



## Discription

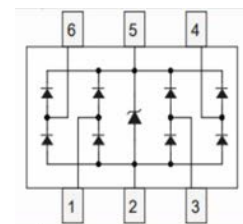
The HSP3012-04HTG is a 5-channel ultra low capacitance rail clamp ESD protection diodes array. Each channel consists of a pair of ESD diodes that steer positive or negative ESD current to either the positive or negative rail. A zener diode is integrated in to the array between the positive and negative supply rails. In the typical applications, the negative rail pin (assigned as GND) is connected with system ground. The Positive ESD current is steered to the ground through an ESD diode and Zener diode and the positive ESD voltage is clamped to the zener voltage.

## Features

- ★ 5 channels of ESD protection
- ★ Provides ESD protection to IEC61000-4-2 level 4
  - $\pm 27\text{kV}$  air discharge
  - $\pm 15\text{kV}$  contact discharge
- ★ Channel I/O to GND capacitance:  $0.4\text{pF}$ (Max)
- ★ Channel I/O to I/O capacitance:  $0.8\text{pF}$ (Max)
- ★ Low clamping voltage
- ★ Low operating voltage
- ★ Improved zener structure
- ★ Optimized package for easy high speed data lines PCB layout
- ★ RoHS compliant.



SOT-23-6L



Circuit Diagram

## Ordering information

| Product ID    | Pack      | Qty(PCS) |
|---------------|-----------|----------|
| HSP3012-04HTG | SOT-23-6L | 3000     |

## Absolute Ratings( $T_{amb} = 25^{\circ}\text{C}$ )

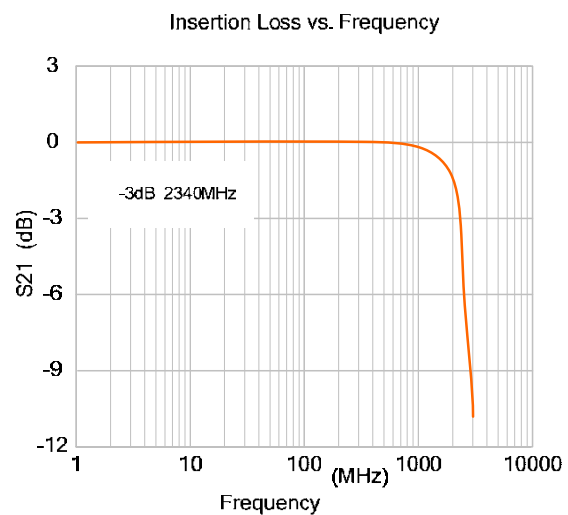
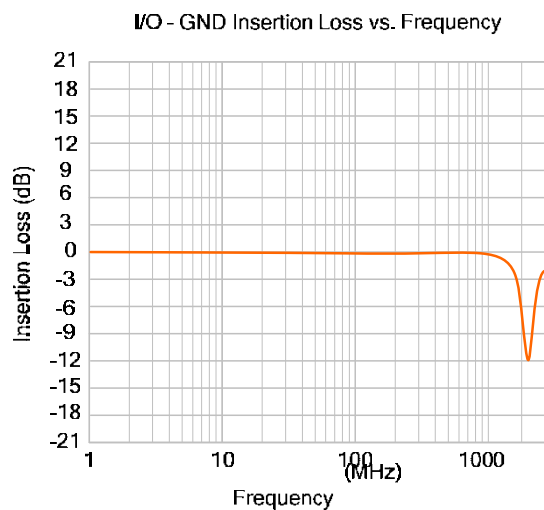
| Characteristics                         | Symbol     | Ratings           | Unit               |
|-----------------------------------------|------------|-------------------|--------------------|
| Peak Pulse Power(8/20 $\mu\text{s}$ )   | $P_{PP}$   | 55                | W                  |
| Peak Pulse Current(8/20 $\mu\text{s}$ ) | $I_{PP}$   | 4                 | A                  |
| ESD per IEC 61000-4-2(Air)              | $V_{ESD1}$ | $\pm 20\text{kV}$ | kV                 |
| ESD per IEC 61000-4-2(Contact)          | $V_{ESD2}$ | $\pm 15\text{kV}$ | kV                 |
| Operating Temperature Range             | $T_{opr}$  | $-55 \sim +125$   | $^{\circ}\text{C}$ |
| Storage Temperature Range               | $T_{stg}$  | $-55 \sim +150$   | $^{\circ}\text{C}$ |

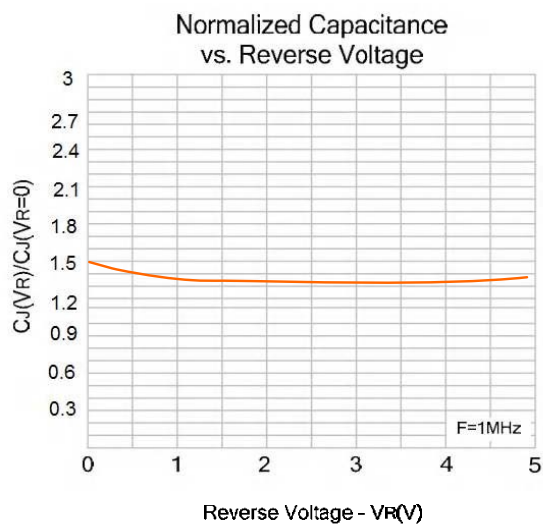
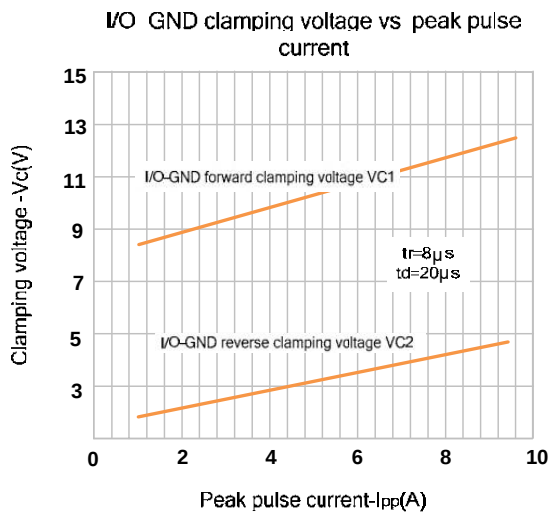
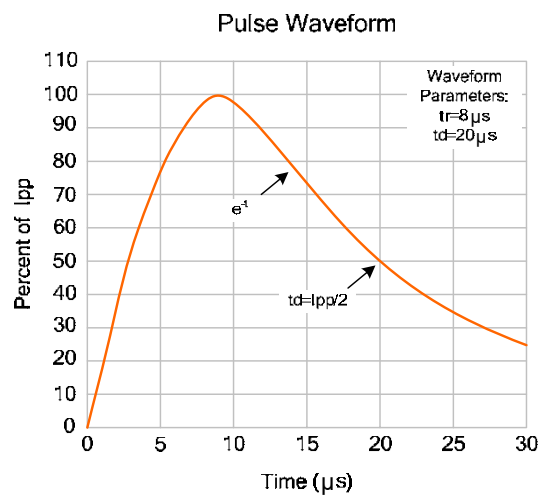


### Electrical Characteristics (T<sub>amb</sub>=25°C)

| Characteristics                          | Symbol           | Test Conditions                                                                        | Min. | Typ. | Max. | Unit |
|------------------------------------------|------------------|----------------------------------------------------------------------------------------|------|------|------|------|
| Reverse Working Voltage                  | V <sub>RWM</sub> | Any I/O pin to GND                                                                     |      |      | 5    | V    |
| Reverse Breakdown Voltage                | V <sub>BR</sub>  | I <sub>T</sub> =1mA;<br>Any I/O pin to GND                                             | 6    |      |      | V    |
| Reverse Leakage Current                  | I <sub>R</sub>   | V <sub>RWM</sub> =5V, T=25°C;<br>Any I/O pin to GND                                    |      |      | 1    | μA   |
| Positive Clamping Voltage                | V <sub>C1</sub>  | I <sub>PP</sub> =4A, t <sub>P</sub> =8/20 μs;<br>Positive pulse;<br>Any I/O pin to GND |      | 8.5  | 12.0 | V    |
| Negative Clamping Voltage                | V <sub>C2</sub>  | I <sub>PP</sub> =4A, t <sub>P</sub> =8/20 μs;<br>Negative pulse;<br>Any I/O pin to GND |      | 1.8  |      | V    |
| Junction Capacitance Between Channel     | C <sub>J1</sub>  | V <sub>R</sub> =0V, f=1MHz;<br>Between I/O pins                                        |      | 0.3  | 0.4  | pF   |
| Junction Capacitance Between I/O And GND | C <sub>J2</sub>  | V <sub>R</sub> =0V, f=1MHz;<br>Any I/O pin to GND                                      |      | 0.6  | 0.8  | pF   |

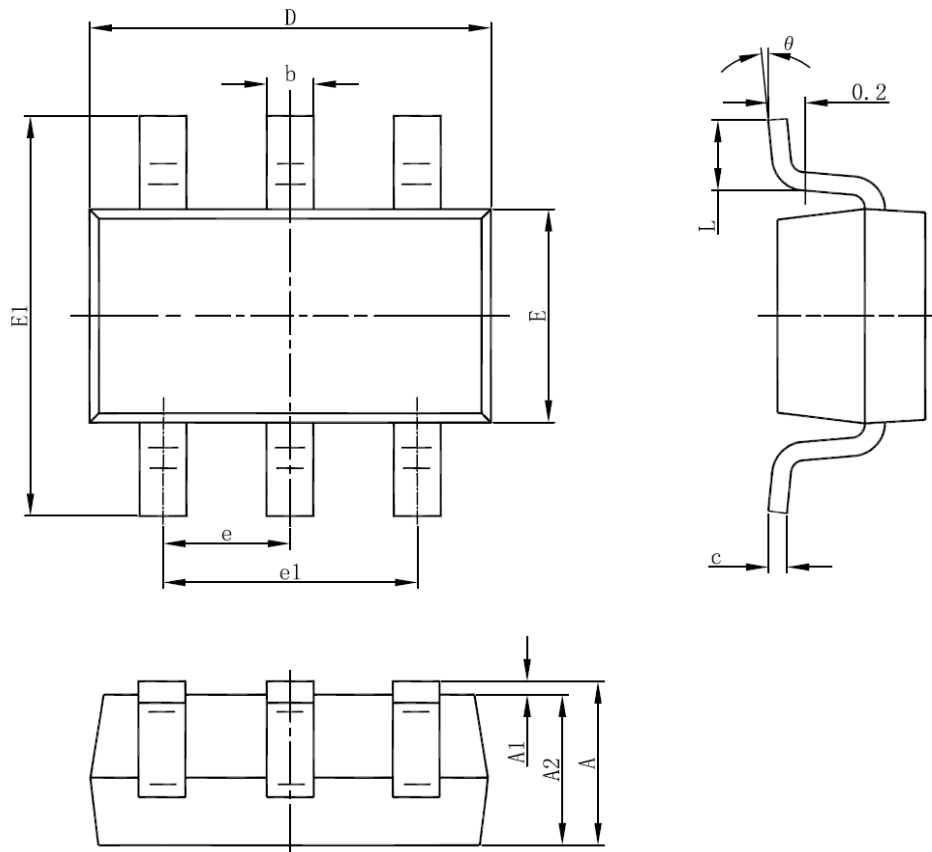
### Typical Characteristics







## SOT-23-6L Package Information



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min                       | Max   | Min                  | Max   |
| A        | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1       | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2       | 1.050                     | 1.150 | 0.041                | 0.045 |
| b        | 0.300                     | 0.500 | 0.012                | 0.020 |
| c        | 0.100                     | 0.200 | 0.004                | 0.008 |
| D        | 2.820                     | 3.020 | 0.111                | 0.119 |
| E        | 1.500                     | 1.700 | 0.059                | 0.067 |
| E1       | 2.650                     | 2.950 | 0.104                | 0.116 |
| e        | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1       | 1.800                     | 2.000 | 0.071                | 0.079 |
| L        | 0.300                     | 0.600 | 0.012                | 0.024 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |



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