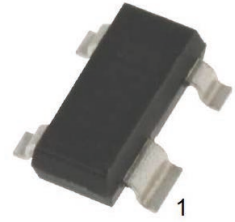


## Features

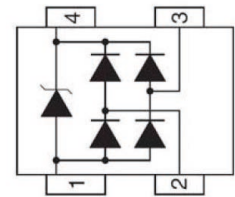
- Ultra low capacitance: 0.8pF typical
- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- 4-pin SOT-143 package
- Protects two data lines and one power line
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
  - Air discharge:  $\pm 25\text{kV}$
  - Contact discharge:  $\pm 20\text{kV}$
  - IEC61000-4-5 (Lightning) 6A (8/20 $\mu\text{s}$ )
- RoHS compliant



**SOT-143**

## Applications

- Cellular handsets and accessories
- Notebooks and handhelds
- Personal digital assistants
- Portable instrumentation
- Digital cameras
- Peripherals
- Audio players, keypads, side keys, LCD
- USB 2.0



**Schematic Diagram**

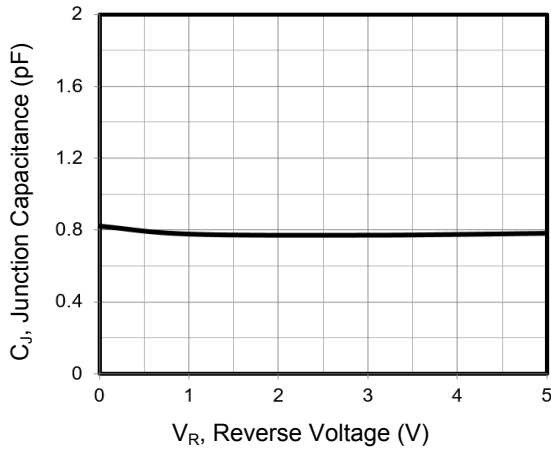
## Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter                                                       | Symbol    | Value       | Unit             |
|-----------------------------------------------------------------|-----------|-------------|------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ ), VCC Pin to Ground       | $P_{PK}$  | 160         | W                |
| Peak Pulse Power (8/20 $\mu\text{s}$ ), any I/O Pin to Ground   |           | 90          | W                |
| Peak Pulse Current (8/20 $\mu\text{s}$ ), VCC Pin to Ground     | $I_{PP}$  | 10          | A                |
| Peak Pulse Current (8/20 $\mu\text{s}$ ), any I/O Pin to Ground |           | 6           | A                |
| ESD per IEC 61000-4-2 (Air)                                     | $V_{ESD}$ | $\pm 25$    | kV               |
| ESD per IEC 61000-4-2 (Contact)                                 |           | $\pm 20$    |                  |
| Operating Temperature Range                                     | $T_J$     | -55 to +125 | $^\circ\text{C}$ |
| Storage Temperature Range                                       | $T_{STG}$ | -55 to +150 | $^\circ\text{C}$ |

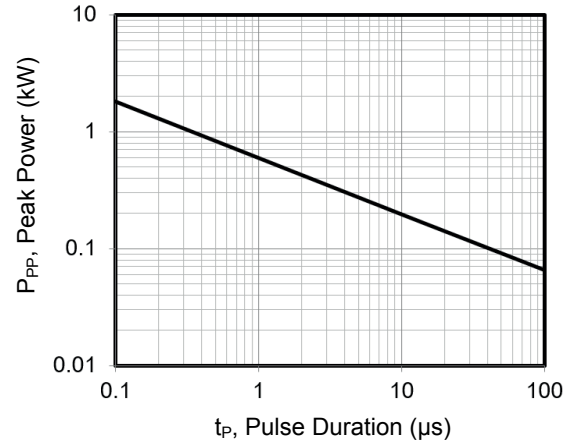
## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter               | Symbol    | Test Condition                                                         | Min | Typ | Max | Unit          |
|-------------------------|-----------|------------------------------------------------------------------------|-----|-----|-----|---------------|
| Reverse Working Voltage | $V_{RWM}$ | Any I/O pin to ground                                                  | -   | -   | 5   | V             |
| Breakdown Voltage       | $V_{BR}$  | $I_T=1\text{mA}$ , any I/O pin to ground                               | 6   | -   | -   | V             |
| Reverse Leakage Current | $I_R$     | $V_{RWM}=5\text{V}$ , any I/O pin to ground                            | -   | -   | 0.5 | $\mu\text{A}$ |
|                         |           | $V_{RWM}=3\text{V}$ , any I/O pin to ground                            | -   | 1   | 100 | nA            |
| Forward Voltage         | $V_F$     | $I_F=1\text{mA}$ , ground to any I/O pin                               | -   | 0.7 | -   | V             |
| Clamping Voltage        | $V_C$     | $I_{PP}=1\text{A}$ (8 x 20 $\mu\text{s}$ pulse), any I/O pin to ground | -   | -   | 10  | V             |
|                         |           | $I_{PP}=6\text{A}$ (8 x 20 $\mu\text{s}$ pulse), any I/O pin to ground | -   | -   | 15  | V             |
|                         |           | $I_{PP}=10\text{A}$ (8 x 20 $\mu\text{s}$ pulse), VCC (pin4) to ground | -   | -   | 16  | V             |
| Junction Capacitance    | $C_J$     | $V_R=0\text{V}$ , f=1MHz, between I/O pins                             | -   | 0.4 | -   | pF            |
|                         |           | $V_R=0\text{V}$ , f=1MHz, any I/O pin to ground                        | -   | 0.8 | -   | pF            |

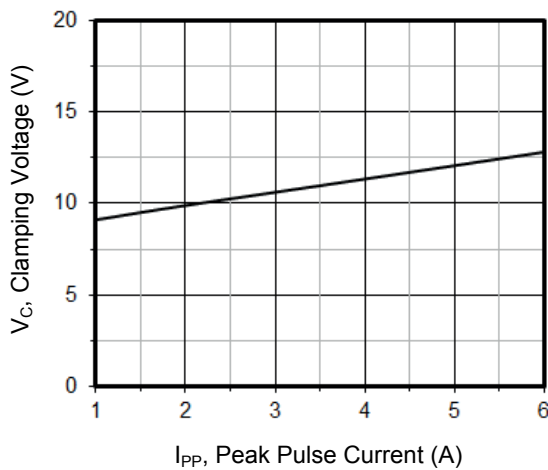
**Typical Performance Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise Specified)



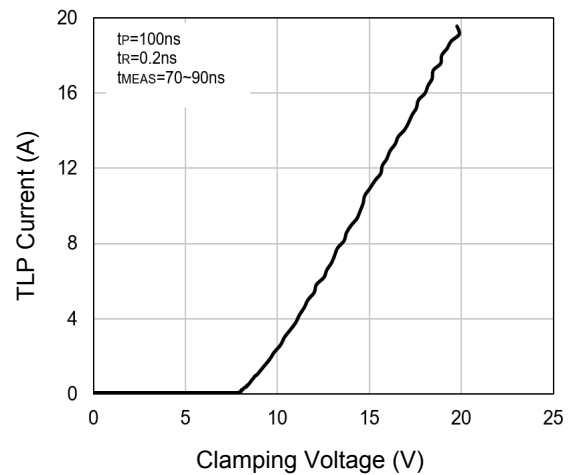
**Figure 1. Junction Capacitance vs. Reverse Voltage**



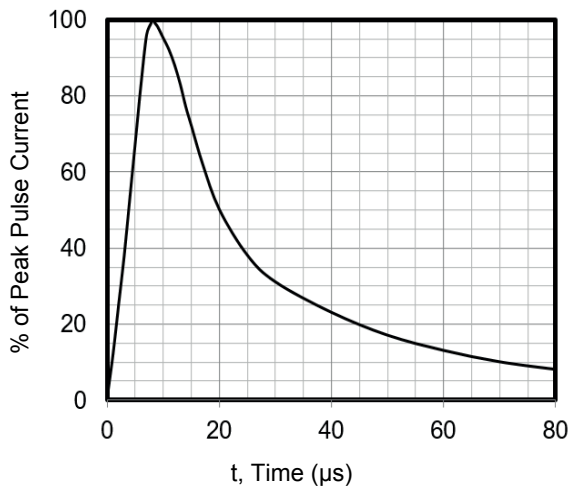
**Figure 2. Peak Pulse Power vs. Pulse Time**



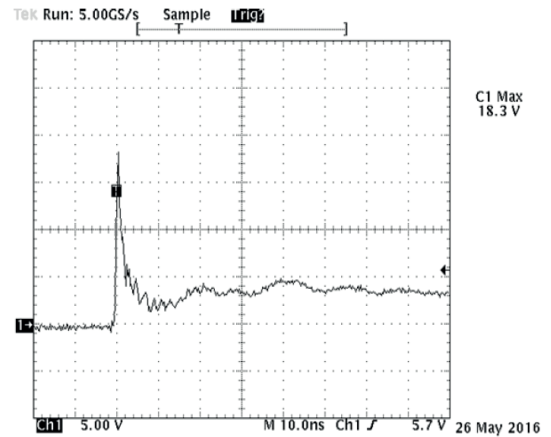
**Figure 3. Clamping Voltage vs. Peak Pulse Current**



**Figure 4. TLP Curve**



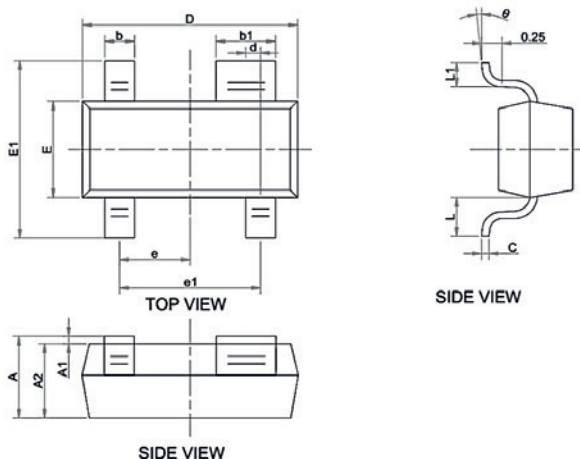
**Figure 5. 8 X 20 $\mu$ s Pulse Waveform**



Note: Data is Taken with a 10x Attenuator

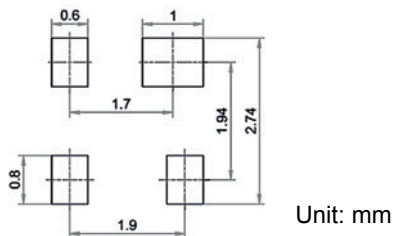
**Figure 6. ESD Clamping Voltage**  
**8kV Contact per IEC61000-4-2**

## Package Outline Dimensions (SOT-143)



| Symbol | Dimensions In Millimeters |      | Dimensions In Inches |       |
|--------|---------------------------|------|----------------------|-------|
|        | Min.                      | Max. | Min.                 | Max.  |
| A      | 0.90                      | 1.15 | 0.035                | 0.045 |
| A1     | 0.00                      | 0.10 | 0.000                | 0.004 |
| A2     | 0.90                      | 1.05 | 0.035                | 0.041 |
| b      | 0.30                      | 0.50 | 0.012                | 0.020 |
| b1     | 0.75                      | 0.90 | 0.030                | 0.035 |
| c      | 0.08                      | 0.15 | 0.003                | 0.006 |
| D      | 2.80                      | 3.00 | 0.110                | 0.118 |
| d      | 0.20 Typ                  |      | 0.008 Typ            |       |
| E      | 1.20                      | 1.40 | 0.047                | 0.055 |
| E1     | 2.25                      | 2.55 | 0.089                | 0.100 |
| e      | 0.95 Typ                  |      | 0.037 Typ            |       |
| e1     | 1.80                      | 2.00 | 0.071                | 0.079 |
| L      | 0.55 REF                  |      | 0.022 REF            |       |
| L1     | 0.30                      | 0.50 |                      |       |
| θ      | 0°                        | 8°   | 0°                   | 8°    |

## Recommended Pad Layout



## Order Information

| Device     | Package | Marking | Carrier     | Quantity         |
|------------|---------|---------|-------------|------------------|
| GSELP5U004 | SOT-143 | S521    | Tape & Reel | 3,000 pcs / Reel |