SPE0402B5.0

Ultra Low Capacitance ESD Protection Diode

FEATURES

- ESD protection for high speed data lines to IEC61000-4-2
- ESD contact discharge typical 8KV, max 15KV
- ESD air discharge typical 15KV, max 25KV
- Surface mount
- Extremely low capacitance
- Very low leakage current
- Fast response time
- Bi-directional ESD protection
- Lead free solder termination
- The best ESD protection for high frequency, low voltage applications

0402

Schematic Symbol

APPLICATIONS

- USB3.0,Firewire,DVI,HDMI,S-ATA,Thunderbolt
- Mobile HDMI Link,MDDI,MIPI,SWP/NFC

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

MECHANICAL DATA

- Case: 0402 (plastic package)
- Molding Compound Flammability Rating:UL 94 V-0

ABSOLUTE MAXIMUM RATINGS

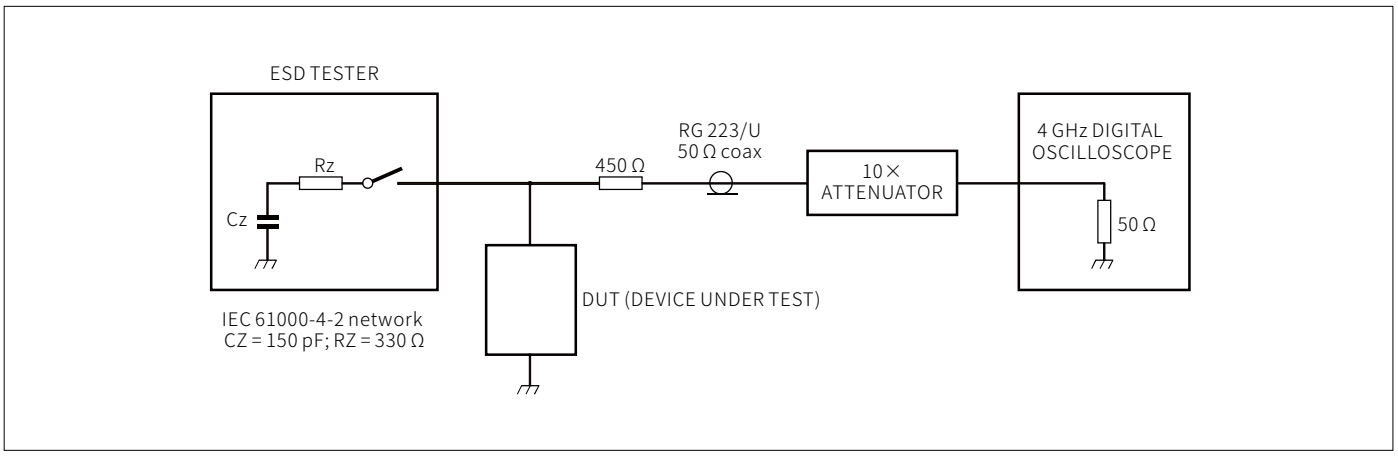
Symbol	Parameter	Value	Unit
-	Maximum Contact discharge voltage Per IEC61000-4-2	15KV	V
-	Maximum Air discharge voltage Per IEC61000-4-2	25KV	V
T_{OPER}	Maximum Operating temperature	-40 to +90	°C
T_{STG}	Maximum Storage temperature	-55 to +125	°C

ELECTRICAL CHARACTERISTICS (T_A=25°C)

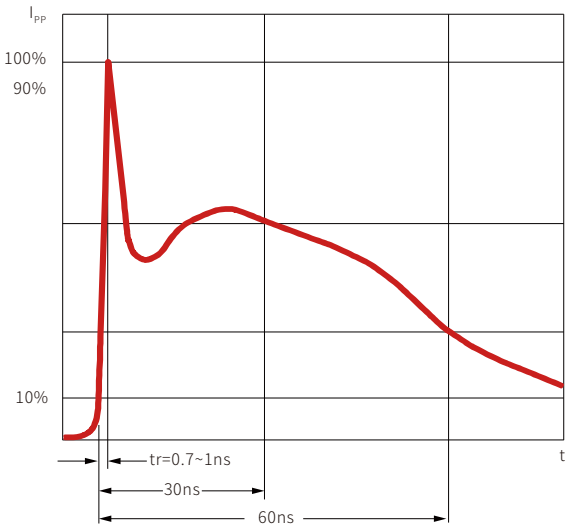
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_R	Rated Voltage	-	-	-	5	V
V_T	Trigger Voltage	IEC61000-4-2 8KV contact discharge	-	300	-	V
V_C	Clamping Voltage	IEC61000-4-2 8KV contact discharge	-	35	-	V
I_L	Leakage Current	DC 5V shall be applied on component	-	-	0.10	μA
C_P	Capacitance	V_R = 0V, f = 1MHz	-	0.05	-	pF

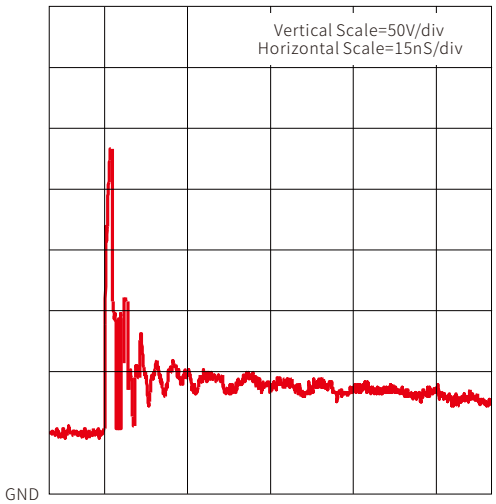
Note:
1、Trigger and clamping voltage are measured per IEC 61000-4-2, 8KV contact discharge method.
2、After reliability tests such as high temp storage, temp cycles, continuous ESD strike etc, the maximum leakage current is less than 10uA.

ESD CLAMPING TEST



CHARACTERISTIC CURVES

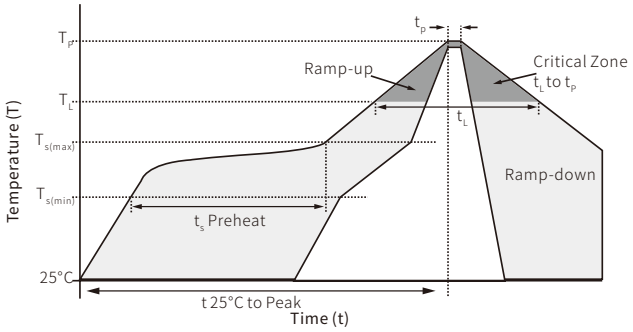




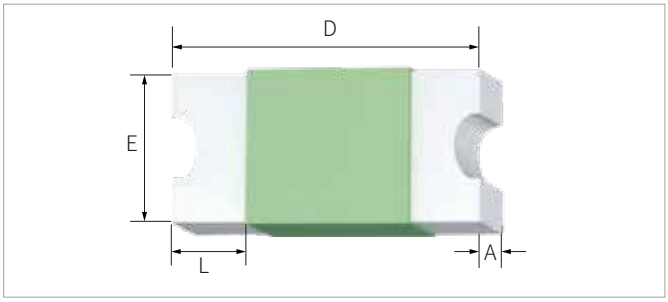
ESD CLAMPING TEST WAVEFORMS

SOLDERING PARAMETERS

Reflow Condition		Lead–free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes max.
Do not exceed		260°C

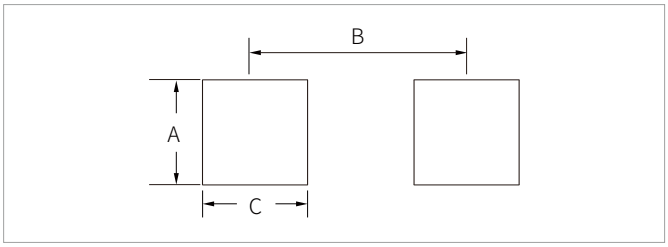


PACKAGE INFORMATION



Ref.	Dimension			
	Min.	Typ.	Max.	Unit
D	0.90	1.05	1.20	mm
E	0.45	0.55	0.65	
L	0.15	0.25	0.35	
A	0.25	0.35	0.45	

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Dimension	Unit
A	0.50	mm
B	0.90	
C	0.65	

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPE0402B5.0	0402	10000PCS	7”

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