

DFN0603 Plastic-Encapsulate ESD Protection Diodes

DESCRIPTION

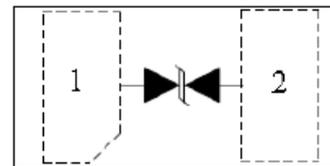
ESD05D6BU is a low-capacitance transient voltage Suppressor (TVS) designed to provide electrostatic events discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.25pF, ESD05D6BU is designed to protect parasitic-sensitive systems against over-voltage and over-current 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.

ESD05D6BU uses ultra-small DFN0603 package. Each ESD05D6BU device can protect one high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern. The combined features of low capacitance, ultra-small size and high ESD robustness make ESD05D6BU ideal for high-speed data port and high-frequency line applications, such as cellular phones and HD visual devices.

Features

- ◆ Peak Power Dissipation : 100 W (8/20 μs)
- ◆ IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
- ◆ IEC61000-4-4 (EFT) 40A (5/50ns)
Cable Discharge Event (CDE)
- ◆ Package optimized for high-speed lines
- ◆ Protects one data, control line
- ◆ Working voltages : 5V
- ◆ Low Capacitance: 0.25pF (Typical)
- ◆ Low leakage current
- ◆ Low clamping voltage

Pin Configuration



Circuit Diagram



Applications

- ◆ Serial ATA
- ◆ Desktops, Servers and Notebooks
- ◆ Cellular Phones
- ◆ MDDI Ports
- ◆ USB Data Line Protection
- ◆ Display Ports
- ◆ Digital Visual Interfaces (DVI)

Mechanical Characteristics

- ◆ Package: DFN0603
- ◆ Flammability Rating: UL 94V-0
- ◆ High temperature soldering guaranteed:
260 $^{\circ}\text{C}$ /10s
- ◆ Packaging: Tape and Reel
- ◆ Marking: 5BU

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}	± 20	KV
ESD per IEC 61000-4-2 (Contact)		± 20	
Peak Pulse Power(8/20us)	P _{PP}	100	W
Operating Temperature	T _{OPT}	-55 to +125	$^{\circ}\text{C}$
Storage Temperature	T _{STG}	-55 to +150	$^{\circ}\text{C}$
Lead Solder Temperature – Maximum (10 Second Duration)	T _L	260(10 sec.)	$^{\circ}\text{C}$

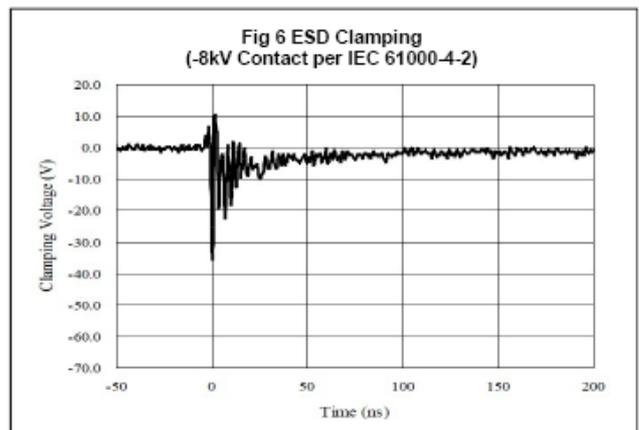
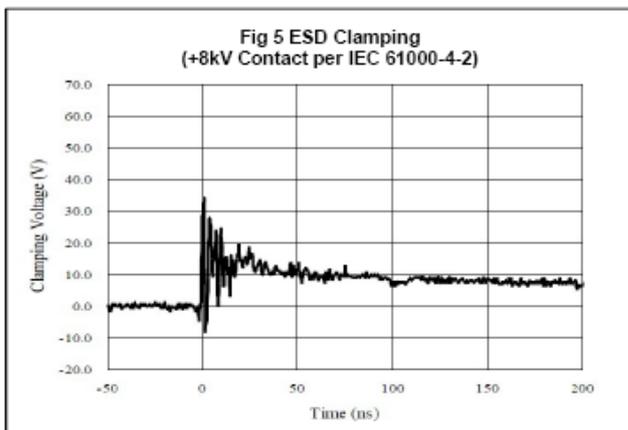
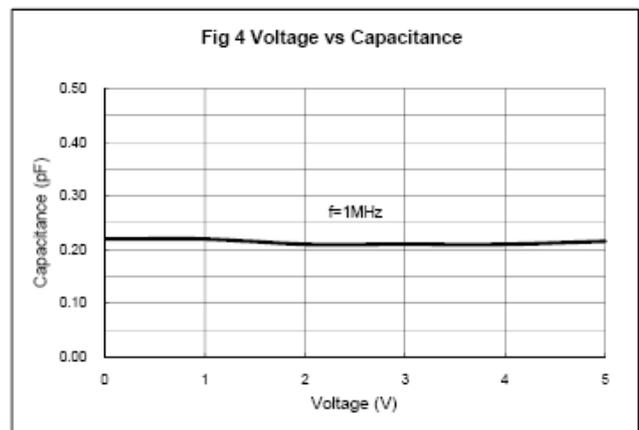
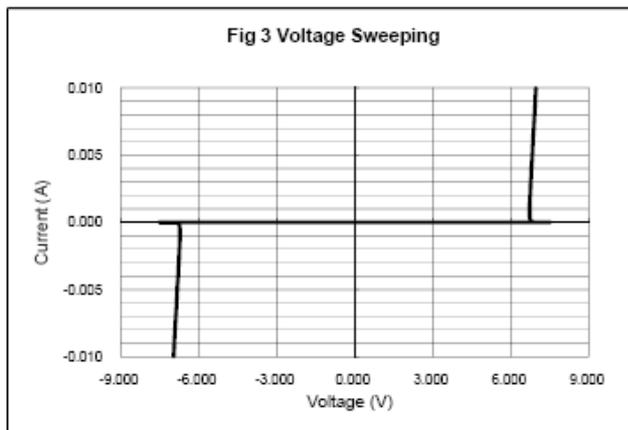
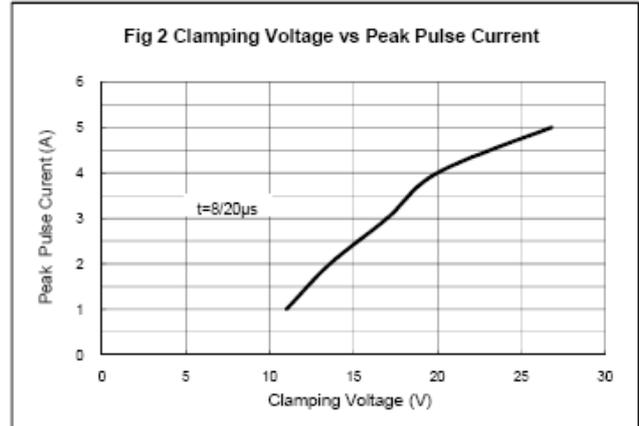
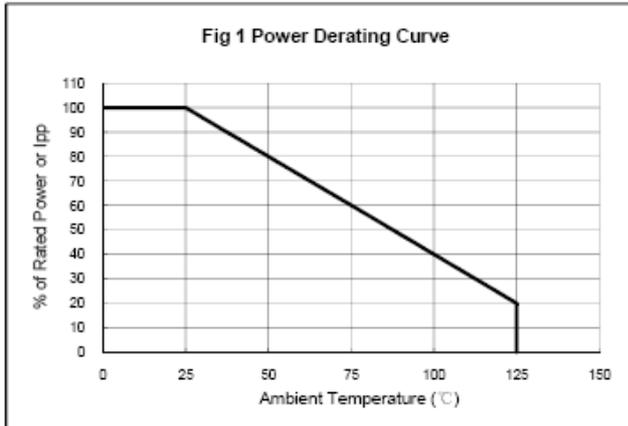
The above data are for reference only.

**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	$I_T = 1\text{mA}$	6.0			V
I_R	Reverse Leakage Current	$V_{RWM} = 5\text{V}$			100	nA
V_C	Clamping Voltage	$I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$			13	V
		$I_{PP} = 4\text{A}, t_p = 8/20\mu\text{s}$			25	V
C_J	Junction Capacitance	$V_R = 0\text{V}, f = 1\text{MHz}$		0.25		pF

The above data are for reference only.

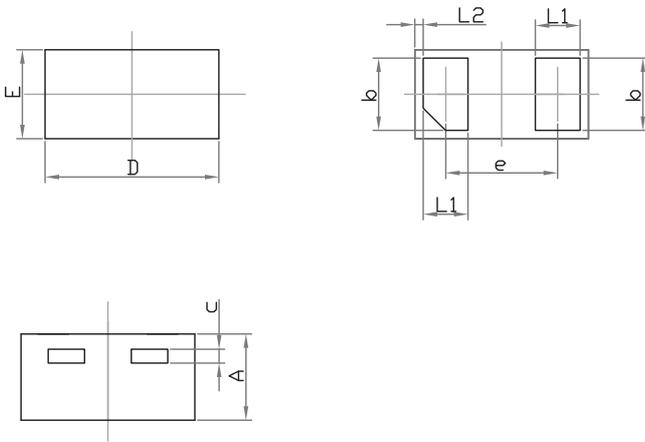
ELECTRICAL CHARACTERISTICS CURVE



The curve above is for reference only.

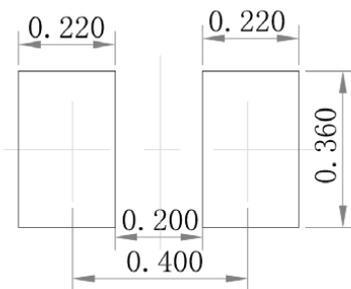
Outlitne Drawing

DFN0603 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.275	340	0.011	0.013
D	0.570	670	0.022	0.026
E	0.270	370	0.011	0.015
b	0.225	295	0.009	0.012
c	0.050 REF.		0.002 REF.	
e	0.365	435	0.014	0.017
L1	0.125	195	0.005	0.008
L2	0.030 REF.		0.001 REF.	

Suggested Pad Layout



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)
DFN0603	7'	178	10,000	210×210×205	100,000	445×445×230	400,000

Important Notice and Disclaimer

Microdiode Electronics (Jiangsu) reserves the right to make changes to this document and its products and specifications at any time without notice. Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

Microdiode Electronics (Jiangsu) makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, not does Microdiode Electronics (Jiangsu) assume any liability for application assistance or customer product design. Microdiode Electronics (Jiangsu) does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of Microdiode Electronics (Jiangsu).

Microdiode Electronics (Jiangsu) products are not authorized for use as critical components in life support devices or systems without express written approval of Microdiode Electronics (Jiangsu).