

**Description**

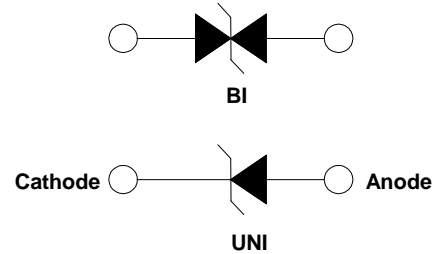
The P6KE series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

**Features**

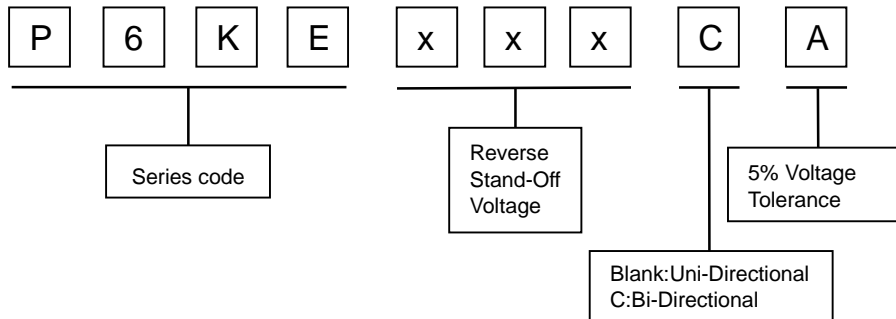
- I Fast response time
- I Matte tin lead-free Plated
- I Low incremental surge resistance
- I Halogen free and RoHS compliant
- I Typical  $I_R$  less than  $1\mu A$  above 12V
- I Compatible with industrial standard package DO-15
- I For surface mounted applications to optimize board space
- I 600W peak pulse power capability with at 10/1000 $\mu s$  waveform, repetition rate (duty cycle): 0.01%
- I High temperature soldering guaranteed:260°C/10 seconds



**Electrical symbol**



**Part Number Code**



**Mechanical Characteristics**

| Rating   | Symbol         | Value      | Units      |
|--|----------------|------------|------------|
| Peak Pulse Power Dissipation by 10x1000 $\mu s$ test Waveform(Fig.2) (Note1)         | $P_{PP}$       | 600        | W          |
| Steady State Power Dissipation on infinite heat sink at $T_L=75^\circ C$ (Fig.6)     | $P_D$          | 5.0        | W          |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional only (Note 2) | $I_{FSM}$      | 100        | A          |
| Maximum instantaneous forward voltage at 25 A for unidirectional only                | $V_F$          | 3.5/6.5    | V          |
| Operating junction and Storage Temperature Range.                                    | $T_J, T_{STG}$ | -55 to 150 | $^\circ C$ |

Notes:

1. Non-repetitive current pulse , per Fig. 4 and derated above  $T_A = 25^\circ C$  per Fig. 3.
2. Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 pulses per minute maximum.



## Electrical Characteristics

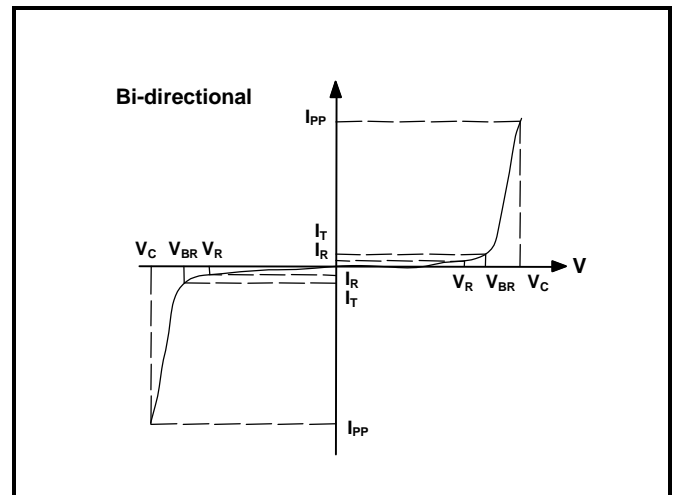
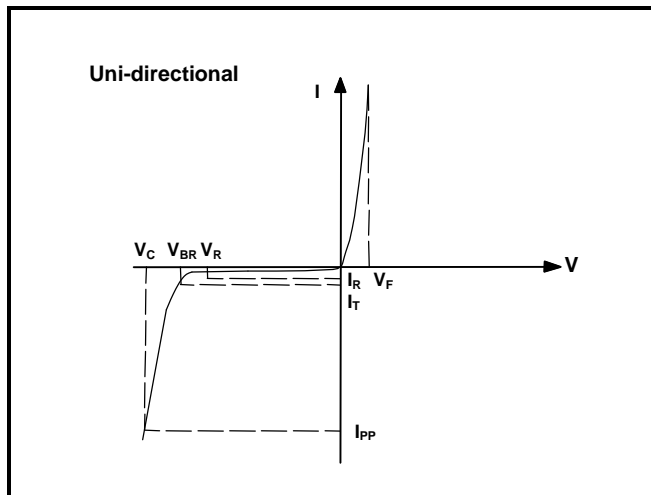
| Type Number |           | Reverse Stand-Off Voltage | Breakdown Voltage |           | Test Current | Max. Clamping Voltage<br>10/1000µs | Max. Peak Pulse Current<br>10/1000µs | Reverse Leakage |
|-------------|-----------|---------------------------|-------------------|-----------|--------------|------------------------------------|--------------------------------------|-----------------|
|             |           |                           | $V_{BR} @ I_T$    |           |              |                                    |                                      |                 |
|             |           | UNI                       | BI                | $V_{RWM}$ | Min          | Max                                | $I_T$                                | $V_C @ I_{PP}$  |
|             |           | V                         | V                 | V         | mA           | V                                  | A                                    | µA              |
| P6KE6.8A    | P6KE6.8CA | 5.80                      | 6.45              | 7.14      | 10           | 10.5                               | 57.0                                 | 1000            |
| P6KE7.5A    | P6KE7.5CA | 6.40                      | 7.13              | 7.88      | 10           | 11.3                               | 53.0                                 | 500             |
| P6KE8.2A    | P6KE8.2CA | 7.02                      | 7.79              | 8.61      | 10           | 12.1                               | 50.0                                 | 200             |
| P6KE9.1A    | P6KE9.1CA | 7.78                      | 8.65              | 9.55      | 1            | 13.4                               | 45.0                                 | 50              |
| P6KE10A     | P6KE10CA  | 8.55                      | 9.50              | 10.50     | 1            | 14.5                               | 41.0                                 | 10              |
| P6KE11A     | P6KE11CA  | 9.40                      | 10.50             | 11.60     | 1            | 15.6                               | 38.0                                 | 5               |
| P6KE12A     | P6KE12CA  | 10.20                     | 11.40             | 12.60     | 1            | 16.7                               | 36.0                                 | 5               |
| P6KE13A     | P6KE13CA  | 11.10                     | 12.40             | 13.70     | 1            | 18.2                               | 33.0                                 | 1               |
| P6KE15A     | P6KE15CA  | 12.80                     | 14.30             | 15.80     | 1            | 21.2                               | 28.0                                 | 1               |
| P6KE16A     | P6KE16CA  | 13.60                     | 15.20             | 16.80     | 1            | 22.5                               | 27.0                                 | 1               |
| P6KE18A     | P6KE18CA  | 15.30                     | 17.10             | 18.90     | 1            | 25.2                               | 24.0                                 | 1               |
| P6KE20A     | P6KE20CA  | 17.10                     | 19.00             | 21.00     | 1            | 27.7                               | 22.0                                 | 1               |
| P6KE22A     | P6KE22CA  | 18.80                     | 20.90             | 23.10     | 1            | 30.6                               | 20.0                                 | 1               |
| P6KE24A     | P6KE24CA  | 20.50                     | 22.80             | 25.20     | 1            | 33.2                               | 18.0                                 | 1               |
| P6KE27A     | P6KE27CA  | 23.10                     | 25.70             | 28.40     | 1            | 37.5                               | 16.0                                 | 1               |
| P6KE30A     | P6KE30CA  | 25.60                     | 28.50             | 31.50     | 1            | 41.4                               | 14.4                                 | 1               |
| P6KE33A     | P6KE33CA  | 28.20                     | 31.40             | 34.70     | 1            | 45.7                               | 13.2                                 | 1               |
| P6KE36A     | P6KE36CA  | 30.80                     | 34.20             | 37.80     | 1            | 49.9                               | 12.0                                 | 1               |
| P6KE39A     | P6KE39CA  | 33.30                     | 37.10             | 41.00     | 1            | 53.9                               | 11.2                                 | 1               |
| P6KE43A     | P6KE43CA  | 36.80                     | 40.90             | 45.20     | 1            | 59.3                               | 10.1                                 | 1               |
| P6KE47A     | P6KE47CA  | 40.20                     | 44.70             | 49.40     | 1            | 64.8                               | 9.30                                 | 1               |
| P6KE51A     | P6KE51CA  | 43.60                     | 48.50             | 53.60     | 1            | 70.1                               | 8.60                                 | 1               |
| P6KE56A     | P6KE56CA  | 47.80                     | 53.20             | 58.80     | 1            | 77.0                               | 7.80                                 | 1               |
| P6KE62A     | P6KE62CA  | 53.00                     | 58.90             | 65.10     | 1            | 85.0                               | 7.10                                 | 1               |
| P6KE68A     | P6KE68CA  | 58.10                     | 64.60             | 71.40     | 1            | 92.0                               | 6.50                                 | 1               |
| P6KE75A     | P6KE75CA  | 64.10                     | 71.30             | 78.80     | 1            | 103.0                              | 5.80                                 | 1               |
| P6KE82A     | P6KE82CA  | 70.10                     | 77.90             | 86.10     | 1            | 113.0                              | 5.30                                 | 1               |
| P6KE91A     | P6KE91CA  | 77.80                     | 86.50             | 95.50     | 1            | 125.0                              | 4.80                                 | 1               |
| P6KE100A    | P6KE100CA | 85.50                     | 95.00             | 105.00    | 1            | 137.0                              | 4.40                                 | 1               |
| P6KE110A    | P6KE110CA | 94.00                     | 105.00            | 116.00    | 1            | 152.0                              | 4.00                                 | 1               |
| P6KE120A    | P6KE120CA | 102.00                    | 114.00            | 126.00    | 1            | 165.0                              | 3.60                                 | 1               |
| P6KE130A    | P6KE130CA | 111.00                    | 124.00            | 137.00    | 1            | 179.0                              | 3.30                                 | 1               |



**Electrical Characteristics**

| Type Number |           | Reverse Stand-Off Voltage | Breakdown Voltage |           | Test Current | Max. Clamping Voltage 10/1000µs | Max. Peak Pulse Current 10/1000µs | Reverse Leakage |
|-------------|-----------|---------------------------|-------------------|-----------|--------------|---------------------------------|-----------------------------------|-----------------|
|             |           |                           | $V_{BR} @ I_T$    |           |              |                                 |                                   |                 |
|             |           | UNI                       | BI                | $V_{RWM}$ | Min          | Max                             | $I_T$                             | $V_C @ I_{PP}$  |
|             |           | V                         | V                 | V         | mA           | V                               | A                                 | µA              |
| P6KE150A    | P6KE150CA | 128.00                    | 143.00            | 158.00    | 1            | 207.0                           | 2.90                              | 1               |
| P6KE160A    | P6KE160CA | 136.00                    | 152.00            | 168.00    | 1            | 219.0                           | 2.70                              | 1               |
| P6KE170A    | P6KE170CA | 145.00                    | 162.00            | 179.00    | 1            | 234.0                           | 2.60                              | 1               |
| P6KE180A    | P6KE180CA | 154.00                    | 171.00            | 189.00    | 1            | 246.0                           | 2.40                              | 1               |
| P6KE200A    | P6KE200CA | 171.00                    | 190.00            | 210.00    | 1            | 274.0                           | 2.20                              | 1               |
| P6KE220A    | P6KE220CA | 185.00                    | 209.00            | 231.00    | 1            | 328.0                           | 1.83                              | 1               |
| P6KE250A    | P6KE250CA | 214.00                    | 237.00            | 263.00    | 1            | 344.0                           | 1.75                              | 1               |
| P6KE300A    | P6KE300CA | 256.00                    | 285.00            | 315.00    | 1            | 414.0                           | 1.45                              | 1               |
| P6KE350A    | P6KE350CA | 300.00                    | 332.00            | 368.00    | 1            | 482.0                           | 1.25                              | 1               |
| P6KE400A    | P6KE400CA | 342.00                    | 380.00            | 420.00    | 1            | 548.0                           | 1.10                              | 1               |
| P6KE440A    | P6KE440CA | 376.00                    | 418.00            | 462.00    | 1            | 602.0                           | 1.00                              | 1               |
| P6KE500A    | P6KE500CA | 427.50                    | 475.00            | 525.00    | 1            | 690.0                           | 0.87                              | 1               |
| P6KE520A    | P6KE520CA | 444.60                    | 494.00            | 546.00    | 1            | 717.6                           | 0.84                              | 1               |
| P6KE550A    | P6KE550CA | 470.30                    | 522.50            | 577.50    | 1            | 759.0                           | 0.79                              | 1               |
| P6KE600A    | P6KE600CA | 513.00                    | 570.00            | 630.00    | 1            | 828.0                           | 0.72                              | 1               |

**I-V Curve Characteristics**



$P_{PPM}$  Peak Pulse Power Dissipation -- Max power dissipation

$V_R$  Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation

$V_{BR}$  Breakdown Voltage -- Maximum voltage that flows though the TVS at a specified test current ( $I_T$ )

$V_C$  Clamping Voltage -- Peak voltage measured across the TVS at a specified  $I_{ppm}$  (peak impulse current)

$I_R$  Reverse Leakage Current – Current measured at  $V_R$

$V_F$  Forward Voltage Drop for Uni-directional



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

Figure 1 - TVS Transients Clamping Waveform

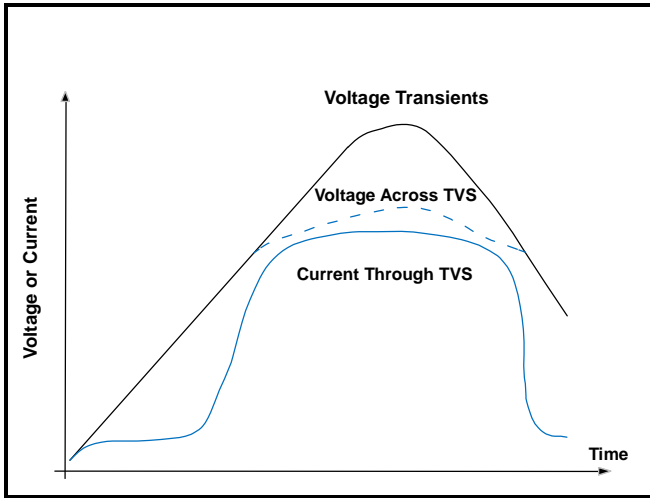


Figure 2 - Peak Pulse Power Rating Curve

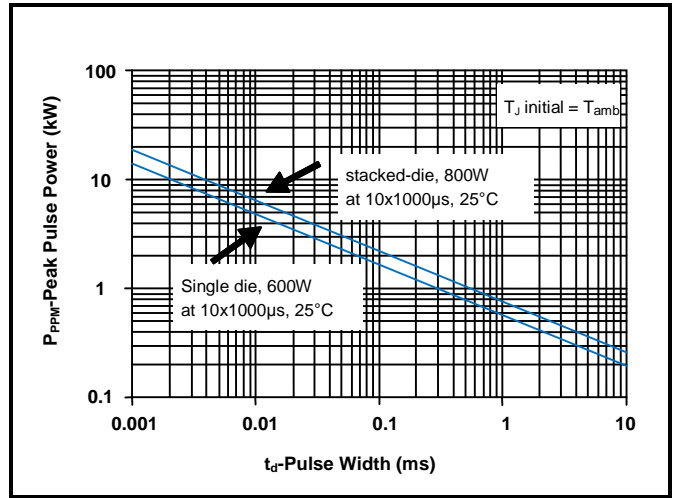


Figure 3 - Pulse Derating Curve

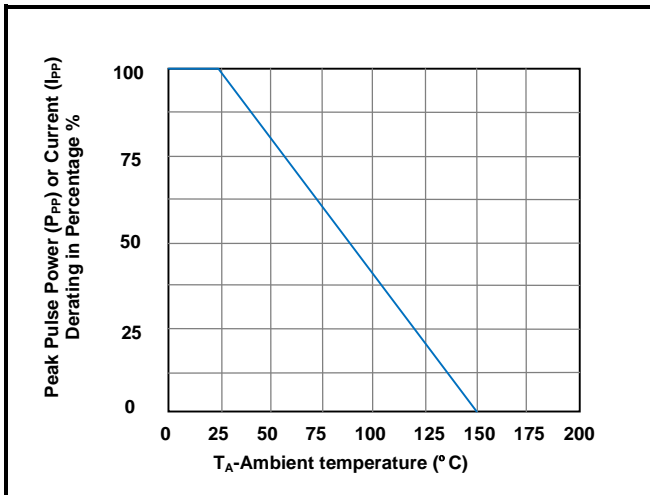


Figure 4 - Pulse Waveform

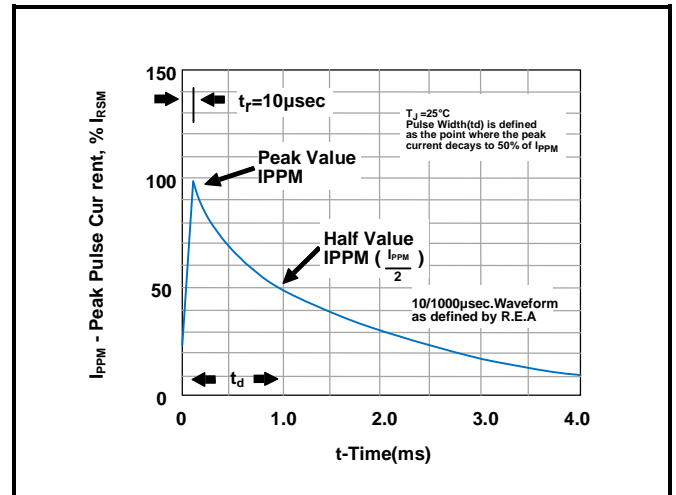


Figure 5 - Typical Junction Capacitance

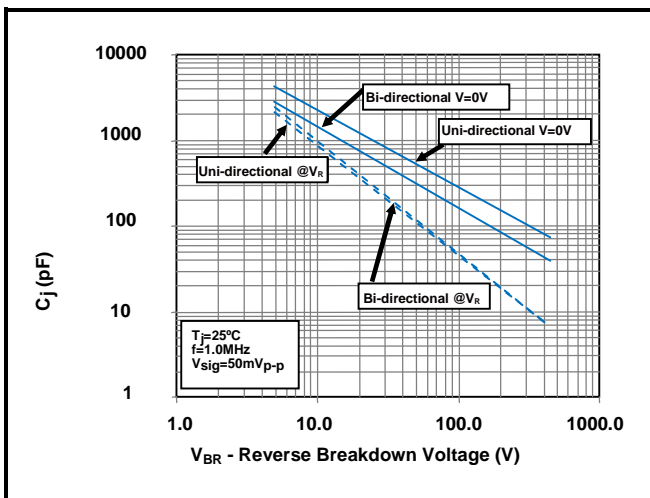


Figure 6 - Steady State Power Derating Curve

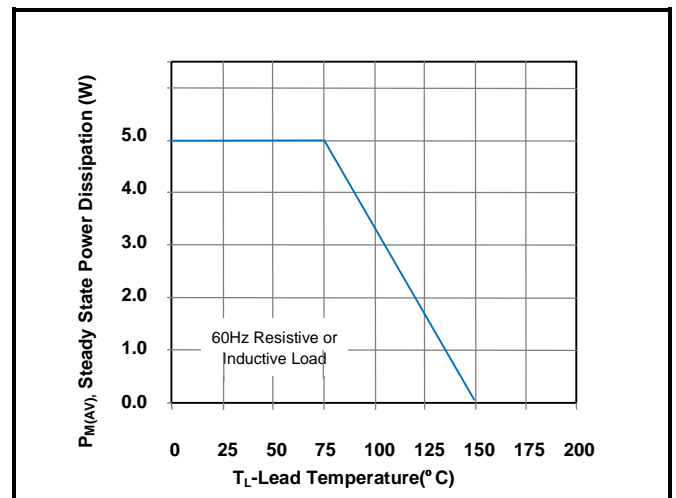
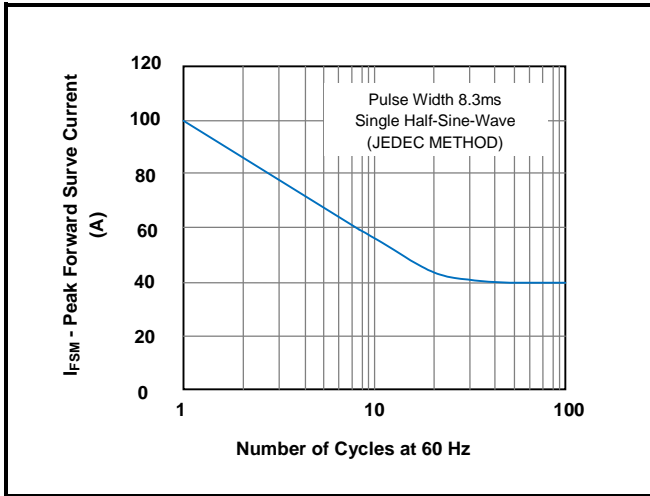
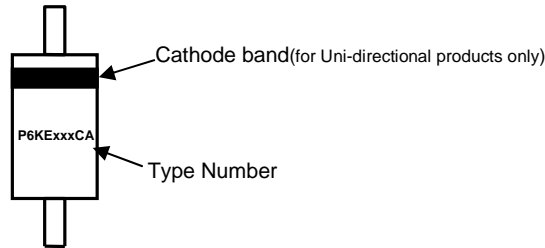


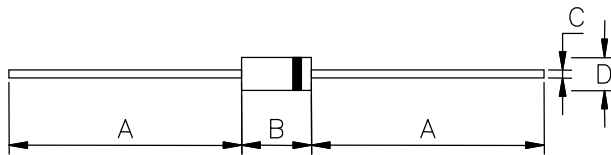
Figure 7 - Maximum Non-Repetitive Surge Current



Part Marking System



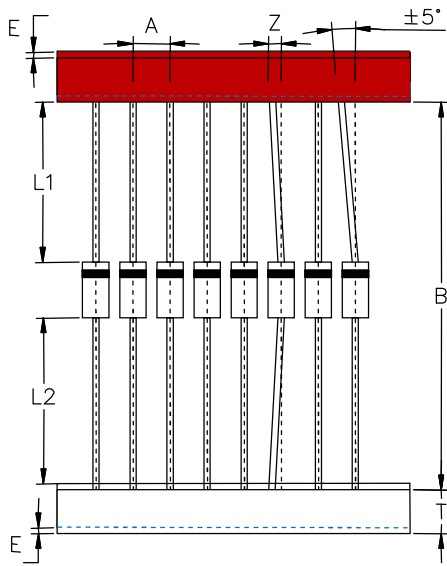
Dimensions



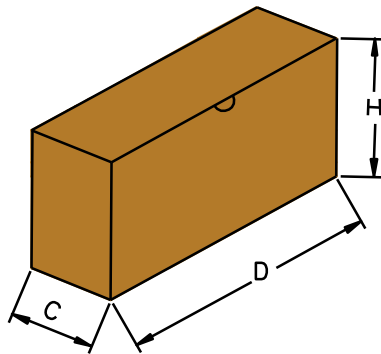
| DIM | Millimeters |      | Inches |       |
|-----|-------------|------|--------|-------|
|     | Min         | Max  | Min    | Max   |
| A   | 25.40       | -    | 1.000  | -     |
| B   | 5.80        | 7.60 | 0.228  | 0.299 |
| C   | 0.70        | 0.90 | 0.028  | 0.035 |
| D   | 2.60        | 3.60 | 0.102  | 0.142 |



**Taping and Reel Specifications**



| Symbol | Millimeters | Inches      |
|--------|-------------|-------------|
| A      | 5.08±0.5    | 0.2±0.019   |
| B      | 53.0±1.0    | 2.087±0.039 |
| Z      | 1.2Max      | 0.047 Max   |
| T      | 6.0±0.4     | 0.236±0.015 |
| E      | 0.8Max      | 0.031 Max   |
| L1-L2  | 1.0Max      | 0.039 Max   |



| Symbol   | Millimeters         | Inches      |
|----------|---------------------|-------------|
| D        | 250.0±5.0           | 9.843±0.197 |
| C        | 75.0±5.0            | 2.953±0.197 |
| H        | 114.0±5.0           | 4.488±0.197 |
| Quantity | 2000PCS / inner box |             |



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