TSSDS-NAACB1 Optical Transceiver

Multi-mode 10G SFP+ SR Optical Transceiver, With Diagnostic Monitoring

Features

- Duplex SFP+ Transceiver
- Hot Pluggable
- MDC connector receptacle
- Optical interface compliant to IEEE 802.3ae
- Electrical interface compliant to SFF-8431
- 2-wire interface with integrated Digital Diagnostic monitoring
- Data rate up to 11.3Gbps
- 850nm VCSEL transmitter, PIN photo-detector
- Maximum link length of 300m on OM3 MMF
- Power Dissipation < 1.0W
- Case operation temperature range ： Standard: temperature 0°C to 70°C
  Industrial temperature: -40°C to 85°C
- RoHS6 compliant (lead free)

Applications

- 10GBASE-SR at 10.3125Gbps
- 10GBASE-SW at 9.95Gbps

Product Description

The TSSDS-NAACB1 is a Single-Channel, Pluggable, Fiber-Optic SFP+ for 10.3125Gbps SR Applications. It is a high performance module for short-range data communication and interconnect applications which operate at 10.3125Gbps up to 82m on OM2 MMF and 300m on OM3 MMF.

This module is designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The electrical interface uses a 20 contact edge type connector. The optical interface uses MDC receptacle.

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Absolute Maximum Ratings

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Parameters	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	-0.5	+3.6	V
Storage Temperature	Tc	-40	+85	°C
Relative Humidity	RH	0	85	%

Recommended Operating Conditions

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

Parameter	Symbol	Min	Typical	Max	Unit
Power Supply Voltage	VCC	3.15	3.30	3.45	V
Operating Case Temperature (Standard)	Tca	0	-	70	°C
Operating Case Temperature (Industrial)	Tca	-40	-	85	°C

Notes:
[1] Supply current is shared between VCCTX and VCCRX.
[2] In-rush is defined as current level above steady state current requirements.

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max	Unit
Transmitter					
Data Rate	Mra	1.0	10.3	11.3	Gbps
Input differential impedance[1]	Rin	-	100	-	Ω
Differential Input Voltage swing	Vin	150	-	1200	mV
Transmit Disable Voltage	VD	2.0	-	VCC+0.3	V
Transmit Enable Voltage[2]	Ven	Vee	-	Vee+0.8	V
Transmit Disable Assert Time	Vn	-	-	100	us
Receiver					
Data Rate	Mra	-	10.3	11.3	Gbps
Output differential impedance[1]	Rout	-	100	-	Ω
Differential Output Swing[3]	Vout	300	-	700	mV
Loss of Signal –Asserted[4]	-	2.0	-	VCC+0.3	V
Loss of Signal –Negated[4]	-	Vee	-	Vee+0.8	V

Notes:
[1] AC coupled.
[2] Or open circuit.

[3] Into 100 ohm, differential termination.
[4] LOS is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

Optical characteristics

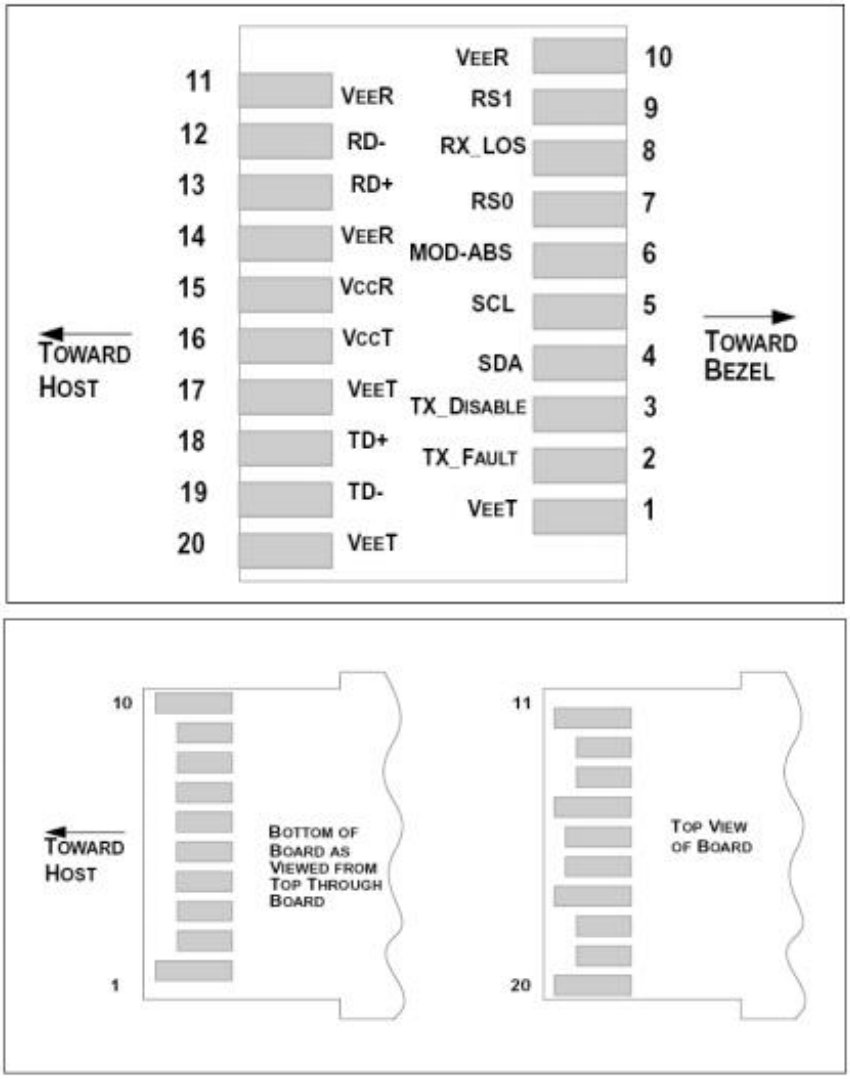
Parameter	Symbol	Min	Typical	Max	Unit
Transmitter					
Center Wavelength	λ	840	850	860	nm
Average Optical Power[1]	Po	-6.0	-	-1	dBm
Extinction Ratio[2]	ER	3.5	-	-	dB
Transmitter Dispersion Penalty	TDP	-	-	3.9	dB
Optical Return Loss Tolerance	ORL	-	-	12	dB
Receiver					
Receiver Sensitivity in OMA[3]	Rsens	-	-	-11.1	dBm
Stressed Sensitivity in OMA[3]	-	-	-	-7.5	dBm
Los function	Los	-30	-	-12	dBm
Receiver Overload[3]	Pmax	-1.0	-	-	dBm
Receiver Reflectance	-	-	-	-12	dB

Notes:
[1] The optical power is launched into MMF
[2] Measured with a PRBS 2^{31}-1 test pattern @10.3125Gbps
[3] Measured with a PRBS 2^{31}-1 test pattern @10.3125Gbps,BER$\leqslant 10^{-12}$.

Low Speed Characteristics

Parameter	Symbol	Min	Typical	Max	Unit
TX_Fault, RX_LOS	VOL	0	-	0.4	V
	VOH	Host_VCC-0.5	-	Host_VCC+0.3	V
TX_DIS	VIL	-0.3	-	0.8	V
	VIH	2.0	-	VCCT+0.3	V
RS0, RS1	VIL	-0.3	-	0.8	V
	VIH	2.0	-	VCCT+0.3	V

SFP+ Transceiver Electrical Pad Layout



Pin definition

Pin	Symbol	Name/Description
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground

11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

Notes:

[1] Module circuit ground is isolated from module chassis ground within the module.

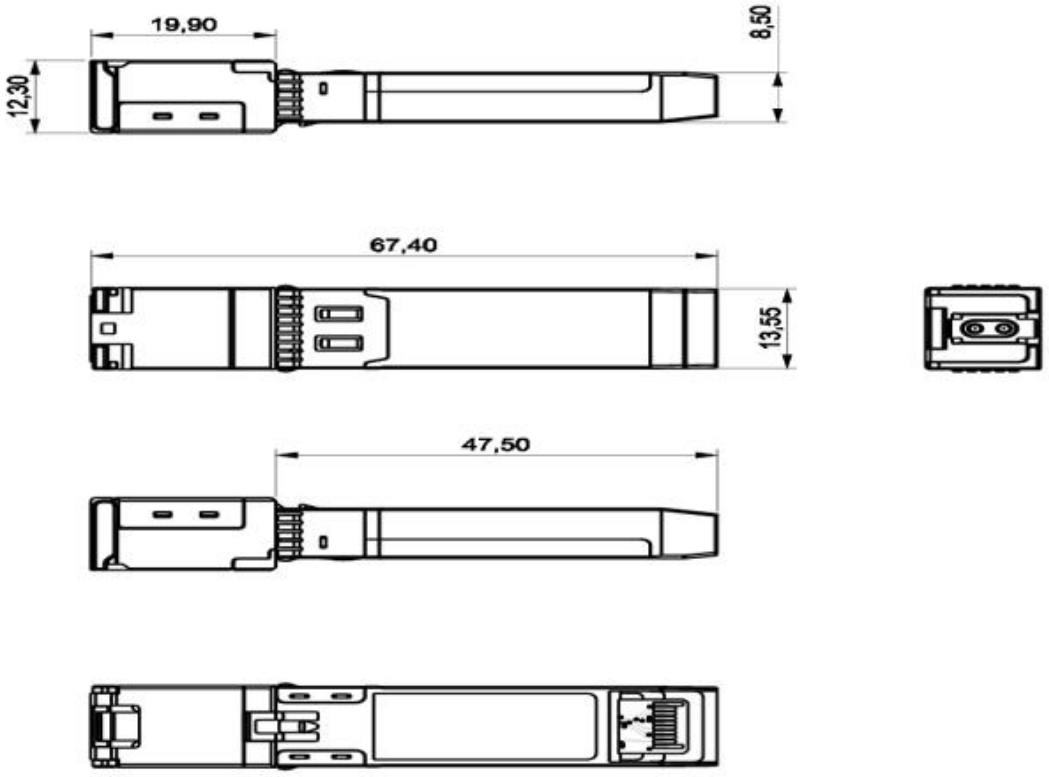
[2] Should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.6V.

[3] Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VCCT inside the module.

[4] Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to VCC_Host with a resistor in the range 4.7 kΩ to10 kΩ.Mod_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.

[5] RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.

Mechanical



Ordering Information

Part Number	Product Description
TSSDS-NAACB1C	10G SFP+ SR Optical Transceiver 82m on OM2 MMF and 300m on OM3 MMF
TSSDS-NAACB1T	10G SFP+ SR Optical Transceiver 82m on OM2 MMF and 300m on OM3 MMF -

Important Notice

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