

## 1.Description

This 5-line voltage transient suppressor array is designed for application requiring transient voltage protection capability. It is intended for use in over-transient voltage and ESD sensitive equipment such as computers, printers, automotive electronics, networking communication and other applications. This device features a monolithic common anode design which protects five independent lines in a single SOT-363 package.

## 3.Features

- Protects up to 5-Line in a Single SOT-363 Package
- Peak Power Dissipation – 100W  
(8x20  $\mu$ s Waveform)
- Compliance with IEC 61000-4-2 (ESD)  
15 kV (Air), 8 kV (Contact)

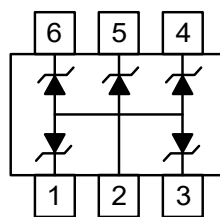
## 4.Applications

- Hand-Held Portable Applications
- Networking and Telecom
- Automotive Electronics

## 5.Pinning information

## 2.Applications

- Hand-Held Portable Applications
- Networking and Telecom
- Automotive Electronics
- Serial and Parallel Ports
- Notebooks, Desktops, Servers
- ESD Rating of Class 3B (Exceeding 8 kV) per Human Body Model and Class C (Exceeding 400 V) per Machine Model.
- Flammability Rating of UL 94 V-0
- Pb-Free Packages are Available\*



**SOT-363**



## 6. Absolute Maximum Ratings ( $T_J=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                                                                        | Symbol    | Value      | Units              |
|----------------------------------------------------------------------------------|-----------|------------|--------------------|
| Peak Power Dissipation 8 x 20 $\mu\text{s}$ Double Exponential Waveform (Note 1) | $P_{PK1}$ | 100        | W                  |
| Junction Temperature Range                                                       | $T_J$     | -40 to 125 | $^{\circ}\text{C}$ |
| Storage Temperature Range                                                        | $T_{STG}$ | -55 to 150 | $^{\circ}\text{C}$ |
| Lead Solder Temperature (10s)                                                    | $T_L$     | 260        | $^{\circ}\text{C}$ |
| Human Body Model (HBM)                                                           | $V_{ESD}$ | 16000      | V                  |
| Machine Model (MM)                                                               |           | 400        | V                  |
| IEC 61000-4-2 Air (ESD)                                                          |           | 15000      | V                  |
| IEC 61000-4-2 Contact (ESD)                                                      |           | 15000      | V                  |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Nonrepetitive current pulse per Figure 3.



## 7.1 Electrical Characteristics (SMF05CT1G)

| Parameter                  | Symbol    | Conditions                          | Min | Typ  | Max  | Units   |
|----------------------------|-----------|-------------------------------------|-----|------|------|---------|
| Reverse Working Voltage    | $V_{RWM}$ | (Note 2)                            |     |      | 5    | V       |
| Breakdown Voltage          | $V_{BR}$  | $I_T=1mA$ , (Note 3)                | 6.2 |      | 7.2  | V       |
| Reverse Leakage Current    | $I_R$     | $V_{RWM}=5V$                        |     | 0.07 | 5    | $\mu A$ |
| Clamping Voltage           | $V_C$     | $I_{PP}=5A$ (8x20 $\mu s$ Waveform) |     |      | 9.8  | V       |
| Clamping Voltage           | $V_C$     | $I_{PP}=8A$ (8x20 $\mu s$ Waveform) |     |      | 12.5 | V       |
| Maximum Peak Pulse Current | $I_{PP}$  | 8x20 $\mu s$ Waveform               |     |      | 8    | A       |
| Capacitance                | $C_J$     | $V_R=0V$ , $f=1MHz$ (Line to GND)   |     | 80   | 130  | pF      |

## 7.1 Electrical Characteristics (SMF12CT1G)

| Parameter                  | Symbol    | Conditions                          | Min  | Typ  | Max | Units   |
|----------------------------|-----------|-------------------------------------|------|------|-----|---------|
| Reverse Working Voltage    | $V_{RWM}$ | (Note 2)                            |      |      | 12  | V       |
| Breakdown Voltage          | $V_{BR}$  | $I_T=1mA$ , (Note 3)                | 13.3 |      | 15  | V       |
| Reverse Leakage Current    | $I_R$     | $V_{RWM}=12V$                       |      | 0.01 | 0.1 | $\mu A$ |
| Clamping Voltage           | $V_C$     | $I_{PP}=3A$ (8x20 $\mu s$ Waveform) |      |      | 21  | V       |
| Clamping Voltage           | $V_C$     | $I_{PP}=6A$ (8x20 $\mu s$ Waveform) |      |      | 23  | V       |
| Maximum Peak Pulse Current | $I_{PP}$  | 8x20 $\mu s$ Waveform               |      |      | 6   | A       |
| Capacitance                | $C_J$     | $V_R=0V$ , $f=1MHz$ (Line to GND)   |      | 40   | 60  | pF      |



### 7.3 Electrical Characteristics (SMF15CT1G)

| Parameter                  | Symbol    | Conditions                          | Min | Typ  | Max | Units   |
|----------------------------|-----------|-------------------------------------|-----|------|-----|---------|
| Reverse Working Voltage    | $V_{RWM}$ | (Note 2)                            |     |      | 15  | V       |
| Breakdown Voltage          | $V_{BR}$  | $I_T=1mA$ , (Note 3)                | 17  |      | 19  | V       |
| Reverse Leakage Current    | $I_R$     | $V_{RWM}=15V$                       |     | 0.01 | 1   | $\mu A$ |
| Clamping Voltage           | $V_C$     | $I_{PP}=1A$ (8x20 $\mu s$ Waveform) |     |      | 23  | V       |
| Clamping Voltage           | $V_C$     | $I_{PP}=5A$ (8x20 $\mu s$ Waveform) |     |      | 29  | V       |
| Maximum Peak Pulse Current | $I_{PP}$  | 8x20 $\mu s$ Waveform               |     |      | 5   | A       |
| Capacitance                | $C_J$     | $V_R=0V$ , $f=1MHz$ (Line to GND)   |     | 33   | 45  | pF      |

### 7.4 Electrical Characteristics (SMF24CT1G)

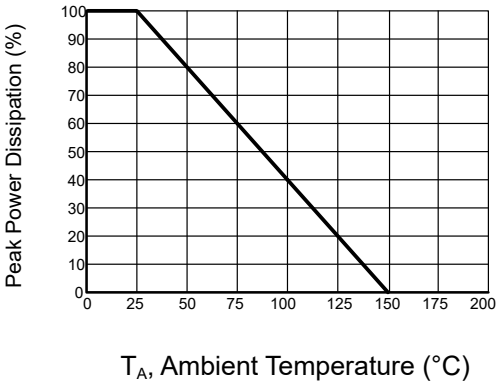
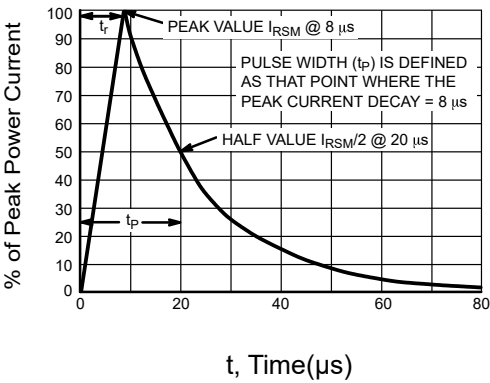
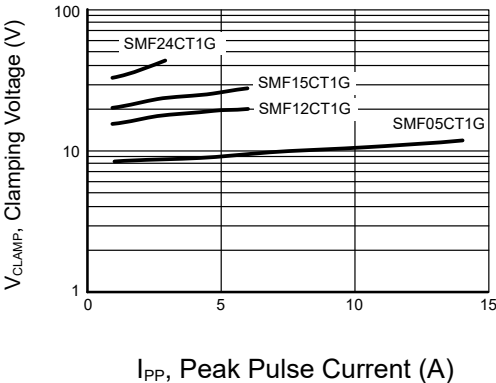
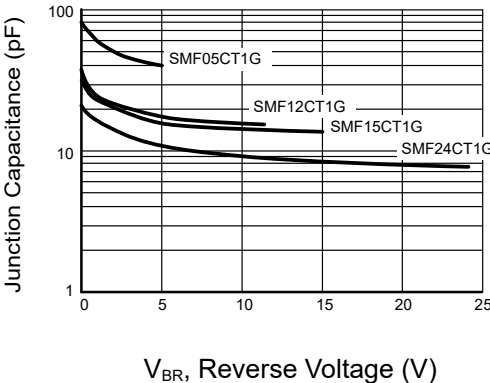
| Parameter                  | Symbol    | Conditions                            | Min  | Typ  | Max | Units   |
|----------------------------|-----------|---------------------------------------|------|------|-----|---------|
| Reverse Working Voltage    | $V_{RWM}$ | (Note 2)                              |      |      | 24  | V       |
| Breakdown Voltage          | $V_{BR}$  | $I_T=1mA$ , (Note 3)                  | 26.7 |      | 32  | V       |
| Reverse Leakage Current    | $I_R$     | $V_{RWM}=24V$                         |      | 0.01 | 1   | $\mu A$ |
| Clamping Voltage           | $V_C$     | $I_{PP}=1A$ (8x20 $\mu s$ Waveform)   |      |      | 40  | V       |
| Clamping Voltage           | $V_C$     | $I_{PP}=2.5A$ (8x20 $\mu s$ Waveform) |      |      | 44  | V       |
| Maximum Peak Pulse Current | $I_{PP}$  | 8x20 $\mu s$ Waveform                 |      |      | 2.5 | A       |
| Capacitance                | $C_J$     | $V_R=0V$ , $f=1MHz$ (Line to GND)     |      | 21   | 25  | pF      |

2. TVS devices are normally selected according to the working peak reverse voltage ( $V_{RWM}$ ), which should be equal or greater than the DC or continuous peak operating voltage level.

3.  $V_{BR}$  is measured at pulse test current  $I_T$ .

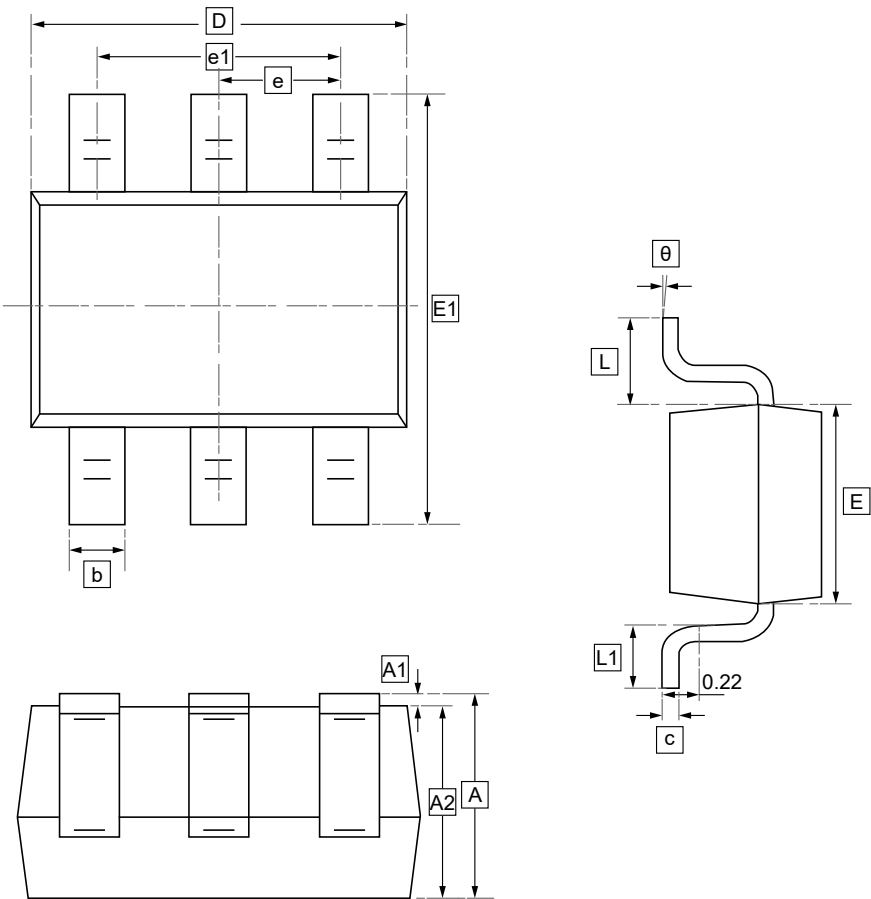


8. Typical characteristic

|                                                                                     |                                                                                      |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|    |    |
| Figure 1: Power Derating Curve                                                      | Figure 2: 8×20µs Pulse Waveform                                                      |
|  |  |
| Figure 3: Clamping Voltage vs Peak Pulse Current                                    | Figure 4: Junction Capacitance vs Reverse Voltage                                    |



9.SOT-363 Package Outline Dimensions



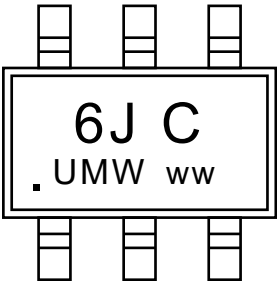
DIMENSIONS (mm are the original dimensions)

| Symbol | A     | A1    | A2    | b     | c     | D     | E     | E1    | e    | e1    | L     | L1    |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|
| Min    | 0.900 | 0.000 | 0.900 | 0.150 | 0.080 | 2.000 | 1.150 | 2.150 | 0.65 | 1.200 | 0.525 | 0.260 |
| Max    | 1.100 | 0.100 | 1.000 | 0.350 | 0.150 | 2.200 | 1.350 | 2.450 | TYP  | 1.400 | REF   | 0.460 |

| Symbol | $\theta$ |
|--------|----------|
| Min    | 0°       |
| Max    | 8°       |



10.Ordering information



ww: Batch Code

| Order Code    | Package | Base QTY | Delivery Mode |
|---------------|---------|----------|---------------|
| UMW SMF05CT1G | SOT-363 | 3000     | Tape and reel |
| UMW SMF12CT1G | SOT-363 | 3000     | Tape and reel |
| UMW SMF15CT1G | SOT-363 | 3000     | Tape and reel |
| UMW SMF24CT1G | SOT-363 | 3000     | Tape and reel |



## 11.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.