Surge Components, Inc.

APPROVAL DRAWING

Sur product name
SES12VD923-2U TR (RoHS compliant)

CONTENTS

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Customer Acknowledgement	Manufacturer Surge Components, Inc. 2009-05-06

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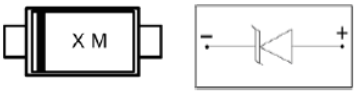
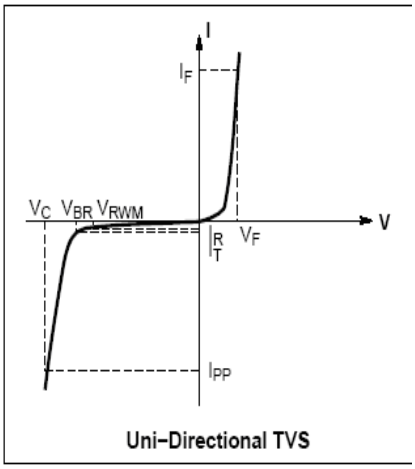
1. DESCRIPTION



The SES12VD923-2U ESD protector is designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and PDA's. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board level protection, such as fast response time, lower operating voltage, lower clamping voltage and no device degradation when compared to MLVs. The SES12VD923-2U protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. The SES12VD923-2U is available in a SOD-923 package with working voltages of 12 volt. It gives designer the flexibility to protect one unidirectional line in applications where arrays are not practical. Additionally, it may be " sprinkled" around the board in applications where board space is at a premium. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (±15kV air, ±8kV contact discharge)

2. FEATURE



Uni-Directional TVS

- 140 Watts peak pulse power (tp=8/20us)
- Transient protection for data lines to
  IEC 61000-4-2(ESD)±25kV(air),±30kV(contact)
  IEC 61000-4-4(EFT) 40A(5/50ns)
  IEC 61000-4-5(Lightning) 24A(8/20us)
- Small package for use in portable electronics
- Suitable replacement for MLV's in ESD protection applications
- Protect one I/O or power line
- Low clamping voltage
- Stand off voltage : 12V
- Low leakage current
- Solid-state silicon-avalanche technology
- Small body Outline Dimensions: 1.0mm*0.6mm*0.4mm

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3. APPLICATION

- Cell Phone Handsets and Accessories
- Personal Digital Assistants (PDA's)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Cordless Phones
- Digital Cameras
- Peripherals
- MP3 Players

4. ELECTRICAL CHARACTERISTICS PER LINE@25℃(UNLESS OTHERWISE SPECIFIED)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Working Voltage	V_{RWM}				12	V
Breakdown Voltage	V_{BR}	I_t=1mA	13.5			V
Reverse Leakage Current	I_R	V_{RWM}=12V	v		1.0	uA
Forward voltage	V_F	I_F=10mA		0.8		
Clamping Voltage	V_C	I_{PP}=5.9A t_P=8/20uS			23.7	V
Junction Capacitance	C_J	V_R=0V f=1MHz			30	pF

5. ABSOLUTE MAXIMUM RATING @25℃

Rating	Symbol	Value	Units
Peak Pulse Power(t_p=8/20μs)	P_{PP}	140	Watts
Maximum peak pulse current(t_p=8/20μs)	I_{PP}	5.9	Amps
Lead Soldering temperature	T_L	260(10 sec)	℃
Operating Temperature	T_j	-55 to +125	℃
Storage Temperature	T_{STG}	-55 to +150	℃

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6.TYPICAL CHARACTERISTICS

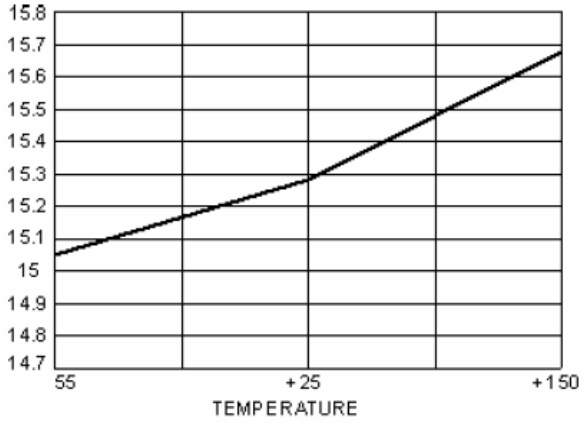

Figure 1. Typical Breakdown Voltage versus Temperature

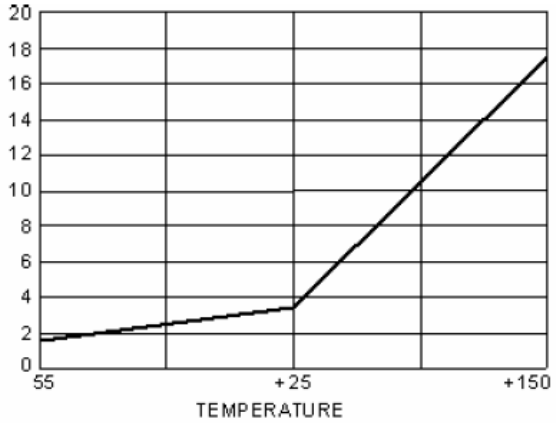

Figure 2. Typical Leakage Current versus Temperature

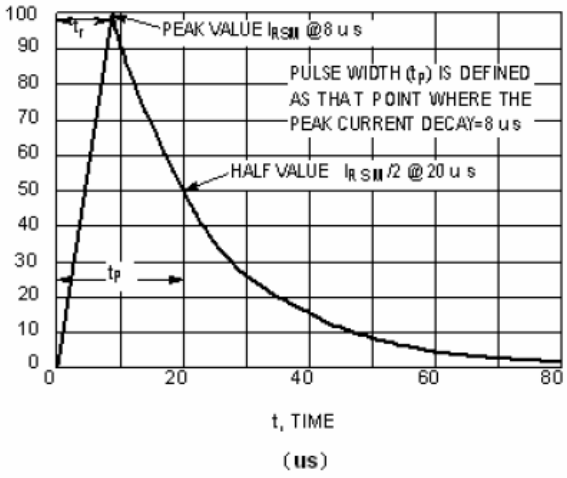

Figure 3. 8 X 20 us Pulse Waveform

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7. APPLICATION INFORMAITON

■ **Device Connection options**

SES12VD923-2U is designed to protect one data, I/O, or power supply line. The device is unidirectional and may be used on lines where the signal polarity is above ground. The cathode dot should be placed towards the line that is to be protected.

■ **Circuit Board Layout recommendations for Suppression of ESD.**

Good circuit board layout is critical for the suppression of ESD induced transients. The following guidelines are recommended:

Place the TVS near the input terminals or connectors to restrict transient coupling

Minimize the path length between the TVS and the protected line.

Minimize all conductive loops including power and ground loops.

The ESD transient return path to ground should be kept as short as possible.

Never run critical signals near board edges.

Use ground planes whenever possible, for multiplayers printed-circuit boards, use ground vias.

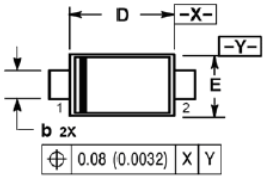
Keep parallel signal paths to a minimum.

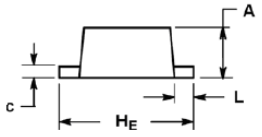
Avoid running protection conductors in parallel with unprotected conductor.

Minimize all printed-circuit board conductive loops including power and ground loops.

Avoid using shared transient return paths to a common ground point.

8. PRODUCT DIMENSION





NOTES:

1.DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982

2.CONTROLLING DIMENSION: MILLIMETERS.

3.MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS.MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.36	0.40	0.43	0.014	0.016	0.017
b	0.15	0.20	0.25	0.006	0.008	0.010
c	0.07	0.12	0.17	0.003	0.005	0.007
D	0.75	0.80	0.85	0.030	0.031	0.033
E	0.55	0.60	0.65	0.022	0.024	0.026
H_E	0.95	1.00	1.05	0.037	0.039	0.041
L	0.05	0.10	0.15	0.002	0.004	0.006

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