

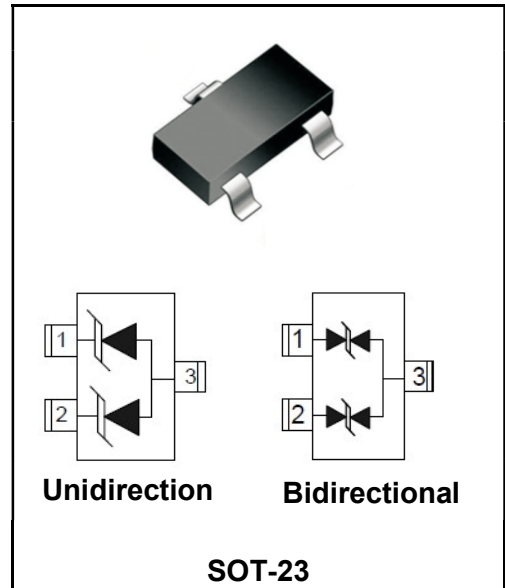
**Transient Voltage Suppressor**

**Features**

- ✦350 watts peak pulse power (tp = 8/20μs)
- ✦Unidirectional & Bidirectional Configurations
- ✦Working Voltages: 3.3V, 5V, 8V,12V, 15V, 24V and 36V
- ✦Low clamping voltages
- ✦Low Leakage Current
- ✦Response Time is Typically < 1 ns
- ✦IEC 61000-4-2 ( ESD ) ±30KV contact ±30 KV Air
- ✦IEC 61000-4-4 (EFT) 40A (5/50ns)

**Application**

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

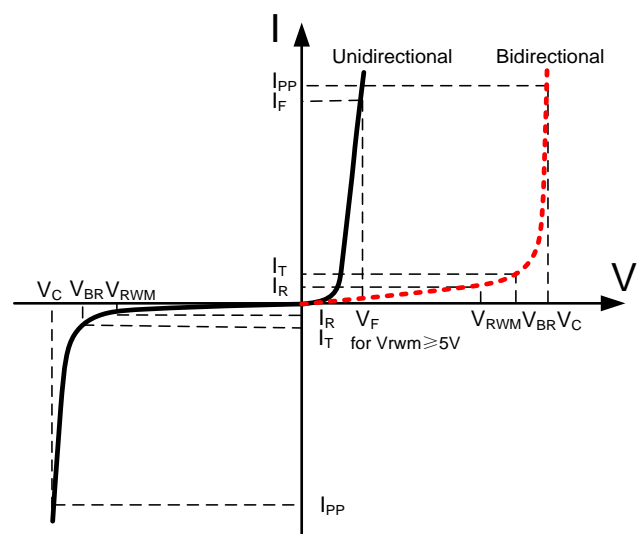


**Limiting Values(TA = 25 °C, unless otherwise specified)**

Symbol	Parameter	Conditions	value	Unit
P <sub>PP</sub>	Peak Pulse Power ( tp =8/20μs )	Contact	350	W
TL	Lead Soldering Temperature	-	260(10sec)	°C
T <sub>J</sub>	Operating Temperature	-	-55 to+125	°C
T <sub>stg</sub>	Storage Temperature	-	-55 to+150	°C

**Electrical Parameters (T=25°C)**

Symbol	Parameter
I <sub>PP</sub>	Maximum Peak Pulse Current
V <sub>C</sub>	Clamping Voltage @ I <sub>PP</sub>
V <sub>RWM</sub>	Reverse Stand-Off Voltage
I <sub>R</sub>	Reverse Leakage Current @ V <sub>RWM</sub>
V <sub>BR</sub>	Breakdown Voltage @ I <sub>T</sub>
I <sub>T</sub>	Test Current
I <sub>F</sub>	Forward Current
V <sub>F</sub>	Forward Voltage @ I <sub>F</sub>

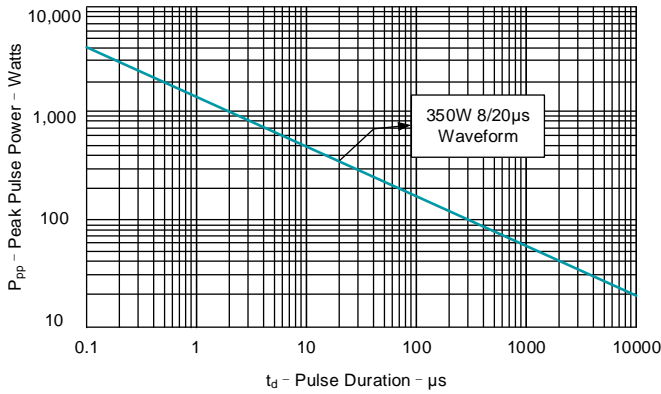


Electrical Characteristics

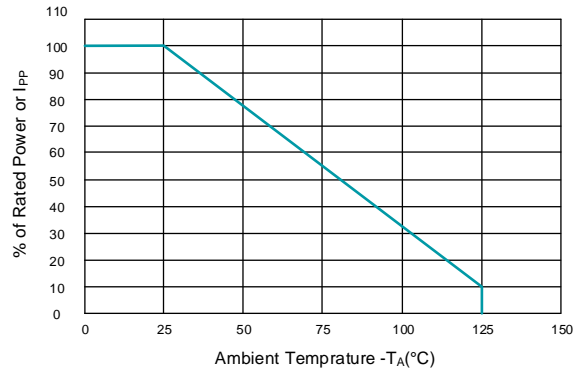
Part Number	Reverse Stand off Voltage $V_{RWM}$ (Volts)	Minimum Breakdown Voltage $V_{BR@1mA}$ (Volts)	Maximum Peak Pulse Current $I_{pp}$ (Amps)	Maximum Clamping Voltage $V_c @ I_{pp}$ (Volts)	Maximum Reverse Leakage $I_R @ V_{RWM}$ ( $\mu A$ )	Typical Capacitance DC=0V $C_J @ 1 MHz$ (pF)	Maximum Capacitance DC=0V $C_J @ 1 MHz$ (pF)	Marking Code
ESD3V3FT233	3.3	4.0	25	15	1	200	240	3M2
ESD3V3FBT233	3.3	4.0	25	15	1	100	120	3B2
ESD5VFT233	5	6.0	20	16	1	150	180	5M2
ESD5VFBT233	5	6.0	20	16	1	75	90	5B2
ESD8VFT233	8	9.0	15	25	1	70	80	8M2
ESD8VFBT233	8	9.0	15	25	1	40	45	8B2
ESD12VFT233	12	13.3	12	30	1	75	90	AM2
ESD12VFBT233	12	13.3	12	30	1	40	45	AB2
ESD15VFT233	15	16.7	10	35	1	45	55	BM2
ESD15VFBT233	15	16.7	10	35	1	25	30	BB2
ESD24VFT233	24	26.7	6	55	1	30	40	CM2
ESD24VFBT233	24	26.7	6	55	1	15	20	CB2
ESD36VFT233	36	40	6	95	1	25	30	DM2
ESD36VFBT233	36	40	6	95	1	15	18	DB2

Typical Characteristics

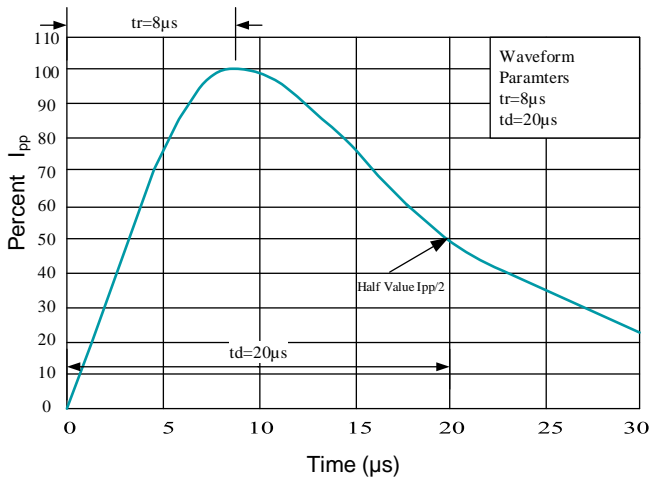
Peak Pulse Power vs. Pulse Time



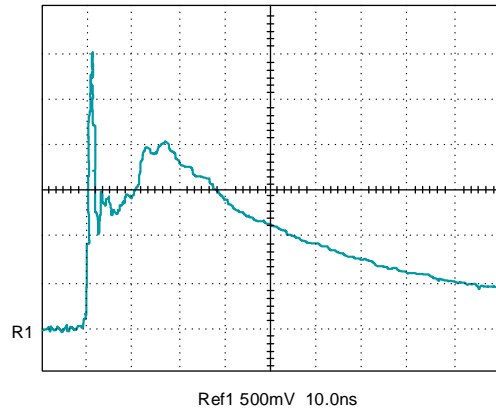
Power Derating Curve

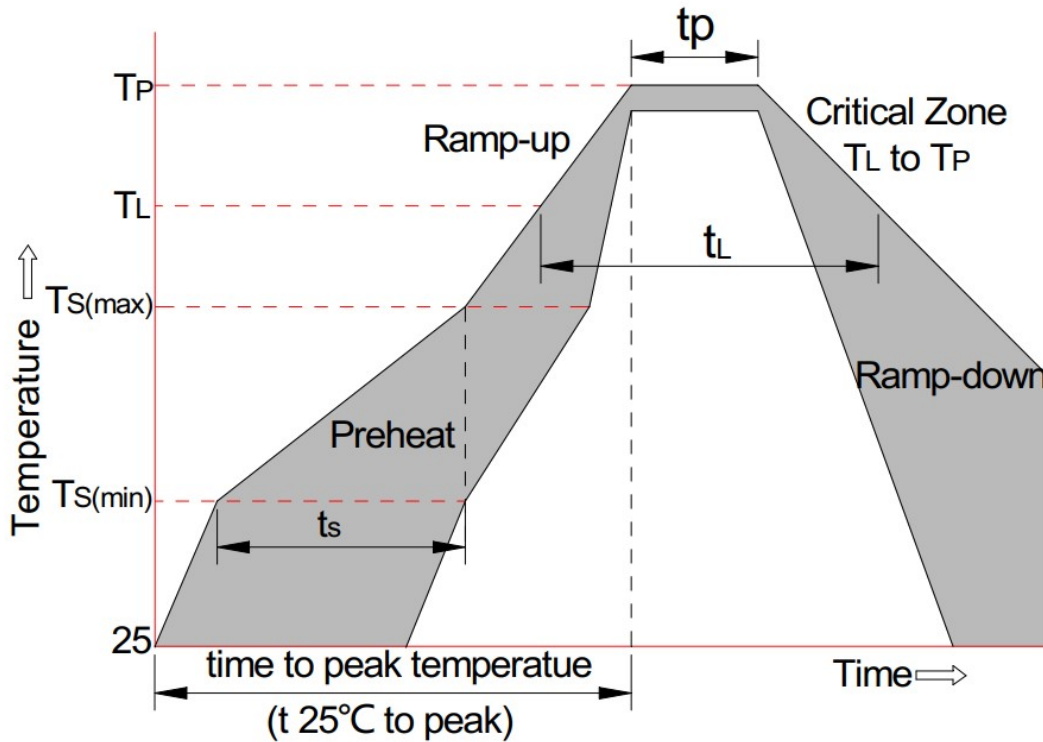


Pulse Waveform



ESD Pulse Waveform (Per IEC 61000-4-2)





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 (Liquid us Temp ( $T_L$ ) to peak)		5°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		5°C/sec. Max
Reflow	-Temperature( $T_L$ )(Liquid us)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_p$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		20-40 secs. Max
Ramp-down Rate		5°C/sec. Max
Time 25°C to Peak Temp ( $T_P$ )		8 min. Max
Do not exceed		+280°C

**Package Dimension**

### PACKAGE OUTLINE

DIMENSIONS				
SYMBOL	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
A2	0.60	0.70	0.0236	0.0275
b	0.30	0.50	0.012	0.020
c	0.08	0.15	0.003	0.006
D	2.80	3.00	0.110	0.118
E	2.25	2.55	0.089	0.100
E1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 BSC	
e1	1.80	2.00	0.071	0.079
L	0.30	0.50	0.012	0.020
θ	0	8°	0	8°

DIMENSIONS		
DIM	INCHES	MILLIMETERS
M	0.0795	2.02
C	0.0315	0.80
Z	0.111	2.82
e	0.037 BSC	0.95 BSC
e1	0.075 BSC	1.9 BSC
b	0.0315	0.80

**Notes**

1. Dimensioning and tolerances per ANSI Y14.5M, 1985.
2. Controlling Dimension: Inches
3. Pin 3 is the cathode (Unidirectional Only).
4. Dimensions are exclusive of mold flash and metal burrs.