1442543F2-AO

ADTRAN® 1442543F2 Compatible TAA 1G/10GBase-N2/C+ SFP+ OLT Transceiver (SMF, 1577nmTx/1270nmRx and 1490nmTx/1310nmRx, 20km, SC, -40 to 85C)

Features

- Hot Pluggable SFP+
- 4 Lambda
- 3.3V DC Power Supply
- 2x10 SFP+ Electrical Interface
- ITU-T G.9807.1 Class N1/N2 compliant
- SC receptacle optical connector
- ITU-T G.984.2 Class B+/C+ compliant
- ITU-T G.987.2 Class N1/N2a compliant
- RoHS compliant and Lead Free
- Industrial Temperature -40 to 85 Celsius

Applications

- PON
- Access and Enterprise

Product Description

This ADTRAN® 1442543F2 compatible SFP+ transceiver provides 1G/10GBase-N2/C+ throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1577nmTx/1270nmRx and 1490nmTx/1310nmRx via a SC connector. It is guaranteed to be 100% compatible with the equivalent ADTRAN® 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."

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage	VCC3	0	3.6	V
Storage Ambient Temperature	T_{stg}	-40	+85	°C
Operating Case Temperature	Tc	-40	+85	°C
Relative Humidity Storage	RH_S	5	90	%
Relative Humidity Operating	RH_O	5	85	%

Note:

Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.

Absolute Maximum Ratings: Control Function Logic Levels

Parameter	Symbol	Min.	Max.	Unit	Notes
Tx_DISABLE	Tx_Dis	0	V_{CC3}+0.5	V	LVTTL
Burst Mode SIGNAL Detect	Rx_SD	0	V_{CC3}+0.5	V	LVTTL
Rx_Reset	Rx_Reset	0	V_{cc3}+0.5	V	1
Digital Rx_RSSI_Trigger Input	TRI	0	V_{CC3}+0.5	V	1
I²C Serial Data	SDA	0	V_{CC3}+0.5	V	2
I²C Serial Clock	SCL	0	V_{CC3}+0.5	V	1

Notes:

1. Signal Ended LVTTL input
2. Single Ended LVTTL I/O

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc3	3.135	3.30	3.465	V	
Power Supply Current	Icc3		750		mA	
Power Consumption	P			3.5	W	
Transmitter						
Tx Differential Input Impendence	Z_{IN}	90	100	110	Ω	
10Gb/s Tx Differential Input Amplitude	V_{IN10}	120		800	mV	
2.5Gb/s Tx Differential Input Amplitude	V_{IN1}	120		800	mV	
Tx_Dis = HIGH (Transmitter OFF / DISABLED)	V_{TDH}	$0.7*V_{CC3}$		VCC3	V	1
Tx_Dis = LOW (Transmitter ON / ENABLED)	V_{TDL}	0		0.8	V	1
Receiver						
Rx Differential Output Impendence	Z_{OUT}	90	100	110	Ω	
10Gb/s Rx_Data Differential Output Voltage Amplitude	V_{OUT10}	300		850	mV	LVCML
10Gb/s Output HIGH Voltage	V_{OH10}	$V_{cc3}-20$	$V_{cc3}-5$	V_{cc3}	mV	LVCML
10Gb/s Output LOW Voltage	V_{OL10}	$V_{cc3}-400$	$V_{cc3}-350$	$V_{cc3}-300$	mV	LVCML
1.25Gb/s Rx_Data Differential Output Voltage Amplitude	V_{OUT1}	600		1600	mV	LVPECL
1.25Gb/s Output HIGH Voltage	V_{OH1}	$V_{cc3}-1085$	$V_{cc3}-955$	$V_{cc3}-880$	mV	LVPECL
1.25Gb/s Output LOW Voltage	V_{OL1}	$V_{cc3}-1850$	$V_{cc3}-1705$	$V_{cc3}-1555$	mV	LVPECL
Rx_SD = HIGH (Receiver ON)	V_{OH}	2.0		VCC3	V	2
Rx_SD = LOW (Receiver OFF)	V_{OL}	0		0.8	V	2
Ratesel/Reset=HIGH	V_{IH}	1.9		VCC3	V	3
Ratesel/Reset=Middle	V_{IM}	1.2		1.6	V	3
Ratesel/Reset=LOW	V_{IL}	0		0.9	V	3
TRI=HIGH	V_{IH}	$0.7*V_{CC3}$		VCC3	V	1
TRI=LOW	V_{IL}	0		0.8	V	1

Notes:

1. LVTTL (Control INPUT)
2. LVTTL (Monitor OUTPUT)
3. Tri-level (Control INPUT)

9.95328Gb/s Transmitter Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Laser Type			1577nm CW EML			
Downstream Signal Rate			9.95328		Gb/s	
Average Launch Power	$P_{OUT}10$	4		7	dBm	
Optical Center Wavelength	$\lambda 10$	1575		1580	nm	
Spectral Width	$\Delta\lambda_{10}$			1.0	nm	
Side Mode Suppression Ratio	$SMSR_{10}$	30			dB	
Extinction Ratio	ER_{10}	8.2			dB	
Output Eye Diagram		Compliant with ITU-T G.987.2 &ITU-T G.9807.1				

2.48832Gb/s Transmitter Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Laser Type			1490nm CW DFB Laser			
Downstream Signal Rate			2.48832		Gb/s	
Average Launch Power	P_{OUT2}	3		7	dBm	
Optical Rise and Fall Time	Tr / Tf			200	ps	20% to 80%
Optical Center Wavelength	λ_1	1480	1490	1500	nm	
Spectral Width	$\Delta\lambda_1$			1.0	nm	
Side Mode Suppression Ratio	$SMSR_1$	30			dB	
Extinction Ratio	ER_1	8.2			dB	
Output Eye Diagram		Compliant with ITU-T G.984.2				

9.95328/2.48832Gb/s Receiver Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver Type			1270nm APD/TIA Receiver			
Upstream Signal Rate			9.95328/2.48832		Gb/s	
Optical Center Wavelength	λ	1260	1270	1280	nm	
XGS-PON Receiver Sensitivity	P_{IN}			-28	dBm	1
XG-PON Receiver Sensitivity	P_{IN}			-29.5	dBm	2
XGS-PON Receiver Optical Overload	P_{IN}(SAT)	-7			dBm	3
XG-PON Receiver Optical Overload	P_{IN}(SAT)	-9			dBm	3
Damaged Input Optical Power	P_d			-5	dBm	
Rx_SD Assert	P_A	-45		-29.5	dBm	
Rx_SD De Assert	P_D	-45		-29.5	dBm	
Rx_SD Hysteresis	PHy	0		7	dBm	

Notes:

1. BER@10^{-3} *; Test Condition: PRBS: 2^{31}-1, ER=8.2 dB
2. BER@10^{-4} *: Test Condition: PRBS: 2^{23}-1, ER=8.2 dB
3. Test Condition: BER@10^{-10}, PRBS 2^{23}-1, ER=10dB

1.24416Gb/s Receiver Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver Type			1310nm Burst APD/TIA Receiver			
Upstream Signal Rate			1.24416		Gb/s	
Optical Center Wavelength	λ	1290	1310	1330	nm	
Receiver Sensitivity	P_{IN}			-30	dBm	1
Receiver Optical Overload	P_{IN}(SAT)	-7			dBm	
Damaged Input Optical Power	P_d			-5	dBm	
Receiver Settling Time	Trx			51.2	ns	
Rx_SD Assert	P_A	-45		-30	dBm	
Rx_SD De Assert	P_D	-45		-30	dBm	
Rx_SD Hysteresis	PHy	0		7	dB	

Notes:

1. Test Condition: BER@10^{-10}, PRBS 2^{23}-1, ER=10dB

Pin Descriptions

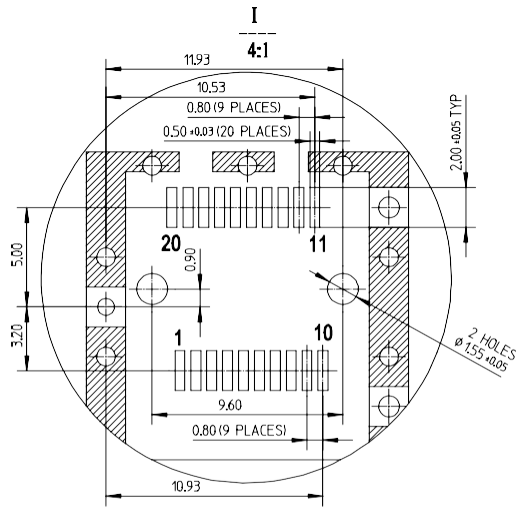| Pin	Symbol	Name/Descriptions	Ref.
1	GPON_TD+	Transmit Non-Inverted 2.48832Gb/s Data Input; AC coupled inside the module.	
2	GPON_TD-	Transmit Inverted 2.48832Gb/s Data Input; AC coupled inside the module.	
3	GND	Module Ground.	
4	SDA	2-Wire Serial Interface Data Line, with the pull-up resistance: 4.7kΩ～10kΩ.	
5	SCL	2-Wire Serial Interface Clock, with the pull-up resistance: 4.7kΩ～10kΩ.	
6	GPON_RD-	Receive Burst Mode Inverted 1.2488Gb/s Data Output; DC coupled inside the module.	1
7	Ratesel/Reset	Three-level input combining "Rate Select" and "Reset" information. Set high level to reset TIA/LA. Middle level indicates 2.5G data rate. Low level indicates 10G data rate.	
8	XGS-PON_SD	Receiver Signal Detect Indicator for XGS-PON/XGPON Receiver, when Low, indicates insufficient optical input power to the module; when High, means in normal.	
9	Trig/Txdis	Two signals multiplex, which selected by the register. Receiver signal strength indication trigger for Digital RSSI. As TXdisable, when Low level, the transceiver port work in normal; when High level, both 10Gb/s and 2.5Gb/s are disabled.	
10	GPON_RD+	Receive Burst Mode Non-Inverted 1.2488Gb/s Data Output; DC coupled inside the module.	1
11	GND	Module Ground.	
12	XGS-PON_RD-	Receive Burst Mode Inverted 9.953 or 2.48832Gb/s Data Output. DC coupled inside the module.	
13	XGS-PON_RD+	Receive Burst Mode Non-Inverted 9.953 or 2.48832Gb/s Data Output. DC coupled inside the module.	
14	GPON_SD	Receiver Signal Detect Indicator for G-PON Receiver. When Low, indicates insufficient optical input power to the module. When High, means in normal.	
15	VCC3_RX	+3.3V power supply for RX. Tolerance: 3.3V±5%.	
16	VCC3_TX	+3.3V power supply for TX. Tolerance: 3.3V±5%.	
17	GPON_Reset	Burst Mode Receiver Reset for GPON Receiver. When HIGH, indicates the receiver is OFF/being reset.	
18	XGS-PON_TD+	Transmit Non-Inverted 9.95328Gb/s Data Input; AC coupled inside the module.	
19	XGS-PON/_TD-	Transmit Inverted 9.95328Gb/s Data Input; AC coupled inside the module.	
20	GND	Module Ground.	

Notes:

1. When GPON_RD+/- set as LVPECL, and the module without the pull-down resistances. The differential signal amplitude must be satisfied with the Electrical Characteristics.
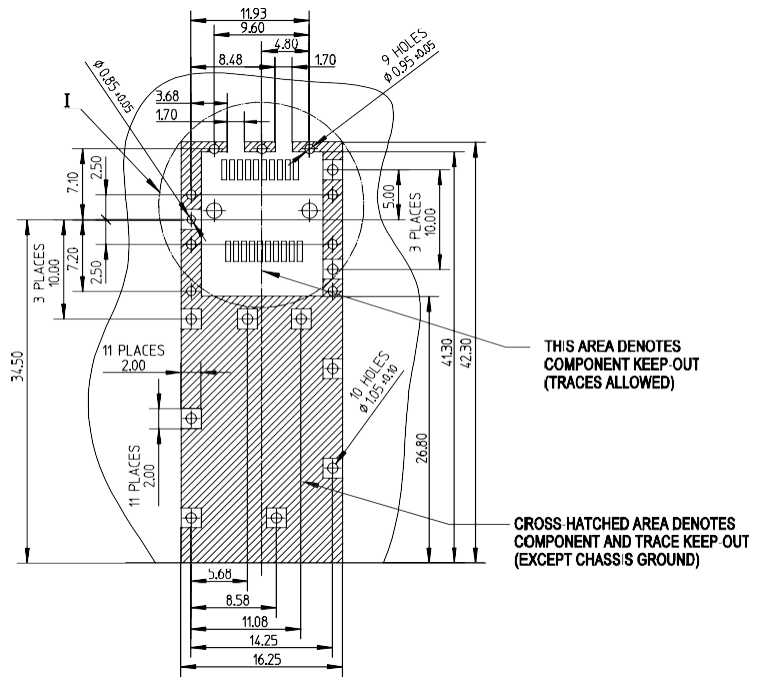
TOP VIEW OF BOARD
Pin 20
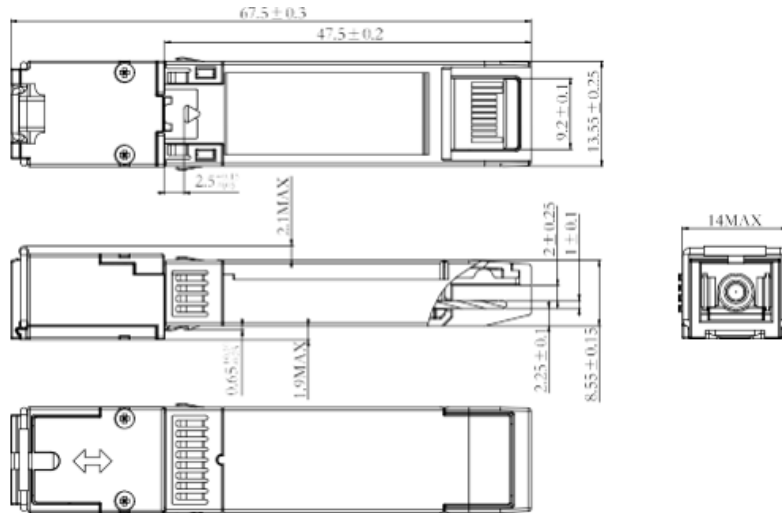Pin 11

BOTTOM VIEW OF BOARD
Pin 10
Pin 1

Electrical Interface

+3.3V
10μF
0.1μF 10μF
0.1μF
1μH
1μH
VCC3_RX (15)
VCC3_TX (16)

PON MAC

SerDes

10G Tx+
10G
1 G Tx+
1G Tx -

Z=50Ω
Z=50Ω
Z=50Ω
Z=50Ω

XGS-PON/XGPON TD +(18)
XGS-PON/XGPON TD -(19)
GPON TD+(1)
GPON TD-(2)

100
100

10Gb/s CDR EML Driver

10Gb/s CW1577nm TOSA

10G Tx_Dis
2.5Gb/s CW1490nm
2.5G Tx_Dis

2x150Ω
+3.3V

Rx_SD_GPON
Rx_Reset

GPON_SD(14)
GPON_Reset(17)

+3.3V
2x130Ω
2x82Ω

1G Rx+
1G Rx-

Z=50Ω
Z=50Ω

GPON
GPON_RD-(6)

1.25Gb/s BM1310nm ROSA
B

10G Rx+
10 G Rx-

Z=50
Z=50

XGS-PON/XGPON RD+(12)
XGS-PON/

10

10Gb/s BM1270nm ROSA
Burst

+3.3V
Rx_SD_XGSPON

XGS-PON/XGPON_SD(8)

Rate Sel/Res

+3.3V
3
SCL Serial Clock
SDA Serial Data

SCL Serial Clock (5)
SDA Serial Data (4)

MCU

MIU

SC Receptacle

Rx_Tri/
Trig

GND (3,11,20)

SFP+ Connector Dimensions

I
4:1

11.93
10.53
0.80 (9 PLACES)
0.50 +0.03 (20 PLACES)
2.00 +0.05 TYP

20   11
0.90

1   10

5.00
3.20

9.60
0.80 (9 PLACES)
10.93

2 HOLES
∅ 1.55 +0.05

Notes:
1. Datum and basic dimensions established by customer
2. Pads and vias are chassis ground, 11 places
3. Thru holes, plating optional

11.93
9.60
8.48
4.80
1.70

∅ 0.85 +0.05

I

3.68
1.70

9 HOLES
∅ 0.95 +0.05

7.10
2.50

3 PLACES
10.00
2.50

7.20

5.00
10.00

3 PLACES

34.50

11 PLACES
2.00

11 PLACES
2.00

10 HOLES
∅ 1.05 +0.05

4.30
42.30

26.80

THIS AREA DENOTES
COMPONENT KEEP-OUT
(TRACES ALLOWED)

CROSS-HATCHED AREA DENOTES
COMPONENT AND TRACE KEEP-OUT
(EXCEPT CHASSIS GROUND)

5.68
8.58
11.08
14.25
16.25

Mechanical Specifications

67.5 ± 0.3
47.5 ± 0.2
9.2 ± 0.1
13.55 ± 0.25
2.5
2.1 MAX

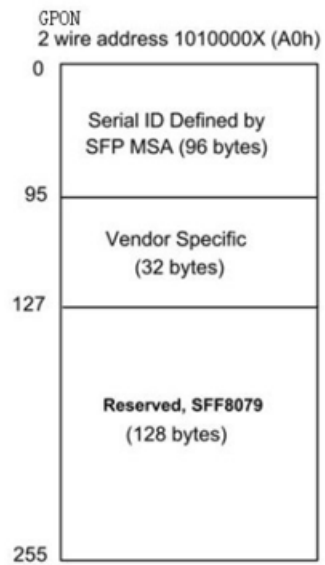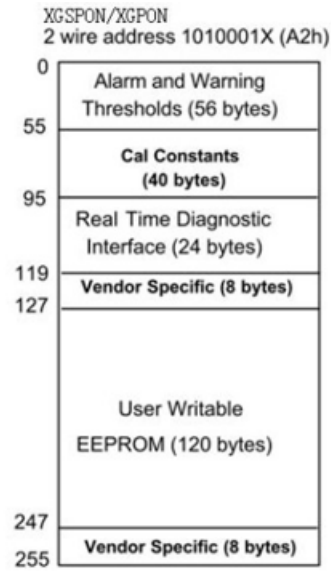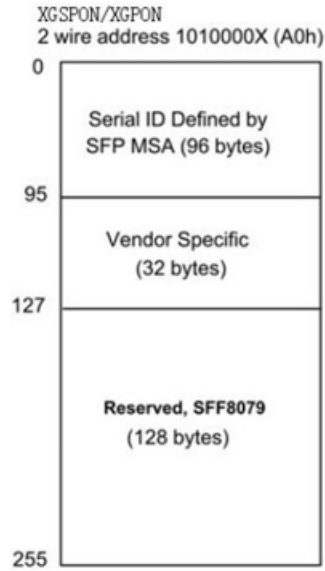2 ± 0.25
1 ± 0.1

0.65
1.9 MAX

2.25 ± 0.1
8.55 ± 0.15

14 MAX

NOTES:
1. TOLERANCE: ± 0.1MM;
2. OTHERS ACCORDING WITH SFF-8074i/SFF-8432 OR CUSTOMER SPEC;
3. LIGHT PORT ACCORDING WITH FIBER CONNECTOR SPEC.

EEPROM Information

EEPROM memory map specific data field description is as below:
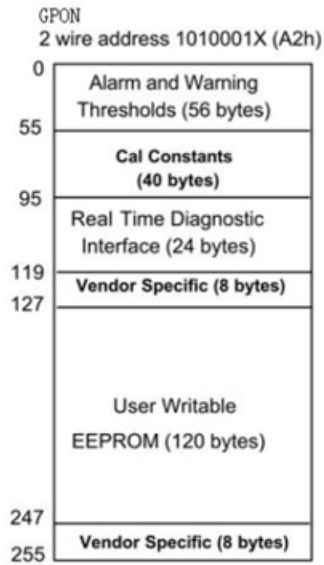
About AddOn Networks

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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