YRSF-2420-31DC/I/KL
SFP 1.25Gb/s 20km Transceiver with DDMI
Hot Pluggable, 1310nm with LC Receptacle

Features:

- Data-rate of 1.25Gbps operation
- 1310nm FP Laser Transmitter and PIN-TIA Receiver
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- 10km transmission with 9/125 μm SMF
- Hot-Pluggable Capability with SFP form factor
- Single +3.3V Power Supply
- Operating Case Temperature:

  Standard: 0°C ~+70°C

  Industrial: -40℃~+85℃

  Exceptional: -40℃~+105℃
- Compatible with RoHS

Applications:

- Gigabit Ethernet Switches and Routers
- Fiber Channel Switch Infrastructure
- Other optical links

YRSF-2420-31DC/I/KL transceiver is small form factor pluggable module for double fiber optical data communications. It's RoHS compliant and lead-free per Directive 2002/95/EC. The digital diagnostics functions are compliant with SFF-8472, which are available via the 2-wire serial bus specified in the SFP MSA.

Order Information:

Part No.	Bit Rate (Gbps)	Laser(nm)	Distance [note2]	Fiber Type	DDMI	Connector	Temp [note1]
YRSF-2420-31DCL	1.25	1310	20km	SMF	YES	LC	0℃~+70℃
YRSF-2420-31DIL	1.25	1310	20km	SMF	YES	LC	-40℃~+85℃
YRSF-2420-31DKL	1.25	1310	20km	SMF	YES	LC	-40℃~+105℃

Notes:
1.Case Temperature.
2.Maximum Supported Distances.

Absolute Maximum Ratings:

Parameter	Symbol	Min.	Typ	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5	-	4.0	V
Storage Temperature	TS	-40	-	105	℃
Operating Humidity	-	5	-	95	%

Recommended Operating Environment:

Parameter		Symbol	Min.	Typ	Max.	Unit
Power Supply Voltage		Vcc	3.13	3.30	3.47	V
Power Supply Current		Icc	-	-	300	mA
Surge current		Isurge	-	-	30	mA
Case Operating Temperature	YRSF-2420-31DCL	Top	0	-	+70	°C
	YRSF-2420-31DIL		-40	-	+85	°C
	YRSF-2420-31DKL		-40	-	+105	°C
Data Rate		DR	-	1.25	-	Gbps

Transmitter Electrical and Optical Characteristics:(Condition: T_a=T_{OP})

Parameter	Symbol	Min.	Typ	Max.	Unit
Center Wavelength	λ_C	1260	1310	1360	nm
Output Spectral Width	△λ(RMS)	-	-	4	nm
Average Output Power	P_o	-9.0	-	-3.0	dBm
Extinction Ratio	ER	9	-	-	dB
Output Optical Eye	IEEE802.3z and ANSI Fiber Channel Compliant				
Average Launch power of OFF TX	Poff	-	-	-30	dBm
Rise/Fall Time (20%~80%)	Tr/Tf	-	-	260	ps
Transmitter Differential Input Volt	+/-TX_DAT	400	-	1800	mV_{p-p}
Tx_Disable Input Voltage – Low	V_{IL}	0	-	0.8	V
Tx_Disable Input Voltage – High	V_{IH}	2.0	-	Vcc	V
Tx_Fault Output Voltage – Low	V_{OL}	0	-	0.8	V
Tx_Fault Output Voltage – High	V_{OH}	2.4	-	Vcc	V

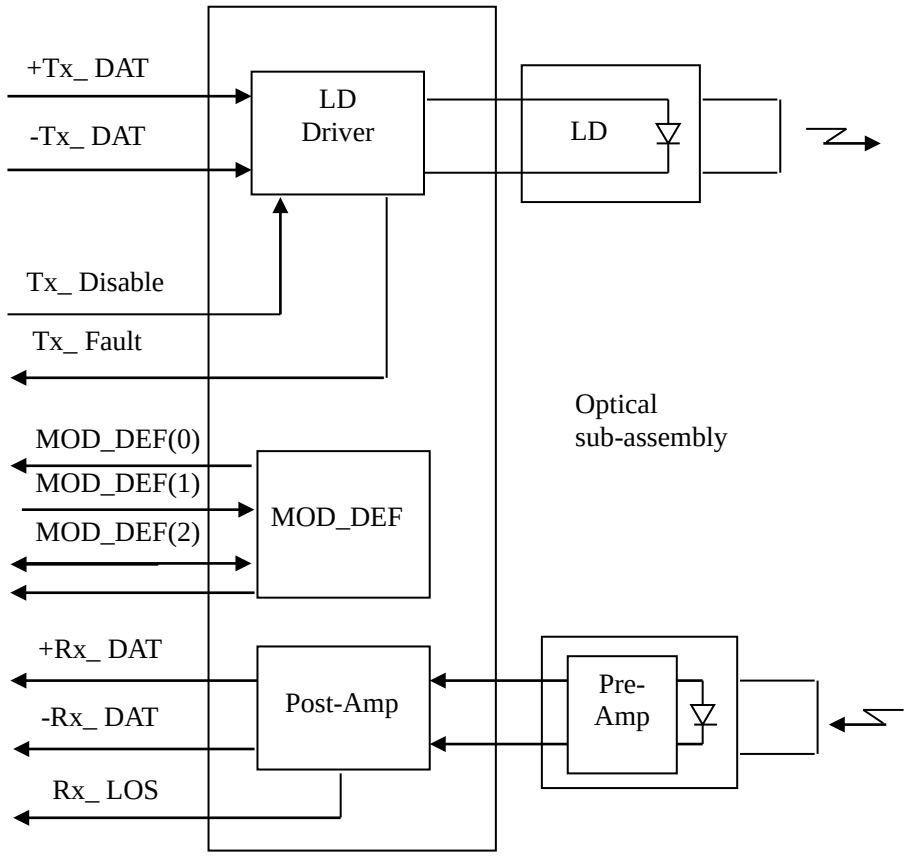
Receiver Electrical and Optical Characteristics:(Condition: T_a=T_{OP})

Parameter	Symbol	Min.	Typ	Max.	Unit
Operating Wavelength	λ_C	1260	1310	1610	nm
Receive Sensitivity(Note 1)	P_{min}	-	-	-22	dBm
Maximum Input Power(Note 1)	P_{MAX}	0.5	-	-	dBm
LOS Assert	LOSA	-30	-	-	dBm

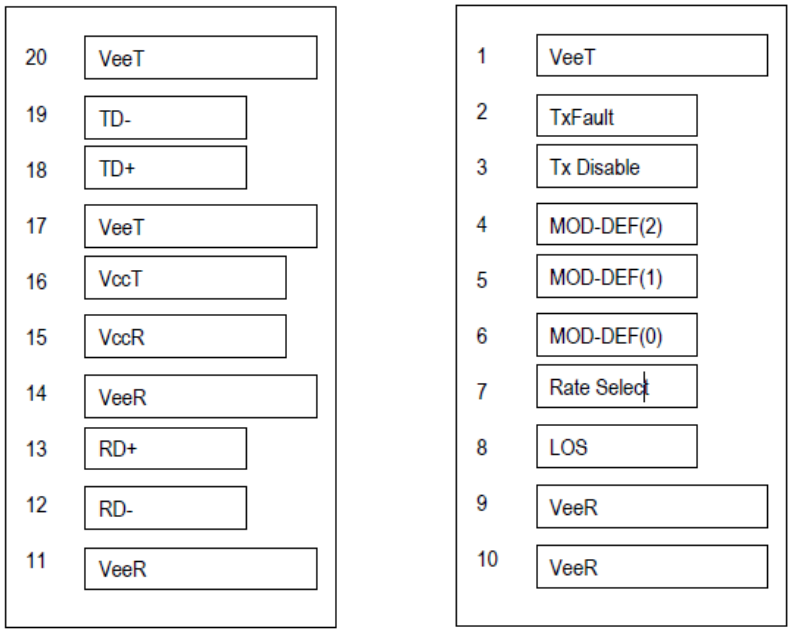
LOS De-assert	LOSD	-	-	-23	dBm
LOS Hysteresis	-	0.5	-	4	dB
Output High Voltage	V_{OH}	Vcc-1.03	-	Vcc-0.89	V
Output Low Voltage	V_{OL}	Vcc-1.82	-	Vcc-1.63	V
Receiver Differential Output Volt	+/-RX_DAT	400	-	1800	mV p-p
Rx_LOS Output Voltage- Low	V_{OL}	0	-	0.8	V
Rx_LOS Output Voltage- High	V_{OH}	2.0	-	Vcc	V

Note:
1.Measured with a PRBS 2^7 -1 test pattern @1250Mbps, BER ≤1×10^{-12}.

● Block Diagram of Transceiver:



Pin Assignment:



Pin out of Connector Block on Host Board

Pin Description:

Pin	Symbol	Name/Description	Notes
1	VEET	Module Transmitter Ground	1
2	TX_FAULT	Module Transmitter Fault	2
3	TX_DISABLE	Transmitter Disable; Turns off transmitter laser output	3
4	MOD-DEF2	2-Wire Serial Interface Data Line (MOD-DEF2)	2
5	MOD-DEF1	2-Wire Serial Interface Clock (MOD-DEF1)	2
6	MOD-DEF0	Module Absent, connected to VEET or VEER in the module	
7	Rate Select	Not connect	
8	LOS	Loss of Signal	2
9	VEER	Module Receiver Ground	
10	VEER	Module Receiver Ground	1
11	VEER	Module Receiver Ground	1
12	RD-	Receiver Inverted Data Output	
13	RD+	Receiver Non-Inverted Data Output	
14	VEER	Module Receiver Ground	1
15	VCCR	Module Receiver 3.3 V Supply	

16	VCCT	Module Transmitter 3.3 V Supply	
17	VEET	Module Transmitter Ground	1
18	TD+	Transmitter Non-Inverted Data Input	
19	TD-	Transmitter Inverted Data Input	
20	VEET	Module Transmitter Ground	1

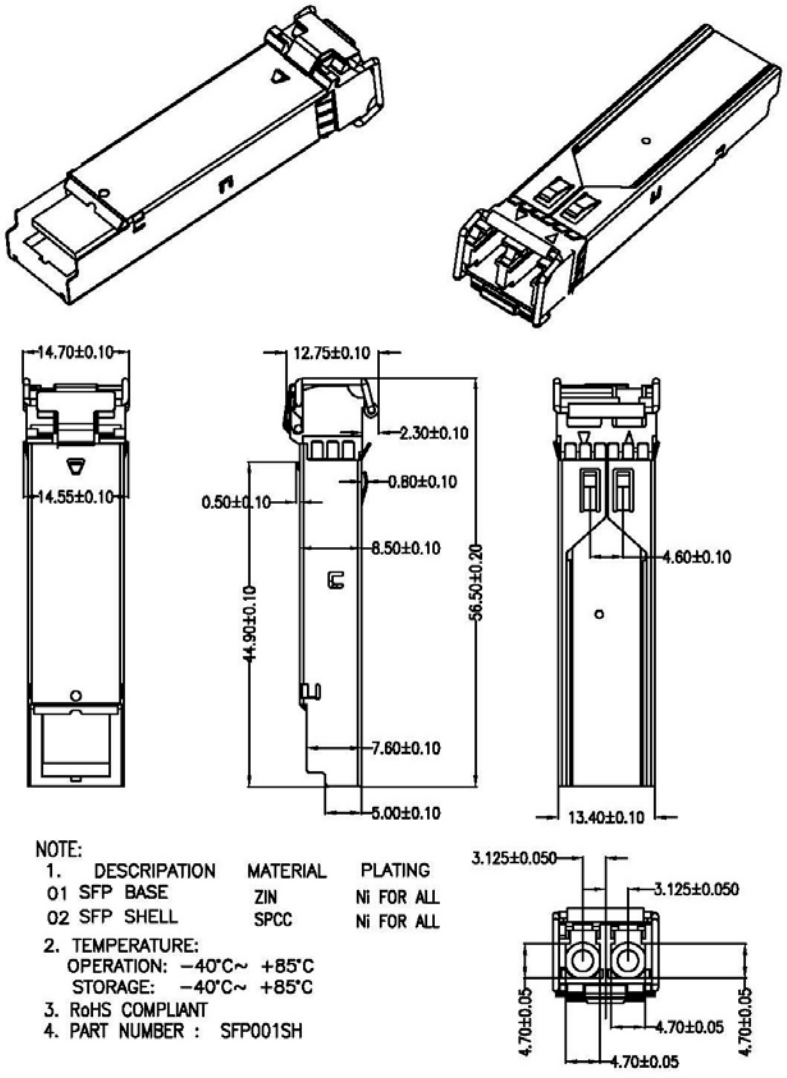
Notes:

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

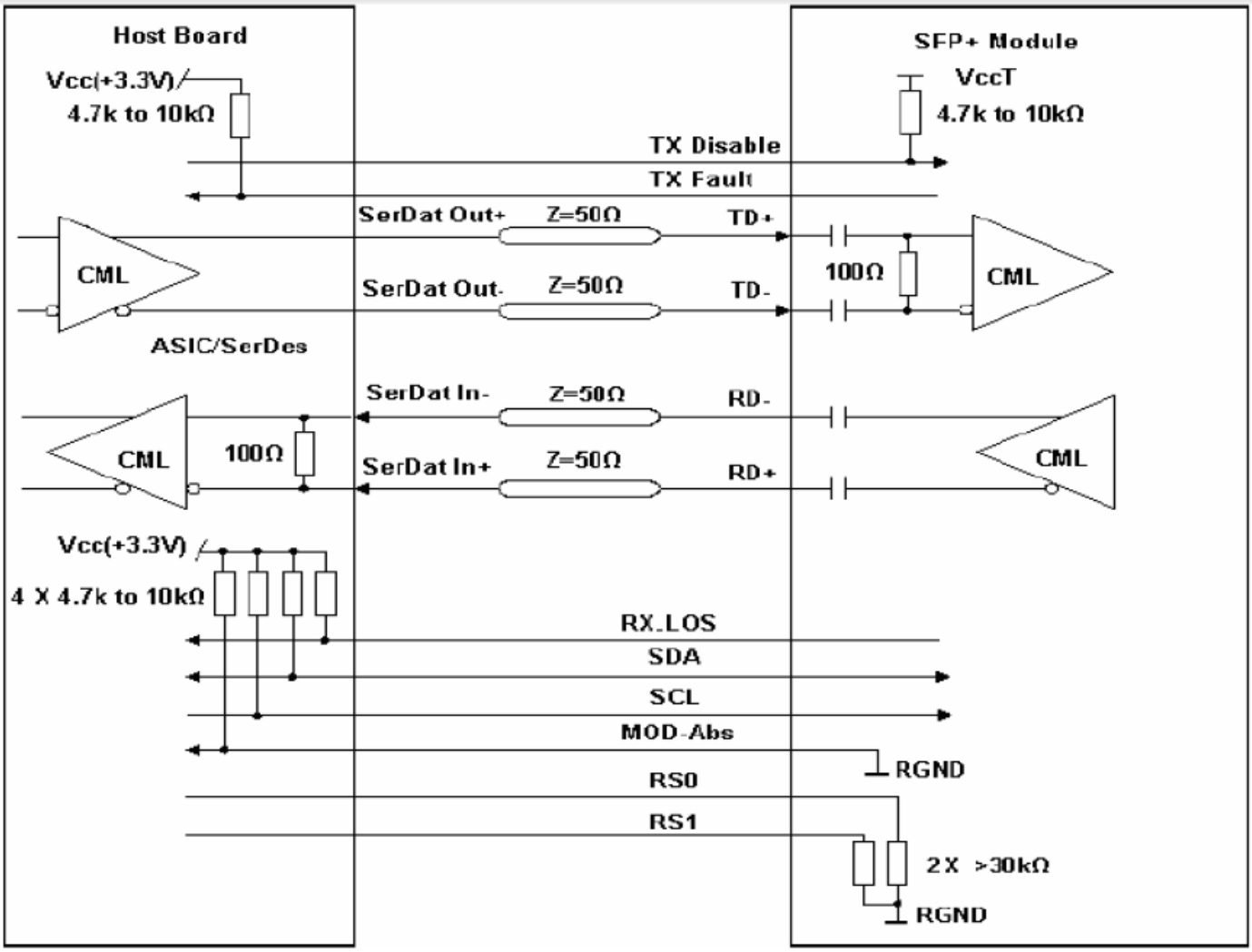
2.Should be pulled up with 4.7kΩ to 10kΩ ohms on host board to a voltage between 3.15Vand 3.6V.

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

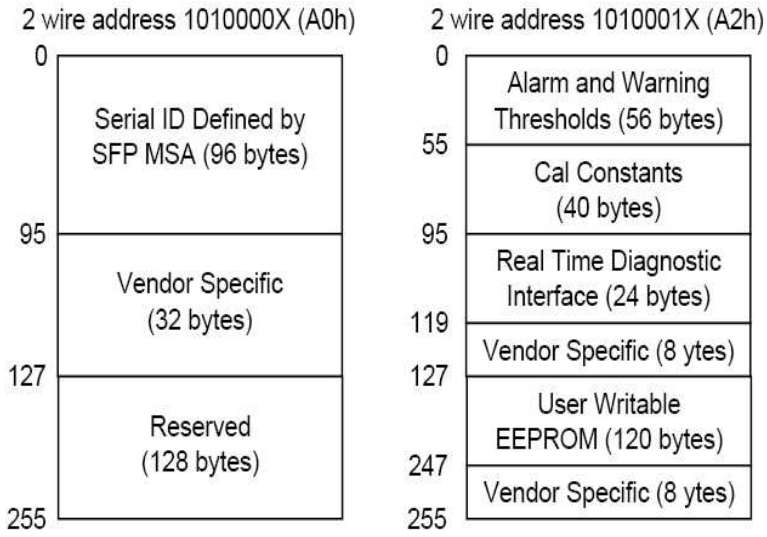
● Mechanical Dimensions:



- **Recommended Circuit:**



Digital Diagnostic Functions



YRSF-2420-31DC/I/KL SFP transceiver supports the 2-wire serial communication protocol as defined in SFP MSA: in which defines a 256-byte memory map in EEPROM at 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface be assigned with 8 bit address 1010001X (A2h)

Additionally, SFP transceivers provide a unique digital diagnostic monitoring interface (DDMI), which allows real-time access to product operating parameters such as transceiver supply voltage, transceiver temperature, transmitted optical power, laser bias current and received optical power. It also defines alarm and warning threshold, which alerts end-users when particular operating parameters are outside of factory setting.

When the serial protocol is activated, the serial clock signal (SCL, Mod Def 1) is generated by the host. The positive edge clocks data into those segments of the EEPROM that are not write-protected. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA, Mod Def 2) is bi-Directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

Digital diagnostics for the YRSF-2420-31DC/I/KL are internally calibrated by default: Calibration and alarm/warning threshold data is written during device manufacturing.

Digital Diagnostic Specifications

YRSF-2420-31DC/I/KL transceivers have internally calibrated digital diagnostics.

Monitor accuracy					
Parameter	**Min**	**Typ**	**Max**	**Units**	**Ref**
Internally measured transceiver temperature			±3	ºC	
Internally measured transceiver supply voltage			±3	%	
Measured TX bias current			±10	%	
Measured TX output power			±3	dB	
Measured RX received average optical power			±3	dB	