



# SPE0589

## Ultra Low Capacitance Single-Line ESD Protection Array

### DESCRIPTION

The SPE0589 is an ESD transient voltage suppression component which provides a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge (ESD).

It is particularly well-suited for cellular phones, portable device, digital cameras, power supplies and many other portable applications because of its small package and low weight. The SPE0589 is Uni-directional, Safely dissipate ESD strikes of Level 4, IEC61000-4-2, exceeding the maximum requirement. Using the MILSTD-883 (Method 3015) specification for Human Body Model (HBM) ESD, the device provides protection for contact discharges to greater than +/-10KV.

The SPE0589 is available in a WBFBP-02C package with peak reverse working voltage of 5 voltages.

### APPLICATIONS

- ◆ Cellular Handsets and Accessories
- ◆ Cordless Phone
- ◆ PDA
- ◆ Notebooks and Handhelds
- ◆ Portable Instrumentation
- ◆ Digital Cameras
- ◆ MP3 Player

### FEATURES

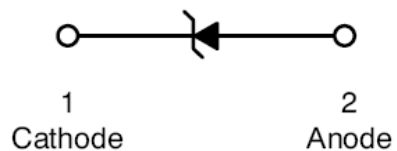
- ◆ Transient protection for data lines to

IEC 61000-4-2 (ESD)  
±15kV (air)  
±8kV (contact)

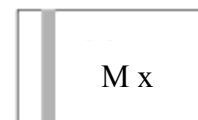
IEC 61000-4-4 (EFT)  
40A (5/50ns)

- ◆ Protects single I/O lines
- ◆ Working voltage: 5V
- ◆ Low leakage current
- ◆ Low operating and clamping voltages
- ◆ Small Body Outline: 1.0 x 0.6 x 0.5mm

### PIN CONFIGURATION ( FBP-02C )



### PART MARKING



M= Month Code  
x=Specific Device Code



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### ORDERING INFORMATION

Part Number	Package	Part Marking
SPE0589BP02RGB	FBP-02C	Mx

M=Month Code (A~Z)

※ SPE0589BP02RGB : Tape Reel ; Pb – Free ; Halogen – Free

### ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Peak Pulse Power ( tp = 8/20 μs )	Ppk	180	W
Maximum Peak Pulse Current ( tp = 8/20 μs )	Ipp	7	A
ESD per IEC 61000 – 4 – 2 (Air )	Vpp	±15	KV
ESD per IEC 61000 – 4 – 2 (Contact )	Vpp	±10	KV
Operating Junction Temperature	Tj	-55 ~ 125	°C
Storage Temperature Range	TSTG	-55 ~ 150	°C
Lead Soldering Temperature	TL	260 ( 10sec )	°C

### ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Reverse Stand – Off Voltage	VRWM				5	V
Reverse Breakdown Voltage	VBR	It = 1mA	6			V
Reverse Leakage Current	IR	VRWM = 5V , T=25°C			1	μA
Clamping Voltage	Vc	Ipp = 1A , tp = 8/20 μs			8	V
Junction Capacitance	Cj	Between I/O Pin and GND VR = 0V , f = 1MHz		0.5	0.9	pF



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### TYPICAL CHARACTERISTICS

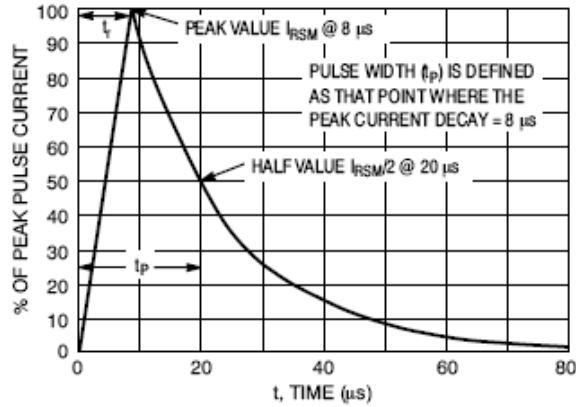


Figure 1. 8 X 20  $\mu s$  Pulse Waveform

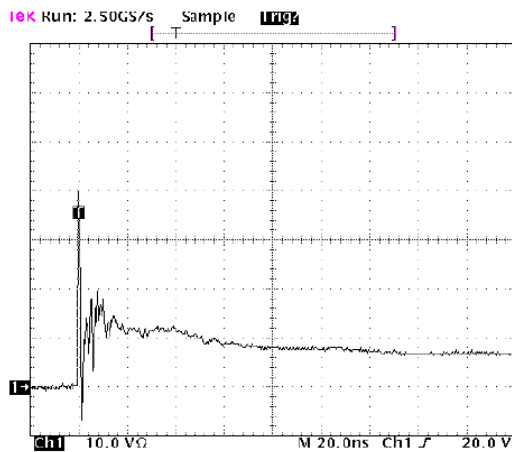


Figure 2. ESD Clamping Voltage Screenshot  
Positive 8 kV Contact per IEC61000-4-2

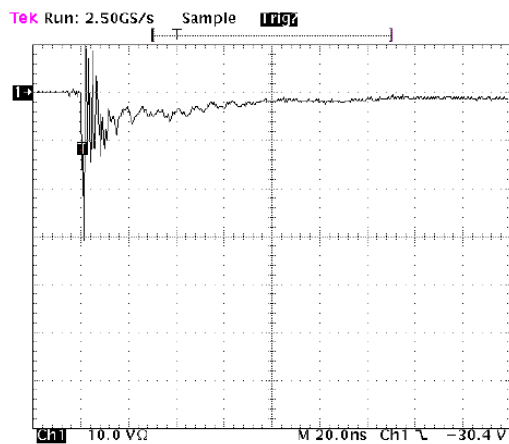


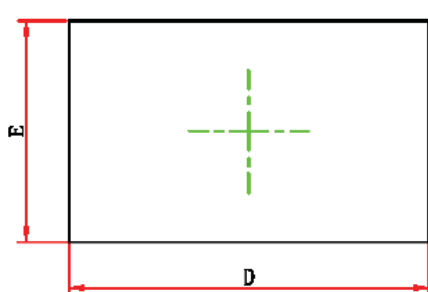
Figure 3. ESD Clamping Voltage Screenshot  
Negative 8 kV Contact per IEC61000-4-2



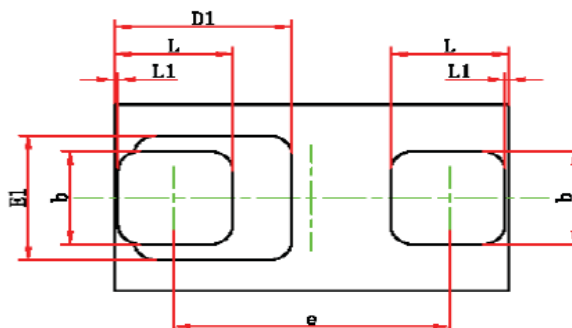
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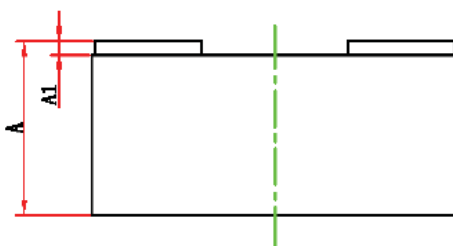
### FBP-02C PACKAGE OUTLINE



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
A1	0.010	0.070	0.000	0.003
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
D1	0.450REF.		0.018REF.	
E1	0.400REF.		0.016REF.	
b	0.275	0.325	0.011	0.013
e	0.675	0.725	0.027	0.029
L	0.275	0.325	0.011	0.013
L1	0.010REF.		0.000REF.	



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