



BYD Microelectronics Co., Ltd.

BDE2S5.0DC

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Transient Voltage Suppressor

Bidirectional Protection With Ultra-Low Capacitance

The BDE2S5.0DC Series is designed to protect voltage sensitive components that require ultra-low capacitance from damage due to ESD. Excellent clamping capability, low leakage, low capacitance, and fast response time make it ideal for ESD protection where board space is at a premium.

The BDE2S5.0DC is a bidirectional TVS with a capacitance of only 0.5pF. This allows it to be used on circuits operating in excess of 3GHz without signal attenuation. It may be used to meet the ESD immunity requirements of IEC61000-4-2 Level 4 ($\pm 15\text{KV}$ air, $\pm 8\text{KV}$ contact discharge).

Specification Features:

- Ultra-low Capacitance 0.5pF
- Low Clamping Voltage
- Small Body Outline Dimensions: 0.039" x 0.024" (1.0 mm x 0.60 mm)
- Low Body Height: 0.019" (0.5 mm)
- Stand-off Voltage: 5.0V
- Low Leakage
- Response Time is Typically < 1 ns
- IEC61000-4-2 Level 4 ESD Protection for data lines
- These are Pb-Free Devices

Mechanical Characteristics:

- CASE: Void-free, transfer-molded, thermosetting plastic Epoxy Meets UL 94 V-0
- LEAD FINISH: NiPdAu
- MOUNTING POSITION: Any
- QUALIFIED MAX REFLOW TEMPERATURE: 260°C
- Device Meets MSL 1 Requirements
- RoHS / WEEE Compliant
- Marking: Marking code

Applications

- USB interfaces
- 10/100/1000 Mb/s Ethernet
- FireWire
- Display ports
- MDDI ports
- Digital Visual Interface (DVI)
- Cellular handsets & accessories
- Computer and peripherals

Package Type

DFN1006-2L



Ordering Information

Device	Package	Shipping
BDE2S5.0DC	DFN1006-2L	5000/Tape & Reel

**Maximum Ratings**

Rating	Symbol	Value	Unit
IEC 61000-4-2 (HBM-ESD) Contact Air		± 8 ± 15	kV
Total Power Dissipation on FR-5 [®] Board @ TA = 25°C	P _D	150	mW
Junction and Storage Temperature Range	T _J , T _{stg}	-55 to +150	°C
Lead Solder Temperature – Maximum (10 Second Duration)	T _L	260	°C

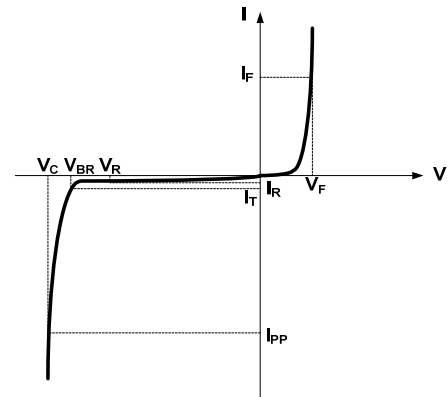
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Note1: FR-5 = 1.0*0.75*0.062inch (25.4*19.05*1.58mm).

Electrical Characteristics

(T_A = 25°C unless otherwise noted.)

Symbol	Parameter
I _{PP}	Maximum Reverse Peak Pulse Current
V _C	Clamping Voltage @ I _{PP}
V _{RWM}	Working Peak Reverse Voltage
I _R	Maximum Reverse Leakage Current @ V _{RWM}
I _T	Test Current
V _{BR}	Breakdown Voltage @ I _T
I _F	Forward Current
V _F	Forward Voltage @ I _F
P _{PK}	Peak Power Dissipation
C	Max. Capacitance @ V _R = 0 and freq.=1 MHz



Uni-Directional TVS I-V Curve

Device	Mark	V _{RWM} (V)	I _R (μA)@V _{RWM}		V _{BR} (V)@ I _T			I _T (mA)	Max. V _C (V) @ I _{PP} = 1A	C (pF)	
			Typ.	Max.	Min.	Typ.	Max.			Typ.	Max.
BDE2S5.0DC	ZZ	5	0.02	0.5	7.8	8.2	8.6	1	9.8	0.45	0.7

Note2: Surge current wave form per figure 3.

TYPICAL CHARACTERISTICS

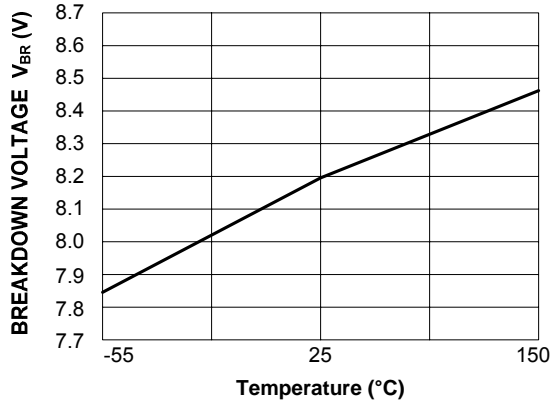


Figure 1: Typical Breakdown Voltage versus Temperature

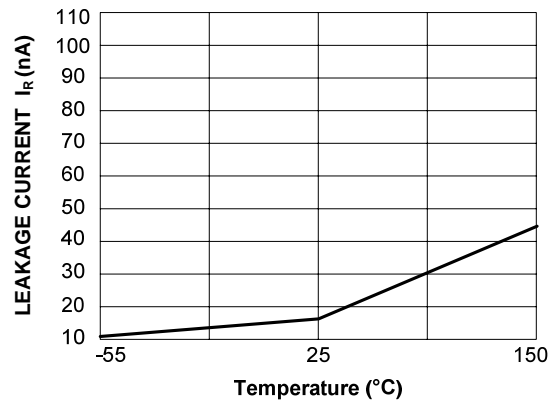


Figure 2: Typical Leakage Current versus Temperature

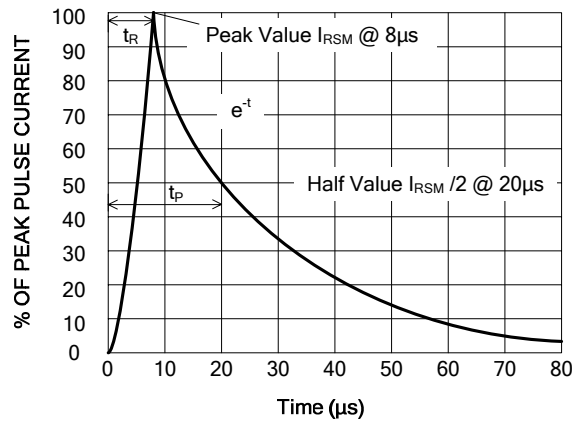
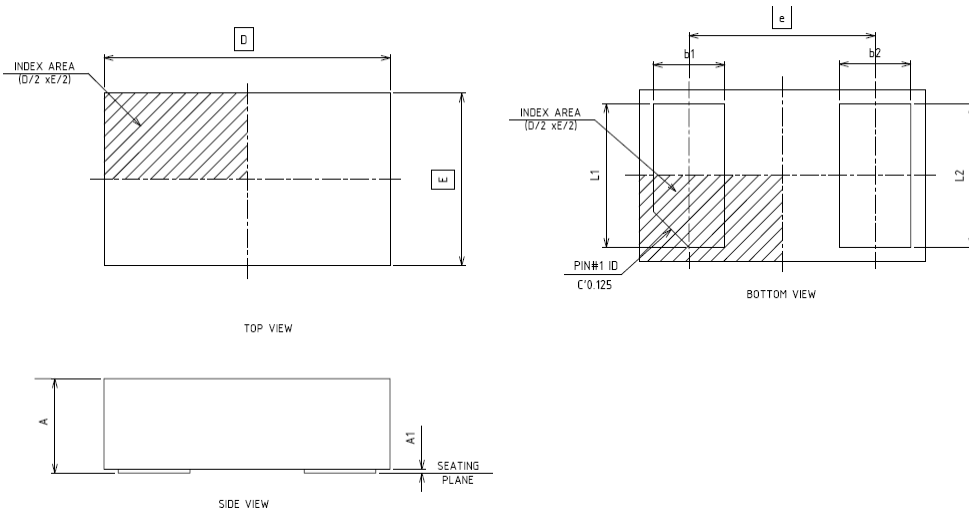


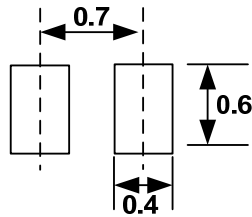
Figure 3: 8/20µs Pulse Wave Form

PACKAGE OUTLINE DIMENSIONS

DFN1006-2L



Dimension: Millimeter
(Stencil thickness: 0.1)



Soldering Footprint

Symbol	Dimensions in mm		
	Min	Nom	Max
A	0.450	0.500	0.550
A1	0.000	0.002	0.050
D	0.950	1.000	1.050
E	0.550	0.600	0.650
e		0.650	
b1	0.200	0.250	0.300
b2	0.200	0.250	0.300
L1	0.450	0.500	0.550
L2	0.450	0.500	0.550



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