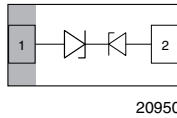


# Bidirectional Asymmetrical (BiAs) Single Line ESD Protection Diode in DFN1006-2A


**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  $\mu$ A
- Low load capacitance typical  $C_D = 8$  pF
- ESD immunity acc. IEC 61000-4-2  
 $\pm 25$  kV contact discharge  
 $\pm 30$  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.vishay.com/patents](http://www.vishay.com/patents)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



| ORDERING INFORMATION  |                    |  |            |                             |                    |
|-----------------------|--------------------|--|------------|-----------------------------|--------------------|
| PART NUMBER (EXAMPLE) | AEC-Q101 QUALIFIED | ENVIRONMENTAL AND QUALITY CODE               |            | PACKAGING CODE              | ORDERING CODE      |
|                       |                    | RoHS-COMPLIANT + LEAD (Pb)-FREE TERMINATIONS | TIN PLATED | 10K PER 7" REEL (8 mm TAPE) |                    |
|                       |                    | GREEN  |            | MOQ = 10K                   |                    |
| VCUT0714BHD1          | -                  | G  | 3          | -08                         | VCUT0714BHD1-G3-08 |
| VCUT0714BHD1          | H                  | 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          | 2P        | 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 $\mu$ s/single shot |  | $I_{PPM}$ | 3.6         | A    |
|                          | Pin 2 to pin 1, acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot |  |           | 2           | A    |
| Peak pulse power         | Pin 1 to pin 2, acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot |  | $P_{PP}$  | 50          | W    |
|                          | Pin 2 to pin 1, acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot |  |           | 61          | W    |
| ESD immunity             | Contact discharge acc. IEC 61000-4-2; 10 pulses              |  | $V_{ESD}$ | $\pm 25$    | kV   |
|                          | Air discharge acc. IEC 61000-4-2; 10 pulses                  |  |           | $\pm 30$    | kV   |
| Operating temperature    | Junction temperature; for AEC-Q101 qualified devices         |  | $T_J$     | -55 to +150 | °C   |
| Storage temperature      |  |  | $T_{stg}$ | -65 to +150 | °C   |

PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)

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

**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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| <b>ELECTRICAL CHARACTERISTICS</b> (pin 2 to pin 1)<br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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               | $V_{RWM}$     | -    | -    | 14   | V             |
| Reverse voltage  | At $I_R = 0.1\text{ }\mu\text{A}$          | $V_R$         | 14   | -    | -    | V             |
| Reverse current  | At $V_{RWM} = 14\text{ V}$                 | $I_R$         | -    | -    | 0.1  | $\mu\text{A}$ |
| Reverse breakdown voltage  | At $I_R = 1\text{ mA}$                     | $V_{BR}$      | 14.5 | -    | -    | V             |
| Reverse clamping voltage   | At $I_{PP} = 1\text{ A}$                   | $V_C$         | -    | -    | 27   | V             |
|  | At $I_{PP} = I_{PPM} = 2\text{ A}$         | $V_C$         | -    | -    | 30   | V             |
| Capacitance  | At $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$ | $C_D$         | -    | 8    | 8.5  | pF            |
|  | At $V_R = 7\text{ V}$ ; $f = 1\text{ MHz}$ | $C_D$         | -    | 4    | -    | pF            |

| <b>ELECTRICAL CHARACTERISTICS</b> (pin 1 to pin 2)<br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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               | $V_{RWM}$     | -    | -    | 7    | V             |
| Reverse voltage  | At $I_R = 0.1\text{ }\mu\text{A}$          | $V_R$         | 7    | -    | -    | V             |
| Reverse current  | At $V_{RWM} = 7\text{ V}$                  | $I_R$         | -    | -    | 0.1  | $\mu\text{A}$ |
| Reverse breakdown voltage  | At $I_R = 1\text{ mA}$                     | $V_{BR}$      | 7.3  | -    | -    | V             |
| Reverse clamping voltage   | At $I_{PP} = 1\text{ A}$                   | $V_C$         | -    | -    | 13   | V             |
|  | At $I_{PP} = I_{PPM} = 3.6\text{ A}$       | $V_C$         | -    | -    | 15   | V             |
| Capacitance  | At $V = 0\text{ V}$ ; $f = 1\text{ MHz}$   | $C_D$         | -    | 8    | 8.5  | pF            |
|  | At $V = 3.5\text{ V}$ ; $f = 1\text{ MHz}$ | $C_D$         | -    | 6.4  | -    | pF            |

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

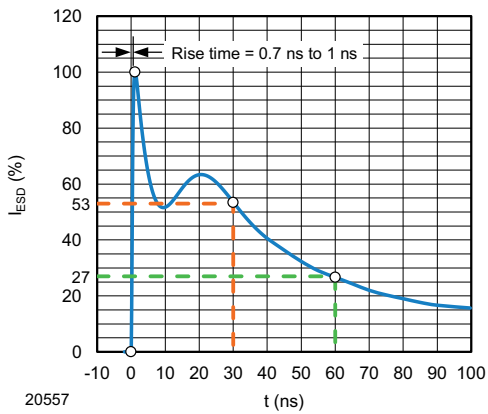


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330  $\Omega$ /150 pF)

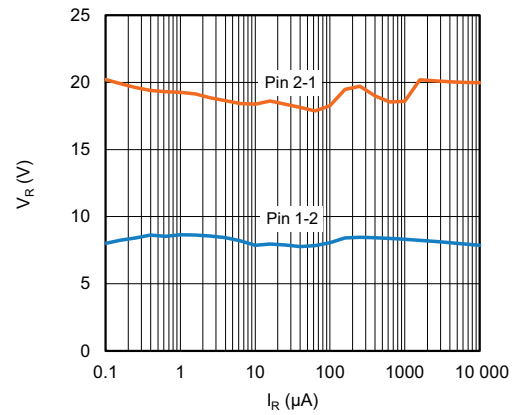


Fig. 4 - Typical Reverse Voltage vs. Reverse Current

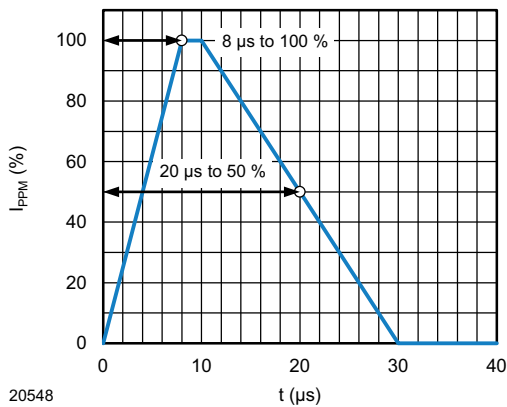


Fig. 2 - 8/20  $\mu\text{s}$  Peak Pulse Current Wave Form acc. IEC 61000-4-5

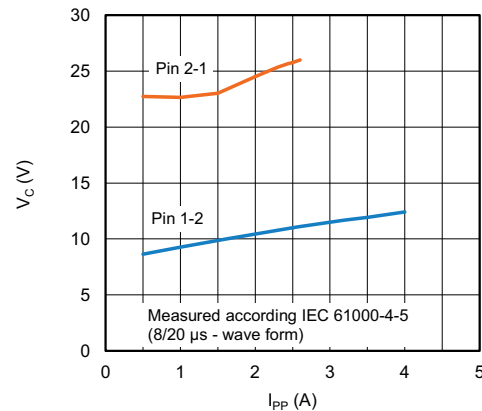


Fig. 5 - Typical Peak Clamping Voltage vs. Peak Pulse Current

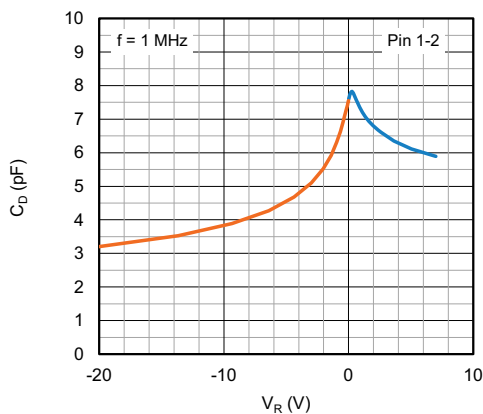


Fig. 3 - Typical Capacitance vs. Reverse Voltage

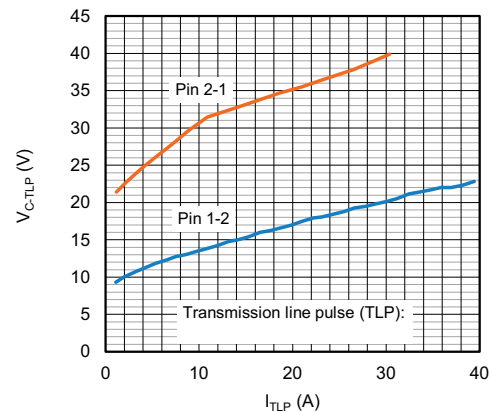
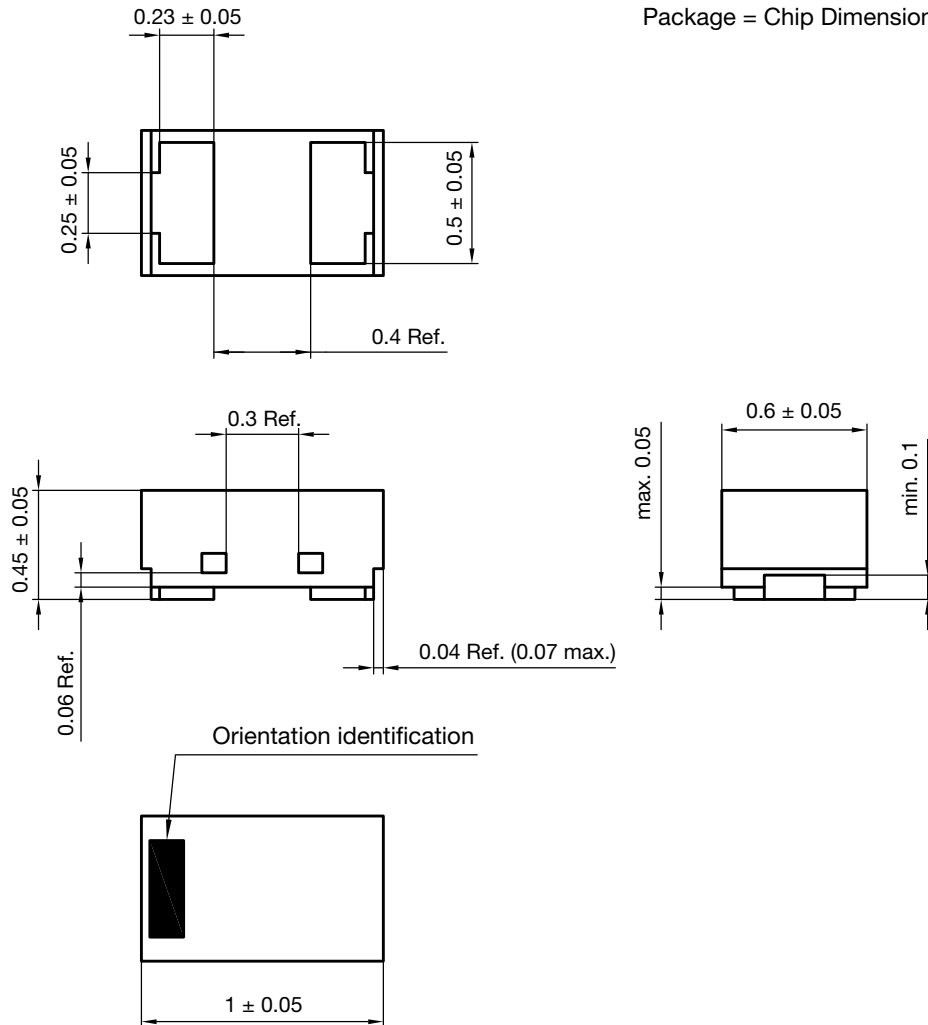


Fig. 6 - Typical Clamping Voltage vs. Peak Pulse Current

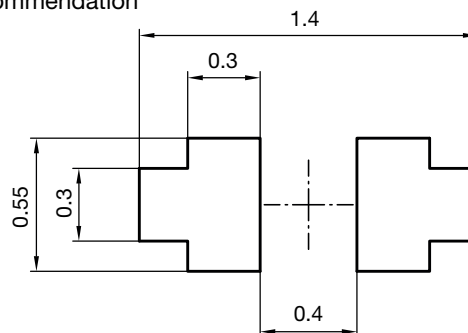


**PACKAGE DIMENSIONS** in millimeters (inches): **DFN1006-2A**

Package = Chip Dimension in mm



**Footprint recommendation**

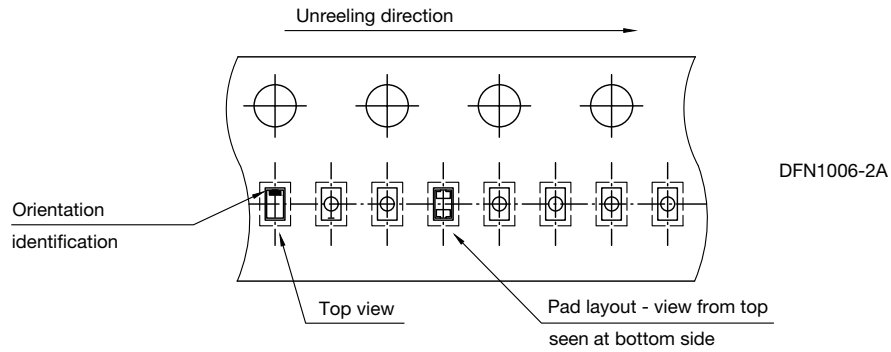


Document no.: S8-V-3906.04-059 (4)  
Created - Date: 11-Jul-2018  
Rev.5 - Date: 17-Sep-2021

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**ORIENTATION IN CARRIER TAPE: DFN1006-2A**



S8-V-3906.04-017 (4)  
02.05.2017  
22965



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