



# **ALLNET ALLGPL-FPSC-43 GPON OLT Transceiver**

**1.25Gbps Upstream / 2.5Gbps Downstream**

**Artikel: 113608**

- *Bi-directional 1.25Gbps Upstream / 2.5Gbps Downstream*
- *Complies with ITU-T G.984.2 Class B+*
- *SFP package with SC Receptacle*
- *1490nm continuous-mode 2.5Gbps DFB transmitter*
- *1310nm burst-mode 1.25Gbps APD receiver*
- *Single +3.3V power supply*
- *Rx Signal Detect output*
- *Laser Class 1 Product which comply with the Requirements of IEC 60825-1 and IEC 60825-2*



## Product description

ALLNETs GPON OLT transceiver ALLGPL-FPSC-43 is designed for G.984.2 Class B+ requirements Network transmission. The module is contained in a SFP package with SC/UPC receptacle connector. The module consists 1490nm DFB laser, InGaAs APD, Preamplifier and WDM filter in a high-integrated optical sub-assembly, and it Transmit up to 2.5Gbps of continuous data at 1490nm, and receives 1.25Gbps burst-mode data at 1310nm. The module data link up to 20km in 9/125um single mode fiber.

## Applications

- GPON OLT Class B+

## Specification

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Ts	-40	85	°C
Relative Humidity	RH	5	95	%
Power Supply Voltage	VCC	-0.3	4	V
Signal Input Voltage		-0.3	Vcc+0.3	V
Receiver Damage Threshold		+5		dBm

### Recommended Operating Conditions

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Case Operating Temperature	Tcase	-40	85		°C	Ordering Info
Power Supply Voltage	VCC	3.14	3.3	3.47	V	
Power Supply Current	ICC	-0.3	4	380	mA	
Power Supply Noise Rejection						100Hz to 1MHz
Data Rate			1.25Gbps / 2.5Gbps		Gbps	RX data/Tx data

### Specification of Transmitter

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Average Launched Power	PO	2		5	dBm	Ordering Info
Extinction Ratio	ER	10			dB	
Center Wavelength	$\lambda_C$	1480		1500	nm	DFB Laser
Spectrum Width (-20dB)	$\sigma$			1.0	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Transmitter OFF Output Power	POff			-45	dBm	
Optical Return Loss Tolerance	ORLT			15	db	
Output Eye Mask	Compliant with ITU5T G.984.2 Mask					



### Specification of Receiver

Parameter		Symbol	Min	Typ	Max	Unit	Note
Input Optical Wavelength		$\lambda_{in}$	1260	1310	1360	nm	APD
Receiver Sensitivity		$P_{sen}$			-28	dBm	Note (1)
Input Saturation Power (Overload)		$P_{sat}$	-8			dBm	
Burst Packet Detect sensitivity		PA			-30	dBm	Note (2)
Data Output Rise/Fall time		tr/tf			260	ps	20%~80%
Receiver Reflectance	1260 to 1360nm				-12	dB	Note (4)

Note (1): Measured with Light source 1490nm, ER=10dB; BER = <math>10^{-10}</math> @ PRBS=2<sup>23</sup>-1 NRZ, This assurance should be met with asynchronous data flowing out of the optical transmitter of the system under test. The output data pattern from the transmitter of the system under test is a repetition of alternate 0/1 pattern as defined for this measurement.

Note (2): Measured with 1310nm, 1.244Gbps PRBS2<sup>23</sup>-1 burst mode optical input, ER=10dB

Note (3): These are 20%~80% values.

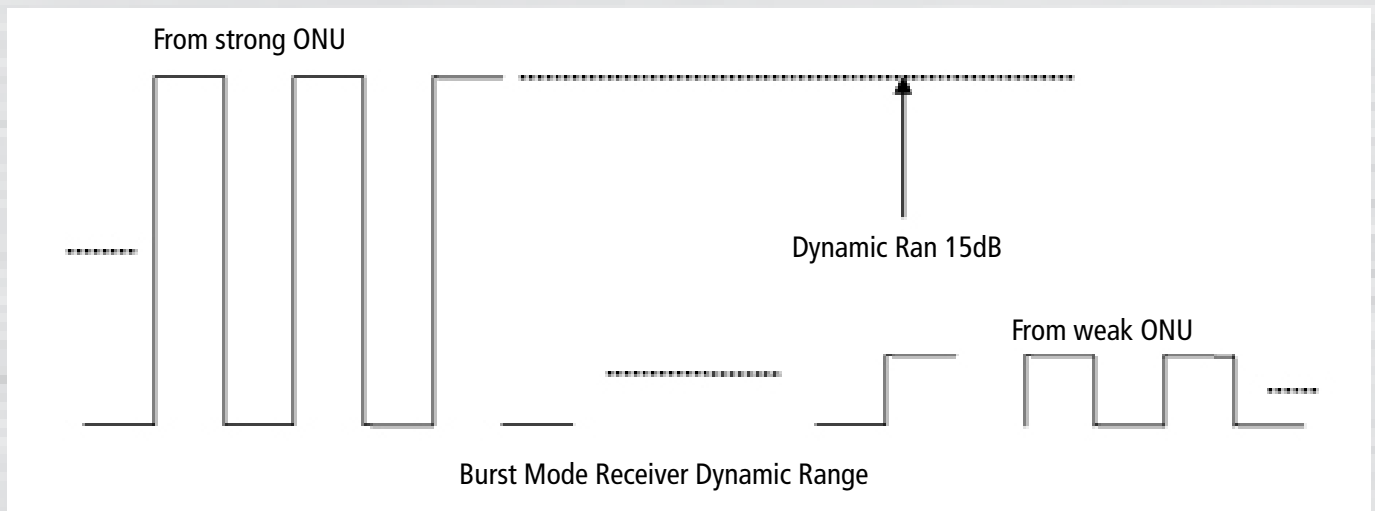
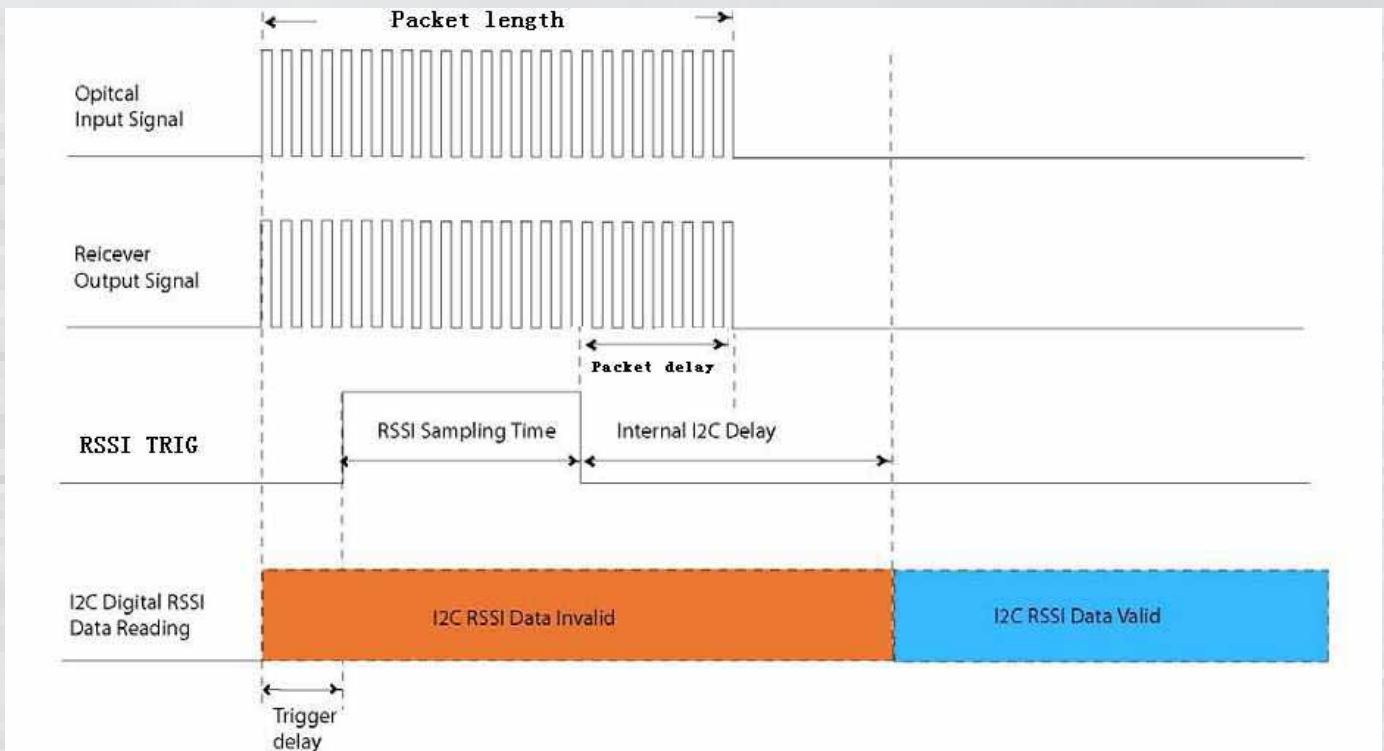
Note (4): Measured at wavelength of 1310nm.

### Electrical Interface Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
<b>Transmitter</b>						
Differential line input Impedance	$R_{in}$	80	100	120	Ohm	
Differential Data Input Swing	Vdt	300		1600	mVp-p	
TX_disable Input Voltage- High	$V_{DisH}$	2		Vcc	V	LVTTTL
TX_disable Input Voltage- Low	$V_{DisL}$	0		0.8	V	
Transmitter Fault Output-High	$V_{FaultH}$	2		Vcc	V	OC oupput
Transmitter Fault Output-Low	$V_{FaultL}$	0		0.8	V	
<b>Receiver</b>						
Differential Data Output Swing	Vdr	400		1600	mVp-p	
BPD Output Voltage High	$V_{LOSH}$	2.0		Vcc	V	LVTTTL
BPD Output Voltage Low	$V_{LOSL}$	0		0.8	V	

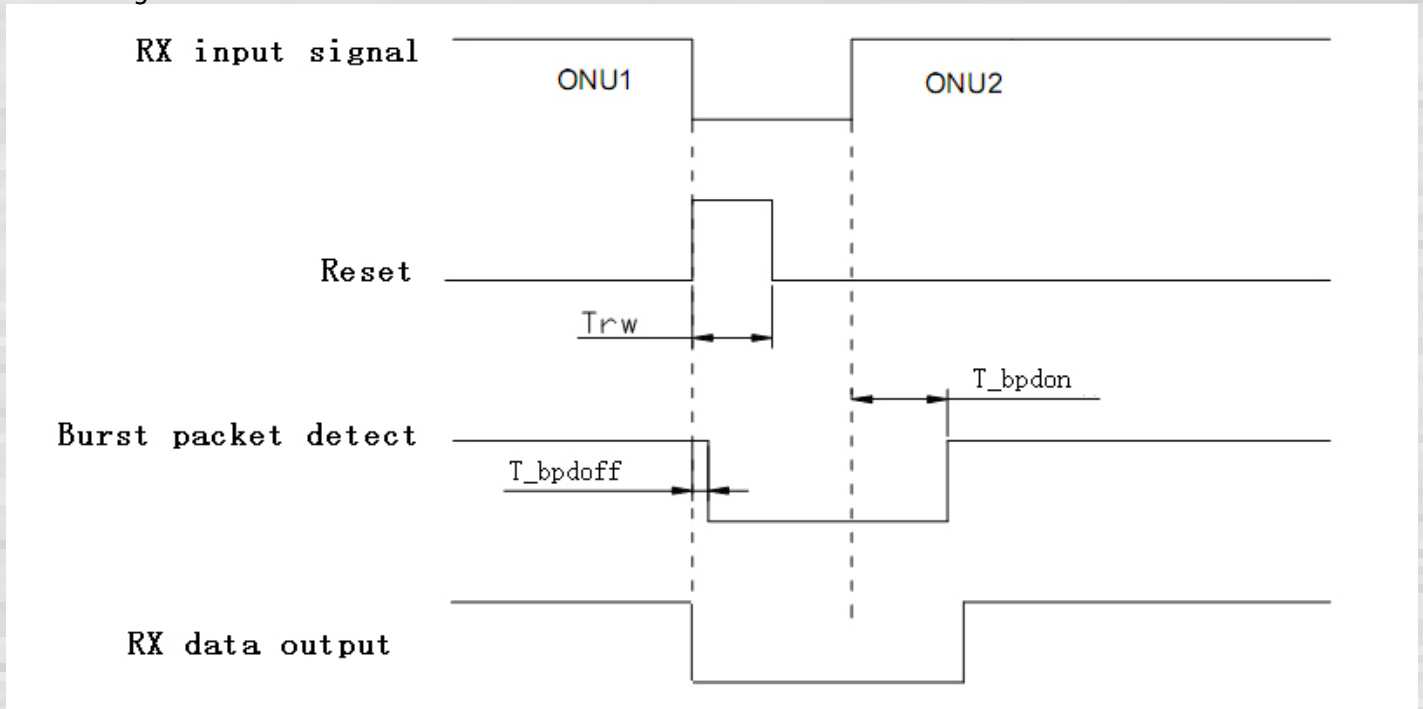


Parameter	Symbol	Min	Typ	Max	Unit
Trigger delay	Td	25			ns
Packet length		525			ns
Packet delay		0			ns
Internal I2C delay	Ts	400		500	ns





### Reset Timing Characteristics



Parameter	Symbol	Min	Typ	Max	Unit
Guard with	$T_g$	32			bit
BPD off	$T_{bpdoff}$		10	20	ns
BPD on	$T_{bpdon}$		10	20	ns



### PIN Description

20	VeeT	1	VeeT
19	TD-	2	TxFault
18	TD+	3	Tx Disable
17	VeeT	4	MOD-DEF(2)
16	VccT	5	MOD-DEF(1)
15	VccR	6	MOD-DEF(0)
14	VeeR	7	Reset
13	RD+	8	BPD
12	RD-	9	RSSI-Trigger
11	VeeR	10	VeeR

### Electrical Interface Characteristics

PIN	Name	Function	Notes
1	VeeT	Transmitter Ground	
2	TX Fault	Transmitter Fault Indication	open collector/drain output,
3	TX Disable	Transmitter Disable	Module disables on high or open
4	MOD-DEF2	Module Definition 2	2 wire serial ID interface, SDA
5	MOD-DEF1	Module Definition 1	2 wire serial ID interface, SCL
6	MOD-DEF0	Module Definition 0	Grounded in Module
7	Reset		
8	BPD	Burst packet detect	
9	RSSI-Trigger		
10	VeeR	Receiver Ground	
11	VeeR	Receiver Ground	
12	RD-	Inv. Received Data Out	DC-coupled
13	RD+	Received Data Out	DC-coupled
14	VeeR	Receiver Ground	
15	VccR	Receiver Power	3.3V± 5%
16	VccT	Transmitter Power	3.3V± 5%
17	VeeT	Transmitter Ground	
18	TD+	Transmit Data In	AC-coupled, differential lines with 100Ω differential termination inside the module
19	TD-	Inv. Transmit Data In	AC-coupled, differential lines with 100Ω differential termination inside the module
20	VeeT	Transmitter Ground	



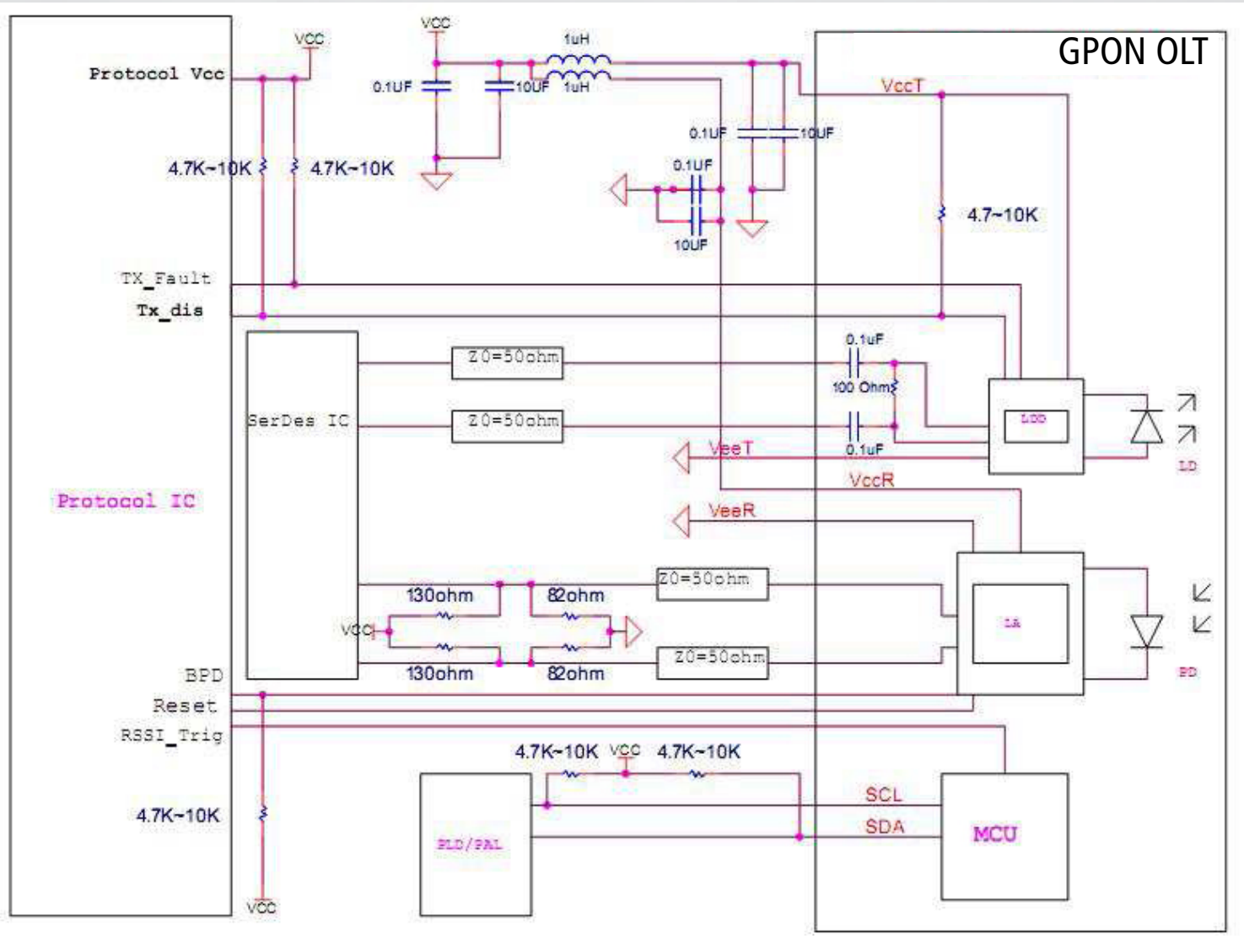
#### Notes:

1. TX Fault is an open collector/drain output, which should be pulled up with a 4.7K – 10K $\Omega$  resistor on the host board. Pull up voltage between 2.0V and VccT, R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V. TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module.
2. with a 4.7 – 10 K  $\Omega$  resistor. Its states are:

- Low (0 – 0.8V):	Transmitter on
- (>0.8, < 2.0V):	Undefined
- High (2.0 – 3.465V):	Transmitter Disabled
- Open:	Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10K $\Omega$  resistor on the host board. The pull-up voltage shall be VccT or VccR (see Section IV for further details). Mod-Def 0 is grounded by the module to indicate that the module is present Mod-Def 1 is the clock line of two wire serial interface for serial ID Mod-Def 2 is the data line of two wire serial interface for serial ID.
4. BPD is a LVTTTL out put,. When low, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). High indicates burst packet is come. In the low state, the output will be pulled to < 0.8V.
5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+ : These are the differential receiver outputs. They are AC coupled 100 $\Omega$  differential lines which should be terminated with 100 $\Omega$  (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board. The voltage swing on these lines will be between 370 and 2000 mV differential (185 – 1000 mV single ended) when properly terminated.
7. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V  $\pm$ 5% at the SFP connector pin. Maximum supply current is 300mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1 ohm should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply-filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.
8. TD-/+ : These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 $\Omega$  differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board. The inputs will accept differential swings of 500 – 2400 mV (250 – 1200 mV single-ended), though it is recommended that values.



Notes:

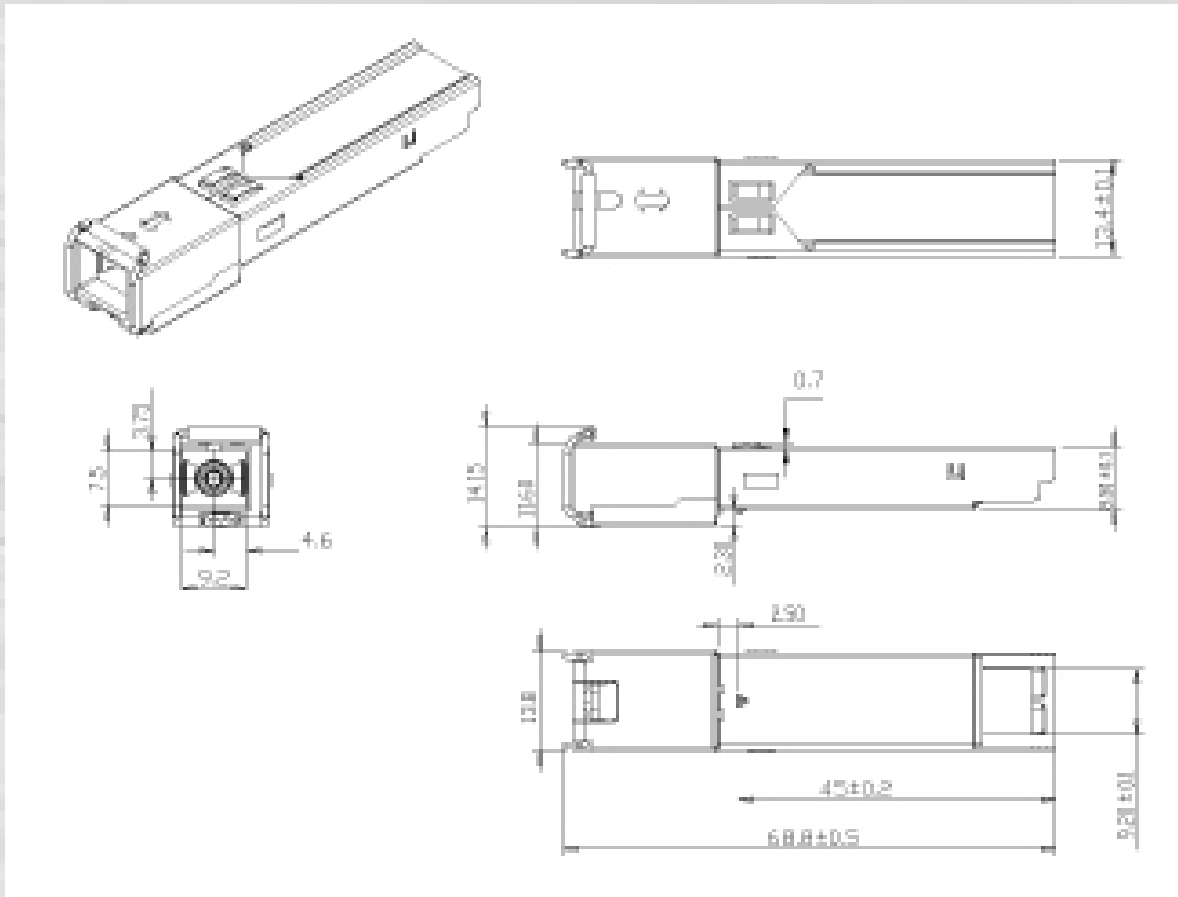






### Outline Dimensions

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



### Regulatory Compliance

Feature	Reference	Performance
Electrostatic Discharge (ESD)	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class (CISPR 22A)	Compatible with standards
Laser Eye Safety	IEC/EN 60825-1, 2	Class 1 laser product
Component Recognition	IEC/EN 60950	Compatible with standards
ROHS	2002/95/EC	Compatible with standards