TECH PUBLIC
台舟电子

TPESDxxH Series

1-Line Bi-directional ESD Protection Diode

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Features

- Deal ESD protection for high frequency, low voltage ap-plications.
- Exceeds testing requirements outlined in IEC 61000-4-2
- Ultra low capacitance (3pF typ.)
- Low clamping voltage
- Very low leakage current
- Fast response time
- 2-pin leadless package
- These are Pb−Free Devices
- Response Time is Typically < 1 ns

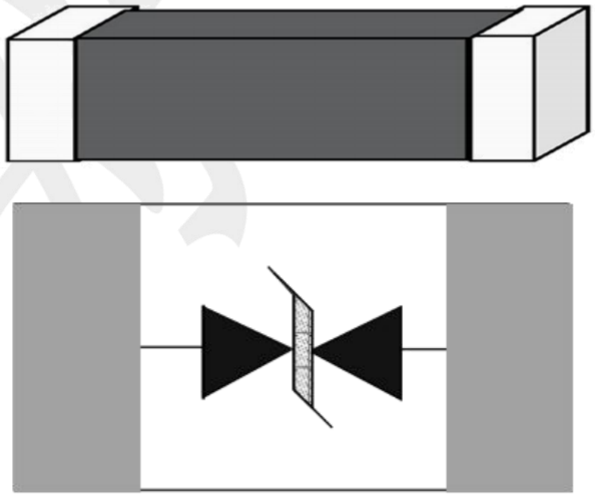
Mechanical Characteristics

- Surface mount
- Lead Finish: Matte Tin
- RoHS Compliant
- Poly mix ESD Suppressor (Multi-Polymer)
- -IEC 61000-4-2 (ESD) immunity test

Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Peripherals

Dimensions and Pin Configuration



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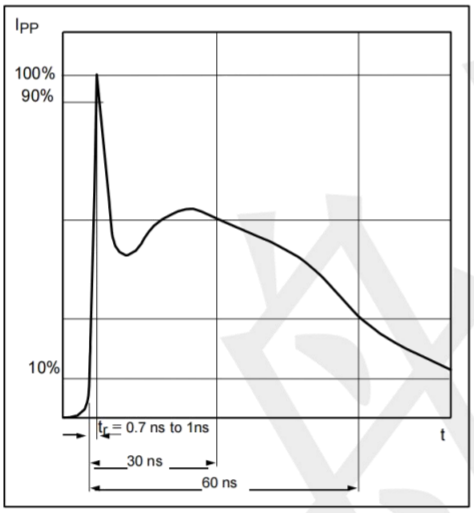
Absolute Maximum Ratings(Tamb=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±15 ±8	KV
Response time	TRISE	<0.5	nS
Withstanding ESD capability	IEC61000-4-2	Level 4	--
Operating Ambient Temperature	TA	−50 to +85	°C
Storage Temperature Range	Tstg	−50 to +125	°C

ESD Wave Form



Electrical Characteristics

SEVERITY LEVEL	AIR DIRCHARGE	DIRECT DISCHARGE
1	2KV	2KV
2	4KV	4KV
3	8KV	6KV
4	15KV	8KV

IEC61000-4-2 compliant ESD current pulse waveform

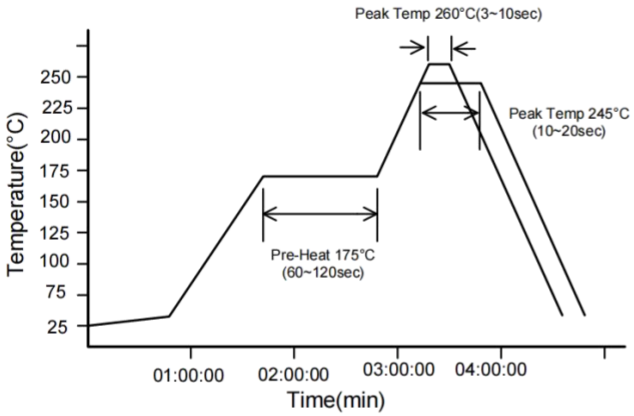
Electrical Characteristics (TA=25°C unless otherwise specified)

Part NO.	Working Voltage	Varistor[1] voltage measured	Maximum[2] ESD allowable clamping Voltage	Leakage[3] Current (at Initial State)	Leakage[3] Current (after ESD Test)	Typical Cap.Value at 1MHz
Symbol	$V_{DC(max.)}$	$V_{trigger}$	V_C	I_{LDC}	I_{LDCA}	C
Unit	V	V	V	μA	μA	pF
TPESD0201H05V	5	60~80	<130	< 1	<2.0	2~4.5
TPESD0201H09V	9	60~80	<130	< 1	<2.0	2~4.5
TPESD0201H12V	12	60~80	<130	< 1	<2.0	2~4.5
TPESD0201H14V	14	60~80	<130	< 1	<2.0	2~4.5
TPESD0201H18V	18	60~80	<130	< 1	<2.0	2~4.5
TPESD0201H24V	24	60~80	<130	< 1	<2.0	2~4.5
TPESD0201H36V	36	60~80	<130	< 1	<2.0	2~4.5
TPESD0402H05V	5	100~150	<200	<0.1	<1.0	2~4.5
TPESD0402H09V	9	100~150	<200	<0.1	<1.0	2~4.5
TPESD0402H12V	12	100~150	<200	<0.1	<1.0	2~4.5
TPESD0402H14V	14	100~150	<200	<0.1	<1.0	2~4.5
TPESD0402H18V	18	100~150	<200	<0.1	<1.0	2~4.5
TPESD0402H24V	24	100~150	<200	<0.1	<1.0	2~4.5
TPESD0402H36V	36	100~150	<200	<0.1	<1.0	2~4.5
TPESD0603H05V	5	100~150	<240	<0.1	<2.0	2~4.5
TPESD0603H09V	9	100~150	<240	<0.1	<2.0	2~4.5
TPESD0603H12V	12	100~150	<240	<0.1	<2.0	2~4.5
TPESD0603H14V	14	100~150	<240	<0.1	<2.0	2~4.5
TPESD0603H18V	18	100~150	<240	<0.1	<2.0	2~4.5
TPESD0603H24V	24	100~150	<240	<0.1	<2.0	2~4.5
TPESD0603H36V	36	100~150	<240	<0.1	<2.0	2~4.5

Notes:

1. The varistor voltage was measured at 1 mA current
2. The Clamping voltage was measured at 8*20 us standard current.
3. The Leakage current was measured at working voltage.

Soldering Parameters



IR reflow Pb free process suggestion profile

(1)The solder recommend is Sn96.5/Ag3.5 and thickness recommend as shown in table 5.3.

(2)Ramp-up rate (217°C to peak) + 3°C /second max.

(3)Temp. maintain at 175±25°C 180 seconds max.

(4)Temp. maintain above 217°C 60~150 seconds.

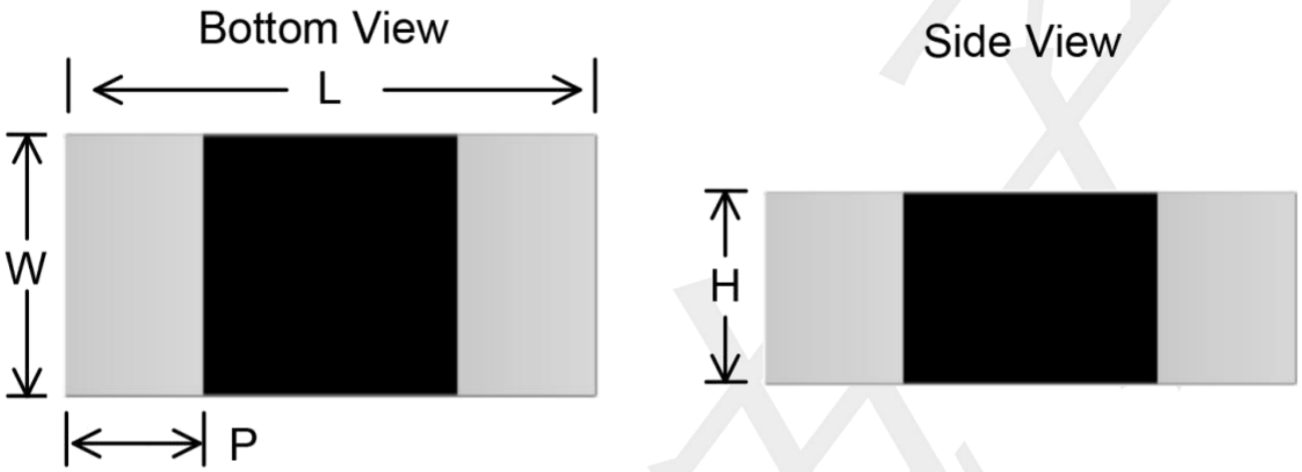
(5) Peak temperature range 245 +20/-10°C within 5°C of actually peak temperature (tp) 10~20 seconds.

(6) Ramp down rate -6°C/second max.

Environment Reliability Test

<table>
<tr><th>Characteristic</th><th colspan="4">Test Method and Description</th></tr>
<tr><td>High Temperature Storage</td><td colspan="4">The specimen shall be subjected to 125±2°C for 1000±2 hours without load and then stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10%.</td></tr>
<tr><td rowspan="5">Temperature Cycle</td><td rowspan="5">The temperature cycle of specified temperature shall be repeated five times and then stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10% and mechanical damage shall be examined.</td><td>Step</td><td>Temperature</td><td>Period</td></tr>
<tr><td>1</td><td>-40±3°C</td><td>30±3min</td></tr>
<tr><td>2</td><td>room temperature</td><td>1 hour</td></tr>
<tr><td>3</td><td>125±3°C</td><td>30±3min</td></tr>
<tr><td>4</td><td>room temperature</td><td>1 hour</td></tr>
<tr><td>High Temperature Load</td><td colspan="4">After being continuously applied the maximum allowable voltage at 85±2°C for 1000±2 hours, the specimen shall be stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10%.</td></tr>
<tr><td>Damp Heat Load/Humidity Load</td><td colspan="4">The specimen should be subjected to 40±2°C and 90~95% RH, the maximum allowable voltage applied for 1000±2 hours and then stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10%.</td></tr>
<tr><td>Low Temperature Storage</td><td colspan="4">The specimen should be subjected to -40±2°C for 500±2 hours without load and then stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10%.</td></tr>
</table>

Package Outline & Dimensions



SYMBOL	MILLIMETERS		
	0201	0402	0603
L	0.60±0.03	1.00±0.10	1.60±0.15
W	0.30±0.03	0.50±0.10	0.80±0.10
P	0.15±0.05	0.25±0.10	0.30±0.10
H	0.30±0.03	0.60(Max.)	0.90(Max.)