

1442544F2C-AO

ADTRAN® 1442544F2C Compatible TAA 10G XGSPON OLT SFP+ Transceiver (SMF, 1577nmTx/1270nmRx, N2, SC, DOM)

Features

- Hot Pluggable SFP+
- 4 Lambda
- 3.3V DC Power Supply
- 2x10 SFP+ Electrical Interface
- ITU-T G.9807.1 Class N2 compliant
- SC receptacle optical connector
- RoHS compliant and Lead Free
- Commercial Temperature 0 to 70 Celsius



Applications

- XGS PON OLT
- Access and Enterprise

Product Description

This ADTRAN® 1442544F2C compatible XGSPON OLT class N2 SFP+ transceiver provides 10G throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1577nmTx/1270nmRx via an SC connector. It can operate at temperatures between 0 and 70C. This product is in compliance with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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	Notes
Maximum Supply Voltage	V _{CC3}	0	3.6	V	
Storage Temperature	T _{stg}	-40	85	°C	
Operating Temperature	T _c	0	70	°C	
Operating Relative Humidity	RH	5	85	%	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V _{CC3}	3.14	3.3	3.47	V	
Supply Current	I _{CC3}			750	mA	
Module Power Dissipation	P _{DISS}			2.5	W	
Transmitter						
Data Input Differential Swing	V _{IN}	120		850	mVp-p	
Input Differential Impedance	Z _{IN}	80	100	120	Ω	
Tx_Disable (Asserted)	V _{DH}	2.0		3.3	V	
Tx_Disable (Negated)	V _{DL}	0		0.8	V	
Tx_Fault Output Voltage - High		2.4		3.3	V	
Tx_Fault Output Voltage - Low		0		0.4	V	
Receiver						
Differential Output Differential Swing	V _{RXDIFF}	400		800	mVp-p	
Signal Detected Voltage - High	V _{sd_h}	2		3.3	V	
Signal Detected Voltage - Low	V _{sd_l}	0		0.4	V	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes	
Transmitter (9.953G)							
Data Rate	BR		9.953		Gbps		
Center Wavelength	λ_C	1575	1577	1580	nm		
Spectral Width (-20dB)	$\Delta\lambda$			1	nm		
SMSR		30			dB		
Optical Power Output	POUT	4		7	dBm		
Extinction Ratio	ER	8.2			dB		
Eye Mask Margin	EM	Compliance ITU.T G.9807.1 Requirement					
Optical Output Power with Tx Off	Poff			-39	dBm		
RIN ₁₂ OMA				-128	dB/Hz		
Receiver (9.953/2.488G)							
Input Operating Wavelength	λ_{RX}	1260	1270	1280	nm		
Receiver Sensitivity (BER 10 ⁻³)	@9.953			-28	dBm		
Receiver Sensitivity (BER 10 ⁻⁴)	@2.488			-29.5	dBm		
Receiver Overload (BER 10 ⁻¹²)	@9.953	-5			dBm		
Receiver Overload (BER 10 ⁻¹²)	@2.488	-7			dBm		
Maximum Input Power		-3			dBm		
Receiver Reflectance	RRX			-12	dB		
Receiver Tolerance to Reflected Optical Power				10	dB		
Signal Detected De-Assert Level	Psdd	-40			dBm		
Signal Detected Assert Level	Psda			-29	dBm		
SD Hysteresis	SD_Hys		0.5		dB		

Digital Diagnostic Functions

Parameter	Range	Unit	Accuracy	Notes
Temperature	-40°C to 85°C	°C	±3	LSB equal to 1/256C
Supply Voltage (3.3V)	3.14V to 3.47V	V	±3%	LSB equal to 100uV
Tx Bias Current	0mA to 150mA	mA	±10%	LSB equal to 4uA
Tx Optical Power	4dBm to 7dBm	dBm	±2	LSB equal to 0.2uW
Rx Power	-30dBm to -6dBm	dBm	±3	LSB equal to 0.1uW

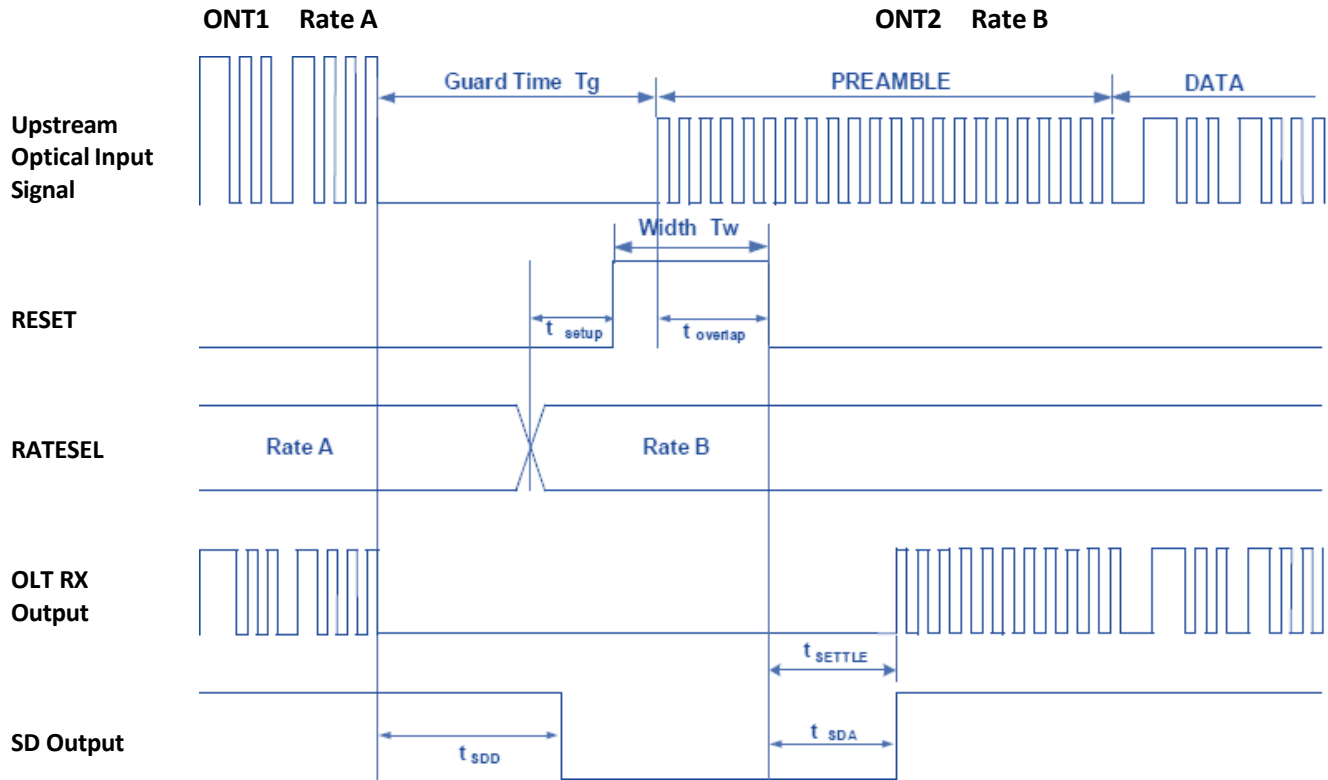
Upstream Timing

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Burst Receiver Settling Time	T_SETTLE			100	ns	
Burst Signal Detect Assert	T_SDA		25	100	ns	
Burst Signal Detect De-Assert	T_SDD		100		ns	1
Guard Time	Tg	51.4			ns	
Reset Pulse Width	Tw	25			ns	
Reset Time Overlapping Preamble	T_overlap	0			ns	2
Setup Time of Rate Level for Following Burst	T_setup	5			ns	

Notes:

1. Auto reset function is applied. Signal detect de-assert time is about 100ns forced by auto reset and will short to about 20ns with external Reset pulse.
2. Reset pulse is required to be partially inside the preamble.

Upstream Timing Diagram

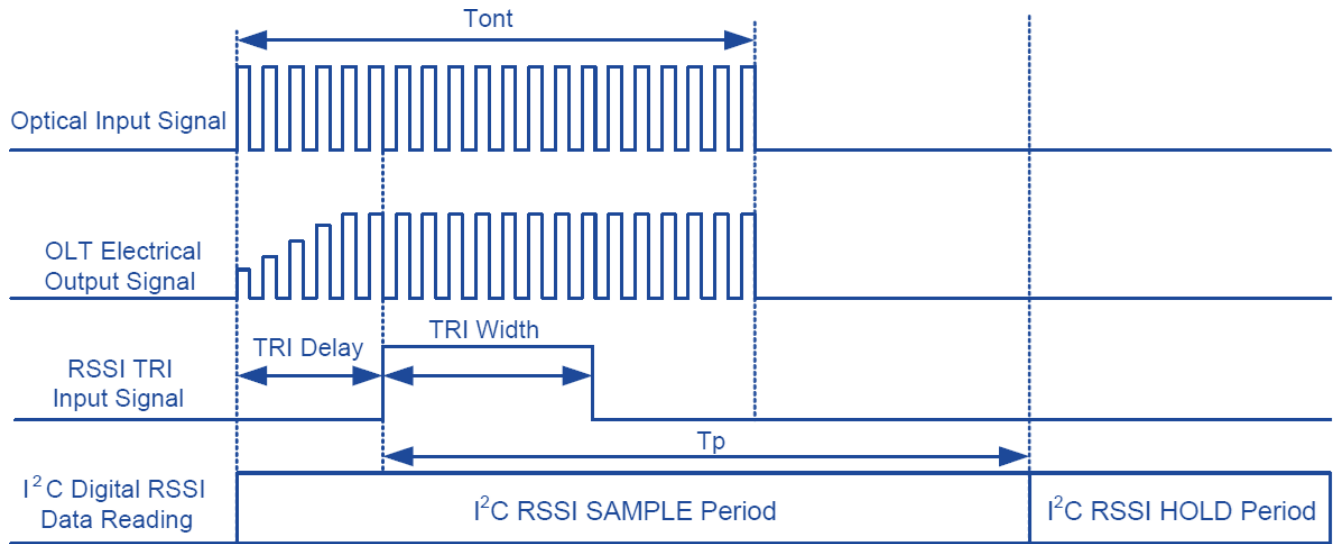


Digital RSSI Sample/Hold Timing

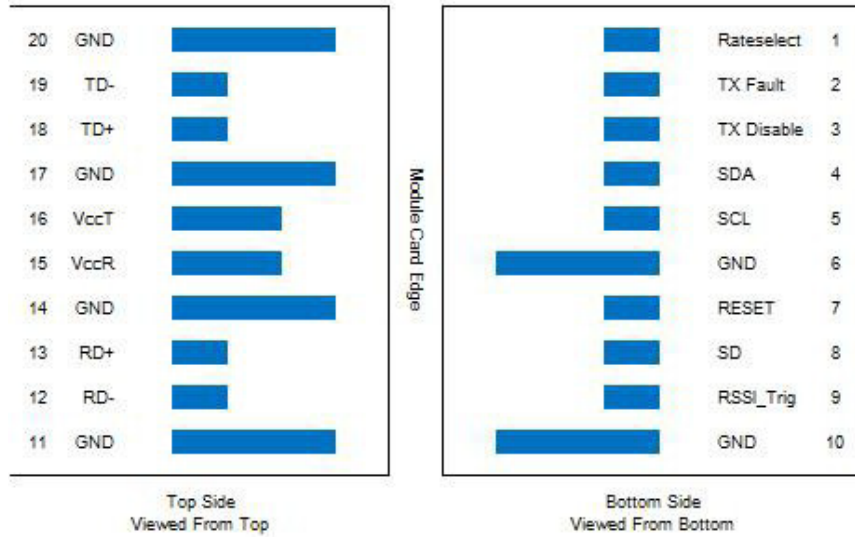
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
I ² C Read Time	T_p	500			μs	
Optical Input Signal Width	T_{ont}	300			ns	
RSSI Monitor Range	P_{mon}	-30		-7	dBm	
RSSI Precision	P_{rssi}	-3	+/-2	3	dB	
RSSI Trigger Delay	T_{tri} (TRI Delay)	0	300		ns	
RSSI Trigger Width	T_{i2c} (TRI Width)	500		$T_{ont} - T_{tri}$	ns	

Note: $T_{tri} + T_{i2c} < T_{ont}$.

Digital RSSI Sample/Hold Timing Diagram



Pin-Out Definitions



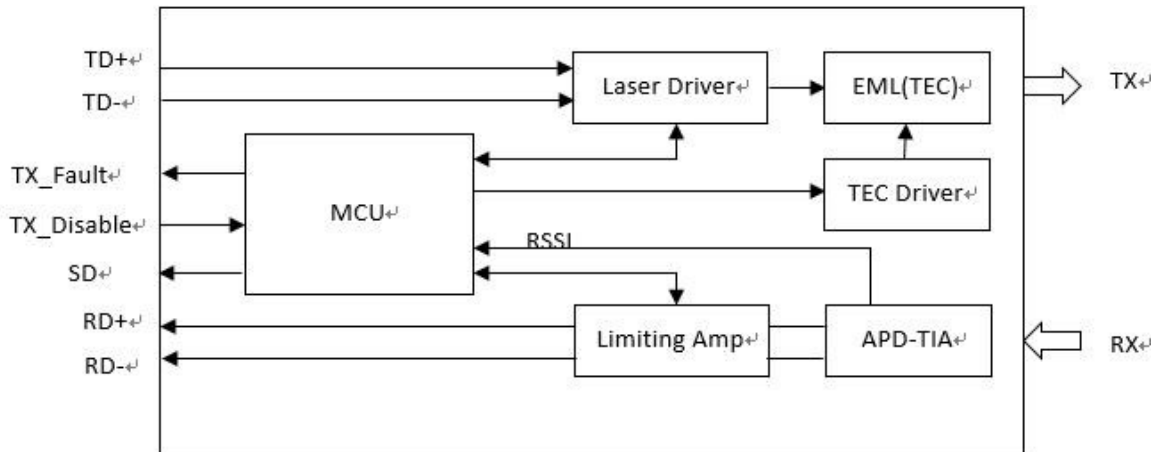
Pin Descriptions

Pin	Logic	Symbol	Description	Note
1	LVTTTL	Rate_Select	Rate Select.	1
2	LVTTTL	Tx_Fault	High Voltage: Tx Laser Fault or Safety. Low Voltage: Normal Operation.	
3	LVTTTL	Tx_Disable	Active "high" to disable laser.	
4		SDA	2-Wire Serial Interface SDA.	
5		SCL	2-Wire Serial Interface SCL.	
6		GND	Module Ground.	
7		Reset	Reset for TIA/LIA.	
8	LVTTTL	SD	"Logic 1" indicates normal operation.	
9	LVTTTL	RSSI_Trig	RSSI Trigger.	
10		GND	Module Ground.	
11		GND	Module Ground.	
12	LVCML	RD-	2.5/10G LVCML output with DC coupling.	
13	LVCML	RD+	2.5/10G LVCML output with DC coupling.	
14		GND	Module Ground.	
15		VccR	+3.3V Power Supply.	
16		VccT	+3.3V Power Supply.	
17		GND	Module Ground.	
18	LVCML	TD+	10G LVCML input with AC coupling.	
19	LVCML	TD-	10G LVCML input with AC coupling.	
20		GND	Module Ground.	

Notes:

1. Rate Select is high-speed when Pin 1 value is "high" and low-speed when Pin 1 value is "low."

Transceiver Block Diagram



Transmitter Section

Tx_Disable

Tx_Disable is an input pin that is used to shut down the XGSPON transmitter optical output at the same time. It is pulled up within the module with a 4.7k Ω to 10k Ω resistor. Its states are: low (0 – 0.8V) - transmitter on; (>0.8, < 2.0V) - undefined; high (2.0 – VCC) - transmitter disabled; open - transmitter disabled. The Tx_Disable signal is “high” (LVTTTL “logic 1”) to turn off the laser output. The laser will turn on when Tx_Disable is “low” (LVTTTL “logic 0”).

XGSPON TD+/-

XGSPON_TD+/- are the differential XGSPON transmitter inputs. They are AC-coupled, differential lines with 100 Ω differential termination inside the module. It allows a differential input swing of 120-850mV, 9.953Gbps data rate.

Receiver Section

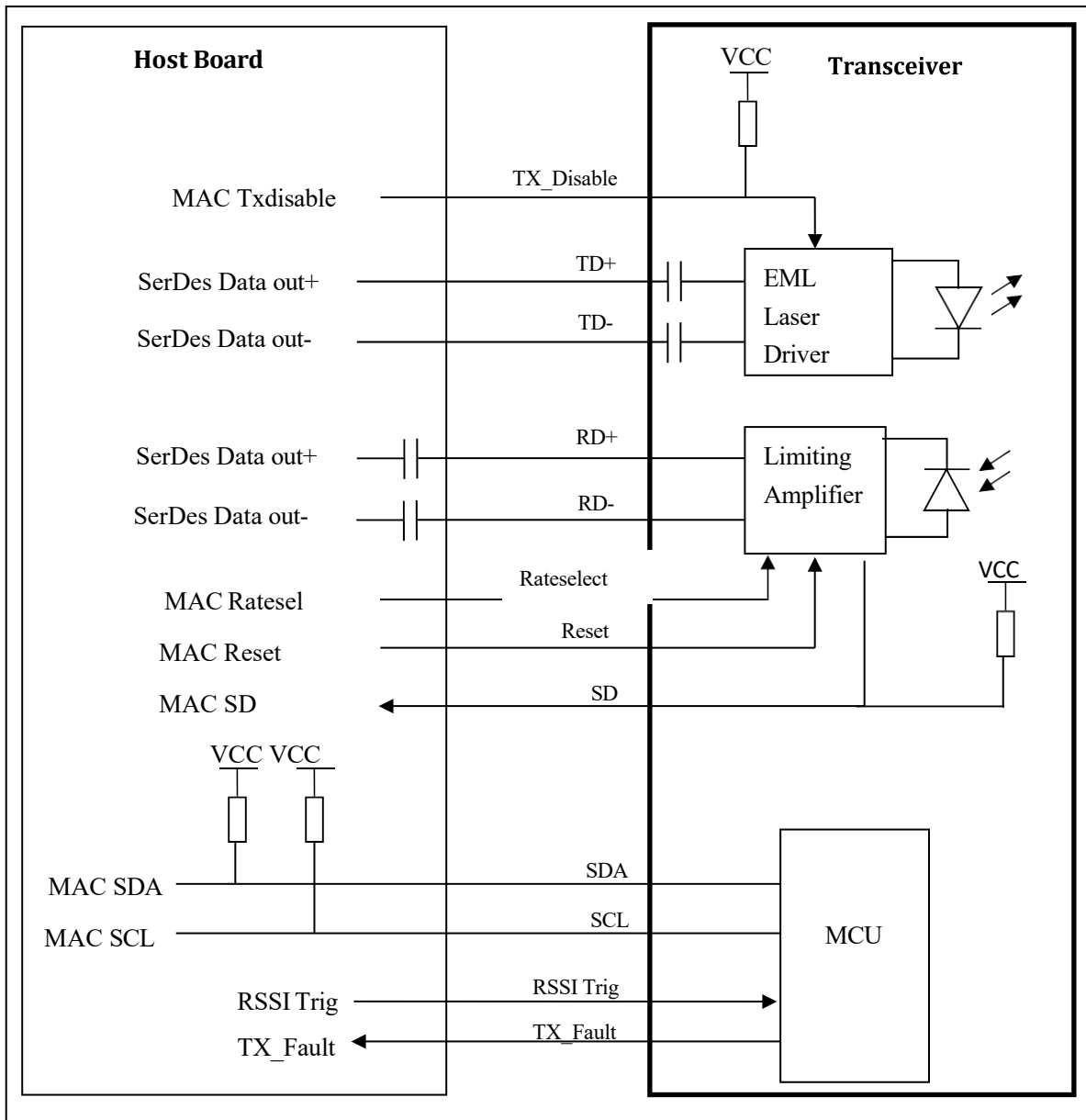
XGSPON_SD

SD (Signal Detect) is an open collector/drain output, which should be pulled up with a 4.7k Ω to 10k Ω resistor to a voltage between 2.4V and Vcc+0.3V. 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 < 0.4V.

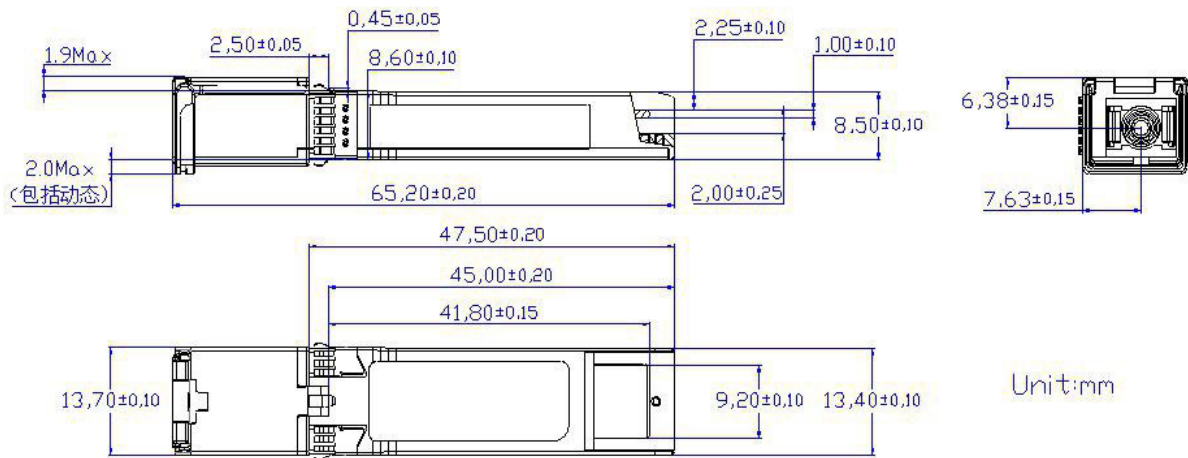
XGSPON RD+/-

These are the XGSPON differential receiver outputs. They are DC coupled 100 Ω differential lines which should be terminated with 100 Ω (differential) at the user SERDES. The AC coupling is done on the host board. The voltage swing on these lines will be between 400 and 800mV differential output when properly terminated.

Recommended Interface Circuit

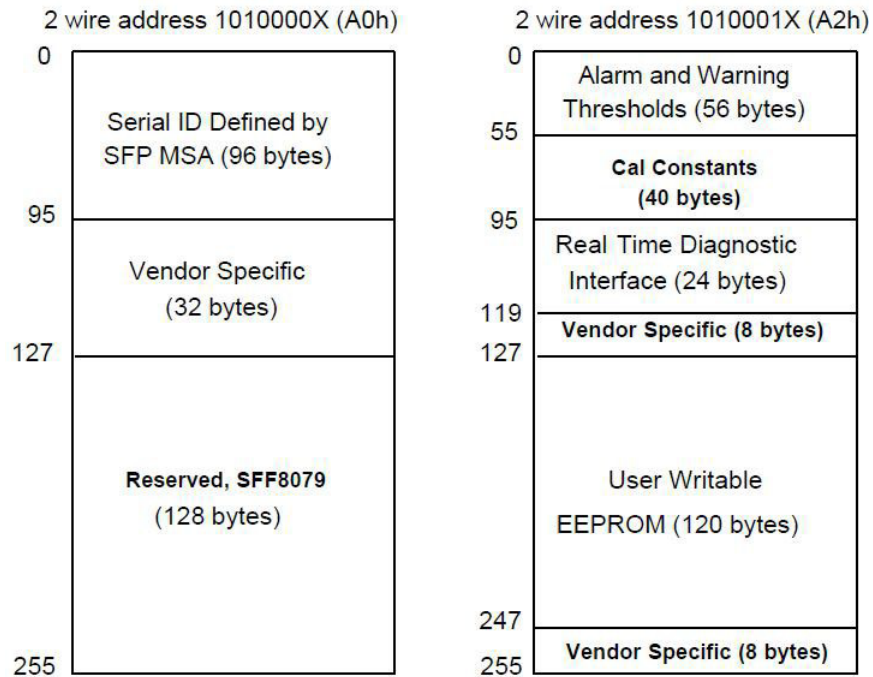


Mechanical Specifications



Digital Diagnostic Memory Map

Compatible with SFF-8472.



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 ingrained 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 ranging from NEBS Level 3 to ISO 9001:2015 with every new development while maintaining the signature reliability of its products.



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