

## PROTECTION PRODUCTS

### Absolute Maximum Rating

| Rating                                                                                   | Symbol    | Value            | Units |
|------------------------------------------------------------------------------------------|-----------|------------------|-------|
| Peak Pulse Power ( $t_p = 8/20\mu s$ )                                                   | $P_{pk}$  | 25               | Watts |
| Maximum Peak Pulse Current ( $t_p = 8/20\mu s$ )                                         | $I_{pp}$  | 2                | Amps  |
| ESD per IEC 61000-4-2 (Air) <sup>1</sup><br>ESD per IEC 61000-4-2 (Contact) <sup>1</sup> | $V_{ESD}$ | +/- 17<br>+/- 17 | kV    |
| Operating Temperature                                                                    | $T_J$     | -55 to +125      | °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                                   |         |         | 5       | V     |
| Reverse Breakdown Voltage         | $V_{BR}$  | $I_t = 1mA$<br>Pin 1 to 2 or 2 to 1                    | 6       | 8.2     | 9.5     | V     |
| Reverse Leakage Current           | $I_R$     | $V_{RWM} = 5V, T=25^\circ C$<br>Pin 1 to 2 or 2 to 1   |         | 3       | 50      | nA    |
| Clamping Voltage                  | $V_C$     | $I_{pp} = 1A, t_p = 8/20\mu s$<br>Pin 1 to 2 or 2 to 1 |         |         | 12      | V     |
| Clamping Voltage                  | $V_C$     | $I_{pp} = 2A, t_p = 8/20\mu s$<br>Pin 1 to 2 or 2 to 1 |         |         | 15      | V     |
| Dynamic Resistance <sup>2,3</sup> | $R_{DYN}$ | $t_{lp} = 0.2 / 100ns$                                 |         | 0.78    |         | Ohms  |
| Junction Capacitance              | $C_J$     | $V_R = 0V, f = 1MHz$                                   |         | 6.5     | 9       | pF    |

#### Notes

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

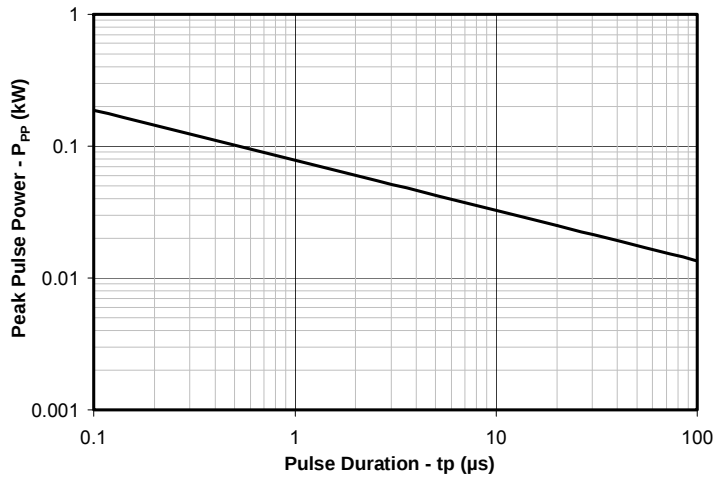
2)Transmission Line Pulse Test (TLP) Settings:  $t_p = 100ns$ ,  $t_r = 0.2ns$ ,  $I_{TLP}$  and  $V_{TLP}$  averaging window:  $t_1 = 70ns$  to  $t_2 = 90ns$ .

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

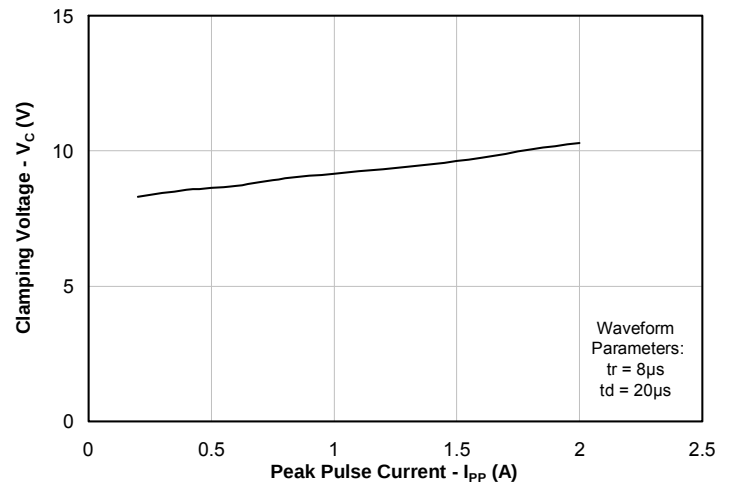
## PROTECTION PRODUCTS

### Typical Characteristics

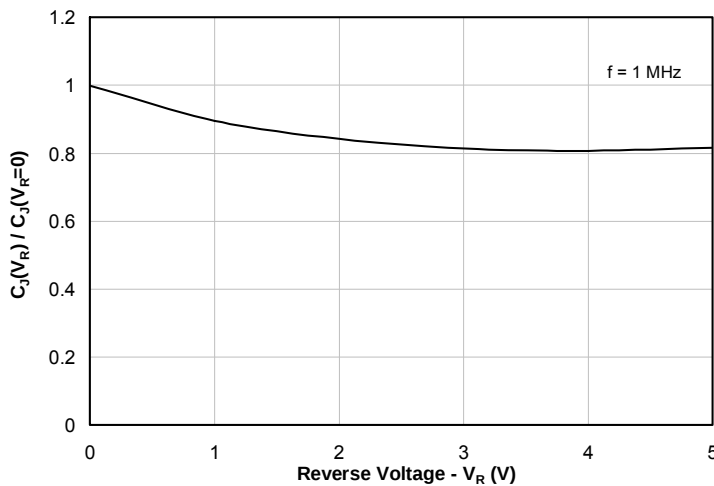
Non-Repetitive Peak Pulse Power vs. Pulse Time



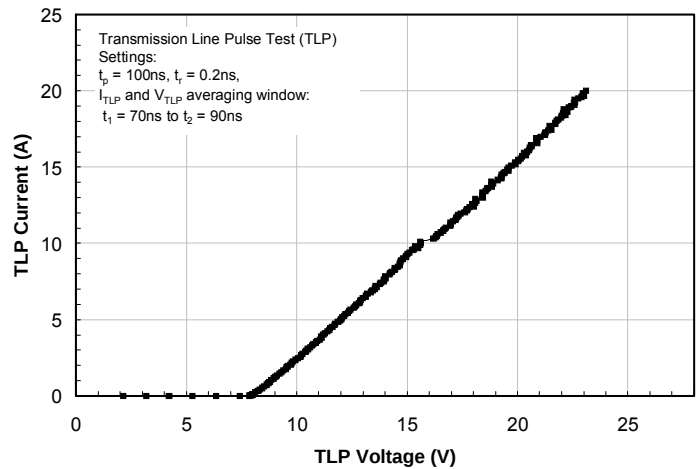
Clamping Voltage vs. Peak Pulse Current ( $t_p=8/20\mu$ s)



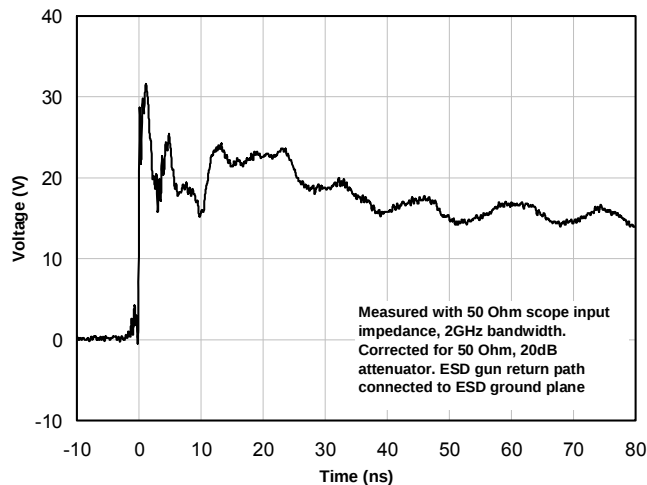
Junction Capacitance vs. Reverse Voltage



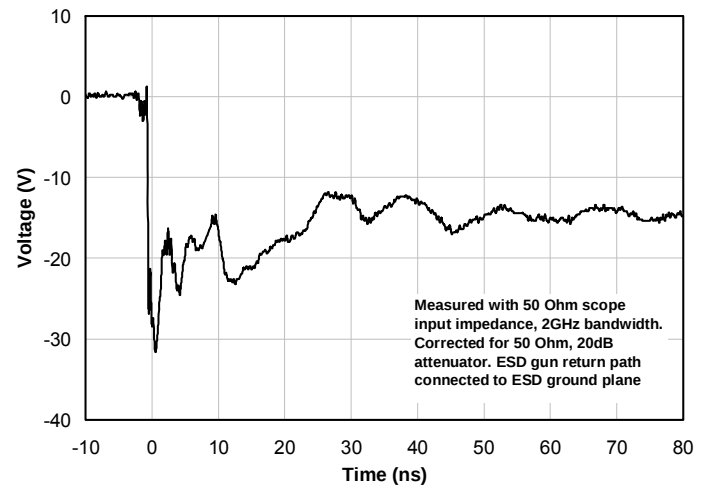
TLP Characteristic



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



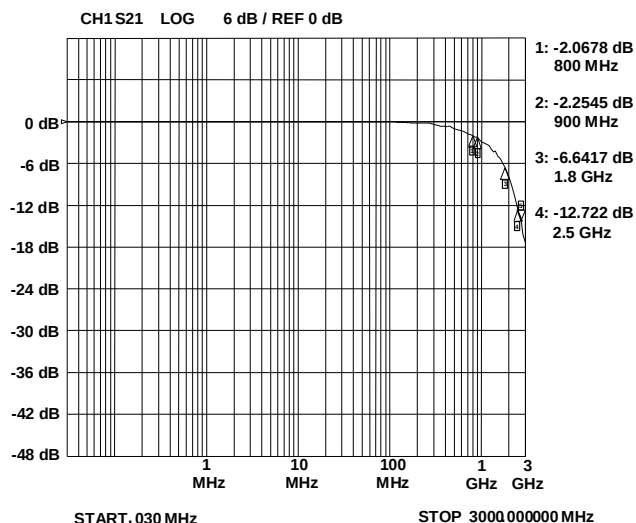
ESD Clamping (-8kV Contact per IEC 61000-4-2)



## PROTECTION PRODUCTS

### Typical Characteristics

#### Typical Insertion Loss S21

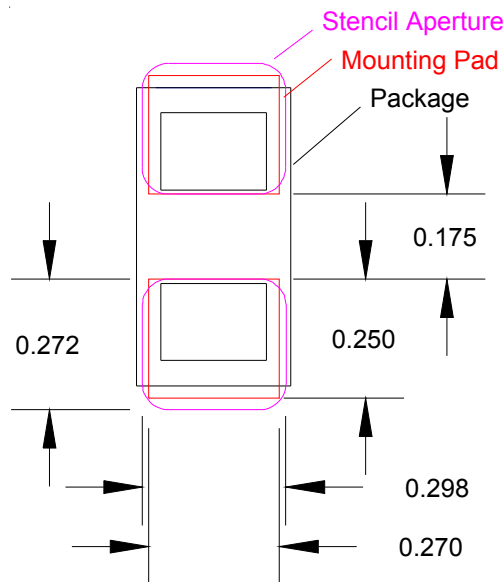


### Applications Information

#### 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.

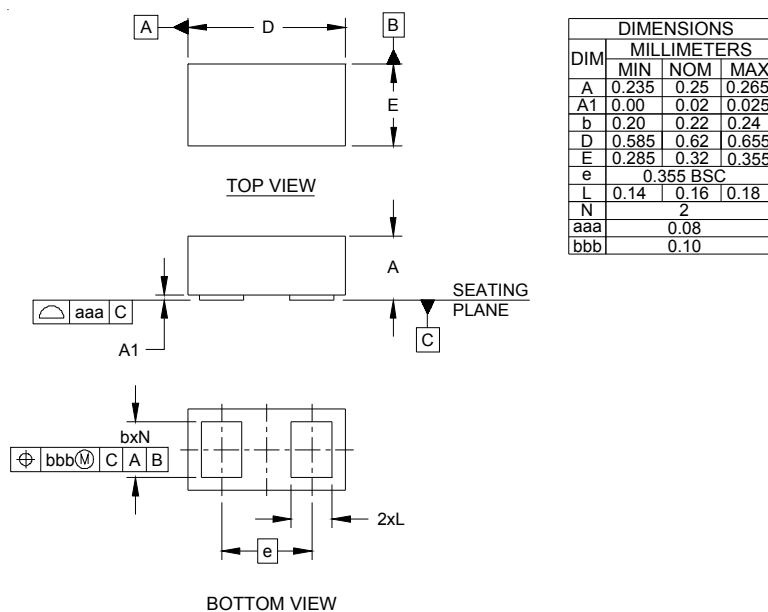
| Assembly Parameter       | Recommendation                   |
|--------------------------|----------------------------------|
| Solder Stencil Design    | Laser cut, Electro-polished      |
| Aperture shape           | Rectangular with rounded corners |
| Solder Stencil Thickness | 0.100 mm (0.004")                |
| 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                      |



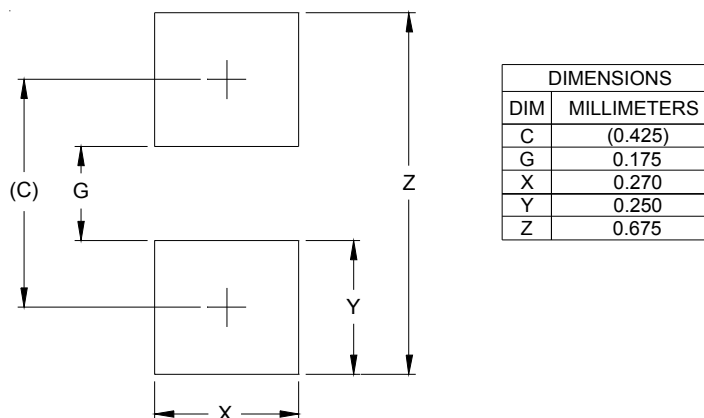
Recommended Mounting Pattern

## PROTECTION PRODUCTS

## Outline Drawing - SLP0603P2X3

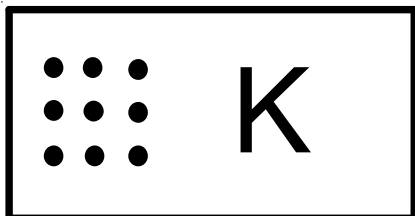


## Land Pattern - SLP0603P2X3



## PROTECTION PRODUCTS

### Marking Code



Notes:

1) Dots represent matrix date code

### Ordering Information

| Ordering Number | Qty per Reel | Carrier Tape | Reel Size | Comments                        |
|-----------------|--------------|--------------|-----------|---------------------------------|
| uClamp0541Z.TNT | 10,000       | Plastic      | 7 Inch    | Not Recommended for New Designs |
| uClamp0541Z.TFT | 15,000       | Paper        | 7 Inch    |                                 |
| uClamp0541Z.TVT | 50,000       | Paper        | 13 Inch   |                                 |

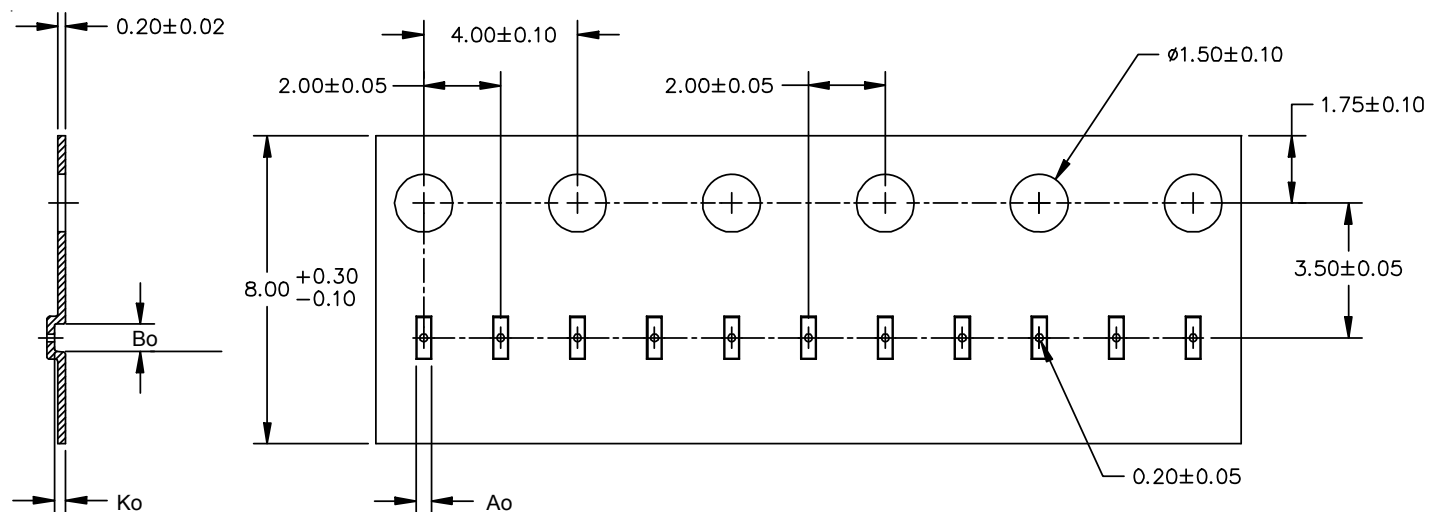
Notes:

1) MicroClamp, uClamp and  $\mu$ Clamp are trademarks of Semtech Corporation

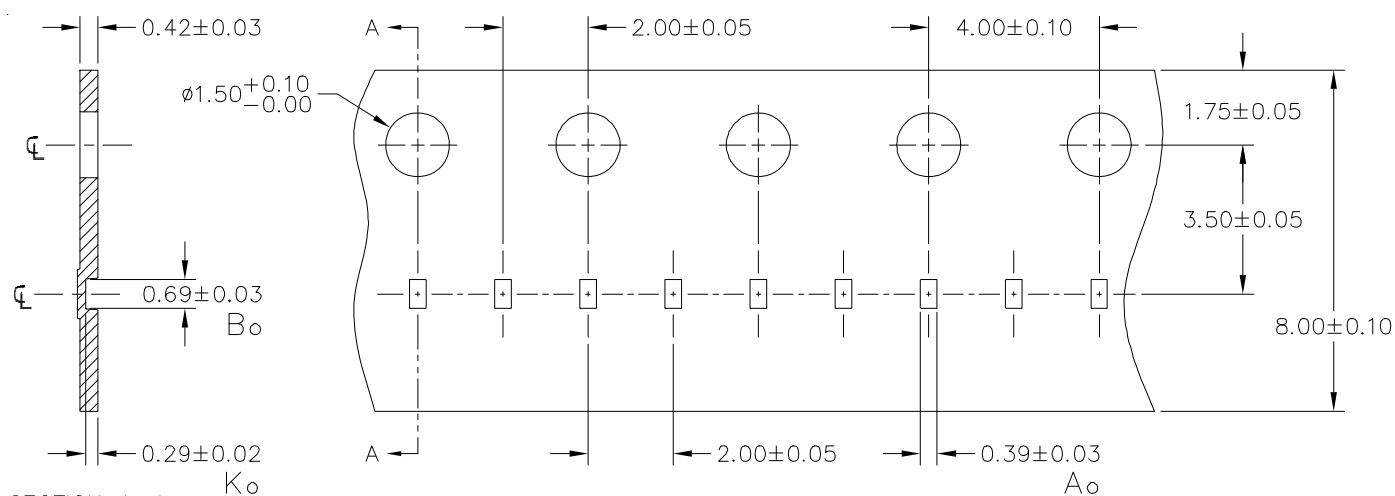
## PROTECTION PRODUCTS

### Carrier Tape Specification

#### Plastic Tape



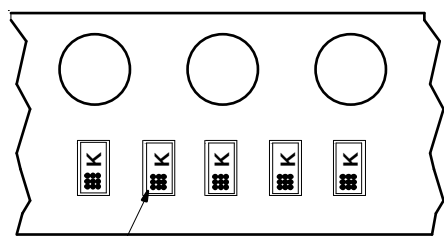
#### Paper Tape



SECTION A-A

Note: All dimensions in mm unless otherwise specified

#### Device Orientation in Tape



Date Code Location  
(Away from Sprocket Holes)

**Contact Information**

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