Characteristics

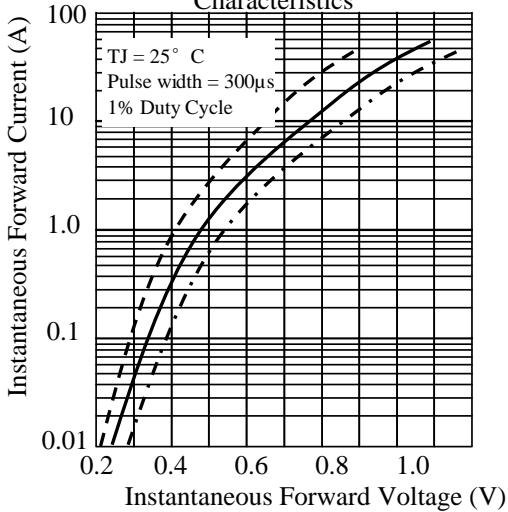


Fig 4. - Typical Reverse Characteristics

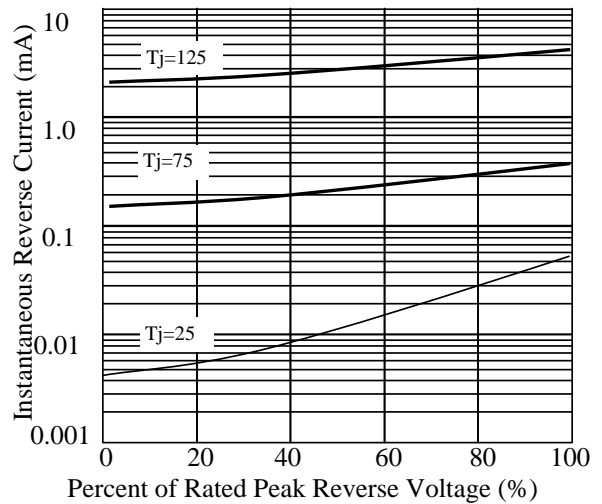


Fig 5. - typical transient thermal impedance

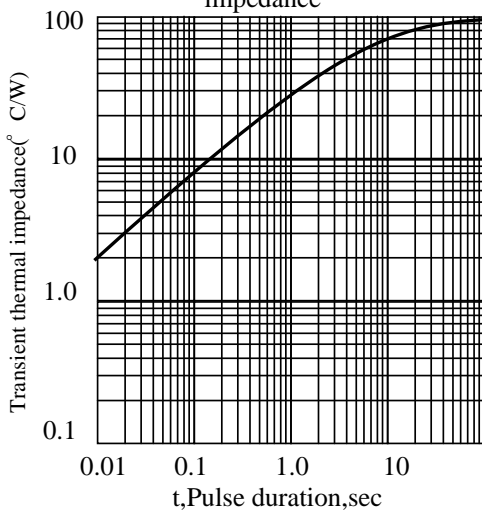
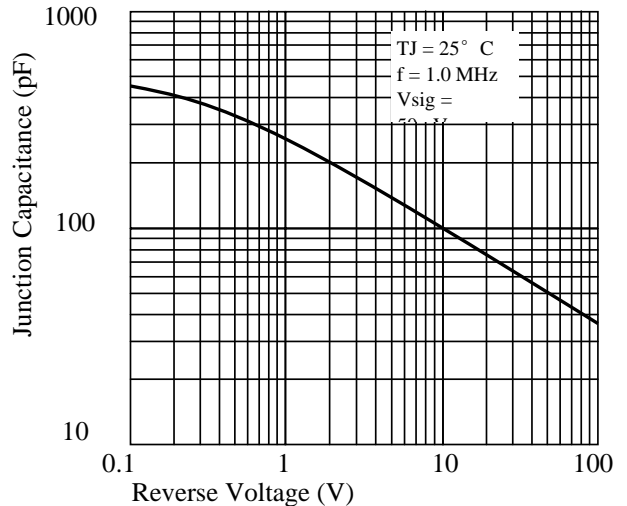


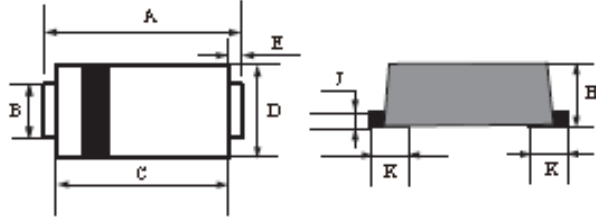
Fig 6. - Typical Junction Capacitance



# LMBR120FT1G thru LMBR1200FT1G

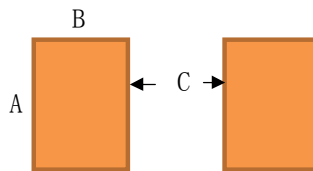
## 3. dimension:

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

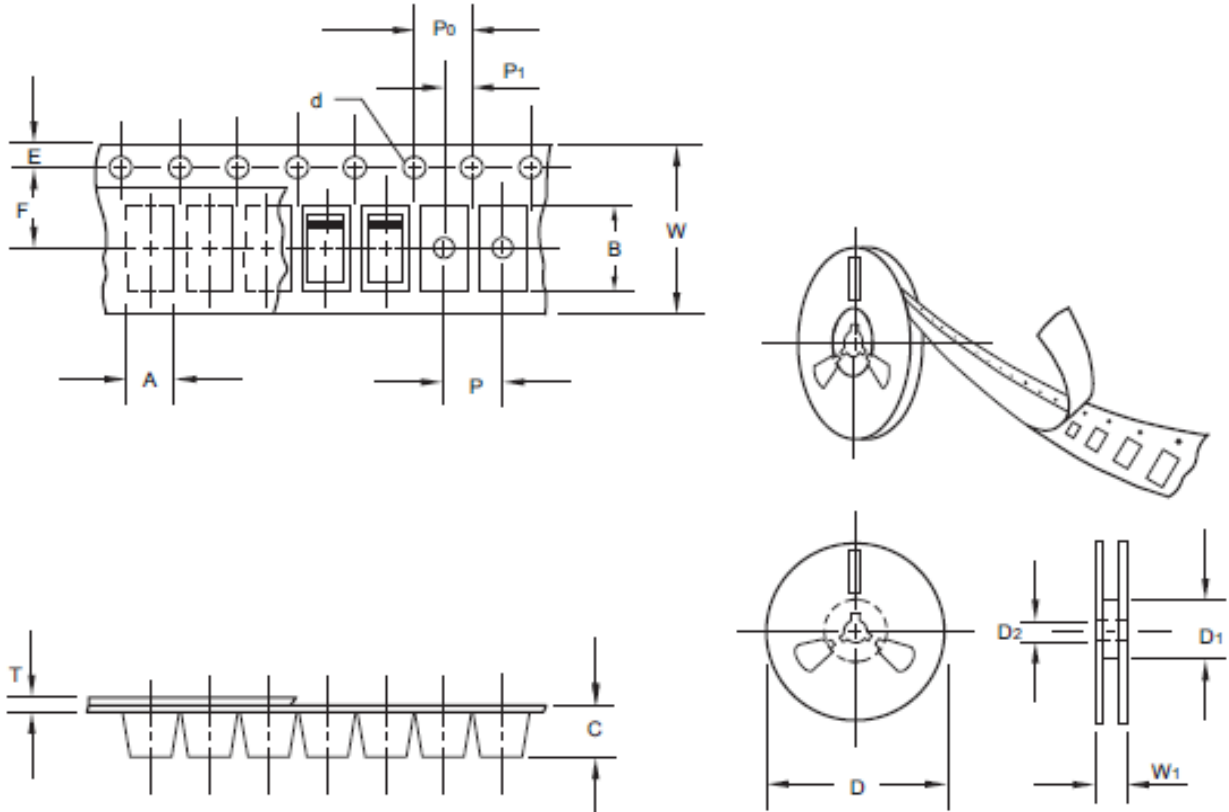


Dimensions in inches and (millimeters)

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

# LMBR120FT1G thru LMBR1200FT1G

## 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

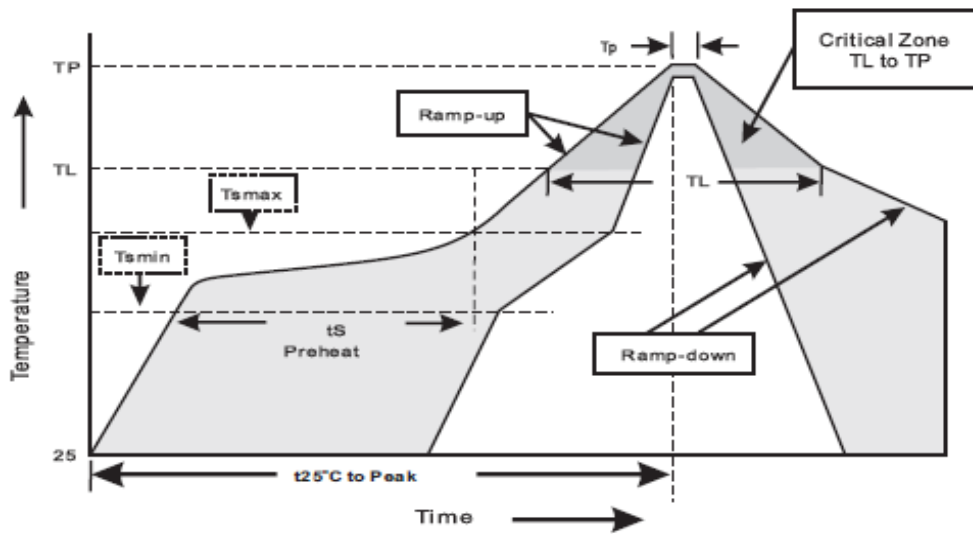
# LMBR120FT1G thru LMBR1200FT1G

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°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>min</sub> )	150°C
- Temperature Max(T <sub>max</sub> )	200°C
- Time(min to max)(t <sub>s</sub> )	60~120sec
T <sub>max</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

# LMBR120FT1G thru LMBR1200FT1G

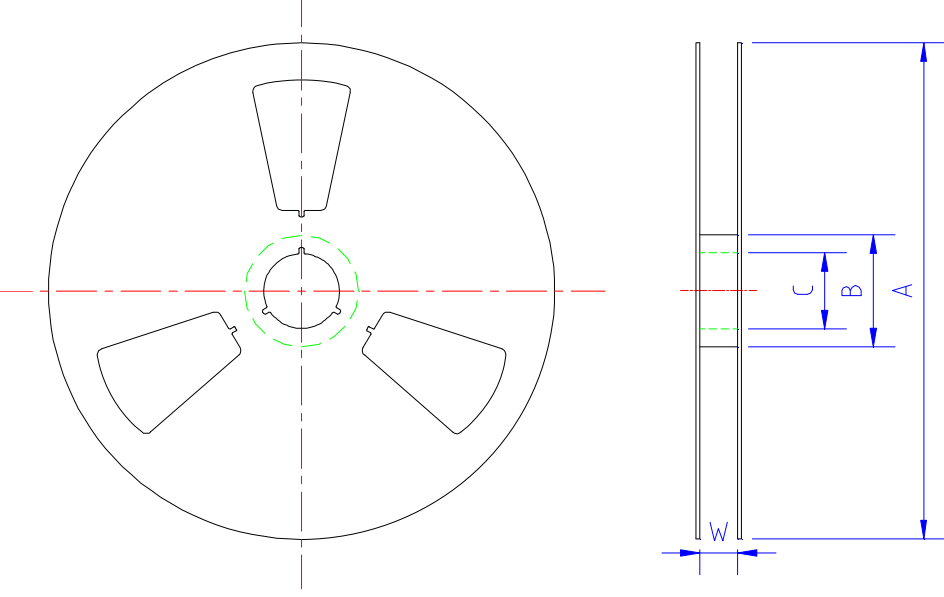
## 6.High reliability test capabilities

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 168hr	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 , RH=85% for 1000hrs	MIL-STD-750D METHOD-1021
High Temperature Storage Life	at 175°C for 1000hrs	MIL-STD-750D METHOD-1031

5.1 、 SMD Packing Reel Spec & Packing Quantity

5.1.1 Reel Packing

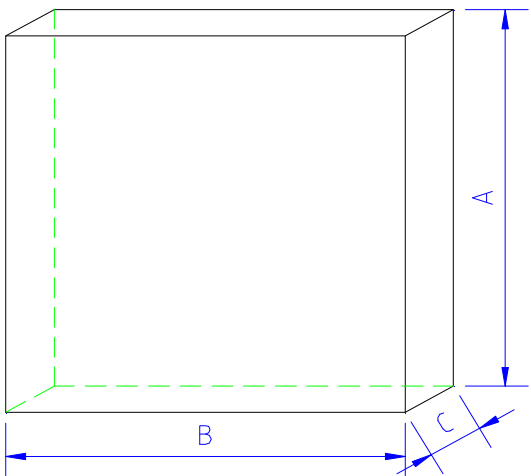
A. Reel Spec



unit: mm

SPEC	A	B	C	W	Quantity/Reel
SMA-FL 7" reel	177.0±2.0	54.0±0.5	13.0±0.5	13.2±0.2	3K
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



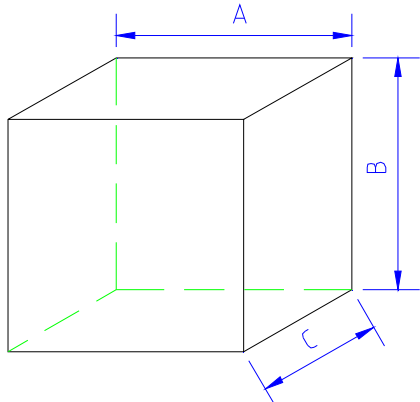
unit: mm

size	A	B	C
	335±5.0	335±2.0	40±1.0

as per above packing

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

C. 7" reel packing box



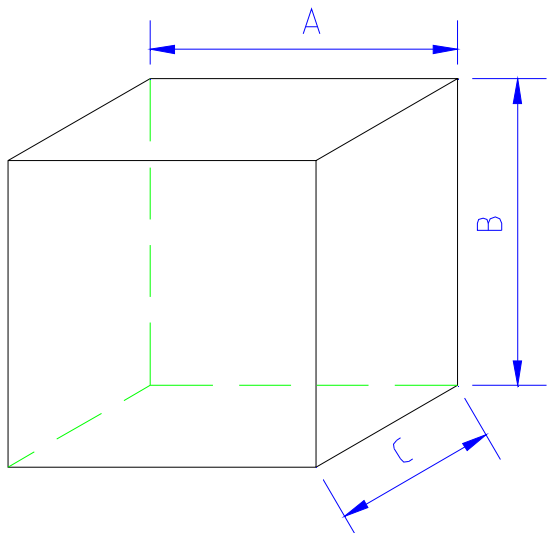
unit: mm

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

as per above packing

	Q' ty/Box
SMA-FL	30K
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
TO277 13" reel	80K
SMB-FL 13" reel	80K

unit: mm

	A	B	C
SMA-FL			
SOD123FL			
SOD323HE	455±2.0	400±2.0	410±2.0

as per above packing

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

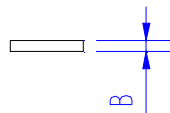
5.1.2 Tape Spec

A. Cover Tape



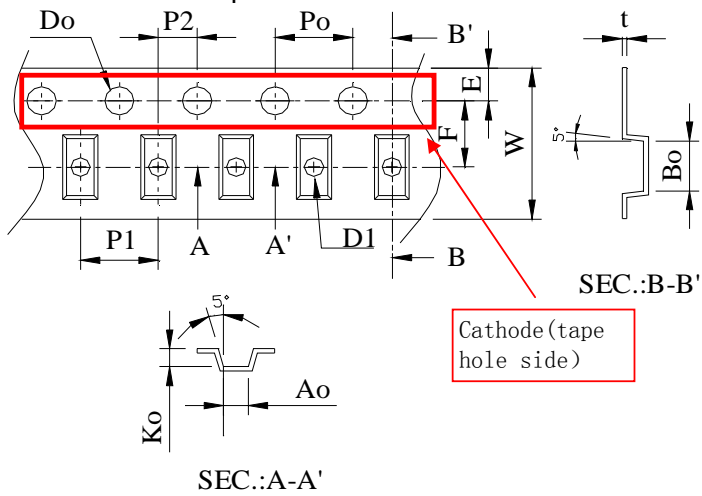
unit: mm

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





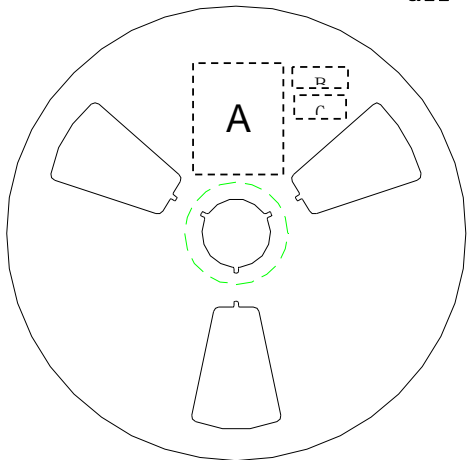
**B. Carrier Tape**



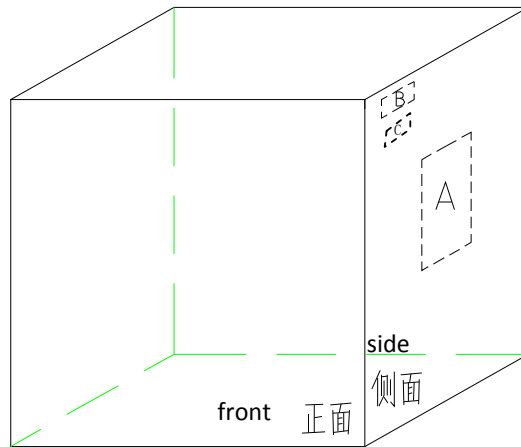
Item	SOD323HE	SOD123FL	SMA-FL	SMB-FL	TO277
W	8±0.3	8±0.3	12±0.3	12±0.3	12±0.3
P1	4±0.1	4±0.1	4±0.1	8±0.1	8±0.1
E	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1
F	3.5±0.05	3.5±0.05	5.5±0.05	5.5±0.05	5.5±0.05
D0	1.55±0.05	1.55±0.05	1.55±0.05	1.55±0.05	1.55±0.05
D1	1.1±0.1	1.1±0.1	1.5±0.1	1.55±0.05	1.5±0.1
P0	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
10P0	40±0.2	40±0.2	40±0.2	40±0.2	40±0.2
A0	1.45±0.1	1.95±0.1	2.83±0.1	3.8±0.1	4.3±0.1
B0	2.75±0.1	3.95±0.1	4.75±0.1	5.75±0.1	6.8±0.1
K0	0.80±0.1	1.30±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

5.2、SMD Power Diode General Packing Spec

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

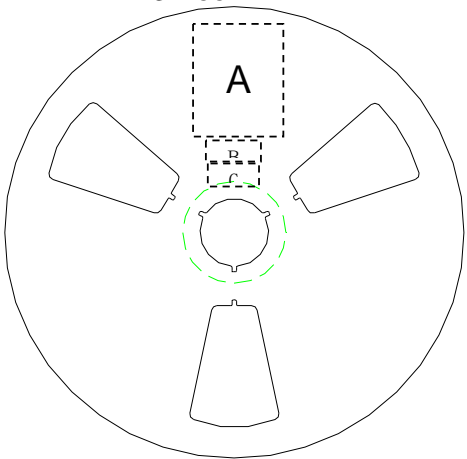


A:LRC label;



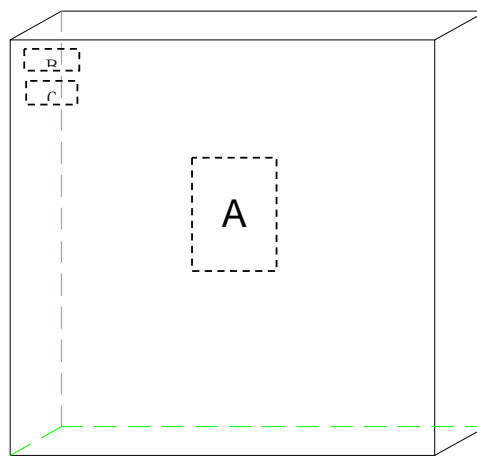
B:Environment Label C:Halide free label

B. 13" reel



A:LRC label;

B:Environment Labe C:Halide free label



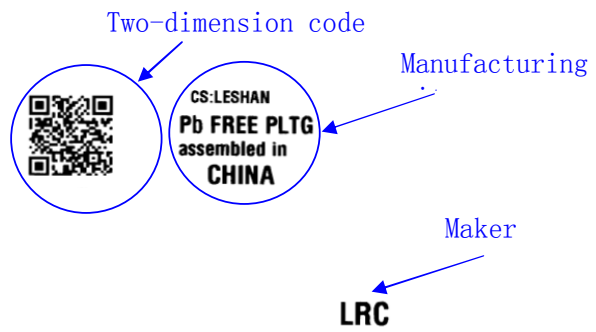
C. Tape lead: face anode side of the reel, upper side is the tape lead position. All labels are at cathode side of the reel.



标题: <b>Power Diode SMD Package Packing Spec</b>	DOC NO.: WI-258
	Version: 5    Modification: 0
	Page: 6

C. Label Content :  
LRC Label

P/N → (1P) LPN: **SM140A**  
 Lot No. → (1T) LOT: **140106049X**  
 Date code → (9D) DTE: **1403**  
 Quantity → (Q) QTY: **10000**



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

Environment Label



Halide-free Label



## LMBR120FT1G thru LMBR1200FT1G

### 7. Update Record

版次	更新记录	更新作者	更新日期
1	第一版	周杰	2013. 04. 03
2	增加LMBR145FT1G	周杰	2014. 11. 06

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