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-L
- 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
- $1\times$ Fiber Channel
- High Speed I/O for file server
- Switched backbone application

Absolute maximum ratings

PARAMETER	SYMBOL	UNITS	MIN	MAX
Storage Temperature	T_S	^{o}C	-40	+85
Supply Voltage	V_{CC}	V	-0.5	4.0
Storage Relative Humidity	RH	%	5	95

Recommended operating conditions

PARAMETER	SYMBOL	UNITS	MIN	Typ	MAX
Case Operating Temperature	T_c	^{o}C	0	---	70
Supply Voltage	VccT / vccR	V	3.1	3.3	3.5
Supply Current	$I_{TX} + I_{RX}$	mA	---	---	250
Data rate	Gbps			1.25	

Transmitter Electro-optical Characteristics

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Output Optical Power	Pout	-9.5	---	-3	dBm	1
Extinction Ratio	ER	9	---	---	dB	1
Center Wavelength	λ_C	1270	1310	1360	nm	
Spectral Width (FWHM)	$\triangle\lambda$	---	---	2.5	nm	RMS(σ)
Optical Rise/Fall Time	T_r / T_f	---	---	260	ps	2
Output Eye	Compliant with IEEE 802.3z					
Total jitter	T_i	---	---	227	ps	
Relative Intensity Noise	RIN	---	---	-120	dB/Hz	
Max.P$_{out}$ TX-Disable Asserted	P_{OFF}	---	---	-45	dBm	
Differential Input Voltage	V_{DIFF}	0.4	---	2.0	V	

Notes:
1. All of data is measured with at 1250Mbps,PRBS 2^{7}-1 NRZ..
2. 20% to 80% Values

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	λ_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_LOS_L	0	---	0.5	V	
Receiver Loss of Signal Output Voltage-High	RX_LOS_H	2.4	---	Vcc	V	

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

Block Diagram of Transceiver

Pin Assignment

Pin-Out
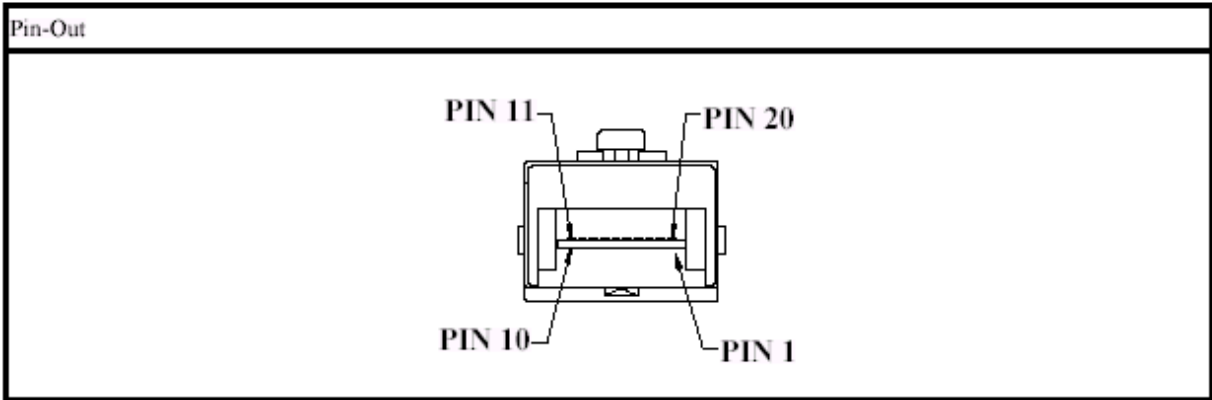
Pin Num.	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	Note 1
3	TX Disable	Transmitter Disable	3	Note 2 Module disable on high or open
4	MOD DEF 2	Module Definition 2	3	Note 3 2 wire serial ID interface
5	MOD DEF 1	Module Definition 1	3	Note 3 2 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	$V_{CC}R$	Receiver Power	2	3.3V±5%
16	$V_{CC}T$	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	

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& resistor on the host board. Pull up voltage between 2.0V and VccT+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& resistor.

3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7k - 10k& resistor on the host board. The pull-up voltage shall be VccT or VccR.
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& resistor. Pull up voltage between 2.0V and VccR+0.3V. Low indicates normal operation.

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

Ordering Information
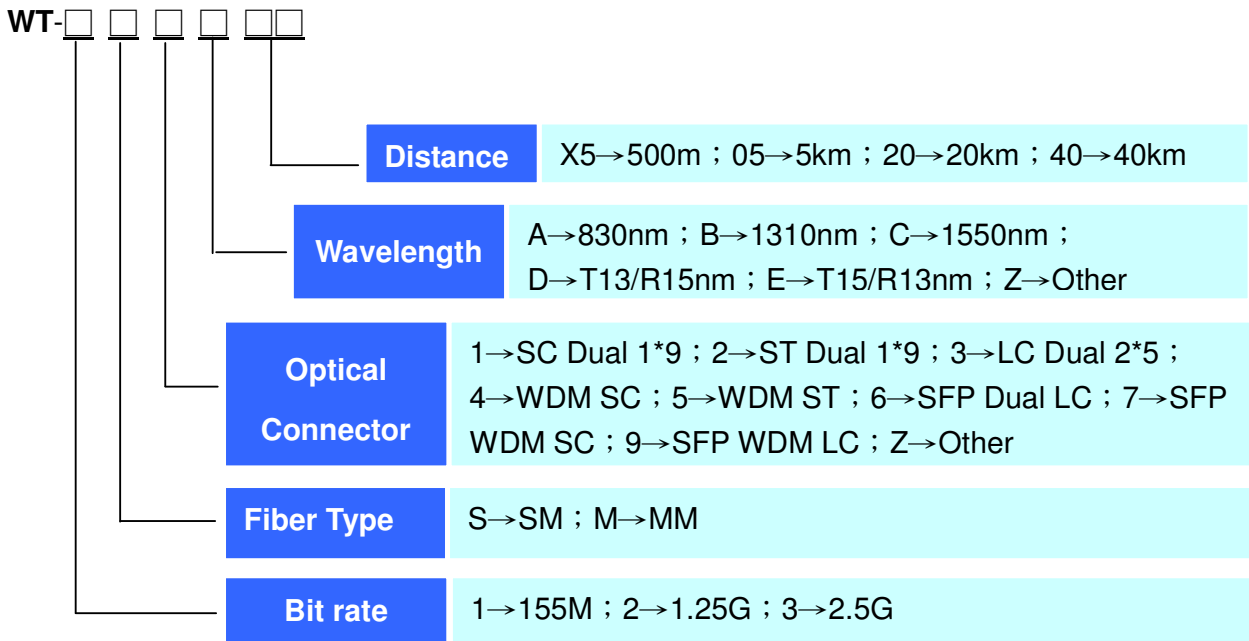
WT-☐ ☐ ☐ ☐ ☐☐

Distance	X5→500m；05→5km；20→20km；40→40km
Wavelength	A→830nm；B→1310nm；C→1550nm；D→T13/R15nm；E→T15/R13nm；Z→Other
Optical Connector	1→SC Dual 1*9；2→ST Dual 1*9；3→LC Dual 2*5；4→WDM SC；5→WDM ST；6→SFP Dual LC；7→SFP WDM SC；9→SFP WDM LC；Z→Other
Fiber Type	S→SM；M→MM
Bit rate	1→155M；2→1.25G；3→2.5G