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PLED

P6SMBXXXA(CA)(MS)

Product specification

Features

- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 600W peak pulse power capability at 10/1000μswaveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical IR less than 1μA above 12V
- High Temperature soldering: 260°C/ 40 seconds at terminals
- Plastic package has underwriters laboratory flammability 94V-0

Mechanical Data

Case : JEDEC DO-214AA/SMB molded plastic body

Terminals : Solderable per MIL-STD-750, Method 2026

Polarity : Polarity symbol marking on body


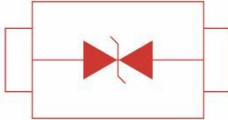


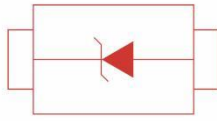
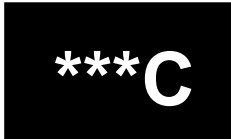
Mounting Position : Any

Weight : 0.003 ounce, 0.095 grams

Applications

- I/O interface
- AC/DC power supply
- Industrial and Consumer electronic applications.

Reference News

| PACKAGE OUTLINE | PIN CONFIGURATION | Marking Information |
|---|---|--|
|  |  |  |
| Unipolar | | |
|  |  |  |
| Bipolar | | |

Maximum Ratings And Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter | Symbol | Value | Unit |
|---|-----------------|-------------|-------|
| Peak Pulse Power Dissipation at $T_A=25^\circ\text{C}$ by 10x1000 μs waveform (Fig.1) (Note 1), (Note 2) | P_{PPM} | 600 | Watts |
| Power Dissipation on infinite heat sink at $T_A=50^\circ\text{C}$ | $P_{M(AV)}$ | 5.0 | Watts |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3) | I_{FSM} | 100 | Amps |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional only (Note 4) | V_F | 3.5V/5.0 | V |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -65 to +150 | °C |
| Typical Thermal Resistance Junction to Lead | $R_{\theta JL}$ | 20 | °C/W |
| Typical Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 100 | °C/W |

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25^\circ\text{C}$ per Fig. 2.
2. Mounted on copper pad area of 0.2x0.2" (5.0 x 5.0mm) to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.
4. $V_F < 3.5\text{V}$ for $V_{BR} < 200\text{V}$ and $V_F < 5.0\text{V}$ for $V_{BR} > 201\text{V}$.

Electrical Characteristics (TA=25°C)

| Part Number | | Device Marking Code | | Reverse Stand-Off Voltage | Breakdown Voltage @ I_T | Test Current | Maximum Clamping Voltage @ I_{PP} | Peak Pulse Current | Reverse Leakage @ V_{RWM} |
|----------------|-----------------|---------------------|------|---------------------------|---------------------------|--------------|-------------------------------------|--------------------|-----------------------------|
| Unidirectional | Bidirectional | UNI | BI | $V_{RWM}(V)$ | $V_{BR}(V)$ | $I_T(mA)$ | $V_C(V)$ | $I_{PP}(A)$ | $I_R(\mu A)$ |
| P6SMB6.8A (MS) | P6SMB6.8CA (MS) | 6V8A | 6V8C | 5.80 | 6.45~7.14 | 10 | 10.5 | 58.1 | 1000 |
| P6SMB7.5A (MS) | P6SMB7.5CA (MS) | 7V5A | 7V5C | 6.40 | 7.13~7.88 | 10 | 11.3 | 54.0 | 500 |
| P6SMB8.2A (MS) | P6SMB8.2CA (MS) | 8V2A | 8V2C | 7.02 | 7.79~8.61 | 10 | 12.1 | 50.4 | 200 |
| P6SMB9.1A (MS) | P6SMB9.1CA (MS) | 9V1A | 9V1C | 7.78 | 8.65~9.55 | 1 | 13.4 | 45.5 | 50 |
| P6SMB10A (MS) | P6SMB10CA (MS) | 10A | 10C | 8.55 | 9.50~10.50 | 1 | 14.5 | 42.1 | 10 |
| P6SMB11A (MS) | P6SMB11CA (MS) | 11A | 11C | 9.40 | 10.50~11.60 | 1 | 15.6 | 39.1 | 5 |
| P6SMB12A (MS) | P6SMB12CA (MS) | 12A | 12C | 10.20 | 11.40~12.60 | 1 | 16.7 | 36.5 | 5 |
| P6SMB13A (MS) | P6SMB13CA (MS) | 13A | 13C | 11.10 | 12.40~13.70 | 1 | 18.2 | 33.5 | 1 |
| P6SMB15A (MS) | P6SMB15CA (MS) | 15A | 15C | 12.80 | 14.30~15.80 | 1 | 21.2 | 28.8 | 1 |
| P6SMB16A (MS) | P6SMB16CA (MS) | 16A | 16C | 13.60 | 15.20~16.80 | 1 | 22.5 | 27.1 | 1 |
| P6SMB18A (MS) | P6SMB18CA (MS) | 18A | 18C | 15.30 | 17.10~18.90 | 1 | 25.2 | 24.2 | 1 |
| P6SMB20A (MS) | P6SMB20CA (MS) | 20A | 20C | 17.10 | 19.00~21.00 | 1 | 27.7 | 22.0 | 1 |
| P6SMB22A (MS) | P6SMB22CA (MS) | 22A | 22C | 18.80 | 20.90~23.10 | 1 | 30.6 | 19.9 | 1 |
| P6SMB24A (MS) | P6SMB24CA (MS) | 24A | 24C | 20.50 | 22.80~25.20 | 1 | 33.2 | 18.4 | 1 |
| P6SMB27A (MS) | P6SMB27CA (MS) | 27A | 27C | 23.10 | 25.70~28.40 | 1 | 37.5 | 16.3 | 1 |
| P6SMB30A (MS) | P6SMB30CA (MS) | 30A | 30C | 25.60 | 28.50~31.50 | 1 | 41.4 | 14.7 | 1 |
| P6SMB33A (MS) | P6SMB33CA (MS) | 33A | 33C | 28.20 | 31.40~34.70 | 1 | 45.7 | 13.3 | 1 |

Electrical Characteristics (TA=25°C)

| Part Number | | Device Marking Code | | Reverse Stand-Off Voltage | Breakdown Voltage @I _r | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @ V _{RWM} |
|----------------|-----------------|---------------------|------|---------------------------|-----------------------------------|---------------------|---|---------------------|------------------------------------|
| Unidirectional | Bidirectional | UNI | BI | V _{RWM} (V) | V _{BR} (V) | I _r (mA) | V _C (V) | I _{PP} (A) | k(μA) |
| P6SMB36A (MS) | P6SMB36CA (MS) | 36A | 36C | 30.80 | 34.20~37.80 | 1 | 49.9 | 12.2 | 1 |
| P6SMB39A (MS) | P6SMB39CA (MS) | 39A | 39C | 33.30 | 37.10~41.00 | 1 | 53.9 | 11.3 | 1 |
| P6SMB43A (MS) | P6SMB43CA (MS) | 43A | 43C | 36.80 | 40.90~45.20 | 1 | 59.3 | 10.3 | 1 |
| P6SMB47A (MS) | P6SMB47CA (MS) | 47A | 47C | 40.20 | 44.70~49.40 | 1 | 64.8 | 9.4 | 1 |
| P6SMB51A (MS) | P6SMB51CA (MS) | 51A | 51C | 43.60 | 48.50~53.60 | 1 | 70.1 | 8.7 | 1 |
| P6SMB56A (MS) | P6SMB56CA (MS) | 56A | 56C | 47.80 | 53.20~58.80 | 1 | 77.0 | 7.9 | 1 |
| P6SMB62A (MS) | P6SMB62CA (MS) | 62A | 62C | 53.00 | 58.90~65.10 | 1 | 85.0 | 7.2 | 1 |
| P6SMB68A (MS) | P6SMB68CA (MS) | 68A | 68C | 58.10 | 64.60~71.40 | 1 | 92.0 | 6.6 | 1 |
| P6SMB75A (MS) | P6SMB75CA (MS) | 75A | 75C | 64.10 | 71.30~78.80 | 1 | 103.0 | 5.9 | 1 |
| P6SMB82A (MS) | P6SMB82CA (MS) | 82A | 82C | 70.10 | 77.90~86.10 | 1 | 113.0 | 5.4 | 1 |
| P6SMB91A (MS) | P6SMB91CA (MS) | 91A | 91C | 77.80 | 86.50~95.50 | 1 | 125.0 | 4.9 | 1 |
| P6SMB100A (MS) | P6SMB100CA (MS) | 100A | 100C | 85.50 | 95.00~105.00 | 1 | 137.0 | 4.5 | 1 |
| P6SMB110A (MS) | P6SMB110CA (MS) | 110A | 110C | 94.00 | 105.00~116.00 | 1 | 152.0 | 4.0 | 1 |
| P6SMB120A (MS) | P6SMB120CA (MS) | 120A | 120C | 102.00 | 114.00~126.00 | 1 | 165.0 | 3.7 | 1 |
| P6SMB130A (MS) | P6SMB130CA (MS) | 130A | 130C | 111.00 | 124.00~137.00 | 1 | 179.0 | 3.4 | 1 |
| P6SMB150A (MS) | P6SMB150CA (MS) | 150A | 150C | 128.00 | 143.00~158.00 | 1 | 207.0 | 2.9 | 1 |
| P6SMB160A (MS) | P6SMB160CA (MS) | 160A | 160C | 136.00 | 152.00~168.00 | 1 | 219.0 | 2.8 | 1 |
| P6SMB170A (MS) | P6SMB170CA (MS) | 170A | 170C | 145.00 | 162.00~179.00 | 1 | 234.0 | 2.6 | 1 |
| P6SMB180A (MS) | P6SMB180CA (MS) | 180A | 180C | 154.00 | 171.00~189.00 | 1 | 246.0 | 2.5 | 1 |
| P6SMB200A (MS) | P6SMB200CA (MS) | 200A | 200C | 171.00 | 190.00~210.00 | 1 | 274.0 | 2.2 | 1 |
| P6SMB220A (MS) | P6SMB220CA (MS) | 220A | 220C | 185.00 | 209.00~231.00 | 1 | 328.0 | 1.9 | 1 |
| P6SMB250A (MS) | P6SMB250CA (MS) | 250A | 250C | 214.00 | 237.00~263.00 | 1 | 344.0 | 1.8 | 1 |
| P6SMB300A (MS) | P6SMB300CA (MS) | 300A | 300C | 256.00 | 285.00~315.00 | 1 | 414.0 | 1.5 | 1 |
| P6SMB350A (MS) | P6SMB350CA (MS) | 350A | 350C | 300.00 | 332.00~368.00 | 1 | 482.0 | 1.3 | 1 |
| P6SMB400A (MS) | P6SMB400CA (MS) | 400A | 400C | 342.00 | 380.00~420.00 | 1 | 548.0 | 1.1 | 1 |
| P6SMB440A (MS) | P6SMB440CA (MS) | 440A | 440C | 376.00 | 418.00~462.00 | 1 | 602.0 | 1.0 | 1 |
| P6SMB480A (MS) | P6SMB480CA (MS) | 480A | 480C | 408.00 | 456.00~504.00 | 1 | 658.0 | 0.9 | 1 |
| P6SMB510A (MS) | P6SMB510CA (MS) | 510A | 510C | 434.00 | 485.00~535.00 | 1 | 698.0 | 0.9 | 1 |
| P6SMB530A (MS) | P6SMB530CA (MS) | 530A | 530C | 450.00 | 503.50~556.50 | 1 | 725.0 | 0.8 | 1 |
| P6SMB540A (MS) | P6SMB540CA (MS) | 540A | 540C | 459.00 | 513.00~567.00 | 1 | 740.0 | 0.8 | 1 |
| P6SMB550A (MS) | P6SMB550CA (MS) | 550A | 550C | 467.00 | 522.50~577.50 | 1 | 760.0 | 0.8 | 1 |

 Notes: For bidirectional type having V_{RWM} of 10V 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

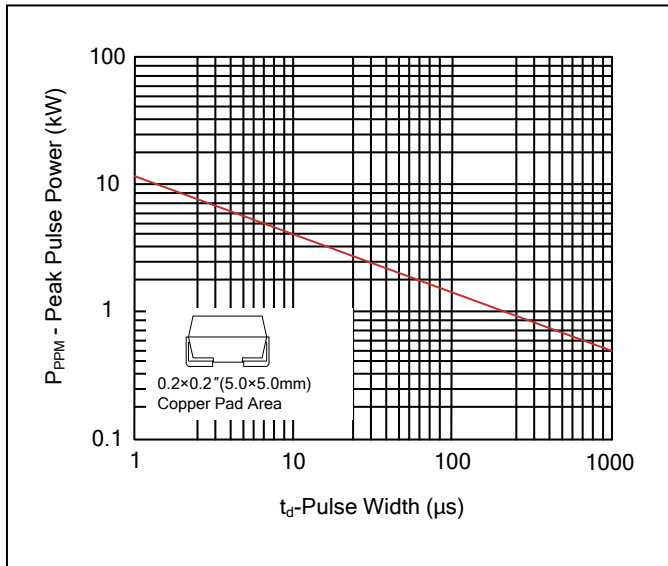


Figure 2. Pulse Derating Curve

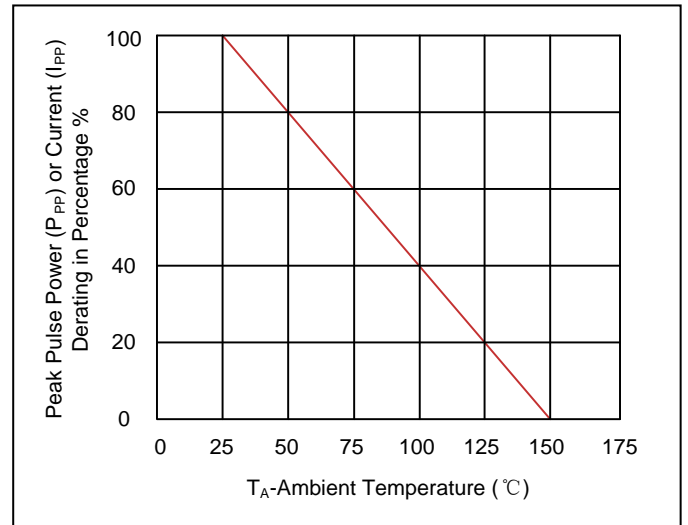


Figure 3. Pulse Waveform

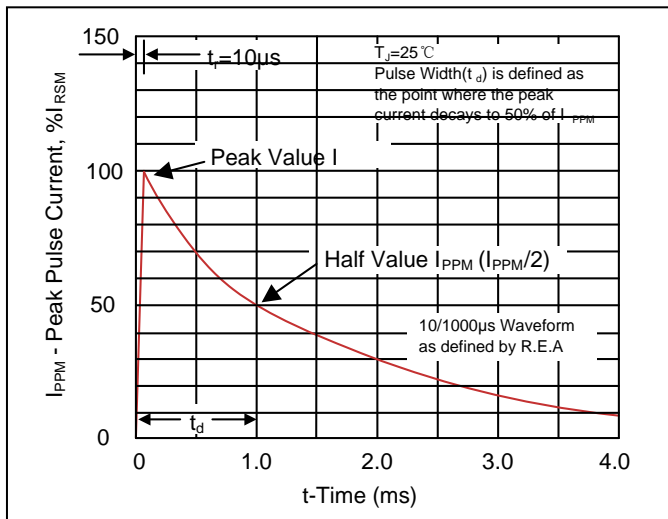


Figure 4. Typical Junction Capacitance

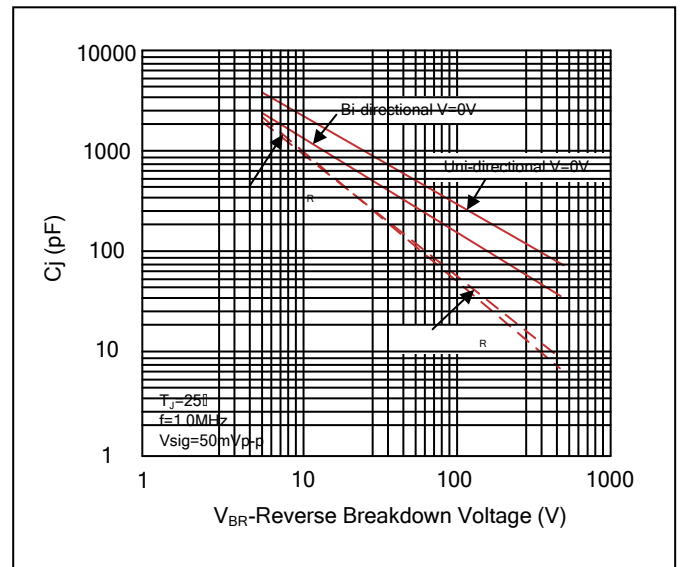


Figure 5. Steady State Power Dissipation Derating Curve

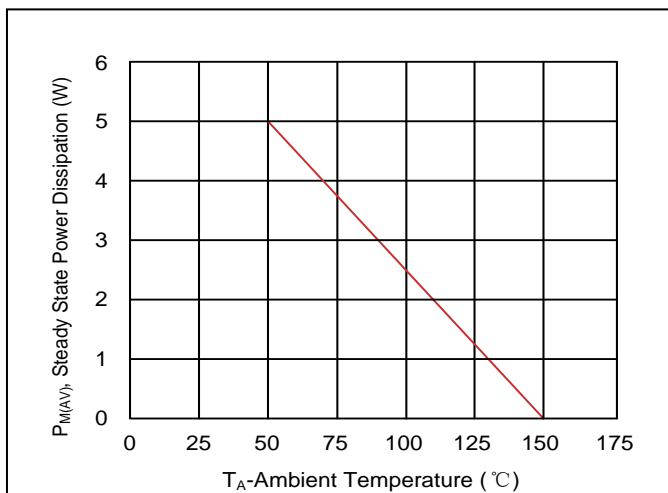
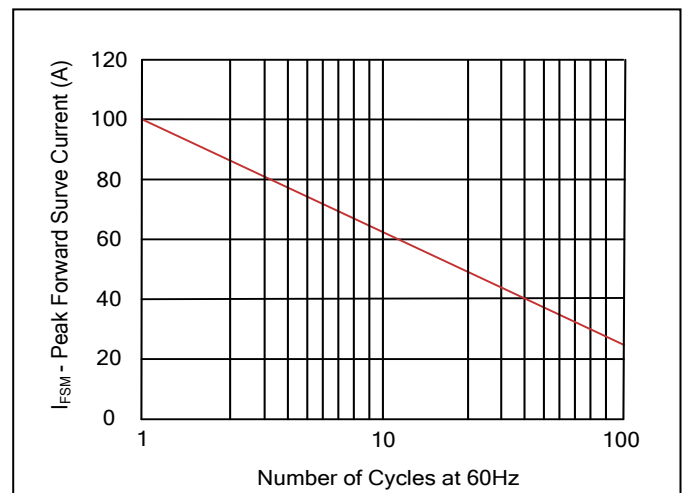
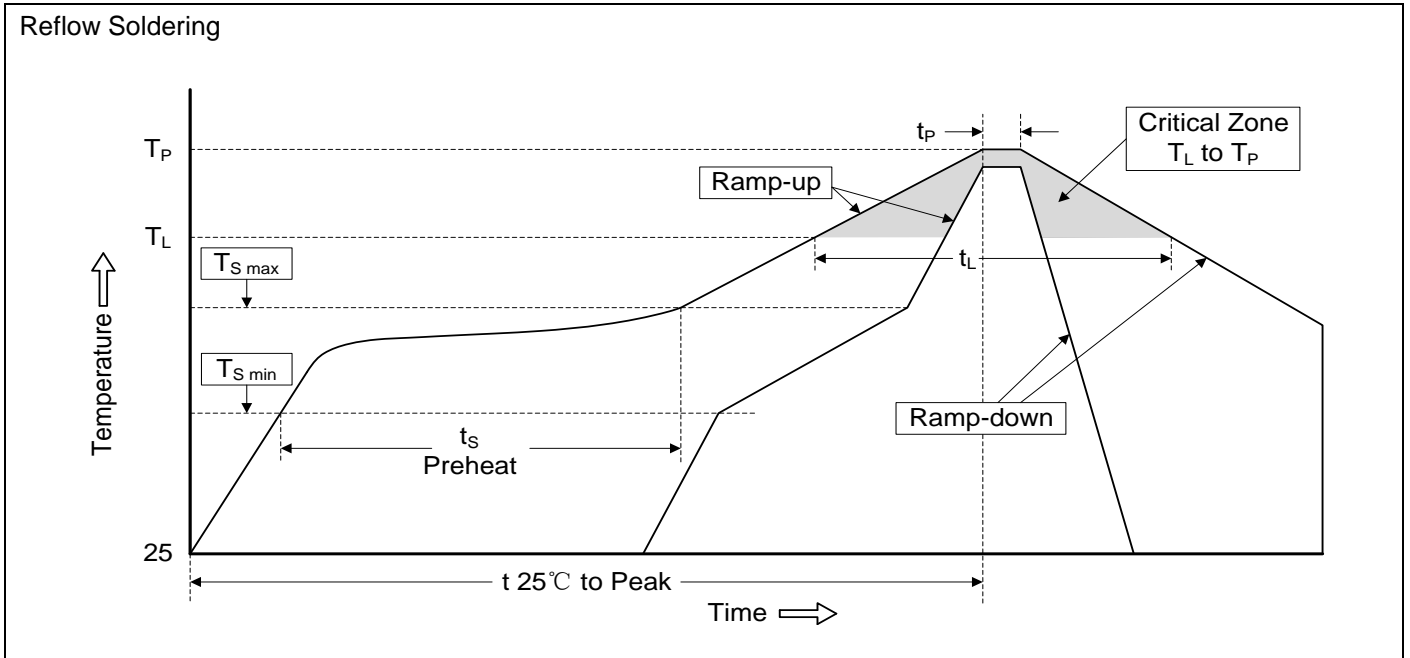


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



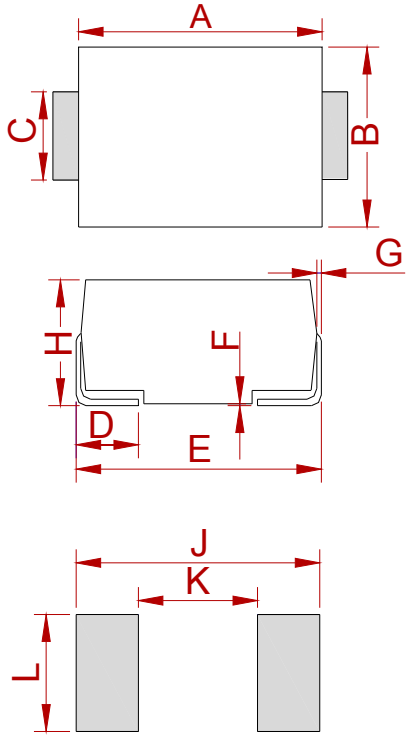
Recommended Soldering Conditions



Recommended Conditions

| Profile Feature | Pb-Free Assembly |
|---|----------------------------------|
| Average ramp-up rate (T_L to T_P) | 3°C/second max. |
| Preheat <ul style="list-style-type: none"> -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_S) | 150°C 200°C 60-180 seconds |
| $T_{S\ max}$ to T_L <ul style="list-style-type: none"> -Ramp-up Rate | 3°C/second max. |
| Time maintained above: <ul style="list-style-type: none"> -Temperature (T_L) -Time (t_L) | 217°C 60-150 seconds |
| Peak Temperature (T_P) | 260°C |
| Time within 5°C of actual Peak Temperature (t_P) | 20-40 seconds |
| Ramp-down Rate | 6°C/second max. |
| Time 25°C to Peak Temperature | 8 minutes max. |

PACKAGE MECHANICAL DATA



DO-214AA (SMB)

| Ref. | Dimensions | | | |
|------|-------------|-------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.25 | 4.75 | 0.167 | 0.187 |
| B | 3.30 | 3.94 | 0.130 | 0.155 |
| C | 1.85 | 2.21 | 0.073 | 0.087 |
| D | 0.76 | 1.52 | 0.030 | 0.060 |
| E | 5.08 | 5.59 | 0.200 | 0.220 |
| F | 0.051 | 0.203 | 0.002 | 0.008 |
| G | 0.15 | 0.31 | 0.006 | 0.012 |
| H | 2.11 | 2.44 | 0.083 | 0.096 |
| J | 6.80 | | 0.270 | |
| K | | 2.60 | | 0.100 |
| L | 2.40 | | 0.090 | |

REEL SPECIFICATION

| P/N | PKG | QTY |
|-------------------|-----|------|
| P6SMBXXXA(CA)(MS) | SMB | 3000 |

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