

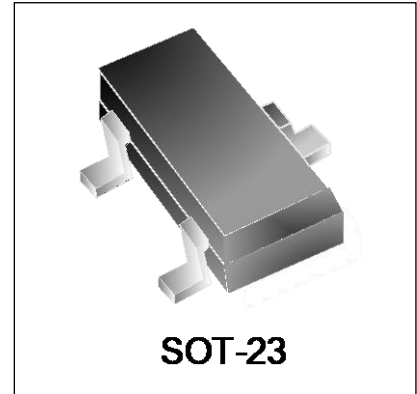
## Transient Voltage Suppressor

### Features

- 325 watts peak pulse power ( $t_p = 8/20\mu s$ )
- Protects one bidirectional line or two unidirectional lines
- Working Voltages: 12V
- Low clamping voltages

### IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2 (ESD)  $\pm 30kV$  (air),  $\pm 30kV$  (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 13A (8/20 $\mu s$ )



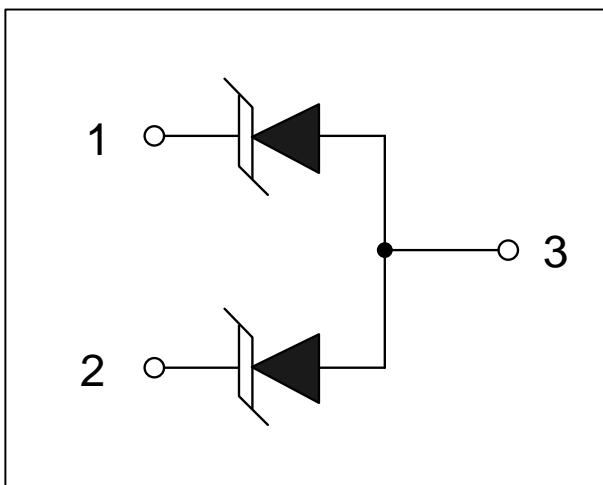
### Mechanical Characteristics

- JEDEC SOT-23 package
- Marking: Marking Code
- Packaging : Tape and Reel
- RoHS Compliant & HF
- Device meets MSL3 requirement

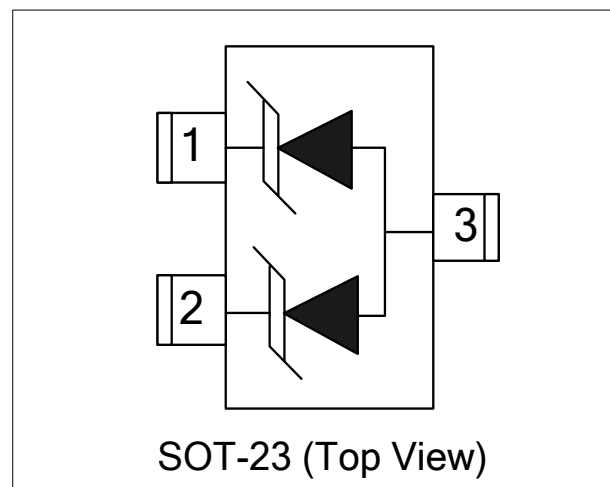
### Applications

- RS-232, RS-422 & RS-485
- Cellular Handsets and Accessories
- Control & Monitoring Systems
- Portable Electronics
- Set-Top Box
- Servers, Notebook, and Desktop PC
- Wireless Bus Protection

### Circuit Diagram



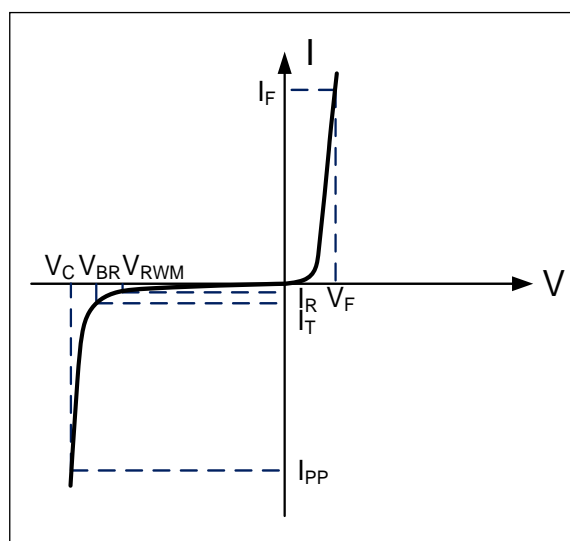
### Schematic & PIN Configuration



Absolute Maximum Rating			
Rating	Symbol	Value	Units
Peak Pulse Power ( $t_p=8/20\mu s$ )	$P_{PP}$	325	W
Peak Pulse Current ( $t_p=8/20\mu s$ )	$I_{PP}$	13	A
Operating Temperature	$T_J$	-55 to +125	°C
Storage Temperature	$T_{STG}$	-55 to +150	°C

## Electrical Parameters

Symbol	Parameter
$I_{PP}$	Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$



## Electrical Characteristics( $T=25^{\circ}\text{C}$ unless otherwise noted)

WS12M2T						
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	$V_{RWM}$				12	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1\text{mA}$	13.3			V
Reverse Leakage Current	$I_R$	$V_{RWM}=12\text{V}$			500	nA
Clamping Voltage	$V_C$	$I_{PP}=1\text{A}$ , $t_p=8/20\mu s$			19	V
Clamping Voltage	$V_C$	$I_{PP}=13\text{A}$ , $t_p=8/20\mu s$		21.5	25	V
Dynamic Resistance <sup>1,2</sup>	$R_{DYN}$	$TLP=0.2/100\text{ns}$		0.22		$\Omega$
ESD Clamping Voltage <sup>1</sup>	$V_C$	$I_{PP} = 4\text{A}$ $t_p = 0.2/100\text{ns}$		15.2		V
ESD Clamping Voltage <sup>1</sup>	$V_C$	$I_{PP} = 16\text{A}$ $t_p = 0.2/100\text{ns}$		17.8		V
Junction Capacitance	$C_j$	Pin 1 to 2 $V_R = 0\text{V}$ , $f = 1\text{MHz}$		40		pF
		Pin 1 to 3 and Pin 2 to 3 $V_R = 0\text{V}$ , $f = 1\text{MHz}$		80		pF

**Note:** 1、TLP Setting:  $t_p=100\text{ns}$ ,  $t_r=0.2\text{ns}$ ,  $I_{TLP}$  and  $V_{TLP}$  sample window:  $t_1=70\text{ns}$  to  $t_2=90\text{ns}$ .

2、Dynamic resistance calculated from  $I_{PP}=4\text{A}$  to  $I_{PP}=16\text{A}$  using “Best Fit”

## Typical Characteristics

Figure 1: Peak Pulse Power Vs Pulse Time

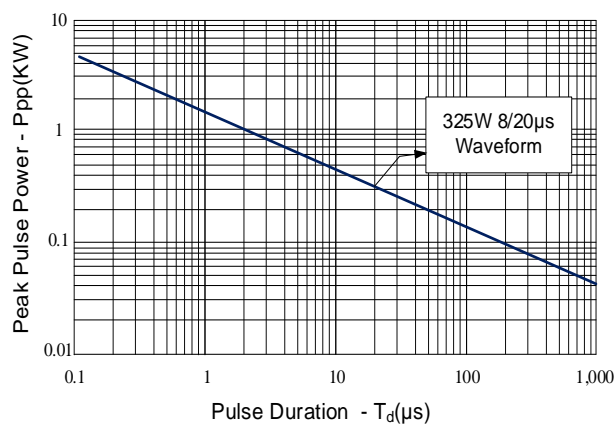


Figure 2: Power Derating Curve

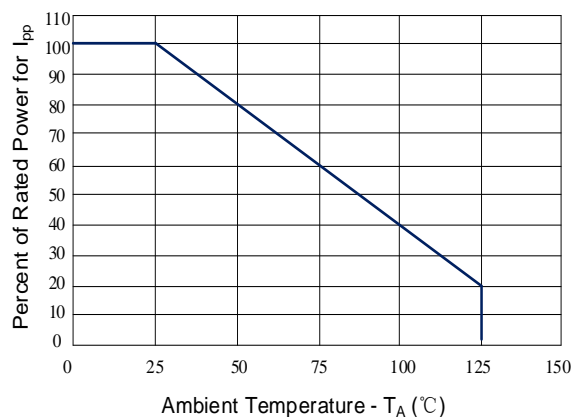


Figure 3: Clamping Voltage vs. Peak Pulse Current

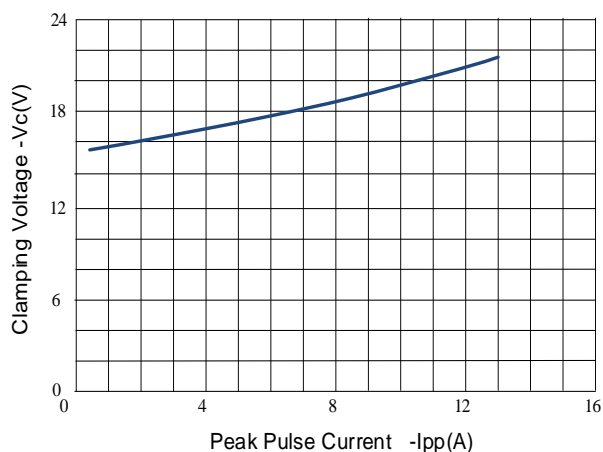


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

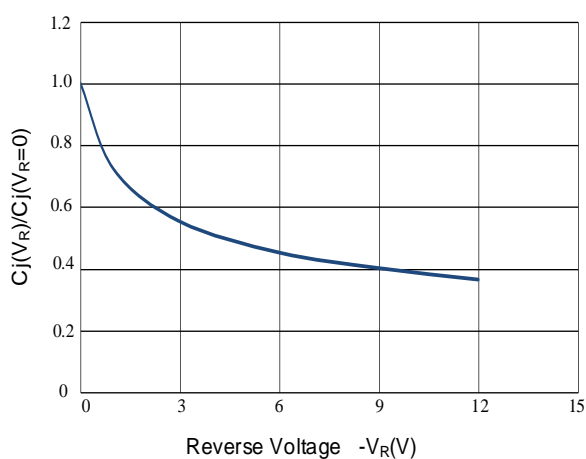


Figure 5: 8/20μs Pulse Waveform

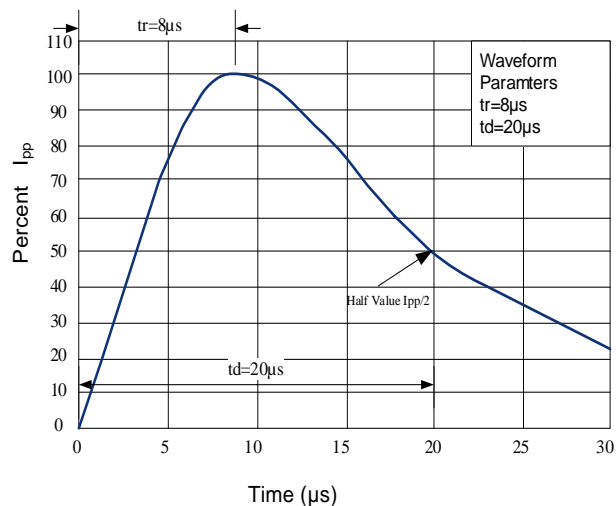
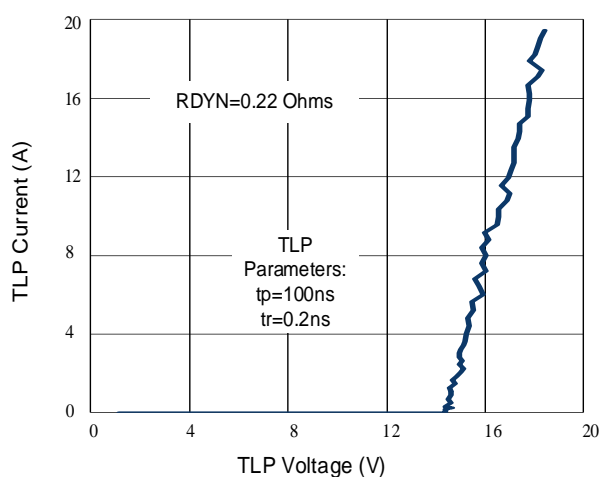
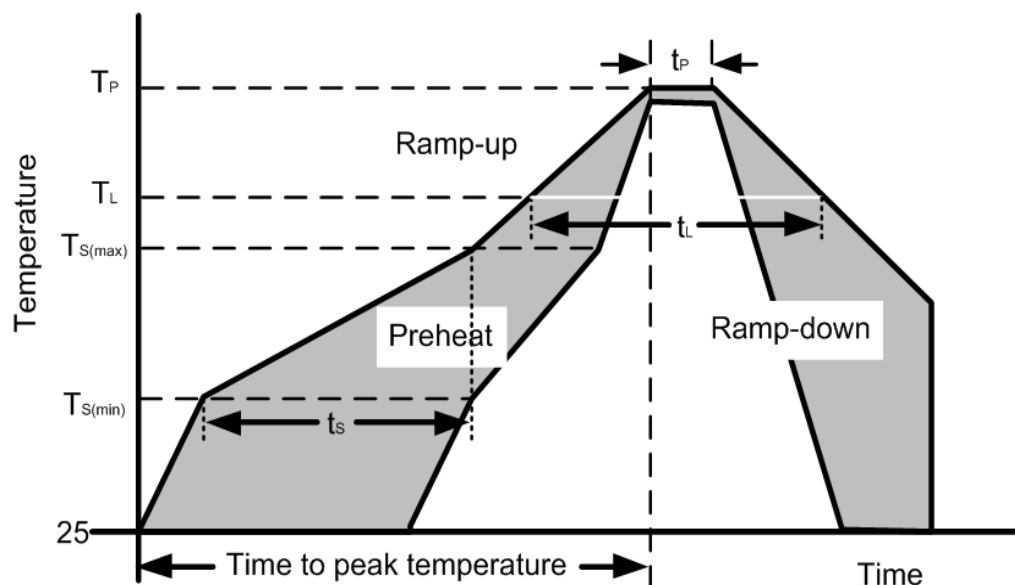


Figure 6: TLP I-V Curve



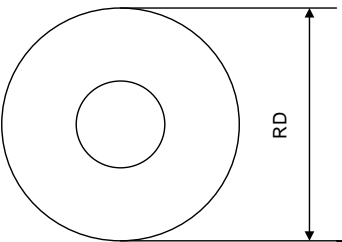
## Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	Temperature Min ( $T_{s(min)}$ )	150°C
	Temperature Max ( $T_{s(max)}$ )	200°C
	Time (min to max) ( $t_s$ )	60 – 190 secs
Average ramp up rate (Liquidus Temp) ( $T_L$ ) to peak		5°C/second max
$T_{s(max)}$ to $T_L$ ——Ramp-up Rate		5°C/second max
Reflow	Temperature ( $T_L$ ) (Liquidus)	217°C
	Temperature ( $t_L$ )	60 – 150 seconds
Peak Temperature ( $T_P$ )		260+0/-5 °C
Time within actual peak Temperature ( $t_p$ )		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature ( $T_P$ )		8 minutes Max.
Do not exceed		280°C

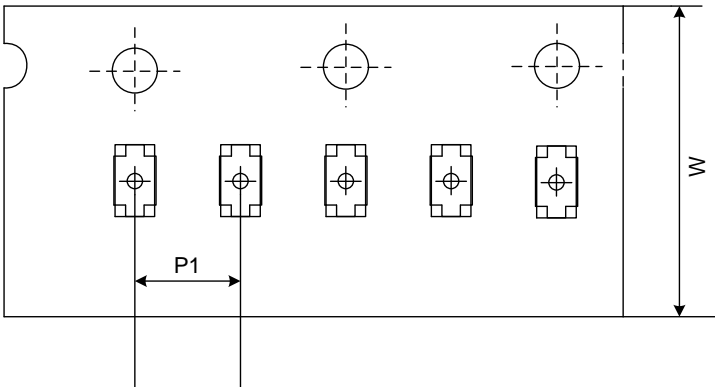


Tape And Reel Information

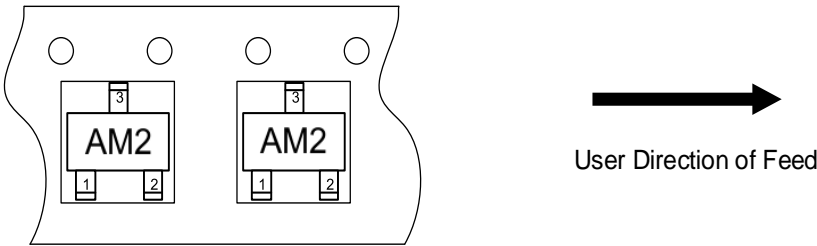
Reel Dimensions



Tape Dimensions

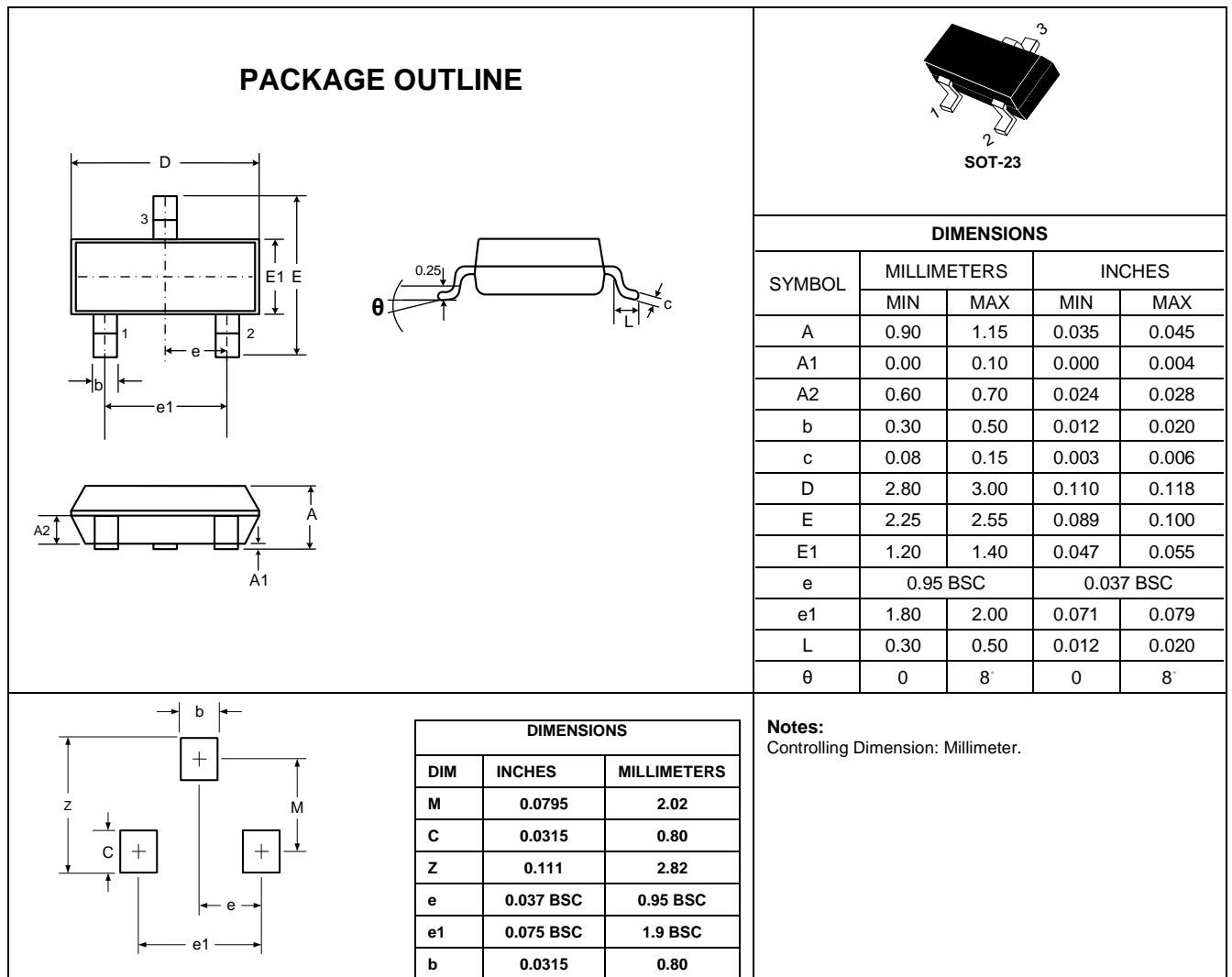


Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimensions	7 inch
W	Overall width of the carrier tape	8 mm
P1	Pitch between successive cavity centers	4 mm

## Outline Drawing – SOT-23



## Marking Codes

Part Number	WS12M2T
Marking Code	

## Package Information

Qty: 3k/Reel

## CONTACT INFORMATION

No.1001, Shiwan (7) Road, Pudong District, Shanghai, P.R.China.201207

Tel: 86-21-50310888 Fax: 86-21-50757680 Email: [market@way-on.com](mailto:market@way-on.com)WAYON website: <http://www.way-on.com>

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**Product Specification Statement**

1. The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.
2. The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.
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