GPON OLT C+ SFP Transceiver

SFP245x-GBEx

SC/UPC Receptacle

Features

- SC BIDI SFP Single Mode Transceiver
- SFP package with SC / UPC receptacle
- Single 3.3 V power supply
- Hot-pluggable capability
- 1490 nm Continuous Mode 2.488 Gb/s DFB Transmitter
- 1310 nm Burst Mode 1.244 Gb/s APD-TIA Receiver
- Support 20 km transmission distance with SMF
- RoHS-6 compliance
- Case temperature range:
  Commercial: 0 °C to 70 °C / Industrial: -40 °C to 85 °C

Applications

- GPON OLT For P2MP Application

Standard

- Complies with SFP+ MSA (SFF-8431)
- Complies with ITU-T G.984.2
- Complies with SFF-8472
- LVTTL receiver Fast Burst Packet Detect indication
- Burst mode received signal strength indication (RSSI) function
- Complies with Telcordia (Bellcore) GR-468-CORE
  except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

1. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
StorageAmbient Temperature	T_{STG}	-40	85	°C	
Operating Humidity	OH	5	95	%	
Supply Voltage	V_{CC}	-0.5	3.6	V	

Recommended Operating Condition

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	TC	0		70	°C	Commercial
		-40		85	°C	Industrial
Power Supply Voltage	Vcc	3.13	3.3	3.465	V	
Power Supply Current	Icc			400	mA	
Tx data Rate			2.488		Gb/s	
Rx data Rate			1.244		Gb/s	
Damage Threshold For Receiver				-3	dBm	

Transmitter Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Average Launch Optical Power	Pout	1.5		5	dBm	Class B+
		3		7		Class C+
		4.5		10		Class C++
Extinction Ratio	ER	9			dB	
Centre Wavelength	λc	1480	1490	1500	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Side Mode Suppression Mode	SMSR	30			dB	
Rise/Fall Time	Tr/Tf			180	ps	Remove filter 20% to 80%
Average Launched Power of Off Transmitter	Poff			-39	dBm	
Eye Diagram		Compliant With ITU-T G.984.2				

4. Transmitter Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Input Differential Impedance	ZIN	90	100	110	ohm	
Data Input Swing Differential	VIN	300		1600	mV	
Tx Disable Input Voltage-Low	VIL	0		0.8	V	
Tx Disable Input Voltage-High	VIH	2.0		Vcc	V	

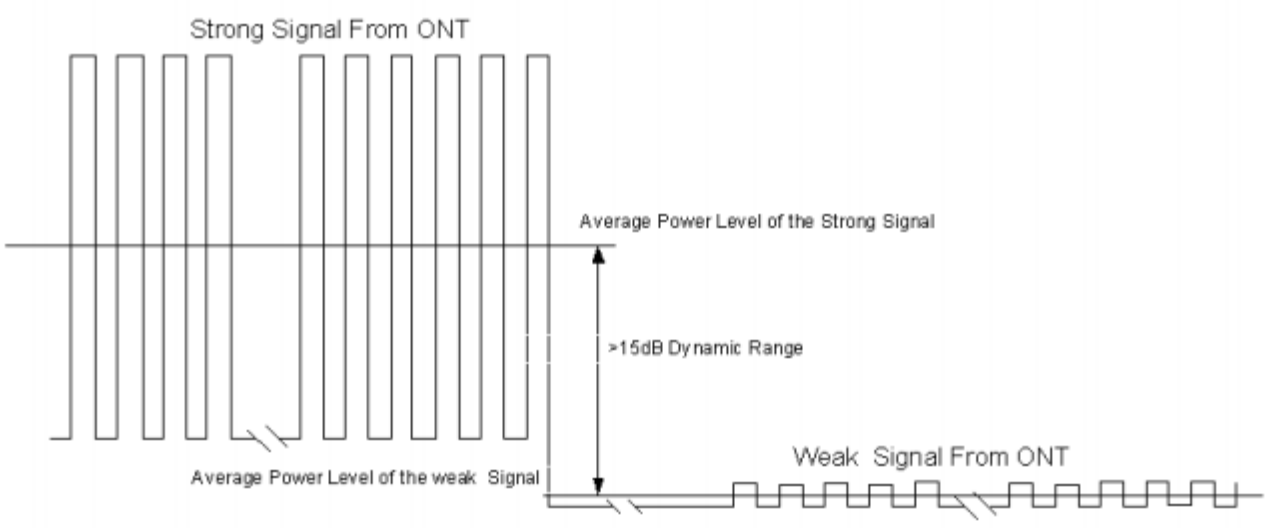
Tx-Fault Voltage - Low		0		0.8	V	
Tx-Fault Voltage - HIGH		2.0		Vcc	V	

5. Receiver Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Optical Center Wavelength	c	1280	1310	1340	nm	
Sensitivity(Class B+)	SEN			-28	dBm	1
Sensitivity(Class C+)				-30		
Sensitivity(Class C++)				-31		
Receiver Overload	OL	-10			dBm	
RX Dynamic Range		15			dB	2
SDAssert	SDA	-30			dBm	
SD De-Assert	SDD			-45	dBm	
SD Hysteresis		0.5		5	dB	
RX_Data Differential Output Voltage	V_{OUT}	600		2000	mVp-p	
SD	High	2		Vcc	V	
	Low	0		0.8	V	

Note:

1. Minimum Sensitivity and saturation levels for an NRZ 223-1 PRBS. BER≤10^{-10} 1.244Gb/s, ER=10dB
2. RX Dynamic Range Definition



6. Pin Description

Pin No.	Name	Function	Notes
1	VeeT	Transmitter Ground	
2	Tx Fault	Transmitter Fault Indication	TX Fault Alarm, TX Fault State: High; TX Normal State: Low
3	Tx Disable	Transmitter Disable	High: Tx disable; Low: Tx enable
4	MOD-DEF2	SDA	I2C data
5	MOD-DEF1	SCL	I2C clock
6	MOD-DEF0		Module Definition 0, Grounding in SFP
7	Reset	Receiver Reset	Active High
8	BPD	RX Signal Detect	High: signal detected; Low: loss of signal
9	RSSI-Trigger	RSSI Trigger for Rx input A/D Conversion	High: enable RSSI A/D conversion
10	VeeR	Receiver Ground	
11	VeeR	Receiver Ground	
12	RD-	RX Data- / LVPECL	Inv. RX data output, internally DC coupled output
13	RD+	RX Data+/ LVPECL	RX data output, internally DC coupled output
14	VeeR	Receiver Ground	
15	VccR	Receiver Power Supply	3.3V±5%
16	VccT	Transmitter Power Supply	3.3V±5%
17	VeeT	Transmitter Ground	
18	TD+	Transmitter Data In	TX data input, internally AC coupled with 100ohm terminated
19	TD-	InvTransmitter Data In	Inv. TX data input, internally AC coupled with 100ohm terminated
20	VeeT	Transmitter Ground	

7. Pin-out Drawing

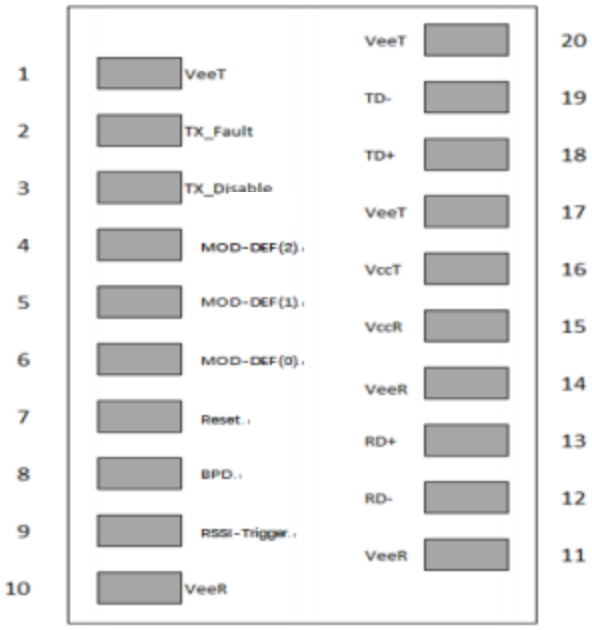


Figure 1. Pin-out

8. Typical Interface Circuit

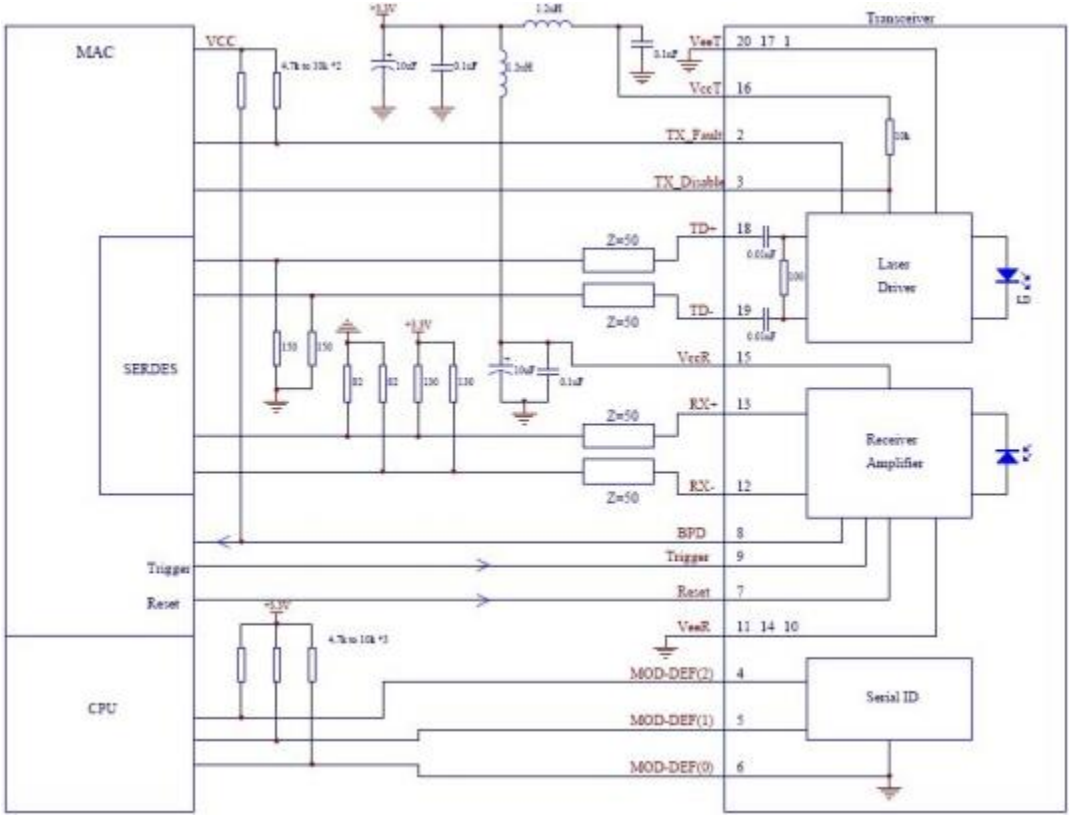


Figure 2. Typical Interface Circuit

9. Timing Parameter Definition

Parameter	Min.	Typ.	Max.	Unit	Note
Guard Time (T_{GUARD})	25.6	-	-	ns	
Reset Pulse Width (T_{RESET})	12.6	-	-	ns	
Rx SDAssert Time (T_{SDA})	-	-	50	ns	
Rx SD De-assert Time (T_{SDD})	-	-	12.8	ns	Refer to the Reset signal rising edge
Settling Time ($T_{RECOVERY}$)	-	-	25.6	ns	Refer to the reset signal falling edge

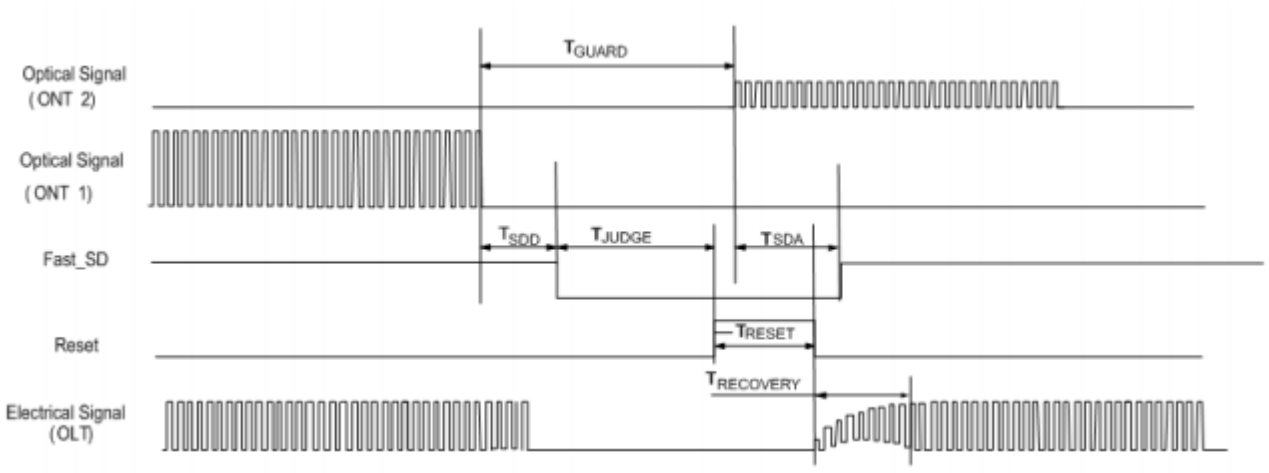


Figure 3. Burst Receiver Timing Sequence

Parameter	Min.	Typ.	Max.	Unit	Note
RSSI Trigger Delay(T_D)	25.6	-	-	ns	Refer to first bit of the preamble
RSSI Trigger width(T_W)	300	-	T_{ONT}-T_D	ns	
Optical Signal During Time($T_{ONT\ EN\_DUR}$)	525	-	-	ns	
I2CAccess Prohibited Time	500	-	-	ns	

Figure 4. RSSI Timing Sequence

10. Package Outline

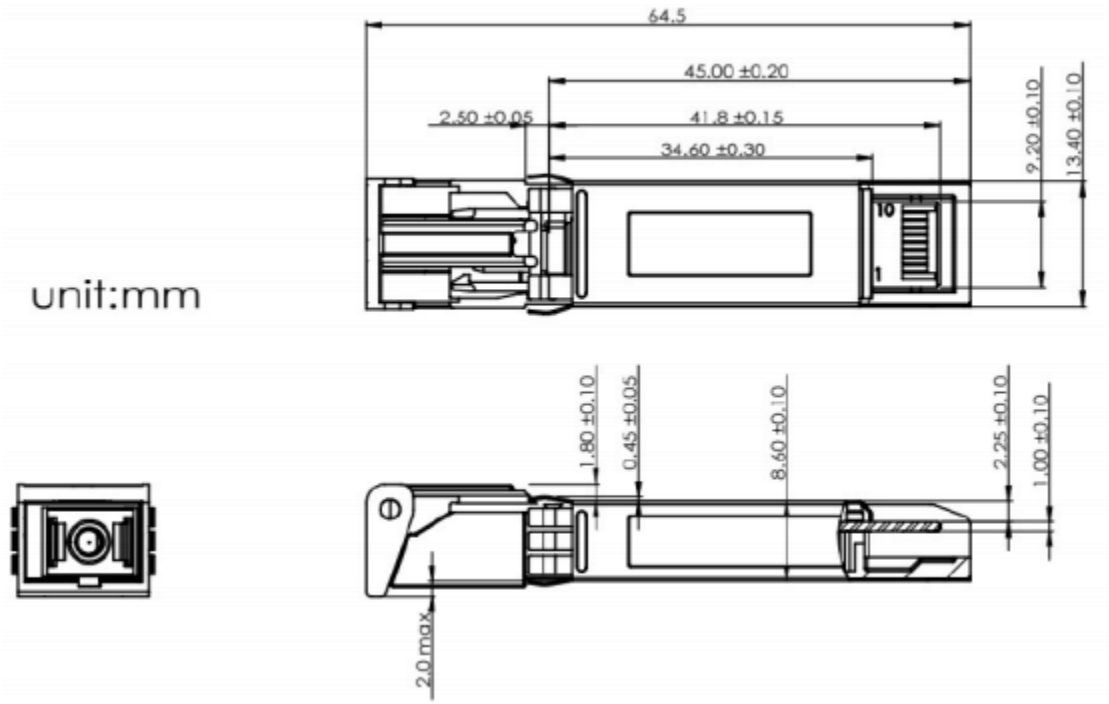


Figure 5. Package Outline

11. EEPROM Block Diagram

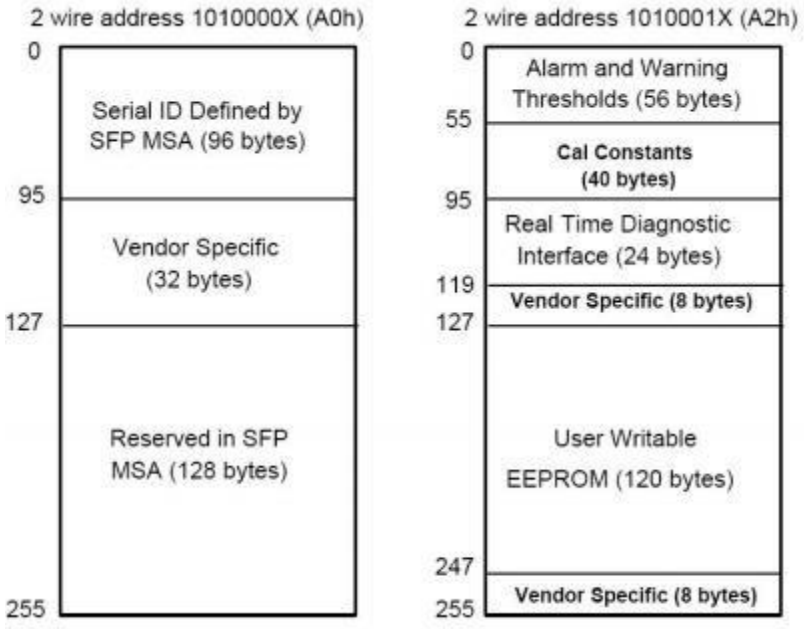


Figure 6. EEPROM Memory Map Specific Data Field Descriptions

12. Digital Diagnostic Monitoring Interface

Parameter	Range	Accuracy	Calibration	Notes
Temperature	0 to70°C	±3 °C	Internal	Commercial
	-40 to 85 °C			Industrial
Voltage	3.13 to3.465 V	±3%	Internal	
Bias Current	1 to 100 mA	±10%	Internal	
TX Power	1.5 to 5 dBm	±3 dB	Internal	Class B+
	3 to 7 dBm			Class C+
	4.5to 10 dBm			Class C++
RX Power monitor	-28 to -10 dBm	±3 dB	Internal	Class B+
	-30 to -10 dBm			Class C+
	-31to -10 dBm			Class C++

13. Ordering Information

Part No.	Package	Data Rate	Reach	Wavelength	Temp.	Class
SFP245C-GBE2	SFP	TX:2.448 Gb/s RX:1.244Gb/s	20 km	TX: 1490 nm RX: 1310 nm	0 to70°C	B+
SFP245H-GBE0					-40to 85 °C	
SFP245C-GBE0					0 to70°C	C+
SFP245H-GBE2					-40to 85 °C	
SFP245C-GBE3					0 to70°C	C++
SFP245H-GBE1					-40to 85 °C	

14. Warnings

- Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD).A static free environment is highly recommended.
- Follow guidelines according to proper ESD procedures.
- Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes.Avoid eye exposure to direct or indirect radiation.