



# SPECTRUM TERRABIT DATASHEET (GLC-W20-B5-CM)

SFP Transceiver: 1.25Gb/s, 1550/1310nm, Single mode, 20km, with DDM Function



## Features:

- 🔥 Up to 1.25Gb/s Data Rate
- 🔥 1550nmDFB Tx/1310nm Rx
- 🔥 Up to Distance 20km
- 🔥 Simplex LC Connector Interface
- 🔥 Digital diagnostic monitor interface Compatible with SFF-8472
- 🔥 Single +3.3V Power Supply and TTL Logic Interface
- 🔥 Hot-Pluggable
- 🔥 Compliant with MSA SFP Specification
- 🔥 Work as a pair with Spectrum GLC-W20-B3-CM

## Applications:

- 🔥 Fiber Channel Links
- 🔥 WDM Gigabit Ethernet Links
- 🔥 SONET/SDH Equipment Interconnect

## Specification:

### a) Electrical and Optical Characteristics:

Parameter	Symbol	Min	Typical	Max	Unit
9µm Core Diameter SMF			20		km
Data Rate			1.25		Gbps
<b>Transmitter</b>					
Centre Wavelength	$\lambda_C$	1500	1550	1580	Nm
Spectral Width (-20dB)	$\sigma$			1	Nm
Average Output Power	P <sub>Out</sub>	-8		3	dBm
Extinction Ratio	EX	9			dB
Rise/Fall Time (20% ~ 80%)	tr/tf			90	ps
Total Jitter	TJ			1	ns
Output Optical Eye	IUT-T G.957 Compliant				
Data Input Swing Differential	V <sub>IN</sub>	500		2000	mV
Input Differential Impedance	Z <sub>IN</sub>	90	100	110	$\Omega$
Tx_Disable – Disable		2.0	-	V <sub>cc</sub> +0.3	V
Tx_Disable – Enable		0		0.8	V
TX_Fault – Fault		2.0	-	V <sub>cc</sub> +0.3	V
TX_Fault - Normal		0		0.8	V
TX_Disable Assert Time	t <sub>off</sub>			10	us
<b>Receiver</b>					
Centre Wavelength	$\lambda_C$	1270	1310	1360	nm
Sensitivity	P <sub>IN</sub>	-21	-26	-28	dBm
Overload (Saturation)		-3	-1		dBm
Output Differential Impedance	P <sub>IN</sub>	90	100	110	$\Omega$
Data Output Swing Differential	V <sub>OUT</sub>	370		2000	mV
Rise/Fall Time	Tr/TF			2.2	ns
LOS – High		2.0		V <sub>CC</sub> +0.3	V
LOS – Low		0		0.8	V



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## b) Performance Specifications - Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
<b>TRANSMITTER</b>						
LVPECL Inputs(Differential)	Vin	400		2500	mVp	AC Coupled inputs
Input Impedance (Differential)	Zin	85	100	115	ohms	Rin > 100 kohms @ DC
Tx_DISABLE Input Voltage – High		2		3.45	V	
Tx_DISABLE Input Voltage – Low		0		0.8	V	
Tx_FAULT Output Voltage – High		Vcc-0.5		Vcc+0.3	V	Io = 400µA; Host Vcc
Tx_FAULT Output Voltage – Low		0		0.5	V	Io = -4.0mA
<b>RECEIVER</b>						
LVPECL Outputs (Differential)	Vout	400	800	1200	mVpp	AC coupled outputs
Output Impedance (Differential)	Zout	85	100	115	ohms	
Rx_LOS Output Voltage - High		Vcc-0.5		Vcc+0.3	V	Io = 400µA; Host Vcc
Rx_LOS Output Voltage – Low		0		0.8	V	Io = -4.0mA
MOD_DEF ( 0:2 ) – VoH		2.5			V	With Serial ID
MOD_DEF ( 0:2 ) – VoL		0		0.5	V	With Serial ID

## c) Absolute Maximum Ratings:

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T <sub>ST</sub>	-40	+85	°C
Supply Voltage	VCC	-0.5	3.6	V

## d) Recommended Operating Conditions:

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TA	0		+70	°C
Power Supply Voltage	VCC	3.15	3.3	3.45	V
Power Supply Current	ICC		-	300	mA
Surge Current	ISurge			+30	mA
Baud Rate			1.25		GBaud

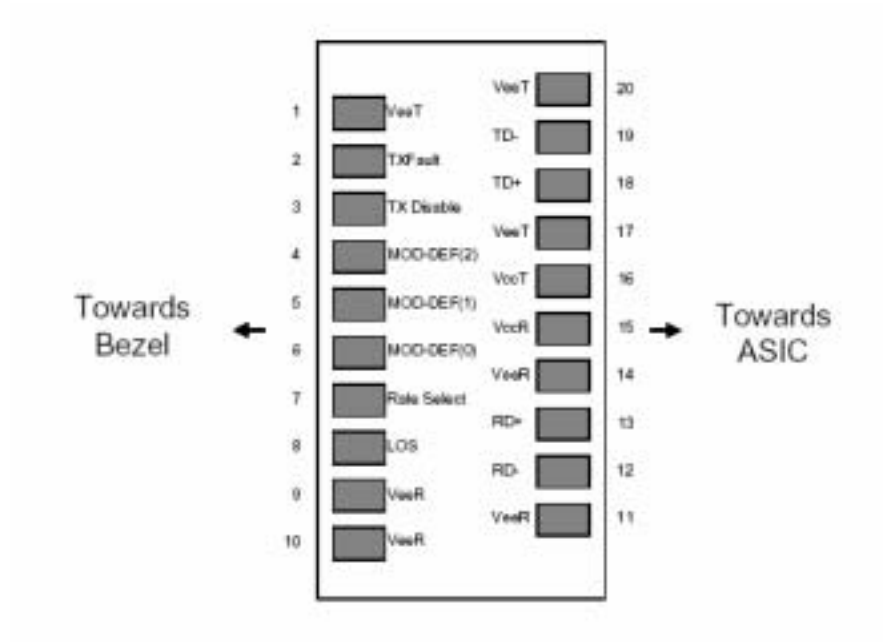


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## e) Block Diagram of Transceiver: Pin Assignment:



Pin out of Connector Block on Host Board



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## f) Pin Description:

Pin Num.	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2, Module disables on high or open
4	MOD-DEF2	Module Definition 2	3	Note 3, Data line for Serial ID.
5	MOD-DEF1	Module Definition 1	3	Note 3, Clock line for Serial ID.
6	MOD-DEF0	Module Definition 0	3	Note 3, Grounded within the module.
7	Rate Select	Not Connect	3	Function not available
8	LOS	Loss of Signal	3	Note 4
9	VeeR	Receiver Ground	1	Note 5
10	VeeR	Receiver Ground	1	Note 5
11	VeeR	Receiver Ground	1	Note 5
12	RD-	Inv. Received Data Out	3	Note 6
13	RD+	Received Data Out	3	Note 7
14	VeeR	Receiver Ground	1	Note 5
15	VccR	Receiver Power	2	3.3 ± 5%, Note 7
16	VccT	Transmitter Power	2	3.3 ± 5%, Note 7
17	VeeT	Transmitter Ground	1	Note 5
18	TD+	Transmit Data In	3	Note 8
19	TD-	Inv. Transmit Data In	3	Note 8
20	VeeT	Transmitter Ground	1	Note 5

### Notes:

- TX Fault is an open collector/drain output, which should be pulled up with a 4.7K - 10KΩ resistor on the host board. Pull up voltage between 2.0V and VccT, R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.
- TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7 - 10 KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on  
(>0.8, < 2.0V): Undefined  
High (2.0 – 3.465V): Transmitter Disabled  
Open: Transmitter Disabled
- Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be VccT or VccR (see Section IV for further details). Mod-Def 0 is grounded by the module to indicate 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.
- LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor. Pull up voltage between 2.0V and VccT, R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.
- VeeR and VeeT may be internally connected within the SFP module.
- RD-/+ : These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board. The voltage swing on these lines will be between 370 and 2000 mV differential (185 - 1000 mV single ended) when properly terminated.
- VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V ±5% at the SFP connector pin. Maximum supply current is 300mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1 ohm should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply-filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.
- 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. The inputs will accept differential swings of 500 – 2400 mV (250 – 1200mV single-ended), though it is recommended that values between 500 and 1200mV differential (250 – 600mV single-ended) be used for best EMI performance.