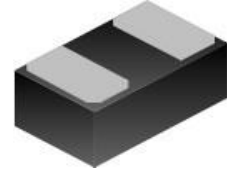


Transient Voltage Suppressors for ESD Protection

Description

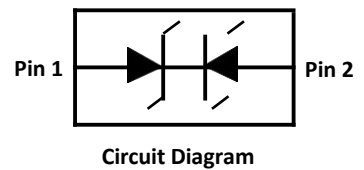
The ESD203-B1-02EL protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board level protection, such as fast response time, low operating voltage. It gives designer the flexibility to protect one bi-directional line in applications where arrays are not practical.



DFN1006-2L(Bottom View)

Feature

- 90W peak pulse power per line ($t_P = 8/20\mu s$)
- DFN1006-2L package
- Replacement for MLV(0402)
- Bidirectional configurations
- Response time is typically < 1ns
- Low clamping voltage
- RoHS compliant
- Transient protection for data lines to IEC61000-4-2(ESD) $\pm 30KV$ (air), $\pm 30KV$ (contact); IEC61000-4-4 (EFT) 40A (5/50ns)



Applications

- Cellular phones
- Portable devices
- Digital cameras
- Power supplies

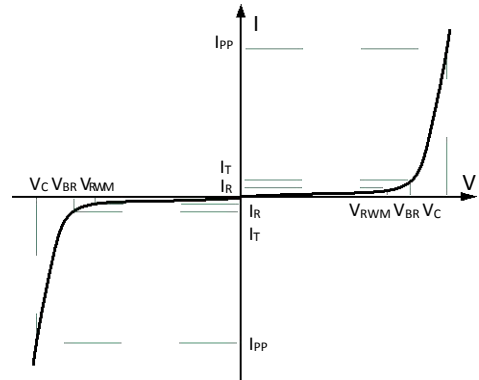
Mechanical Characteristics

- Mounting position: Any
- Qualified max reflow temperature: 260°C
- Device meets MSL 1 requirements
- DFN1006-2L without plating

Transient Voltage Suppressors for ESD Protection

Electronics Parameter

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



Electrical characteristics per line@25°C (unless otherwise specified)

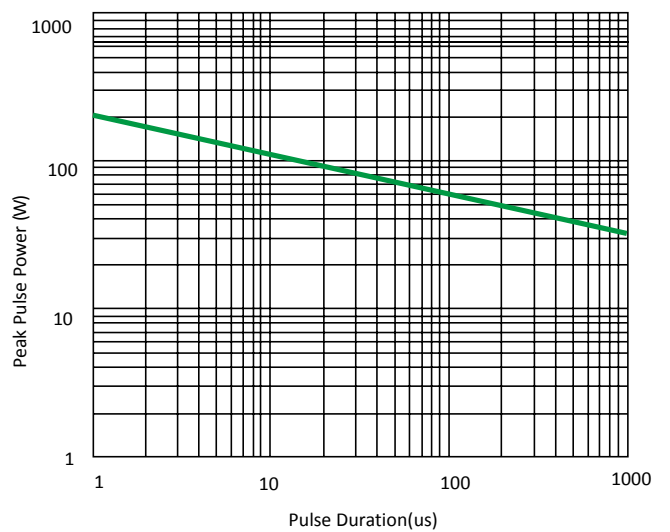
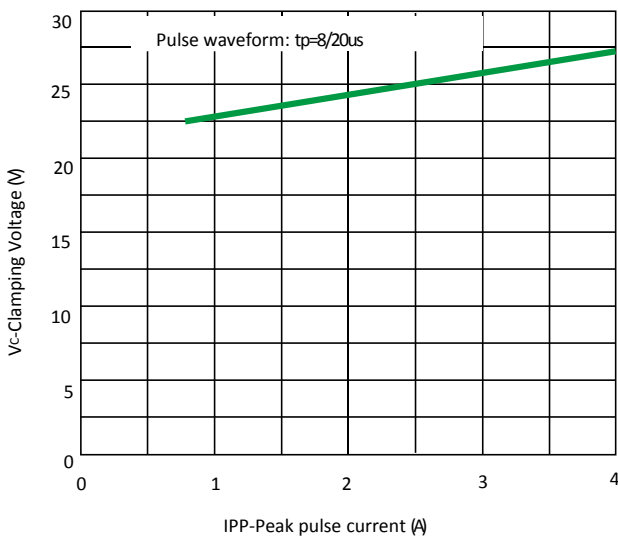
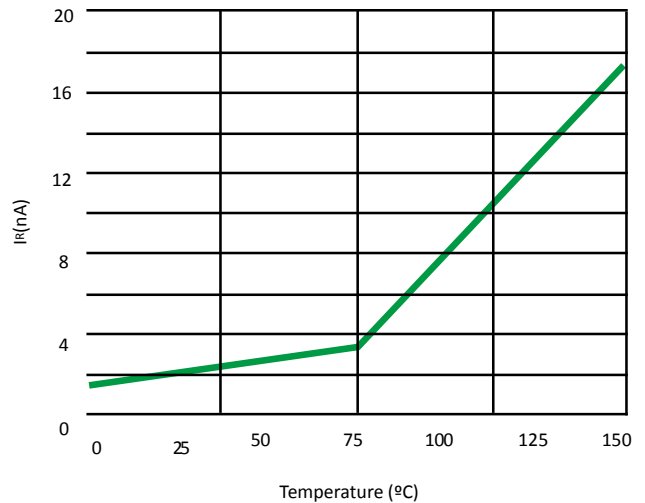
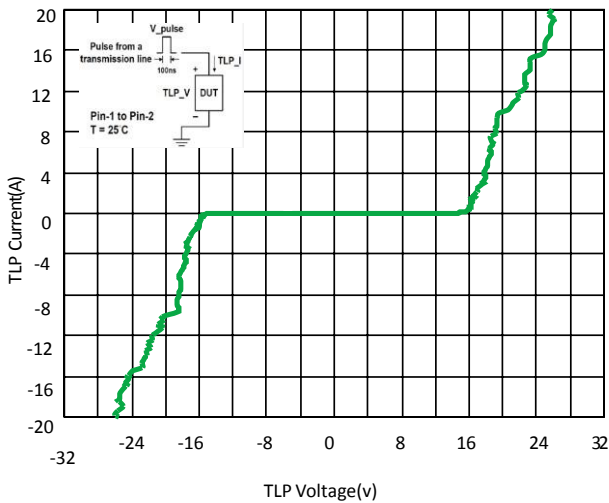
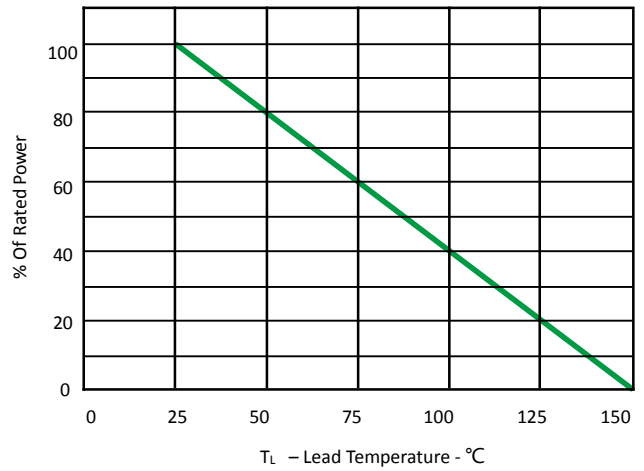
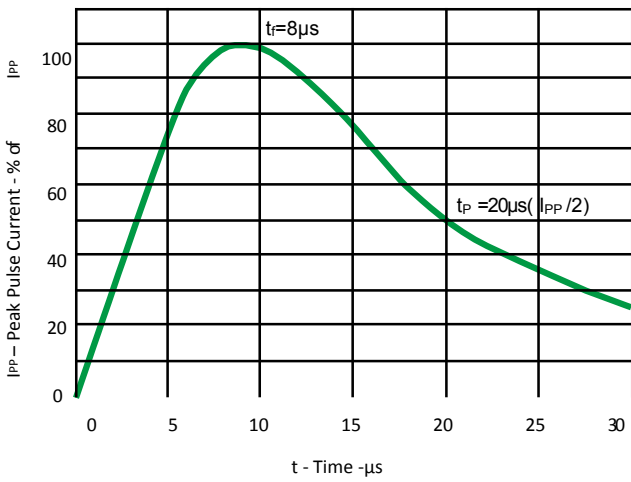
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}				12	V
Breakdown Voltage	V_{BR}	$I_t = 1\text{mA}$	14			V
Reverse Leakage Current	I_R	$V_{RWM} = 12\text{V } T=25^\circ\text{C}$			1.0	μA
Clamping Voltage	V_{CL}	$I_{PP}=16\text{A } t_p=100\text{ns}$		25		V
Clamping Voltage	V_C	$I_{PP}=1\text{A } t_p = 8/20\mu\text{s}$		16	18	V
Clamping Voltage	V_C	$I_{PP}=4\text{A } t_p = 8/20\mu\text{s}$		21	23	V
Junction Capacitance	C_j	$V_R=0\text{V } f = 1\text{MHz}$		8	15	pF

Absolute maximum rating@25°C

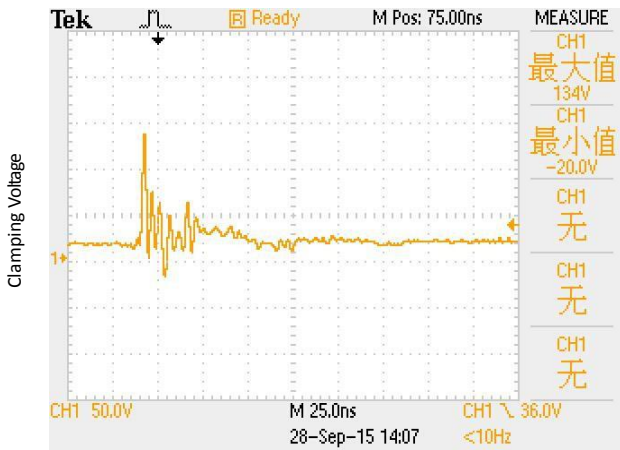
Rating	Symbol	Value	Units
Peak Pulse Power ($t_p=8/20\mu\text{s}$)	P_{pp}	90	W
Peak Pulse Current ($t_p=8/20\mu\text{s}$)	I_{pp}	4	A
Operating Temperature	T_J	-55 to 150	$^\circ\text{C}$
Storage Temperature	T_{STTh}	-55 to 150	$^\circ\text{C}$

Transient Voltage Suppressors for ESD Protection

Typical Characteristics



Transient Voltage Suppressors for ESD Protection

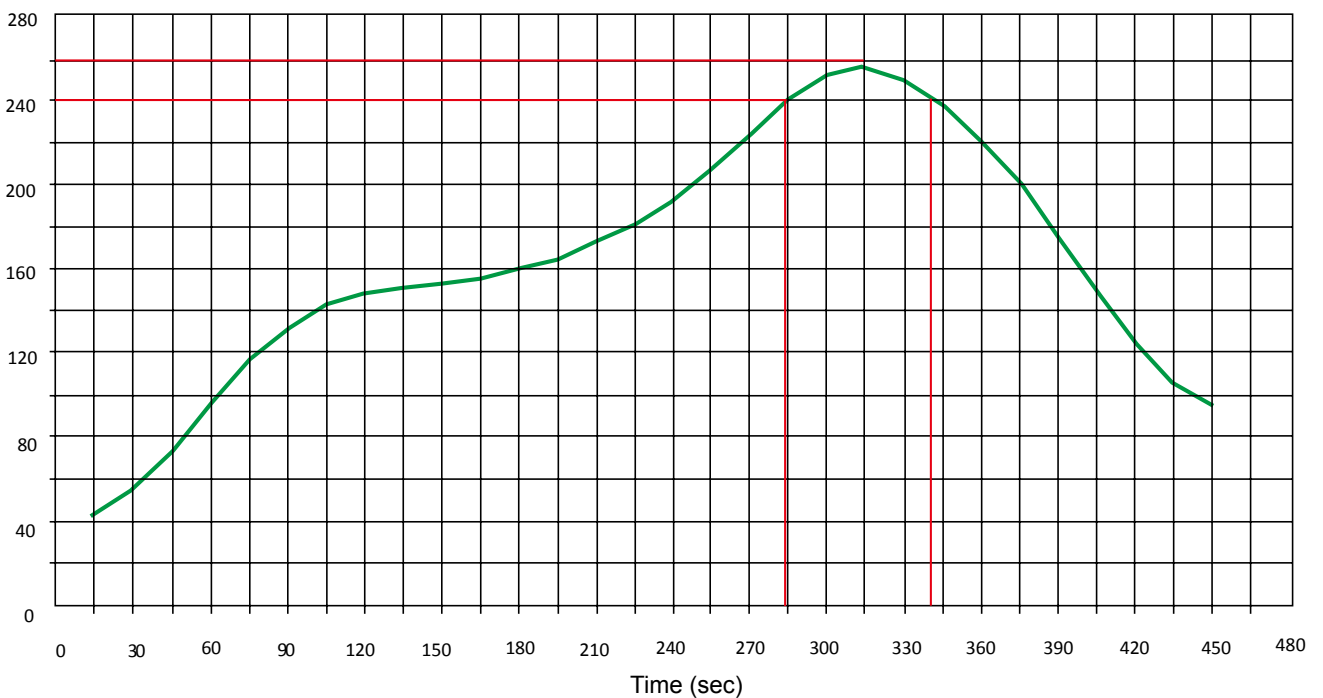


ESD clamping

Fig 7. (8kV contact discharge per IEC61000-4-2)

Solder Reflow Recommendation

Peak Temp=257°C, Ramp Rate=0.802deg. °C/sec



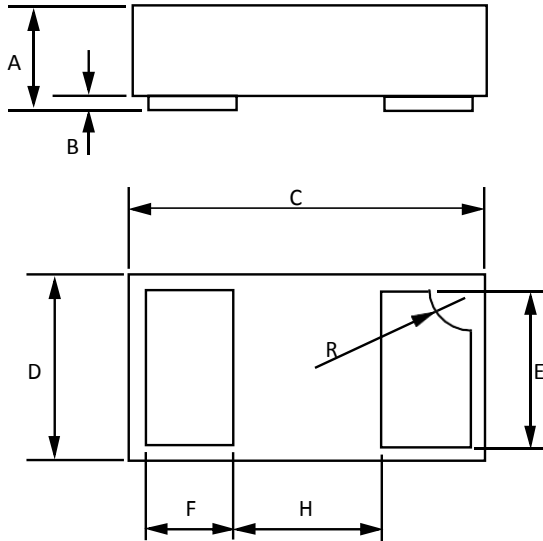
PCB Design

For TVS diodes a low-ohmic and low-inductive path to chassis earth is absolutely mandatory in order to achieve good ESD protection. Novices in the area of ESD protection should take following suggestions to heart:

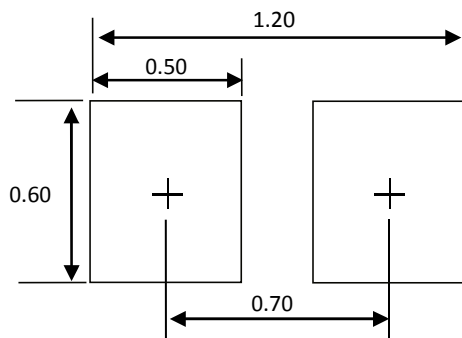
- Do not use stubs, but place the cathode of the TVS diode directly on the signal trace.
- Do not make false economies and save copper for the ground connection.
- Place via holes to ground as close as possible to the anode of the TVS diode.
- Use as many via holes as possible for the ground connection.
- Keep the length of via holes in mind! The longer the more inductance they will have.

Transient Voltage Suppressors for ESD Protection

Product dimension (DFN1006-2L)



Dim	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.013	0.020	0.34	0.50
B	0.000	0.002	0.00	0.05
C	0.037	0.043	0.95	1.080
D	0.022	0.027	0.55	0.680
E	0.016	0.024	0.40	0.60
F	0.008	0.012	0.20	0.30
H	0.015Typ.		0.40Typ.	
R	0.001	0.005	0.05	0.15



Unit:mm

Suggested PCB Layout

Ordering information

Device	Package	Reel	Shipping
ESD203-B1-02EL	DFN1006-2L (Pb-Free)	7"	10000 / Tape & Reel