

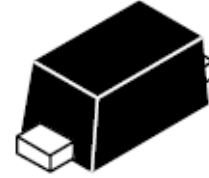
**ESD9D5U**

**1-Line, Uni-directional, Ultra-low Capacitance  
Transient Voltage Suppressor**

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

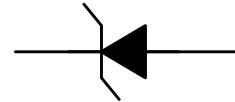
**Descriptions**

The ESD9D5U is transient voltage suppressors (TVS) which provide a very high level protection for sensitive electronic components that may be subjected to electrostatic discharge (ESD). It is designed to replace multilayer varistors (MLV) in consumer equipment applications such as mobile phone, notebook, PAD, STB, LCD TV etc.



**SOD-923**

The ESD9D5U may be used to provide ESD protection up to  $\pm 8\text{KV}$  (contact) according to IEC61000-4-2 and withstand peak pulse current up to 3A for 8/20 $\mu\text{s}$  pulse according to IEC61000-4-5.



**Circuit diagram**

The ESD9D5U is available in SOD-923 package. Standard products are Pb-free and Halogen-free.

**Features**

- Working voltage : 5V
- Peak power (tp=8/20 $\mu\text{s}$ ) : 42W
- ESD protection(IEC61000-4-2) :  $\pm 8\text{KV}$  contact
- ESD protection(IEC61000-4-2) :  $\pm 15\text{KV}$  air
- Low clamping voltage
- Low leakage current
- Small package SOD-923



**SOD-923**

**X = Device code**

**Marking (Top View)**

**Applications**

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

**Order information**

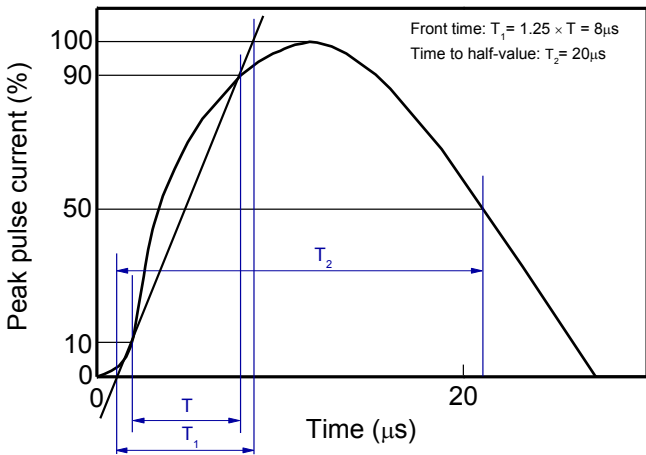
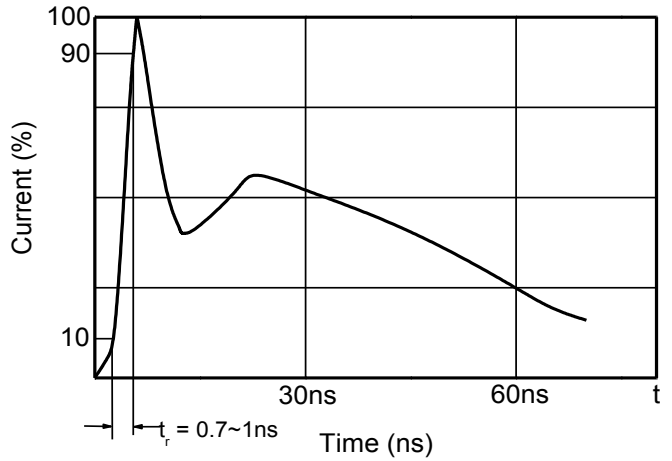
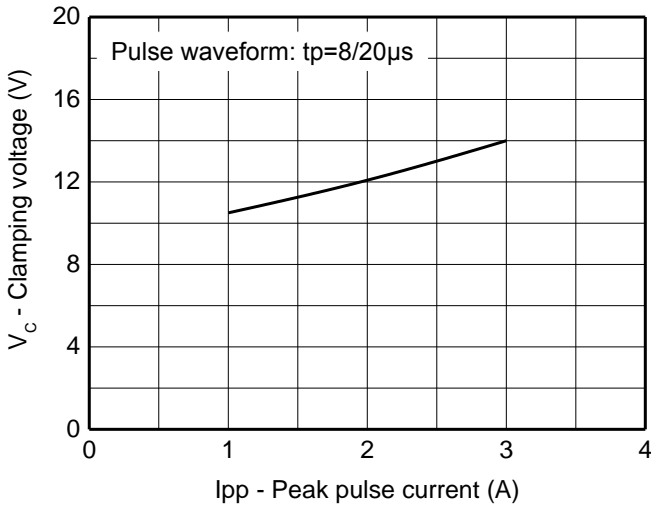
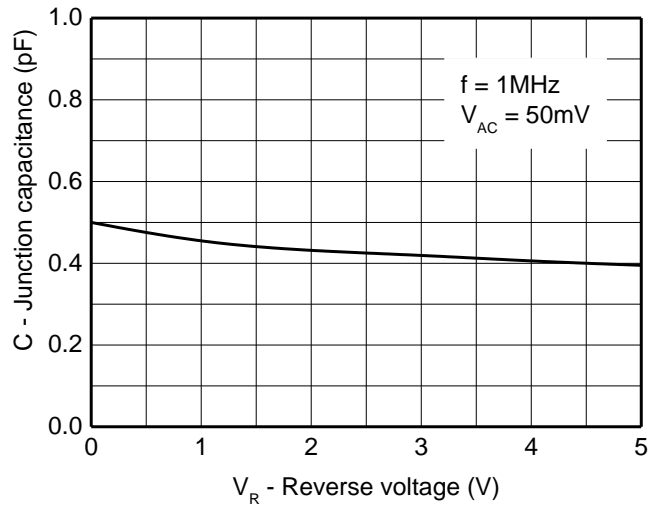
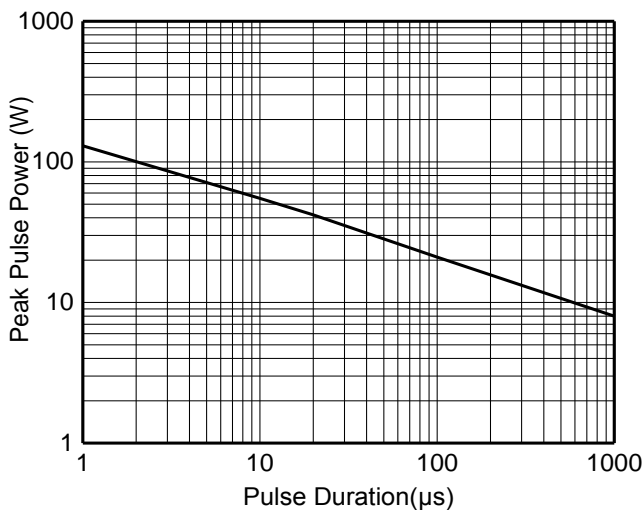
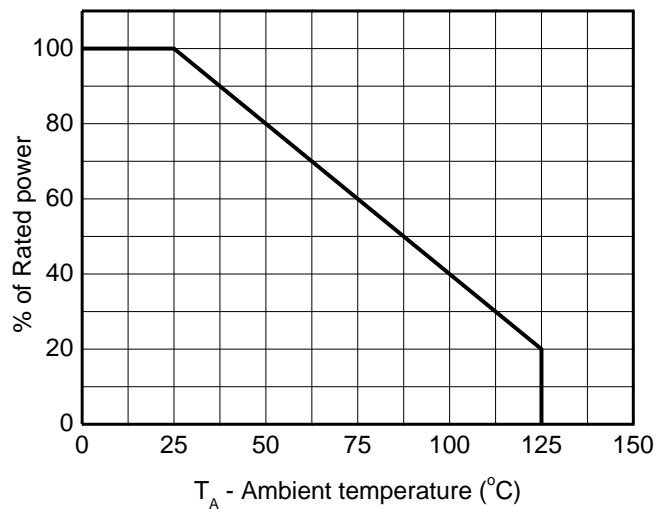
Device	Package	Shipping
ESD9D5U-2/TR	SOD-923	10000/Tape&Reel

**Absolute maximum ratings**

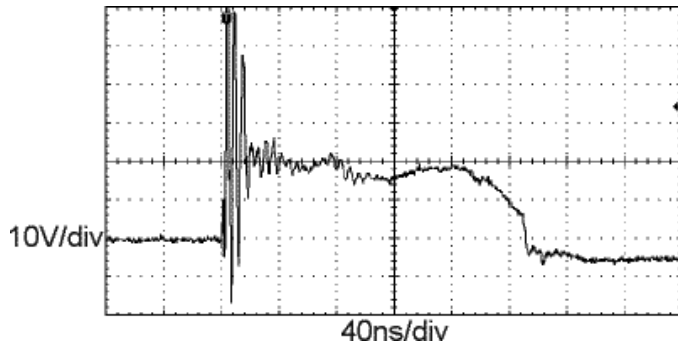
Parameter	Symbol	Rating	Unit
Peak pulse power (tp=8/20μs )	Ppk	42	W
Peak pulse current (tp=8/20μs )	Ipp	3	A
ESD according to IEC61000-4-2 air discharge	V <sub>ESD</sub>	±15	KV
ESD according to IEC61000-4-2 contact discharge		±8	KV
Junction temperature	T <sub>J</sub>	125	°C
Operating temperature	T <sub>OP</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)**

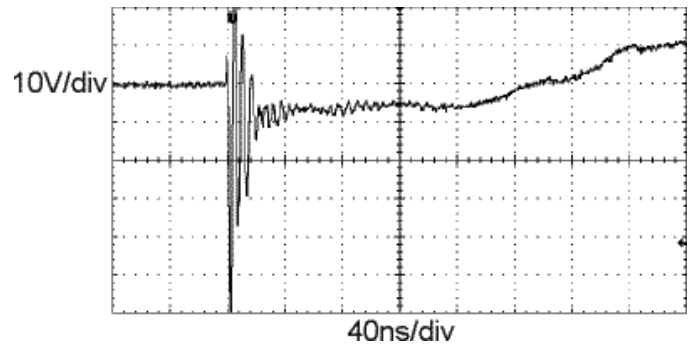
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				5.0	V
Reverse leakage current	I <sub>R</sub>	V <sub>RWM</sub> =5.0V			1.0	μA
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	6.5			V
Forward voltage	V <sub>F</sub>	I <sub>F</sub> =10mA	0.4		1.4	V
Clamping voltage	V <sub>CL</sub>	Ipp=1A tp=8/20μs			10.5	V
		Ipp=3A tp=8/20μs			14.0	V
Junction capacitance	C <sub>J</sub>	VR = 0V, f = 1MHz		0.5	0.9	pF

**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**

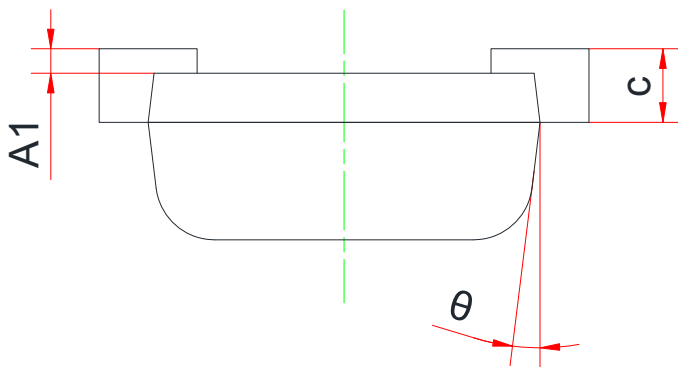
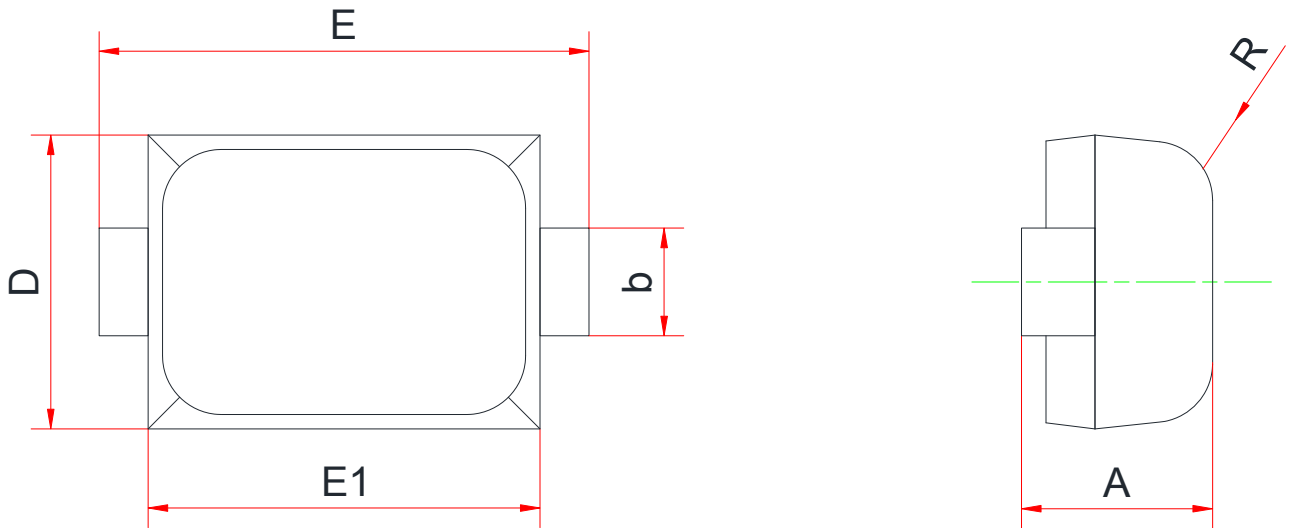
Typical characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)



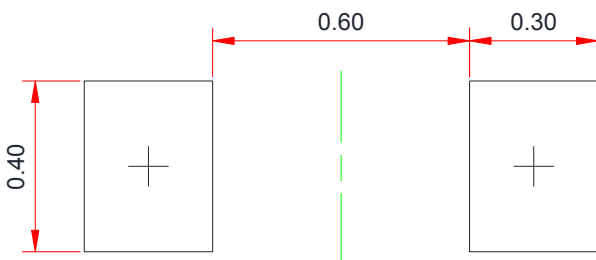
ESD clamping  
(+8kV contact discharge per IEC61000-4-2)



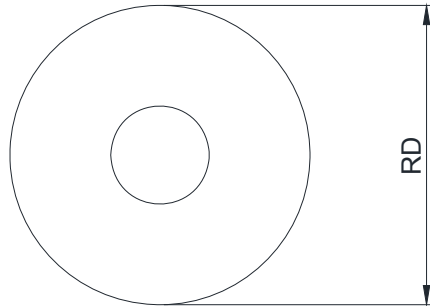
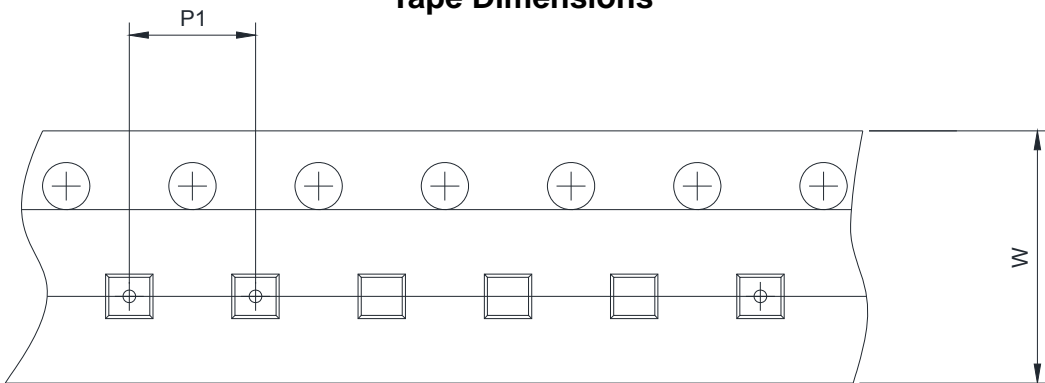
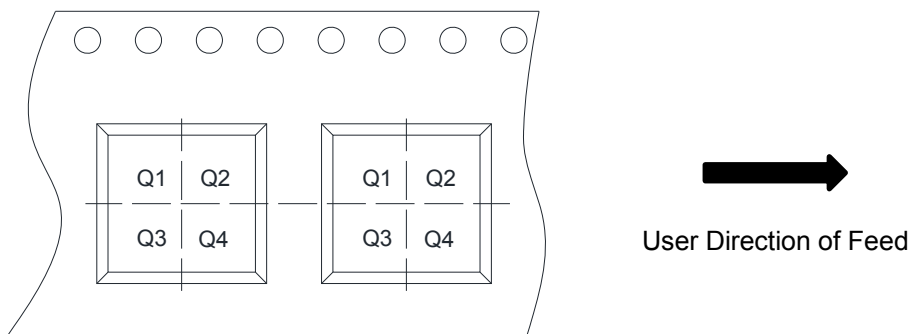
ESD clamping  
(-8kV contact discharge per IEC61000-4-2)

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


Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	-	0.42	0.45
A1	0.00	-	0.05
b	0.15	0.20	0.25
c	0.07	0.12	0.17
D	0.55	0.60	0.65
E	0.95	1.00	1.05
E1	0.75	0.80	0.85
$\theta$	6° Ref.		
R	-	-	0.12

**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.

**TAPE AND REEL INFORMATION**
**Reel Dimensions**

**Tape Dimensions**

**Quadrant Assignments For PIN1 Orientation In Tape**


RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch	<input type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm	<input type="checkbox"/> 12mm <input type="checkbox"/> 16mm
P1	Pitch between successive cavity centers	<input checked="" type="checkbox"/> 2mm	<input type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input checked="" type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4