

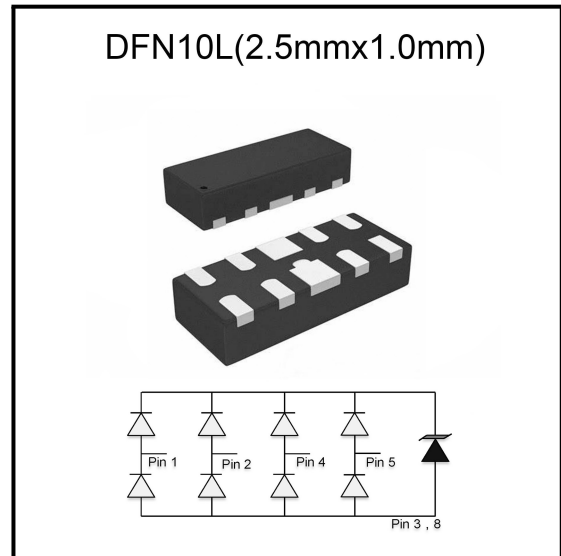
BNTPD4E02B04DQAR

ESD Protection
Diode Array

Features

- 25Watts peak pulse power ($t_p = 8/20\mu s$)
- Unidirectional configurations
- Solid-state silicon-avalanche technology
- Low clamping Voltage
- Low leakage current
- Low capacitance ($C_j=0.5pF$ typ.I/O to I/O)
- Protection one data/power line
- IEC 61000-4-2 $\pm 10kV$ contact ; $\pm 12kV$ air
- Low clamping voltage: $V_{CLVCL} = 5.3V$ typ @ $I_{PP} = 16A$ (TLP)
- IEC 61000-4-5 (Lightning) 5A ($8/20\mu s$)

Package



Applications

- USB 3.0, USB3.1
- HDMI1.3,HDMI1.4 and HDMI2.0
- Very sensitive interface lines
- Notebooks, Desktops, and Servers
- Industrial equipment

Mechanical Data

- Tiny DFN10L(2.5mmx1.0mm) package
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

Marking



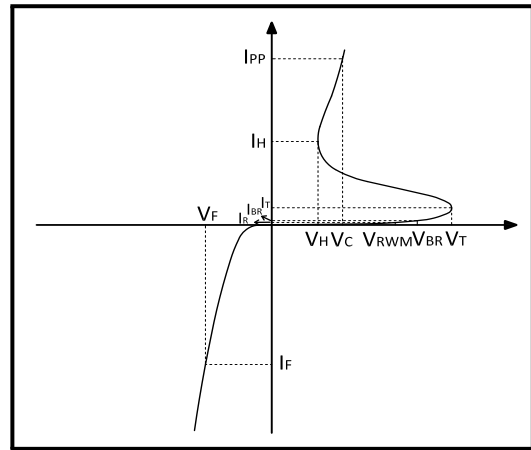
Ordering information

| Order code | Package | Base qty | Delivery mode |
|------------------|---------------------|----------|---------------|
| BNTPD4E02B04DQAR | DFN10L(2.5mmx1.0mm) | 3k | Tape and reel |



Electrical Parameters ($T_A = 25^\circ\text{C}$ 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} | Revers Breakdown Voltage |
| V_T | Trigger Voltage |
| I_H | Holding Current |
| V_H | Holding Voltage |



Note: 8/20us pulse Waveform.

Absolute Maximum Rating

| Rating | Symler | Value | Units |
|--|-----------|----------------|------------------|
| Peak Pulse Power ($t_p = 8/20\mu\text{s}$) | P_{PP} | 25 | Watts |
| Peak Pulse Current ($t_p = 8/20\mu\text{s}$) | I_{PP} | 5 | A |
| ESD per IEC 61000-4-2 (Air) | V_{ESD} | 12 | KV |
| ESD per IEC 61000-4-2 (Contact) | | 10 | |
| Lead Soldering Temperature | T_L | 260(10seconds) | $^\circ\text{C}$ |
| Junction Temperature | T_J | -55 to + 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to + 150 | $^\circ\text{C}$ |

Electrical Characteristics

| Parameter | Symler | Conditions | Min | Typical | Max | Units |
|---------------------------|-----------|--|-----|---------|-----|---------------|
| Reverse Stand-Off Voltage | V_{RWM} | – | – | – | 3.3 | V |
| Holding Voltage | V_H | $I_T = 1\text{mA}$ | 2.0 | – | 3.3 | V |
| Reverse Leakage Current | I_R | $V_{RWM} = 3.3\text{V}, T = 25^\circ\text{C}$ | – | – | 0.5 | μA |
| Trigger Voltage | V_T | – | – | 8.0 | – | V |
| Clamping Voltage | V_{CL} | $I_{PP} = 16\text{A}, t_p = 100\text{ns}$ | – | 5.3 | 6 | V |
| Clamping Voltage | V_C | $I_{PP} = 5\text{A}, t_p = 8/20\mu\text{s}$ | – | 4 | 5 | V |
| dynamic resistance | R_{dyn} | $T_{amd} = 25^\circ\text{C}, I_R = 10\text{A}$ | – | 0.3 | 0.4 | Ω |
| Junction Capacitance | C_j | $V_R = 0\text{V}, f = 1\text{MHz}, I/O$ to I/O | – | 0.3 | – | pF |
| | | $V_R = 0\text{V}, f = 1\text{MHz}, I/O$ to GND | – | 0.55 | – | |



Typical Characteristics

Figure 1: Clamping Voltage vs. IPP

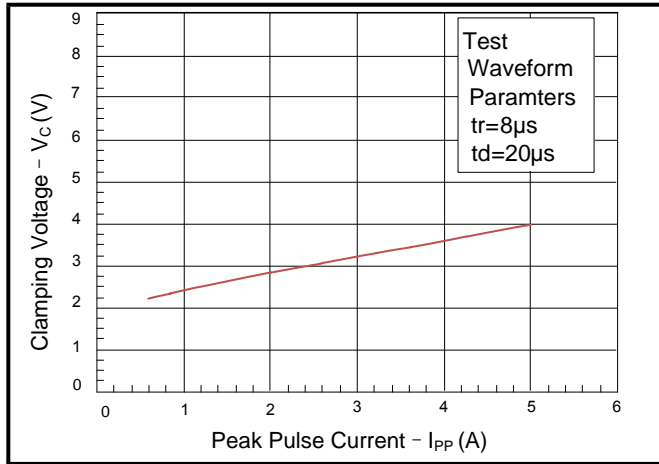


Figure 2: Peak Pluse Power vs. Pluse Time

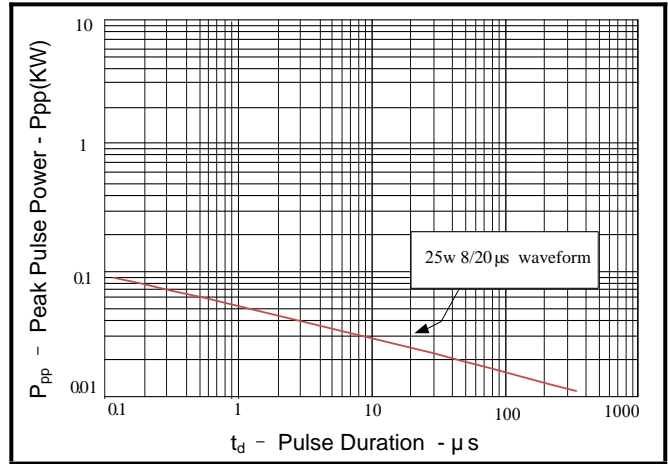


Figure 3: Positive Clamping voltage (TLP)

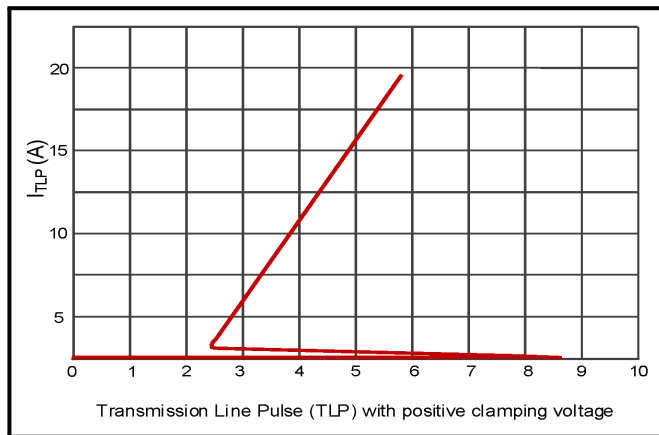


Figure 4: Capacitance vs. Reverse Voltage

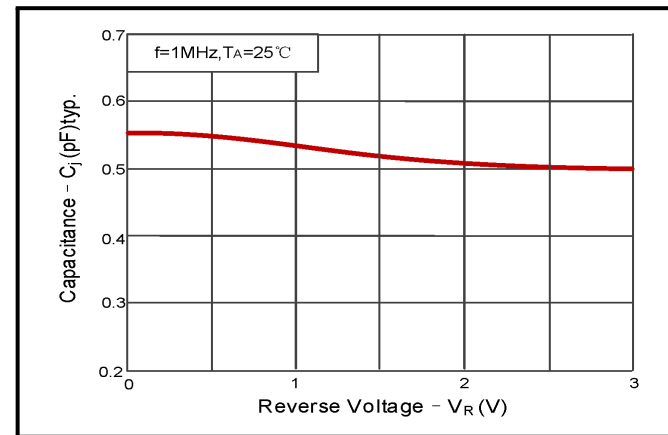


Figure 5: IEC61000-4-2 : 8 kV positive pulse(I/O to

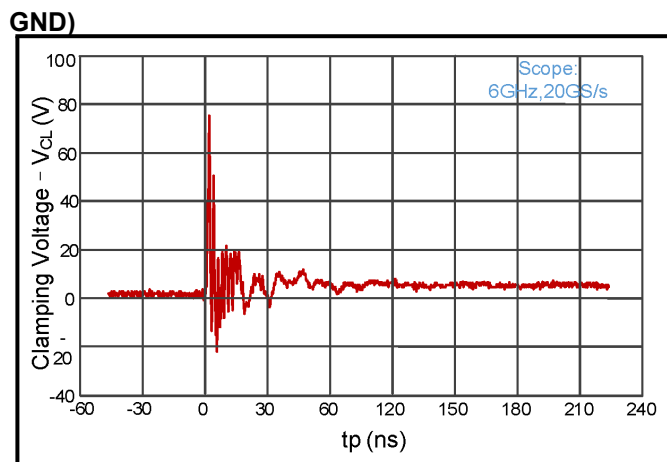
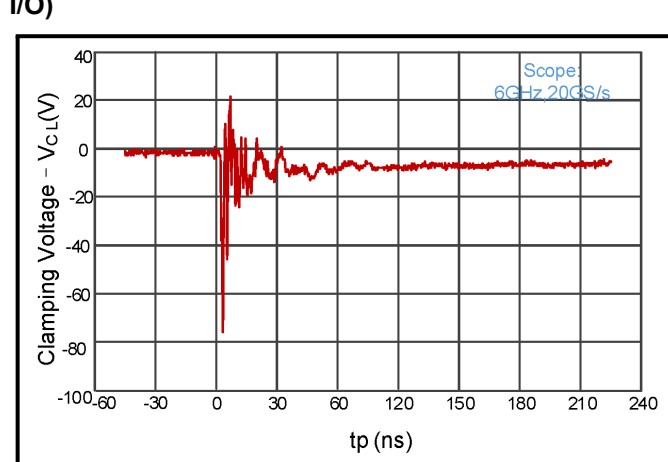


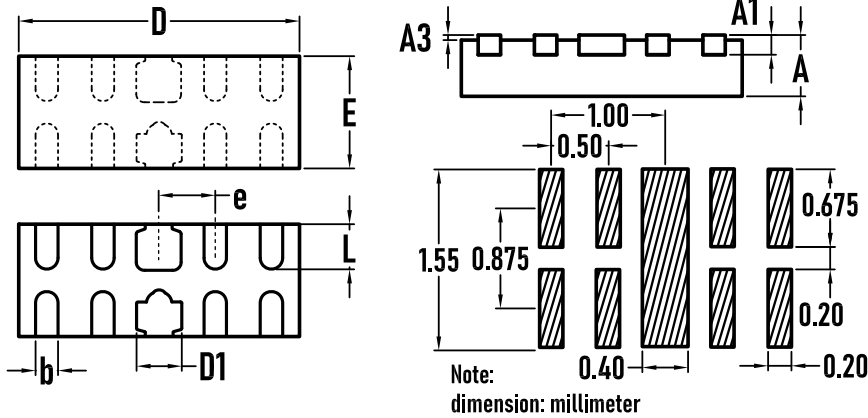
Figure 6: IEC61000-4-2 : 8 kV positive pulse(GND to



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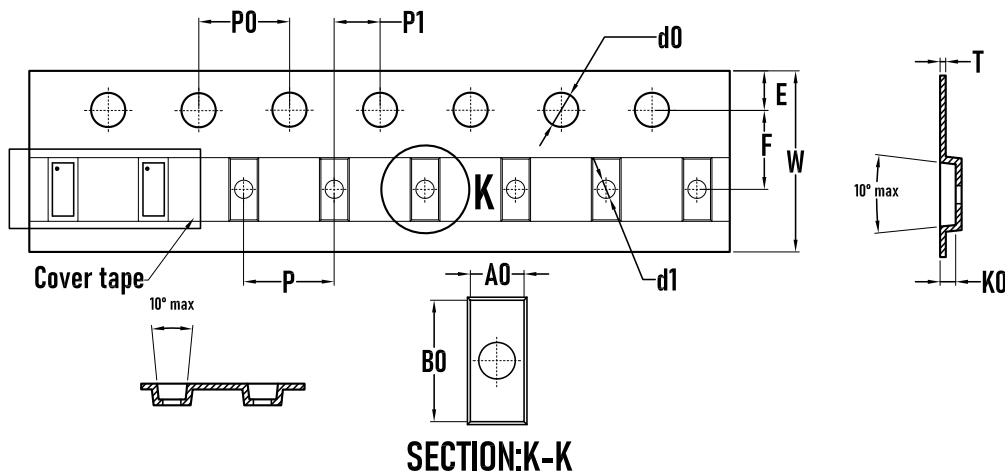
**ESD Protection
Diode Array**

Outline Drawing – DFN10L(2.5mmx1.0mm)



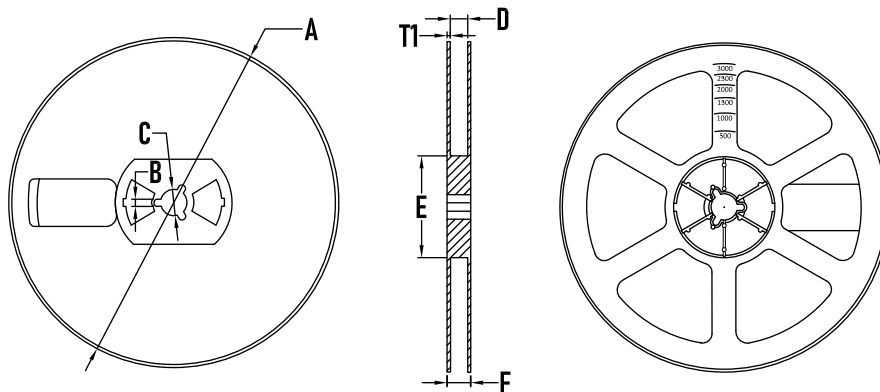
| SYMBOL | MILLIMETER | | |
|--------|------------|------|------|
| | MIN. | Typ. | MAX. |
| A | 0.45 | 0.50 | 0.55 |
| A1 | – | 0.02 | 0.05 |
| A3 | 0.10 | 0.15 | 0.20 |
| D | 2.45 | 2.50 | 2.55 |
| E | 0.95 | 1.00 | 1.05 |
| D1 | 0.35 | 0.40 | 0.45 |
| b | 0.15 | 0.20 | 0.25 |
| e | 0.50BSC | | |
| L | 0.35 | 0.40 | 0.45 |

Packaging Tape - DFN2510-10L



| SYMBOL | MILLIMETER |
|--------|--|
| A0 | 1.2±0.05 |
| B0 | 2.7±0.05 |
| d0 | 1.5 ^{+0.1} ₋₀ |
| d1 | 0.8±0.1 |
| E | 1.75±0.10 |
| F | 3.50±0.05 |
| K0 | 0.7±0.05 |
| P | 4.00±0.05 |
| P0 | 4.00±0.05 |
| P1 | 8.00±0.05 |
| W | 8.00 ^{+0.03} _{-0.01} |
| T | 0.22±0.03 |

Packaging Reel



| SYMBOL | MILLIMETER |
|----------|---------------------------------|
| A | 178±1 |
| B | 3.5±0.2 |
| C | 14.3±0.2 |
| D | 9.8 ⁺² ₋₁ |
| E | 54.5±0.5 |
| F | 12.4±0.5 |
| T1 | 1.0±0.2 |
| Quantity | 3000PCS |



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