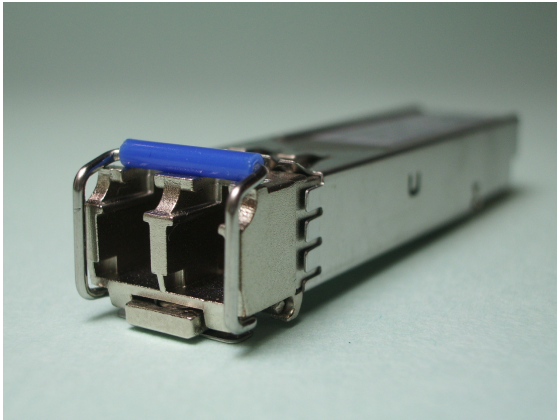




## Product Overview

WFT's SFP transceiver modules is specifically designed for the high performance and cost-effectiveness integrated duplex data link over a single fiber. The high-speed laser diode and photo diode are provided as a light source and a detector, Respectively. Am EEPROM is used to store the required data via the 2-wire serial CMOS EEPROM protocol. These Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). WFT provides not only a total solution from low data rates up to 2.5G, but also OEM/ODM, manufacturing services for fiber applications.



## Features

- Up to 1.25Gb/s bi-directional data links
- Duplex LC connector
- Transmitter disable input
- Receiver Loss of Signal output
- Compliant with Fiber Channel 100-SM-LC-I
- Compliant with IEEE 802.3z Gigabit Ethernet Standard
- Single 3.3V power supply
- Metal enclosure for low EMI
- Class 1 laser product complies with EN 60825-1
- Hot-Pluggable SFP footprint
- Low power dissipation

## Application

- Point-to-Point network
- Gigabit Ethernet
- Distributed multi-processing
- High Speed I/O for file server
- Switched backbone application

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## Absolute maximum ratings

PARAMETER	SYMBOL	UNITS	MIN	MAX
Storage Temperature	T <sub>s</sub>	°C	-40	+85
Supply Voltage	V <sub>CC</sub>	V	-0.5	4.0
Storage Relative Humidity	RH	%	5	95

## Recommended operating conditions

PARAMETER	SYMBOL	UNITS	MIN	Typ	MAX
Case Operating Temperature	T <sub>c</sub>	°C	0	---	70
Supply Voltage	V <sub>CC</sub> T / v <sub>CC</sub> R	V	3.1	3.3	3.5
Supply Current	I <sub>TX</sub> + I <sub>RX</sub>	mA	---	---	250
Data rate	Gbps			1.25	

## Transmitter Electro-optical Characteristics

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Output Optical Power	P <sub>out</sub>	-9.5	---	-3	dBm	1
Extinction Ratio	ER	9	---	---	dB	1
Center Wavelength	λ <sub>c</sub>	1270	1310	1360	nm	
Spectral Width (FWHM)	Δλ	---	---	2.5	nm	RMS(σ)
Optical Rise/Fall Time	T <sub>r</sub> / T <sub>f</sub>	---	---	260	ps	2
Output Eye	Compliant with IEEE 802.3z					
Total jitter	T <sub>j</sub>	---	---	227	ps	
Relative Intensity Noise	RIN	---	---	-117	dB/Hz	
Max.P <sub>out</sub> TX-Disable Asserted	P <sub>OFF</sub>	---	---	-45	dBm	
Differential Input Voltage	V <sub>DIFF</sub>	0.4	---	2.0	V	

Notes:

1. All of data is measured with at 1250Mbps, PRBS 2<sup>7</sup>, -1 NRZ..
2. 20% to 80% Values

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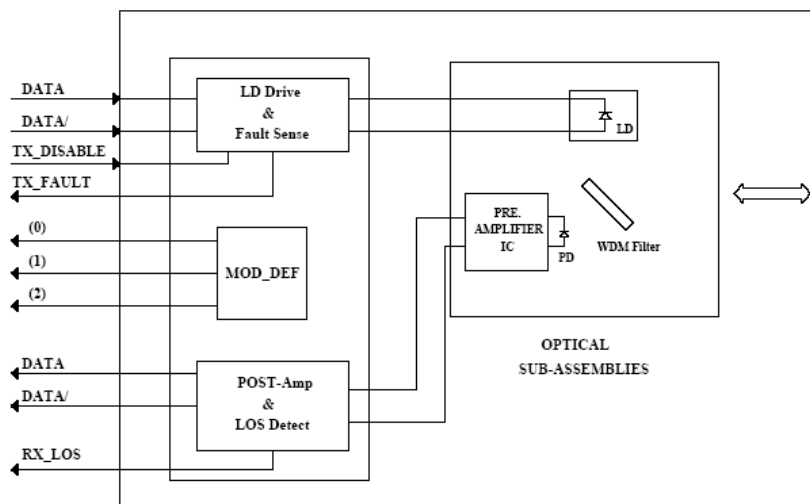
## Receiver Electro-optical Characteristics

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Maximum Input Power	$P_{IN}$	-3	---	---	dBm	1
Receiver Sensitivity	$P_{IN}$	---	---	-20	dBm	1
Center Wavelength	$\lambda_C$	1260	---	1610	nm	
Optical Return Loss	ORL	12			dBm	
Signal Detect Asserted	$P_A$	---	---	-20	dBm	
Signal Detect De-asserted	$P_D$	-35	---	---	dBm	
Signal Detect Hysteresis	$P_A - P_D$	0.5	---	---	dB	
Differential Output Voltage	$V_{DIFF}$	0.5	---	1.2	V	
Data output Rise/Fall Time	$T_r/T_f$	---	---	0.35	ns	2
Receiver Loss of Signal Output Voltage-Low	RX_LOSL	0	---	0.5	V	
Receiver Loss of Signal Output Voltage-High	RX_LOSH	2.4	---	Vcc	V	

Notes:

1. With BER better than or equal to  $1 \times 10^{-12}$ , measured in the center of the eye opening with PRBS  $2^7 - 1$  NRZ.
2. 20% to 80% Values

## Block Diagram of Transceiver



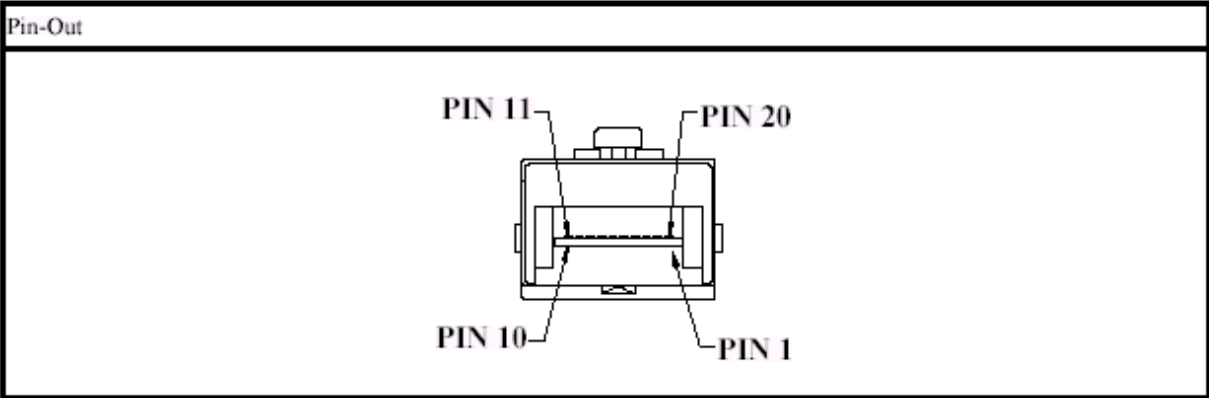
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Pin Assignment



Pin Num.	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	Note 1
3	TX Disable	Transmitter Disable	3	Note 2 Module disable on high or open
4	MOD DEF 2	Module Definition 2	3	Note 3 2 wire serial ID interface
5	MOD DEF 1	Module Definition 1	3	Note 3 2 wire serial ID interface
6	MOD DEF 0	Module Definition 0	3	Note 3 Ground in Module
7	Rate Select	Select between full or reduced receiver bandwidth	3	No User Connection reserved for future Function
8	LOS	Loss of Signal	3	Note 4
9	VeeR	Receiver Ground	1	
10	VeeR	Receiver Ground	1	
11	VeeR	Receiver Ground	1	
12	RD-	Inv. Receive Data	3	Note 5
13	RD+	Receive Data out	3	Note 5
14	VeeR	Receiver Ground	1	
15	V <sub>cc</sub> R	Receiver Power	2	3.3V±5%
16	V <sub>cc</sub> T	Transmitter Power	2	3.3V±5%
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data in	3	Note 6
19	TD-	Inv. Transmit Data	3	Note 6
20	VeeT	Transmitter Ground	1	

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## Note

Plug Seq.: Pin engagement during hot plugging.

1) Tx Fault is an open collector output that shall be pulled up with a 4.7k - 10k $\Omega$  resistor on the host board. Pull up voltage between 2.0V and  $V_{ccT}+0.3V$ . When high, output indicates a laser fault of some kind. Low indicates normal operation.

Tx Fault is asserted when bias current of laser exceeds the factory-calibrated threshold level. The laser output is not turned off in case of TX Fault.

2) Tx Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k $\Omega$  resistor.

3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7k - 10k $\Omega$  resistor on the host board. The pull-up voltage shall be  $V_{ccT}$  or  $V_{ccR}$ .

Mod-Def 0 indicates that the module is present

Mod-Def 1 is the clock line of two wire serial interface for serial ID

Mod-Def 2 is the data line of two wire serial interface for serial ID

4) LOS (Loss of Signal) is an open collector output that shall be pulled up with a 4.7k - 10k $\Omega$  resistor. Pull up voltage between 2.0V and  $V_{ccR}+0.3V$ . Low indicates normal operation.

5) RD-/+ : These are the differential receiver outputs. They are AC coupled 100 $\Omega$  differential lines which should be terminated with 100 $\Omega$  (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.

6) TD-/+ : These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 $\Omega$  differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

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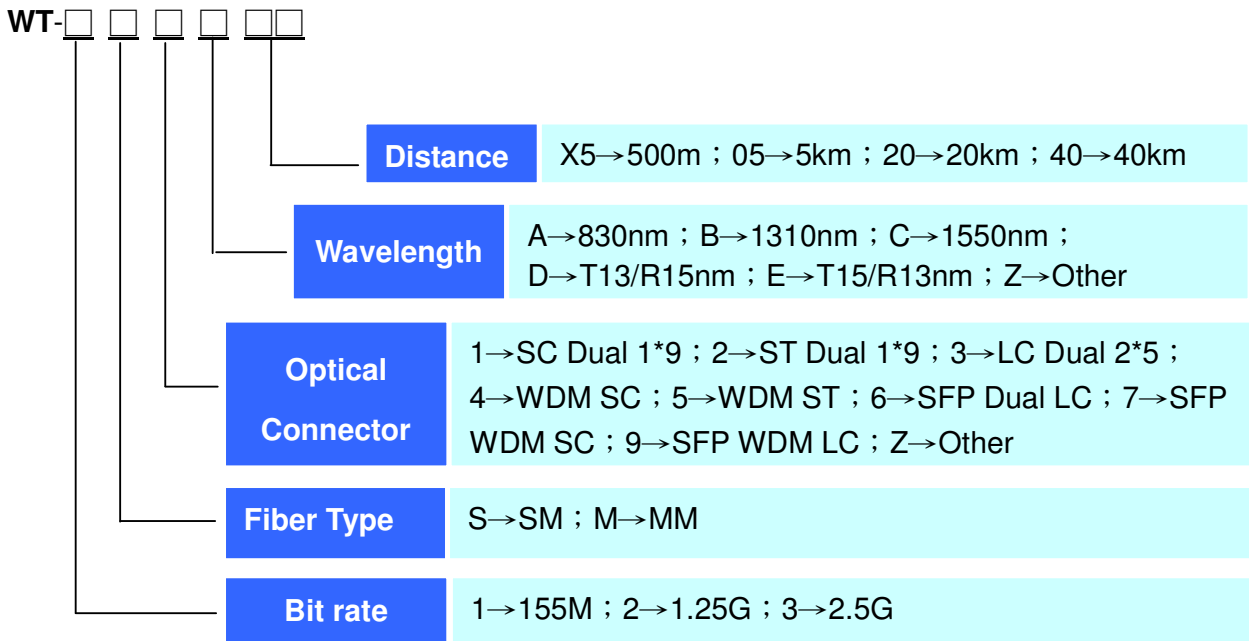
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## Ordering Information




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