Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Current (tp = 8/20μs)	I_{PP}	4	A
ESD per IEC 61000-4-2 (Air)[1] ESD per IEC 61000-4-2 (Contact)[1]	V_{ESD}	+/- 20 +/- 17	kV
Operating Temperature	T_J	-40 to +85	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C Unless Otherwise Specified)

Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}	Any I/O to GND			3.3	V
Breakdown Voltage	V_{BR}	I_{BR} = 10μA	7.5	8.8	9.8	V
Reverse Leakage Current	I_R	V_{RWM} = 3.3V, T=25°C Any I/O to GND		0.01	0.05	μA
Clamping Voltage	V_C	I_{PP} = 1A, tp = 8/20μs Any I/O to GND		3.5	5	V
Clamping Voltage	V_C	I_{PP} = 4A, tp = 8/20μs Any I/O to GND		5	6.5	V
ESD Clamping Voltage[2]	V_C	I_{PP} = 16A, tlp = 0.2/100ns		9.5		V
ESD Clamping Voltage[2]	V_C	I_{PP} = -16A, tlp = 0.2/100ns		9.5		V
Dynamic Resistance (Positive)[2,3]	R_D	tlp = 0.2/100ns		0.30		Ohms
Dynamic Resistance (Negative)[2,3]	R_D	tlp = 0.2/100ns		0.30		Ohms
Junction Capacitance	C_j	V_R = 0V, f = 1MHz, Any I/O to GND		0.30	0.35	pF

Notes

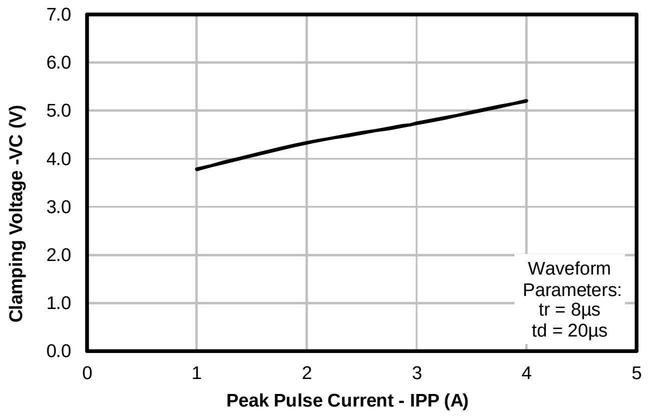
1)Measured with a 20dB attenuator, 50 Ohm scope input impedance, 2GHz bandwidth. ESD gun return path connected to ESD ground plane.

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. Parameters guaranteed by design.

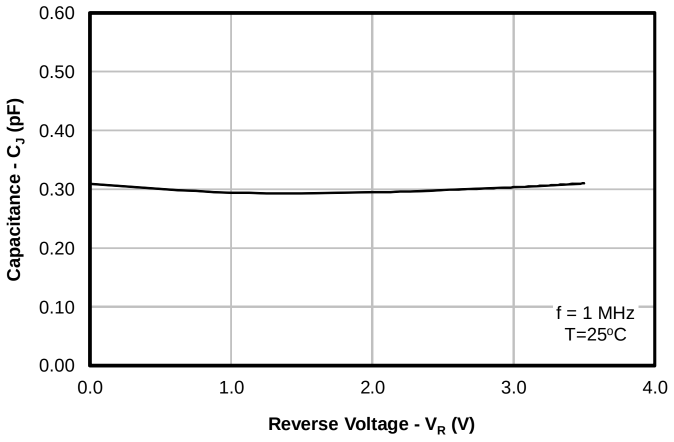
3) Dynamic resistance calculated from I_{TLP} = 4A to I_{TLP} = 16A

Typical Characteristics

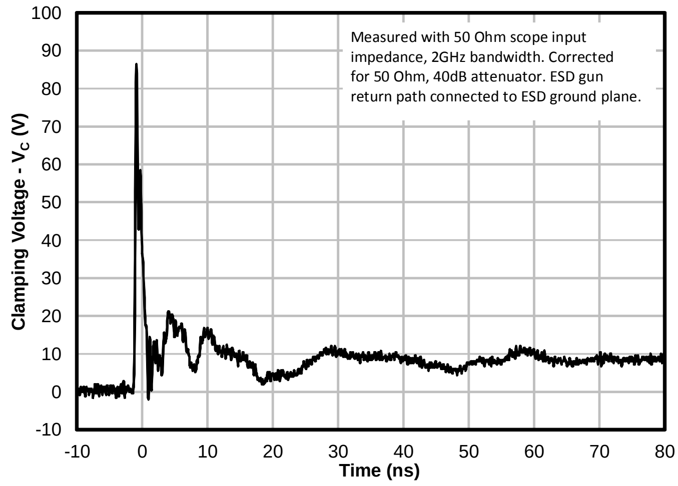
Clamping Voltage vs. Peak Pulse Current (Between any I/O and Ground)



Junction Capacitance vs. Reverse Voltage (Between any I/O and Ground)

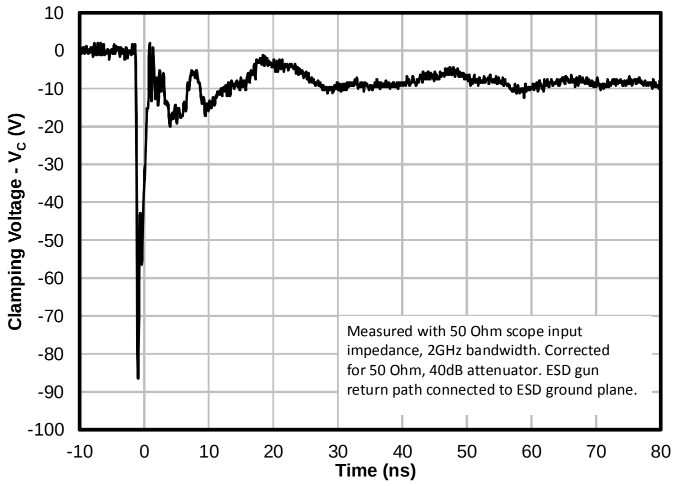


ESD Clamping (+8kV Contact per IEC 61000-4-2) (Between any I/O and Ground)



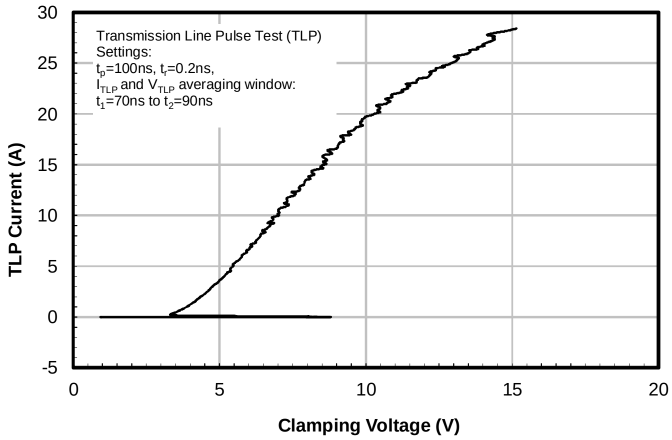
Measured with 50 Ohm scope input impedance, 2GHz bandwidth. Corrected for 50 Ohm, 40dB attenuator. ESD gun return path connected to ESD ground plane.

ESD Clamping (-8kV Contact per IEC 61000-4-2) (Between any I/O and Ground)



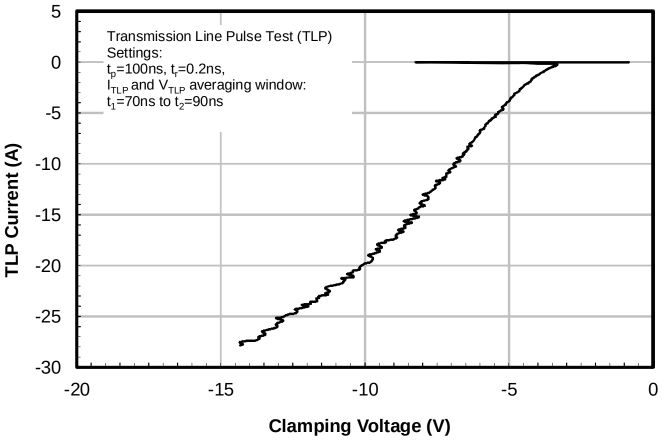
Measured with 50 Ohm scope input impedance, 2GHz bandwidth. Corrected for 50 Ohm, 40dB attenuator. ESD gun return path connected to ESD ground plane.

TLP Characteristic (Positive)



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

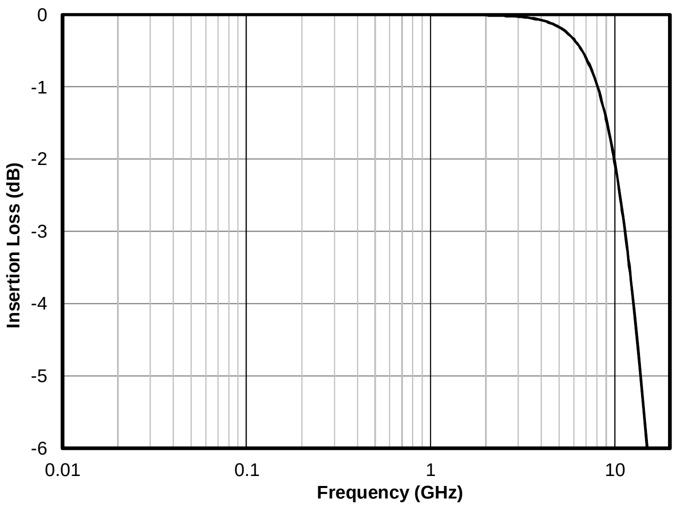
TLP Characteristic (Negative)



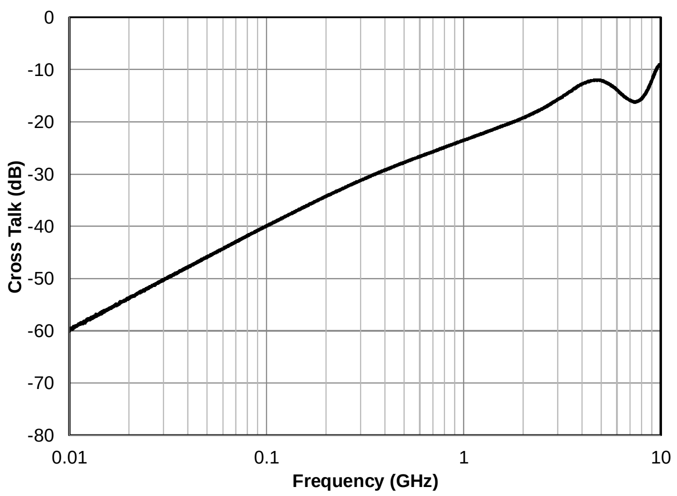
Transmission Line Pulse Test (TLP) Settings:
t_p=100ns, t_r=0.2ns,
I_{TLP} and V_{TLP} averaging window:
t_1=70ns to t_2=90ns

Typical Characteristics

Typical Insertion Loss S21



Analog Crosstalk

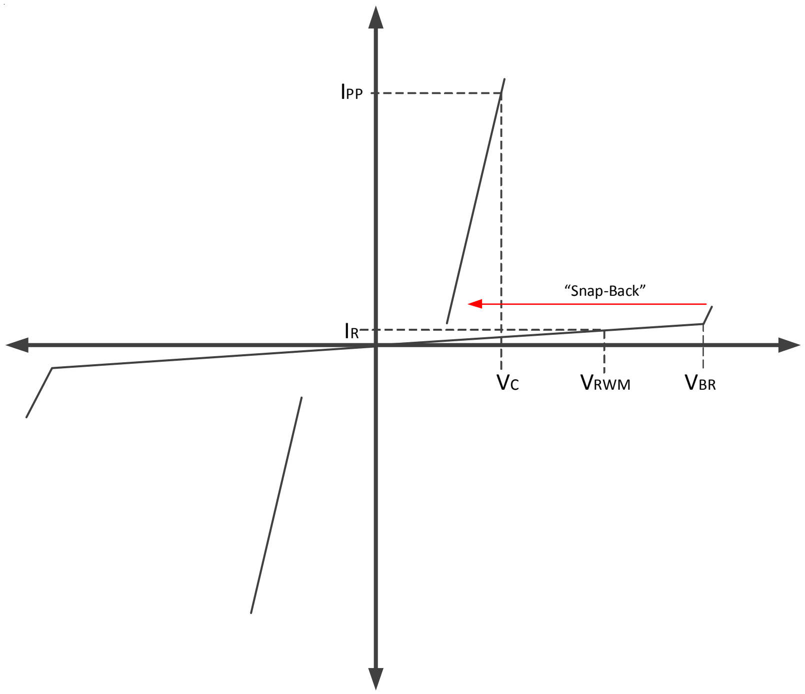


Applications Information

Device Operation

This device utilizes a multi-junction structure that is designed to switch to a low voltage state when triggered by ESD, EOS, or other transient events. During normal operation, the device will present a high-impedance to the circuit for voltage up to the working voltage (V_{RWM}) of the device. When the voltage across the device terminals exceeds the breakdown voltage (V_{BR}), avalanche breakdown occurs in the blocking junction causing the device to "snap-back" or switch to a low impedance on-state. This has the advantage of lowering the overall clamping voltage (V_C) as ESD peak pulse current (I_{PP}) flows through the device. Once the current subsides, the device will return to a high-impedance off-state. Since this device is bidirectional, it will behave the same way for positive or negative polarity transient events.

Symbol	Parameter
V_{RWM}	Maximum Working Voltage
V_{BR}	Breakdown Voltage
V_C	Clamping Voltage
I_R	Reverse Leakage Current
I_{PP}	Peak Pulse Current



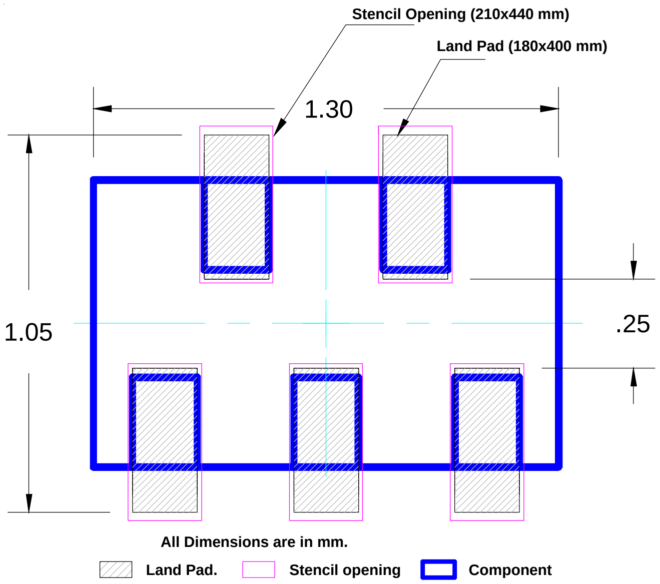
Characteristic Curve

Applications Information

Assembly Guidelines

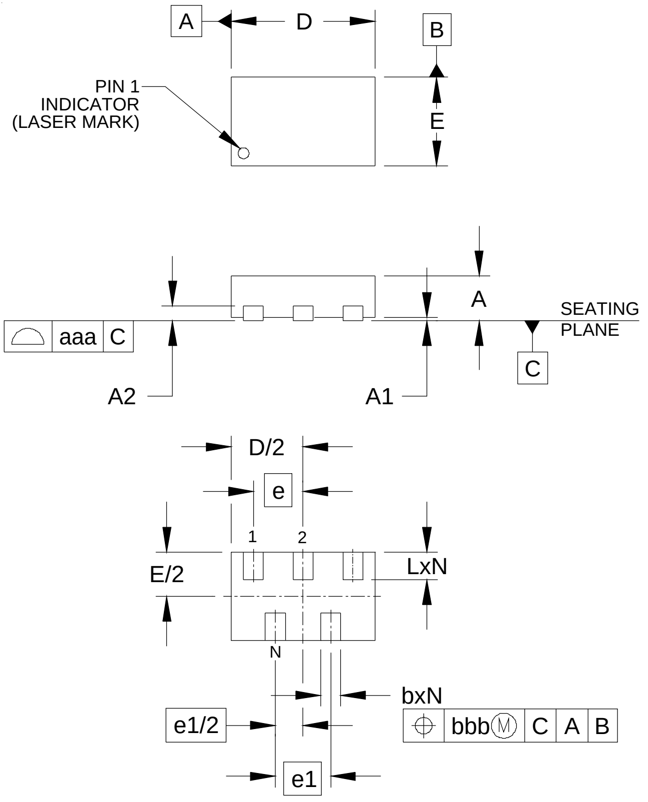
The small size of this device means that some care must be taken during the mounting process to insure reliable solder joint. The table below provides Semtech's recommended assembly guidelines for mounting this device. The figure at the right details Semtech's recommended aperture based on the below recommendations. 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. The 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
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

Outline Drawing - SLP1308N5T

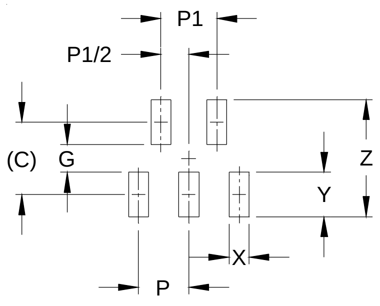


DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.37	0.40	0.43
A1	0.00	0.02	0.05
A2		(0.13)	
b	0.13	0.18	0.23
D	1.20	1.30	1.40
E	0.70	0.80	0.90
e		0.45 BSC	
e1		0.50 BSC	
L	0.20	0.25	0.30
N		5	
aaa		0.08	
bbb		0.10	

NOTES:

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

Land Pattern - SLP1308N5T

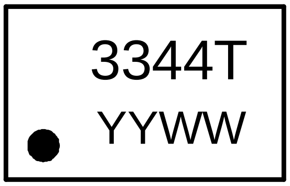


DIM	MILLIMETERS
C	(0.65)
G	0.25
P	0.45
P1	0.50
X	0.18
Y	0.40
Z	1.05

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



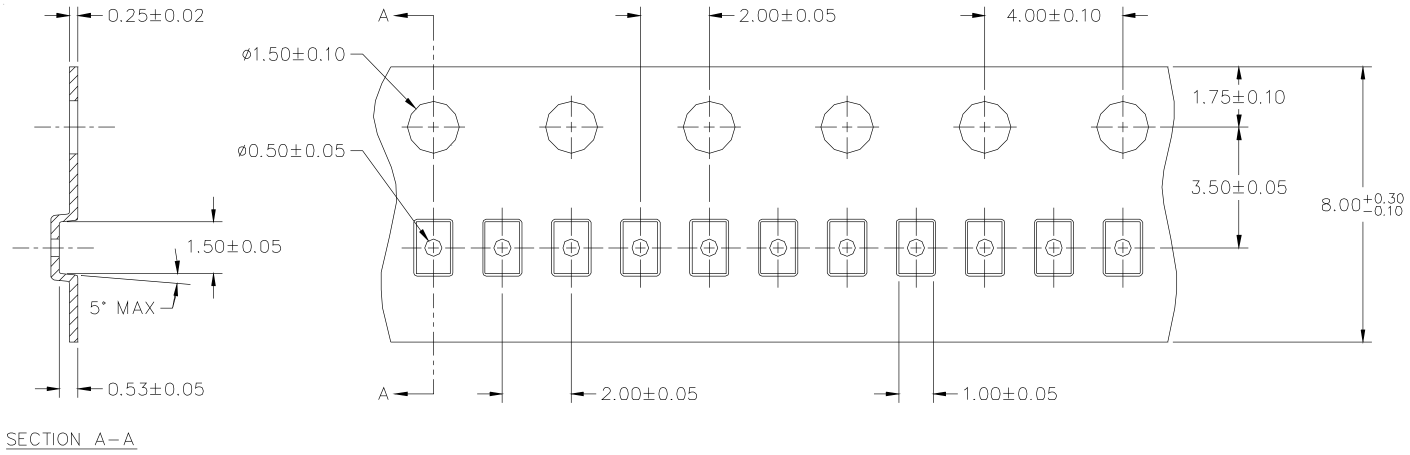
YYWW = Date Code
Dot indicates pin 1

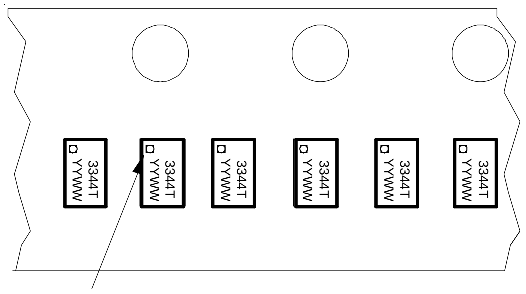
Ordering Information

Part Number	Qty per Reel	Reel Size
RClamp3344T.TNT	10,000	7 Inch

RailClamp and RClamp are trademarks of Semtech Corporation.

Carrier Tape Specification





Pin 1 Location (Towards Sprocket Holes)

User Direction of feed

Device Orientation in Tape

Contact Information

Semtech Corporation
Protection Products Division
200 Flynn Rd., Camarillo, CA 93012
Phone: (805)498-2111 FAX (805)498-3804