

## GEAPON ONU SFF 2X5 GEUF-3412P-E2C

### Features

- ◆ Single fiber Bi-Directional transceiver with single SC/PC pigtail
- ◆ 1310nm burst-mode 1.25Gbps transmitter with DFB LD laser
- ◆ 1490nm continuous-mode 2.5Gbps receiver with PIN-TIA
- ◆ Complies with Multi-Source Agreement (MSA) Small Form
- ◆ Burst mode:"low" active
- ◆ Complies with IEEE Std 802.3ah™ -2004
- ◆ Factor (SFF) 2x5 Footprint
- ◆ 3.3V Single power supply
- ◆ Complies with RoHS directive (2002/95/EC)
- ◆ Operating case temperature: Standard : 0 to +70°C



### Applications

- ◆ IEEE 802.3ah 1000BASE-PX20
- ◆ GE-PON ONU
- ◆ Burst mode application.
- ◆ FTTx broadband access system

### Description

The GEUF-3412P-E2C Bi-Directional Transceiver is the high performance module for single fiber communications by using 1310nm 1.25Gbps burst mode transmitter and 1490nm 2.5Gbps continuous receiver. It is Optical Network Unit (ONU) for IEEE Std 802.3ah™ -2004. The optical transceiver is compliant with Multi-Source Agreement (MSA) Small Form Factor (SFF) 2x5 footprint.

The transmitter section uses a 1310nm DFB laser diode with automatic power control (APC) function and temperature compensation circuitry to ensure stable extinction ratio over all operating temperature range, and full IEC825 and CDRH class 1 eye safety. The receiver has a hermetically packaged PIN-TIA (trans-impedance amplifier) pre-amplifier and a limiting amplifier with CML compatible differential outputs.

## Absolute Maximum Ratings

Table 1 - Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	Tst	-40	+85	°C	-
Operating Case Temperature	Tc	0	70	°C	-
Operating Humidity	RH	5	90	%	Non-condensing
Input Voltage	-	GND	Vcc	V	-
Power Supply Voltage	Vcc-Vee	0	3.6	V	-

## Recommended Operating Conditions

Table 2 - Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	0	-	70	°C
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Current	Icc	-	-	300	mA

## Optical and Electrical Characteristics

Table 3 - Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Tx Data Rate	R <sub>T</sub>	-	1.25	-	Gb/S	-
Centre Wavelength	λ <sub>c</sub>	1276	1310	1356	nm	-
Spectral Width	Δλ	-	-	2.8	nm	-
Side Mode Suppression Ratio	SMSR	30				
Total Jitter	TJ	-	-	0.35	UI	-
Average Output Power	P <sub>out</sub>	-1	-	4	dBm	1
Average Launch Power-OFF Transmitter	P <sub>off</sub>			-45	dBm	
Extinction Ratio	ER	9	-	-	dB	-

Burst Enable Delay	Ton	-	-	32	ns	Fig.1
Burst Disable Delay	Toff	-	-	32	ns	Fig.1
Relative Intensity Noise	$RIN_{15\_OM\_A}$			-115	dB/Hz	
Transmitter & dispersion penalty	TDP			1.8	dB	
Optical Eye Diagram	Compliant with of IEEE 802.3ah (Fig. 60-6) transmitter eye mask definition					
Optical Rise/Fall Time (20%~80%)	tr/tf			260	ps	
Data Input Swing Differential	$V_{IN}$	200		1600	mV	2
Input Differential Impedance	$Z_{IN}$	90	100	110	$\Omega$	
Burst	Disable		2.0	$V_{cc}$	V	
	Enable		0	0.8	V	
Receiver						
Rx Data Rate	$R_R$	-	2.5	-	Gb/s	3
Centre Wavelength	$\lambda_c$	1480		1500	nm	
Receiver Sensitivity(BOL)	Sen			-21	dBm	3
Receiver Overload	Sat	-3			dBm	3
Receiver Reflectance				-12	dB	
Signal Detect De-Assert	SDD	-32			dBm	
Signal Detect Assert	SDA			-22	dBm	
Signal Detect Hysteresis	SDH	0.5		6	dB	
Output Differential Impedance	$Z_{IN}$	90	100	110	$\Omega$	
Data Output Swing Differential	$V_{out}$	400		1400	mV	
SD Output Voltage	High		2.0	$V_{cc}$	V	
	Low		0	0.8	V	

**Notes:**

1. The optical power is launched into SMF.
2. PECL input, internally DC-coupled and terminated.
3. Measured with a PRBS  $2^7-1$  test pattern @2500Mbps, ER=9dB, BER  $\leq 1 \times 10^{-12}$ .

## Transmitter Burst Mode Timing Characteristics

### Definition of Burst Enable Delay ( $T_{on}$ ) and Burst Disable Delay ( $T_{off}$ )

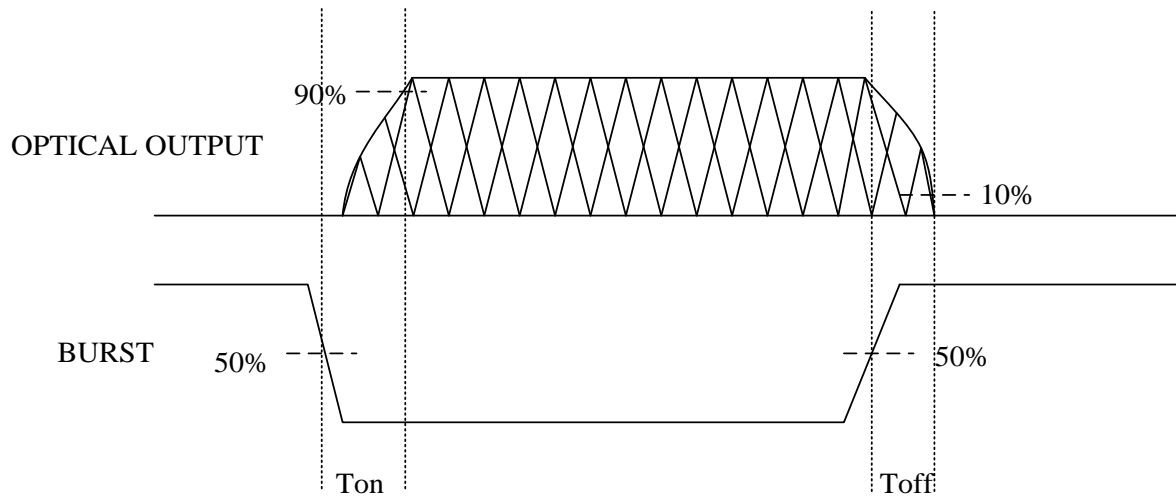
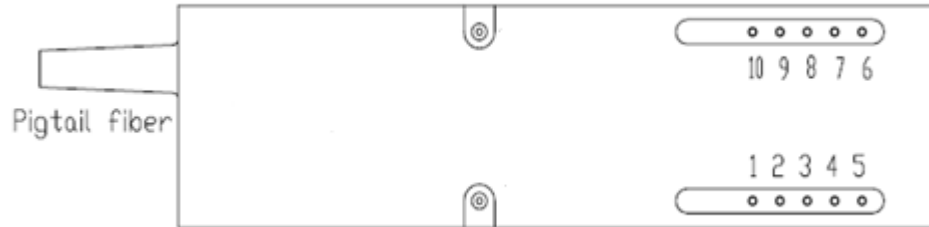


Fig.1

## Pin Definitions

### Pin Diagram



### Pin Descriptions

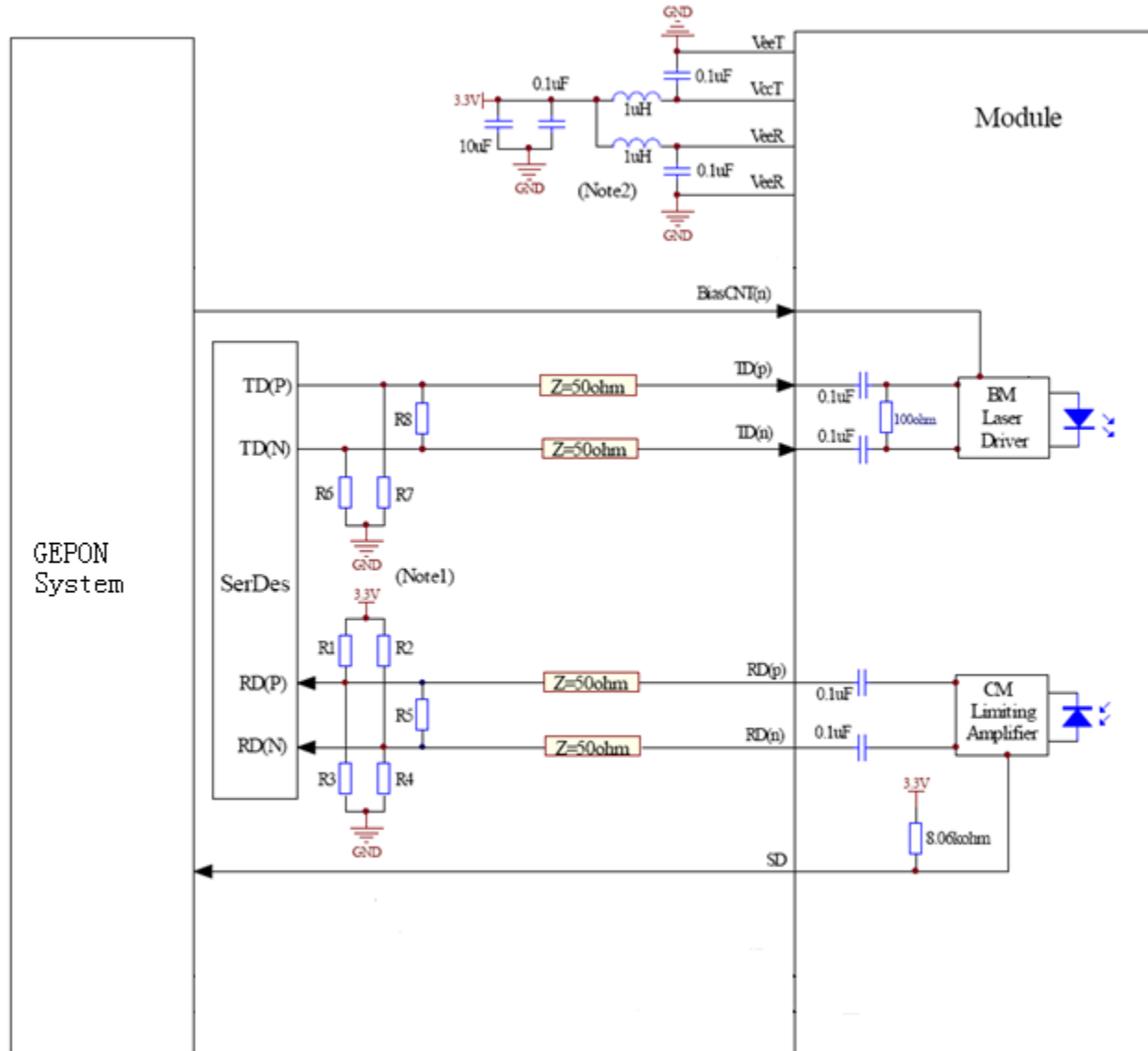
Pin	Signal Name	Description	Notes
1	$V_{EER}$	Receiver ground	
2	$V_{CCR}$	Receiver Power Supply	
3	SD	Signal Detect Output	Note 1
4	RD-	Inv. Received Data CML Output, internal AC Coupling	Note 2
5	RD+	Received Data CML Output, internal AC Coupling	Note 2
6	$V_{CCT}$	Transmitter Power Supply	
7	$V_{EET}$	Transmitter Ground	
8	BURST	Transmitter Burst Control	Note 3
9	TD+	Transmit Data LVPECL Input, Internal AC Coupling	Note 4
10	TD-	Inv. Transmit Data LVPECL Input, Internal AC Coupling	Note 4

#### Notes:

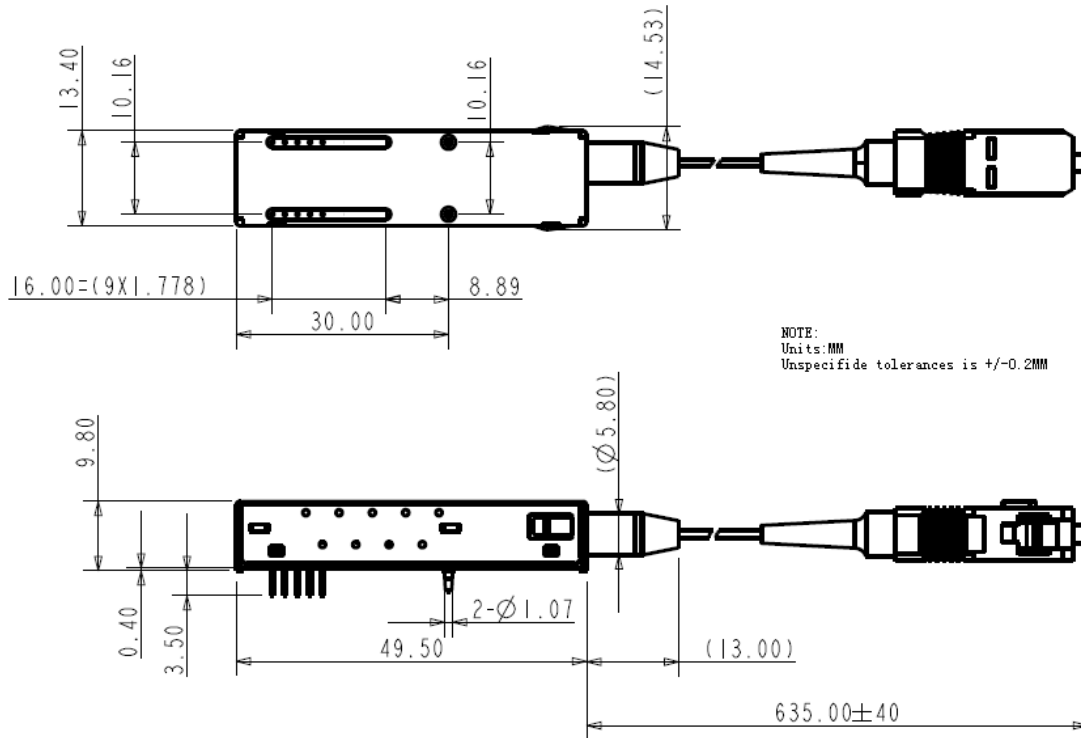
Plug Seq.: Pin engagement sequence during hot plugging.

- 1) Logic 0 indicates loss of signal; Logic 1 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.
- 2) RD-/+ : These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100 $\Omega$  (differential) at the user SERDES.
- 3) BURST is a TTL input. When it is low, LD is on; when it is high, LD is off.
- 4) TD-/+ : These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100 $\Omega$  differential termination inside the module.

## Recommend Application Circuit



## Mechanical Dimensions



## Ordering information

Part Number	Product Description
GEUF-3412P-E2C	Tx1310nm, Rx1490nm, 1.25Gbps/2.5Gbps,with pigtail, 1000BASE-PX20, Burst low, 0°C ~ +70°C

E-mail: [sales@gigalight.com.cn](mailto:sales@gigalight.com.cn)

Web : <http://www.gigalight.com.cn>