Свойства

1310нм DFB лазер + PIN фотоприемник

до 40км на 9/125 мкм одномодовом оптическом кабеле

XAUI Electrical Interface: 4 Lanes @ 3.125Gbit/s

соответствие X2 MSA

дуплексный SC коннектор

IEEE 802.3ae 10GBASE-ER Application

● Максимальные параметры

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T_{ST}	-40	+85	℃
Supply Voltage 1	V_{CC5}	0	+6.0	V
Supply Voltage 2	V_{CC3}	0	+4.0	V
Supply Voltage 3(APS)	$V_{CC\ APS}$	0	+1.5	V

● Рекомендованные параметры

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage 1	V_{CC5}	4.75	5.0	5.25	V
Supply Current 1	I_{CC5}			10	mA
Supply Voltage 2	V_{CC3}	3.135	3.3	3.465	V
Supply Current 2	I_{CC3}			550	mA
Supply Voltage 3(APS)	$V_{CC\ APS}$	1.152	1.2	1.248	V
Supply Current 3(APS)	$I_{CC\ APS}$			1100	mA
Case Temperature	T_C	-5		70	℃

● Электрические характеристики

✧ Parameter	Symbol	Values			Unit
		min	typ	max	
1.2 V CMOS (1.8 V CMOS Compatible[1]) I/O DC Characteristics (PRTAD; LASI; RESET; TX_ONOFF)					
External Pull-up Resistor for Open Drain	R_{pullup}	10		22	kΩ
Output High Voltage[2]	V_{oh}	1			V
Output Low Voltage[2]	V_{ol}			0.15	V
Input High Voltage	V_{ih}	0.84		1.5	V
Input Low Voltage	V_{il}			0.36	V
Input Pull-down Current[3]	I_{pd}	20		120	µA
XAUI I/O DC Characteristics (TXLANE[0..3]; RXLANE[0..3])					
Differential Input Amplitude (pk-pk) [4]	V_{in_xaui}	200		2500	mV
Differential Output Amplitude (pk-pk) [4]	V_{out_xaui}	800		1600	mV
MDIO I/O DC Characteristics (MDIO; MDC)					
Output Low Voltage[5]	V_{OL}	-0.3		0.2	V
Output Low Current	I_{OL}			4	mA
Input High Voltage	VIH	0.84	1.2	1.5	V
Input Low Voltage	V_{IL}	-0.3		0.36	V
Pull-up Supply Voltage	V_{PU}	1.152	1.2	1.284	V
Input Capacitance	C_{IN}			10	pF
Load Capacitance	C_{LOAD}			470	pF
External Pull-up Resistance	R_{LOAD}	200			Ω

1) For 1.8 V_{CMOS} V_{oh} = 1.65 V min., V_{ol} = 0.15 V max., V_{ih} = 1.17 V min., V_{il} = 0.63 V max.

2) $R_{pull\text{-}up}$ = 10 kΩ to 1.8 V.

3) V_{in} = 1.8 V.

4) AC coupled.

5) I_{OL} = 100 µA

Electrical AC Characteristics

Parameter	Symbol	Values			Unit
		min	typ	max	

XAUI Input AC Characteristics (TXLANE[0..3])					
Baud Rate Fibre Channel Ethernet	R_{XAUIIN}		 3.1875 3.125		Gbit/s
Baud Rate Tolerance	$R_{TOLXAUI}$	-100		100	ppm
Differential Input Impedance	Z_{INXAUI}	80	100	120	Ω
Differential Return Loss[1)]	$\|S_{11}\|$	10			dB
Input Differential Skew[2)]	t_{SKEWIN}			75	ps
Jitter Amplitude Tolerance[3)]	$J_{XAUITOL}$			0.65	UIp-p
XAUI Output AC Characteristics (RXLANE[0..3])					
Baud Rate Fibre Channel Ethernet	$R_{XAUIOUT}$		 3.1875 3.125		Gbit/s
Baud Rate Variation	$R_{XAUIVAR}$	-100		100	ppm
XAUI Eye Mask (far-end)	According to IEEE 802.3ae and 10G Fiber Channel				
Output Differential Skew	$t_{SKEWOUT}$			15	ps
Output Differential Impedance	$Z_{OUTXAUI}$	80	100	120	Ω
Differential Output Return Loss[1)]	$\|S_{22}\|$	10			dB
Total Jitter[4)]	TJ_{XAUI}			0.35	UI
Deterministic Jitter[4)]	DJ_{XAUI}			0.37	UI
Power-On Reset AC Characteristics					
Power-On Reset and TX_ONOFF Characteristics	According to XENPAK MSA Issue 3.0, 2002-9-18				
MDIO I/O AC Characteristics (MDIO; MDC)					
MDIO Data Hold Time	t_{HOLD}	10			ns
MDIO Data Setup Time	t_{SU}	10			ns
Delay from MDC Rising Edge to MDIO Data Change	t_{DELAY}			300	ns
MDC Clock Rate	f_{MAX}			2.5	MHz

1) 100 MHz to 2.5 GHz.

2) At crossing point.

3) Per IEEE Std 802.3ae.

● Оптические параметры

✧ Parameter	Symbols	Min.	Typ.	Max.	Unit
Transmitter					
Center Wavelength	λ_C	1260	1310	1355	nm
Spectral Width	$\Delta\lambda$			1	nm
Signaling speed		-	10.3125	-	Gbit/s
Optical modulation amplitude	OMA	-2.1			dBm
Optical Output Power	Po	0	-	+2	dBm
Extinction Ratio	Er	8.2	-		dB
Off Transmit Power	P_{off}	-	-	-30	dBm
Receiver					
Center Wavelength	λ_C	1260		1355	nm
Receiver Stressed Sensitivity In OMA	Sen_{st}			-16	dBm
Receiver Overload	Rro	-1	-	-	dBm
Signal Detect De-assert Level	P_{SDD}			-17	dBm
Signal Detect Assert Level	P_{SDA}	-35.0			dBm
Receiver Reflectance	Rrx		-	-12	dB

Назначение контактов

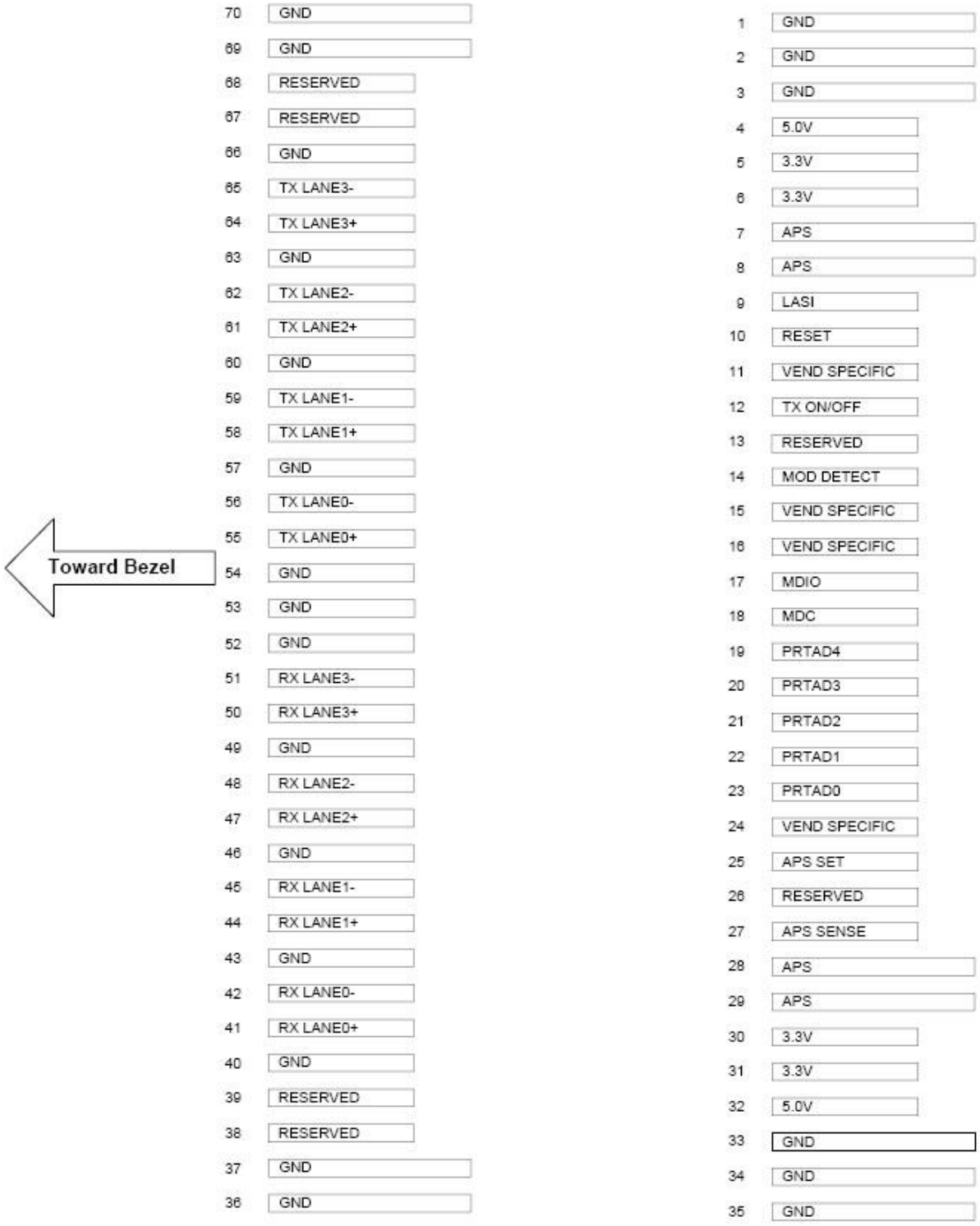


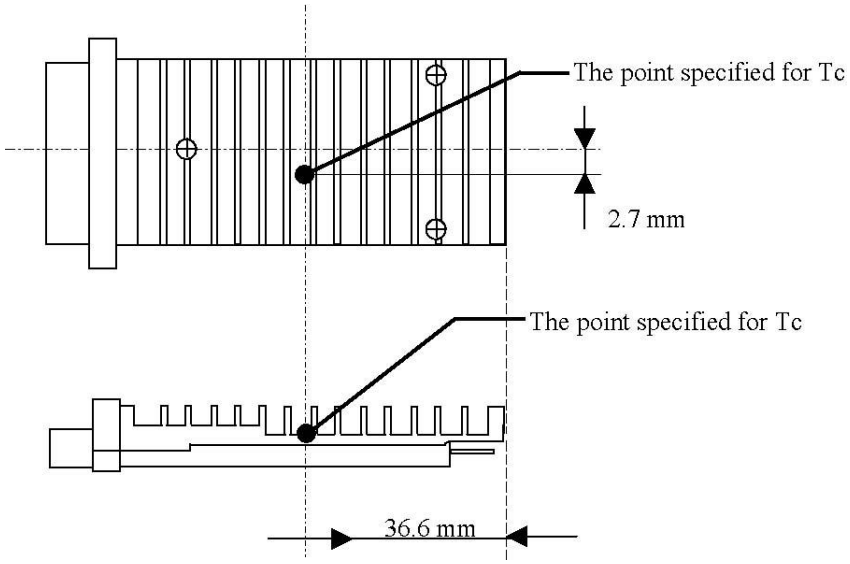
Diagram of Host Board Connector Block Pin Numbers and Name

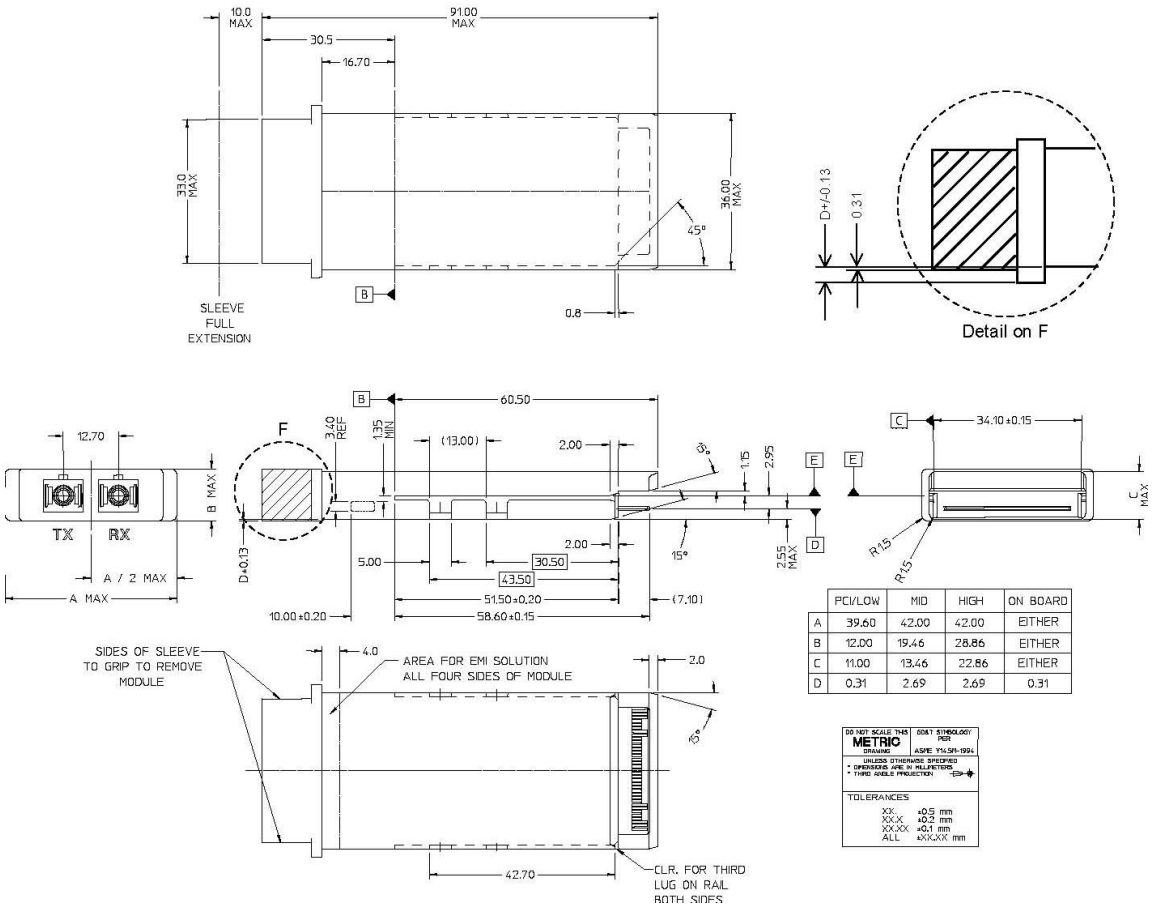
● Описание контактов

Signal Name	Level	I/O	Pin No	Description
Management and Monitoring Ports				
MDIO	Open Drain	I/O	17	Management Data I/O. Requires external 10 - 22 kΩ pull-up to the APS on host.
MDC	1.2 V CMOS	I	18	Management Data Clock Input
PRTAD4	1.2 V CMOS	I	19	Port Address Input bit 4
PRTAD3	1.2 V CMOS	I	20	Port Address Input bit 3
PRTAD2	1.2 V CMOS	I	21	Port Address Input bit 2
PRTAD1	1.2 V CMOS	I	22	Port Address Input bit 1
PRTAD0	1.2 V CMOS	I	23	Port Address Input bit 0
LASI	Open Drain	O	9	Link Alarm Status Interrupt Output. Open Drain Compatible Output with 10 - 20 kΩ pull-up on host. Logic high = Normal Operation Logic low = Status Flag Triggered
RESET	Open Drain	I	10	Reset Input. Open Drain Compatible Input with 22 kΩ pull-up to APS internal to transponder. Logic high = Normal Operation Logic low = RESET
Vendor Specific			11,15,16,24	Vendor Specific Pins. Leave unconnected when not used.
TX ON/OFF	Open Drain	I	12	TX ON/OFF Input. Open Drain Compatible Input with 22 kΩ pull-up to APS internal to transponder. Logic high = Transmitter On Logic low = Transmitter Off
MOD DETECT		O	14	Pulled low inside transponder through a 1 kΩ resistor to Ground
Transmit Functions				
Reserved Reserved		I I	68 67	Reserved For Future Use Reserved For Future Use
TX LANE 3– TX LANE 3+	AC-coupled, Internally biased differential XAUI	I I	65 64	Module XAUI Input Lane 3– Module XAUI Input Lane 3+
TX LANE 2– TX LANE 2+		I I	62 61	Module XAUI Input Lane 2– Module XAUI Input Lane 2+
TX LANE 1– TX LANE 1+		I I	59 58	Module XAUI Input Lane 1– Module XAUI Input Lane 1+
TX LANE 0– TX LANE 0+		I I	56 55	Module XAUI Input Lane 0– Module XAUI Input Lane 0+
Receive Functions				
Reserved Reserved		O O	38 39	Reserved For Future Use Reserved For Future Use

RX LANE 0+ RX LANE 0–		O O	41 42	Module XAUI Output Lane 0+ Module XAUI Output Lane 0–
RX LANE 1+ RX LANE 1–		O O	44 45	Module XAUI Output Lane 1+ Module XAUI Output Lane 1–
RX LANE 2+ RX LANE 2–		O O	47 48	Module XAUI Output Lane 2+ Module XAUI Output Lane 2–
RX LANE 3+ RX LANE 3–		O O	50 51	Module XAUI Output Lane 3+ Module XAUI Output Lane 3–
DC Power				
GND	0 V DC		1, 2, 3, 33, 34, 35, 36, 37, 40, 43, 46, 49, 52, 53, 54, 57, 60, 63, 66, 69, 70	Ground connection for signal ground on the module
APS	+1.2 V		7, 8, 28, 29	Input from Adaptive Power Supply
APS SENSE	+1.2 V		27	APS Sense Output. Connected to the APS input inside transponder.
APS SET			25	Feedback input from APS. Connected to GND through a 1180Ω resistor inside the transponder.
3.3 V	+3.3 V DC		5, 6, 30, 31	DC Power Input, +3.3 V DC, Nominal
5.0 V	+5.0 V DC		4, 32	DC Power Input, +5.0 V DC, Nominal
Reserved			26	Reserved for APD.
Reserved			13	Reserved.

● Размеры





	PCI/LOW	MID	HIGH	ON BOARD
A	39.60	42.00	42.00	EITHER
B	12.00	19.46	28.86	EITHER
C	11.00	13.46	22.86	EITHER
D	0.31	2.69	2.69	0.31