Features:

- ✧ 18 CWDM Wavelengths Available
- ✧ Build-in Isolator Optional
- ✧ Hot-Pluggable Duplex LC/PC Connector
- ✧ Single +3.3V Power Supply
- ✧ Operating Temperature from -40°C to +85°C
- ✧ Compliant with ITU-T G694.2
- ✧ Compliant with Telcordia (Bellcore) GR-468-CORE
- ✧ Designed to meet Laser Class1 Compliant with IEC60825-1
- ✧ With real time monitors of
  - ✓ Transmitter Output Power
  - ✓ Receiver Input Power
  - ✓ Laser Bias Current
  - ✓ Temperature
  - ✓ Supply Voltage

Applications:

- ✧ Metro/Access Networks
- ✧ 1×Fiber Channel
- ✧ Other Optical Links

Description:

OPWAY'S OP3680D-XX CWDM Transceiver products provide optical networking equipment manufacturers with a timely and cost effective tool in supporting the unceasing demand for higher bandwidth equipment build-outs in the enterprise access and metropolitan area networks. There are 18 center wavelengths available from 1270nm to 1610nm. The 20nm channel spacing allows for un-cooled laser operation, a high yield manufacturing process, and lower cost Mux/Demux technology, thus providing a complete cost effective solution for various data and telecom applications.

Specification:

● Absolute Maximum Ratings:(T_C=25°C)

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	Tst	-40	+85	°C
Operating Temperature	Top	0	+70	°C
Supply Voltage	Vcc	0	Vcc	V
Output Current	Io	0	30	mA

● Operating Environment:

Parameter	Symbol	Min.	Max.	Units
Supply Voltage	V_{CC}	+3.1	+3.5	V
Ambient Operating Temperature	T_A	0	70	°C

Electrical and Optical Characteristics (Condition: Tc= T_{op})

Parameter	Symbol	Min.	Typical	Max.	Unit

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Transmitter Differential Input Voltage	+/-TX_DAT	650		2000	mV p-p
Supply Current	I_{CC}			300	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	400		2000	mV p-p
Rx_LOS Output Voltage- Low	V_{OL}	0		0.8	V
Rx_LOS Output Voltage- High	V_{OH}	2.0		Vcc	V
Transmitter					
Data Rate	B	-	2.5	-	Gb/s
Output Center Wavelength(0~70°C)	λ_C	λ-6.5	λ	λ+6.5	nm
Output Spectral Width	△λ	-	-	1	nm
Average Output Power	P_O	0	-	+5	dBm
Extinction Ratio	E.R.	8.2	-	-	dB
Rise and Fall Time (20~80%)	T_r	-		0.26	ns
Data Input Voltage-High	V_{IHS}	V_{cc}-1.16	-	V_{cc}-0.89	V
Data Input Voltage -Low	V_{ILS}	V_{cc}-1.82	-	V_{cc}-1.48	V
Supply Current	I_{CC}	-	-	120	mA
Output Optical Eye	Compliant with ITU-T G.957				
Receiver					
Date Rate	B	-	2.5	-	Gb/s
Receive Sensitivity	S	-	-	-28	dBm
Maximum Input Power	Pmax	-7	-	-	dBm
Operating Wavelength	λc	1100	-	1620	nm
Signal Detect Threshold-Assertion:	SD_{HIGH}			-29	dBm
Signal Detect Threshold-Deassertion:	SD_{LOW}	-39			dBm
Hysteresis	-		2.0		dBm
Supply Current	I_{CC}	-	-	110	mA
Rise and Fall Time (20~80%)	T_r/T_f			0.26	ns
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
Alarm Output Interface	LV-TTL				

● 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_DISBEL 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

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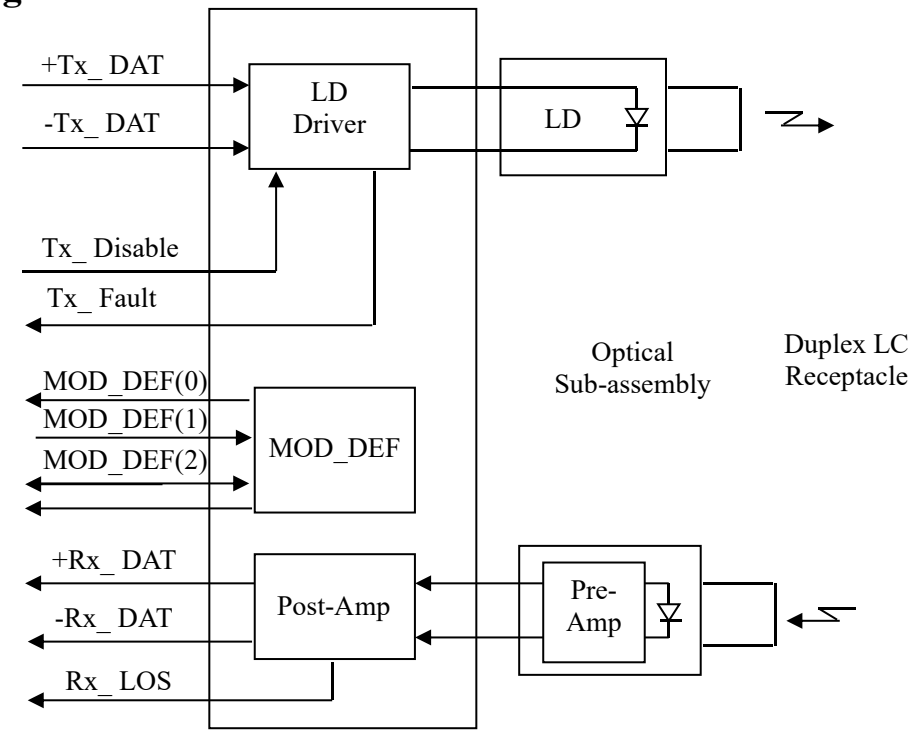
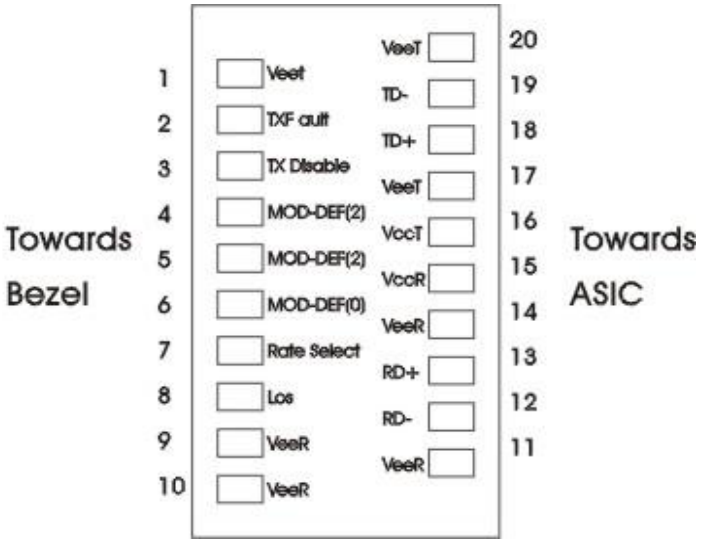
Block Diagram of Transceiver:



Pin Assignment:



Pin out of Connector Block on Host Board

Pin Description:

Pin No	Name	Function	Plug Seq	Notes
1	VeeT	Transmitter Ground	1	1
2	TX Fault	Transmitter Fault Indication	3	
3	TX Disable	Transmitter Disable	3	2
4	MOD-DEF2	Module Definition	2	3
5	MOD-DEF1	Module Definition 1	3	3
6	MOD-DEF0	Module Definition 0	3	3

7	Rate Select	Not Connected	3	4
8	LOS	Loss of Signal	3	5
9	VeeR	Receiver Ground	1	1
10	VeeR	Receiver Ground	1	1
11	VeeR	Receiver Ground		1
12	RD-	Inv. Received Data Out	3	6
13	RD+	Received Data Out	3	6
14	VeeR	Receiver Ground	3	1
15	VccR	Receiver Power	2	1
16	VccT	Transmitter Power	2	
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	6
19	TD-	Inv. Transmit In	3	6
20	VeeT	Transmitter 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 - 10 kohms 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. Rate select is not used
5. LOS is open collector output. Should be pulled up with 4.7k – 10 kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
6. AC Coupled

Serial ID Memory Contents:

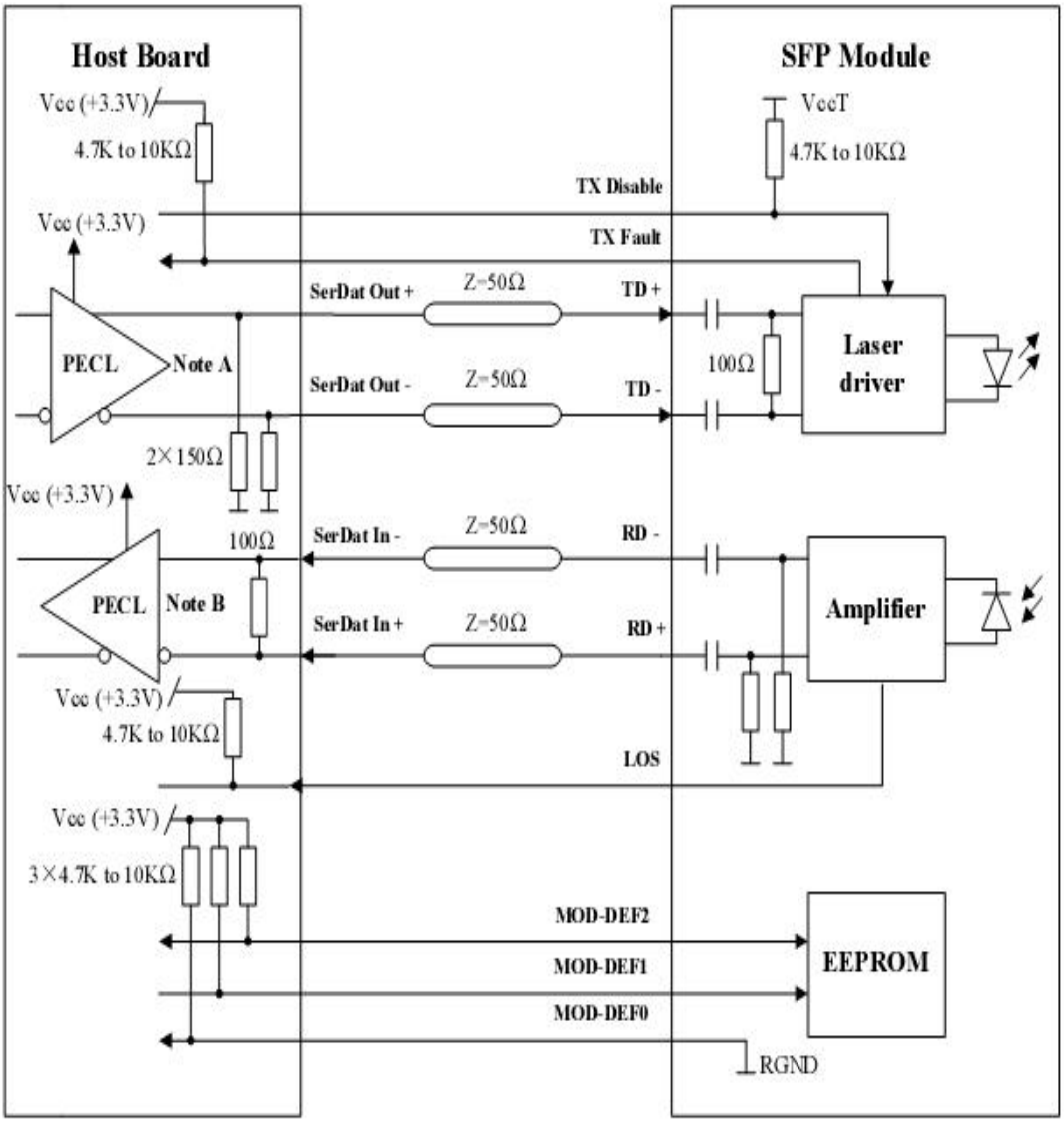
Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	Gigabit Ethernet 1000Base-ZX & Fiber Channel
11	1	Encoding	SONET(01h)
12	1	BR,Nominal	Nominal baud 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
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: “OPXXXXXX” (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-61	2	Wavelength	Laser wavelength
62	1	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62

Extended ID Fields			
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	Manufacturing date code
92	1	Diagnostic Type	Diagnostics
93	1	Enhanced Options	Diagnostics
94	1	SFF-8472	Diagnostics
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	Specific date, read only

● Diagnostics Memory Contents(A2h):

Data Address	Length (Byte)	Name of Length	Description and Contents
Diagnostic and control/status fields			
0-39	40	A/W Thresholds	Diagnostic Flag Alarm and Warning Thresholds
40-55	16	Unallocated	
56-91	16	Ext Cal Constants	Diagnostic calibration constants for optional External Calibration
92-94	3	Unallocated	
95	1	CC_DMI	Check code for Base Diagnostic Fields (addresses 0 to 94)
96-105	10	Diagnostics	Diagnostic Monitor Data (internally or externally calibrated)
106-109	4	Unallocated	
110	1	Status/Control	Optional Status and Control Bits
111	1	Reserved	Reserved for SFF-8079
112-113	2	Alarm Flags	Diagnostic Alarm Flag Status Bits
114-115	2	Unallocated	
116-117	2	Warning Flags	Diagnostic Warning Flag Status Bits
118-119	2	Ext Status/Control	Extended module control and status bytes
General use fields			
120-127	8	Vendor Specific	Vendor specific memory addresses
128-247	120	User EEPROM	User writable non-volatile memory
248-255	8	Vendor Control	Vendor specific control addresses

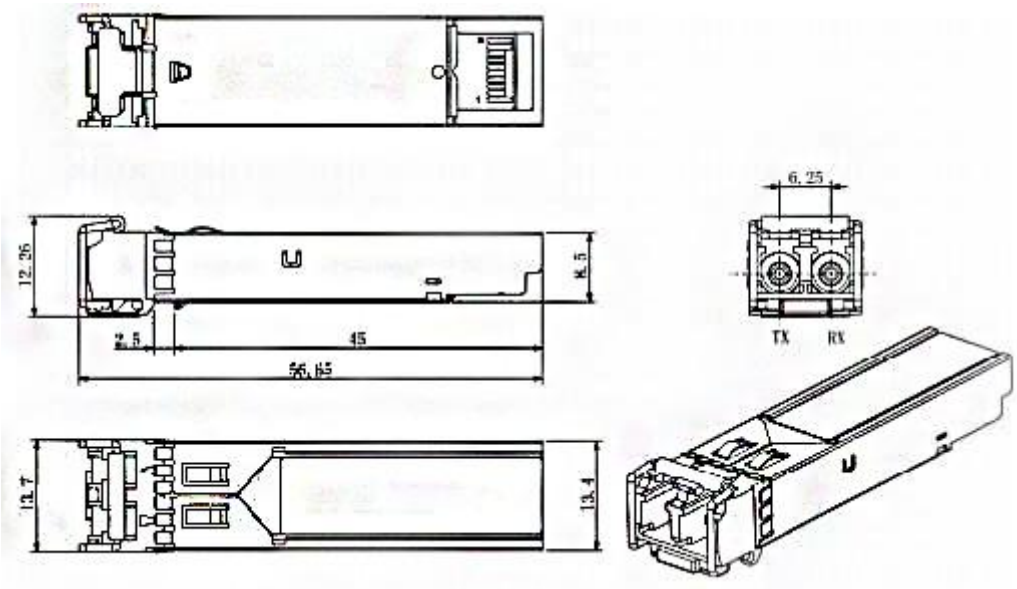
Recommended Circuit:



Note A: Circuit assumes open emitter output

Note B: Circuit assumes high impedance internal bias @Vcc-1.3V

Mechanical Dimensions:



Note: In the Part No. of OP3680D-XX, XX stands for wavelength, such as:
27: for 1271nm, 29: for 1291nm, 31: for 1311nm, 33: for 1331nm, 35: for 1351nm,
37: for 1371nm, 39: for 1391nm, 41: for 1411nm, 43: for 1431nm, 45: for 1451nm,
47: for 1471nm, 49: for 1491nm, 51: for 1511nm, 53: for 1531nm, 55: for 1551nm,
57: for 1571nm, 59: for 1591nm, 61: for 1611nm.

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