## »Features

- Excellent clamping capability
- Low leakage current
- Low capacitance
- High surge capability
- Glass passivated chip
- Epoxy resin package
- Built-in strain relief
- Will not fatigue
- RoHS Compliant
- Fast response time:
  typically less than 1.0ps from 0 Volts to $V_{BR}$ min



SMC (DO-214AB)

## »Mechanical Characteristics

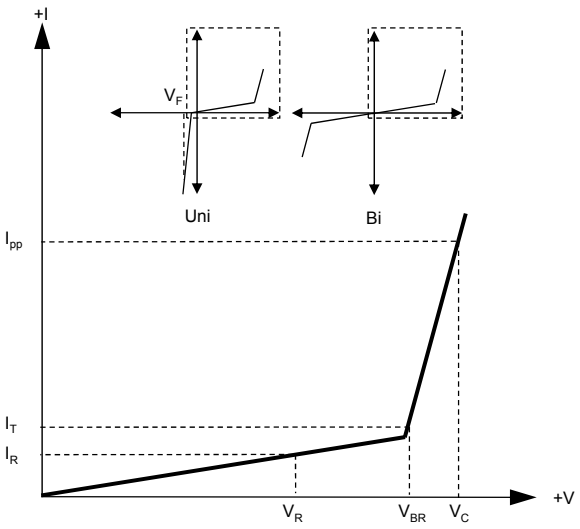
- Package: SMC plastic package.
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

## »Applications

- Telecom
- Computer
- Industrial electronic
- Consumer electronic

## »Electrical Parameters

| Parameter | Definition |
|---|---|
| $C_J$ | Junction Capacitance - typical capacitance measured with 0V or $V_R$ bias |
| $I_{PP}$ | Peak Pulse Current - maximum rated peak impulse current |
| $V_C$ | Clamping Voltage - Peak voltage measured across the suppressor at a specified Ippm (peak impulse current) |
| $V_{BR}$ | Breakdown Voltage - Maximum voltage that flows though the TVS at a specified test current ($I_T$) |
| $I_R$ | Leakage Current - maximum peak off-state current measured at $V_R$ |
| $V_R$ | Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state |




## »Summary of Packing Options

| Package | Packing Description | Packing Quantity | Industry Standard |
|---|---|---|---|
| SMC | Tape/Reel,13" reel | 3000 | EIA-481-1 |
| | Tape/Reel,7" reel | 500 | EIA-481-1 |

## »Absolute Maximum Ratings ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Units | Remarks |
|---|---|---|---|---|
| Peak Pulse Power Dissipation | $P_{PPM}$ | 3000 | W | (Note1)(Note2) |
| Steady State Power Dissipation | $P_D$ | 6.5 | W | (Note3) |
| Peak Forward Surge Current | $I_{FSM}$ | 300 | A | (Note4) |
| Maximum Instantaneous Forward Voltage at 100A | $V_{FM}$ | 3.5/5 | V | (Note5) |
| Typical Thermal Resistance Junction to Lead | $R_{\theta JL}$ | 15 | ℃/W | |
| Typical Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 75 | ℃/W | |
| Operating Temperature Range | $T_J$ | -55 to 150 | ℃ | |
| Storage Temperature Range | $T_{STG}$ | -55 to 150 | ℃ | |

Notes1: Non-repetitive current pulse , 10/1000us Waveform.

Notes2: Mounted on copper pad area of 8×8mm to each terminal.

Notes3: Infinite HeatSink at $T_A$=50°C

Notes4: Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.

Notes5: For UnidirectionalOnly, $V_{FM}$<3.5V for $V_{BR}$ ≤200V and $V_{FM}$<5.0V for $V_{BR}$≥201V.

## »Electrical Characteristics ($T_A$=25°C unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Marking Code | | Reverse Stand off Voltage $V_R$ (V) | Breakdown Voltage $V_{BR}$ @ $I_T$ (V) | | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$@ $I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximun Reverse Leakage $I_R$ @ $V_R$ (μA) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Uni | Bi | | Min | Max | | | | |
| SMDJ5.0A | SMDJ5.0CA | HDE | IDE | 5 | 6.4 | 7 | 10 | 9.2 | 326.1 | 800 |
| SMDJ6.0A | SMDJ6.0CA | HDG | IDG | 6 | 6.67 | 7.37 | 10 | 10.3 | 291.3 | 800 |
| SMDJ6.5A | SMDJ6.5CA | HDK | IDK | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 267.9 | 500 |
| SMDJ7.0A | SMDJ7.0CA | HDM | IDM | 7 | 7.78 | 8.6 | 10 | 12 | 250 | 200 |
| SMDJ7.5A | SMDJ7.5CA | HDP | IDP | 7.5 | 8.33 | 9.21 | 1 | 12.9 | 232.6 | 100 |
| SMDJ8.0A | SMDJ8.0CA | HDR | IDR | 8 | 8.89 | 9.83 | 1 | 13.6 | 220.6 | 50 |
| SMDJ8.5A | SMDJ8.5CA | HDT | IDT | 8.5 | 9.44 | 10.4 | 1 | 14.4 | 208.3 | 20 |
| SMDJ9.0A | SMDJ9.0CA | HDV | IDV | 9 | 10 | 11.1 | 1 | 15.4 | 194.8 | 10 |
| SMDJ10A | SMDJ10CA | HDX | IDX | 10 | 11.1 | 12.3 | 1 | 17 | 176.5 | 5 |
| SMDJ11A | SMDJ11CA | HDZ | IDZ | 11 | 12.2 | 13.5 | 1 | 18.2 | 164.8 | 2 |
| SMDJ12A | SMDJ12CA | HEE | IEE | 12 | 13.3 | 14.7 | 1 | 19.9 | 150.8 | 2 |
| SMDJ13A | SMDJ13CA | HEG | IEG | 13 | 14.4 | 15.9 | 1 | 21.5 | 139.5 | 2 |
| SMDJ14A | SMDJ14CA | HEK | IEK | 14 | 15.6 | 17.2 | 1 | 23.2 | 129.3 | 2 |
| SMDJ15A | SMDJ15CA | HEM | IEM | 15 | 16.7 | 18.5 | 1 | 24.4 | 123 | 2 |
| SMDJ16A | SMDJ16CA | HEP | IEP | 16 | 17.8 | 19.7 | 1 | 26 | 115.4 | 2 |
| SMDJ17A | SMDJ17CA | HER | IER | 17 | 18.9 | 20.9 | 1 | 27.6 | 108.7 | 2 |
| SMDJ18A | SMDJ18CA | HET | IET | 18 | 20 | 22.1 | 1 | 29.2 | 102.7 | 2 |
| SMDJ20A | SMDJ20CA | PEV | IEV | 20 | 22.2 | 24.5 | 1 | 32.4 | 92.6 | 2 |
| SMDJ22A | SMDJ22CA | HEX | IEX | 22 | 24.4 | 26.9 | 1 | 35.5 | 84.5 | 2 |
| SMDJ24A | SMDJ24CA | HEZ | IEZ | 24 | 26.7 | 29.5 | 1 | 38.9 | 77.1 | 2 |

## »Electrical Characteristics ($T_A$=25°C unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Marking Code | | Reverse Stand off Voltage $V_R$ (V) | Breakdown Voltage $V_{BR}$ @ $I_T$ (V) | | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$@ $I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximun Reverse Leakage $I_R$ @ $V_R$ (μA) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Uni | Bi | | Min | Max | | | | |
| SMDJ26A | SMDJ26CA | HFE | IFE | 26 | 28.9 | 31.9 | 1 | 42.1 | 71.3 | 2 |
| SMDJ28A | SMDJ28CA | HFG | IFG | 28 | 31.1 | 34.4 | 1 | 45.4 | 66.1 | 2 |
| SMDJ30A | SMDJ30CA | HFK | IFK | 30 | 33.3 | 36.8 | 1 | 48.4 | 62 | 2 |
| SMDJ33A | SMDJ33CA | HFM | IFM | 33 | 36.7 | 40.6 | 1 | 53.3 | 56.3 | 2 |
| SMDJ36A | SMDJ36CA | HFP | IFP | 36 | 40 | 44.2 | 1 | 58.1 | 51.6 | 2 |
| SMDJ40A | SMDJ40CA | HFR | IFR | 40 | 44.4 | 49.1 | 1 | 64.5 | 46.5 | 2 |
| SMDJ43A | SMDJ43CA | HFT | IFT | 43 | 47.8 | 52.8 | 1 | 69.4 | 43.2 | 2 |
| SMDJ45A | SMDJ45CA | HFV | IFV | 45 | 50 | 55.3 | 1 | 72.7 | 41.3 | 2 |
| SMDJ48A | SMDJ48CA | HFX | IFX | 48 | 53.3 | 58.9 | 1 | 77.4 | 38.8 | 2 |
| SMDJ51A | SMDJ51CA | HFZ | IFZ | 51 | 56.7 | 62.7 | 1 | 82.4 | 36.4 | 2 |
| SMDJ54A | SMDJ54CA | HGE | IGE | 54 | 60 | 66.3 | 1 | 87.1 | 34.4 | 2 |
| SMDJ58A | SMDJ58CA | HGG | IGG | 58 | 64.4 | 71.2 | 1 | 93.6 | 32.1 | 2 |
| SMDJ60A | SMDJ60CA | HGK | IGK | 60 | 66.7 | 73.7 | 1 | 96.8 | 31 | 2 |
| SMDJ64A | SMDJ64CA | HGM | IGM | 64 | 71.1 | 78.6 | 1 | 103 | 29.1 | 2 |
| SMDJ70A | SMDJ70CA | HGP | IGP | 70 | 77.8 | 86 | 1 | 113 | 26.5 | 2 |
| SMDJ75A | SMDJ75CA | HGR | IGR | 75 | 83.3 | 92.1 | 1 | 121 | 24.8 | 2 |
| SMDJ78A | SMDJ78CA | HGT | IGT | 78 | 86.7 | 95.8 | 1 | 126 | 23.8 | 2 |
| SMDJ85A | SMDJ85CA | HGV | IGV | 85 | 94.4 | 104 | 1 | 137 | 21.9 | 2 |
| SMDJ90A | SMDJ90CA | HGX | IGX | 90 | 100 | 111 | 1 | 146 | 20.5 | 2 |
| SMDJ100A | SMDJ100CA | HGZ | IGZ | 100 | 111 | 123 | 1 | 162 | 18.5 | 2 |
| SMDJ110A | SMDJ110CA | HHE | IHE | 110 | 122 | 135 | 1 | 177 | 16.9 | 2 |
| SMDJ120A | SMDJ120CA | HHG | IHG | 120 | 133 | 147 | 1 | 193 | 15.5 | 2 |
| SMDJ130A | SMDJ130CA | HHK | IHK | 130 | 144 | 159 | 1 | 209 | 14.4 | 2 |
| SMDJ150A | SMDJ150CA | HHM | IHM | 150 | 167 | 185 | 1 | 243 | 12.3 | 2 |
| SMDJ160A | SMDJ160CA | HHP | IHP | 160 | 178 | 197 | 1 | 259 | 11.6 | 2 |
| SMDJ170A | SMDJ170CA | HHR | IHR | 170 | 189 | 209 | 1 | 275 | 10.9 | 2 |
| SMDJ180A | SMDJ180CA | HHT | IHT | 180 | 198 | 230.4 | 1 | 292 | 10.3 | 2 |
| SMDJ220A | SMDJ220CA | HIE | IIE | 220 | 242 | 281.6 | 1 | 356 | 8.4 | 2 |

## »Rating And Characteristic Curves ($T_A$=25°C unless otherwise noted)

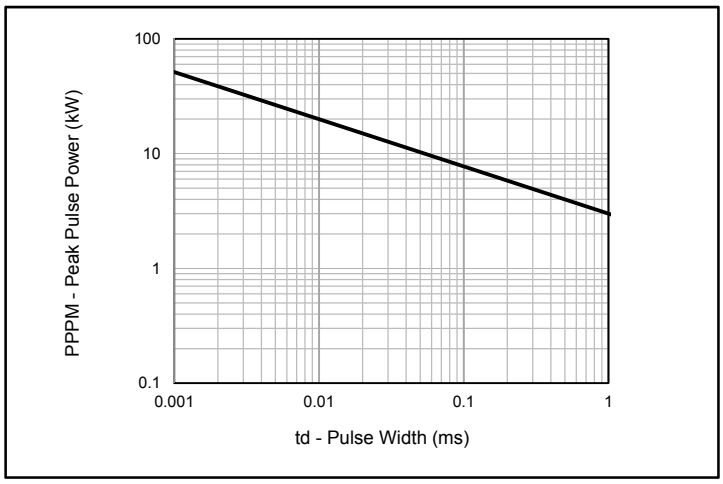



Fig.1 - Peak Pulse Power Rating

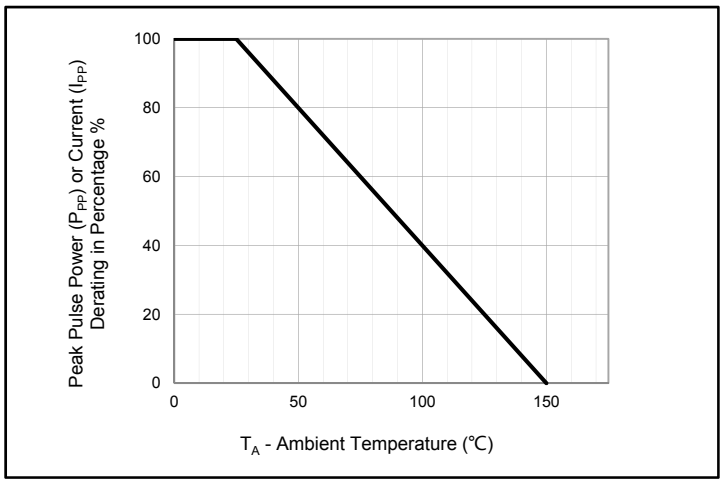



Fig.2 - Pulse Derating Curve

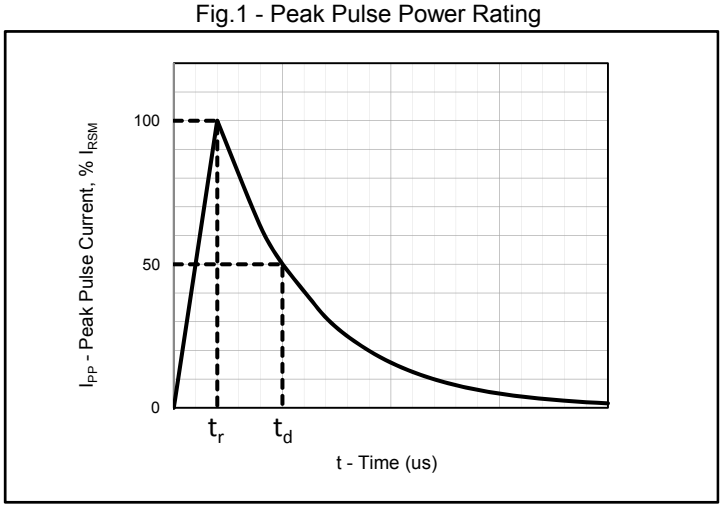



Fig.3 - Pulse Waveform

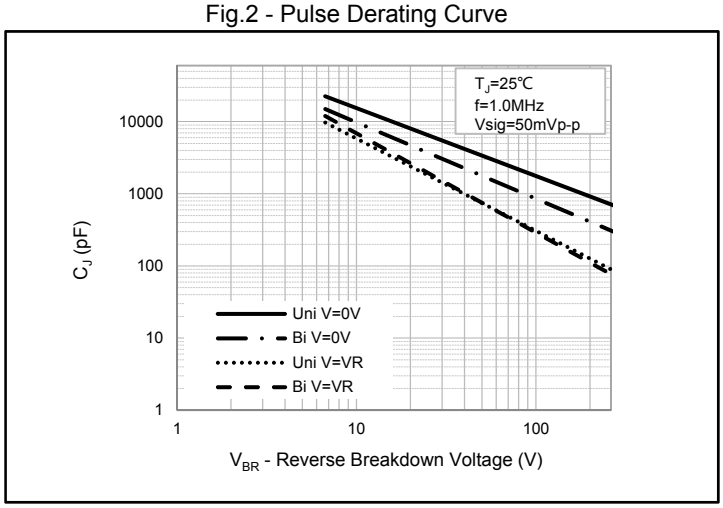



Fig.4 - Typical Junction Capacitance

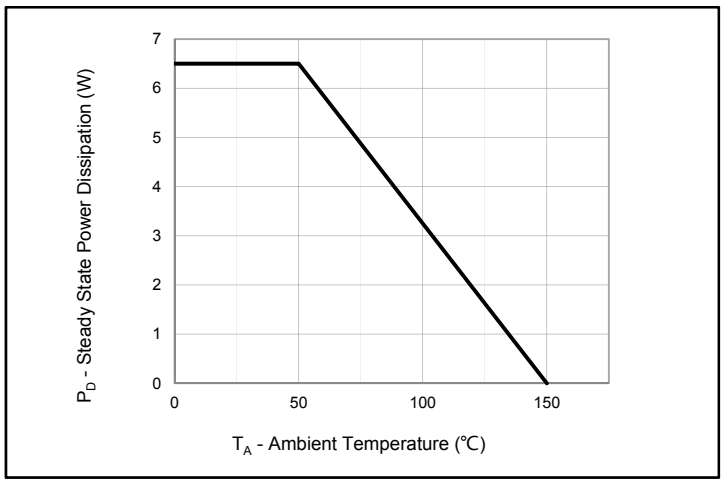



Fig.5 - Steady State Power Dissipation Derating Curve

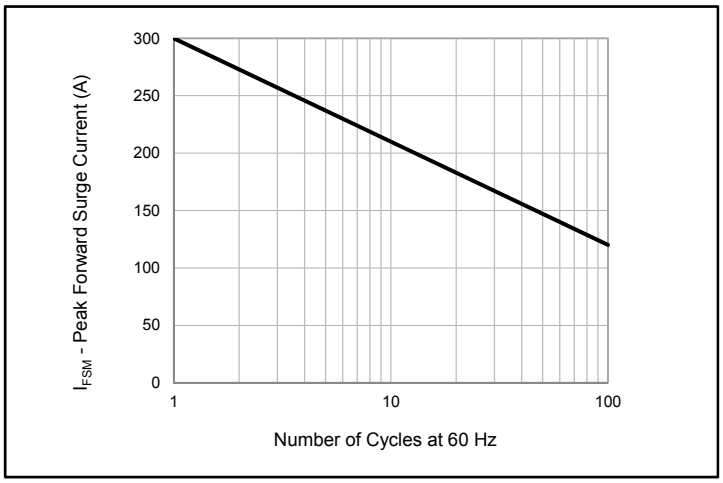
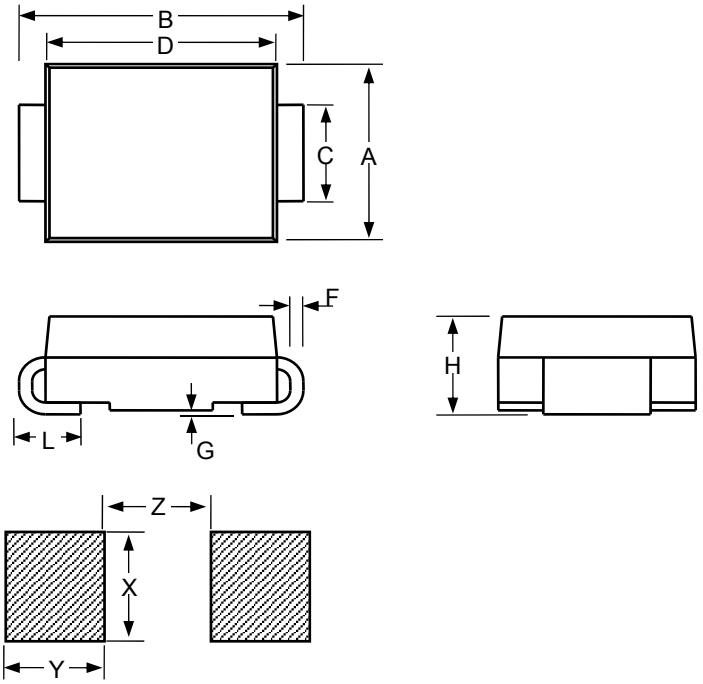


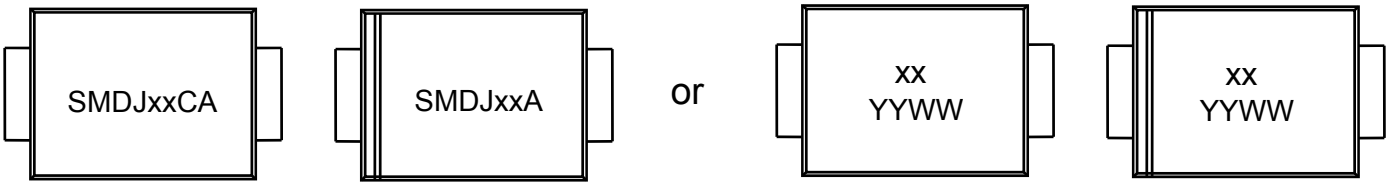

Fig.6 - Maximum Non-Repetitive Peak Forward Surge Current
Uni-Directional Only

## »Package Dimensions




| SMC | | | | | | |
|---|---|---|---|---|---|---|
| Dimension | Inches | | | Millimeters | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.22 | | 0.245 | 5.59 | | 6.22 |
| B | 0.305 | | 0.32 | 7.75 | | 8.13 |
| C | 0.114 | | 0.126 | 2.9 | | 3.2 |
| D | 0.26 | | 0.28 | 6.6 | | 7.11 |
| F | 0.006 | | 0.012 | 0.15 | | 0.305 |
| G | - | | 0.008 | - | | 0.203 |
| H | 0.087 | | 0.11 | 2.2 | | 2.8 |
| L | 0.03 | | 0.06 | 0.76 | | 1.52 |
| X | | 0.15 | | | 3.82 | |
| Y | | 0.119 | | | 3.03 | |
| Z | | 0.151 | | | 3.84 | |

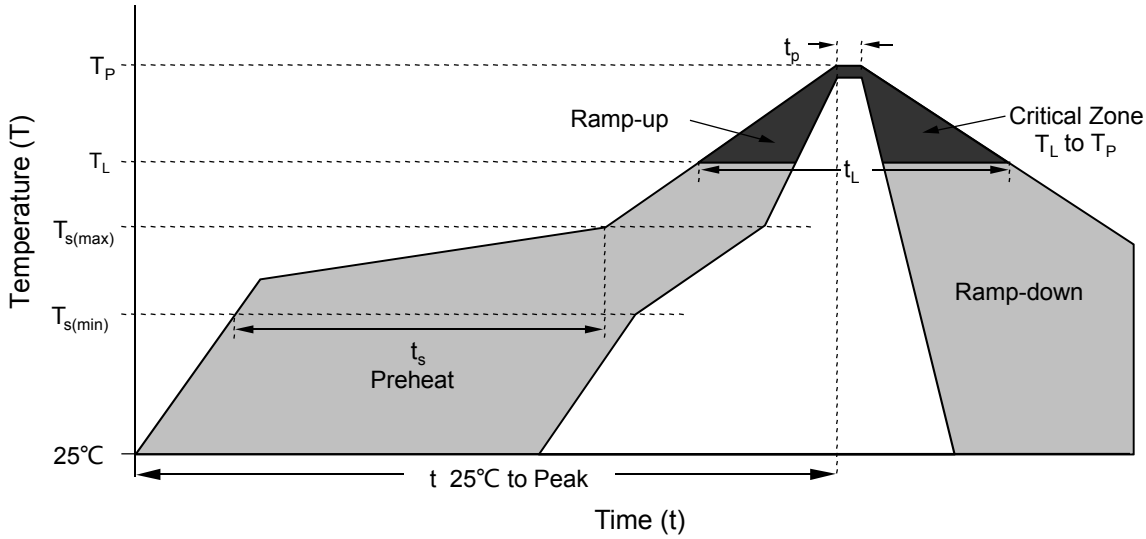
## »Marking Information




xx = Type Code
YYWW = Date Code

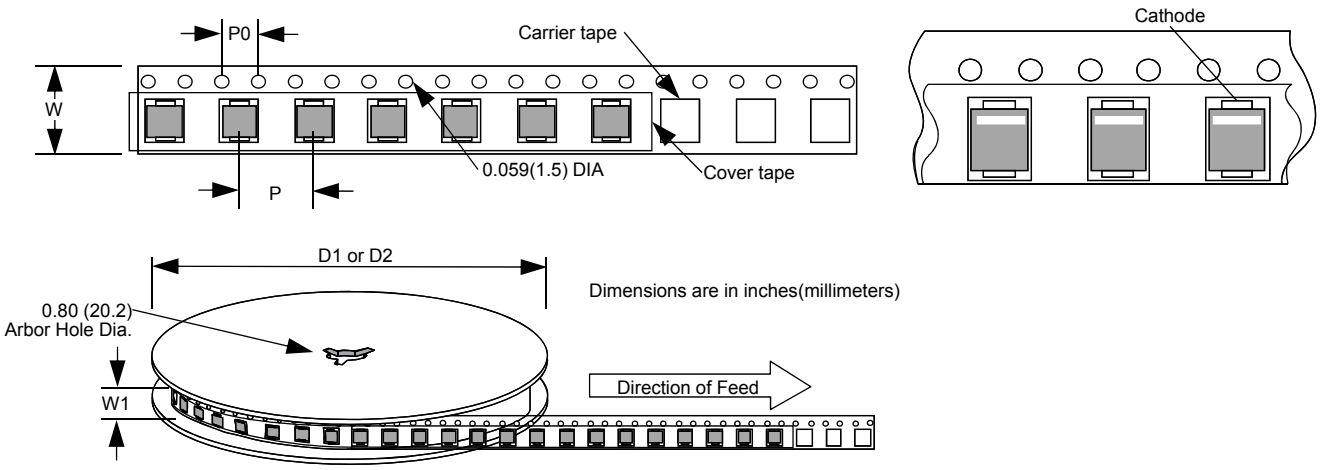
xx = Type Code
YYWW = Date Code

## »Soldering Parameters




| Reflow Condition | | Lead-free assembly |
|---|---|---|
| Pre Heat | - Temperature Min ($T_{s(min)}$) | 150°C |
| | - Temperature Max ($T_{s(max)}$) | 200°C |
| | - Time (min to max) ($t_s$) | 60 – 180 secs |
| Average ramp up rate (Liquidus Temp ($T_L$) to peak) | | 3°C/second max |
| $T_{S(max)}$ to TL - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature ($T_L$) (Liquidus) | 217°C |
| | - Time ($t_L$) | 60 – 150 secs |
| Peak Temperature ($T_P$) | | $260^{+0/-5\ °C}$ |
| Time within 5°C of actual peak Temperature ($t_p$) | | 20 – 40 secs |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature (t) | | 8 minutes Max. |
| Do not exceed | | 260°C |

## »Tape and Reel Specification




| Dimension | Inches | | | Millimeters | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| P | | 0.315 | | | 8 | |
| P0 | | 0.157 | | | 4 | |
| W | | 0.63 | | | 16 | |
| W1 | | 0.646 | | | 16.4 | |
| D1 | | 7 | | | 177.8 | |
| D2 | | 13 | | | 330.2 | |

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