

AdTran Compatible 1442200G1 Quick Spec:

| | |
|-----------------|-----------|
| Part Number: | 1442200G1 |
| Form Factor: | SFP |
| Reach: | 100m |
| Cable Type: | CATx |
| Rate Category: | 1000Base |
| Interface Type: | T |
| DDM: | No |
| Connector Type: | RJ45 |



AdTran Compatible 1442200G1 Features:

- Up to 1.25Gb/s bi-directional data links
- Hot-pluggable SFP footprint
- Fully metallic enclosure for low EMI
- Low power dissipation (1.05 W typical)
- Compact RJ45 connector Applications assembly
- 1.25 Gigabit Ethernet over Cat 5
- Access to physical layer IC via 2-cable wire serial bus
- 10/100/1000 BASE-T operation in host systems with SGMII interface
- Operating temperature range:
 - Standard 0 to +70 °C
 - Industrial -40 to +85 °C

FluxLight's 1442200G1 Copper Small Form Pluggable (SFP) transceivers are based on the SFP Multi Source Agreement (MSA)1. They are compatible with the Gigabit Ethernet and 1442200G1 standards as specified in IEEE Std 802.3z2 and IEEE Std 802.3ab3. The 1442200G1 physical layer IC (PHY) can be accessed via I2C, allowing access to all PHY settings and features.

I. SFP to Host Connector Pin Out

| Pin | Symbol | Name/Description | Note |
|-----|-------------|---|------|
| 1 | VEET | Transmitter ground (common with receiver ground) | 1 |
| 2 | TFAULT | Transmitter Fault Not supported | |
| 3 | TDIS | Transmitter Disable. PHY disabled on high or open | 2 |
| 4 | MOD_DEF(2) | Module Definition 2. Data line for serial ID | 3 |
| 5 | MOD_DEF(1) | Module Definition 1. Clock line for serial ID | 3 |
| 6 | MOD_DEF(0) | Module Definition 0. Grounded within the module | 3 |
| 7 | Rate Select | No connection required | |
| 8 | LOS | Loss of Signal indication. Not supported | |
| 9 | VEER | Receiver ground (common with transmitter ground) | 1 |
| 10 | VEER | Receiver ground (common with transmitter ground) | 1 |
| 11 | VEER | Receiver ground (common with transmitter ground) | 1 |
| 12 | RD- | Receiver Inverted DATA out. AC coupled | |
| 13 | RD+ | Receiver Non-inverted DATA out. AC coupled | |
| 14 | VEER | Receiver ground (common with transmitter ground) | 1 |
| 15 | VCCR | Receiver power supply | |
| 16 | VCCT | Transmitter power supply | |
| 17 | VEET | Transmitter ground (common with receiver ground) | 1 |
| 18 | TD+ | Transmitter Non-Inverted DATA in. AC coupled | |
| 19 | TD- | Transmitter Inverted DATA in. AC coupled | |
| 20 | VEET | Transmitter ground (common with receiver ground) | 1 |

Notes:

- 1) Circuit ground is connected to chassis ground
- 2) PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V
- 3) Should be pulled up with 4.7k – 10k Ohms on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in

II. +3.3V Volt Electrical Power Interface

The 1000Base-T has an input voltage range of 3.3 V +/- 5%. The 4 V maximum voltage is not allowed for continuous operation.

+3.3 Volt Electrical Power Interface

| Parameter | Symbol | Min | Typ | Max | Units | Notes/Conditions |
|-----------------|--------------------|------|-----|------|-------|---|
| Supply Current | I _s | | 320 | 375 | mA | 1.2W max power over full range of voltage and temperature. See caution note below |
| Input Voltage | V _{cc} | 3.13 | 3.3 | 3.47 | V | Referenced to GND |
| Maximum Voltage | V _{max} | | | 4 | V | |
| Surge Current | I _{surge} | | | 30 | mA | Hot plug above steady state current. See caution note below |

Caution: Power consumption and surge current are higher than the specified values in the SFP MSA.

III. Low-Speed Signals

MOD_DEF(1) (SCL) and MOD_DEF(2) (SDA), are open drain CMOS signals (see section VII, “Serial Communication Protocol”). Both MOD_DEF(1) and MOD_DEF(2) must be pulled up to host_Vcc.

Low-Speed Signals, Electronic Characteristics

| Parameter | Symbol | Min | Max | Units | Notes/Conditions |
|-----------------|--------|----------------|----------------|-------|---|
| SFP Output LOW | VOL | 0 | 0.5 | V | 4.7k to 10k pull-up to host_Vcc, measured at host side of connector |
| SFP Output HIGH | VOH | host_Vcc - 0.5 | host_Vcc + 0.3 | V | 4.7k to 10k pull-up to host_Vcc, measured at host side of connector |
| SFP Input LOW | VIL | 0 | 0.8 | V | 4.7k to 10k pull-up to Vcc, measured at SFP side of connector |
| SFP Input HIGH | VIH | 2 | Vcc + 0.3 | V | 4.7k to 10k pull-up to Vcc, measured at SFP side of connector |

IV. High-Speed Electrical Interface

All high-speed signals are AC-coupled internally.

High-Speed Electrical Interface, Transmission Line-SFP

| Parameter | Symbol | Min | Typ | Max | Units | Notes/Conditions |
|---------------------|---------|-----|-----|-----|-------|---|
| Line Frequency | fL | | 125 | | MHz | 5-level encoding, per IEEE 802.3ab |
| Tx Output Impedance | Zout,TX | | 100 | | Ohm | Differential, for all frequencies between 1MHz and 125MHz |
| Rx Input Impedance | Zin,RX | | 100 | | Ohm | Differential, for all frequencies between 1MHz and 125MHz |

High-Speed Electrical Interface, Host-SFP

| Parameter | Symbol | Min | Typ | Max | Units | Notes/Conditions |
|--------------------------------|----------|-----|-----|------|-------|------------------|
| Single ended data input swing | Vinsing | 250 | | 1200 | mV | Single ended |
| Single ended data output swing | Voutsing | 350 | | 800 | mV | Single ended |
| Rise/Fall Time | Tr,Tf | | 175 | | psec | 20%-80% |
| Tx Input Impedance | Zin | | 50 | | Ohm | Single ended |
| Rx Output Impedance | Zout | | 50 | | Ohm | Single ended |

General Specifications

| Parameter | Symbol | Min | Typ | Max | Units | Notes/Conditions |
|--------------|--------|-----|-----|-------|--------|--|
| Data Rate | BR | 10 | | 1,000 | Mb/sec | IEEE 802.3 compatible. See Notes 2 through 4 below |
| Cable Length | L | | | 100 | m | Category 5 UTP. BER <10 ⁻¹² |

Notes:

1. Clock tolerance is +/- 50 ppm
2. By default, the 1000Base-T is a full duplex device in preferred master mode
3. Automatic crossover detection is enabled. External crossover cable is not required
4. 10/100/1000 BASE-T operation requires the host system to have an SGMII interface with no clocks. With a SERDES interface, the module will operate as [1442200G1](#) only.

V. Environmental Specifications

The 1000Base-T has an extended range from 0°C to +85°C case temperature as specified in the table below.

Environmental Specifications

| Parameter | Symbol | Min | Typ | Max | Units | Notes/Conditions |
|-----------------------------|--------|-----|-----|-----|-------|---------------------|
| Operating Temp (Standard) | Top | 0 | | +70 | °C | Case temperature |
| Operating Temp (Industrial) | Top | -40 | | +85 | °C | Case temperature |
| Storage Temperature | Tsto | -40 | | +85 | °C | Ambient temperature |

VI. Serial Communication Protocol

All FluxLight SFPs support the 2-wire serial communication protocol outlined in the SFP MSA1. These SFPs use an Atmel AT24C01A 128 byte E2PROM with an address of A0h. For details on interfacing with the E2PROM, see the Atmel data sheet titled "AT24C01A/02/04/08/16 2-Wire Serial CMOS E2PROM."4

The [1442200G1](#) physical layer IC can also be accessed via the 2-wire serial bus at address ACh. For details interfacing with the PHY IC, see Marvell data sheet titled "Alaska Ultra 88E1111 Integrated Gigabit Ethernet Transceiver"5 (Marvell document number MV-S100649-00).

Serial Bus Timing Requirements

| Parameter | Symbol | Min | Typ | Max | Units | Notes/Conditions |
|----------------|--------|-----|-----|---------|-------|------------------|
| I2C Clock Rate | | 0 | | 100,000 | Hz | |