



PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000264

Date: 4/20/2015

P1/2

<input checked="" type="checkbox"/> Semtech Corporation, 200 Flynn Road, Camarillo CA 93012
<input type="checkbox"/> Semtech Canada Corporation, 4281 Harvester Road, Burlington, Ontario L7L 5M4 Canada
<input type="checkbox"/> Semtech Irvine, 5141 California Ave., Suite 100, Irvine CA 92617
<input type="checkbox"/> Semtech Neuchatel Sarl, Route des Gouttes d'Or 40, CH-2000 Neuchatel Switzerland
<input type="checkbox"/> Nanotech Semiconductor, Semtech Corporation, 2 West Point Court, Bristol, United Kingdom, BS32 4PY
<input type="checkbox"/> Semtech Corpus Christi SA de CV, Carretera Matamorros Edificio 7, Reynosa, Tamaulipas, Mexico 88780
<input type="checkbox"/>

Change Details

Part Number(s) Affected: <p style="text-align: center; font-weight: bold;">uClamp3311Z.TNT</p>	Customer Part Number(s) Affected: <input checked="" type="checkbox"/> N/A
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Description, Purpose and Effect of Change:

The 200mm wafer from ASMC Fab 3 has been qualified as an addition wafer source to support current and future supply of uClamp3311Z.TNT

Parts made from 200mm Fab 3 wafers will meet the current data sheet, no change to Datasheet electrical parameters or package dimensions.

Semtech will supply parts from Fab 3 (200mm) wafers as soon as customer completes qualification and provides approval to ship.

Purpose: It is Semtech's intention to increase production of the uClamp3311Z.TNT product by qualifying another ASMC Fab, Fab 3. Once PCN is approved, Semtech will be able to manufacture wafers from both Fab 1-2, and Fab 3. Semtech currently uses ASMC Fab 1-2 for the manufacture of wafers serving many of Semtech product families.

Please contact your local sales representative to order.

Change Classification	<input checked="" type="checkbox"/> Major <input type="checkbox"/> Minor	Impact to Form, Fit, Function	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Impact to Data Sheet	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Revision or Date	<input checked="" type="checkbox"/> N/A

Impact to Performance, Characteristics or Reliability:

No Impact to performance, characteristics, quality, application or reliability.

Implementation Date	7/20/2015	Work Week	1531
Last Time Ship (LTS) <small>Of unchanged product</small>	7/20/2015	Affecting Lot No. / Serial No. (SN)	NA
Sample Availability	4/1/2015	Qualification Report Availability	4/1/2015

Supporting Documents for Change Validation/Attachments:

- Rel Job# 5675
- Rel Job# 5814



PRODUCT / PROCESS CHANGE NOTIFICATION
PCN-000264

Date: 4/20/2015

P2/2

- UClamp3311Z Product Data Sheet

Issuing Authority

Semtech Business Unit:	Protection Products Group	
Semtech Contact Info:	Pat Sanchez Semtech Corporation Sr. Manager, Corporate Quality 200 Flynn Road Camarillo, CA 93012 Psanchez@semtech.com Office: (805) 480-2074 Fax: (805) 498-3804	

FOR FURTHER INFORMATION & WORLDWIDE SALES COVERAGE: <http://www.semtech.com/contact/index.html#support>

Rel Job Detail Report

by Sublot, by Sequence
Contact: Gurmail Sajjan
(805) 480 2142
gsajjan@semtech.com

<i>Businessunit</i>	<i>Protection</i>			
<i>Reljob#</i>	<i>Part_Number, Job Name/Type</i>	<i>Fab, Package</i>	<i>Rel Job Status</i>	<i>Key Dates:</i>
5675	uClamp3311Z.TNT	ASMC14TVS		<i>Job Accepted:</i> 29-May-2014
	New Device and package (Grey Epoxy) Qual	Z-Package		<i>Requested CD:</i>
	New Product on qualified process and qualified package		<i>Hold</i>	<i>Actual Start Date:</i> 17-Oct-2013
<i>Hold Reason</i>				<i>ECD for Conditional:</i>
				<i>Job ECD:</i>

Completed Tasks

Rel Job Detail Report

by Sublot, by Sequence
Contact: Gurmail Sajjan
(805) 480 2142
gsajjan@semtech.com

1.0	Lot	AER1434	AssemblyLot	AER1434	DateCode	1341			
Seq	TaskCode	SampleSize	Criteria	Complete	Failures	DataSource	Results/Comments		
1	Data-Prep	None	None	24-Oct-2013		Camarillo			
2	HTRB_Pre_Elect_150°C_RT24	210		20-Nov-2013	0	Camarillo			
3	HTRB_150°C_Real Time_0024	210	Pass on Zero Fails	21-Nov-2013	0	Camarillo			
4	HTRB_Pre_Elect	105	Pass on Zero Fails	15-Nov-2013	0	Camarillo			
5	BI_BD_Valid	NA	Meet HTOL Schematics	15-Nov-2013	0	Camarillo			
6	HTRB_150°C_0072	105	Pass on Zero Fails	18-Nov-2013	0	Camarillo			
7	Int_Pack_Review_Cond_Qual	NA	Meet Conditional Release Requirements.	10-Dec-2013		Camarillo			
8	HTRB_150°C_0408	105	Pass on Zero Fails	03-Dec-2013	0	Camarillo			
9	85/85_Pre Elec	20	Pass on Zero Fails	19-Nov-2013		Camarillo			
10	85/85_120hr_On/Off	20	Pass on Zero Fails	02-Dec-2013	0	Camarillo			
11	Pre_Elect_Precond	154	Pass on Zero Fails	19-Nov-2013	0	Camarillo			
12	Precond_Temp_Cyc_5cyc	154	Pass on Zero Fails	19-Nov-2013	0	Camarillo			
13	Precond_HTS_24hr	154	Pass on Zero Fails	20-Nov-2013	0	Camarillo			
14	Precond_85/85_NoElec168hr	154	Pass on Zero Fails	27-Nov-2013	0	Camarillo			
15	Precond_260°C_IR_Ref_Char	154	Pass on Zero Fails	27-Nov-2013	0	Camarillo			
16	T/C_Pre_Elect	77	Pass on Zero Fails	27-Nov-2013	0	Camarillo			
17	T/C_wPre_0250	77	Pass on Zero Fails	03-Dec-2013	0	Camarillo			
18	T/C_wPre_0500	77	Pass on Zero Fails	09-Dec-2013	0	Camarillo			
19	T/C_wPre_1000	77	Pass on Zero Fails	18-Dec-2013	0	Camarillo			
20	HAST_Pre_Elect	77	Pass on Zero Fails	27-Nov-2013	0	Camarillo			
21	HAST_wPRE_0200	77	Pass on Zero Fails	18-Dec-2013	0	Camarillo	Rel. Eng.: Part passed when retested w/ different tester.		
22	Rider_Card_Wash/Bake			18-Nov-2013		Camarillo			
23	Pack_Clos	0	0	07-Jan-2014		Camarillo			

Rel Job Detail Report

by Sublot, by Sequence
Contact: Gurmail Sajjan
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gsajjan@semtech.com

2.0	Lot	AER1601	AssemblyLot	AER1601	DateCode	1410
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Seq	TaskCode	SampleSize	Criteria	Complete	Failures	DataSource	Results/Comments
1	Data-Prep	None	None	18-Mar-2014		Camarillo	
2	HTRB_Pre_Elect_150°C_RT24	210		20-Mar-2014	0	Camarillo	
3	HTRB_150°C_Real Time_0024	210	Pass on Zero Fails	28-Mar-2014	0	Camarillo	
4	HTRB_Pre_Elect	105	Pass on Zero Fails	20-Mar-2014	0	Camarillo	
5	BI_BD_Valid	NA	Meet HTOL Schematics	19-Mar-2014	0	Camarillo	
6	HTRB_150°C_0072	105	Pass on Zero Fails	24-Mar-2014	0	Camarillo	
8	HTRB_150°C_0408	105	Pass on Zero Fails	07-Apr-2014	0	Camarillo	
9	85/85_Pre Elec	77	Pass on Zero Fails	19-Mar-2014	0	Camarillo	
10	85/85_Biased_168hr	77	Pass on Zero Fails	26-Mar-2014	0	Camarillo	
11	85/85_on/off_500hrs	77	None	09-Apr-2014	0	Camarillo	
12	85/85_on/off_1000hrs	77	None	30-Apr-2014	0	Camarillo	
13	Pre_Elect_Precond	77	Pass on Zero Fails	20-Mar-2014	0	Camarillo	
14	Precond_Temp_Cyc_5cyc	77	Pass on Zero Fails	20-Mar-2014	0	Camarillo	
15	Precond_HTS_24hr	77	Pass on Zero Fails	21-Mar-2014	0	Camarillo	
16	Precond_85/85_NoElec168hr	77	Pass on Zero Fails	27-Mar-2014	0	Camarillo	
17	Precond_260°C_IR_Ref_Char	77	Pass on Zero Fails	27-Mar-2014	0	Camarillo	
18	T/C_Pre_Elect	77	Pass on Zero Fails	27-Mar-2014	0	Camarillo	
19	T/C_wPre_0250	77	Pass on Zero Fails	02-Apr-2014	0	Camarillo	
20	T/C_wPre_0500	77	Pass on Zero Fails	07-Apr-2014	0	Camarillo	
21	T/C_wPre_1000	77	Pass on Zero Fails	22-Apr-2014	0	Camarillo	
22	Pack_Clos	0	0	01-May-2014		Camarillo	

Rel Job Detail Report

by Sublot, by Sequence
Contact: Gurmail Sajjan
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3.0	Lot	AER1796	AssemblyLot	AER1796	DateCode	1421
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Seq	TaskCode	SampleSize	Criteria	Complete	Failures	DataSource	Results/Comments
1	Data-Prep	None	None	07-Jul-2014		Camarillo	
2	HTRB_Pre_Elect_150°C_RT24	210		16-Jul-2014	0	Camarillo	
3	HTRB_150°C_Real Time_0024	192	Pass on Zero Fails	23-Jul-2014	0	Camarillo	
4	HTRB_Pre_Elect	105	Pass on Zero Fails	10-Jul-2014	0	Camarillo	
5	BI_BD_Valid	NA	Meet HTOL Schematics	11-Jul-2014	0	Camarillo	
6	HTRB_150°C_0072	105	Pass on Zero Fails	14-Jul-2014	0	Camarillo	
8	HTRB_150°C_0408	105	Pass on Zero Fails	28-Jul-2014	0	Camarillo	
9	85/85_Pre Elec	77	Pass on Zero Fails	10-Jul-2014	0	Camarillo	
10	85/85_Biased_168hr	77	Pass on Zero Fails	22-Jul-2014	0	Camarillo	
11	85/85_on/off_500hrs	77	None	05-Aug-2014	0	Camarillo	
12	85/85_on/off_1000hrs	77	None	26-Aug-2014	0	Camarillo	
13	Pre_Elect_Precond	77	Pass on Zero Fails	10-Jul-2014	0	Camarillo	
14	Precond_Temp_Cyc_5cyc	77	Pass on Zero Fails	10-Jul-2014	0	Camarillo	
15	Precond_HTS_24hr	77	Pass on Zero Fails	11-Jul-2014	0	Camarillo	
16	Precond_85/85_NoElec168hr	77	Pass on Zero Fails	18-Jul-2014		Camarillo	
17	Precond_260°C_IR_Ref_Char	77	Pass on Zero Fails	18-Jul-2014	0	Camarillo	
18	T/C_Pre_Elect	77	Pass on Zero Fails	18-Jul-2014	0	Camarillo	
19	T/C_wPre_0250	77	Pass on Zero Fails	24-Jul-2014	0	Camarillo	
20	T/C_wPre_0500	77	Pass on Zero Fails	31-Jul-2014	0	Camarillo	
21	T/C_wPre_1000	77	Pass on Zero Fails	08-Aug-2014	0	Camarillo	
22	Pack_Clos	0	0	27-Aug-2014		Camarillo	

Rel Job Detail Report

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 Contact: Gurmail Sajjan
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 gsajjan@semtech.com

<i>Businessunit</i>	<i>Protection</i>			
<i>Reljob#</i>	<i>Part_Number, Job Name/Type</i>	<i>Fab, Package</i>	<i>Rel Job Status</i>	<i>Key Dates:</i>
5814	uClamp3311Z	ASMC14TVS	Rel Testing Complete Passes All Requirements	<i>Job Accepted:</i> 29-May-2014
	BOM change Package (Z1) qualification	Z-Package		<i>Requested CD:</i>
	New Product on qualified process with un-qualified package		Hold	<i>Actual Start Date:</i> 07-May-2014
				<i>ECD for Conditional:</i>
				<i>Job ECD:</i>

Hold Reason

Completed Tasks

<i>I.O</i>	<i>Lot</i>	<i>AssemblyLot</i>	<i>DateCode</i>			
	EP2783-3	EP2783-3	0			
<i>Seq</i>	<i>TaskCode</i>	<i>SampleSize</i>	<i>Criteria</i>	<i>Complete</i>	<i>Failures</i>	<i>DataSource Results/Comments</i>
1	Data-Prep	None	None	16-Jun-2014		Camarillo
2	HTRB_Pre_Elect_150°C_RT24	210		24-Jun-2014	0	Camarillo
3	HTRB_150°C_Real Time_0024	210	Pass on Zero Fails	26-Jun-2014	0	Camarillo
4	HTRB_Pre_Elect	105	Pass on Zero Fails	19-Jun-2014	0	Camarillo
5	BI_BD_Valid	NA	Meet HTOL Schematics	18-Jun-2014		Camarillo
6	HTRB_150°C_0072	105	Pass on Zero Fails	24-Jun-2014	0	Camarillo
7	HTRB_150°C_0408	105	Pass on Zero Fails	08-Jul-2014	0	Camarillo
8	HTS_Pre_Elect	77	Pass on Zero Fails	18-Jun-2014	0	Camarillo
9	HTS_0168	77	Pass on Zero Fails	26-Jun-2014	0	Camarillo
10	HTS_0500	77	Pass on Zero Fails	10-Jul-2014	0	Camarillo
11	HTS_1000	77	Pass on Zero Fails	31-Jul-2014	0	Camarillo
12	Rider_Card_Wash/Bake			17-Jun-2014		Camarillo
13	Pre_Elect_Precond	154	Pass on Zero Fails	19-Jun-2014	0	Camarillo
14	Precond_Temp_Cyc_5cyc	154	Pass on Zero Fails	19-Jun-2014	0	Camarillo
15	Precond_HTS_24hr	154	Pass on Zero Fails	20-Jun-2014	0	Camarillo

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16 Precond_85/85_NoElec168hr	154	Pass on Zero Fails	27-Jun-2014	0	Camarillo
17 Precond_IR_Refl_Char	154	Pass on Zero Fails	30-Jun-2014	0	Camarillo
18 T/C_Pre_Elect	77	Pass on Zero Fails	30-Jun-2014	0	Camarillo
19 T/C_wPre_0250	77	Pass on Zero Fails	03-Jul-2014	0	Camarillo
20 T/C_wPre_0500	77	Pass on Zero Fails	08-Jul-2014	0	Camarillo
21 T/C_wPre_1000	77	Pass on Zero Fails	16-Jul-2014	0	Camarillo
22 HAST Pre_Elect	77	Pass on Zero Fails	30-Jun-2014	0	Camarillo
23 HAST_BD_Validation	N/A	Pass on Zero Fails	27-Jun-2014		Camarillo
24 HAST_wPRE_0200	77	Pass on Zero Fails	09-Jul-2014	0	Camarillo
25 Pack_Clos	0	0	01-Aug-2014		Camarillo

PROTECTION PRODUCTS - Z-Pak™

Description

μ Clamp[®] TVS diodes are designed to protect sensitive electronics from damage or latch-up due to ESD. They are designed to replace 0201 size multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and other portable electronics. They feature large cross-sectional area junctions for conducting high transient currents. These devices offer desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

μ Clamp[®]3311Z is constructed using Semtech's proprietary EPD process technology. The EPD process provides low standoff voltages with significant reductions in leakage currents and capacitance over silicon-avalanche diode processes. They feature a true operating voltage of 3.3 volts for superior protection when compared to traditional pn junction devices.

μ Clamp3311Z is in a 2-pin SLP0603P2X3A package. It measures 0.6 x 0.3 mm with a nominal height of only 0.25mm. Leads are finished with lead-free NiAu. Each device will protect one line operating at 3.3 volts. It gives the designer the flexibility to protect single lines in applications where arrays are not practical. The combination of small size and high ESD surge capability makes them ideal for use in portable applications such as cellular phones, digital cameras, and MP3 players.

Features

- ◆ High ESD withstand Voltage: **+/-14kV** (Contact) and **+/- 16kV** (Air) per **IEC 61000-4-2**
- ◆ Able to withstand over 1000 ESD strikes per IEC 61000-4-2 Level 4
- ◆ Ultra-small **0201 package**
- ◆ Protects one data line
- ◆ Low reverse current: <10nA typical (VR=5V)
- ◆ Working voltage: +/- 3.3V
- ◆ Low capacitance: 6pF typical
- ◆ Extremely low dynamic resistance: 0.21 Ohms (Typ)
- ◆ Solid-state silicon-avalanche technology

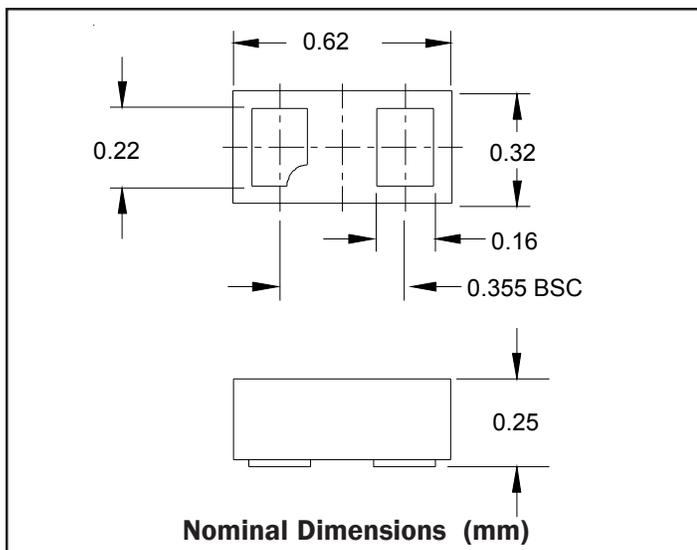
Mechanical Characteristics

- ◆ SLP0603P2X3A package
- ◆ Pb-Free, Halogen Free, RoHS/WEEE Compliant
- ◆ Nominal Dimensions: 0.6 x 0.3 x 0.25 mm
- ◆ Lead Finish: NiAu
- ◆ Marking : Marking code
- ◆ Packaging : Tape and Reel

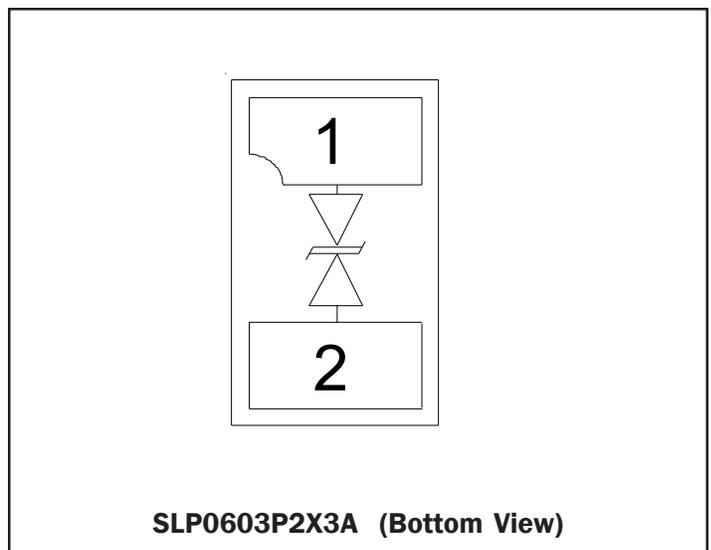
Applications

- ◆ Cellular Handsets & Accessories
- ◆ Keypads, Side Keys, Audio Ports
- ◆ Portable Instrumentation
- ◆ Digital Lines
- ◆ Tablet PC

Nominal Dimensions



Schematic



PROTECTION PRODUCTS

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20μs)	P_{pk}	30	Watts
Maximum Peak Pulse Current (tp = 8/20μs)	I_{pp}	4	Amps
ESD per IEC 61000-4-2 (Air) ¹ ESD per IEC 61000-4-2 (Contact) ¹	V_{ESD}	+/- 16 +/- 14	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}				3.3	V
Punch-Through Voltage	V_{PT}	$I_{PT} = 50\mu A$	3.65	4	4.4	V
Snap-Back Voltage	V_{SB}	$I_{SB} = 50mA$	2.8			V
Reverse Leakage Current	I_R	$V_{RWM} = 3.3V$		0.001	0.05	μA
Clamping Voltage	V_C	$I_{pp} = 1A, tp = 8/20\mu s$			5.5	V
Clamping Voltage	VC	$I_{pp} = 3A, tp = 8/20\mu s$			6.5	V
Clamping Voltage	V_C	$I_{pp} = 4A, tp = 8/20\mu s$			7.5	V
Dynamic Resistance ^{2, 3}	R_D	tp = 100ns		0.21		Ohms
Junction Capacitance	C_j	I/O pin to Gnd $V_R = 0V, f = 1MHz$		6	9	pF

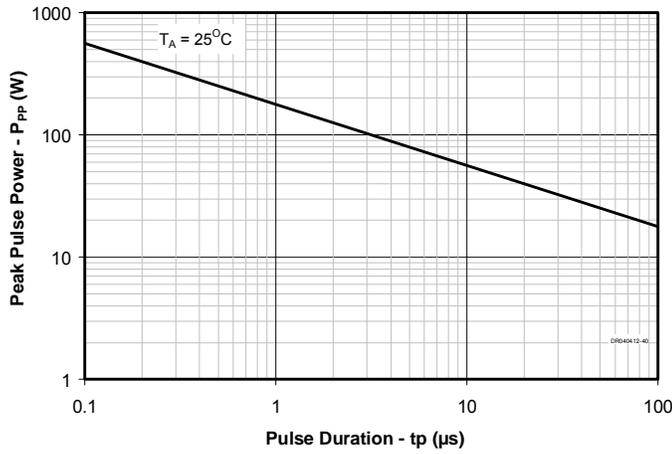
Notes

- 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 $I_{TLP} = 16A$

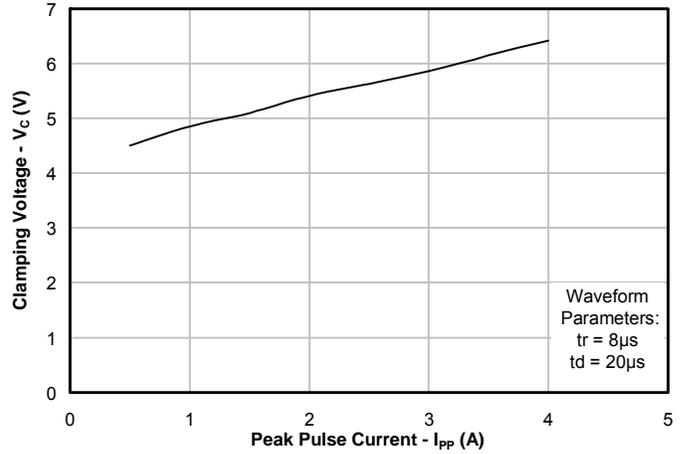
PROTECTION PRODUCTS

Typical Characteristics

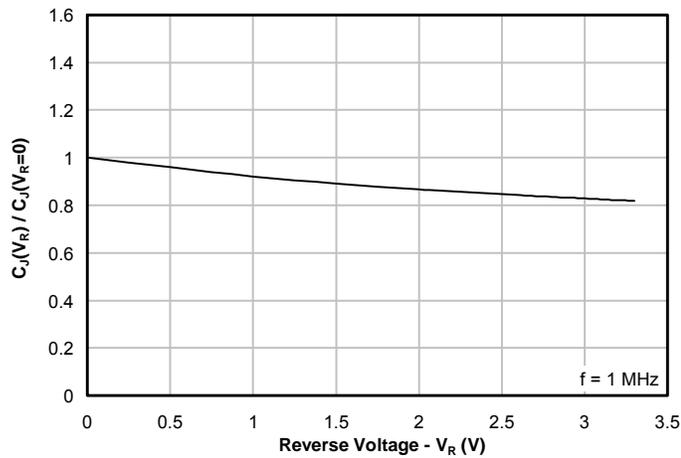
Non-Repetitive Peak Pulse Power vs. Pulse Time



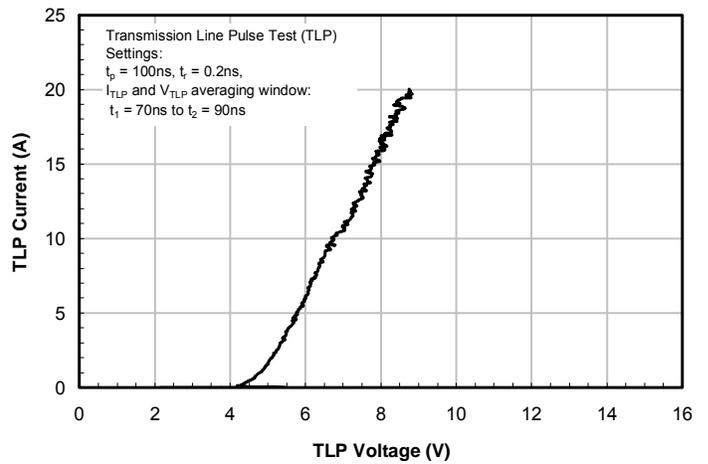
Clamping Voltage vs. Peak Pulse Current (tp=8/20us)



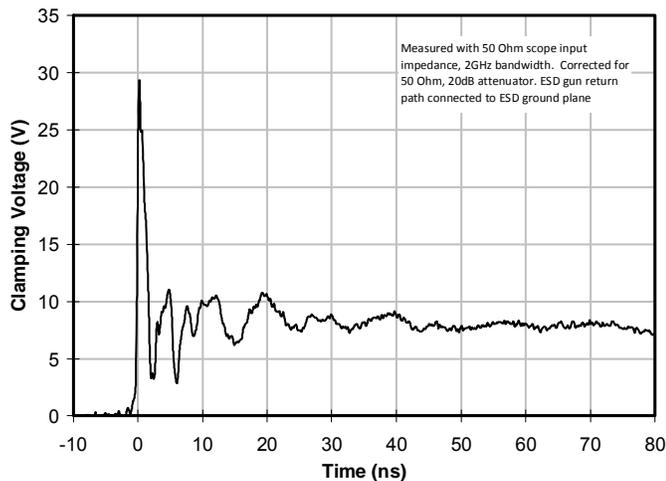
Normalized Junction Capacitance vs. Reverse Voltage



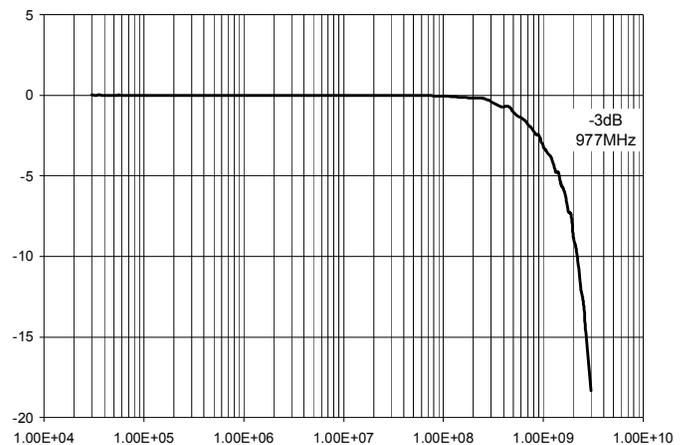
TLP Characteristic



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



**Typical Insertion Loss (S21)
30KHz to 3GHz**



PROTECTION PRODUCTS

Applications Information

Device Connection Options

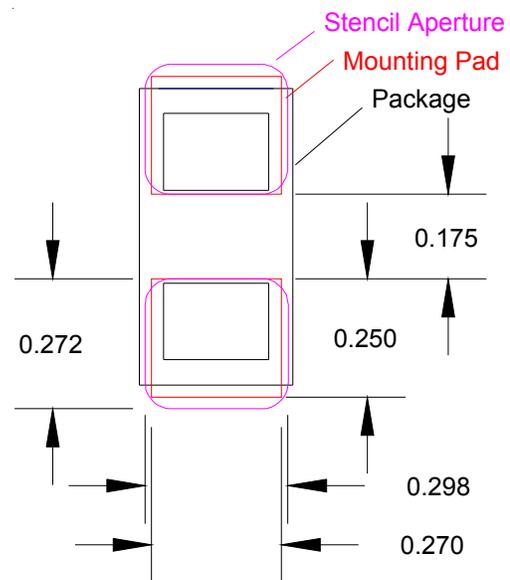
The μ Clamp3311Z is designed to protect one data line operating up to 3.3 volts. It will present a high impedance to the protected line up to 3.3 volts. It will “turn on” when the line voltage exceeds 3.5 volts. The device is bidirectional and may be used on lines where the signal polarity is above and below ground. These devices are not recommended for use on DC power supply lines due to their snap-back voltage characteristic.

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 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

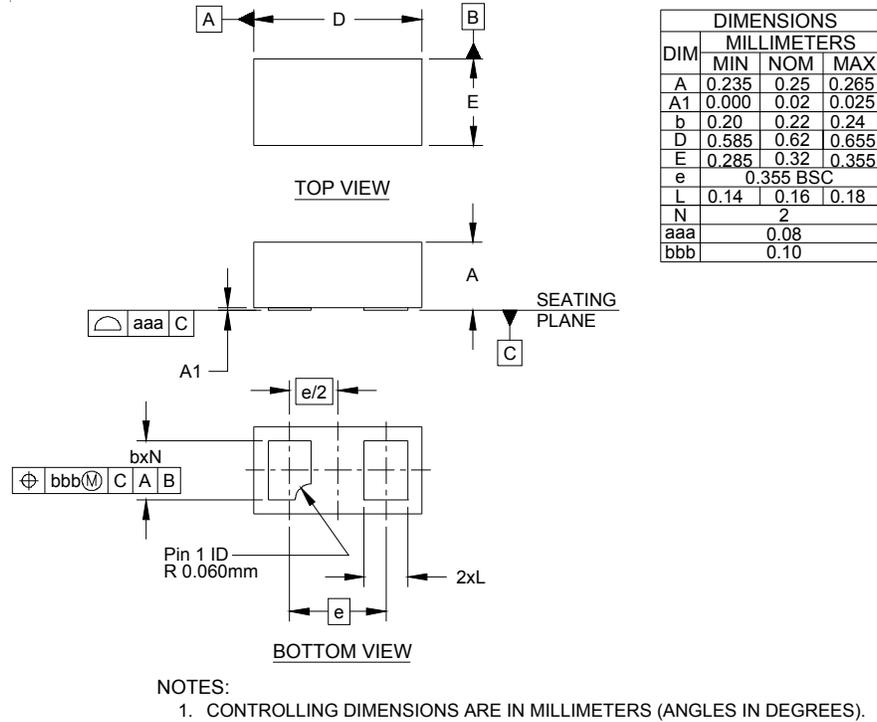
Circuit Diagram



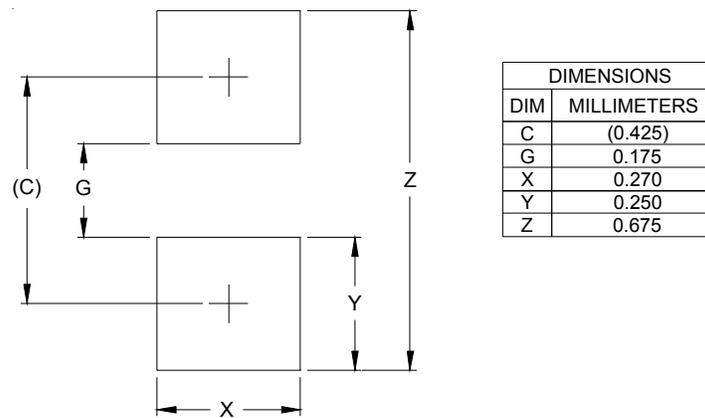
Recommended Mounting Pattern

PROTECTION PRODUCTS

Outline Drawing - SLP0603P2X3A



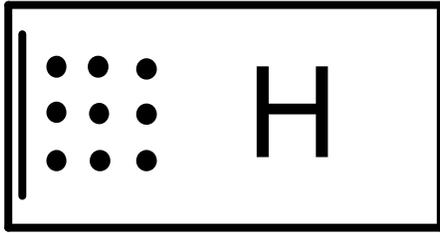
Land Pattern - SLP0603P2X3A



- 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.

PROTECTION PRODUCTS

Marking Code



Notes:

1) Dots represent date code matrix and Pin 1 location

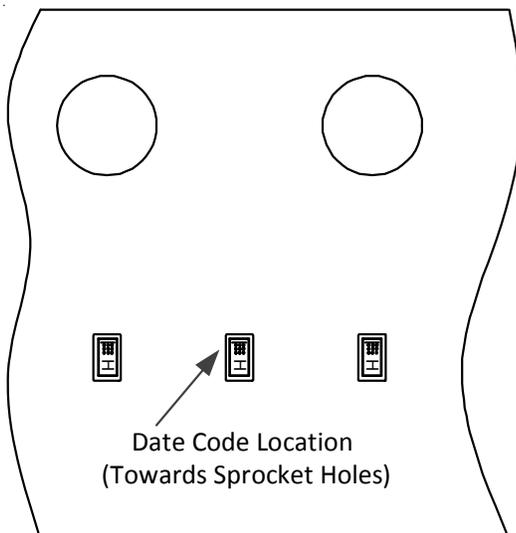
Ordering Information

Ordering Number	Qty per Reel	Carrier Tape	Reel Size	Comments
uClamp3311Z.TNT	10,000	Plastic	7 Inch	Not Recommended for New Designs
uClamp3311Z.TFT	15,000	Paper	7 Inch	
uClamp3311Z.TVT	50,000	Paper	13 Inch	

Notes:

1) MicroClamp, uClamp and μ Clamp are trademarks of Semtech Corporation

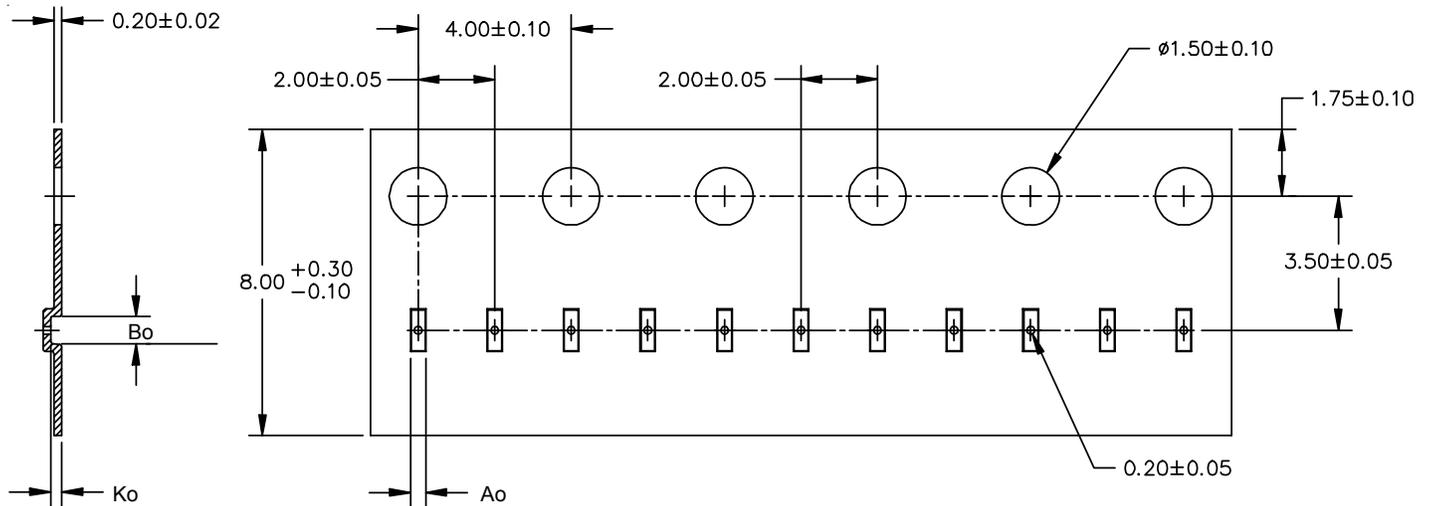
Device Orientation in Tape



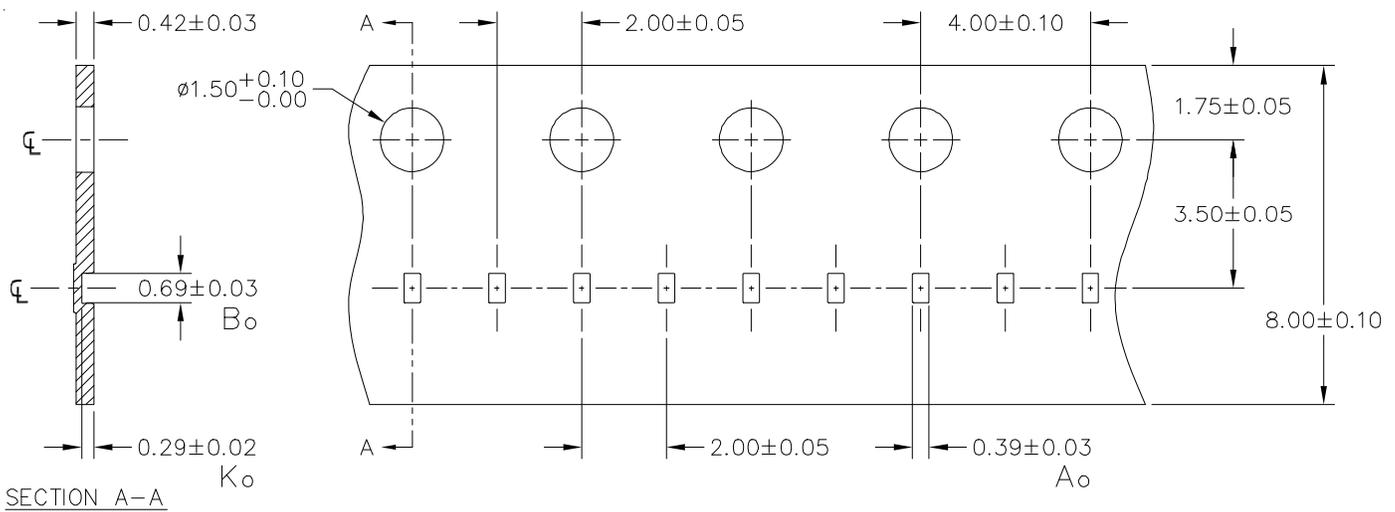
PROTECTION PRODUCTS

Carrier Tape Specification

Plastic Tape



Paper Tape



Note: All dimensions in mm unless otherwise specified

Contact Information for Semtech International AG

Taiwan Branch	Tel: 886-2-2748-3380 Fax: 886-2-2748-3390	Japan (Tokyo) Office	Tel: 81-3-5719-7560 Fax: 81-3-5719-7561
Korea Branch	Tel: 82-2-527-4377 Fax: 82-2-527-4376	Semtech Limited (U.K.)	Tel: 44-1794-527-600 Fax: 44-1794-527-601
Shanghai Office	Tel: 86-21-6391-0830 Fax: 86-21-6391-0831	Semtech France SARL	Tel: 33-(0)169-28-22-00 Fax: 33-(0)169-28-12-98
Japan (Osaka) Office	Tel: 81-6-6347-6570 Fax: 81-6-6347-6571	Semtech Germany GmbH	Tel: 49-(0)8161-140-123 Fax: 49-(0)8161-140-124

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