

**1-Line, Bi-directional, Low-Capacitance,  
Transient Voltage Suppressors**

**Descriptions**

The ESD9B\*\*L series are Bi-directional transient voltage suppressors (TVS) to protect sensitive electronic components from electrostatic discharge (ESD). It is particularly well-suited for cellular phones, PMP, MID, PDA, digital cameras and other electronic equipments.

The ESD9B\*\*L series are safely dissipating ESD strikes to meet the ESD immunity testing of IEC61000-4-2 level 4.

The ESD9B\*\*L series are available in a FBP-02C, SOD-923 and DFN1006 package with Pb-free.



**FBP-02C**



**SOD-923**



**DFN1006**



**Pin configuration (Top view)**

**Features**

- Working voltage : 5V
- Peak power (tp=8/20us) : 40W Max.
- Peak current (tp=8/20us) : 3.5A Max.
- Transient protection  
IEC61000-4-2 : ±15KV air  
: ±9KV contact
- Low clamping voltage
- Low leakage current
- Small package



**FBP-02C**



**SOD-923**



**DFN1006**

\* = Month (A~Z)

.B = Device code

L = Device code

**Marking**

**Applications**

- Cell phone
- PMP
- MID
- PDA
- Digital camera
- Other electronics equipments

**Order information**

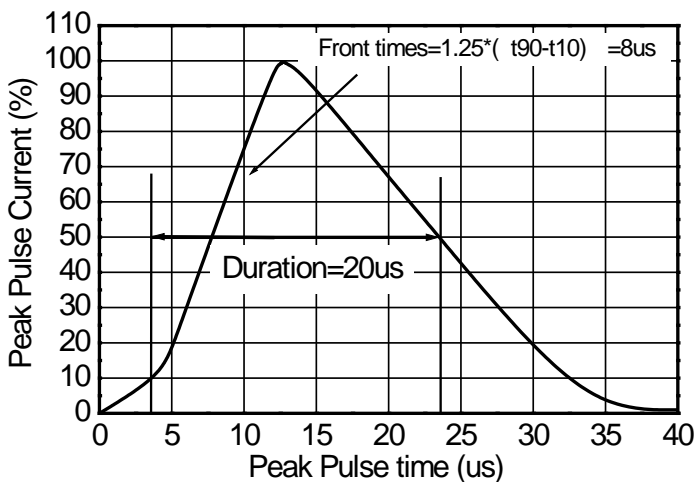
Device	Package	Shipping
ESD9B5VL-2/TR	FBP-02C	10000/Tape&Reel
ESD9B5VLD-2/TR	SOD-923	5000/Tape&Reel
ESD9N5BL-2/TR	DFN1006	10000/Tape&Reel

**Absolute maximum ratings**

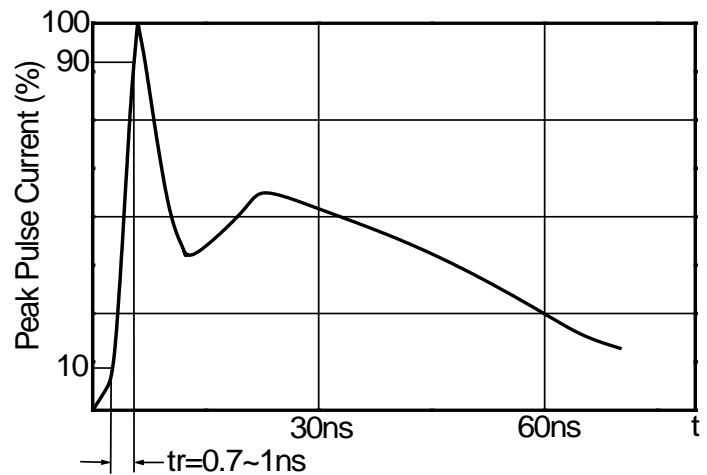
Parameter	Symbol	Rating	Unit
Peak pulse power (tp=8/20us)	Ppk	40	W
Peak pulse current (tp=8/20us)	Ipp	3.5	A
ESD voltage IEC61000-4-2 air	V <sub>ESD</sub>	±15	KV
ESD voltage IEC61000-4-2 contact		±9	
Operation junction temperature	T <sub>J</sub>	150	°C
Lead temperature	T <sub>L</sub>	260	°C
Storage temperature	T <sub>sg</sub>	-55~150	°C

**Electronics characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reveres maximum working voltage	V <sub>RWM</sub>				5.0	V
Reveres leakage current	I <sub>R</sub>	V <sub>RWM</sub> =5V			5.0	uA
Reveres breakdown voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	6.5		8.2	V
Forward voltage	V <sub>F</sub>	I <sub>F</sub> =1mA	6.5		8.2	V
Clamping voltage	V <sub>C</sub>	I <sub>pp</sub> =1A tp=8/20us			8	V
		I <sub>pp</sub> =3.5A tp=8/20us			11.5	V
Junction capacitance	C	F=1MHz, V <sub>R</sub> =0V		5	12	pF

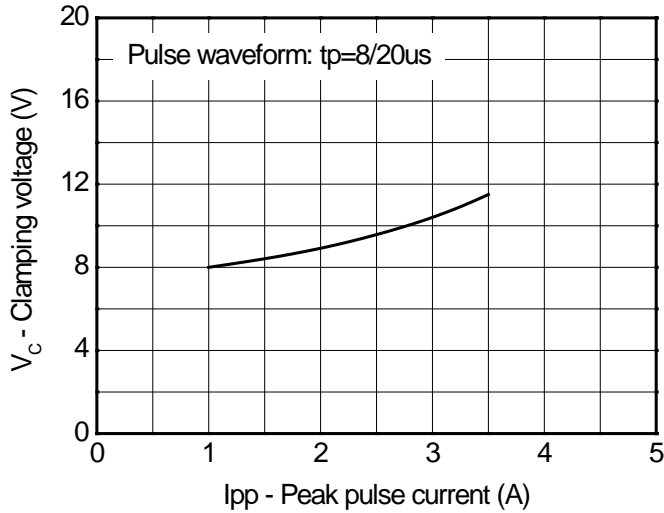


**8/20us waveform**

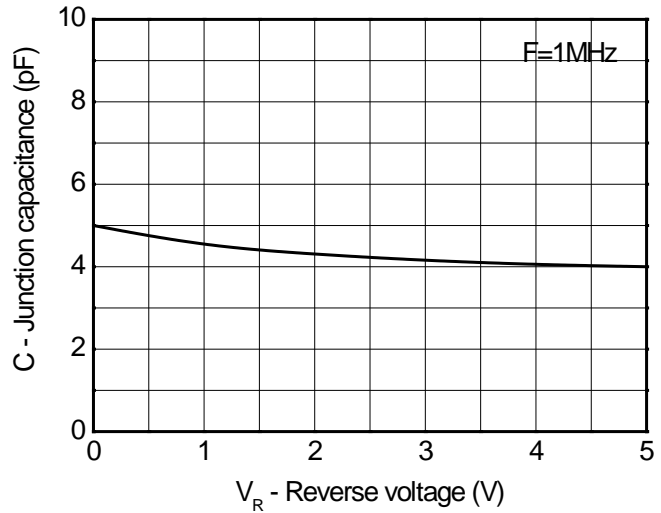


**IEC61000-4-2 waveform**

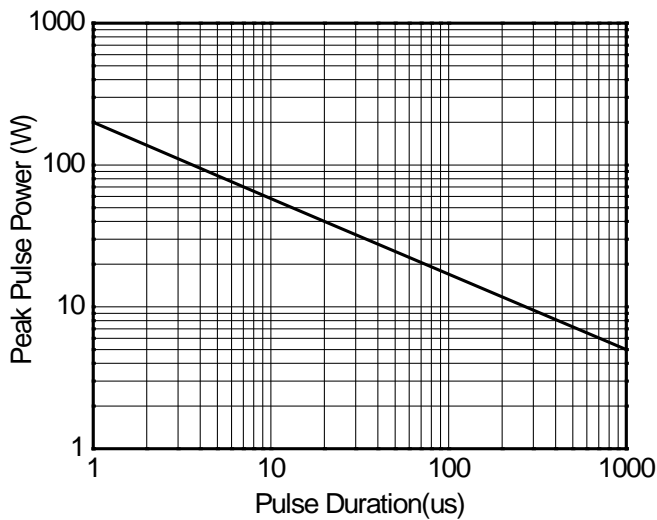
Typical characteristics (Ta=25°C, unless otherwise noted)



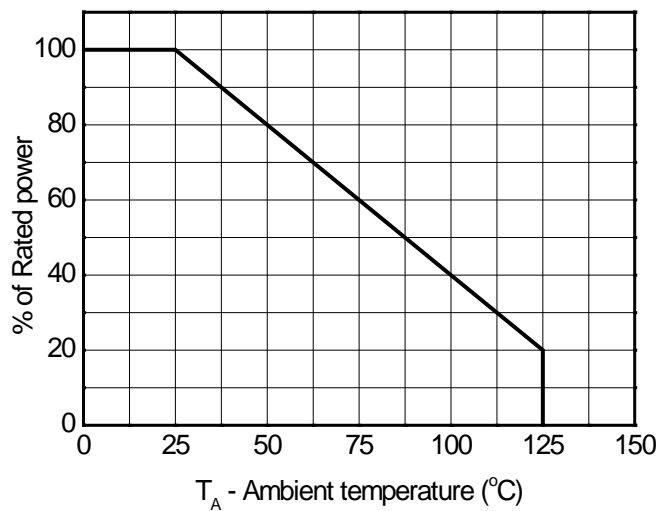
Clamping voltage vs. Peak pulse current



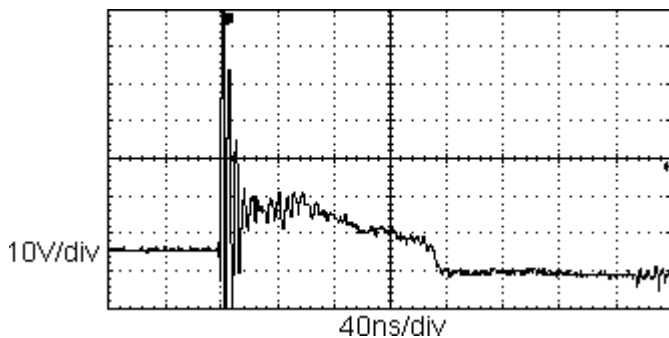
Capacitance vs. Reverse voltage



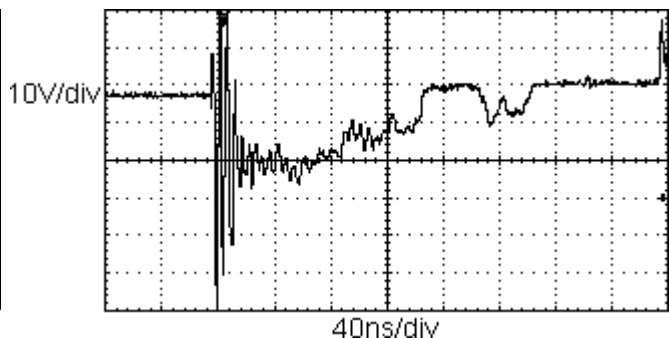
Non-Repetitive Peak Pulse Power vs. Pulse time



Power derating vs. Temperature



ESD clamping voltage  
(IEC61000-4-2 +9KV contact)

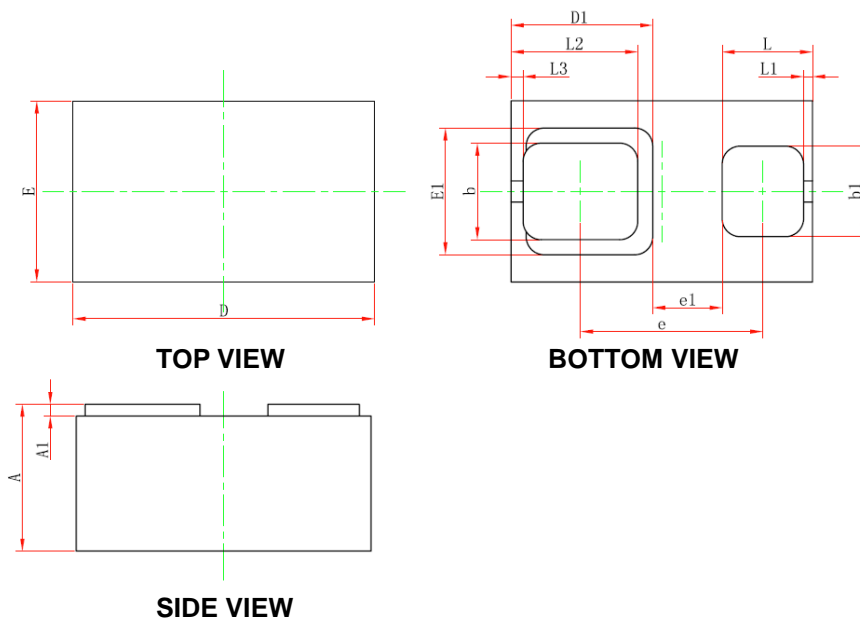


ESD clamping voltage  
(IEC61000-4-2 -9KV contact)

Package outline dimensions

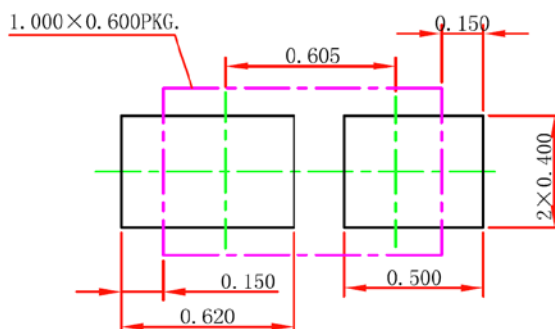
ESD9B\*\*L

FBP-02C



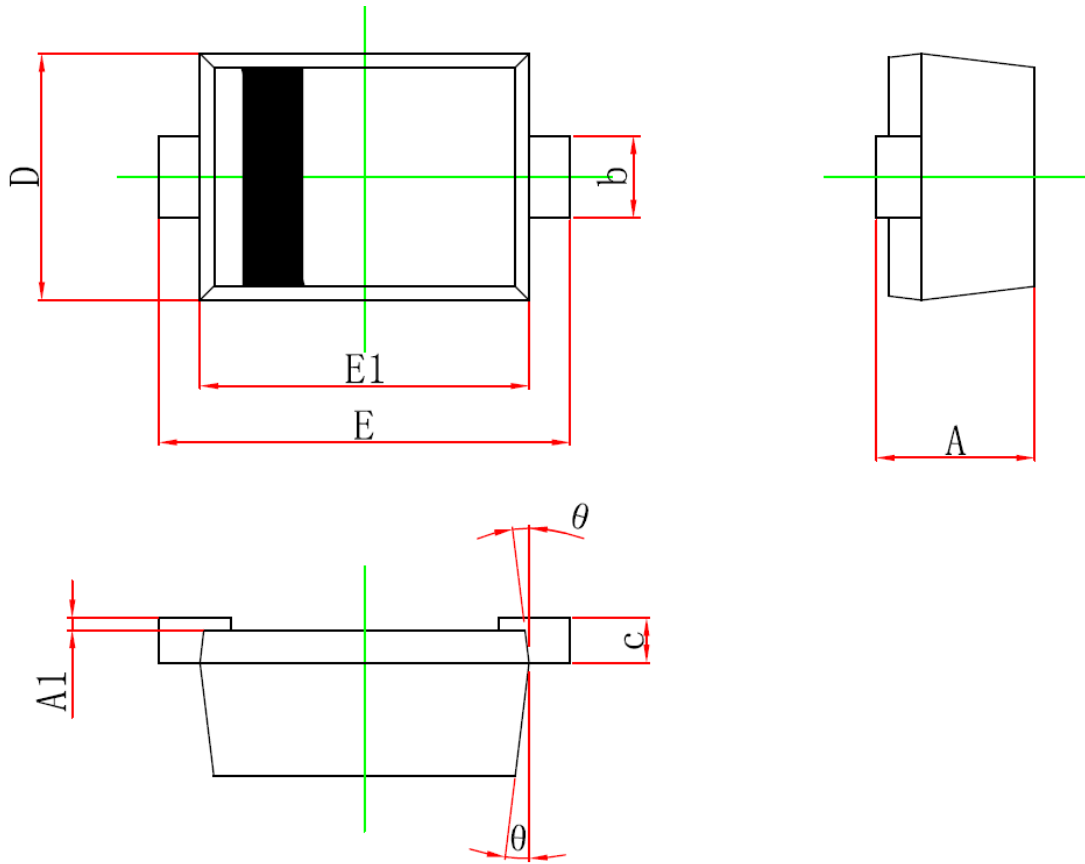
Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.450	0.500	0.550
A1	0.010	--	0.100
D	0.950	1.000	1.050
E	0.550	0.600	0.650
D1	0.470 Ref.		
E1	0.420 Ref.		
b	0.270	0.320	0.370
b1	0.250	0.300	0.350
e	0.555	0.605	0.655
e1	0.230 Ref.		
L	0.250	0.300	0.350
L1	0.030 Ref.		
L2	0.370	0.420	0.470
L3	0.040 Ref.		
备注:	其各个尺寸公差有所变动为正常情况		

Recommend PCB Layout (Unit: mm)



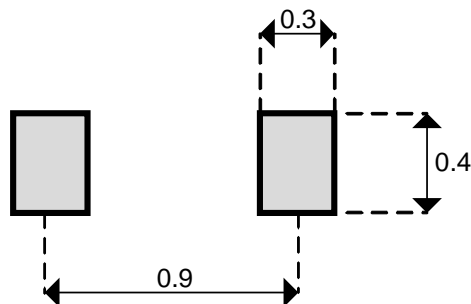
Package outline dimensions

SOD-923



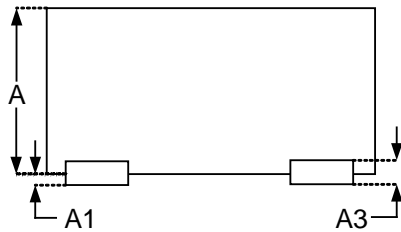
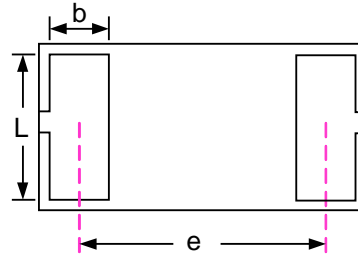
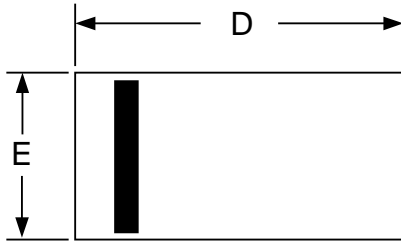
Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.350	-	0.430
A1	0.000	-	0.050
b	0.170	0.200	0.270
c	0.000	-	0.150
D	0.550	0.600	0.650
E	0.900	1.000	1.100
E1	0.750	0.800	0.850
θ	7° Ref.		
备注:	其各个尺寸公差有所变动为正常情况		

Recommend PCB Layout (Unit: mm)



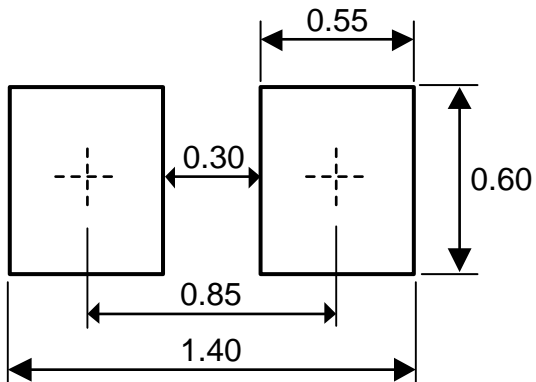
Package outline dimensions

DFN1006-2L



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.40	-	0.50
A1	0.00	-	0.05
A3	0.125 Ref.		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b	0.20	0.25	0.30
L	0.45	0.50	0.55
e	0.65 Typ.		

Recommend PCB Layout (Unit: mm)



Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.