

Features

- Ultra low capacitance: 0.3pF typical (I/O to I/O)
- Ultra low leakage: nA level
- Low operating voltage: 5V
- Low clamping voltage
- Up to 4 lines protects
- Leadless flow-through package
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: $\pm 30\text{kV}$
Contact discharge: $\pm 25\text{kV}$
 - IEC61000-4-5 (Lightning) 5A (8/20 μs)
- RoHS Compliant

Applications

- HDMI 1.3 & 1.4 & 2.0, USB 2.0 & 3.0 and MDDI ports
- 10/100/1000 Ethernet
- Monitors and flat panel displays
- Set-top box and Digital TV
- Video graphics cards
- Digital Video Interface (DVI)
- Notebook Computers
- PCI Express and Serial SATA Ports

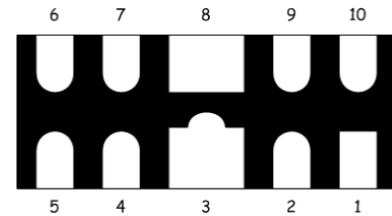
Mechanical Characteristics

- Package: DFN2510-10 (2.5x1.0x0.5mm)
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Quantity Per Reel: 3,000pcs
- Reel Size: 7 inch
- Device Marking: 0524S

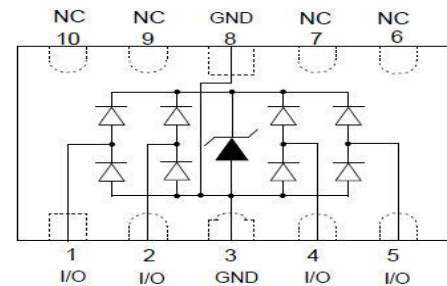
Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|--------|-------------|------------------|
| Peak Pulse Power (8/20 μs) | Ppk | 75 | W |
| ESD per IEC 61000-4-2 (Air) | VESD | ± 30 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ± 25 | |
| Operating Temperature Range | TJ | -55 to +125 | $^\circ\text{C}$ |
| Storage Temperature Range | Tstg | -55 to +150 | $^\circ\text{C}$ |

Dimensions DFN2510P10



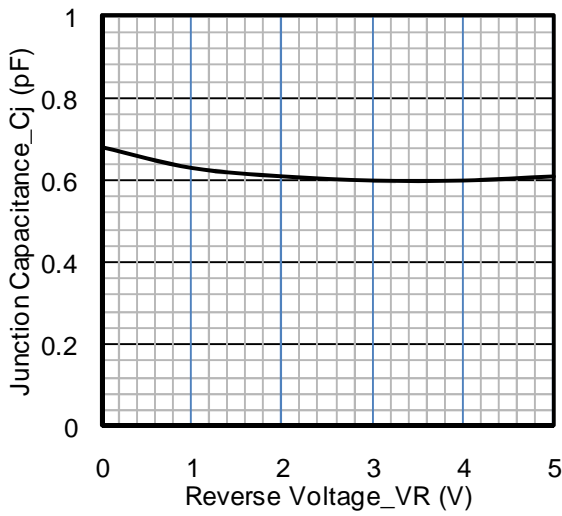
Pin Configuration



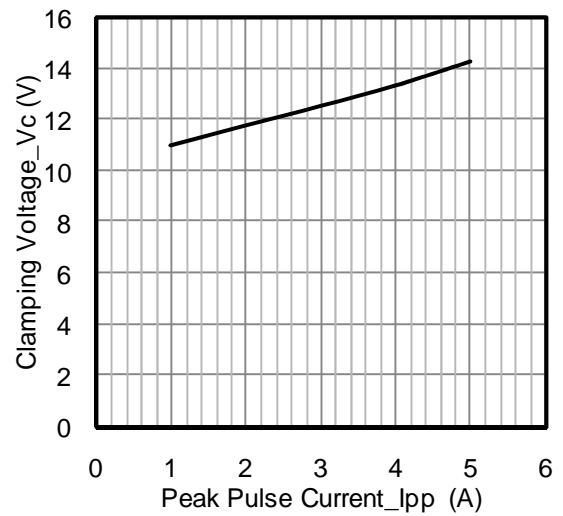
Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|-------------------------|--------|--|-----|-----|-----|---------------|
| Reverse Working Voltage | VRWM | Any I/O pin to ground | | | 5 | V |
| Breakdown Voltage | VBR | $I_T = 1\text{mA}$, any I/O pin to ground | 6 | | | V |
| Reverse Leakage Current | I_R | VRWM = 5V, any I/O pin to ground | | | 0.1 | μA |
| Clamping Voltage | VC | $I_{PP} = 1\text{A}$ (8 x 20 μs pulse), any I/O pin to ground | | | 9.8 | V |
| Clamping Voltage | VC | $I_{PP} = 5\text{A}$ (8 x 20 μs pulse), any I/O pin to ground | | | 15 | V |
| Junction Capacitance | CJ | VR = 0V, f = 1MHz, between I/O pins | | 0.3 | 0.4 | pF |
| Junction Capacitance | CJ | VR = 0V, f = 1MHz, any I/O pin to ground | | | 0.8 | pF |

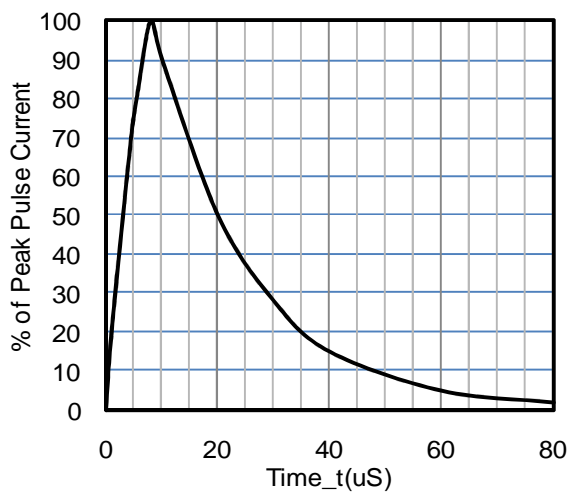
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



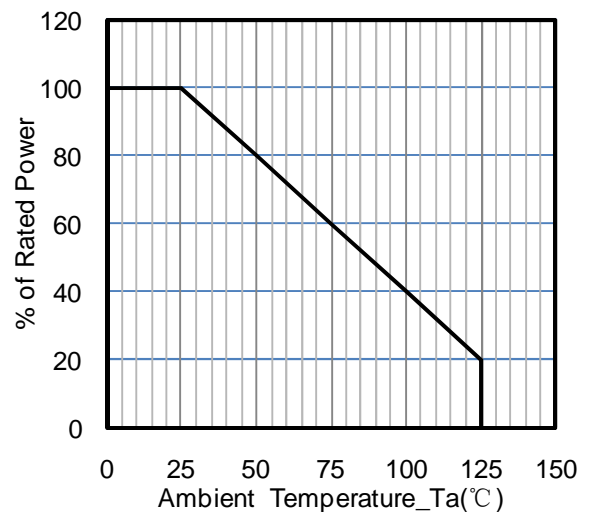
Junction Capacitance vs. Reverse Voltage



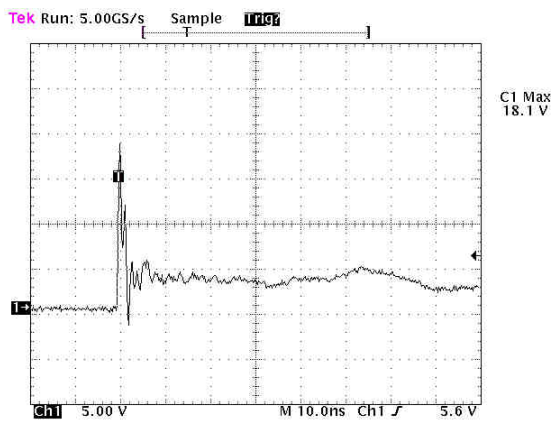
Clamping Voltage vs. Peak Pulse Current



8 X 20uS Pulse Waveform



Power Derating Curve

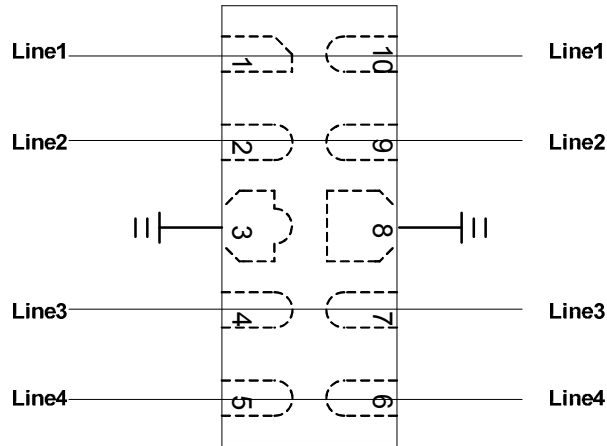


ESD Clamping Voltage

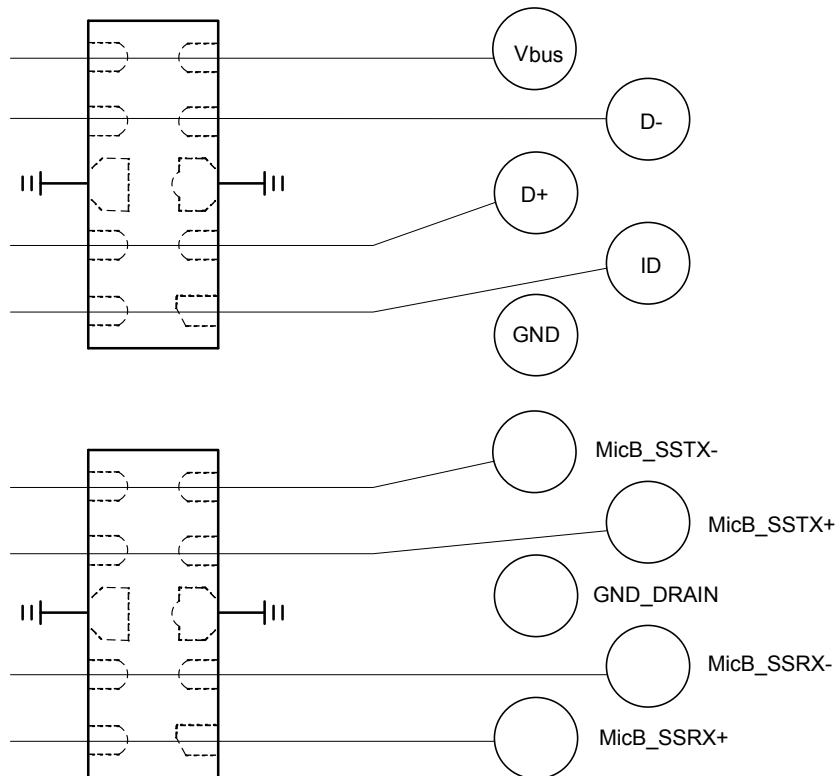
8 kV Contact per IEC61000-4-2

Typical Application

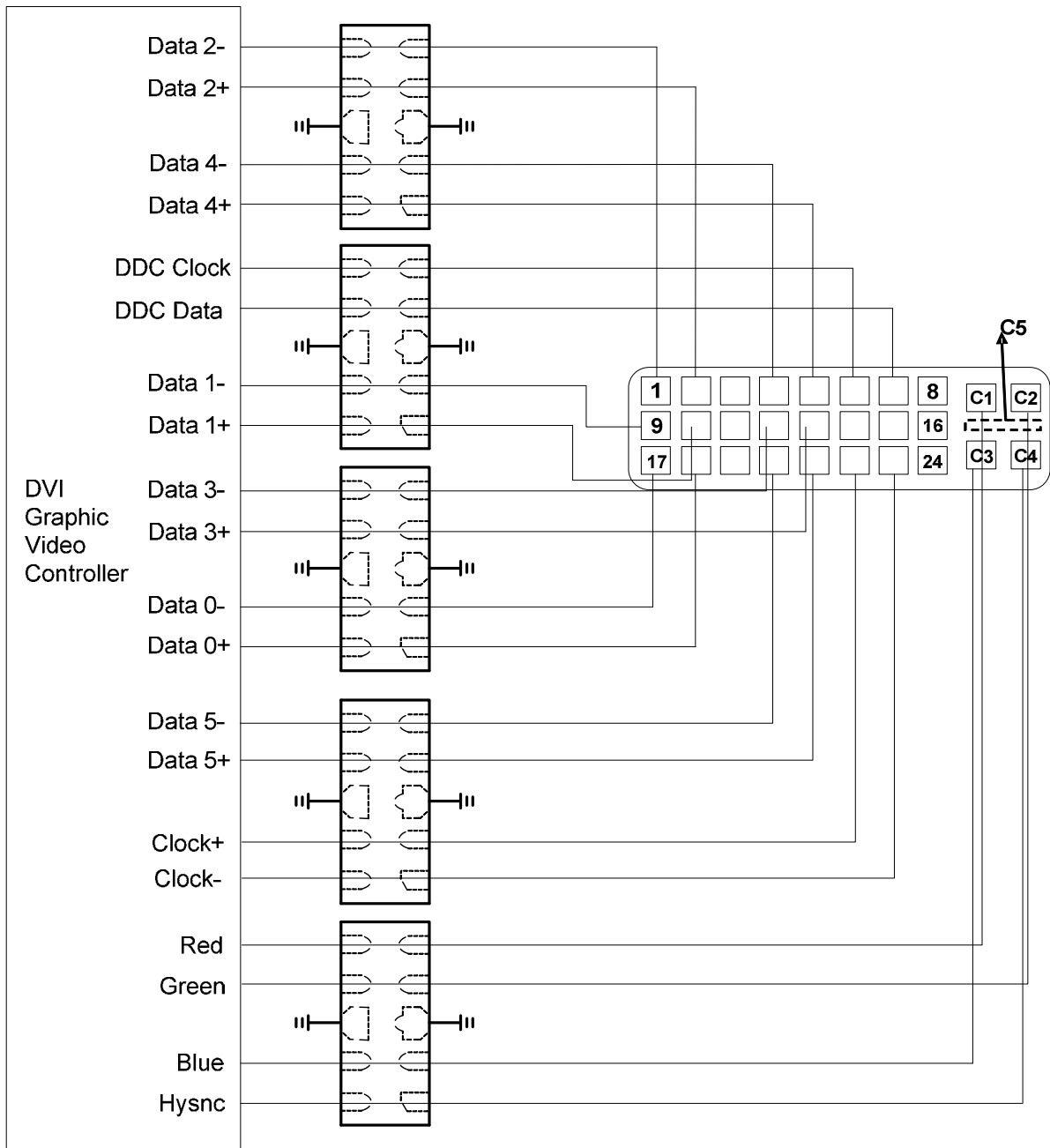
The ULC0524P is designed for easy PCB layout by allowing the traces to run straight through the device. The PCB traces could be used to connect the pin pairs for each line. For example, line 1 enters at pin 1 and exits at pin 10 and the PCB trace connects Pin 1 and Pin 10 together. Ground is connected at Pin 3 and Pin 8.



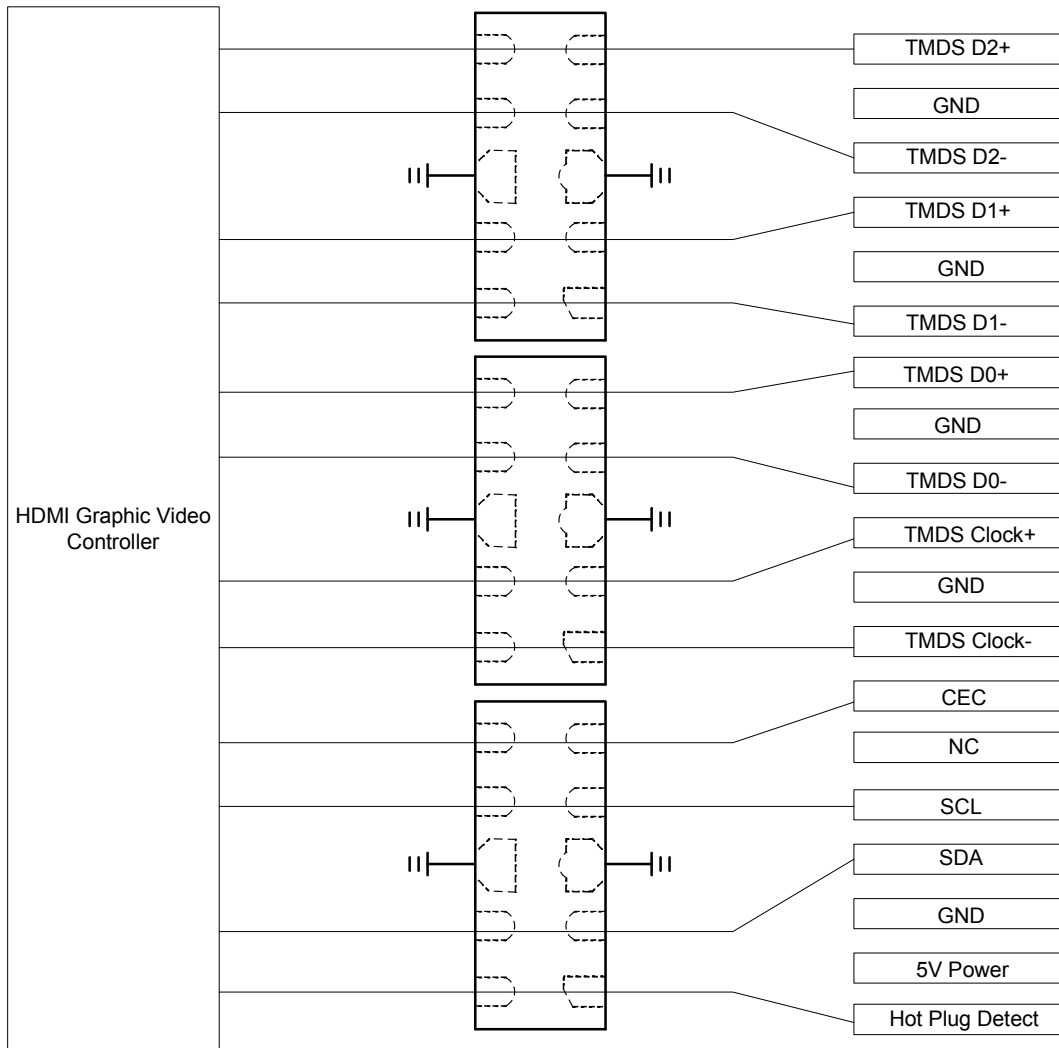
ULC0524P on USB 3.0 Port Application



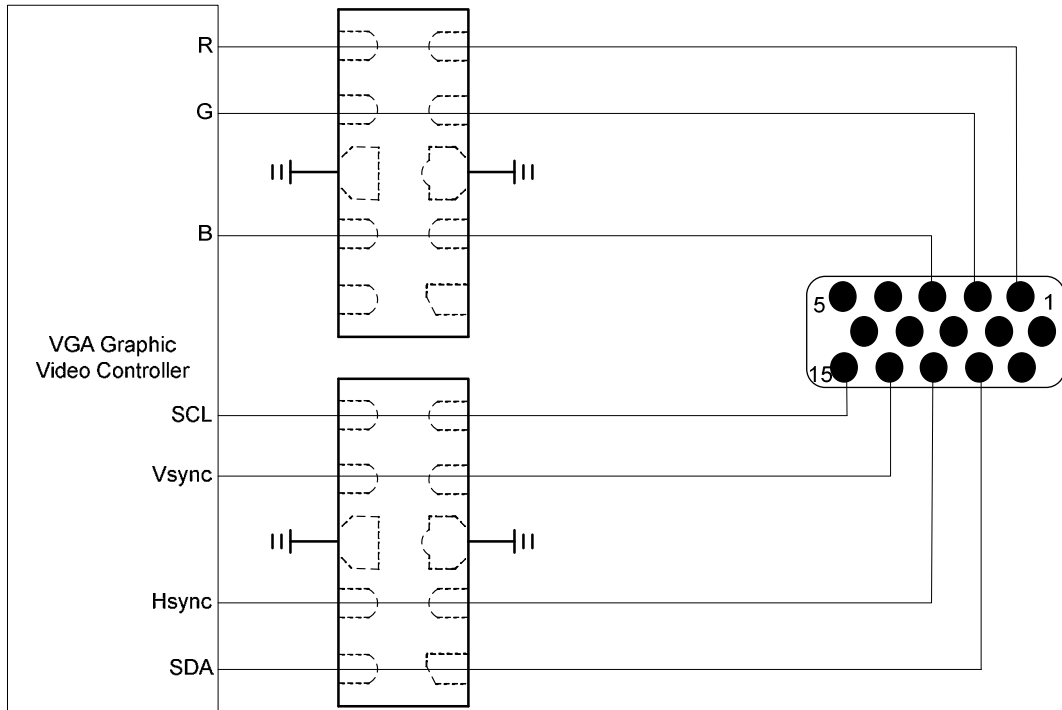
ULC0524P on DVI Port Application



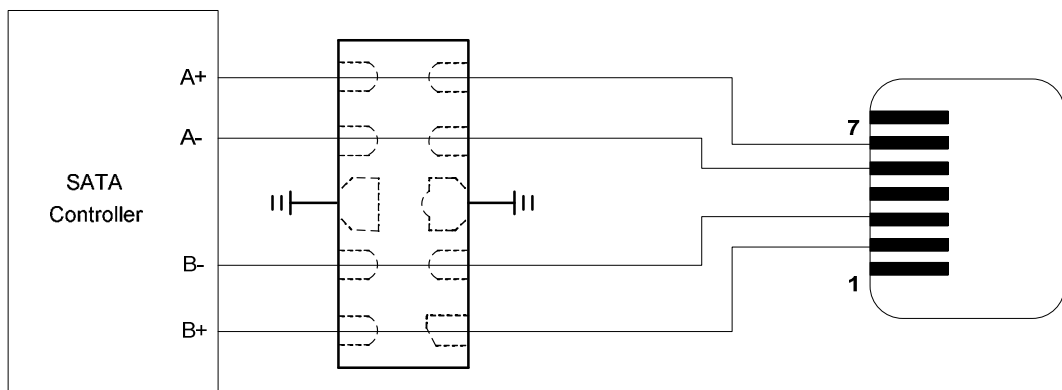
ULC0524P on HDMI Port Application



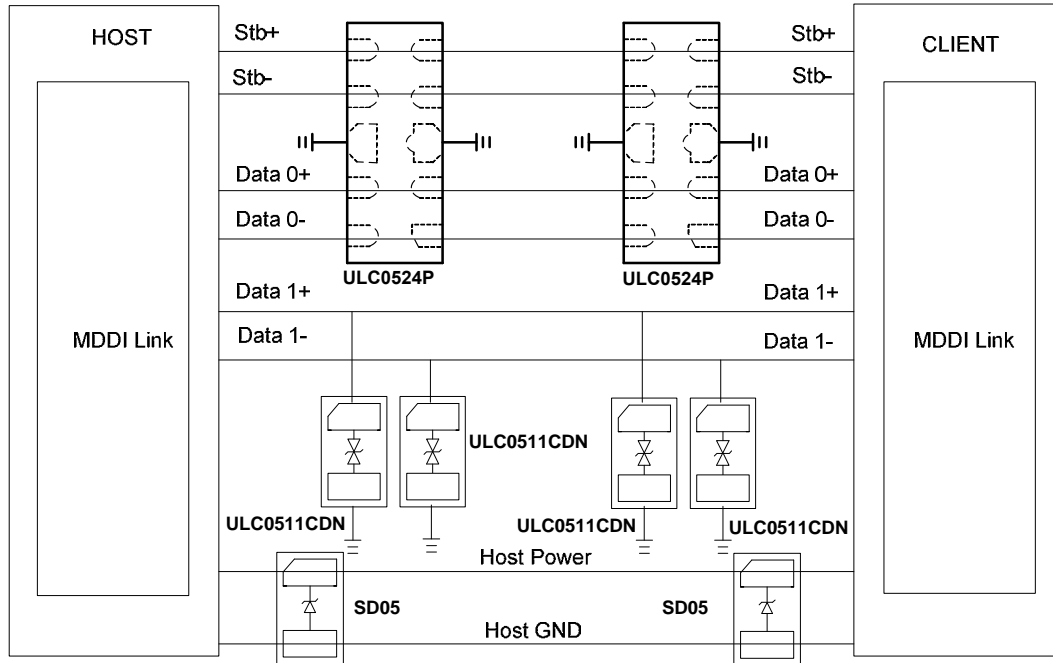
ULC0524P on VGA Port Application



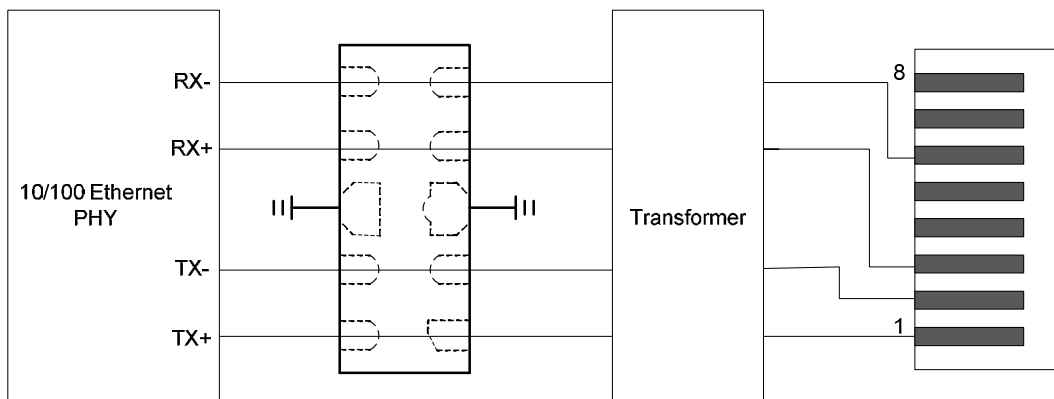
ULC0524P on eSATA Port Application



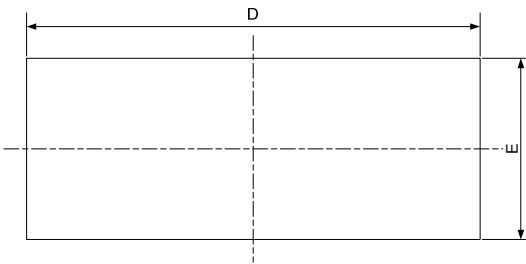
ULC0524P on MDDI Port Application



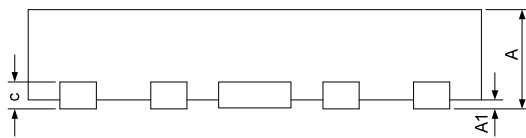
ULC0524P on 10/100 Base Ethernet Port Application



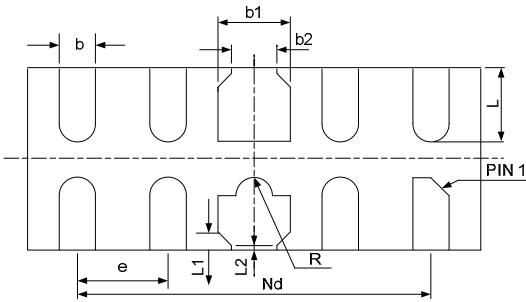
DFN2510-10 Package Outline Drawing



TOP VIEW



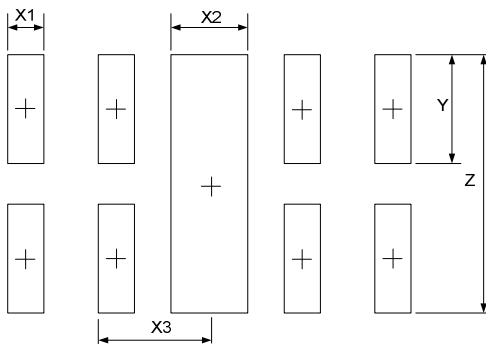
SIDE VIEW



BOTTOM VIEW

| SYM | DIMENSIONS | | | | | |
|-----|-------------|------|------|----------|-------|-------|
| | MILLIMETERS | | | INCHES | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| A1 | 0.00 | 0.02 | 0.05 | 0.000 | 0.001 | 0.002 |
| b | 0.15 | 0.20 | 0.25 | 0.006 | 0.008 | 0.010 |
| b1 | 0.35 | 0.40 | 0.45 | 0.014 | 0.016 | 0.018 |
| b2 | 0.20 | 0.25 | 0.30 | 0.008 | 0.010 | 0.012 |
| c | 0.10 | 0.15 | 0.20 | 0.004 | 0.006 | 0.008 |
| D | 2.45 | 2.50 | 2.55 | 0.098 | 0.100 | 0.102 |
| e | 0.50BSC | | | 0.020BSC | | |
| Nd | 2.00BSC | | | 0.080BSC | | |
| E | 0.95 | 1.00 | 1.05 | 0.038 | 0.040 | 0.042 |
| L | 0.35 | 0.40 | 0.45 | 0.014 | 0.016 | 0.018 |
| L1 | 0.075REF | | | 0.003REF | | |
| L2 | 0.050REF | | | 0.002REF | | |
| h | 0.08 | 0.12 | 0.15 | 0.003 | 0.005 | 0.006 |
| R | 0.05 | 0.10 | 0.15 | 0.002 | 0.004 | 0.006 |

Suggested Land Pattern



| SYM | DIMENSIONS | |
|-----|-------------|--------|
| | MILLIMETERS | INCHES |
| X1 | 0.200 | 0.008 |
| X2 | 0.400 | 0.016 |
| X3 | 0.600 | 0.024 |
| Y | 0.600 | 0.024 |
| Z | 1.400 | 0.056 |

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