

## ULTRA LOW CAPACITANCE TVS ARRAY



**SOD-323 PACKAGE**

### DESCRIPTION

The GBLCxxI and GBLCxxCI 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 250 Watts for an 8/20 $\mu$ s waveshape.

The GBLCxxI and GBLCxxCI 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
- 250 Watts Peak Pulse Power per Line (tp = 8/20 $\mu$ s)
- Replacement for MLV (0805)
- Unidirectional & Bidirectional Configurations
- 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: 0.6pF (Typical)
- RoHS Compliant
- REACH Compliant

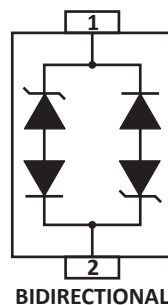
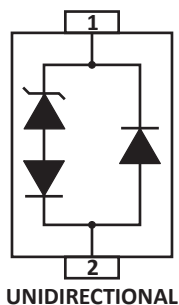
### APPLICATIONS

- 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
- Patent Pending

### PIN CONFIGURATIONS



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

PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20μs) - See Figure 1	P <sub>PP</sub>	250	Watts
Operating Temperature	T <sub>A</sub>	-55 to 150	°C
Storage Temperature	T <sub>STG</sub>	-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 <sub>WM</sub> VOLTS	@ 1mA V <sub>(BR)</sub> VOLTS	@ IP = 1A V <sub>C</sub> VOLTS	@ V <sub>WM</sub> I <sub>D</sub> μA	@ 0V, 1MHz C pF
GBLC03I	C	3.0	4.0	7.0	5	0.6
GBLC03CI	CC	3.0	4.0	7.0	5	0.6
GBLC05I	A	5.0	6.0	9.8	5	0.6
GBLC05CI	AC	5.0	6.0	9.8	5	0.6
GBLC08I	B	8.0	8.5	13.4	2	0.6
GBLC08CI	BC	8.0	8.5	13.4	2	0.6
GBLC12I	D	12.0	13.3	19.0	1	0.6
GBLC12CI	DC	12.0	13.3	19.0	1	0.6
GBLC15I	E	15.0	16.7	24.0	1	0.6
GBLC15CI	EC	15.0	16.7	24.0	1	0.6
GBLC18I	F	18.0	20.0	29.0	1	0.6
GBLC18CI	FC	18.0	20.0	29.0	1	0.6
GBLC24I	H	24.0	26.7	43.0	1	0.6
GBLC24CI	HC	24.0	26.7	43.0	1	0.6

**NOTES**

- Part numbers with an additional "C" suffix are bidirectional devices, i.e., GBLC05CI.
- Unidirectional Only: Positive potential is applied from pin 1 to 2.

## TYPICAL DEVICE CHARACTERISTICS

FIGURE 1  
PEAK PULSE POWER VS PULSE TIME

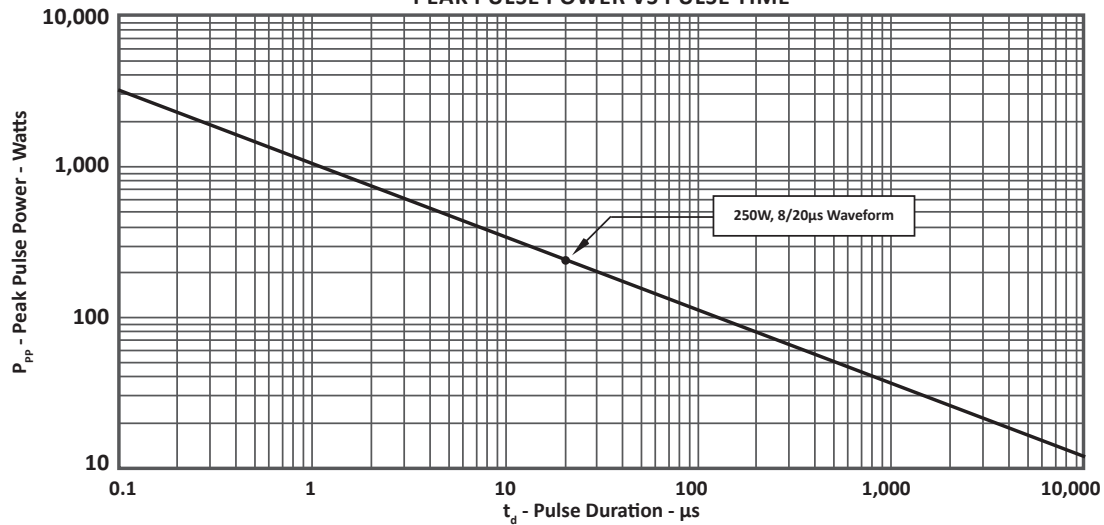
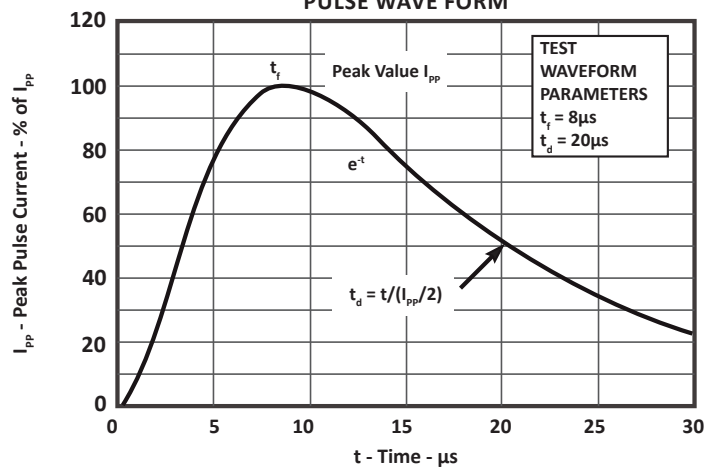
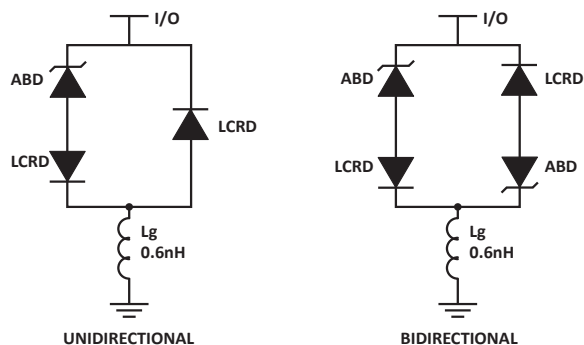


FIGURE 2  
PULSE WAVE FORM



## 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	100
IBV	μA	1	0.5
C <sub>jo</sub>	pF	See Table 2	0.3
I <sub>s</sub>	A	See Table 2	1E-11
Vj	V	0.6	0.6
M	-	0.33	0.33
N	-	1	1
R <sub>s</sub>	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 <sub>v</sub> (VOLTS)	C <sub>jo</sub> (pF)	I <sub>s</sub> (AMPS)	Rs(OHMS)
GBLC03I	4.0	200	1E-11	0.22
GBLC05I	6.0	140	1E-11	0.18
GBLC08I	8.5	67	1E-11	0.12
GBLC12I	13.3	55	1E-13	1.10
GBLC15I	16.7	47	1E-13	1.43
GBLC18I	20.0	40	1E-13	2.30
GBLC24I	26.7	28	1E-13	4.24
GBLC03CI	4.0	200	1E-11	0.22
GBLC05CI	6.0	140	1E-11	0.18
GBLC08CI	8.5	67	1E-11	0.12
GBLC12CI	13.3	55	1E-13	1.10
GBLC15CI	16.7	47	1E-13	1.43
GBLC18CI	20.0	40	1E-13	2.3
GBLC24CI	26.7	28	1E-13	4.24

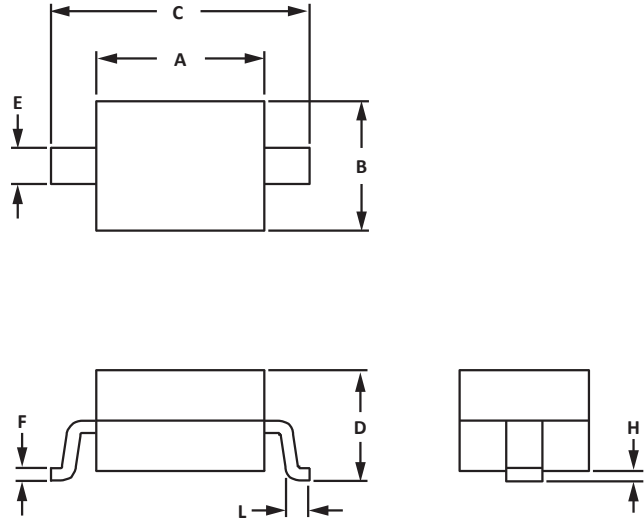
## SOD-323 PACKAGE INFORMATION

## 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.

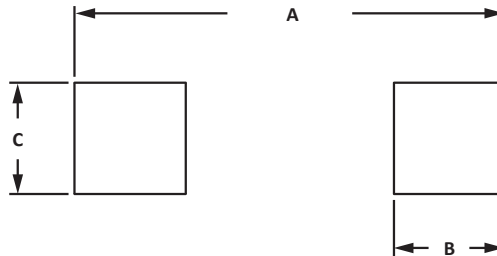


## PAD LAYOUT DIMENSIONS

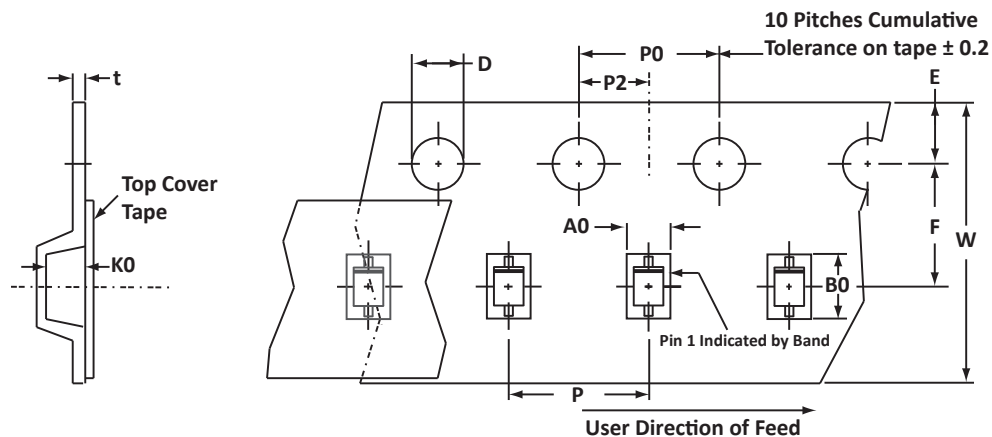
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.87	3.12	0.113	0.123
B	0.66	0.91	0.026	0.036
C	0.66	0.91	0.026	0.036

## 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).

## ORDERING INFORMATION

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

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

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 25 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products. ProTek Devices is ISO 9001:2015 certified.

### CONTACT US

#### Corporate Headquarters

2929 South Fair Lane  
Tempe, Arizona 85282  
USA

#### By Telephone

General: 602-431-8101  
Sales: & Marketing: 602-414-5109  
Customer Service: 602-414-5114  
Product Technical Support: 602-414-5107

#### By Fax

General: 602-431-2288

#### By E-mail:

Asia Sales: [asiasales@protekdevices.com](mailto:asiasales@protekdevices.com)  
Europe Sales: [europesales@protekdevices.com](mailto:europesales@protekdevices.com)  
U.S. Sales: [ussales@protekdevices.com](mailto:ussales@protekdevices.com)  
Distributor Sales: [distysales@protekdevices.com](mailto:distysales@protekdevices.com)  
Customer Service: [service@protekdevices.com](mailto:service@protekdevices.com)  
Technical Support: [support@protekdevices.com](mailto:support@protekdevices.com)

#### ProTek Devices (Asia Pacific) Pte. Ltd.

8 Ubi Road 2, #06-19  
Zervex  
Singapore - 408538  
Tel: +65-67488312  
Fax: +65-67488313

#### Web

[www.protekdevices.com](http://www.protekdevices.com)

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