

BiAs-MODE (2-line bidirectional asymmetrical protection mode)

With the GSOT05CL-V two signal- or data-lines (L1, L2) can be protected against voltage transients. With pin 3 connected to ground and pin 1 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 pin 2 and pin 3 and between pin 1 and pin 3 offer 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 GSOT05CL-V clamping behaviour is bidirectional and asymmetrical (BiAs).

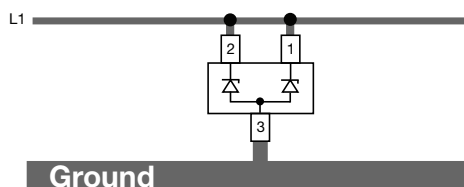


20358

If a higher surge current or peak pulse current (I_{PP}) is needed, both protection diodes in the GSOTxxC can also be used in parallel in order to “double” the performance.

This offers:

- double surge power = double peak pulse current ($2 \times I_{PPM}$)
- half of the line inductance = reduced clamping voltage
- half of the line resistance = reduced clamping voltage
- double line capacitance ($2 \times C_D$)
- double reverse leakage current ($2 \times I_R$)



20359

ELECTRICAL CHARACTERISTICS GSOT05CLV						
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 $I_R = 1 \mu A$	V_{RWM}	5.5	6.1	7	V
Reverse current	at $V_R = 5.5 V$	I_R	-	-	1	μA
Reverse breakdown voltage	at $I_R = 1 mA$	V_{BR}	6	6.75	-	V
Reverse clamping voltage	at $I_{PP} = 1 A$	V_C	-	6.9	9	V
	at $I_{PP} = I_{PPM} = 13 A$		-	10	12	V
Forward clamping voltage	at $I_{PP} = 1 A$	V_F	-	1	1.3	V
	at $I_{PP} = I_{PPM} = 30 A$		-	2.6	3	V
Capacitance	at $V_R = 0 V$; $f = 1 MHz$	C_D	-	100	120	pF
	at $V_R = 2.5V$; $f = 1 MHz$		-	60	-	pF

Note

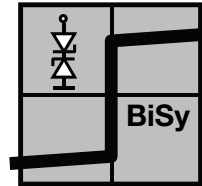
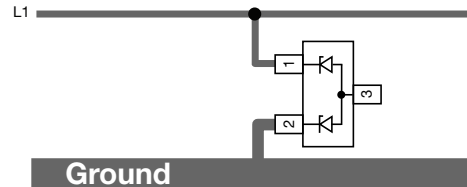
- BiAs mode (between pin 1 to pin 3 or pin 2 to 1)

BiSy-MODE (1-line bidirectional symmetrical protection mode)

If a bipolar symmetrical protection device is needed the GSOT05CL-V can also be used as a single line protection device. Therefore pin 1 has to be connected to the signal- or data-line (L1) and pin 2 to ground (or vice versa). Pin 3 must not be connected.

Positive and negative voltage transients will be clamped in the same way. The clamping current through the GSOT05CL-V passes one diode in forward direction and the other one in reverse direction. The clamping voltage (V_C) is defined by the breakthrough voltage (V_{BR}) level of one diode plus the forward voltage of the other diode plus the voltage drop at the series impedances (resistances and inductances) of the protection device.

Due to the same clamping levels in positive and negative direction the GSOT05CL-V voltage clamping behaviour is bidirectional and symmetrical (BiSy).



20361

ELECTRICAL CHARACTERISTICS GSOT05CL-V						
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 $I_R = 1 \mu A$	V_{RWM}	6	-	-	V
Reverse current	at $V_R = 6 V$	I_R	-	-	1	μA
Reverse breakdown voltage	at $I_R = 1 mA$	V_{BR}	6.5	7.5	-	V
Reverse clamping voltage	at $I_{PP} = 1 A$	V_C	-	8	10	V
	at $I_{PP} = I_{PPM} = 13 A$		-	12.6	15	V
Capacitance	at $V_R = 0 V$; $f = 1 MHz$	C_D	-	50	60	pF
	at $V_R = 2.5 V$; $f = 1 MHz$		-	37	-	pF

Note

- Ratings at 25 °C, ambient temperature unless otherwise specified. BiAs mode (between pin 1 to 2 or pin 2 to 1; pin 3 not connected)

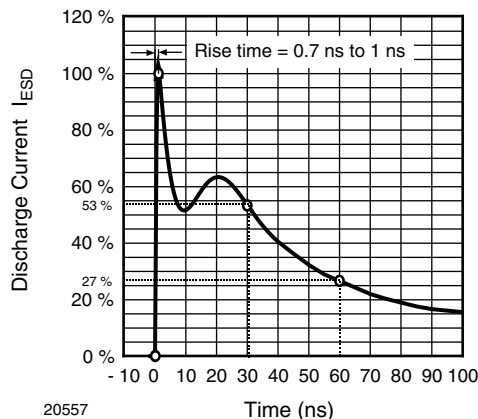
TYPICAL CHARACTERISTICS ($T_{amb} = 25 \text{ }^{\circ}C$, unless otherwise specified)


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

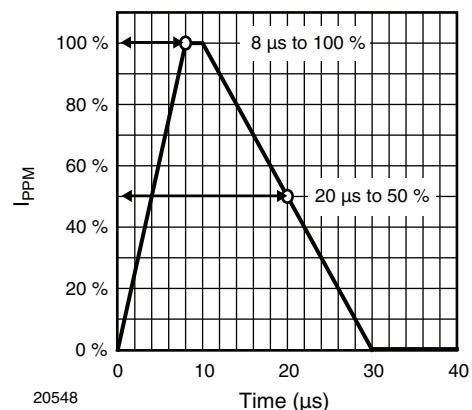


Fig. 2 - 8/20 μs Peak Pulse Current Wave Form
acc. IEC 61000-4-5

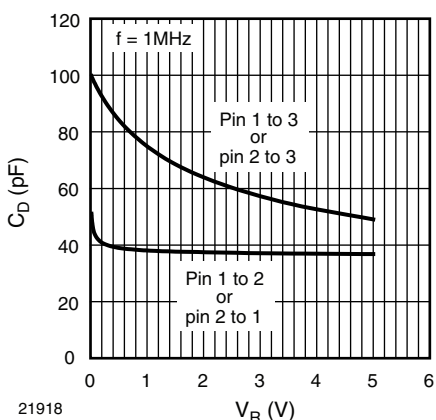


Fig. 3 - Typical Capacitance C_D vs. Reverse Voltage V_R

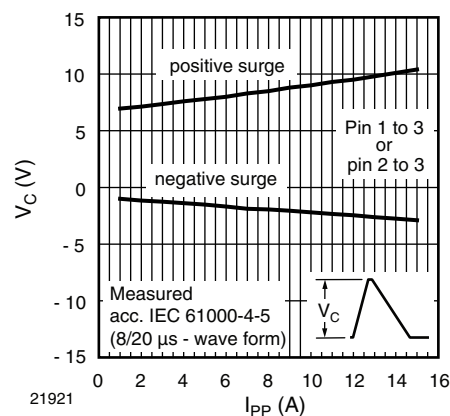


Fig. 6 - Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

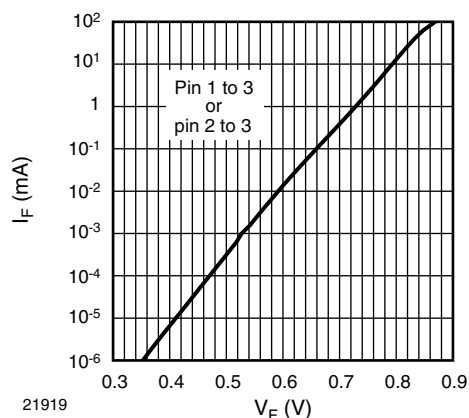


Fig. 4 - Typical Forward Current I_F vs. Forward Voltage V_F

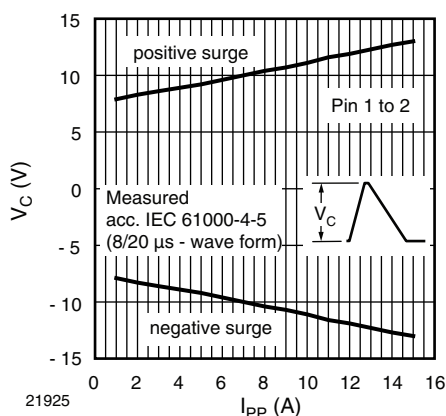


Fig. 7 - Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

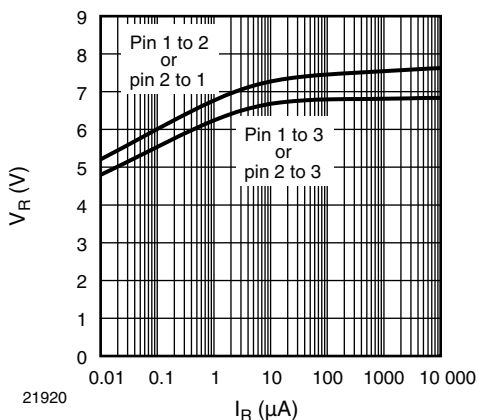


Fig. 5 - Typical Reverse Voltage V_R vs. Reverse Current I_R

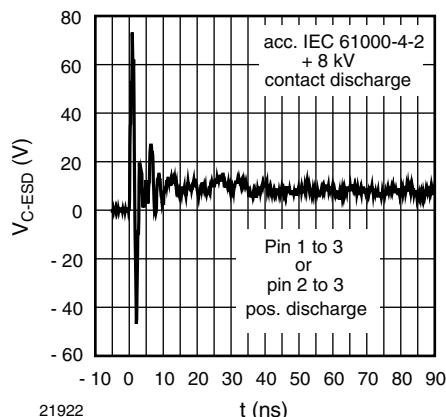


Fig. 8 - Typical Clamping Performance at + 8 kV Contact Discharge (acc. IEC 61000-4-2)

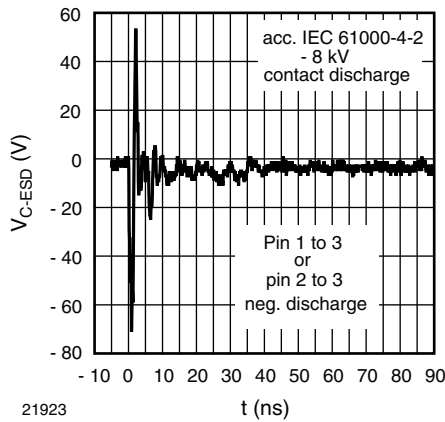


Fig. 9 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

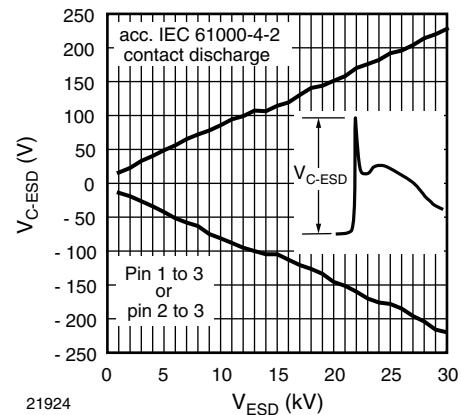
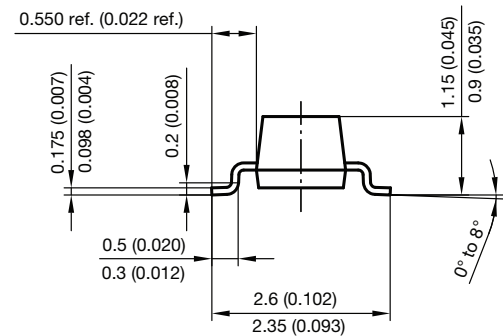
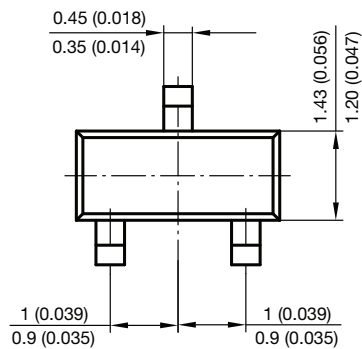
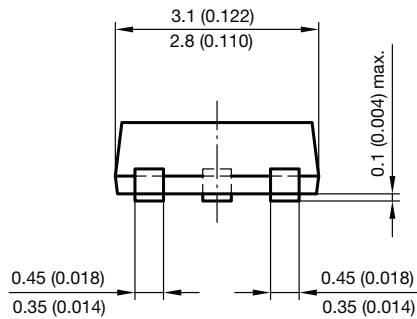
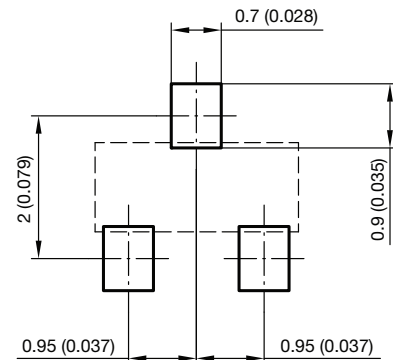


Fig. 10 - Typical Peak Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

PACKAGE DIMENSIONS in millimeters (inches): **SOT-23**



Foot print recommendation:



Document no.: 6.541-5014.01-4

Rev. 8 - Date: 23.Sept.2009

17418



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.