# SMB TRANSIENT VOLTAGE SUPPRESSOR

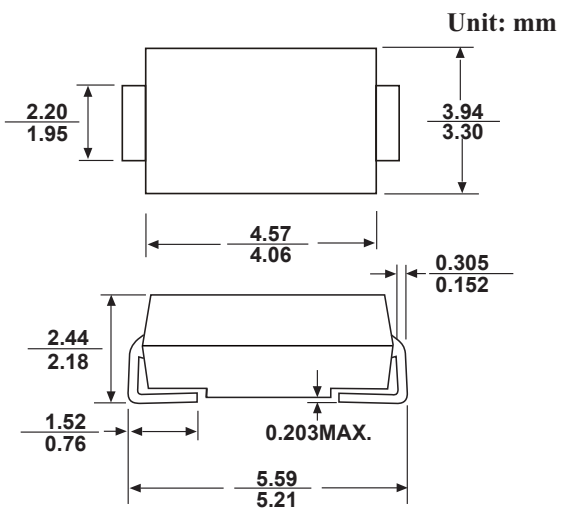
**BREAKDOWN VOLTAGE: 6.8 --- 440 V PEAK PULSE POWER: 600 W**

## Features

- ●Low profile package
- ●Ideal for automated placement
- ●Glass passivated chip junction
- ●Available in Unidirectional and Bidirectional
- ●600 W peak pulse power capability with a 10/1000 μs waveform, repetitive rate (duty cycle): 0.01 %
- ●Excellent clamping capability
- ●Very fast response time
- ●Low incremental surge resistance
- ●Meets MSL level 1, per J-STD-020C, LF max peak of 260 °C Solder Dip 260 °C, 10 seconds
- ●Component in accordance to RoHS 2015/863 and WEEE 2012/19/EU

## Mechanical Data

- ● Package: DO-214AA(SMB)Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- ● Terminals: Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D
- ● Polarity: Color band denotes cathode end




## DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bidirectional use C or CA suffix for types 1.5KE6.8 thru 1.5KE540(e.g. 1.5KE6.8C,1.5KE440CA)

Electrical characteristics apply in both directions.

## MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

| Parameter | Symbol | Value | Units |
|---|---|---|---|
| Peak Power Dissipation (Note 1.) @$T_L$ = 25°C, Pulse Width = 1 ms | $P_{PK}$ | 600 | W |
| Forward Surge Current (Note 2.) @$T_A$ = 25°C | $I_{FSM}$ | 100 | A |
| Power Dissipation On Infinite Heatsink, @$T_A$ = 50°C | $P_{M(AV)}$ | 5.0 | W |
| Thermal Resistance Junction To Ambient Air (Note 3.) | $R_{\theta JA}$ | 100 | °C/W |
| Thermal Resistance Junction To Leads | $R_{\theta JL}$ | 20 | °C/W |
| Storage Temperature Range | $T_{STG}$ | -55 to 150 | °C |
| Operating Junction Temperature Range | $T_J$ | -55 to 150 | °C |

1） 10 X 1000 us, non–repetitive

2）1/2 sine wave (or equivalent square wave), PW = 8.3 ms, duty cycle = 4 pulses per minute maximum

3）Mounted on minimum recommended pad layout

## Electrical Specification ($T_A$=25°C unless otherwise specified)

| PartNumber | | Marking | | Reverse Stand off Voltage VR (Volts) | Breakdown Voltage VBR (Volts) @ IT | | | Maximum Clamping Voltage VC @ IPP (Volts) | Maximum Peak Pulse Current IPP (A) | Maximum Reverse Leakage IR @ VR (μA) |
|---|---|---|---|---|---|---|---|---|---|---|
| Uni | Bi | Uni | Bi | | MIN | MAX | (mA) | | | |
| P6SMB6.8 | P6SMB6.8C | 6V8 | 6V8C | 5.50 | 6.12 | 7.48 | 10.0 | 10.8 | 56.0 | 1000 |
| P6SMB6.8A | P6SMB6.8CA | 6V8A | 6V8CA | 5.80 | 6.45 | 7.14 | 0.0 | 10.5 | 57.0 | 1000 |
| P6SMB7.5 | P6SMB7.5C | 7V5 | 7V5C | 6.05 | 6.75 | 8.25 | 0.0 | 11.7 | 51.0 | 500 |
| P6SMB7.5A | P6SMB7.5CA | 7V5A | 7V5CA | 6.40 | 7.13 | 7.88 | 10.0 | 11.3 | 53.0 | 500 |
| P6SMB8.2 | P6SMB8.2C | 8V2 | 8V2C | 6.63 | 7.38 | 9.02 | 0.0 | 12.5 | 48.0 | 200 |
| P6SMB8.2A | P6SMB8.2CA | 8V2A | 8V2CA | 7.02 | 7.79 | 8.61 | 0.0 | 12.1 | 50.0 | 200 |
| P6SMB9.1 | P6SMB9.1C | 9V1 | 9V1C | 7.37 | 8.19 | 0.00 | 1.0 | 13.8 | 44.0 | 50 |
| P6SMB9.1A | P6SMB9.1CA | 9V1A | 9V1CA | 7.78 | 8.65 | 9.55 | 1.0 | 13.4 | 45.0 | 50 |
| P6SMB10 | P6SMB10C | 10 | 10C | 8.10 | 9.00 | 11.00 | 1.0 | 15.0 | 40.0 | 10 |
| P6SMB10A | P6SMB10CA | 10A | 10CA | 8.55 | 9.50 | 10.50 | 1.0 | 14.5 | 41.0 | 10 |
| P6SMB11 | P6SMB11C | 11 | 11C | 9.37 | 9.90 | 12.10 | 1.0 | 16.2 | 37.0 | 5.0 |
| P6SMB11A | P6SMB11CA | 11A | 11CA | 9.87 | 10.50 | 11.60 | 1.0 | 15.6 | 38.0 | 5.0 |
| P6SMB12 | P6SMB12C | 12 | 12C | 10.21 | 10.80 | 13.20 | 1.0 | 17.3 | 35.0 | 5.0 |
| P6SMB12A | P6SMB12CA | 12A | 12CA | 10.71 | 11.40 | 12.60 | 1.0 | 16.7 | 36.0 | 5.0 |
| P6SMB13 | P6SMB13C | 13 | 13C | 11.03 | 11.70 | 14.30 | 1.0 | 19.0 | 32.0 | 5.0 |
| P6SMB13A | P6SMB13CA | 13A | 13CA | 11.66 | 12.40 | 13.70 | 1.0 | 18.2 | 33.0 | 5.0 |
| P6SMB15 | P6SMB15C | 15 | 15C | 12.71 | 13.50 | 16.50 | 1.0 | 22.0 | 27.0 | 5.0 |
| P6SMB15A | P6SMB15CA | 15A | 15CA | 13.44 | 14.30 | 15.80 | 1.0 | 21.2 | 28.0 | 5.0 |
| P6SMB16 | P6SMB16C | 16 | 16C | 13.55 | 14.40 | 17.60 | 1.0 | 23.5 | 26.0 | 5.0 |
| P6SMB16A | P6SMB16CA | 16A | 16CA | 14.28 | 15.20 | 16.80 | 1.0 | 22.5 | 27.0 | 5.0 |
| P6SMB18 | P6SMB18C | 18 | 18C | 15.23 | 16.20 | 19.80 | 1.0 | 26.5 | 23.0 | 5.0 |
| P6SMB18A | P6SMB18CA | 18A | 18CA | 16.07 | 17.10 | 18.90 | 1.0 | 25.2 | 24.0 | 5.0 |
| P6SMB20 | P6SMB20C | 20 | 20C | 17.01 | 18.00 | 22.00 | 1.0 | 29.1 | 21.0 | 5.0 |
| P6SMB20A | P6SMB20CA | 20A | 20CA | 17.96 | 19.00 | 21.00 | 1.0 | 27.7 | 22.0 | 5.0 |
| P6SMB22 | P6SMB22C | 22 | 22C | 18.69 | 19.80 | 24.20 | 1.0 | 31.9 | 19.0 | 5.0 |
| P6SMB22A | P6SMB22CA | 22A | 22CA | 19.74 | 20.90 | 23.10 | 1.0 | 30.6 | 20.0 | 5.0 |
| P6SMB24 | P6SMB24C | 24 | 24C | 20.37 | 21.60 | 26.40 | 1.0 | 34.7 | 17.0 | 5.0 |

## Electrical Specification ($T_A$=25°C unless otherwise specified)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| P6SMB24A | P6SMB24CA | 24A | 24CA | 21.53 | 22.80 | 25.20 | 1.0 | 33.2 | 18.0 | 5.0 |
| P6SMB27 | P6SMB27C | 27 | 27C | 22.89 | 24.30 | 29.70 | 1.0 | 39.1 | 15.0 | 5.0 |
| P6SMB27A | P6SMB27CA | 27A | 27CA | 24.26 | 25.70 | 28.40 | 1.0 | 37.5 | 16.0 | 5.0 |
| P6SMB30 | P6SMB30C | 30 | 30C | 25.52 | 27.00 | 33.00 | 1.0 | 43.5 | 14.0 | 5.0 |
| P6SMB30A | P6SMB30CA | 30A | 30CA | 26.88 | 28.50 | 31.50 | 1.0 | 41.4 | 14.4 | 5.0 |
| P6SMB33 | P6SMB33C | 33 | 33C | 28.14 | 29.70 | 36.30 | 1.0 | 47.7 | 12.6 | 5.0 |
| P6SMB33A | P6SMB33CA | 33A | 33CA | 29.61 | 31.40 | 34.70 | 1.0 | 45.7 | 13.2 | 5.0 |
| P6SMB36 | P6SMB36C | 36 | 36C | 30.56 | 32.40 | 39.60 | 1.0 | 52.0 | 11.6 | 5.0 |
| P6SMB36A | P6SMB36CA | 36A | 36CA | 32.34 | 34.20 | 37.80 | 1.0 | 49.9 | 12.0 | 5.0 |
| P6SMB39 | P6SMB39C | 39 | 39C | 33.18 | 35.10 | 42.90 | 1.0 | 56.4 | 10.5 | 5.0 |
| P6SMB39A | P6SMB39CA | 39A | 39CA | 34.97 | 37.10 | 41.00 | 1.0 | 53.9 | 11.2 | 5.0 |
| P6SMB43 | P6SMB43C | 43 | 43C | 36.54 | 38.70 | 47.30 | 1.0 | 61.9 | 9.6 | 5.0 |
| P6SMB43A | P6SMB43CA | 43A | 43CA | 38.64 | 40.90 | 45.20 | 1.0 | 59.3 | 10.1 | 5.0 |
| P6SMB47 | P6SMB47C | 47 | 47C | 40.01 | 42.30 | 51.70 | 1.0 | 67.8 | 8.9 | 5.0 |
| P6SMB47A | P6SMB47CA | 47A | 47CA | 42.21 | 44.70 | 49.40 | 1.0 | 64.8 | 9.3 | 5.0 |
| P6SMB51 | P6SMB51C | 51 | 51C | 43.37 | 45.90 | 56.10 | 1.0 | 73.5 | 8.2 | 5.0 |
| P6SMB51A | P6SMB51CA | 51A | 51CA | 45.78 | 48.50 | 53.60 | 1.0 | 70.1 | 8.6 | 5.0 |
| P6SMB56 | P6SMB56C | 56 | 56C | 47.67 | 50.4 | 61.6 | 1.0 | 80.5 | 7.40 | 5.0 |
| P6SMB56A | P6SMB56CA | 56A | 56CA | 50.19 | 53.2 | 58.8 | 1.0 | 77.0 | 7.80 | 5.0 |
| P6SMB62 | P6SMB62C | 62 | 62C | 52.71 | 55.8 | 68.2 | 1.0 | 89.0 | 6.80 | 5.0 |
| P6SMB62A | P6SMB62CA | 62A | 62CA | 55.65 | 58.9 | 65.1 | 1.0 | 85.0 | 7.10 | 5.0 |
| P6SMB68 | P6SMB68C | 68 | 68C | 57.86 | 61.2 | 74.8 | 1.0 | 98.0 | 6.10 | 5.0 |
| P6SMB68A | P6SMB68CA | 68A | 68CA | 61.01 | 64.6 | 71.4 | 1.0 | 92.0 | 6.50 | 5.0 |
| P6SMB75 | P6SMB75C | 75 | 75C | 63.74 | 67.5 | 82.5 | 1.0 | 108.0 | 5.50 | 5.0 |
| P6SMB75A | P6SMB75CA | 75A | 75CA | 67.31 | 71.3 | 78.8 | 1.0 | 103.0 | 5.80 | 5.0 |
| P6SMB82 | P6SMB82C | 82 | 82C | 69.72 | 73.8 | 90.2 | 1.0 | 118.0 | 5.10 | 5.0 |
| P6SMB82A | P6SMB82CA | 82A | 82CA | 73.61 | 77.9 | 86.1 | 1.0 | 113.0 | 5.30 | 5.0 |
| P6SMB91 | P6SMB91C | 91 | 91C | 77.39 | 81.9 | 100.0 | 1.0 | 131.0 | 4.50 | 5.0 |
| P6SMB91A | P6SMB91CA | 91A | 91CA | 81.69 | 86.5 | 95.5 | 1.0 | 125.0 | 4.80 | 5.0 |
| P6SMB100 | P6SMB100C | 100 | 100C | 85.05 | 90.0 | 110.0 | 1.0 | 144.0 | 4.20 | 5.0 |
| P6SMB100A | P6SMB100CA | 100A | 100CA | 89.78 | 95.0 | 105.0 | 1.0 | 137.0 | 4.40 | 5.0 |
| P6SMB110 | P6SMB110C | 110 | 110C | 93.66 | 99.0 | 121.0 | 1.0 | 158.0 | 3.80 | 5.0 |

## Electrical Specification ($T_A$=25°C unless otherwise specified)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| P6SMB110A | P6SMB110CA | 110A | 110CA | 98.70 | 105.0 | 116.0 | 1.0 | 152.0 | 4.00 | 5.0 |
| P6SMB120 | P6SMB120C | 120 | 120C | 102.06 | 108.0 | 132.0 | 1.0 | 173.0 | 3.50 | 5.0 |
| P6SMB120A | P6SMB120CA | 120A | 120CA | 107.10 | 114.0 | 126.0 | 1.0 | 165.0 | 3.60 | 5.0 |
| P6SMB130 | P6SMB130C | 130 | 130C | 110.25 | 117.0 | 143.0 | 1.0 | 187.0 | 3.20 | 5.0 |
| P6SMB130A | P6SMB130CA | 130A | 130CA | 116.55 | 124.0 | 137.0 | 1.0 | 179.0 | 3.30 | 5.0 |
| P6SMB150 | P6SMB150C | 150 | 150C | 127.05 | 135.0 | 165.0 | 1.0 | 215.0 | 2.80 | 5.0 |
| P6SMB150A | P6SMB150CA | 150A | 150CA | 134.40 | 143.0 | 158.0 | 1.0 | 207.0 | 2.90 | 5.0 |
| P6SMB160 | P6SMB160C | 160 | 160C | 136.50 | 144.0 | 176.0 | 1.0 | 230.0 | 2.60 | 5.0 |
| P6SMB160A | P6SMB160CA | 160A | 160CA | 142.80 | 152.0 | 168.0 | 1.0 | 219.0 | 2.70 | 5.0 |
| P6SMB170 | P6SMB170C | 170 | 170C | 144.90 | 153.0 | 187.0 | 1.0 | 244.0 | 2.50 | 5.0 |
| P6SMB170A | P6SMB170CA | 170A | 170CA | 152.25 | 162.0 | 179.0 | 1.0 | 234.0 | 2.60 | 5.0 |
| P6SMB180 | P6SMB180C | 180 | 180C | 153.30 | 162.0 | 198.0 | 1.0 | 258.0 | 2.30 | 5.0 |
| P6SMB180A | P6SMB180CA | 180A | 180CA | 161.70 | 171.0 | 189.0 | 1.0 | 246.0 | 2.40 | 5.0 |
| P6SMB200 | P6SMB200C | 200 | 200C | 170.10 | 180.0 | 220.0 | 1.0 | 287.0 | 2.10 | 5.0 |
| P6SMB200A | P6SMB200CA | 200A | 200CA | 179.55 | 190.0 | 210.0 | 1.0 | 274.0 | 2.20 | 5.0 |
| P6SMB220 | P6SMB220C | 220 | 220C | 183.75 | 198.0 | 242.0 | 1.0 | 344.0 | 1.75 | 5.0 |
| P6SMB220A | P6SMB220CA | 220A | 220CA | 194.25 | 209.0 | 231.0 | 1.0 | 328.0 | 1.83 | 5.0 |
| P6SMB250 | P6SMB250C | 250 | 250C | 212.10 | 225.0 | 275.0 | 1.0 | 360.0 | 1.67 | 5.0 |
| P6SMB250A | P6SMB250CA | 250A | 250CA | 224.70 | 237.0 | 263.0 | 1.0 | 344.0 | 1.75 | 5.0 |
| P6SMB300 | P6SMB300C | 300 | 300C | 255.15 | 270.0 | 330.0 | 1.0 | 430.0 | 1.40 | 5.0 |
| P6SMB300A | P6SMB300CA | 300A | 300CA | 268.80 | 285.0 | 315.0 | 1.0 | 414.0 | 1.45 | 5.0 |
| P6SMB350 | P6SMB350C | 350 | 350C | 298.20 | 315.0 | 385.0 | 1.0 | 504.0 | 1.20 | 5.0 |
| P6SMB350A | P6SMB350CA | 350A | 350CA | 315.00 | 332.0 | 368.0 | 1.0 | 482.0 | 1.25 | 5.0 |
| P6SMB400 | P6SMB400C | 400 | 400C | 340.20 | 360.0 | 440.0 | 1.0 | 574.0 | 1.05 | 5.0 |
| P6SMB400A | P6SMB400CA | 400A | 400CA | 359.10 | 380.0 | 420.0 | 1.0 | 548.0 | 1.10 | 5.0 |
| P6SMB440 | P6SMB440C | 440 | 440C | 373.80 | 396.0 | 484.0 | 1.0 | 631.0 | 0.95 | 5.0 |
| P6SMB440A | P6SMB440CA | 440A | 440CA | 394.80 | 418.0 | 462.0 | 1.0 | 602.0 | 1.00 | 5.0 |

※ For Bi-directional type having VRWM of 10 Volts and less, the IR limit is double

1. A transient suppressor is normally selected according to the working peak reverse voltage (VRWM), which should be equal to or greater than the DC or continuous peak operating voltage level.
2. VBR measured at pulse test current IT at an ambient temperature of 25°C.
3. Surge current waveform per Figure 1 and derate per Figure 3.

## RATINGS AND CHARACTERISTIC CURVES

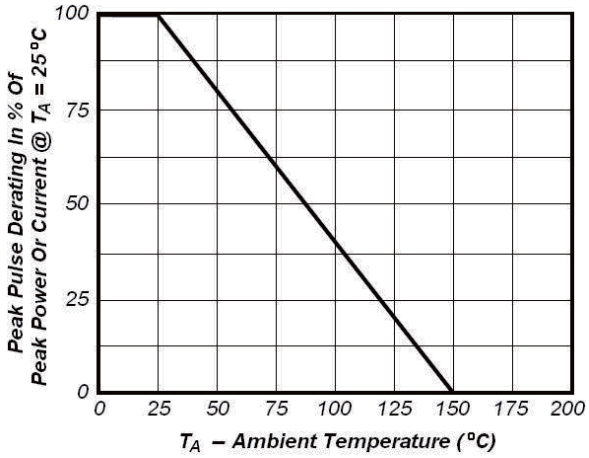



Fig1. Pulse Dearting Curve

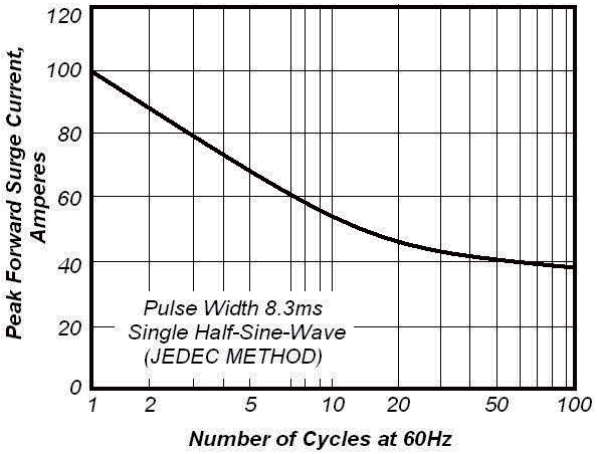



Fig2. Maximum Non-Repetitive Peak Forward Surge Current

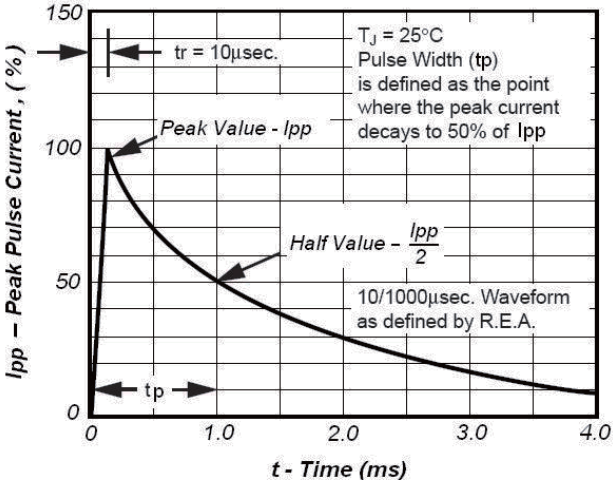



Fig3. Pulse Waveform

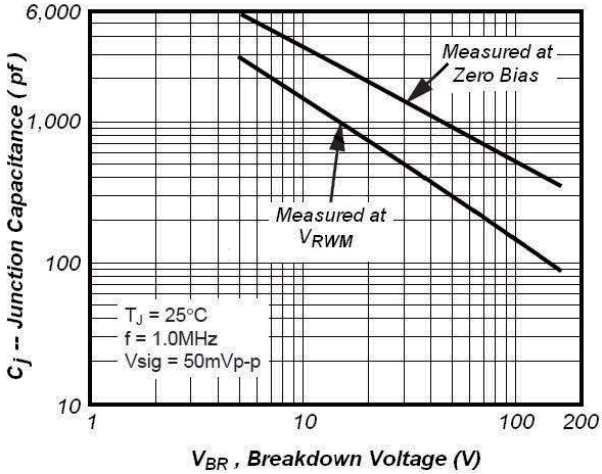



Fig4. Typical Junction Capacitance

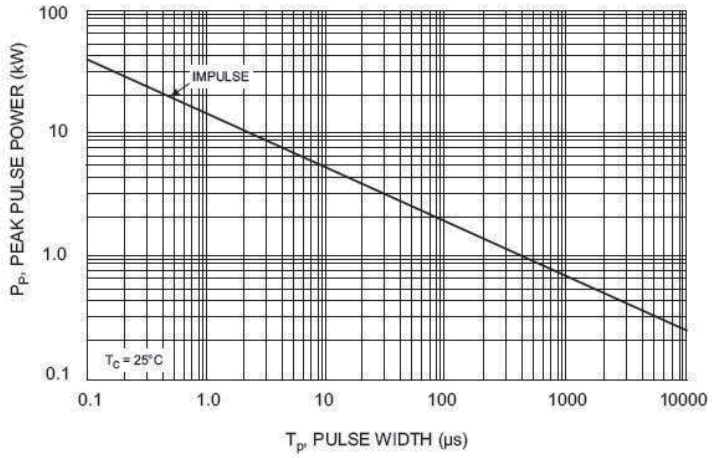



Fig5. Peak Pulse Power Rating curve

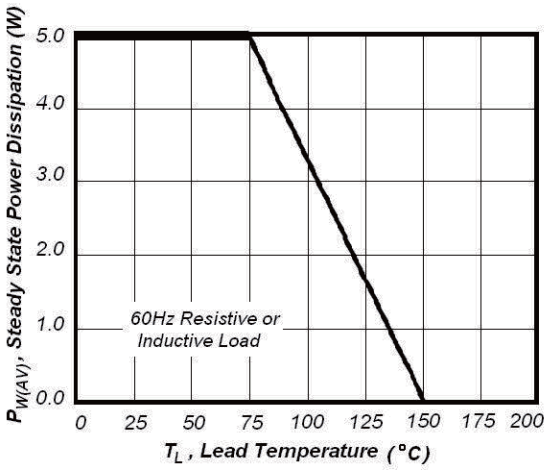



Fig6. Steady State Power