AUTOMOTIV

RoHS

HALOGEN

FREE

GREEN

(5-2008)



Vishay Semiconductors

Bidirectional Asymmetrical (BiAs) Single Line ESD Protection Diode in DFN1006-2A





MARKING (example only)



Bar = pin 1 marking

Y = type code (see table below)

X = date code

LINKS TO ADDITIONAL RESOURCES







FEATURES

- Ultra compact DFN1006-2A
- AEC-Q101 qualified available
- Low package height
- 1-line ESD protection
- Working range -7 V up to +14 V or -14 V up to +7 V
- Low leakage current < 0.1 μA
- Low load capacitance typical C_D = 8 pF
- ESD immunity acc. IEC 61000-4-2
 ± 25 kV contact discharge
 ± 30 kV air discharge
- e3 Sn

Tin plated exposed side wall of lead frame

- Soldering can be checked by standard vision inspection
- AOI = automated optical inspection
- No X-ray necessary
- PATENT(S): www.vishav.com/patents
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

ORDERING INFORMATION							
		ENVIRONMENTAL AND QUALITY CODE		PACKAGING CODE			
PART NUMBER (EXAMPLE)	AEC-Q101 QUALIFIED	Rohs-Compliant + Lead (Pb)-free terminations	TIN PLATED	10K PER 7" REEL (8 mm TAPE)	ORDERING CODE		
		GREEN	PLAIED	MOQ = 10K			
VCUT0714BHD1	-	G	3	-08	VCUT0714BHD1-G3-08		
VCUT0714BHD1	Н	G	3	-08	VCUT0714BHD1HG3-08		

PACKAGE DATA								
DEVICE NAME	PACKAGE NAME	PIN PLATING	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS	
VCUT0714BHD1	DFN1006-2A	e3	:А	0.83 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C	

ABSOLUTE MAXIMUM RATINGS							
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT			
Peak pulse current	Pin 1 to pin 2, acc. IEC 61000-4-5, 8/20 μs/single shot	,	3.6	Α			
	Pin 2 to pin 1, acc. IEC 61000-4-5, 8/20 μs/single shot	ІРРМ	2	Α			
Peak pulse power	Pin 1 to pin 2, acc. IEC 61000-4-5, 8/20 μs/single shot	В	50	W			
	Pin 2 to pin 1, acc. IEC 61000-4-5, 8/20 μs/single shot	- P _{PP}	61	W			
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V	± 25	kV			
ESD IIIIIIuility	Air discharge acc. IEC 61000-4-2; 10 pulses	V _{ESD}	± 30	kV			
Storage temperature		T _{STG}	-55 to +150	°C			
Operating temperature	Junction temperature; for AEC-Q101 qualified devices	TJ	-55 to +150	°C			

PATENT(S): www.vishay.com/patents

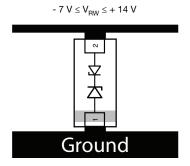
This Vishay product is protected by one or more United States and international patents.

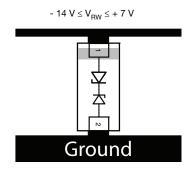


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CUT THE SPIKES

The VCUT0714BHD1 is a bidirectional but asymmetrical (BiAs) ESD protection device which clamps positive and negative overvoltage transients to ground. Connected between the signal or data line and the ground the VCUT0714BHD1 offers a high isolation (low leakage current, small capacitance) within the specified working range of -7 V to +14 V or -14 V and +7 V. Due to the short leads and small package size of the tiny DFN1006-2A package the line inductance is very low, so that fast transients like an ESD strike can be clamped with minimal over- or undershoots.





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ELECTRICAL CHARACTERISTICS (pin 2 to pin 1) (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}	-	-	14	V		
Reverse voltage	At I _R = 0.1 μA	V_R	14	-	-	V		
Reverse current	At V _{RWM} = 14 V	I _R	-	-	0.1	μΑ		
Reverse breakdown voltage	At I _R = 1 mA	V_{BR}	14.5	-	-	V		
Reverse clamping voltage	At I _{PP} = 1 A	V _C	-	-	27	V		
	At I _{PP} = I _{PPM} = 2 A	V _C	-	-	30	V		
0	At $V_R = 0$ V; $f = 1$ MHz	C _D	-	8	8.5	pF		
Capacitance	At $V_R = 7 \text{ V}$; $f = 1 \text{ MHz}$	C_D	-	4	-	pF		

ELECTRICAL CHARACTERISTICS (pin 1 to pin 2) (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}	-	-	7	V			
Reverse voltage	At I _R = 0.1 μA	V_R	7	-	-	V			
Reverse current	At V _{RWM} = 7 V	I _R	-	-	0.1	μA			
Reverse breakdown voltage	At I _R = 1 mA	V_{BR}	7.3	-	-	V			
Reverse clamping voltage	At I _{PP} = 1 A	V _C	-	-	13	V			
	At $I_{PP} = I_{PPM} = 3.6 \text{ A}$	V _C	-	-	15	V			
Capacitance	At V = 0 V; f = 1 MHz	C _D	-	8	8.5	pF			
	At V = 3.5 V; f = 1 MHz	C_D	1	6.4	-	pF			



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

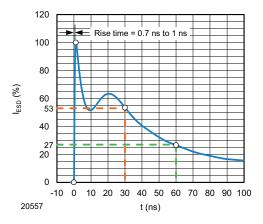


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω /150 pF)

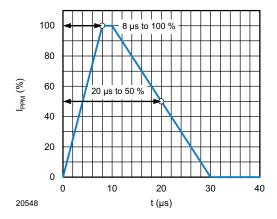


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form acc. IEC 61000-4-5

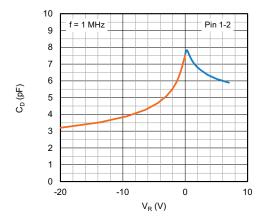


Fig. 3 - Typical Capacitance vs. Reverse Voltage

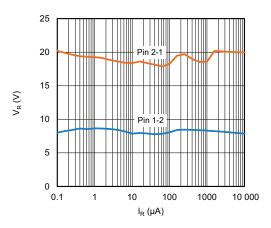


Fig. 4 - Typical Reverse Voltage vs. Reverse Current

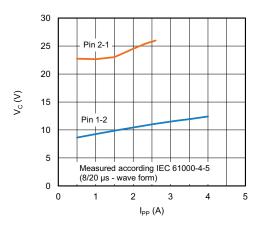


Fig. 5 - Typical Peak Clamping Voltage vs. Peak Pulse Current

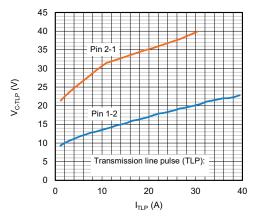
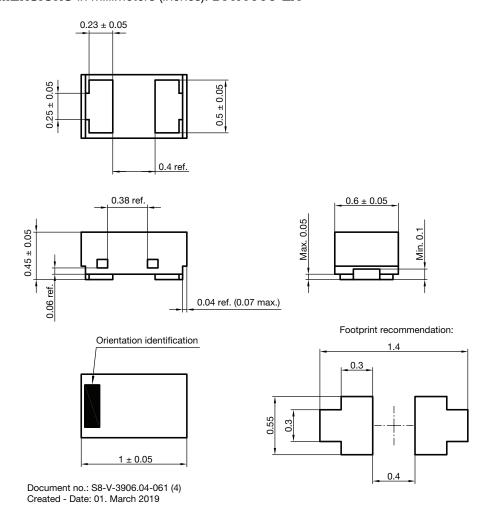


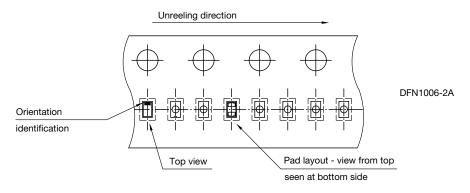
Fig. 6 - Typical Clamping Voltage vs. Peak Pulse Current

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PACKAGE DIMENSIONS in millimeters (inches): DFN1006-2A



ORIENTATION IN CARRIER TAPE: DFN1006-2A



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