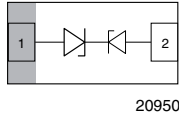


Bidirectional Asymmetrical (BiAs) Single Line ESD Protection Diode in DFN1006-2A



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 μ A
- 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.vishay.com/patents
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



MARKING (example only)



Bar = pin 1 marking
 Y = type code (see table below)
 X = date code

LINKS TO ADDITIONAL RESOURCES



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 | :A | 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 μ s/single shot | I_{PPM} | 3.6 | A |
| | Pin 2 to pin 1, acc. IEC 61000-4-5, 8/20 μ s/single shot | | 2 | A |
| Peak pulse power | Pin 1 to pin 2, acc. IEC 61000-4-5, 8/20 μ s/single shot | P_{PP} | 50 | W |
| | Pin 2 to pin 1, acc. IEC 61000-4-5, 8/20 μ s/single shot | | 61 | W |
| ESD immunity | Contact discharge acc. IEC 61000-4-2; 10 pulses | V_{ESD} | ± 25 | kV |
| | Air discharge acc. IEC 61000-4-2; 10 pulses | | ± 30 | kV |
| Storage temperature | | T_{STG} | -55 to +150 | °C |
| Operating temperature | Junction temperature; for AEC-Q101 qualified devices | T_J | -55 to +150 | °C |

PATENT(S): 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.



22286

ELECTRICAL CHARACTERISTICS (pin 2 to pin 1)

 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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 | μA |
| 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 |

ELECTRICAL CHARACTERISTICS (pin 1 to pin 2)

 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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 | μA |
| 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)

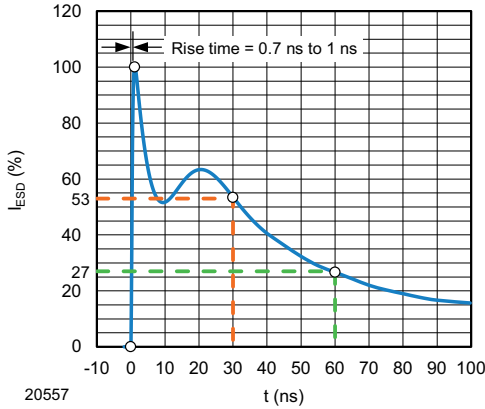


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω /150 pF)

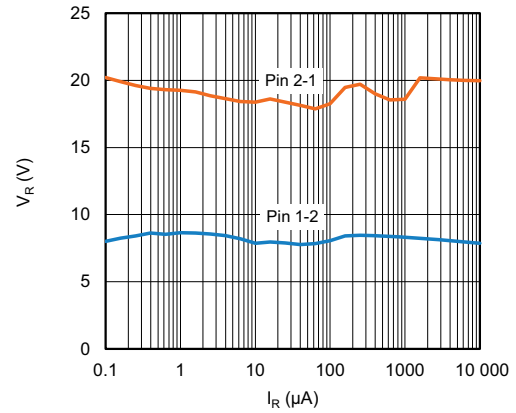


Fig. 4 - Typical Reverse Voltage vs. Reverse Current

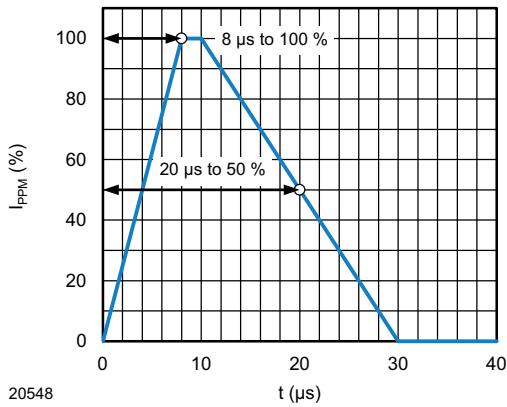


Fig. 2 - 8/20 μs Peak Pulse Current Wave Form acc. IEC 61000-4-5

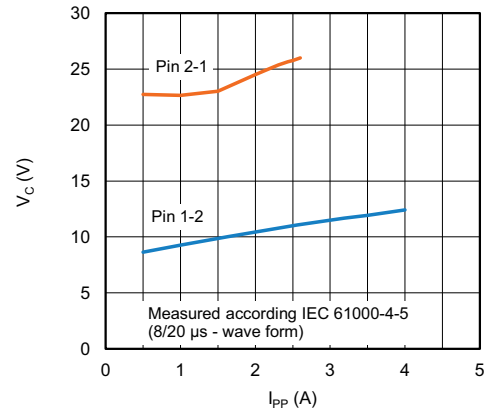


Fig. 5 - Typical Peak Clamping Voltage vs. Peak Pulse Current

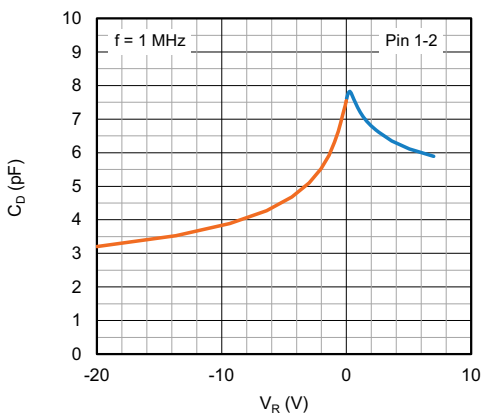


Fig. 3 - Typical Capacitance vs. Reverse Voltage

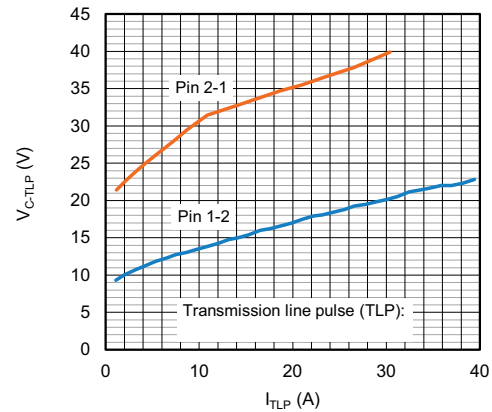
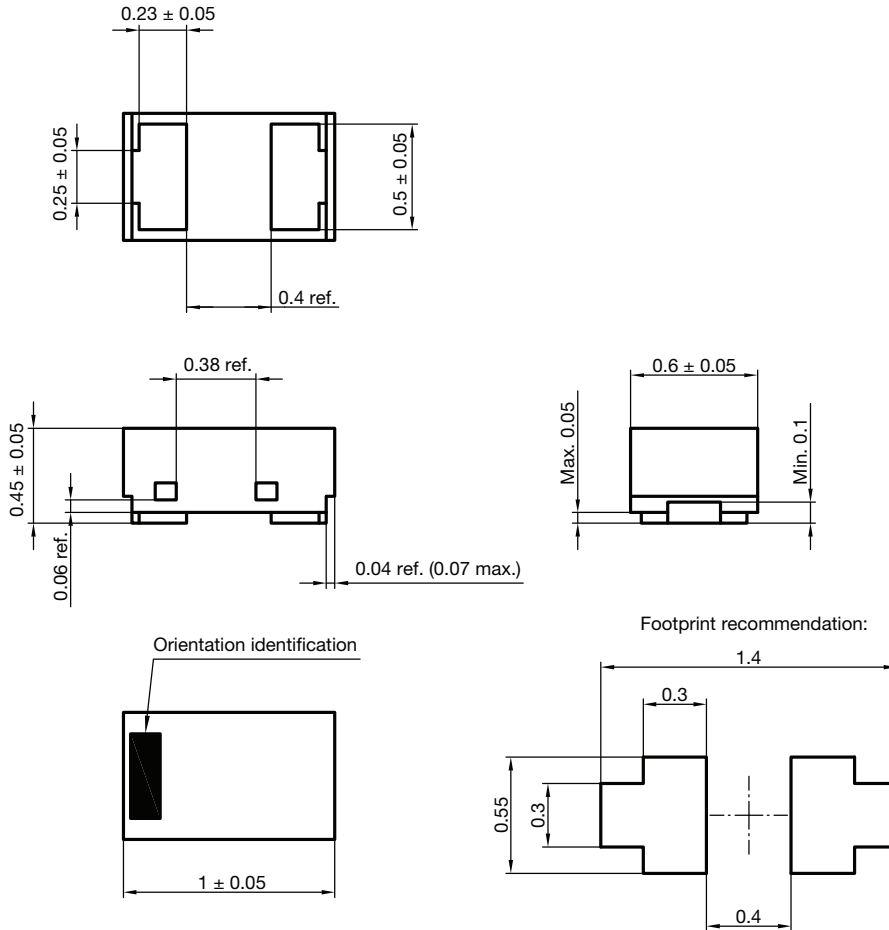


Fig. 6 - Typical Clamping Voltage vs. Peak Pulse Current

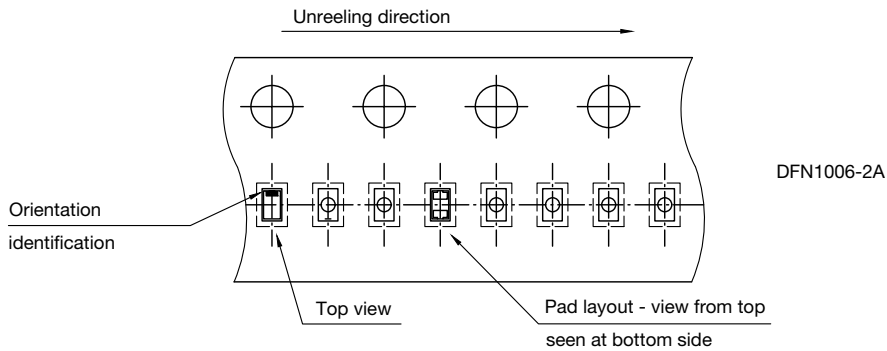


PACKAGE DIMENSIONS in millimeters (inches): **DFN1006-2A**



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ORIENTATION IN CARRIER TAPE: DFN1006-2A



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22965



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