RoHS

COMPLIANT

HALOGEN FREE

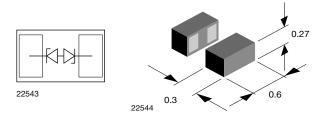
**GREEN** 

(5-2008)



Vishay Semiconductors

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



#### **FEATURES**

- Ultra compact CLP0603-2L package
- Low package height < 0.3 mm
- 1-line ESD-protection
- AEC-Q101 qualified available
- Working range ± 10 V
- Low leakage current < 0.05 μA</li>
- Low load capacitance C<sub>D</sub> = 7.7 pF (typ.)
- ESD-protection acc. IEC 61000-4-2
  ± 24 kV contact discharge
  ± 24 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 <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **MARKING**



#### **LINKS TO ADDITIONAL RESOURCES**







#### Footprint and soldering recommendation:

please see Application Note: www.vishay.com/doc?85917

ORDERING INFORMATION						
DADT WINDED	450 0404	ENVIRONMENTAL AND QUAI	LITY CODE	PACKAGING CODE	ORDERING CODE (EXAMPLE)	
PART NUMBER (EXAMPLE)	AEC-Q101 QUALIFIED	RoHS-COMPLIANT + LEAD (Pb)-FREE TERMINATIONS	GOLD PLATED	15K PER 7" REEL (8 mm TAPE)		
		GREEN		15K/BOX = MOQ		
VCUT10G1-SD0	-	G	4	-08	VCUT10G1-SD0-G4-08	
VCUT10G1-SD0	Н	G	4	-08	VCUT10G1-SD0HG4-08	

PACKAGE DATA						
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	SOLDERING CONDITIONS		
VCUT10G1-SD0	CLP0603-2L	10	0.12 mg	Peak temperature max. 260 °C Reflow soldering according JEDEC <sup>®</sup> 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 <sub>PPM</sub>	4	Α		
Peak pulse power	Pin 1 to pin 2 acc. IEC 61000-4-5; t <sub>p</sub> = 8/20 µs; single shot	P <sub>PP</sub>	72	W		
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V	± 24	kV		
	Air discharge acc. IEC 61000-4-2; 10 pulses	V <sub>ESD</sub>	± 24	ĸv		
Operating temperature	Junction temperature	TJ	-55 to +150	°C		
Storage temperature		T <sub>stg</sub>	-55 to +150	°C		



#### **CUT THE SPIKES WITH VCUT10G1-SD0**

The VCUT10G1-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 VCUT10G1-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 CLP0603-2L 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 <sub>amb</sub> = 25 °C, unless otherwise specified)						
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 stand-off voltage	Max. reverse working voltage	$V_{RWM}$	-	-	10	V
Reverse voltage	at I <sub>R</sub> = 0.05 μA	$V_R$	10	-	-	V
Reverse current	at V <sub>RWM</sub> = 10 V	I <sub>R</sub>	-	-	0.05	μA
Reverse breakdown voltage	at I <sub>R</sub> = 1 mA	$V_{BR}$	11	12	13	V
Reverse clamping voltage	at I <sub>PP</sub> = 1 A; t <sub>p</sub> = 8/20 µs single shot	V <sub>C</sub>	-	13	15	V
	at $I_{PP} = I_{PPM} = 4$ A; $t_p = 8/20$ µs single shot	V <sub>C</sub>	-	16	18	V
0 "	at V <sub>R</sub> = 0 V; f = 1 MHz	C <sub>D</sub>	-	7.7	9	pF
Capacitance	at V <sub>R</sub> = 5 V; f = 1 MHz	C <sub>D</sub>	-	5.4	-	pF
Clamping voltage	Transmission Line Pulse (TLP); $t_p = 100 \text{ ns}$ $I_{TLP} = 8 \text{ A}$	V <sub>C-TLP</sub>	-	15.3	-	V
Clamping voltage	Transmission Line Pulse (TLP); $t_p = 100 \text{ ns}$ $I_{TLP} = 16 \text{ A}$	V <sub>C-TLP</sub>	-	17.4	-	V
Dynamic resistance	Transmission Line Pulse (TLP); t <sub>p</sub> = 100 ns	R <sub>DYN</sub>	-	0.29	-	Ω

#### TYPICAL CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

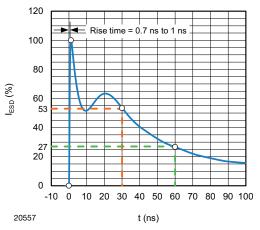


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330  $\Omega$ /150 pF)

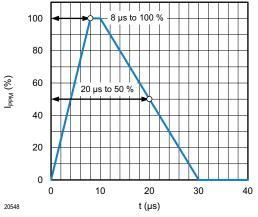


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form acc. IEC 61000-4-5

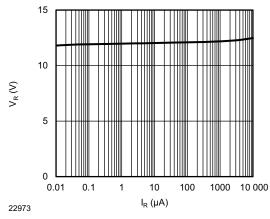


Fig. 3 - Typical Reverse Voltage vs. Reverse Current

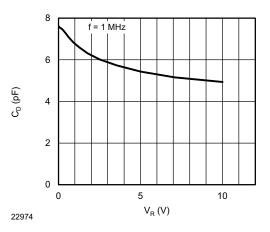


Fig. 4 - Typical Capacitance vs. Reverse Voltage

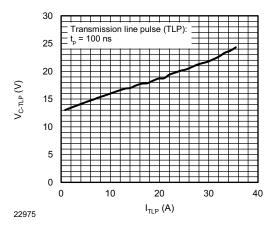


Fig. 5 - Typical Clamping Voltage vs. Peak Pulse Current

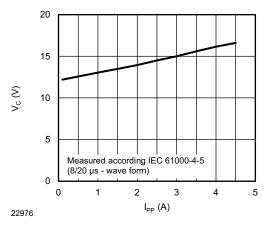
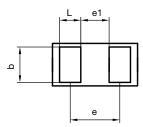
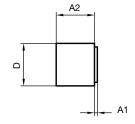


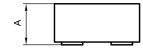
Fig. 6 - Typical Peak Clamping Voltage vs. Peak Pulse Current

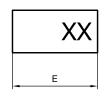


#### PACKAGE DIMENSIONS in millimeters (mils): CLP0603-2L Gen2





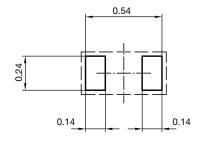




	Millimeters					
	min.	nom.	max.	min.	nom.	max.
Α	0.25	0.28	0.30	9.84	11.02	11.81
A1	0.01	0.01	0.02	0.39	0.39	0.79
A2	0.24	0.27	0.28	9.45	10.63	11.02
b	0.22	0.25	0.28	8.66	9.84	11.02
D	0.27	0.30	0.33	10.62	11.81	12.99
Е	0.57	0.60	0.63	22.44	23.62	24.80
е		0.40			15.75	
e1		0.25			9.84	
L	0.12	0.15	0.18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

#### XX ... TYPE CODE AND ALSO PIN1 LOCATION

#### foot print recommendation:



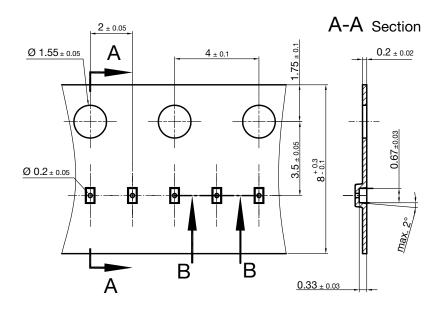
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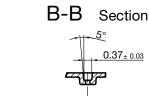
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#### Footprint and soldering recommendation:

please see Application Note: www.vishay.com/doc?85917

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

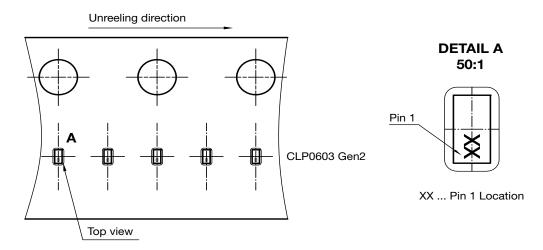




Cummulative tolerances of 10 sprocket holes is +/-0.2 mm

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

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