100-01784-AO

Calix® 100-01784 Compatible TAA Compliant 2.4Gbs/1.2Gbs-B+ SFP Transceiver (SMF, 1490nmTx/1310nmRx, 40km, SC)

Features

- INF-8074 and SFF-8472 Compliance
- Simplex SC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free

Applications

- GPON
- Access and Enterprise

Product Description

This Calix® 100-01784 compatible SFP transceiver provides 2.4Gbs/1.2Gbs-B+ throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1490nmTx/1310nmRx via an LC 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. It is built to meet or exceed the specifications of Calix®, as well as to comply with MSA (Multi-Source Agreement) standards to ensure seamless network integration. 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

Rev. 101921

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	Vcc	3.14	3.46	V
Storage Temperature	TS	-40	85	°C
Operating Case Temperature	Tc	0	70	°C
Data Rate Drift		-100	+100	PPM
Receiver Damaged Threshold		3		dBm

Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.14	3.	3.46	V	
Power Supply Current	Icc			350	mA	
Transmitter						
Differential data input swing	Vin,pp	200		1600	mV	
Input differential impedance	Zin		100		Ω	
Input Signal Level (LVTTL L)	V	0		0.8	V	
Input Signal Level (LVTTL H)	V	2.0		Vcc	V	
Receiver						
Differential data output swing	Vout, pp	300		1200	mV	
Output differential impedance	Zin		100		Ω	
Output Signal Level (LVTTL H)	V	2.4		V_{CC}	V	
Output Signal Level (LVTTL L)	V	0		0.4	V	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Transmitter Type	1310nm DFB Laser					1
Signaling Speed	Stx	1244			Mb/s	
Optical Power (average)	P_{AVE}	1.5		5	dBm	2
Optical Extinction Ratio	ER	10			dB	
Optical Center Wavelength	λC	1290		1330	nm	
Optical Output with TX OFF				-45	dBm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Output Eye		Compliant with G.984. 2		Data Rate=1244Mb/s		
Tx Burst Enable/Disable Time	$T_{on/off}$			12.8	ns	
Receiver						
Receiver Type	1490nm APD/TIA Receiver					
Signaling Speed	SRX	2488			Mb/s	
Receiver Sensitivity (average)	R_{AVE}			-28	dBm	3
Receiver overload	P_{max}	-8			dBm	
LOS Assert	LOS_A	-45			dBm	
LOS De-Assert	LOS_D			-30	dBm	
LOS Hysteresis	LOS_H	0.5			dB	

Notes:

1. Burst-mode
2. Measured with PRBS 223-1@1244.16Mbit/s, and the filter is turned on.
3. @BER 10^{-10} PRBS 2^{23}-1

Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	VeeT	Transmitter Ground	1
2	Tx_FaulT	Transmitter Fault indication	2
3	TX_Burst	Transmitter Burst control, (LVTTL)	3
4	SDA	Module Definition 2, SDA Serial Data Signal	4
5	SCL	Module Definition 1, SCL Serial Clock Signal	4
6	MOD_Det	Module Definition 0. Grounded within the module	4
7	TX_SD	Transmitter signal detect	5
8	LOS	Loss of Signal, need external 4.7k~10k pull up resistor	6
9	VeeR	Receiver Ground	1
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverted Received Data Out	7
13	RD+	Received Data Out	7
14	VeeR	Receiver Ground (optional no connection)	1
15	VccR	Receiver power supply	8
16	VccT	Transmitter power supply	8
17	VeeT	Transmitter Ground	1
18	TD+	Transmit Data In	9
19	TD-	Inverted Transmit Data In	9
20	VeeT	Transmitter Ground	1

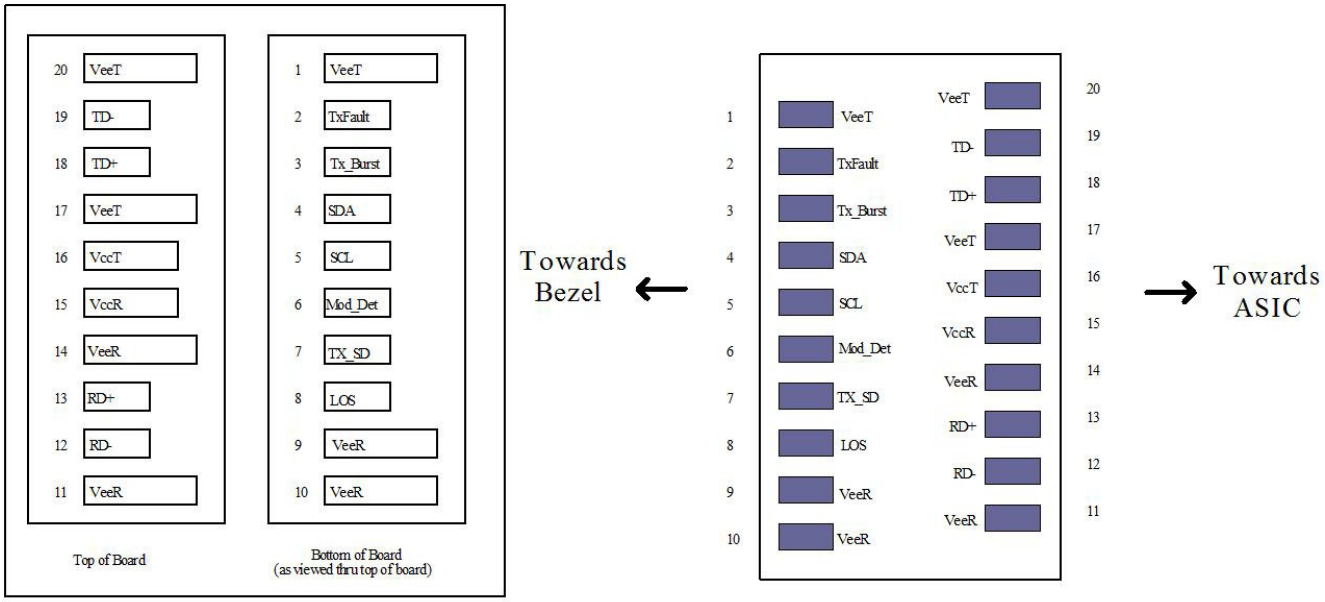
Notes:

1. VeeR and VeeT internally connected within the PON module.
2. TX Fault indicates the status of module with pull up resistor of 10 KΩ externally. 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.
3. TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 10KΩ resistor. (See Timing Parameter Definition in Burst Mode Sequence)
4. These are the module definition pins.

   SDA is serial data signal with 10 KΩ pull up resistor externally. SCL is serial clock signal with 10 KΩ pull up resistor externally.

   MOD_Detis grounded internally and need 10 KΩ pull up resistor externally to indicate that the module is present.
5. TX_SD function with 1KΩ pull up resistor internally, it monitors the state of the LD laser, when the MAC enables the module, the TX_SD goes high within a short time.

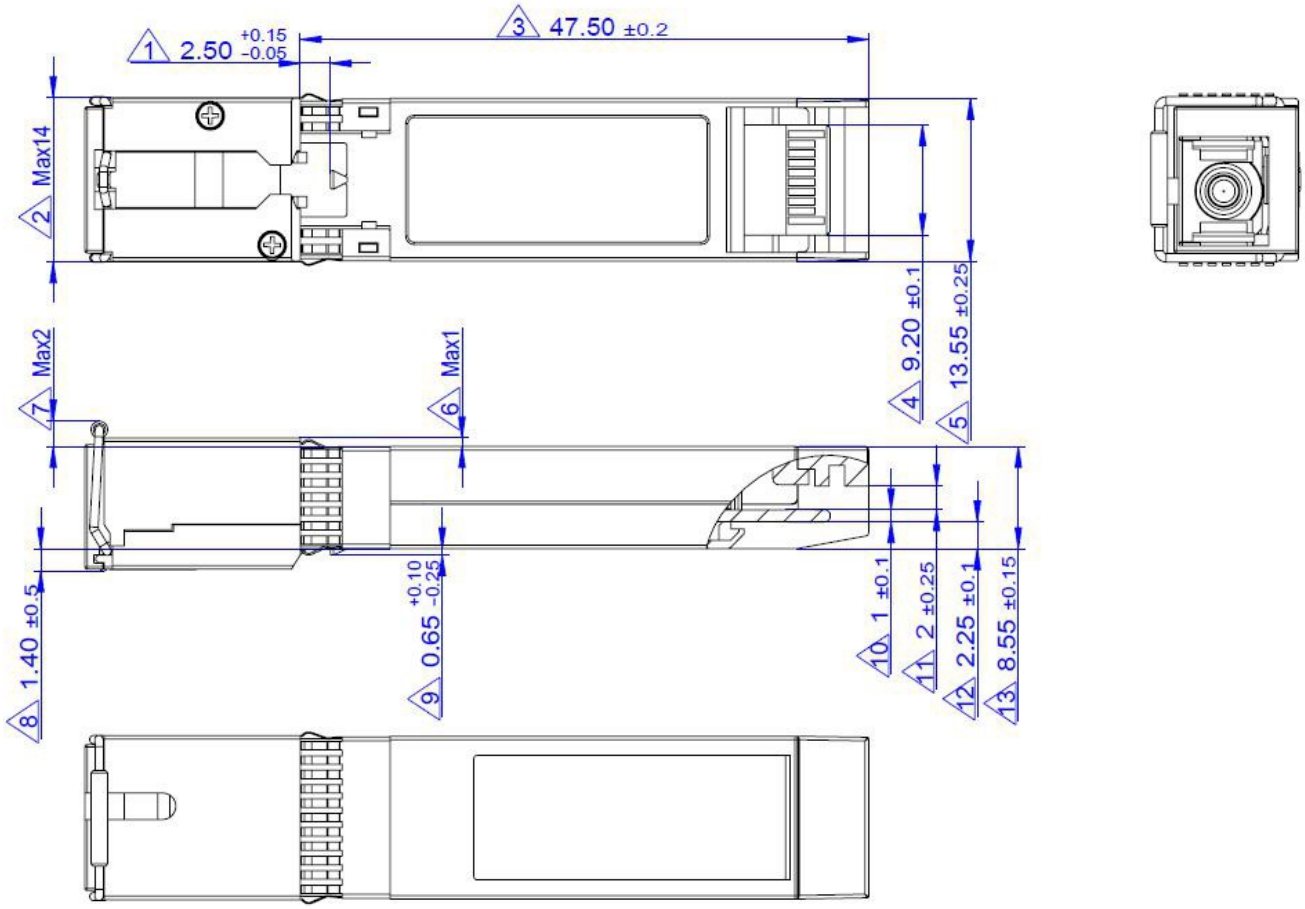
6. LOS (Loss of Signal) indicates the status of received optical power with 10 KΩ pull up resistor externally. Pull up voltage between 2.0V and VccT, R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.
7. RD -/+: These are the differential receiver outputs. They are AC-coupled with CML voltage level and required 100ohm resistor to match the differential termination.
8. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V±5% at the SFP connector pin. Maximum supply current is 300 mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than1Ωshould be used in order to maintain the required voltage at the SFP input pin with 3.3Vsupply 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 30 mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.
9. TD-/+: These are the differential transmitter inputs. They are AC or DC-coupled, differential lines with 100Ω differential termination inside the module. The AC or DC coupling is done inside the module and is thus not required on the host board.



SFP Transceiver Electrical Pad Layout

Host Board Connector Pad Layout

Mechanical Specifications



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED UNIT: mm

Digital Diagnostic Functions

This module supports the 2-wire serial communication protocol as defined in the SFP MSA. Digital diagnostic information is accessible over the 2-wire interface at the address 0xA2. Digital diagnostics for this transceiver is internally calibrated by default. A micro controller unit inside the transceiver gathers the monitoring information and reports the status of transceiver.

Transceiver Temperature, internally measured, represented as a 16 bit signed twos complement value in increments of 1/256 degrees Celsius, Temperature accuracy is better than ±3 degrees Celsius over specified operating temperature and voltage.

Transceiver Supply Power, internally measured, represented as a 16 bit unsigned integer with the voltage defined as the full 16 bit value (0 – 65535) with LSB equal to 100 µVolt, yielding a total range of 0 to +6.55 Volts.

Transceiver TX bias current, internally measured, represented as a 16 bit unsigned integer with the current defined as the full 16 bit value (0 – 65535) with LSB equal to 2 µA, yielding a total range of 0 to 131mA. Accuracy is better than ±10% over specified operating temperature and voltage.

Transceiver TX output power, internally measured, represented as a 16 bit unsigned integer with the power defined as the full 16 bit value (0 – 65535) with LSB equal to 0.1 µW. Data is assumed to be based on measurement of laser monitor photodiode current. Accuracy is better than ±3dB over specified temperature and voltage. Data is not valid when the transmitter is disabled.

Transceiver RX received optical power, internally measured, represented as a 16 bit unsigned integer with the power defined as the full 16 bit 35 value (0 – 65535) with LSB equal to 0.1 µW. Accuracy is better than ±3dB over specified temperature and voltage.

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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