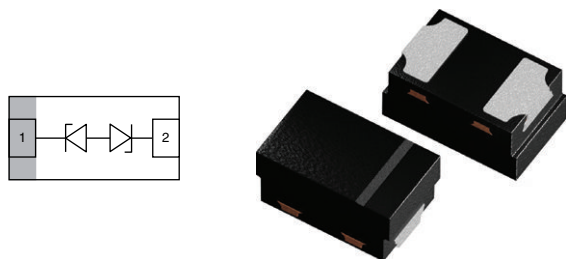


# Single-Line Bidirectional ESD-Protection Diode in DFN1006-2B



## MARKING (example only)



Bar = pin 1 marking

X = date code

YY = type code (see table below)

## LINKS TO ADDITIONAL RESOURCES



3D Models



Models



Application Notes

## FEATURES

- Compact DFN1006-2B package
- Low package height < 0.5 mm
- 1-line bidirectional ESD-protection
- AEC-Q101 qualified available
- Working range  $\pm 16$  V
- ESD immunity acc. IEC 61000-4-2  $\pm 30$  kV contact and air discharge
- ESD immunity acc. ISO10605 (330 pF / 330  $\Omega$ )  $\pm 30$  kV contact discharge
- Lead plating: Sn (e3)  
Tin plated exposed side wall of lead frame
  - Soldering can be checked by standard vision inspection
  - AOI = Automated Optical Inspection
  - No X-ray necessary
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



## Soldering Recommendations for DFN Packages:

please see Application Note: [www.vishay.com/doc?86198](http://www.vishay.com/doc?86198)

## APPLICATIONS

For automotive network such as LIN-BUS

## ORDERING INFORMATION

PART NUMBER (EXAMPLE)	AEC-Q101 QUALIFIED	ENVIRONMENTAL AND QUALITY CODE			ORDERING CODE (EXAMPLE)
		RoHS COMPLIANT + LEAD (Pb)-FREE TERMINATIONS	TIN PLATED	10K PER 7" REEL (8 mm TAPE)	
		GREEN		MOQ = 10K/BOX	
VLIN1616-DD1	-	G	3	-08	VLIN1616-DD1-G3-08
VLIN1616-DD1	H	G	3	-08	VLIN1616-DD1HG3-08

## PACKAGE DATA

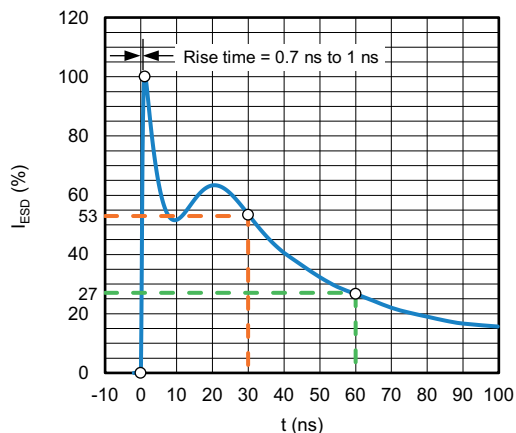
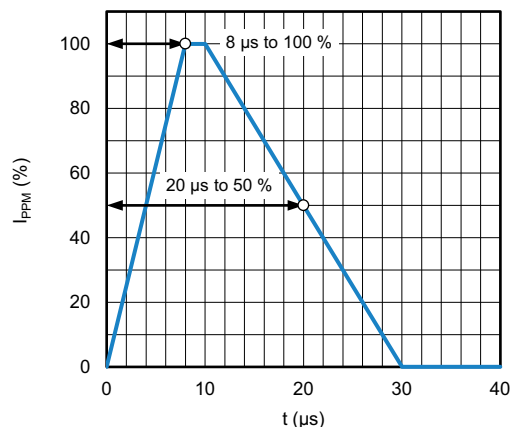
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VLIN1616-DD1	DFN1006-2B	20	0.83 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot <sup>(1)</sup>	$I_{PPM}$	5	A
Peak pulse power	Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot <sup>(1)</sup>	$P_{PP}$	160	W
Peak pulse current	$t_p = 10/1000\text{ }\mu\text{s}$ <sup>(1)</sup>	$I_{PPM}$	0.6	A
Peak pulse power	$t_p = 10/1000\text{ }\mu\text{s}$ <sup>(1)</sup>	$P_{PP}$	18	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses <sup>(1)</sup>	$V_{ESD}$	30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses <sup>(1)</sup>		30	kV
	Contact discharge acc. ISO10605 (330 pF / 330 $\Omega$ ); 10 pulses <sup>(1)</sup>		30	kV
Operating temperature	Junction temperature	$T_J$	-55 to +150	$^{\circ}\text{C}$
Storage temperature		$T_{stg}$	-55 to +150	$^{\circ}\text{C}$

**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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	$V_{RWM}$	-	-	16	V
Reverse voltage	At $I_R = 50\text{ nA}$	$V_R$	16	-	-	V
Reverse current	At $V_R = 16\text{ V}$	$I_R$	-	< 1	0.05	$\mu\text{A}$
Reverse breakdown voltage	At $I_R = 1\text{ mA}$	$V_{BR}$	17.4	18.5	20.0	V
	At $I_R = 1\text{ mA}$ ; $T_J = -40\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$ <sup>(1)</sup>		16	-	22.5	V
Reverse clamping voltage	At $I_{PP} = I_{PPM} = 5\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ <sup>(1)</sup>	$V_C$	-	27	32	V
	At $I_{PP} = I_{PPM} = 0.6\text{ A}$ , $t_p = 10/1000\text{ }\mu\text{s}$ <sup>(1)</sup>		-	25	30	V
	$t_p = 100\text{ ns}$ (TLP); $I_{TLP} = 16\text{ A}$ <sup>(1)</sup>	$V_{C\_TLP}$	-	26	-	V
Dynamic resistance	$t_p = 100\text{ ns}$ (TLP); $I_{TLP} = 0\text{ A}$ to $50\text{ A}$ <sup>(1)</sup>	$r_{dyn}$	-	0.28	-	$\Omega$
Capacitance	At $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$	$C_D$	-	21	24	pF

**Note**
<sup>(1)</sup> Guaranteed by design; tested during device characterization

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

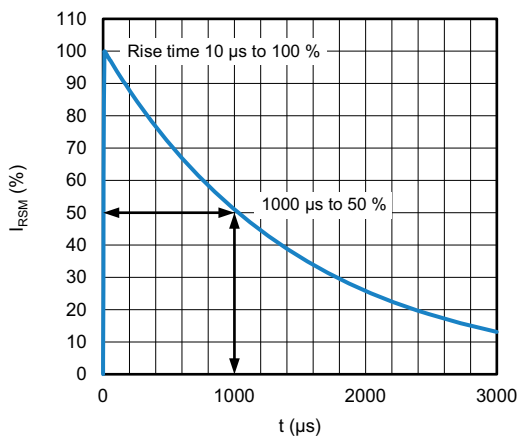
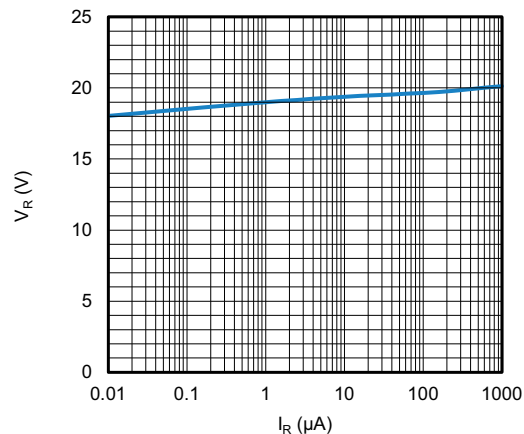

Fig. 3 - 10/1000  $\mu$ s Peak Pulse Current Wave Form


Fig. 6 - Typical Reverse Voltage vs. Reverse Current

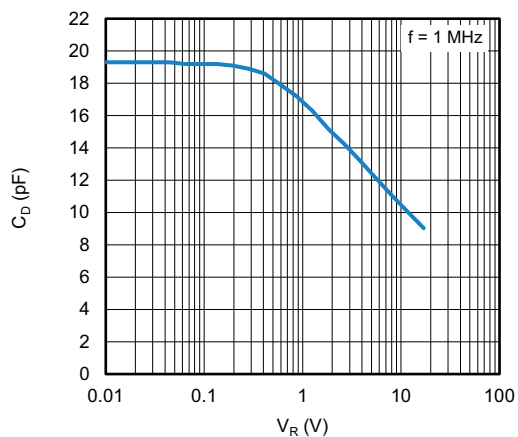


Fig. 4 - Typical Capacitance vs. Reverse Voltage

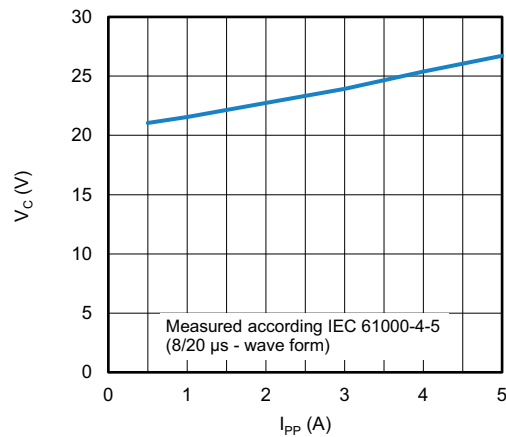


Fig. 7 - Typical Peak Clamping Voltage vs. Peak Pulse Current

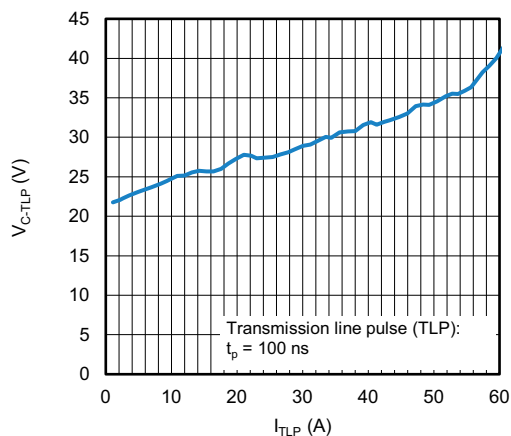


Fig. 5 - Typical Clamping Voltage vs. Peak Pulse Current

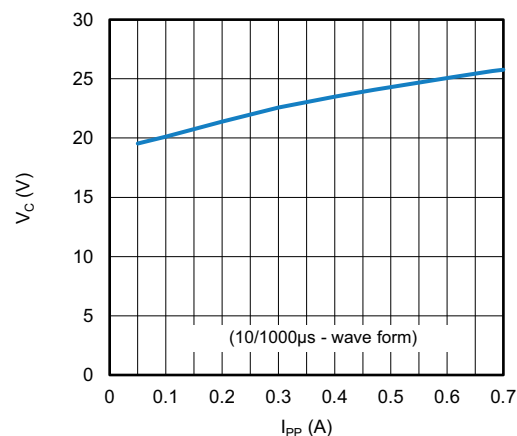
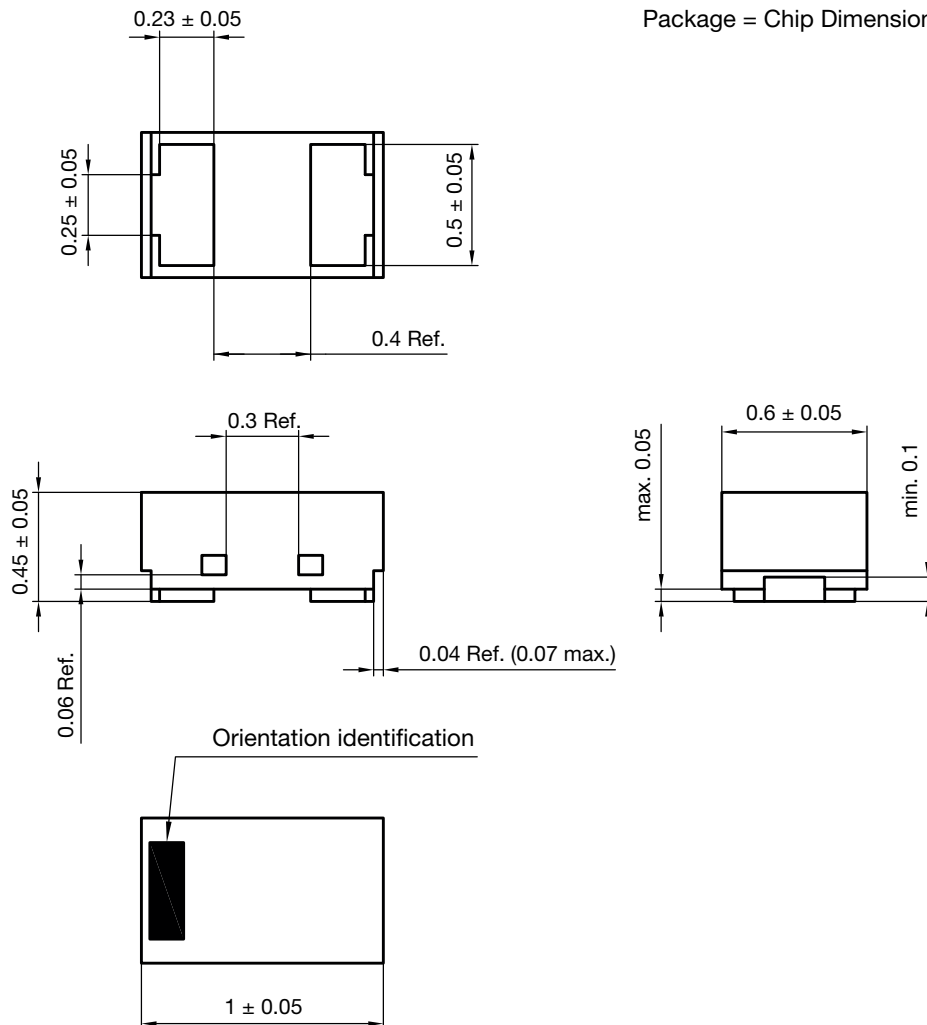
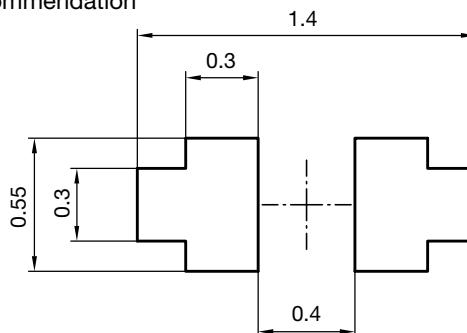


Fig. 8 - Typical Peak Clamping Voltage vs. Peak Pulse Current

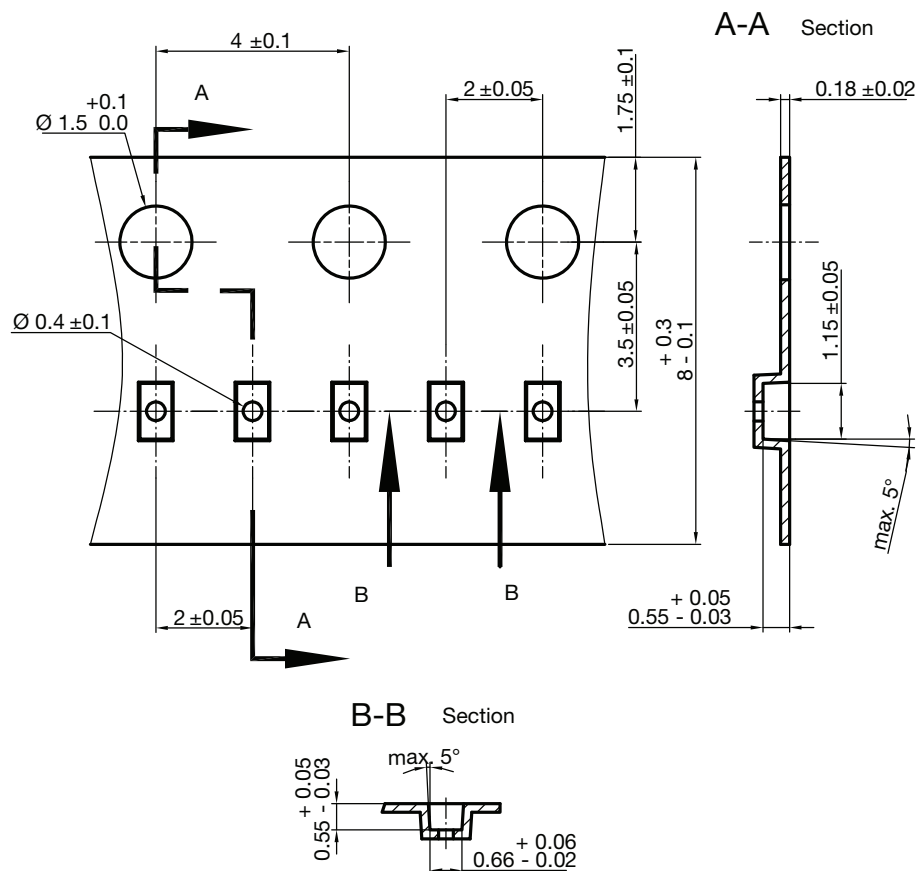
**PACKAGE DIMENSIONS** in millimeters (inches): **DFN1006-2B**

Package = Chip Dimension in mm


**Footprint recommendation**


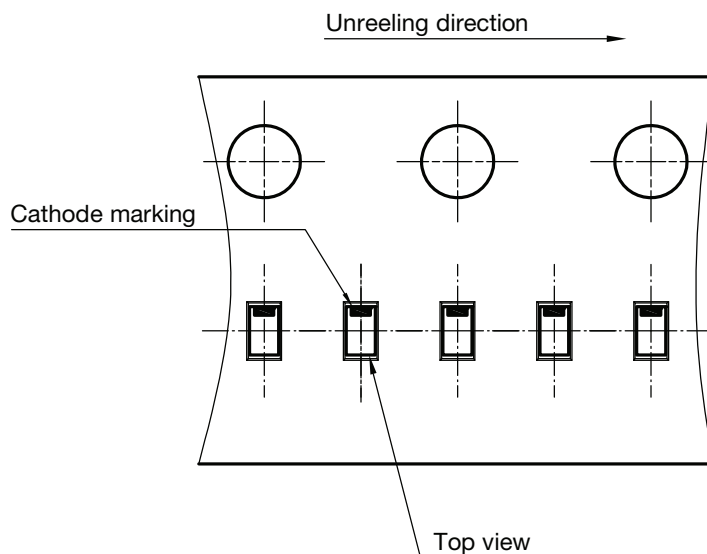
Document no.: S8-V-3906.04-059 (4)  
Created - Date: 11-Jul-2018  
Rev.5 - Date: 17-Sep-2021

23191

**CARRIER TAPE DFN1006-2B**


S8-V-3906.04-063 (4)  
created 28.10.2019

surface resistance:  $10^5 - 10^{11} \frac{\text{OHMS}}{\text{SQ}}$   
Cumulative tolerances of 10 sprocket holes is  $\pm 0.2 \text{ mm}$

**ORIENTATION IN CARRIER TAPE DFN1006-2B**


S8-V-3906.04-064 (4)  
created 28.10.2019



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