

# DS-8G-ZR-Cxx

SFP+, 8/4/2/1 Gbps FC/FICON, CWDM, SM, DDM, 23dB, 70km

## DS-8G-ZR-Cxx OVERVIEW

The DS-8G-ZR-Cxx fiber optical SFP+ (small form pluggable) transceivers are uniquely layer 1 tested and approved by Cisco. They include an APD receiver and temperature stabilized DFB-EML transmitter. The modules operate at data-rates up to 8.5 Gbps. CWDM modules operate at nominal Coarse Wavelength Division Multiplexing (CWDM) wavelengths. Eight center wavelengths available from 1471 nm to 1611 nm with each step being 20 nm. The CWDM characteristics are fully compliant to the wavelength parameters specified in ITU standards G.694.2 and G.695. The transceiver is compliant to wavelength requirements from ITU-T G.957 and ITU-T G.695. The module has a duplex LC optical interface and all mechanical characteristics are compliant with the current SFP+ specification (SFF-8431 and SFF-8432). All SFP modules fulfill the content of the serial EEPROM described in the SFP MSA, Appendix B4, table 3.1, at base data fields (defined as addresses 0 to 63) and extended data fields (defined as addresses 64 to 95). The nominal transmitter output wavelength is stated at the reserved addresses 60-61 according to SFF document SFF-8472 rev 10.4, "Digital Diagnostics Monitoring Interface". Wavelengths stated in the specification are measured in vacuum. All requirements in this specification are valid throughout the specified lifetime and operational environmental temperature range unless otherwise stated. The transceiver modules are compliant to RoHS-6/6

## PRODUCT FEATURES

- Layer 1 tested and approved by Cisco
- Up to 8.5 Gbps data-rates
- Up to 70km on 9/125um SMF (G.652)
- Duplex LC connector
- Compliant with SFP+ MSA
- Hot-pluggable SFP footprint
- Built-in digital diagnostic functions
- Single power supply 3.3V
- RoHS6 Compliant
- Class 1 laser product complies with EN 60825-1
- Operating temperature range: 0°C to 70°C
- Power consumption <1.5W

## APPLICATIONS

- 8/4/2/1 Gbps Fibre Channel / 10G Fibre Channel
- CWDM, SAN, WAN connectivity

## ORDERING INFORMATION

Part Number	Description
DS-8G-ZR-Cxx	SFP+, 8/4/2/1 Gbps FC/FICON, CWDM, SM, DDM, 23dB, 70km

Subject to change without notice.

For more information visit [smartoptics.com](http://smartoptics.com).

## GENERAL SPECIFICATIONS

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Rate	$DR$			8.5	Gbps	
Bit Error Rate	$BER$			$10^{-12}$		
Operating Temperature	$T_{OP}$	0		70	°C	Case temperature
Storage Temperature	$T_{STO}$	-40		85	°C	Ambient temperature
Supply Current	$I_S$		330	450	mA	For electrical power interface
Input Voltage	$V_{CC}$	3.13	3.3	3.45	V	
Maximum Voltage	$V_{MAX}$	-0.5		3.6	V	For electrical power interface
Total Power Dissipation			1.2	1.5	W/1	

## OPTICAL CHARACTERISTICS – TRANSMITTER

End of Life, overall operating conditions

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Output Optical Power	$P_{TX}$	-0.5		+4	dBm	Average, coupled into 9/125um SMF
Extinction ratio	$Er$	8.2			dB	
Optical center wavelength	$\lambda_c$	ITU -6.5	ITU	ITU + 6.5	nm	
Spectral width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	$SMSR$	30			dB	
Transmitter and Dispersion Penalty				3	dB	1400ps/nm, 8.5Gb/s
Relative Intensity noise	$RIN$			-128	dB/Hz	Peak-to-Peak
Launch Power OFF	$P_{off}$			-30	dBm	Average

## OPTICAL CHARACTERISTICS – RECEIVER

End of Life, overall operating conditions

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Optical Receiver Power	$P_{RX}$			-7	dBm	Average
Optical Center Wavelength	$\lambda_c$	1260		1620	nm	
Receiver Sensitivity @ 10.3GBps	$RX\_SENS$			-23.5	dBm	$BER < 10^{-12}$ , PRBS $2^{31}-1$
Loss of Signal-Asserted	$P_{LOS\_A}$	-32			dBm	
Loss of Signal-Deasserted	$P_{LOS\_D}$			-24	dBm	

### ELECTRICAL CHARACTERISTICS – HIGH-SPEED SIGNAL INTERFACE (CML)

End of Life, overall operating conditions

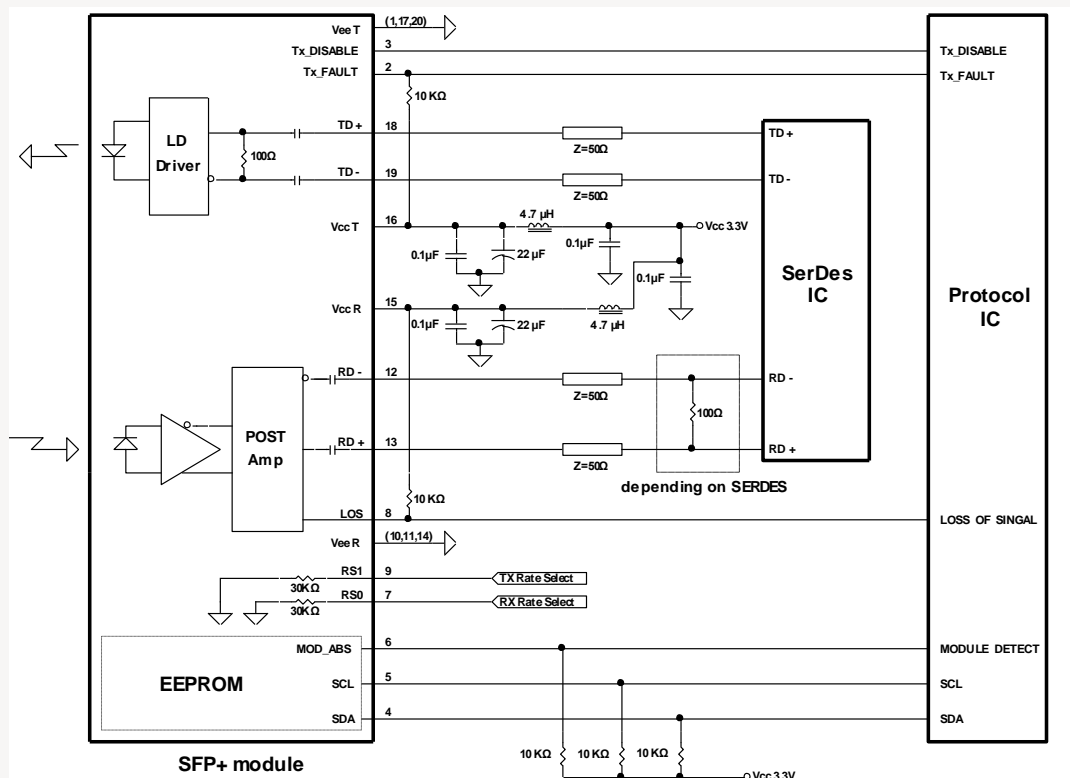
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Differential Input Impedance	$R_{IN}$		100		$\Omega$	
Differential data input amplitude	$V_{IN\_PP}$	150		1200	mVpp	Internally AC coupled
Differential Output Impedance	$R_{OUT}$		100		$\Omega$	
Differential data output amplitude	$V_{OUT\_PP}$	350		700	mVpp	Internally AC coupled

### ELECTRICAL CHARACTERISTICS – LOW-SPEED SIGNAL INTERFACE (LVTTTL)

End of Life, overall operating conditions

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Input High Voltage		2.0		$V_{CC}+0.3$	V	TX-DIS, TX-FAULT
Input Low Voltage		GND		0.8	V	
Output High Voltage		2.4		$V_{CC}$	V	RX-LOS
Output Low Voltage		GND		0.5	V	

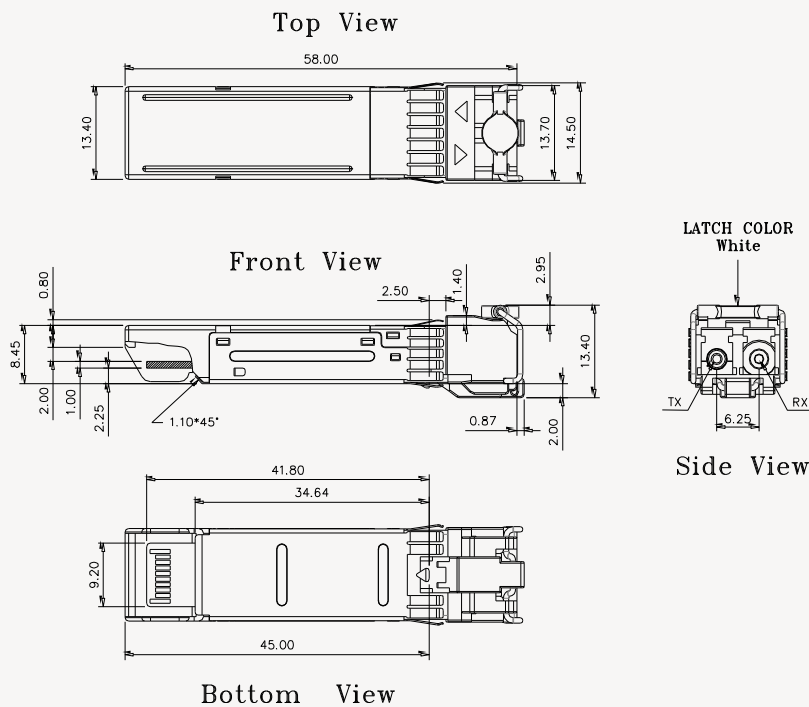
### FUNCTIONAL DIAGRAM OF TRANSCEIVER AND RECOMMENDED CIRCUIT SCHEMATIC



**PIN FUNCTION DEFINITIONS ACCORDING TO MSA**

PIN	Signal Name	Description	PIN	Signal Name	Description
1	V <sub>EE</sub> T	Transmitter Signal Ground	11	V <sub>EE</sub> R	Receiver Signal Ground
2	TX_Fault	Transmitter Fault Indication. Logic "1" Output = Laser Fault. Logic "0" Output = Normal Operation	12	RD-	Inverse Receiver Data Out
3	TX_Disable	Logic "1" Input (or no connection) = Laser off, Logic "0" = Laser on.	13	RD+	Receiver Data Out
4	SDA	Modulation Definition 2 – Two wires serial ID Interface	14	V <sub>EE</sub> R	Receiver Signal Ground
5	SDL	Modulation Definition 1 – Two wires serial ID Interface	15	V <sub>CC</sub> R	Receiver Power – 3.3V±5%
6	MOD-ABS	Modulation Definition 0 – Ground in Module	16	V <sub>CC</sub> T	Transmitter Power – 3.3V±5%
7	RS0	RX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	17	V <sub>EE</sub> T	Transmitter Signal Ground
8	RX_LOS	Loss of Signal Out (OC).	18	TD+	Transmitter Data In
9	RS1	TX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	19	TD-	Inverse Transmitter Data In
10	V <sub>EE</sub> R	Receiver Signal Ground	20	V <sub>EE</sub> T	Transmitter Signal Ground

**MECHANICAL DRAWING**



## ORDERING INFORMATION

Label part number	Center wavelength (nm)
DS-8G-ZR-C47	1470
DS-8G-ZR-C49	1490
DS-8G-ZR-C51	1510
DS-8G-ZR-C53	1530
DS-8G-ZR-C55	1550
DS-8G-ZR-C57	1570
DS-8G-ZR-C59	1590
DS-8G-ZR-C61	1610