

PROTECTION PRODUCTS
Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power ($t_p = 8/20\mu s$)	P_{pk}	60	Watts
Maximum Peak Pulse Current ($t_p = 8/20\mu s$)	I_{pp}	3	Amps
ESD per IEC 61000-4-2 (Air) ¹ ESD per IEC 61000-4-2 (Contact) ¹	V_{ESD}	+/- 16 +/- 16	kV
Operating Temperature	T_J	-40 to +85	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C)

Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}	Pin 1 to 2 or 2 to 1			24	V
Trigger Voltage ²	V_{TRIG}	$t_p = 0.2/100ns$		28		V
Reverse Leakage Current	I_R	$V_{RWM} = 24V$, $T=25^\circ C$ Pin 1 to 2 or 2 to 1		<1	50	nA
ESD Clamping Voltage ²	V_C	$I_{pp} = 4A$, $t_{lp} = 0.2/100ns$		5		V
ESD Clamping Voltage ²	V_C	$I_{pp} = 16A$, $t_{lp} = 0.2/100ns$		7		V
Dynamic Resistance ^{2, 3}	R_D	$t_p = 0.2/100ns$		0.16		Ohms
Junction Capacitance	C_J	$V_R = 0V$, $f = 1MHz$		0.35	0.45	pF

Notes

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

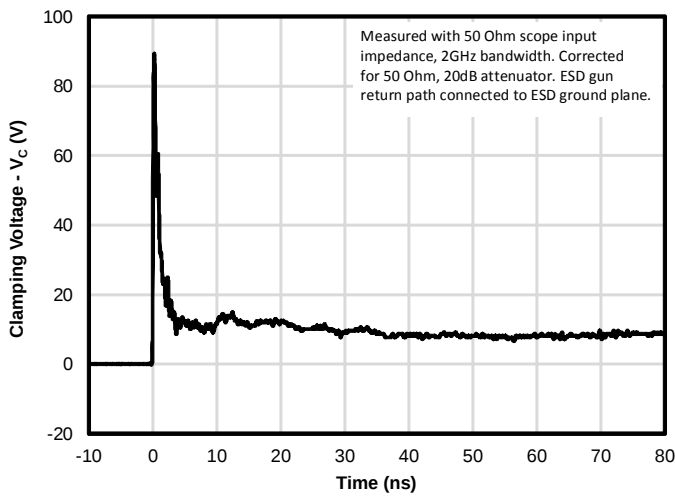
2)Transmission Line Pulse Test (TLP) Settings: $t_p = 100ns$, $t_r = 0.2ns$, I_{TLP} and V_{TLP} averaging window: $t_1 = 70ns$ to $t_2 = 90ns$.

3) Dynamic resistance calculated from $I_{TLP} = 4A$ to $I_{TLP} = 16A$

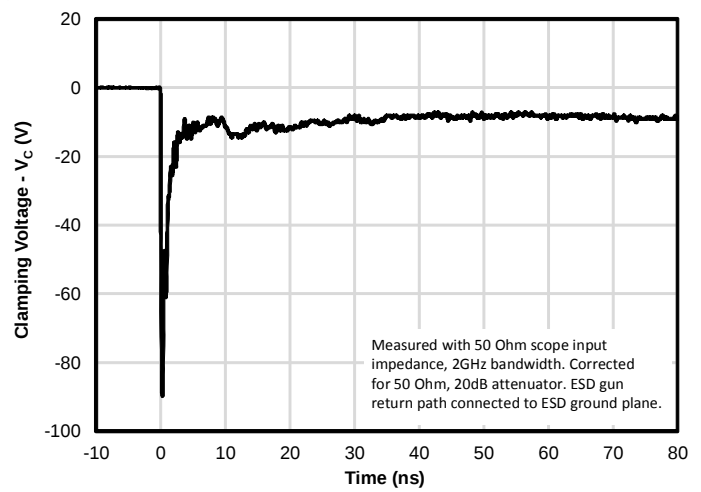
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Typical Characteristics

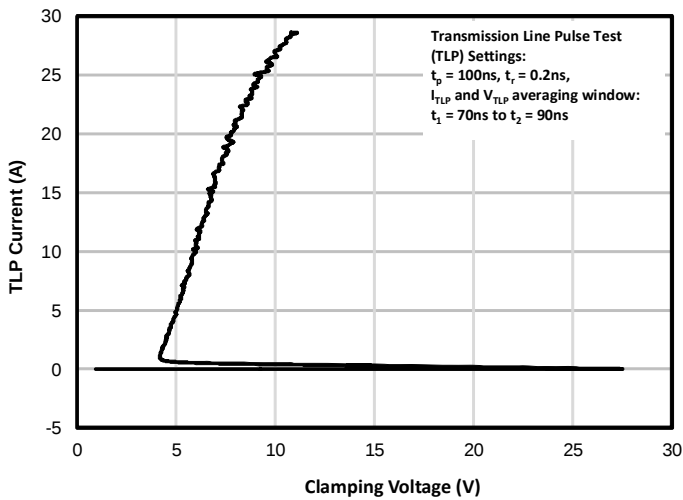
ESD Clamping (+8kV Contact per IEC 61000-4-2)



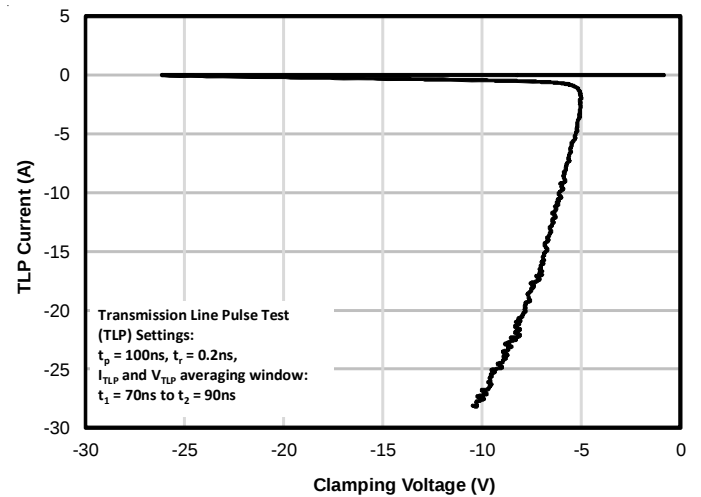
ESD Clamping (-8kV Contact per IEC 61000-4-2)



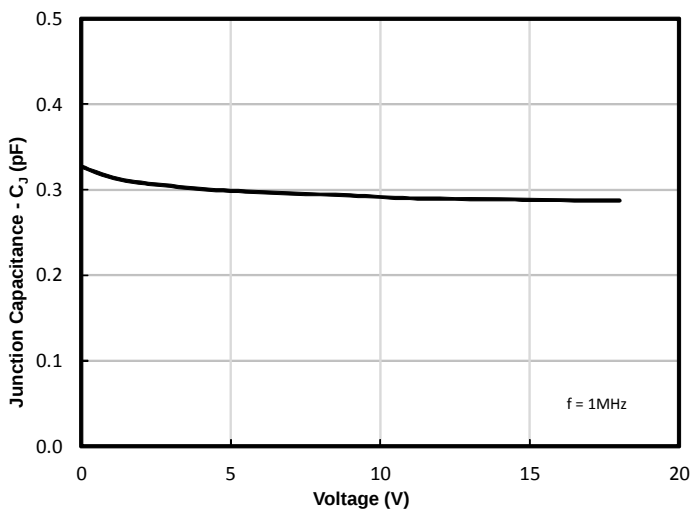
TLP Characteristic (Positive)



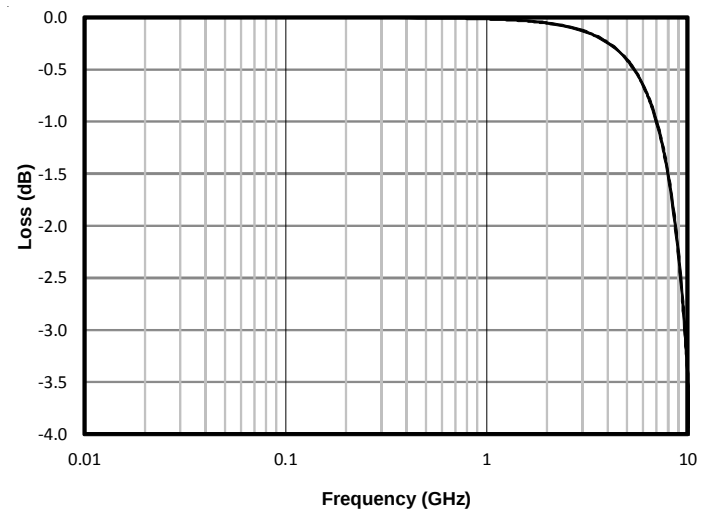
TLP Characteristic (Negative)



Junction Capacitance vs. Reverse Voltage



Typical Insertion Loss (S21)



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Applications Information

ESD Protection of NFC Interfaces

The Near Field Communication (NFC) antenna is usually connected to the NFC controller IC via contact points on the phone. These contact points are user accessible and therefore may be subjected to ESD strikes. External protection (TVS) devices should be placed between the antenna and the NFC chip interface. The working voltage of the TVS should be high enough as not to clip the NFC signal. Additionally, the capacitance of the device should be minimized in order to avoid harmonic distortion of the RF signal.

RClamp2451Y meets these requirements and also features extremely low dynamic resistance (<0.1 Ohms) resulting in low ESD clamping voltage. The low dynamic resistance also helps insure protection for Schottky diodes that may be used in the NFC circuit. RClamp2451Y is designed to work on NFC circuits with AC signals as high as 24V. An example protection circuit using RClamp2451Y is shown below in Figure 1.

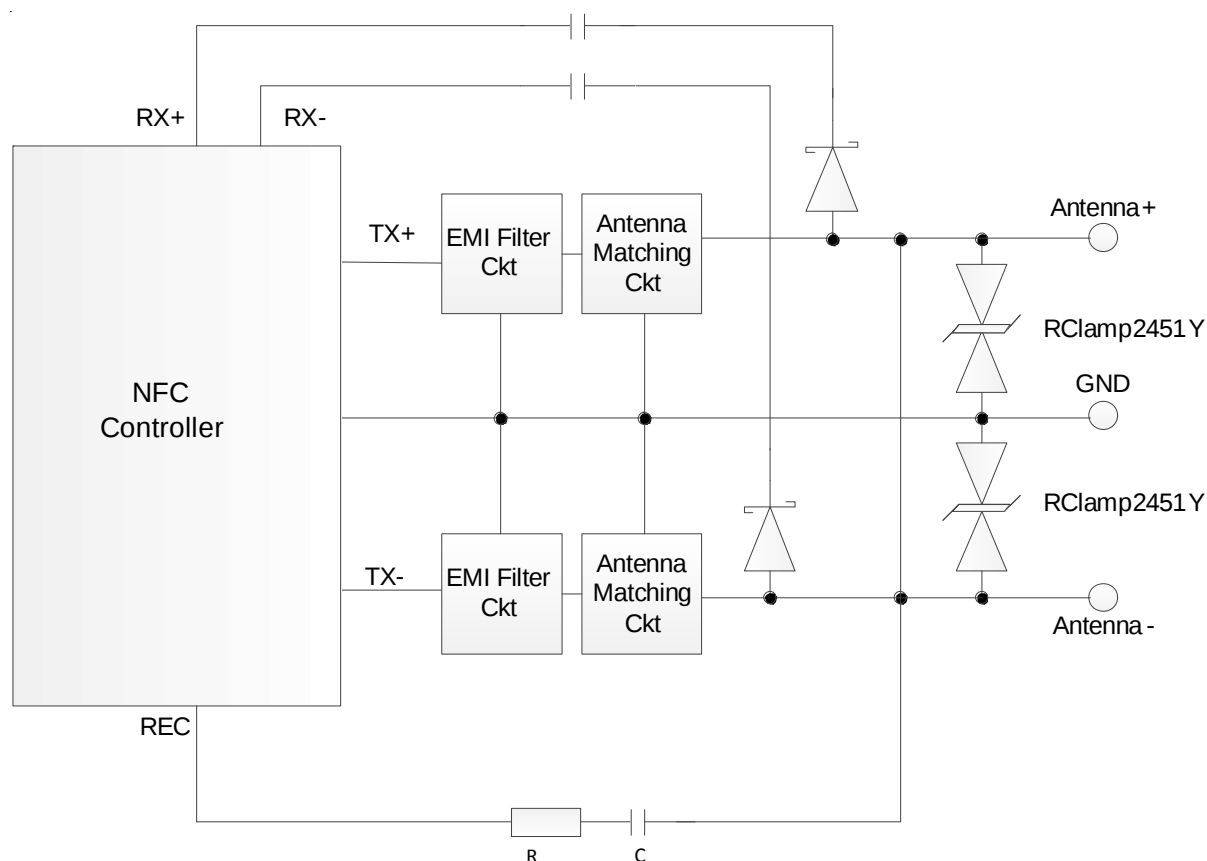


Figure 1 - NFC Protection Example

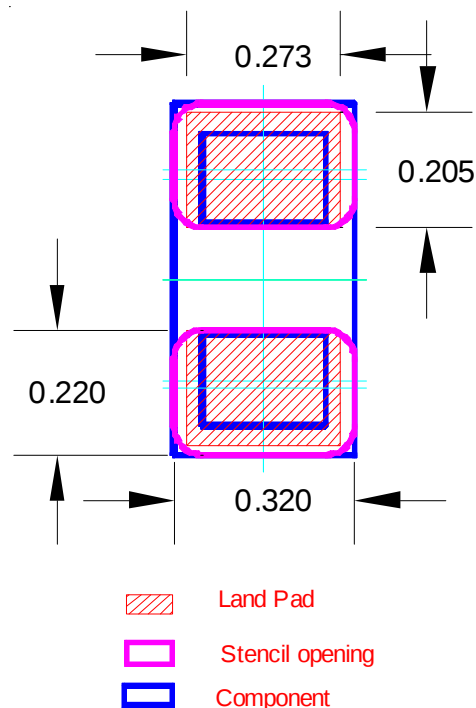
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Applications Information

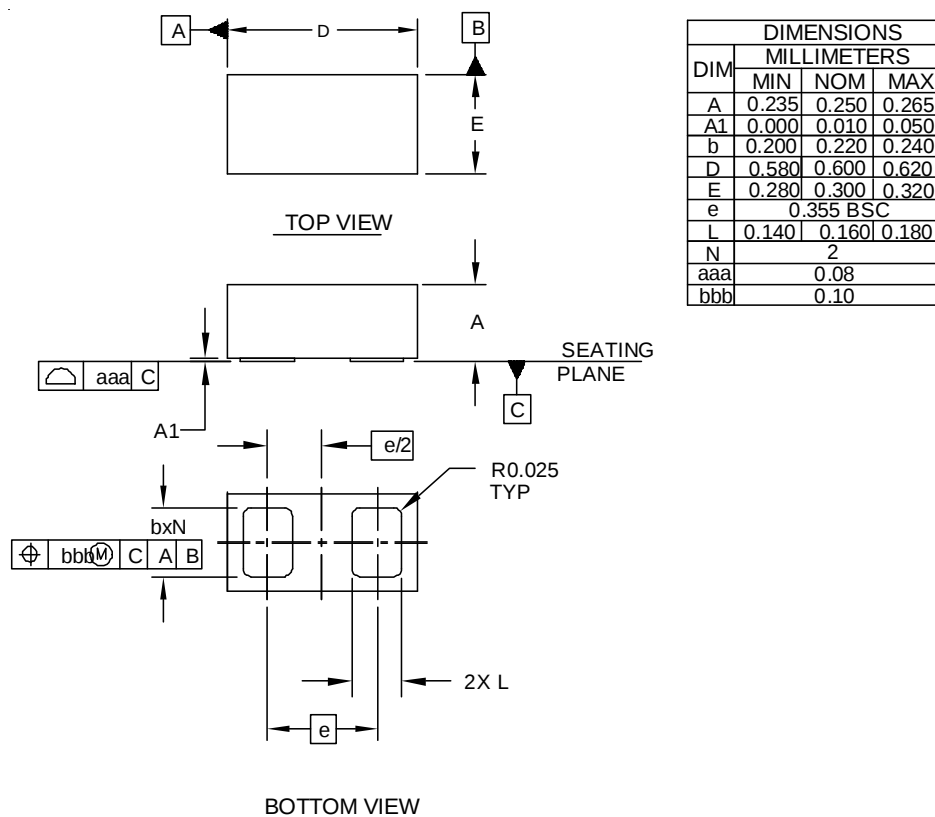
Assembly Guidelines

The small size of this device means that some care must be taken during the mounting process to insure reliable solder joints. The figure at the right details Semtech's recommended aperture based on the assembly guidelines detailed in the table below. Note that these are only recommendations and should serve only as a starting point for design since there are many factors that affect the assembly process. Exact manufacturing parameters will require some experimentation to get the desired solder application.

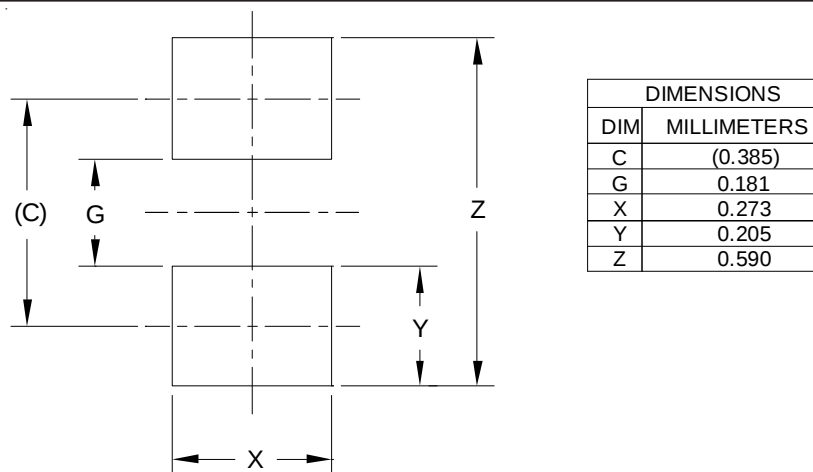
Assembly Parameter	Recommendation
Solder Stencil Design	Laser cut, Electro-polished
Aperture shape	Rectangular with rounded corners
Solder Stencil Thickness	0.100 mm (0.004")
Solder Paste Type	Type 4 size sphere or smaller
Solder Reflow Profile	Per JEDEC J-STD-020
PCB Solder Pad Design	Non-Solder mask defined
PCB Pad Finish	OSP OR NiAu



Recommended Mounting Pattern

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Outline Drawing - SLP0603P2X3E

NOTES:

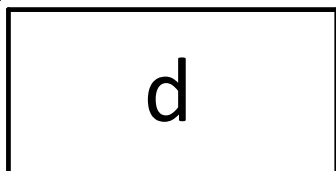
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS(ANGLES IN DEGREES).

Land Pattern - SLP0603P2X3E

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 .

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Marking Code



Ordering Information

Part Number	Qty per Reel	Pocket Pitch	Reel Size
RClamp2451Y.TFT	15,000	2mm	7 Inch

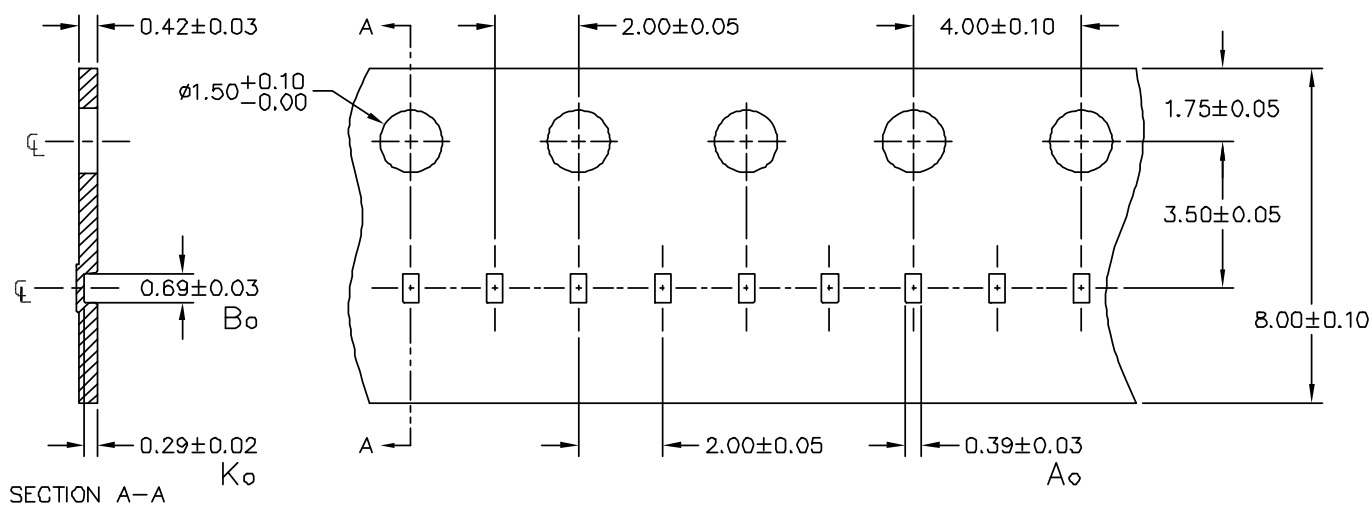
Notes:

RailClamp and RClamp are trademarks of Semtech Corporation

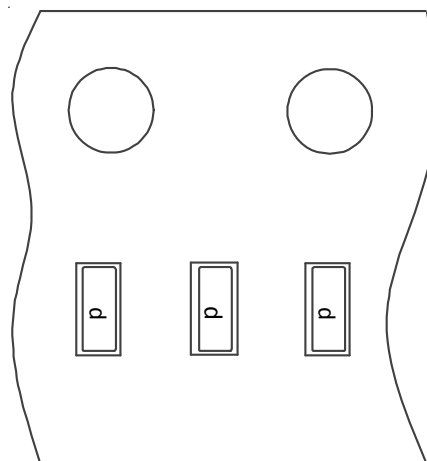
Note:

Device is electrically symmetrical

Carrier Tape Specification



NOTES: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.



Device Orientation in Tape

Contact Information

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