

### Ultra-low Capacitance Bidirectional Micro Packaged TVS Diodes for ESD Protection

The MESD0521PSCR1 is designed with SCR technology to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space comes at a premium. Also because of its low capacitance, it is suited for use in high frequency designs such as USB 3.0 super speed, USB 3.1 super speed ,VGA, DVI, HDMI, eSATA and other high speed line applications.

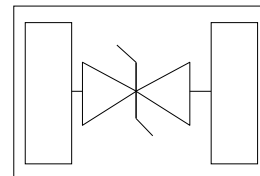
It has been specifically designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by ESD(electrostatic discharge), and EFT (electrical fast transients).

#### Features

- Stand-off Voltage: 5.0 V
- No insertion loss to 10.0GHz
- Protects I/O Port
- Low Clamping Voltage
- Low Leakage
- Low Capacitance
- Meets MSL 1 Requirements
- ROHS compliant
- **SCR Process technology**



**DFN0603-2L**



#### Main applications

- High Speed Line :USB3.0/3.1,VGA,DVI,SDI
- High Definition Multi-Media Interface (HDMI1.3/1.4/2.0)
- Serial and Parallel Ports
- Notebooks, Desktops, Servers
- Projection TV
- Cellular handsets and accessories
- Portable instrumentation
- Peripherals

#### Ordering Information

Device	MARKING	Qty per Reel	Reel Size
MESD0521PSCR1	P	9,000pcs	7 Inch

#### Protection solution to meet

- IEC61000-4-2 (ESD) ±20kV (air), ±20kV (contact)
- IEC61000-4-5 (Lightning) 9A (8/20μs)

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### Maximum ratings (Tamb=25°C Unless Otherwise Specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (tp=8/20μs waveform)	P <sub>PPP</sub>	50	Watts
ESD Rating per IEC61000-4-2:	Contact	20	KV
	Air	20	
Lead Soldering Temperature	T <sub>L</sub>	260 (10 sec.)	°C
Operating Temperature Range	T <sub>J</sub>	-55 ~ 150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 ~ 150	°C
Lead Solder Temperature – Maximum (10 Second Duration)	T <sub>L</sub>	260	°C

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.

\*Other voltages may be available upon request.

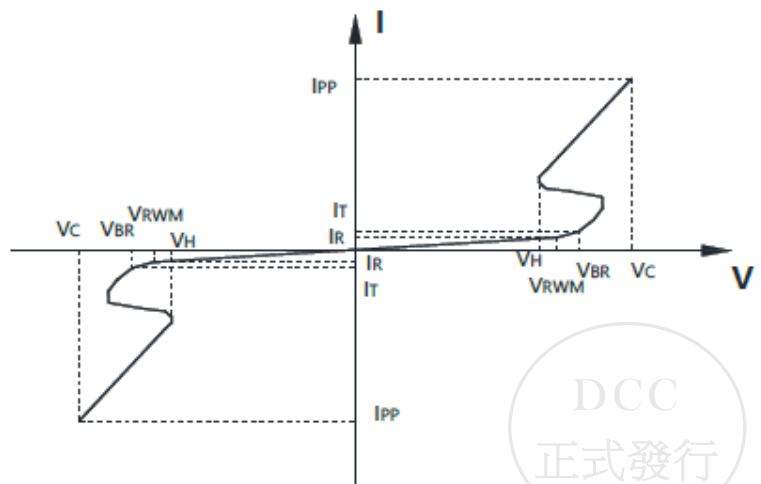
1. Non-repetitive current pulse, per Figure 1.

### Electrical characteristics (Tamb=25°C Unless Otherwise Specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V <sub>RWM</sub>	Reverse Working Voltage			5	5.5	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> = 1mA,	6			V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> = 5.5V,			0.01	μA
V <sub>c</sub>	Clamping Voltage	I <sub>PP</sub> = 1A; 8/20us		3.2		V
		I <sub>PP</sub> = 9A; 8/20us		5.5	8	V
V <sub>C2</sub>	Clamping Voltage	TLP=8A		4.5		
		TLP=16A		6.5		
R <sub>dyn</sub>	dynamic resistance	TLP=10A		0.23		
C <sub>j</sub> <sup>(2)</sup>	Junction Capacitance	V <sub>IN</sub> = 1.0V, f = 1MHz,		0.14	0.18	pF
		V <sub>IN</sub> =1.0V, f = 1GHz,		0.13		pF
V <sub>H</sub>	Holding Reverse Current	I/O Pin to GND		2.15		V
I <sub>H</sub>	Reverse Holding Voltage	I/O Pin to GND		50		mA

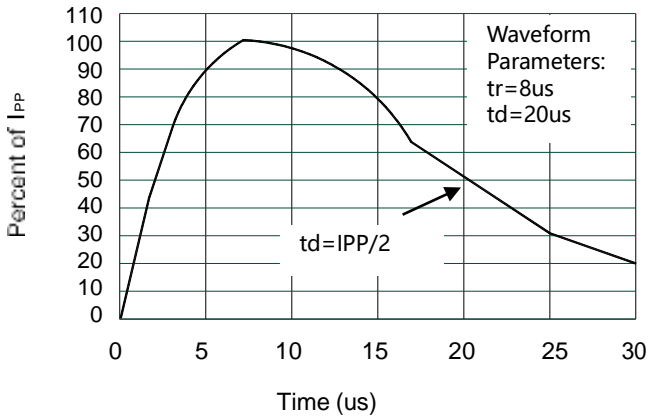
Junction capacitance is measured in VR=0V, F=1MHz

Symbol	Parameter
V <sub>RWM</sub>	Working Peak Reverse Voltage
V <sub>BR</sub>	Breakdown Voltage @ I <sub>r</sub>
V <sub>c</sub>	Clamping Voltage @ 8/20us (IEC61000-4-5)
I <sub>T</sub>	Test Current
I <sub>RM</sub>	Leakage current at V <sub>RWM</sub>
I <sub>PP</sub>	Peak pulse current
C <sub>O</sub>	Off-state Capacitance
C <sub>J</sub>	Junction Capacitance

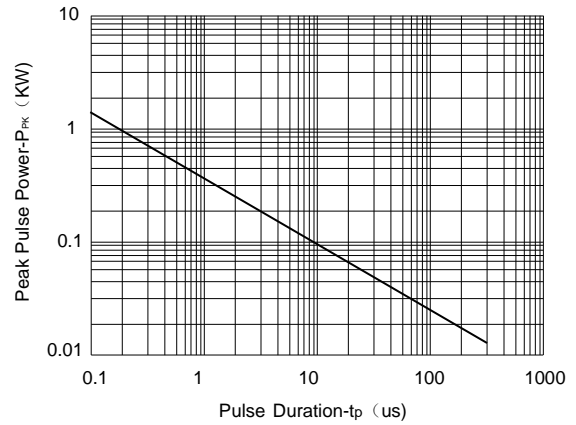


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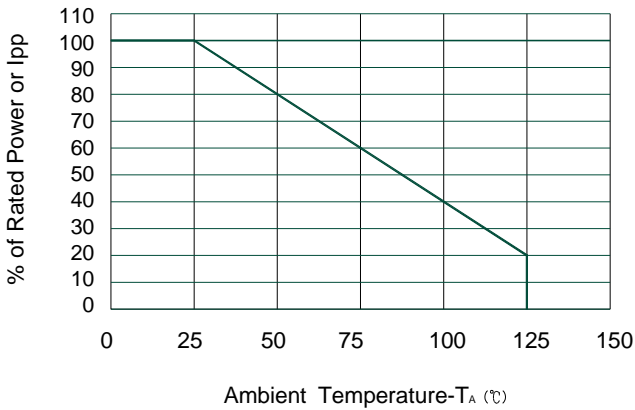
### Typical electrical characterist applications



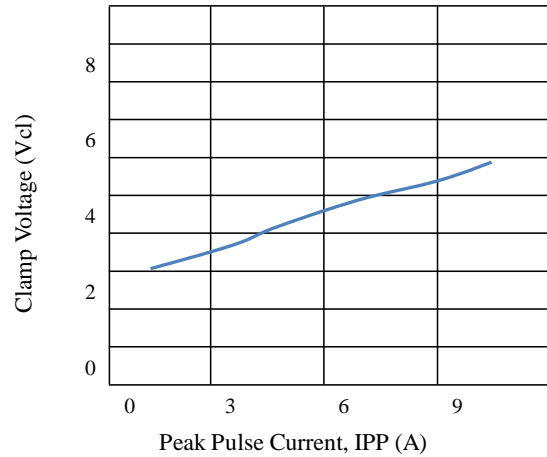
Pulse Waveform



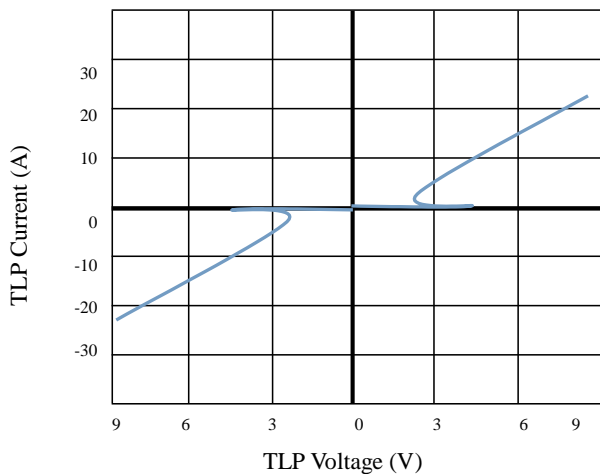
Non-Repetitive Peak Pulse Power vs. Pulse Time



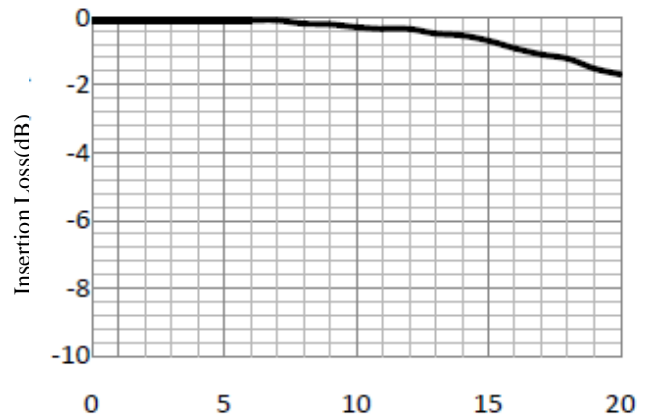
Power Derating Curve



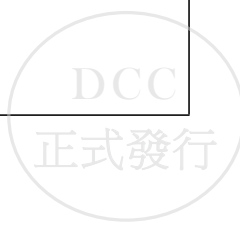
Clamping Voltage Vs Peak PulseCurrent(Ipp)

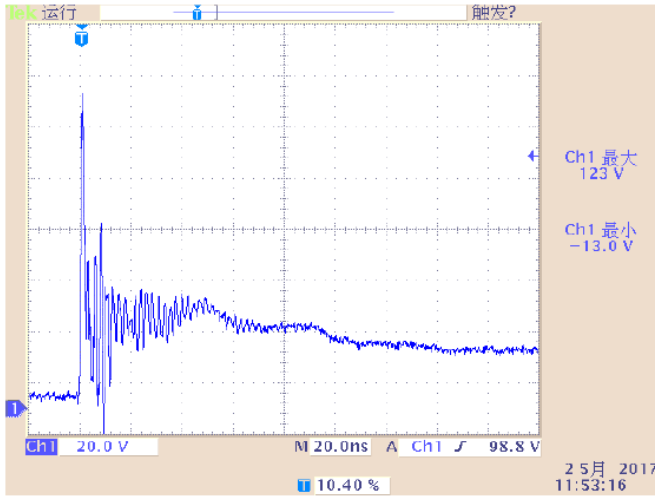


Clamping Voltage Vs Peak PulseCurrent( $I_{TLP}$ )

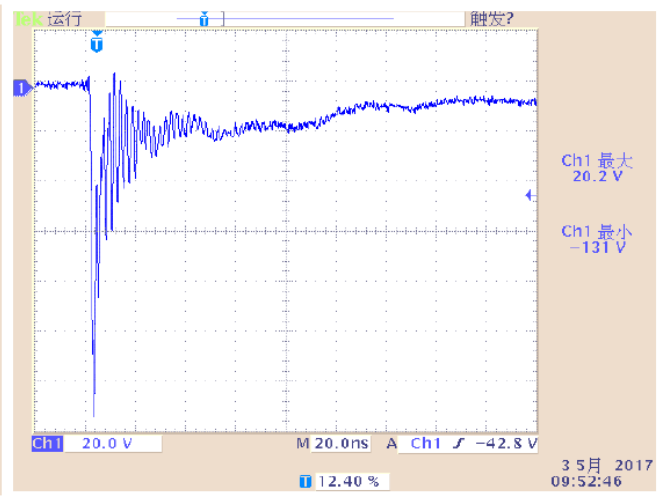


Frequency(GHz)  
 Insertion Loss S21

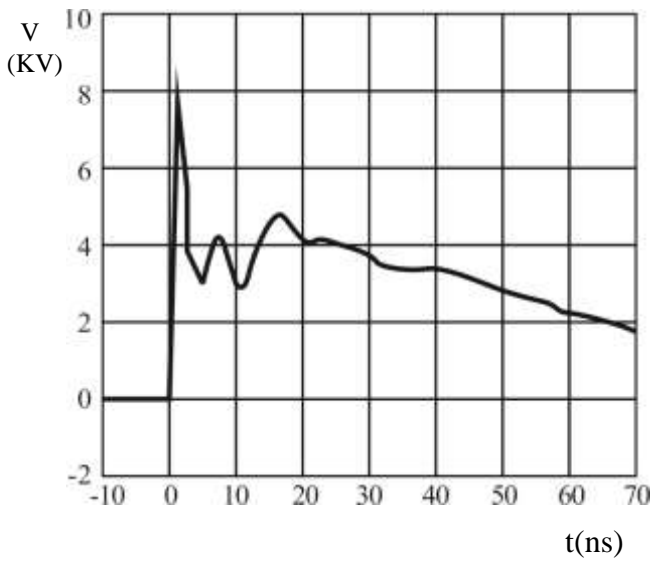




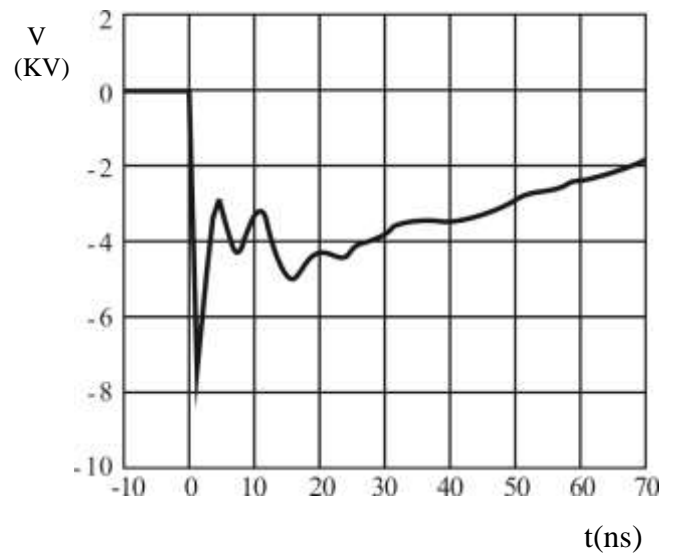
ESD Response (8kV Contact per IEC 61000-4-2)



ESD Response (-8kV Contact per IEC 61000-4-2)



Unclamped+8kv



Unclamped-8kv

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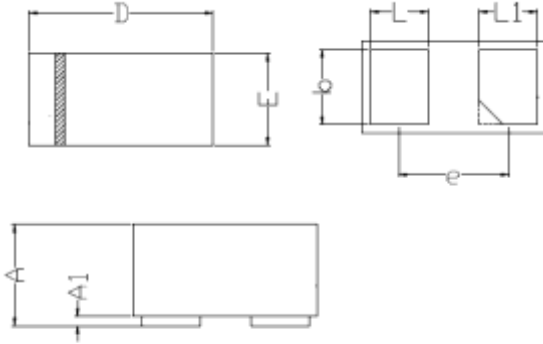
### Package Information

#### DFN0603-2L

#### Mechanical Data

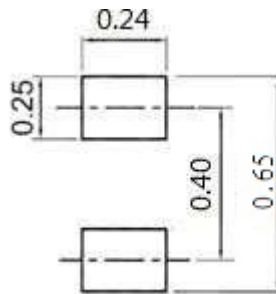
Case: CSP0603-2L

Case Material: Molded Plastic. UL Flammability

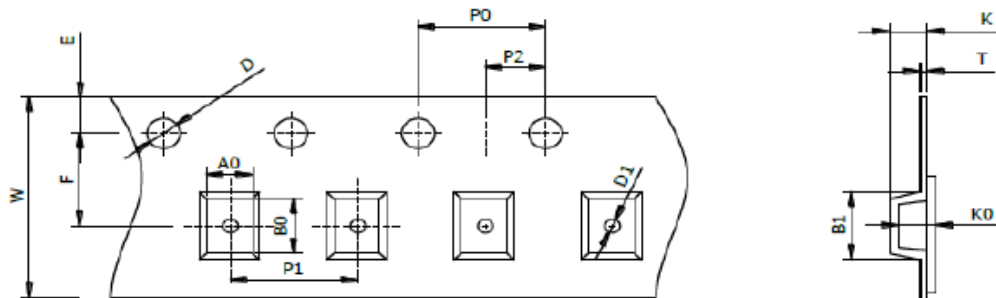


DIM	Millimeters	
	Min	Max
A	0.230	0.330
A1	0.000	0.050
D	0.550	0.650
E	0.250	0.350
b	0.220	0.270
L	0.120	0.170
L1	0.120	0.170
e	0.4BSC	

#### Suggested Pad Layout



#### DFN0603-2L Reel Dim



Package	Chip Size (mm)	Pocket Size B0×A0×K0(mm)	Tape Width	Reel Diameter	Quantity Per Reel	P0	P1
DFN0603-2L	0.6×0.3×0.33	0.68×0.38×0.36	8mm	178mm(7")	9000 pcs	4mm	2mm
D0	D1	E	F	K	T	W	
1.5mm	0.2mm	1.75mm	3.5mm	0.38mm	0.2mm	8mm	

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