

Cisco Dense Wavelength-Division Multiplexing Small Form-Factor Pluggable Module

The Cisco® Dense Wavelength-Division Multiplexing (DWDM) Small Form Factor Pluggable (SFP) module (Figure 1) allow enterprise companies and service providers to provide scalable and easy-to-deploy Gigabit Ethernet or Fibre Channel services in their networks.

Figure 1. Cisco DWDM SFP Module



Main features of the Cisco DWDM SFP include:

- Support for International Telecommunication Union (ITU) 100-GHz wavelength grid
- Match for wavelength plan of Cisco 100-GHz ONS product family
- Fixed-wavelength SFP, with 40 different SFP models
- Hot-swappable input/output device that plugs into Gigabit Ethernet SFP ports or slots of a Cisco switch or router, linking the port with the network

Performance

- Supported protocols: Gigabit Ethernet, Fibre Channel 1 Gbps and 2 Gbps.
- Optical link budget of 28 db

Platform Support

The Cisco DWDM SFP module is supported across a variety of Cisco switches, routers, and optical transport devices. For more details, see the document [Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix](#).

Connectors and Cabling

- Equipment: standard SFP interface network: dual LC/PC connector

Note: Only connections with patch cords with PC or UPC connectors are supported. Patch cords with APC connectors are not supported.

All cables and cable assemblies used must be compliant with the standards specified in the standards section.

Environmental Conditions and Power Requirements

- Operating temperature range: 32 to 158°F (0 to 70°C)
- Storage temperature range: –40 to 185°F (–40 to 85° C)

Dimensions

- Dimensions (H x W x D): 8.5 x 13.4 x 56.5 mm
- Cisco SFPs typically weigh less than 75 grams.

Table 1 describes the electrical power interface details, and Table 2 describes optical parameters.

Table 1. Electrical Power Interface Data

Parameter	Symbol	Minimum	Typical	Maximum	Units
Supply Current	I_s	–	200	300	mA
Surge Current	I_{Surge}	–	–	30	mA
Input Voltage	V_{cc}	3.1	3.3	3.5	V

Table 2. Optical Parameters

Parameter	Symbol	Minimum	Typical	Maximum	Units	Notes and Conditions
Transmitter						
Spectral Width				0.2	nm	Full width, –20dB from maximum, with resolution bandwidth (RBW) = 0.01 nm
Transmitter Center Wavelength		x – 100	x	x + 100	pm	Refer to Table 4 for center wavelengths
Side-Mode Suppression Ratio	SMSR	30			dB	
Transmitter Extinction Ratio	OMI	8.2			dB	
Transmitter Optical Output Power	P_{out}	0		4.0	dBm	Average power coupled into single-mode fiber
Receiver						
Receiver Optical Input Wavelength		1530		1565	nm	
Receiver Damage Threshold				+5	dBm	
<i>Power-Limited Performance at OSNR of 20 dB (1 GbE or 1-Gbps FC) or 21 dB (2 Gbps FC) at 0.1-nm RBW</i>						
Optical Input Power	P_{in}	–28.0		–9.0	dBm	

Parameter	Symbol	Minimum	Typical	Maximum	Units	Notes and Conditions
Dispersion Power Penalty < 1 GbE and 1 Gbps FC				3	dB	-800/+3600 ps/nm
Dispersion Power Penalty > 2 Gbps FC				3	dB	-800/+2400 ps/nm
<i>Noise-Limited Performance at OSNR of 19 dB (1 GbE or 1 Gbps FC) or 20 dB (2 Gbps FC) at 0.1-nm RBW</i>						
Optical Input Power	P_{in}	-22.0		-9.0	dB	
Dispersion OSNR Penalty < 1 GbE and 1 Gbps FC				2	dB	-800/+3600 ps/nm
Dispersion OSNR Penalty > 2 Gbps FC				3		-800/+2400 ps/nm

Note:

- a) Parameters are specified over temperature and at end of life unless otherwise noted.
- b) OSNR is measured at 0.1nm resolution bandwidth.
- c) Receiver performance is always specified for a BER < 10e-12.

Note: When shorter distances of single-mode fiber are used, it might be necessary to insert an optical attenuator in the link. At least 1 dB of attenuation is required to prevent damaging the optical receiver, and at least 9 dB of attenuation are required to avoid receiver overloading conditions.

Warranty

- Standard warranty: 90 days
- Extended warranty (option): available under a Cisco SMARTnet[®] support contract for the Cisco switch or router chassis or available under separate SMARTnet Product IDs specific for DWDM SFPs.

Ordering Information

Refer to Table 3 for details on ordering Cisco DWDM SFP modules.

Table 3. Cisco DWDM SFP Product Information

Product Number	Description	ITU Channel
DWDM-SFP-6141	1000BASE-DWDM 1561.42 nm SFP (100-GHz ITU grid)	20
DWDM-SFP-6061=	1000BASE-DWDM 1560.61 nm SFP (100-GHz ITU grid)	21
DWDM-SFP-5979=	1000BASE-DWDM 1559.79 nm SFP (100-GHz ITU grid)	22
DWDM-SFP-5898=	1000BASE-DWDM 1558.98 nm SFP (100-GHz ITU grid)	23
DWDM-SFP-5817=	1000BASE-DWDM 1558.17 nm SFP (100-GHz ITU grid)	24
DWDM-SFP-5736=	1000BASE-DWDM 1557.36 nm SFP (100-GHz ITU grid)	25
DWDM-SFP-5655=	1000BASE-DWDM 1556.55 nm SFP (100-GHz ITU grid)	26
DWDM-SFP-5575=	1000BASE-DWDM 1555.75 nm SFP (100-GHz ITU grid)	27
DWDM-SFP-5494=	1000BASE-DWDM 1554.94 nm SFP (100-GHz ITU grid)	28
DWDM-SFP-5413=	1000BASE-DWDM 1554.13 nm SFP (100-GHz ITU grid)	29
DWDM-SFP-5332=	1000BASE-DWDM 1553.33 nm SFP (100-GHz ITU grid)	30
DWDM-SFP-5252=	1000BASE-DWDM 1552.52 nm SFP (100-GHz ITU grid)	31
DWDM-SFP-5172=	1000BASE-DWDM 1551.72 nm SFP (100-GHz ITU grid)	32
DWDM-SFP-5092=	1000BASE-DWDM 1550.92 nm SFP (100-GHz ITU grid)	33
DWDM-SFP-5012=	1000BASE-DWDM 1550.12 nm SFP (100-GHz ITU grid)	34
DWDM-SFP-4931=	1000BASE-DWDM 1549.32 nm SFP (100-GHz ITU grid)	35
DWDM-SFP-4851=	1000BASE-DWDM 1548.51 nm SFP (100-GHz ITU grid)	36
DWDM-SFP-4772=	1000BASE-DWDM 1547.72 nm SFP (100-GHz ITU grid)	37
DWDM-SFP-4692=	1000BASE-DWDM 1546.92 nm SFP (100-GHz ITU grid)	38
DWDM-SFP-4612=	1000BASE-DWDM 1546.12 nm SFP (100-GHz ITU grid)	39
DWDM-SFP-4532=	1000BASE-DWDM 1545.32 nm SFP (100-GHz ITU grid)	40
DWDM-SFP-4453=	1000BASE-DWDM 1544.53 nm SFP (100-GHz ITU grid)	41
DWDM-SFP-4373=	1000BASE-DWDM 1543.73 nm SFP (100-GHz ITU grid)	42
DWDM-SFP-4294=	1000BASE-DWDM 1542.94 nm SFP (100-GHz ITU grid)	43
DWDM-SFP-4214=	1000BASE-DWDM 1542.14 nm SFP (100-GHz ITU grid)	44
DWDM-SFP-4134=	1000BASE-DWDM 1541.35 nm SFP (100-GHz ITU grid)	45
DWDM-SFP-4056=	1000BASE-DWDM 1540.56 nm SFP (100-GHz ITU grid)	46
DWDM-SFP-3977=	1000BASE-DWDM 1539.77 nm SFP (100-GHz ITU grid)	47
DWDM-SFP-3898=	1000BASE-DWDM 1538.98 nm SFP (100-GHz ITU grid)	48
DWDM-SFP-3819=	1000BASE-DWDM 1538.19 nm SFP (100-GHz ITU grid)	49
DWDM-SFP-3739=	1000BASE-DWDM 1537.40 nm SFP (100-GHz ITU grid)	50
DWDM-SFP-3661=	1000BASE-DWDM 1536.61 nm SFP (100-GHz ITU grid)	51
DWDM-SFP-3582=	1000BASE-DWDM 1535.82 nm SFP (100-GHz ITU grid)	52
DWDM-SFP-3504=	1000BASE-DWDM 1535.04 nm SFP (100-GHz ITU grid)	53
DWDM-SFP-3425=	1000BASE-DWDM 1534.25 nm SFP (100-GHz ITU grid)	54
DWDM-SFP-3346=	1000BASE-DWDM 1533.47 nm SFP (100-GHz ITU grid)	55
DWDM-SFP-3268=	1000BASE-DWDM 1532.68 nm SFP (100-GHz ITU grid)	56
DWDM-SFP-3190=	1000BASE-DWDM 1531.90 nm SFP (100-GHz ITU grid)	57
DWDM-SFP-3112=	1000BASE-DWDM 1531.12 nm SFP (100-GHz ITU grid)	58
DWDM-SFP-3033=	1000BASE-DWDM 1530.33 nm SFP (100-GHz ITU grid)	59

Regulatory and Standards Compliance

- Compatible with 1000BASE-X standard as specified in IEEE 802.3z
- GR-20-CORE: Generic Requirements for Optical Fiber and Optical Fiber Cable
- GR-326-CORE: Generic Requirements for Singlemode Optical Connectors and Jumper Assemblies
- GR-1435-CORE: Generic Requirements for Multi-Fiber Optical Connectors

Regulatory and Standard Compliance

Safety:

- Laser Class I 21CFR1040 LN#50 7/2001
- Laser Class I IEC 60825-1



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

CCDE, CCENT, Cisco Eos, Cisco HealthPresence, the Cisco logo, Cisco Lumin, Cisco Nexus, Cisco StadiumVision, Cisco TelePresence, Cisco WebEx, DCE, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play, and Learn and Cisco Store are service marks; and Access Registrar, Aironet, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, EtherFast, EtherSwitch, Event Center, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, iQuick Study, IronPort, the IronPort logo, LightStream, Linksys, MediaTone, MeetingPlace, MeetingPlace Chime Sound, MGX, Networkers, Networking Academy, Network Registrar, PCNow, PIX, PowerPanels, ProConnect, ScriptShare, SenderBase, SMARTnet, Spectrum Expert, StackWise, The Fastest Way to Increase Your Internet Quotient, TransPath, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0812R)