

ESD Protection Diodes with Ultra-Low Capacitance

1-Line, Bi-directional, Transient Voltage Suppressors

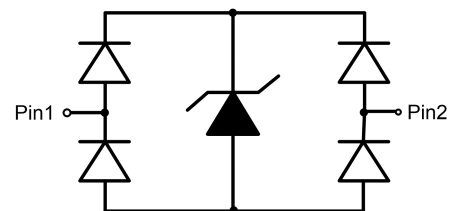
Descriptions

The ESD12D005LA is a bi-directional TVS (Transient Voltage Suppressor). It is specifically designed to protect sensitive electronic components that may be subjected to ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning. It is particularly well-suited for cellular phones, portable device, digital cameras, power supplies and many other portable applications because of its small package and low weight.

The ESD12D005LA may be used to provide ESD protection up to $\pm 15\text{KV}$ Air, $\pm 15\text{KV}$ contact compliance to IEC61000-4-2, and withstand peak pulse current up to 5 A (8/20 μs) according to IEC61000-4-5.



DFN1006-2L



Pin configuration

Features

- Stand-off voltage: $\pm 12.0\text{V}$ Max
- Transient protection for each line according to IEC61000-4-2 (ESD): $\pm 15\text{KV}$ Air, $\pm 15\text{KV}$ contact IEC61000-4-5 (Surge): 5 A (8/20 μs)
- Solid-state silicon technology
- Low leakage current

Order information

Device	Marking	Package	Shipping
ESD12D005LA	18B	DFN1006-2L	10000/Tape&Reel

Applications

- Cell phone handsets and accessories
- Personal Digital Assistants (PDAs)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Digital Cameras
- CAR/MID DVD/MP3/MP4/PMP Players

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse current ($t_p = 8/20\mu s$)	I_{PP}	5.0	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 15	kV
ESD according to IEC61000-4-2 contact discharge		± 15	
Operating temperature	T_{OP}	-40~125	$^{\circ}C$
Storage temperature	T_{STG}	-55~150	$^{\circ}C$

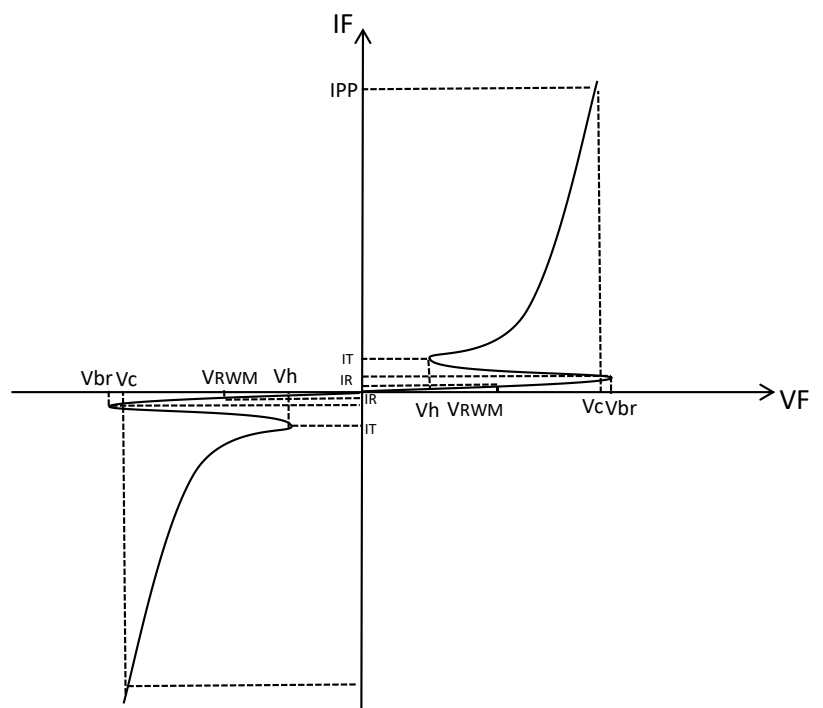
Electrical characteristics (TA=25 $^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				12.0	V
Breakdown Voltage	V_{BR}	$I_T = 1mA$	14.0			V
Holding Voltage	V_h	$I_T = 100mA$	2.0	2.8		V
Reverse Leakage Current	I_R	$V_{RWM} = 12V$			0.2	μA
Clamping Voltage ⁽¹⁾	V_C	$I_{PP} = 1A$ (8 x 20 μs pulse)		4.1		V
Clamping Voltage ⁽¹⁾	V_C	$I_{PP} = 5A$ (8 x 20 μs pulse)		6.0	8.0	V
Clamping Voltage	V_C	TLP = 16A (ESD=8KV)		8.1		V
Junction Capacitance	C_J	$V_R = 0V$, $f = 1MHz$		0.5	0.7	pF

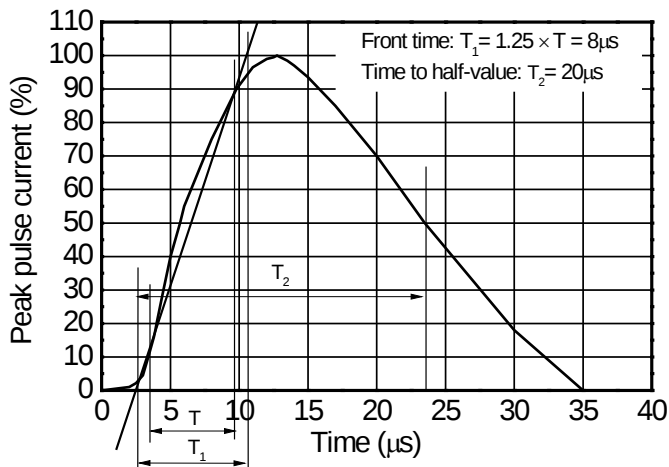
(1) Combination Waveform, RS = 12 Ω

Electrical performance curve

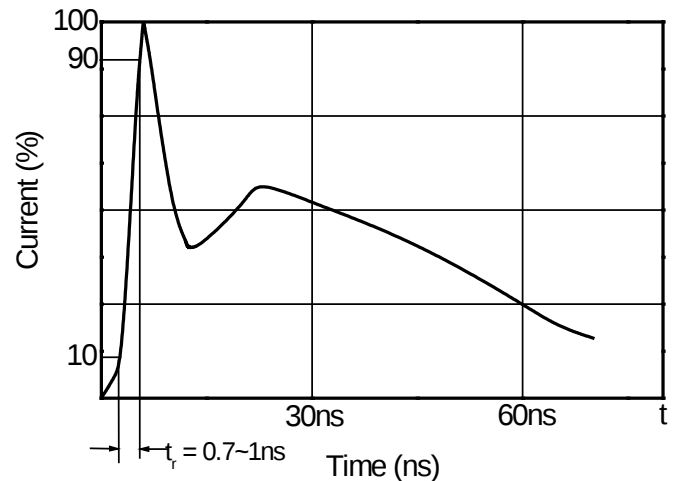
- V_F Forward voltage
- I_F Forward current
- V_R Reverse voltage
- I_R Reverse current
- R_{DYN} Dynamic resistance
- V_{RWM} Reverse working voltage max
- V_{t1} Trigger voltage
- V_h Holding voltage
- V_{CL} Clamping voltage
- V_{TLP} TLP voltage
- I_R Reverse leakage current
- I_{PP} Peak pulse current
- I_{TLP} TLP current
- I_T Test current



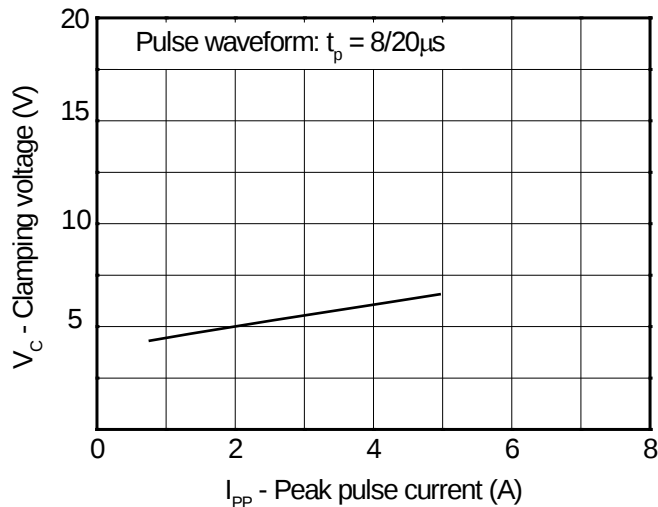
Typical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)



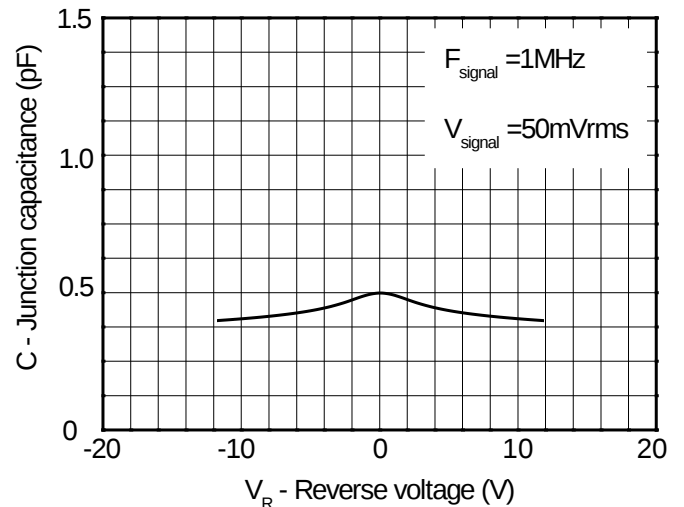
8/20 μs waveform per IEC61000-4-5



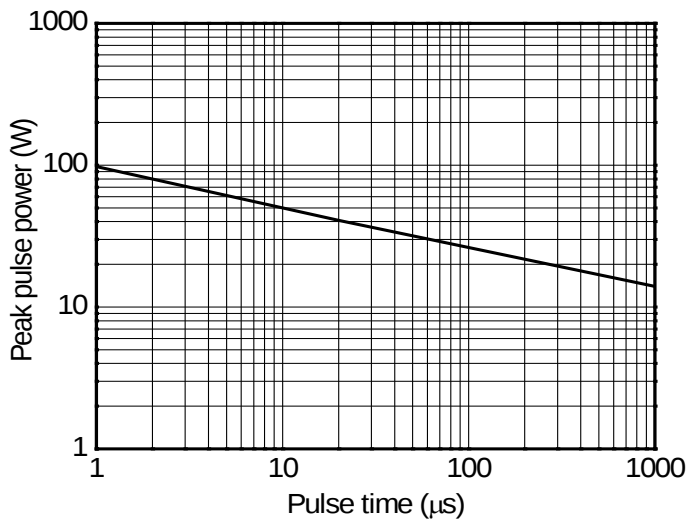
Contact discharge current waveform per IEC61000-4-2



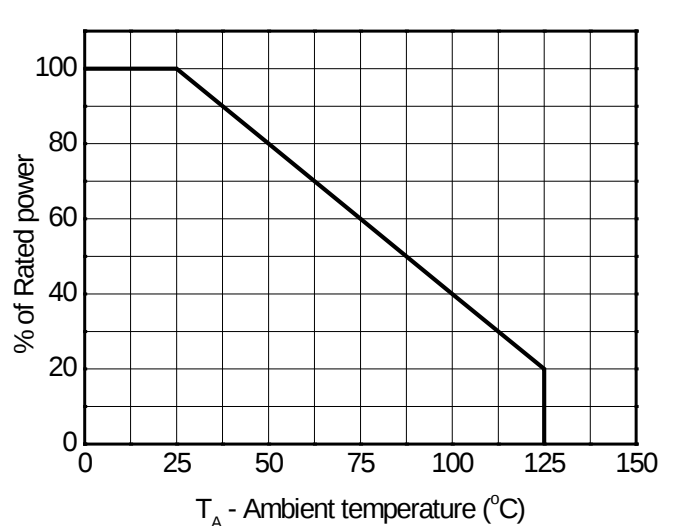
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverses voltage

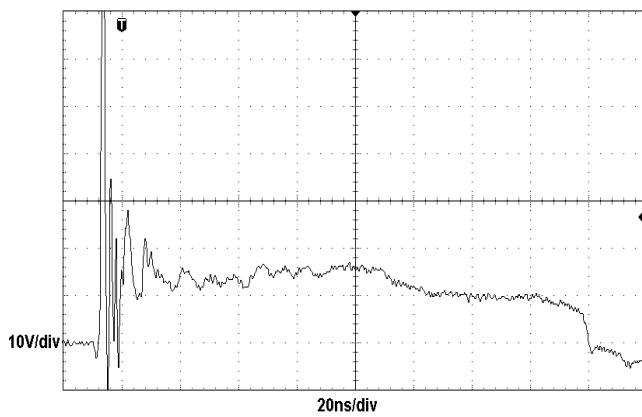
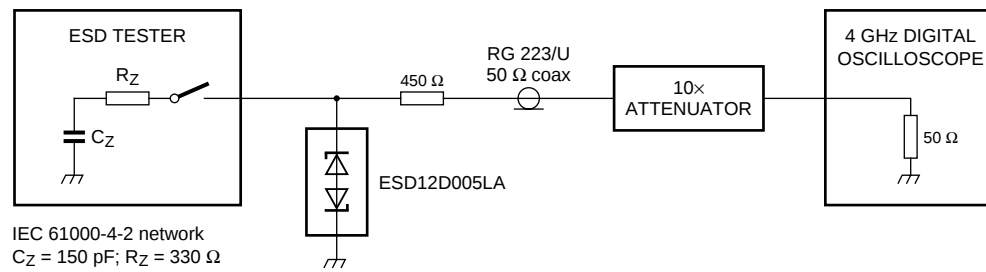


Non-repetitive peak pulse power vs. Pulse time

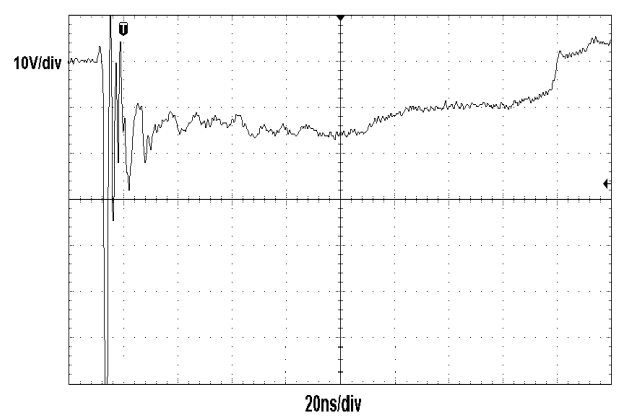


Power derating vs. Ambient temperature

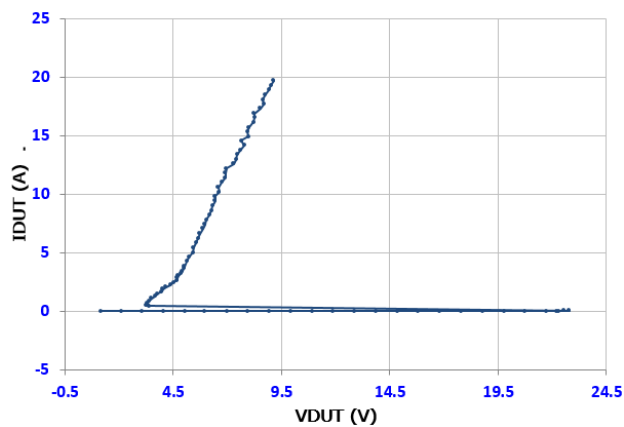
ESD clamping test setup and waveforms



ESD clamping
 (+8kV contact discharge per IEC61000-4-2)



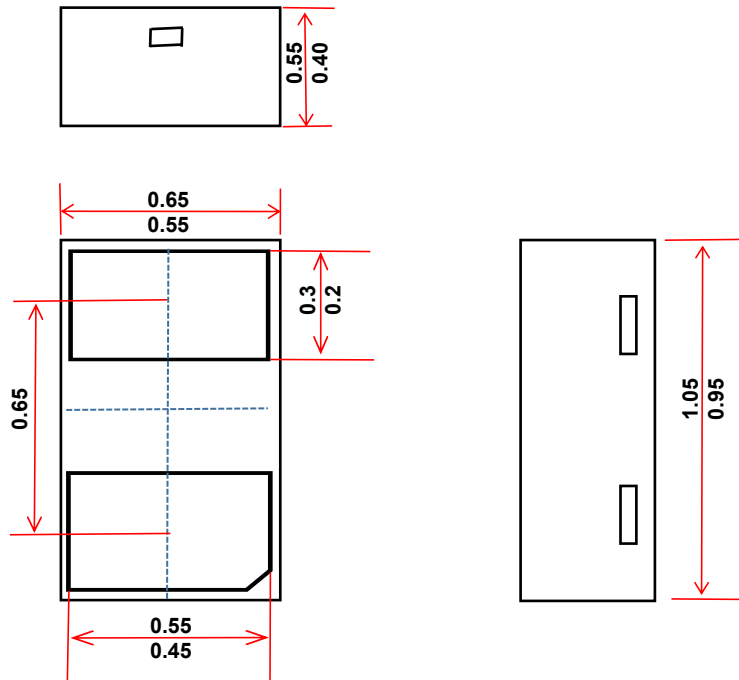
ESD clamping
 (-8kV contact discharge per IEC61000-4-2)



TLP Measurement

Package outline dimensions

DFN1006-2L



Recommended Mounting Pad Layout Unit:mm

