BORN SEMICONDUCTOR

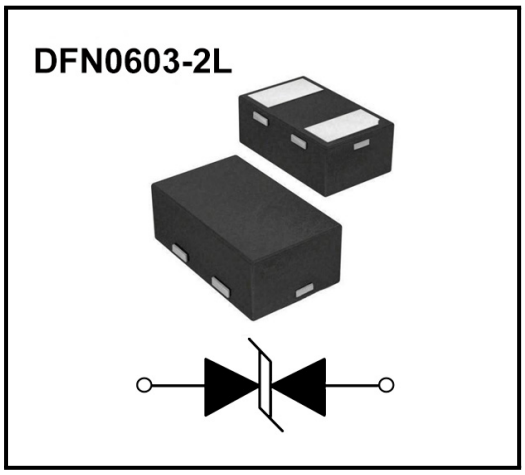
# BDFN1C031V

**ESD Protection Diode**

## Features

- 130Watts peak pulse power (tp = 8/20μs)
- Bidirectional configurations
- Solid-state silicon-avalanche technology
- Low clamping Voltage
- Low leakage current
- IEC 61000-4-2 ±30kV contact ; ±30kV air
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 10A (8/20μs)

## Package



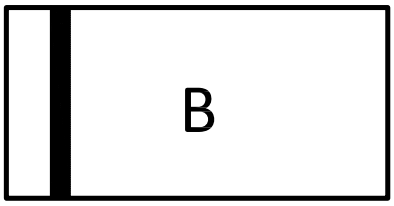

## Applications

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Personal Digital Assistants (PDA's)
- Notebooks, Desktops, and Servers
- Portable Instrumentation

## Mechanical Characteristics

- DFN0603-2L package
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

## Marking




## Ordering information

| Order code | Package | Base qty | Delivery mode |
|---|---|---|---|
| BDFN1C031V | DFN0603-2L | 10k | Tape and reel |

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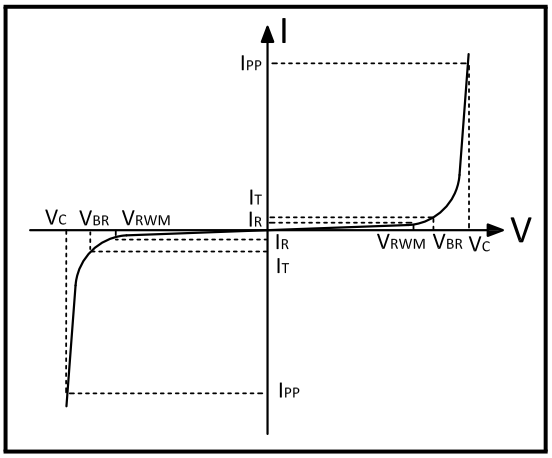
**Revision: 2022-Jan-1-A**

# BDFN1C031V

**ESD Protection Diode**

## 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 |
| $I_R$ | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$ | Breakdown Voltage @ $I_T$ |
| $I_T$ | Test Current |
| | |
| | |
| | |




Note:8/20us pulse Waveform.

## Absolute Maximum Rating

| Rating | Symber | Value | Units |
|---|---|---|---|
| Peak Pulse Power ( tp =8/20μs ) | $P_{PP}$ | 130 | Watts |
| Peak Pulse Current (tp =8/20μs ) | $I_{PP}$ | 10 | A |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $V_{ESD}$ | 30<br>30 | KV |
| Lead Soldering Temperature | $T_L$ | 260(10seconds) | °C |
| Junction Temperature | $T_J$ | -55 to + 150 | °C |
| Storage Temperature | $T_{stg}$ | -55 to + 150 | °C |

## Electrical Characteristics

| Parameter | Symber | Conditions | Min | Typical | Max | Units |
|---|---|---|---|---|---|---|
| Reverse Stand-Off Voltage | $V_{RWM}$ | – | – | – | 3.3 | V |
| Reverse Breakdown Voltage | $V_{BR}$ | $I_T$=1mA | 3.4 | 4.3 | 6.5 | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$=3.3V,T=25°C | – | – | 1.0 | uA |
| Peak Pulse Current | $I_{PP}$ | tp =8/20us | – | – | 10 | A |
| Clamping Voltage | $V_{CL}$ | $I_{PP}$=16A, tp =100ns | – | 8 | – | V |
| Clamping Voltage | $V_C$ | $I_{PP}$=1A, tp =8/20us | – | 5 | – | V |
| Clamping Voltage | $V_C$ | $I_{PP}$=10A, tp =8/20us | – | 8 | 13 | V |
| Junction Capacitance | $C_j$ | $V_R$=0V,f=1MHZ | – | 18 | 25 | pF |

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# BDFN1C031V

**ESD Protection Diode**

## Typical Characteristics

**Figure 1: Peak Pulse Power vs. Pulse Time**

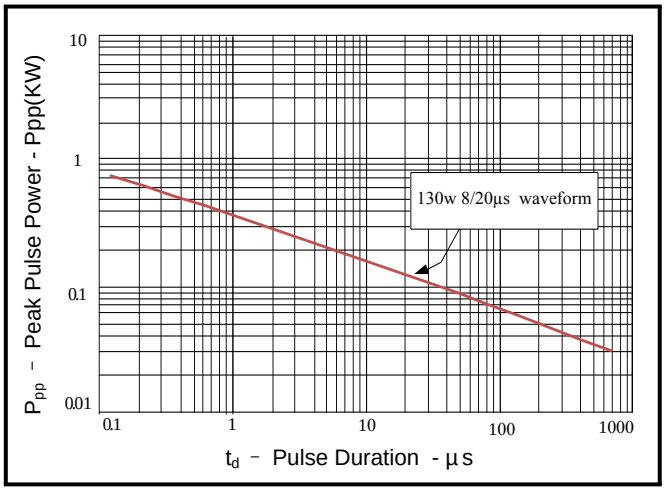



**Figure 2: Power Derating Curve**

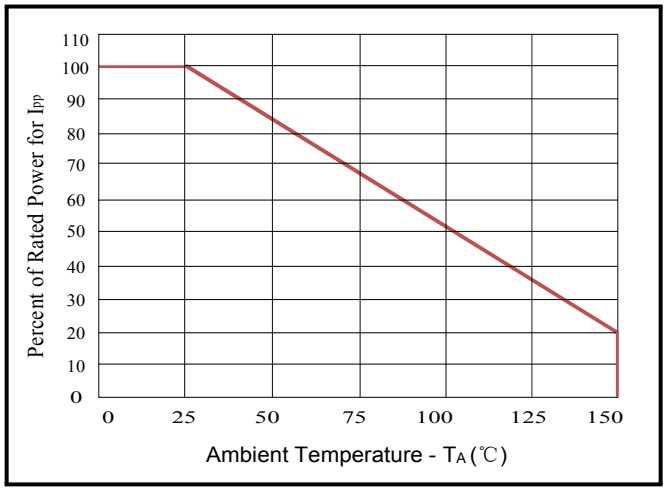



**Figure 3: Pulse Waveform**

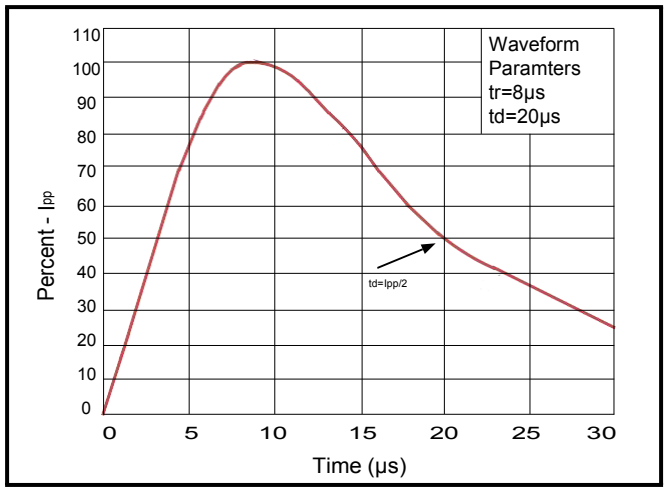
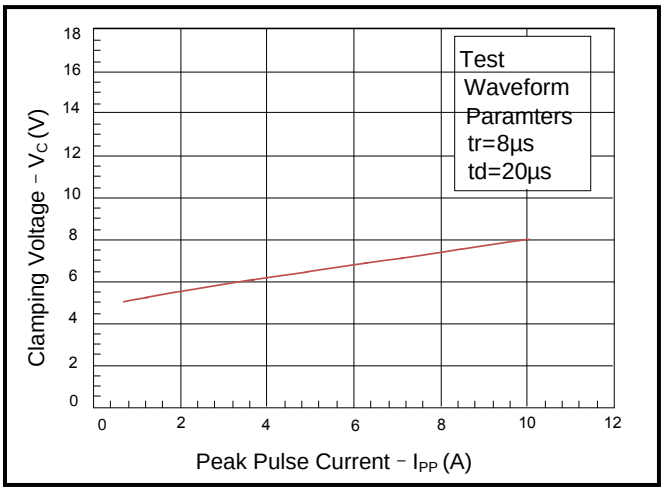


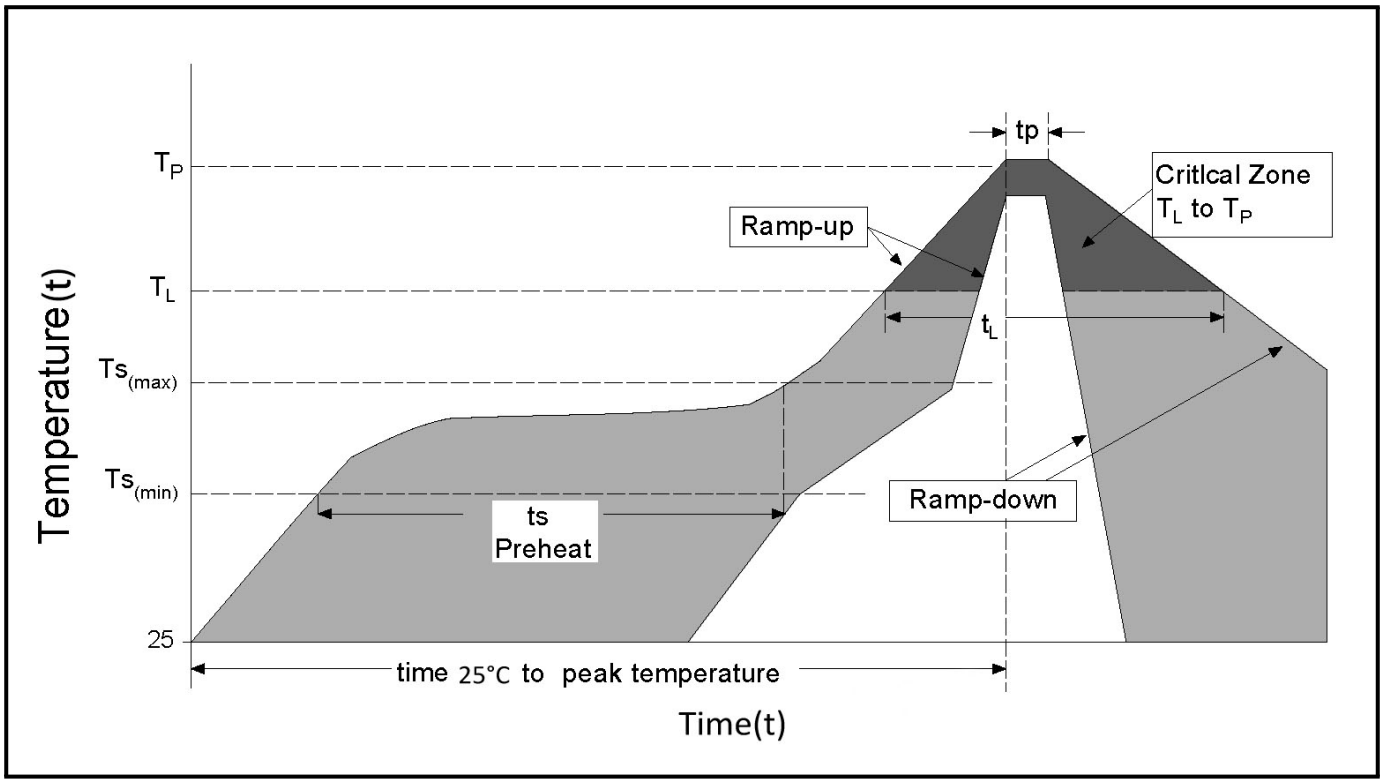

**Figure 4: Clamping Voltage vs. $I_{PP}$**




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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 |

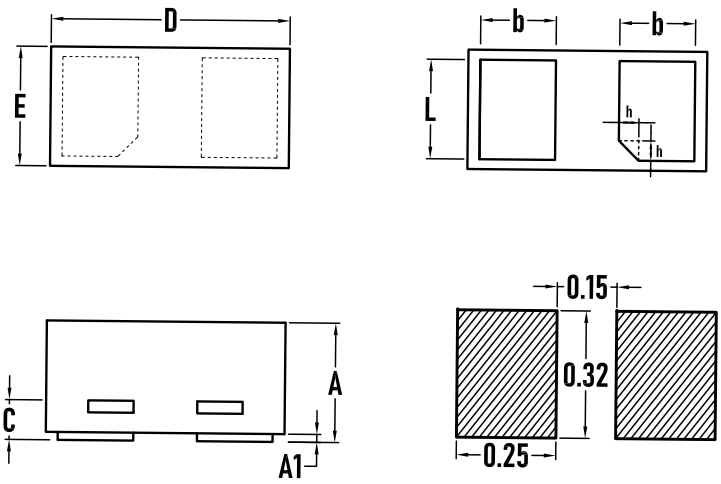
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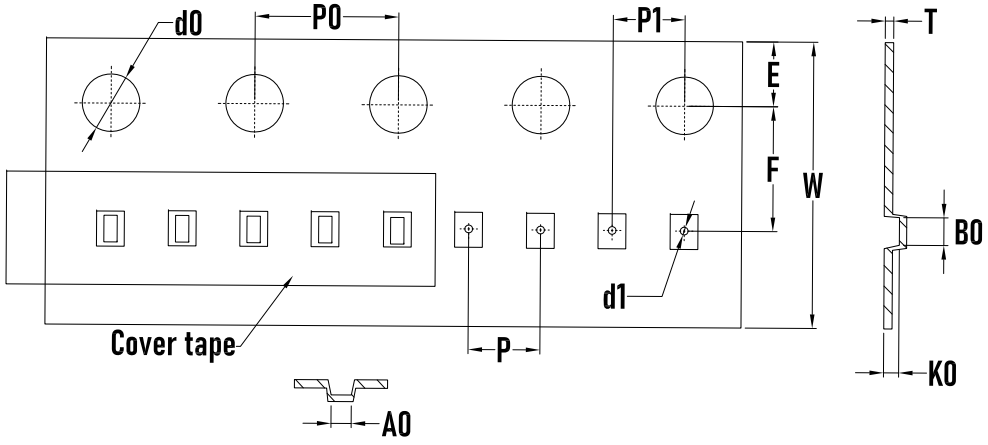
**ESD Protection Diode**

## Outline Drawing – DFN0603-2L



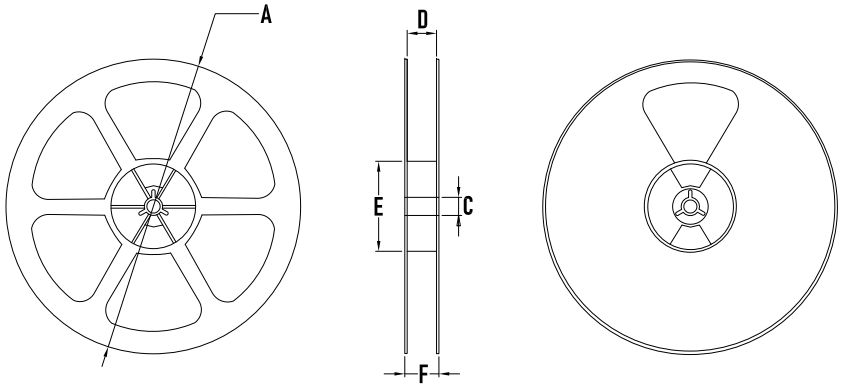

| SYMBOL | MILLIMETER | | |
|---|---|---|---|
| | MIN. | Typ. | MAX. |
| A | 0.28 | 0.30 | 0.32 |
| A1 | 0.00 | 0.02 | 0.05 |
| C | 0.05 | 0.10 | 0.15 |
| D | 0.55 | 0.60 | 0.65 |
| E | 0.25 | 0.30 | 0.35 |
| b | 0.14 | 0.19 | 0.24 |
| L | 0.20 | 0.25 | 0.30 |
| h | – | 0.05 | 0.10 |

## 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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