

Bi-directional ESD Protection Diode

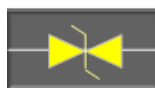
FEATURES

- Meet IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
- Designed for mounting on small surface
- Protects one Bi-directional I/O line
- Moisture sensitivity level 1
- Working Voltage : 5V, 12V, 24V
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21


0603


MECHANICAL DATA

- Case: 0603 small outline plastic package
- Terminal : Gold plated, solder per MIL-STD-705, method 2026 guaranteed
- High temperature soldering guaranteed : $260^{\circ}\text{C}/10\text{s}$
- Weight: $3 \pm 0.5\text{ mg}$



APPLICATIONS

- Cell Phone Handsets and Accessories
- Notebooks, Desktops, and Servers
- Keypads, Side Keys, USB 2.0, LCD Displays
- Portable Instrumentation
- Touch Panel

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER		SYMBOL	VALUE	UNIT
Peak Pulse Power (tp=8/20μs waveform)	TESDU5V0	P _{PP}	75	W
	TESDU12V		25	
	TESDU24V		47	
ESD per IEC 61000-4-2 (Air)		V _{ESD}	± 15	KV
ESD per IEC 61000-4-2 (Contact)			± 8	
Junction and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

PARAMETER			SYMBOL	MIN	MAX	UNIT
Reverse Stand-Off Voltage	TESDU5V0		V_{RWM}	-	5	V
	TESDU12V			-	12	
	TESDU24V			-	24	
Reverse Breakdown Voltage	TESDU5V0	$I_R = 1\text{ mA}$	$V_{(BR)}$	5.1	-	V
	TESDU12V			13	-	
	TESDU24V			25	-	
Reverse Leakage Current	TESDU5V0	$V_R = 5\text{ V}$	I_R	-	2	μA
	TESDU12V	$V_R = 12\text{ V}$				
	TESDU24V	$V_R = 24\text{ V}$				
Clamping Voltage	TESDU5V0	$I_{PP} = 1\text{ A}$	V_C	-	9.8	V
		$I_{PP} = 5\text{ A}$		-	15	
Clamping Voltage	TESDU12V	$I_{PP} = 1\text{ A}$	V_C	-	25	V
		$I_{PP} = 5\text{ A}$		-	33	
Clamping Voltage	TESDU24V	$I_{PP} = 1\text{ A}$	V_C	-	47	V
		$I_{PP} = 5\text{ A}$		-	51	
Junction Capacitance	TESDU5V0	$V_R = 0\text{ V}$	C_J	15		pF
	TESDU12V	$f = 1.0\text{ MHz}$		12		
	TESDU24V			10		

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RATINGS AND CHARACTERISTICS CURVES

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

Fig. 1 Admissible Power Dissipation Curve

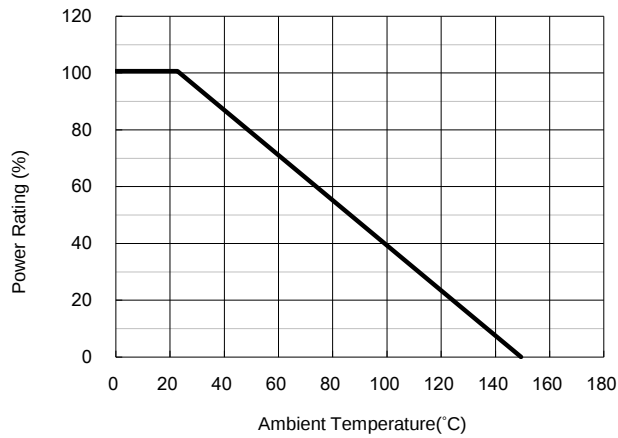


Fig. 2 Typical Junction Capacitance

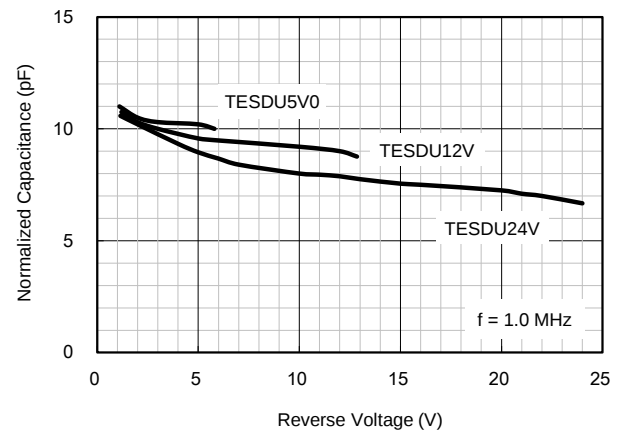
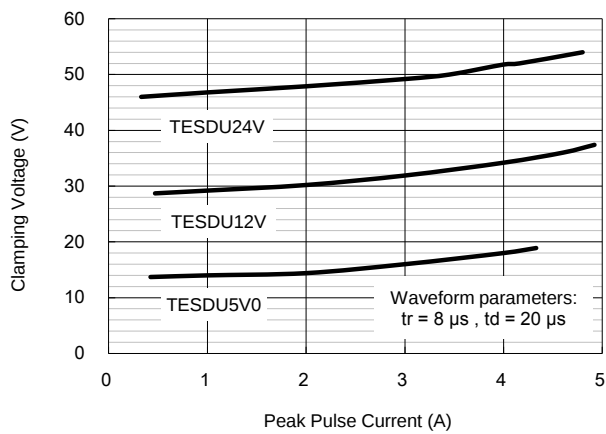


Fig. 3 Clamping Voltage VS. Peak Pulse Current



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ORDERING INFORMATION

PART NO.	PACKING CODE	PACKING CODE SUFFIX	PACKAGE	PACKING
TESDUxxx (Note1, 2)	RG	G	0603	4,000 / 7" Reel

Note 1: "xxx" defines voltage from 5V (TESDU5V0) to 24V (TESDU24V)

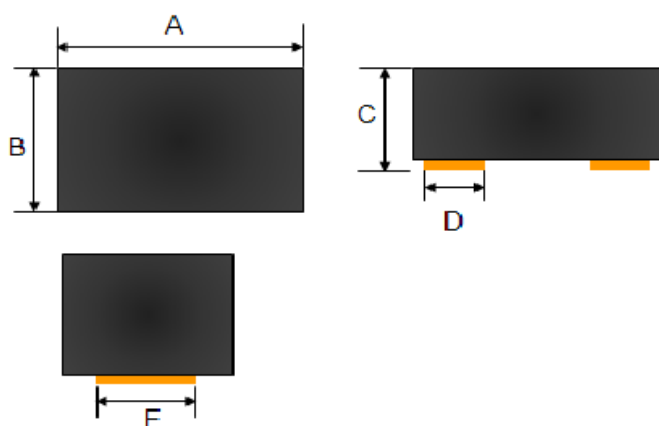
Note 2: Whole series with green compound

EXAMPLE

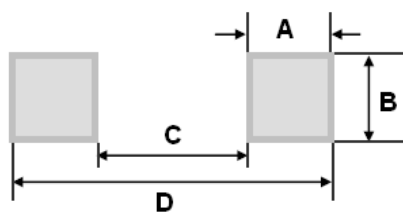
EXAMPLE P/N	PART NO.	PACKING CODE	PACKING CODE SUFFIX	DESCRIPTION
TESDU5V0 RGG	TESDU5V0	RG	G	Green compound

PACKAGE OUTLINE DIMENSIONS

0603



DIM.	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	1.60	1.80	0.063	0.071
B	0.80	1.00	0.031	0.039
C	0.70	0.85	0.028	0.033
D	0.45 (Typ.)		0.018 (Typ.)	
E	0.70 (Typ.)		0.028 (Typ.)	

SUGGEST PAD LAYOUT


DIM.	Unit (mm)	Unit (inch)
	Typ.	Typ.
A	0.60	0.024
B	1.00	0.039
C	0.65	0.026
D	1.85	0.073

Note: The suggested land pattern dimensions have been provided for reference only, as actual pad layouts may vary depending on application.

MARKING

Part NO.	Marking
TESDU5V0	E05
TESDU12V	E12
TESDU24V	E24

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APPLICATIONS INFORMATION

- ◇ Designed to protect one data, I/O, or power supply line
- ◇ Designed to protect sensitive electronics from damage or latch-up due to ESD
- ◇ Designed to replace multilayer varistors (MLVs) in portable applications
- ◇ Features large cross-sectional area junctions for conducting high transient currents
- ◇ Offers superior electrical characteristics such as lower clamping voltage and no device degradation when compared to MLVs
- ◇ The combination of small size and high ESD surge capability makes them ideal for use in portable applications

CIRCUIT BOARD LAYOUT RECOMMENDATIONS

Good circuit board layout is critical for the suppression of ESD induced transients

- ◇ Place the ESD Protection Diode near the input terminals or connectors to restrict transient coupling
- ◇ Minimize the path length between the ESD Protection Diode and the protected line
- ◇ Minimize all conductive loops including power and ground loops
- ◇ The ESD transient return path to ground should be kept as short as possible
- ◇ Never run critical signals near board edges
- ◇ Use ground planes whenever possible

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