

### Surface Mount TVS For ESD Protection Diode

 Lead(Pb)-Free

#### Features:

- \* Stand-off Voltage: 3.3 V–12 V
- \* Low Leakage
- \* Response Time is Typically < 1 ns
- \* ESD Rating of Class 3 (> 16 kV) per Human Body Model
- \* IEC61000–4–2 Level 4 ESD Protection
- \* These are Pb–Free Devices

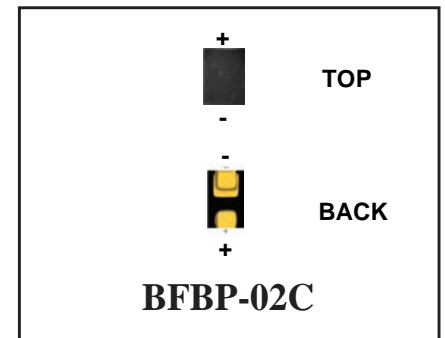
#### Main Applications:

- \* Cellular Handsets & Accessories
- \* Personal Digital Assistants (PDAs)
- \* Notebooks & Handhelds
- \* Portable Instrumentation
- \* Digital Cameras
- \* Peripherals
- \* MP3 Players

#### Mechanical Characteristics:

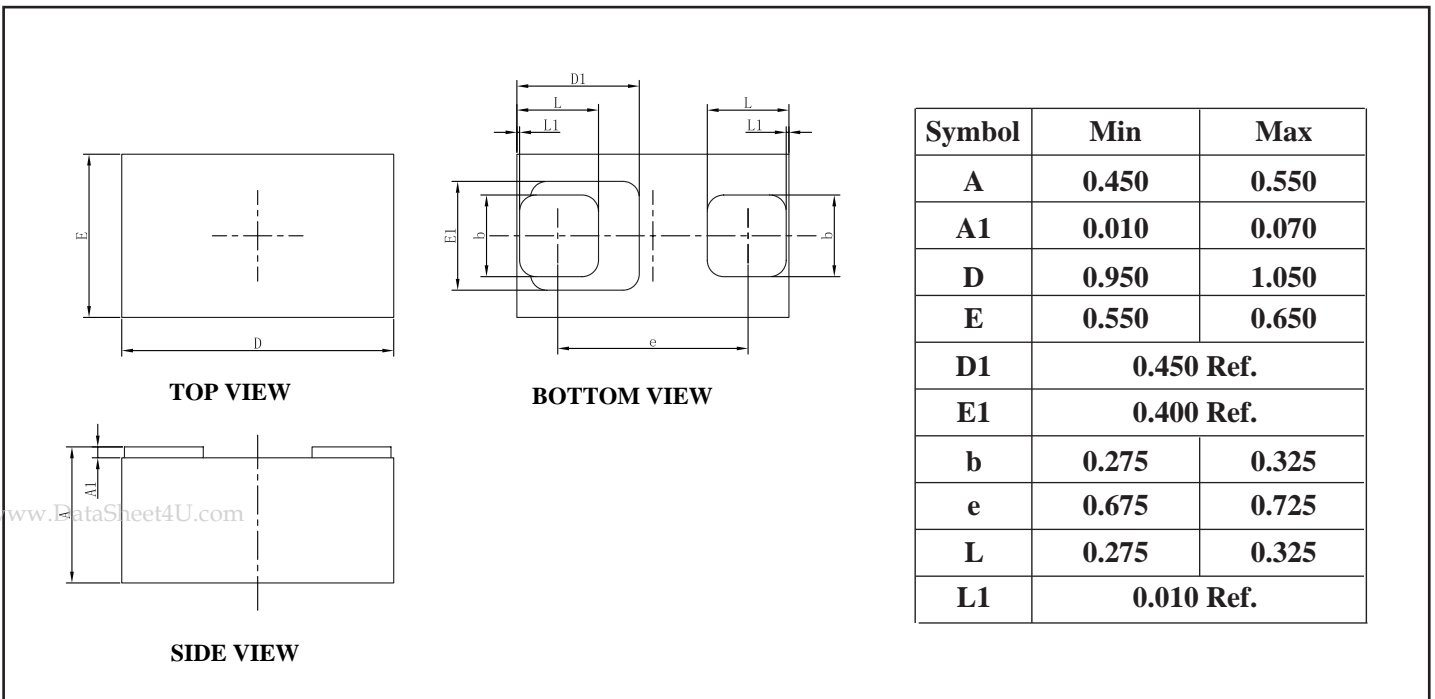
- \* Molding compound flammability rating: UL 94V-0

Peak Pulse Power  
100 Watts  
Reverse Working Voltage  
3.3-12 Volts



### BFBP Outline Dimensions

Unit:mm



## Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

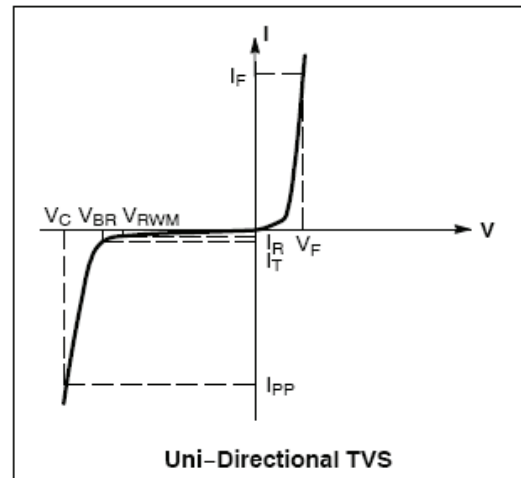
Parameter	Symbol	Limits	Unit
IEC61000-4-2(ESD) Contact		±30	KV
ESD voltage per human body model Per machine model		16	KV
		400	V
Total power dissipation on FR-5 board (Note 1)	<b>P<sub>D</sub></b>	150	mW
Thermal Resistance Junction-to-Ambient	R <sub>θJA</sub>	833	°C/W
Lead Solder Temperature – Maximum (10 Second Duration)	<b>T<sub>L</sub></b>	260	°C
Junction and Storage temperature range	<b>T<sub>j</sub>, T<sub>stg</sub></b>	-55 ~ +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended. Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. FR-5 = 1.0 x 0.75 x 0.62 in.

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current
V <sub>C</sub>	Clamping Voltage @ I <sub>PP</sub>
V <sub>RWM</sub>	Working Peak Reverse Voltage
I <sub>R</sub>	Maximum Reverse Leakage Current @ V <sub>RWM</sub>
V <sub>BR</sub>	Breakdown Voltage @ I <sub>T</sub>
I <sub>T</sub>	Test Current
I <sub>F</sub>	Forward Current
V <sub>F</sub>	Forward Voltage @ I <sub>F</sub>
P <sub>pk</sub>	Peak Power Dissipation
C	Max. Capacitance @ V <sub>R</sub> =0 and f =1MHz



## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted, V<sub>F</sub> = 0.9 V Max. @ I<sub>F</sub> = 10mA for all types)

Device*	Device Marking	V <sub>RWM</sub> (V)	I <sub>R</sub> (μA) @ V <sub>RWM</sub>	V <sub>BR</sub> (V) @ I <sub>T</sub> (Note 2)	I <sub>T</sub> mA	Max I <sub>PP</sub> (A) (Note 3)	V <sub>C</sub> (V) @Max I <sub>PP</sub> (A) (Note 3)	P <sub>pk</sub> (W) (8 x 20 μs)	C (pF)
		Max	Max	Min		-	Max	Typ	Typ
ESD3301B2C	A	3.3	2.5	5.0	1.0	9.8	11.4	102	80
ESD0501B2C	B	5.0	1.0	6.2	1.0	8.7	12.3	107	65
ESD1201B2C	C	12	1.0	13.5	1.0	5.9	23.7	140	30

\*Other voltages available upon request.

2. V<sub>BR</sub> is measured with a pulse test current I<sub>T</sub> at an ambient temperature of 25°C.

3. Surge current waveform per Figure 3.

## TYPICAL CHARACTERISTICS

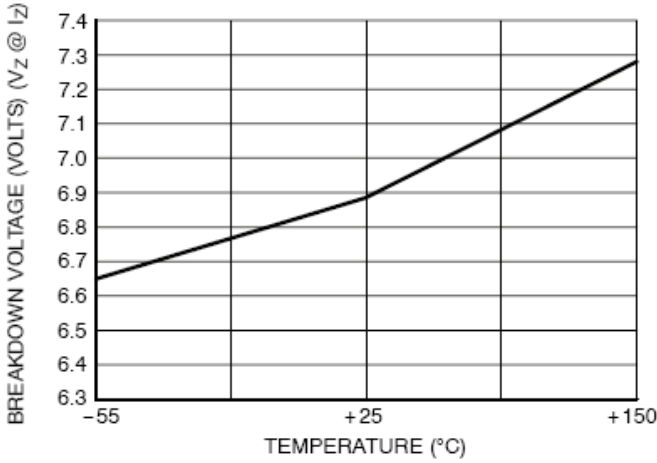


Figure 1. Typical Breakdown Voltage versus Temperature

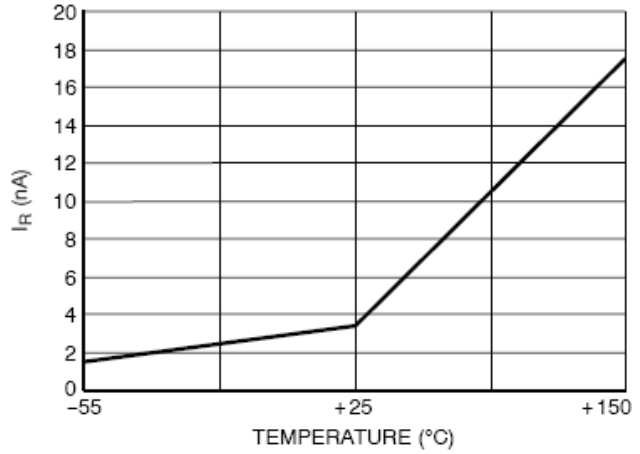


Figure 2. Typical Leakage Current versus Temperature

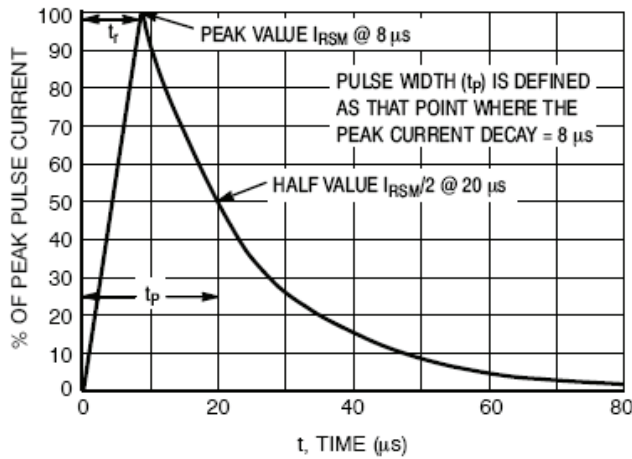


Figure 3. 8 X 20  $\mu s$  Pulse Waveform