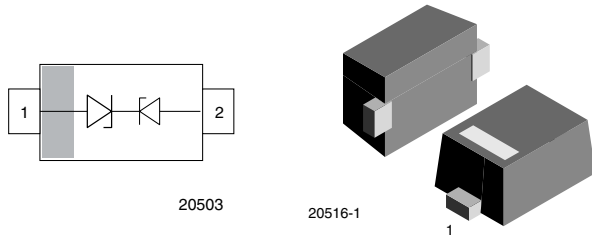


## Bidirectional Asymmetrical (BiAs) Single Line ESD-Protection Diode in SOD923



20503

20516-1

1

**MARKING** (example only)


Bar = pin 1 marking

Y = type code (see table below)

X = date code

**FEATURES**

- Tiny SOD-923 package
- Package height < 0.4 mm
- Working range - 7 V up to + 14 V or - 14 V up to + 7 V
- Low leakage current  $I_R < 0.1 \mu A$
- Low capacitance typical  $C_D = 8 \text{ pF}$
- ESD-protection acc. IEC 61000-4-2  
± 25 kV contact discharge  
± 30 kV air discharge
- Working voltage range  $V_{RWM} = 5 \text{ V}$
- e3 - Sn
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC


**ORDERING INFORMATION**

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL (8 mm TAPE ON 7" REEL)	MINIMUM ORDER QUANTITY
VCUT0714A-02Z	VCUT0714A-02Z-GS08	8000	8000

**PACKAGE DATA**

DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VCUT0714A-02Z	SOD-923	A	0.45 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

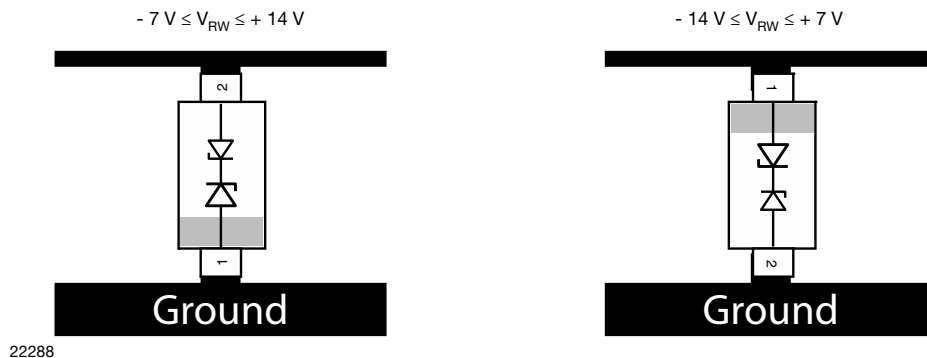
**ABSOLUTE MAXIMUM RATINGS VCUT0714A-02Z**

PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	Pin 1 to pin 2 acc. IEC 61000-4-5, 8/20 $\mu s$ /single shot	$I_{PPM}$	5	A
	Pin 2 to pin 1 acc. IEC 61000-4-5, 8/20 $\mu s$ /single shot		2	A
Peak pulse power	Pin 1 to pin 2 acc. IEC 61000-4-5, 8/20 $\mu s$ /single shot	$P_{PP}$	63	W
	Pin 2 to pin 1 acc. IEC 61000-4-5, 8/20 $\mu s$ /single shot		54	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	$V_{ESD}$	± 25	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	kV
Operating temperature	Junction temperature	$T_J$	- 40 to + 125	°C
Storage temperature		$T_{STG}$	- 55 to + 150	°C

 \*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

## CUT THE SPIKES WITH VCUT0714A-02Z

The VCUT0714A-02Z is a bidirectional but asymmetrical (BiAs) ESD-protection device which clamps positive and negative overvoltage transients to ground. Connected between the signal or data line and the ground the VCUT0714A-02Z offers a high isolation (low leakage current, small capacitance) within the specified working range of - 7 V to + 14 V or - 14 V and + 7 V. Due to the short leads and small package size of the tiny SOD-923 package the line inductance is very low, so that fast transients like an ESD-strike can be clamped with minimal over- or undershoots.



ELECTRICAL CHARACTERISTICS VCUT0714A-02Z						
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	N <sub>channel</sub>	-	-	1	lines
Reverse working voltage	at I = 1 μA	V <sub>RWM</sub>	14	-	-	V
Reverse current	at V = 14 V	I <sub>R</sub>	-	-	0.1	μA
Reverse breakdown voltage	at I = 1 mA	V <sub>BR</sub>	14.5	-	-	V
Reverse clamping voltage	at I <sub>PP</sub> = 1 A	V <sub>C</sub>	-	-	27	V
	at I <sub>PP</sub> = I <sub>PPM</sub> = 2 A		-	-	30	V
Capacitance	at V = 0 V; f = 1 MHz	C <sub>D</sub>	-	8	8.5	pF
	at V = 7 V; f = 1 MHz		-	4	-	pF

### Note

- Ratings at 25 °C, ambient temperature unless otherwise specified. Measured from pin 2 to pin 1.

ELECTRICAL CHARACTERISTICS VCUT0714A-02Z						
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	N <sub>channel</sub>	-	-	1	lines
Reverse working voltage	at I = 1 μA	V <sub>RWM</sub>	7	-	-	V
Reverse current	at V = 7 V	I <sub>R</sub>	-	-	0.1	μA
Reverse breakdown voltage	at I = 1 mA	V <sub>BR</sub>	7.3	-	-	V
Reverse clamping voltage	at I <sub>PP</sub> = 1 A	V <sub>C</sub>	-	-	13	V
	at I <sub>PP</sub> = I <sub>PPM</sub> = 5 A		-	-	17	V
Capacitance	at V = 0 V; f = 1 MHz	C <sub>D</sub>	-	8	8.5	pF
	at V = 3.5 V; f = 1 MHz		-	6.4	-	pF

### Note

- Ratings at 25 °C, ambient temperature unless otherwise specified. Measured from pin 1 to pin 2.

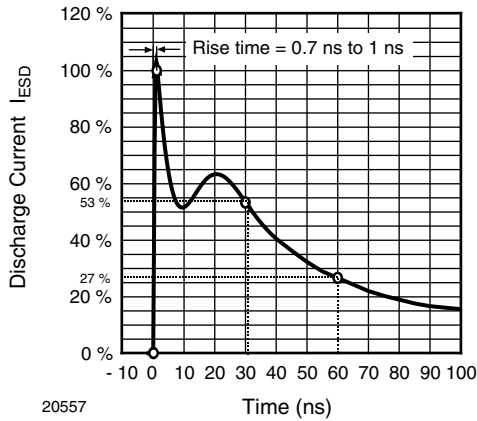
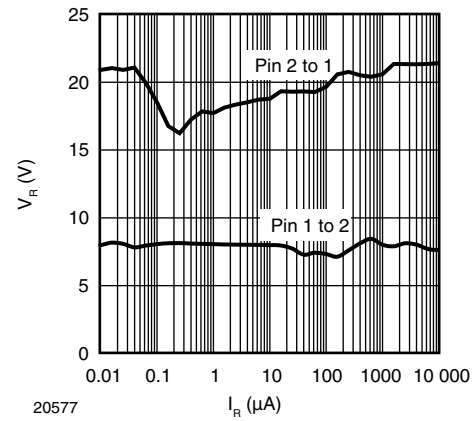
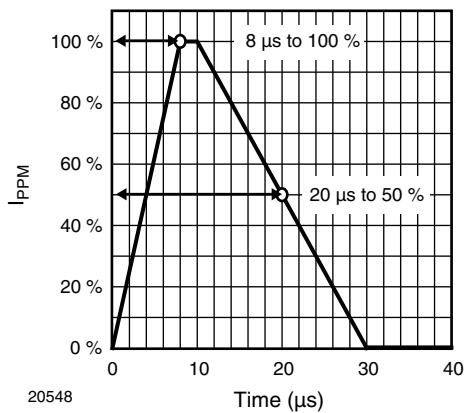
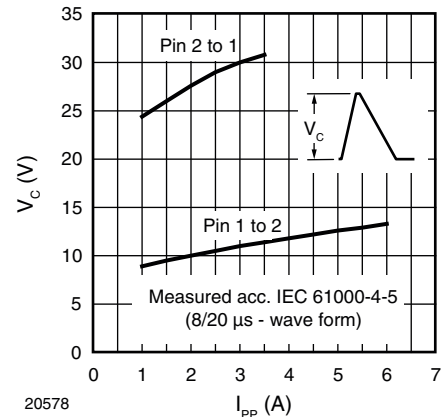
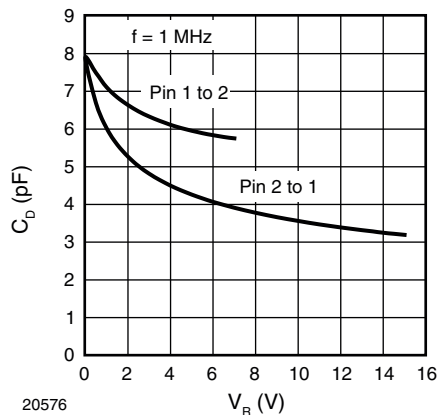
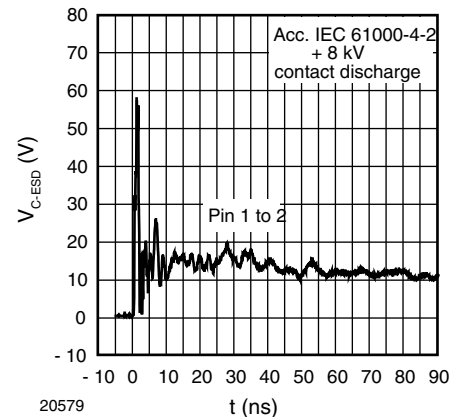
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

 Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330  $\Omega$ /150 pF)

 Fig. 4 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$ 

 Fig. 2 - 8/20  $\mu\text{s}$  Peak Pulse Current Wave Form acc. IEC 61000-4-5

 Fig. 5 - Typical Peak Clamping Voltage  $V_C$  vs. Peak Pulse Current  $I_{PP}$ 

 Fig. 3 - Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$ 


Fig. 6 - Typical Clamping Performance at +8 kV Contact Discharge (acc. IEC 61000-4-2)

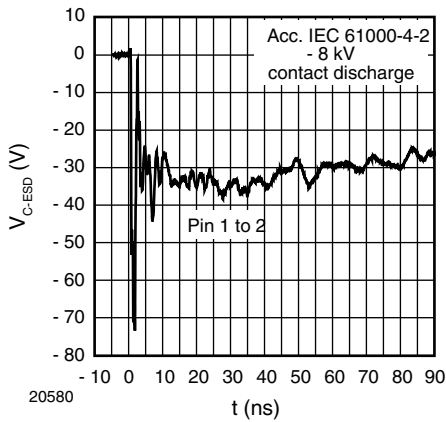


Fig. 7 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

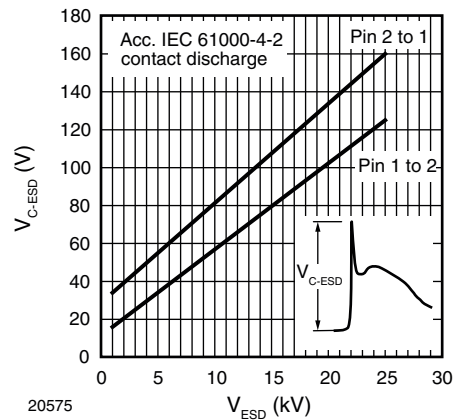
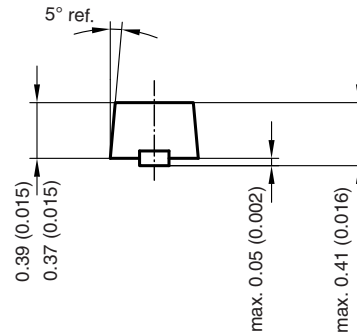
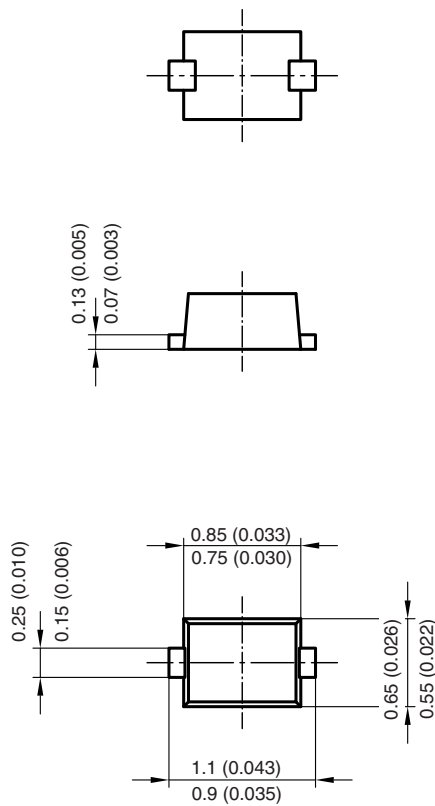
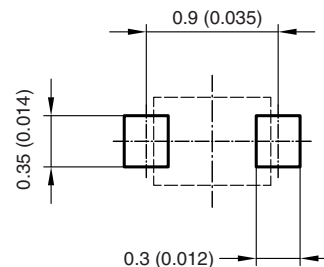


Fig. 8 - Typical Peak Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

**PACKAGE DIMENSIONS** in millimeters (inches): **SOD-923**



Foot print recommendation:



Document no.: S8-V-3880.05-001 (4)  
Rev. 1 - Date: 05.July.2006  
20096



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