

10G SFP+ CWDM Optical Transceiver (STC-80055) Datasheet



- ▶ Operating case temperature: 0~ 70°C
- ▶ Power dissipation: <1.7W
- ▶ RoHS compliant

Applications:

- ▶ 10G Ethernet
- ▶ SDH/SONET
- ▶ Fibre Channel

Features:

- ▶ Supports 1.0 to 11.3Gb/s bit rates
- ▶ Hot-Pluggable SFP+ form factor
- ▶ Duplex LC connector
- ▶ 1471~1611nm CWDM EML transmitter, APD photo-detector
- ▶ 23dB optical link budget
- ▶ Built-in digital diagnostic functions
- ▶ Single +3.3V Power Supply

Description:

SWEDISH TELECOM OPTO's STC-80055 is a very compact 10Gb/s optical transceiver module for serial optical communication applications at 10Gb/s. The STC-80055 converts a 10Gb/s serial electrical data stream to 10Gb/s optical output signal and a 10Gb/s optical input signal to 10Gb/s serial electrical data streams. The high speed 10Gb/s electrical interface is fully compliant with SFI specification.

The high performance CWDM EML transmitter and high sensitivity APD receiver provide superior performance for Multiple applications.

The SFP+ Module compliant with SFF-8431, SFF-8432. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

The fully SFP compliant form factor provides hot pluggability, easy optical port upgrades and low EMI emission.

► Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V _{CC}	0		3.6	V
Storage Temperature	T _s	-40		85	°C
Operating Case Temperature	T _A	0		70	°C
Relative Humidity	RH	0		85	%

► Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	V _{cc}	3.135		3.465	V	
Supply Current	I _{cc}			515	mA	
Power Consumption	P			1.7	W	
Transmitter Section:						
Input differential impedance	R _{in}		100		Ω	1
Differential input voltage swing	V _{in,pp}	100		1000	mV	
Transmit Disable Voltage	V _D	2		V _{cc}	V	
Transmit Enable Voltage	V _{EN}	V _{ee}		V _{ee} +0.8	V	
Receiver Section:						
Differential output voltage swing	V _o	120		800	mV	
LOS Fault	V _{losfault}	2		V _{CC_host}	V	2
LOS Normal	V _{los norm}	V _{ee}		V _{ee} +0.8	V	2

Notes

1. Connected directly to TX data input pins. AC coupling from pins into laser driver IC.
2. LOS is an open collector output. Should be pulled up with 4.7k – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1.

► Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Center Wavelength	λ _t	λ-6.5	λ	λ+6.5	nm	
Spectral width	Δλ			0.4	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Power	P _{avg}	0		+5.5	dBm	
Laser Off Power	P _{off}			-30	dBm	
Extinction Ratio	ER	6			dB	
Receiver Section:						

Center Wavelength	λ_r	1260		1620	nm	
Receiver Sensitivity	Sen			-23	dBm	1
Input Saturation Power (Overload)	Sat	-7			dBm	
Los Assert	LOSA	-30		-	dBm	
Los Dessert	LOSD			-24	dBm	
Los Hysteresis	LOSH	0.5			dB	

Notes:

1. Measured with a PRBS 2³¹ - 1 test pattern, @10.3125Gb/s, BER < 10⁻¹².

► Pin Assignment

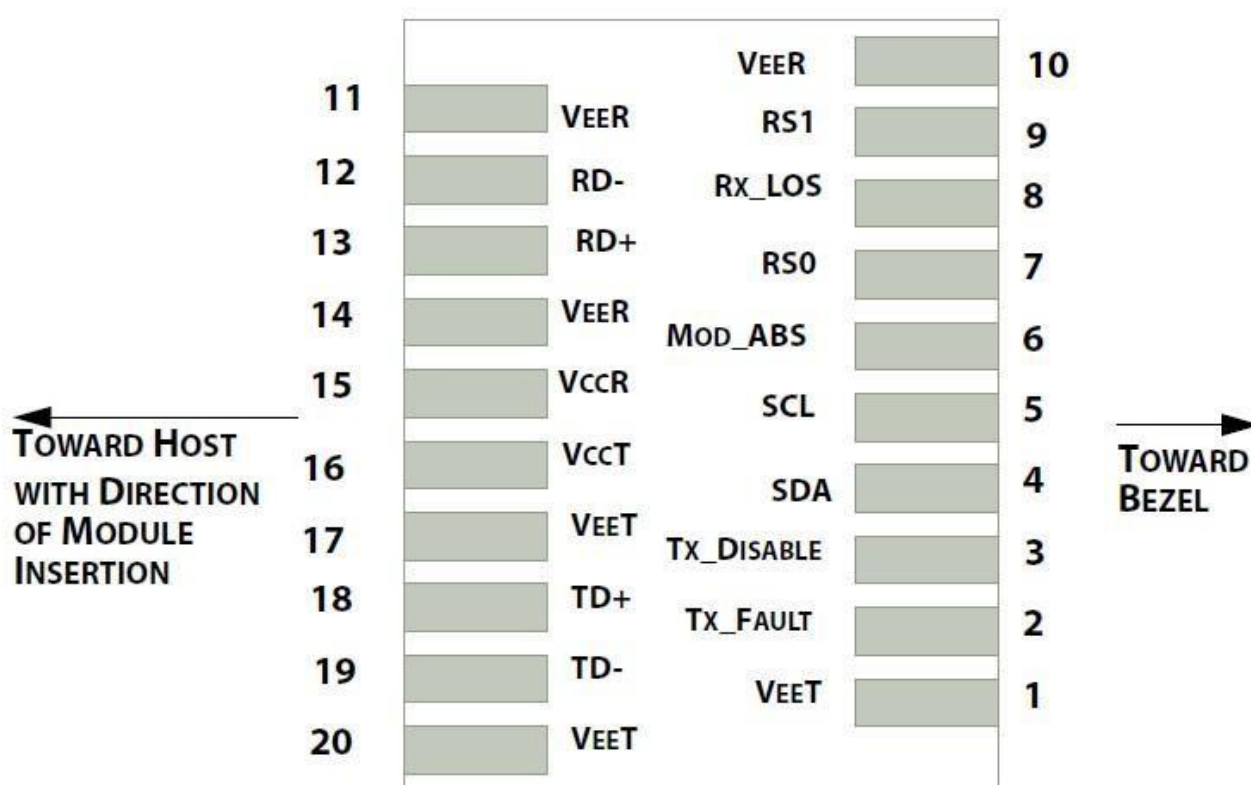


Diagram of Host Board Connector Block Pin Numbers and Names

► Pin Function Definitions

PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	1
2	Tx Fault	Module transmitter fault	2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDA	2 wire serial interface data input/output (SDA)	
5	SCL	2 wire serial interface clock input (SCL)	
6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	2

PIN #	Name	Function	Notes
7	RS0	Rate Select 0. Not Used	
8	LOS	Receiver Loss of Signal Indication	4
9	RS1	Rate Select 1. Not Used	
10	VeeR	Module receiver ground	1
11	VeeR	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	1
15	VccR	Module receiver 3.3V supply	
16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	1
18	TD+	Transmitter non-inverted data out put	
19	TD-	Transmitter inverted data out put	
20	VeeT	Module transmitter ground	1

Note

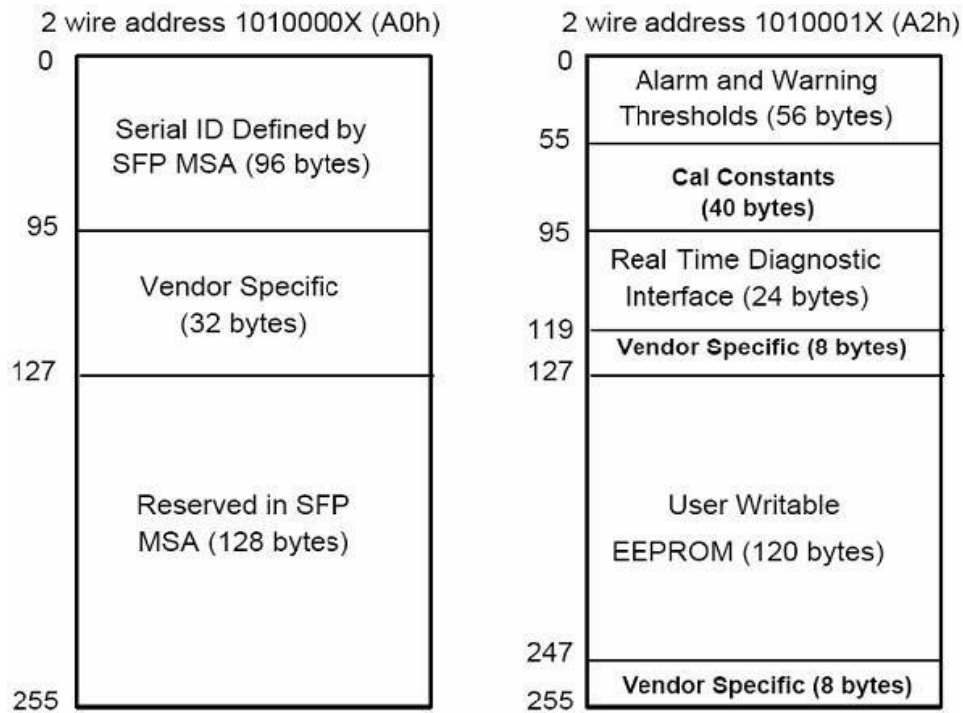
1. The module ground pins shall be isolated from the module case.
2. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.
3. This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.
4. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.

► SFP Module EEPROM Information and Management

The SFP modules implement the 2-wire serial communication protocol as defined in the SFF -8472. The serial ID information of the SFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0h and A2h.

The memory is mapped in **Table 1**.

For more details of the memory map and byte definitions, please refer to the SFF-8472, “Digital Diagnostic Monitoring Interface for Optical Transceivers”. The DDM parameters have been internally calibrated.

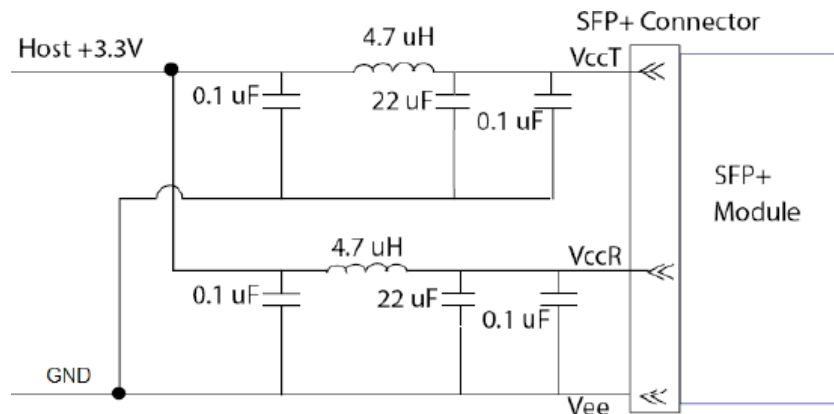
Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)


► Digital Diagnostic Monitor Characteristics

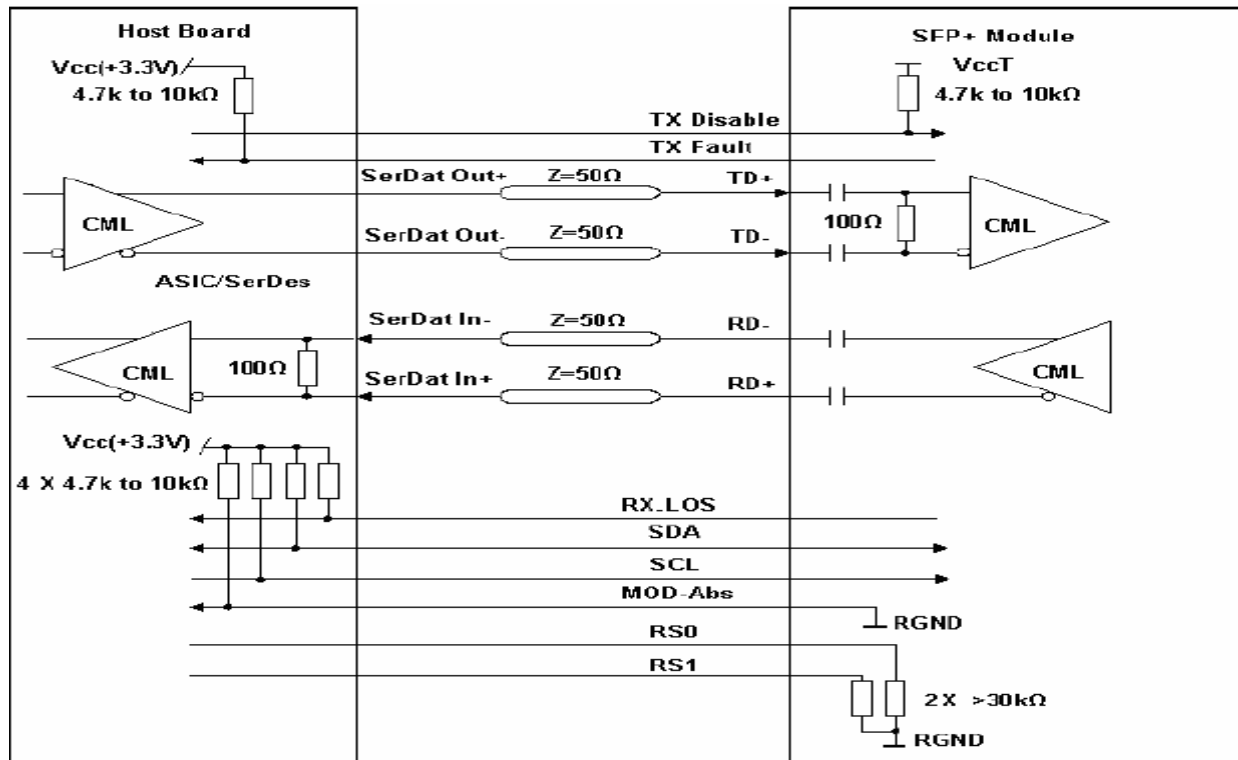
Data Address	Parameter	Accuracy	Unit
96-97	Transceiver Internal Temperature	±3.0	°C
98-99	VCC Internal Supply Voltage	±3.0	%
100-101	Laser Bias Current	±10	%
102-103	Tx Output Power	±3.0	dB
104-105	Rx Input Power	±3.0	dB

► Recommended Circuit:

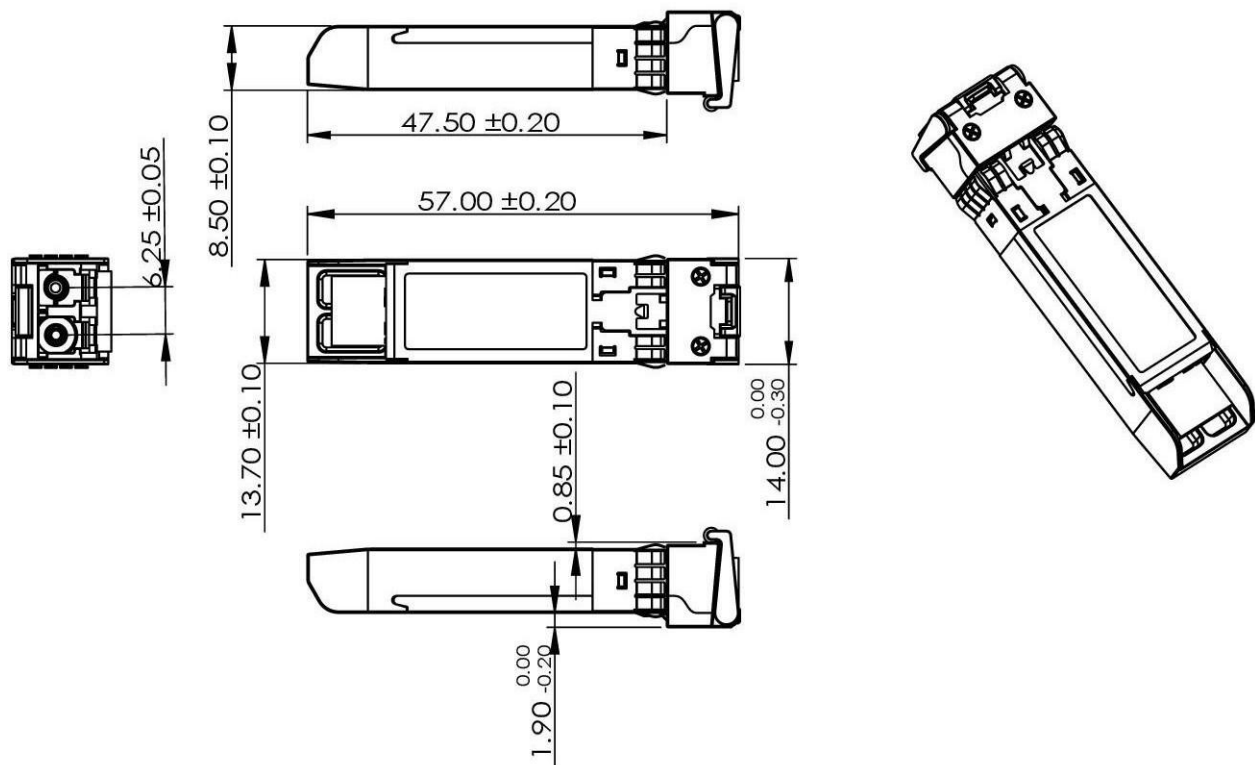
Recommended Host Board Power Supply Circuit



Recommended High-speed Interface Circuit



► Mechanical Dimensions (Unit: mm)



► Order Information

Part No.	Data Rate	Central wavelength	Optical Link budget	Recommend Distance
STC-80055-47	10Gbps	1471nm	23dB	80km
STC-80055-49	10Gbps	1491nm	23dB	80km
STC-80055-51	10Gbps	1511nm	23dB	80km
STC-80055-53	10Gbps	1531nm	23dB	80km
STC-80055-55	10Gbps	1551nm	23dB	80km
STC-80055-57	10Gbps	1571nm	23dB	70km
STC-80055-59	10Gbps	1591nm	23dB	70km
STC-80055-61	10Gbps	1611nm	23dB	70km

► Document Revision

Version No.	Date	Reviser	Description
V1.0	2023-11-13	Kevin	Template update

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