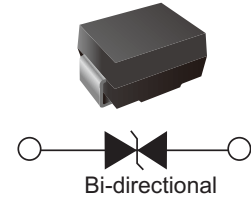
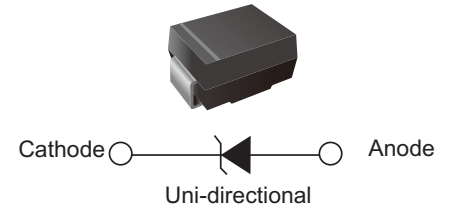


## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- For surface mounted applications in order to optimize board space
- 600W peak pulse power capability at 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.01%
- Typical  $I_R$  less than 1 $\mu$ A above 10V
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- Fast response time
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- Lead free in comply with EU RoHS 2011/65/EU directives



### Mechanical Data

- Case: SMB
- Terminals: Solderable per MIL-STD-750, Method 2026
- Polarity: For uni-directional types the band denotes cathode end, no marking on bi-directional types

### Applications

- I/O interface
- Vcc bus
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

### Ordering Information

| Part Number     | Shipping          | Reel      |
|-----------------|-------------------|-----------|
| LTVBxxA(C)J-TR3 | 3000PCS Tape&Reel | 13 inches |

### Maximum Ratings and Characteristics

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

| Rating  | Symbol          | Value       | Units          |
|---|-----------------|-------------|----------------|
| Peak pulse power dissipation at 10/1000 $\mu$ s waveform (Note1, Note2, Fig.1)                                    | $P_{PPM}$       | Minimum 600 | W              |
| Peak pulse current of at 10/1000 $\mu$ s waveform (Note 1, Fig.3)   | $I_{PPM}$       | See Table   | A              |
| Steady state power dissipation at $T_A=50^{\circ}$ C (Fig.5)  | $P_{M(AV)}$     | 5.0         | W              |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6) | $I_{FSM}$       | 100         | A              |
| Operating junction and Storage Temperature Range.   | $T_J, T_{STG}$  | -55 to +150 | $^{\circ}$ C   |
| Typical thermal resistance junction to lead   | $R_{\theta JL}$ | 20          | $^{\circ}$ C/W |
| Typical thermal resistance junction to ambient  | $R_{\theta JA}$ | 100         | $^{\circ}$ C/W |

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^{\circ}$ C per Fig.2.

2. Mounted on 5.0mm $\times$ 5.0mm (0.03mm thick) copper pads to each terminal.

3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum, unidirectional only.



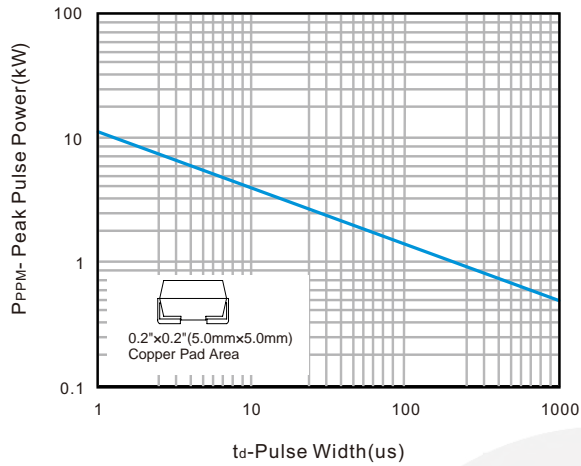
**Electrical Characteristics (T<sub>A</sub>=25°C)**

| Part Number (Uni) | Part Number (Bi) | Marking    |            | Reverse Stand off Voltage V <sub>R</sub> (Volts) | Breakdown Voltage V <sub>BR</sub> (Volts)@ I <sub>T</sub> |        | Test Current I <sub>T</sub> (mA) | Maximum Clamping Voltage V <sub>C</sub> @ I <sub>FP</sub> (V) | Maximum Peak Pulse Current I <sub>PP</sub> (A) | Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (μA) |
|-------------------|------------------|------------|------------|--|---|--------|----------------------------------|---|--|--|
|                   |                  | Uni        | Bi         |  | Min   | Max    |                                  |   |  |  |
| LTVB5.0AJ         | LTVB5.0CJ        | KE or 5J   | AE or 5J   | 5.0  | 6.40  | 7.00   | 10                               | 9.2   | 65.3   | 500  |
| LTVB6.0AJ         | LTVB6.0CJ        | KG or 6J   | AG or 6J   | 6.0  | 6.67  | 7.37   | 10                               | 10.3  | 58.3   | 500  |
| LTVB6.5AJ         | LTVB6.5CJ        | KK or 6J5  | AK ro 6J5  | 6.5  | 7.22  | 7.98   | 10                               | 11.2  | 53.6   | 300  |
| LTVB7.0AJ         | LTVB7.0CJ        | KM or 7J   | AM or 7J   | 7.0  | 7.78  | 8.60   | 10                               | 12.0  | 50.0   | 200  |
| LTVB7.5AJ         | LTVB7.5CJ        | KP or 7J5  | AP or 7J5  | 7.5  | 8.33  | 9.21   | 1                                | 12.9  | 46.6   | 100  |
| LTVB8.0AJ         | LTVB8.0CJ        | KR or 8J   | AR or 8J   | 8.0  | 8.89  | 9.83   | 1                                | 13.6  | 44.2   | 50   |
| LTVB8.5AJ         | LTVB8.5CJ        | KT or 8J5  | AT or 8J5  | 8.5  | 9.44  | 10.40  | 1                                | 14.4  | 41.7   | 20   |
| LTVB9.0AJ         | LTVB9.0CJ        | KV or 9J   | AV or 9J   | 9.0  | 10.00   | 11.10  | 1                                | 15.4  | 39.0   | 10   |
| LTVB10AJ          | LTVB10CJ         | KX or 10J  | AX or 10J  | 10.0   | 11.10   | 12.30  | 1                                | 17.0  | 35.3   | 5  |
| LTVB11AJ          | LTVB11CJ         | KZ or 11J  | AZ or 11J  | 11.0   | 12.20   | 13.50  | 1                                | 18.2  | 33.0   | 1  |
| LTVB12AJ          | LTVB12CJ         | LE or 12J  | BE or 12J  | 12.0   | 13.30   | 14.70  | 1                                | 19.9  | 30.2   | 1  |
| LTVB13AJ          | LTVB13CJ         | LG or 13J  | BG or 13J  | 13.0   | 14.40   | 15.90  | 1                                | 21.5  | 28.0   | 1  |
| LTVB14AJ          | LTVB14CJ         | LK or 14J  | BK or 14J  | 14.0   | 15.60   | 17.20  | 1                                | 23.2  | 25.9   | 1  |
| LTVB15AJ          | LTVB15CJ         | LM or 15J  | BM or 15J  | 15.0   | 16.70   | 18.50  | 1                                | 24.4  | 24.6   | 1  |
| LTVB16AJ          | LTVB16CJ         | LP or 16J  | BP or 16J  | 16.0   | 17.80   | 19.70  | 1                                | 26.0  | 23.1   | 1  |
| LTVB17AJ          | LTVB17CJ         | LR or 17J  | BR or 17J  | 17.0   | 18.90   | 20.90  | 1                                | 27.6  | 21.8   | 1  |
| LTVB18AJ          | LTVB18CJ         | LT or 18J  | BT or 18J  | 18.0   | 20.00   | 22.10  | 1                                | 29.2  | 20.6   | 1  |
| LTVB20AJ          | LTVB20CJ         | LV or 20J  | BV or 20J  | 20.0   | 22.20   | 24.50  | 1                                | 32.4  | 18.6   | 1  |
| LTVB22AJ          | LTVB22CJ         | LX or 22J  | BX or 22J  | 22.0   | 24.40   | 26.90  | 1                                | 35.5  | 16.9   | 1  |
| LTVB24AJ          | LTVB24CJ         | LZ or 24J  | BZ or 24J  | 24.0   | 26.70   | 29.50  | 1                                | 38.9  | 15.5   | 1  |
| LTVB26AJ          | LTVB26CJ         | ME or 26J  | CE or 26J  | 26.0   | 28.90   | 31.90  | 1                                | 42.1  | 14.3   | 1  |
| LTVB28AJ          | LTVB28CJ         | MG or 28J  | CG or 28J  | 28.0   | 31.10   | 34.40  | 1                                | 45.4  | 13.3   | 1  |
| LTVB30AJ          | LTVB30CJ         | MK or 30J  | CK or 30J  | 30.0   | 33.30   | 36.80  | 1                                | 48.4  | 12.4   | 1  |
| LTVB33AJ          | LTVB33CJ         | MM or 33J  | CM or 33J  | 33.0   | 36.70   | 40.60  | 1                                | 53.3  | 11.3   | 1  |
| LTVB36AJ          | LTVB36CJ         | MP or 36J  | CP or 36J  | 36.0   | 40.00   | 44.20  | 1                                | 58.1  | 10.4   | 1  |
| LTVB40AJ          | LTVB40CJ         | MR or 40J  | CR or 40J  | 40.0   | 44.40   | 49.10  | 1                                | 64.5  | 9.3  | 1  |
| LTVB43AJ          | LTVB43CJ         | MT ot 43J  | CT or 43J  | 43.0   | 47.80   | 52.80  | 1                                | 69.4  | 8.7  | 1  |
| LTVB45AJ          | LTVB45CJ         | MV or 45J  | CV or 45J  | 45.0   | 50.00   | 55.30  | 1                                | 72.7  | 8.3  | 1  |
| LTVB48AJ          | LTVB48CJ         | MX or 48J  | CX or 48J  | 48.0   | 53.30   | 58.90  | 1                                | 77.4  | 7.8  | 1  |
| LTVB51AJ          | LTVB51CJ         | MZ or 51J  | CZ or 51J  | 51.0   | 56.70   | 62.70  | 1                                | 82.4  | 7.3  | 1  |
| LTVB54AJ          | LTVB54CJ         | NE or 54J  | DE or 54J  | 54.0   | 60.00   | 66.30  | 1                                | 87.1  | 6.9  | 1  |
| LTVB58AJ          | LTVB58CJ         | NG or 58J  | DG or 58J  | 58.0   | 64.40   | 71.20  | 1                                | 93.6  | 6.5  | 1  |
| LTVB60AJ          | LTVB60CJ         | NK or 60J  | DK or 60J  | 60.0   | 66.70   | 73.70  | 1                                | 96.8  | 6.2  | 1  |
| LTVB64AJ          | LTVB64CJ         | NM or 64J  | DM or 64J  | 64.0   | 71.10   | 78.60  | 1                                | 103.0   | 5.9  | 1  |
| LTVB70AJ          | LTVB70CJ         | NP or 70J  | DP or 70J  | 70.0   | 77.80   | 86.00  | 1                                | 113.0   | 5.3  | 1  |
| LTVB75AJ          | LTVB75CJ         | NR or 75J  | DR or 75J  | 75.0   | 83.30   | 92.10  | 1                                | 121.0   | 5.0  | 1  |
| LTVB78AJ          | LTVB78CJ         | NT or 78J  | DT or 78J  | 78.0   | 86.70   | 95.80  | 1                                | 126.0   | 4.8  | 1  |
| LTVB85AJ          | LTVB85CJ         | NV or 85J  | DV or 85J  | 85.0   | 94.40   | 104.00 | 1                                | 137.0   | 4.4  | 1  |
| LTVB90AJ          | LTVB90CJ         | NX or 90J  | DX or 90J  | 90.0   | 100.00  | 111.00 | 1                                | 146.0   | 4.1  | 1  |
| LTVB100AJ         | LTVB100CJ        | NZ or 100J | DZ or 100J | 100.0  | 111.00  | 123.00 | 1                                | 162.0   | 3.7  | 1  |
| LTVB110AJ         | LTVB110CJ        | PE or 110J | EE or 110J | 110.0  | 122.00  | 135.00 | 1                                | 177.0   | 3.4  | 1  |
| LTVB120AJ         | LTVB120CJ        | PG or 120J | EG or 120J | 120.0  | 133.00  | 147.00 | 1                                | 193.0   | 3.1  | 1  |
| LTVB130AJ         | LTVB130CJ        | PK or 130J | EK or 130J | 130.0  | 144.00  | 159.00 | 1                                | 209.0   | 2.9  | 1  |
| LTVB150AJ         | LTVB150CJ        | PM or 150J | EM or 150J | 150.0  | 167.00  | 185.00 | 1                                | 243.0   | 2.5  | 1  |
| LTVB160AJ         | LTVB160CJ        | PP or 160J | EP or 160J | 160.0  | 178.00  | 197.00 | 1                                | 259.0   | 2.3  | 1  |
| LTVB170AJ         | LTVB170CJ        | PR or 170J | ER or 170J | 170.0  | 189.00  | 209.00 | 1                                | 275.0   | 2.2  | 1  |
| LTVB180AJ         | LTVB180CJ        | PT or 180J | ET or 180J | 180.0  | 201.00  | 222.00 | 1                                | 292.0   | 2.1  | 1  |
| LTVB190AJ         | LTVB190CJ        | PA or 190J | EC or 190J | 190.0  | 211.00  | 233.00 | 1                                | 308.0   | 2.0  | 1  |
| LTVB200AJ         | LTVB200CJ        | PV or 200J | EV or 200J | 200.0  | 224.00  | 247.00 | 1                                | 324.0   | 1.9  | 1  |
| LTVB210AJ         | LTVB210CJ        | PB or 210J | ED or 210J | 210.0  | 237.00  | 263.00 | 1                                | 340.0   | 1.8  | 1  |
| LTVB220AJ         | LTVB220CJ        | PX or 220J | EX or 220J | 220.0  | 246.00  | 272.00 | 1                                | 356.0   | 1.7  | 1  |
| LTVB250AJ         | LTVB250CJ        | PZ or 250J | EZ or 250J | 250.0  | 279.00  | 309.00 | 1                                | 405.0   | 1.5  | 1  |
| LTVB300AJ         | LTVB300CJ        | QE or 300J | FE or 300J | 300.0  | 335.00  | 371.00 | 1                                | 486.0   | 1.3  | 1  |
| LTVB350AJ         | LTVB350CJ        | QG or 350J | FG or 350J | 350.0  | 391.00  | 432.00 | 1                                | 567.0   | 1.1  | 1  |
| LTVB400AJ         | LTVB400CJ        | QK or 400J | FK or 400J | 400.0  | 447.00  | 494.00 | 1                                | 648.0   | 0.9  | 1  |
| LTVB440AJ         | LTVB440CJ        | QM or 440J | FM or 440J | 440.0  | 492.00  | 543.00 | 1                                | 713.0   | 0.9  | 1  |

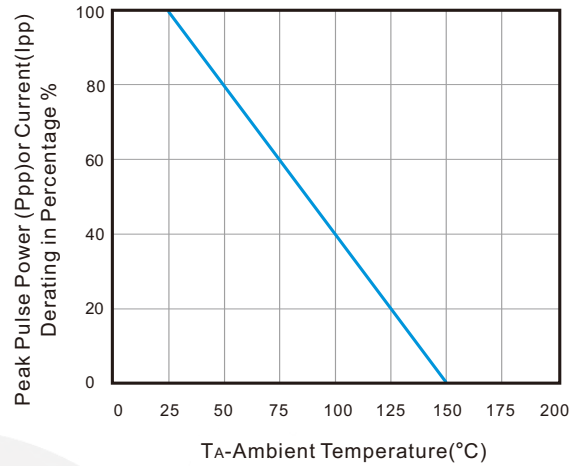
Notes: For bidirectional type having V<sub>R</sub> of 10V and less, the I<sub>R</sub> limit is double.

## Characteristics Curves (TA = 25°C unless otherwise noted)

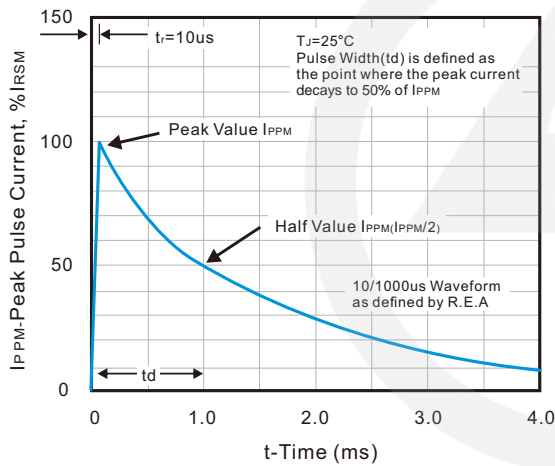
**Fig.1 Peak Pulse Power Rating Curve**



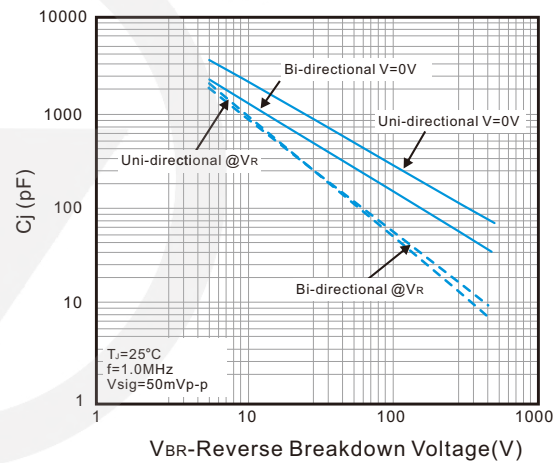
**Fig.2 Pulse Derating Curve**



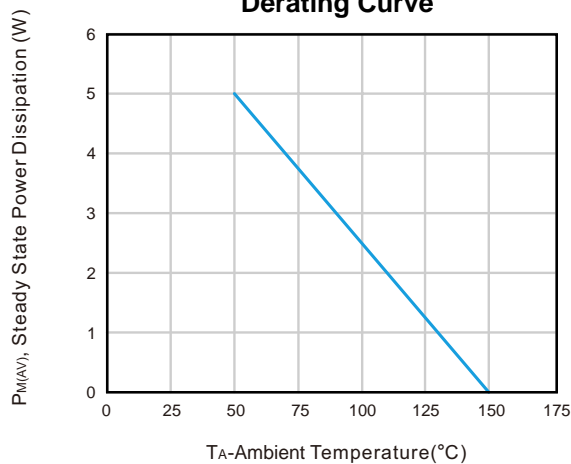
**Fig.3 Pulse Waveform**



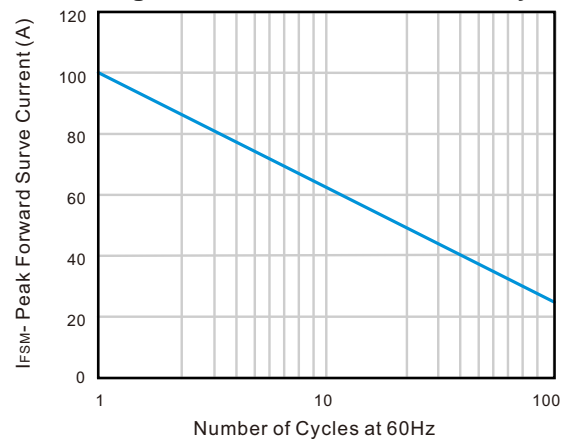
**Fig.4 Typical Junction Capacitance**



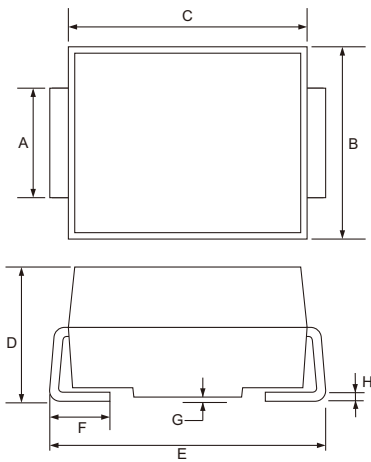
**Fig.5 Steady State Power Dissipation Derating Curve**



**Fig.6 Maximum Non-Repetitive Forward Surge Current Uni-Directional Only**



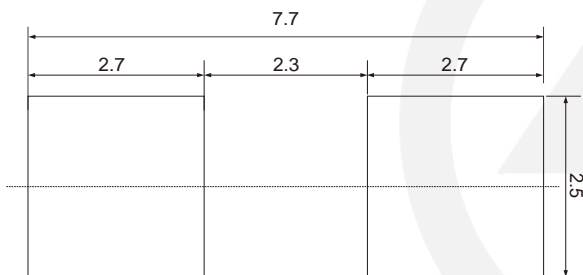
## SMB Package Outline



Unit: mm

| SYMBOL | DIMENSIONS |      |
|--------|------------|------|
|        | MIN.       | MAX. |
| A      | 1.90       | 2.20 |
| B      | 3.30       | 3.94 |
| C      | 4.05       | 4.75 |
| D      | 2.13       | 2.65 |
| E      | 5.08       | 5.59 |
| F      | 0.76       | 1.52 |
| G      | 0.203 TYP. |      |
| H      | 0.15       | 0.31 |

## SMB Suggested Pad Layout

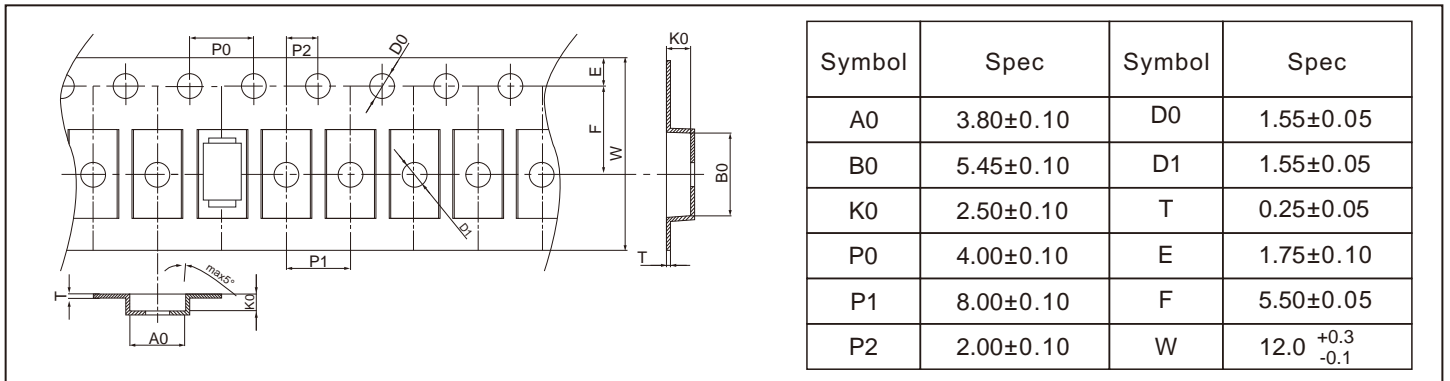


**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$
3. The pad layout is for reference purpose only.

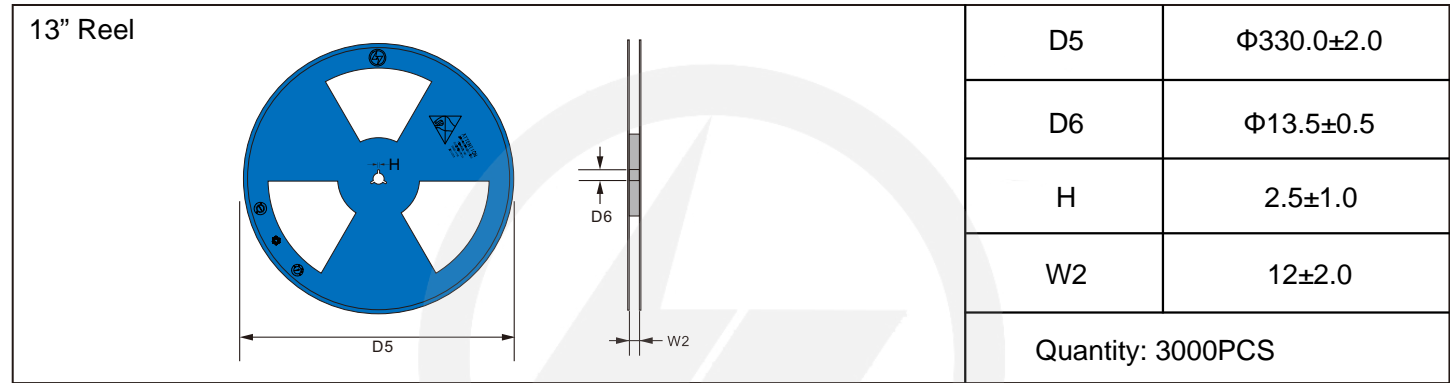
## Carrier Tape Dimensions

Unit : mm

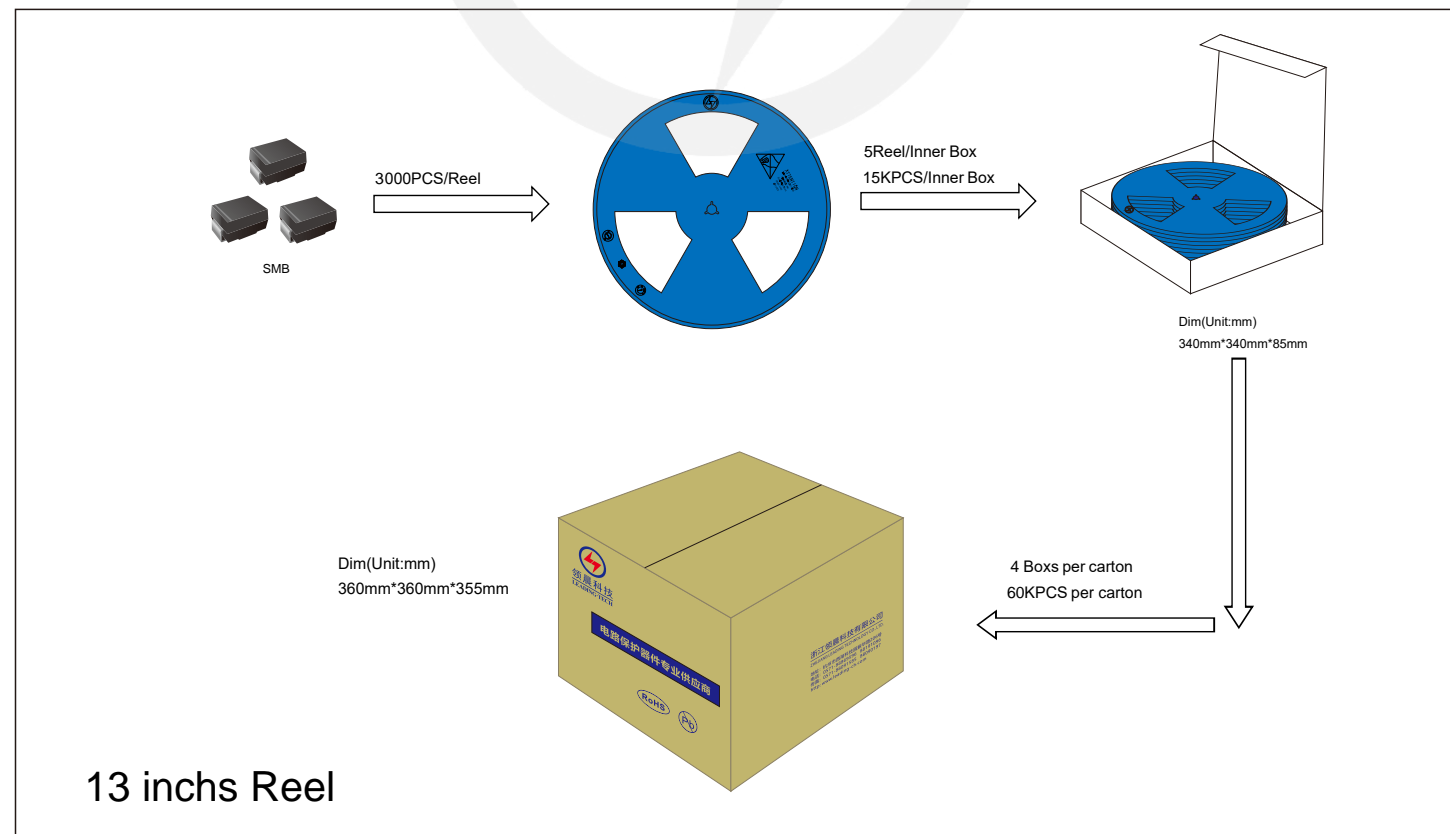


## Reel Dimensions

Unit : mm



## Packaging





Recommended Soldering Conditions



Recommended Conditions

| Profile Feature  | Pb-Free Assembly |
|--|------------------|
| Average ramp-up rate (T <sub>L</sub> to T <sub>P</sub> )     | 3°C/second max.  |
| Preheat  |                  |
| -Temperature Min (T <sub>S min</sub> )                       | 150°C            |
| -Temperature Max (T <sub>S max</sub> )                       | 200°C            |
| -Time (min to max) (t <sub>s</sub> )                         | 60-180 seconds   |
| T <sub>S max</sub> to T <sub>L</sub>                         |                  |
| -Ramp-up Rate  | 3°C/second max.  |
| Time maintained above:                                       |                  |
| -Temperature (T <sub>L</sub> )                               | 217°C            |
| -Time (t <sub>L</sub> )                                      | 60-150 seconds   |
| Peak Temperature (T <sub>P</sub> )                           | 260°C            |
| Time within 5°C of actual Peak Temperature (t <sub>p</sub> ) | 20-40 seconds    |
| Ramp-down Rate   | 6°C/second max.  |
| Time 25°C to Peak Temperature                                | 8 minutes max.   |

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## Version Update Information

| Series NO. | Enactment/Revision Date | Effective Date | Version | Revision content             | Revision Reason | Revision Person | Note |
|------------|-------------------------|----------------|---------|------------------------------|-----------------|-----------------|------|
| 01         | 2024.3.19               | 2024.3.19      | 3.0     | New File                     | /               | Ding            |      |
| 02         | 2025.06.11              | 2025.06.11     | 3.1     | Update packaging information | /               | Ding            |      |