

SO-SFP-10GE-LR10-Cxx

SFP+, 10GBase-LR, CWDM 1270nm-1610nm, SM, DDM, 10dB, 10km

OVERVIEW

The so-sfp-10ge-lr10-cxx series optical transceiver is designed for fiber communications application such as 10g ethernet (10gbase-lr), which fully compliant with the specification of sfp+ msa sff-8431. This module is designed for single mode fiber and operates at a nominal wavelength of cwdm wavelength. There are eighteen center wavelengths available from 1270nm to 1610nm, with each step 20nm. A guaranteed minimum optical link budget of 10 db is offered. The module is with the sfp+ connector to allow hot plug capability. Single 3.3v power supply is needed. The optical output can be disabled by lvtll logic high-level input of tx_dis. Loss of signal (rx_los) output is provided to indicate the loss of an input optical signal of receiver. This module provides digital diagnostic functions via a 2-wire serial interface as defined by the sff-8472 specification.

PRODUCT FEATURES

- Supports 9.95Gb/s to 11.1Gb/s bit rates
- Hot-Pluggable SFP+ footprint
- 18-Wavelength CWDM DFB transmitter from 1270nm to 1610 nm, with step 20 nm
- 10dB power budget, minimum
- Duplex LC connector
- Power dissipation < 1.2W
- Case operation temperature range 0°C to 70°C
- Compliant with SFP+ MSA specification SFF-8431
- Build-in digital diagnostic functions
- Compliant with SFF-8472 MSA

APPLICATIONS

- 10GBASE-LR/LW 10G Ethernet
- 10GBASE-LR at 10.31 Gbps
- 10GBASE-LW at 9.95 Gbps
- Other optical links

ORDERING INFORMATION

Part Number	Description
SO-SFP-10GE-LR10-Cxx	SFP+, 10GBase-LR, CWDM 1270nm-1610nm, SM, DDM, 10dB, 10km

*xx = Refers to notation for frequency data. Please see extended order information on last page for additional information.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Maximum Supply Voltage 1	V_{CC}	-0.5	4.0	V
Storage Temperature	TS	-40	85	°C
Case Operating Temperature	TOP	0	70	°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	0		70	°C
Supply Voltage	V_{CC}	3.13	3.3	3.45	V
Supply Current	I_{CC}			350	mA
Data Rate		9.95		11.1	Gbps

PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Inputs(Differential)	V_{IN}	150		1200	mVpp	AC coupled inputs
Input Impedance (Differential)	C_{IN}	85	100	115	ohms	$R_{in} > 100 \text{ kohms @ DC}$
Tx_DISABLE Input Voltage - High		2		$V_{CC}+0.3$	V	
Tx_DISABLE Input Voltage - Low		0		0.8	V	
Tx_FAULT Output Voltage -- High		2		$V_{CC}+0.3$	V	$I_o = 400\mu\text{A}; \text{Host } V_{CC}$
Tx_FAULT Output Voltage -- Low		0		0.8	V	$I_o = -4.0\text{Ma}$

PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Outputs (Differential)	V_{out}	350		700	mVpp	AC coupled inputs
Output Impedance (Differential)	C_{out}	85	100	115	ohms	
Rx_LOS Output Voltage – High		2		$V_{CC}+0.3$	V	$I_o = 400\mu\text{A}; \text{Host } V_{CC}$
Rx_LOS Output Voltage – Low		0		0.8	V	$I_o = -4.0\text{Ma}$
MOD_DEF (0:2)	V_{oH}	2.5			V	With Serial ID
	V_{oL}	0		0.5	V	

OPTICAL AND ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
50 / 125 um MMF			300		m
Data Rate			10.3125		Gbps

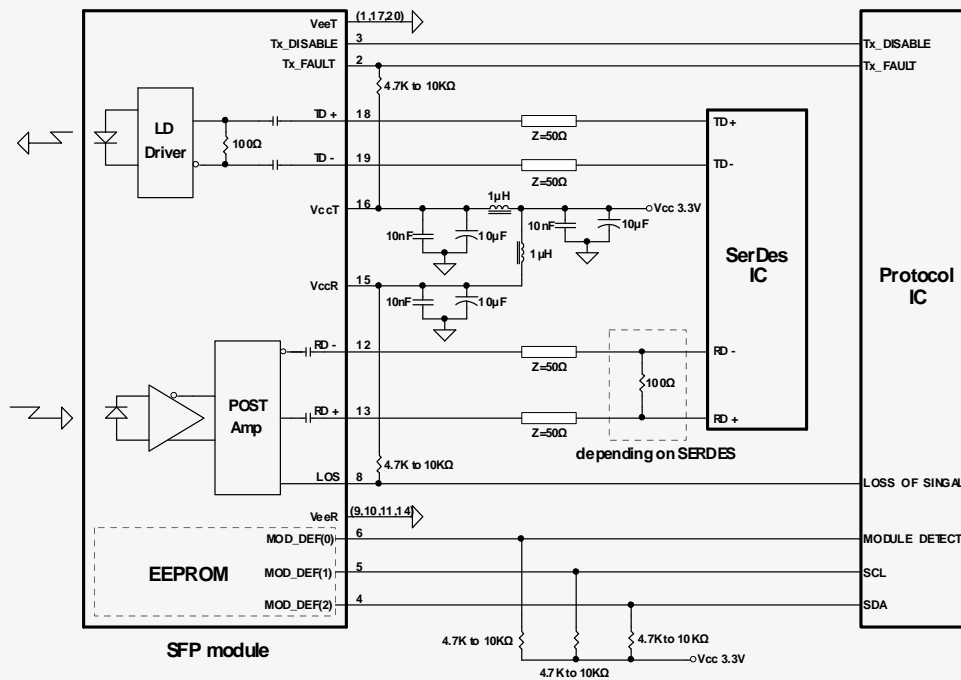
OPTICAL AND ELECTRICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Output Opt. Pwr: 9/125 SMF	P_{out}	-5		0	dBm
Optical Extinction Ratio	ER	3.5			dB
Optical Wavelength	λ	$\lambda_c - 5.5$	λ_c	$\lambda_c + 7.5$	nm
-20dB Spectrum Width	$\Delta\lambda$			1	nm
Side Mode Suppression Ratio	SMSR	30			
Transmitter and Dispersion Penalty	TDP			2	dB
Average Launch Power of OFF Transmitter	POFF			-30	dBm
TX Jitter Generation (Peak-to-Peak)	TXj			0.1	UI
TX Jitter Generation (RMS)	TXj RMS		-	0.01	UI

OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Receiver Sensitivity @ 10.7Gb/s	P_{min}			-15	dBm
Maximum Input Power	P_{max}	+0.5			dBm
Optical Center Wavelength	λ	1260		1620	nm
Receiver Reflectance	Rrf			-27	dB
LOS De-Assert	LOSD			-16	dBm
LOS Assert	LOSA	-28			dBm
LOS Hysteresis		1			dB

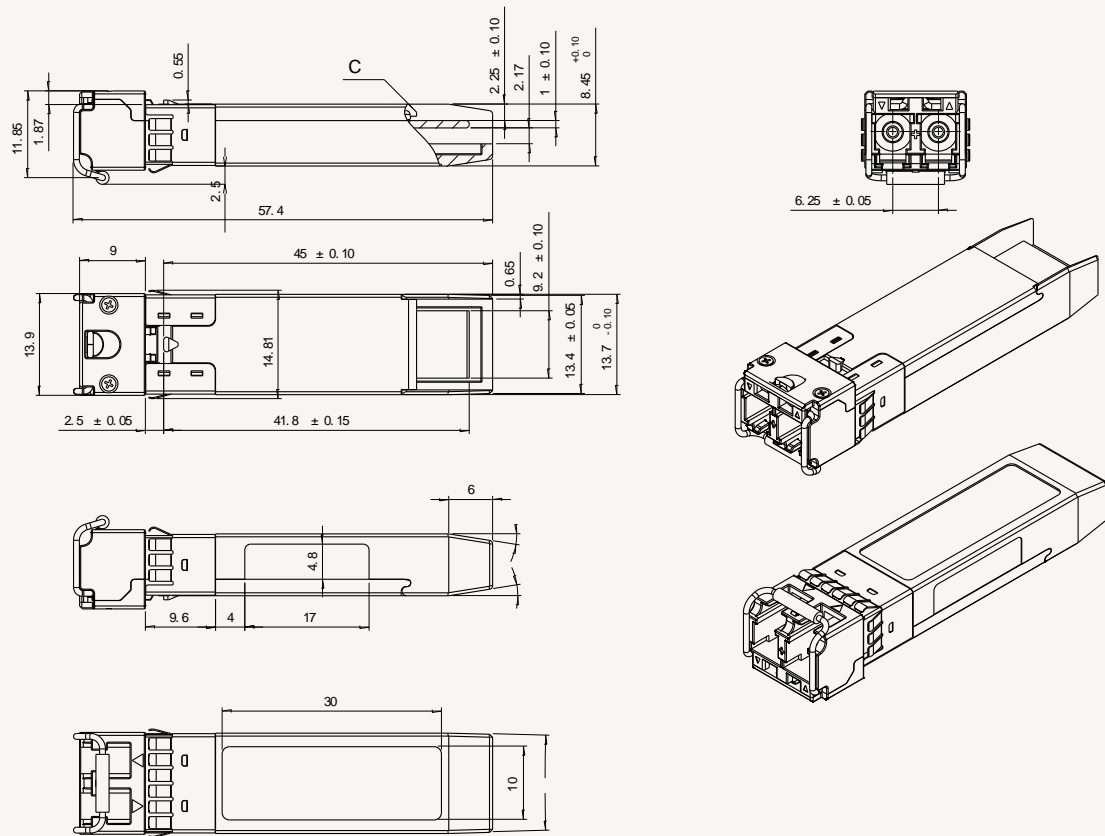
RECOMMENDED CIRCUIT SCHEMATIC



PIN FUNCTION DEFINITIONS

PIN	Signal Name	Description	PIN	Signal Name	Description
1	V _{EE} T	Transmitter Signal Ground	11	V _{EE} 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 _{EE} R	Receiver Signal Ground
5	SDL	Modulation Definition 1 – Two wires serial ID Interface	15	V _{CC} R	Receiver Power – 3.3V±5%
6	MOD-ABS	Modulation Definition 0 – Ground in Module	16	V _{CC} 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 _{EE} 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 _{EE} R	Receiver Signal Ground	20	V _{EE} T	Transmitter Signal Ground

MECHANICAL DRAWING



Subject to change without notice.

For more information, visit smaroptics.com.

EXTENDED ORDERING INFORMATION

Part Number	Description
SO-SFP-10GE-LR10-C27	SFP+, 10GBase-LR, CWDM 1270nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C29	SFP+, 10GBase-LR, CWDM 1290nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C31	SFP+, 10GBase-LR, CWDM 1310nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C33	SFP+, 10GBase-LR, CWDM 1330nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C35	SFP+, 10GBase-LR, CWDM 1350nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C37	SFP+, 10GBase-LR, CWDM 1370nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C39	SFP+, 10GBase-LR, CWDM 1390nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C41	SFP+, 10GBase-LR, CWDM 1410nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C43	SFP+, 10GBase-LR, CWDM 1430nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C45	SFP+, 10GBase-LR, CWDM 1450nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C47	SFP+, 10GBase-LR, CWDM 1470nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C49	SFP+, 10GBase-LR, CWDM 1490nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C51	SFP+, 10GBase-LR, CWDM 1510nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C53	SFP+, 10GBase-LR, CWDM 1530nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C55	SFP+, 10GBase-LR, CWDM 1550nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C57	SFP+, 10GBase-LR, CWDM 1570nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C59	SFP+, 10GBase-LR, CWDM 1590nm, SM, DDM, 10dB, 10km
SO-SFP-10GE-LR10-C61	SFP+, 10GBase-LR, CWDM 1610nm, SM, DDM, 10dB, 10km

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