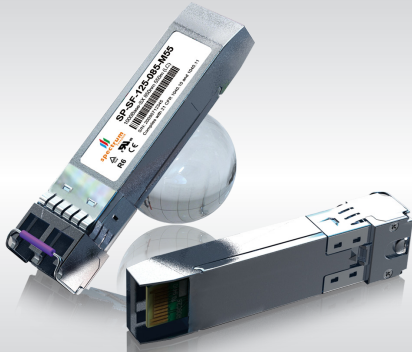


# SPECTRUM TRANSCEIVER



## GLC-S20-13-CMI 1.25G Small Form Pluggable

### FEATURES

- Compliant with IEEE802.3Z.
- Multi-Source Package with Duplex LC Connector.
- Up to 1.25Gb/s Data Rate.
- Distance up to 20km.
- Single Mode 1310nm DFB-LD.
- Single +3.3V Power Supply.
- Hot Pluggable.
- Compliant with Bellcore TA-NWT-000983.
- Eye Safety Designed to Meet Laser Class1, Compliant with IEC60825-1.
- RoHS Compliant Products Available.

### APPLICATIONS

- Gigabit Ethernet.
- 1x Fiber Channel.
- Switch to Switch Interface.
- Switched Backplane Applications.
- Router/ Server Interface.
- Other Optical Links.

### SPECIFICATIONS

#### a) Electrical and Optical Characteristics: (Condition: $T_a = T_{Op}$ )

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter Differential Input Voltage	+/-TX_DAT	200	-	2400	mVpp
Supply Current	$I_{CC}$	-	130	180	mA
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	$V_{OH}$	2.0	-	Vcc	V
Receiver Differential Output Voltage	+/-RX_DAT	600	-	1400	mVpp
Rx_LOS Output Voltage- Low	$V_{OL}$	0	-	0.8	V
Rx_LOS Output Voltage- High	$V_{OH}$	2.0	-	Vcc	V

#### b) Transmitter

Parameter	Symbol	Min.	Typical	Max.	Unit
Data Rate	B	-	1250	-	Mb/s
Centre Wavelength	$\lambda_C$	1296	1310	1330	nm
Output Spectral Width	$\lambda$	-	-	4	nm
Average Output Power	$P_o$	-6	-	-1	dBm
Extinction Ratio	EXT	9	-	-	dB
Data Input Voltage-High	$V_{IHS}$	Vcc-1.16	-	Vcc-0.89	V
Data Input Voltage -Low	$V_{ILS}$	Vcc-1.82	-	Vcc-1.48	V
Supply Current	$I_{CC}$	-	90	150	mA
Output Optical Eye		Compliant with IEEE802.3Z			

# SPECTRUM TRANSCEIVER

## c) Receiver

Parameter	Symbol	Min.	Typical	Max.	Unit
Receive Sensitivity	$P_{min}$	-	-	-22	dBm
Maximum Input Power	$P_{MAX}$	-3	-	-	dBm
Threshold-Assertion	$SD_{HIGH}$	-	-	-22	dBm
Signal Detect Threshold-Deassertion	$SD_{LOW}$	-32	-	-	dBm
Hysteresis	-	-	2.0	-	dBm
Output High Voltage	$V_{OH}$	$V_{cc}-1.03$	-	$V_{cc}-0.89$	V
Output Low Voltage	$V_{OL}$	$V_{cc}-1.82$	-	$V_{cc}-1.63$	V
Operating Wavelength	$\lambda_C$	1100	-	1600	nm
Supply Current	ICC	-	80	110	mA

## d) Absolute Maximum Ratings: (TC=25°C)

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	$T_{ST}$	-40	+85	°C
Operating Temperature	$T_{IP}$	-40	+85	°C
Input Voltage	$T_{CC}$	0	+5	V

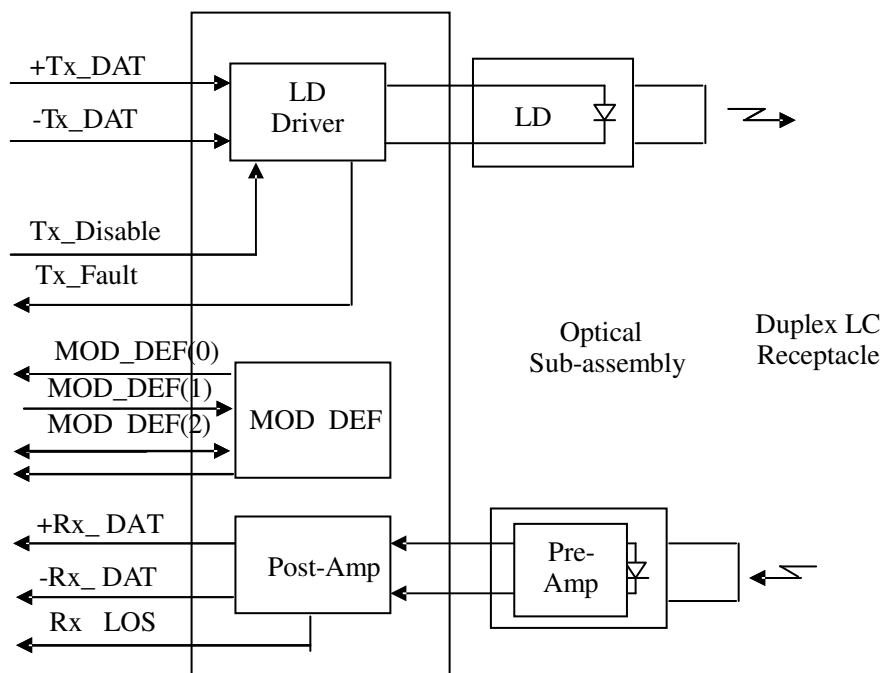
## e) Recommended Operating Environment

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	VCC	+3.0	+3.3	+3.6	V
Operating Temperature	$T_{OP}$	0	-	+70	°C

## f) Timing Characteristics

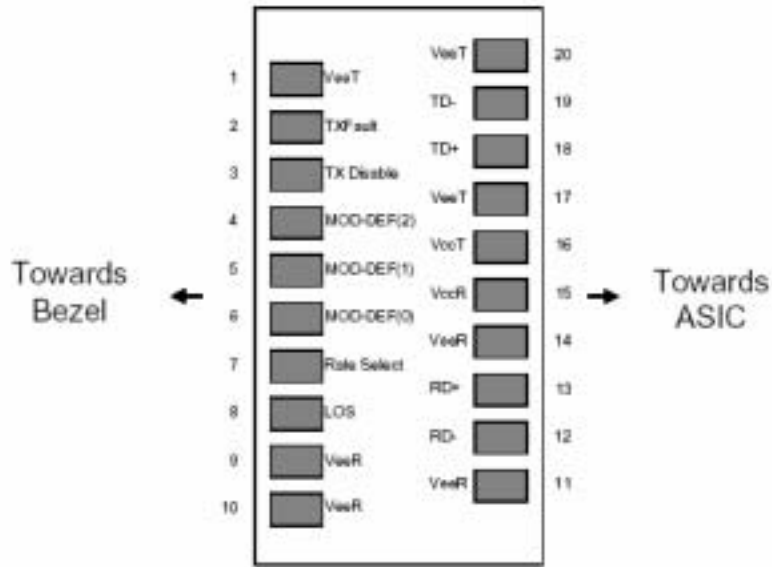
Parameter	Symbol	Min.	Typical	Max.	Unit
TX_DISABLE Assert Time	$t_{off}$	-	3	10	Usec
TX_DISABLE Negate Time	$t_{on}$	-	0.5	1	Msec
Time to Initialize Include Reset of TX_FAULT	$t_{int}$	-	30	300	Msec
TX_FAULT from Fault to Assertion	$t_{fault}$	-	20	100	Usec
TX_DISABLE Time to Start Reset	$t_{reset}$	10	-	-	Usec
Receiver Loss of Signal Assert Time (Off to On)	$T_{A,RX\_LOS}$	-	-	100	Usec
Receiver Loss of Signal Assert Time (On to Off)	$T_{D,RX\_LOS}$	-	-	100	Usec

## g) Block Diagram of Transceiver



# SPECTRUM TRANSCEIVER

## h) Pin Assignment



Pin out of Connector Block on Host Board

## i) Pin Description

Pin	Symbol	Name/Description	Ref.
1	VeeT	Transmitter Ground (Common with Receiver Ground)	1
2	TX Fault	Transmitter Fault. Low normal Operation, High fault indication	
3	TX Disable	Transmitter Disable. Laser output disable on high or open	2
4	MOD-DEF(2)	Module Definition 2. Data line for Serial ID	3
5	MOD-DEF(1)	Module Definition 1. Clock line for Serial ID	3
6	MOD-DEF(0)	Module Definition 0. Grounded within the module	3
7	Rate Select	Not Connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	4
9	VeeR	Receiver Ground (Common with Transmitter Ground)	1
10	VeeR	Receiver Ground (Common with Transmitter Ground)	1
11	VeeR	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Received Inverted DATA out. AC Coupled	
13	RD+	Received Non-inverted DATA out. AC Coupled	
14	VeeR	Receiver Ground (Common with Transmitter Ground)	1
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-inverted DATA in. AC Coupled	
19	TD-	Transmitter Inverted DATA in. AC Coupled	
20	VeeT	Transmitter Ground (Common with Receiver Ground)	1

### Notes:

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. MOD\_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; Logic 1 indicates loss of signal.

# SPECTRUM TRANSCEIVER

## j) Serial ID Memory Contents

Data Address	Length(Byte)	Name of Length	Description and Contents
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	Gigabit Ethernet 1000Base-SX & Fiber Channel
11	1	Encoding	8B10B (01h)
12	1	BR,Nominal	Nominal band rate, unit of 100Mbps
13-14	2	Reserved	(0000h)
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name: Spectrum
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: GLC-Sxx-xx-C
56-59	4	Vendor rev	Revision level for part number
60-62	3	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62

## k) Extended ID Fields

Data Address	Length(Byte)	Name of Length	Description and Contents
64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Spectrum's Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)

## k) Vendor Specific ID Fields

Data Address	Length(Byte)	Name of Length	Description and Contents
96-127	32	Readable	Spectrum's specific date, read only

## l) Mechanical Dimensions

