

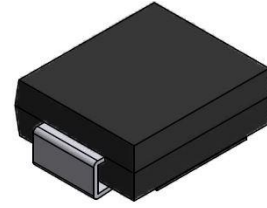
Transient Voltage Suppressor

Version: A7 2020/08/12

Features

- IEC 61000-4-2(ESD) $\pm 15KV$ (air), $\pm 8KV$ (contact)
- 3000Watts peak pulse power ($t_p=10/1000\mu S$)
- Quick response to surge voltage
- Low clamping voltage
- Moisture sensitivity level: Level 1
- Molding compound meets UL 94 V-0 flammability rating
- EFT protection of data lines in accordance with IEC 61000-4-4(IEC801-4)

Exterior



DO-214AB (SMC)

Application Information

- DC Port
- RS485/232/422
- I/O Port

Agency Approvals

| Icon | Description |
|-------------|------------------------------------|
| RoHS | Compliance with 2011/65/EU |
| HF | Compliance with IEC61249-2-21:2003 |
| UL | UL Certificated E232249 |

Schematic symbol



BI-directional



UNI-directional

Part Number and Electrical Parameter

| Part Number | | Marking | | V_R (V) | V_{BR} min.(V) | V_{BR} max.(V) | I_t (mA) | Max $V_C@I_{PP}^{\text{①}}$ (V) | $I_{PP}^{\text{①}}$ (A) | $I_R@V_R$ (uA) |
|--------------|-------------|---------|------|-----------|------------------|------------------|------------|---------------------------------|-------------------------|----------------|
| BI | UNI | BI | UNI | | | | | | | |
| BV-SMDJ5CA | BV-SMDJ5A | D5C | D5 | 5 | 6.4 | 7 | 10 | 9.2 | 326.1 | 800 |
| BV-SMDJ6CA | BV-SMDJ6A | D6C | D6 | 6 | 6.67 | 7.37 | 10 | 10.3 | 291.3 | 800 |
| BV-SMDJ6.5CA | BV-SMDJ6.5A | D6.5C | D6.5 | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 267.9 | 500 |
| BV-SMDJ7CA | BV-SMDJ7A | D7C | D7 | 7 | 7.78 | 8.6 | 10 | 12 | 250.0 | 200 |
| BV-SMDJ7.5CA | BV-SMDJ7.5A | D7.5C | D7.5 | 7.5 | 8.33 | 9.21 | 1 | 12.9 | 232.6 | 100 |
| BV-SMDJ8CA | BV-SMDJ8A | D8C | D8 | 8 | 8.89 | 9.83 | 1 | 13.6 | 220.6 | 50 |
| BV-SMDJ8.5CA | BV-SMDJ8.5A | D8.5C | D8.5 | 8.5 | 9.44 | 10.4 | 1 | 14.4 | 208.3 | 20 |
| BV-SMDJ9CA | BV-SMDJ9A | D9C | D9 | 9 | 10 | 11.1 | 1 | 15.4 | 194.8 | 10 |
| BV-SMDJ10CA | BV-SMDJ10A | D10C | D10 | 10 | 11.1 | 12.3 | 1 | 17 | 176.5 | 5 |
| BV-SMDJ11CA | BV-SMDJ11A | D11C | D11 | 11 | 12.2 | 13.5 | 1 | 18.2 | 164.8 | 2 |
| BV-SMDJ12CA | BV-SMDJ12A | D12C | D12 | 12 | 13.3 | 14.7 | 1 | 19.9 | 150.8 | 1 |
| BV-SMDJ13CA | BV-SMDJ13A | D13C | D13 | 13 | 14.4 | 15.9 | 1 | 21.5 | 139.5 | 1 |
| BV-SMDJ14CA | BV-SMDJ14A | D14C | D14 | 14 | 15.6 | 17.2 | 1 | 23.2 | 129.3 | 1 |
| BV-SMDJ15CA | BV-SMDJ15A | D15C | D15 | 15 | 16.7 | 18.5 | 1 | 24.4 | 123.0 | 1 |
| BV-SMDJ16CA | BV-SMDJ16A | D16C | D16 | 16 | 17.8 | 19.7 | 1 | 26 | 115.4 | 1 |
| BV-SMDJ17CA | BV-SMDJ17A | D17C | D17 | 17 | 18.9 | 20.9 | 1 | 27.6 | 108.7 | 1 |
| BV-SMDJ18CA | BV-SMDJ18A | D18C | D18 | 18 | 20 | 22.1 | 1 | 29.2 | 102.7 | 1 |

| Part Number | | Marking | | V _R (V) | V _{BR} min.(V) | V _{BR} max.(V) | I _t (mA) | MaxVc@ I _{PP} ^① (V) | I _{PP} ^① (A) | I _R @V _R (uA) |
|--------------|-------------|---------|------|--------------------|----------------------------|----------------------------|------------------------|--|----------------------------------|--|
| BI | UNI | BI | UNI | | | | | | | |
| BV-SMDJ20CA | BV-SMDJ20A | D20C | D20 | 20 | 22.2 | 24.5 | 1 | 32.4 | 92.6 | 1 |
| BV-SMDJ22CA | BV-SMDJ22A | D22C | D22 | 22 | 24.4 | 26.9 | 1 | 35.5 | 84.5 | 1 |
| BV-SMDJ24CA | BV-SMDJ24A | D24C | D24 | 24 | 26.7 | 29.5 | 1 | 38.9 | 77.1 | 1 |
| BV-SMDJ26CA | BV-SMDJ26A | D26C | D26 | 26 | 28.9 | 31.9 | 1 | 42.1 | 71.3 | 1 |
| BV-SMDJ28CA | BV-SMDJ28A | D28C | D28 | 28 | 31.1 | 34.4 | 1 | 45.4 | 66.1 | 1 |
| BV-SMDJ30CA | BV-SMDJ30A | D30C | D30 | 30 | 33.3 | 36.8 | 1 | 48.4 | 62.0 | 1 |
| BV-SMDJ33CA | BV-SMDJ33A | D33C | D33 | 33 | 36.7 | 40.6 | 1 | 53.3 | 56.3 | 1 |
| BV-SMDJ36CA | BV-SMDJ36A | D36C | D36 | 36 | 40 | 44.2 | 1 | 58.1 | 51.6 | 1 |
| BV-SMDJ40CA | BV-SMDJ40A | D40C | D40 | 40 | 44.4 | 49.1 | 1 | 64.5 | 46.5 | 1 |
| BV-SMDJ43CA | BV-SMDJ43A | D43C | D43 | 43 | 47.8 | 52.8 | 1 | 69.4 | 43.2 | 1 |
| BV-SMDJ45CA | BV-SMDJ45A | D45C | D45 | 45 | 50 | 55.3 | 1 | 72.7 | 41.3 | 1 |
| BV-SMDJ48CA | BV-SMDJ48A | D48C | D48 | 48 | 53.3 | 58.9 | 1 | 77.4 | 38.8 | 1 |
| BV-SMDJ51CA | BV-SMDJ51A | D51C | D51 | 51 | 56.7 | 62.7 | 1 | 82.4 | 36.4 | 1 |
| BV-SMDJ54CA | BV-SMDJ54A | D54C | D54 | 54 | 60 | 66.3 | 1 | 87.1 | 34.4 | 1 |
| BV-SMDJ58CA | BV-SMDJ58A | D58C | D58 | 58 | 64.4 | 71.2 | 1 | 93.6 | 32.1 | 1 |
| BV-SMDJ60CA | BV-SMDJ60A | D60C | D60 | 60 | 66.7 | 73.7 | 1 | 96.8 | 31.0 | 1 |
| BV-SMDJ64CA | BV-SMDJ64A | D64C | D64 | 64 | 71.1 | 78.6 | 1 | 103 | 29.1 | 1 |
| BV-SMDJ70CA | BV-SMDJ70A | D70C | D70 | 70 | 77.8 | 86 | 1 | 113 | 26.5 | 1 |
| BV-SMDJ75CA | BV-SMDJ75A | D75C | D75 | 75 | 83.3 | 92.1 | 1 | 121 | 24.8 | 1 |
| BV-SMDJ78CA | BV-SMDJ78A | D78C | D78 | 78 | 86.7 | 95.8 | 1 | 126 | 23.8 | 1 |
| BV-SMDJ85CA | BV-SMDJ85A | D85C | D85 | 85 | 94.4 | 104 | 1 | 137 | 21.9 | 1 |
| BV-SMDJ90CA | BV-SMDJ90A | D90C | D90 | 90 | 100 | 111 | 1 | 146 | 20.5 | 1 |
| BV-SMDJ100CA | BV-SMDJ100A | D100C | D100 | 100 | 111 | 123 | 1 | 162 | 18.5 | 1 |
| BV-SMDJ110CA | BV-SMDJ110A | D110C | D110 | 110 | 122 | 135 | 1 | 177 | 16.9 | 1 |
| BV-SMDJ120CA | BV-SMDJ120A | D120C | D120 | 120 | 133 | 147 | 1 | 193 | 15.5 | 1 |
| BV-SMDJ130CA | BV-SMDJ130A | D130C | D130 | 130 | 144 | 159 | 1 | 209 | 14.4 | 1 |
| BV-SMDJ150CA | BV-SMDJ150A | D150C | D150 | 150 | 167 | 185 | 1 | 243 | 12.3 | 1 |
| BV-SMDJ160CA | BV-SMDJ160A | D160C | D160 | 160 | 178 | 197 | 1 | 259 | 11.6 | 1 |
| BV-SMDJ170CA | BV-SMDJ170A | D170C | D170 | 170 | 189 | 209 | 1 | 275 | 10.9 | 1 |

Note: absolute maximum ratings measured at T= 25°C RH = 45%-75% (unless otherwise noted).

① Surge Waveform: 10/1000μS

Mark



BI:DXXC



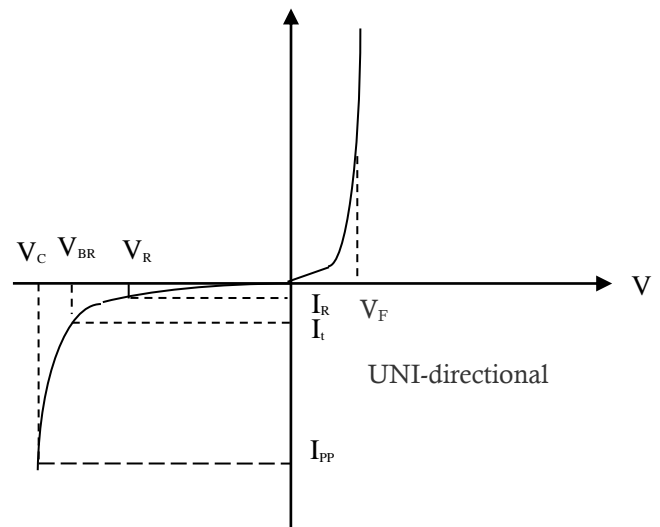
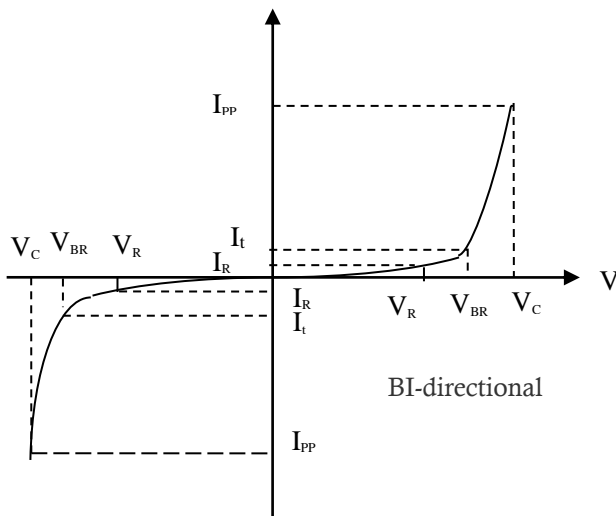
UNI:DXX

Part Number System

BV SMDJ XX C A
(1) (2) (3) (4) (5)

- (1) Bencent Transient Voltage Suppressor
- (2) Series Code
- (3) $V_R=XXV$
- (4) BI-directional
- (5) Suffix 'A' denotes 5% tolerance devices

V-I Curve



| Parameters | Definition |
|------------|--|
| V_F | Forward Voltage drop for UNI-directional |
| V_C | Clamping Voltage |
| I_{pp} | Surge Waveform 10/1000 μ s |
| V_R | Stand-off Voltage |
| V_{BR} | Breakdown Voltage |
| I_R | Reverse Leakage Current |
| I_t | Test Current |
| P_{pp} | Peak Pulse Power Dissipation |

Thermal Considerations

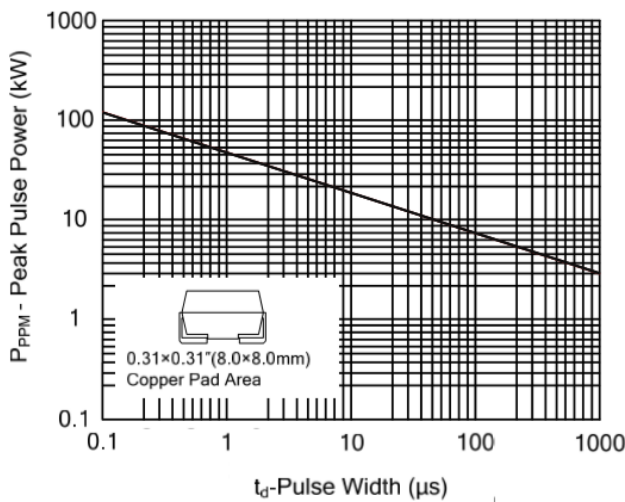
| symbol | Parameter | Value | Unit |
|-----------|---|-------------|------|
| T_J | Operating Junction Temperature Range | -55 to +150 | °C |
| T_S | Storage Temperature Range | -55 to +150 | °C |
| VF | Maximum Instantaneous Forward; Voltage at 100A for Unidirectional Only (Note 1) | 3.5/5 | V |
| I_{FSM} | Peak Forward Surge Current, 8.3ms;Single Half Sine Wave (Note 2) | 300 | A |

Notes:

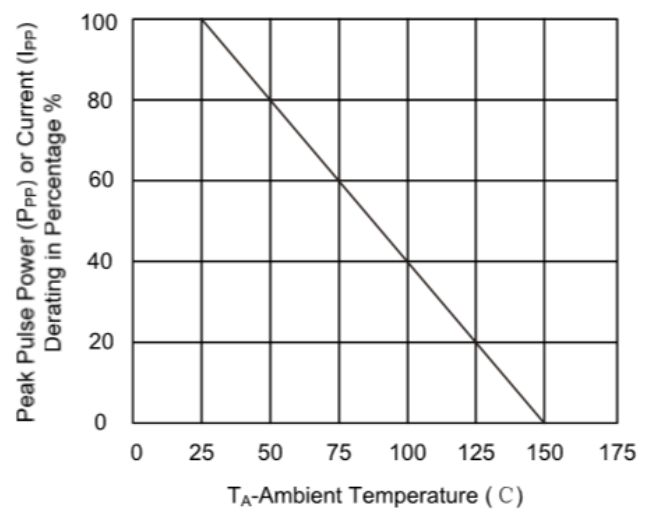
1. VF < 3.5V for single die parts and VF < 5.0V for stacked-die parts.
2. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.

Typical Characteristics

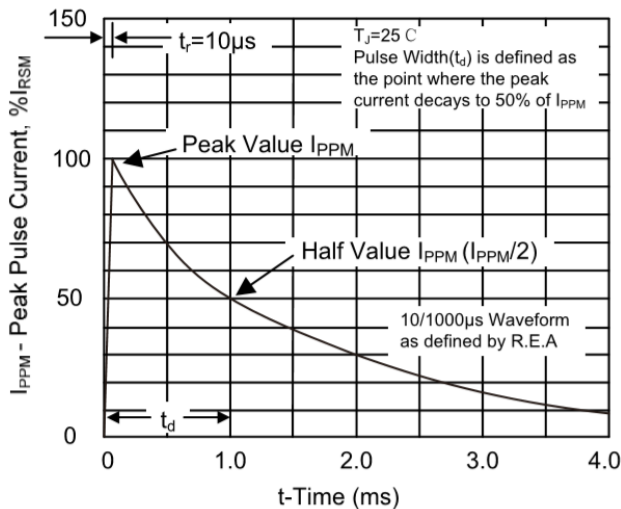
Peak Pulse Power Rating Curve



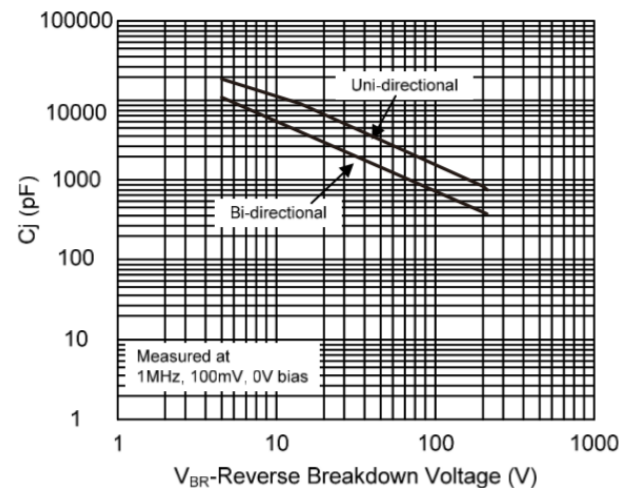
Pulse Derating Curve



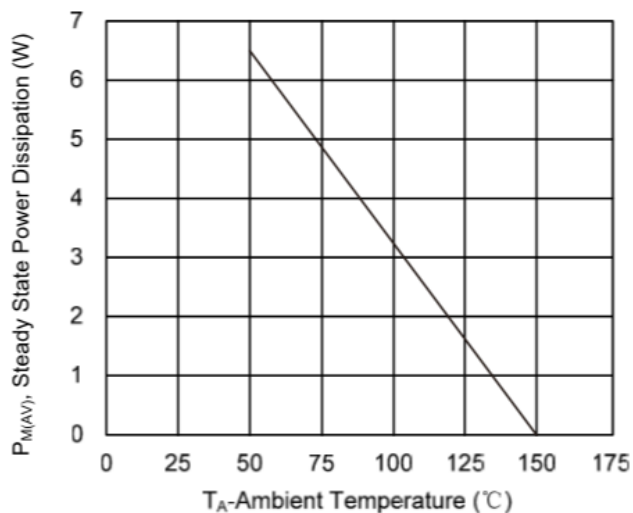
Pulse Waveform



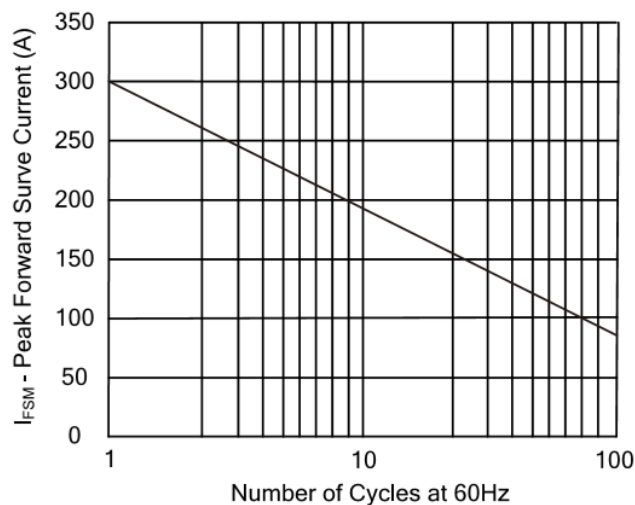
Typical Junction Capacitance



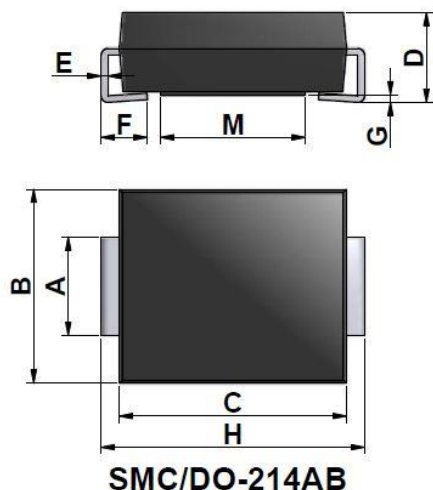
Steady State Power Dissipation Derating Curve



Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

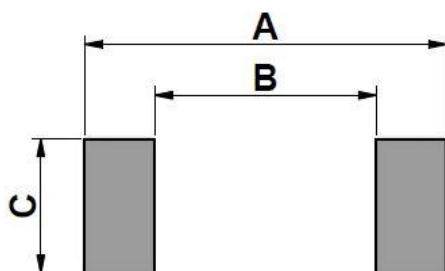


Product Dimensions



| REF | mm | inch |
|-----|----------------|--------------------|
| A | 3 ± 0.1 | 0.118 ± 0.004 |
| B | 5.9 ± 0.3 | 0.232 ± 0.012 |
| C | 7 ± 0.2 | 0.276 ± 0.008 |
| D | 2.6 ± 0.35 | 0.102 ± 0.014 |
| E | 0.2 ± 0.1 | 0.008 ± 0.004 |
| F | 1.3 ± 0.4 | 0.051 ± 0.016 |
| G | $0 \sim 0.4$ | $0.000 \sim 0.016$ |
| H | 8 ± 0.3 | 0.315 ± 0.012 |
| M | 4.4 ± 0.2 | 0.173 ± 0.008 |

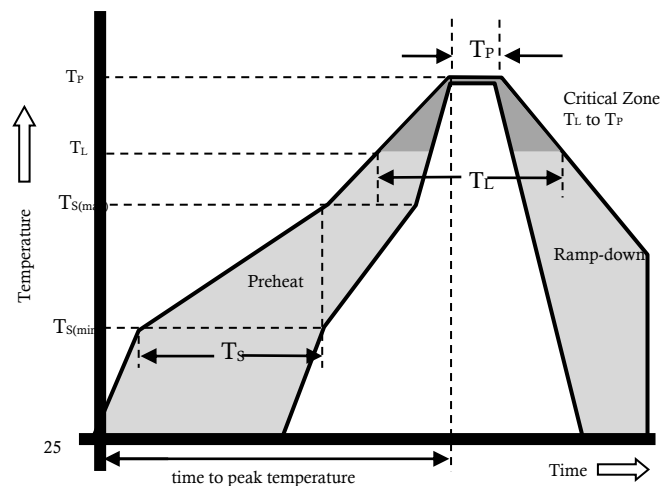
Recommended Soldering Pad



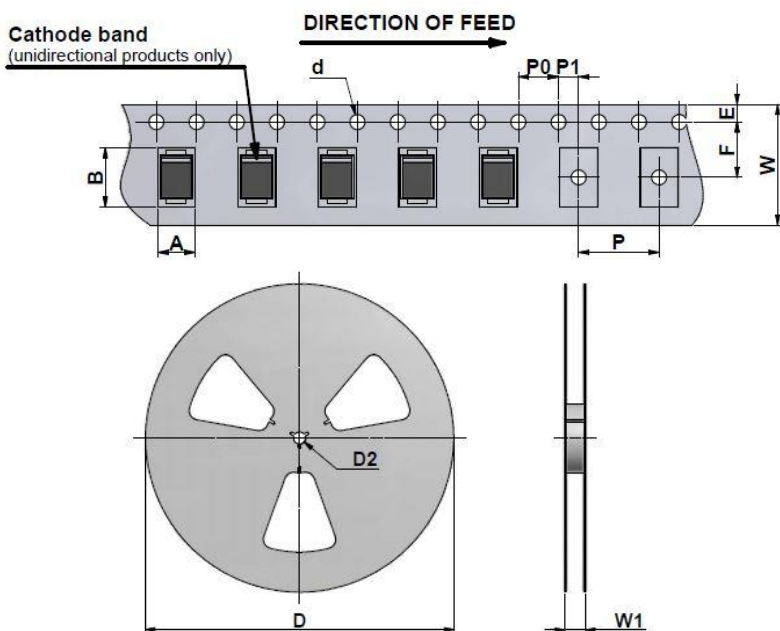
| REF | mm | inch |
|-----|------|-------|
| A | 8.25 | 0.325 |
| B | 5.05 | 0.199 |
| C | 3.05 | 0.120 |

Reflow Profile

| Reflow Condition | | Pb-Free Assembly |
|--|--|------------------|
| Pre Heat | Temperature Min. | +150°C |
| | Temperature Max. | +200°C |
| | Time(Min to Max) | 60 – 180 seconds |
| Average ramp up rate (Liquidus Temp (T _L) to peak) | | 3°C/second max |
| T _{S(max)} to T _L - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature (T _L) (Liquidus) | 217°C |
| | - Temperature (T _L) | 60 – 150 seconds |
| Peak Temp (T _P) | | 260+0/-5 °C |
| Time within 5°C of actual Peak Temp (T _P) | | 8-15 seconds |
| Ramp-down Rate | | 6°C/s max |
| Time 25°C to peak Temp (T _P) | | 8 min max. |
| Do not exceed | | 260°C |



Package Reel Information



| REF. | mm | inch |
|------|---------|-------------|
| A | 6.1±0.3 | 0.240±0.012 |
| B | 8.3±0.3 | 0.327±0.012 |
| d | 1.5±0.1 | 0.059±0.004 |
| D | 330.0 | 13.0 |
| D2 | 13±1.5 | 0.512±0.059 |
| E | 1.7±0.3 | 0.067±0.012 |
| F | 7.5±0.3 | 0.295±0.012 |
| P | 8±0.3 | 0.315±0.012 |
| P0 | 4±0.3 | 0.157±0.012 |
| P1 | 2±0.3 | 0.079±0.012 |
| W | 16±0.5 | 0.630±0.020 |
| W1 | 23±3 | 0.906±0.118 |

| Outline | Reel (pcs) | Per Carton (pcs) | Reel Diameters (mm) | Carton Size(mm) | | |
|---------|------------|------------------|---------------------|-----------------|-----|-----|
| | | | | L | W | H |
| Taping | 3,000 | 48,000 | 330 | 360 | 360 | 385 |