

### Absolute Maximum Ratings

| Symbol     | Parameter                        | Value      | Units |
|------------|----------------------------------|------------|-------|
| $I_{PP}$   | Peak Current ( $t_p=8/20\mu s$ ) | 3.0        | A     |
| $T_{OP}$   | Operating Temperature            | -40 to 125 | °C    |
| $T_{STOR}$ | Storage Temperature              | -55 to 150 | °C    |

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

### Thermal Information

| Parameter                                   | Rating     | Units |
|---------------------------------------------|------------|-------|
| Storage Temperature Range                   | -55 to 150 | °C    |
| Maximum Junction Temperature                | 150        | °C    |
| Maximum Lead Temperature (Soldering 20-40s) | 260        | °C    |

### Electrical Characteristics ( $T_{OP}=25^{\circ}C$ )

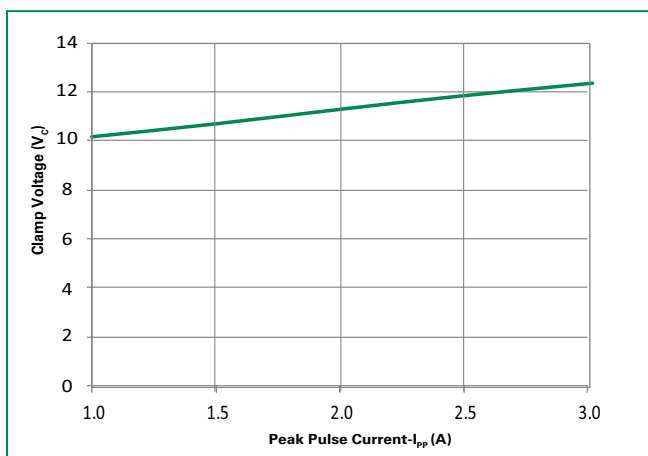
| Parameter                          | Symbol    | Test Conditions                   | Min      | Typ  | Max | Units    |
|------------------------------------|-----------|-----------------------------------|----------|------|-----|----------|
| Reverse Standoff Voltage           | $V_{RWM}$ |                                   |          |      | 5.0 | V        |
| Reverse Breakdown Voltage          | $V_{BD}$  | $I_R=1mA$                         | 6.0      |      |     | V        |
| Leakage Current                    | $I_R$     | $V_R=5V$                          |          |      | 1.0 | $\mu A$  |
| Clamp Voltage <sup>1</sup>         | $V_C$     | $I_{PP}=1A, t_p=8/20\mu s, Fwd$   |          | 10.2 |     | V        |
|                                    |           | $I_{PP}=3A, t_p=8/20\mu s, Fwd$   |          | 12.3 |     | V        |
| Dynamic Resistance <sup>2</sup>    | $R_{DYN}$ | TLP, $t_p=100ns$ , I/O to GND     |          | 0.48 |     | $\Omega$ |
| ESD Withstand Voltage <sup>1</sup> | $V_{ESD}$ | IEC 61000-4-2 (Contact Discharge) | $\pm 15$ |      |     | kV       |
|                                    |           | IEC 61000-4-2 (Air Discharge)     | $\pm 30$ |      |     | kV       |
| Diode Capacitance <sup>1</sup>     | $C_D$     | Reverse Bias=0V (I/O to GND)      |          | 6.5  |     | pF       |

Note:

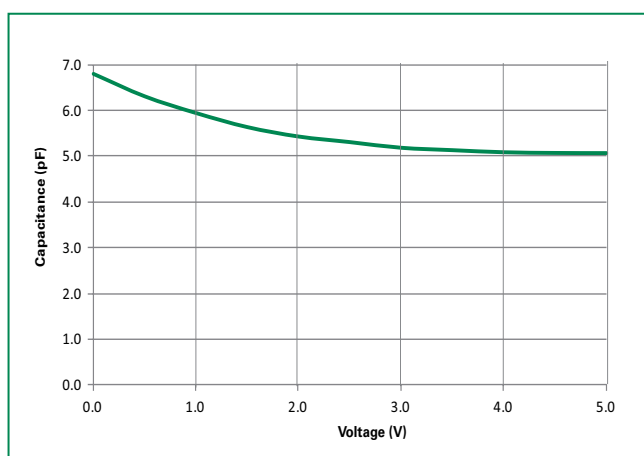
<sup>1</sup> Parameter is guaranteed by design and/or device characterization.

<sup>2</sup> Transmission Line Pulse (TLP) with 100ns width and 200ps rise time.

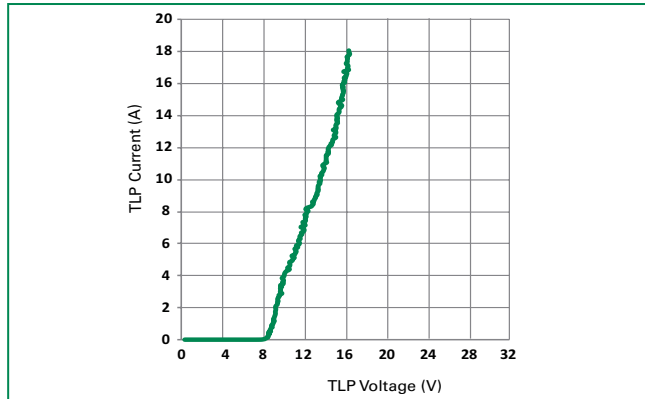
### Clamping Voltage vs. $I_{PP}$



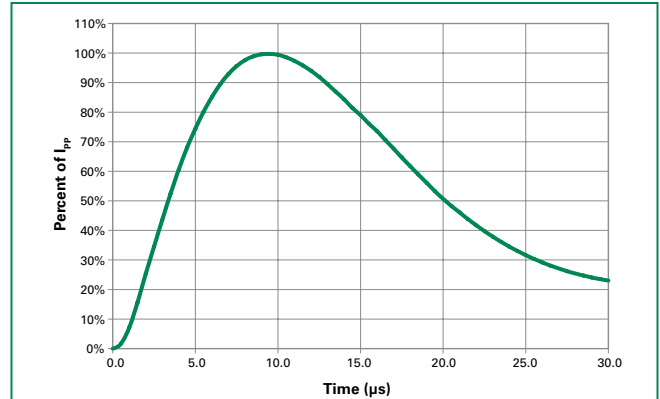
### Capacitance vs. Reverse Bias



### Transmission Line Pulsing (TLP) Plot

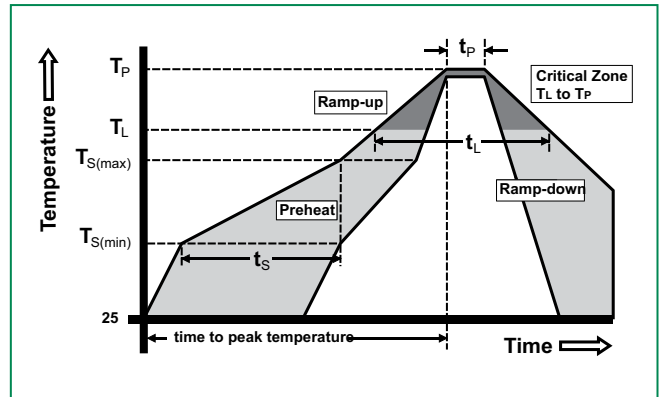


### Pulse Waveform

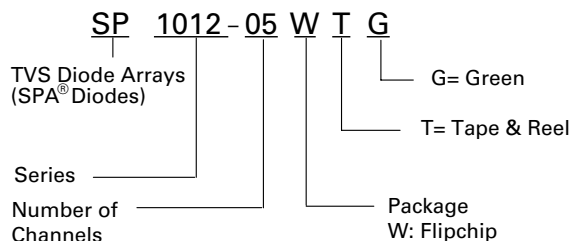


### Soldering Parameters

|                                                        |                                    |                         |
|--------------------------------------------------------|------------------------------------|-------------------------|
| Reflow Condition                                       |                                    | Pb – Free assembly      |
| Pre Heat                                               | - Temperature Min ( $T_{s(min)}$ ) | 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                   |
|                                                        | - Temperature ( $t_L$ )            | 60 – 150 seconds        |
| Peak Temperature ( $T_P$ )                             |                                    | 260 <sup>+0/-5</sup> °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                   |



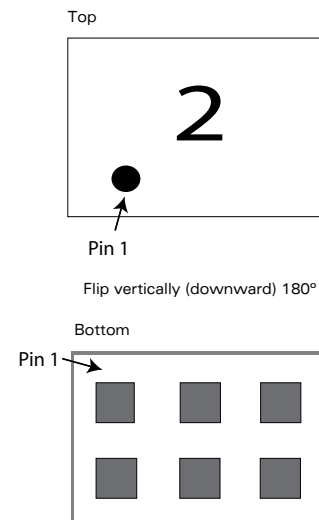
### Part Numbering System



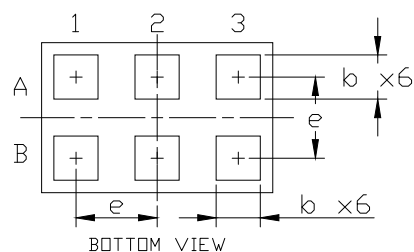
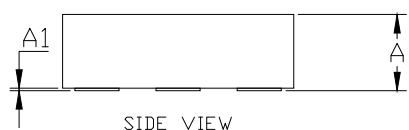
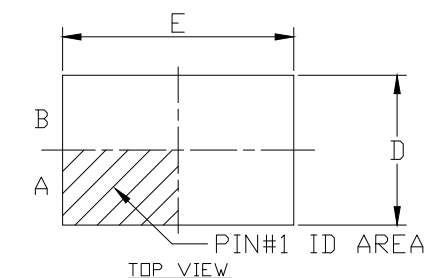
### Ordering Information

| Part Number  | Package               | Marking | Min. Order Qty. |
|--------------|-----------------------|---------|-----------------|
| SP1012-05WTG | 0.94x0.61mm Flip Chip | 2       | 5000            |

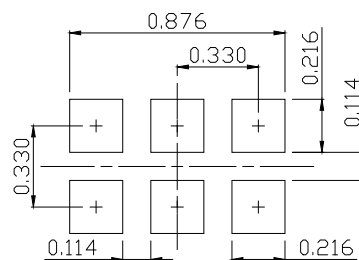
### Part Marking System



## Package Dimensions

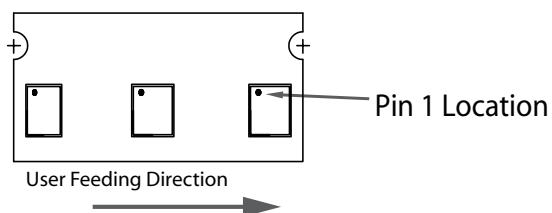
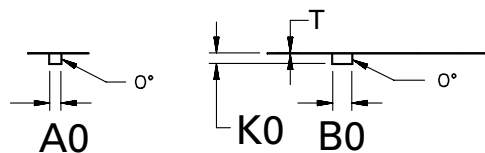
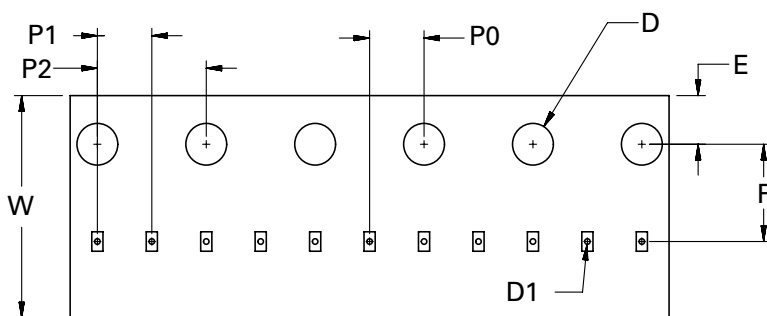


| Symbol    | 0.94x0.61mm Flip Chip |       |       |        |        |        |
|-----------|-----------------------|-------|-------|--------|--------|--------|
|           | Millimeters           |       |       | Inches |        |        |
|           | Min                   | Typ   | Max   | Min    | Typ    | Max    |
| <b>A</b>  | 0.280                 | 0.310 | 0.340 | 0.0110 | 0.0122 | 0.0134 |
| <b>A1</b> | 0.005                 | 0.010 | 0.015 | 0.0002 | 0.0004 | 0.0006 |
| <b>b</b>  | 0.175                 | 0.180 | 0.185 | 0.0069 | 0.0071 | 0.0073 |
| <b>D</b>  | 0.585                 | 0.610 | 0.635 | 0.0230 | 0.0240 | 0.0250 |
| <b>E</b>  | 0.915                 | 0.940 | 0.965 | 0.0360 | 0.0370 | 0.0380 |
| <b>e</b>  | 0.330                 |       |       | 0.0130 |        |        |



RECOMMENDED SOLDER PAD  
SIZE IN MM

## Embossed Carrier Tape & Reel Specification — Flipchip



| Symbol    | Millimeters       |
|-----------|-------------------|
| <b>A0</b> | 0.68+/-0.03       |
| <b>B0</b> | 1.12+/-0.03       |
| <b>D</b>  | ø 1.50 + 0.10     |
| <b>D1</b> | ø 0.40 +/- 0.05   |
| <b>E</b>  | 1.75+/-0.10       |
| <b>F</b>  | 3.50+/-0.05       |
| <b>K0</b> | 0.36+/-0.03       |
| <b>P0</b> | 2.00+/-0.05       |
| <b>P1</b> | 2.00+/-0.05       |
| <b>P2</b> | 4.00+/-0.10       |
| <b>W</b>  | 8.00 + 0.30 -0.10 |
| <b>T</b>  | 0.20+/-0.02       |