

SU69CA-A 10Gbps XFP Transceiver

Features

- Supports 9.95Gb/s to 11.1Gb/s bit rates
- Hot-pluggable XFP footprint
- Maximum link length of 10km
- Uncooled 1310nm EML/DFB laser
- Duplex LC connector
- Power dissipation <2.5W
- Built-in digital diagnostic functions
- Temperature range -5°C to 70°C



Applications

SONET OC-192 SR-1 SDH STM
 I-64.1 at 9.953Gbps
 10GBASE-LR/LW 10G Ethernet
 1200-SM-LL-L 10G Fiber Channel
 10GE over G.709 at 11.09Gbps
 OC192 over FEC at 10.709Gbp

Regulatory Compliance

| Feature | Standard | Performance |
|--|---|---|
| Electrostatic Discharge (ESD) to the Electrical Pins | MIL-STD-883E Method 3015.7 | Class 1(>500 V) |
| Electromagnetic Interference (EMI) | FCC Part 15 Class B | Compatible with standards |
| Laser Eye Safety | FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2 | Compatible with Class I laser product. Compatible with T μ V standards |
| Component Recognition | UL and CUL | UL file E317337 |
| Green Products | RoHS | RoHS6 |

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XFP, 10GBASE-LR 10G Ethernet Module
1310nm, 10km, SMF, LC RoHS6



| Absolute Maximum Ratings | | | | | | | |
|---|------|---------------|------------|-------------|----------------|-------------|-------------|
| Parameter | | Symbol | | Min. | Max. | Unit | |
| Maximum Supply Voltage 1 | | VCC3 | | -0.5 | 4.0 | V | |
| Maximum Supply Voltage 2 | | VCC5 | | -0.5 | 6.0 | V | |
| Storage Temperature | | Ts | | -40 | 85 | °C | |
| Case Operating Temperature | | Top | | -5 | 70 | °C | |
| Recommended Operating Conditions | | | | | | | |
| Parameter | | Symbol | | Min. | Typical | Max. | Unit |
| Operating Temperature | | Top | | -5 | | 70 | °C |
| Supply Voltage 1 | | VCC3 | | 3.13 | | 3.45 | V |
| Supply Voltage 2 | | VCC5 | | 4.75 | | 5.25 | V |
| Electrical Characteristics | | | | | | | |
| (TOP = -5 to 70°C, VCC5 = 4.75 to 5.25 Volts) | | | | | | | |
| Parameter | | Symbol | Min | Typ | Max | Unit | Note |
| Main Supply Voltage | | Vcc5 | 4.75 | | 5.25 | V | |
| Supply Voltage S#2 | | Vcc3 | 3.13 | | 3.45 | V | |
| Supply Current | Vcc5 | Icc5 | | | 250 | mA | |
| Supply Current | Vcc3 | Icc3 | | | 500 | mA | |
| Module total power | | P | | | 2.5 | W | |
| Transmitter | | | | | | | |
| Input differential impedance | | Rin | | 100 | | Ω | 1 |
| Differential data input swing | | Vin,pp | 120 | | 820 | mV | |
| Transmit Disable Voltage | | VD | 2 | | Vcc | V | |
| Transmit Enable Voltage | | VEN | GND | | GND+0.8 | V | |
| Transmit Disable Assert Time | | | | | 10 | us | |
| Receiver | | | | | | | |
| Differential data output swing | | Vout,pp | 340 | 650 | 850 | mV | |
| Data output rise time | | tr | | | 38 | ps | 2 |
| Data output fall time | | tf | | | 38 | ps | 2 |
| LOS Fault | | VLOS fault | Vcc-0.5 | | VccHOST | V | 3 |

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| | | | | | | |
|------------------------|-----------|------------------|--|---------|---|---|
| LOS Normal | VLOS norm | GND | | GND+0.5 | V | |
| Power Supply Rejection | PSR | See Note 4 below | | | | 4 |

Notes

1. After internal AC coupling.
2. 20 – 80 %
3. Loss of signal is open collector to be pulled up with a 4.7k–10kohm resistor to 3.15–3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
4. Per Section 2.7.1. in the XFP MSA Specification.

Optical Characteristics

(TOP = -5 to 70°C, VCC5 = 4.75 to 5.25 Volts)

| Parameter | Symbol | Min. | Typ. | Max | Unit | Ref. |
|---|-------------|---|------|-------|------|------|
| Transmitter | | | | | | |
| Optical output Power | P | -6 | | 0 | dBm | |
| Optical Wavelength | λ | 1290 | 1310 | 1330 | nm | |
| Optical Extinction Ratio | ER | 6 | | | dB | |
| Sidemode Suppression ratio | SSRmin | | | 30 | dB | |
| Average Launch power of OFF transmitter | POFF | -30 | | | dBm | |
| Tx Jitter | Txj | Compliant with each standard requirements | | | | |
| Receiver | | | | | | |
| Receiver Sensitivity (OMA) @ 10.7Gb/s | RSENS | | | -14.5 | dBm | |
| Maximum Input Power | PMAX | +0.5 | | | dBm | |
| Optical Center Wavelength | λ_C | 1270 | | 1600 | nm | |
| Receiver Reflectance | Rrx | | | -14 | dB | |
| LOS De-Assert | LOSD | | | -18 | dBm | |
| LOS Assert | LOSA | -32 | | | dBm | |
| LOS Hysteresis | | 1 | | | dB | |

General Specifications

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XFP, 10GBASE-LR 10G Ethernet Module
1310nm, 10km, SMF, LC RoHS6



| Parameter | Symbol | Min | Typ | Max | Units |
|----------------------------|--------|------|---------|-------|-------|
| Bit Rate | BR | 9.95 | | 11.1 | Gb/s |
| Bit Error Ratio | BER | | | 10-12 | |
| Max. Supported Link Length | LMAX | | 10 | | km |
| MTBF | HRS | | 715,000 | | hrs |

Digital Diagnostic Functions

SU69CA-A 10Gb/s (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification Rev 4.5.

As defined by the XFP MSA, XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- Transceiver temperature
- Laser bias current
- Transmitted optical power
- Received optical power
- Transceiver supply voltage

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the host. The positive edge clocks data into the XFP transceiver into those segments of its memory map that is not write-protected. The negative edge clocks data from the XFP transceiver. The serial data signal (SDA pin) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory.

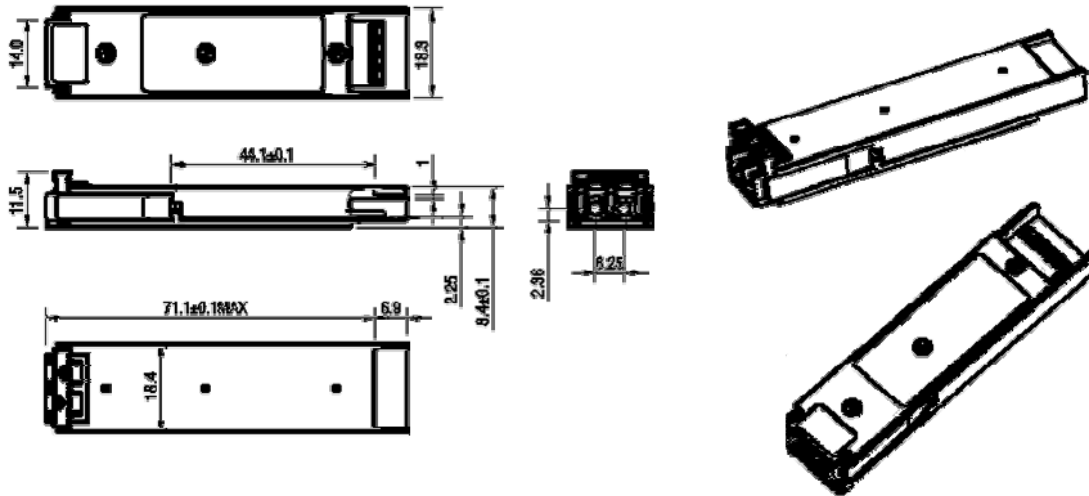
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Mechanical Specifications

Approved Optics XFP transceivers are compliant with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).



Contact Information

Approved Optics 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 CM's 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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