10G Symmetrical EPON ONU Transceiver

PRODUCT FEATURES

IEEE802.3av Gigabit Ethernet compliant

SFP+ package with SC Receptacle

1270nm DFB Burst Mode 10.3125Gbps transmitt

Continuous Mode 10.3125Gbps Receiver

Single +3.3V power supply

SFP+ MSA SFF-8431 compliant

Digital Diagnostic SFF-8472 compliant

Case operation temperature:0~70 ℃

LVTTL Bias Control input and Rx Signal Detect output

Laser Class 1 Product which comply with the

Requirements of IEC 60825-1 and IEC 60825-2

APPLICATIONS

IEEE 802.3av 10GBASE-PR30

Burst Mode Application

FTTx WDM Broadband Access

PRODUCT DESCRIPTION

HC's 10G EPON ONU transceiver EX-U1211-30D is designed for Gigabit Ethernet Passive Optical

Network transmission. The module is contained in a SFP+ package with SC/UPC receptacle connector. The module consists 1270nm DFB laser, APD+TIA, Preamplifier and WDM filter in a high-integrated optical sub-assembly, and it receives up to 10.3125Gbps of continuous data at 1577nm, and transmits 10.3125Gbps of burst-mode data at 1270nm.

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40		85	ºC	
Storage Ambient Humidity	HA	5		95	%	
Power Supply Voltage	VCC	-0.3		4	V	
Signal Input Voltage		-0.3		Vcc+0.3	V	
Receiver Damage Threshold		5			dBm	

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0		70	ºC	
Ambient Humidity	HA	5		95	%	Non-condensing
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC			660	mA	
Power Supply Noise Rejection				100	mVp-p	100Hz to 1MHz
Data Rate	DR	10.3125-100ppm	10.3125	10.3125+100ppm	Gbps	
Coupled fiber	Single mode fiber					9/125um SMF

III. Specification of Transmitter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Average Launched Power	PO	4		9	dBm	Note (1)
Extinction Ratio	ER	6			dB	
Center Wavelength	λC	1260		1280	nm	DFB Laser
Spectrum Width (-20dB)	σ			1	nm	
Side Mode Suppression Ratio	SMSR	30			nm	
Transmitter OFF Output Power	POff			-45	dBm	
Total Jitter	tJ			0.35	UI	Note (2)
Optical Return Loss Tolerance	ORLT			15	dB	

Relative Intensity Noise	RIN15OMA			-128	dB/Hz	
Optical Transmitter Reflectance				-10	dB	
Output Eye Mask	Compliant with IEEE 802.3av					Note (3)

Note (1). Launched power (avg.) is power coupled into

a single mode fiber with master connector.(Before of Life) Note (2).

Measure at 2^31-1 NRZ PRBS pattern

Note (3). Transmitter eye mask definition

IV. Specification of Receiver

Parameter		Symbol	Min.	Typ.	Max.	Unit	Note
Input Optical Wavelength		λIN	1575	1577	1580	nm	
Receiver Sensitivity		Psen1			-24.5	dBm	Note (1)
		Psen2			-28.5	dBm	
Input Saturation Power (Overload)		PSAT	-8			dBm	
Los Of Signal Assert		PA			-30	dBm	
Los Of Signal De-assert		PD	-38			dBm	Note (2)
LOS Hysteresis		PA-PD	0.5	2	6	dB	
Receiver Reflectance	1580 to 1600nm				-12	dB	Note (3)
Optical Isolation from External Source	1260 to 1360nm				-43	dB	

Note (1). Psen1 measured with Light source 1577nm, ER=9dB; BER =<10-10@PRBS=2^31 NRZ Psen2 measured with Light source 1577nm, ER=9dB; BER =<10-3@PRBS=2^31 NRZ

Note (2). When LOS de-asserted, the RX data+/- output is High-level (fixed) Note (3).

Measured at wavelength of 1577nm.

V. Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Differential line input Impedance	RIN	90	100	110	Ohm	
Differential Data Input Swing	VDT	200		1600	mVp-p	Note (1)
BiasCNT(n) Input Voltage- High	VBCH	2		Vcc+0.3	V	LVTTL
BiasCNT(n) Input Voltage- Low	VBCL	0		0.8	V	
Receiver						
Differential Data Output Swing	VDR	500		1000	mVp-p	Note (1)

Signal Detect Output Voltage-High	VLOSH	2		Vcc+0.3	V	LVTTL
Signal Detect Output Voltage-Low	VLOSL	0		0.8	V	

Note (1). Internally AC coupled.

VI. Transmitter Burst Mode Timing Characteristics（BEN=low level）

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Burst Enable Duration	T_{EN_DUR}	1000			ns	
Burst Disable Duration	T_{DIS_DUR}	112		1000000	ns	
Burst Turn On Time	T_{BURST_ON}			512	ns	
Burst Turn Off Time	T_{BURST_off}			512	ns	

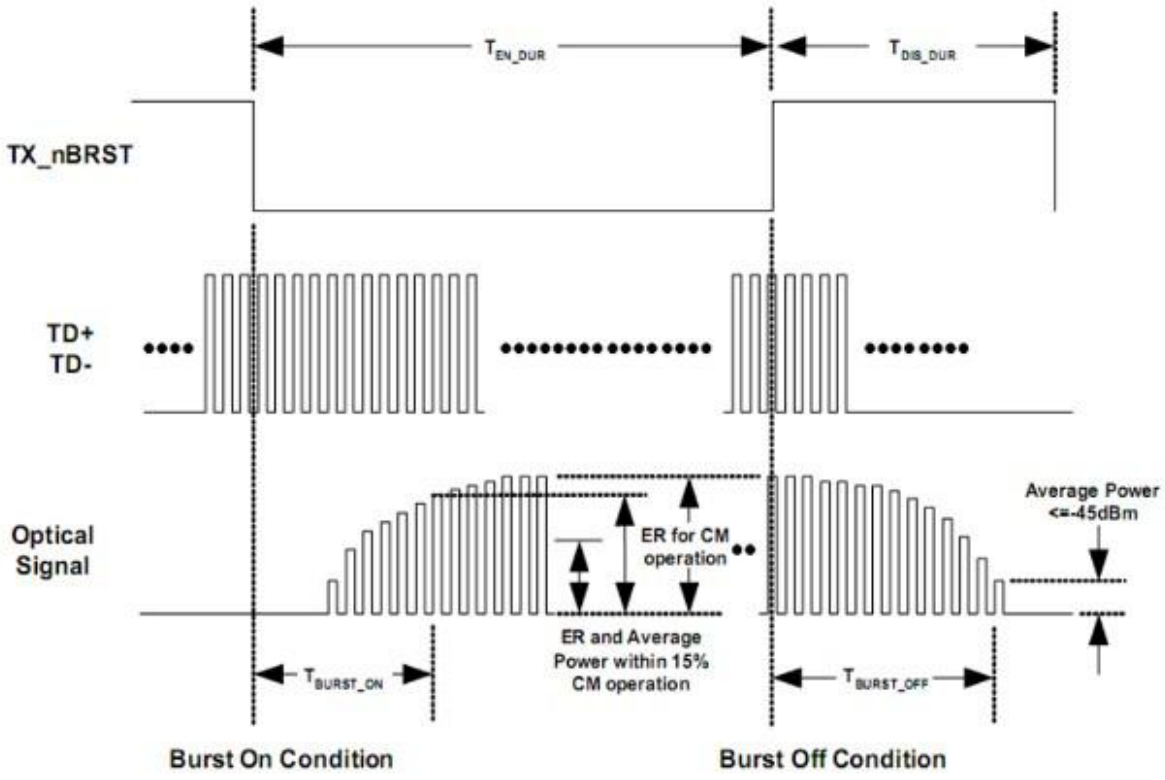
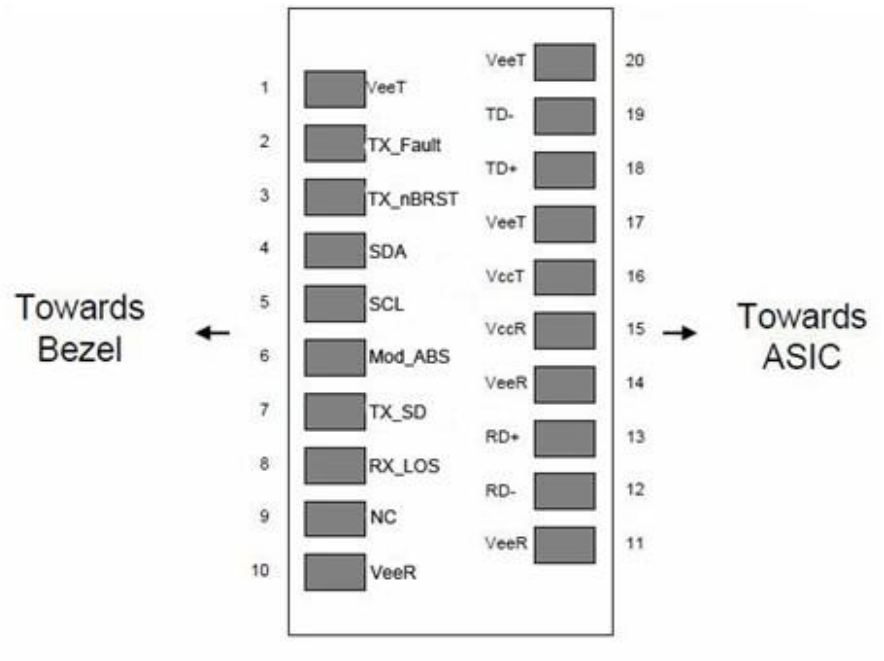


Figure1: Timing Parameter Definition In Burst Mode Sequence

VII. Pin Description



Pin	Symbol	Name/Description	Ref.
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault.	
3	TX_nBRST	Transmitter Burst Control	
4	SDA	2 wire Serial Interface Data Line(MOD_DEF2)	2
5	SCL	2 wire Serial Interface Clock(MOD_DEF1)	
6	Mod_ABS	Module Absent, Connect to VeeT or VeeR in the module(MOD_DEF0)	
7	TX_SD	TX signal Detect	3
8	RX_LOS	Loss of Signal indication.	4
9	NC	Not Connected	
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	Vee	Receiver Ground	1
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	

20	VeeT	Transmitter Ground	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. SDA is open collector output. Should be pulled up with 4.7k - 10kohms to VccT in the module.
3. TX signal Detect, TX Active State:High.

LOS is open collector output. Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

VIII. Recommended Interface Circuit

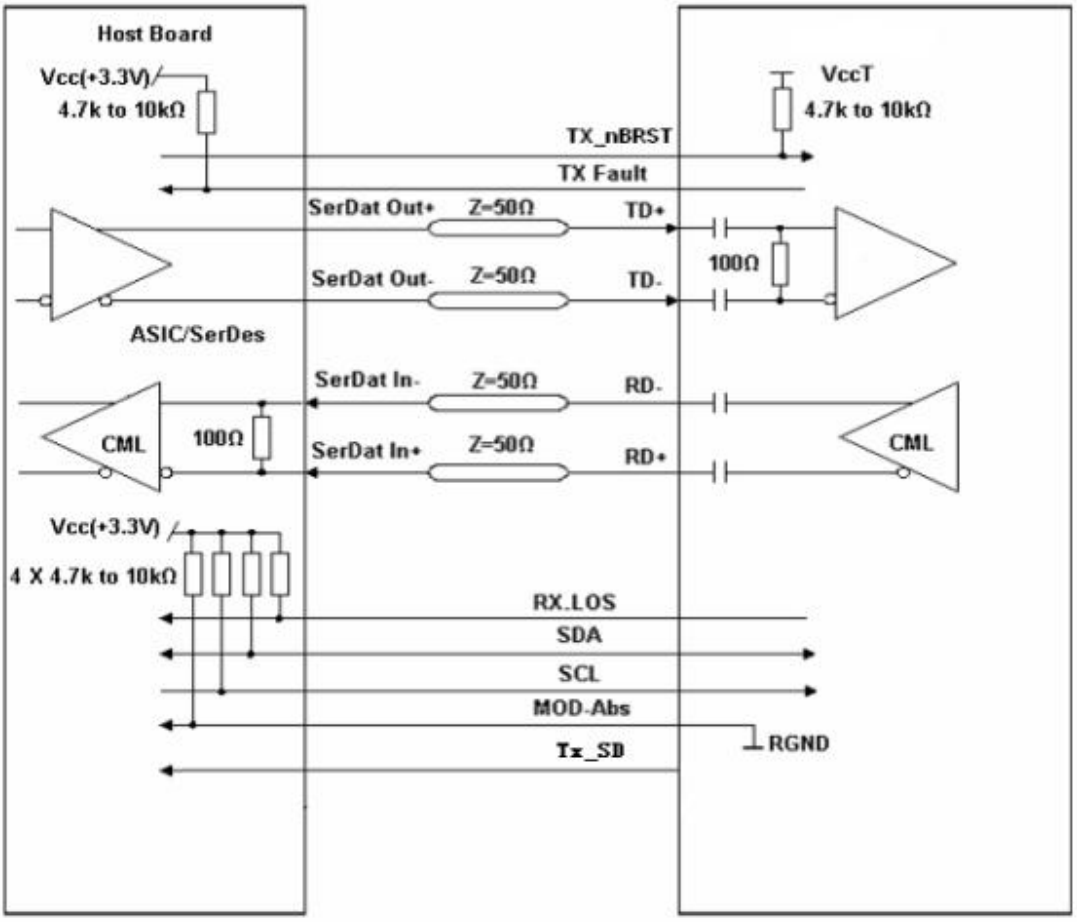


Figure2: Recommended Interface Circuit

IX. Outline Dimensions

Parameter	Unit	Description	Note
Mechanical Dimensions	mm	68.8 x 13.4 x 8.5	
Connector Type	-	SC/UPC connector	IEC-61754-4