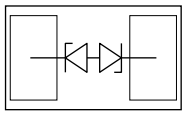
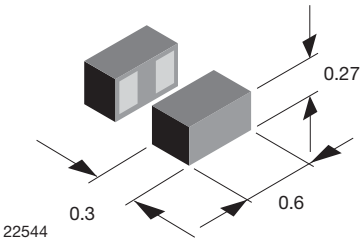
Bidirectional Symmetrical (BiSy) Single Line ESD Protection Diode in Silicon Package



22543



22544

FEATURES

- Ultra compact CLP0603 package
- Low package height < 0.3 mm
- 1-line ESD protection
- Working range ± 5.5 V
- Low leakage current < 0.1 µA
- Low load capacitance C_D < 14 pF
- ESD immunity acc. IEC 61000-4-2
  ± 30 kV contact discharge
  ± 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

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

MARKING (example only)

22454

1 = year code
Open circle = month code and pin 1
XY = type code

DESIGN SUPPORT TOOLS AVAILABLE

3D Models

ORDERING INFORMATION

PART NUMBER (EXAMPLE)	ENVIRONMENTAL AND QUALITY CODE		PACKAGING CODE	ORDERING CODE (EXAMPLE)
	RoHS-COMPLIANT + LEAD (Pb)-FREE TERMINATIONS GREEN	GOLD PLATED	15K PER 7" REEL (8 mm TAPE) 15K/BOX = MOQ	
VCUT05E1-SD0-	G	4	-08	VCUT05E1-SD0-G4-08

PACKAGE DATA

DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	SOLDERING CONDITIONS
VCUT05E1-SD0	CLP0603-2L	5D	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 µs/single shot	I_{PPM}	6	A
Peak pulse power	Pin 1 to pin 2 acc. IEC 61000-4-5; t_p = 8/20 µs; single shot	P_{PP}	78	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V_{ESD}	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{stg}	-55 to +150	°C

CUT THE SPIKES WITH VCUT05E1-SD0

The VCUT05E1-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 VCUT05E1-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.

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °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 µA	V_R	5.5	-	-	V
Reverse current	at V_{RWM} = 5.5 V	I_R	-	-	0.1	µA
Reverse breakdown voltage	at I_R = 1 mA	V_{BR}	6.5	8	9	V
Reverse clamping voltage	at I_{PP} = 1 A	V_C	-	8.8	10	V
	at I_{PP} = I_{PPM} = 6 A	V_C	-	11	13	V
Capacitance	at V_R = 0 V; f = 1 MHz	C_D	-	13	14	pF
	at V_R = 2.5 V; f = 1 MHz	C_D	-	11	-	pF
Clamping voltage	Transmission Line Pulse (TLP); t_p = 100 ns I_{TLP} = 8 A	V_{C-TLP}	-	9.8	-	V
Clamping voltage	Transmission Line Pulse (TLP); t_p = 100 ns I_{TLP} = 16 A	V_{C-TLP}	-	11	-	V
Dynamic resistance	Transmission Line Pulse (TLP); t_p = 100 ns	R_{DYN}	-	0.15	-	Ω

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

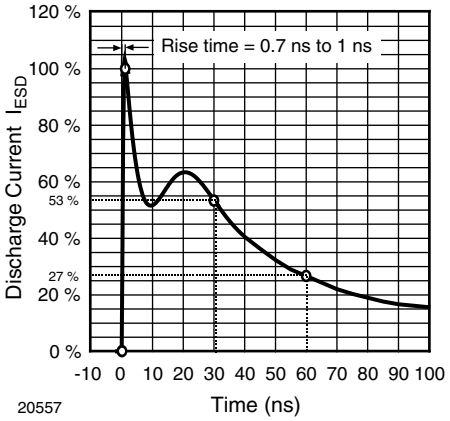


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω/150 pF)

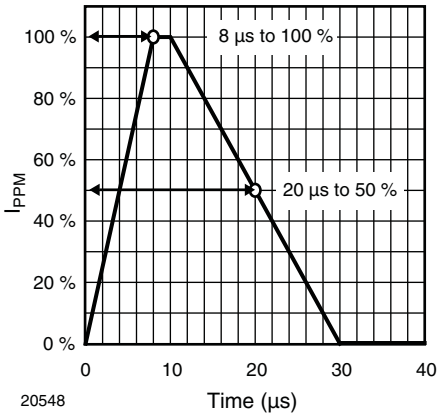


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form acc. IEC 61000-4-5

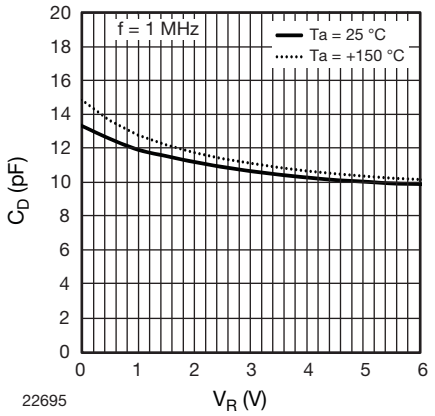


Fig. 3 - Typical Capacitance C_D vs. Reverse Voltage V_R

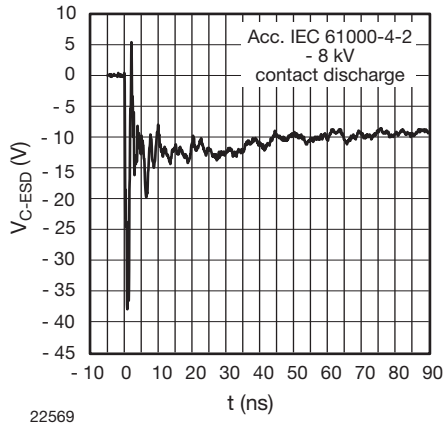


Fig. 6 - Typical Clamping Performance at 8 kV Contact Discharge acc. IEC 61000-4-2

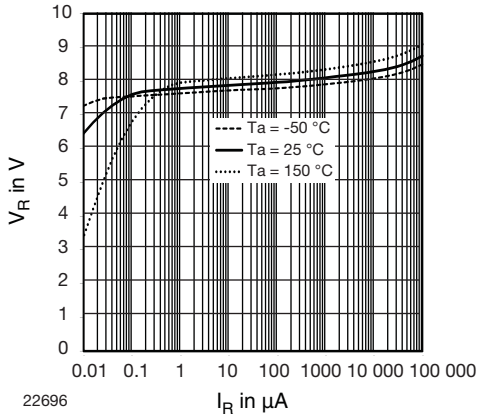


Fig. 4 - Typical Reverse Voltage V_R vs. Reverse Current I_R

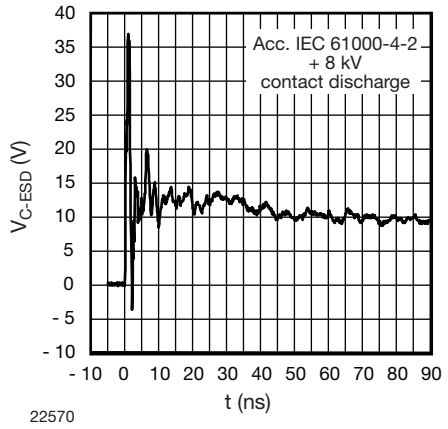


Fig. 7 - Typical Clamping Performance at 8 kV Contact Discharge acc. IEC 61000-4-2

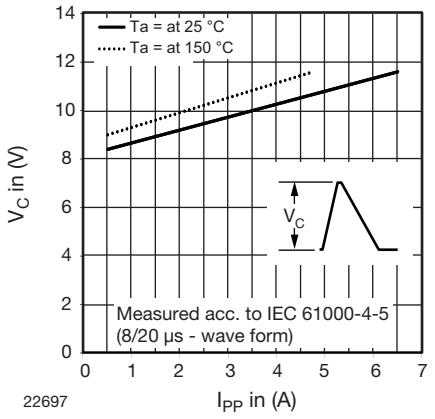


Fig. 5 - Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

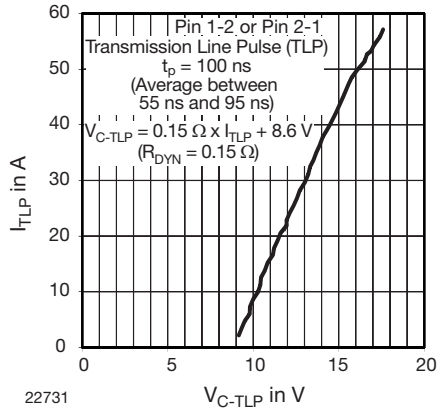
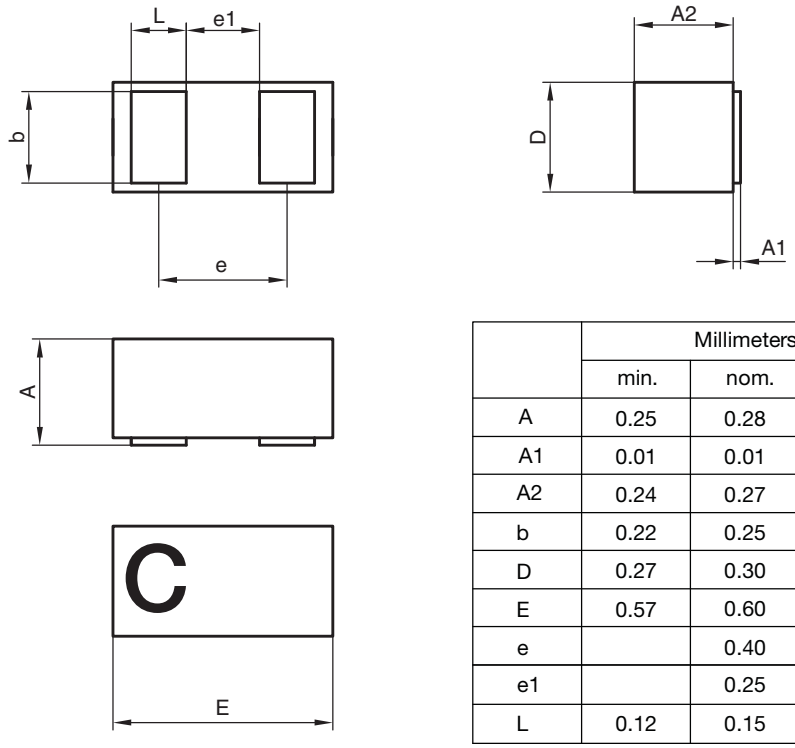


Fig. 8 - Typical Clamping Voltage at 100 ns Transmission Line Pulse (TLP)

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



Package = chip dimensions in mm [mils]

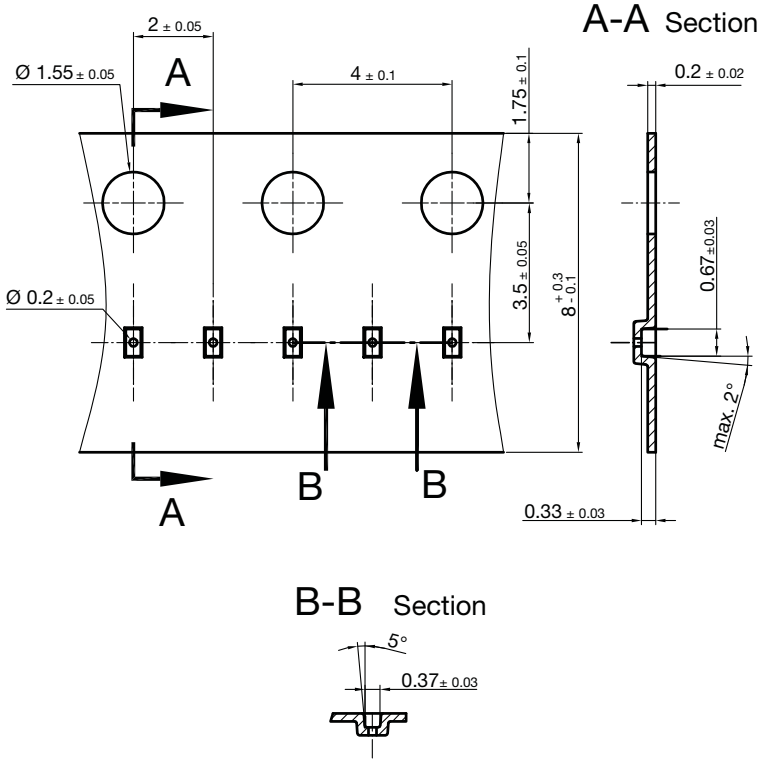
	Millimeters			mils		
	min.	nom.	max.	min.	nom.	max.
A	0.25	0.28	0.30	9.84	11.02	11.81
A1	0.01	0.01	0.02	0.39	0.39	0.79
A2	0.24	0.27	0.28	9.45	10.63	11.02
b	0.22	0.25	0.28	8.66	9.84	11.02
D	0.27	0.30	0.33	10.62	11.81	12.99
E	0.57	0.60	0.63	22.44	23.62	24.80
e		0.40			15.75	
e1		0.25			9.84	
L	0.12	0.15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

22941

2 terminal leadless package (CLP)
Document no.: S8-V-3906.04-023 (4)
Created - Date: 22. Nov. 2010
Rev.8 - Date: 11. Nov. 2016

Footprint and soldering recommendation:
please see Application Note: www.vishay.com/doc?85917

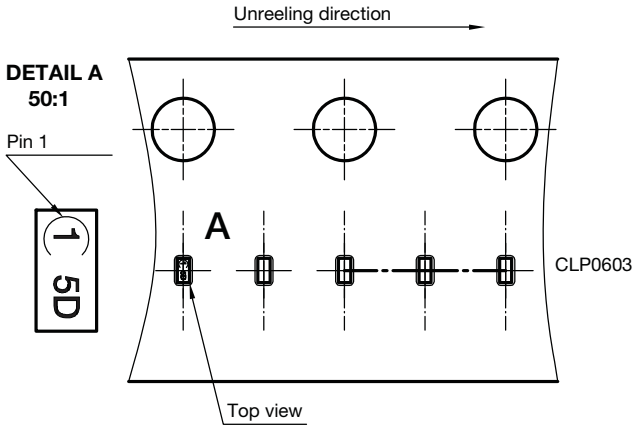
CARRIER TAPE in millimeters: **CLP0603-2L**



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

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

ORIENTATION IN CARRIER CLP0603-2L



Orientation in Carrier Tape (CLP0603)
S8-V-3906.04-026 (4)
22.10.2010

22936

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. 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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Vishay:
VCUT05E1-SD0-G4-08