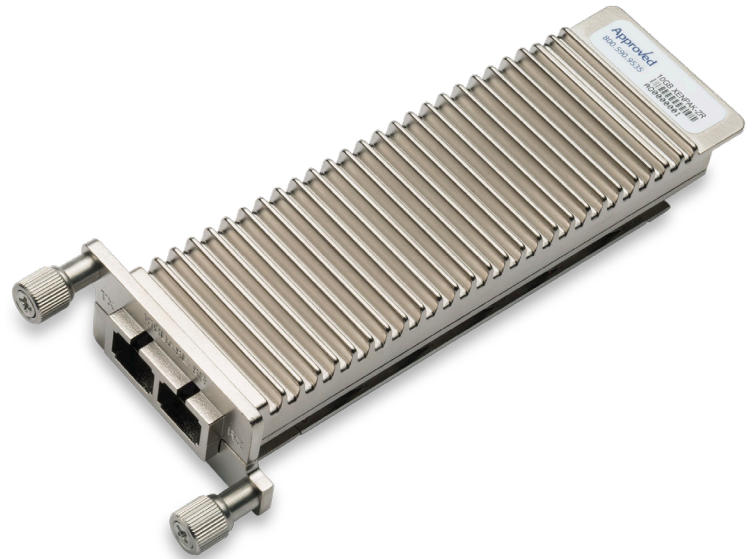


FIM82020-A
10GBASE, XENPAK, ZR Transceiver

Features

- XENPAK MSA Compliant
- 70-PIN connector
- SC duplex receptacle package
- XAUI 4x3.125Gb/s and TX/RX 10Gb/s data rate
- Cooled EA-DFB/APD
- Power supply: +5.0 V, +3.3 V, APS:+1.2 V
- Power Dissipation 4W Maximum
- 0°C to 70°C Operating Case Temperature
- Digital Diagnostic Monitoring
- Management and control with MDIO 2-wire bus
- XAUI electrical interface 4 x 3.125 Gb/s Ethernet
- ≤80km ZR 10GBE
- RoHS compliant and lead free



Applications

- 10GE Ethernet switches and routers
- 10GE Core-routers
- 10GE Storage
- Other 10Gbps Ethernet Transmission System

1. Product Description

The 10GBASE-XENPAK-ZR is a highly integrated Serial optical transponder module for high-speed, 10Gbit/s data transmission applications. 4x3.125Gbps Ethernet Signal Input by XAUI Interface. An integrated Coder / Decoder and multiplexer / demultiplexer (SERDES: Serializer / Deserializer). Designing for 10GBASE-ZR Transmission with an uncooled directly modulated 1550nm Cooled EA-DFB Laser. The transponder operates within a wide case temperature range of 0°C to +70°C and offers optimum heat dissipation and excellent electromagnetic shielding which enables high port densities for 10 GbE systems. A 70 pin electrical connector and a duplex SC connector optical interface assure that connectivity is compliant to the XENPAK MSA Rev.3.0.

2. Absolute Maximum Ratings

Any stress beyond the maximum ratings can result in permanent damage. The device specifications are guaranteed only under the recommended operating conditions.

| Parameter | Symbol | Min | Max | Unit |
|------------------------------|--------|-----|-----|------|
| Supply Voltage +5V | Vcc5 | 0 | 6.0 | V |
| Supply Voltage_3.3V | Vcc3 | 0 | 4 | V |
| Supply Voltage APS | Vaps | 0 | 2 | V |
| Storage Temperature | Tst | -20 | 85 | °C |
| Optical Input Received Power | ADP | - | -7 | dBm |

3. Recommended Operating Conditions

| Parameter | Symbol | Min | Typ | Max | Unit |
|----------------------------|--------|------|-----|------|------|
| Operating Case temperature | Tca | 0 | - | 70 | °C |
| Supply Voltage+5V | Vcc5 | 4.75 | 5 | 5.25 | V |
| Supply Current+5V | Icc5 | | | 500 | mA |
| Supply Voltage_3.3V | VCC3 | 3.14 | 3.3 | 3.47 | V |
| Supply Current+3.3V | Icc3 | | | 1000 | mA |
| Supply Voltage APS | Vaps | 1.14 | 1.2 | 1.26 | V |
| Supply Current APS | Iaps | | | 1100 | mA |
| Module Power Dissipation | Pm | - | | 4 | W |

4. Transmitter Specifications - Electrical

| Parameter | Symbol | Min | Typ | Max | Unit |
|-------------------------------|---------|-----|------|-----|------|
| Data Rate (TXLINE0-3) | TX-xaui | - | 3125 | - | Mbps |
| Differential impedance | Zo | 80 | 100 | 120 | Ω |
| Differential Input Amplitude | Vin P-P | 160 | - 2 | 000 | mVpp |
| Input Rise/Fall | TR / TF | 60 | - 1 | 30 | ps |
| Differential Impedance of Zin | Zin | - | 100 | - | ohm |

5. Receiver Specifications – Optical

| Parameter | Symbol | Min | Typ | Max | Unit |
|----------------------------|-------------|-------|-----|------|-------|
| Received power | Rpo | -24.0 | - | -7 | dBm |
| Maximum Input Power | RX-overload | -7 | - | - | dBm |
| Input Operating Wavelength | λ | 1260 | - | 1565 | nm |
| Dispersion tolerance | Dt | 0 | - 1 | 600 | ps/nm |

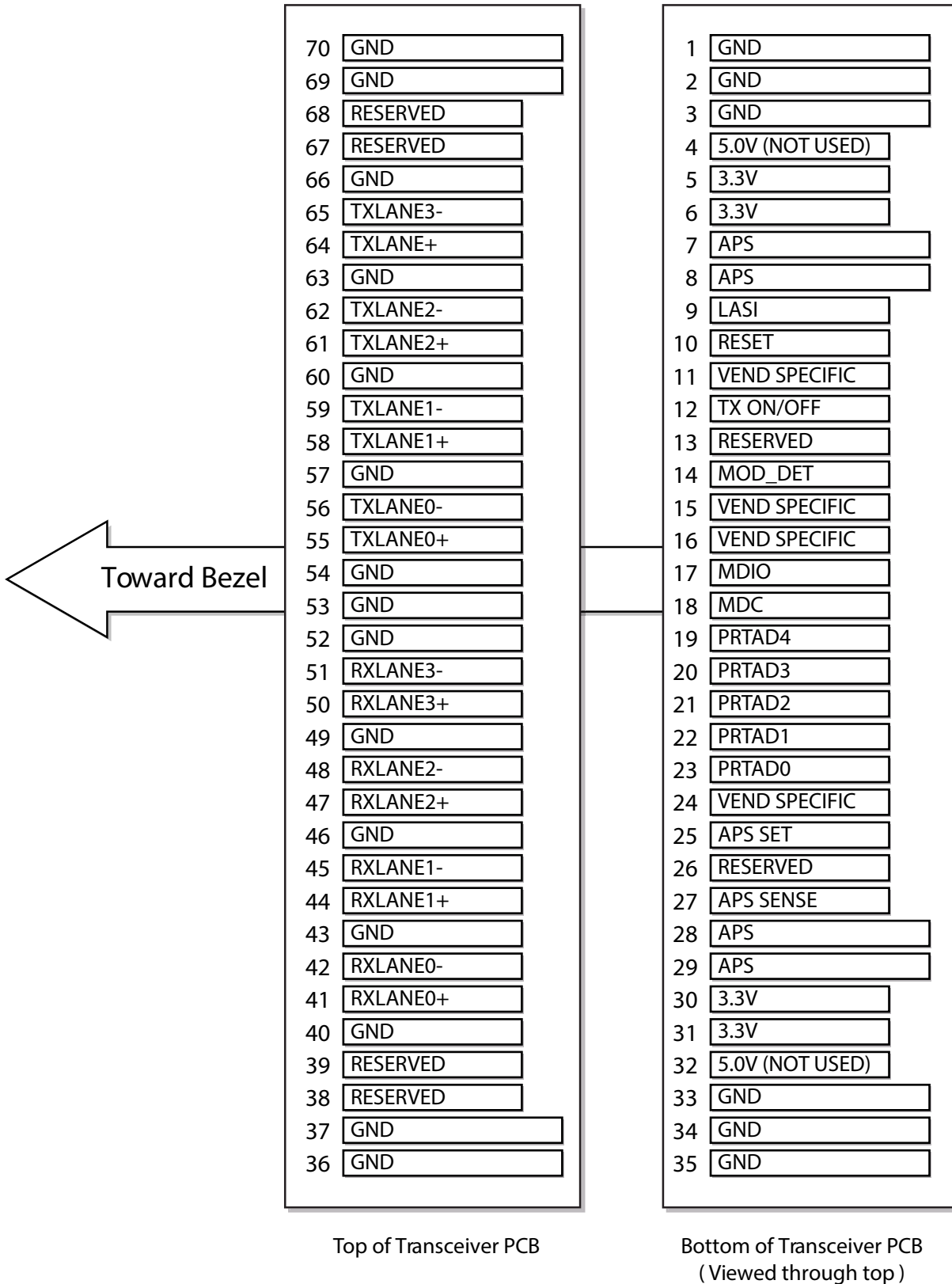
6. Receiver Specifications – Electrical

| Parameter | Symbol | Min | Typ | Max | Unit |
|--------------------------------|----------|------|------|------|------|
| Data Rate (TXLINE0-3) | RX-xaui | | 3125 | | Mbps |
| Supply Voltage | VccRX | 3.13 | 3.3 | 3.47 | V |
| Differential Output Amplitude | Vout P-P | 800 | - | 1600 | mV |
| Rise/Fall Time | Tr / Tf | 50 | - | 90 | ps |
| Differential Impedance of Zout | Zout | - | 100 | - | ohm |

7. Signal Specifications – Electrical

| Parameter | Symbol | Min | Typ | Max | Units |
|-----------------------------|----------|------|-----|------|-------|
| 1.2 V CMOS | | | | | |
| Input High Voltage | VIL(MAX) | - | - | 0.36 | V |
| Input Low Voltage | VIH(MIN) | 0.84 | - | 1.25 | V |
| Capacitance | | - | - | 320 | pF |
| Pull Up Resistance | Rpull | 10k | - | 22k | ohm |
| MDIO I/O | | | | | |
| Output Low Voltage | VOL | -0.3 | - | 0.2 | V |
| Output Low Current | IOL | - | - | 4 | mA |
| Input High Voltage | VIH | 0.84 | - | 1.5 | V |
| Input Low Voltage | VIL | -0.3 | - | 0.36 | V |
| Pull-up Supply Voltage | VPULL | 1.14 | 1.2 | 1.26 | |
| Input Capacitance | CIN | - | - | 10 | Pf |
| Load Capacitance | CLOD | - | - 4 | 70 | Pf |
| External Pull-up Resistance | EPULL | 200 | - | - | Ohm |

8. Electrical Pin-out Details



9. Pin Definitions

| Pin No | Name | Dir | Function | Notes |
|--------|---------------|-----|---|-------|
| 1 | GND | | Electrical Ground | 1 |
| 2 | GND | | Electrical Ground | 1 |
| 3 | GND | | Electrical Ground | 1 |
| 4 | 5.0V | | Power | 2 |
| 5 | 3.3V | | Power | 2 |
| 6 | 3.3V | | Power | 2 |
| 7 | APS =1.2V | | Adaptive Power Supply | 2 |
| 8 | APS =1.2V | | Adaptive Power Supply | 2 |
| 9 | LASI | | Open Drain Compatible 10K-22K pull up on host. Logic High: Normal Operation Logic Low: LASI Asserted | 3 |
| 10 | RESET | I | Open Drain compatible. 10-22K pull-up on transceiver Logic high = Normal operation Logic low = Reset Minimum reset assert time 1 ms | 3 |
| 11 | VEND SPECIFIC | | Vendor Specific Pin. Leave unconnected when not in use. | 7 |
| 12 | TX ON/OFF | I | Open Drain compatible. 10-22K pull-up on transceiver Logic high = Transmitter On (capable) Logic low = Transmitter Off (always) | 3 |
| 13 | RESERVED | | Reserved | 3 |
| 14 | MOD DETECT | O | Pulled low inside module through 1k | |
| 15 | VEND SPECIFIC | | Vendor Specific Pin. Leave unconnected when not in use. | 7 |
| 16 | VEND SPECIFIC | | Vendor Specific Pin. Leave unconnected when not in use. | 7 |
| 17 | MDIO | I/O | Management Data IO | 3, 4 |
| 18 | MDC | I | Management Data Clock | 3, 4 |
| 19 | PRTAD4 | I | Port Address Bit 4 (Low = 0) | 3 |
| 20 | PRTAD3 | I | Port Address Bit 3 (Low = 0) | 3 |
| 21 | PRTAD2 | I | Port Address Bit 2 (Low = 0) | 3 |
| 22 | PRTAD1 | I | Port Address Bit 1 | 3 |
| 23 | PRTAD0 | I | Port Address Bit 0 (Low = 0) | 3 |
| 24 | VEND SPECIFIC | | Vendor Specific Pin. Leave unconnected when not in use. | 7 |
| 25 | APS SET | | Feedback input for APS | |
| 26 | RESERVED | | Reserved for Avalanche Photodiode use. | 7 |
| 27 | APS SENSE | | APS Sense Connection | |

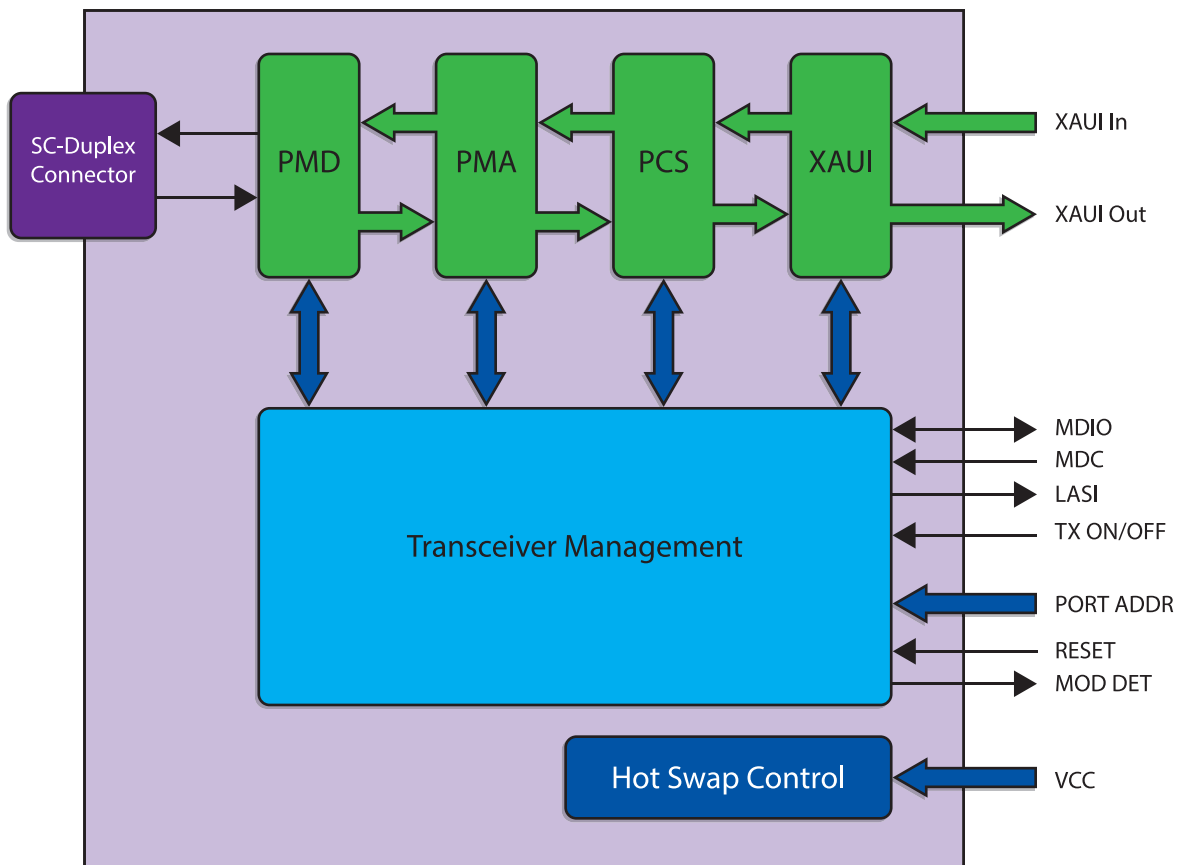
| Pin No | Name | Dir | Function | Notes |
|--------|-----------|-----|----------------------------|-------|
| 28 | APS =1.2V | | Adaptive Power Supply | 2 |
| 29 | APS =1.2V | | Adaptive Power Supply | 2 |
| 30 | 3.3V | | Power | 2 |
| 31 | 3.3V | | Power | 2 |
| 32 | 5.0V | | Power | 2 |
| 33 | GND | | Electrical Ground | 1 |
| 34 | GND | | Electrical Ground | 1 |
| 35 | GND | | Electrical Ground | 1 |
| 36 | GND | | Electrical Ground | 1 |
| 37 | GND | | Electrical Ground | 1 |
| 38 | RESERVED | | Reserved | |
| 39 | RESERVED | | Reserved | |
| 40 | GND | | Electrical Ground | 1 |
| 41 | RX LANE0+ | O | Module XAUI Output Lane 0+ | 5 |
| 42 | RX LANE0- | O | Module XAUI Output Lane 0- | 5 |
| 43 | GND | | Electrical Ground | 1 |
| 44 | RX LANE1+ | O | Module XAUI Output Lane 1+ | 5 |
| 45 | RX LANE1- | O | Module XAUI Output Lane 1- | 5 |
| 46 | GND | | Electrical Ground | 1 |
| 47 | RX LANE2+ | O | Module XAUI Output Lane 2+ | 5 |
| 48 | RX LANE2- | O | Module XAUI Output Lane 2- | 5 |
| 49 | GND | | Electrical Ground | 1 |
| 50 | RX LANE3+ | O | Module XAUI Output Lane 3+ | 5 |
| 51 | RX LANE3- | O | Module XAUI Output Lane 3- | 5 |
| 52 | GND | | Electrical Ground | 1 |
| 53 | GND | | Electrical Ground | 1 |
| 54 | GND | | Electrical Ground | 1 |
| 55 | TX LANE0+ | I | Module XAUI Input Lane 0+ | 5 |
| 56 | TX LANE0- | I | Module XAUI Input Lane 0- | 5 |
| 57 | GND | | Electrical Ground | 1 |
| 58 | TX LANE1+ | I | Module XAUI Input Lane 1+ | 5 |
| 59 | TX LANE1- | I | Module XAUI Input Lane 1- | 5 |
| 60 | GND | | Electrical Ground | 1 |
| 61 | TX LANE2+ | I | Module XAUI Input Lane 2+ | 5 |
| 62 | TX LANE2- | I | Module XAUI Input Lane 2- | 5 |
| 63 | GND | | Electrical Ground | 1 |
| 64 | TX LANE3+ | I | Module XAUI Input Lane 3+ | 5 |

| Pin No | Name | Dir | Function | Notes |
|--------|-----------|-----|---------------------------|-------|
| 65 | TX LANE3- | I | Module XAUI Input Lane 3- | 5 |
| 66 | GND | | Electrical Ground | 1 |
| 67 | RESERVED | | Reserved | |
| 68 | RESERVED | | Reserved | |
| 69 | GND | | Electrical Ground | 1 |
| 70 | GND | | Electrical Ground | 1 |

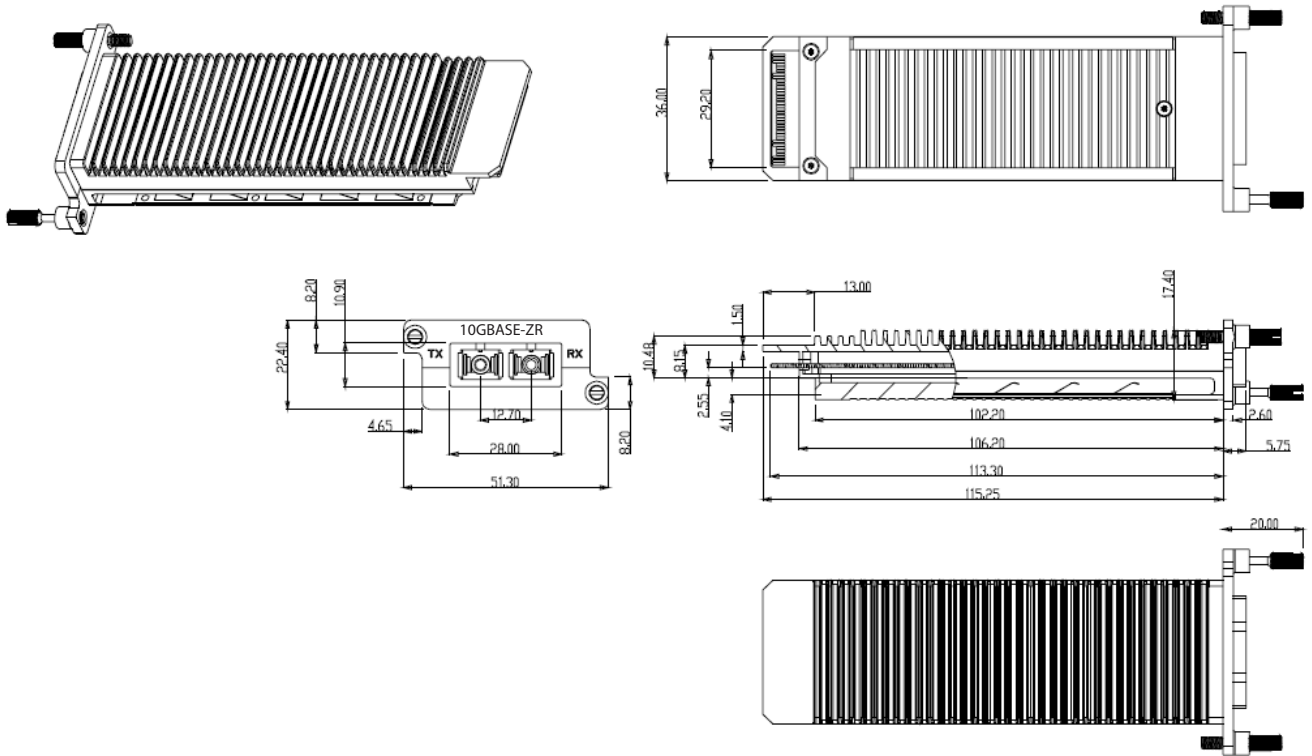
Notes:

1. Ground connections are common for TX and RX.
2. All connector contacts are rated at 0.5A nominal.
3. 1.2V CMOS compatible.
4. MDIO and MDC timing must comply with IEEE802.3ae, Clause 45.3
5. XAUI output characteristics should comply with IEEE802.3ae Clause 47.
6. Transceivers will be MSA compliant when no signals are present on the vendor specific pins.

10. Functional Diagram of Typical XENPAK Style Transceiver



11. Mechanical Dimentions



12. Contact Information

Approved Networks is a leading supplier of Network Transceivers and Connectivity products to Channel Partners, Resellers, and OEMs. With more than 9 years of direct industry experience, our products are resident in the most demanding and mission critical functional networks Worldwide. We serve as a Master Distributor to the largest CMs in the world and deploy the most rigorous testing and firmware management programs to bring the highest level of functional product to the market at a cost that makes sense.

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