ONS-SE-2G-1590-C

Cisco® ONS ONS-SE-2G-1590 Compatible TAA OC-48-CWDM SFP Transceiver (SMF, 1590nm, 80km, LC, -5 to +85C)

Features:

- Class 1 Laser Safety
- SFP MSA Compliant
- CWDM Wavelengths, Uncooled DFB Laser
- Up to 2.67Gbps Bi-Directional Data Links
- Duplex LC Connector
- Single 3.3V Power Supply
- Hot-Pluggable
- Operating Temperature: -40 to 85 Celsius
- RoHS Compliant and Lead-Free



Applications:

- Ethernet over CWDM
- Access, Metro and Enterprise

Product Description

This Cisco® ONS ONS-SE-2G-1590 compatible SFP transceiver provides OC-48 (2488 mbs) CWDM transmission rates for up to 80km over single-mode fiber (SMF) using a wavelength of 1590nm via an LC connector. It can operate at temperatures between -5 and +85C. The listed reach has been determined using a link budget calculation and tested in a standard environment. Actual link distances achieved will be dependent upon the deployed environment. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Cisco® ONS. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S.-made or designated country end products."

TAA COMPLIANT

CWDM Available Wavelengths

Wavelengths	Min.	Typ.	Max.
45	1444.5	1451	1457.5
47	1464.5	1471	1477.5
49	1484.5	1491	1497.5
51	1504.5	1511	1517.5
53	1524.5	1531	1537.5
55	1544.5	1551	1557.5
57	1564.5	1571	1577.5
59	1584.5	1591	1597.5
61	1604.5	1611	1617.5

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	Tc	-40	25	85	°C	
Storage Temperature	Tstg	-40		85	°C	
Relative Humidity	RH	5		95	%	
Supply Voltage	Vcc	-0.5		4.0	V	
Data Rate	DR			2.67	Gbps	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Supply Current	Icc			450	mA	
Power Dissipation	PD			1500	mW	
Transmitter Differential Input Voltage (TD +/-)		300		2200	mVp-p	1
Receiver Differential Input Voltage (TD +/-)		600		1200	mVp-p	2
Low-Speed Output: Transmitter Fault (Tx_Fault)/Loss of Signal (LOS)	VOH	2.0		Vcc	V	3
	VOL	0		0.8	V	
Low-Speed Input: Transmitter Disable (Tx_Disable), MOD_DEF1, MOD_DEF2	VIH	2.0		Vcc	V	4
	VIL	0		0.8	V	

Notes:

1. Internally AC coupled and terminated to 100Ω differential load.
2. Internally AC coupled but requires a 100Ω differential termination or internal to serializer/de-serializer.

3. Pulled up with a 4.7kΩ to 10kΩ resistor on the host board to VccT, VccR.
4. MOD_DEF1 and MOD_DEF2 must be pulled up extremely with a 4.7kΩ to 10kΩ resistor on the host board to VccT, VccR.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λC	λ-6.5	λ	λ+6.5	nm	
Launch Optical Power	Po	0		5	dBm	
Extinction Ratio	ER	8.2			dB	
Spectral Width (-20dB)	Δλ			1	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Total Jitter	TJ			40	ps	
Dispersion Penalty	TDP			2	dB	
Optical Rise/Fall Time	Tr/Tf			160	dB	
POUT @Tx_Disable Asserted	Poff			-45	dBm	
Eye Diagram	SONET OC-48/ SDH STM-16 Compatible					
Receiver						
Receiver Sensitivity	S			-29	dBm	1
Receiver Overload	POL	-9			dBm	1
Optical Return Loss	ORL	27			dB	
LOS Assert	LOSA	-45			dBm	
LOS De-Assert	LOSD			-60	dBm	
LOS Hysteresis	LOSH	0.5	3	5	dB	

Notes:

1. Measured with PRBS2^{23}-1 test pattern, @2.488Gbps, ER=8.2dB, and BER<10^{-12}.

Pin Descriptions

Pin	Symbol	Name/Description	Plug Seq.	Notes
1	VeeT	Transmitter Ground.	1	
2	Tx_Fault	Transmitter Fault Indication.	3	1
3	Tx_Disable	Transmitter Disable. Module disables on “high” or “open.”	3	2
4	MOD_DEF2	Module Definition 2. 2-Wire Serial ID Interface.	3	3
5	MOD_DEF1	Module Definition 2. 2-Wire Serial ID Interface.	3	3
6	MOD_DEF0	Module Definition 0. Grounded within the module.	3	3
7	Rate Select	Not Connected.	3	
8	LOS	Loss of Signal.	3	4
9	VeeR	Receiver Ground.	1	
10	VeeR	Receiver Ground.	1	
11	VeeR	Receiver Ground.	1	
12	RD-	Receiver Inverse Data Out.	3	5
13	RD+	Receiver Data Out.	3	5
14	VeeR	Receiver Ground.	1	
15	VccR	3.3 ± 5% Receiver Power.	2	6
16	VccT	3.3 ± 5% Transmitter Power.	2	6
17	VeeT	Transmitter Ground.	1	
18	TD+	Transmitter Data In.	3	7
19	TD-	Transmitter Inverse Data In.	3	7
20	VeeT	Transmitter Ground.	1	

Notes:

1. Tx_Fault is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board to supply <VccT+0.3V or VccR+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.
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 4.7kΩ to 10kΩ resistor. Its states are:

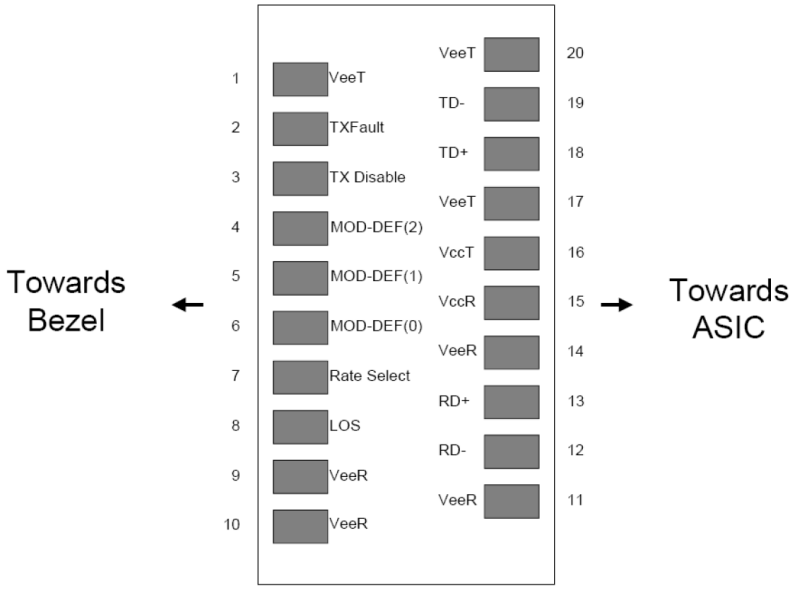
   Low (0V – 0.8V): Transmitter On
   (>0.8V, <2.0V): Undefined
   High (2.0V – 3.465V): Transmitter Disabled
   Open: Transmitter Disabled.
3. MOD_DEF0, 1, & 2. These are the module definition pins. They should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board to supply VccT+0.3V or VccR+0.3V.

   MOD_DEF0 is grounded by the module to indicate that the module is present.
   MOD_DEF1 is the clock line of 2-wire serial interface for optional serial ID.
   MOD_DEF2 is the data line of 2-wire serial interface for optional serial ID.
4. LOS (Loss of Signal) is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board to supply <VccT+0.3V or VccR+0.3V. When “high,” this output indicates that

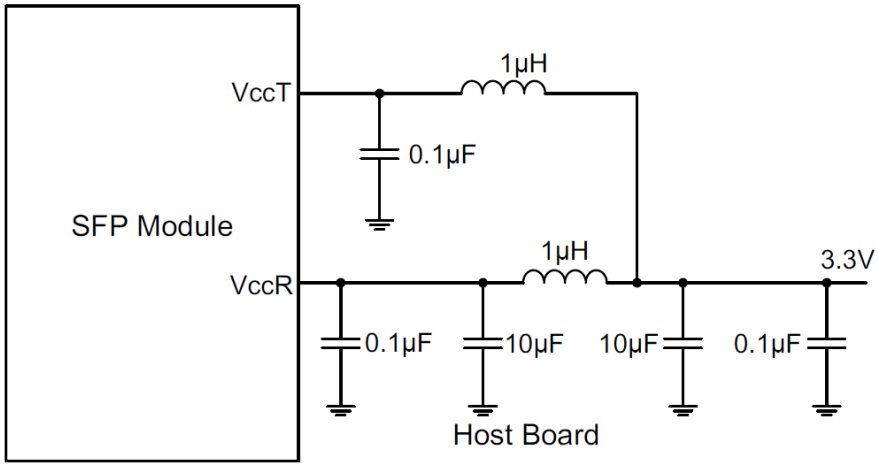
the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). “Low” indicates normal operation. In the “low” state, the output will be pulled to <0.8V.

5. RD-/+. These are the differential receiver outputs. They are AC-coupled, 100Ω differential lines that 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.
6. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V ± 5% at the SFP connector pin. The in-rush current will typically be no more than 30mA above steady supply current after 500ns.
7. 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.

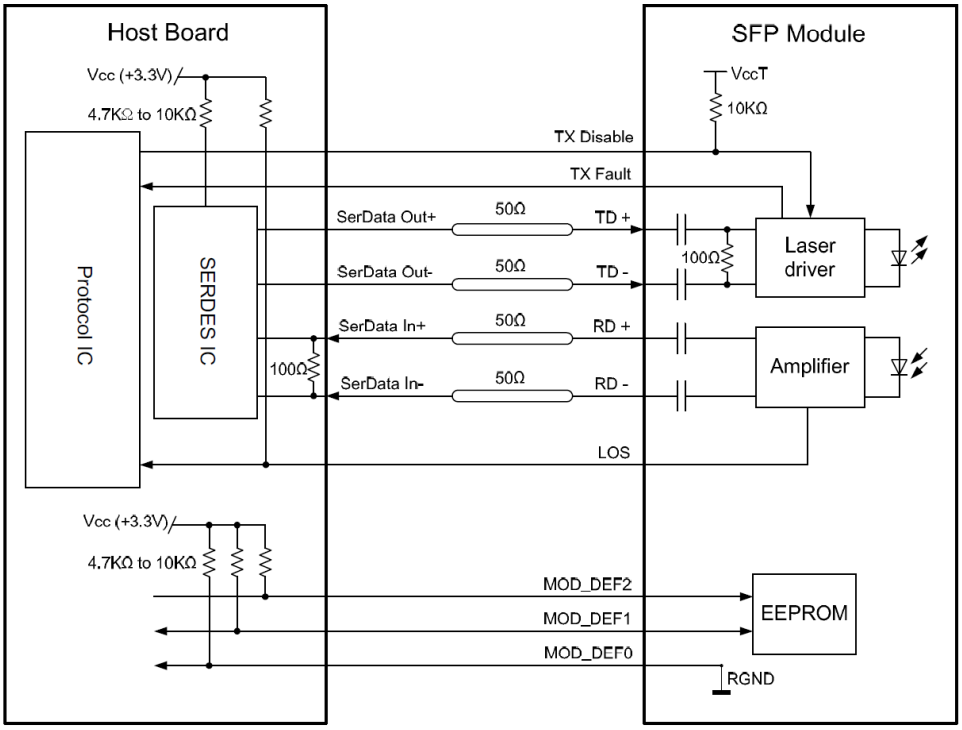
Electrical Pad Layout



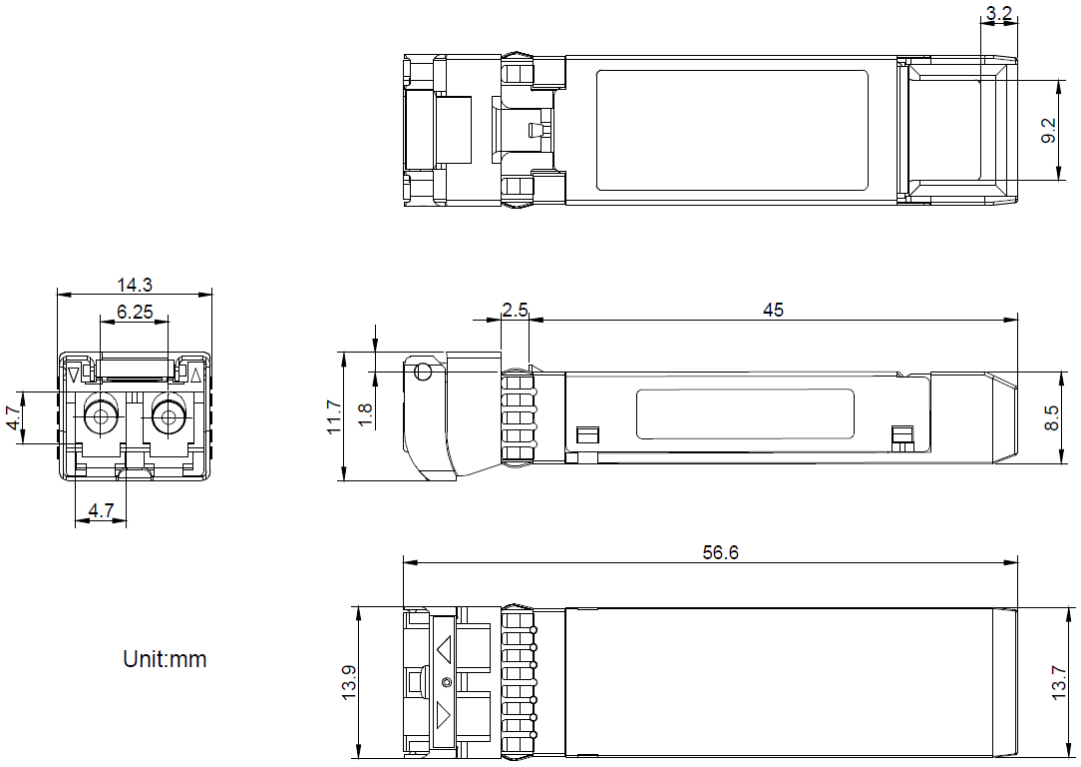
Recommended Host Board Power Supply Circuit



Recommended Circuit Schematic



Mechanical Specifications



About ProLabs

Our extensive experience comes as standard. For over 20 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with more than 100 optical switching and transport platforms.

A Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 1.6T while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

The Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure compatible products, and immediate answers to your questions. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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