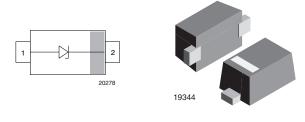
1

www.vishay.com

Vishay Semiconductors

ESD-Protection Diode in SOD-523



MARKING (example only)



Bar = cathode marking

Y = type code (see table below)

X = date code

FEATURES

- Single-line ESD-protection
- Capacitance typical $C_D = 12 \text{ pF}$ (V_R = 2.5 V, f = 1 MHz)
- Leakage current $I_R < 1 \ \mu A \ (V_R = 5 \ V)$
- ESD-protection acc. IEC 61000-4-2 > 20 kV contact discharge > 30 kV air discharge
- Non-magnetic package material
- 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	
VESD05A1B-02V	VESD05A1B-02V-GS08	3000	3000	

PACKAGE DATA						
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VESD05A1B-02V	SOD-523	Н	1.5 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS VESD05A1B-02V						
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT		
Peak pulse current	Acc. IEC 61000-4-5, 8/20 µs/single shot	I _{PPM}	3	A		
Peak pulse power	Acc. IEC 61000-4-5, 8/20 µs/single shot	P _{PP}	33	W		
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	M	± 20	kV		
	Air discharge acc. IEC 61000-4-2; 10 pulses	V _{ESD}	± 30	kV		
Operating temperature	Junction temperature	TJ	- 40 to + 125	°C		
Storage temperature		T _{STG}	- 55 to + 150	°C		



RoHS

COMPLIANT

VESD05A1B-02V

Vishay Semiconductors ESD-Protection Diode in SOD-523



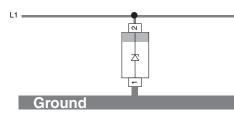
BIAs-MODE (bidirectional asymmetrical protection mode)

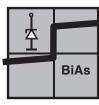
With the VESD05A1B-02V one signal- or data-lines (L1) can be protected against voltage transients. With pin 1 connected to ground and pin 2 connected to a signal- or data-line which has to be protected. As long as the voltage level on the data- or signal-line is between 0 V (ground level) and the specified maximum reverse working voltage (V_{RWM}) the protection diode between data line and ground offers a high isolation to the ground line. The protection device behaves like an open switch.

As soon as any positive transient voltage signal exceeds the break through voltage level of the protection diode, the diode becomes conductive and shorts the transient current to ground. Now the protection device behaves like a closed switch. The clamping voltage (V_C) is defined by the breakthrough voltage (V_{BR}) level plus the voltage drop at the series impedance (resistance and inductance) of the protection device.

Any negative transient signal will be clamped accordingly. The negative transient current is flowing in the forward direction of the protection diode. The low forward voltage (V_F) clamps the negative transient close to the ground level.

Due to the different clamping levels in forward and reverse direction the VESD05A1B-02V clamping behaviour is bidirectional and asymmetrical (BiAs).





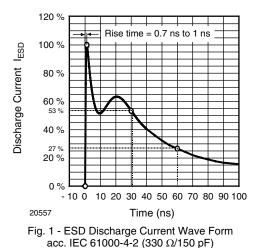
20280

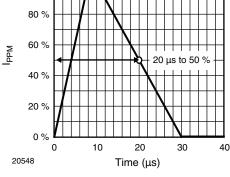
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	N _{channel}	-	-	1	lines
Reverse working voltage	at I _R = 1 μA	V _{RWM}	5	-	-	V
Reverse current	at V _R = 5 V	I _R	-	0.01	0.1	μΑ
Reverse breakdown voltage	at I _R = 1 mA	V _{BR}	6	6.8	7.5	V
Reverse clamping voltage	at I _{PP} = 1 A	Vc	-	8	9.5	V
	at I _{PP} = I _{PPM} = 3 A	vc	-	8.9	11	V
Forward clamping voltage	at I _{PP} = 0.2 A		-	0.95	1.2	V
	at I _{PP} = 1 A	V _F	-	1.3	-	V
	at I _{PP} = I _{PPM} = 3 A] Γ	-	1.9	-	V
Capacitance	at $V_R = 0 V$; f = 1 MHz	- C _D -	-	19	23	pF
	at V _B = 2.5 V; f = 1 MHz	νD	-	12	-	pF

Note

• Ratings at 25 °C, ambient temperature unless otherwise specified. BiAs mode (between pin 1 and pin 2).

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)





8

to 100

100 %

Fig. 2 - 8/20 µs Peak Pulse Current Wave Form acc. IEC 61000-4-5



VESD05A1B-02V

ESD-Protection Diode in SOD-523

Vishay Semiconductors

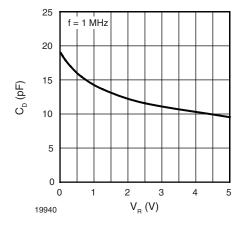


Fig. 3 - Typical Capacitance C_{D} vs. Reverse Voltage V_{R}

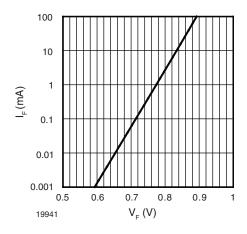


Fig. 4 - Typical Forward Current I_{F} vs. Forward Voltage V_{F}

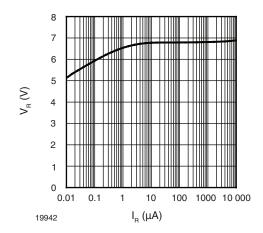


Fig. 5 - Typical Reverse Voltage V_{R} vs. Reverse Current I_{R}

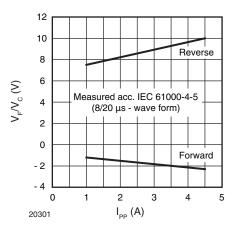


Fig. 6 - Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

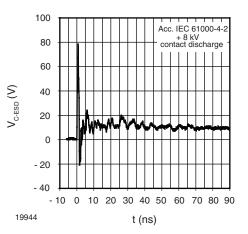


Fig. 7 - Typical Clamping Performance at + 8 kV Contact Discharge (acc. IEC 61000-4-2)

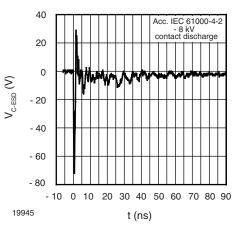


Fig. 8 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

VESD05A1B-02V

Vishay Semiconductors

ESD-Protection Diode in SOD-523



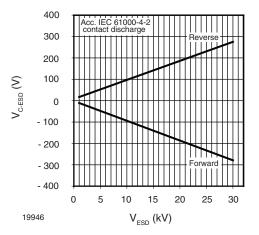
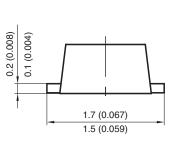
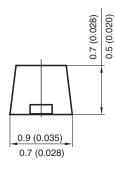


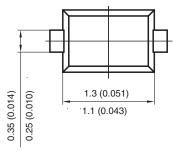
Fig. 9 - Typical Peak Clamping Voltage at ± ESD Contact Discharge (acc. IEC 61000-4-2)

PACKAGE DIMENSIONS in millimeters (inches): SOD-523

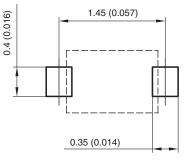




Foot print recommendation:



Document no.: S8-V-3880.02-001 Rev. f - Date: 25. January. 2005 16864





Vishay

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.