FC95700180-I03-AO

Fujitsu® FC95700180-I03 Compatible TAA OC-48-LR SFP Transceiver Multi-Rate (SMF, 1310nm, 40km, LC, DOM)

Features

- INF-8074 and SFF-8472 Compliance
- Duplex LC 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

- OC-48 Transmission
- Access and Enterprise

Product Description

This Fujitsu® FC95700180-I03 compatible SFP transceiver provides OC-48 (2488mbs) transmission rates for up to 40km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Fujitsu® 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 Fujitsu®, 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

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.	Typ	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5		3.6	V
Storage Temperature	TS	-40		85	°C
Operating Case Temperature	Tc	0		70	°C
Operating Relative Humidity	RH			95	%
Data Rate			2.488		Gbps

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.13	3.3	3.45	V	
Power Supply Current		Icc			300	mA	
Transmitter							
LVPECL Inputs (Differential)		Vin	400		1600	mVp-p	1
Input Impedance (Differential)		Zin	85	100	115	ohms	2
TX Disable	Disable		2		Vcc+0.3	V	
	Enable		0		0.8	V	
TX Fault	Fault		2		Vcc+0.3	V	
	Normal		0		0.5	V	
Receiver							
LVPECL Outputs (Differential)		Vout	400	800	1200	mVp-p	2
Output Impedance (Differential)		Zout	85	100	115	ohms	
TX_Disable Assert Time		T_off			10	us	
RX_LOS	LOS		2		Vcc+0.3	V	
	Normal		0		0.8	V	
MOD_DEF (0,2)		VoH	2.5			V	3
		VoL	0		0.5	v	3

Notes:

1. AC coupled.
2. Rin > 100 kohms @ DC
3. With Serial ID

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
9μm Core Diameter SMF	L		40		km	
Data Rate			2.488		Gbps	
Transmitter						
Center Wavelength	λ_c	1260	1310	1360	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Output Power	Pout	-2		3	dBm	2
Extinction Ratio	ER	8.2			dB	3
Rise/Fall Time (20%~80%)	tr/tf			160	ps	
Total Jitter	TJ			0.07	UI	
Output Optical Eye	ITU-T G.957 Compliant					
Pout@TX Disable Asserted	Pout			-45	dBm	
Receiver						
Center Wavelength	λ_C	1260		1600	nm	
Receiver Sensitivity	Pmin			-28	dBm	
Receiver Overload	Pmax	-9			dBm	
LOS De-Assert	LOS_D			-29	dBm	
LOS Assert	LOS_A	-40			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. LVPECL logic, internally AC coupled.
2. Output power is measured by coupling into a 9/125 mm multi-mode fiber.
3. Filtered, measured with a PRBS 2^{23}-1 test pattern @2500Mbps.
4. Minimum average optical power is measured at BER less than 1E-12, with 2^23-1 PRBS and ER=9 dB.

Pin Descriptions

| Pin	Symbol	Name/Descriptions	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	5
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2; Module disables on high or open
4	MOD-DEF2	Module Definition 2	3	3; 2 wire serial ID interface
5	MOD-DEF1	Module Definition 1	3	3; 2 wire serial ID interface
6	MOD-DEF0	Module Definition 0	3	3; Grounded within the module
7	Rate Select	Not Connect	3	Function no available
8	LOS	Loss of Signal	3	4
9	VeeR	Receiver Ground	1	5
10	VeeR	Receiver Ground	1	5
11	VeeR	Receiver Ground	1	5
12	RD-	Inv. Received Data Out	3	6
13	RD+	Received Data Out	3	7
14	VeeR	Receiver Ground	1	5
15	VccR	Receiver Power	2	7; 3.3 ± 5%
16	VccT	Transmitter Power	2	7; 3.3 ± 5%
17	VeeT	Transmitter Ground	1	5
18	TD+	Transmit Data In	3	8
19	TD-	Inv. Transmit Data In	3	8
20	VeeT	Transmitter Ground	1	5

Notes:

1. TX Fault is an open collector/drain output, which should be pulled up with a 4.7K-10K 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.

2. TX disable is an input that is used to shut down the transmitter optical output. It is pulled up withing the module with a 4.7-10K resistor. Its states are:

   Low (0-0.8V): Transmitter on (>0.8, 2.0V): Undefined

   High (2.0-3.465V): Transmitter Disabled: Transmitter Disabled.

3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K -10k resistor on the host board. The pull-up voltage shall be VccT or VccR.

   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. LOS (Loss if Signal) is an open collector/drain output, which should be pulled up with a 4.7K-10K resistor. Pull up voltage between 2.0V and VccT/R+0.3V. When high, this output indicated the received optical

power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicated normal operation. 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 differential Lines which should be terminated with 100 (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 400 and 2000 mV differential (200 –1000 mV single ended) when properly terminated.
7. 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 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 in rush 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 differential terminations inside the module. The AC coupling is done inside the module and is thus not required on the host board. The inputs wil accept differential swings of 400-2000mV (200-1000mV single-ended)
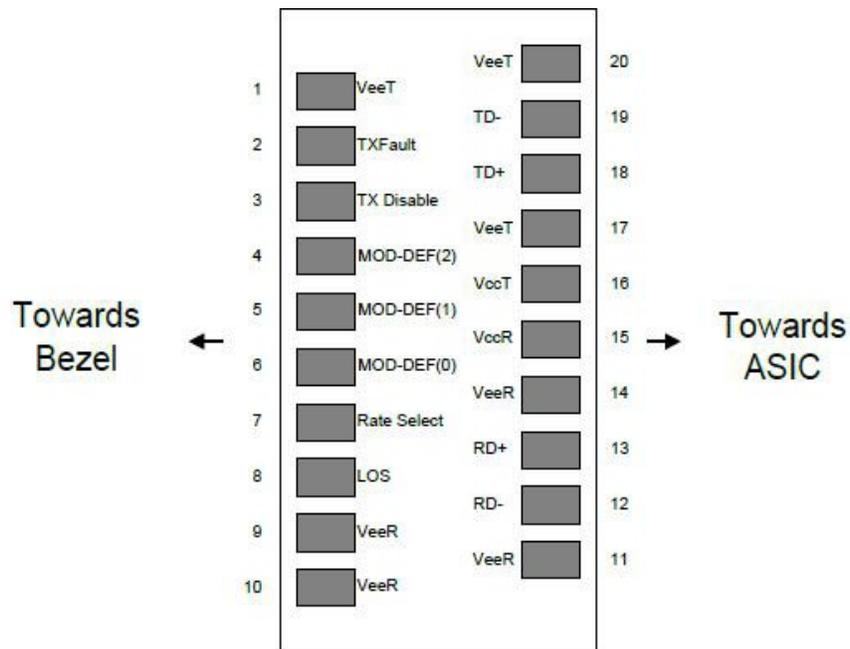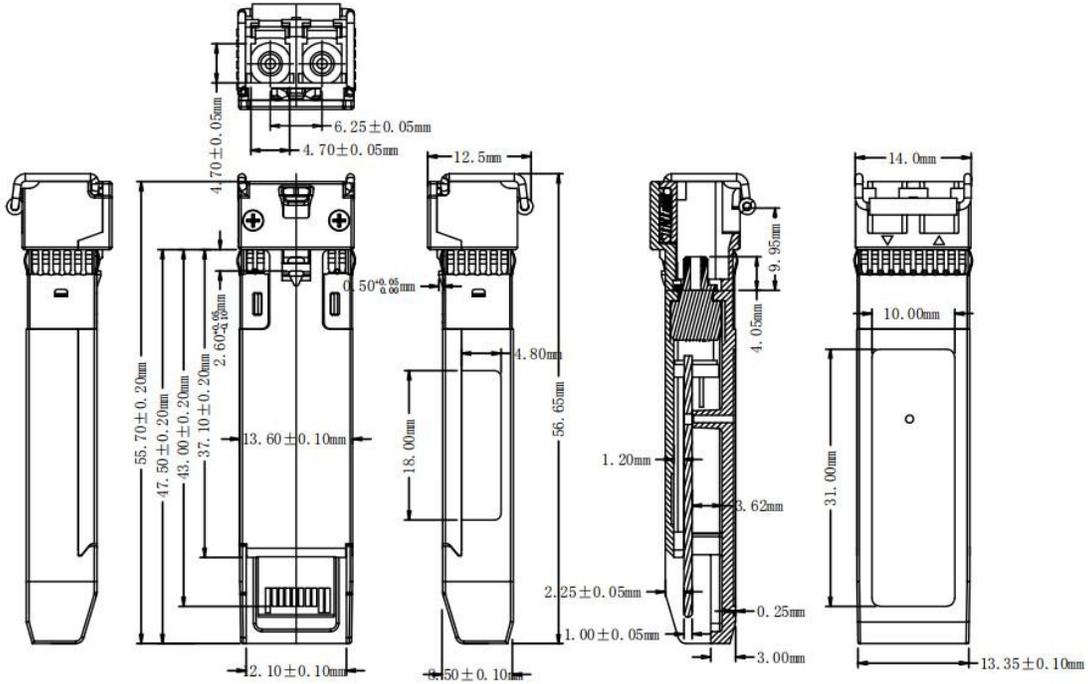

Pin-out of connector Block on Host board

Recommended Circuit Schematic
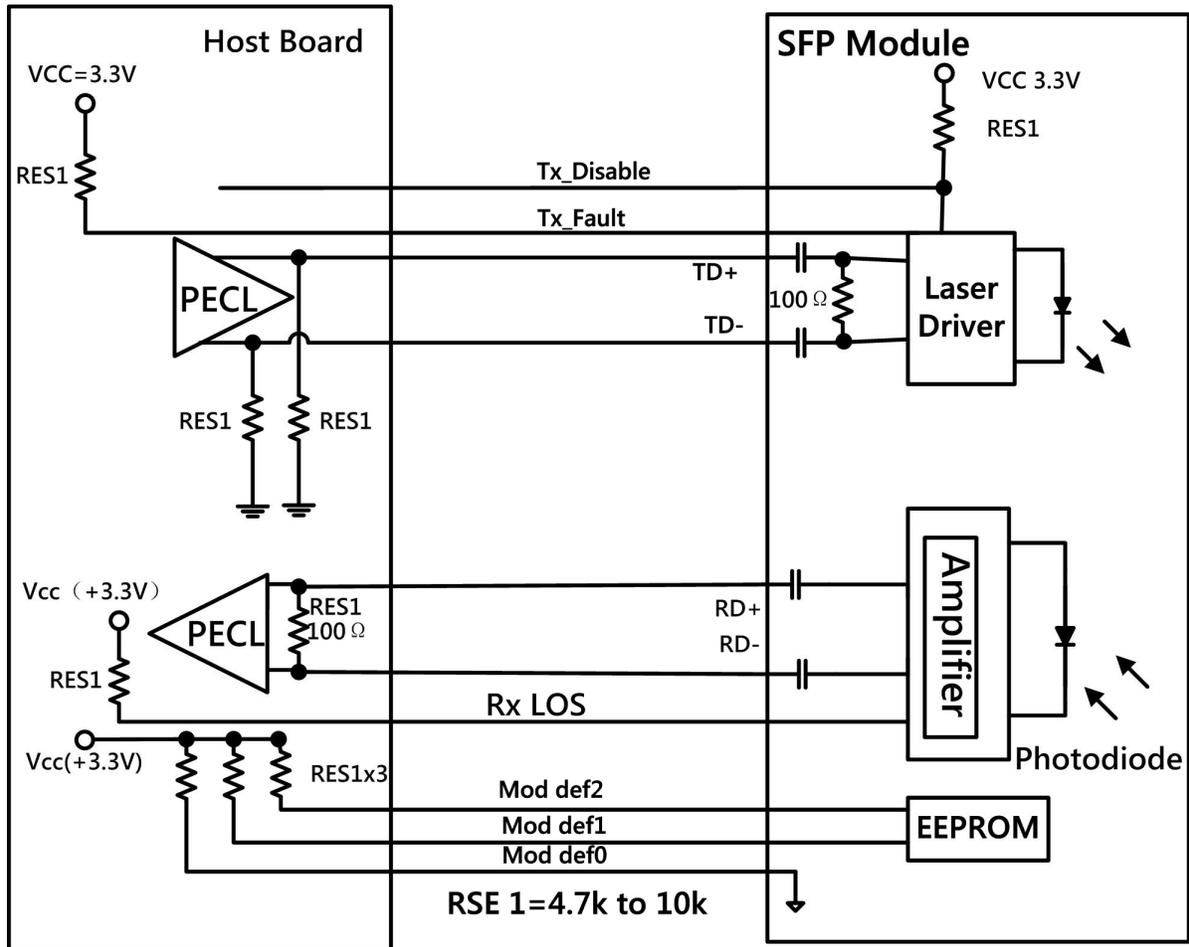
Mechanical Specifications

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).

EEPROM Information

EEPROM memory map specific data field description is as below:

2 wire address 1010000X(A0h)

0	Serial ID Defined by SFP MSA(96 bytes)
95	
	Vendor Specific (32 bytes)
127	
	Reserved (128 bytes)
255	

2 wire address 1010000X (A2h)

0	Alarm and warning Thresholds(56 bytes)
55	Cal Constants (40 bytes)
95	Real Time Diagnostic Interface(24 bytes)
119	Vendor Specific(8 bytes)
127	User Writable EEPROM(120 bytes)
247	Vendor Specific(8 bytes)
255	

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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