

# 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

### Mechanical Data

**Case:** SOD123-FL/MINI SMA  
molded plastic over sky die

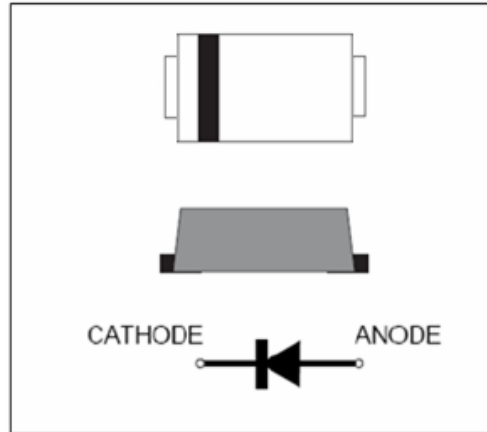
**Terminals:** Tin Plated, solderable per MIL-STD-750, Method 2026

**Polarity:** Color band denotes cathode end

**Mounting Position** Any

**Weight:** 0.0155 g

**Handling precaution** None



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

### 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 $T_C = 75^\circ\text{C}$                            | $I_{F(AV)}$                        | 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)  | $R_{\theta JA}$<br>$R_{\theta JC}$ | 110<br>40     |               |               |               |               |               |               |                |                |                |                  | $^\circ\text{C/W}$ |
| 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°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 ( $I_F = 0.1\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 0.7\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 1.0\text{ A}$ , $T_J = 25^\circ\text{C}$ ) | $V_F$  | -<br>-<br>0.5 | 0.35<br>0.45<br>0.50 | -<br>-<br>0.55 | -<br>-<br>0.7 | -<br>-<br>0.85 | -<br>-<br>0.90 | -<br>-<br>0.92 | -              | -              | -              | V    |    |
| Maximum DC reverse current at rated DC blocking voltage $T_A = 25^\circ\text{C}$<br>$T_j = 125^\circ\text{C}$  | $I_R$  | 0.5<br>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

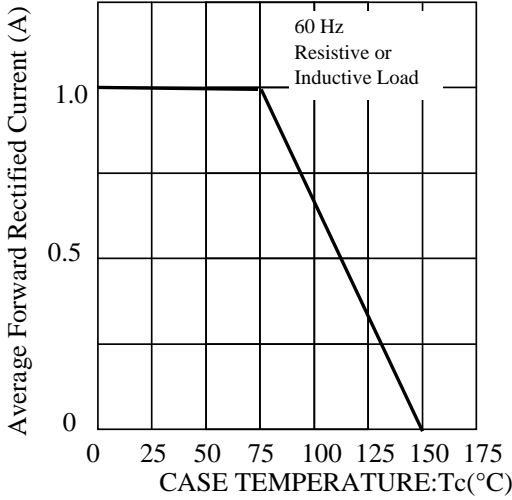


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

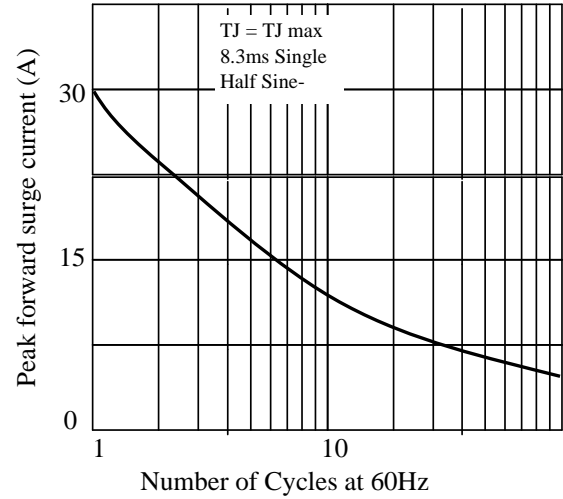


Fig 3. - Typical Instantaneous Forward Characteristics

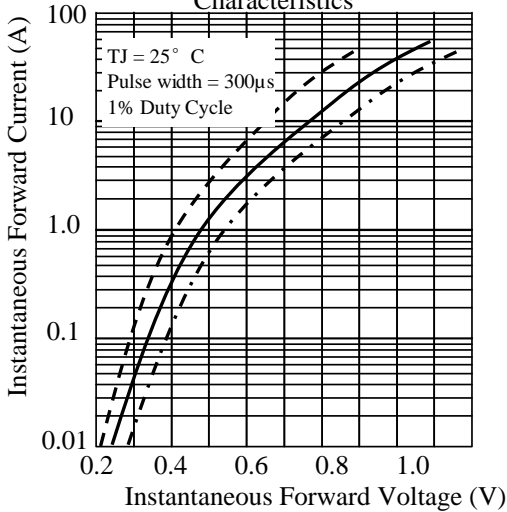


Fig 4. - Typical Reverse Characteristics

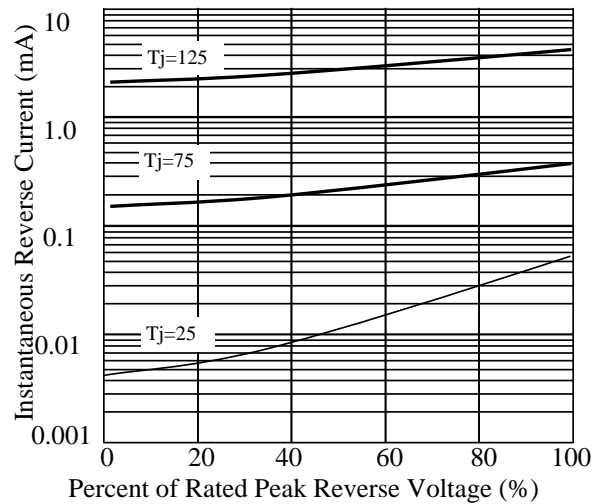


Fig 5. - typical transient thermal impedance

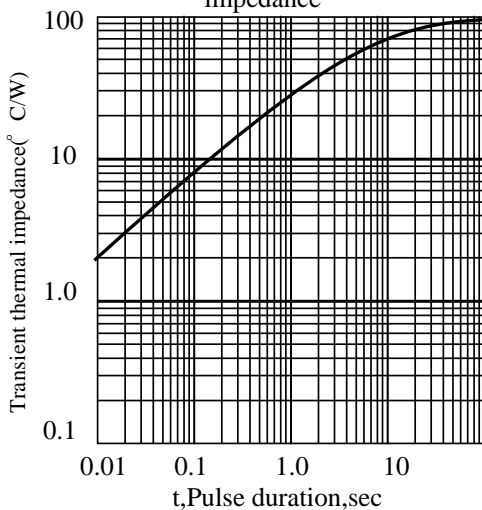
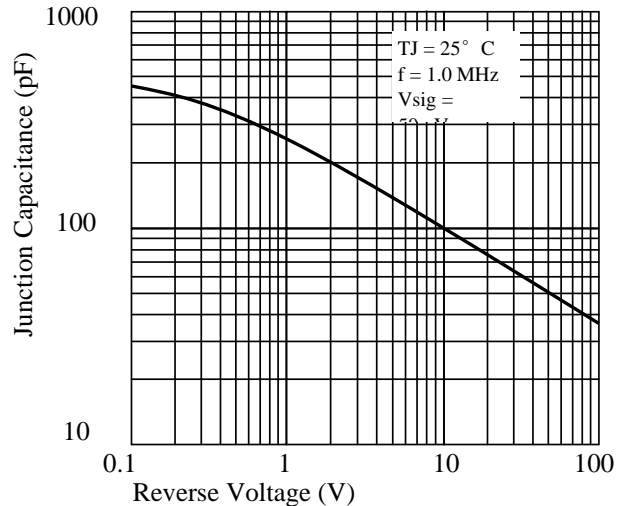


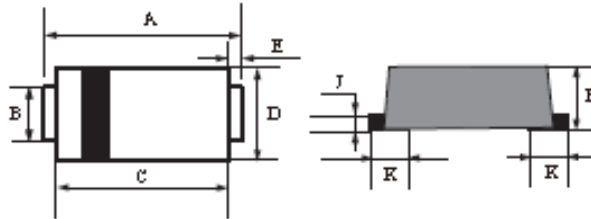
Fig 6. - Typical Junction Capacitance



# LMBR120FT1G thru LMBR1200FT1G

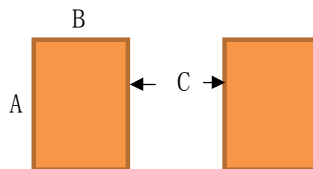
## 3. dimension:

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

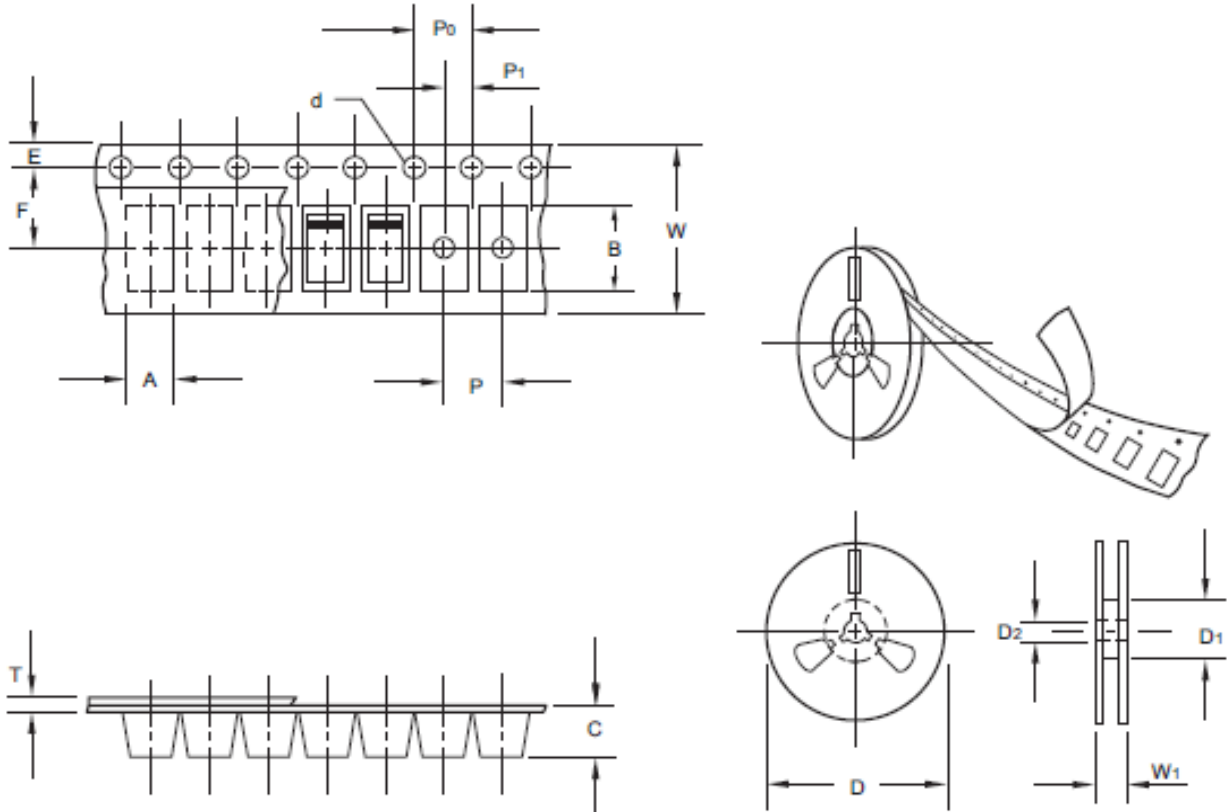


Dimensions in inches and (millimeters)

| 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     |

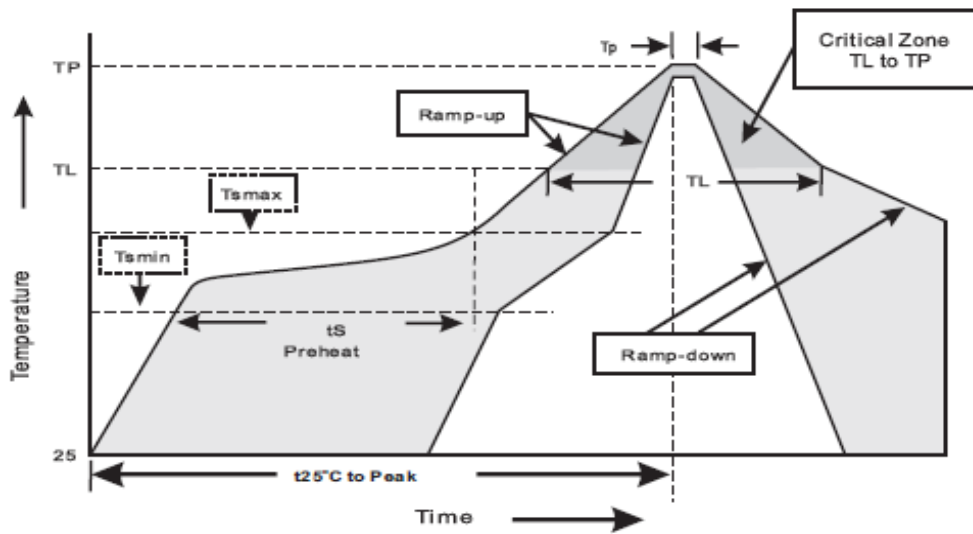
# LMBR120FT1G thru LMBR1200FT1G

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

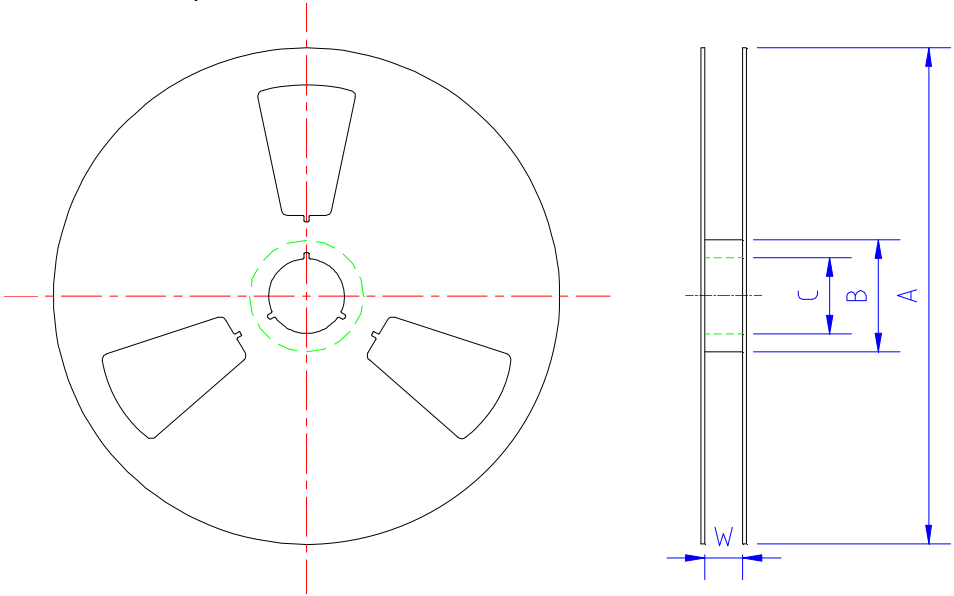
# LMBR120FT1G thru LMBR1200FT1G

## 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<br>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><br>On state:power on for 5 min.<br>Off state:power off for 5 min.<br>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.<br>and transferred for 5min. Total 10 cycles   | MIL-STD-750D METHOD-1051   |
| Thermal Shock                 | 0°C for 5min. Rise to 100°C for 5min.<br>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

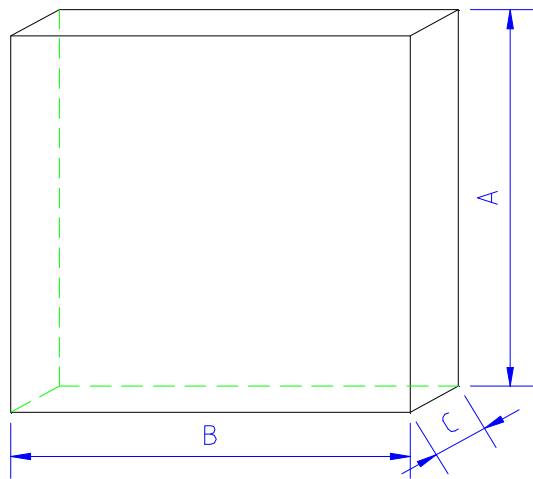
5.1.1 Reel Packing  
A. Reel Spec



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       |

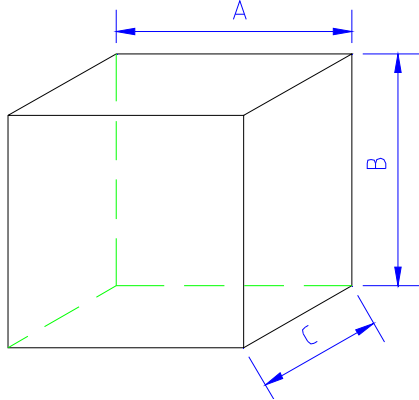
Title:  
Power Diode SMD Package Packing Spec

DOC NO.: WI-258

DOC NO.: WI-258

Page: 3

C. 7" reel packing box



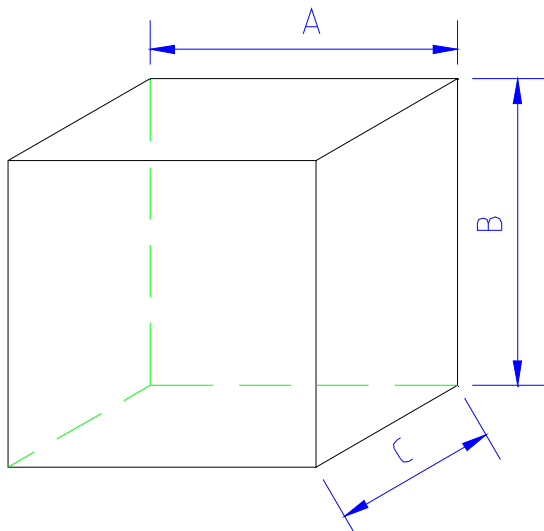
unit: mm

|          | 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

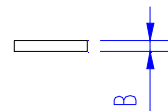
|          | A       | B       | C       |
|----------|---------|---------|---------|
| SMA-FL   |         |         |         |
| SOD123FL |         |         |         |
| SOD323HE | 455±2.0 | 400±2.0 | 410±2.0 |

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

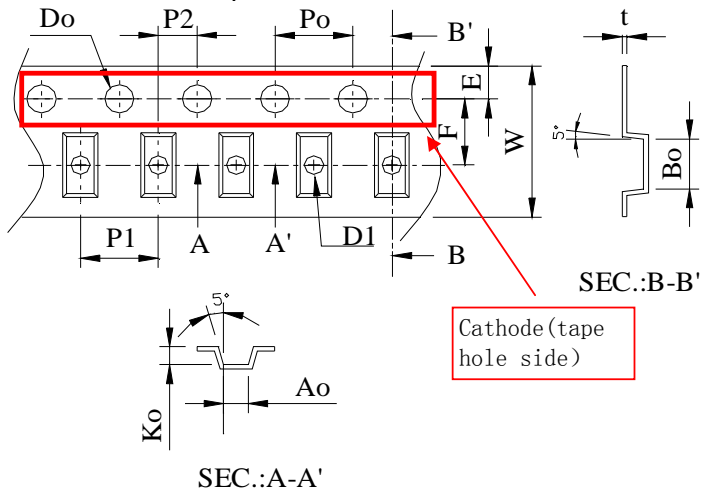


unit: mm

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



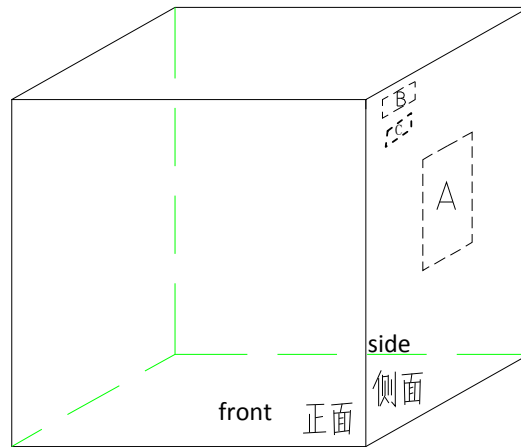
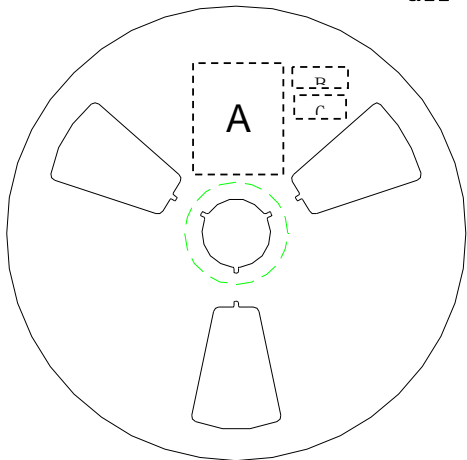
**B. Carrier Tape**



| 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 |

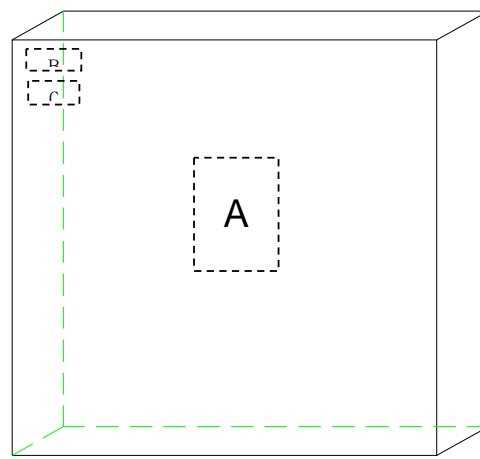
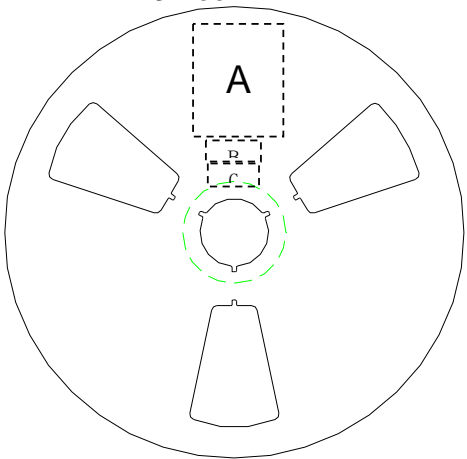
5.2、SMD Power Diode General Packing Spec

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.

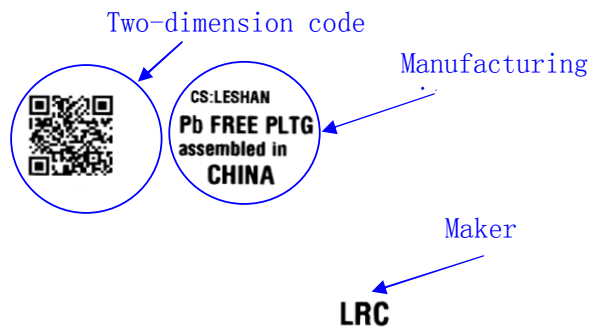


User Direction of Feed

|  |                               |
|--|-------------------------------|
| 标题:<br><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



## 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 |

单击下面可查看定价，库存，交付和生命周期等信息

[>>LRC\(乐山无线电\)](#)