



BYD Microelectronics Co., Ltd.

BDE2S12

ESD Protection Diodes

In Ultra Small DFN1006-2L Package

The BDE2S12 Series is designed to protect voltage sensitive components from damage due to ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD for board level. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space is at a premium.

Specification Features:

- 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: 12V
- Low Leakage
- Response Time is Typically < 1 ns
- IEC61000-4-2 Level 4 ESD Protection
- These are Pb-Free Devices

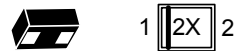
Mechanical Characteristics:

- 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, cathode band

Applications

- Cellular Handsets & Accessories
- Personal Digital Assistants (PDAs)
- Notebooks & Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals
- MP3 Players

Package Type
DFN1006-2L



PIN: 1 cathode
2 anode

Ordering Information

Device	Package	Shipping
BDE2S12	DFN1006-2L	5000/Tape & Reel

**Maximum Ratings**

Rating	Symbol	Value	Unit
IEC 61000-4-2 (ESD) Contact		±30	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

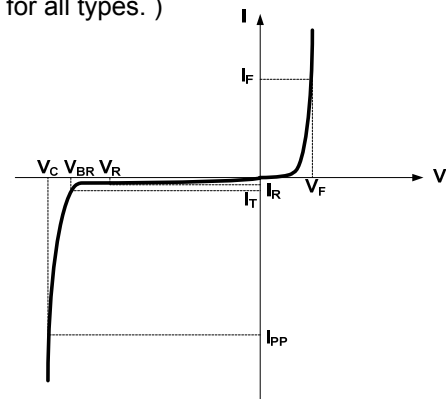
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

Electrical Characteristics

(T_A = 25°C unless otherwise noted, V_F = 0.9 V Max. @ I_F = 10 mA for all types.)

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.			
BDE2S12	2X	12	0.05	1	13.5	14.5	16	1	16	30

Note2: Surge current wave form per figure 3.

TYPICAL CHARACTERISTICS

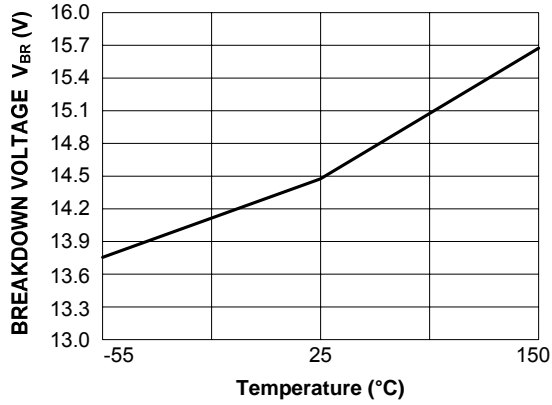


Figure 1: Typical Breakdown Voltage versus Temperature

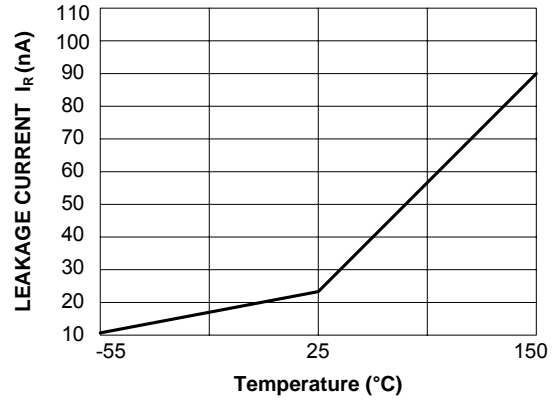


Figure 2: Typical Leakage Current versus Temperature

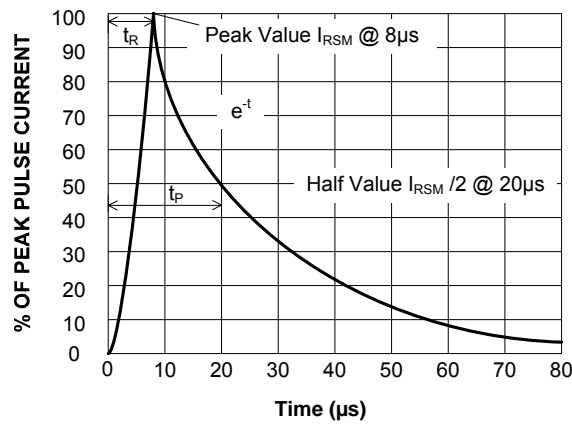
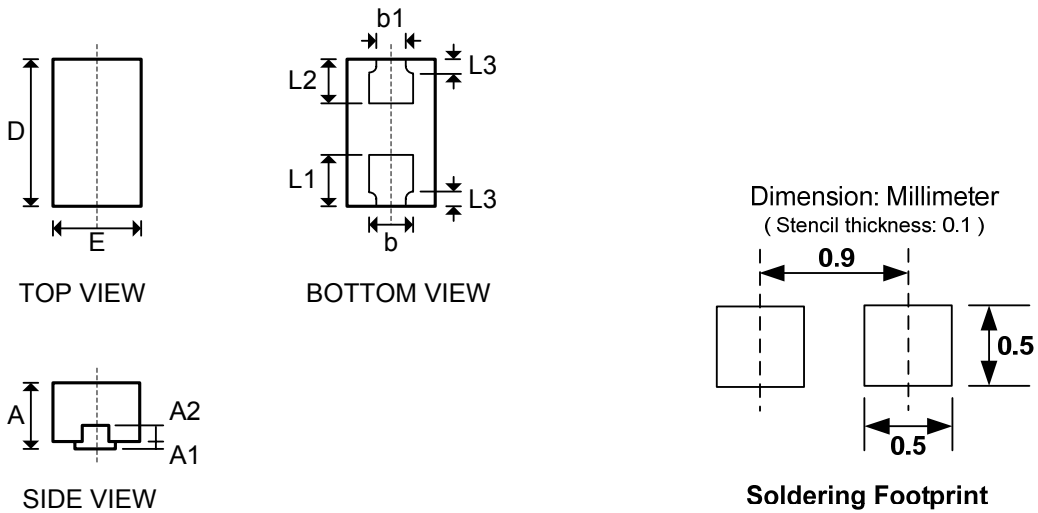


Figure 3: 8/20µs Pulse Wave Form

PACKAGE OUTLINE DIMENSIONS

DFN1006-2L



Symbol	Dimensions in mm		
	MIN.	NOM.	MAX.
A	0.450	0.500	0.550
A1	0.000	-	0.050
A2	0.150REF.		
D	0.950	1.000	1.050
E	0.550	0.600	0.650
b	0.250	0.300	0.350
b1	0.150	0.200	0.250
L1	0.300	0.350	0.400
L2	0.250	0.300	0.350
L3	0.100REF.		



RESTRICTIONS ON PRODUCT USE

- The information contained herein is subject to change without notice.
- BYD Microelectronics Co., Ltd. (short for BME) exerts the greatest possible effort to ensure high quality and reliability. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing BME products, to comply with the standards of safety in making a safe design for the entire system, including redundancy, fire-prevention measures, and malfunction prevention, to prevent any accidents, fires, or community damage that may ensue. In developing your designs, please ensure that BME products are used within specified operating ranges as set forth in the most recent BME products specifications.
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