

### DFN0603 Plastic-Encapsulate ESD Protection Diodes

## DESCRIPTION

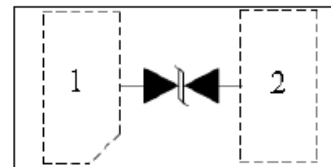
ESD05D6BU is a low-capacitance transient voltage Suppressor (TVS) designed to provide electrostatic events discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.25pF, ESD05D6BU is designed to protect parasitic-sensitive systems against over-voltage and over-current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

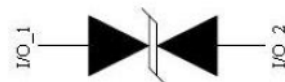
## Features

- ◆ Peak Power Dissipation : 100 W (8/20 $\mu\text{s}$ )
- ◆ 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 <sub>ESD</sub>	$\pm 20$	KV
ESD per IEC 61000-4-2 (Contact)		$\pm 20$	
Peak Pulse Power(8/20us )	P <sub>PP</sub>	100	W
Operating Temperature	T <sub>OPT</sub>	-55 to +125	$^{\circ}\text{C}$
Storage Temperature	T <sub>STG</sub>	-55 to +150	$^{\circ}\text{C}$
Lead Solder Temperature – Maximum (10 Second Duration)	T <sub>L</sub>	260(10 sec.)	$^{\circ}\text{C}$

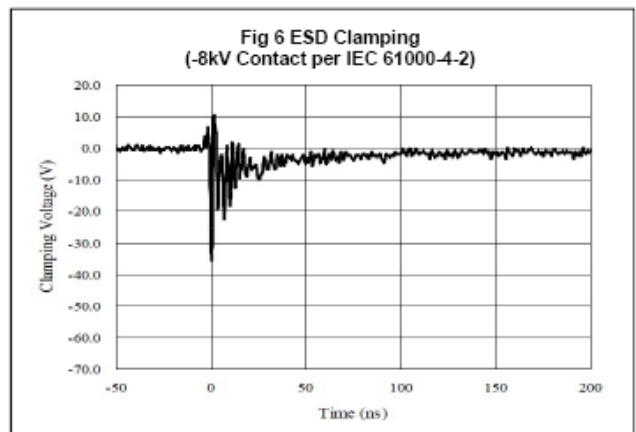
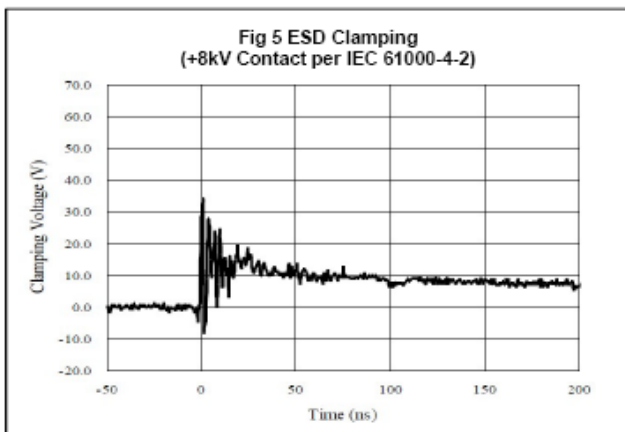
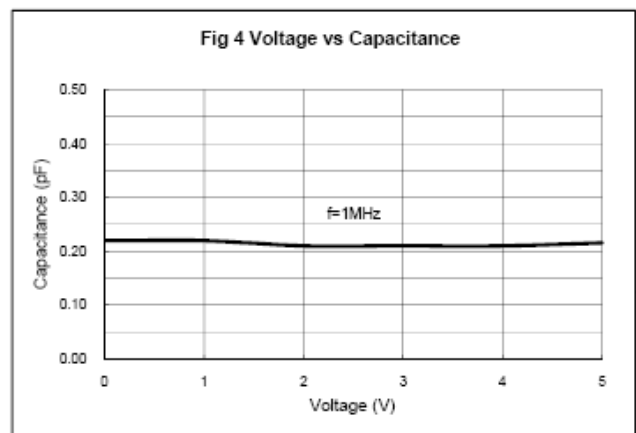
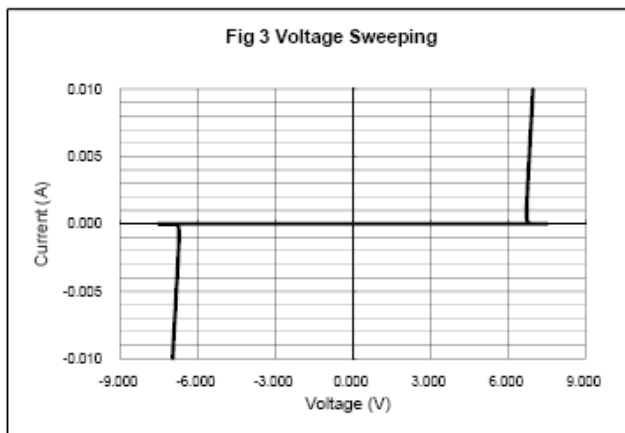
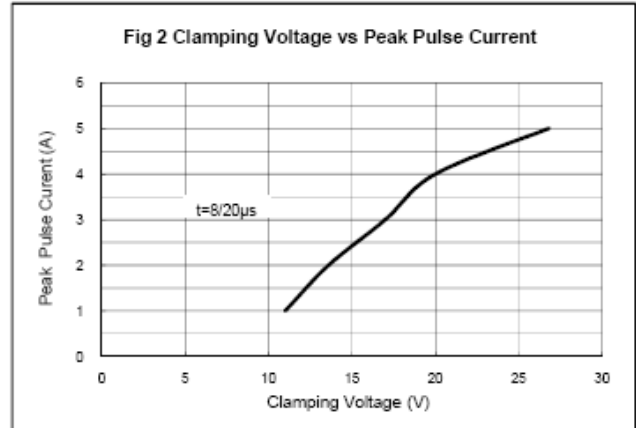
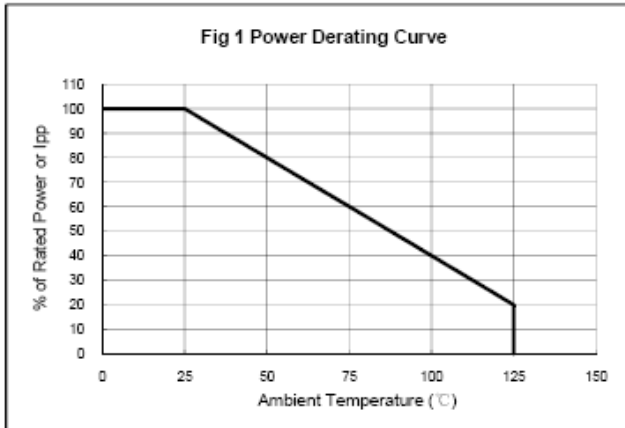
The above data are for reference only.

**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

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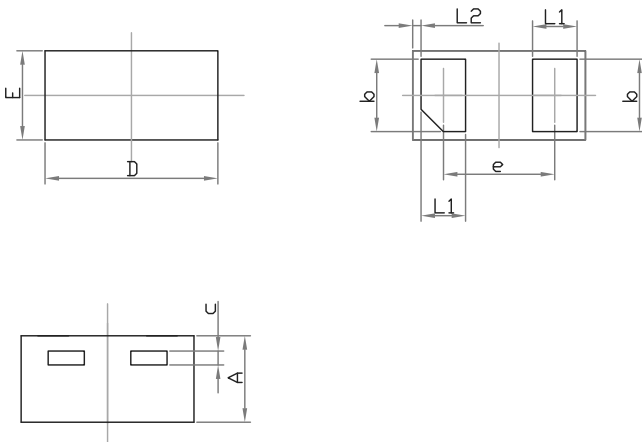
### ELECTRICAL CHARACTERISTICS CURVE



The curve above is for reference only.

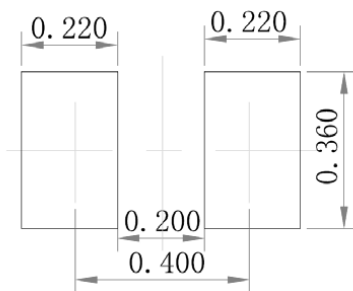
### Outlitne Drawing

#### 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

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