BORN SEMICONDUCTOR

BNPESD3V3Y1BSFYL

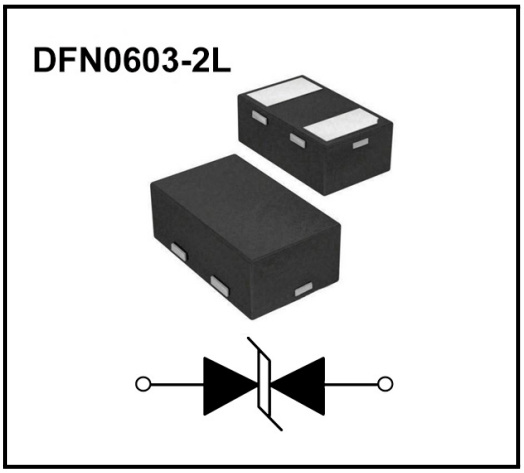
ESD Protection Diode

Features

- 40Watts peak pulse power (tp = 8/20us)
- Snap-Back technology
- Low clamping voltage
- Low leakage current
- Ultra low capacitance (0.25pF typical)
- ESD Protection for high-speed data lines
- IEC 61000-4-2 ±10kV contact ±12kV air
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 5A (8/20μs)
- RoHS compliant

Package

DFN0603-2L



Applications

- USB 3.0, USB 2.0, MHL
- HDMI 2.0, Display Port 1.3, eSATA
- Unified Display Interface (UDI)
- Digital Visual Interface (DVI)
- 1G/2.5G/5G/10G Ethernet

Marking

LS

Ordering information

Device	Package	Carrier	Quantity	HSF Status
BNPESD3V3Y1BSFYL	DFN0603-2L	Tape & Reel (7”)	10000pcs / Ree	Rohs Compliant

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Revision: 2022-Jan-1-A

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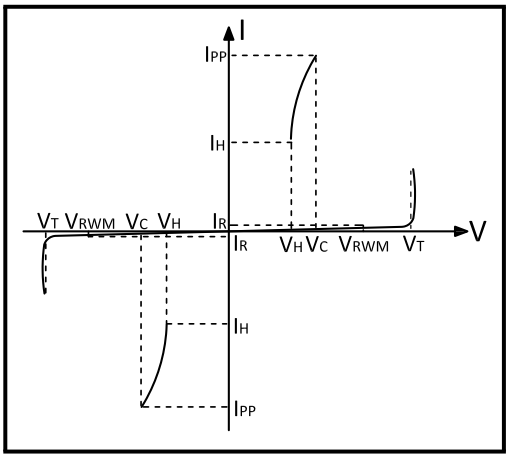
Electrical Parameters (T_A = 25°C unless otherwise noted)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Peak Reverse Working Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_T	Trigger voltage
I_T	Test Current
V_H	Holding voltage
I_H	Holding Current



Note:8/20us pulse Waveform.

Absolute Maximum Rating

Rating	Symber	Value	Units
Peak Pulse Power (tp =8/20μs)	P_{PP}	40	Watts
Peak Pulse Current (tp =8/20μs)	I_{PP}	5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	±12 ±10	KV
Junction Temperature	T_J	-55 to + 150	°C
Storage temperature range	T_{stg}	-55 to + 150	°C

Electrical Characteristics(T_A=25°C,Unless otherwise specified.)

Parameter	Symber	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}	–	–	–	3.3	V
Reverse Breakdown Voltage	V_{BR}	I_T=1mA	5.5	6.8	12	V
Trigger voltage	V_T	I_{PP} =5A,tp =8/20us	–	9.0	–	V
Reverse Leakage Current	I_R	V_{RWM}=3.3V	–	0.01	0.1	uA
Peak Pulse Current	I_{PP}	tp =8/20us	–	–	5	A
Clamping Voltage	V_C	I_{PP}=5A, tp =8/20us	–	6.5	8.0	V
Clamping Voltage(TLP 8A)		IEC 61000-4-2 Level 2 (±4 kV Contact, ±4 kV Air)	–	4.5	–	
Clamping Voltage(TLP 16A)		IEC 61000-4-2 Level 4 (±8 kV Contact, ±8 kV Air)	–	6.0	–	
Dynamic resistance	R_{dyn}	0A≤I_R≤30 A; tp=TLP	–	0.25	–	Ω
Junction Capacitance	C_J	V_R=0V,f=1MHZ	–	0.25	0.35	pF

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Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

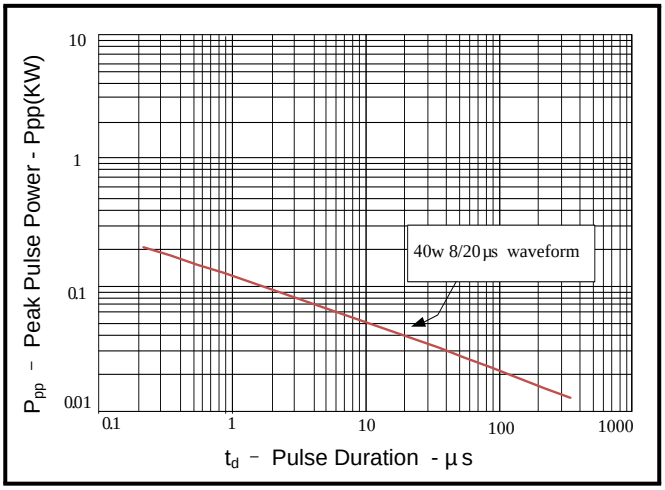


Figure 2: Power Derating Curve

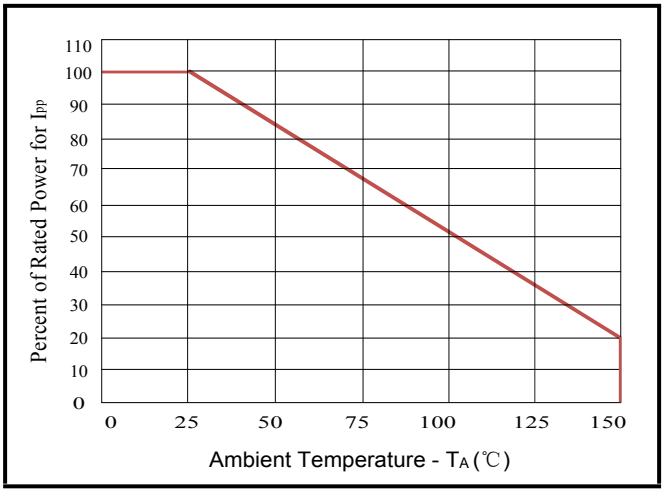


Figure 3: Pulse Waveform

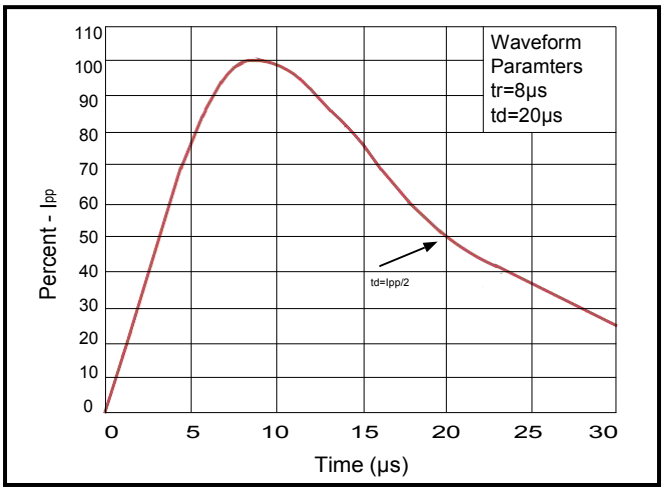
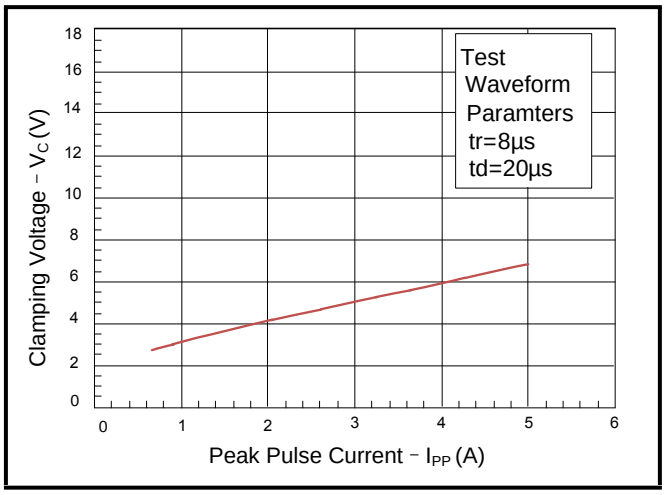


Figure 4: Clamping Voltage vs. I_{PP}



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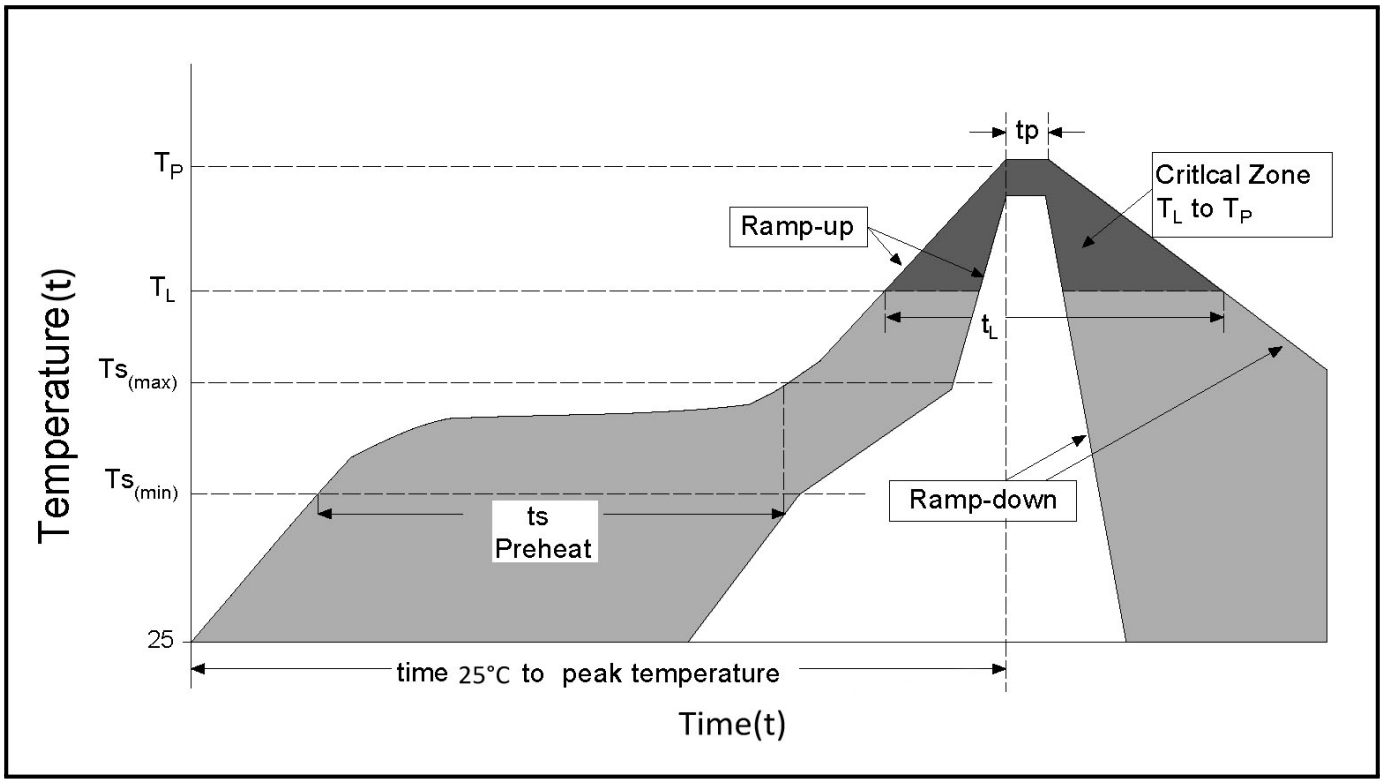
Soldering Parameters



Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min (T_S(min))	150°C
	- Temperature Max (T_S(max))	200°C
	- Time (min to max) (t_S)	60 - 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
T_S(max) to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 -150 secs
Peak Temperature (T_P)		$260^{+0/-5°C}$
Time within 5°C of actual peak Temperature (t_p)		20 - 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C

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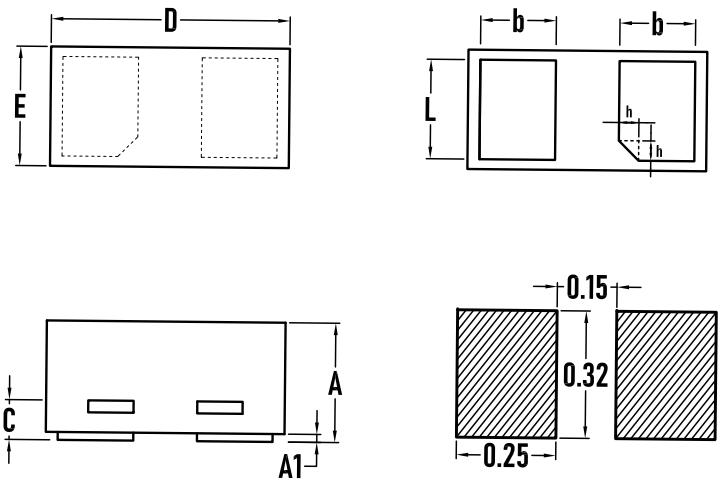
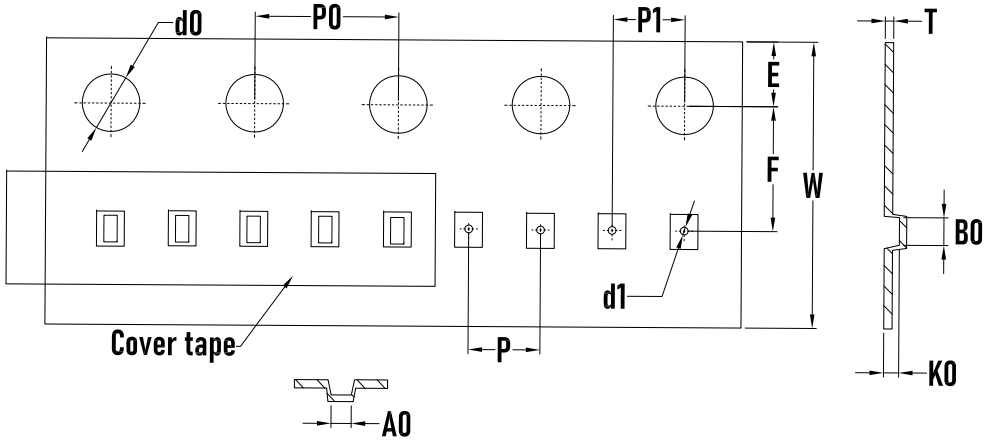
Outline Drawing – DFN0603-2L



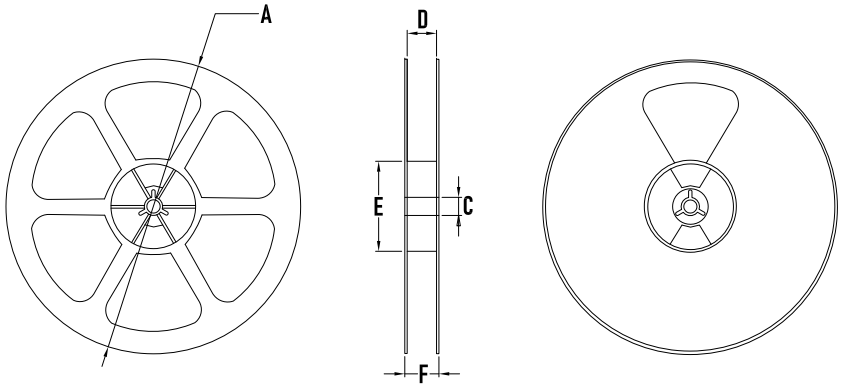
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.28	0.30	0.32
A1	0.00	0.02	0.05
C	0.05	0.10	0.15
D	0.55	0.60	0.65
E	0.25	0.30	0.35
b	0.14	0.19	0.24
L	0.20	0.25	0.30
h	–	0.05	0.10

Packaging Tape - DFN0603-2L



SYMBOL	MILLIMETER
A0	0.39±0.03
B0	0.70±0.03
d0	1.55±0.05
d1	0.20±0.05
E	1.75±0.10
F	3.50±0.04
K0	$0.37^{+0.03}_{-0.02}$
P	2.00±0.10
P0	4.00±0.10
P1	2.00±0.05
W	8.00±0.10
T	0.18±0.03

Packaging Reel



SYMBOL	MILLIMETER
A	178±2
C	$13.0^{+0.5}_{-0.2}$
D	9.5
E	55±5
F	14.4 max.
Quantity	10000PCS

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