FTS-GPON-OLT-D+

GPON OLT SFP transceiver, 1490/1310nm, single-mode, RSSI, 20km Class D

Description

FTS-GPON-OLT-D+ 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 D 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, and many others.

Applications

- Gigabit-capable Passive Optical Networks 20Km

Applications

- Complies with SFP Multi Source Agreement SFF 8432
- Complies with SFF-8472
- Complies with ITU-T G.984.2.
- 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 / RX 1244Mbps application
- 1490nm continuous-mode DFB laser transmitter and 1310nm burst-mode APD-TIA receiver
- Small Form Factor Pluggable package with SC/UPC Connector
- Reset burst mode receiver design support more than 15dB dynamic range
- 0 to 70 °C operating case temperature
- Single 3.3V power supply
- Digital diagnostic monitoring interface
- Digital burst RSSI function to monitor the input optical power level
- LVPECL compatible data input/output interface
- LVTTL transmitter disable control
- LVTTL transmitter laser fault alarm
- LVTTL receiver Signal Detect
- Low EMI and excellent ESD protection
- Class I laser safety standard IEC-60825 compliant
- RoHS-10 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	+7~+10dBm
Receiver sensitivity	-32dBm
Power supply voltage	3.3V
Total power consumption	< 1.8W
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

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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	SDA	I2C Data	
5	SCL	I2C Clock	
6	MOD-DEF0	Module Definition 0-Grounded in module	3
7	Reset	Receiver Reset, LVTTL input.	
8	SD	Signal Detect	8
9	RSSI_Trigger	RSSI Trigger Signal from Host, LVTTL input	4
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 RSSI Trigger is High: Enable RSSI A/D conversion
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.

GPON OLT Transceivers

Electrical parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter Input Differential Swing		200		1600	mV	
Receiver Data Output Differential Swing		400		1600	mV p-p	
Tx_Disable Input Voltage – Low		0		0.8	V	
Tx_Disable Input Voltage – High		2.0		Vcc	V	
Tx_Fault Output Voltage – Low		0		0.4	V	
Tx_Fault Output Voltage – High		2.0		Vcc	V	
Rx_Reset - Low		0		0.8	V	
Rx_Reset - High		2.0		Vcc	V	
RX_SD Voltage - Low		0		0.4	V	
RX_SD Voltage – High		2.4		Vcc	V	
Throughput - upstream			1244		Mb/s	
Throughput - downstream			2488		Mb/s	

Transmitter parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Central wavelength	λc	1480	1490	1500	nm	
Optical Spectrum Width (-20dB)	Δλ			1	nm	
Launch optical power	P_o	+7		+10	dBm	
Extinction ratio	EX	8.2			dB	PRBS 2^{23}-1 @2.488Gbit/s
Side mode supression ratio	SMSR	30			dB	
Transmitter Reflectance				-10	dB	
Transmitter and Dispersion Penalty	TDP			1	dB	Transmit on 20km SMF
Eye diagram	Compliant with ITU-T G.984.2 Class D					

Receiver parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Sensitivity	P_{min}			-32	dBm	EOL, Tc= 0~70°C, PRBS 2^{23}-1 @1.244Gbps, BER=10^{-10}
Central wavelength	λc	1260	1310	1360	nm	
Receiver overload	P_{MAX}	-12			dBm	
RX_LOS Asserted	S_A			-33	dBm	
RX_LOS De-Asserted	S_D	-45			dBm	
RX_LOS Hysteresis	-	0.5		6	dB	
Receiver Reflectance				-20	dB	

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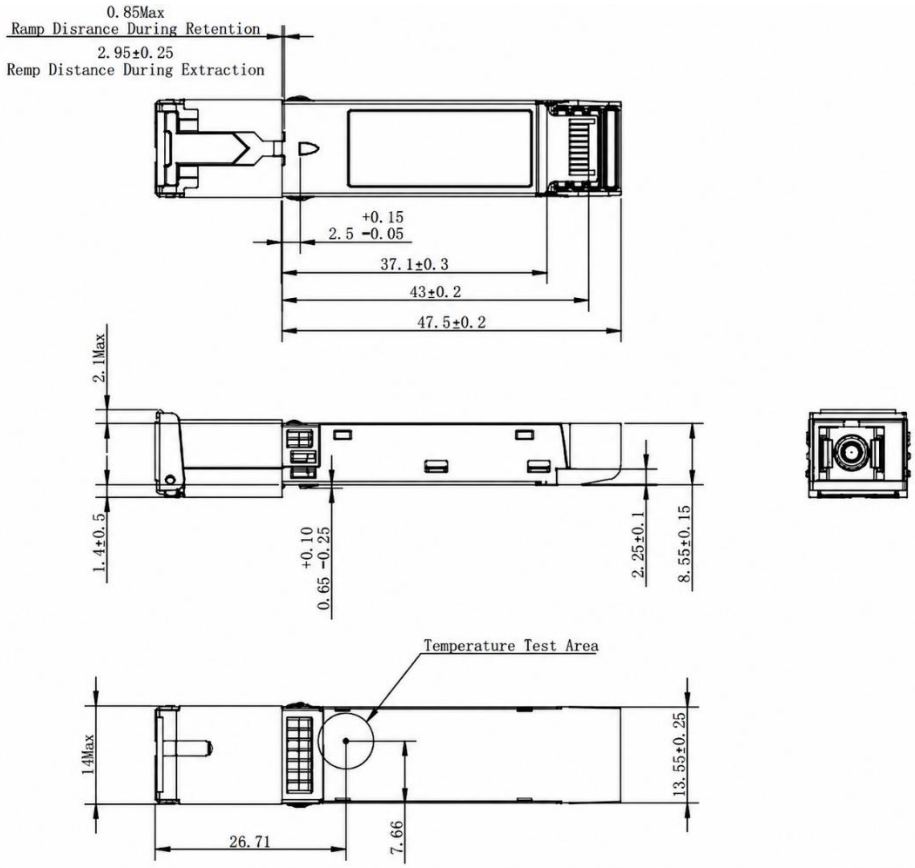
Mechanical specification



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-D+ – GPON OLT SFP, 1490/1310nm, Class D, 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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