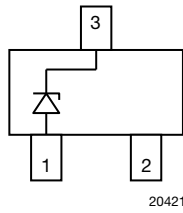
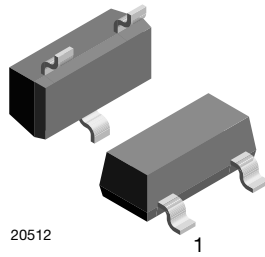


## Single-Line ESD Protection in SOT-23



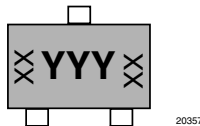
20421



20512

1

### MARKING (example only)



20357

YYY = type code (see table below)

XX = date code

### DESIGN SUPPORT TOOLS [click logo to get started](#)



### FEATURES

- Single-line ESD protection device
- ESD immunity acc. IEC 61000-4-2  
± 30 kV contact discharge  
± 30 kV air discharge
- ESD capability according to AEC-Q101:  
human body model: class H3B: > 8 kV
- Space saving SOT-23 package
- e3 - Sn
- AEC-Q101 qualified available
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### ORDERING INFORMATION

| PART NUMBER (EXAMPLE) | ENVIRONMENTAL AND QUALITY CODE |                                 |       |            | PACKAGING CODE                            |   | ORDERING CODE (EXAMPLE) |
|-----------------------|--------------------------------|---------------------------------|-------|------------|---|---|-------------------------|
|                       | AEC-Q101 QUALIFIED             | RoHS-COMPLIANT + LEAD (Pb)-FREE |       | TIN PLATED | 3K PER 7" REEL (8 mm TAPE), 15K/BOX = MOQ | 10K PER 13" REEL (8 mm TAPE), 10K/BOX = MOQ |                         |
|                       |                                | STANDARD                        | GREEN |            |   |   |                         |
| GSOT05-               |                                | E                               |       | 3          | -08                                       |   | GSOT05-E3-08            |
| GSOT05-               |                                |                                 | G     | 3          | -08                                       |   | GSOT05-G3-08            |
| GSOT05-               | H                              | E                               |       | 3          | -08                                       |   | GSOT05-HE3-08           |
| GSOT05-               | H                              |                                 | G     | 3          | -08                                       |   | GSOT05-HG3-08           |
| GSOT05-               |                                | E                               |       | 3          |   | -18   | GSOT05-E3-18            |
| GSOT05-               |                                |                                 | G     | 3          |   | -18   | GSOT05-G3-18            |
| GSOT05-               | H                              | E                               |       | 3          |   | -18   | GSOT05-HE3-18           |
| GSOT05-               | H                              |                                 | G     | 3          |   | -18   | GSOT05-HG3-18           |

### PACKAGE DATA

| DEVICE NAME | PACKAGE NAME | TYPE CODE | ENVIRONMENTAL STATUS | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL        | SOLDERING CONDITIONS     |
|-------------|--------------|-----------|----------------------|--------|--------------------------------------|-----------------------------------|--------------------------|
| GSOT03      | SOT-23       | 03        | Standard             | 8.8 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |
|             |              | 03G       | Green                | 8.1 mg |                                      |                                   |                          |
| GSOT04      | SOT-23       | 04        | Standard             | 8.8 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |
|             |              | 04G       | Green                | 8.1 mg |                                      |                                   |                          |
| GSOT05      | SOT-23       | 05        | Standard             | 8.8 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |
|             |              | 05G       | Green                | 8.1 mg |                                      |                                   |                          |
| GSOT08      | SOT-23       | 08        | Standard             | 8.8 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |
|             |              | 08G       | Green                | 8.1 mg |                                      |                                   |                          |
| GSOT12      | SOT-23       | 12        | Standard             | 8.8 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |
|             |              | 12G       | Green                | 8.1 mg |                                      |                                   |                          |
| GSOT15      | SOT-23       | 15        | Standard             | 8.8 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |
|             |              | 15G       | Green                | 8.1 mg |                                      |                                   |                          |
| GSOT24      | SOT-23       | 24        | Standard             | 8.8 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |
|             |              | 24G       | Green                | 8.1 mg |                                      |                                   |                          |
| GSOT36      | SOT-23       | 36        | Standard             | 8.8 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |
|             |              | 36G       | Green                | 8.1 mg |                                      |                                   |                          |



| ABSOLUTE MAXIMUM RATINGS GSOT03 |  |           |             |                    |
|---------------------------------|--|-----------|-------------|--------------------|
| PARAMETER                       | TEST CONDITIONS  | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current              | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $I_{PPM}$ | 30          | A                  |
| Peak pulse power                | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $P_{PP}$  | 369         | W                  |
| ESD immunity                    | Contact discharge acc. IEC 61000-4-2; 10 pulses                          | $V_{ESD}$ | $\pm 30$    | kV                 |
|                                 | Air discharge acc. IEC 61000-4-2; 10 pulses                              |           | $\pm 30$    | kV                 |
| Operating temperature           | Junction temperature   | $T_J$     | -40 to +125 | $^{\circ}\text{C}$ |
| Storage temperature             |  | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |

| ABSOLUTE MAXIMUM RATINGS GSOT04 |  |           |             |                    |
|---------------------------------|--|-----------|-------------|--------------------|
| PARAMETER                       | TEST CONDITIONS  | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current              | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $I_{PPM}$ | 30          | A                  |
| Peak pulse power                | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $P_{PP}$  | 429         | W                  |
| ESD immunity                    | Contact discharge acc. IEC 61000-4-2; 10 pulses                          | $V_{ESD}$ | $\pm 30$    | kV                 |
|                                 | Air discharge acc. IEC 61000-4-2; 10 pulses                              |           | $\pm 30$    | kV                 |
| Operating temperature           | Junction temperature   | $T_J$     | -40 to +125 | $^{\circ}\text{C}$ |
| Storage temperature             |  | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |

| ABSOLUTE MAXIMUM RATINGS GSOT05 |  |           |             |                    |
|---------------------------------|--|-----------|-------------|--------------------|
| PARAMETER                       | TEST CONDITIONS  | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current              | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $I_{PPM}$ | 30          | A                  |
| Peak pulse power                | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $P_{PP}$  | 480         | W                  |
| ESD immunity                    | Contact discharge acc. IEC 61000-4-2; 10 pulses                          | $V_{ESD}$ | $\pm 30$    | kV                 |
|                                 | Air discharge acc. IEC 61000-4-2; 10 pulses                              |           | $\pm 30$    | kV                 |
| Operating temperature           | Junction temperature   | $T_J$     | -40 to +125 | $^{\circ}\text{C}$ |
| Storage temperature             |  | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |

| ABSOLUTE MAXIMUM RATINGS GSOT08 |  |           |             |                    |
|---------------------------------|--|-----------|-------------|--------------------|
| PARAMETER                       | TEST CONDITIONS  | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current              | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $I_{PPM}$ | 18          | A                  |
| Peak pulse power                | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $P_{PP}$  | 345         | W                  |
| ESD immunity                    | Contact discharge acc. IEC 61000-4-2; 10 pulses                          | $V_{ESD}$ | $\pm 30$    | kV                 |
|                                 | Air discharge acc. IEC 61000-4-2; 10 pulses                              |           | $\pm 30$    | kV                 |
| Operating temperature           | Junction temperature   | $T_J$     | -40 to +125 | $^{\circ}\text{C}$ |
| Storage temperature             |  | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |



| ABSOLUTE MAXIMUM RATINGS GSOT12 |  |           |             |                    |
|---------------------------------|--|-----------|-------------|--------------------|
| PARAMETER                       | TEST CONDITIONS  | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current              | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $I_{PPM}$ | 12          | A                  |
| Peak pulse power                | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $P_{PP}$  | 312         | W                  |
| ESD immunity                    | Contact discharge acc. IEC 61000-4-2; 10 pulses                          | $V_{ESD}$ | $\pm 30$    | kV                 |
|                                 | Air discharge acc. IEC 61000-4-2; 10 pulses                              |           | $\pm 30$    | kV                 |
| Operating temperature           | Junction temperature   | $T_J$     | -40 to +125 | $^{\circ}\text{C}$ |
| Storage temperature             |  | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |

| ABSOLUTE MAXIMUM RATINGS GSOT15 |  |           |             |                    |
|---------------------------------|--|-----------|-------------|--------------------|
| PARAMETER                       | TEST CONDITIONS  | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current              | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $I_{PPM}$ | 8           | A                  |
| Peak pulse power                | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $P_{PP}$  | 230         | W                  |
| ESD immunity                    | Contact discharge acc. IEC 61000-4-2; 10 pulses                          | $V_{ESD}$ | $\pm 30$    | kV                 |
|                                 | Air discharge acc. IEC 61000-4-2; 10 pulses                              |           | $\pm 30$    | kV                 |
| Operating temperature           | Junction temperature   | $T_J$     | -40 to +125 | $^{\circ}\text{C}$ |
| Storage temperature             |  | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |

| ABSOLUTE MAXIMUM RATINGS GSOT24 |  |           |             |                    |
|---------------------------------|--|-----------|-------------|--------------------|
| PARAMETER                       | TEST CONDITIONS  | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current              | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $I_{PPM}$ | 5           | A                  |
| Peak pulse power                | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $P_{PP}$  | 235         | W                  |
| ESD immunity                    | Contact discharge acc. IEC 61000-4-2; 10 pulses                          | $V_{ESD}$ | $\pm 30$    | kV                 |
|                                 | Air discharge acc. IEC 61000-4-2; 10 pulses                              |           | $\pm 30$    | kV                 |
| Operating temperature           | Junction temperature   | $T_J$     | -40 to +125 | $^{\circ}\text{C}$ |
| Storage temperature             |  | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |

| ABSOLUTE MAXIMUM RATINGS GSOT36 |  |           |             |                    |
|---------------------------------|--|-----------|-------------|--------------------|
| PARAMETER                       | TEST CONDITIONS  | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current              | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $I_{PPM}$ | 3.5         | A                  |
| Peak pulse power                | Pin 3 to 1<br>acc. IEC 61000-4-5, $t_p = 8/20 \mu\text{s}$ ; single shot | $P_{PP}$  | 248         | W                  |
| ESD immunity                    | Contact discharge acc. IEC 61000-4-2; 10 pulses                          | $V_{ESD}$ | $\pm 30$    | kV                 |
|                                 | Air discharge acc. IEC 61000-4-2; 10 pulses                              |           | $\pm 30$    | kV                 |
| Operating temperature           | Junction temperature   | $T_J$     | -40 to +125 | $^{\circ}\text{C}$ |
| Storage temperature             |  | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |

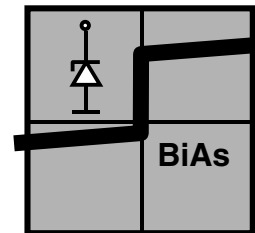
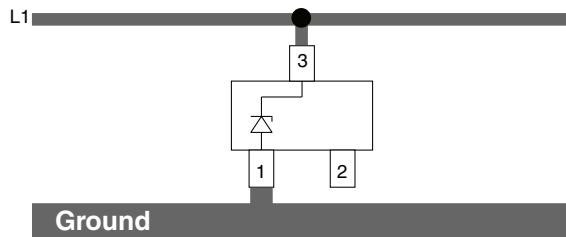
**BiAs-MODE** (1-line Bidirectional Asymmetrical protection mode)

With the GSOTxx one signal- or data-lines (L1) can be protected against voltage transients. With pin 1 connected to ground and pin 3 connected to a signal- or data-line which has to be protected. As long as the voltage level on the data- or signal-line is between 0 V (ground level) and the specified maximum reverse working voltage ( $V_{RWM}$ ) the protection diode between pin 1 and pin 3 offers a high isolation to the ground line. The protection device behaves like an open switch.

As soon as any positive transient voltage signal exceeds the breakdown voltage level of the protection diode, the diode becomes conductive and shorts the transient current to ground. Now the protection device behaves like a closed switch. The clamping voltage ( $V_C$ ) is defined by the breakdown voltage ( $V_{BR}$ ) level plus the voltage drop at the series impedance (resistance and inductance) of the protection diode.

Any negative transient signal will be clamped accordingly. The negative transient current is flowing in the forward direction through the protection diode. The low forward voltage ( $V_F$ ) clamps the negative transient close to the ground level.

Due to the different clamping levels in forward and reverse direction the GSOTxx clamping behavior is Bidirectional and Asymmetrical (BiAs).



20422

| <b>ELECTRICAL CHARACTERISTICS GSOT03</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)<br>between pin 3 and pin 1 |  |               |      |      |      |               |
|--|--|---------------|------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS/REMARKS                      | SYMBOL        | MIN. | TYP. | MAX. | UNIT          |
| Protection paths   | Number of lines which can be protected       | $N_{channel}$ | -    | -    | 1    | lines         |
| Reverse stand-off voltage  | Max. reverse working voltage                 | $V_{RWM}$     | -    | -    | 3.3  | V             |
| Reverse voltage  | at $I_R = 100\text{ }\mu\text{A}$            | $V_R$         | 3.3  | -    | -    | V             |
| Reverse current  | at $V_R = 3.3\text{ V}$                      | $I_R$         | -    | -    | 100  | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$                       | $V_{BR}$      | 4    | 4.6  | 5.5  | V             |
| Reverse clamping voltage   | at $I_{PP} = 1\text{ A}$                     | $V_C$         | -    | 5.7  | 7.5  | V             |
|  | at $I_{PP} = I_{PPM} = 30\text{ A}$          |               | -    | 10   | 12.3 | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$                     | $V_F$         | -    | 1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 30\text{ A}$          |               | -    | 4.5  | -    | V             |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$   | $C_D$         | -    | 420  | 600  | pF            |
|  | at $V_R = 1.6\text{ V}$ ; $f = 1\text{ MHz}$ |               | -    | 260  | -    | pF            |

| <b>ELECTRICAL CHARACTERISTICS GSOT04</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)<br>between pin 3 and pin 1 |  |               |      |      |      |               |
|--|--|---------------|------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS/REMARKS                    | SYMBOL        | MIN. | TYP. | MAX. | UNIT          |
| Protection paths   | Number of lines which can be protected     | $N_{channel}$ | -    | -    | 1    | lines         |
| Reverse stand-off voltage  | Max. reverse working voltage               | $V_{RWM}$     | -    | -    | 4    | V             |
| Reverse voltage  | at $I_R = 20\text{ }\mu\text{A}$           | $V_R$         | 4    | -    | -    | V             |
| Reverse current  | at $V_R = 4\text{ V}$                      | $I_R$         | -    | -    | 20   | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$                     | $V_{BR}$      | 5    | 6.1  | 7    | V             |
| Reverse clamping voltage   | at $I_{PP} = 1\text{ A}$                   | $V_C$         | -    | 7.5  | 9    | V             |
|  | at $I_{PP} = I_{PPM} = 30\text{ A}$        |               | -    | 11.2 | 14.3 | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$                   | $V_F$         | -    | 1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 30\text{ A}$        |               | -    | 4.5  | -    | V             |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$ | $C_D$         | -    | 310  | 450  | pF            |
|  | at $V_R = 2\text{ V}$ ; $f = 1\text{ MHz}$ |               | -    | 200  | -    | pF            |



| <b>ELECTRICAL CHARACTERISTICS GSOT05</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)<br>between pin 3 and pin 1 |  |               |      |      |      |               |
|--|--|---------------|------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS/REMARKS                      | SYMBOL        | MIN. | TYP. | MAX. | UNIT          |
| Protection paths   | Number of lines which can be protected       | $N_{channel}$ | -    | -    | 1    | lines         |
| Reverse stand-off voltage  | Max. reverse working voltage                 | $V_{RWM}$     | -    | -    | 5    | V             |
| Reverse voltage  | at $I_R = 10\text{ }\mu\text{A}$             | $V_R$         | 5    | -    | -    | V             |
| Reverse current  | at $V_R = 5\text{ V}$                        | $I_R$         | -    | -    | 10   | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$                       | $V_{BR}$      | 6    | 6.8  | 8    | V             |
| Reverse clamping voltage   | at $I_{PP} = 1\text{ A}$                     | $V_C$         | -    | 7    | 8.7  | V             |
|  | at $I_{PP} = I_{PPM} = 30\text{ A}$          |               | -    | 12   | 16   | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$                     | $V_F$         | -    | 1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 30\text{ A}$          |               | -    | 4.5  | -    | V             |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$   | $C_D$         | -    | 260  | 350  | pF            |
|  | at $V_R = 2.5\text{ V}$ ; $f = 1\text{ MHz}$ |               | -    | 150  | -    | pF            |

| <b>ELECTRICAL CHARACTERISTICS GSOT08</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)<br>between pin 3 and pin 1 |  |               |      |      |      |               |
|--|--|---------------|------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS/REMARKS                    | SYMBOL        | MIN. | TYP. | MAX. | UNIT          |
| Protection paths   | Number of lines which can be protected     | $N_{channel}$ | -    | -    | 1    | lines         |
| Reverse stand-off voltage  | Max. reverse working voltage               | $V_{RWM}$     | -    | -    | 8    | V             |
| Reverse voltage  | at $I_R = 5\text{ }\mu\text{A}$            | $V_R$         | 8    | -    | -    | V             |
| Reverse current  | at $V_R = 8\text{ V}$                      | $I_R$         | -    | -    | 5    | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$                     | $V_{BR}$      | 9    | 10   | 11   | V             |
| Reverse clamping voltage   | at $I_{PP} = 1\text{ A}$                   | $V_C$         | -    | 10.7 | 13   | V             |
|  | at $I_{PP} = I_{PPM} = 18\text{ A}$        |               | -    | 15.2 | 19.2 | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$                   | $V_F$         | -    | 1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 18\text{ A}$        |               | -    | 3    | -    | V             |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$ | $C_D$         | -    | 160  | 250  | pF            |
|  | at $V_R = 4\text{ V}$ ; $f = 1\text{ MHz}$ |               | -    | 80   | -    | pF            |

| <b>ELECTRICAL CHARACTERISTICS GSOT12</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)<br>between pin 3 and pin 1 |  |               |      |      |      |               |
|--|--|---------------|------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS/REMARKS                    | SYMBOL        | MIN. | TYP. | MAX. | UNIT          |
| Protection paths   | Number of lines which can be protected     | $N_{channel}$ | -    | -    | 1    | lines         |
| Reverse stand-off voltage  | Max. reverse working voltage               | $V_{RWM}$     | -    | -    | 12   | V             |
| Reverse voltage  | at $I_R = 1\text{ }\mu\text{A}$            | $V_R$         | 12   | -    | -    | V             |
| Reverse current  | at $V_R = 12\text{ V}$                     | $I_R$         | -    | -    | 1    | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$                     | $V_{BR}$      | 13.5 | 15   | 16.5 | V             |
| Reverse clamping voltage   | at $I_{PP} = 1\text{ A}$                   | $V_C$         | -    | 15.4 | 18.7 | V             |
|  | at $I_{PP} = I_{PPM} = 12\text{ A}$        |               | -    | 21.2 | 26   | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$                   | $V_F$         | -    | 1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 12\text{ A}$        |               | -    | 2.2  | -    | V             |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$ | $C_D$         | -    | 115  | 150  | pF            |
|  | at $V_R = 6\text{ V}$ ; $f = 1\text{ MHz}$ |               | -    | 50   | -    | pF            |



| <b>ELECTRICAL CHARACTERISTICS GSOT15</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)<br>between pin 3 and pin 1 |  |               |      |      |      |               |
|--|--|---------------|------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS/REMARKS                      | SYMBOL        | MIN. | TYP. | MAX. | UNIT          |
| Protection paths   | Number of lines which can be protected       | $N_{channel}$ | -    | -    | 1    | lines         |
| Reverse stand-off voltage  | Max. reverse working voltage                 | $V_{RWM}$     | -    | -    | 15   | V             |
| Reverse voltage  | at $I_R = 1\text{ }\mu\text{A}$              | $V_R$         | 15   | -    | -    | V             |
| Reverse current  | at $V_R = 15\text{ V}$                       | $I_R$         | -    | -    | 1    | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$                       | $V_{BR}$      | 16.5 | 18   | 20   | V             |
| Reverse clamping voltage   | at $I_{PP} = 1\text{ A}$                     | $V_C$         | -    | 19.4 | 23.5 | V             |
|  | at $I_{PP} = I_{PPM} = 8\text{ A}$           |               | -    | 24.8 | 28.8 | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$                     | $V_F$         | -    | 1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 8\text{ A}$           |               | -    | 1.8  | -    | V             |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$   | $C_D$         | -    | 90   | 120  | pF            |
|  | at $V_R = 7.5\text{ V}$ ; $f = 1\text{ MHz}$ |               | -    | 35   | -    | pF            |

| <b>ELECTRICAL CHARACTERISTICS GSOT24</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)<br>between pin 3 and pin 1 |   |               |      |      |      |               |
|--|---|---------------|------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS/REMARKS                     | SYMBOL        | MIN. | TYP. | MAX. | UNIT          |
| Protection paths   | Number of lines which can be protected      | $N_{channel}$ | -    | -    | 1    | lines         |
| Reverse stand-off voltage  | Max. reverse working voltage                | $V_{RWM}$     | -    | -    | 24   | V             |
| Reverse voltage  | at $I_R = 1\text{ }\mu\text{A}$             | $V_R$         | 24   | -    | -    | V             |
| Reverse current  | at $V_R = 24\text{ V}$                      | $I_R$         | -    | -    | 1    | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$                      | $V_{BR}$      | 27   | 30   | 33   | V             |
| Reverse clamping voltage   | at $I_{PP} = 1\text{ A}$                    | $V_C$         | -    | 34   | 41   | V             |
|  | at $I_{PP} = I_{PPM} = 5\text{ A}$          |               | -    | 41   | 47   | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$                    | $V_F$         | -    | 1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 5\text{ A}$          |               | -    | 1.4  | -    | V             |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$  | $C_D$         | -    | 65   | 80   | pF            |
|  | at $V_R = 12\text{ V}$ ; $f = 1\text{ MHz}$ |               | -    | 20   | -    | pF            |

| <b>ELECTRICAL CHARACTERISTICS GSOT36</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)<br>between pin 3 and pin 1 |   |               |      |      |      |               |
|--|---|---------------|------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS/REMARKS                     | SYMBOL        | MIN. | TYP. | MAX. | UNIT          |
| Protection paths   | Number of lines which can be protected      | $N_{channel}$ | -    | -    | 1    | lines         |
| Reverse stand-off voltage  | Max. reverse working voltage                | $V_{RWM}$     | -    | -    | 36   | V             |
| Reverse voltage  | at $I_R = 1\text{ }\mu\text{A}$             | $V_R$         | 36   | -    | -    | V             |
| Reverse current  | at $V_R = 36\text{ V}$                      | $I_R$         | -    | -    | 1    | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$                      | $V_{BR}$      | 39   | 43   | 47   | V             |
| Reverse clamping voltage   | at $I_{PP} = 1\text{ A}$                    | $V_C$         | -    | 49   | 60   | V             |
|  | at $I_{PP} = I_{PPM} = 3.5\text{ A}$        |               | -    | 59   | 71   | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$                    | $V_F$         | -    | 1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 3.5\text{ A}$        |               | -    | 1.3  | -    | V             |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$  | $C_D$         | -    | 52   | 65   | pF            |
|  | at $V_R = 18\text{ V}$ ; $f = 1\text{ MHz}$ |               | -    | 12   | -    | pF            |

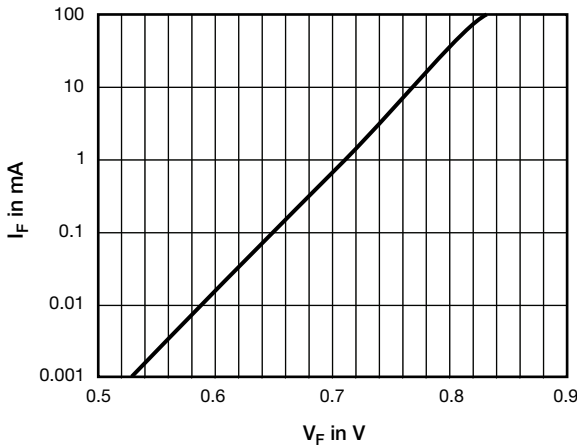


Fig. 1 - Typical Forward Current I<sub>F</sub> vs. Forward Voltage V<sub>F</sub>

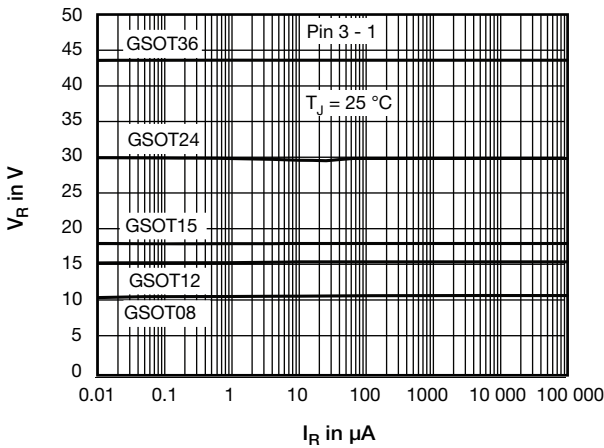


Fig. 2 - Typical Reverse Voltage V<sub>R</sub> vs. Reverse Current I<sub>R</sub>

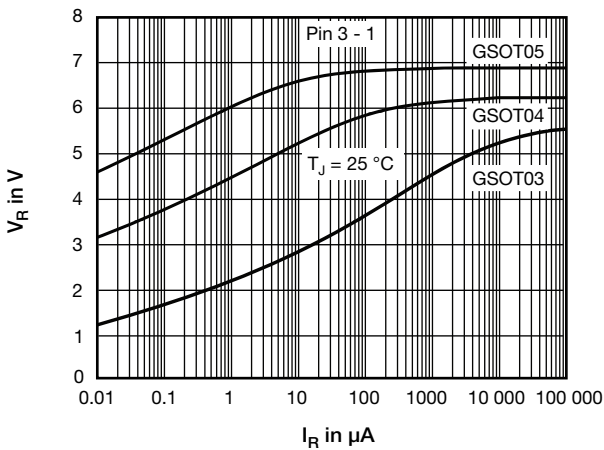
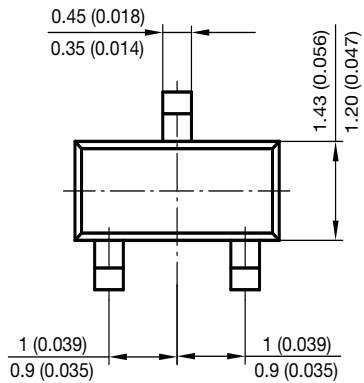
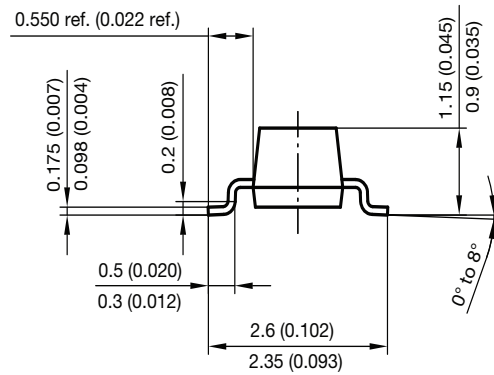
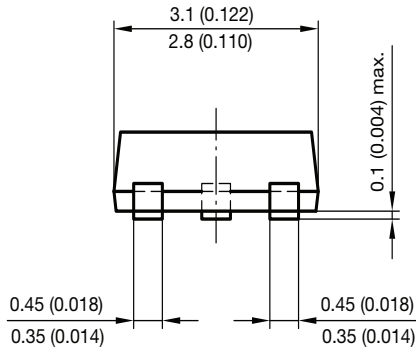


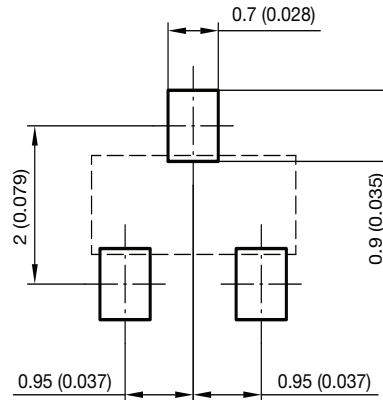
Fig. 3 - Typical Reverse Voltage V<sub>R</sub> vs. Reverse Current I<sub>R</sub>



### PACKAGE DIMENSIONS in millimeters (inches): SOT-23

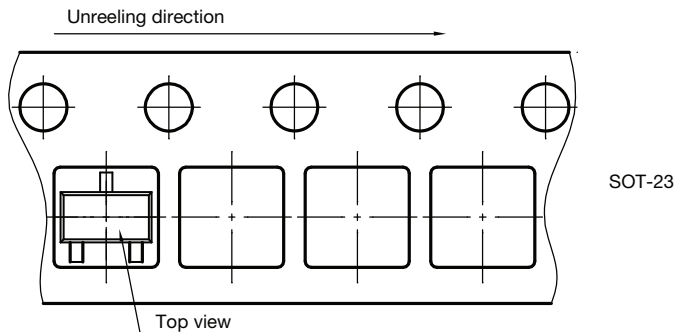


Foot print recommendation:



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 Rev. 8 - Date: 23.Sept.2009  
 17418

Orientation in carrier tape  
 SOT-23  
 S8-V-3929.01-006 (4)  
 04.02.2010  
 22607







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