

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 30000W peak pulse power capability at 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.05%
- Fast response time
- Typical  $I_R$  less than 2 $\mu$ A above 40V.
- High Temperature soldering guaranteed: 265 $^{\circ}$ C/10 seconds/.375", (9.5mm) lead length, 5lbs (2.3kg) tension
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458



### Mechanical Data

- Case: Moulded plastic over glass passivated junction
- Terminal: Plated Axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any
- Weight: 2.46g

### Applications

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

### 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, Fig.1)                                           | $P_{PPM}$       | Minimum<br>30000 | Watts          |
| Peak pulse current of at 10/1000 $\mu$ s waveform (Note 1, Fig.3)                                                 | $I_{PPM}$       | See Table        | Amps           |
| Steady state power dissipation at $T_L=75^{\circ}$ C (Fig.5)                                                      | $P_{M(AV)}$     | 8.0              | Watts          |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2, Fig.6) | $I_{FSM}$       | 400              | Amps           |
| Operating junction and Storage Temperature Range.                                                                 | $T_J, T_{STG}$  | -55 to +150      | $^{\circ}$ C   |
| Typical thermal resistance junction to lead                                                                       | $R_{\theta JL}$ | 8                | $^{\circ}$ C/W |
| Typical thermal resistance junction to ambient                                                                    | $R_{\theta JA}$ | 40               | $^{\circ}$ C/W |

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

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

**Dimensions (P600)**

| Symbol | Millimeters |      | Inches |       |
|--------|-------------|------|--------|-------|
|        | Min.        | Max. | Min.   | Max.  |
| L      | 25.40       | -    | 1.000  | -     |
| T      | 8.60        | 9.10 | 0.340  | 0.360 |
| d      | 8.60        | 9.10 | 0.340  | 0.360 |
| s      | 1.19        | 1.32 | 0.047  | 0.052 |

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

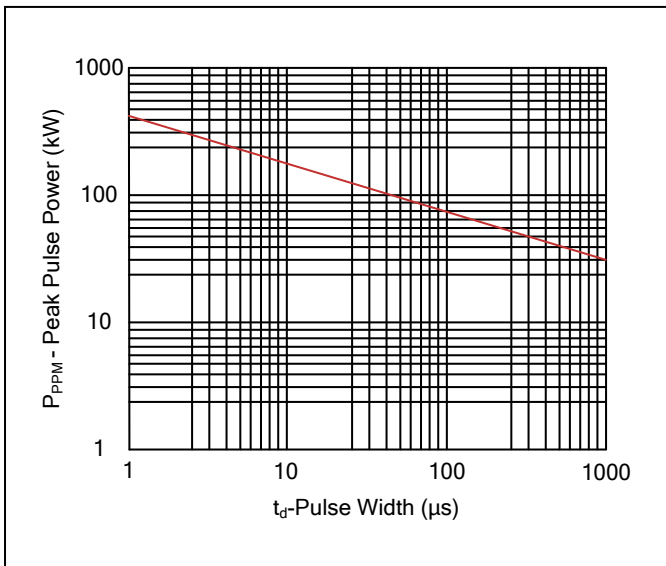
| Part Number    |               | Reverse Stand-Off Voltage | Breakdown Voltage @I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RWM</sub> |
|----------------|---------------|---------------------------|-----------------------------------|---------------------|-------------------------------------------|---------------------|-----------------------------------|
| Unidirectional | Bidirectional | V <sub>RWM</sub> (V)      | V <sub>BR</sub> (V)               | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (μA)               |
| 30KPA28A       | 30KPA28CA     | 28.0                      | 31.28~34.57                       | 50                  | 50.0                                      | 606.0               | 5000                              |
| 30KPA30A       | 30KPA30CA     | 30.0                      | 33.51~37.04                       | 50                  | 55.2                                      | 548.9               | 5000                              |
| 30KPA33A       | 30KPA33CA     | 33.0                      | 36.90~40.78                       | 50                  | 58.5                                      | 517.9               | 5000                              |
| 30KPA36A       | 30KPA36CA     | 36.0                      | 40.20~44.43                       | 50                  | 61.8                                      | 490.3               | 5000                              |
| 30KPA39A       | 30KPA39CA     | 39.0                      | 43.60~48.19                       | 20                  | 67.2                                      | 450.9               | 2000                              |
| 30KPA42A       | 30KPA42CA     | 42.0                      | 46.90~51.84                       | 10                  | 72.0                                      | 420.8               | 1000                              |
| 30KPA43A       | 30KPA43CA     | 43.0                      | 48.00~53.05                       | 10                  | 73.0                                      | 415.1               | 1000                              |
| 30KPA45A       | 30KPA45CA     | 45.0                      | 50.30~55.59                       | 5                   | 77.4                                      | 391.5               | 250                               |
| 30KPA48A       | 30KPA48CA     | 48.0                      | 53.60~59.24                       | 5                   | 81.6                                      | 371.3               | 150                               |
| 30KPA51A       | 30KPA51CA     | 51.0                      | 57.00~63.00                       | 5                   | 86.4                                      | 350.7               | 50                                |
| 30KPA54A       | 30KPA54CA     | 54.0                      | 60.30~66.65                       | 5                   | 91.4                                      | 331.5               | 20                                |
| 30KPA58A       | 30KPA58CA     | 58.0                      | 64.80~71.62                       | 5                   | 92.4                                      | 327.9               | 20                                |
| 30KPA60A       | 30KPA60CA     | 60.0                      | 67.00~74.05                       | 5                   | 102.0                                     | 297.1               | 15                                |
| 30KPA64A       | 30KPA64CA     | 64.0                      | 71.50~79.03                       | 5                   | 104.0                                     | 291.3               | 10                                |
| 30KPA66A       | 30KPA66CA     | 66.0                      | 73.70~81.46                       | 5                   | 107.0                                     | 283.2               | 2                                 |
| 30KPA70A       | 30KPA70CA     | 70.0                      | 78.20~86.43                       | 5                   | 109.0                                     | 278.0               | 2                                 |
| 30KPA71A       | 30KPA71CA     | 71.0                      | 79.30~87.65                       | 5                   | 111.5                                     | 271.7               | 2                                 |
| 30KPA72A       | 30KPA72CA     | 72.0                      | 80.40~88.86                       | 5                   | 114.0                                     | 265.8               | 2                                 |
| 30KPA75A       | 30KPA75CA     | 75.0                      | 83.80~92.62                       | 5                   | 119.4                                     | 253.8               | 2                                 |
| 30KPA78A       | 30KPA78CA     | 78.0                      | 87.10~96.27                       | 5                   | 129.0                                     | 234.9               | 2                                 |
| 30KPA84A       | 30KPA84CA     | 84.0                      | 93.80~103.67                      | 5                   | 139.2                                     | 217.7               | 2                                 |
| 30KPA90A       | 30KPA90CA     | 90.0                      | 100.50~111.08                     | 5                   | 146.4                                     | 207.0               | 2                                 |
| 30KPA96A       | 30KPA96CA     | 96.0                      | 107.20~118.48                     | 5                   | 156.0                                     | 194.2               | 2                                 |

| Part Number    |               | Reverse Stand-Off Voltage | Breakdown Voltage @ $I_T$ | Test Current | Maximum Clamping Voltage @ $I_{PP}$ | Peak Pulse Current | Reverse Leakage @ $V_{RWM}$ |
|----------------|---------------|---------------------------|---------------------------|--------------|-------------------------------------|--------------------|-----------------------------|
| Unidirectional | Bidirectional | $V_{RWM}(V)$              | $V_{BR}(V)$               | $I_T(mA)$    | $V_C(V)$                            | $I_{PP}(A)$        | $I_R(\mu A)$                |
| 30KPA102A      | 30KPA102CA    | 102.0                     | 113.90~125.89             | 5            | 165.6                               | 183.0              | 2                           |
| 30KPA108A      | 30KPA108CA    | 108.0                     | 120.60~133.29             | 5            | 175.2                               | 172.9              | 2                           |
| 30KPA120A      | 30KPA120CA    | 120.0                     | 134.00~148.11             | 5            | 194.4                               | 155.9              | 2                           |
| 30KPA132A      | 30KPA132CA    | 132.0                     | 147.40~162.92             | 5            | 213.0                               | 142.3              | 2                           |
| 30KPA144A      | 30KPA144CA    | 144.0                     | 160.80~177.73             | 5            | 223.2                               | 135.8              | 2                           |
| 30KPA150A      | 30KPA150CA    | 150.0                     | 167.60~185.24             | 5            | 233.4                               | 129.8              | 2                           |
| 30KPA156A      | 30KPA156CA    | 156.0                     | 174.30~192.65             | 5            | 245.0                               | 123.7              | 2                           |
| 30KPA160A      | 30KPA160CA    | 160.0                     | 178.70~197.51             | 5            | 252.6                               | 120.0              | 2                           |
| 30KPA168A      | 30KPA168CA    | 168.0                     | 187.70~207.46             | 5            | 272.4                               | 111.2              | 2                           |
| 30KPA170A      | 30KPA170CA    | 170.0                     | 189.90~209.89             | 5            | 275.0                               | 110.2              | 2                           |
| 30KPA180A      | 30KPA180CA    | 180.0                     | 201.10~222.27             | 5            | 290.4                               | 104.3              | 2                           |
| 30KPA198A      | 30KPA198CA    | 198.0                     | 221.20~244.48             | 5            | 319.8                               | 94.7               | 2                           |
| 30KPA216A      | 30KPA216CA    | 216.0                     | 241.30~266.70             | 5            | 348.6                               | 86.9               | 2                           |
| 30KPA240A      | 30KPA240CA    | 240.0                     | 268.10~296.32             | 5            | 387.0                               | 78.3               | 2                           |
| 30KPA258A      | 30KPA258CA    | 258.0                     | 288.20~318.54             | 5            | 416.4                               | 72.8               | 2                           |
| 30KPA260A      | 30KPA260CA    | 260.0                     | 290.40~320.97             | 5            | 416.0                               | 72.8               | 2                           |
| 30KPA270A      | 30KPA270CA    | 270.0                     | 301.60~333.35             | 5            | 436.2                               | 69.5               | 2                           |
| 30KPA280A      | 30KPA280CA    | 280.0                     | 312.80~345.73             | 5            | 464.0                               | 65.3               | 2                           |
| 30KPA288A      | 30KPA288CA    | 288.0                     | 321.70~355.56             | 5            | 469.9                               | 64.5               | 2                           |

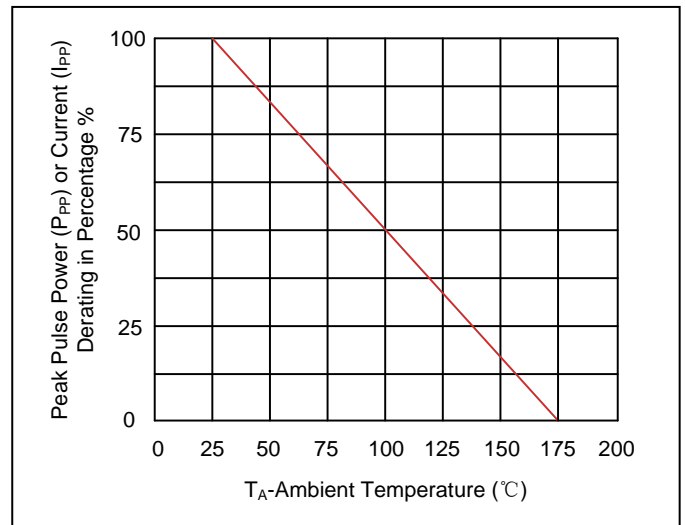
Notes: For bidirectional type having  $V_{RWM}$  of 60V and less, the  $I_R$  limit is double.

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

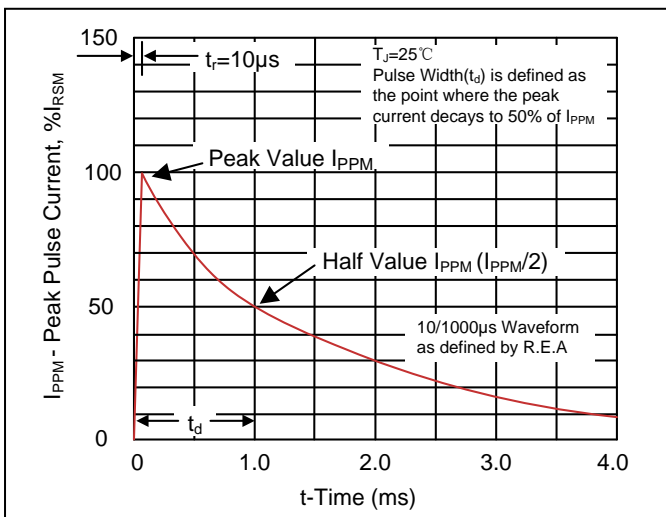
**Figure 1. Peak Pulse Power Rating Curve**



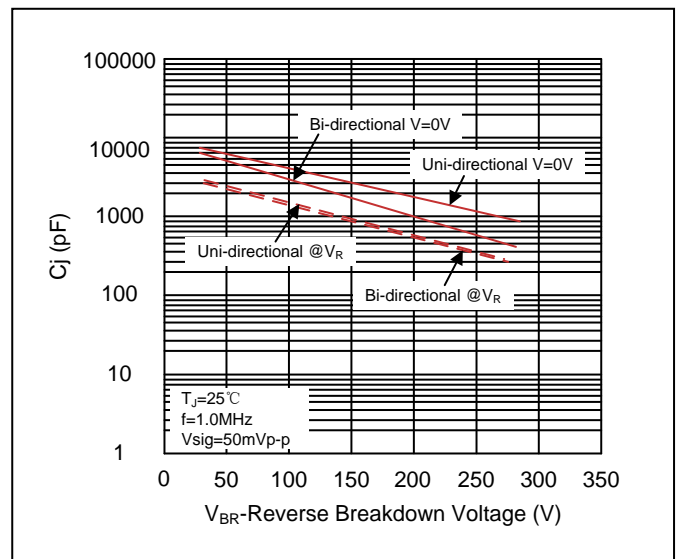
**Figure 2. Pulse Derating Curve**



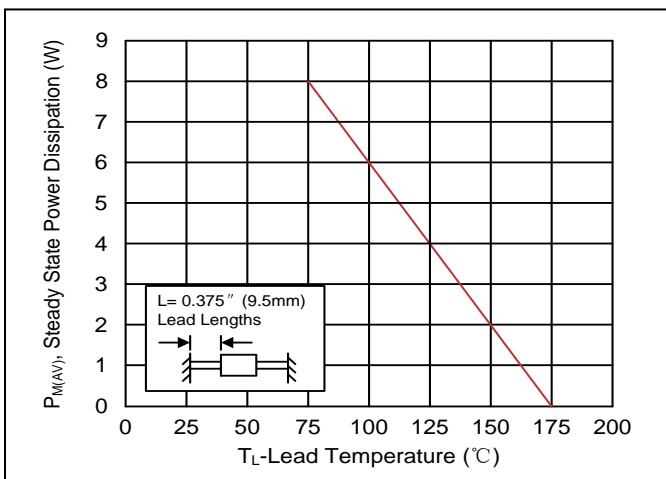
**Figure 3. Pulse Waveform**



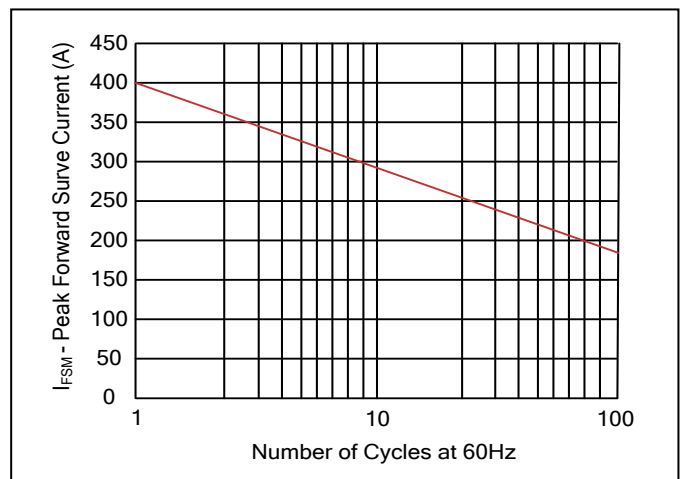
**Figure 4. AC Line Protection Application**



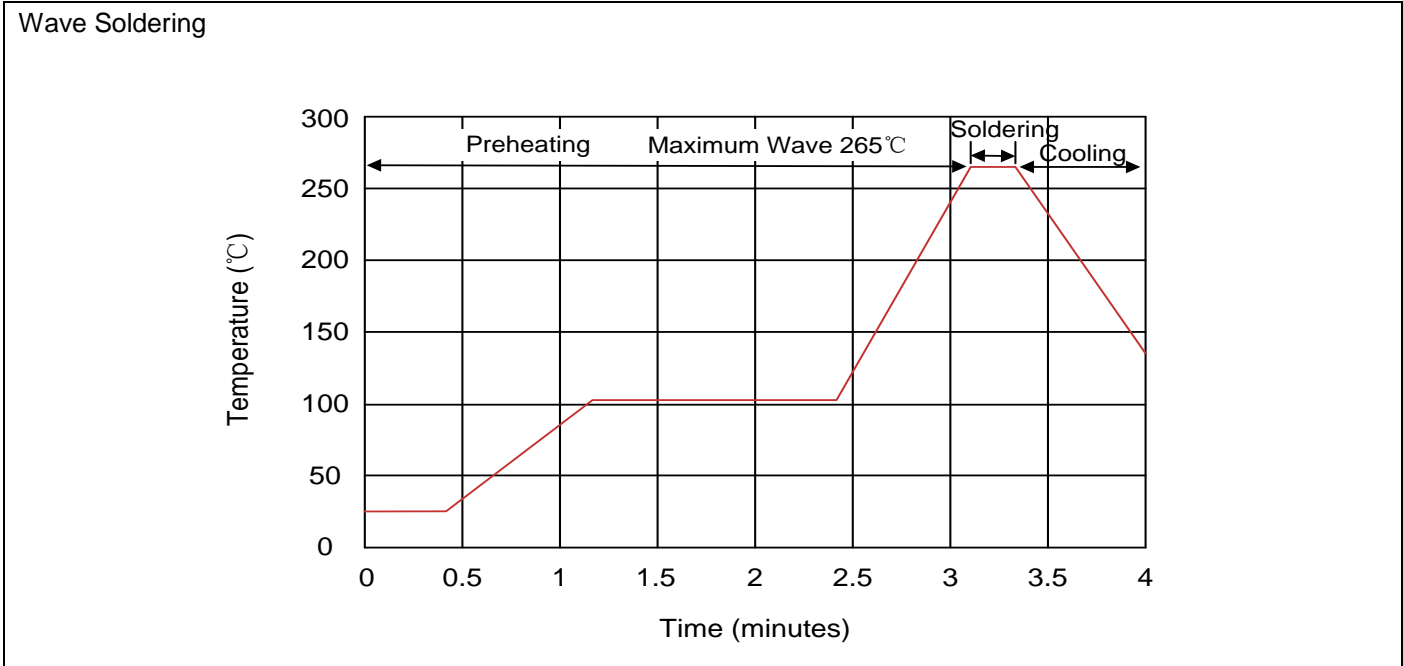
**Figure 5. Steady State Power Dissipation Derating Curve**



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



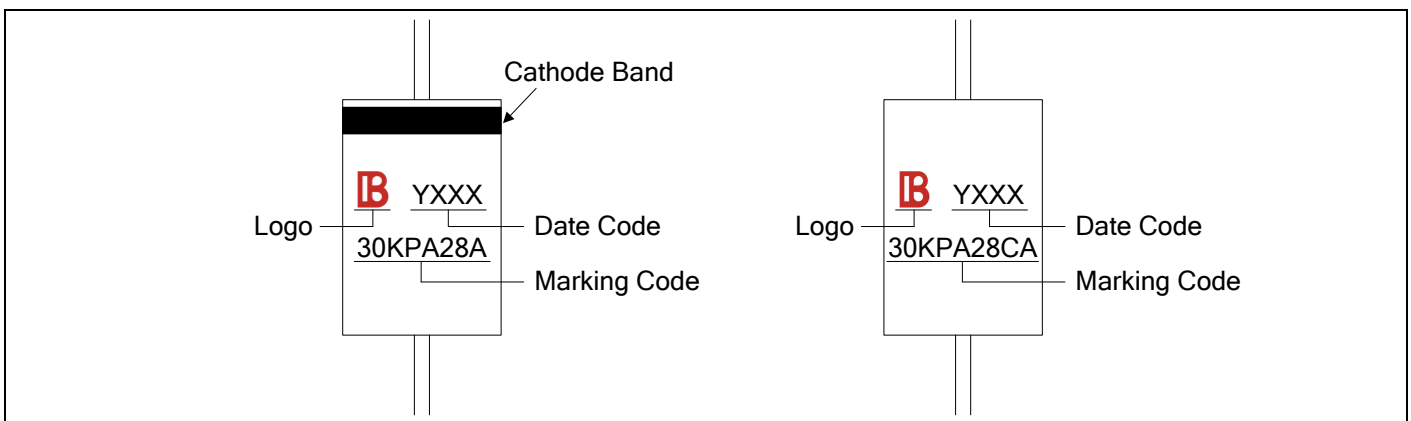
### Recommended Soldering Conditions



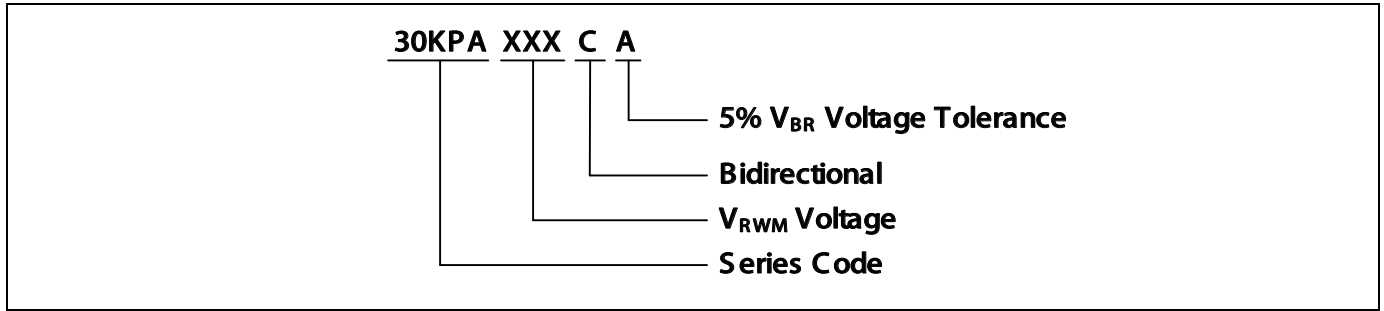
#### Recommended Conditions

| Item             | Conditions |
|------------------|------------|
| Peak Temperature | 265°C      |
| Dipping Time     | 10 seconds |
| Soldering        | 1 time     |

### Marking Code



**Part Number Code**



**Ordering Code for Different Package**

Box package: Add suffix “/B” at the end of the part number, such as 30KPA75A/B

Reel package: Add suffix “/TR13” at the end of the part number, such as 30KPA160CA/TR13

**Packaging**

| Tape            |  | Symbol           | Dimension (mm) |
|-----------------|--|------------------|----------------|
|                 |  | A                | 10.0±0.5       |
|                 |  | B                | 53.0±1.0       |
|                 |  | Z                | 1.2Max.        |
|                 |  | T                | 6.0±0.4        |
|                 |  | E                | 0.8Max.        |
|                 |  | L1-L2            | 1.0Max.        |
|                 |  | L                | 250.0±5.0      |
| <b>Box</b><br>  |  | W                | 75.0±5.0       |
|                 |  | H                | 114.0±5.0      |
|                 |  | Quantity: 300PCS |                |
| <b>Reel</b><br> |  | D                | 330.0±3.0      |
|                 |  | D0               | 16.4±2.0       |
|                 |  | D1               | 86.0±2.0       |
|                 |  | W1               | 76.0±3.0       |
|                 |  | Quantity: 800PCS |                |

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