

Tunable DWDM XFP ER

Tunable DWDM XFP 10G 40km (SMF), LC duplex

Single-Mode Tunable XFP Transceiver RoHS6 Compliant

Features

- ◆ Available in all C-Band Wavelengths on the 50GHz DWDM ITU Grid
- ◆ Supports 8.5Gb/s to 11.35Gb/s bit Rates
- ◆ Hot-Pluggable XFP Footprint
- ◆ power budget >14dB
- ◆ Monolithic MZM Tunable TOSA
- ◆ High performance PIN Receiver
- ◆ Duplex LC Connector
- ◆ Built-in Digital Diagnostic Functions
- ◆ Temperature Range: -5°C to 70°C



Applications

- ◆ DWDM 10Gb/s SONET/SDH DWDM 10Gb/s Ethernet & 10Gb/s Fibre Channel
- ◆ DWDM 10Gb/s SONET/SDH w/FEC
- ◆ DWDM 10Gb/s Ethernet and 10Gb/s Fibre Channel w/FEC

Ordering Information

Part No.	Data Rate	Laser	Fiber Type	Power budget	Optical Interface
SNR-XFP-T40-XXX	8.5~11.35G	MZM	SMF	14dB	LC

Note1: XXX refers to the default DWDM Wavelength channel as ITU-T specified, listing in the following table in detailed.

DWDM Wavelength List:

*Channel (X)	Frequency (THz)	Center Wavelength (nm)
175	191.75	1563.45
180	191.80	1563.05
185	191.85	1562.64
190	191.90	1562.23

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195	191.95	1561.83
200	192.00	1561.42
205	192.05	1561.01
210	192.10	1560.61
215	192.15	1560.20
220	192.20	1559.79
225	192.25	1559.39
230	192.30	1558.98
235	192.35	1558.58
240	192.40	1558.17
245	192.45	1557.77
250	192.50	1557.36
255	192.55	1556.96
260	192.60	1556.55
265	192.65	1556.15
270	192.70	1555.75
275	192.75	1555.34
280	192.80	1554.94
285	192.85	1554.54
290	192.90	1554.13
295	192.95	1553.73
300	193.00	1553.33
305	193.05	1552.93
310	193.10	1552.52
315	193.15	1552.12
320	193.20	1551.72
325	193.25	1551.32
330	193.30	1550.92
335	193.35	1550.52
340	193.40	1550.12
345	193.45	1549.72
350	193.50	1549.32
355	193.55	1548.91
360	193.60	1548.51
365	193.65	1548.11
370	193.70	1547.72
375	193.75	1547.32
380	193.80	1546.92
385	193.85	1546.52
390	193.90	1546.12
395	193.95	1545.72
400	194.00	1545.32
405	194.05	1544.92
410	194.10	1544.53
415	194.15	1544.13
420	194.20	1543.73
425	194.25	1543.33
430	194.30	1542.94
435	194.35	1542.54
440	194.40	1542.14

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445	194.45	1541.75
450	194.50	1541.35
455	194.55	1540.95
460	194.60	1540.56
465	194.65	1540.16
470	194.70	1539.77
475	194.75	1539.37
480	194.80	1538.98
485	194.85	1538.58
490	194.90	1538.19
495	194.95	1537.79
500	195.00	1537.40
505	195.05	1537.00
510	195.10	1536.61
515	195.15	1536.22
520	195.20	1535.82
525	195.25	1535.43
530	195.30	1535.04
535	195.35	1534.64
540	195.40	1534.25
545	195.45	1533.86
550	195.50	1533.47
555	195.55	1533.07
560	195.60	1532.68
565	195.65	1532.29
570	195.70	1531.90
575	195.75	1531.51
580	195.80	1531.12
585	195.85	1530.72
590	195.90	1530.33
595	195.95	1529.94
600	196.00	1529.55
605	196.05	1529.16
610	196.10	1528.77

*: The wavelength is default while manufacture, please contact SNR while ordering.

Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883G Method 3015.7	Class 1C (>1000V)
Electrostatic Discharge to the Enclosure	EN 55024:1998+A1+A2 IEC-61000-4-2 GR-1089-CORE	Compliant with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022: 2006 CISPR 22B: 2006 VCCI Class B	Compliant with standards Noise frequency range: 30MHz to 6GHz. Good system EMI design practice

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		required to achieve Class B margins. System margins are dependent on customer host board and chassis design.
Immunity	EN 55024:1998+A1+A2 IEC 61000-4-3	Compliant with standards. 1KHz sine-wave, 80% AM, from 80MHz to 1GHz. No effect on transmitter/receiver performance is detectable between these limits.
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1: 2007 EN (IEC) 60825-2: 2004+A1	CDRH compliant and Class I laser product. TbV Certificate No. 50135086
Component Recognition	UL and CUL EN60950-1: 2006	UL file E317337 TbV Certificate No. 50135086 (CB scheme)
RoHS6	2002/95/EC 4.1&4.2 2005/747/EC 5&7&13	Compliant with standards ^{*note2}

Note2: For update of the equipments and strict control of raw materials, SNR has the ability to supply the customized products since Jan 1st, 2007, which meet the requirements of RoHS6 (Restrictions on use of certain Hazardous Substances) of European Union.

In light of item 5 in RoHS exemption list of RoHS Directive 2002/95/EC, Item 5: Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.

In light of item 13 in RoHS exemption list of RoHS Directive 2005/747/EC, Item 13: Lead and cadmium in optical and filter glass. The three exemptions are being concerned for SNR's transceivers, because SNR's transceivers use glass, which may contain Pb, for components such as lenses, isolators, and other components.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit
Maximum Supply Voltage 1	Vcc3	-0.5		4.0	V
Maximum Supply Voltage 2	Vcc5	-0.5		6.0	V
Storage Temperature	T _s	-40		85	°C
Case Operating Temperature	T _c	-5		70	°C
Maximum Input Power	Pm			0.5	dBm

Recommend Operating Condition

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Parameter	Symbol	Min	Typ.	Max	Units
Operating Temperature	Tc	-5		70	°C
Supply Voltage 1	Vcc3	3.13	3.3	3.45	V
Supply Voltage 2	Vcc5	4.75	5	5.25	V

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Main Supply Voltage	Vcc5	4.75		5.25	V
Supply Voltage #2	Vcc3	3.13		3.45	V
Supply Current – Vcc5 supply	Icc5			500	mA
Supply Current – Vcc3 supply	Icc3			750	mA
Module Total Power	P			3.5	W
Transmitter					
Input Differential Impedance	Rin		100		Ω
Differential Data Input Swing ³	Vin, pp	120		820	mV
Transmit Disable Voltage	VD	2.0		Vcc	V
Transmit Enable Voltage	VEN	GND		GND+ 0.8	V
Transmit Disable Assert Time				10	us
Receiver					
Differential Data Output Swing ³	Vout, pp	340	650	850	mV
Rise Time (20~80%)	tr			38	ps
Fall Time (20~80%)	tf			39	ps
LOS Fault ⁴	VLOS fault	Vcc – 0.5		VccHOST	V
LOS Normal ⁴	VLOS norm	GND		GND+0.5	V

Note3. After internal AC coupling.

Note4. Loss of signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Transmitter					
Output Opt. Pwr: 9/125 SMF	Pout	-1		+3	dBm
Center Wavelength Spacing			50		GHz
			0.4		nm
Transmitter Center Wavelength –BOL	λc	X-20	X	X+20	pm
Optical Extinction Ratio	ER	8.2	9		dB
Transmitter and Dispersion Penalty	TDP			2	dB
Average Launch Power of	POFF			-30	dBm

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OFF transmitter					
TX Jitter (SONET) 20kHz-80MHz	TXj ₁			0.3	UI
TX Jitter (SONET) 4MHz-80MHz	TXj ₂			0.1	UI
Receiver					
Receiver Sensitivity @ 10.3Gb/s	P _{min}			-15	dBm
Maximum Input Power	P _{max}	0			dBm
Optical Center Wavelength	λ_c	1260		1620	nm
Receiver Reflectance	R _{rx}			-27	dB
LOS De-Assert	LOSD			-17	dBm
LOS Assert	LOSA	-29			dBm
LOS Hysteresis		0.5			dB

General Specifications

Parameter	Symbol	Min	Typ	Max	Units	Note
Bit Rate	BR	8.5		11.35	Gb/s	8
Max. Supported Link Budget	LMAX	14	15		dB	

Note8. SONET OC-192, SONET OC-192 with FEC, 10G Ethernet with FEC, 10G Fiber Channel with FEC, 10G Ethernet

Digital Diagnostic Functions

SNR's TUNABLE 10Gbps (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification Rev 4.5.

As defined by the XFP MSA, SNR XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- ◆ Transceiver temperature
- ◆ Laser bias current
- ◆ Transmitted optical power
- ◆ Received optical power
- ◆ Transceiver supply voltage
- ◆ TEC Temperature

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

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Tuning Management Interface for ITU Frequency Grid Application

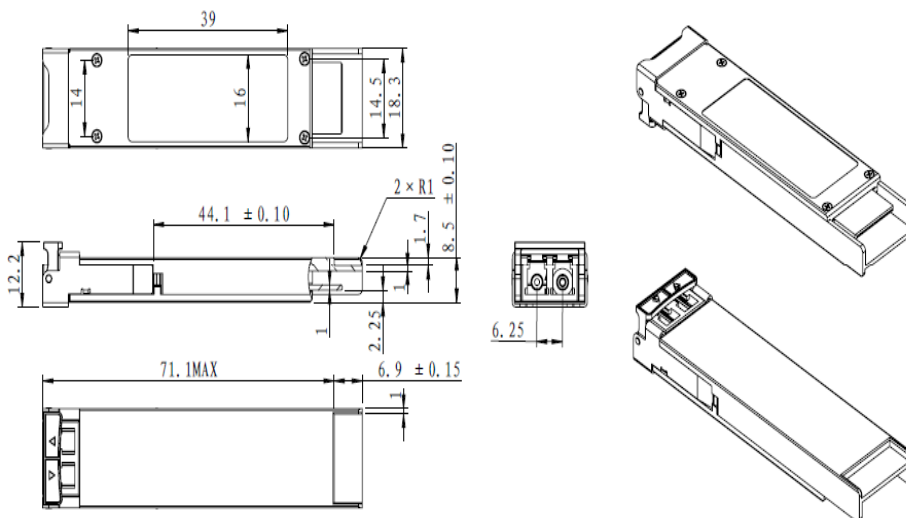
SNR is providing test board for tuning management. Please, contact with us.

Digital Diagnostic Monitor Specification

Address	Parameter	Accuracy	Resolution	Units	Notes
96-97	Module Case Temp	+/-3	+/-0.1	degC	PCB mounted thermocouple
98-99	Reserved				
100-101	TX bias current	+/-8	+/-2	uA	
102-103	Transmit Power	+/-1.5dB	0.1	uW	
104-105	Receive Power	+/-1.5dB	+/-0.1	uW	
106-107	Auxiliary monitor1	+/-3	+/-0.1	degC	Laser Temperature
108-109	Auxiliary monitor2	+/-3	+/-100	uV	3.3V Supply Voltage

Mechanical Specifications

SNR's XFP Tunbale transceivers are compliant with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).



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Notice:

SNR reserves the right to make changes or discontinue any optical link product or service identified in this publication, without notice, in order to improve design and/or performance. Applications that are described herein for any of the optical link products are for illustrative purposes only. SNR makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

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