

# MSQA6V1W5T2

## Quad Array for ESD Protection

This quad monolithic silicon voltage suppressor is designed for applications requiring transient overvoltage protection capability. It is intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment, and other applications. Its quad junction common anode design protects four separate lines using only one package. These devices are ideal for situations where board space is at a premium.

### Features

- SC-88A Package Allows Four Separate Unidirectional Configurations
- Low Leakage < 1  $\mu$ A @ 3 V
- Breakdown Voltage: 6.1 V – 7.2 V @ 1 mA
- Low Capacitance (90 pF typical)
- ESD Protection Meeting IEC1000-4-2
- Pb-Free Package is Available\*

### Mechanical Characteristics:

- Void Free, Transfer-Molded, Thermosetting Plastic Case
- Corrosion Resistant Finish, Easily Solderable
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications

### MAXIMUM RATINGS

| Rating  | Symbol          | Value         | Unit                                       |
|---|-----------------|---------------|--|
| Peak Power Dissipation @ 20 $\mu$ s<br>@ $T_A \leq 25^\circ\text{C}$ (Note 1)                                 | $P_{pk}$        | 150           | W  |
| Steady State Power – 1 Diode (Note 2)   | $P_D$           | 385           | mW   |
| Thermal Resistance, Junction-to-Ambient<br>Above 25 $^\circ\text{C}$ , Derate                                 | $R_{\theta JA}$ | 325<br>3.1    | $^\circ\text{C/W}$<br>mW/ $^\circ\text{C}$ |
| Maximum Junction Temperature  | $T_{Jmax}$      | 150           | $^\circ\text{C}$                           |
| Operating Junction and Storage<br>Temperature Range   | $T_J T_{stg}$   | -55 to +150   | $^\circ\text{C}$                           |
| ESD Discharge<br>MIL STD 883C – Method 3015-6<br>IEC1000-4-2, Air Discharge<br>IEC1000-4-2, Contact Discharge | $V_{PP}$        | 16<br>16<br>9 | kV   |
| Lead Solder Temperature (10 s duration)   | $T_L$           | 260           | $^\circ\text{C}$                           |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

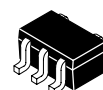
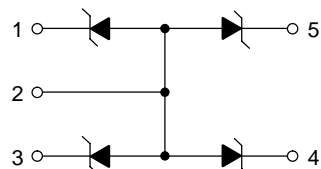
1. Non-repetitive current per Figure 1. Derate per Figure 2.
2. Only 1 diode under power. For all 4 diodes under power,  $P_D$  will be 25%. Mounted on FR-4 board with min pad.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



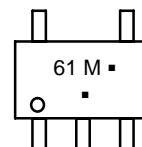
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SC-88A/SOT-323  
CASE 419A

### MARKING DIAGRAM



61 = Device Code  
M = Date Code  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device       | Package             | Shipping†        |
|--------------|---------------------|------------------|
| MSQA6V1W5T2  | SC-88A              | 3000/Tape & Reel |
| MSQA6V1W5T2G | SC-88A<br>(Pb-Free) | 3000/Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

\*T2 Suffix Devices are Packaged with Pin 1 Opposing Sprocket Hole.

# MSQA6V1W5T2

## ELECTRICAL CHARACTERISTICS

| Device    | Breakdown Voltage<br>$V_{BR}$ @ 1 mA (Volts) |     |     | Leakage Current<br>$I_{RM}$ @ $V_{RWM} = 3$ V<br>( $\mu$ A) | Capacitance<br>@ 0 V Bias<br>(pF) | Max<br>$V_F$ @ $I_F = 200$ mA<br>(V) |
|-----------|--|-----|-----|---|-----------------------------------|--------------------------------------|
|           | Min  | Nom | Max |   |                                   |                                      |
| MSQA6V1W5 | 6.1  | 6.6 | 7.2 | 1.0   | 90                                | 1.25                                 |

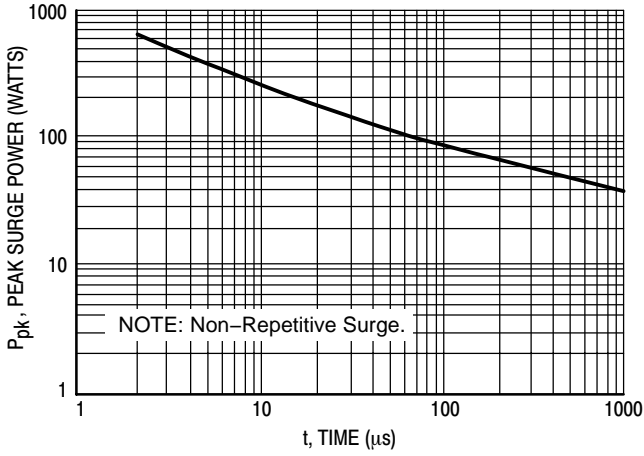


Figure 1. Pulse Width

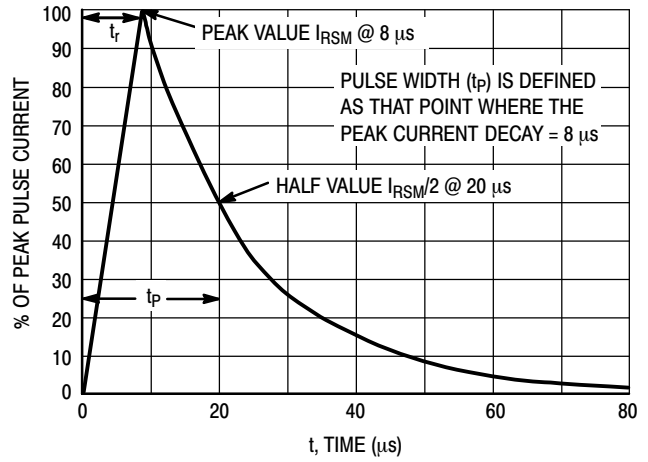


Figure 2. 8 x 20  $\mu$ s Pulse Waveform

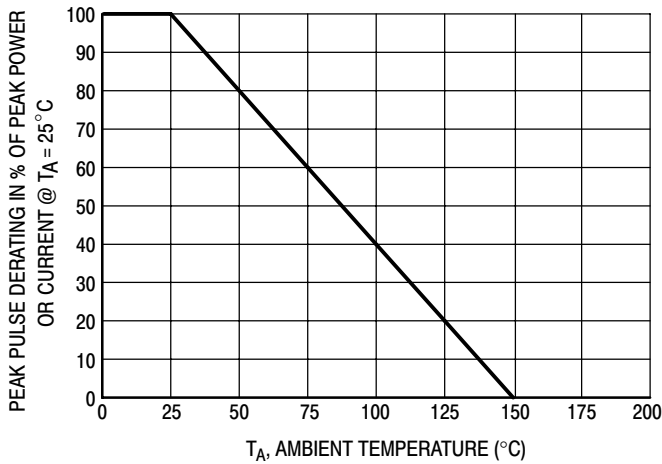


Figure 3. Pulse Derating Curve

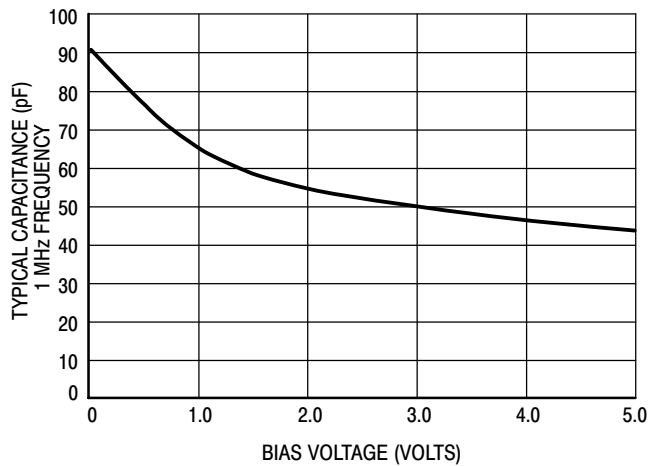


Figure 4. Capacitance

# MSQA6V1W5T2

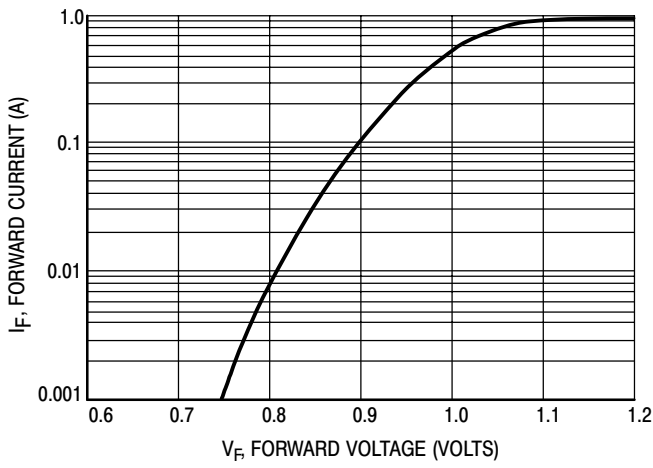


Figure 5. Forward Voltage

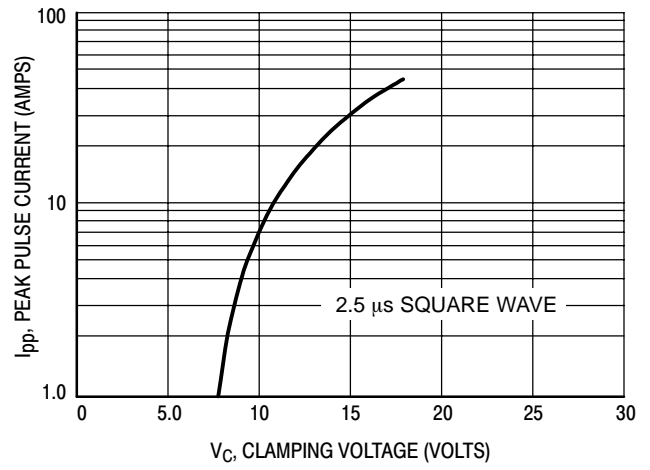


Figure 6. Clamping Voltage versus Peak Pulse Current (Reverse Direction)

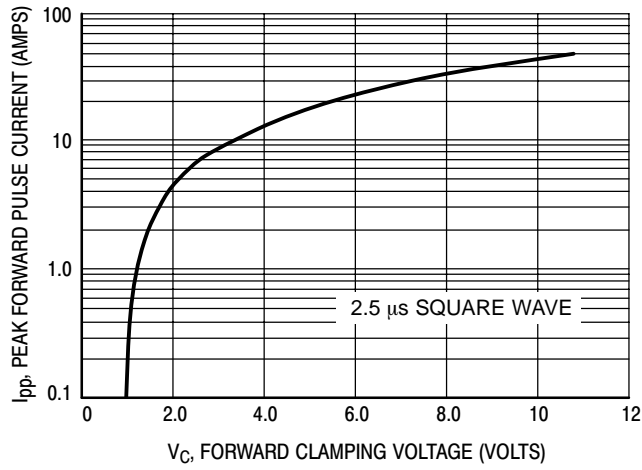
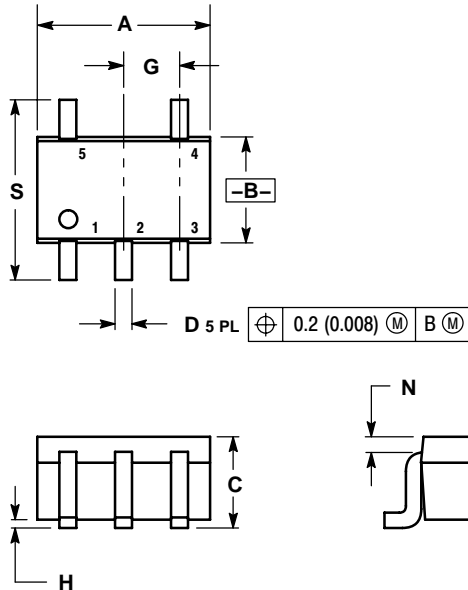


Figure 7. Clamping Voltage versus Peak Pulse Current (Forward Direction)

# MSQA6V1W5T2

## PACKAGE DIMENSIONS

SC-88A / SOT-353 / SC-70  
CASE 419A-02  
ISSUE J



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419A-01 OBSOLETE. NEW STANDARD 419A-02.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| DIM | INCHES    |       | MILLIMETERS |      |
|-----|-----------|-------|-------------|------|
|     | MIN       | MAX   | MIN         | MAX  |
| A   | 0.071     | 0.087 | 1.80        | 2.20 |
| B   | 0.045     | 0.053 | 1.15        | 1.35 |
| C   | 0.031     | 0.043 | 0.80        | 1.10 |
| D   | 0.004     | 0.012 | 0.10        | 0.30 |
| G   | 0.026 BSC |       | 0.65 BSC    |      |
| H   | ---       | 0.004 | ---         | 0.10 |
| J   | 0.004     | 0.010 | 0.10        | 0.25 |
| K   | 0.004     | 0.012 | 0.10        | 0.30 |
| N   | 0.008 REF |       | 0.20 REF    |      |
| S   | 0.079     | 0.087 | 2.00        | 2.20 |

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