

SNR-CFP-100G-ER4-40

CFP, 100G BASE Series

SNR-CFP-100G-ER4-40 Series

Single-Mode OTU4 4I1-9C1F CFP Transceiver
Single-Mode 100GBASE-ER4 CFP Transceiver
RoHS6 Compliant

Features

- ◆ Supports 103Gbps and 112Gbps aggregate bit rates
- ◆ Single 3.3V Power Supply and Power dissipation < 16W
- ◆ Up to 40km 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 4I1-9C1F
- ◆ 100GBASE-ER4

Ordering Information

Part No.	Data Rate	Fiber	Distance *(Note2)	Interface	Temp.	DDMI
SNR-CFP-100G-ER4-40*(Note1)	112Gbps (Note3)	SMF	40km	LC	Standard	Yes

Note1: Standard version

Note2: 40km 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.	Typ.	Max.	Unit
Operating Case Temperature	T _c	SNR-CFP-100G-ER4-40	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 4I1-9C1F 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}	-2.7		2.9	dBm
Maximum channel power difference				3.6	dB
Side Mode Suppression Ratio	SMSR	30			dB
Optical Return Loss Tolerance				20	dB
Extinction Ratio ^{*(Note6)}	ER_1	8			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
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}	-20.7		4.5	dBm

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Maximum mean total input power				10.5	dBm
Equivalent Sensitivity per Lane ^{*(Note11)}	P_{min1}			-23.2	dBm
Maximum channel power difference				4.5	dB

100GBASE-ER4 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}	-		8.9	dBm
Average Launch Power per Lane ^{*(Note8)}	P_{each2}	-2.9		2.9	dBm
Optical modulation amplitude	OMA	0.1		4.5	dB
Side Mode Suppression Ratio	SMSR	30			dB
Optical Return Loss Tolerance				20	dB
Extinction Ratio ^{*(Note8)}	ER_2	8			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
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}	-20.9		4.5	dBm
Receiver power(OMA)	P_{ovl}			4.5	dBm
Difference in receive power between any two lanes(Average and OMA)				4.5	dB
Receive Sensitivity(OMA) per Lane ^{*(Note12)}	P_{min2}			-21.4	dBm
Stressed Sensitivity(OMA) per lane	SRS			-17.9	dBm

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

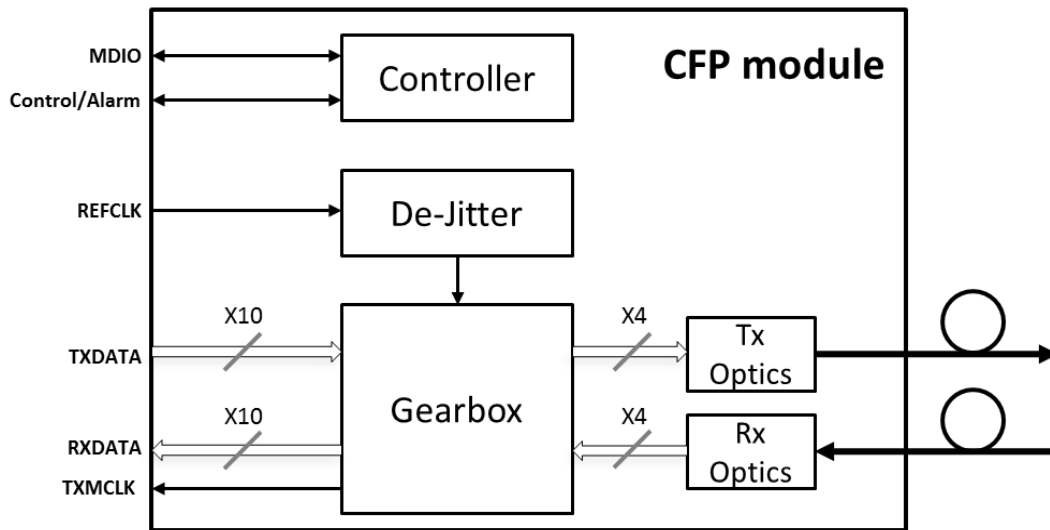
Note9: CFP transceiver works in OTU4 4I1-9C1F mode.

Note10: CFP transceiver works in 100GBASE-ER4 mode.

Note11: Measured at BER less than $1E-12$, with a $2^{31}-1$ PRBS@27.95Gbps (W/ FEC).

Note12: Measured at BER less than $1E-12$, with a $2^{31}-1$ PRBS@25.78Gbps.

Functional Description of Transceiver



CFP Transceiver Electrical Pad Layout

