

# MA3075WALT1

Preferred Device

## Zener Transient Voltage Suppressor

### SOT-23 Dual Common Anode Zeners for ESD Protection

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

#### Features

- SOT-23 Package Allows Two Separate Unidirectional Configurations
- Low Leakage < 1  $\mu$ A @ 5.0 V
- Breakdown Voltage: 7.2–7.9 V @ 5 mA
- Low Capacitance (80 pF typical @ 0 V, 1 MHz)
- ESD Protection Meeting: 16 kV Human Body Model  
30 kV Air and Contact Discharge
- Pb-Free Packages are 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 @ 100 $\mu$ s (Note 1)   | $P_{pk}$        | 15             | W           |
| Steady State Power Dissipation<br>Derate above 25°C (Note 2)  | $P_D$           | 225<br>1.8     | mW<br>mW/°C |
| Thermal Resistance, Junction-to-Ambient   | $R_{\theta JA}$ | 556            | °C/W        |
| Maximum Junction Temperature  | $R_{\theta JA}$ | 417            | °C/W        |
| Operating Junction and Storage<br>Temperature Range   | $T_J, T_{stg}$  | -55 to +150    | °C          |
| ESD Discharge<br>MIL STD 883C – Method 3015-6<br>IEC61000-4-2, Air Discharge<br>IEC61000-4-2, Contact Discharge | $V_{PP}$        | 16<br>30<br>30 | kV          |

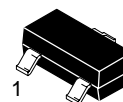
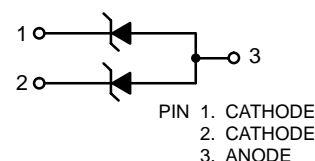
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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

1. Non-repetitive 100  $\mu$ s pulse width
2. Mounted on FR-5 Board = 1.0 X 0.75 X 0.062 in.



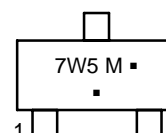
ON Semiconductor®

<http://onsemi.com>



SOT-23  
CASE 318  
STYLE 12

#### MARKING DIAGRAM



7W5 = Specific Device Code  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation and/or overbar may vary depending upon manufacturing location.

#### ORDERING INFORMATION

| Device       | Package             | Shipping†        |
|--------------|---------------------|------------------|
| MA3075WALT1  | SOT-23              | 3000/Tape & Reel |
| MA3075WALT1G | SOT-23<br>(Pb-Free) | 3000/Tape & Reel |

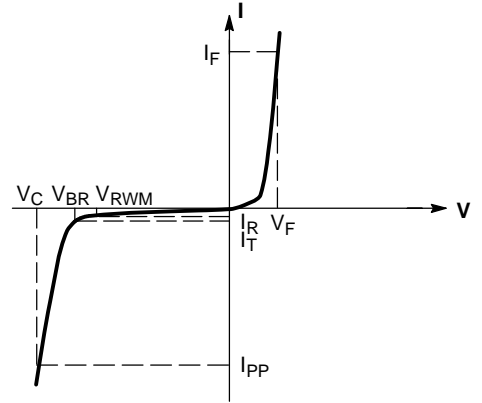
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

Preferred devices are recommended choices for future use and best overall value.

# MA3075WALT1

## ELECTRICAL CHARACTERISTICS

| Parameter  | Symbol   | Conditions             | Min | Typ | Max | Unit                       |
|--|----------|------------------------|-----|-----|-----|----------------------------|
| Forward Voltage  | $V_F$    | $I_F = 10 \text{ mA}$  |     | 0.8 | 0.9 | V                          |
| Zener Voltage <sup>*2</sup>                            | $V_Z$    | $I_Z = 5 \text{ mA}$   | 7.2 | 7.5 | 7.9 | V                          |
| Operating Resistance                                   | $R_{ZK}$ | $I_Z = 0.5 \text{ mA}$ |     |     | 120 | $\Omega$                   |
|  | $R_Z$    | $I_Z = 5 \text{ mA}$   |     | 6   | 15  | $\Omega$                   |
| Reverse Current  | $I_{R1}$ | $V_R = 5 \text{ V}$    |     |     | 1   | $\mu\text{A}$              |
|  | $I_{R2}$ | $V_R = 6.5 \text{ V}$  |     |     | 60  | $\mu\text{A}$              |
| Temperature Coefficient of Zener Voltage <sup>*3</sup> | $S_Z$    | $I_Z = 5 \text{ mA}$   | 2.5 | 4.0 | 5.3 | $\text{mV}/^\circ\text{C}$ |
| Terminal Capacitance                                   | $C_t$    | $V_R = 0 \text{ V}$    |     | 80  |     | $\text{pF}$                |



Uni-Directional TVS

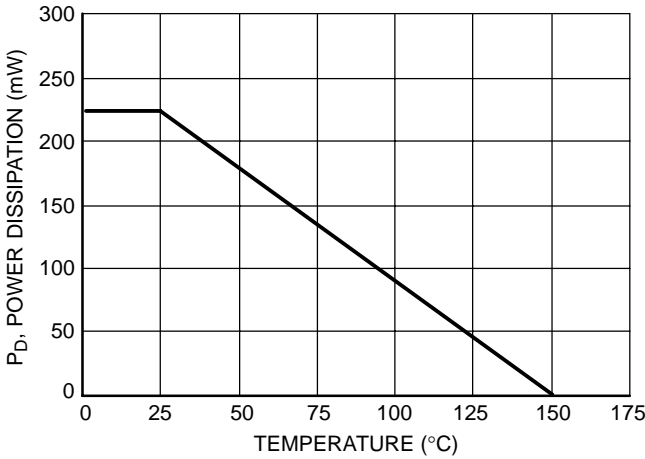


Figure 1. Steady State Power Derating Curve

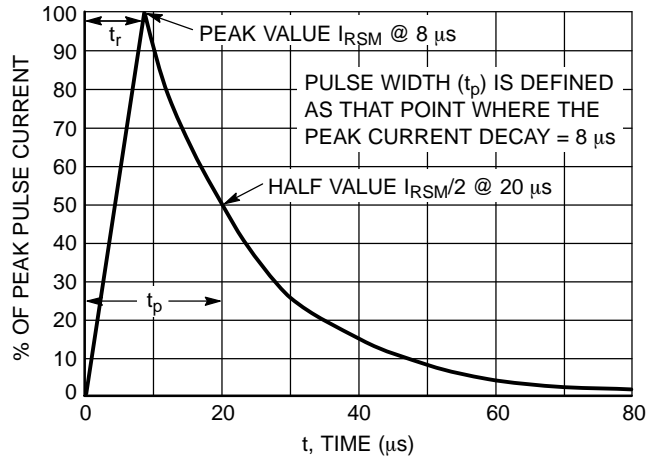


Figure 2. 8 X 20  $\mu\text{s}$  Pulse Waveform

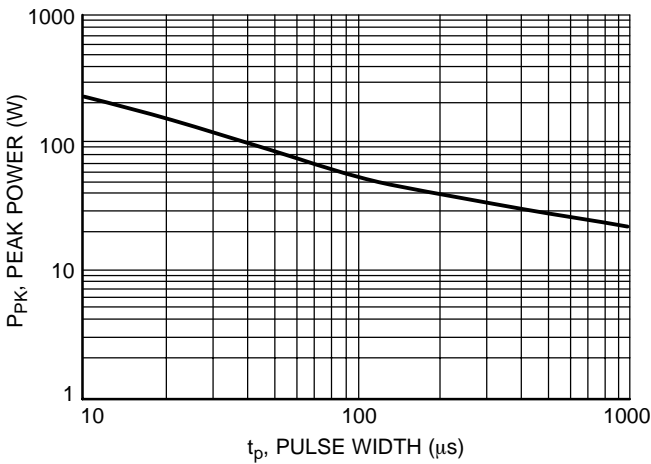


Figure 3. Pulse Rating Curve

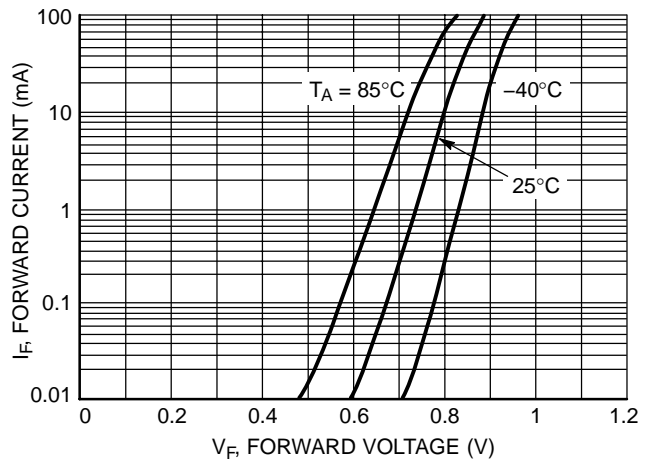


Figure 4. Forward Current versus Forward Voltage

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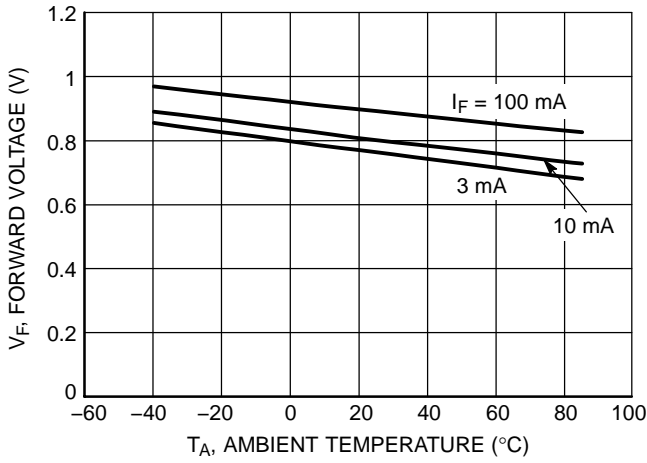


Figure 5. Forward Voltage versus Temperature

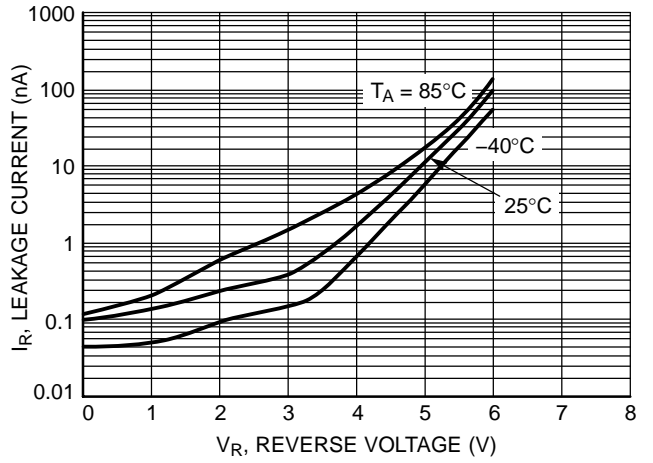


Figure 6. Leakage Current versus Reverse Voltage

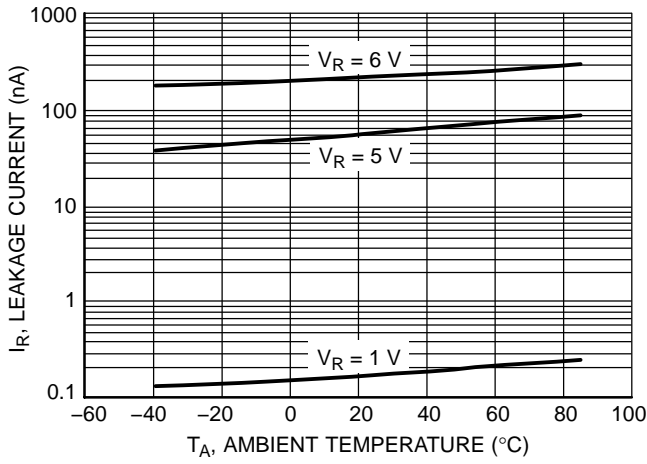


Figure 7. Leakage Current versus Temperature

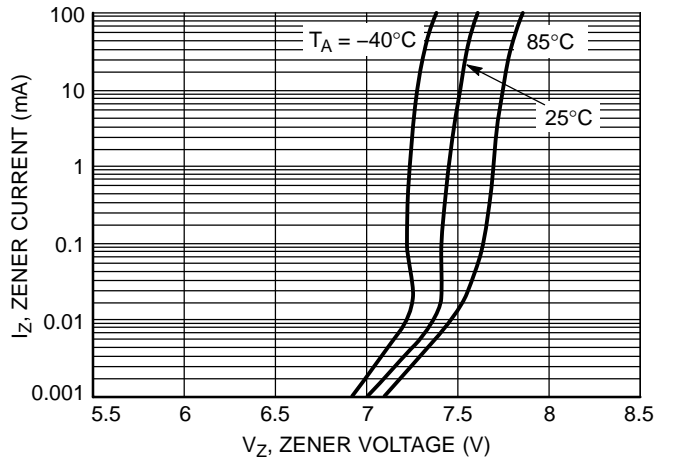


Figure 8. Zener Current versus Zener Voltage

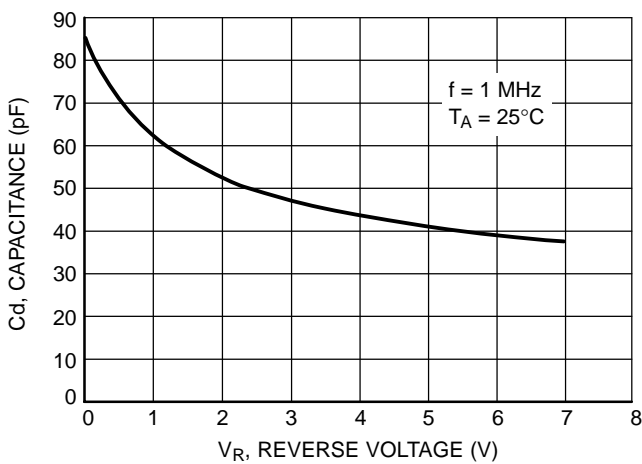


Figure 9. Capacitance

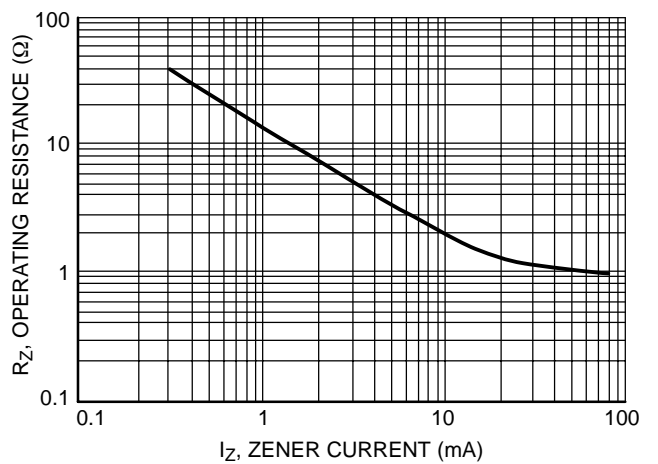
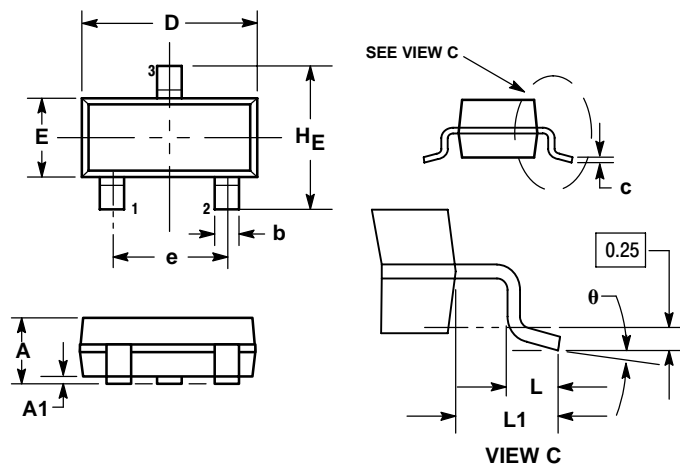


Figure 10. Operating Resistance versus Zener Current

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SOT-23 (TO-236)  
CASE 318-08  
ISSUE AN

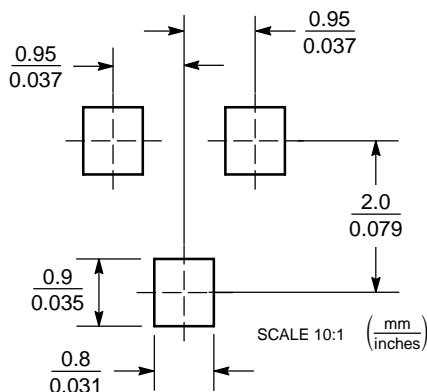


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
  4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.


| DIM | MILLIMETERS |      |      | INCHES |       |       |
|-----|-------------|------|------|--------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A   | 0.89        | 1.00 | 1.11 | 0.035  | 0.040 | 0.044 |
| A1  | 0.01        | 0.06 | 0.10 | 0.001  | 0.002 | 0.004 |
| b   | 0.37        | 0.44 | 0.50 | 0.015  | 0.018 | 0.020 |
| c   | 0.09        | 0.13 | 0.18 | 0.003  | 0.005 | 0.007 |
| D   | 2.80        | 2.90 | 3.04 | 0.110  | 0.114 | 0.120 |
| E   | 1.20        | 1.30 | 1.40 | 0.047  | 0.051 | 0.055 |
| e   | 1.78        | 1.90 | 2.04 | 0.070  | 0.075 | 0.081 |
| L   | 0.10        | 0.20 | 0.30 | 0.004  | 0.008 | 0.012 |
| L1  | 0.35        | 0.54 | 0.69 | 0.014  | 0.021 | 0.029 |
| HE  | 2.10        | 2.40 | 2.64 | 0.083  | 0.094 | 0.104 |

- STYLE 12:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

## SOLDERING FOOTPRINT\*



\*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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