

**ESD9B5VD**

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

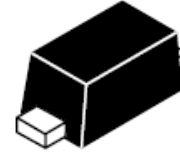
<http://www.sh-willsemi.com>

**Descriptions**

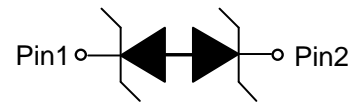
The ESD9B5VD is a Bi-directional transient voltage suppressor (TVS) to protect sensitive electronic components from electrostatic discharge (ESD). It is particularly well-suited for cellular phones, PMP, MID, PDA, digital cameras and other electronic equipment.

The ESD9B5VD is safely dissipating ESD strikes to meet the ESD immunity testing of IEC61000-4-2 level 4.

The ESD9B5VD is available in SOD-923 package. Standard products are Pb-free and Halogen-free.



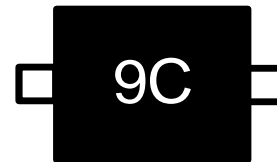
**SOD-923**



**Pin configuration (Top view)**

**Features**

- Reverse stand-off voltage : 5V Max
- Peak power (tp=8/20μs) : 85W Max.
- Peak current (tp=8/20μs) : 6.5A Max.
- Transient protection  
IEC61000-4-2 : ±30kV air  
: ±30kV contact
- Low clamping voltage
- Low leakage current
- Small package



**9C = Device code  
Marking**

**Order information**

Device	Package	Shipping
ESD9B5VD-2/TR	SOD-923	10000/Tape&Reel

**Applications**

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

**Absolute maximum ratings**

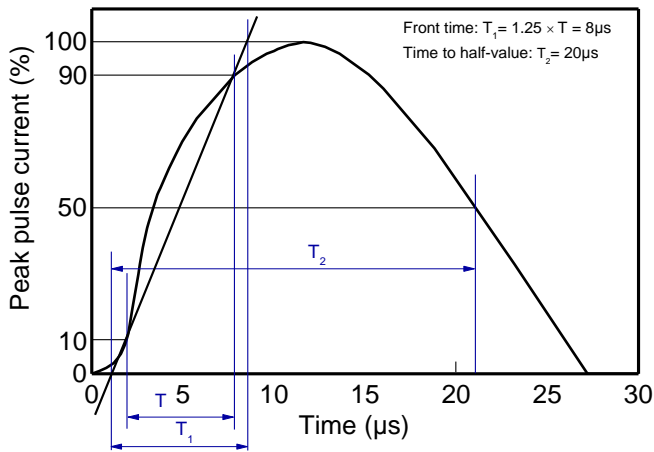
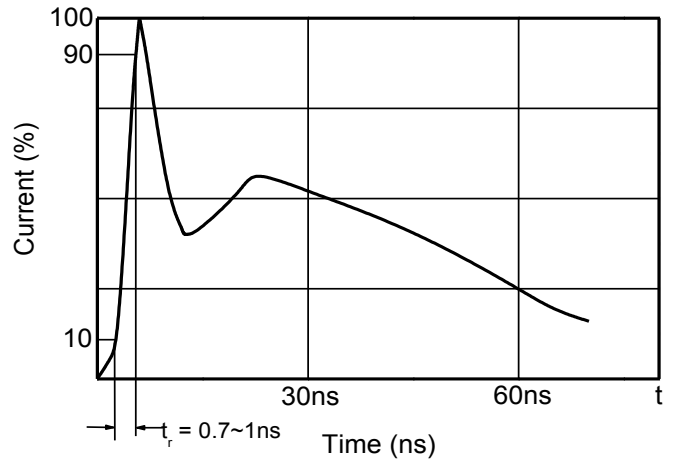
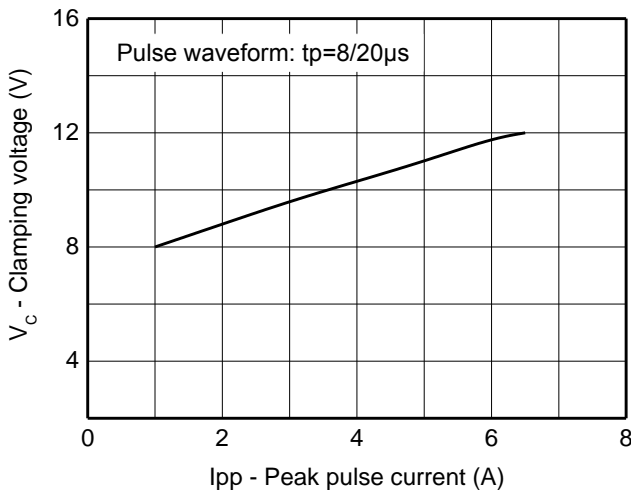
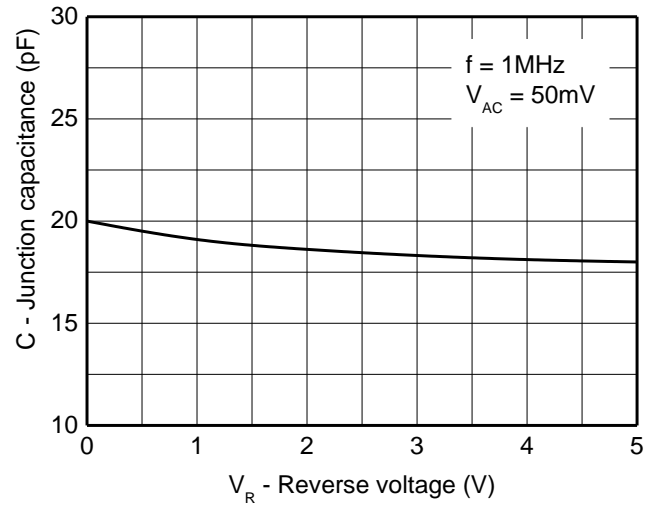
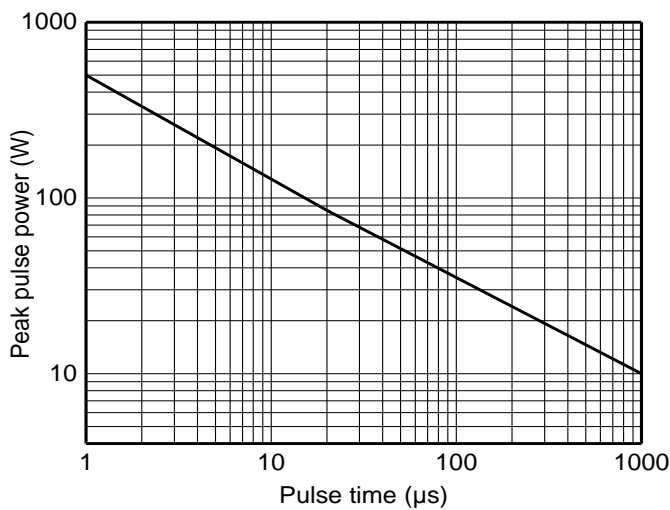
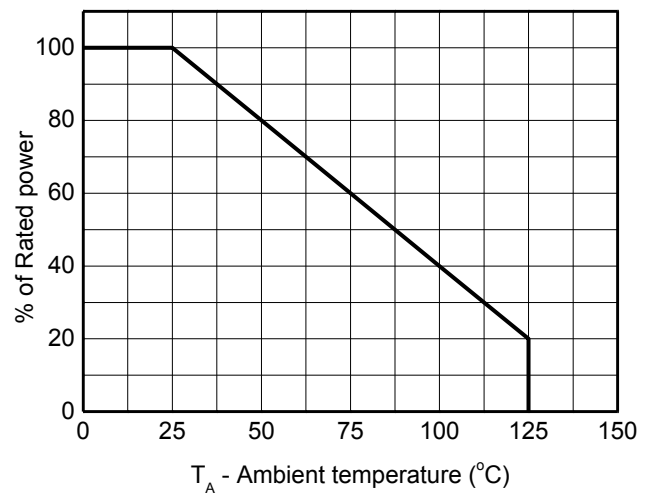
Parameter	Symbol	Rating	Unit
Peak pulse power (tp=8/20μs)	Ppk	85	W
Peak pulse current (tp=8/20μs)	Ipp	6.5	A
ESD according to IEC61000-4-2 air discharge	V <sub>ESD</sub>	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	
Junction temperature	T <sub>J</sub>	125	°C
Operating temperature	T <sub>OP</sub>	-40~85	°C
Lead temperature	T <sub>L</sub>	260	°C
Storage temperature	T <sub>STG</sub>	-55~150	°C

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

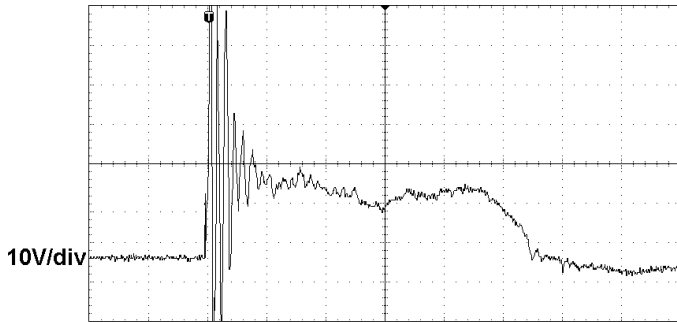
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				5.0	V
Reverse leakage current	I <sub>R</sub>	V <sub>RWM</sub> = 5V			1.0	μA
Reveres breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> = 1mA	5.6	7.5	8.2	V
Clamping voltage <sup>1)</sup>	V <sub>CL</sub>	I <sub>pp</sub> = 1.0A, tp = 8/20μs			9	V
		I <sub>pp</sub> = 6.5A, tp = 8/20μs			13	V
Junction capacitance	C <sub>J</sub>	F=1MHz, V <sub>R</sub> =0V		20	35	pF

Notes:

1) Non-repetitive current pulse, according to IEC61000-4-5.

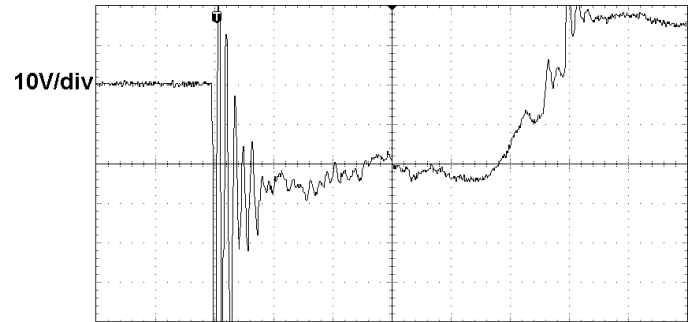
**Typical characteristics (Ta=25°C, unless otherwise noted)**

**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**

Typical characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)



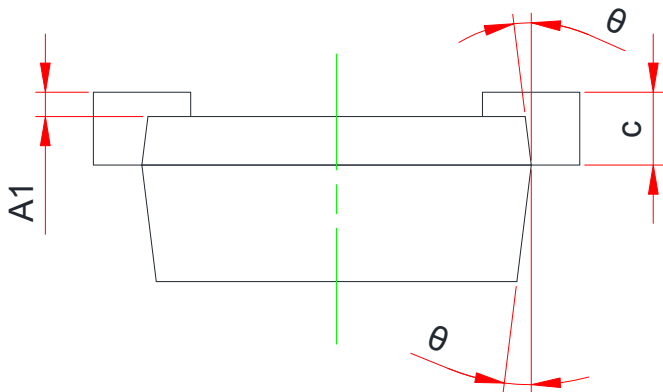
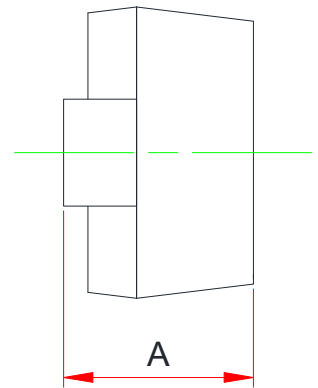
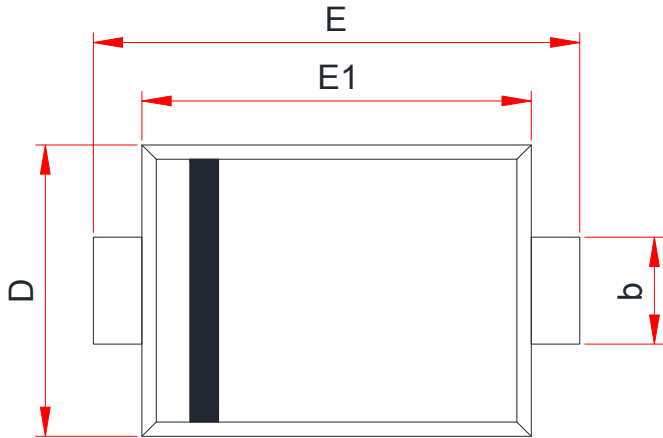
40ns/div  
ESD clamping

(+8kV contact discharge per IEC61000-4-2)

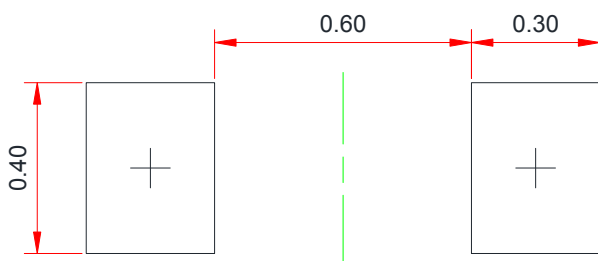


40ns/div  
ESD clamping

(-8kV contact discharge per IEC61000-4-2)

**Package outline dimensions**
**SOD-923**


Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.35	-	0.45
A1	0.00	-	0.05
b	0.15	-	0.27
c	-	-	0.18
D	0.55	0.60	0.65
E	0.90	1.00	1.10
E1	0.75	0.80	0.85
$\theta$	7° Ref.		

**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.

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