

Model: DSM-20
Series: DIANA



1.25Gbps Single mode SFP Transceiver



DIANA : DSM-20 1.25Gbps SFP Transceiver

Feature

- Up to 1.25Gbps data links
- Hot-pluggable SFP footprint
- 1310nm Fabry-Perot laser transmitter
- Duplex LC connector
- RoHS compliant and Lead Free
- Up to 20 km on 9/125µm SMF
- Metal enclosure for lower EMI
- Single power supply 3.3V
- Low power dissipation <500mW typical
- Commercial operating temperature range: 0°C to 70°C

APPLICATIONS

- 1.25Gbps 1000Base-LX Ethernet
- 1.06 Gbps Fibre Channel

AADONA DSM-20 Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE Std 802.3ah and 1x Fibre Channel as defined in FC-PI-2 Rev. 10.0. They are RoHS compliant and lead-free per Directive 2002/95/EC.

I .Pin Descriptions

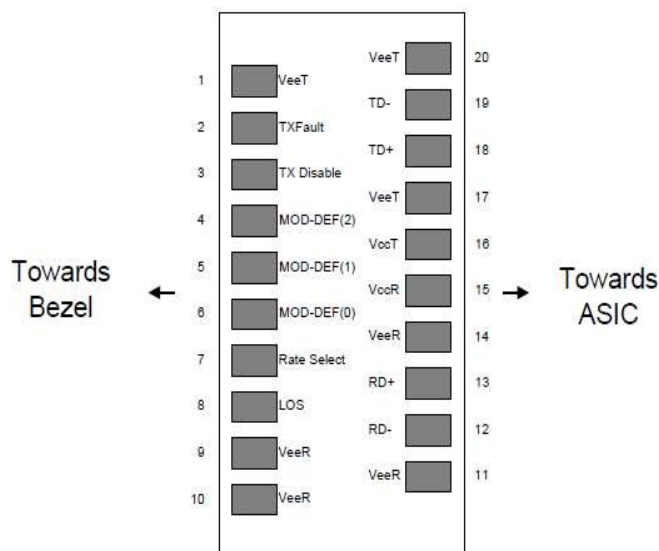


Diagram of Host Board Connector Block Pin Numbers and Names

Pin	Symbol	Name/Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TFAULT	Transmitter Fault. Not supported.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	4
9	VEER	Receiver Ground (Common with Transmitter Ground)	1
10	VEER	Receiver Ground (Common with Transmitter Ground)	1
11	VEER	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VEER	Receiver Ground (Common with Transmitter Ground)	1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

II. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		4.0	V	
Storage Temperature	TS	-40		85	°C	
Case Operating Temperature	TA	0		70	°C	
Relative Humidity	RH	0		85	%	1

III. Electrical Characteristics (TA = 0 to 70 °C, VCC = 3.0 to 3.6 Volts)

Parameter	Symbol	Min	Type	Max	Unit	Ref
Supply Voltage	Vcc	3.00		3.60	V	

Supply Current	I _{cc}		130	300	mA	
Transmitter						
Input differential impedance	R _{in}		100		Ω	2
Single ended data input swing	V _{in,pp}	250		1200	mV	
Transmit Disable Voltage	V _D	V _{cc} – 1.3		V _{cc}	V	
Transmit Enable Voltage	V _{EN}	V _{ee}		V _{ee} +0.8	V	3
Receiver						
Single ended data output swing	V _{out,pp}	300	400	800	mV	4
Data output rise time	T _r			300	ps	5
Data output fall time	T _f			300	ps	5
LOS Fault	V _{LOS} fault	V _{cc} – 0.5		V _{cc} host	V	6
LOS Normal	V _{LOS norm}	V _{ee}		V _{ee} +0.5	V	6
Power Supply Rejection	PSR	100			mVpp	7
Deterministic Jitter Contribution	RX ΔDJ	80			ps	8
Total Jitter Contribution	RX ΔTJ	122.4			ps	

Notes:

1. Non condensing.
2. AC coupled.
3. Or open circuit.
4. Into 100 ohm differential termination.
5. 20 – 80 %
6. LOS is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
7. All transceiver specifications are compliant with a power supply sinusoidal modulation of 20 Hz to 1.5 MHz up to specified value applied through the power supply filtering network shown on page 23 of the Small Form-factor Pluggable (SFP) Transceiver MultiSource Agreement (MSA), September 14, 2000.
8. Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and ΔDJ .

IV. Optical Characteristics (T_{OP} = 0 to 70 °C, V_{CC} = 3.00 to 3.60 Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. power	POUT	-9		-3	dBm	1
Optical Wavelength	λ	1270		1360	nm	2
Spectral Width	σ			3	nm	2
Optical Modulation Amplitude	OMA	174			μ W	2,3
Optical Rise/Fall Time	tr/ tf			260	ps	4
Relative Intensity Noise	RIN			-120	dB/Hz	
Deterministic Jitter Contribution	TX Δ DJ		20	56	ps	5
Total Jitter Contribution	TX Δ TJ		50	119	ps	
Optical Extinction Ratio	ER	9			dB	
Receiver						
Average Rx Sensitivity @ 1.25 Gbps (Gigabit Ethernet)	RSENS 2			-22	dBm	6,7
Average Rx Sensitivity @ 1.06 Gbps (1X Fibre Channel)	RSENS 1			-23	dBm	6,7
Stressed Rx sens. =1.25 Gbps				-14.5	dBm	
Average Receiver Power	RxMAX			0	dBm	
Receiver Elec. 3 dB cutoff freq.				1500	MHz	
Optical Center Wavelength	λ_C	1265		1600	nm	
Optical Return Loss		12			dB	
LOS De-Assert	LOSD			-24	dBm	
LOS Assert	LOSA	-34			dBm	
LOS Hysteresis		0.5			dB	

Notes:

- Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
- Also specified to meet curves in FC-PI-2 Rev. 10.0 Figure 18, which allow trade-off between wavelength, spectral width and OMA.
- Equivalent extinction ratio specification for Fibre Channel. Allows smaller ER at higher average power.
- Unfiltered, 20-80%. Complies with IEEE 802.3 (Gig. E) and FC 1x eye masks when filtered.
- Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and Δ DJ
- Measured with conformance signals defined in FC-PI-2 Rev. 10.0 specifications.
- Measured with PRBS 2⁷-1 at 10⁻¹²BER

V. General Specifications

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Data Rate	BR	1.062		1.250	Gbps	1
Bit Error Rate	BER			10-12		2
Max. Supported Link Length on 9/125 μ m SMF @ 1X Fibre Channel	LMAX1		20		km	3,4
Max. Supported Link Length on 9/125 μ m SMF @ Gigabit Ethernet	LMAX2		20		km	3,4

Notes:

1. Gigabit Ethernet and 1x Fibre Channel compliant.
2. Tested with a PRBS 2⁷ -1 test pattern.
3. Dispersion limited per FC-PI-2 Rev. 10
4. Attenuation of 0.55 dB/km is used for the link length calculations. Distances are indicative only. Please refer to the Optical Specifications in Table IV to calculate a more accurate link Budget based on specific conditions in your application.

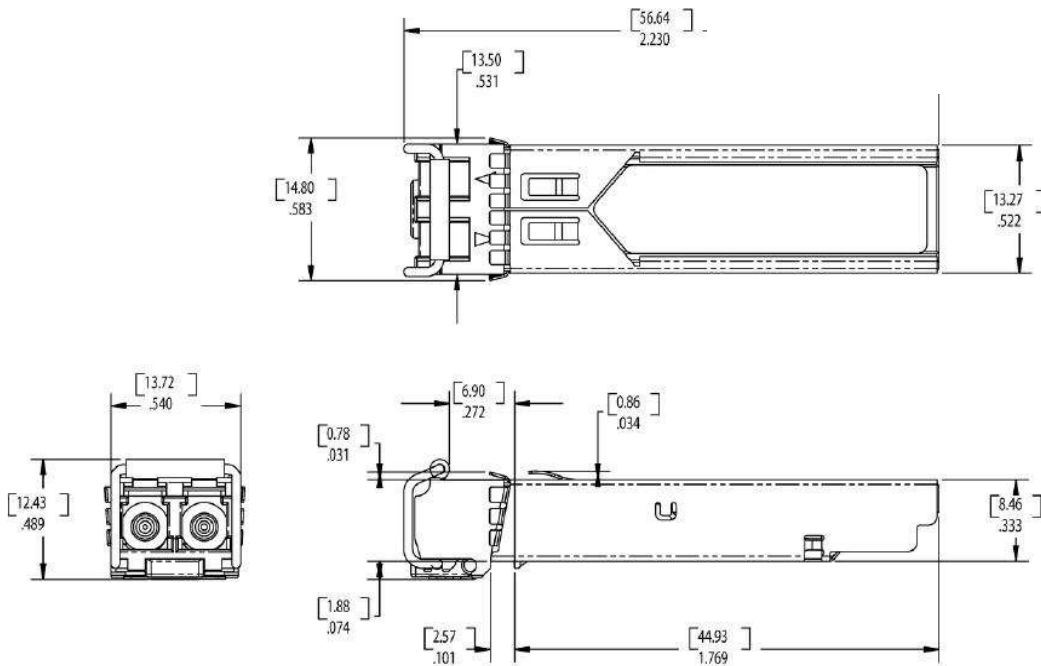
VI. Environmental Specifications

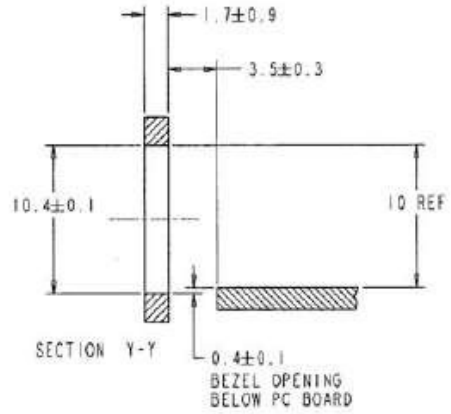
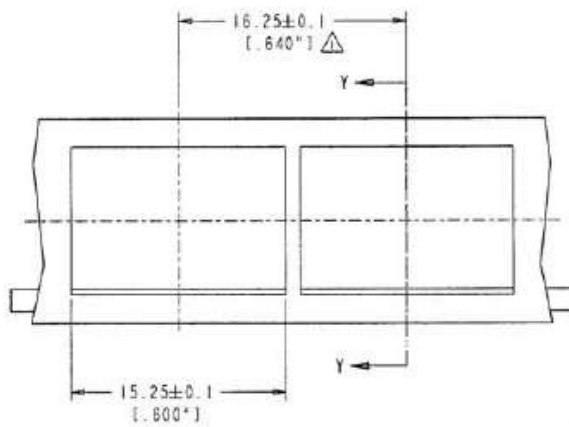
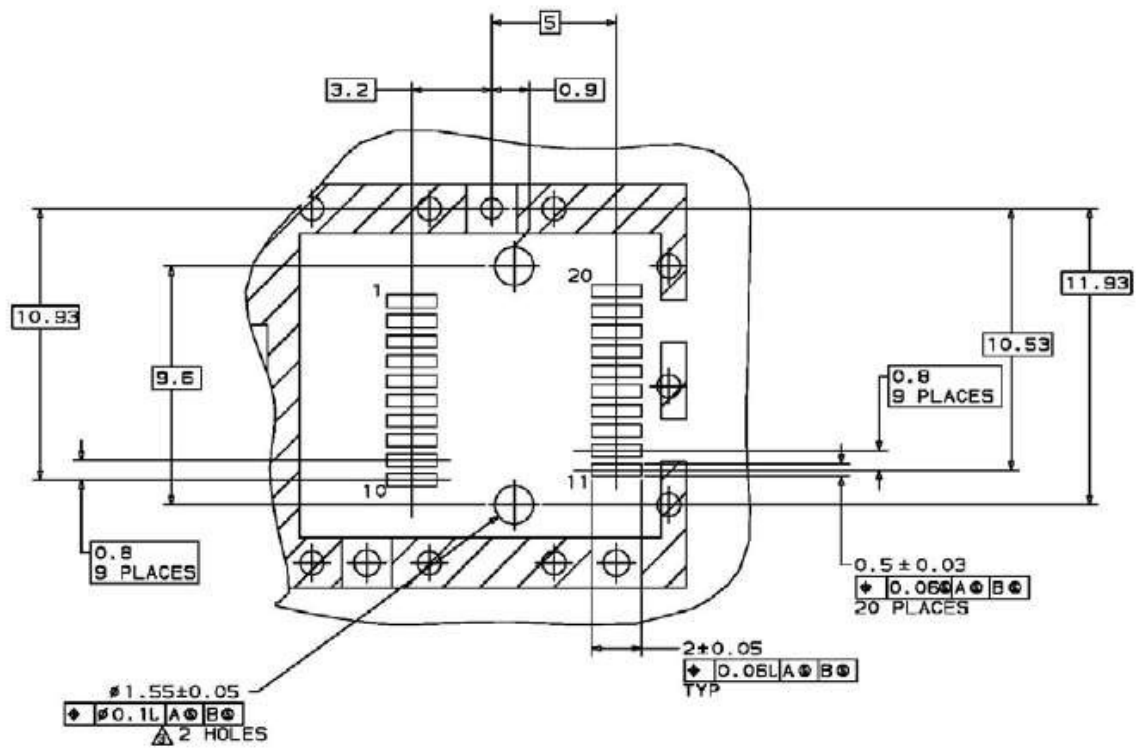
PHYnam 1310nm Industrial Temperature SFP transceivers have an operating temperature range from 0°C to +70°C case temperature.

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Case Operating Temperature	Top	0		70	°C	
Storage Temperature	Tsto	-40		85	°C	

VII. Mechanical Specifications

PHY-3124-1L2 Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).





NOTES:

△ MINIMUM PITCH ILLUSTRATED, ENGLISH DIMENSIONS ARE FOR REFERENCE ONLY

2. NOT RECOMMENDED FOR PCI EXPANSION CARD APPLICATIONS

IX. References

1. IEEE Std 802.3, 2002 Edition, Clause 38, PMD Type 1000BASE-LX. IEEE Standards Department, 2002.
2. "Fibre Channel Physical and Signaling Interface (FC-PH, FC-PH2, FC-PH3)". American National Standard for Information Systems.
3. "Fibre Channel Physical Interface Specification (FC-PI-2 Rev. 10.0)". American National Standard for Information Systems.
4. Small Form-factor Pluggable (SFP) Transceiver Multi-source Agreement (MSA), September 14, 2000.
5. Directive 2002/95/EC of the European Council Parliament and of the Council, "on the restriction of the use of certain hazardous substances in electrical and electronic equipment." January 27, 2003.



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