AUTOMOTIVE GRADE

> HALOGEN FREE

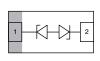
> GREEN

(5-2008)



### Vishay Semiconductors

## 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**







#### **FEATURES**

- Compact DFN1006-2B package
- Low package height < 0.5 mm
- 1-line bidirectional ESD-protection
- AEC-Q101 qualified available
- Working range ±16 V
- ESD immunity acc. IEC 61000-4-2
  ± 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 <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **Soldering Recommendations for DFN Packages:**

please see Application Note: www.vishay.com/doc?86198

#### **APPLICATIONS**

For automotive network such as LIN-BUS

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



<b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT		
Peak pulse current	Acc. IEC 61000-4-5, 8/20 μs/single shot <sup>(1)</sup>	$I_{PPM}$	5	Α		
Peak pulse power	Acc. IEC 61000-4-5, 8/20 μs/single shot <sup>(1)</sup>	$P_{PP}$	160	W		
Peak pulse current	t <sub>p</sub> = 10/1000 μs <sup>(1)</sup>	I <sub>PPM</sub>	0.6	Α		
Peak pulse power	t <sub>p</sub> = 10/1000 μs <sup>(1)</sup>	P <sub>PP</sub>	18	W		
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses (1)		30	kV		
	Air discharge acc. IEC 61000-4-2; 10 pulses (1)	$V_{ESD}$	30	kV		
	Contact discharge acc. ISO10605 (330 pF / 330 $\Omega$ ); 10 pulses <sup>(1)</sup>		30	kV		
Operating temperature	Junction temperature	T <sub>J</sub> -55 to +150		°C		
Storage temperature		T <sub>stg</sub>	-55 to +150	°C		

<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	ich can be protected N <sub>channel</sub>		1	lines		
Reverse stand off voltage	Max. reverse working voltage	$V_{RWM}$	-	-	16	V	
Reverse voltage	At I <sub>R</sub> = 50 nA	$V_{R}$	16	-	-	V	
Reverse current	At V <sub>R</sub> = 16 V	I <sub>R</sub>	-	< 1	0.05	μA	
Davaraa braakdayya yaltaga	At I <sub>R</sub> = 1 mA		17.4	18.5	20.0	V	
Reverse breakdown voltage	At $I_R = 1$ mA; $T_J = -40$ °C to $+150$ °C $^{(1)}$	→ V <sub>BR</sub>	16	-	22.5	V	
Reverse clamping voltage	At $I_{PP} = I_{PPM} = 5 \text{ A}$ , $t_p = 8/20 \text{ µs}^{(1)}$		-	27	32	V	
	At $I_{PP} = I_{PPM} = 0.6$ A, $t_p = 10/1000 \ \mu s^{(1)}$	V <sub>C</sub>	-	25	30	V	
	$t_p = 100 \text{ ns (TLP)}; I_{TLP} = 16 \text{ A}^{(1)}$	$V_{C\_TLP}$	-	26	-	V	
Dynamic resistance	$t_p = 100 \text{ ns (TLP)}; I_{TLP} = 0 \text{ A to 50 A}^{(1)}$	r <sub>dyn</sub>	-	0.28	-	Ω	
Capacitance	At V <sub>R</sub> = 0 V; f = 1 MHz	C <sub>D</sub>	-	21	24	pF	

### Note

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

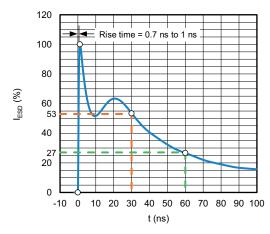


Fig. 1 - ESD Discharge Current Wave Form Acc. IEC 61000-4-2 (330  $\Omega$  / 150 pF)

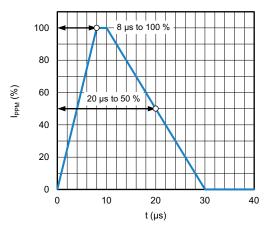


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form Acc. IEC 61000-4-5



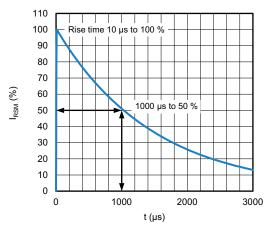


Fig. 3 - 10/1000 µs Peak Pulse Current Wave Form

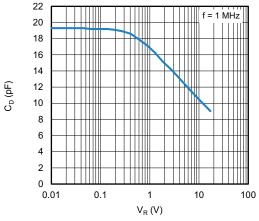


Fig. 4 - Typical Capacitance vs. Reverse Voltage

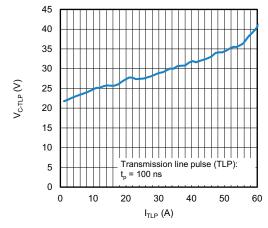


Fig. 5 - Typical Clamping Voltage vs. Peak Pulse Current

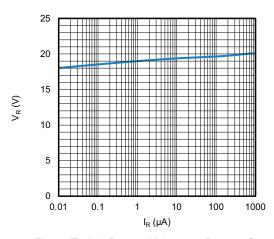


Fig. 6 - Typical Reverse Voltage vs. Reverse Current

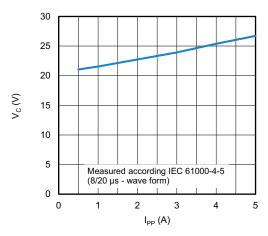


Fig. 7 - Typical Peak Clamping Voltage vs. Peak Pulse Current

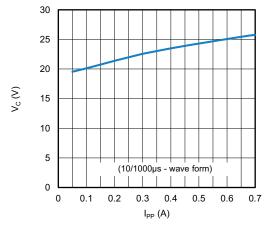
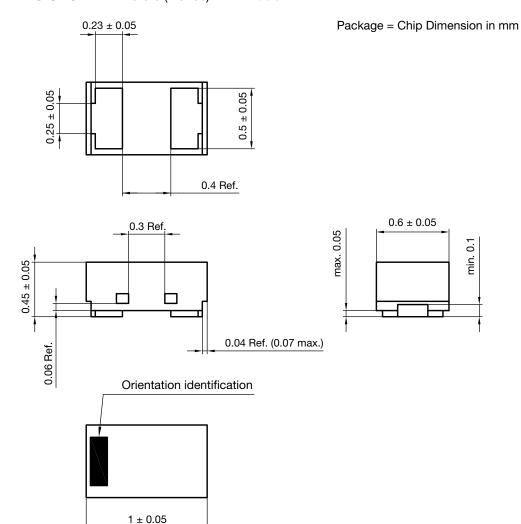
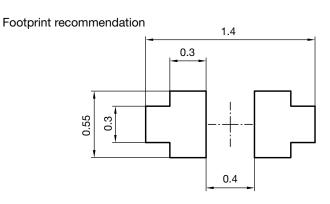


Fig. 8 - Typical Peak Clamping Voltage vs. Peak Pulse Current



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

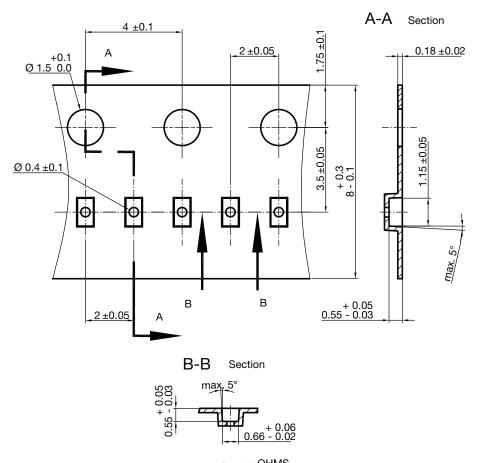




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### **CARRIER TAPE DFN1006-2B**



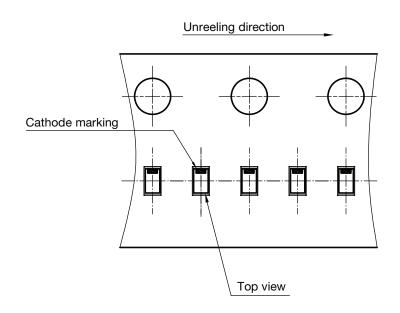
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S8-V-3906.04-064 (4)

created 28.10.2019

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

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



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