

## Single Line ESD Protection Diode Array

**UM50125 SOD523 1.2 × 0.8**

**UM50129 DFN2/FBP2 1.0 × 0.6**

### General Description

The UM50125/50129 ESD protection diode is designed to replace multilayer varistors (MLVs) in portable instrumentation, notebook computers, digital power meter, digital camera and communication systems. 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 UM50125/50129 ESD protection diode protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. The UM50125 is available in SOD523 package and the UM50129 is available in DFN2/FBP2 1.0 × 0.6 (compatible with SOD923 & SOD882) package, both 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, ±30kV air, ±30kV contact discharge.

### Applications

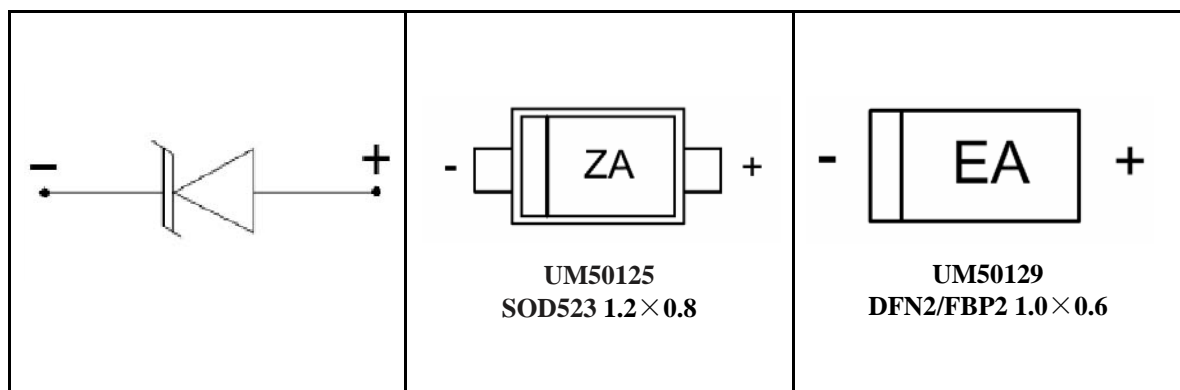
- Cell Phone Handsets and Accessories
- Notebooks, Desktops and Servers
- Portable Instrumentation and Accessories
- Digital Power Meter
- Digital Cameras
- Communication Systems

### Features

- Transient protection for data lines to IEC 61000-4-2 (ESD): ±30kV (air), ±30kV (contact)
- 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

### Pin Configurations

### Top View



## Ordering Information

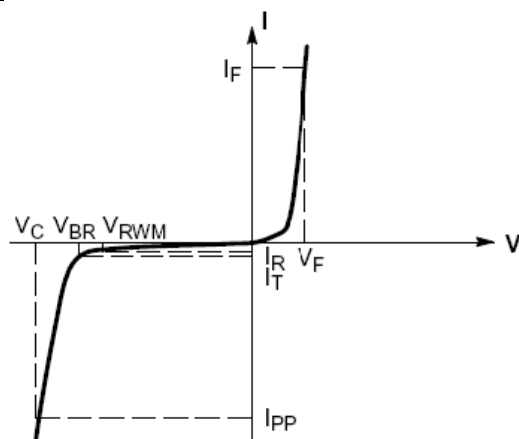
Part Number	Working Voltage	Packaging Type	Channel	Marking Code	Shipping Qty
UM50125	12.0V	SOD523 1.2×0.8 mm <sup>2</sup>	1	ZA	3000pcs/7 Inch Tape & Reel
UM50129	12.0V	DFN2/FBP2 1.2×0.8 mm <sup>2</sup>	1	EA	5000pcs/7 Inch Tape & Reel

## Absolute Maximum Ratings

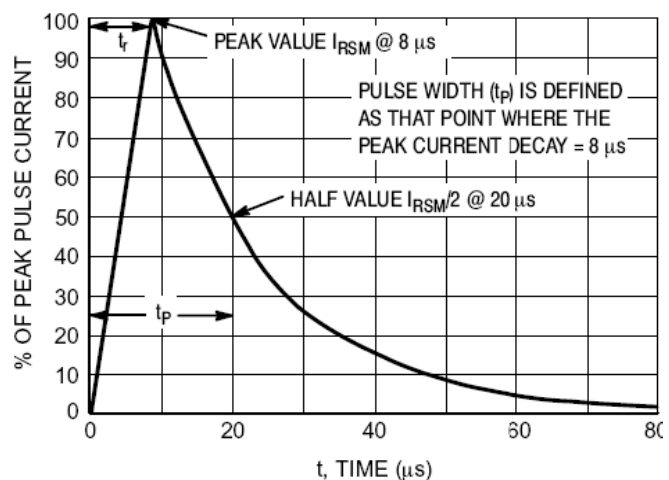
Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20μs)	P <sub>PK</sub>	140	Watts
Maximum Peak Pulse Current (t=8/20μs)	I <sub>PP</sub>	5.9	Amps
Lead Soldering Temperature	T <sub>L</sub>	260 (10 sec.)	°C
Operating Temperature	T <sub>J</sub>	-55 to +125	°C
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C

## Symbol Definition

Parameter	Symbol
Maximum Reverse Peak Pulse Current	I <sub>PP</sub>
Clamping Voltage @ I <sub>pp</sub>	V <sub>C</sub>
Working Peak Reverse Voltage	V <sub>RWM</sub>
Maximum Reverse Leakage Current @ V <sub>RWM</sub>	I <sub>R</sub>
Breakdown Voltage @ I <sub>t</sub>	V <sub>BR</sub>
Test Current	I <sub>t</sub>
Forward Current	I <sub>F</sub>
Forward Voltage @ I <sub>F</sub>	V <sub>F</sub>
Peak Power Dissipation	P <sub>PK</sub>
Max. Capacitance @ V <sub>R</sub> = 0V, f = 1MHz	C



Uni-Directional TVS



## Electrical Characteristics

(T=25°C, Device for 12.0V Reverse Stand-off Voltage)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Stand-Off Voltage	$V_{RWM}$				12	V
Reverse Breakdown Voltage	$V_{BR}$	$I_t = 1\text{mA}$	16		18	V
Reverse Leakage Current	$I_R$	$V_{RWM} = 12\text{V}, T=25^\circ\text{C}$			0.5	$\mu\text{A}$
Clamping Voltage	$V_C$	$I_{PP} = 5.9\text{A}, t_p = 8/20\mu\text{S}$			23	V
Junction Capacitance	$C_J$	$V_R = 0\text{V}, f = 1\text{MHz}$		20	30	pF

## Applications Information

### Device Connection Options

UM50125/50129 ESD protection diode 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:

1. Place the TVS near the input terminals or connectors to restrict transient coupling.
2. Minimize the path length between the TVS and the protected line.
3. Minimize all conductive loops including power and ground loops.
4. The ESD transient return path to ground should be kept as short as possible.
5. Never run critical signals near board edges.
6. Use ground planes whenever possible. For multilayer printed-circuit boards, use ground vias.
7. Keep parallel signal paths to a minimum.
8. Avoid running protection conductors in parallel with unprotected conductor.
9. Minimize all printed-circuit board conductive loops including power and ground loops.
10. Avoid using shared transient return paths to a common ground point.

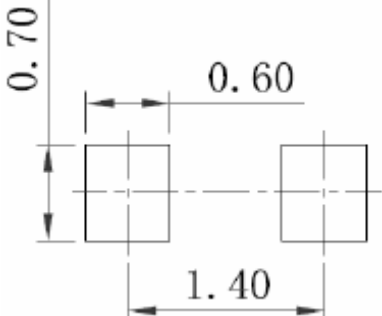
## Package Information

UM50125 SOD523 1.2×0.8

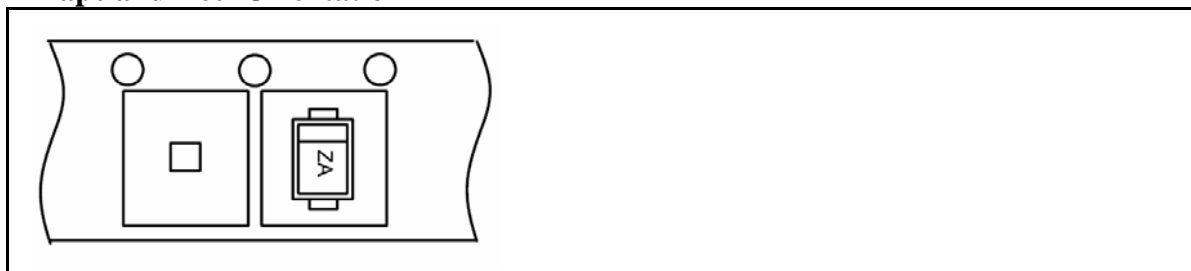
### Outline Drawing

Symbol	DIMENSIONS			
	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.510	0.770	0.020	0.031
A1	0.500	0.700	0.020	0.028
b	0.250	0.350	0.010	0.014
c	0.080	0.150	0.003	0.006
D	0.750	0.850	0.030	0.033
E	1.100	1.300	0.043	0.051
E1	1.500	1.700	0.059	0.067
E2	0.200REF		0.008REF	
L	0.010	0.070	0.001	0.003
$\theta$	7° REF		7° REF	

### Land Pattern

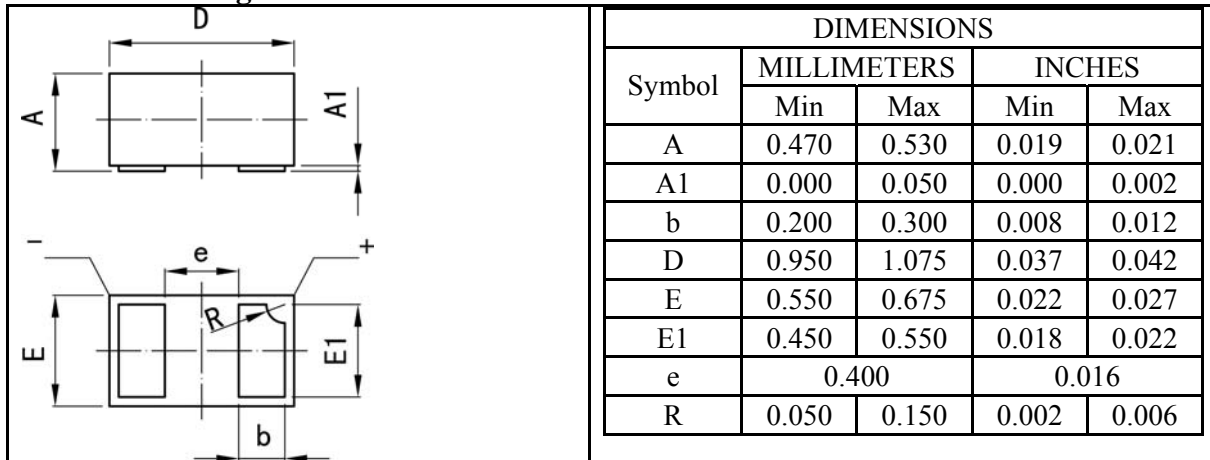
	<p>NOTES:</p> <ol style="list-style-type: none"> <li>Compound dimension: 1.20×0.80;</li> <li>Unit: mm;</li> <li>General tolerance ±0.05mm unless otherwise specified;</li> <li>The layout is just for reference.</li> </ol>
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### Tape and Reel Orientation

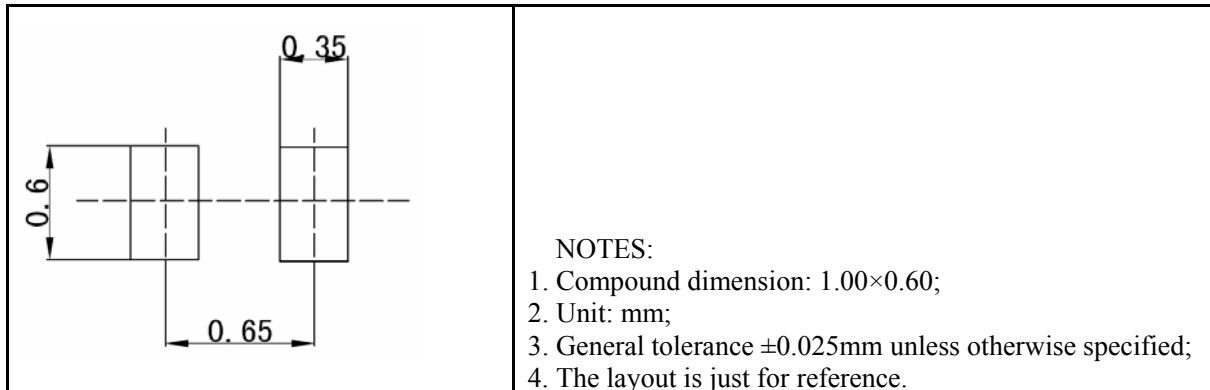


## UM50129 DFN2 1.0×0.6

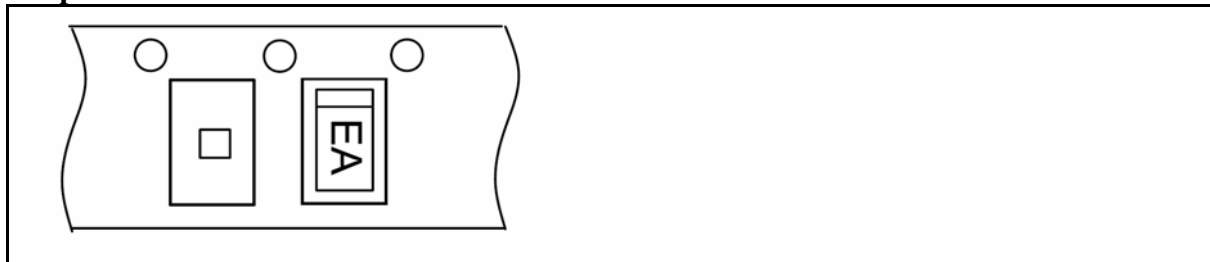
### Outline Drawing



### Land Pattern

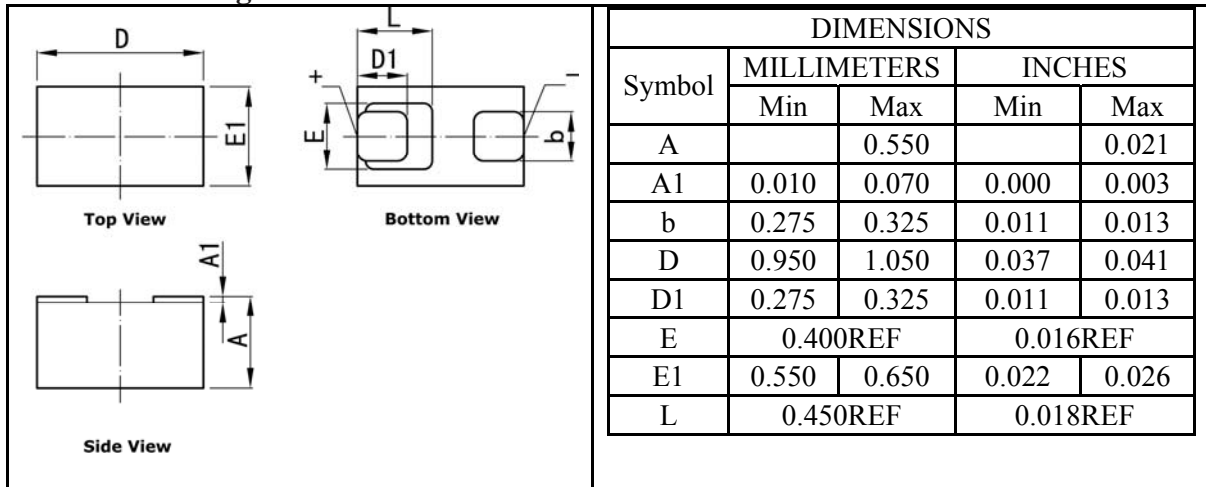


### Tape and Reel Orientation

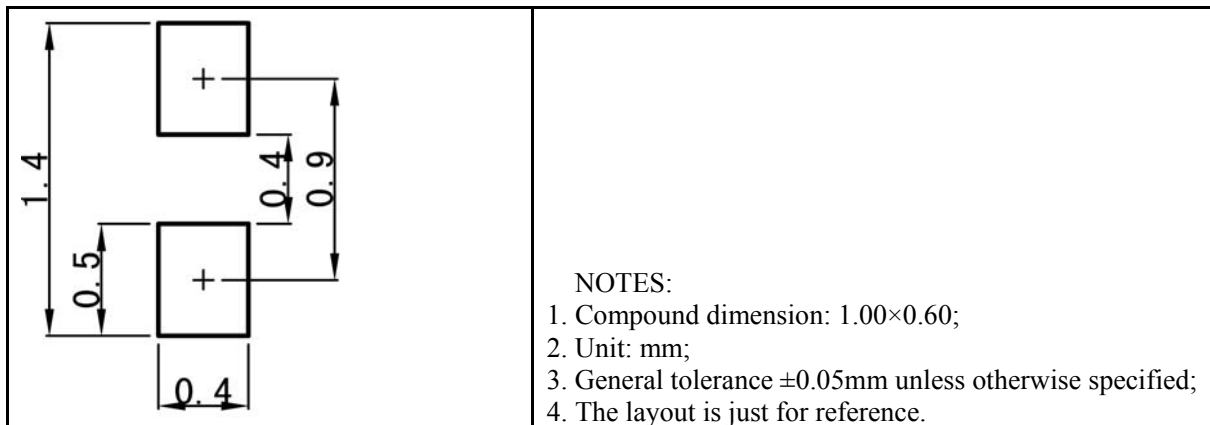


## UM50129 FBP2 1.0×0.6

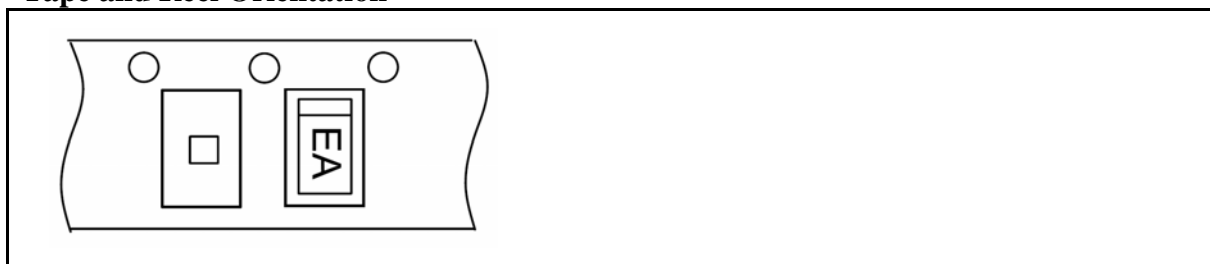
### Outline Drawing



### Land Pattern



### Tape and Reel Orientation



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## IMPORTANT NOTICE

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