100-05071-AO

Calix® 100-05071 Compatible TAA Compliant 2.4Gbs/1.2Gbs-C+ SFP Transceiver (SMF, 1490nmTx/1310nmRx, SC, -40C to 85C)

Features

- 1310nm Burst-Mode APD/TIA Receiver and 1490nm Continuous DFB Laser Transmitter
- Excellent EMI and EMC
- Integrated Single Fiber Bi-Directional Optical Sub-Assembly
- Hot-Pluggable
- Low Power Consumption
- Single SC Receptacle Optical Interface
- Digitized Burst-Mode Optical Power Monitoring
- Guard Time Squelch Function
- Operating Temperature: -40 to 85 Celsius
- CML Compatible Data Input and Output Interface
- RoHS Compliant and Lead-Free

Applications

- Access and Enterprise
- GPON OLT

Product Description

This Calix® SFP transceiver provides 2.5Gbps/1.25Gbps-C++ throughput up to 60km over single-mode fiber (SMF) using a wavelength of 1490nmTx/1310nmRx via a SC connector. It is guaranteed to be 100% compatible with the equivalent Calix® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

AddOn's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."

TAA COMPLIANT

Absolute Maximum Ratings

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature		TS	-40		85	°C	
Operating Case Temperature		Tc	-40		85	°C	
Relative Humidity		RH	5		95	%	
Supply Voltage		Vcc	0		4.0	V	
Input Voltage		Vin	-0.5		Vcc	V	
Pin Input Voltage		V	GND		Vcc		
Receiver Damage Threshold		dBm	3				
Data Rate	**Tx Side**			2488.32		Mbps	
	Rx Side			1244.16		Mbps	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Module Supply Current	Icc			500	mA	
LVPECL Differential Data Input Swing		200		1600	mV	1
LVPECL Differential Data Output Swing		400		1600	mV	2
Differential Data Input Impedance			100		Ω	1
Input Signal Level (LVTTL H)		2.0		Vcc	V	
Input Signal Level (LVTTL L)		0		0.8	V	
Output Signal Level (LVTTL H)		2.4		Vcc	V	
Output Signal Level (LVTTL L)		0		0.4	V	

Notes:

1. AC Coupled Internal.
2. DC Coupled Internal.

Optical Characteristics

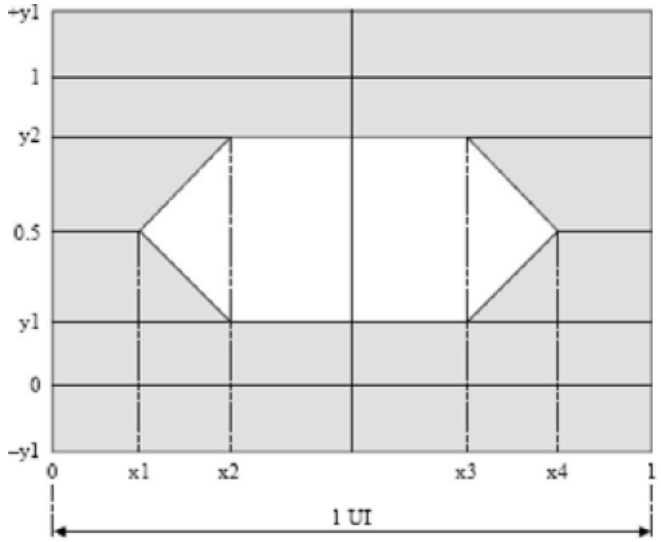
Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Center Wavelength Range		λc	1480	1490	1500	nm	1
Spectral Width(@-20Db)		Δλ			1	nm	
Side Mode Suppression Ratio		SMSR	30			dBm	
Launch Optical Power(BOL)		PBOL	+5.0		9	dB	2
Off level light					-39	dB	3
Extinction Ratio		EX	8.2			Ω	4
Total Jitter		Jtotal			0.2	us	
Rise/Fall time(20-80%)		Tr/Tf			250	ms	5
RIN15OMA					-115	us	
Optical Return Loss Tolerance					15	ms	
Maximum reflectance					-12	us	6
Eye Diagram			Compliant with ITU-T G.984.2				4,7
Receiver							
Centre Wavelength		λc	1260	1310	1360	nm	
Receiver Sensitivity(EOL)		Pmin			-33	dBm	8
Input Optical Power Overload		Pin	-14			dBm	8
Receiver Settling Time		Tsettling			35	ns	9,15
Reset to Data Time		Trd	15			ns	11,15
Reset Pulse Width		Treset		16		bit	15
Guard Time		Tguard	32			bit	11,15
Receiver reflectance					-20	dB	12
Signal Detect (LVTTL)	**Optical De-Assert**		-45			dBm	
	Optical Assert				-34		
Signal Detect Hysteresis			0.5		6	dB	
Measurement Accuracy of Received Burst Optical Power			-3		3	dB	13
Burst Optical Power Conversion Settling Time		BOPCS Time	25			ns	16
Burst Optical Power Conversion Holding Time		Holding Time	350			ns	16
Burst Optical Power Conversion Time					500	us	14

Notes:

1. DFB-LD
2. Coupled into 9/125 SMF.
3. Measured without data input.

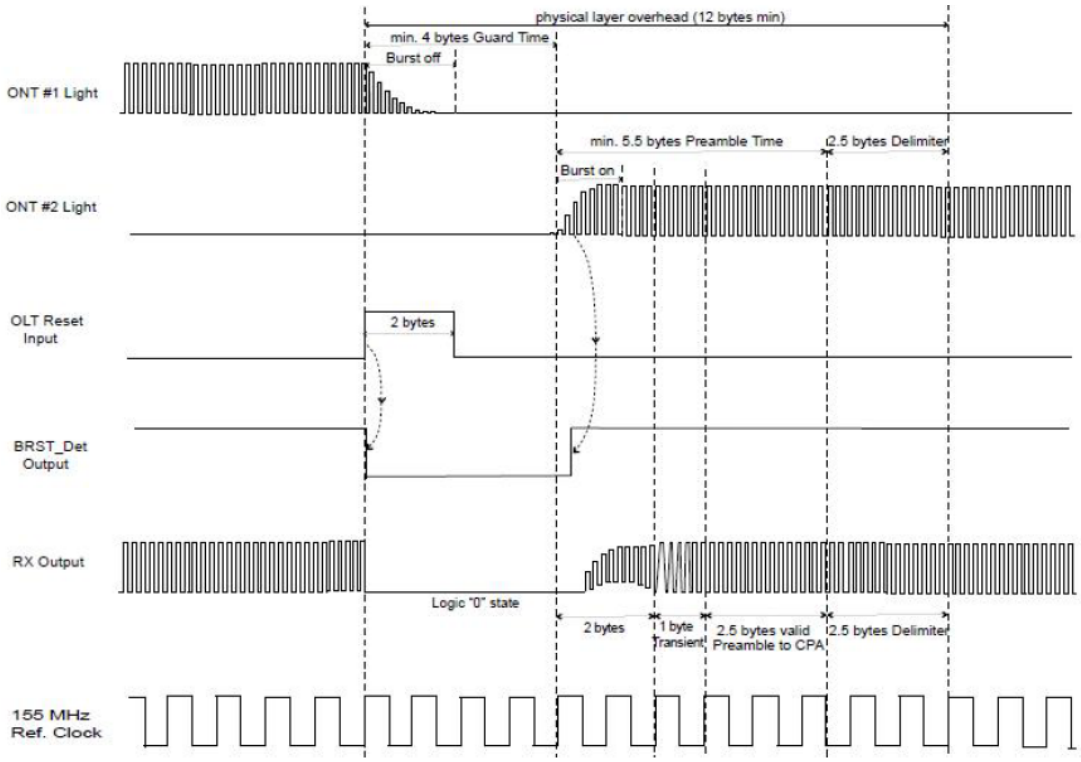
4. Measured with PRBS 2^{23}-1 test pattern @2.488Gbps.
5. Measured with the Bessel-Thompson Filter OFF.
6. λ=1.49nm.
7. See Mask Diagram below.
8. Measured with PRBS 2^{23}-1 test pattern @1.244 Gbps with Gbps on ER=10dB, BER≤10E-10.
9. Time from the arrival of data to the output data settling to within 15% of final amplitude and duty-cycle.
10. Time from a falling edge on reset signal input to the start of preamble at the data input of the receiver.
11. Time from end of previous data burst to beginning of the next data burst.
12. λ=1.31nm.
13. Measured with PRBS23 data pattern @1.244Gbps
14. result can be read out since rising edge of the trigger pulse.
15. See Time parameter definition in GPON system.
16. See Trigger sequence definition in GPON system.

Eye Mask Diagram

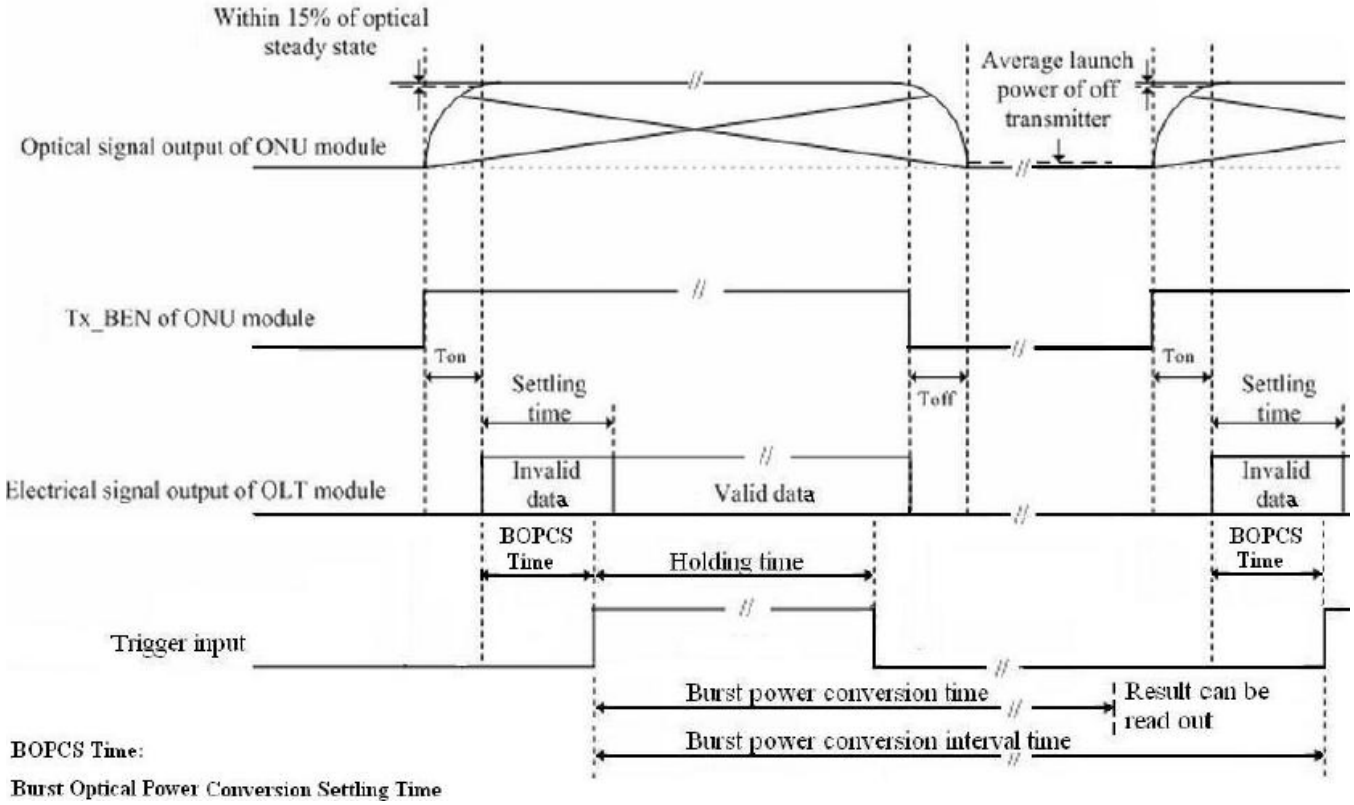


	1244.16 Mbps	**2488.32 Mbps**
x1/x4	0.28/0.72	
X2/x3	0.40/0.60	
X3-x2		0.2
y1/y2	0.20/0.80	0.25/0.75

Time parameter definition in GPON system



Trigger sequence definition in GPON system



Pin Description

Pin	Symbol	Name/Description	Plug Seq.	Notes
1	VeeT	Transmitter Ground.	1	
2	TX Fault	Transmitter Fault Indication.	3	1
3	TX Disable	Transmitter Disable-Module disables on high or open.	3	2
4	MOD-DEF2	Module Definition 2-Two wire serial ID interface.	3	3
5	MOD-DEF1	Module Definition 1-Two wire serial ID interface.	3	3
6	MOD-DEF0	Module Definition 0-Two wire serial ID interface	3	3
7	Reset	Reset signal input.	3	8
8	BPD	Burst Power Detect (active HIGH).	3	4
9	Trigger	Trigger input of burst signal packet received.	3	9
10	VeeR	Receiver Ground.	1	
11	VeeR	Receiver Ground.	1	
12	RD-	Inverted Received Data out.	3	5
13	RD+	Received Data out.	3	5
14	VeeR	Receiver Ground.	1	
15	VccR	Receiver Power supply, +3.3V±5%	2	6
16	VccT	Transmitter Power supply, +3.3 V±5%	2	6
17	VeeT	Transmitter Ground.	1	
18	TD+	Transmitter Data In.	3	7
19	TD-	Inverted Transmitter Data In.	3	7
20	VeeT	Transmitter Ground.	1	

Notes:

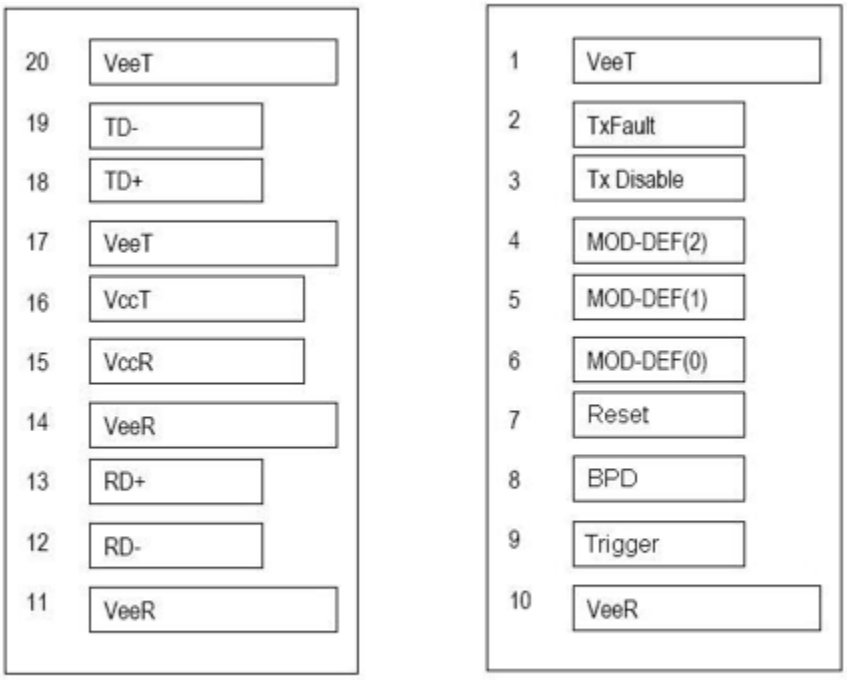
1. Tx_Fault is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board to supply VccT/R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to <0.8V.
2. Tx_Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7kΩ to 10kΩ resistor. Its states are:

   Low (0V to 0.8V): Transmitter On
   (>0.8 and <2V): Undefined
   High (2.0V to 3.465V): Transmitter Disabled
   Open: Transmitter Disabled
3. MOD-DEF0, 1, 2. These are the module definition pins. They should be pulled up with a 4.7kΩ–10kΩ resistor on the host board to supply less than VccT/R+0.3V.

   MOD-DEF 0 is grounded by the module to indicate that the module is present.
   MOD-DEF 1 is the clock line of 2-wire serial interface for optional serial ID.
   MOD-DEF 2 is the data line of 2-wire serial interface for optional serial ID.

4. BPD (Burst Power Detect) is pulled up internally with a 10K resistor to VccR. 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 normal operation. In the low state, the output will be pulled to <0.8V.
5. RD-/+. These are the differential receiver outputs. They are DC-coupled, 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The DC coupling is done inside the module.
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.
8. Reset input compliant with LVTTL. It will be asserted HIGH at the end of a burst packet.
9. Trigger input compliant with LVTTL. One positive pulse will issue a burst optical power conversion.

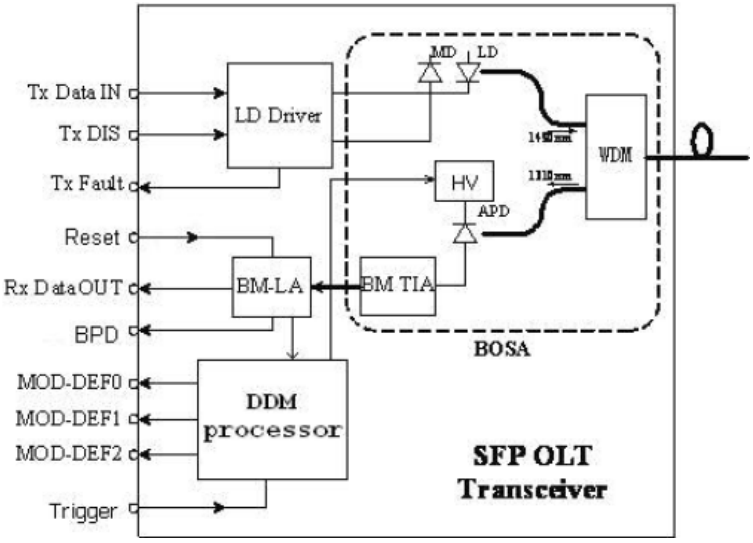
Electrical Pad Layout



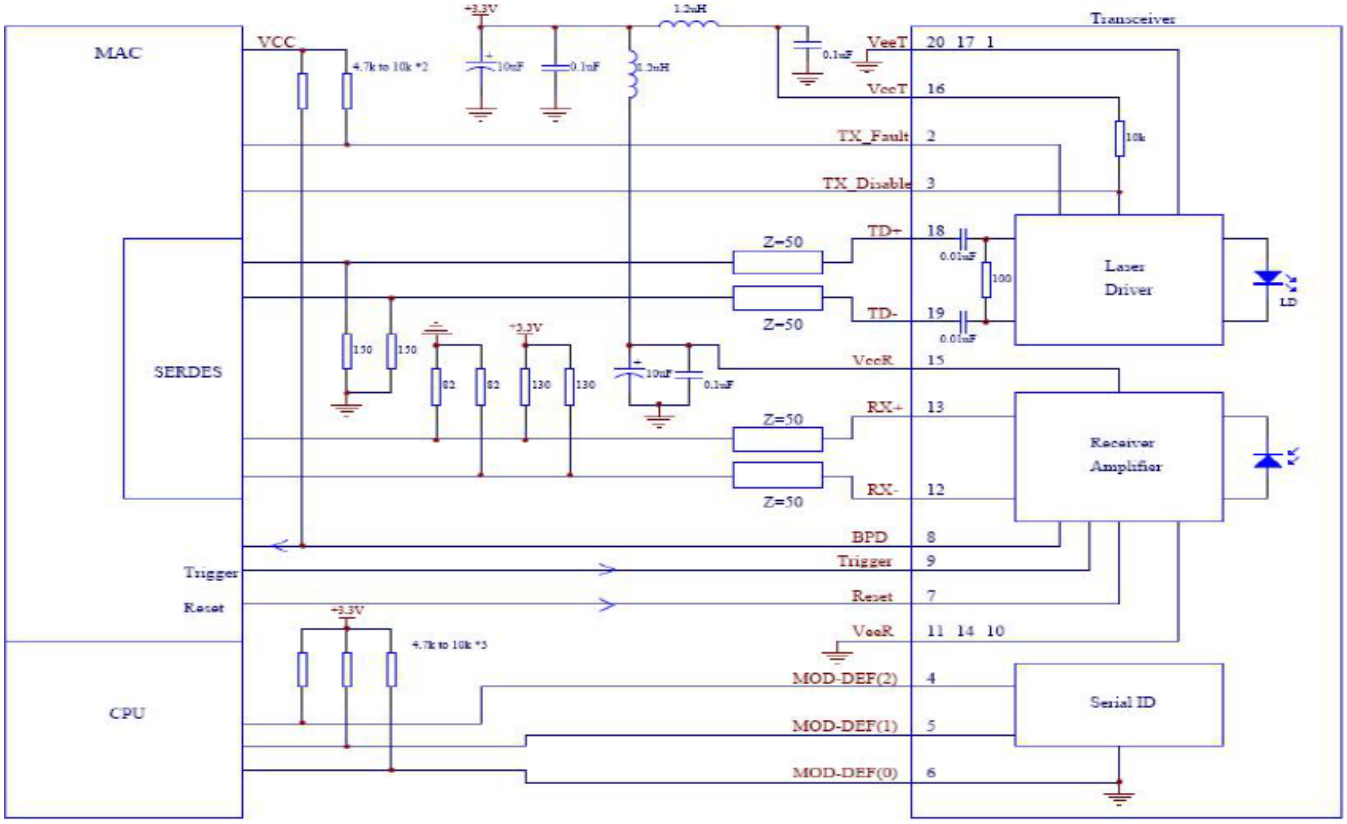
Top of Board

Bottom of Board (as viewed thru top of board)

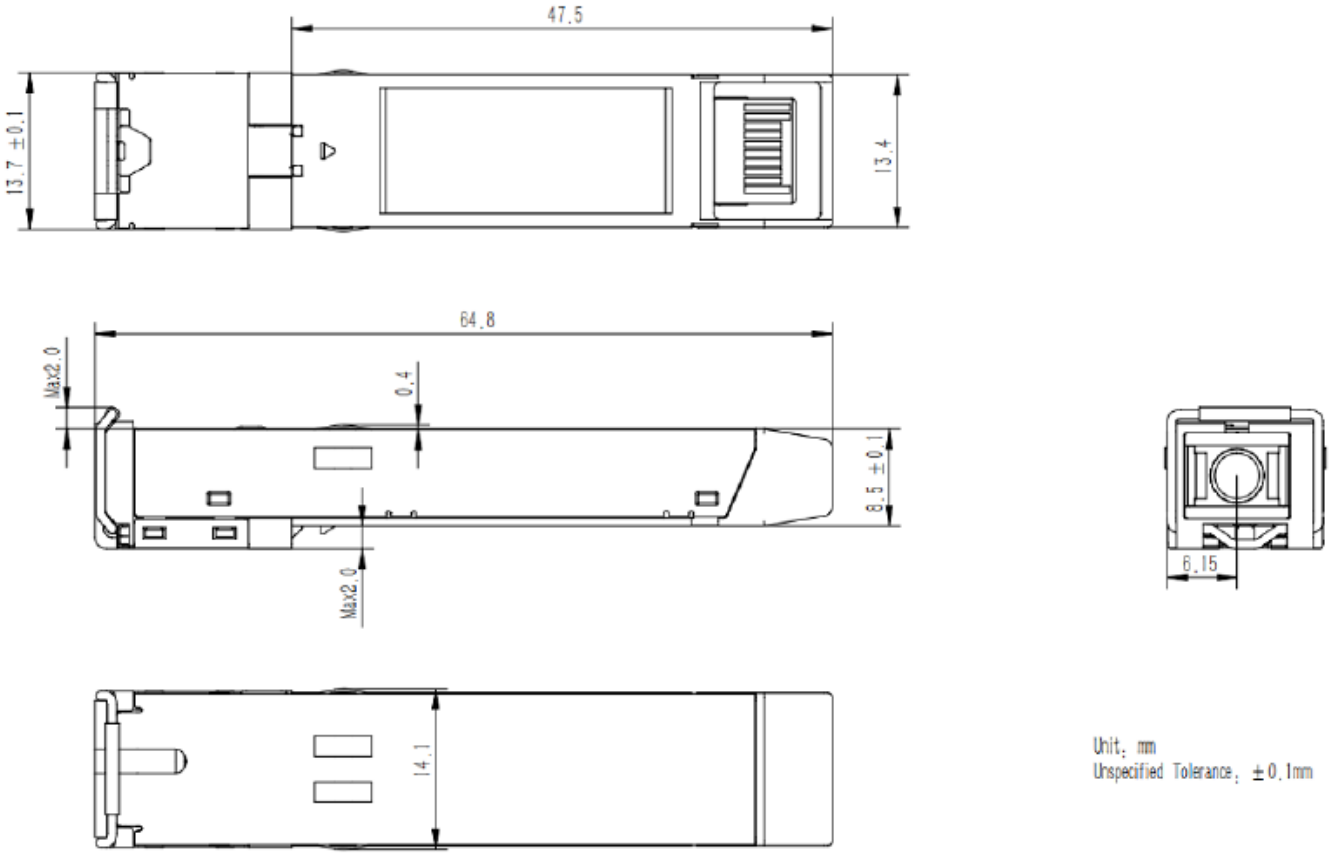
Block Diagram



Typical Application Circuit



Mechanical specifications



Unit: mm
Unspecified Tolerance: ±0.1mm

About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is in engrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.

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