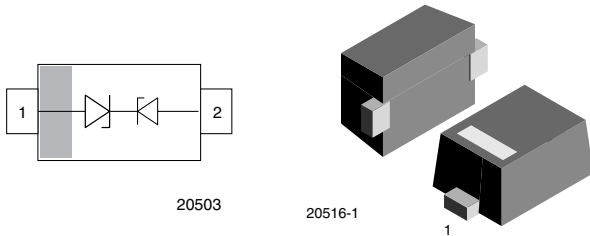


## Bidirectional Asymmetrical (BiAs) Single Line ESD-Protection Diode in SOD923


**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  $I_R < 0.1 \mu\text{A}$
- 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

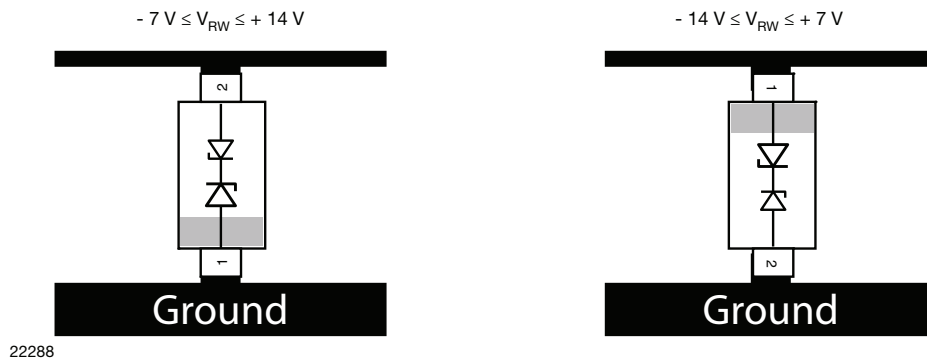
**ABSOLUTE MAXIMUM RATINGS VCUT0714A-02Z**

PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	Pin 1 to pin 2 acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot	$I_{PPM}$	5	A
	Pin 2 to pin 1 acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot		2	A
Peak pulse power	Pin 1 to pin 2 acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot	$P_{PP}$	63	W
	Pin 2 to pin 1 acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /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.

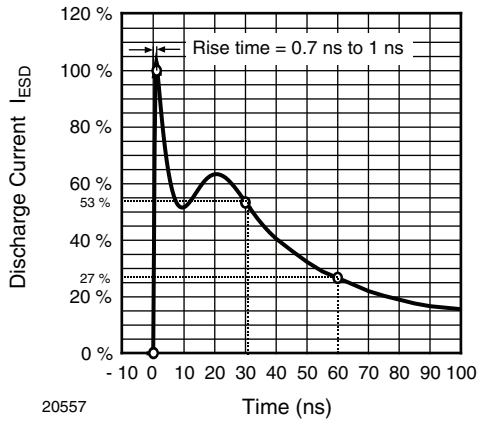
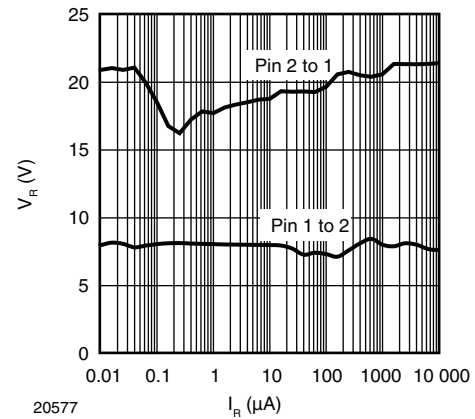
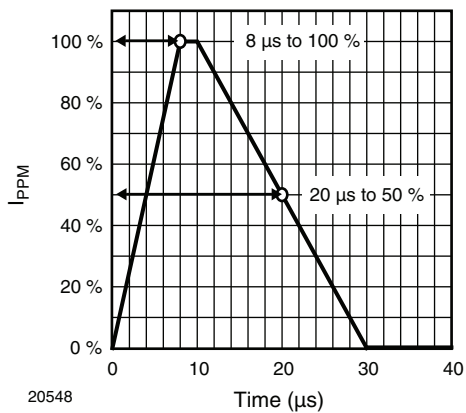
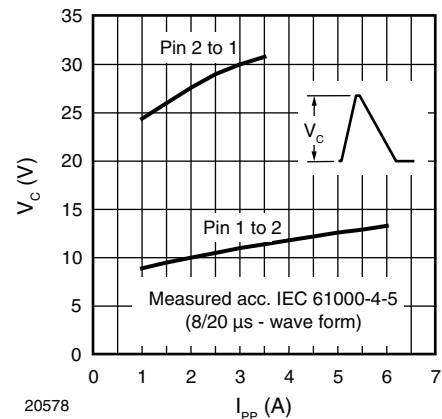
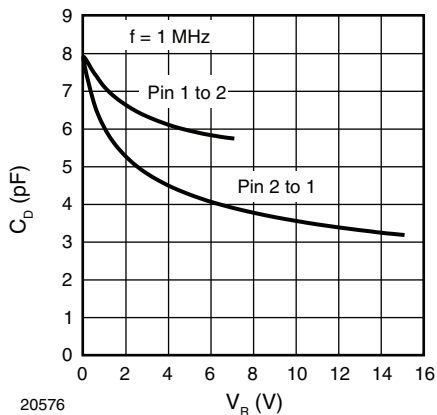
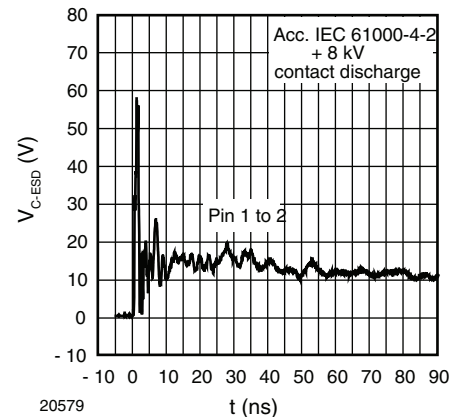
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

 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)

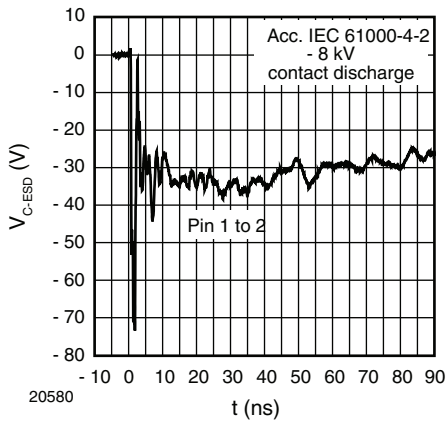


Fig. 7 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

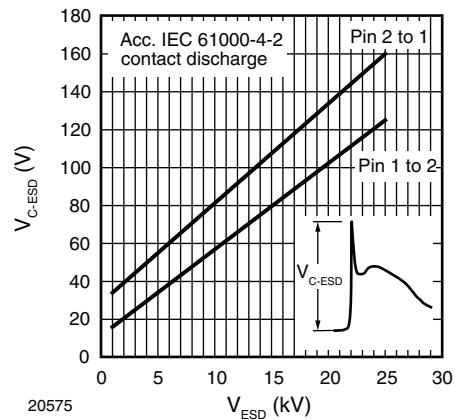
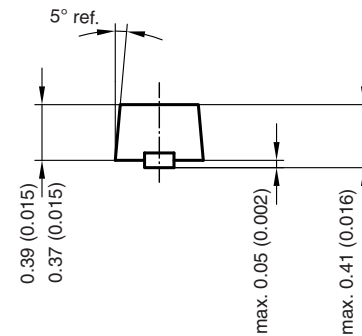
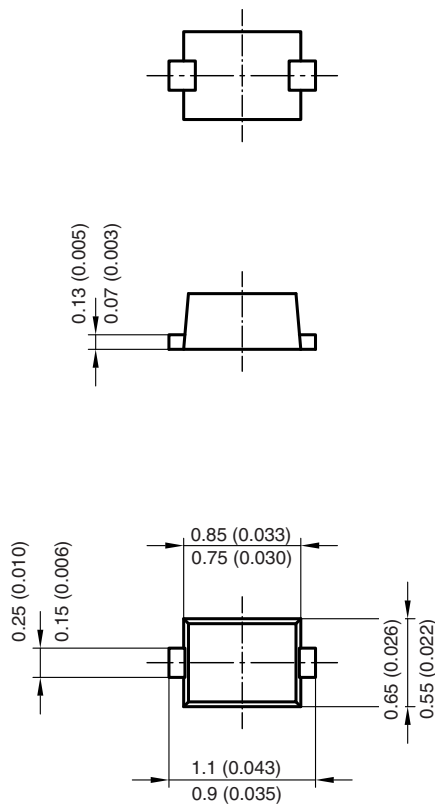
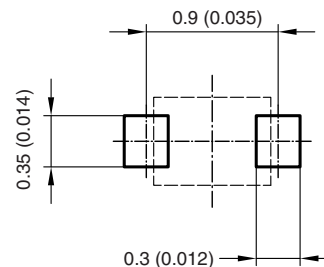


Fig. 8 - Typical Peak Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

**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



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.