

SNR-CFP-100G-LR4 Series

Single-Mode OTU4 4I1-9D1F CFP Transceiver
Single-Mode 100GBASE-LR4 CFP Transceiver
RoHS6 Compliant

Features

- ◆ Supports 103Gbps and 112Gbps aggregate bit rates
- ◆ Single 3.3V Power Supply and Power dissipation < 10W
- ◆ Up to 10km transmission on SMF
- ◆ Hot-Pluggable CFP Footprint Duplex LC Connector Interface
- ◆ Class 1 FDA and IEC60825-1 Laser Safety Compliant
- ◆ RoHS6 Compliant
- ◆ Operating Case Temperature Standard: 0°C ~ +70°C
- ◆ Compliant with CFP MSA Specification
- ◆ MDIO interface with integrated Digital Diagnostic Monitoring
- ◆ CAUI electrical interface



Applications

- ◆ OTU4 4I1-9D1F
- ◆ 100GBASE-LR4

Ordering Information

Part No.	Data Rate	Fiber	Distance *(Note2)	Interface	Temp.	DDMI
SNR-CFP-100G-LR4*(Note1)	112Gbps (Note3)	SMF	10km	LC	Standard	Yes

Note1: Standard version

Note2: 10km with 9/125µm SMF

Note3: can change to 103Gbps rate through MDIO.

*The product image only for reference purpose.

Regulatory Compliance*

Product Certificate	Certificate Number	Applicable Standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12+A2
		EN 60825-1:2014
		EN 60825-2:2004+A1+A2
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50285865 0001	EN 55022:2010
		EN 55024:2010
FCC	WTF14F0514417E	47 CFR PART 15 OCT., 2013
FDA	/	CDRH 1040.10
ROHS	/	2011/65/EU

*The above certificate number updated to June 2014, because some certificate will be updated every year, such as FDA and ROHS.

Absolute Maximum Ratings*^{Note4}

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Ts	-40	+85	°C
Case Temperature	Tc	-5	+75	°C
Supply Voltage	Vcc	-0.5	3.6	V
Operating Relative Humidity	RH	5	85	%

Note4: Exceeding any one of these values may destroy the device immediately.

Recommended Operating Conditions

Parameter	Symbol		Min.	Typical	Max.	Unit
Operating Case Temperature	T _C	SNR-CFP-100G-LR4	0		+70	°C
Power Supply Voltage	Vcc		3.2	3.3	3.4	V
Power Supply Current	Icc			2700		mA

Performance Specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
Input Amplitude (Differential)	Vin			1050	mVpp	AC coupled inputs* ^(Note7)
Input Impedance (Differential)	Zin	80	100	120	ohms	Rin > 100 kohms @ DC
Receiver						
Output Amplitude (Differential)	Vout	360		770	mVpp	AC coupled outputs* ^(Note7)
Output Impedance (Differential)	Zout	80	100	120	ohms	
Output Rise/Fall Time	t _r /t _f	24			ps	20%~80%

MDIO Interface Specifications

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Input Voltage	V _{IH}	0.84		1.5	V	
	V _{IL}	-0.3		0.36	V	
Input Leak current	I _{IN}	-100		100	uA	
Output Voltage	V _{OH}	1.0		1.5	V	
	V _{OL}	-0.3		0.2	V	
Input Capacitance	C _I			10	pF	
Input MDC Clock	f _{MDC}	0.1		4	MHz	
MDC Clock Period	T _{MDC}	250		10000	ns	
MDIO Hold Time	T _{hold}	10			ns	
MDIO Setup Time	T _{setup}	10			ns	
GLB_ALM	T _{glb_alm_ass}			150	ms	
	T _{glb_alm_dea}			150	ms	

Optical and Electrical Characteristics

OTU4 4I1-9D1F Operation

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Signaling Speed per Lane	BR _{AVE}		27.95		Gbps
Lane_0 Center Wavelength	λ _{C0}	1294.53	1295.56	1296.59	nm
Lane_1 Center Wavelength	λ _{C1}	1299.02	1300.05	1301.09	nm
Lane_2 Center Wavelength	λ _{C2}	1303.54	1304.58	1305.63	nm
Lane_3 Center Wavelength	λ _{C3}	1308.09	1309.14	1310.19	nm
Total Average Output Power ^{*(Note5, Note6)}	P _{O1}	-		8.9	dBm
Average Launch Power per Lane ^{*(Note6)}	P _{each1}	-2.5		2.9	dBm
Side Mode Suppression Ratio	SMSR	30			dB
Optical Return Loss Tolerance				20	dB
Extinction Ratio ^{*(Note6)}	ER ₁	7			dB
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} ^{*(Note6)}			G.959.1 Compliant		
TX Disable Assert Time	t _{off}			100	us
Receiver					
Signaling Speed per Lane	BR _{AVE}		27.95		Gbps
Lane_0 Center Wavelength	λ _{C0}	1294.53	1295.56	1296.59	nm
Lane_1 Center Wavelength	λ _{C1}	1299.02	1300.05	1301.09	nm
Lane_2 Center Wavelength	λ _{C2}	1303.54	1304.58	1305.63	nm
Lane_3 Center Wavelength	λ _{C3}	1308.09	1309.14	1310.19	nm
Average Receive Power per Lane ^{*(Note9)}	R _{pow1}	-8.8		4	dBm
Equivalent Sensitivity per Lane ^{*(Note11)}	P _{min1}			-10.3	dBm
Damage Threshold per Lane	P _{max}	5.5			dBm
Optical Return Loss	ORL			-26	dB
LOS Assert	LOSA	-26			dBm
LOS De-Assert	LOSD			-15	dBm
LOS Hysteresis		0.5			dB

100GBASE-LR4 Operation

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Signaling Speed per Lane	BR _{AVE}		25.78		Gbps
Lane_0 Center Wavelength	λ_{C0}	1294.53	1295.56	1296.59	nm
Lane_1 Center Wavelength	λ_{C1}	1299.02	1300.05	1301.09	nm
Lane_2 Center Wavelength	λ_{C2}	1303.54	1304.58	1305.63	nm
Lane_3 Center Wavelength	λ_{C3}	1308.09	1309.14	1310.19	nm
Total Average Output Power ^{*(Note5, Note8)}	P _{O2}	-		10.5	dBm
Average Launch Power per Lane ^{*(Note8)}	P _{each2}	-4.3		4.5	dBm
Side Mode Suppression Ratio	SMSR	30			dB
Optical Return Loss Tolerance				20	dB
Extinction Ratio ^{*(Note8)}	ER ₂	7			dB
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} ^{*(Note8)}		IEEE802.3ba-2010 Compliant			
TX Disable Assert Time	t _{off}			100	us
Receiver					
Signaling Speed per Lane	BR _{AVE}		25.78		Gbps
Lane_0 Center Wavelength	λ_{C0}	1294.53	1295.56	1296.59	nm
Lane_1 Center Wavelength	λ_{C1}	1299.02	1300.05	1301.09	nm
Lane_2 Center Wavelength	λ_{C2}	1303.54	1304.58	1305.63	nm
Lane_3 Center Wavelength	λ_{C3}	1308.09	1309.14	1310.19	nm
Average Receive Power per Lane ^{*(Note10)}	R _{pow2}	-10.6		4.5	dBm
Receive Sensitivity(OMA) per Lane ^{*(Note12)}	P _{min2}			-8.6	dBm
Stressed Sensitivity(OMA) per lane	SRS			-6.8	dBm
Damage Threshold per Lane	P _{max}	5.5			dBm
Optical Return Loss	ORL			-26	dB
LOS Assert	LOSA	-26			dBm
LOS De-Assert	LOSD			-15	dBm
LOS Hysteresis		0.5			dB

Note5: Output is coupled into a 9/125 μ m single-mode fiber.

Note6: Filtered, measured with a PRBS 2³¹-1 test pattern @27.95Gbps

Note7: High speed I/O, internally AC coupled.

Note8: Filtered, measured with a PRBS 2³¹-1 test pattern @25.78Gbps

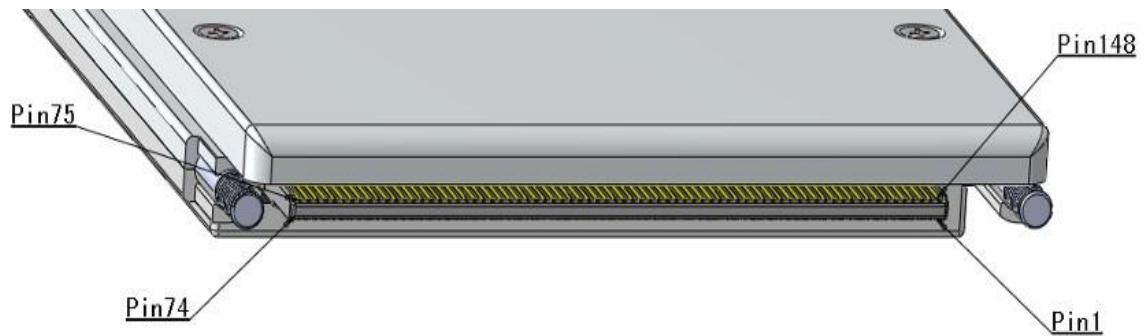
Note9: CFP transceiver works in OTU4 4I1-9D1F mode.

Note10: CFP transceiver works in 100GBASE-LR4 mode.

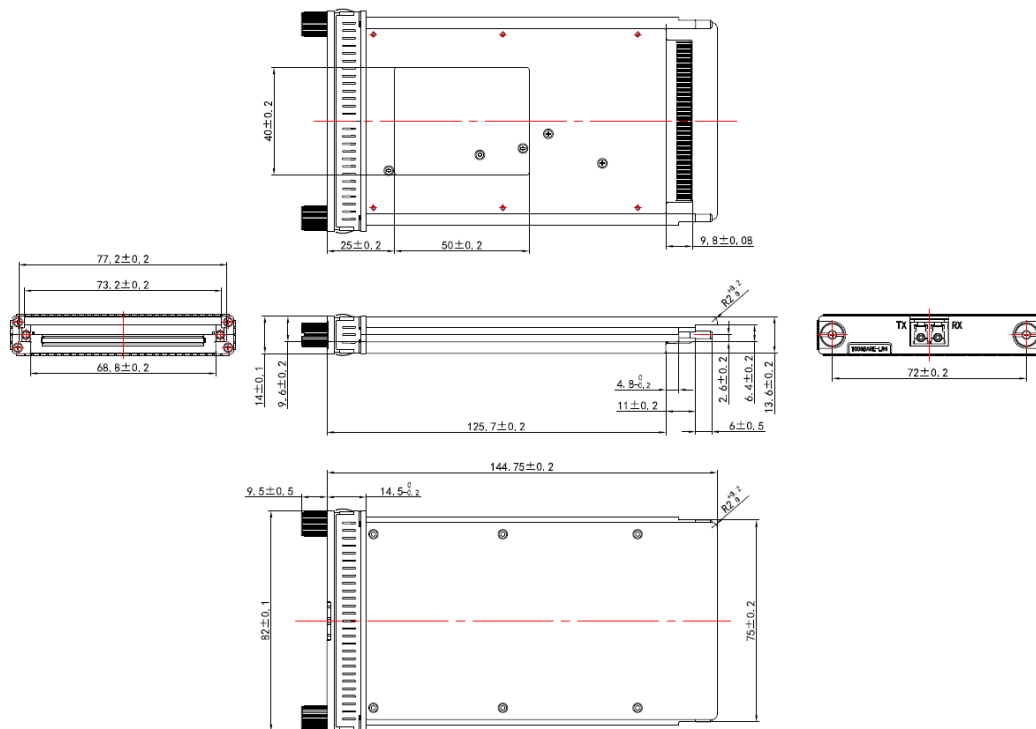
Note11: Measured at BER less than 1E-12, with a 2³¹-1 PRBS@27.95Gbps (W/ FEC).

Note12: Measured at BER less than 1E-12, with a 2³¹-1 PRBS@25.78Gbps.

CFP Transceiver Electrical Pad Layout



Mechanical Specifications



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