

## Transient Voltage Suppressors for ESD Protection

### ESD05V88D-ULC

#### Description

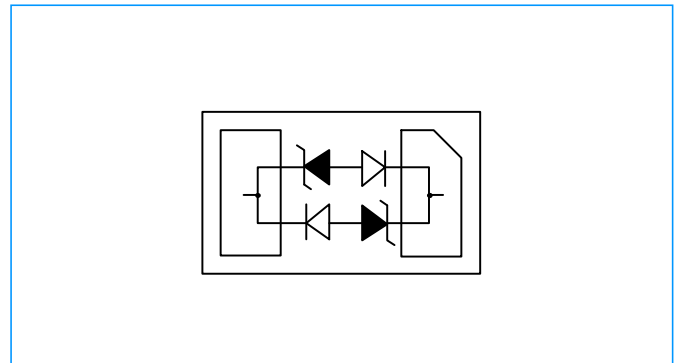
The ESD05V88D-ULC is ultra low capacitance TVS arrays designed to protect high speed data interfaces. This series has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from over-voltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).



#### Feature

- ◆ 90 Watts Peak Pulse Power per Line ( $t_p=8/20\mu s$ )
- ◆ Protects One Bidirectional I/O Line
- ◆ Low clamping voltage
- ◆ Working voltages : 5.0V
- ◆ Low leakage current
- ◆ IEC61000-4-4 (EFT) 40A (5/50ns)
- ◆ IEC61000-4-5 (LIGHTING) 3A (8/20 $\mu s$ )
- ◆ IEC61000-4-2(ESD): $\pm 20kV$  (air discharge)  
 $\pm 15kV$  (contact discharge)

#### Functional Diagram



#### Applications

- ◆ Cell Phone Handsets and Accessories
- ◆ USB 3.0 / USB 3.1 Interfaces
- ◆ HDMI 1.4 / HDMI 2.0 Interfaces
- ◆ Video Graphics Cards
- ◆ Notebooks, Desktops, and Servers
- ◆ Portable Instrumentation
- ◆ Industrial Controls
- ◆ Peripherals

#### Mechanical Data

- ◆ SOD-882/DFN1006 (1.0x0.6x0.5mm) Package
- ◆ Molding Compound Flammability Rating : UL 94V-O
- ◆ Weight 0.5 Milligrams (Approximate)
- ◆ Lead Finish : Lead Free

#### Mechanical Characteristics

Symbol	Parameter	Value	Units
$P_{PP}$	Peak Pulse Power ( $t_p=8/20\mu s$ waveform)	90	Watts
$T_L$	Lead Soldering Temperature	260 (10 sec.)	$^{\circ}C$
$T_{STG}$	Storage Temperature Range	-55 to +150	$^{\circ}C$
$T_J$	Operating Junction Temperature Range	-40 to +125	$^{\circ}C$

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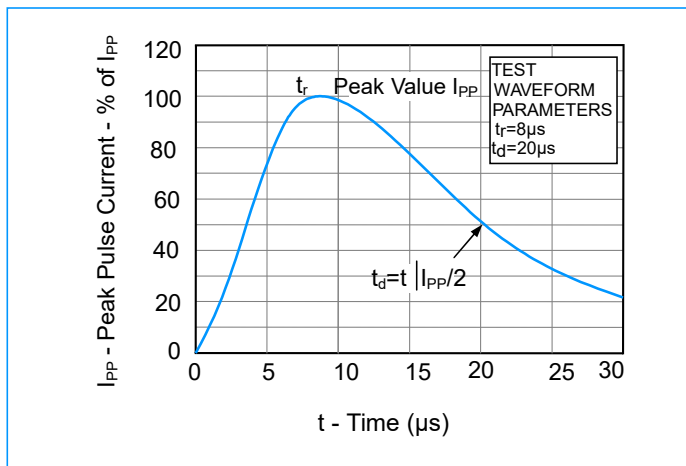
## ESD05V88D-ULC

### Electrical Characteristics (@ 25°C Unless Otherwise Specified)

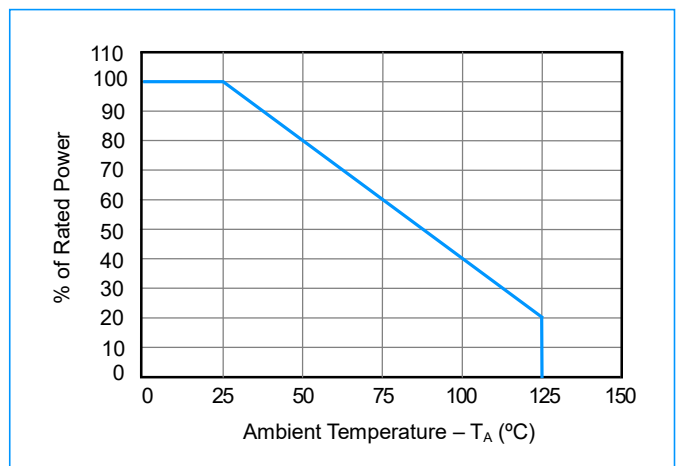
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse Working Voltage	$V_{RWM}$	--	--	--	5.0	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$ ;	6.0	--	--	V
Reverse Leakage Current	$I_R$	$V_{RWM}=5V, T=25^{\circ}C$ ;	--	--	1	$\mu A$
Positive Clamping Voltage	$V_C$	$I_{PP}=1A, T_P=8/20\mu s$ ;	--	--	15	V
		$I_{PP}=3A, T_P=8/20\mu s$ ;	--	18	30	V
Junction capacitance	$C_J$	$V_R=0V, f=1MHz$ ;	--	0.25	--	pF

### Characteristic Curves

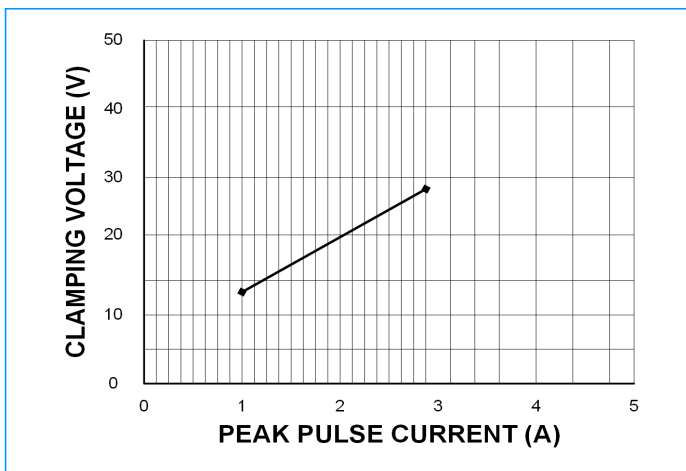
**Fig1. 8/20 $\mu s$  Pulse Waveform**



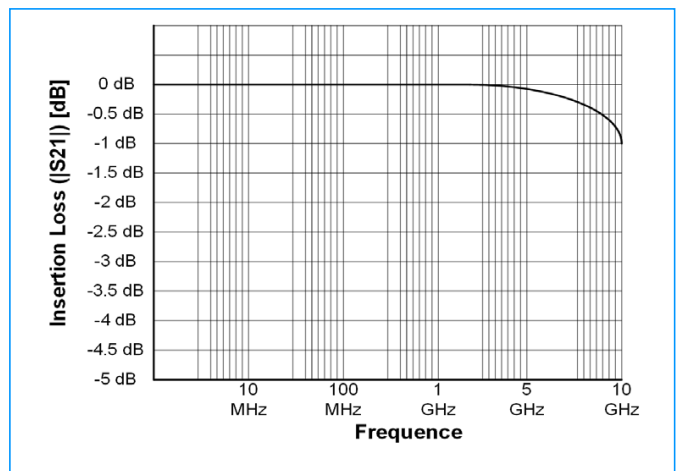
**Fig2. Power Derating Curve**



**Fig3. Clamping Voltage vs. Peak Pulse Current**



**Fig4. Insertion Loss (S21)**

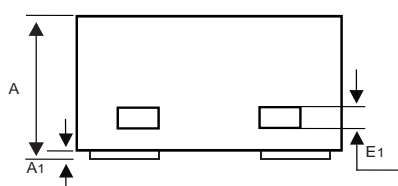


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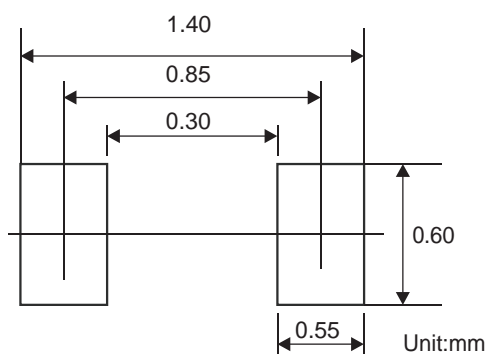
### ESD05V88D-ULC

#### SOD-882/DFN1006 Package Outline & Dimensions

#### SOD-882/DFN1006



#### Suggested PAD Layout



Symbol	Millimeters		
	Min	Nom	Max
A	0.450	0.500	0.550
A1	0	0.020	0.050
E1	0.013	0.063	0.113
D	0.900	1.000	1.100
E	0.500	0.600	0.700
e	0.65BSC		
L	0.150	0.250	0.350
b	0.400	0.500	0.600
L1	0.300	0.400	0.500

#### Ordering Information

Device	Marking	Package	Quantity	Reel Size
ESD05V88D-ULC	HA	SOD-882/DFN1006	12,000pcs/Reel	7 inch