

DFN1006 Plastic-Encapsulate ESD Protection Diodes

DESCRIPTION

ESD0501OC is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for data, control or power lines. With typical capacitance of 10pF only, ESD0501OC is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc. ESD0501OC uses ultra-small DFN1006 package. Each ESD0501OC device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

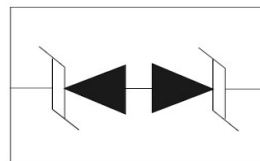
Features

- ◆ Transient protection for high speed data lines
- ◆ IEC61000-4-2 (ESD) $\pm 30\text{kV}$ (air), $\pm 30\text{kV}$ (contact)
- ◆ IEC61000-4-4 (EFT) 40A (5/50ns)
- ◆ Cable Discharge Event (CDE)
- ◆ Package optimized for high-speed lines Protects
- ◆ one data, control or power line
- ◆ Low Capacitance
- ◆ Low leakage current
- ◆ Low clamping voltage
- ◆ Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ contact discharge

Pin Configuration



Circuit Diagram



Applications

- ◆ Portable Electronics
- ◆ Desktops, Servers and Notebooks
- ◆ Cellular Phones
- ◆ MP3 Ports
- ◆ Display Ports
- ◆ Subscriber Identity Module (SIM) card
- ◆ Digital Visual Interfacing (DVI)

Mechanical Characteristics

- ◆ Package: DFN1006
- ◆ Flammability Rating: UL 94V-0
- ◆ Packaging: Tape and Reel
- ◆ Terminals: Gold plated, solderable per MIL-STD-750, method 2026
- ◆ Marking: FOC

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2 (Air)	V_{ESD}	± 30	kV
ESD per IEC 61000-4-2 (Contact)		± 30	
Peak Pulse Power ($t_p = 8/20\mu\text{s}$ waveform)	P_{PP}	150	W
Operating Temperature	T_{OPT}	-40 to $+125$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-40 to $+150$	$^\circ\text{C}$
Lead Solder Temperature – Maximum (10 Second Duration)	T_L	260 (10 sec.)	$^\circ\text{C}$

The above data are for reference only.

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Param	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage				5.0	V
V_{BR}	Reverse Breakdown Voltage	$I_T = 1\text{mA}$	5.6		7.8	V
I_R	Reverse Leakage Current	$V_{RWM} = 5\text{V}$			1.0	μA
V_C	Clamping Voltage	$I_{PP} = 5\text{A}, t_p = 8/20\mu\text{s}$			11.6	V
		$I_{PP} = 9.4\text{A}, t_p = 8/20\mu\text{s}$			16	V
C_J	Junction Capacitance	$V_R = 0\text{V}, f = 1\text{MHz}$		10	15	pF

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ELECTRICAL CHARACTERISTICS CURVE

Fig 1 8/20 μ s Waveform per IEC61000-4-5

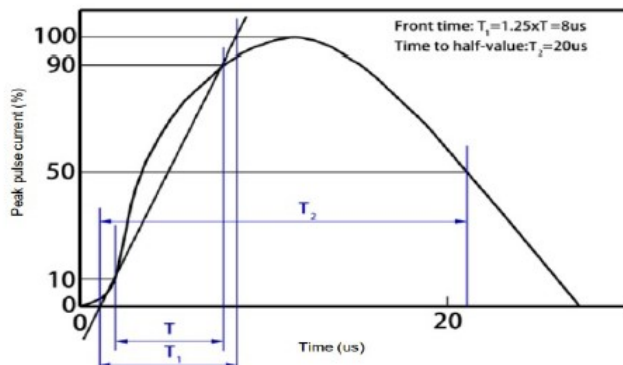


Fig 2 Contact Discharge Current Waveform per IEC 61000-4-2)

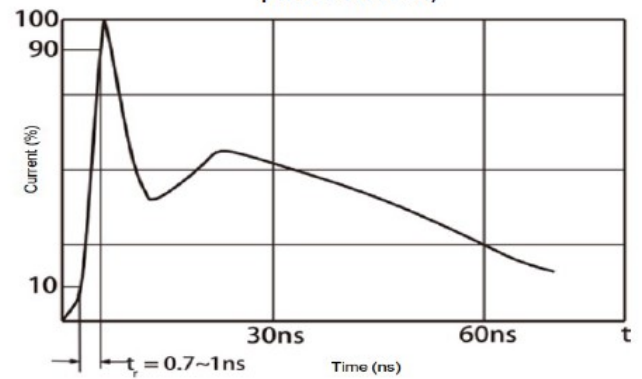


Fig 3 Power Derating Curve

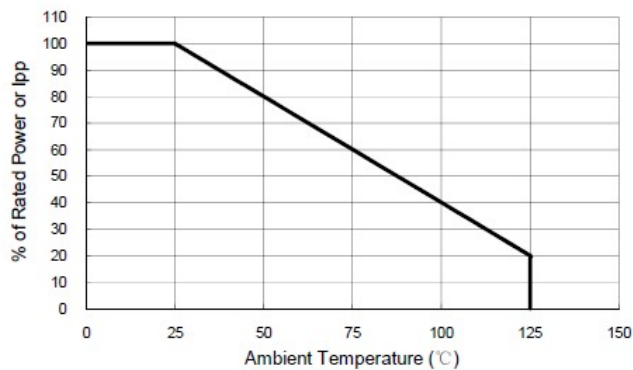


Fig 4 Voltage vs Capacitance

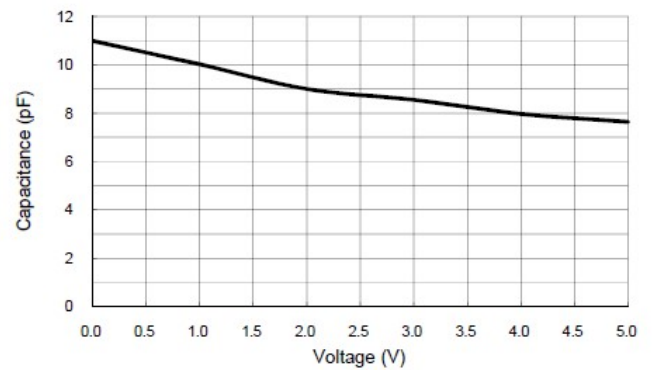


Fig 5 Voltage Sweeping

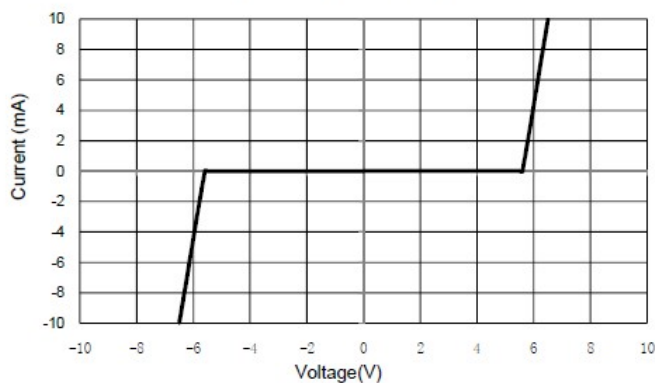
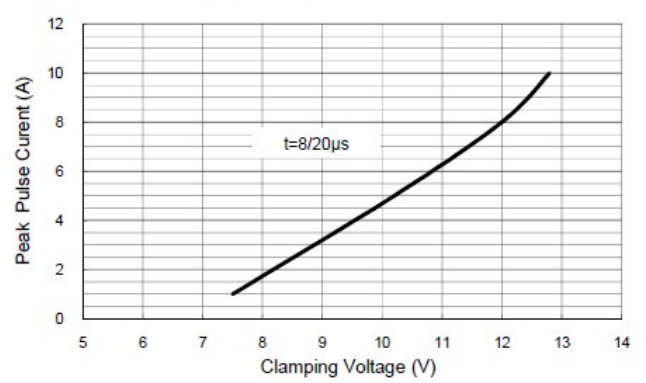


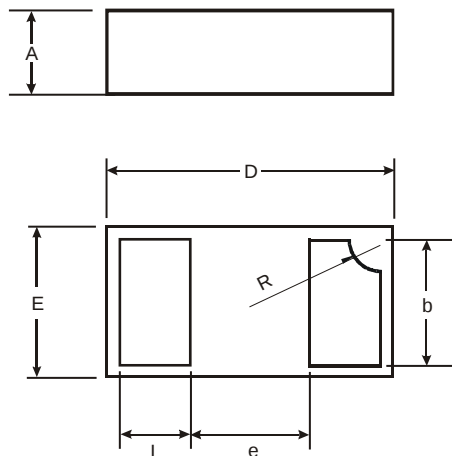
Fig 6 Clamping Voltage vs Peak Pulse Current



The curve above is for reference only. .

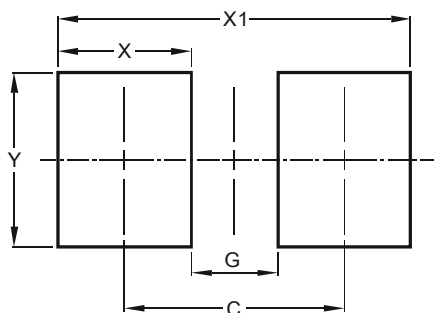
Outlitne Drawing

DFN1006 Package Outline Dimensions



DFN1006			
Dim	Min	Max	Typ
A	0.45	0.55	0.50
b	0.45	0.55	0.50
D	0.95	1.05	1.00
E	0.55	0.65	0.60
e	-	-	0.40
L	0.20	0.30	0.25
R	0.07	0.17	0.12
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.90
G	0.40
X	0.50
X1	1.10
Y	0.50

Note:

1. Controlling dimension: in/millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

PACKAGE SPECIFICATIONS

Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (pcs)	Box Size (mm)	QTY/Box (pcs)	Carton Size (mm)	Q'TY/Carton (pcs)
DFN1006	7'	178	10,000	210×210×205	100,000	445×445×230	400,000