SNR-CFP2-100G-LR4-10 Series

Single-Mode OTU4 4I1-9D1F CFP2 Transceiver

Single-Mode 100GBASE-LR4 CFP2 Transceiver

RoHS6 Compliant

Features

- Supports 103Gbps and 112Gbps aggregate bit rates
- Single 3.3V Power Supply and Power dissipation < 6W
- Up to 10km transmission on SMF
- Hot-Pluggable CFP2 Footprint Duplex LC Connector Interface
- Class 1 FDA and IEC60825-1 Laser Safety Compliant
- RoHS6 Compliant
- Operating Case Temperature Standard: 0℃~+70℃
- Compliant with CFP2 MSA Specification
- MDIO interface with integrated Digital Diagnostic Monitoring
- 4 x 28G electrical interface

Applications

- 100GBASE-LR4 Ethernet
- OTU4 4I1-9D1F

Ordering Information

Part No.	Data Rate*note2	Fiber	Distance* note1	Interface	Temp.	DDMI
SNR-CFP2-100G-LR4-10	112Gbps	SMF	10km	LC	Standard	Yes

Note1: 10 km with 9/125μm SMF
Note2: Switching between 100GBASE-LR4 and OTU4 4I1-9D1F 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 FCC, FDA and ROHS.

Absolute Maximum Ratings*note3

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	%
ESD*note4			500	V

Note3: Exceeding any one of these values may destroy the device immediately.
Note4: Human body model.

Recommended Operating Conditions

Parameter	Symbol		Min.	Typical	Max.	Unit
Operating Case Temperature	T_C	SNR-CFP2-100G-LR4-10	0		+70	°C
Power Supply Voltage	Vcc		3.2	3.3	3.4	V
Power Consumption	P				6	W

Performance Specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
Input Amplitude (Differential)	Vin			900	mVpp	AC coupled inputs*(Note7)
Input Impedance (Differential)	Zin	85	100	115	ohms	Rin > 100 kohms @ DC
Receiver						
Output Amplitude (Differential)	Vout			900	mVpp	AC coupled outputs*(Note7)
Output Impedance (Differential)	Zout	85	100	115	ohms	

1.2V 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 SetupTime	T_{setup}	10			ns	
Clock to output delay from the MMD	T_{dely}	0		300	ns	
GLB_ALM	$T_{glb\_alm\_ass}$			150	ms	
	$T_{glb\_alm\_dea}$			150	ms	
MDC High time	T_{high}			160	ns	
MDC Low time	T_{low}			160	ns	

Optical and Electrical Characteristics

OTU4 4I1-9D1F Operation

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Signaling Speed per Lane	BR_{AVE}		27.95		Gbps
Data Rate Variation		-20		+20	ppm
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
Maximum channel power difference				5	dB
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			
Optical Eye Mask Margin*(Note14)	MM	5			%
TX Disable Assert Time	t_off			100	us
Receiver					
Signaling Speed per Lane	BR_{AVE}		27.95		Gbps

Data Rate Variation		-20		+20	ppm
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		2.9	dBm
Equivalent Sensitivity per Lane*(Note11)	P_{min1}			-10.3	dBm
Damage Threshold per Lane	P_{max}	5.5			dBm
Maximum channel power difference				5.5	dB
Maximum optical path penalty				1.5	dB
Optical Return Loss	ORL			-26	dB
LOS Assert	LOSA	-21	-17	-16	dBm
LOS De-Assert	LOSD		-16	-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
Data Rate Variation		-100		+100	ppm
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
Difference in launch power between any two lanes				5	dB
Average launch power of OFF transmitter per lane				-30	dBm
Optical Return Loss Tolerance				20	dB
Transmitter reflectance				-12	dB
Extinction Ratio*(Note8)	ER	4			dB
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}*(Note8)		IEEE802.3ba-2010 Compliant			
Optical Eye Mask Margin*(Note14)	MM	5			%
TX Disable Assert Time	t_off			100	us
Receiver					
Signaling Speed per Lane	BR_{AVE}		25.78		Gbps
Data Rate Variation		-100		+100	ppm
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	-21	-17	-16	dBm
LOS De-Assert	LOSD		-16	-15	dBm
LOS Hysteresis*(Note13)		0.5			dB

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

Note6: Filtered, measured with a PRBS 2^{31}-1 test pattern @27.95Gbps

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

Note8: Filtered, measured with a PRBS 2^{31}-1 test pattern @25.78Gbps

Note9: CFP2 transceiver works in OTU4 4I1-9D1F mode.

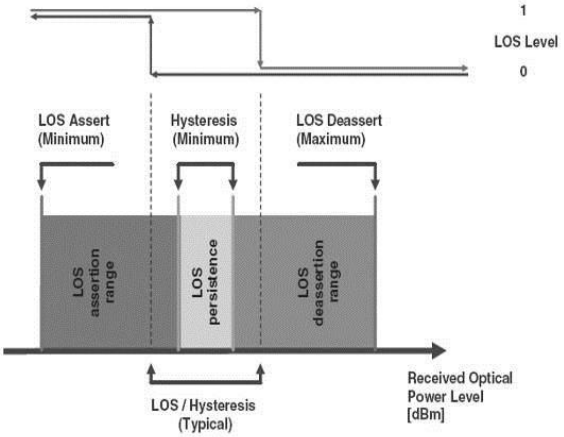
Note10: CFP2 transceiver works in 100GBASE-LR4 mode.

Note11: Minimum average optical power measured at BER less than 1E-12, with a 2^{31}-1 PRBS@27.95Gbps.

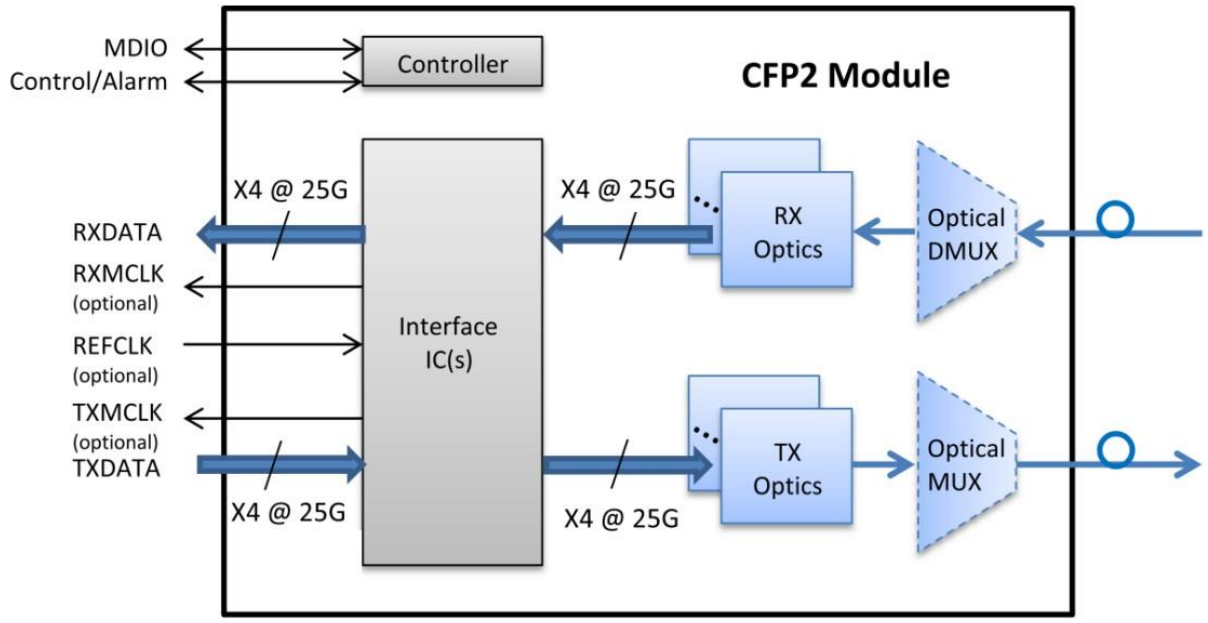
Note12: Minimum average optical power measured at BER less than 1E-12, with a 2^{31}-1 PRBS@25.78Gbps.

Note13: LOS Hysteresis

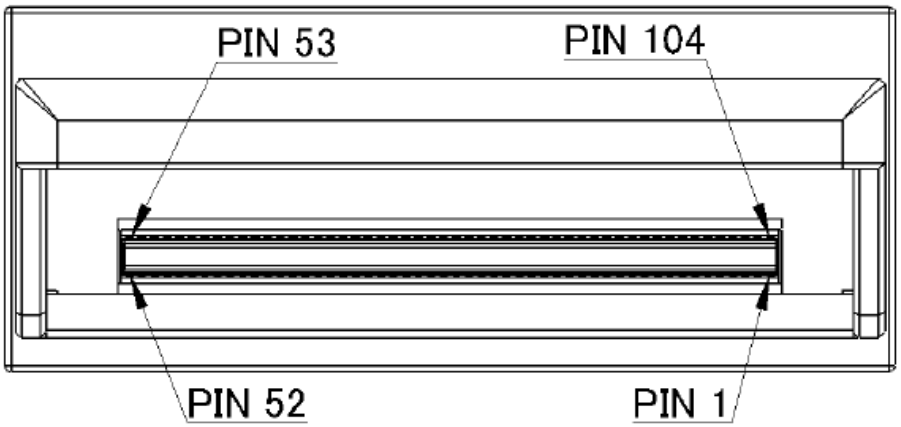
Note14: Eye Margin within 1000 waveforms.



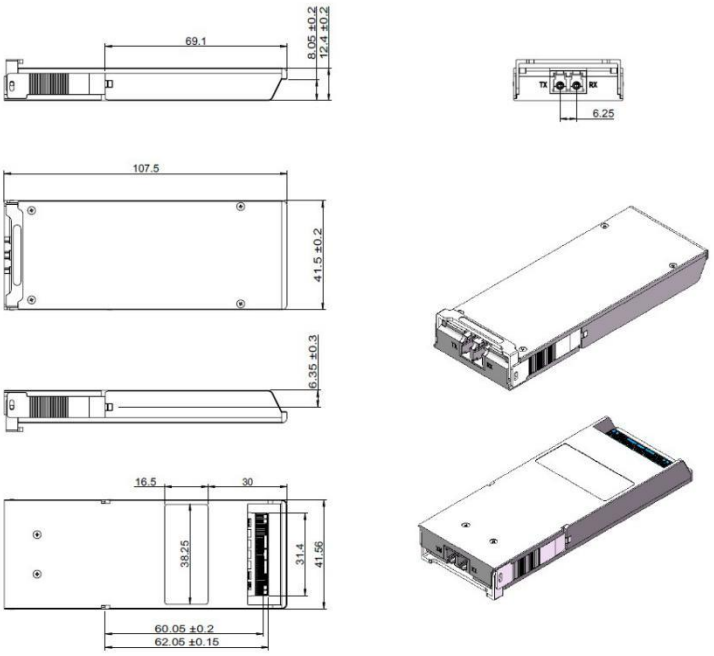
Functional Description of Transceiver



CFP2 Transceiver Electrical Pad Layout



Mechanical Specifications



CFP2

GUARANTEE:

CONTACT:

Addres: Building 56/2, Predelnaya Street, Yekaterinburg, Russia
Tel: +7(343) 379-98-38
Fax: +7(343) 379-98-38
E-mail: info@nag.ru
Online shop:

http://shop.nag.ru