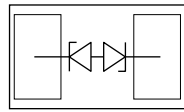
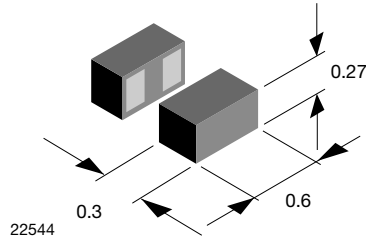


# Bidirectional Symmetrical (BiSy) Single Line ESD Protection Diode in Silicon Package



22543



## MARKING



## LINKS TO ADDITIONAL RESOURCES



## FEATURES

- Ultra compact CLP0603 package
- Low package height < 0.3 mm
- 1-line ESD protection
- AEC-Q101 qualified available
- Working range  $\pm 5.5$  V
- Low leakage current < 0.1  $\mu$ A
- Low load capacitance  $C_D < 14$  pF
- ESD immunity acc. IEC 61000-4-2  $\pm 30$  kV contact discharge  $\pm 30$  kV air discharge
- Lead plating: Au (e4)
- Lead material: Ni
- Topside coating
- e4 - precious metal (e.g. Ag, Au, NiPd, NiPdAu) (no Sn)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



## Footprint and soldering recommendation:

 please see Application Note: [www.vishay.com/doc?85917](http://www.vishay.com/doc?85917)

ORDERING INFORMATION					
PART NUMBER (EXAMPLE)	AEC-Q101 QUALIFIED	ENVIRONMENTAL AND QUALITY CODE		PACKAGING CODE 15K PER 7" REEL (8 mm TAPE) 15K/BOX = MOQ	ORDERING CODE (EXAMPLE)
		RoHS-COMPLIANT + LEAD (Pb)-FREE TERMINATIONS	GOLD PLATED		
		GREEN			
VCUT05G1-SD0	-	G	4	-08	VCUT05G1-SD0-G4-08
VCUT05G1-SD0	H	G	4	-08	VCUT05G1-SD0HG4-08

PACKAGE DATA				
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	SOLDERING CONDITIONS
VCUT05G1-SD0	CLP0603-2L	5G	0.12 mg	Peak temperature max. 260 °C Reflow soldering according JEDEC® STD-020

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot	$I_{PPM}$	6	A
Peak pulse power	Pin 1 to pin 2 acc. IEC 61000-4-5; $t_p = 8/20$ $\mu$ s; single shot	$P_{PP}$	78	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	$V_{ESD}$	$\pm 30$	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		$\pm 30$	
Operating temperature	Junction temperature	$T_J$	-55 to +150	°C
Storage temperature		$T_{stg}$	-55 to +150	°C

**CUT THE SPIKES WITH VCUT05G1-SD0**

The VCUT05G1-SD0 is a Bidirectional and Symmetrical (BiSy) ESD protection device which clamps positive and negative overvoltage transients to ground. Connected between the signal or data line and the ground the VCUT05G1-SD0 offers a high isolation (low leakage current, low capacitance) within the specified working range. Due to the short leads and small package size of the tiny CLP0603 package the line inductance is very low, so that fast transients like and ESD strike can be clamped with minimal over- or undershoots.

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	$N_{channel}$	-	-	1	lines
Reverse stand-off voltage	Max. reverse working voltage	$V_{RWM}$	-	-	5.5	V
Reverse voltage	at $I_R = 0.1\text{ }\mu\text{A}$	$V_R$	5.5	-	-	V
Reverse current	at $V_{RWM} = 5.5\text{ V}$	$I_R$	-	-	0.1	$\mu\text{A}$
Reverse breakdown voltage	at $I_R = 1\text{ mA}$	$V_{BR}$	6.5	8	9	V
Reverse clamping voltage	at $I_{PP} = 1\text{ A}$ ; $t_p = 8/20\text{ }\mu\text{s}$ single shot	$V_C$	-	8.8	10	V
	at $I_{PP} = I_{PPM} = 6\text{ A}$ ; $t_p = 8/20\text{ }\mu\text{s}$ single shot	$V_C$	-	11	13	V
Capacitance	at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$	$C_D$	-	13	14	pF
	at $V_R = 2.5\text{ V}$ ; $f = 1\text{ MHz}$	$C_D$	-	11	-	pF
Clamping voltage	Transmission Line Pulse (TLP); $t_p = 100\text{ ns}$ $I_{TLP} = 8\text{ A}$	$V_{C-TLP}$	-	9.8	-	V
Clamping voltage	Transmission Line Pulse (TLP); $t_p = 100\text{ ns}$ $I_{TLP} = 16\text{ A}$	$V_{C-TLP}$	-	11	-	V
Dynamic resistance	Transmission Line Pulse (TLP); $t_p = 100\text{ ns}$	$R_{DYN}$	-	0.15	-	$\Omega$

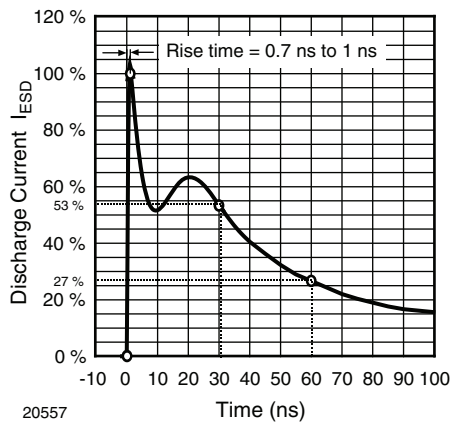
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


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

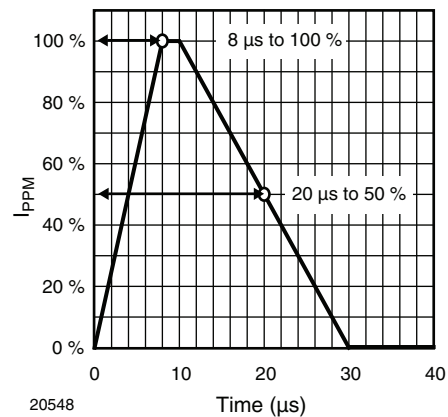


Fig. 2 - 8/20  $\mu\text{s}$  Peak Pulse Current Wave Form  
acc. IEC 61000-4-5

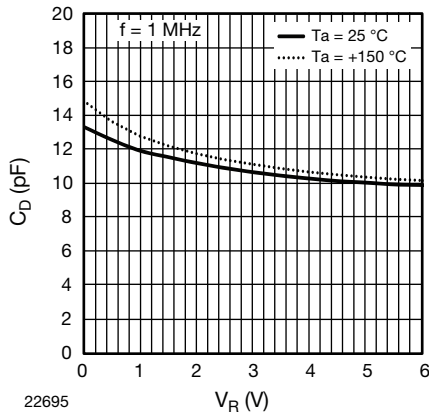


Fig. 3 - Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$

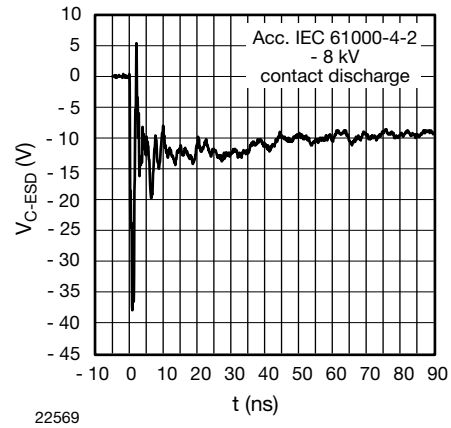


Fig. 6 - Typical Clamping Performance at 8 kV Contact Discharge acc. IEC 61000-4-2

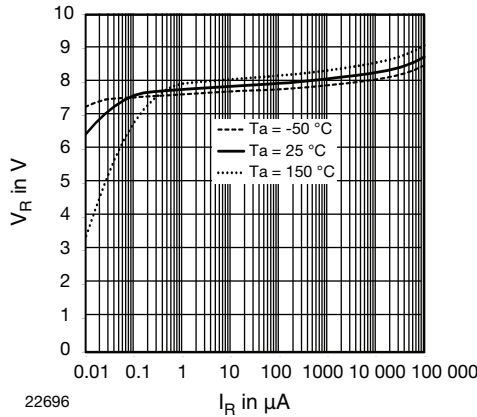


Fig. 4 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$

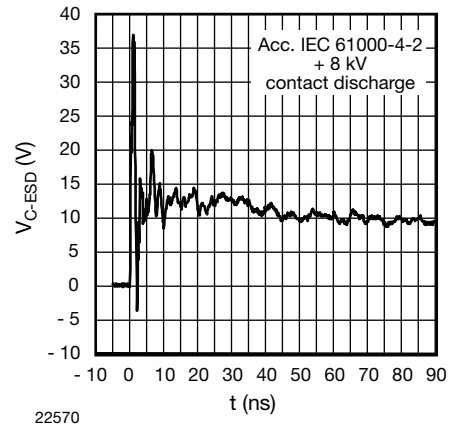


Fig. 7 - Typical Clamping Performance at 8 kV Contact Discharge acc. IEC 61000-4-2

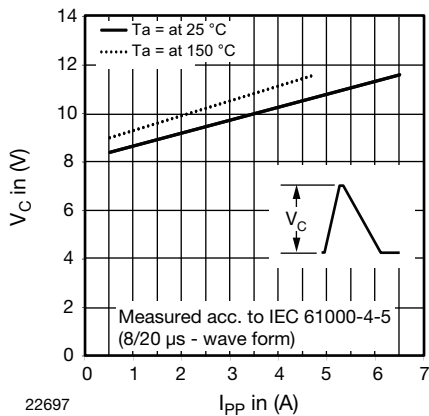


Fig. 5 - Typical Peak Clamping Voltage  $V_C$  vs. Peak Pulse Current  $I_{PP}$

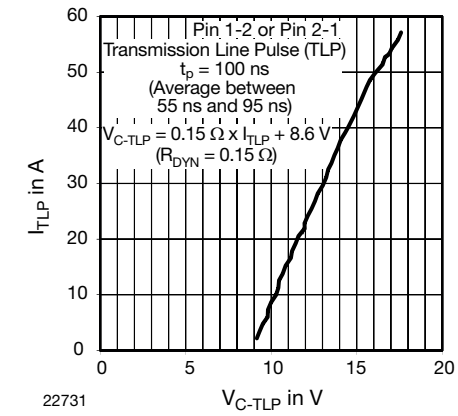
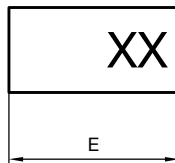
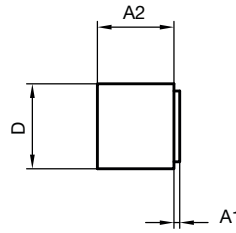
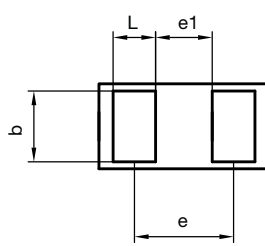


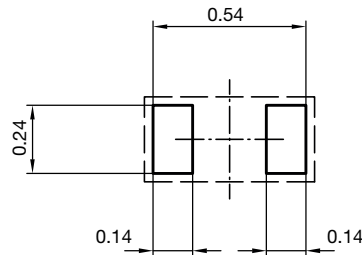
Fig. 8 - Typical Clamping Voltage at 100 ns Transmission Line Pulse (TLP)

**PACKAGE DIMENSIONS** in millimeters (mils): **CLP0603-2L Gen2**


	Millimeters			mils		
	min.	nom.	max.	min.	nom.	max.
A	0.25	0.28	0.30	9.84	11.02	11.81
A1	0.01	0.01	0.02	0.39	0.39	0.79
A2	0.24	0.27	0.28	9.45	10.63	11.02
b	0.22	0.25	0.28	8.66	9.84	11.02
D	0.27	0.30	0.33	10.62	11.81	12.99
E	0.57	0.60	0.63	22.44	23.62	24.80
e		0.40			15.75	
e1		0.25			9.84	
L	0.12	0.15	0.18	4.72	5.91	7.09

XX ... TYPE CODE AND ALSO PIN1 LOCATION

foot print recommendation:



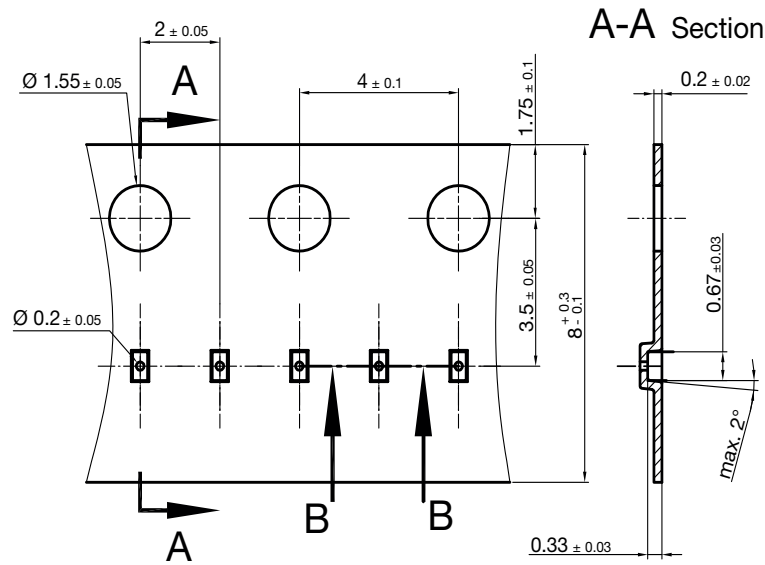
Document no.: S8-V-3906.04-068 (4)  
 Created - Date: 14. July 2020  
 Rev. 1 - Date 03-June 2021

23178

**Footprint and soldering recommendation:**

please see Application Note: [www.vishay.com/doc?85917](http://www.vishay.com/doc?85917)

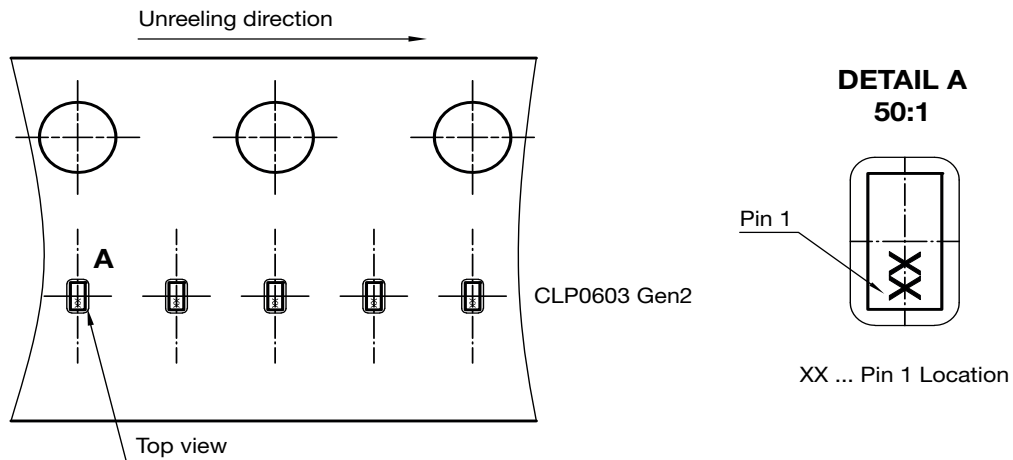
**CARRIER TAPE** in millimeters: **CLP0603-2L Gen2**



Cummulative tolerances of 10 sprocket holes is +/-0.2 mm

22591  
 Document no. S8-V-3906.04-0025 (4)  
 Created - Date: 22. Nov. 2010

**ORIENTATION IN CARRIER CLP0603-2L Gen2**



Document no.: S8-V-3906.04-069 (4)  
 Created - Date: 14-July-2020  
 Rev. 1 - Date 23-January-2024

23179



## 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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. 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.