

FTS-GPON-OLT-C+MAX2

GPON OLT SFP transceiver, 1490/1310nm, single-mode, RSSI, 60km



Description

FTS-GPON-OLT-C+MAX2 series SFP transceiver can be used to connect multiple GPON optical network terminals to GPON OLT. Maximum link span can reach 60km. This transceiver is based on WDM (BiDi) technology thus it is possible to send (TX:1490nm) and receive (RX:1310nm) data simultaneously in both directions over single strain of fiber (optical splitters are needed to connect multiple ONTs). Module is compliant with ITU-T G.984.2 Class C+ and SFP MSA standards. Host device can access module internal EEPROM memory and DDMI via I2C interface. DDMI (Digital Diagnostic Monitoring Interface) is fully compliant with DOM. Transceiver can be prepared as compatible with: Dasan, Huawei, Alcatel-Lucent, Cisco, and many others.

Applications

- ITU-T G.984.2 (GPON)
- Fiber to the Home, Curb, Office (FTTx)
- Point to Multi Point Service (P2MP)
- FSAN Class B+
- Other optical connections



Key features

- SC Simplex receptacle
- Transmission distance up to 60km*
- BOSA with DFB laser diode (1490nm) (with built-in isolator), APD photodiode burst mode receiver (1310nm)
- Throughput up to: 2488Mbps (downstream) / 1244Mbps (upstream)
- Fully compliant with ITU-T G.984.2 Class C+, SFP MSA INF-8074i rev. 1.0 and INF-8472 rev. 11.3 (where applicable)
- Hot-Pluggable
- RoHS compliant
- Low power dissipation (<2W)
- Metal case for low EMI
- Operating case temperature* : 0~70°C

Specification

Supported transmission technology

ITU-T G.984.2

Downstream throughput

2488Mbps

Upstream throughput

1244Mbps

Transmission medium

Single-mode fiber 9/125μm

Transmission distance**

60km

Receptacle type

SC Simplex

Wavelength

TX: 1490nm / RX:1310nm

Output power

+7~+10dBm

Receiver sensitivity

-33dBm

Power supply voltage

3.3V

Total power consumption

< 2W

Operating environment – temperature

0~70°C

Operating environment - humidity

5~95% non-condensing

Dimensions

65.5mm × 14mm × 8.5mm

** - transmission distance depends on optical link attenuation



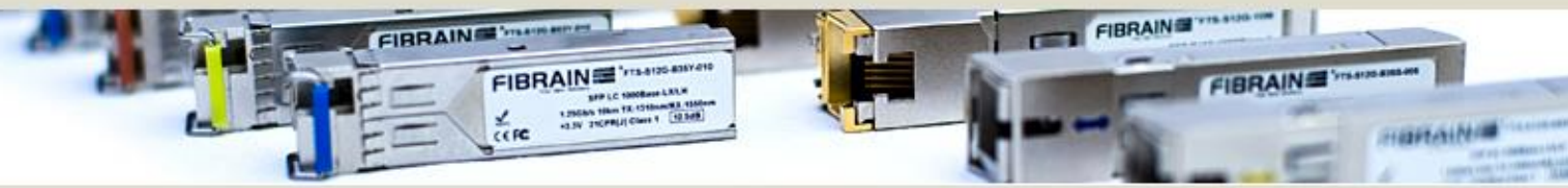
Detailed technical specification

Pin Description

Pin	Name	Function/Description	Engagement order	Notes
1	VeeT	Transmitter Ground	1	-
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable-Module disables on high or open	3	2
4	MOD-DEF2	Module Definition 2-Two wire serial ID interface	3	3
5	MOD-DEF1	Module Definition 1-Two wire serial ID interface	3	3
6	MOD-DEF0	Module Definition 0-Grounded in module	3	3
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	4
9	VeeR	Receiver Ground	1	-
10	VeeR	Receiver Ground	1	-
11	VeeR	Receiver Ground	1	-
12	RD-	Inverse Received Data out	3	5
13	RD+	Received Data out	3	5
14	VeeR	Receiver Ground	1	-
15	VccR	Receiver Power - +3.3V±5%	2	6
16	VccT	Transmitter Power - +3.3 V±5%	2	6
17	VeeT	Transmitter Ground	1	-
18	TD+	Transmitter Data In	3	7
19	TD-	Inverse Transmitter Data In	3	7
20	VeeT	Transmitter Ground	1	-

Notes:

- TX Fault is open collector/drain output which should be pulled up externally with a 4.7KΩ-10KΩ resistor on the host board. When high, this output indicates a laser fault of some kind. Low indicates normal operation.
- TX Disable input is used to shut down the laser output per the state table below. It is pulled up to Vcc within the module.
Low (0 – 0.8V): Transmitter on
Open or High (2.0 – VccT): Transmitter Disabled
- Mod-Def 0, 1, 2. These are the module definition pins. They should be pulled up to Vcc with a 4.7KΩ-10KΩ resistor on the host board
Mod-Def 0 is grounded by the module to indicate that the module is present.
Mod-Def 1 is clock line of two wire serial interface for optional serial ID.
Mod-Def 2 is data line of two wire serial interface for optional serial ID.
- LOS (Loss of signal) - when high, this output indicates the received optical power is below the worst case receiver sensitivity (as defined by the standard in use). Low indicates normal operation.
- These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω differential at the user SERDES. The AC coupling is done inside the module and thus not required on the host board.
- VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V±5% at the SFP connector pin. The in-rush current will typically be no more than 30mA above steady state supply current after 500ns.
- TD-/+: These are the differential transmitter inputs. They are AC coupled differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on host board.



Electrical parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter Differential Input Volt	+/-TX_DAT	300		2200	mV p-p	1
Receiver Differential Output Volt	+/-RX_DAT	600		1400	mV p-p	2
Tx_Disable Input Voltage – Low	V _{IL}	0		0.8	V	
Tx_Disable Input Voltage – High	V _{IH}	2.0		V _{CC}	V	
Tx_Fault Output Voltage – Low	V _{OL}	0		0.8	V	3
Tx_Fault Output Voltage – High	V _{OH}	2.0		V _{CC}	V	3
Rx_LOS Output Voltage- Low	V _{OL}	0		0.8	V	3
Rx_LOS Output Voltage- High	V _{OH}	2.0		V _{CC}	V	3
Throughput - upstream	B		1244		Mb/s	
Throughput - downstream			2488		Mb/s	
Total current requirement			350	500	mA	

Transmitter parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Central wavelength	λ_c	1480	1490	1500	nm	
Spectral width	$\Delta\lambda$			1	nm	
Launch optical power	P _o	+7		+10	dBm	4
Extinction ratio	EX	10			dB	
Side mode suppression ratio	SMSR	30			dB	
Optical rise/fall time	T _{rise} /T _{fall}			180	ps	5
Eye diagram	Compliant with ITU-T G.984.2 Class C+					

Receiver parameters

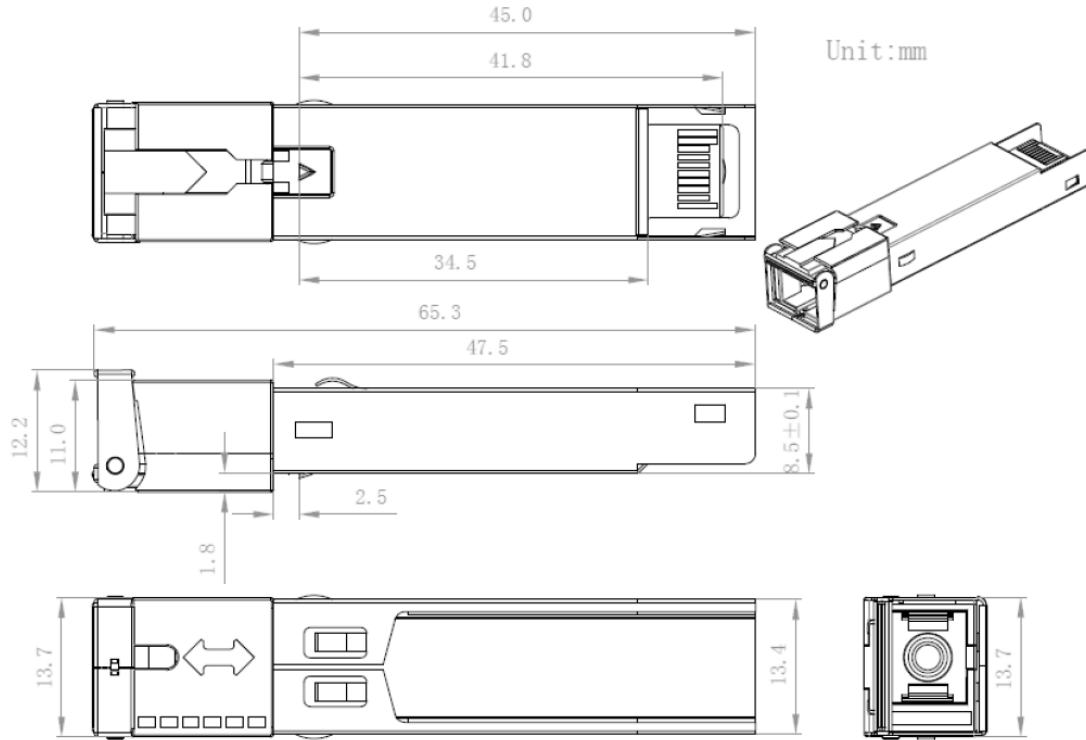
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Sensitivity	P _{min}			-33	dBm	6
Central wavelength	λ_c	1260	1310	1360	nm	
Receiver overload	P _{MAX}	-12			dBm	6
RX_LOS Asserted	S _A	-35			dBm	
RX_LOS De-Asserted	S _D			-25	dBm	
RX_LOS Hysteresis	-		3.0		dB	
Optical return loss	ORL	12			dB	

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 @ 25°C
- 20-80%
- Measured with PRBS 2²³-1 at 10⁻¹⁰ BER



Mechanical specification



Recommended environment conditions

Parameter	Symbol	Min	Typ	Max	Unit
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

FTS-GPON-OLT-C+MAX2 – GPON OLT SFP, 1490/1310nm, single-mode, SC simplex, commercial temperature (0~70°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-8074 - Technical specification for SFP transceiver](#)

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