FTS-GPON-OLT-C+5

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

Description

FTS-GPON-OLT-C+5 series SFP transceiver can be used to connect multiple GPON optical network terminals to GPON OLT. 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 C+
- Other optical connections

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GPON OLT Transceivers

Key features

- SC Simplex receptacle
- Transmission distance up to 20km*
- 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	**Output power**
ITU-T G.984.2	+3~+7dBm
Downstream throughput	**Receiver sensitivity**
2488Mbps	-31dBm
Upstream throughput	**Power supply voltage**
1244Mbps	3.3V
Transmission medium	**Total power consumption**
Single-mode fiber 9/125µm	< 2W
Transmission distance**	**Operating environment – temperature**
20km	0~70°C
Receptacle type	**Operating environment - humidity**
SC Simplex	5~95% non-condensing
Wavelength	**Dimensions**
TX: 1490nm / RX:1310nm	65mm × 14mm × 8.5mm

** - transmission distance depends on optical link attenuation

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Detailed technical specification

Pin Description

Pin	Name	Function/Description	Notes
1	VeeT	Transmitter Ground	-
2	TX Fault	Transmitter Fault Indication	1
3	TX Disable	Transmitter Disable-Module disables on high or open	2
4	MOD-DEF2	Module Definition 2-Two wire serial ID interface	3
5	MOD-DEF1	Module Definition 1-Two wire serial ID interface	3
6	MOD-DEF0	Module Definition 0-Grounded in module	3
7	Reset	Receiver Reset	
8	SD	Signal Detect	4
9	RSSI Trigger	RSSI Trigger for transceiver A/D Conversion	8
10	VeeR	Receiver Ground	-
11	VeeR	Receiver Ground	-
12	RD-	Inverse Received Data out	5
13	RD+	Received Data out	5
14	VeeR	Receiver Ground	-
15	VccR	Receiver Power - +3.3V±5%	6
16	VccT	Transmitter Power - +3.3 V±5%	6
17	VeeT	Transmitter Ground	-
18	TD+	Transmitter Data In	7
19	TD-	Inverse Transmitter Data In	7
20	VeeT	Transmitter Ground	-

Notes:

1. 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.
2. 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 Enabled
   Open or High (2.0 – VccT): Transmitter Disabled
3. 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.
4. When High, signal is detected, when Low: loss of signal. Signal Detect indication response within 50ns.
5. These are the differential receiver outputs. They are DC coupled.
6. 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.
7. 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.
8. When RSSI Trigger is High: Enable RSSI A/D conversion

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GPON OLT Transceivers

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		Vcc	V	
Tx_Fault Output Voltage – Low	V_{OL}	0		0.8	V	3
Tx_Fault Output Voltage – High	V_{OH}	2.0		Vcc	V	3
Rx_LOS Output Voltage- Low	V_{OL}	0		0.8	V	3
Rx_LOS Output Voltage- High	V_{OH}	2.0		Vcc	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	λc	1480	1490	1500	nm	
Spectral width	Δλ			1	nm	
Launch optical power	P_o	+3		+7	dBm	4
Extinction ratio	EX	10			dB	
Side mode supression 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}			-31	dBm	6
Central wavelength	λc	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:

1. Internally AC coupled and terminated to 100Ω differential load.
2. Internally AC coupled, but requires a 100Ω differential termination or internal to Serializer/Deserializer.
3. It is open collector/drain output which should be pulled up externally to Vcc with a 4.7KΩ-10KΩ resistor on the host board. LOS: logic 0 indicates normal operation; logic 1 indicates no signal detected.
4. Optical power is launched into SMF
5. 20-80%
6. Measured with PRBS 2^{23}-1 at 10^{-10} BER

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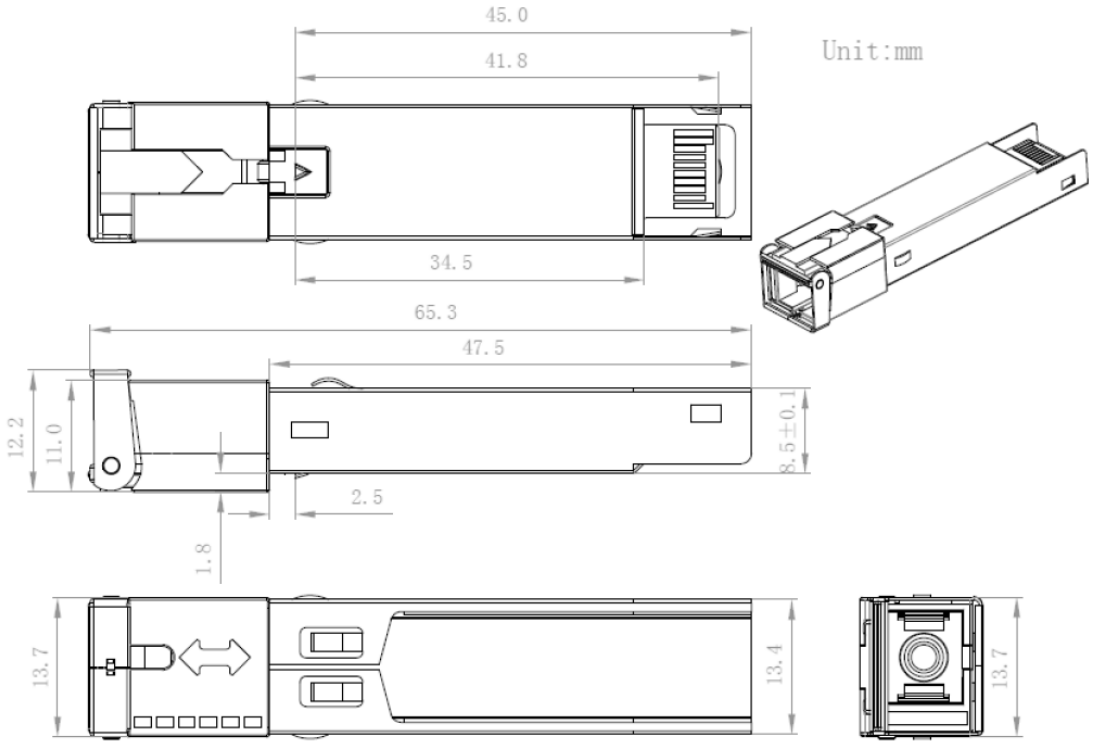
Mechanical specification



Recommended environment conditions

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

Ordering information

FTS-GPON-OLT-C+5 – 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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