PulseJack™ - Single port Ethernet over stacked 2x1 USB

Description:
RJ45/Dual USB Combo is a Through Hole (THT) Integrated Connector Module with a single RJ45 in combination with 2xUSB ports. The internal magnetics are designed to support 10/100 and 1000Base-TX applications such as LAN-on-Motherboard (LOM) and PC applications.

Features and Benefits:
- RJ45 connection meets CAT 6 standards
- USB module complies with USB 2.0/3.0 standards
- RoHS peak wave solder temperature rating 260°C

Electrical Performance Summary:
- Meets IEEE 802.3u/ab.af specification
- High performance for maximum EMI suppression
- Minimum 1500Vrms isolation per IEEE 802.3 requirement

### Electrical Specifications @ 25°C - Operating Temperature 0°C to +70°C

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Data Rate</th>
<th>Turn Ratio</th>
<th>USB Style</th>
<th>LEDs</th>
<th>Insertion Loss (TX/RX (dB MAX))</th>
<th>Return Loss @ 100Ω ±15Ω (dB TYP)</th>
<th>Cross talk (dB MIN)</th>
<th>Common Mode Rejection (dB TYP)</th>
<th>Hipot (Vrms) (MIN) @60Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>JW0-0009NL</td>
<td>10/100</td>
<td>ICT.1</td>
<td>USB2.0</td>
<td>G/Y</td>
<td>-1.0</td>
<td>-20</td>
<td>-16</td>
<td>-12</td>
<td>-40</td>
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<td>-40</td>
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<tr>
<td>JW0-0013NL</td>
<td>10/100/1000</td>
<td>ICT.1</td>
<td>USB2.0</td>
<td>G-O/Y</td>
<td>-1.0</td>
<td>-20</td>
<td>-16</td>
<td>-12</td>
<td>-40</td>
</tr>
<tr>
<td>JD4-0012NL</td>
<td>10/100/10000</td>
<td>ICT.1</td>
<td>USB3.0</td>
<td>Y/G-O</td>
<td>-1.0</td>
<td>-20</td>
<td>-16</td>
<td>-12</td>
<td>-40</td>
</tr>
</tbody>
</table>

Notes:
1. LEDs Left/Right: G = green; Y = yellow; O = Orange
2. G = Green with 250Ω internal resistor; Y = Yellow with 250Ω internal
3. Operating Temperature = 40°C to +85°C

### RJ45 Durability Testing Rating

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Mating Force (MAX)</th>
<th>Unmating Force (MAX)</th>
<th>Durability</th>
<th>Plug to Jack Retention (MIN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JW0/JD4/JXD4 Series</td>
<td>5 lbs./2.268 kgs.</td>
<td>5 lbs./2.268 kgs.</td>
<td>500 Insertions</td>
<td>20 lbs./9.072 kgs.</td>
</tr>
</tbody>
</table>

### RJ45 Material Specification

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Shield</th>
<th>Contact</th>
<th>Housing</th>
<th>MSL 1 Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>JW0/JD4/JXD4 Series</td>
<td>Brass 20-40µ inches thick Nickel over brass</td>
<td>Phosphor Bronze</td>
<td>Thermoplastic UL 94 V-0</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes:
1. Connector dimensions comply with FCC dimension requirements
2. MSL = Moisture Sensitivity Level
3. NL parts are tin matte finish over nickel
PulseJack™ - Single port Ethernet over stacked 2x1 USB

Mechanical

JD4-4003NL

Weight ............... 8.1 grams
Tray .................. 25/tray

Dimensions: mm
Unless otherwise specified, all tolerances are ± 0.25
**PulseJack™ - Single port Ethernet over stacked 2x1 USB**

**Mechanical**

**JXD4-4001NL**

**Dimensions:**

- Connector Boundary
- Keep-Out Area (Component Side View)

**Weight:** 8.1 grams

**Tray:** 25/tray

**Dimensions:** mm

- 9X 1.27 = 11.43
- 9.32
- 1.27
- 0.85

- 20X φ0.90
- 8X φ2.30

- 15.52
- 12.69
- 10.15
- 10.05
- 5.68
- 5.33
- 2.71
- 2.63

- 18.70
- 7.00
- 13.14

Unless otherwise specified, all tolerances are ±0.25
**PulseJack™** - Single port Ethernet over stacked 2x1 USB

**Mechanical**

**JXD4-4012NL**

**RECOMMENDED PCB LAYOUT**

(Component Side View)

- **Weight** ........... 8.1 grams
- **Tray** ............... 25/tray

**Dimensions:** mm

Unless otherwise specified, all tolerances are ± 0.25
PulseJack™ - Single port Ethernet over stacked 2x1 USB

Mechanical

Dimensions: mm

Suggested footprint (shown from component side):

- Weight: 8.1 grams
- Tray: 25/tray

Unless otherwise specified, all tolerances are ± 0.25
PulseJack™ - Single port Ethernet over stacked 2x1 USB

Schematic

**JD4-4003NL**

**Schematic Diagram**

**LED Specification:**

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<tr>
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<th>STANDARD LED</th>
<th>WAVELENGTH</th>
<th>FORWARD V(MAX)</th>
<th>TYP</th>
</tr>
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<tbody>
<tr>
<td>GREEN</td>
<td>565nm</td>
<td>2.4V</td>
<td>2.2V</td>
<td></td>
</tr>
<tr>
<td>YELLOW</td>
<td>590nm</td>
<td>2.5V</td>
<td>2.1V</td>
<td></td>
</tr>
<tr>
<td>ORANGE</td>
<td>605nm</td>
<td>2.3V</td>
<td>2.0V</td>
<td></td>
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*With a forward current of 20mA

**JXD4-4001NL**

**Schematic Diagram**

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Schematic

JWO-006NL

JWO-0013NL

PulseJack

TM
-Single port Ethernet over stacked 2x1 USB

PulseElectronics.com

Schematic

JWO-006NL

JWO-0013NL

PulseJack

TM
-Single port Ethernet over stacked 2x1 USB

PulseElectronics.com
USB/RJ45 Application Note

This line of Integrated Connector Modules are specifically designed for the implementation of a 10Base-T, 100Base-TX and 1000Base-TX transmission over data-grade unshielded twisted pair cable (UTP-3, 5/5e).

The connectors provide excellent EMI filtering and are suitable for Desktop PC, Embedded Systems and Multiport Applications. Pulse has worked closely with the leading IC manufacturers in providing these 10/100/1000 solutions, thereby assuring compatibility with each transceiver.

JW0, JD4 and JXD4 series meet the stringent open circuit inductance requirements of IEEE. When an 8mA DC current is applied across the transformer windings, the transformer will provide at least 350µH. The transformers used in each module also provide 1500Vrms minimum isolation, wide bandwidth with minimal attenuation and fast rise times to minimise system level jitter.

For More Information:

Americas - prodinfo_network_americas@yageo.com  |  Europe - prodinfo_network_emea@yageo.com  |  Asia - prodinfo_network_asia@yageo.com

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PCB Layout Recommendations:

1. For maximum EMI suppression (electromagnetic interference) place the decoupling capacitors adjacent to Vcc and 50Ω connections.
2. Connections to ground should be as short as possible.
3. Connections between the 10/100/1000 IC and the connector should be direct (ideally no change in direction) and of minimum length.