FTS-GPON-OLT-C+8

GPON OLT SFP transceiver, 1490/1310nm, single-mode, RSSI, Class C+

Description

FTS-GPON-OLT-C+8 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

- Complies with SFP Multi Source Agreement (MSA) SFF-8074i
- Complies with SFF-8472 Rev 9.5
- Complies with ITU-T G.984.2 Amendment 2
- Complies with FCC 47 CFR Part 15, Class B
- Complies with FDA 21 CFR 1040.10 and 1040.11

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GPON OLT Transceivers

Key features

- Single fiber bi directional data links asymmetric TX 2488Mbps/RX1244Mbps application
- 1490nm continuous mode DFB laser transmitter and 1310nm burst mode APD-TIA receiver
- Small Form Factor Pluggable package with SC/UPC Connector
- Support Class C+ 17~32dB attenuation range application (With FEC)
- Reset burst mode receiver design support more than 15dB dynamic rang e
- 0 to 70°C operating c ase temperature
- Single 3.3V power supply
- Digital diagnostic monitoring interface
- Digital burst RSSI function to monito r the input optical power level
- LVPECL compatible data input/output interface
- LVTTL transmitter disable control
- LVTTL transmitter laser fault alarm
- LVTTL receiver Signal Detect (S D) indication response within 50ns.
- Low EMI and excellent ESD protection
- Class I laser safety standard IEC 60825 compliant
- RoHS-6 compliance

Specification

Supported transmission technology	ITU-T G.984.2
Downstream throughput	2488Mbps
Upstream throughput	1244Mbps
Transmission medium	Single-mode fiber 9/125µm
Transmission distance**	20km
Receptacle type	SC Simplex
Wavelength	TX: 1490nm / RX:1310nm
Output power	+4dBm ~ +7dBm
Receiver sensitivity	-31dBm
Power supply voltage	3.3V
Total power consumption	< 1.8W
Operating environment – temperature	0~70°C
Operating environment - humidity	5~95% non-condensing
Dimensions	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

GPON OLT Transceivers

Electrical parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter Data Input Differential Swing		600		1600	mV p-p	
Receiver Data Output Differential Swing		400		1600	mV p-p	
Tx_Disable Input Voltage – Low	V_{IL}	0		0.8	V	
Tx_Disable Input Voltage – High	V_{IH}	2.0		Vcc	V	
Tx_Fault Alarm Voltage – Low	V_{OL}	0		0.4	V	
Tx_Fault Alarm Voltage – High	V_{OH}	2.4		Vcc	V	
Rx_Reset - Low	V_{OL}	0		0.4	V	
Rx_Reset - High	V_{OH}	2.4		Vcc	V	
Throughput - upstream	B		1244		Mb/s	
Throughput - downstream			2488		Mb/s	

Transmitter parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Central wavelength	λc	1480	1490	1500	nm	
Spectral width	Δλ			1	nm	
Launch optical power	Po	+4		+7	dBm	BOL, Room Temperature
		+3		+7	dBm	EOL, 0~70°C
Extinction ratio	EX	8.2			dB	
Side mode supression ratio	SMSR	30			dB	
Transmitter and Dispersion Penalty	TDP			1	dB	
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	
Central wavelength	λc	1260	1310	1360	nm	
Receiver overload	P_{MAX}	-12			dBm	
RX_LOS Asserted	S_A			-31	dBm	
RX_LOS De-Asserted	S_D	-45			dBm	
RX_LOS Hysteresis	-	0.5	6		dB	
Receiver Reflectance				-12	dB	

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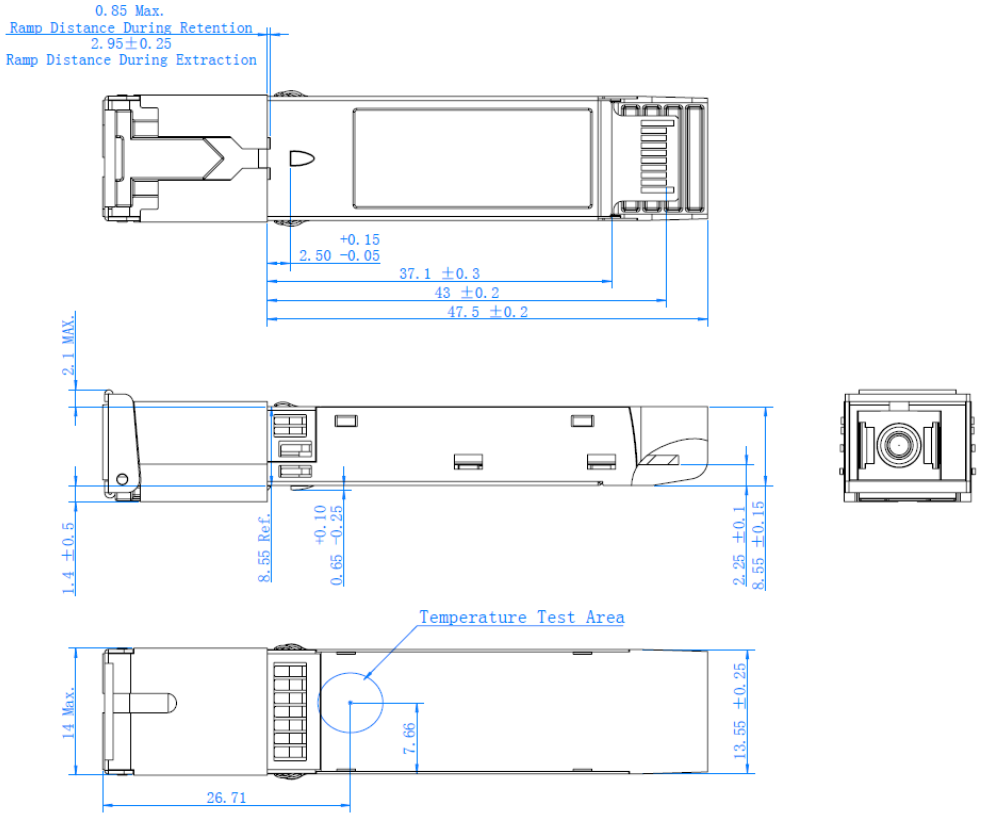
Mechanical specification



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+8 – GPON OLT SFP, 1490nm/1310nm, Class C+, 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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