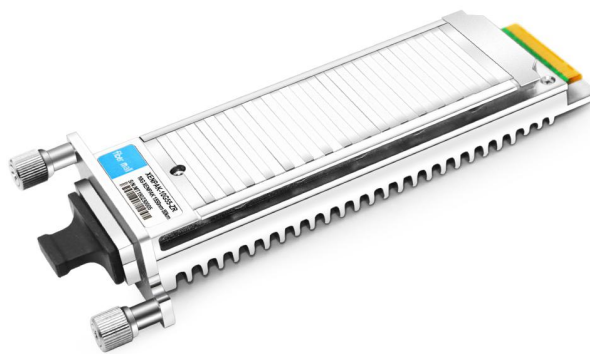


XENPAK-10G55-ZR

10Gbps XENPAK ZR Transceiver, Single Mode, 80km Reach



Product Features

- ❖ XENPAK MSA Compliant
- ❖ 70-PIN connector
- ❖ SC duplex receptacle package
- ❖ XAUI 4x3.125Gb/s and TX/RX 10Gb/s data rate
- ❖ Cooled EML/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

Product Description

The XENPAK Module is a highly integrated, Serial optical transponder module for high-speed, 10Gbit/s data transmission applications. 4×3.125Gbps 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 EML 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.

Absolute Maximum Ratings

| 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 | APD | - | -7 | dBm |

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

Recommended Operating Conditions

| Parameter | Symbol | Min | Typical | 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 |

Transmitter Specifications – Optical

| Parameter | Symbol | Min | Typical | Max | Unit |
|-----------------------------------|------------------------|-----|---------|-----|------|
| Center Wavelength | c | | | | nm |
| Optical Transmit Power | Po | 0 | | 4 | dBm |
| Optical Transmit Power (disabled) | Ptx-dis | - | - | -40 | dBm |
| Extinction Ratio | ER | 9 | | - | dB |
| Side Mode Suppression Ratio | SMSR | 30 | - | - | dB |
| Eye Mask | IEEE 802.3ae Compliant | | | | |

Transmitter Specifications – Electrical

| Parameter | Symbol | Min | Typical | Max | Unit |
|-------------------------------|---------|-----|---------|------|----------|
| Data Rate (TXLINE0-3) | TX-xaui | - | 3125 | - | Mbps |
| Differential impedance | Zo | 80 | 100 | 120 | Ω |
| Differential Input Amplitude | Vin P-P | 160 | - | 2000 | mVpp |
| Input Rise/Fall | TR / TF | 60 | - | 130 | ps |
| Differential Impedance of Zin | Zin | - | 100 | - | ohm |

Receiver Specifications – Optical

| Parameter | Symbol | Min | Typical | 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 | - | 1600 | ps/nm |

Receiver Specifications – Electrical

| Parameter | Symbol | Min | Typical | 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 |

Signal Specifications – Electrical

| Parameter | Symbol | Min | Typical | 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 | - | - | 470 | Pf |
| External Pull-up Resistance | EPULL | 200 | - | - | Ohm |

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 | 4 |
| 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 | 4 |
| 11 | VEND SPECIFIC | | Vendor Specific Pin. Leave unconnected when not in use. | 8 |
| 12 | TX ON/OFF | I | Open Drain compatible. 10-22K pull-up on transceiver Logic high = Transmitter On (capable) Logic low = Transmitter Off (always) | 4 |
| 13 | RESERVED | | Reserved | 4 |
| 14 | MOD DETECT | O | Pulled low inside module through 1k | |
| 15 | VEND SPECIFIC | | Vendor Specific Pin. Leave unconnected when not in use. | 8 |
| 16 | VEND SPECIFIC | | Vendor Specific Pin. Leave unconnected when not in use. | 8 |
| 17 | MDIO | I/O | Management Data IO | 4, 5 |
| 18 | MDC | I | Management Data Clock | 4, 5 |
| 19 | PRTAD4 | I | Port Address Bit 4 (Low = 0) | 4 |
| 20 | PRTAD3 | I | Port Address Bit 3 (Low = 0) | 4 |
| 21 | PRTAD2 | I | Port Address Bit 2 (Low = 0) | 4 |
| 22 | PRTAD1 | I | Port Address Bit 1 (Low = 0) | 4 |

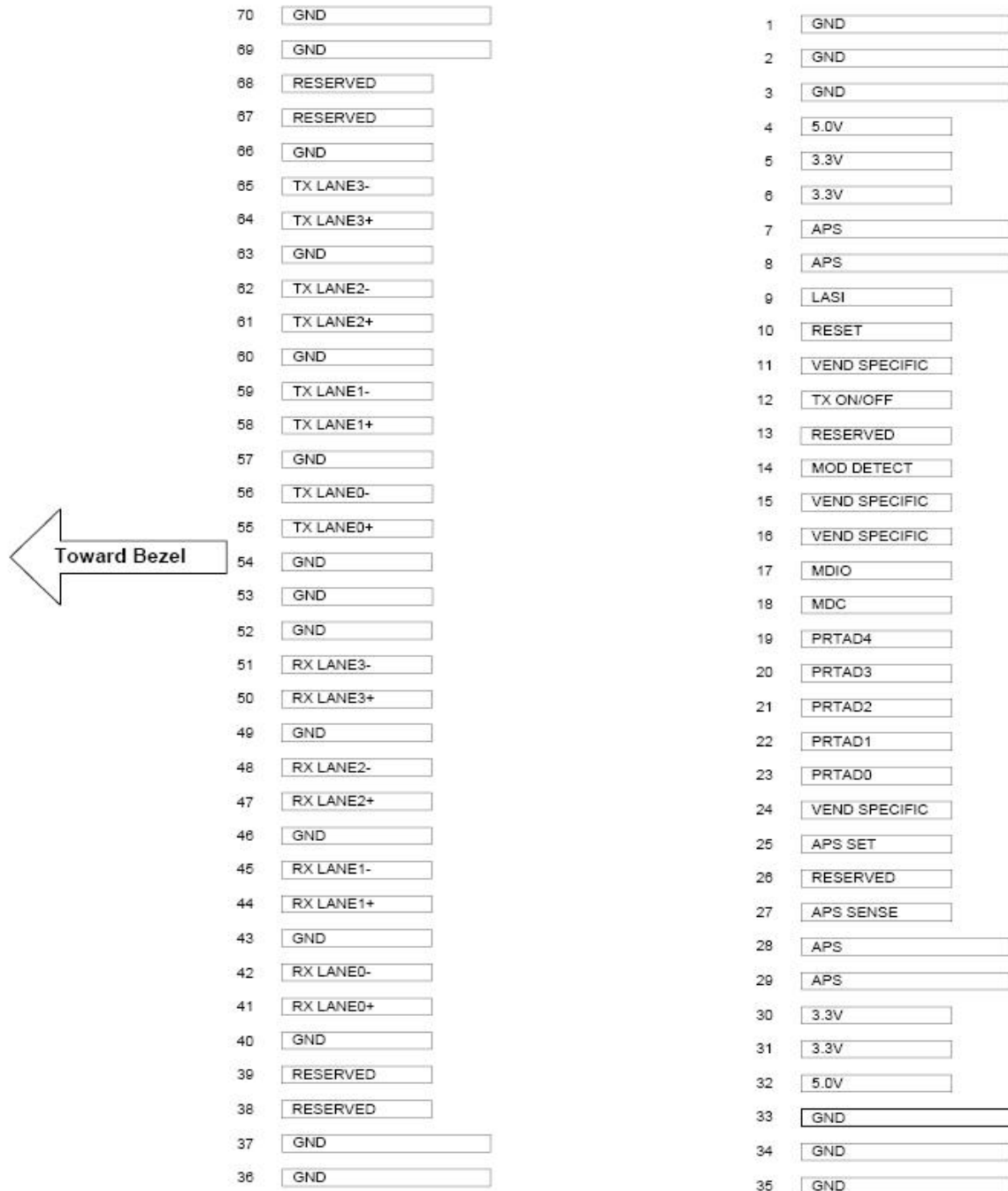
| | | | | |
|----|---------------|---|--|---|
| 23 | PRTAD0 | I | Port Address Bit 0 (Low = 0) | 4 |
| 24 | VEND SPECIFIC | | Vendor Specific Pin. Leave unconnected when not in use. | 8 |
| 25 | APS SET | | Feedback input for APS | |
| 26 | RESERVED | | Reserved for Avalanche Photodiode use. | 8 |
| 27 | APS SENSE | | APS Sense Connection | |
| 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+ | 7 |
| 42 | RX LANE0- | O | Module XAUI Output Lane 0- | 7 |
| 43 | GND | | Electrical Ground | 1 |
| 44 | RX LANE1+ | O | Module XAUI Output Lane 1+ | 7 |
| 45 | RX LANE1- | O | Module XAUI Output Lane 1- | 7 |
| 46 | GND | | Electrical Ground | 1 |
| 47 | RX LANE2+ | O | Module XAUI Output Lane 2+ | 7 |
| 48 | RX LANE2- | O | Module XAUI Output Lane 2- | 7 |
| 49 | GND | | Electrical Ground | 1 |

| | | | | |
|----|-----------|---|----------------------------|---|
| 50 | RX LANE3+ | O | Module XAUI Output Lane 3+ | 7 |
| 51 | RX LANE3- | O | Module XAUI Output Lane 3- | 7 |
| 52 | GND | | Electrical Ground | 1 |
| 53 | GND | | Electrical Ground | 1 |
| 54 | GND | | Electrical Ground | 1 |
| 55 | TX LANE0+ | I | Module XAUI Input Lane 0+ | 7 |
| 56 | TX LANE0- | I | Module XAUI Input Lane 0- | 7 |
| 57 | GND | | Electrical Ground | 1 |
| 58 | TX LANE1+ | I | Module XAUI Input Lane 1+ | 7 |
| 59 | TX LANE1- | I | Module XAUI Input Lane 1- | 7 |
| 60 | GND | | Electrical Ground | 1 |
| 61 | TX LANE2+ | I | Module XAUI Input Lane 2+ | 7 |
| 62 | TX LANE2- | I | Module XAUI Input Lane 2- | 7 |
| 63 | GND | | Electrical Ground | 1 |
| 64 | TX LANE3+ | I | Module XAUI Input Lane 3+ | 7 |
| 65 | TX LANE3- | I | Module XAUI Input Lane 3- | 7 |
| 66 | GND | | Electrical Ground | 1 |
| 67 | RESERVED | | Reserved | |
| 68 | RESERVED | | Reserved | |
| 69 | GND | | Electrical Ground | 1 |
| 70 | GND | | Electrical Ground | 1 |

Notes:

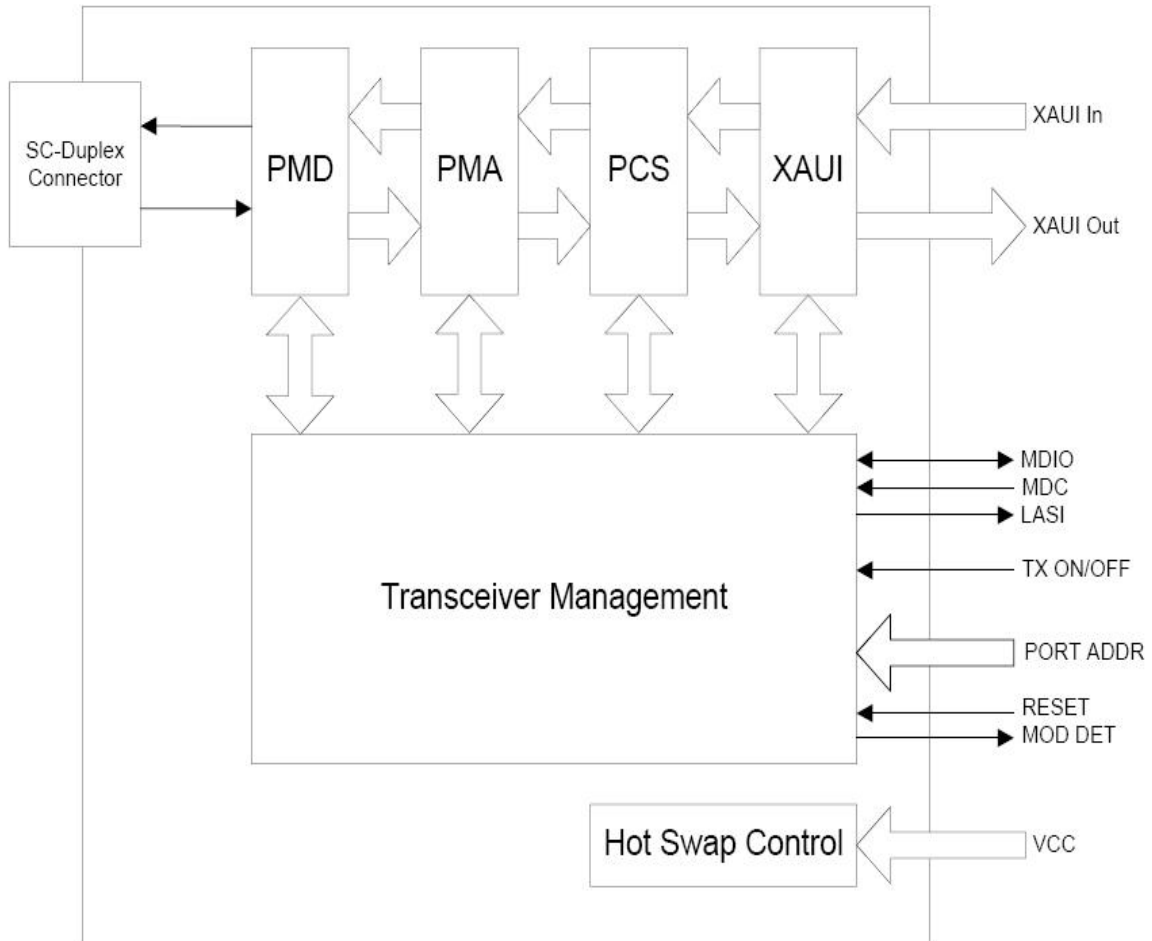
- 1) Ground connections are common for TX and RX.
- 2) All connector contacts are rated at 0.5A nominal.
- 4) 1.2V CMOS compatible.
- 5) MDIO and MDC timing must comply with IEEE802.3ae, Clause 45.3
- 7) XAUI output characteristics should comply with IEEE802.3ae Clause 47.
- 8) Transceivers will be MSA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

Electrical PAD Layout



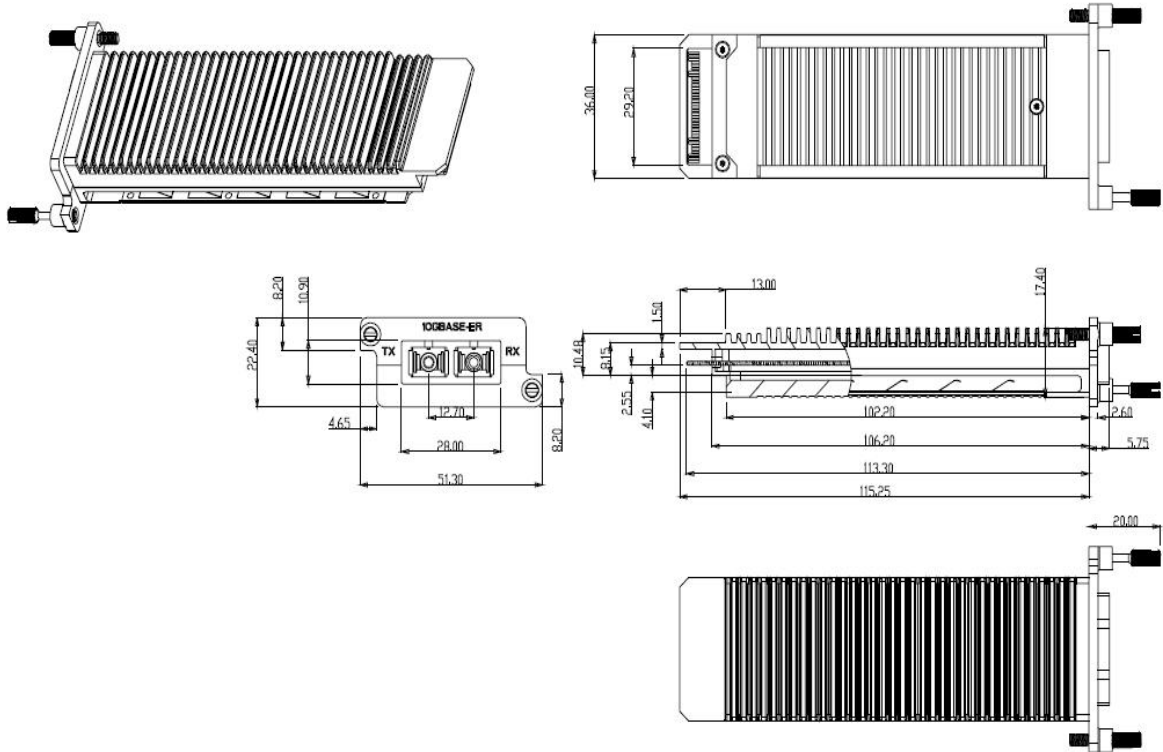
Electrical Pin-out Details

Block Diagram of XENPAK Style Transceiver



Functional Diagram of Typical XENPAK Style Transceiver

Mechanical Dimensions



Dimensions in mm

Ordering Information

| Part Number | Product Description |
|-----------------|---|
| XENPAK-10G55-ZR | 10.3125Gbps Xenpak ZR,1550nm, 80km, 0°C ~ +70°C, with DDM |