

ULTRA LOW CAPACITANCE TVS ARRAY



DESCRIPTION

The GBLCxx and GBLCxxC Series are ultra low capacitance transient voltage suppressor arrays, designed to protect applications such as portable electronics and SMART phones. This series is available in both unidirectional and bidirectional configurations and is rated at 350 Watts for an 8/20 μ s waveshape.

The GBLCxx and GBLCxxC Series meets IEC 61000-4-2 (ESD) and IEC 61000-4-4 (EFT) requirements. At higher operating frequencies or faster edge rates, insertion loss and signal integrity are a major concern. This series offers a ultra low capacitance and low leakage current in a miniature SOD-323 package.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
Exceeds Level 4: Handles 10kV Contact & 25kV Air Discharge
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge)
- 350 Watts Peak Pulse Power per Line (tp = 8/20 μ s)
- Replacement for MLV (0805)
- Unidirectional & Bidirectional Configuration
- Protects One Power or I/O Port
- ESD Protection > 25kV
- Low Clamping Voltage
- Available in Multiple Voltages Ranging From 3V to 24V
- Ultra Low Capacitance: 3pF (Typical)
- RoHS Compliant
- REACH Compliant

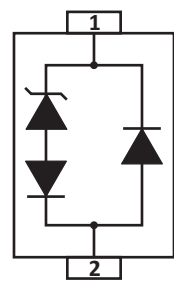
APPLICATIONS

- Ethernet 10/100/1000 Base T
- SMART Phones
- Handheld - Wireless Systems
- USB Interface

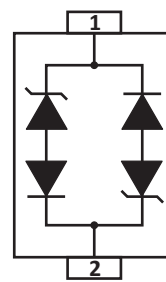
MECHANICAL CHARACTERISTICS

- Molded JEDEC SOD-323 Package
- Approximate Weight: 5 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:
Pure-Tin - Sn, 100: 260-270°C
- 8mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

PIN CONFIGURATIONS



UNIDIRECTIONAL



BIDIRECTIONAL

TYPICAL DEVICE CHARACTERISTICS
MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

| PARAMETER | SYMBOL | VALUE | UNITS |
|---|------------------|------------|-------|
| Peak Pulse Power (tp = 8/20μs) - See Figure 1 | P _{PP} | 350 | Watts |
| Operating Temperature | T _A | -55 to 150 | °C |
| Storage Temperature | T _{STG} | -55 to 150 | °C |

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

| PART NUMBER (Note 1 -2) | DEVICE MARKING | RATED STAND-OFF VOLTAGE | MINIMUM BREAKDOWN VOLTAGE | MAXIMUM CLAMPING VOLTAGE (Fig. 2) | MAXIMUM LEAKAGE CURRENT | TYPICAL CAPACITANCE |
|----------------------------|----------------|--------------------------|-------------------------------------|--------------------------------------|---|-----------------------|
| | | V _{WM} VOLTS | @ 1mA V _(BR) VOLTS | @ IP = 1A V _C VOLTS | @ V _{WM} I _D μA | @ 0V, 1MHz C pF |
| GBLC03 | 3 | 3.3 | 4.0 | 7.0 | 5 | 3 |
| GBLC03C | 3C | 3.3 | 4.0 | 7.0 | 5 | 3 |
| GBLC05 | 5 | 5.0 | 6.0 | 9.8 | 5 | 3 |
| GBLC05C | 5C | 5.0 | 6.0 | 9.8 | 5 | 3 |
| GBLC08 | 8 | 8.0 | 8.5 | 13.4 | 2 | 3 |
| GBLC08C | 8C | 8.0 | 8.5 | 13.4 | 2 | 3 |
| GBLC12 | 2 | 12.0 | 13.3 | 19.0 | 1 | 3 |
| GBLC12C | 2C | 12.0 | 13.3 | 19.0 | 1 | 3 |
| GBLC15 | 6 | 15.0 | 16.7 | 24.0 | 1 | 3 |
| GBLC15C | 6C | 15.0 | 16.7 | 24.0 | 1 | 3 |
| GBLC24 | 4 | 24.0 | 26.7 | 43.0 | 1 | 3 |
| GBLC24C | 4C | 24.0 | 26.7 | 43.0 | 1 | 3 |

NOTES

1. Part numbers with an additional "C" suffix are bidirectional devices, i.e., GBLC05C.
2. Unidirectional Only: Positive potential is applied from pin 1 to 2.

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

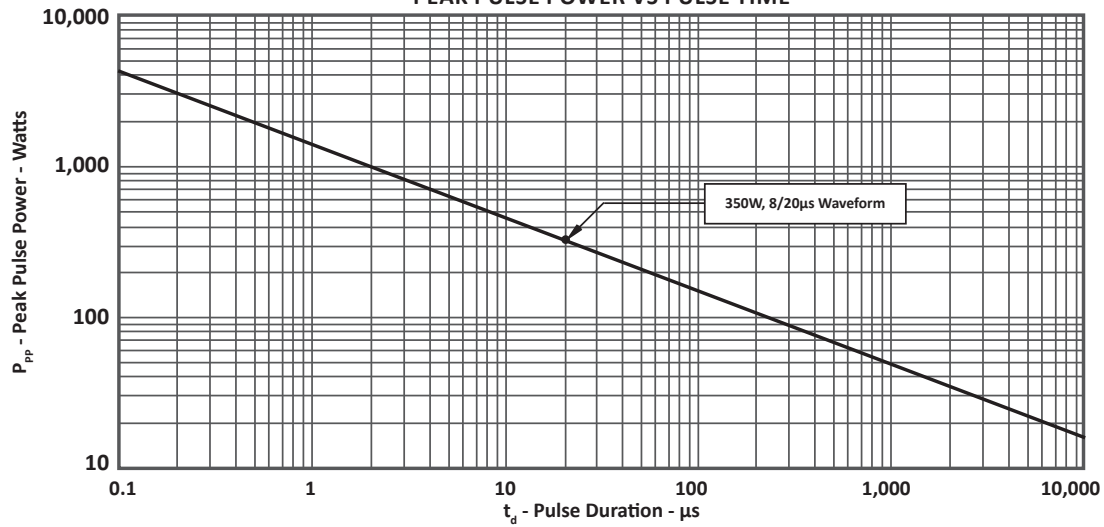
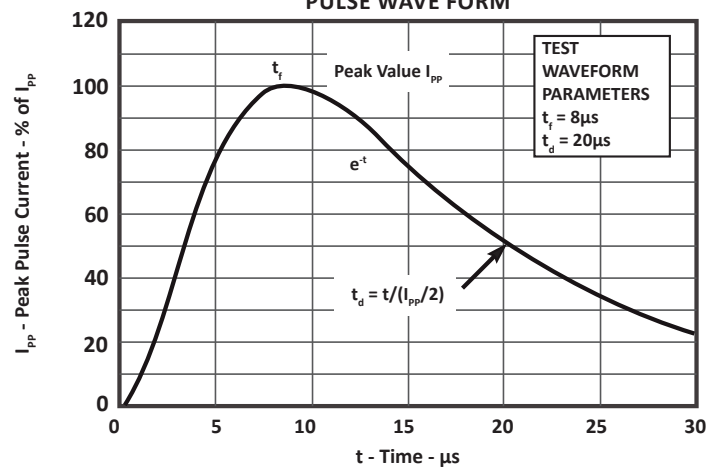
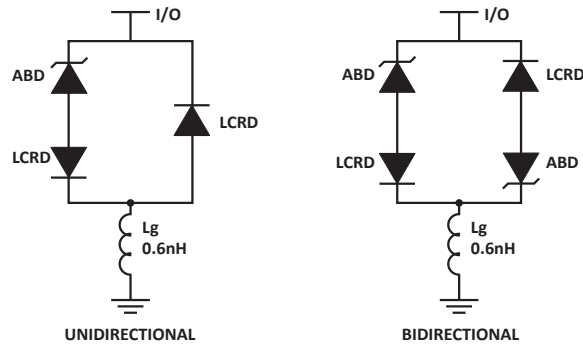


FIGURE 2
PULSE WAVE FORM



SPICE MODEL

FIGURE 1
SPICE MODEL


ABD - Avalanche Breakdown Diode (TVS)
 LCRD: Low Capacitance Rectifier Diode
 Lg - Lead Inductance

TABLE 1 - SPICE PARAMETERS

| PARAMETER | UNIT | ABD(TVS) | LCRD |
|-----------|---------|-------------|-------|
| BV | V | See Table 2 | 200 |
| IBV | μ A | 1 | 0.01 |
| C_{jo} | pF | See Table 2 | 6 |
| I_s | A | See Table 2 | 1E-11 |
| Vj | V | 0.6 | 0.6 |
| M | - | 0.33 | 0.33 |
| N | - | 1 | 1 |
| R_s | Ohms | See Table 2 | 0.75 |
| TT | s | 1E-8 | 1E-9 |
| EG | eV | 1.11 | 1.11 |

TABLE 2 - ABD SPECIFIC SPICE PARAMETERS

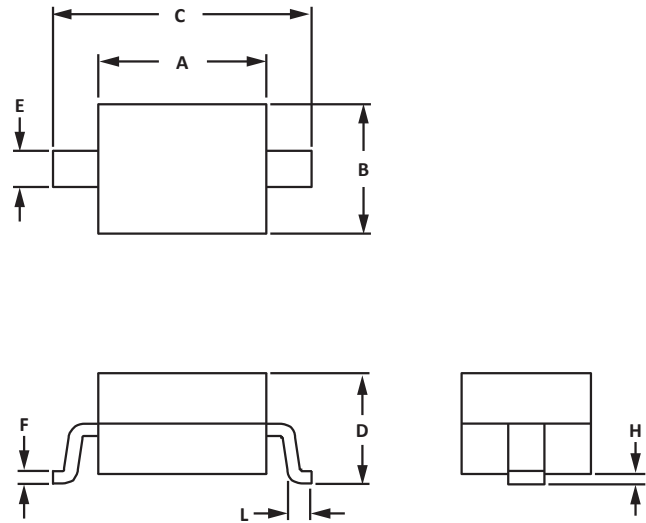
| PART NUMBER | B_V (VOLTS) | C_{jo} (pF) | I_s (AMPS) | R_s (OHMS) |
|------------------|---------------|---------------|--------------|--------------|
| GBLC03 & GBLC03C | 4.0 | 438 | 1E-11 | 0.21 |
| GBLC05 & GBLC05C | 6.0 | 284 | 1E-11 | 0.14 |
| GBLC08 & GBLC08C | 8.5 | 146 | 1E-11 | 0.28 |
| GBLC12 & GBLC12C | 13.3 | 123 | 1E-13 | 0.40 |
| GBLC15 & GBLC15C | 16.7 | 102 | 1E-13 | 0.52 |
| GBLC18 & GBLC18C | 20.0 | 80 | 1E-13 | 0.80 |
| GBLC24 & GBLC24C | 26.7 | 61 | 1E-13 | 1.54 |

SOD-323 PACKAGE INFORMATION
OUTLINE DIMENSIONS

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.60 | 1.90 | 0.063 | 0.075 |
| B | 1.15 | 1.45 | 0.045 | 0.057 |
| C | 2.39 | 2.70 | 0.094 | 0.106 |
| D | 0.80 | 1.10 | 0.031 | 0.043 |
| E | 0.25 | 0.40 | 0.010 | 0.016 |
| F | 0.10 | 0.20 | 0.004 | 0.008 |
| H | - | 0.10 | - | 0.004 |
| L | 0.20 | - | 0.008 | - |

NOTES

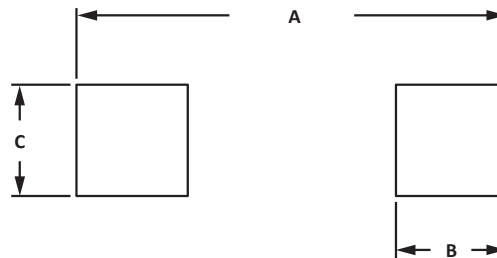
- Controlling dimension: millimeters.
- Dimensioning and tolerances per ANSI Y14.5M, 1985.
- Dimensions are exclusive of mold flash and metal burrs.


PAD LAYOUT DIMENSIONS

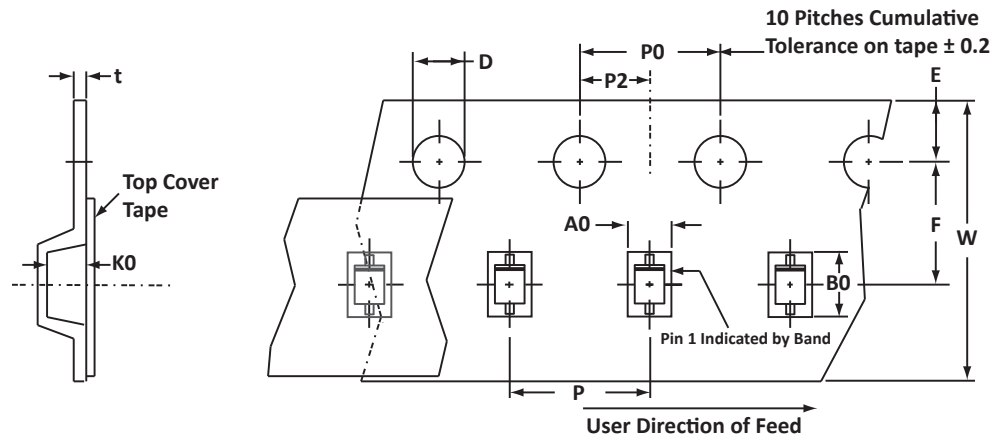
| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 2.87 | 3.12 | 0.113 | 0.123 |
| B | 0.66 | 0.91 | 0.026 | 0.036 |
| C | 0.66 | 0.91 | 0.026 | 0.036 |

NOTES

- Controlling dimension: millimeters.



TAPE AND REEL



SPECIFICATIONS

| REEL DIA. | TAPE WIDTH | A0 | B0 | K0 | D | E | F | W | P0 | P2 | P | tmax |
|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------|
| 178mm (7") | 8mm | 1.55 ± 0.10 | 2.90 ± 0.10 | 1.35 ± 0.10 | 1.50 ± 0.10 | 1.75 ± 0.10 | 3.50 ± 0.05 | 8.00 ± 0.30 | 4.00 ± 0.10 | 2.00 ± 0.05 | 4.00 ± 0.10 | 0.25 |

NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T7 = 7" Reel - 3,000 pieces per 8mm tape.
- Marking on Part - marking code (see page 2), polarity band (Unidirectional Only).

Package outline, pad layout and tape specifications per document number 06010.R4 9/10.

ORDERING INFORMATION

| BASE PART NUMBER (xx = Voltage) | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
|------------------------------------|-----------------|-------------|----------|-----------|----------|
| GBLCxx/GBLCxxC | -LF | -T7 | 3,000 | 7" | n/a |

This device is only available in a Lead-Free configuration.

COMPANY INFORMATION

COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately-held company located in Tempe, Arizona, that offers a product line of transient voltage suppressors (TVS); avalanche breakdown diodes; steering diode TVS arrays and other surge suppressor component products. These TVS devices protect electronic systems from the effects of lightning, electrostatic discharge (ESD), nuclear electromagnetic pulses (NEMP), inductive switching and EMI / RFI. ProTek Devices also offers high performance interface and linear products that include analog switches; multiplexers; LED drivers; audio control ICs; RF and related high frequency products. The analog devices work in a host of consumer; industrial; automotive and other applications.

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