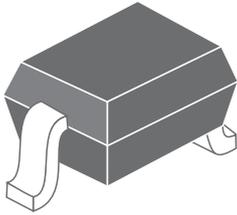
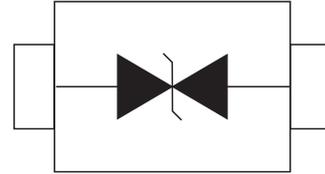


## Electro-Static Discharge TESD03-36FB Bidirectional TVS Diode

### SOD-323



### Pin Configuration



### Features

- 320 Watts Peak Pulse Power per Line ( $t_p=8/20\mu s$ )
- Protects one I/O or power line
- Low clamping voltage
- Working voltages: 3. 3V, 5V, 12V, 15V, 18V, 24V and 36V
- Low leakage current

### IEC Compatibility

- IEC61000-4-2 (ESD)  $\pm 30kV$  (air),  $\pm 30kV$  (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)

### Applications

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Personal Digital Assistants(PDA's)
- Notebooks,Desktops,and Servers
- Portable Instrumentation
- Peripherals
- Pagers

### Mechanical Characteristics

- JEDEC SOD-323 Package
- Molding Compound Flammability Rating:L 94V-O
- Weight 0.5 Milligrams(Approximate)
- Quantity Per Reel:3000pcs
- Reel Size:7 inch
- Lead Finish:Lead Free

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

Parameter	Symbol	Value	Units
Peak Pulse Power( $t_p=8/20\mu\text{s}$ )	$P_{PP}$	320	Watts
Lead Soldering Temperature	$T_L$	260(10 sec.)	$^{\circ}\text{C}$
Operating Temperature Range	$T_J$	-55~150	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55~150	$^{\circ}\text{C}$

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

**TESD03FB(Marking:2A)**

Parameter	Symbol	Conditions	Min.	Max.	Units
Reverse Stand-off Voltage	$V_{RWM}$			3.3	V
Breakdown Voltage	$V_{BR}$	$I_T=1\text{mA}$	3.6		V
Clamping Voltage	$V_C$	$I_{PP}=1\text{A}, t_p=8/20\mu\text{s}$		7.5	V
		$I_{PP}=18\text{A}, t_p=8/20\mu\text{s}$		13	V
Reverse Leakage Current	$I_R$	@ $V_{RWM}$		1	$\mu\text{A}$
Junction Capacitance	$C_{I/O}$	0Vdc, f=1MHz Between I/O Pins and GND		250	pF

**TESD05FB(Marking:2B)**

Parameter	Symbol	Conditions	Min.	Max.	Units
Reverse Stand-off Voltage	$V_{RWM}$			5	V
Breakdown Voltage	$V_{BR}$	$I_T=1\text{mA}$	6		V
Clamping Voltage	$V_C$	$I_{PP}=1\text{A}, t_p=8/20\mu\text{s}$		9.8	V
		$I_{PP}=17\text{A}, t_p=8/20\mu\text{s}$		18	V
Reverse Leakage Current	$I_R$	@ $V_{RWM}$		1	$\mu\text{A}$
Junction Capacitance	$C_{I/O}$	0Vdc, f=1MHz Between I/O Pins and GND		200	pF

**TESD08FB(Marking:2C)**

Parameter	Symbol	Conditions	Min.	Max.	Units
Reverse Stand-off Voltage	$V_{RWM}$			8	V
Breakdown Voltage	$V_{BR}$	$I_T=1\text{mA}$	8.5		V
Clamping Voltage	$V_C$	$I_{PP}=1\text{A}, t_p=8/20\mu\text{s}$		13.4	V
		$I_{PP}=15\text{A}, t_p=8/20\mu\text{s}$		25	V
Reverse Leakage Current	$I_R$	@ $V_{RWM}$		1	$\mu\text{A}$
Junction Capacitance	$C_{I/O}$	0Vdc, f=1MHz Between I/O Pins and GND		120	pF

**Electrical Characteristics(T<sub>A</sub>=25 °C unless otherwise specified )**

<b>TESD12FB(Marking:2D)</b>					
Parameter	Symbol	Conditions	Min.	Max.	Units
Reverse Stand-off Voltage	V <sub>RWM</sub>			12	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	13.3		V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =1A, tp=8/20μs		19	V
		I <sub>PP</sub> =12A, tp=8/20μs		35	V
Reverse Leakage Current	I <sub>R</sub>	@V <sub>RWM</sub>		1	μA
Junction Capacitance	C <sub>I/O</sub>	0Vdc, f=1MHz Between I/O Pins and GND		100	pF

<b>TESD15FB(Marking:2J)</b>					
Parameter	Symbol	Conditions	Min.	Max.	Units
Reverse Stand-off Voltage	V <sub>RWM</sub>			15	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	16.7		V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =1A, tp=8/20μs		24	V
		I <sub>PP</sub> =10A, tp=8/20μs		40	V
Reverse Leakage Current	I <sub>R</sub>	@V <sub>RWM</sub>		1	μA
Junction Capacitance	C <sub>I/O</sub>	0Vdc, f=1MHz Between I/O Pins and GND		75	pF

<b>TESD18FB(Marking:2K)</b>					
Parameter	Symbol	Conditions	Min.	Max.	Units
Reverse Stand-off Voltage	V <sub>RWM</sub>			18	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	19		V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =1A, tp=8/20μs		29	V
		I <sub>PP</sub> =9A, tp=8/20μs		45	V
Reverse Leakage Current	I <sub>R</sub>	@V <sub>RWM</sub>		1	μA
Junction Capacitance	C <sub>I/O</sub>	0Vdc, f=1MHz Between I/O Pins and GND		57	pF

<b>TESD24FB(Marking:2H)</b>					
Parameter	Symbol	Conditions	Min.	Max.	Units
Reverse Stand-off Voltage	V <sub>RWM</sub>			24	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	26.7		V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =1A, tp=8/20μs		40	V
		I <sub>PP</sub> =7A, tp=8/20μs		52	V
Reverse Leakage Current	I <sub>R</sub>	@V <sub>RWM</sub>		1	μA
Junction Capacitance	C <sub>I/O</sub>	0Vdc, f=1MHz Between I/O Pins and GND		50	pF

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

TESD36FB(Marking:2N)					
Parameter	Symbol	Conditions	Min.	Max.	Units
Reverse Stand-off Voltage	$V_{RWM}$			36	V
Breakdown Voltage	$V_{BR}$	$I_T=1\text{mA}$	40		V
Clamping Voltage	$V_C$	$I_{PP}=1\text{A}, t_p=8/20\mu\text{s}$		60	V
		$I_{PP}=5\text{A}, t_p=8/20\mu\text{s}$		75	V
Reverse Leakage Current	$I_R$	@ $V_{RWM}$		1	$\mu\text{A}$
Junction Capacitance	$C_{I/O}$	0Vdc, f=1MHz Between I/O Pins and GND		40	pF

Ratings and Characteristic Curves

Fig.1 ESD Clamping Voltage Screenshot Positive 8 kV Contact per IEC61000-4-2

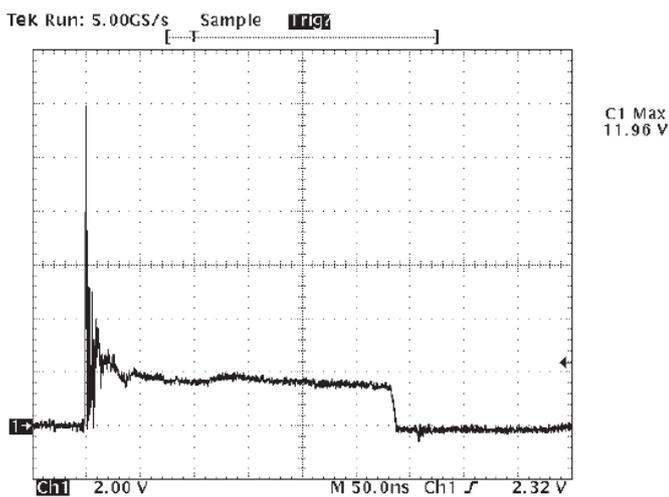
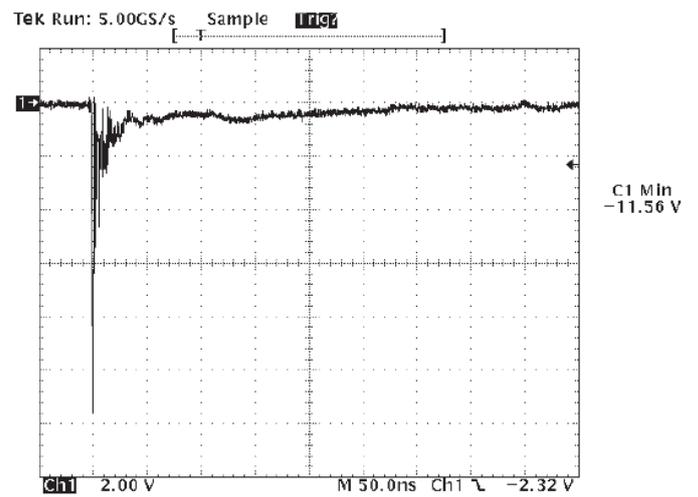
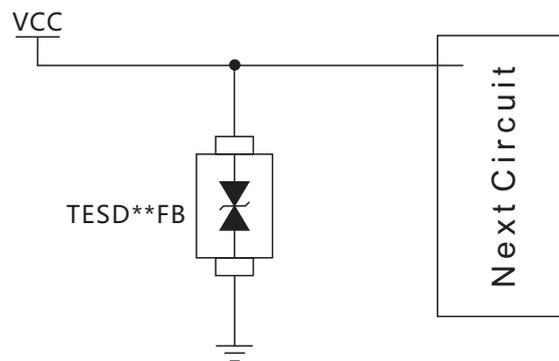


Fig.2 ESD Clamping Voltage Screenshot Negative 8 kV Contact per IEC61000-4-2



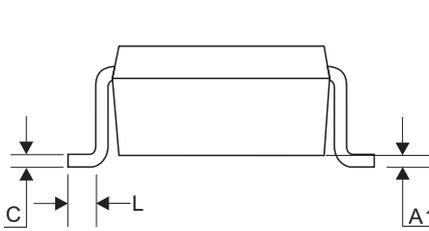
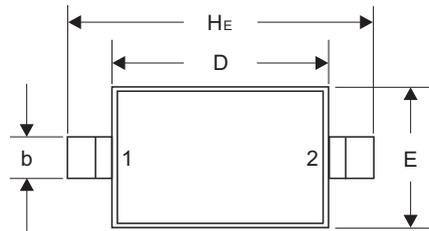
Application

Power Protection



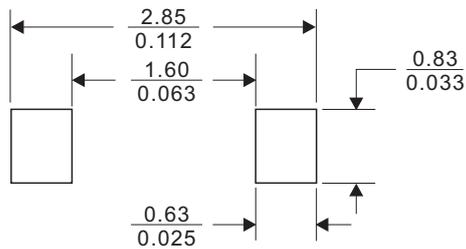
Dimensions(SOD-323)

SOD-323



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.80	1.00	0.031	0.040
A1	0.00	0.10	0.000	0.004
A3	0.15REF		0.006REF	
b	0.25	0.40	0.010	0.016
C	0.089	0.177	0.003	0.007
D	1.60	1.80	0.062	0.070
E	1.15	1.35	0.045	0.053
L	0.08		0.003	
He	2.30	2.70	0.090	0.105

Recommended Mounting Pad Layout



Dimensions in ( $\frac{\text{millimeters}}{\text{inches}}$ )