

## Small Signal Product

## Bi-directional ESD Protection Diode

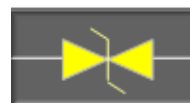
**FEATURES**

- 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)		$V_{ESD}$	$\pm 15$	KV
ESD per IEC 61000-4-2 (Contact)			$\pm 8$	
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	$\mu\text{A}$	
	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		

**Small Signal Product**

**RATINGS AND CHARACTERISTICS CURVES**

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

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

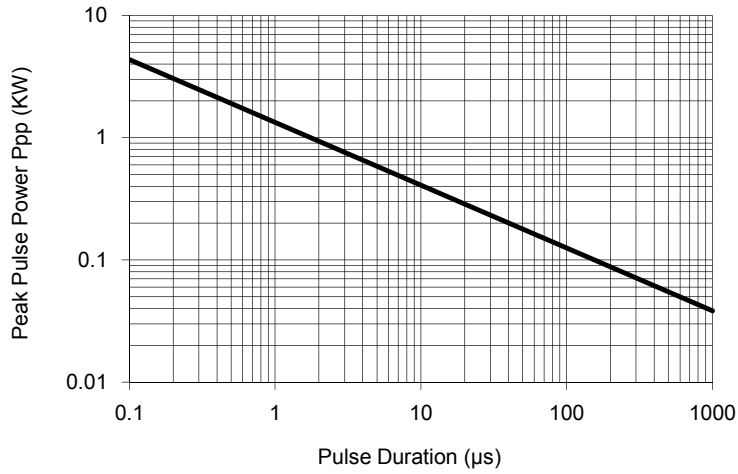


Fig. 2 Pulse Waveform

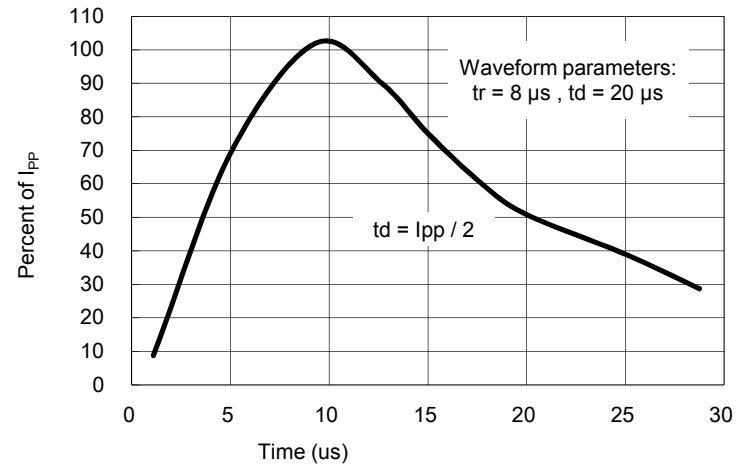


Fig. 3 Admissible Power Dissipation Curve

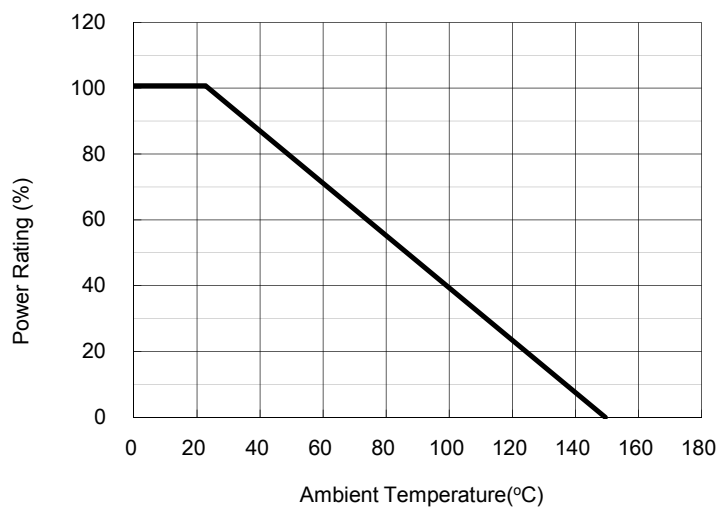


Fig. 4 Typical Junction Capacitance

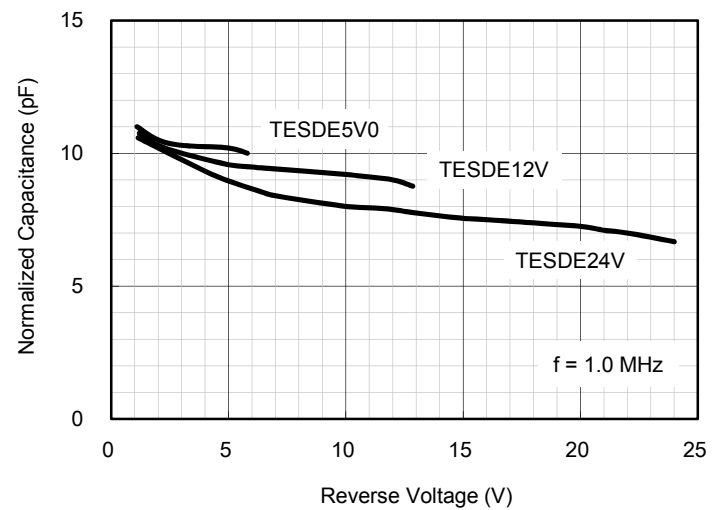
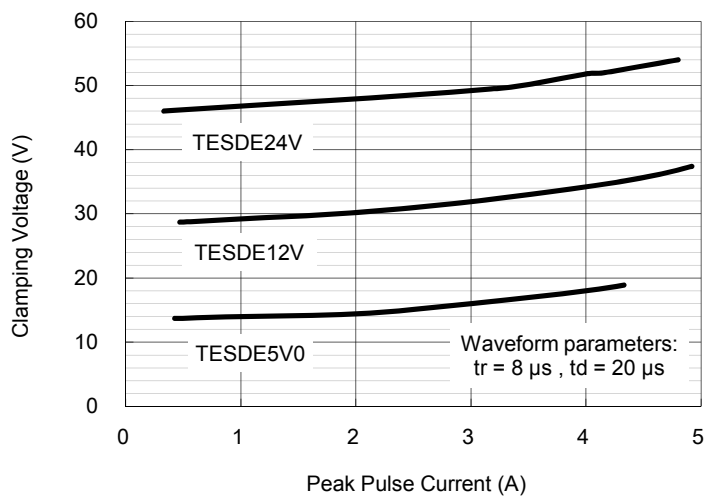


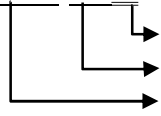
Fig. 5 Clamping Voltage VS. Peak Pulse Current



Small Signal Product

ORDER INFORMATION (EXAMPLE)

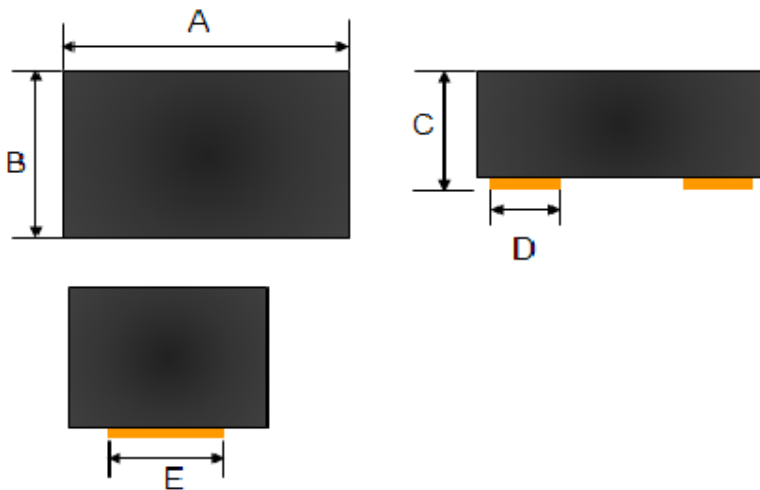
TESDE5V0 RZG



Green compound code  
Packing code  
Part no.

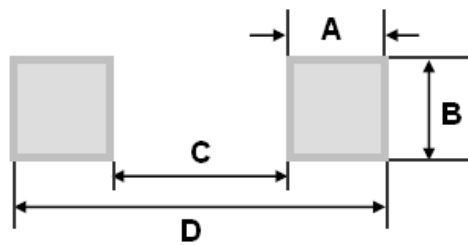
PACKAGE OUTLINE DIMENSIONS

**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

## Small Signal Product

### 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

### Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.