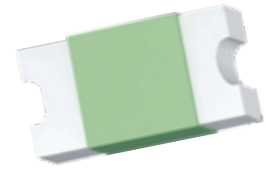


## FEATURES

- | 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



## APPLICATIONS

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

## MECHANICAL DATA

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

## APPROVALS

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

## 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 <sub>OPER</sub>	Maximum Operating temperature	-55 to +125	°C
T <sub>STG</sub>	Maximum Storage temperature	-55 to +125	°C

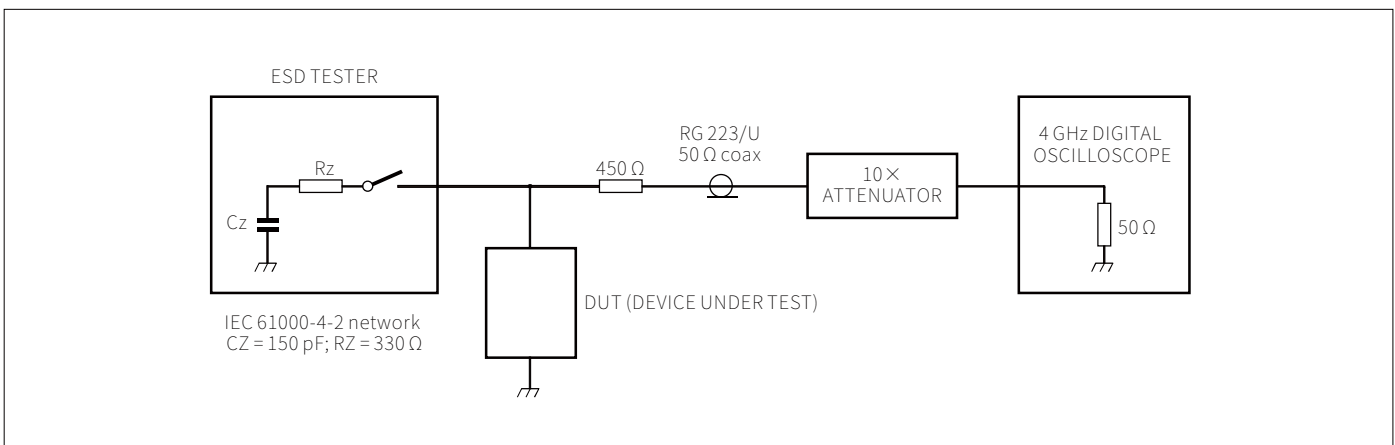
## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V <sub>R</sub>	Rated Voltage	-	-	-	12	V
V <sub>T</sub>	Trigger Voltage	IEC61000-4-2 8KV contact discharge	-	1000	-	V
V <sub>C</sub>	Clamping Voltage	IEC61000-4-2 8KV contact discharge	-	100	-	V
I <sub>L</sub>	Leakage Current	DC 12V shall be applied on component	-	0.01	0.10	μA
C <sub>P</sub>	Capacitance	V <sub>R</sub> = 0V, f = 1MHz	-	0.05	-	pF

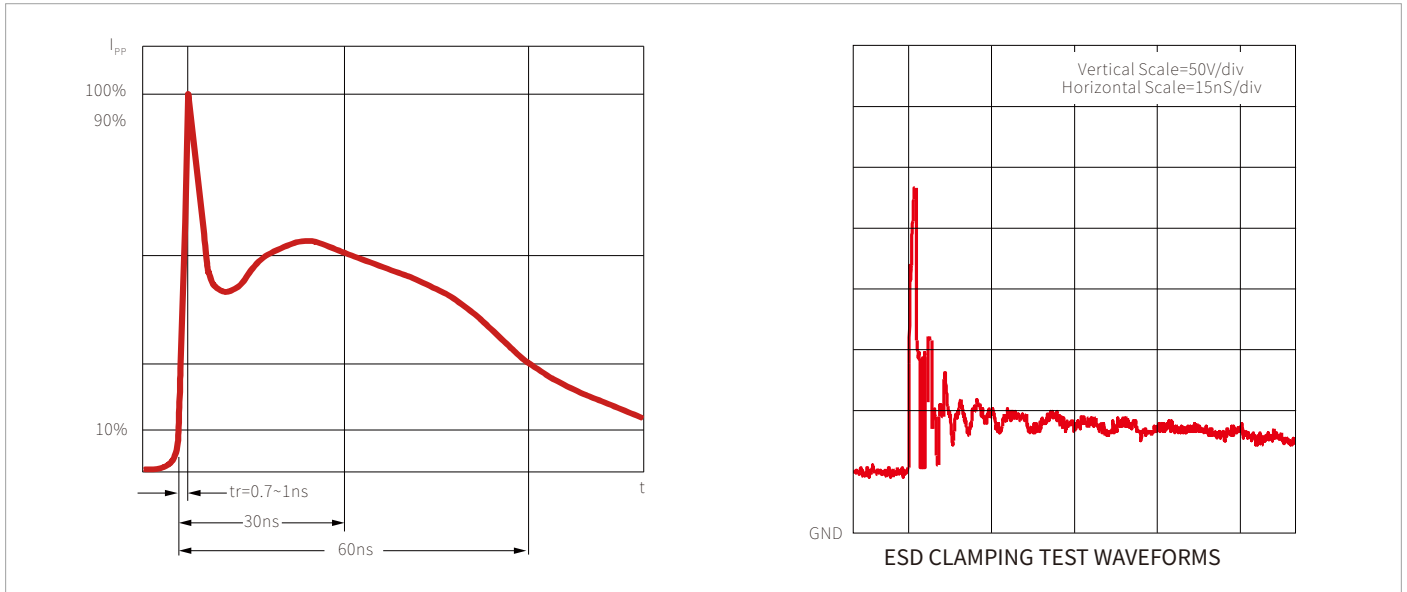
Note:

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

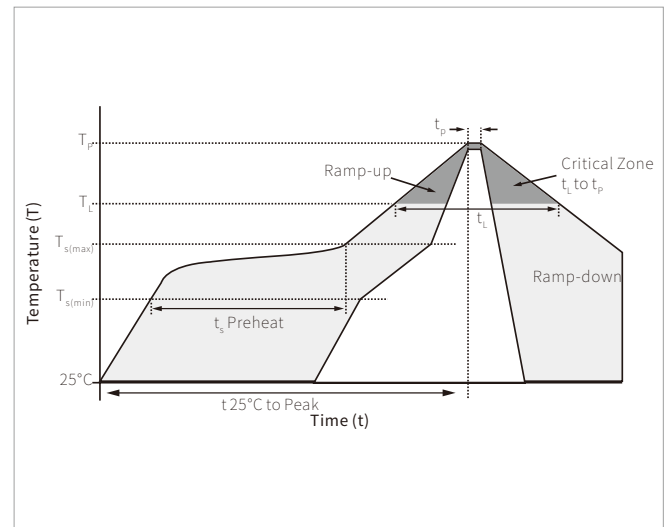


## CHARACTERISTIC CURVES

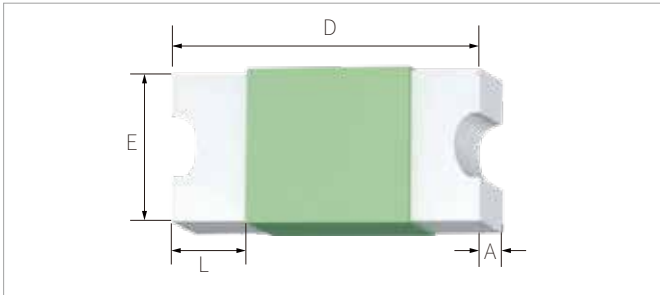


## SOLDERING PARAMETERS

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

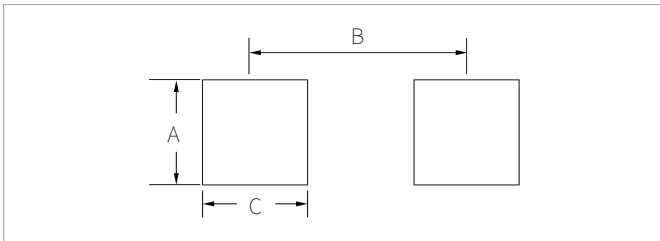


## PACKAGE INFORMATION



Ref.	Dimension			Unit
	Min.	Typ.	Max.	
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
SPE0402B12	0402	10000PCS	7"

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