

**MSEMFxxxLC SERIES**  
**Low Capacitance Quad Array for ESD Protection**

Revision:B

**General Description**

This integrated transient voltage suppressor device (TVS) is designed for applications requiring transient overvoltage protection, printers, business machines, communication systems, medical equipment, and other applications. Its integrated design provides very effective and reliable protection for separate lines using only one package. These devices are ideal for situations where board space is at a premium.

**Applications**

- Serial and Parallel Ports
- Microprocessor Based Equipment
- Notebooks, Desktops, Servers
- Cellular and Portable Equipment

**Features**

- Four Separate Unidirectional Configurations for Protection
- Low Leakage Current < 1  $\mu$  A @ 3Volts
- Power Dissipation: 380mW
- Small SOT-553 SMT Package
- Low Capacitance
- Complies to USB 1.1 Low Speed & Speed Specifications
- These are Pb-Free Devices

**Complies with the following standards**

**IEC61000-4-2**

**Level 4 15 kV (air discharge)**

**8 kV(contact discharge)**

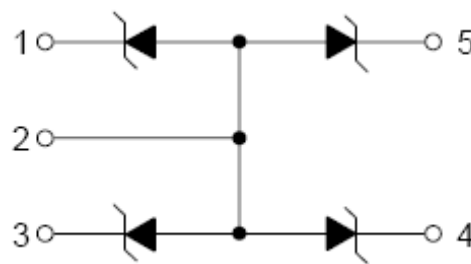
**MIL STD 883E - Method 3015-7 Class 3**

**25 kV HBM (Human Body Model)**

**Functional diagram**



SOT-553



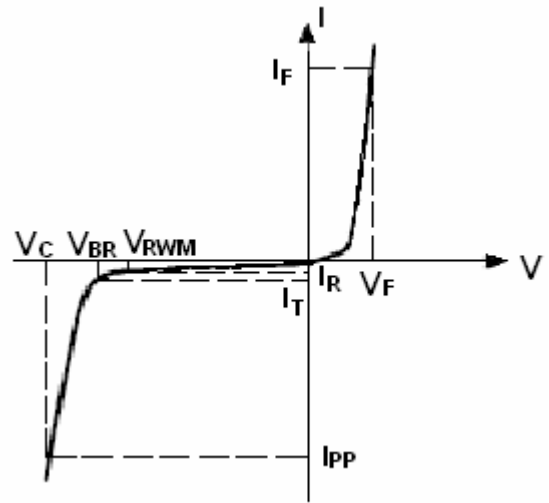
**Maximum Ratings (T<sub>A</sub>=25°C)**

Symbol	Parameter	Value	Units
P <sub>PK</sub>	Peak Power Dissipation(8×20 $\mu$ s@T <sub>A</sub> =25°C)	25	W
P <sub>D</sub>	Steady State Power-1 Diode	380	mW
R <sup>θ</sup> <sub>JA</sub>	Thermal Resistance, Junction-to-Ambient Above 25°C, Derate	327 3.05	°C/W Mw/°C
T <sub>Jmax</sub>	Maximum Junction Temperature	150	°C
T <sub>J</sub> T <sub>stg</sub>	Operation Junction and Storage Temperature Range	-55 to +150	°C
T <sub>L</sub>	Lead Solder Temperature(10 seconds duration)	260	°C

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## Electrical Parameter

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



## Electrical Characteristics

Part Numbers	$V_{BR}$			$I_T$	$V_{RWM}$	$I_R$	<b>C</b>
	Min.	Typ.	Max.				Typ. 0v bias
	V	V	V				pF
MSEMF3V3LC	5.3	5.6	5.9	1	3.0	1.0	12
MSEMF05LC	6.1	6.8	7.2	1	5.0	1.0	8
MSEMF12LC	11.4	12	12.7	5	9.0	1.0	7

1. Non-repetitive current per Figure 1.
2. Only 1 diode under power. For 4 diodes under power
3. Capacitance of one diode at  $f=1\text{MHz}, T_A=25^\circ\text{C}$

## Typical Characteristics

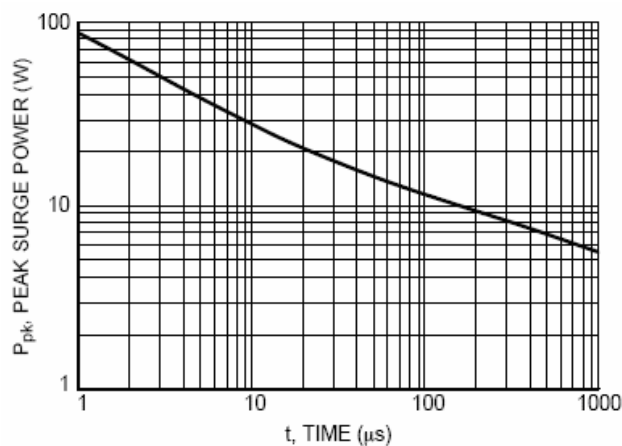


Figure 1 Pulse Width

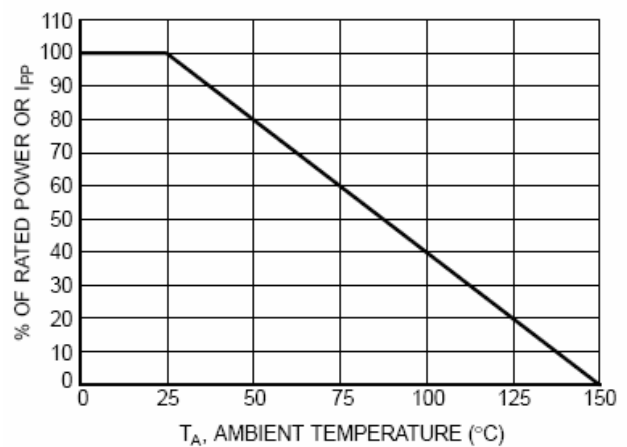


Figure 2 Power Derating Curve

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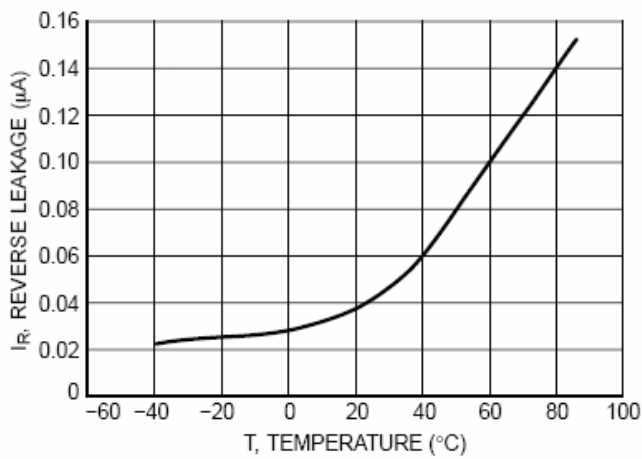


Figure 3 Reverse Leakage versus temperature

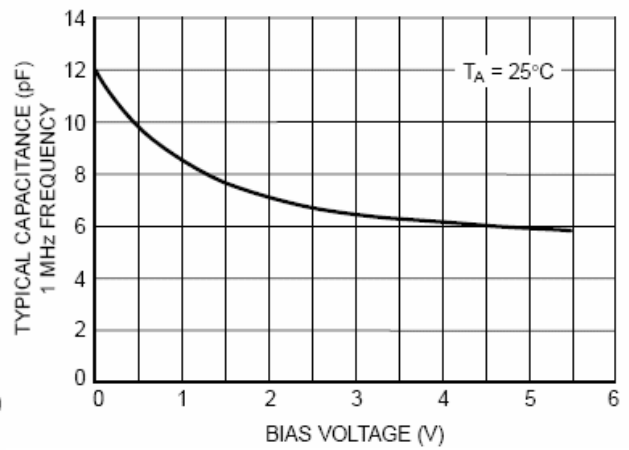


Figure 4 Capacitance

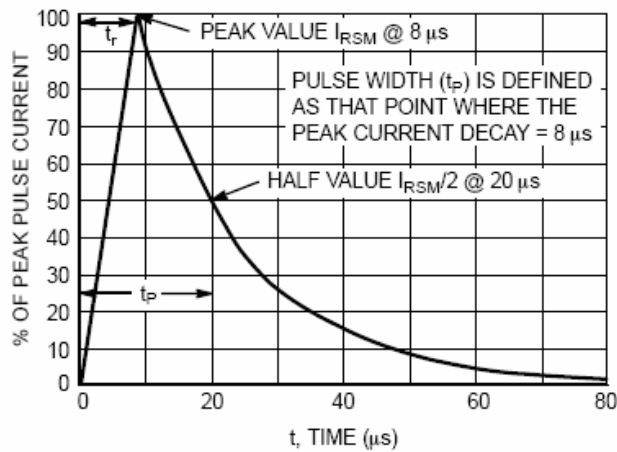


Figure 5 8\*20 Pulse Waveform

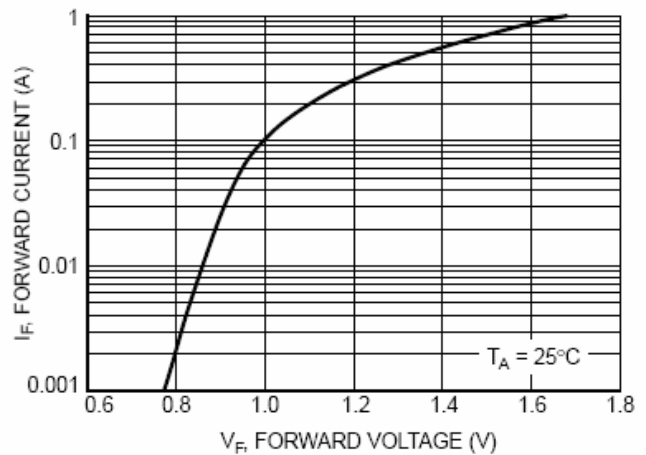
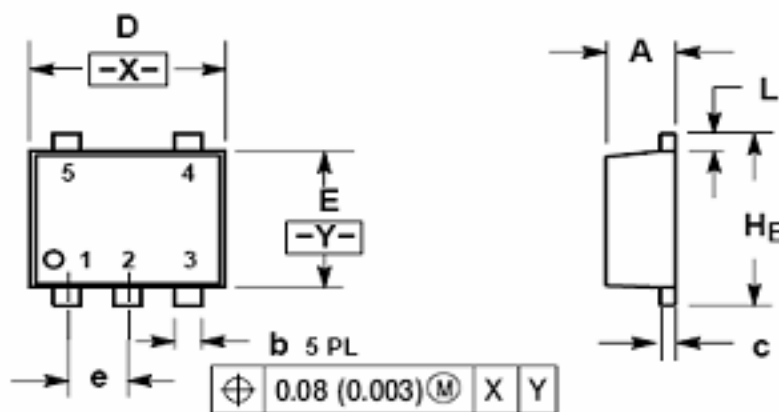


Figure 6 Forward Voltage

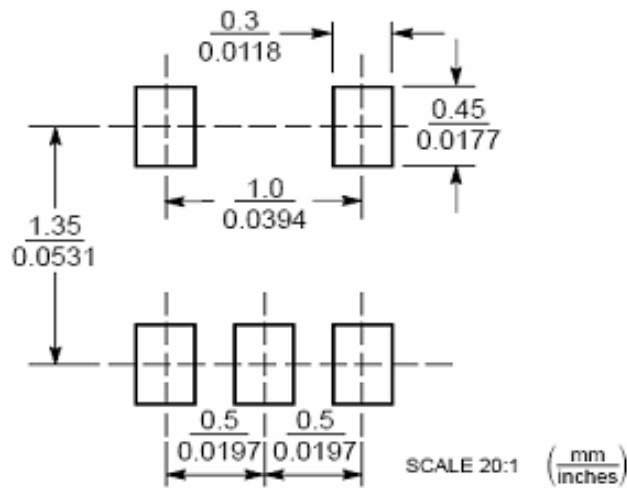
## SOT-553 Mechanical Data



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DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.50	0.55	0.60	0.020	0.022	0.024
b	0.17	0.22	0.27	0.007	0.009	0.011
c	0.08	0.13	0.18	0.003	0.005	0.007
D	1.50	1.60	1.70	0.059	0.063	0.067
E	1.10	1.20	1.30	0.043	0.047	0.051
e	0.50BSC			0.020BSC		
L	0.10	0.20	0.30	0.004	0.008	0.012
H <sub>E</sub>	1.50	1.60	1.70	0.059	0.063	0.067

## SOLDERING FOOTPRINT\*



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