TDS2621LP
1-Line, 26V EOS Protection

Description

Transient Diverting Suppressors(TDS) are designed to provide high energy EOS protection with superior clamping and temperature characteristics when compared to standard TVS devices. The device uses a surge rated FET as the main protection element. During an EOS event, transient voltage increases beyond the rated breakdown voltage of the device. The FET in turn switches on and conducts transient current to ground. The TDS clamping voltage is nearly constant across the rated peak pulse current range due to the extremely low ON Resistance of the FET. Lower clamping voltage at maximum peak pulse current makes them more suitable for protecting today's sensitive IC's, when compared to standard TVS diodes.

TDS2621LP is designed to protect voltage bus or data lines with the max operating voltage of 26.4V. It is rated for a high-energy transient current up to 24A (tp = 8/20µs) and may be used to meet the common industrial voltage surge standard of +/-1kV per IEC 61000-4-5 (RS = 42Ω, CS= 0.5µF).

TDS2621LP is in a small DFN 1.6 x 1.6 x 0.55mm 2-Lead package and represent significant board space savings over traditional SMAJ and SMBJ packaged devices.

Features

- High ESD withstand Voltage: ±20kV (Contact) & ±25kV (Air) per IEC 61000-4-2
- High peak pulse current capability: 24A (tp = 8/20µs), 1kV (tp = 1.2/50µs, RS = 42Ω) per IEC 61000-4-5
- Protects one I/O or power line
- Max working voltage 26.4V
- Solid-state technology

Applications

- USB Type-C
- VBUS Lines
- IoT Devices

Mechanical Characteristics

- Package: DFN 1.6 x 1.6 x 0.55mm 2-Lead
- Pb-free, Halogen Free, RoHS/WEEE Compliant
- Molding compound flammability rating: UL 94V-0
- Lead Finish: Lead-free
- Marking: Marking code and Date Code
- Packaging: Tape and Reel

Dimensions

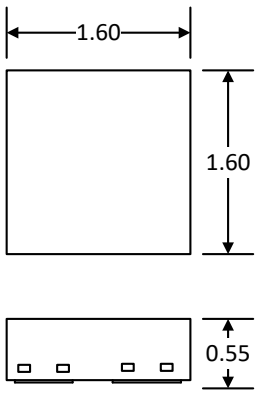


Figure (1) Nominal Dimensions Drawing

Functional Diagram

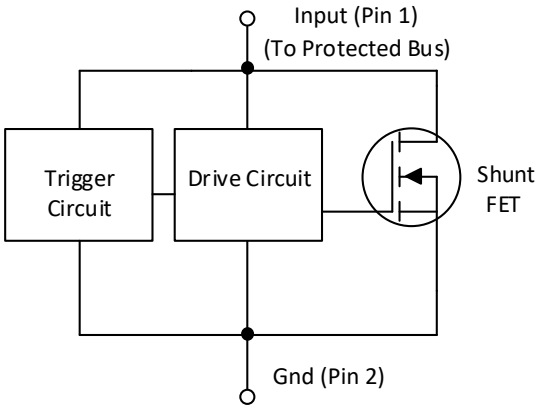


Figure (2) Functional diagram

Absolute Maximum ESD Rating

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power (t_p = 8/20µs)	P_{PK}	840	W
Peak Pulse Current (t_p = 8/20µs)	I_{PP}	24	A
Peak Pulse Current (t_p = 10/1000µs)	I_{PP}	1.3	A
ESD per IEC 61000-4-2 (Air)(1) ESD per IEC 61000-4-2 (Contact)(1)	V_{ESD}	±25 ±20	kV kV
Operating Temperature	T_{OP}	-40 to +125	°C
Junction and Storage Temperature	T_J and T_{STG}	-55 to +150	°C

Exceeding the above specifications may result in permanent damage to the device or device malfunction. Operation outside of the parameters specified in the Electrical Characteristics section is not recommended.

Electrical Characteristics

T_A = 25°C unless otherwise specified. All data taken from Pin 1 to 2 unless otherwise specified.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse Stand-Off Voltage	V_{RWM}				26.4	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA	31	32	33.2	V
Forward Voltage	V_F	I_t = 1mA, Pin 2 to Pin 1		0.6		V
Reverse Leakage Current	I_R	V_{RWM} = 26.4V		5	60	nA
Clamping Voltage(2)	V_C	I_{PP}=24A, t_p = 8/20µs		32.7	35	V
Dynamic Resistance(2),(3)	R_{DYN}	tp = 8/20µs		32		mΩ
Junction Capacitance	C_J	V_R = 26.4V, f = 1MHz		86		pF

Notes:

1) ESD gun return path connected to ESD ground plane.

2) Parameter guaranteed by design.

3) Dynamic resistance measured between 1A and IPP (tp = 8/20µs)

Application Information

DESCRIPTION

Transient Diverting Suppressors(TDS) are designed to provide high energy EOS protection with superior clamping and temperature characteristics when compared to standard TVS devices.

This device uses a surge rated FET as the main protection element. During an EOS event, transient voltage increases beyond the breakdown voltage of the trigger circuit. This in turn activates the drive circuit and turns on the shunt FET which conducts transient current to ground. The TDS has an extremely low dynamic resistance and exhibits a nearly constant clamping voltage across the rated peak pulse current range.

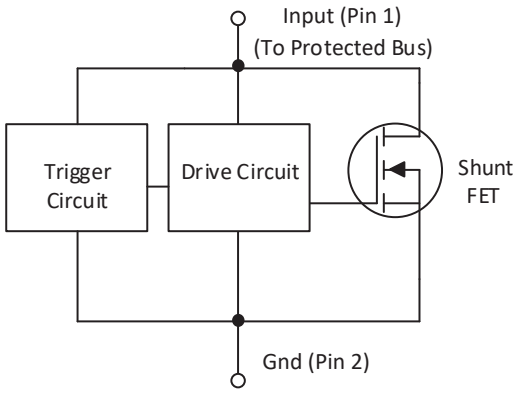
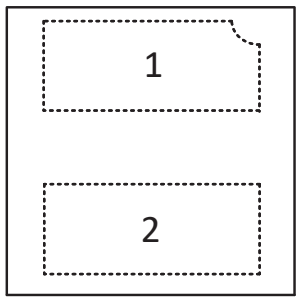


Figure (3) Function Diagram

PIN CONFIGURATION

TDS2621LP is in a 1.6 x 1.6mm, 2-pin DFN package. The input or connection to the protected bus is made at pin 1. Ground connection is made at pin 2. Ground connection with multiple vias is recommended.



(Top View)

Figure (4) Pin Configuration

LAYOUT GUIDELINES

Figure 5 shows a recommended layout. Ground connection with multiple vias is recommended.

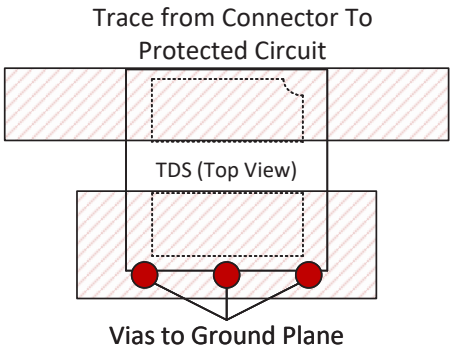
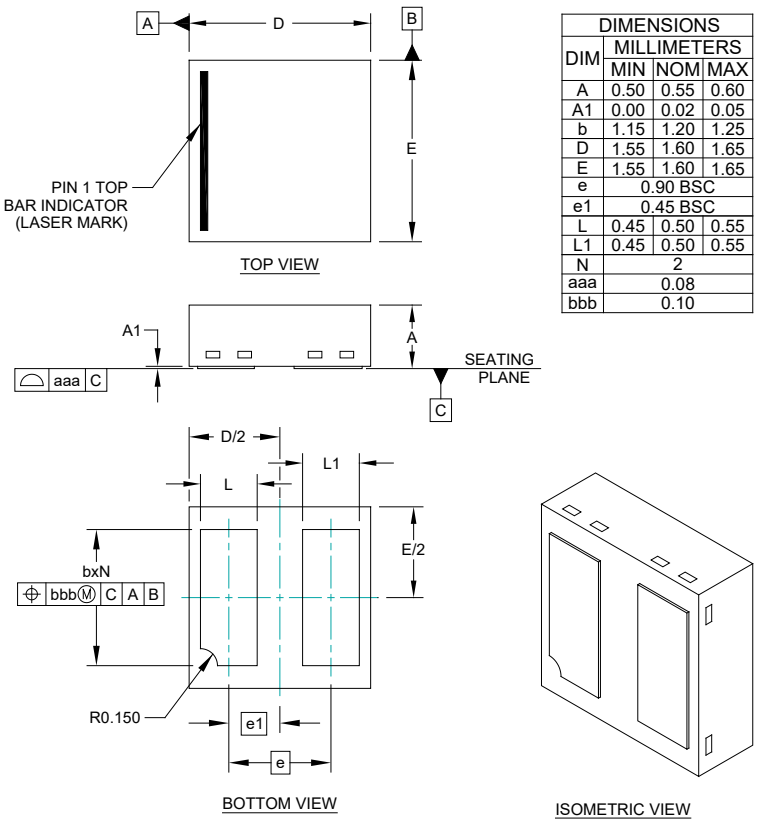


Figure (5) Layout Diagram

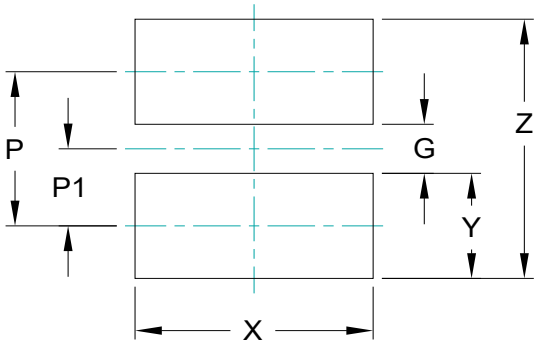
Outline Drawing - DFN 1.6 x 1.6 x 0.55 mm, 2 Lead



DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
b	1.15	1.20	1.25
D	1.55	1.60	1.65
E	1.55	1.60	1.65
e	0.90 BSC		
e1	0.45 BSC		
L	0.45	0.50	0.55
L1	0.45	0.50	0.55
N	2		
aaa	0.08		
bbb	0.10		

NOTE:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

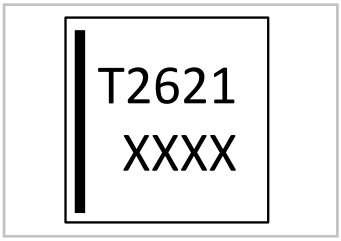
Landing Pattern - DFN 1.6 x 1.6 x 0.55 mm, 2 Lead



DIMENSIONS	
DIM	MILLIMETERS
G	0.35
P	1.10
P1	0.55
X	1.60
Y	0.75
Z	1.85

NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY.
   CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR
   COMPANY'S MANUFACTURING GUIDELINES ARE MET.

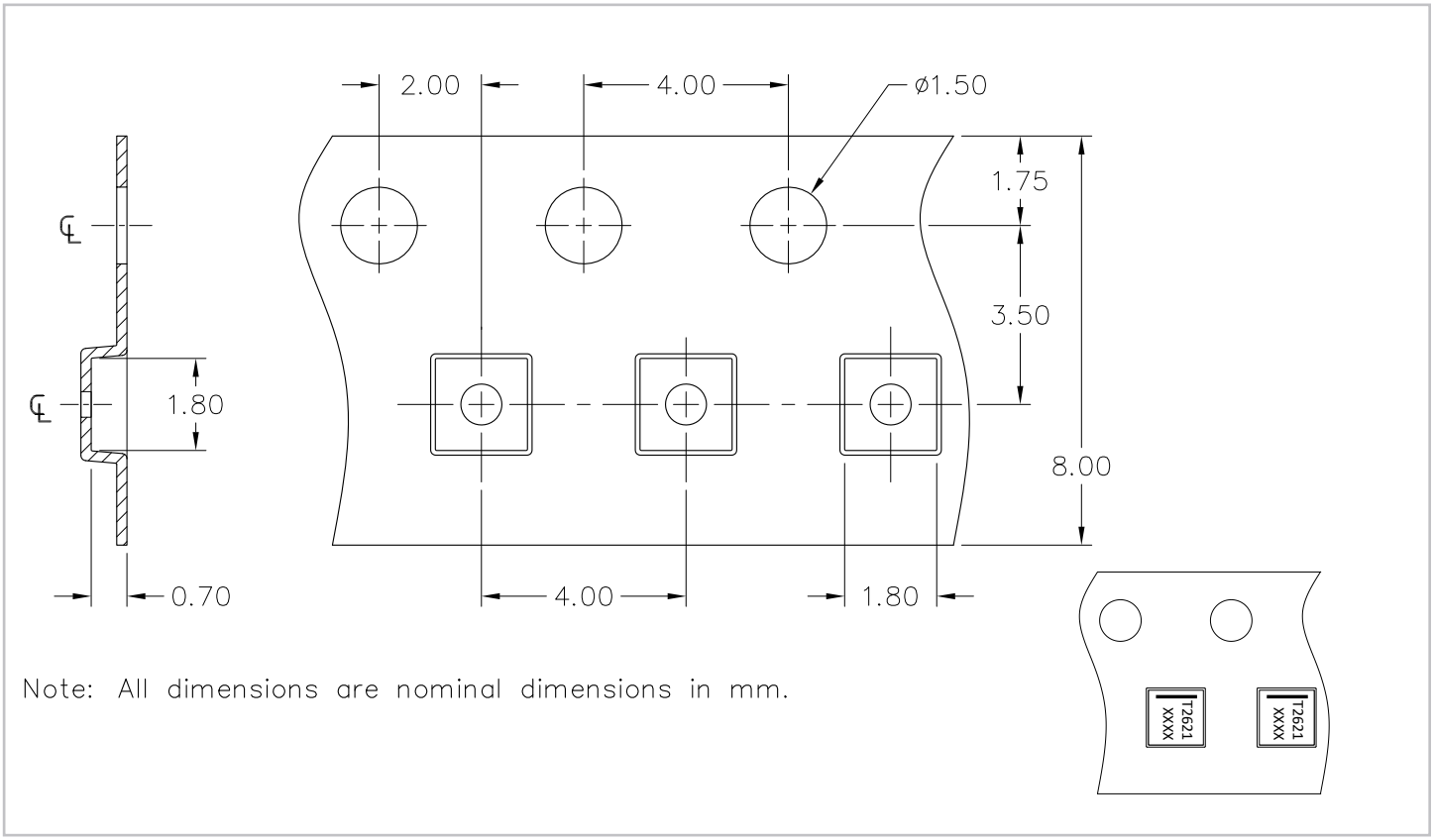
Marking Code



Note:

1. Bar indicates Pin 1 location.
2. XXXX Date Code

Tape and Reel Specification



Note: All dimensions are nominal dimensions in mm.

Order Information

PART NUMBER	QTY PER REEL	DESCRIPTION
TDS2621LP.C	3,000	7" Reel

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