

Description

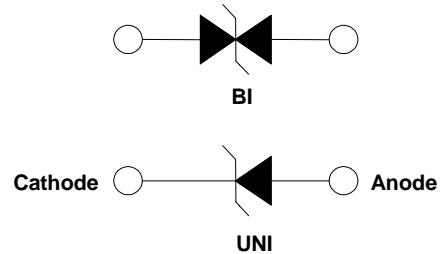
The 5KP Series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Features

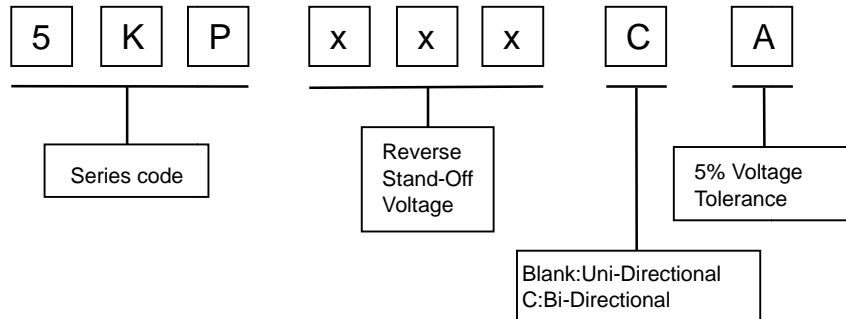
- I Fast response time
- I Matte tin lead-free Plated
- I Low incremental surge resistance
- I Halogen free and RoHS compliant
- I Typical I_R less than 2 μ A above 10V
- I Compatible with industrial standard package P600
- I For surface mounted applications to optimize board space
- I 5000W peak pulse power capability with at 10/1000 μ 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 μ s test Waveform (Note1)(Fig. 2) | P_{PP} | 5000 | W |
| Steady State Power Dissipation on infinite heat sink at $T_L=75^\circ\text{C}$ (Fig. 6) | P_D | 8.0 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional only (Note 2) | I_{FSM} | 500 | A |
| Maximum instantaneous forward voltage at 100 A for unidirectional only | V_F | 3.5/5.0 | V |
| Operating junction and Storage Temperature Range. | T_J, T_{STG} | -55 to 150 | $^\circ\text{C}$ |

Notes:

1. Non-repetitive current pulse , per Fig. 4 and derated above $T_A = 25^\circ\text{C}$ 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 10/1000µs | Max. Peak Pulse Current 10/1000µs | Reverse Leakage |
|-------------|----------|---------------------------|---------------------------------|-------|----------------|------------------------------------|--------------------------------------|----------------------------------|
| | | | V _{BR} @I _T | | | | | |
| | | V _{RWM} | Min | Max | I _T | V _C @I _{PP} | I _{PP} | I _R @V _{RWM} |
| UNI | BI | V | V | V | mA | V | A | µA |
| 5KP5.0A | 5KP5.0CA | 5.0 | 6.40 | 7.00 | 50 | 9.2 | 543.48 | 5000 |
| 5KP6.0A | 5KP6.0CA | 6.0 | 6.67 | 7.37 | 50 | 10.3 | 485.44 | 5000 |
| 5KP6.5A | 5KP6.5CA | 6.5 | 7.22 | 7.98 | 50 | 11.2 | 446.43 | 2000 |
| 5KP7.0A | 5KP7.0CA | 7.0 | 7.78 | 8.60 | 50 | 12.0 | 416.67 | 1000 |
| 5KP7.5A | 5KP7.5CA | 7.5 | 8.33 | 9.21 | 5 | 12.9 | 387.60 | 250 |
| 5KP8.0A | 5KP8.0CA | 8.0 | 8.89 | 9.83 | 5 | 13.6 | 367.65 | 150 |
| 5KP8.5A | 5KP8.5CA | 8.5 | 9.44 | 10.40 | 5 | 14.4 | 347.22 | 50 |
| 5KP9.0A | 5KP9.0CA | 9.0 | 10.00 | 11.10 | 5 | 15.4 | 324.68 | 20 |
| 5KP10A | 5KP10CA | 10.0 | 11.10 | 12.30 | 5 | 17.0 | 294.12 | 15 |
| 5KP11A | 5KP11CA | 11.0 | 12.20 | 13.50 | 5 | 18.2 | 274.73 | 2 |
| 5KP12A | 5KP12CA | 12.0 | 13.30 | 14.70 | 5 | 19.9 | 251.26 | 2 |
| 5KP13A | 5KP13CA | 13.0 | 14.40 | 15.90 | 5 | 21.5 | 232.56 | 2 |
| 5KP14A | 5KP14CA | 14.0 | 15.60 | 17.20 | 5 | 23.2 | 215.52 | 2 |
| 5KP15A | 5KP15CA | 15.0 | 16.70 | 18.50 | 5 | 24.4 | 204.92 | 2 |
| 5KP16A | 5KP16CA | 16.0 | 17.80 | 19.70 | 5 | 26.0 | 192.31 | 2 |
| 5KP17A | 5KP17CA | 17.0 | 18.90 | 20.90 | 5 | 27.6 | 181.16 | 2 |
| 5KP18A | 5KP18CA | 18.0 | 20.00 | 22.10 | 5 | 29.2 | 171.23 | 2 |
| 5KP19A | 5KP19CA | 19.0 | 21.10 | 23.30 | 5 | 30.8 | 162.44 | 2 |
| 5KP20A | 5KP20CA | 20.0 | 22.20 | 24.50 | 5 | 32.4 | 154.32 | 2 |
| 5KP22A | 5KP22CA | 22.0 | 24.40 | 26.90 | 5 | 35.5 | 140.85 | 2 |
| 5KP24A | 5KP24CA | 24.0 | 26.70 | 29.50 | 5 | 38.9 | 128.53 | 2 |
| 5KP26A | 5KP26CA | 26.0 | 28.90 | 31.90 | 5 | 42.1 | 118.76 | 2 |
| 5KP28A | 5KP28CA | 28.0 | 31.10 | 34.40 | 5 | 45.4 | 110.13 | 2 |
| 5KP30A | 5KP30CA | 30.0 | 33.30 | 36.80 | 5 | 48.4 | 103.31 | 2 |
| 5KP33A | 5KP33CA | 33.0 | 36.70 | 40.60 | 5 | 53.3 | 93.81 | 2 |
| 5KP36A | 5KP36CA | 36.0 | 40.00 | 44.20 | 5 | 58.1 | 86.06 | 2 |
| 5KP40A | 5KP40CA | 40.0 | 44.40 | 49.10 | 5 | 64.5 | 77.52 | 2 |
| 5KP43A | 5KP43CA | 43.0 | 47.80 | 52.80 | 5 | 69.4 | 72.05 | 2 |
| 5KP45A | 5KP45CA | 45.0 | 50.00 | 55.30 | 5 | 72.7 | 68.78 | 2 |
| 5KP48A | 5KP48CA | 48.0 | 53.30 | 58.90 | 5 | 77.4 | 64.60 | 2 |
| 5KP51A | 5KP51CA | 51.0 | 56.70 | 62.70 | 5 | 82.4 | 60.68 | 2 |
| 5KP54A | 5KP54CA | 54.0 | 60.00 | 66.30 | 5 | 87.1 | 57.41 | 2 |



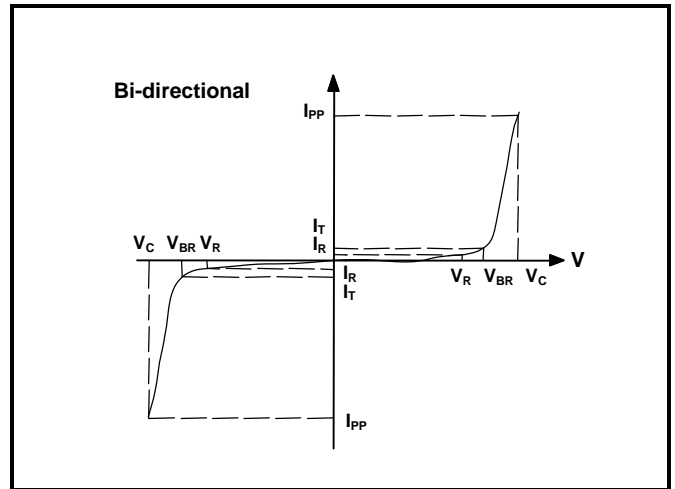
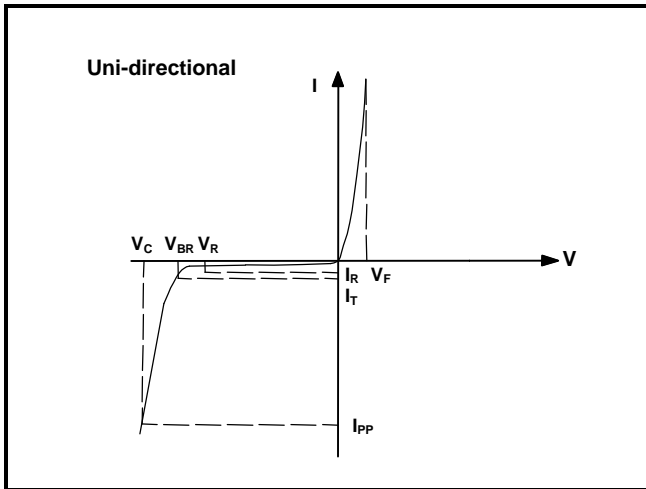
Electrical Characteristics

| 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 | | | | | |
| | | V _{RWM} | Min | Max | I _T | V _C @I _{PP} | I _{PP} | I _R @V _{RWM} |
| UNI | BI | V | V | V | mA | V | A | µA |
| 5KP58A | 5KP58CA | 58.0 | 64.40 | 71.20 | 5 | 93.6 | 53.42 | 2 |
| 5KP60A | 5KP60CA | 60.0 | 66.70 | 73.70 | 5 | 96.8 | 51.65 | 2 |
| 5KP64A | 5KP64CA | 64.0 | 71.10 | 78.60 | 5 | 103.0 | 48.54 | 2 |
| 5KP70A | 5KP70CA | 70.0 | 77.80 | 86.00 | 5 | 113.0 | 44.25 | 2 |
| 5KP75A | 5KP75CA | 75.0 | 83.30 | 92.10 | 5 | 121.0 | 41.32 | 2 |
| 5KP78A | 5KP78CA | 78.0 | 86.70 | 95.80 | 5 | 126.0 | 39.68 | 2 |
| 5KP80A | 5KP80CA | 80.0 | 88.80 | 97.60 | 5 | 129.6 | 38.58 | 2 |
| 5KP85A | 5KP85CA | 85.0 | 94.40 | 104.00 | 5 | 137.0 | 36.50 | 2 |
| 5KP90A | 5KP90CA | 90.0 | 100.00 | 111.00 | 5 | 146.0 | 34.25 | 2 |
| 5KP100A | 5KP100CA | 100.0 | 111.00 | 123.00 | 5 | 162.0 | 30.86 | 2 |
| 5KP110A | 5KP110CA | 110.0 | 122.00 | 135.00 | 5 | 177.0 | 28.25 | 2 |
| 5KP120A | 5KP120CA | 120.0 | 133.00 | 147.00 | 5 | 193.0 | 25.91 | 2 |
| 5KP130A | 5KP130CA | 130.0 | 144.00 | 159.00 | 5 | 209.0 | 23.92 | 2 |
| 5KP140A | 5KP140CA | 140.0 | 155.00 | 171.00 | 5 | 226.8 | 22.05 | 2 |
| 5KP150A | 5KP150CA | 150.0 | 167.00 | 185.00 | 5 | 243.0 | 20.58 | 2 |
| 5KP160A | 5KP160CA | 160.0 | 178.00 | 197.00 | 5 | 259.0 | 19.31 | 2 |
| 5KP170A | 5KP170CA | 170.0 | 189.00 | 209.00 | 5 | 275.0 | 18.18 | 2 |
| 5KP180A | 5KP180CA | 180.0 | 200.00 | 220.00 | 5 | 291.6 | 17.15 | 2 |
| 5KP190A | 5KP190CA | 190.0 | 211.00 | 232.00 | 5 | 307.8 | 16.24 | 2 |
| 5KP200A | 5KP200CA | 200.0 | 224.00 | 247.0 | 5 | 324.0 | 15.43 | 2 |
| 5KP210A | 5KP210CA | 210.0 | 233.00 | 258.0 | 5 | 349.5 | 14.31 | 2 |
| 5KP220A | 5KP220CA | 220.0 | 246.00 | 272.0 | 5 | 356.0 | 14.04 | 2 |
| 5KP250A | 5KP250CA | 250.0 | 279.00 | 309.0 | 5 | 405.0 | 12.35 | 2 |
| 5KP300A | 5KP300CA | 300.0 | 335.00 | 371.0 | 5 | 486.0 | 10.29 | 2 |
| 5KP350A | 5KP350CA | 350.0 | 391.00 | 432.0 | 5 | 567.0 | 8.82 | 2 |
| 5KP400A | 5KP400CA | 400.0 | 447.00 | 494.0 | 5 | 648.0 | 7.72 | 2 |
| 5KP440A | 5KP440CA | 440.0 | 492.00 | 543.0 | 5 | 713.0 | 7.01 | 2 |

Notes: For bidirectional type having V_R of 10V and less, the I_R limit is double.



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 ($T_A=25^\circ C$ unless otherwise noted)

Figure 1 - TVS Transients Clamping Waveform

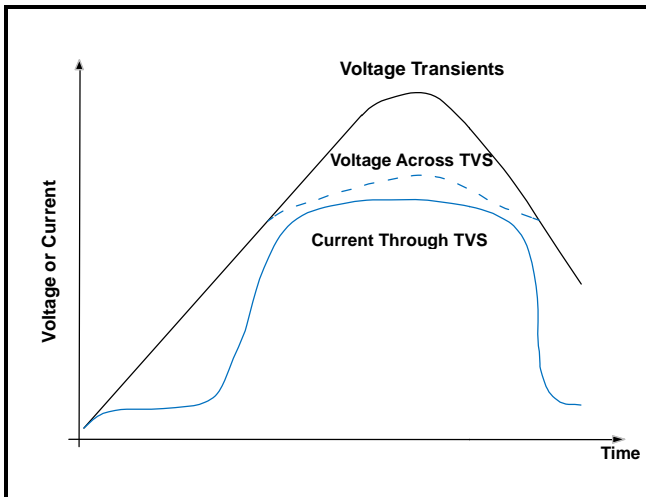


Figure 2 - Peak Pulse Power Rating Curve

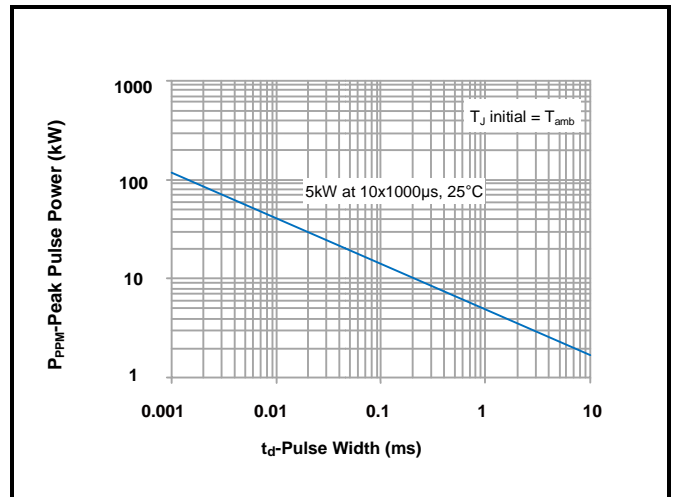


Figure 3 - Pulse Derating Curve

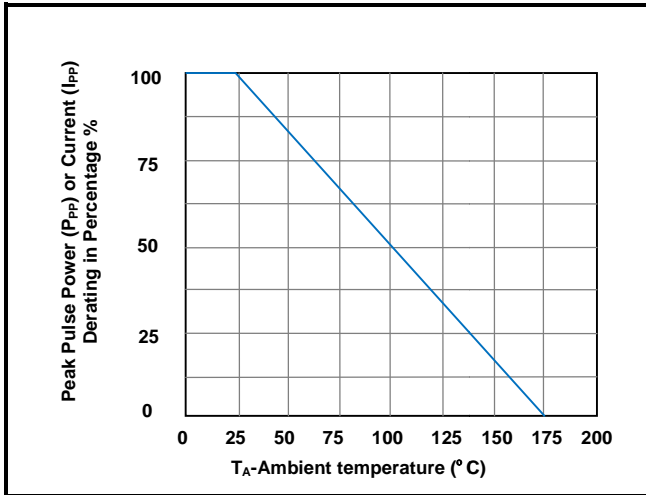


Figure 4 - Pulse Waveform

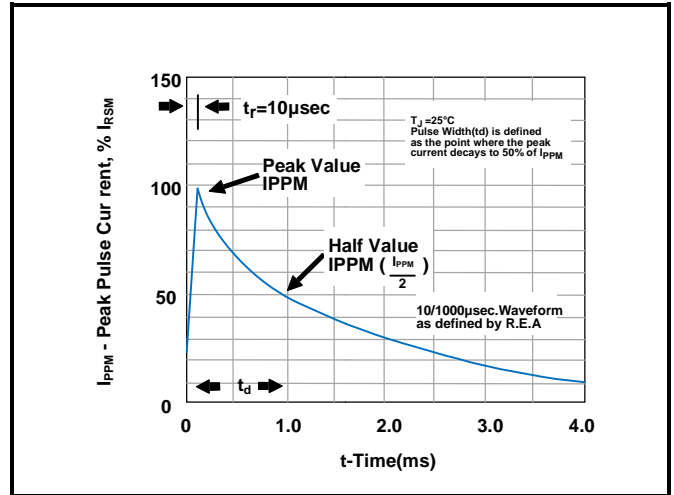


Figure 5 - Typical Junction Capacitance

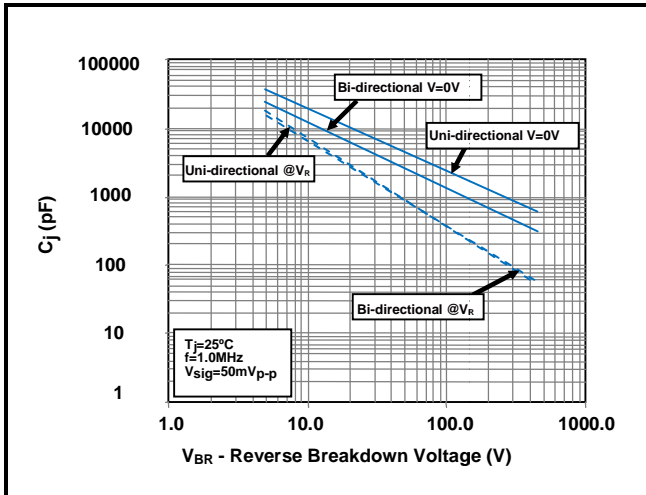


Figure 6 - Steady State Power Derating Curve

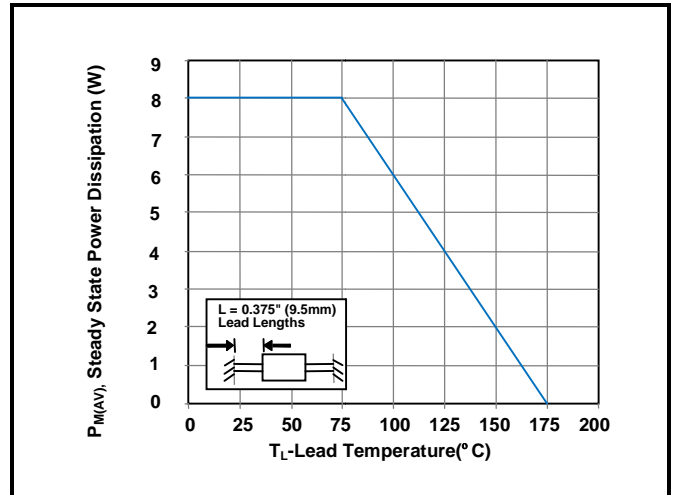
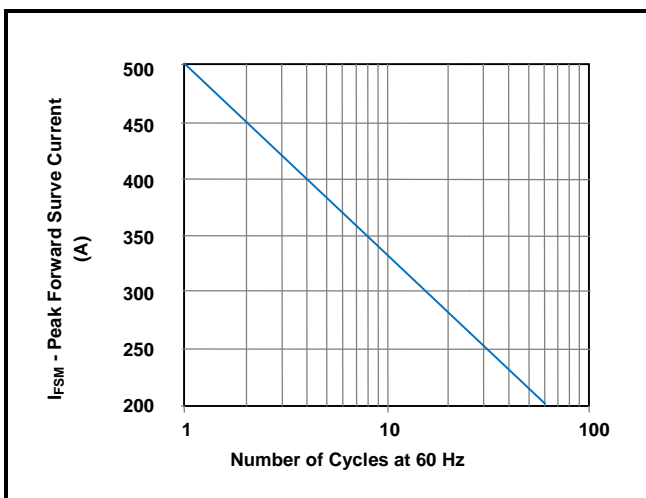
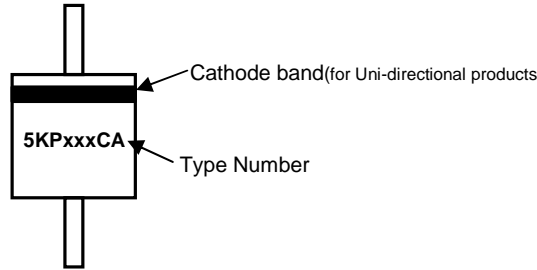


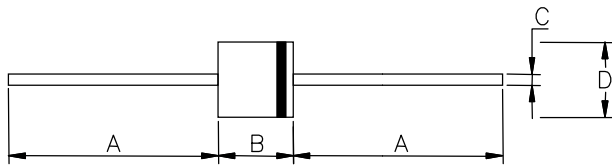
Figure 7 - Maximum Non-Repetitive Surge Current



Part Marking System

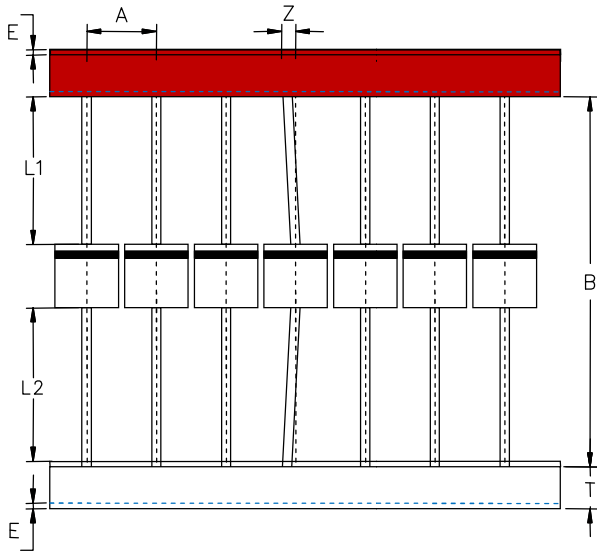


Dimensions

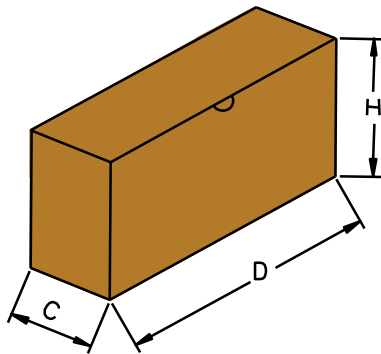


| DIM | Millimeters | | Inches | |
|-----|-------------|------|--------|-------|
| | Min | Max | Min | Max |
| A | 25.4 | - | 1.000 | - |
| B | 8.6 | 9.14 | 0.339 | 0.360 |
| C | 1.2 | 1.32 | 0.047 | 0.052 |
| D | 8.6 | 9.14 | 0.339 | 0.360 |

Packaging Information



| Symbol | Millimeters | Inches |
|--------|-------------|-------------|
| A | 10±0.5 | 0.394±0.019 |
| B | 53.0±1.0 | 2.087±0.039 |
| Z | 1.2Max | 0.047 Max |
| T | 6.0±0.5 | 0.236±0.019 |
| E | 0.8Max | 0.031 Max |
| L1-L2 | 1.0Max | 0.039 Max |



| Symbol | Millimeters | Inches |
|----------|-------------------|--------------|
| D | 257.0±5.0 | 10.118±0.197 |
| C | 80.0±5.0 | 3.15±0.197 |
| H | 149.0±5.0 | 5.866±0.197 |
| Quantity | 400PCS/ inner box | |

