

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 : 1005 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 : 6 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
TESDL5V0	RWG	1005	4K / 7" Reel	E05
TESDL12V	RWG	1005	4K / 7" Reel	E12
TESDL24V	RWG	1005	4K / 7" Reel	E24

Maximum Ratings and Electrical Characteristics

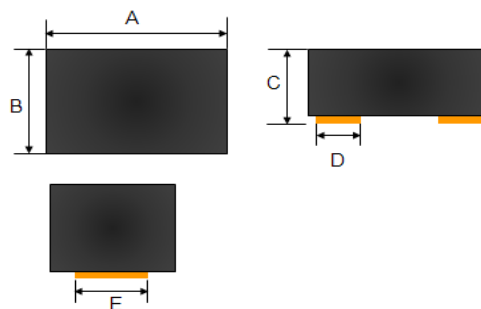
Rating at 25°C ambient temperature unless otherwise specified.

Maximum Ratings

Type Number	Symbol	Value	Units
Peak Pulse Power ($t_p=8/20\mu\text{s}$ waveform)	P_{PP}	75	W
		25	
		47	
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	± 15 ± 8	kV
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to + 150	$^{\circ}\text{C}$

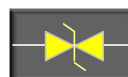
TESDL5V0/TESDL12V/TESDL24V Bi-directional ESD Protection Diode

1005

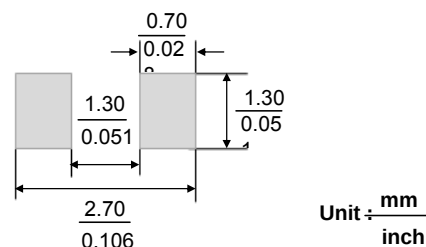


Dimensions	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	2.40	2.60	0.095	0.102
B	1.10	1.30	0.043	0.051
C	0.70	0.90	0.027	0.035
D	0.50(Typ.)		0.020(Typ.)	
E	1.00(Typ.)		0.040(Typ.)	

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	TESDL5V0		V_{RWM}	-	5	V
	TESDL12V				12	
	TESDL24V				24	
Reverse Breakdown Voltage	TESDL5V0	$I_R=1\text{mA}$	$V_{(BR)}$	5.1	-	V
	TESDL12V			13	-	
	TESDL24V			25	-	
Reverse Leakage Current	TESDL5V0	$V_R=5\text{V}$	I_R	-	2	μA
	TESDL12V	$V_R=12\text{V}$				
	TESDL24V	$V_R=24\text{V}$				
Clamping Voltage	TESDL5V0	$I_{PP}=1\text{A}$ $I_{PP}=5\text{A}$	V_C	-	9.8	V
				-	15	
Clamping Voltage	TESDL12V	$I_{PP}=1\text{A}$ $I_{PP}=5\text{A}$	V_C	-	25	V
				-	33	
Clamping Voltage	TESDL24V	$I_{PP}=1\text{A}$ $I_{PP}=5\text{A}$	V_C	-	47	V
				-	51	
Junction Capacitance	TESDL5V0	$V_R=0\text{V}, f=1.0\text{MHz}$	C_J	15 (Typ.)		pF
	TESDL12V			12 (Typ.)		
	TESDL24V			10 (Typ.)		

Small Signal Diode

Rating and Sharacteristic Curves

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

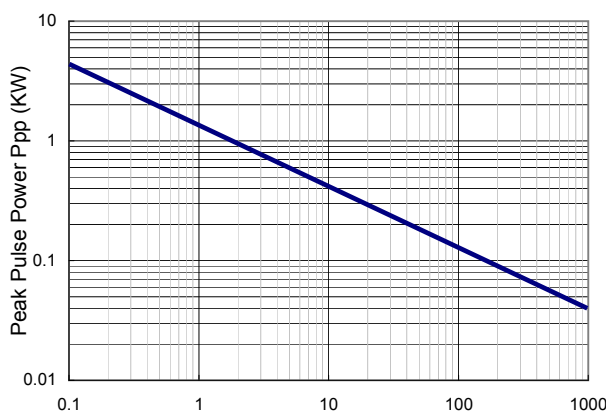


FIG 2 Pulse Waveform

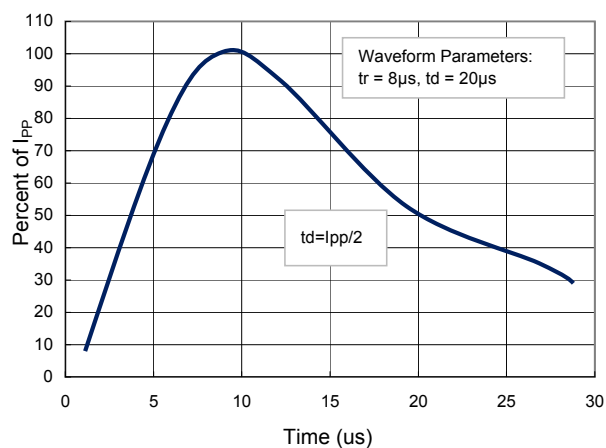


FIG 3 Admissible Power Dissipation Curve

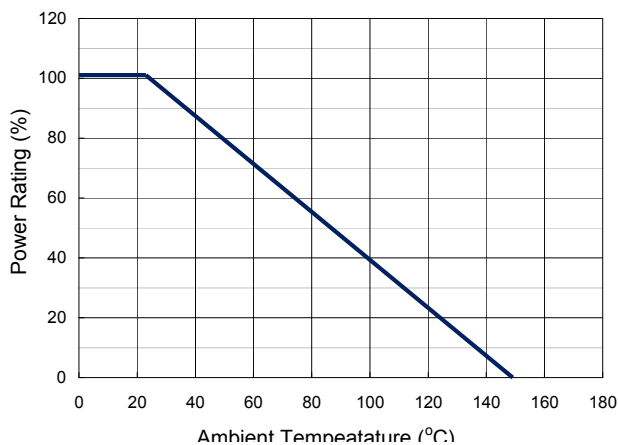


FIG 4 Typical Junction Capacitance

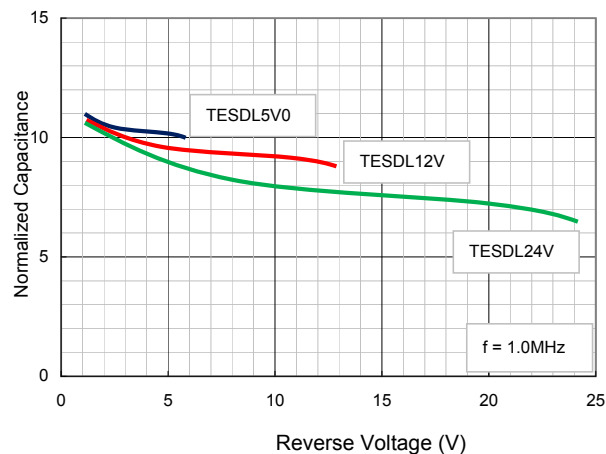
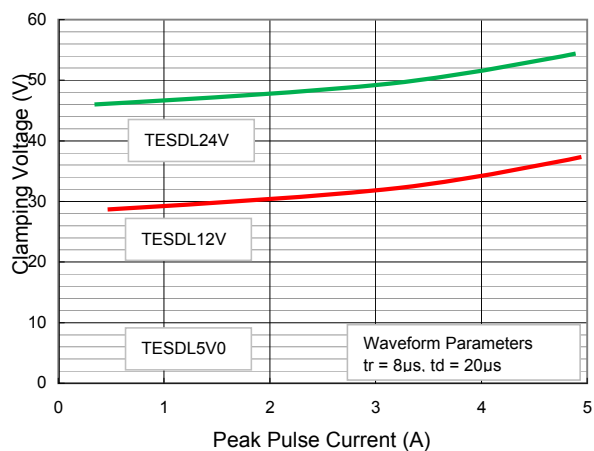


FIG 5 Clamping Voltage vs. Peak Pulse Current)



Small Signal Diode

Applications Information

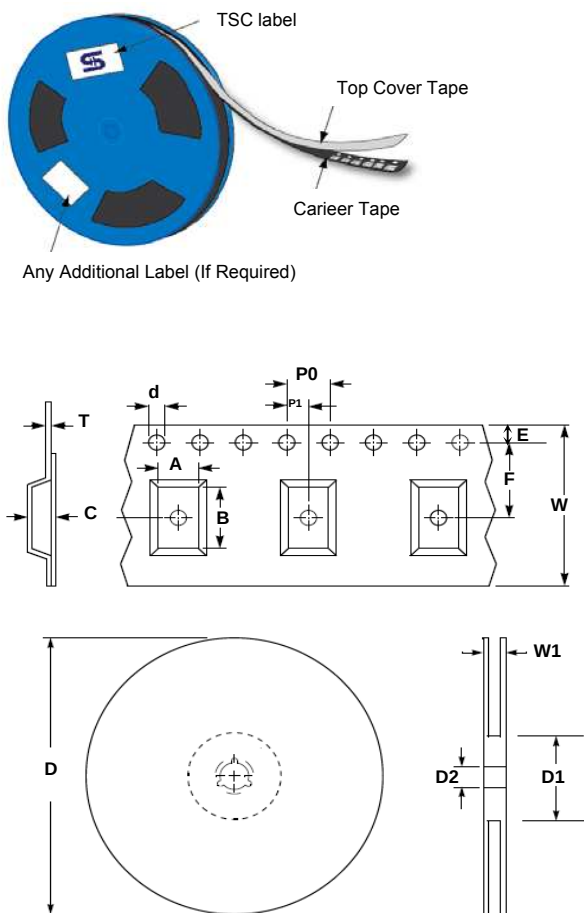
- ✧ Designed to protect one data, I/O, or power supply line.
- ✧ Designed to protect sensitive electronics from damage or latch-up due to ESD
- ✧ Designed to replace multilayer varistors (MLVs) in portable applications
- ✧ Features large crosssectional area junctions for conducting high transient currents
- ✧ 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	1.55 ± 0.10
Carrier length	B	2.65 ± 0.10
Carrier depth	C	1.05 ± 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

