

GTL9-1301-40-GXX**GTL9-1301-50-GXX****GTL9-1301-60-GXX****Single-Mode 64kbps to 50Mbps****Duplex 1 x 9 Transceiver****RoHS Compliant****Features**

- ◆ Duplex SC/FC /ST Single-Mode Transceiver
- ◆ Industry Standard 1 x 9 Footprint
- ◆ 1310nm FP-LD Transmitter
- ◆ 3.3V/5V single power supply
- ◆ TTL signal input and output
- ◆ Analog RSSI(received signal strength indication) output
- ◆ Digital Diagnostic Monitoring Interface
- ◆ Wave Solderable and Aqueous Washable with process plug inserted

Class 1 FDA and IEC60825-1 laser safety compliant.

- ◆ Operating Case Temperature

Standard: 0℃~+70℃

Industrial:-40℃~+85℃

Applications

- ◆ Switch to Switch Interface
- ◆ IEEE C37.94
- ◆ Digital video transmission system

**Ordering information**

Part No.	Input	Output	RSSI or LOS	Distance	Voltage	Interface	Temp.
GTL9-1301-40-GIFR(N)	DC	DC	Analog	40km	3.3V/5V	FC	industrial
GTL9-1301-40-GIFR	DC	DC	Analog	40km	3.3V/5V	FC	industrial
GTL9-1301-40-GIFR2	DC	DC	Analog	40km	3.3V/5V	FC	industrial
GTL9-1301-40-GIFR+	DC	DC	Analog	40km	3.3V/5V	FC with long pins	industrial
GTL9-1301-40-GNR	DC	DC	Analog	40km	3.3V/5V	FC Plastics	Standard
GTL9-1301-40-GINR	DC	DC	Analog	40km	3.3V/5V	FC Plastics	industrial
GTL9-1301-40-GTR	DC	DC	Analog	40km	3.3V/5V	ST Plastics	Standard

GTL9-1301-40-GITR	DC	DC	Analog	40km	3.3V/5V	ST Plastics	industrial
GTL9-1301-40-GTR+	DC	DC	Analog	40km	3.3V/5V	ST Plastics with long pins	Standard
GTL9-1301-40-GITR+	DC	DC	Analog	40km	3.3V/5V	ST Plastics with long pins	industrial
GTL9-1301-40-GNR+	DC	DC	Analog	40km	3.3V/5V	FC Plastics with long pins	Standard
GTL9-1301-40-GINR+	DC	DC	Analog	40km	3.3V/5V	FC Plastics with long pins	industrial
GTL9-1301-40-GR	DC	DC	Analog	40km	3.3V/5V	SC	Standard
GTL9-1301-40-GIR	DC	DC	Analog	40km	3.3V/5V	SC	industrial
GTL9-1301-40-GIF2(N)	DC	DC	LOS	40km	3.3V/5V	FC	industrial
GTL9-1301-40-GIF2	DC	DC	LOS	40km	3.3V/5V	FC	industrial
GTL9-1301-40-GIPF2 (N)	DC	DC	LOS	40km	3.3V/5V	Pigtail/FC/PC	industrial
GTL9-1301-40-GF2+	DC	DC	LOS	40km	3.3V/5V	FC with long pins	Standard
GTL9-1301-40-GIF2+	DC	DC	LOS	40km	3.3V/5V	FC with long pins	industrial
GTL9-1301-40-GI2(N)	DC	DC	LOS	40km	3.3V/5V	SC	industrial
GTL9-1301-40-GI2	DC	DC	LOS	40km	3.3V/5V	SC	industrial
GTL9-1301-40-GT2	DC	DC	LOS	40km	3.3V/5V	ST Plastics	Standard
GTL9-1301-40-GIT2	DC	DC	LOS	40km	3.3V/5V	ST Plastics	industrial
GTL9-1301-40-GT2+	DC	DC	LOS	40km	3.3V/5V	ST Plastics with long pins	Standard
GTL9-1301-40-GIT2+	DC	DC	LOS	40km	3.3V/5V	ST Plastics with long pins	industrial
GTL9-1301-40-GFRR	DC	DC	SD	40km	3.3V/5V	FC	Standard
GTL9-1301-40-GIFRR	DC	DC	SD	40km	3.3V/5V	FC	industrial
GTL9-1301-40-GFRR+	DC	DC	SD	40km	3.3V/5V	FC with long pins	Standard
GTL9-1301-40-GIFRR+	DC	DC	SD	40km	3.3V/5V	FC with long pins	industrial
GTL9-1301-40-GRR	DC	DC	SD	40km	3.3V/5V	SC	Standard
GTL9-1301-40-GIRR	DC	DC	SD	40km	3.3V/5V	SC	industrial
GTL9-1301-40-GTRR	DC	DC	SD	40km	3.3V/5V	ST Plastics	Standard
GTL9-1301-40-GITRR	DC	DC	SD	40km	3.3V/5V	ST Plastics	industrial
GTL9-1301-40-GTRR+	DC	DC	SD	40km	3.3V/5V	ST Plastics with long pins	Standard
GTL9-1301-40-GITRR+	DC	DC	SD	40km	3.3V/5V	ST Plastics with long pins	industrial
GTL9-1301-50-GFR	DC	DC	Analog	50km	3.3V/5V	FC	Standard
GTL9-1301-50-GIFR	DC	DC	Analog	50km	3.3V/5V	FC	industrial
GTL9-1301-50-GFR+	DC	DC	Analog	50km	3.3V/5V	FC with long pins	Standard
GTL9-1301-50-GIFR+	DC	DC	Analog	50km	3.3V/5V	FC with long pins	industrial
GTL9-1301-50-GNR	DC	DC	Analog	50km	3.3V/5V	FC Plastics	Standard
GTL9-1301-50-GINR	DC	DC	Analog	50km	3.3V/5V	FC Plastics	industrial

GTL9-1301-50-GTR	DC	DC	Analog	50km	3.3V/5V	ST Plastics	Standard
GTL9-1301-50-GITR	DC	DC	Analog	50km	3.3V/5V	ST Plastics	industrial
GTL9-1301-50-GTR+	DC	DC	Analog	50km	3.3V/5V	ST Plastics with long pins	Standard
GTL9-1301-50-GITR+	DC	DC	Analog	50km	3.3V/5V	ST Plastics with long pins	industrial
GTL9-1301-50-GNR+	DC	DC	Analog	50km	3.3V/5V	FC Plastics with long pins	Standard
GTL9-1301-50-GINR+	DC	DC	Analog	50km	3.3V/5V	FC Plastics with long pins	industrial
GTL9-1301-50-GR	DC	DC	Analog	50km	3.3V/5V	SC	Standard
GTL9-1301-50-GIR	DC	DC	Analog	50km	3.3V/5V	SC	industrial
GTL9-1301-50-GF2	DC	DC	LOS	50km	3.3V/5V	FC	Standard
GTL9-1301-50-GIF2	DC	DC	LOS	50km	3.3V/5V	FC	industrial
GTL9-1301-50-GF2+	DC	DC	LOS	50km	3.3V/5V	FC with long pins	Standard
GTL9-1301-50-GIF2+	DC	DC	LOS	50km	3.3V/5V	FC with long pins	industrial
GTL9-1301-50-G2	DC	DC	LOS	50km	3.3V/5V	SC	Standard
GTL9-1301-50-GI2	DC	DC	LOS	50km	3.3V/5V	SC	industrial
GTL9-1301-50-GT2	DC	DC	LOS	50km	3.3V/5V	ST Plastics	Standard
GTL9-1301-50-GIT2	DC	DC	LOS	50km	3.3V/5V	ST Plastics	industrial
GTL9-1301-50-GT2+	DC	DC	LOS	50km	3.3V/5V	ST Plastics with long pins	Standard
GTL9-1301-50-GIT2+	DC	DC	LOS	50km	3.3V/5V	ST Plastics with long pins	industrial
GTL9-1301-50-GFRR	DC	DC	SD	50km	3.3V/5V	FC	Standard
GTL9-1301-50-GIFRR	DC	DC	SD	50km	3.3V/5V	FC	industrial
GTL9-1301-50-GFRR+	DC	DC	SD	50km	3.3V/5V	FC with long pins	Standard
GTL9-1301-50-GIFRR+	DC	DC	SD	50km	3.3V/5V	FC with long pins	industrial
GTL9-1301-50-GRR	DC	DC	SD	50km	3.3V/5V	SC	Standard
GTL9-1301-50-GIRR	DC	DC	SD	50km	3.3V/5V	SC	industrial
GTL9-1301-50-GTRR	DC	DC	SD	50km	3.3V/5V	ST Plastics	Standard
GTL9-1301-50-GITRR	DC	DC	SD	50km	3.3V/5V	ST Plastics	industrial
GTL9-1301-50-GTRR+	DC	DC	SD	50km	3.3V/5V	ST Plastics with long pins	Standard
GTL9-1301-50-GITRR+	DC	DC	SD	50km	3.3V/5V	ST Plastics with long pins	industrial
GTL9-1301-60-GFR	DC	DC	Analog	60km	3.3V/5V	FC	Standard
GTL9-1301-60-GIFR	DC	DC	Analog	60km	3.3V/5V	FC	industrial
GTL9-1301-60-GFR+	DC	DC	Analog	60km	3.3V/5V	FC with long pins	Standard
GTL9-1301-60-GIFR+	DC	DC	Analog	60km	3.3V/5V	FC with long pins	industrial
GTL9-1301-60-GNR	DC	DC	Analog	60km	3.3V/5V	FC Plastics	Standard
GTL9-1301-60-GINR	DC	DC	Analog	60km	3.3V/5V	FC Plastics	industrial
GTL9-1301-60-GNR+	DC	DC	Analog	60km	3.3V/5V	FC Plastics with	Standard

						long pins	
GTL9-1301-60-GINR+	DC	DC	Analog	60km	3.3V/5V	FC Plastics with long pins	industrial
GTL9-1301-60-GR	DC	DC	Analog	60km	3.3V/5V	SC	Standard
GTL9-1301-60-GIR	DC	DC	Analog	60km	3.3V/5V	SC	industrial
GTL9-1301-60-GTR	DC	DC	Analog	60km	3.3V/5V	ST Plastics	Standard
GTL9-1301-60-GITR	DC	DC	Analog	60km	3.3V/5V	ST Plastics	industrial
GTL9-1301-60-GTR+	DC	DC	Analog	60km	3.3V/5V	ST Plastics with long pins	Standard
GTL9-1301-60-GITR+	DC	DC	Analog	60km	3.3V/5V	ST Plastics with long pins	industrial
GTL9-1301-60-GF2	DC	DC	LOS	60km	3.3V/5V	FC	Standard
GTL9-1301-60-GIF2	DC	DC	LOS	60km	3.3V/5V	FC	industrial
GTL9-1301-60-GIPF2(N)	DC	DC	LOS	60km	3.3V/5V	Pigtail/FC/PC	industrial
GTL9-1301-60-GF2+	DC	DC	LOS	60km	3.3V/5V	FC with long pins	Standard
GTL9-1301-60-GIF2+	DC	DC	LOS	60km	3.3V/5V	FC with long pins	industrial
GTL9-1301-60-G2	DC	DC	LOS	60km	3.3V/5V	SC	Standard
GTL9-1301-60-GI2	DC	DC	LOS	60km	3.3V/5V	SC	industrial
GTL9-1301-60-GT2	DC	DC	LOS	60km	3.3V/5V	ST Plastics	Standard
GTL9-1301-60-GIT2	DC	DC	LOS	60km	3.3V/5V	ST Plastics	industrial
GTL9-1301-60-GT2+	DC	DC	LOS	60km	3.3V/5V	ST Plastics with long pins	Standard
GTL9-1301-60-GIT2+	DC	DC	LOS	60km	3.3V/5V	ST Plastics with long pins	industrial
GTL9-1301-60-GFRR	DC	DC	SD	60km	3.3V/5V	FC	Standard
GTL9-1301-60-GIFRR	DC	DC	SD	60km	3.3V/5V	FC	industrial
GTL9-1301-60-GFRR+	DC	DC	SD	60km	3.3V/5V	FC with long pins	Standard
GTL9-1301-60-GIFRR+	DC	DC	SD	60km	3.3V/5V	FC with long pins	industrial
GTL9-1301-60-GRR	DC	DC	SD	60km	3.3V/5V	SC	Standard
GTL9-1301-60-GIRR	DC	DC	SD	60km	3.3V/5V	SC	industrial
GTL9-1301-60-GTRR	DC	DC	SD	60km	3.3V/5V	ST Plastics	Standard
GTL9-1301-60-GITRR	DC	DC	SD	60km	3.3V/5V	ST Plastics	industrial
GTL9-1301-60-GTRR+	DC	DC	SD	60km	3.3V/5V	ST Plastics with long pins	Standard
GTL9-1301-60-GITRR+	DC	DC	SD	60km	3.3V/5V	ST Plastics with long pins	industrial

*The PN GTL9-1301-40/50/60-XXXX+ for long pin modules.

*For other PN, please contact YUGUANG.

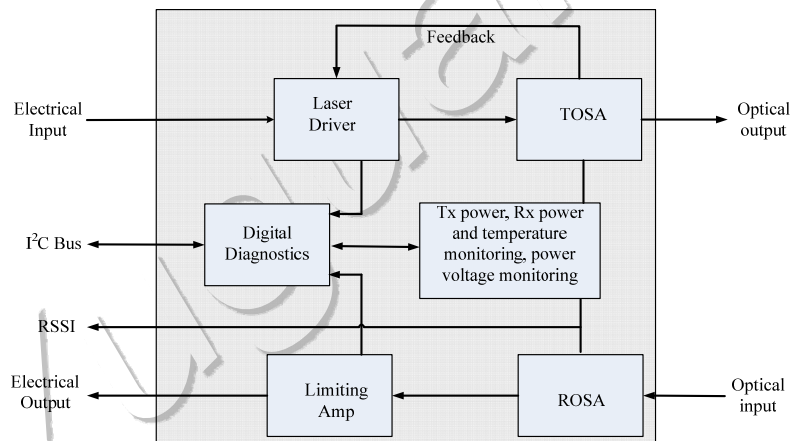
*The product image only for reference purpose.

Regulatory Compliance*

Product Certificate	Certificate Number	Applicable Standard
EMC CE	AE 50384190 0001	EN 55032:2012
		EN 55032:2015
		EN 55024:2010
		EN 55024:2010+A1
'FCC	WTF14F0514417E	47 CFR PART 15 OCT., 2013
FDA	/	CDRH 1040.10
ROHS	/	2011/65/EU

*The above certificate number updated to June 2018, because some certificate will be updated every year, such as FDA and ROHS. For the latest certification information, please check with Yuguang.

Functional Diagram



Product Description

The GTL9-1301-X-GXX Series Single-mode transceivers are low power, high performance modules for duplex optical data communications.

The transmitter section uses a multiple quantum well FP laser and is a class1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

A TTL logic interface simplifies interface to the external circuitry.

Absolute Maximum Ratings*Note1

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T _s	-40	+85	°C
Supply Voltage	V _{cc}	-0.5	7.0	V

Operating Relative Humidity	-		95	%
Soldering Conditions Temp/Time			260/10	°C/s

Note1: Exceeding any one of these values may destroy the device immediately.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T_c	0		+70	°C
		-40		+85	
Power Supply Voltage	V_{CC}	4.75	5	5.25	V
Power Supply Voltage	V_{CC}	3.15	3.3	3.45	V
Power Supply Current ^{*(note2)}	I_{CC}		60	90	Ma
Data Rate		0.064		50	Mbps
Serial ID clock data			100	400	KHz

Note2: Maximum current is specified at V_{CC} in all range of operating case temperature.

Optical and Electrical Characteristic

(GTL9-1301-40-GXX Series, FP and PIN)

Parameter	Symbol	Min.	Typical	Max.	Unit
Data Rate		0.064		50	Mbps
I ² C CLK, I ² C SDA	V _H	2.8		3.3	V
	V _L			0.6	V
Transmitter					
Centre Wavelength	λ _C	1260	1310	1360	nm
Spectral Width	Δλ			4	nm
Average Output Power ^{*(note3)}	P _{out}	-13		-9	dBm
Extinction Ratio	ER	9			Db
Relative Intensity Noise	RIN			-117	Db/Hz
Input High Voltage	V _H	2.0		V _{cc}	V
Input Low Voltage	V _L			0.8	V
Eye Diagram	ITU-T G.957 Compliant ^{*(note5)}				
Receiver					
Input center wavelength	λ _C	1260		1620	nm
Receiver Sensitivity ^{*(note4)}	P _{min}			-36	dBm
Receiver Overload	P _{max}	-3			dBm
Output High Voltage	V _H	2.4		V _{cc}	V
Output Low Voltage	V _L			0.4	V

GTL9-1301-40-GXX Series RSSI Specification

Parameter	Symbol	Min.	Typical	Max.	Unit
RSSI output voltage@-13 to -36dBm optical input		10		2500	Mv
RSSI accuracy			5		%

GTL9-1301-40-GXX Series DDM Monitoring Specification (2-Wire Address A2H)

Parameter	Range	Accuracy	Calibration
Temperature	-40 to +85℃	± 3℃	Internal
Voltage	3.0 to 5.5V	± 3%	Internal
Bias Current	0 to 100Ma	±10%	Internal
TX Power	-15 to -7dBm	± 3Db	Internal
RX Power	-36 to -13dBm	± 3Db	Internal

(GTL9-1301-50-GXX Series, FP and PIN)

Parameter	Symbol	Min.	Typical	Max.	Unit
Data Rate		0.064		50	Mbps
I ² C CLK, I ² C SDA	V _H	2.8		3.3	V
	V _L			0.6	V
Transmitter					
Centre Wavelength	λ _C	1260	1310	1360	nm
Spectral Width	Δλ			4	nm
Average Output Power*(note3)	P _{out}	-11		-7	dBm
Extinction Ratio	ER	9			Db
Relative Intensity Noise	RIN			-117	Db/Hz
Input High Voltage	V _H	2.0		V _{cc}	V
Input Low Voltage	V _L			0.8	V
Eye Diagram	ITU-T G.957 Compliant*(note5)				
Receiver					
Input center wavelength	λ _C	1260		1620	nm
Receiver Sensitivity*(note4)	P _{min}			-36	dBm
Receiver Overload	P _{max}	-3			dBm
Output High Voltage	V _H	2.4		V _{cc}	V
Output Low Voltage	V _L			0.4	V

GTL9-1301-50-GXX Series RSSI Specification

Parameter	Symbol	Min.	Typical	Max.	Unit
RSSI output voltage@-13 to -36dBm optical input		10		2500	Mv
RSSI accuracy			5		%

GTL9-1301-50-GXX Series DDM Monitoring Specification (2-Wire Address A2H)

Parameter	Range	Accuracy	Calibration
Temperature	-40 to +85℃	± 3℃	Internal
Voltage	3.0 to 5.5V	± 3%	Internal
Bias Current	0 to 100Ma	±10%	Internal
TX Power	-13 to -5dBm	± 3Db	Internal
RX Power	-36 to -13dBm	± 3Db	Internal

(GTL9-1301-60-GXX Series, FP and PIN)

Parameter	Symbol	Min.	Typical	Max.	Unit
Data Rate		0.064		50	Mbps
I ² C CLK, I ² C SDA	V _H	2.8		3.3	V
	V _L			0.6	V
Transmitter					
Centre Wavelength	λ _C	1260	1310	1360	nm
Spectral Width	Δλ			4	nm
Average Output Power ^{*(note3)}	P _{out}	-4		0	dBm
Extinction Ratio	ER	9			Db
Relative Intensity Noise	RIN			-117	Db/Hz
Input High Voltage	V _H	2.0		V _{cc}	V
Input Low Voltage	V _L			0.8	V
Eye Diagram	ITU-T G.957 Compliant ^{*(note5)}				
Receiver					
Input center wavelength	λ _C	1260		1620	nm
Receiver Sensitivity ^{*(note4)}	P _{min}			-36	dBm
Receiver Overload	P _{max}	-3			dBm
Output High Voltage	V _H	2.4		V _{cc}	V
Output Low Voltage	V _L			0.4	V

GTL9-1301-60-GXX Series RSSI Specification

Parameter	Symbol	Min.	Typical	Max.	Unit
RSSI output voltage@-13 to -36dBm optical input		10		2500	Mv
RSSI accuracy			5		%

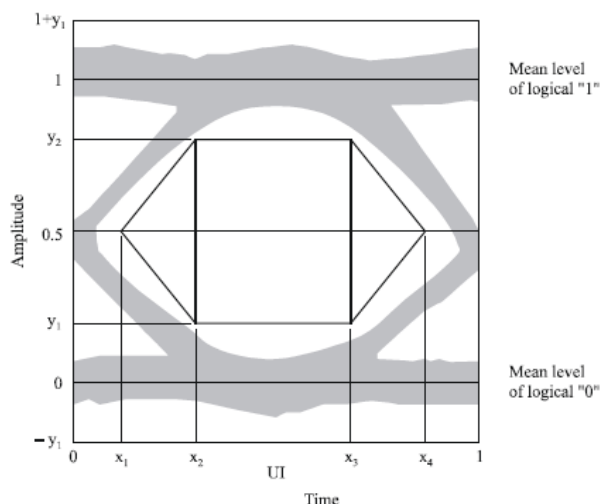
GTL9-1301-60-GXX Series DDM Monitoring Specification (2-Wire Address A2H)

Parameter	Range	Accuracy	Calibration
Temperature	-40 to +85℃	± 3℃	Internal
Voltage	3.0 to 5.5V	± 3%	Internal
Bias Current	0 to 100Ma	±10%	Internal
TX Power	-6 to +2dBm	± 3Db	Internal
RX Power	-36 to -13dBm	± 3Db	Internal

Note3: The optical power is launched into 9/125um SMF.

Note4: Minimum average optical power measured at BER less than 1E-12, with a 2²³-1 PRBS and ER=9 Db.

Note5: Eye pattern mask



EEPROM Serial ID Memory Contents

Accessing Serial ID Memory uses the 2 wire address 1010000X(A0). Memory Contents of Serial ID are shown as follows.

Table 1 Serial ID Memory Contents

Addr.	Size (Bytes)	Name of Field	Hex	Description
BASE ID FIELDS				
0	1	Identifier	00	
1	1	Ext. Identifier	00	
2	1	Connector	00	
3-10	8	Transceiver	00	
11	1	Encoding	00	
12	1	BR, Nominal	00	
13	1	Reserved	00	
14	1	Length (9μm)km	28/32/3C	40/50/60km
15	1	Length(9μm)100m	FF	
16	1	Length (50μm) 10m	00	
17	1	Length(62.5μm)10m	00	
18	1	Length (Copper)	00	
19	1	Reserved	00	
20-35	16	Vendor name	XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX	Yuguang
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	
40-55	16	Vendor PN	XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX	Vendor PN (ASCII)
56-59	4	Vendor rev	31 2E 30 20	1.0
60-61	2	Wavelength	05 1E	1310nm

62	1	Reserved	00	
63	1	CC_BASE	Check Sum (Variable)	Check code for Base ID Fields
EXTENDED ID FIELDS				
64-65	2	Options	00 00	
66	1	BR,max	00	
67	1	BR,min	00	
68-83	16	Vendor SN	XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX	Vendor SN (ASCII)
84-91	8	Date code		
92	1	Diagnostic Monitoring Type	68	Digital diagnostic monitoring implemented; Internally calibrated; average power
93	1	Enhanced Options	80	Optional Alarm/warning flags implemented
94	1	SFF_8472 Compliance	01	Includes in Rev 9.3 of SFF-8472.
95	1	CC_EXT		
VENDOR SPECIFIC ID FIELDS				
96-127	32	Vendor Specific	00	
128-255	128	Reserved	XX	

Accessing Serial ID Memory uses the 2 wire address 1010001X(A2H). Memory Contents of Serial ID are shown as follows.

Data Addr	Field Size (Byte)	Name Of field	Description of field	Coded value	Hex
Alarm & Warning Thresholds					
0	2	Temp High Alarm	Temp High Alarm	110℃	6EH
1					00H
2	2	Temp Low Alarm	Temp Low Alarm	-45℃	D3H
3					00H
4	2	Temp High Warning	Temp High Warning	95℃	5FH
5					00H
6	2	Temp Low Warning	Temp Low Warning	-42℃	D6H
7					00H
8	2	Voltage High Alarm	Voltage High Alarm	5.5V	D6H
9					D8H
10	2	Voltage Low Alarm	Voltage Low Alarm	3V	75H

11					30H
12	2	Voltage High Warning	Voltage High Warning	5.3V	CFH
13					08H
14	2	Voltage Low Warning	Voltage Low Warning	3.05V	77H
15					24H
16	2	Bias High Alarm	Bias High Alarm	70Ma	88H
17					B8H
18	2	Bias Low Alarm	Bias Low Alarm	0.5Ma	00H
19					FAH
20	2	Bias High Warning	Bias High Warning	60Ma	75H
21					30H
22	2	Bias Low Warning	Bias Low Warning	1Ma	01H
23					F4H
24	40km	2	TX Power High Alarm	-7dBm	07H
25					CBH
24	50km	2	TX Power High Alarm	-5dBm	0CH
25					5AH
24	60km	2	TX Power High Alarm	2dBm	3DH
25					EBH
26	40km	2	TX Power Low Alarm	-15dBm	01H
27					3CH
26	50km	2	TX Power Low Alarm	-13 dBm	01H
27					F5H
26	60km	2	TX Power Low Alarm	-6dBm	09H
27					CEH
28	40km	2	TX Power High Warning	-8dBm	06H
29					31H
28	50km	2	TX Power High Warning	-6 dBm	09H
29					D0H
28	60km	2	TX Power High Warning	1dBm	31H
29					2CH
30	40km	2	TX Power Low Warning	-14dBm	01H
31					8EH
30	50km	2	TX Power Low Warning	-12 dBm	02H
31					77H
30	60km	2	TX Power Low Warning	-5dBm	0CH
31					58H
32	2	RX Power High Alarm	RX Power High Alarm	-13dBm	01H
33					F5H
34	2	RX Power Low Alarm	RX Power Low Alarm	-37dBm	00H
35					02H
36	2	RX Power High Warning	RX Power High Warning	-14dBm	01H
37					8EH

38	2	RX Power Low Warning	RX Power Low Warning	-35.2dBm	00H
39					03H
40~55	16	Reserved			0
Calibration constants for External Calibration Option					
56	4	Rx_PWR(4)	Polynomial Fit Coefficient of Order 4 for Rx Optical Power Calibration.	0	0
57					0
58					0
59					0
60	4	Rx_PWR(3)	Polynomial Fit Coefficient of Order 3 for Rx Optical Power Calibration.	0	0
61					0
62					0
63					0
64	4	Rx_PWR(2)	Polynomial Fit Coefficient of Order 3 for Rx Optical Power Calibration.	0	0
65					0
66					0
67					0
68	4	Rx_PWR(1)	Polynomial Fit Coefficient of Order 3 for Rx Optical Power Calibration.	1	3F
69					80
70					0
71					0
72	4	Rx_PWR(0)	Polynomial Fit Coefficient of Order 3 for Rx Optical Power Calibration.	0	0
73					0
74					0
75					0
76	2	Tx_I(Slope)	Slope of Laser Bias Current Linear Calibration	1	1
77					0
78	2	Tx_I(Offset)	Offset of Laser Bias Current Linear Calibration	0	0
79					0
80	2	Tx_PWR(Slope)	Slope of Transmitter Coupled Output Power Linear Calibration	1	1
81					0
82	2	Tx_PWR(Offset)	Offset of Transmitter Coupled Output Power Linear Calibration	0	0
83					0
84	2	T (Slope)	Slope of Temperature Linear Calibration	1	1
85					0
86	2	T (Offset)	Offset of Temperature Linear Calibration	0	0
87					0
88	2	V (Slope)	Slope of Supply Voltage Linear Calibration	1	1
89					0
90	2	V (Offset)	Offset of Supply Voltage Linear Calibration	0	0
91					0
92	3	Reserved			0
93					0
94					0

95	1	CC_EXT	Check code for the Extended ID Fields (addresses 0 to 94)		xx
----	---	--------	---	--	----

Bytes 96-111 are the real time diagnostic and control registers, where 96-109 are the converted analog values and 110-111 are the optional status/control bits registers.

Bytes 112-117 registers are the warning and alarm flags which contain an optional set of alarm and warning flags.

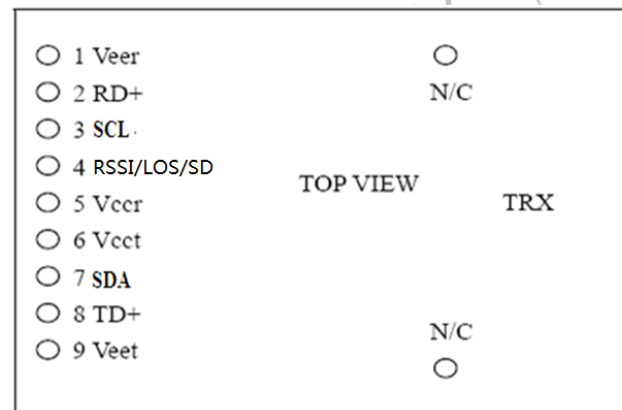
Using the two wire serial bus address 1010001X (A2H), diagnostic information about the module's present operating conditions can be real time monitored. The device operation of I2C Bus is the just standard I2C protocol, and the recommended serial clock rate is 100KHz.

For more details of the A2H, please refer to the SFF-8472 specification.

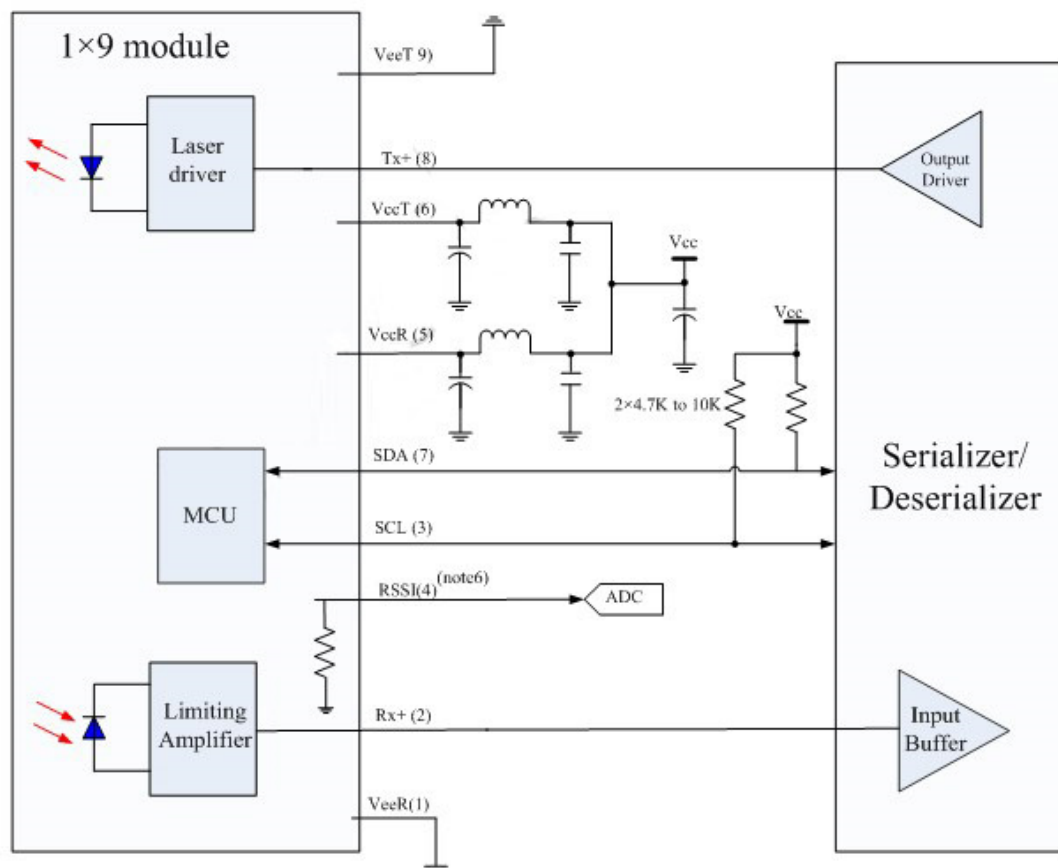
Pin Description

Pin	Name	Level	Description
1	VEER		Receiver Signal Ground, connect to receiver ground plane directly
2	RD+	TTL	Receiver Data Out.
3	SCL	LVTTL	Serial 2-wire interface clock.
4	RSSI LOS/SD(optional) (Note6)		Received signal strength indication (analog output), LOS (TTL signal output) or SD(TTL signal output). For LOS signal, low voltage indicates the normal optical signal input, while high voltage indicates low level optical signal input. For SD signal, just reverses the LOS, high voltage means normal optical signal input and low voltage means low level optical input.
5	VccR		Receiver Power Supply, provide 3.3V/5V DC via the recommended receiver power supply filter circuit. Locate the power filter circuit as close as possible to the VCCR pin.
6	VccT		Transmitter Power Supply, provide 3.3V/5V DC via the recommended transmitter power supply filter circuit. Locate the power filter circuit as close as possible to the VCCT pin.
7	SDA	LVTTL	Serial 2-wire interface data.
8	TD+	TTL	Transmitter Data in.
9	VEET		Transmitter Signal Ground, connect to the transmitter ground planed directly.

Pin Definitions

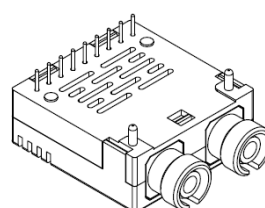
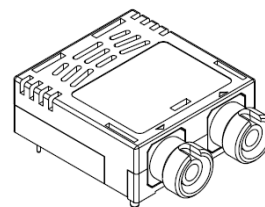
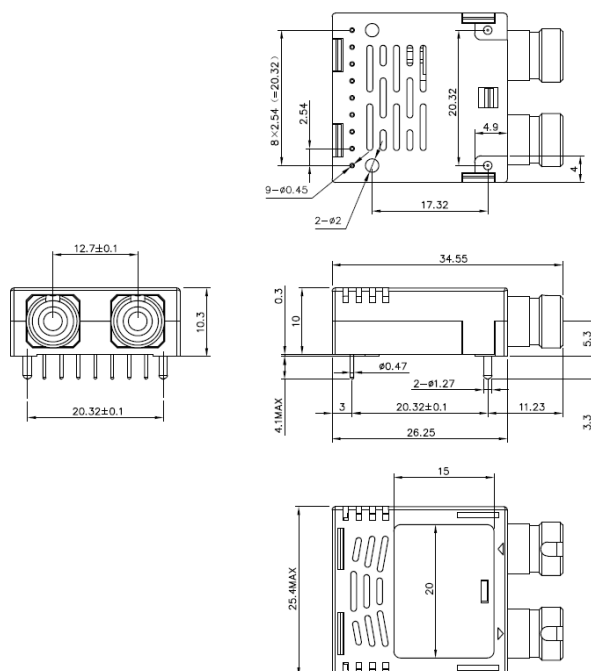


Recommended Circuit



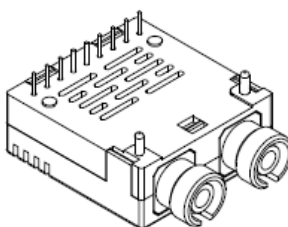
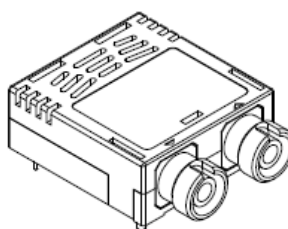
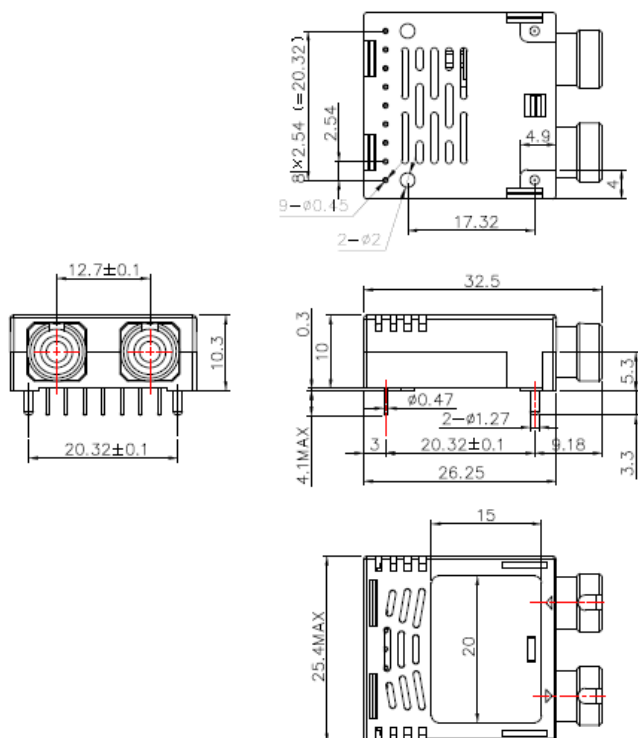
Note6: For RSSI output, PIN 4 is analog signal output can be connected to DAC or disconnected. There are internal pull-down resistors to sample the current of receiver, so any external pull-up or pull-down resistor is not required.

Package outline (Unit: mm)



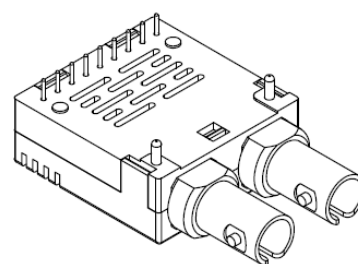
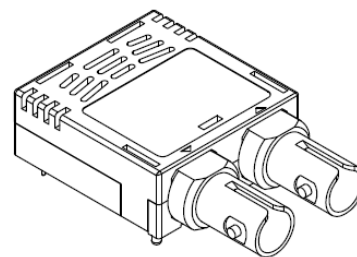
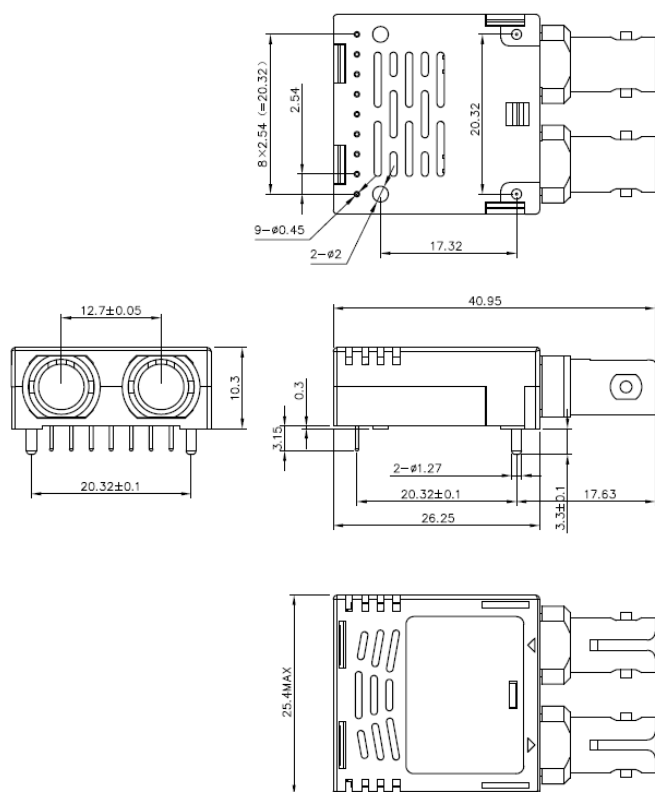
Unremarked tolerances ± 0.2 mm

FC metal receptacle



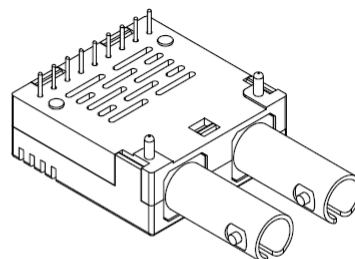
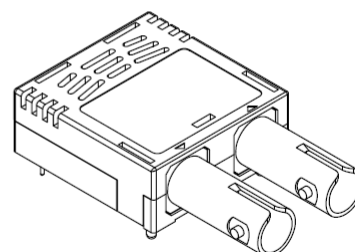
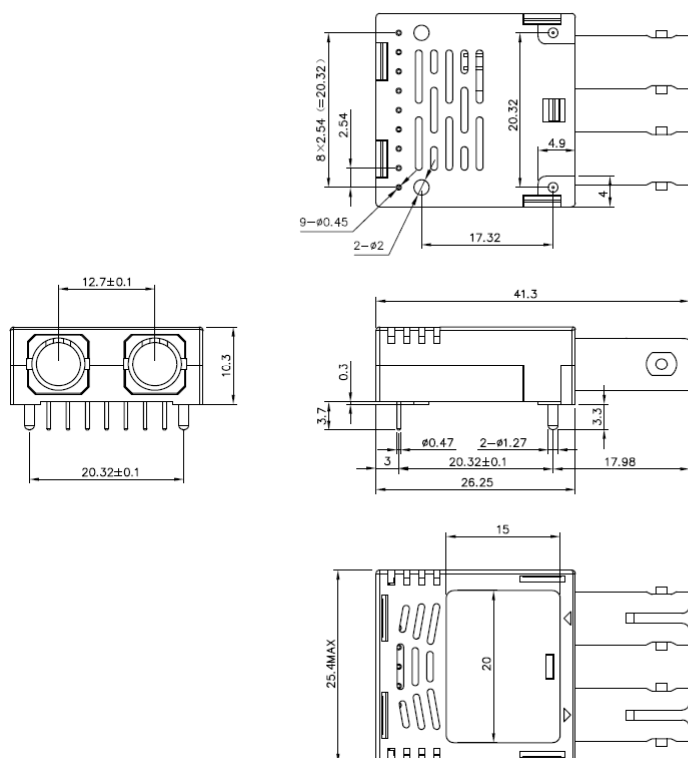
Unremarked tolerances ± 0.1 mm

FC plastic receptacle



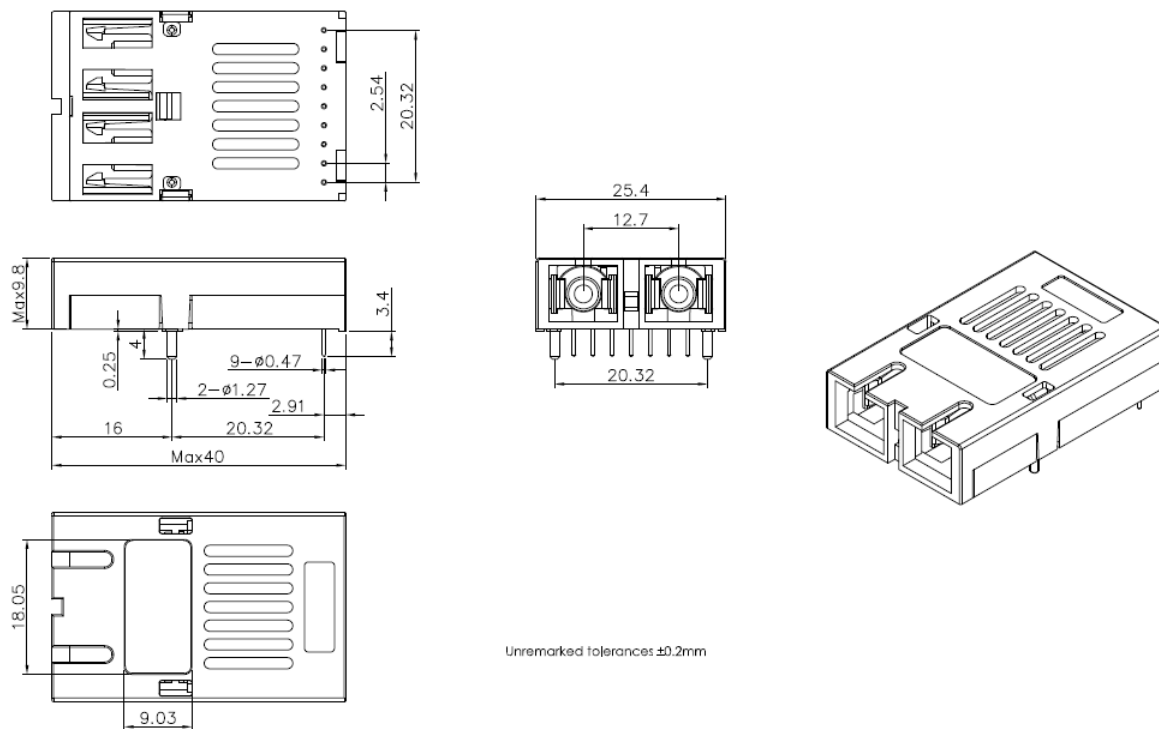
Unremarked tolerances $\pm 0.2\text{mm}$

ST plastic receptacle

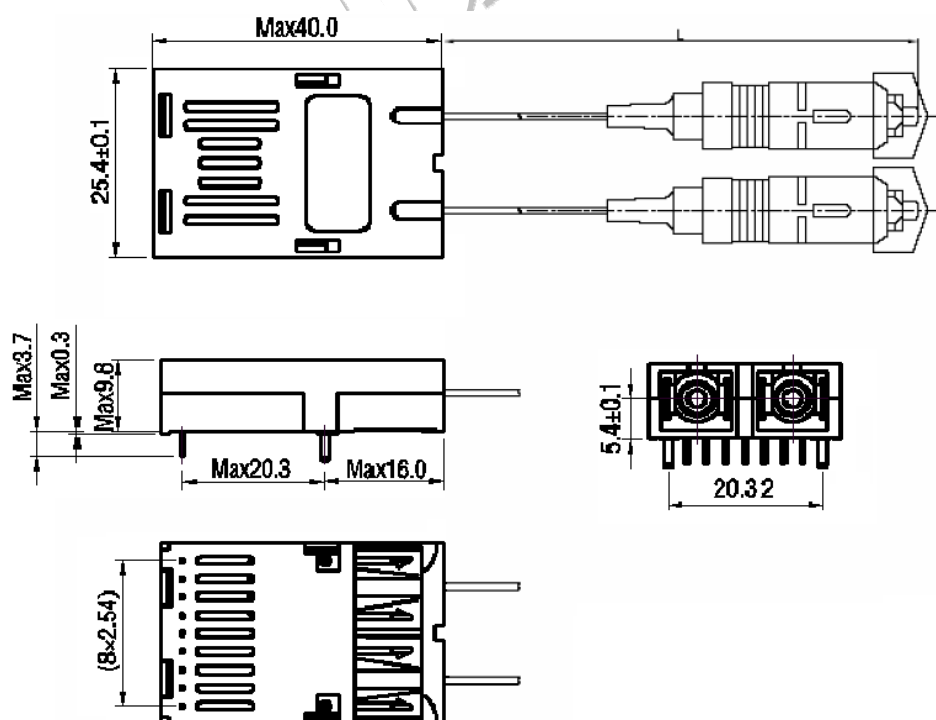


Unremarked tolerances $\pm 0.2\text{mm}$

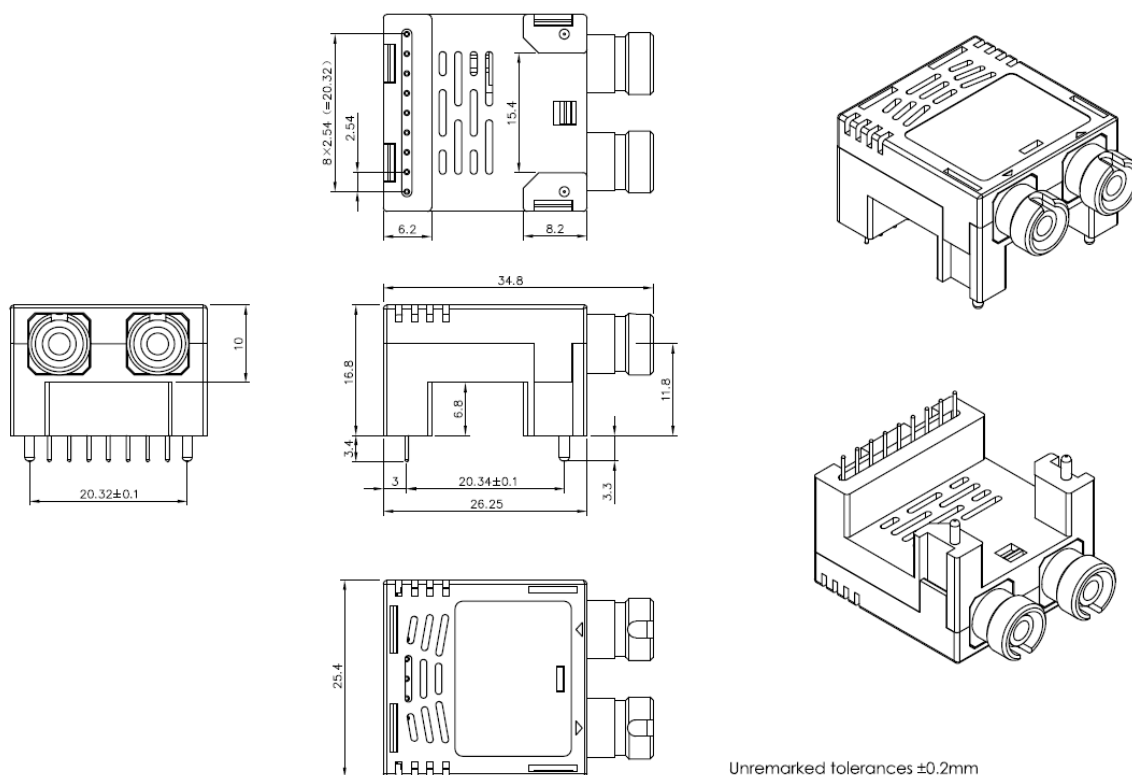
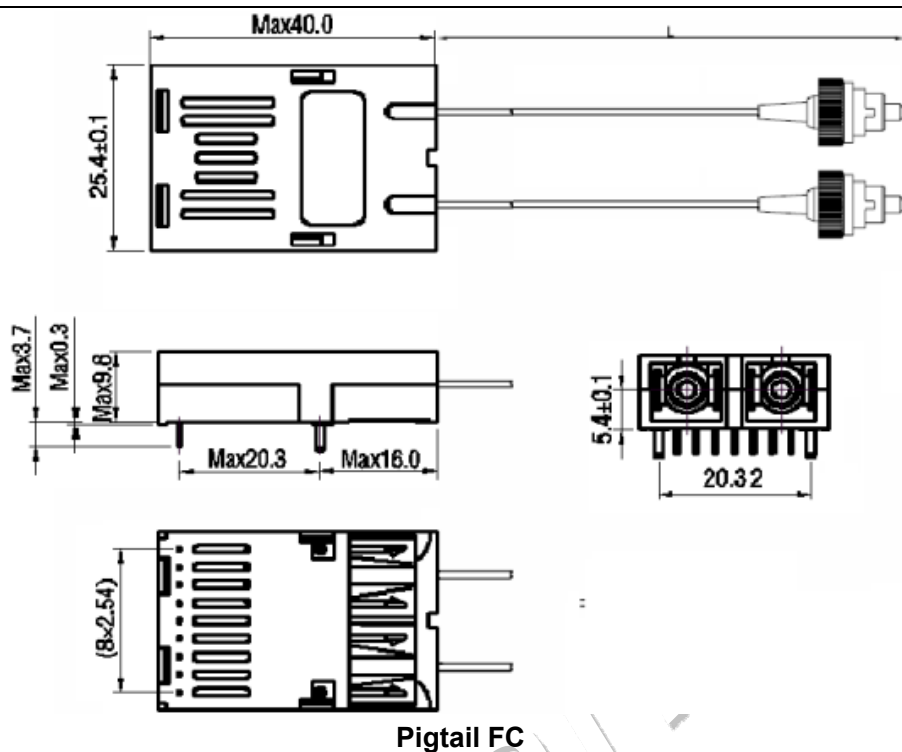
ST metal receptacle



SC receptacle (9014)



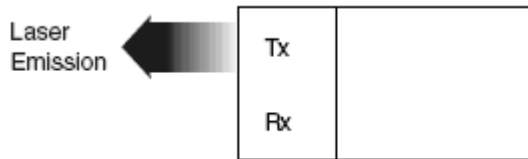
Pigtail SC



Matel FC with long pins

*This 2D drawing only for reference, please check with Yuguang before ordering.

Laser Emission



Revision History

Revision	Initiated	Reviewed	Approved	Revision History	Release Date
V1.a	Xavi	Lyn,Jason,Walt	Alex	Customized	June 7, 2013
V1.b	Xavi	Lyn,Jason,Walt	Alex	Update the recommended circuit	June 9, 2013
V1.c	Xavi	Lyn,Jason,Walt/ Nygai		Add new models with 60km fiber link and LOS output. Update the A0H and A2H.	June 25, 2013
V1.d	Xavi			Add the serial Clock data	July 12, 2013
V1.e	Xavi Angela			Update the recommended circuit, product picture and regulatory compliance. Add pigtail structure drawing.	May 7, 2014
V1.f	Xavi/Vina	Peter/Tony/Chao.Wang		Updated package outline and lcc	Mar 14, 2017
V1.g	Xavi	Black/Kelly/Flag on		Added SD signal PN ,and updated the power dissipation of new solution	Oct 20, 2017
V1.h	Heathcliff	Xavi	Alex	Update ordering information	Nov 21, 2018
V1.i	Xavi/Heath cliff		Alex	Added long pin PN	Dec 19,2018
V1.j	Xavi/Heath cliff		Alex	Added the 2D module in package outline	Dec 20,2018
V1.k	Xavi/Heath cliff	angela	Alex	Update ordering information	Dec 24,2018
V1.L	Xavi/Heath cliff	angela	Alex	Added the 2D module in package outline	Dec 26,2018
V1.m	Xavi/Heath cliff	Yi.Wan/Kelly	Alex	Added 50km information	Nov 12,2019

Notice:

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Contact:

Chengdu Yuguang communication Technology co., Ltd.

Add: No.66 4 St Tianfu ,Hi-Tech district,Chengdu ,China. Post Code:610041

Tel: 86-28-84435715 84422718 85332102 85332105 85332106

Fax: 86-28-84435716 /85332106

www.yuguang-cn.com

E-mail:sales@yuguang-cn.com

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