

## Small Signal Diode



### Features

- ✦ Meet IEC61000-4-2 (ESD)  $\pm 15\text{kV}$  (air),  $\pm 8\text{kV}$  (contact)
- ✦ Designed for mounting on small surface.
- ✦ Moisture sensitivity level 1
- ✦ Protects one bidirectional I/O line
- ✦ Working Voltage : 5V, 12V, 24V
- ✦ Pb free version, RoHS compliant, and Halogen free

### Mechanical Data

- ✦ Case : 0503 standard package, molded plastic
- ✦ Terminal: Gold plated, solder per MIL-STD-750, Method 2026 guaranteed
- ✦ High temperature soldering guaranteed:  $260^\circ\text{C}/10\text{s}$
- ✦ Mounting position: Any
- ✦ Weight : 2 mg (approximately)
- ✦ Marking Code : E05, E12, E24

### Applications

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

### Ordering Information

Part No.	Package code	Package	Packing	Marking
TESDE5V0	R1G	0503	4K / 7" Reel	E05
TESDE12V	R1G	0503	4K / 7" Reel	E12
TESDE24V	R1G	0503	4K / 7" Reel	E24

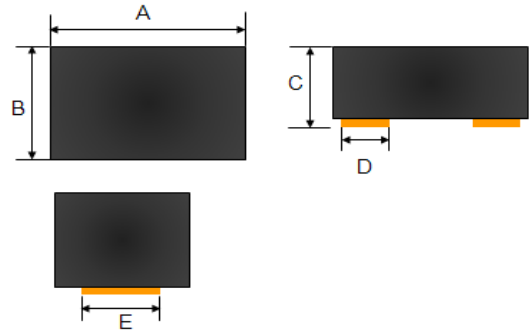
### Maximum Ratings and Electrical Characteristics

Rating at  $25^\circ\text{C}$  ambient temperature unless otherwise specified.

#### Maximum Ratings

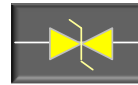
Type Number	Symbol	Value	Units
Peak Pulse Power (tp=8/20 $\mu\text{s}$ waveform)	P <sub>PP</sub>	TESDE5V0	75
		TESDE12V	25
		TESDE24V	47
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V <sub>ESD</sub>	$\pm 15$ $\pm 8$	kV
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to + 150	$^\circ\text{C}$

0503

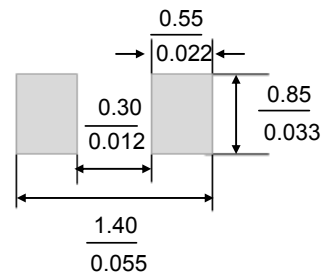


Dimensions	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	1.15	1.35	0.045	0.053
B	0.65	0.85	0.026	0.034
C	0.60	0.75	0.024	0.030
D	0.40(Typ.)		0.016(Typ.)	
E	0.55(Typ.)		0.022(Typ.)	

### Pin Configuration



### Suggested PAD Layout



Unit :  $\frac{\text{mm}}{\text{inch}}$

**Small Signal Diode**
**Electrical Characteristics**

Type Number	Symbol	Min	Max	Units
Reverse Stand-Off Voltage	TESDE5V0	-	5	V
	TESDE12V		12	
	TESDE24V		24	
Reverse Breakdown Voltage	TESDE5V0	5.1	-	V
	TESDE12V	13	-	
	TESDE24V	25	-	
Reverse Leakage Current	TESDE5V0	-	2	uA
	TESDE12V		2	
	TESDE24V		2	
Clamping Voltage	TESDE5V0	-	9.8	V
			15	
Clamping Voltage	TESDE12V	-	25	V
			33	
Clamping Voltage	TESDE24V	-	47	V
			51	
Junction Capacitance	TESDE5V0	15 (Typ.)		pF
	TESDE12V	12 (Typ.)		
	TESDE24V	10 (Typ.)		

## Small Signal Diode

### Rating and Sharacteristic Curves

FIG 1 Non-Repetitive Peak Pulse Power vs. Pulse Time

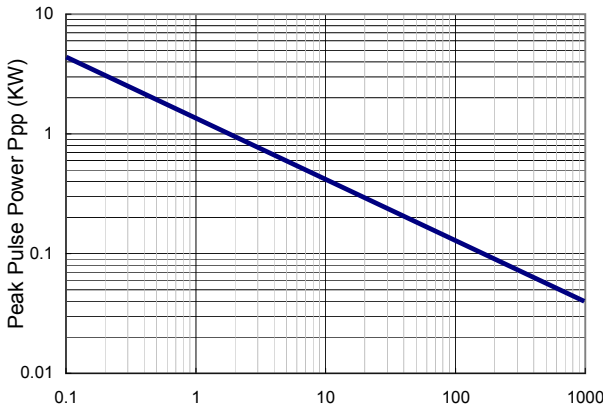


FIG 2 Pulse Waveform

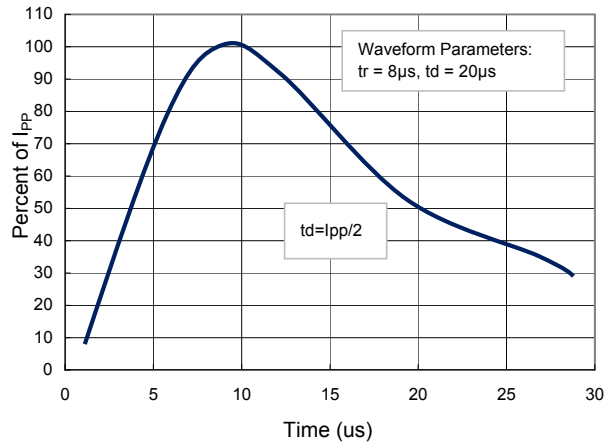


FIG 3 Admissible Power Dissipation Curve

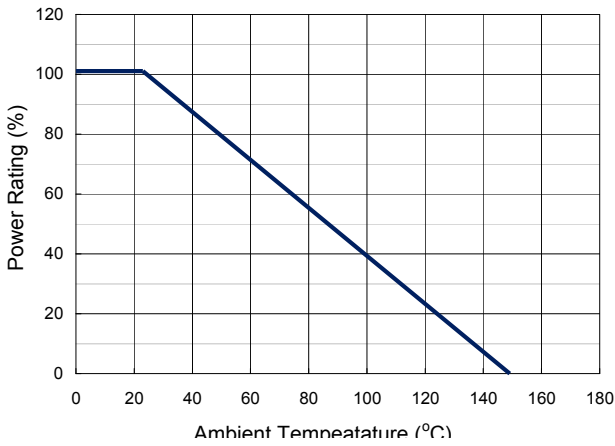


FIG 4 Typical Junction Capacitance

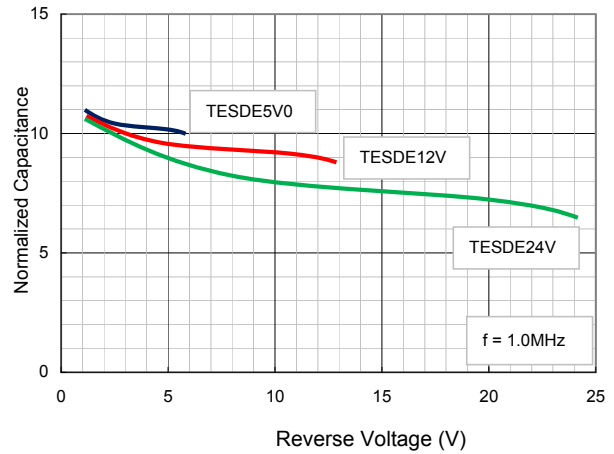
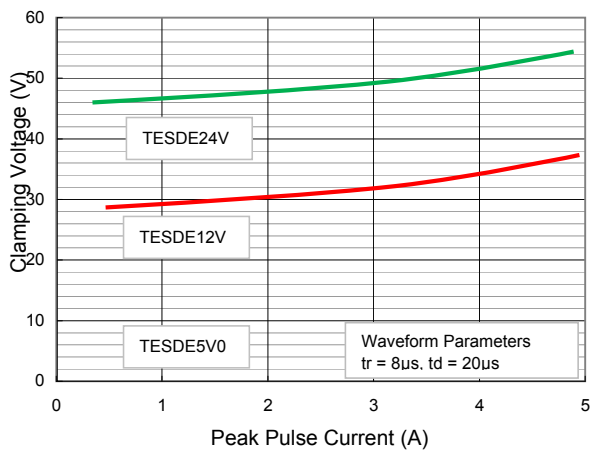


FIG 5 Clamping Voltage vs. Peak Pulse Current



## Small Signal Diode

### Applications Information

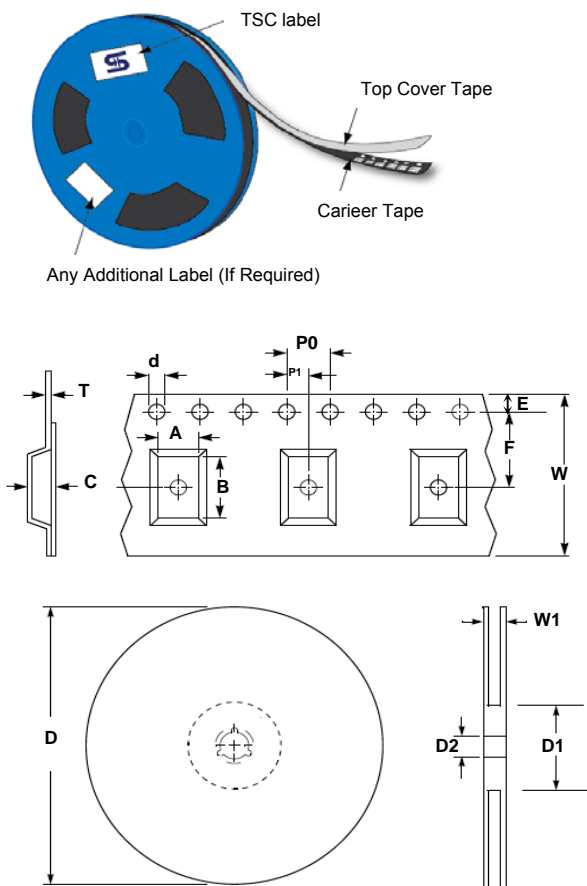
- ◇ Designed to protect one data, I/O, or power supply line.
- ◇ Designed to protect sensitive electronics from damage or latch-up due to ESD
- ◇ Designed to replace multilayer varistors (MLVs) in portable applications
- ◇ Features large crosssectional area junctions for conducting high transient currents
- ◇ 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.

### Tape & Reel specification



Item	Symbol	Dimension (mm)
Carrier width	A	0.90 ± 0.10
Carrier length	B	1.46 ± 0.10
Carrier depth	C	0.80 ± 0.10
Sprocket hole	d	1.55 ± 0.05
Reel outside diameter	D	178 ± 1
Reel inner diameter	D1	60.0 Min
Feed hole width	D2	13.0 ± 0.20
Sprocket hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.05
Punch hole pitch	P	4.00 ± 0.10
Sprocket hole pitch	P0	4.00 ± 0.10
Embossment center	P1	2.00 ± 0.05
Overall tape thickness	T	0.23 ± 0.05
Tape width	W	8.00 ± 0.20
Reel width	W1	13.5 Max

