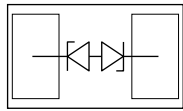
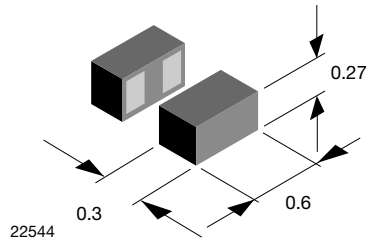


# Ultra Low Capacitance Bidirectional Symmetrical (BiSy) Single Line ESD Protection Diode in Silicon Package



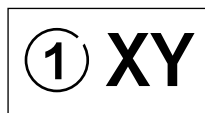
22543



22544

**MARKING**

(example only)



22454

1 = year code

Open circle = month code and pin 1

XY = type code

**DESIGN SUPPORT TOOLS** click logo to get started

**FEATURES**

- Ultra compact CLP0603 package
- Low package height < 0.3 mm
- 1-line ESD protection
- AEC-Q101 qualified available
- Working range  $\pm 3.3$  V
- Low leakage current < 0.05  $\mu$ A
- Ultra low load capacitance  $C_D = 0.29$  pF typ.
- ESD immunity acc. IEC 61000-4-2  
 $\pm 16$  kV contact discharge  
 $\pm 16$  kV air discharge
- Lead plating: Au (e4)
- Lead material: Ni
- Backside coating
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**ORDERING INFORMATION**

PART NUMBER (EXAMPLE)	ENVIRONMENTAL AND QUALITY CODE			PACKAGING CODE 15K PER 7" REEL (8 mm TAPE) 15K/BOX = MOQ	ORDERING CODE (EXAMPLE)
	AEC-Q101 QUALIFIED	RoHS-COMPLIANT + LEAD (Pb)-FREE TERMINATIONS	GOLD PLATED		
		GREEN			
VBUS03B1-SD0	-	G	4	-08	VBUS03B1-SD0-G4-08
VBUS03B1-SD0	H	G	4	-08	VBUS03B1-SD0HG4-08

**PACKAGE DATA**

DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	SOLDERING CONDITIONS
VBUS03B1-SD0	CLP0603-2L	3B	0.12 mg	260 °C/10 s at terminals 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	$I_{PPM}$	2.5	A
Peak pulse power	Pin 1 to pin 2 acc. IEC 61000-4-5; $t_p = 8/20$ $\mu$ s; single shot	$P_{PP}$	45	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	$V_{ESD}$	$\pm 16$	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		$\pm 16$	
Operating temperature	Junction temperature	$T_J$	-55 to +150	°C
Storage temperature		$T_{stg}$	-55 to +150	°C



ESD PROTECTION FOR HIGH-SPEED SIGNAL OR DATA LINES

The VBUS03B1-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 VBUS03B1-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. Due to the very low capacitance the VBUS03B1-SD0 can be used for high speed data ports like HDMI, USB 3.0 or Thunderbolt.

Table with 7 columns: PARAMETER, TEST CONDITIONS/REMARKS, SYMBOL, MIN., TYP., MAX., UNIT. Rows include Protection paths, Reverse stand-off voltage, Reverse voltage, Reverse current, Reverse breakdown voltage, Reverse clamping voltage, Capacitance, Clamping voltage, and Dynamic resistance.

Note

(1) Defined by design. Such a low leakage current is too low for a 100 % final test verification

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

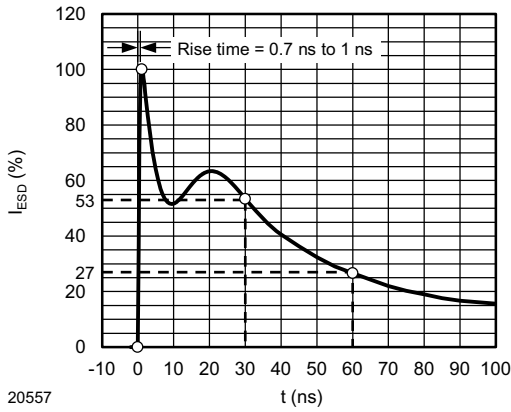


Fig. 1 - ESD Discharge Current Wave Form  
acc. IEC 61000-4-2 (330  $\Omega$ /150 pF)

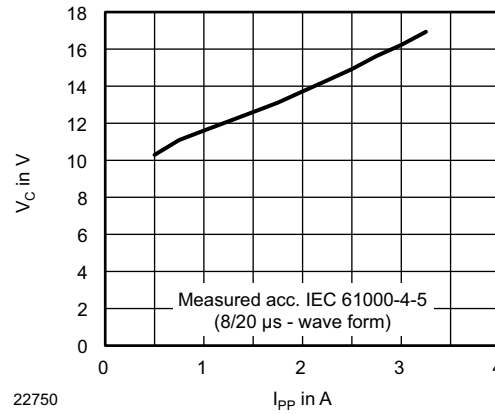


Fig. 4 - Typical Peak Clamping Voltage  $V_C$  vs.  
Peak Pulse Current  $I_{PP}$

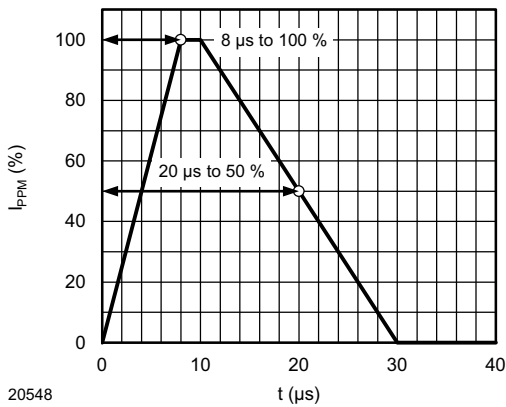


Fig. 2 - 8/20  $\mu\text{s}$  Peak Pulse Current Wave Form  
acc. IEC 61000-4-5

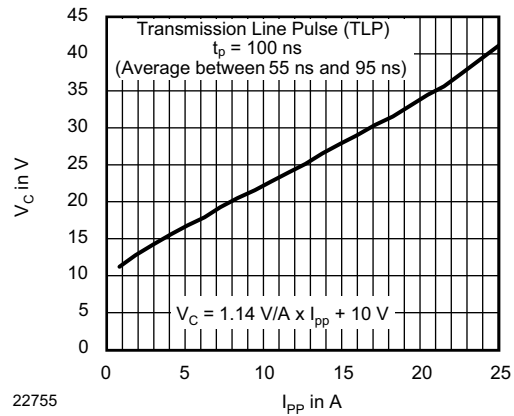


Fig. 5 - Typical Peak Clamping Voltage  $V_C$  vs.  
Peak Pulse Current  $I_{PP}$

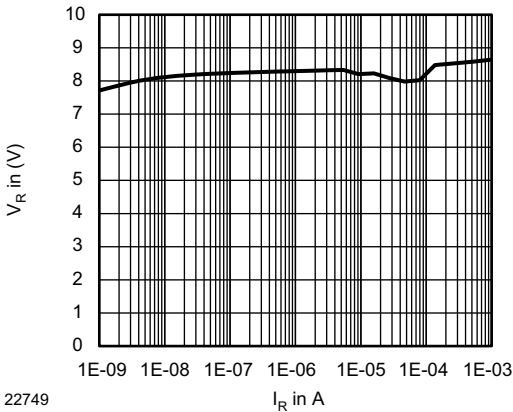


Fig. 3 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$

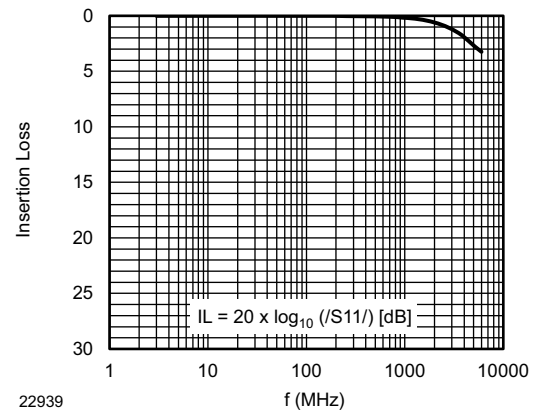
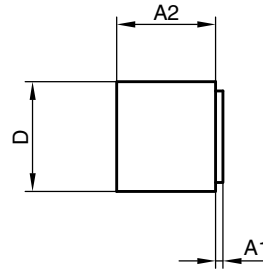
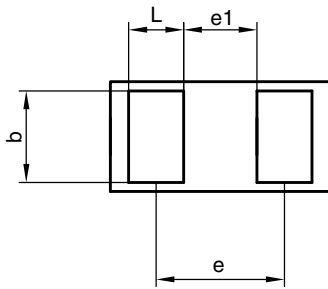
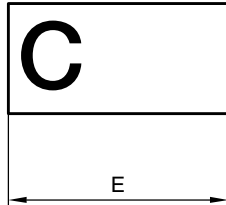
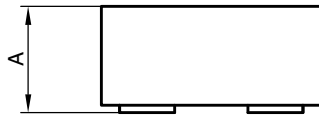


Fig. 6 - Typical Insertion Loss (IL) vs. Frequency

**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

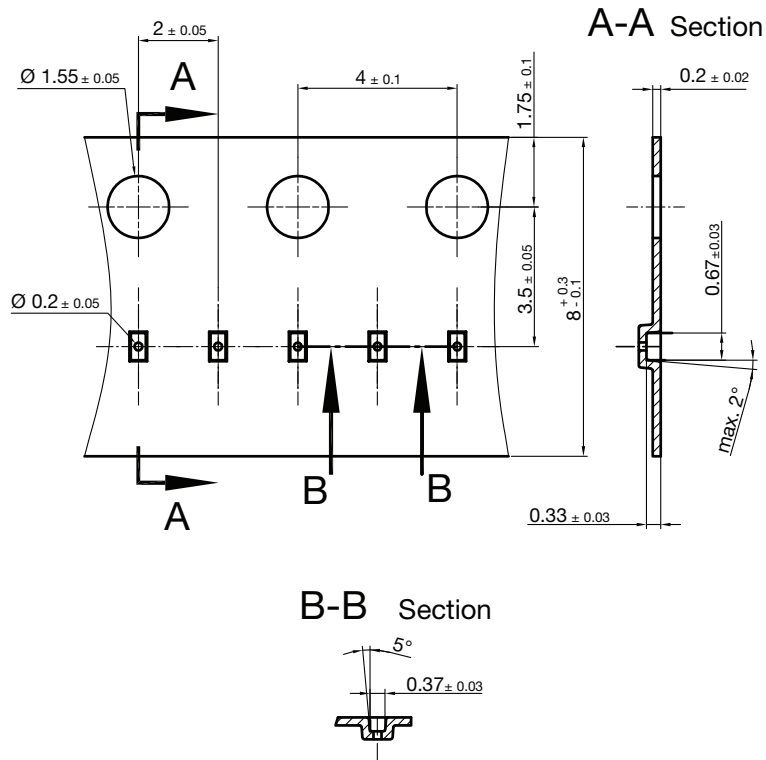
22941

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](http://www.vishay.com/doc?85917)

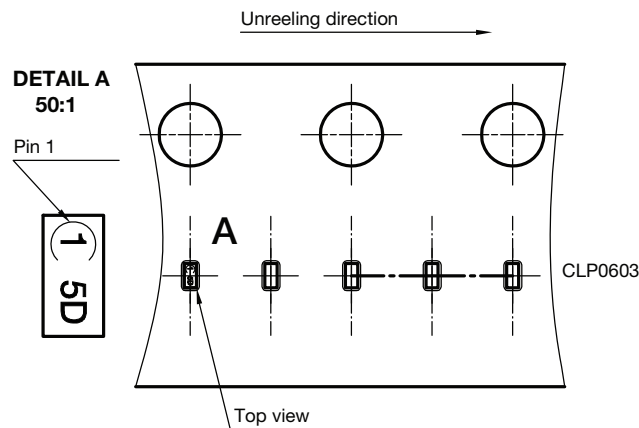
**CARRIER TAPE** in millimeters: **CLP0603-2L**



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**



22607

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



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