

Small Signal Product

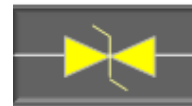
Bi-directional ESD Protection Diode
FEATURES

- 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
- Pb free version and RoHS compliant
- Packing code with suffix "G" means green compound (halogen-free)


0503

MECHANICAL DATA

- Case: 0503 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: $2 \pm 0.5 \text{ mg}$


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 ($t_p=8/20\mu\text{s}$ waveform)	TESDE5V0	P_{PP}	75	W
	TESDE12V		25	
	TESDE24V		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	$^{\circ}\text{C}$

PARAMETER		SYMBOL	MIN	MAX	UNIT	
Reverse Stand-Off Voltage	TESDE5V0	V_{RWM}	-	5	V	
	TESDE12V		-	12		
	TESDE24V		-	24		
Reverse Breakdown Voltage	TESDE5V0	$V_{(BR)}$	5.1	-	V	
	TESDE12V		$I_R = 1 \text{ mA}$	13		-
	TESDE24V		25	-		
Reverse Leakage Current	TESDE5V0	I_R	-	2	μA	
	TESDE12V		$V_R = 5 \text{ V}$	-		2
	TESDE24V		$V_R = 12 \text{ V}$	-		2
Clamping Voltage	TESDE5V0	V_C	$I_{PP} = 1 \text{ A}$	9.8	V	
			$I_{PP} = 5 \text{ A}$	15		
Clamping Voltage	TESDE12V	V_C	$I_{PP} = 1 \text{ A}$	25	V	
			$I_{PP} = 5 \text{ A}$	33		
Clamping Voltage	TESDE24V	V_C	$I_{PP} = 1 \text{ A}$	47	V	
			$I_{PP} = 5 \text{ A}$	51		
Junction Capacitance	TESDE5V0	C_J	-	15	pF	
	TESDE12V		$V_R = 0 \text{ V}$	12		
	TESDE24V		$f = 1.0 \text{ MHz}$	10		

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RATINGS AND CHARACTERISTICS CURVES

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

Fig. 1 Non-Repetitive Peak Pulse Power VS. Pulse Time

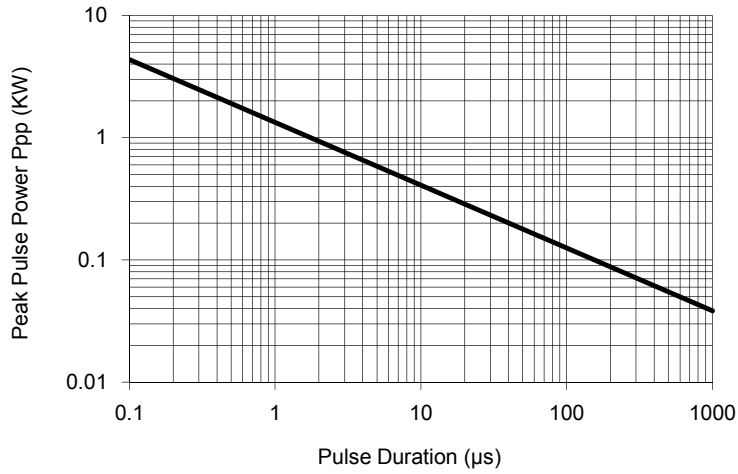


Fig. 2 Pulse Waveform

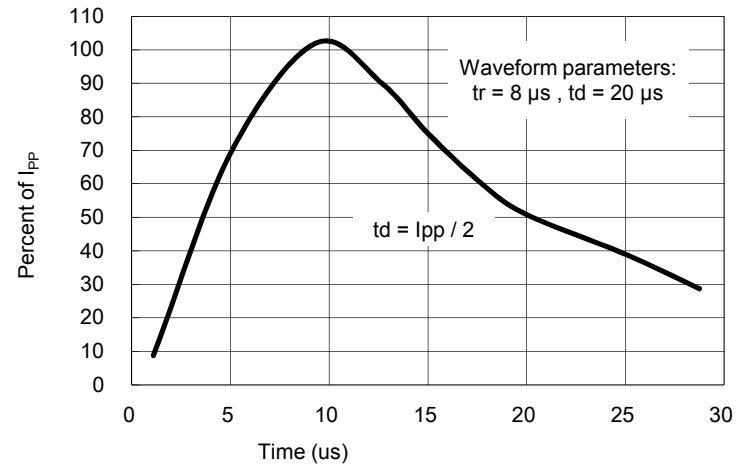


Fig. 3 Admissible Power Dissipation Curve

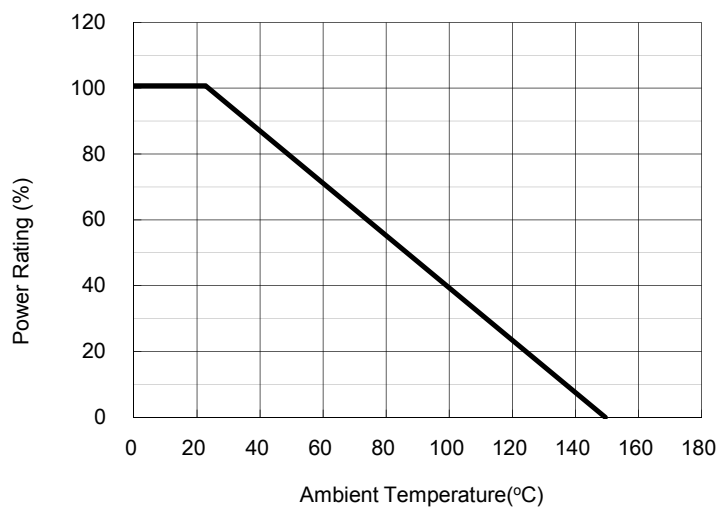


Fig. 4 Typical Junction Capacitance

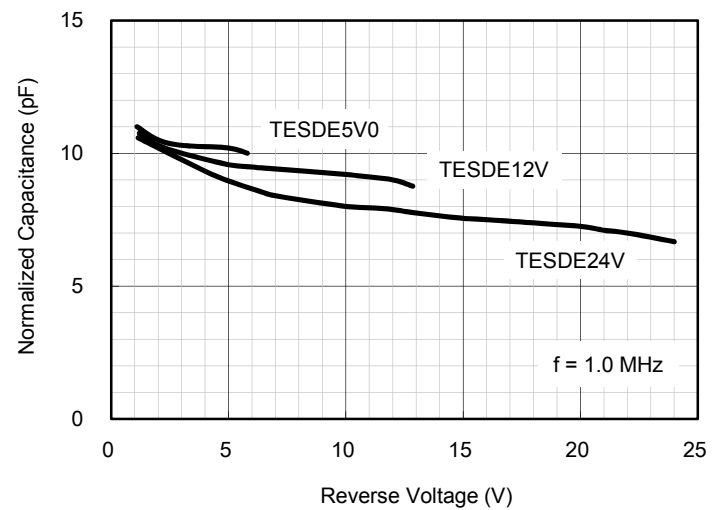
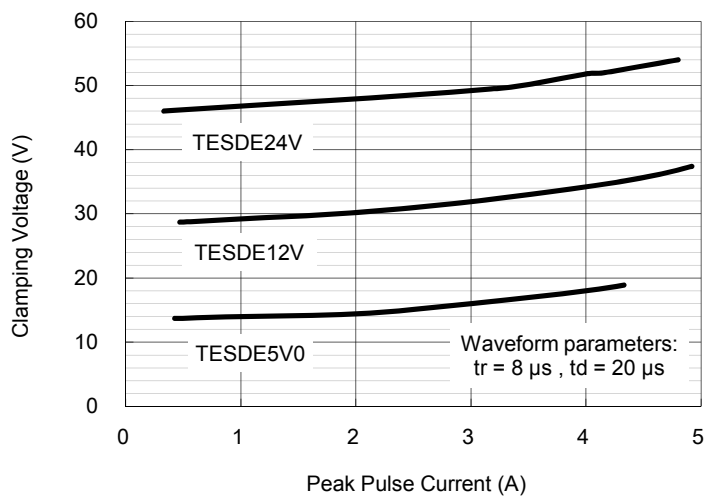


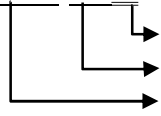
Fig. 5 Clamping Voltage VS. Peak Pulse Current



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ORDER INFORMATION (EXAMPLE)

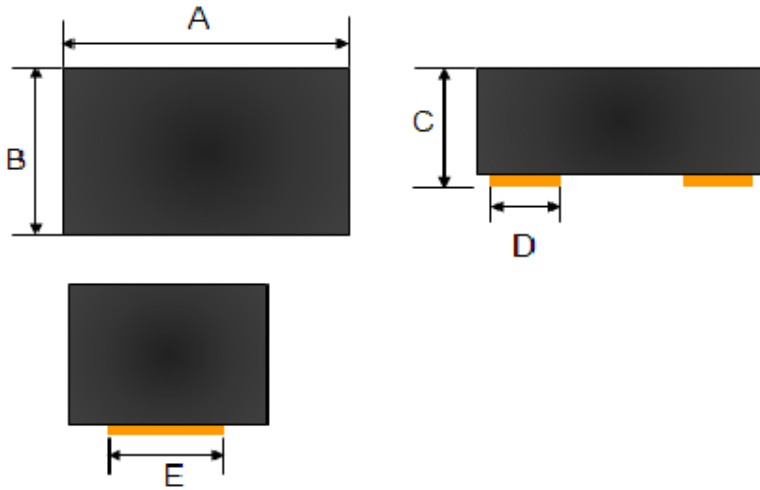
TESDE5V0 RZG



Green compound code
Packing code
Part no.

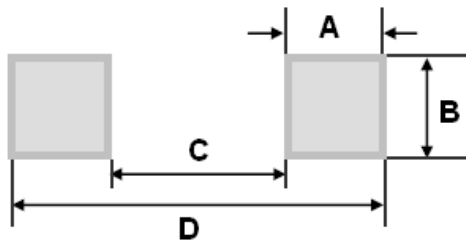
PACKAGE OUTLINE DIMENSIONS

0503



DIM.	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	1.15	1.35	0.045	0.053
B	0.65	0.85	0.026	0.033
C	0.60	0.75	0.024	0.030
D	0.40 (Typ.)		0.016 (Typ.)	
E	0.55 (Typ.)		0.022 (Typ.)	

SUGGEST PAD LAYOUT



DIM.	Unit (mm)	Unit (inch)
	Typ.	Typ.
A	0.55	0.022
B	0.85	0.033
C	0.30	0.012
D	1.40	0.055

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
TESDE5V0	E05
TESDE12V	E12
TESDE24V	E24

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APPLICATION 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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