



FTX-S1XG-S55L-040D

XFP 10GBase-ER, 1550nm, single-mode, 40km



Description

FTX-S1XG-S55L-040D series XFP transceiver can be used to setup a reliable, high speed serial data link over single-mode fiber. Maximum link span can reach 40km. Casing made fully from metal alloys ensures very good EMI immunity. Module is fully compliant with XFP MSA specification and it is available in two hardware versions:

| Model | Operating case temperature |
|---------------------|----------------------------|
| FTX-S1XG-S55L-040D | 0~70°C |
| FTX-S1XG-S55L-040DI | -40~85°C |

Host device can access module internal EEPROM memory and DDMI via I²C interface.

Built-in digital diagnostic interface (DOM, DDMI) allows a network administrator to monitor module parameters such as: transmitted and received optical power, temperature, supply voltage and laser current. Those information and data are very helpful e.g. in prediction and prevention of connection failures. A module is available in various dedicated versions, which can be compatible with devices from vendors such as Cisco, HP, Juniper, Extreme Networks, Alcatel-Lucent, 3Com, Linksys and more.

Applications

- 10G Ethernet
- Fiber Channel (10G FC)
- SONET/SDH (OC-192/STM64)
- Gigabit Ethernet (1.25Gbps)



Key features

- LC Duplex receptacle
- Transmission distance up to 40km*
- EML laser diode 1550nm transmitter, PIN receiver
- Throughput up to 11.3Gb/s
- Fully compliant with XFP MSA INF-8077i and INF-8472 rev. 11.3
- Hot-Pluggable
- RoHS compliant
- Class 1 laser safety
- Low power dissipation (<1W)
- Metal case for low EMI
- Operating case temperature* : 0~70°C / -40~85°C

Specification

Supported transmission technology

10G Ethernet, Fibre Channel

Speed supported for Ethernet technology

10.25Gbps, 1.25Gbps

Speed supported for Fibre Channel technology

10.51875Gbps

Transmission medium

Single-mode fiber 9/125μm

Transmission distance**

40km

Receptacle type

LC Duplex

Wavelength

1550nm

Output power

-1~+4dBm

Receiver sensitivity

-16dBm

Power supply voltage

3.3V

Total power consumption

< 1W

Operating environment – temperature*

0~70°C / -40~+85°C

Operating environment - humidity

5~95% non-condensing

Dimensions

Compliant with SFP+ Multi-Source Agreement

* - standard / industrial version

** - transmission distance depends on optical link attenuation



Detailed technical specification

Pin Description

| Pin | Name | Function/Description | Logic | Notes |
|-----|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|
| 1 | GND | Module Ground | | 1 |
| 2 | V _{EE5} | Optional -5.2V Power Supply - Not Required | | - |
| 3 | Mod_DeSel | Module De-select; When held low allows module to respond to 2-wire serial interface | LVTTTL-I | - |
| 4 | Interrupt | Interrupt; Indicates presence of an important condition | LVTTTL-0 | 2 |
| 5 | TX_DIS | Transmitter Disable; Turns off transmitter laser output | LVTTTL-I | - |
| 6 | V _{CC5} | +5V Power Supply - Not Required | | - |
| 7 | GND | Module Ground | | 1 |
| 8 | V _{CC3} | +3.3V Power Supply | | - |
| 9 | V _{CC3} | +3.3V Power Supply | | - |
| 10 | SCL | 2-Wire Serial Interface Clock | LVTTTL-I/O | 2 |
| 11 | SDA | 2-Wire Serial Interface Data Line | LVTTTL-I/O | 2 |
| 12 | Mod_Abs | Indicates Module is not present. Grounded in the Module | LVTTTL-0 | 2 |
| 13 | Mod_NR | Module Not Ready; Indicating Module Operational Fault | LVTTTL-0 | 2 |
| 14 | RX_LOS | Receiver Loss Of Signal Indicator | LVTTTL-0 | 2 |
| 15 | GND | Module Ground | | 1 |
| 16 | GND | Module Ground | | 1 |
| 17 | RD- | Receiver Inverted Data Output | CML-0 | - |
| 18 | RD+ | Receiver Non-Inverted Data Output | CML-0 | - |
| 19 | GND | Module Ground | | 1 |
| 20 | V _{CC2} | +1.8V Power Supply - Not Required | | - |
| 21 | P_Down/RST | Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode. Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle. | LVTTTL-I | - |
| 22 | V _{CC2} | +1.8V Power Supply - Not Required | | - |
| 23 | GND | Module Ground | | 1 |
| 24 | RefCLK+ | Reference Clock Non-Inverted Input, AC coupled on the host board - Not Required | PECL-I | 3 |
| 25 | RefCLK- | Reference Clock Inverted Input, AC coupled on the host board - Not Required | PECL-I | 3 |
| 26 | GND | Module Ground | | 1 |
| 27 | GND | Module Ground | | 1 |
| 28 | TD- | Transmitter Inverted Data Input | CML-1 | - |
| 29 | TD+ | Transmitter Non-Inverted Data Input | CML-1 | - |
| 30 | GND | Module Ground | | 1 |

Notes:

1. Module ground pins GND are isolated from the module case.
2. Shall be pulled up with 4.7KΩ to 10KΩ to a voltage between 3.15V and 3.45V on the host board.
3. Reference Clock is not required. If present, it will be ignored.



Electrical parameters

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|-------------------------------------|-----------------------|-----------------|------|-----------------|--------|-------|
| Transmitter Differential Input Volt | +/-TX_DAT | 120 | | 1000 | mV p-p | 1 |
| Receiver Differential Output Volt | +/-RX_DAT | 400 | | 800 | mV p-p | 2 |
| Tx_Disable, P_Down/RST | Input Voltage – Low | V _{IL} | 0 | 0.8 | V | |
| | Input Voltage - High | V _{IH} | 2.0 | V _{CC} | V | |
| RX_LOS, Mod_NR, Interrupt | Output Voltage – Low | V _{OL} | 0 | 0.8 | V | 3 |
| | Output Voltage - High | V _{OH} | 2.0 | V _{CC} | V | 3 |
| Throughput | B | | | 11.3 | Gb/s | |
| Total current requirement | | | | 700 | mA | 3.3V |
| | | | | 450 | mA | 5V |

Transmitter parameters

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|-------------------------------|-------------------------------------------|------|------|------|------|-------|
| Central wavelength | λ_c | 1530 | 1550 | 1565 | nm | |
| Spectral width | $\Delta\lambda$ | | | 1 | nm | |
| Launch optical power | P _o | -1 | | +4 | dBm | 4 |
| Extinction ratio | EX | 8.2 | | | dB | |
| Dispersion penalty | | | | 3 | dB | |
| Optical Return Loss Tolerance | ORLT | 20 | | | dB | |
| Optical rise/fall time | T _{rise} /T _{fall} | | | 30 | ps | 5 |
| Eye diagram | Compliant with IEEE802.3-2005 10G BASE-ER | | | | | |

Receiver parameters

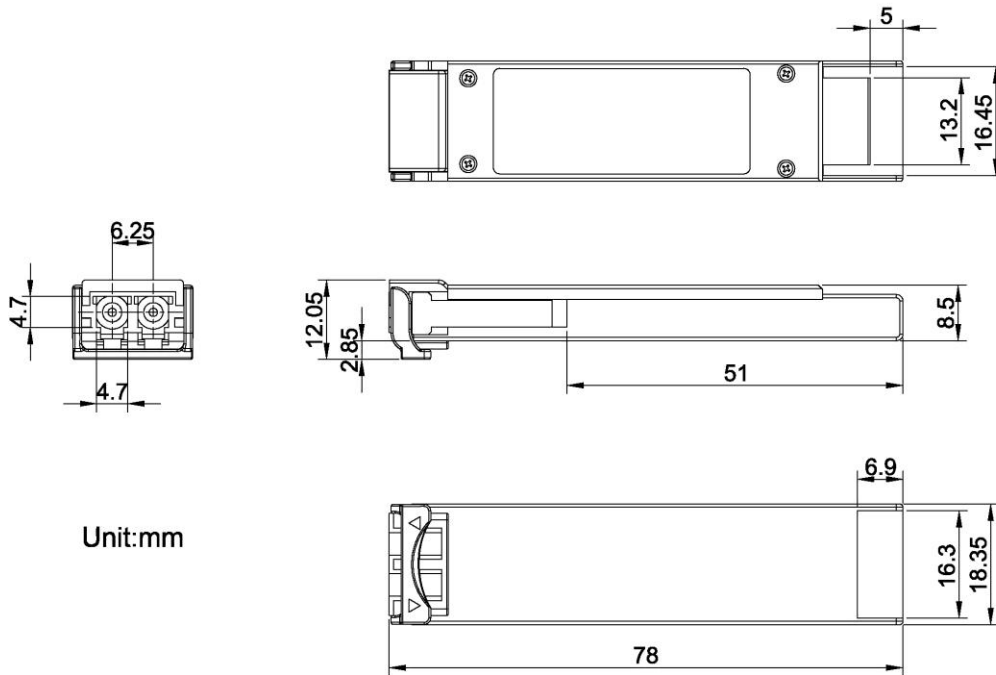
| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|----------------------------|------------------|------|------|------|------|-------|
| Sensitivity | P _{min} | | | -16 | dBm | 6 |
| Stressed Sensitivity (OMA) | | | | -14 | dBm | |
| Central wavelength | λ_c | 1270 | | 1600 | nm | |
| Receiver overload | P _{MAX} | -1 | | | dBm | 6 |
| RX_LOS Asserted | S _A | -30 | | | dBm | |
| RX_LOS De-Asserted | S _D | | | -17 | dBm | |
| RX_LOS Hysteresis | - | | 3.0 | | dB | |

Notes:

- Internally AC coupled and terminated to 100Ω differential load.
- Internally AC coupled, but requires a 100Ω differential termination or internal to Serializer/Deserializer.
- It is open collector/drain output which should be pulled up externally to V_{CC} with a 4.7KΩ-10KΩ resistor on the host board. LOS: logic 0 indicates normal operation; logic 1 indicates no signal detected.
- Optical power is launched into SMF
- 20-80%
- Measured with PRBS 2³¹-1 at test pattern @10.3125Gbps.



Mechanical specification



Recommended environment conditions

| Parameter | Symbol | Min | Typ | Max | Unit |
|------------------------------------------|-----------------|-------|-----|-------|------|
| Operating Temperature Range (industrial) | T | -40 | - | 85 | °C |
| Operating Temperature Range (standard) | T | 0 | 25 | 70 | °C |
| Supply Voltage | V _{CC} | 3.135 | 3.3 | 3.465 | V |
| Relative Humidity | RH | 5 | - | 95 | % |

Ordering information

FTX-S1XG-S55L-040D– 1550nm, 40km, single-mode, LC duplex, **DDMI**, commercial temperature (0~70°C)

FTX-S1XG-S55L-040DI– 1550nm, 40km, single-mode, LC duplex, **DDMI**, **extended temperature** (-40~85°C)

For further information regarding host device PCB layout recommendation, power supply requirements, EEPROM memory map, DDMI specification please check:

[SFF-8472 - Description of EEPROM and Digital Diagnostic Monitoring Interface](#) and [INF-8077i - Technical specification for XFP transceiver](#)

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