



### General Description

The AFE9B5V is a bi-directional TVS (Transient Voltage Suppressor) designed to protect sensitive electronic components from damage due to ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and CDE (Cable Discharge Event). The AFE9B5V has been specifically designed to replace MLV (Multilayer Varistor) in portable application such as cellular handsets, notebook computers, tablets and PADs.

The AFE9B5V is based on solid-state silicon technology and offer unique electrical characteristics like lower clamping voltage and no device degrading compared to MLV.

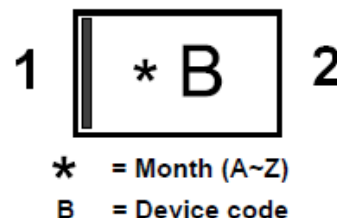
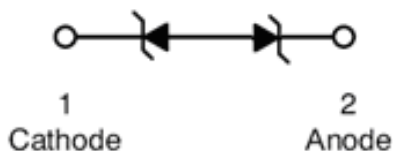
The AFE9B5V may be used to provide ESD protection up to  $\pm 30\text{kV}$  (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 6.5A (8/20 $\mu\text{s}$ ) according to IEC61000-4-5.

The AFE9B5V is available in FBP-02C package. Standard products are Pb-free and Halogen-free.

### Features

- Stand-off voltage: 5V Max
- Transient protection for each line according to IEC61000-4-2 (ESD):  $\pm 30\text{kV}$  (contact discharge)  
IEC61000-4-5 (surge): 6.5A (8/20 $\mu\text{s}$ )
- Capacitance:  $C_J = 22\text{pF}$  (typ.)
- Low clamping voltage
- Solid-state silicon technology

### Pin Description ( FBP-02C )



### Application

- Cellular handsets
- Tablets
- Computers and peripherals
- Notebooks
- Digital camera
- Other electronics equipments

### Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFE9B5VBP02RG	*B	FBP-02C	Tape & Reel	10000 EA

※ \* Month Code

※ B Device Code

※ AFE9B5VBP02RG : 7" 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 )	P <sub>pk</sub>	85	W
Peak Pulse Current ( tp = 8/20 μs )	I <sub>PP</sub>	6.5	A
ESD Per IEC 61000– 4 – 2 (Air)	V <sub>ESD</sub>	±30	KV
ESD Per IEC 61000 – 4 – 2 (Contact)		±30	
Operation Junction Temperature	T <sub>J</sub>	125	°C
Maximum Lead Temperature for soldering during 10s	T <sub>L</sub>	260	°C
Storage temperature range	T <sub>stg</sub>	-55 ~ +150	°C

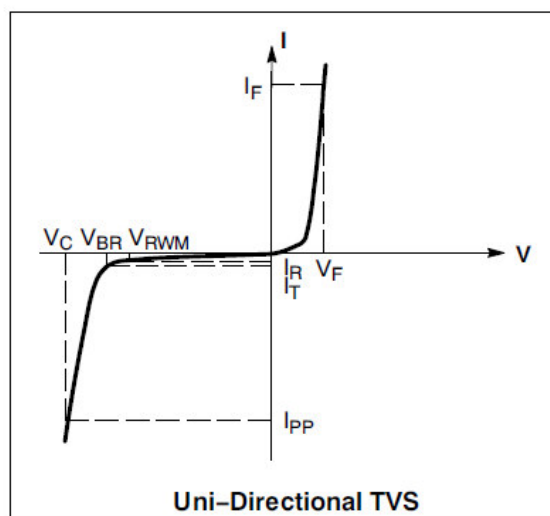
**Electrical Characteristics**

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Reverse Stand – Off Voltage	V <sub>RWM</sub>				5.0	V
Reverse Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> = 1mA	5.6	7.5	8.2	V
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 1mA	5.6	7.5	8.2	V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> = 5V			1.0	μA
Clamping Voltage	V <sub>CL</sub>	I <sub>PP</sub> = 1A ( tp = 8/20 μs )			9.0	V
		I <sub>PP</sub> = 6.5A ( tp = 8/20 μs )			13.0	
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz		22	35	pF

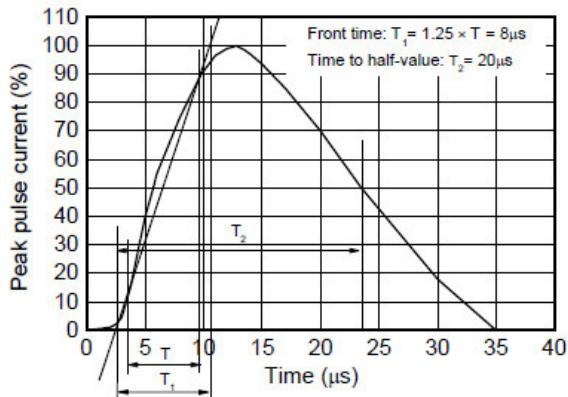
**Electronics Parameter**

Symbol	Parameter
V <sub>rwm</sub>	Peak Reverse Working Voltage
I <sub>r</sub>	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>pp</sub>	Maximum Reverse Peak Pulse Current
V <sub>c</sub>	Clamping Voltage @ I <sub>pp</sub>
P <sub>pk</sub>	Peak Power Dissipation
C	Junction Capacitance
I <sub>f</sub>	Forward Current
V <sub>f</sub>	Forward Voltage @ I <sub>f</sub>

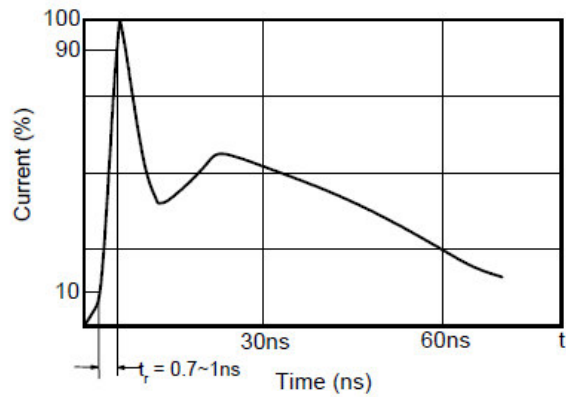




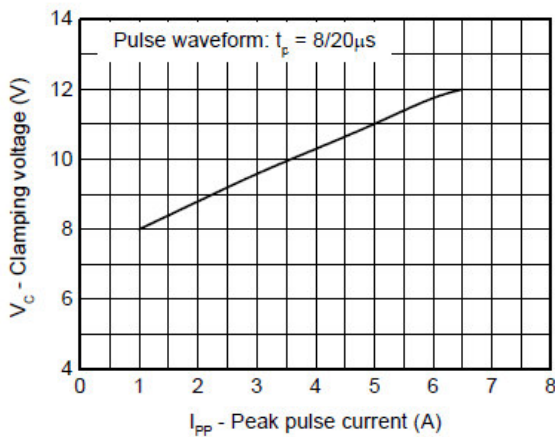
### Typical Characteristics (TA=25°C Unless otherwise noted)



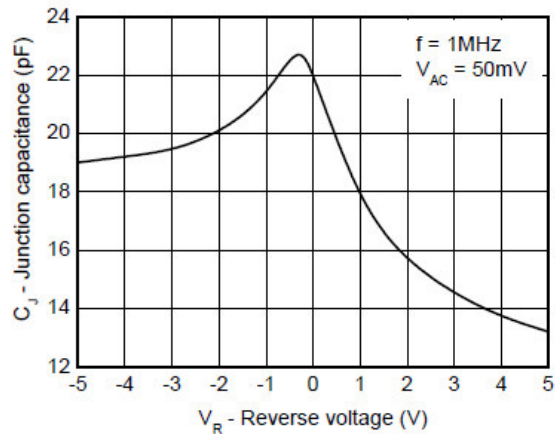
8/20μs waveform per IEC61000-4-5



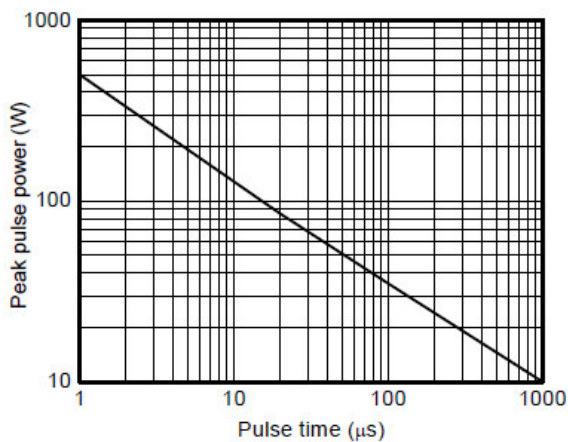
Contact discharge current waveform per IEC61000-4-2



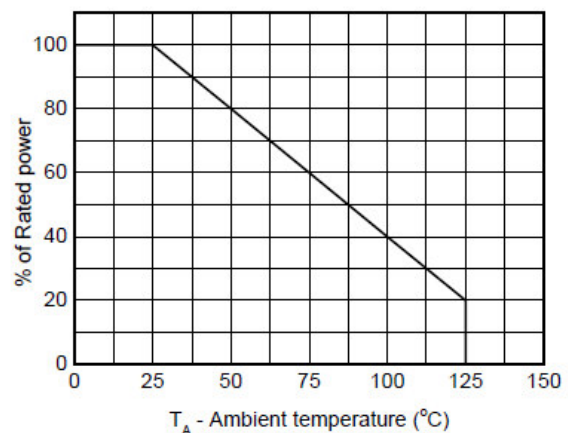
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage



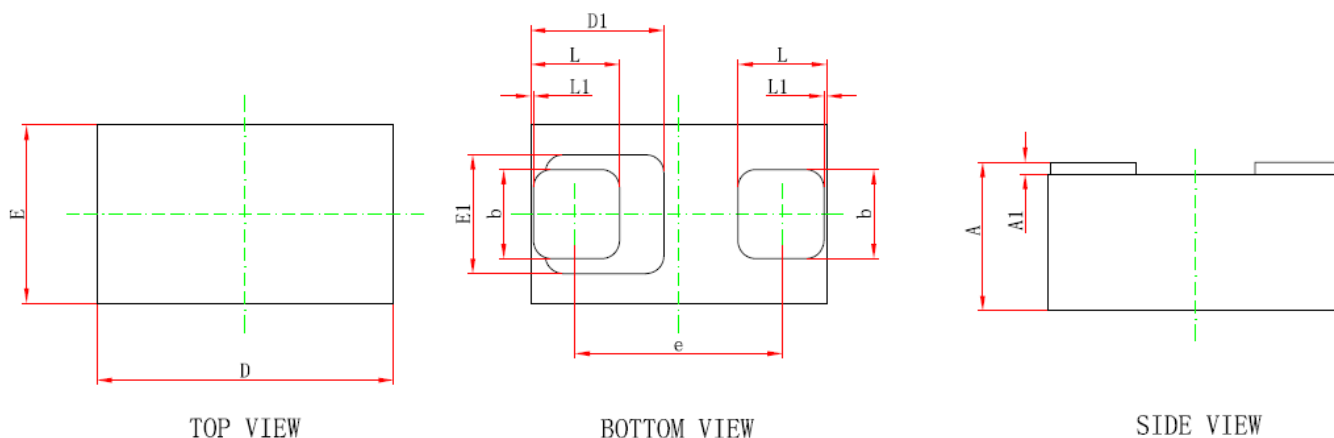
Non-repetitive peak pulse power vs. Pulse time



Power derating vs. Ambient temperature



**Package Information ( FBP-02C )**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.350/0.450	0.450/0.550	0.014/0.018	0.018/0.022
A1	0.010	0.090	0.000	0.004
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
D1	0.450 REF.		0.017 REF.	
E1	0.400 REF.		0.016 REF.	
b	0.250	0.350	0.010	0.014
e	0.650	0.750	0.026	0.030
L	0.250	0.350	0.010	0.014
L1	0.010 REF.		0.000 REF.	

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