

DFN1006 Plastic-Encapsulate ESD Protection Diodes

DESCRIPTION

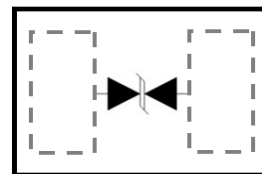
ESD0301PBC is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for data, control or power lines. With Maximum capacitance of 15pF, ESD0301PBC is designed to protect parasitic-sensitive systems against over-voltage and over-current transient 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.

ESD0301PBC uses ultra-small DFN1006 package. Each ESD0301PBC device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

Features

- ◆ Peak Power Dissipation : 84W (8/20 μs)
- ◆ 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
- ◆ Ultra-small package (1.0mm x 0.6mm x 0.4mm)
- ◆ Protects one data, control or power line
- ◆ Low Capacitance : 15pF(Maximum)
- ◆ Low leakage current
- ◆ Low clamping voltage

Pin Configuration



Circuit Diagram



Applications

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

Mechanical Characteristics

- ◆ Package: DFN1006
- ◆ Flammability Rating: UL 94V-0
- ◆ Packaging: Tape and Reel
- ◆ High temperature soldering guaranteed:
260 $^{\circ}\text{C}$ / 10s
- ◆ Marking: F3
- ◆ MSL 3

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

Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2 (Air)	VESD	± 30	KV
ESD per IEC 61000-4-2 (Contact)		± 30	
Peak Pulse Power($t_p=8/20\mu\text{s}$ waveform)	PPP	84	W
Operating Temperature	T _{OPT}	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T _{STG}	-55 to +150	$^{\circ}\text{C}$

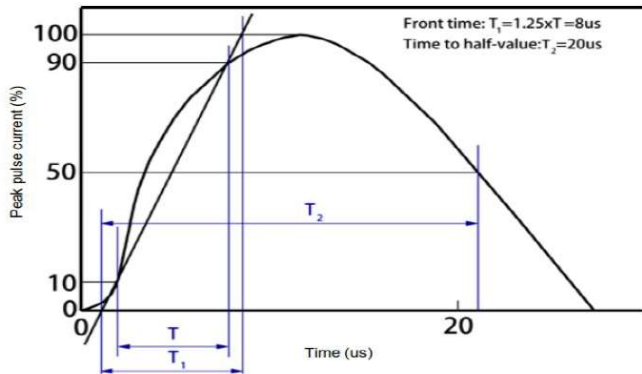
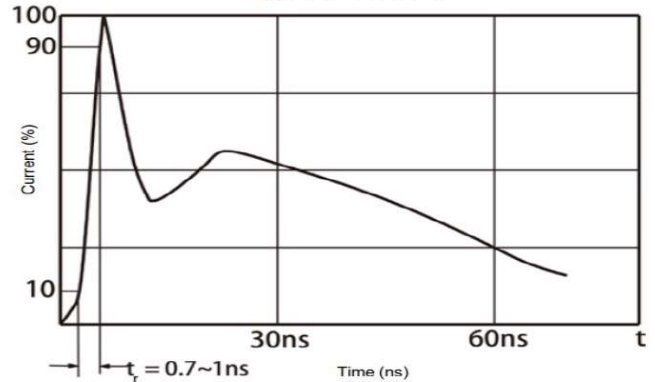
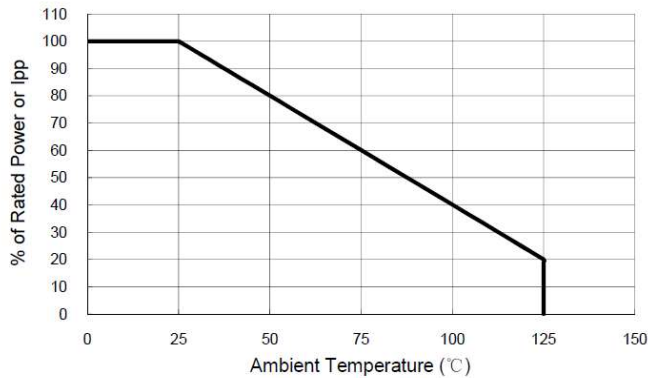
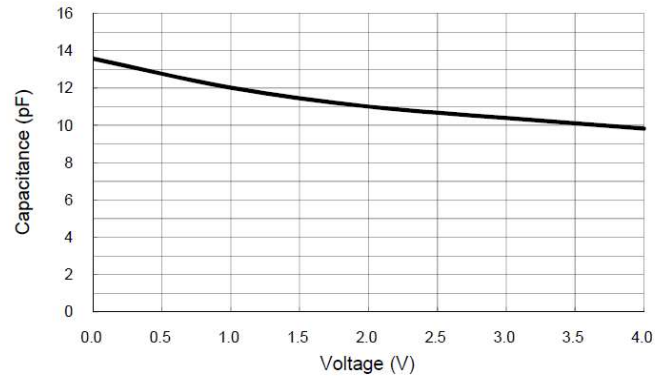
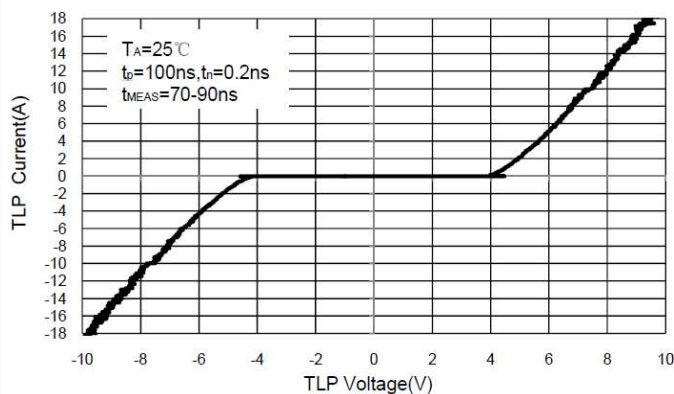
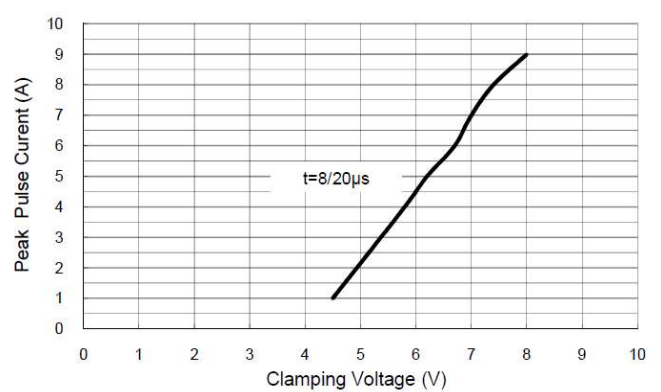
The above data are for reference only.

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

Symbol	Param	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage				3.3	V
V_{BR}	Reverse Breakdown Voltage	$I_T = 1\text{mA}$	3.6			V
I_R	Reverse Leakage Current	$V_{RWM} = 3.3\text{V}$			0.5	μA
V_C	Clamping Voltage	$I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$		4.4	5.6	V
		$I_{PPmax} = 7\text{A}, t_p = 8/20\mu\text{s}$		7.0	12	V
C_J	Junction Capacitance	$V_R = 0\text{V}, f = 1\text{MHz}$		13	15	pF

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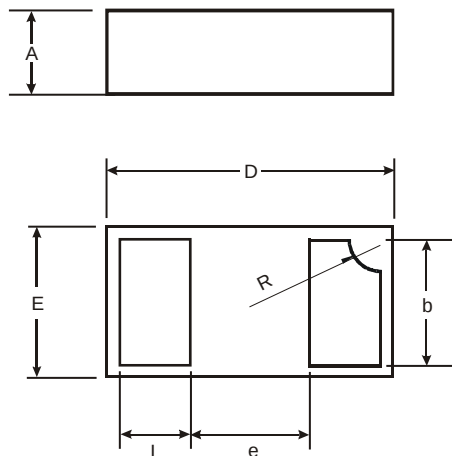
ELECTRICAL CHARACTERISTICS CURVE

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 Transmission Line Pulsing (TLP) Measurement

Fig 6 Clamping Voltage vs Peak Pulse Current


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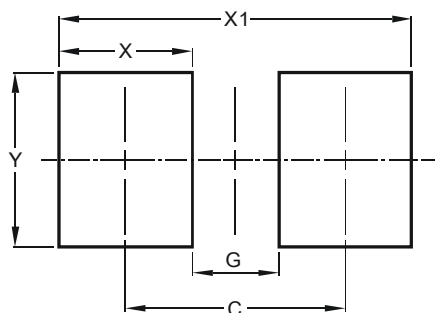
Outlitne Drawing

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