FMU-D402160M Data Sheet

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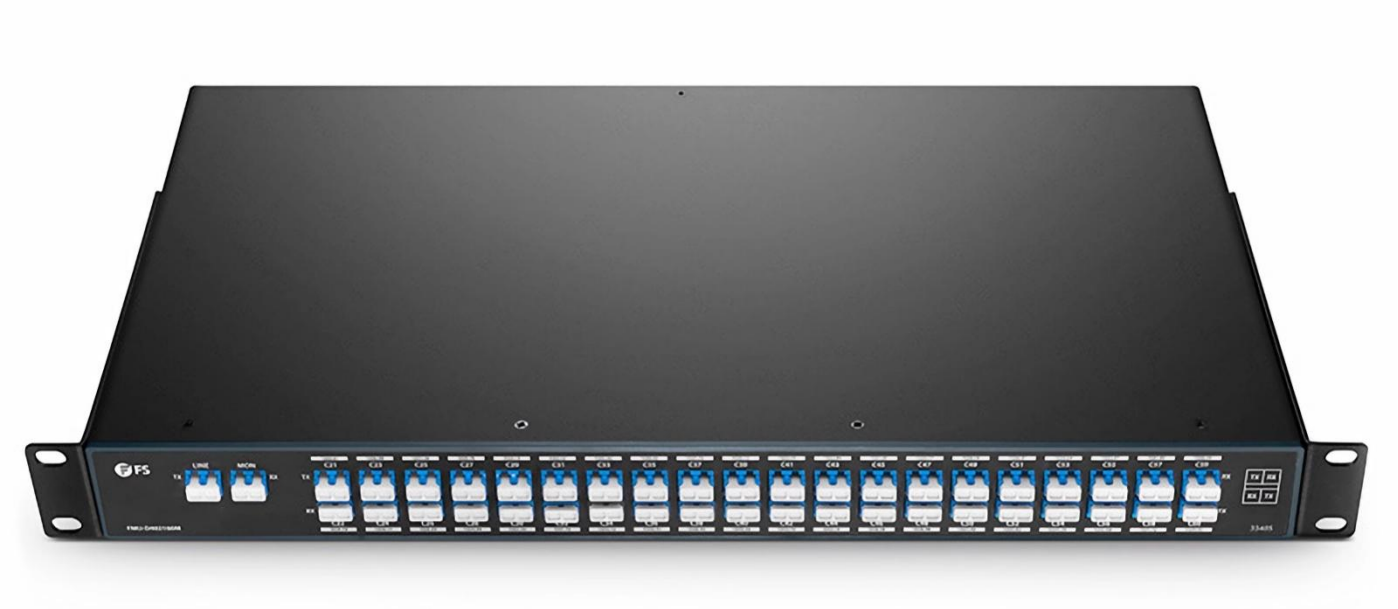
Product Overview

The 40CH Mux Demux, based on AAWG (Flat-top), is a passive DWDM device featuring high density, low loss, and long-haul transmission suitability. It is integrated with a monitor port, which allows easy troubleshooting without downtime. In addition, this unit can be used as either a multiplexer or de-multiplexer (Mux/Demux). It combines 40-channel of DWDM wavelengths into a composite signal and separates the combined DWDM signal into 40-channel individual wavelengths over a pair of single-mode optical fiber. In accordance with the ITU-T G.694.2, it maximizes the capacity of the C-band range.

It supports 1G/10G/25G Ethernet, SDH/SONET, 16/8/4/2/1G Fiber Channel, FTTx and CATV. When deployed with FS DWDM optical transceivers, OEO, EDFA and OADM modules, the Mux Demux seamlessly enables flexible network architectures ranging from simple point-to-point connections to amplified ring configurations.



Features and Benefits

- Multiplexing of up to 40 Channels on Fiber Pair to Maximize the Using of Existing Fiber
- Compatible with ITU Grid and Interconnects with All Optical Networking Products
- Monitor Port Taps off 1% of the Signal to Monitor the Channel Power Levels
- Passive Transparent Multiplexing at Any Rate, Any Service, Including Ethernet, SDH/SONET, Fiber Channel, FTTx, and CATV
- Suitable for Long-distance Transmission, Including OTN, DCI and WAN Networkss
- The Solution Can be Customized per Customer Application Requirements

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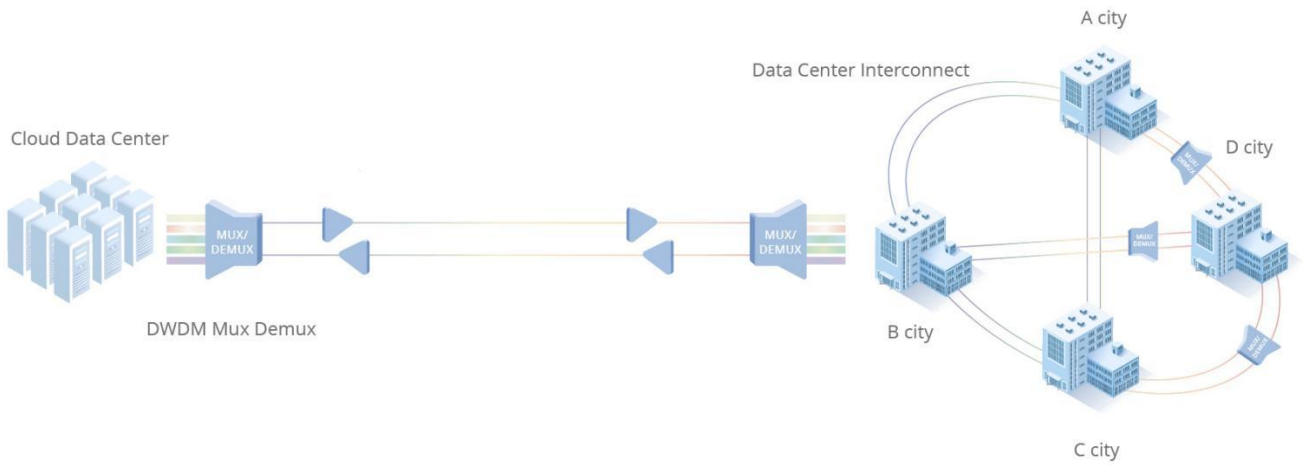
Front Panel and Port Description

LINE	MON
Line interface for common signal	1% Monitoring for easy troubleshooting

Application

Mux Demux interconnect seamlessly with transponder, muxponder, and third-party WDM products, to form cost-effective high-capacity DWDM tailored solutions.



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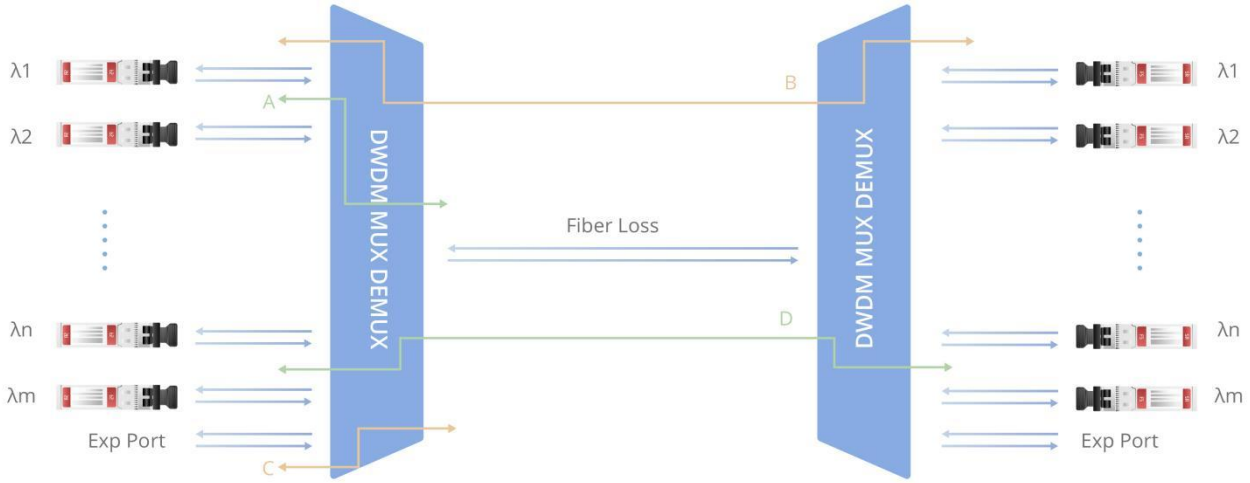
Fiber Loss



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Product Specification

Parameter	Value
ITU Channel	40 channels C21-C60 (DWDM ports)
Operating Wavelength	1520-1570mm
Channel Spacing	100GHz (0.8nm)
Channel Passband	±0.11nm
Center Wavelength Accuracy	±0.05nm
-1dB Channel Bandwidth	≥0.24nm
-3dB Channel Bandwidth	≥0.43nm
Insertion Loss	≤4.5dB, 3.0dB Typical
Insertion Loss (1% Mon)	≤26dB
Adjacent Channel Isolation	≥25dB
Non-adjacent Channel Isolation	≥29dB
Technology	AAWG(Gaussian)
Insertion Loss Uniformity	≤1.5dB
Return Loss	≥40dB
Directivity	≥40dB
Polarization Dependent Loss	≤0.7dB
Polarization Mode Dispersion	≤0.5ps
Operating Temperature	-5° C to 65° C (23 to 149°F)
Storage Temperature	-40° C to 85° C (-40 to 185°F)

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Parameter	Value
Max Optical Power	≤300mW (24.77dBm)
Rack Space	Standard 1U
Connector	LC/UPC
Dimensions (HxWxD)	1.73"x19"x12" (44x482.6x400mm)
Housing	FMU 1U Rack Mount

Notes: Specified with connectors and adapters.

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ITU Channel Guiding

ITU Channel (xx or yy)	21	22	23	24	25	26	27	28	29	30
Wavelength(nm)	1560.61	1559.79	1558.98	1558.17	1557.36	1556.55	1555.75	1554.94	1554.13	1553.33

ITU Channel (xx or yy)	31	32	33	34	35	36	37	38	39	40
Wavelength(nm)	1552.52	1551.72	1550.92	1550.12	1549.32	1548.51	1547.72	1546.92	1546.12	1545.32

ITU Channel (xx or yy)	41	42	43	44	45	46	47	48	49	50
Wavelength (nm)	1544.53	1543.73	1542.94	1542.14	1541.35	1540.56	1539.77	1538.98	1538.19	1537.4

ITU Channel (xx or yy)	51	52	53	54	55	56	57	58	59	60
Wavelength(nm)	1536.61	1535.82	1535.04	1534.25	1533.47	1532.68	1531.90	1531.12	1530.33	1529.55

High Quality DWDM Transceivers to Build a Passive DWDM System

FS.COM offers DWDM transceiver modules in SFP, SFP+ and XFP formats. Every optics is tested in real switches and full compatible with Cisco, Juniper, Arista, Brocade, Dell, Extreme, etc.

Transmission distances range from 20-120km for Gigabit speeds, and 40-120km for 10 Gigabit speeds, without the use of optical amplifiers.

DWDM-SFP10G-80

DWDM-XFP10G-80

DWDM-Tunable-XFP

DWDM-Tunable-SFP+

DWDM-SFP1G-ZX

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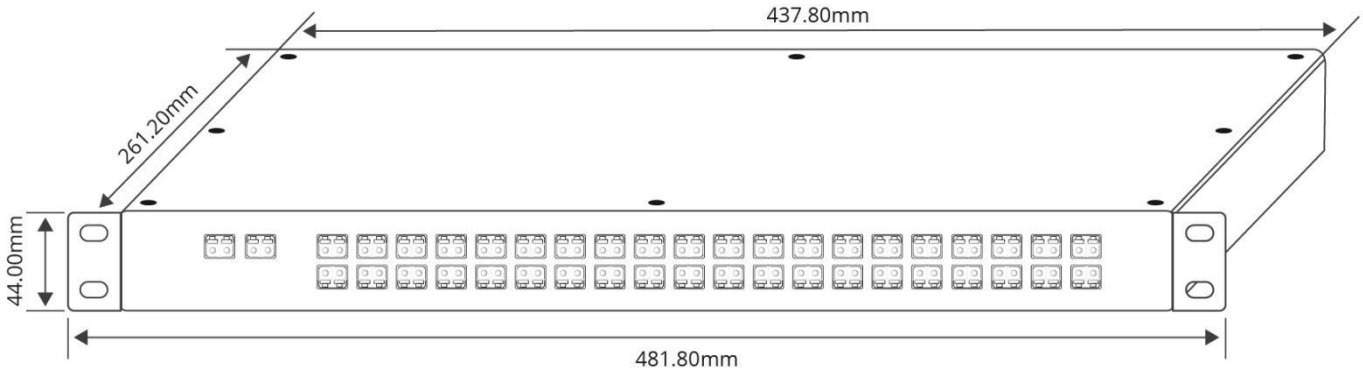
Layout and Dimensions



- Height: 44mm (1.73")
- Width: 481.8±0.2mm (19")
- Depth: 261.2mm (10.28")

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Ordering Information

Mux Demux & OADM		
FMU Series Mux Demux	FMU-MC045561ES	4 Channels CWDM Mux or Demux, 1550-1610nm, with Expansion Port, 1.5dB Typical IL, LC/UPC, Single Fiber, FMU Plug-in Module#214979
	FMU-MC163161EMS	16 Channels CWDM Mux or Demux, 1310-1610nm, with Monitor and Expansion Port, 4.5dB Typical IL, LC/UPC, Single Fiber, FMU Plug-in Module#214981
	FMU-MC082759EMA	8 Channels CWDM Mux Demux, 1270-1590nm, with Monitor and Expansion Port, 4.5dB Typical IL, LC/UPC, Single Fiber, Side A, FMU Plug-in Module#214983
	FMU-MC082961EMB	8 Channels CWDM Mux Demux, 1290-1610nm, with Monitor and Expansion Port, 4.5dB Typical IL, LC/UPC, Single Fiber, Side B, FMU Plug-in Module#214985
	FMU-C182761M	18 Channels CWDM Mux Demux, 1270-1610nm, with Monitor Port, 5.0dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#33489
	FMU-MC082745	8 Channels CWDM Mux Demux, 1270-1450nm (Skip 1390, 1410nm), 2.5dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module#42937
	FMU-MC042733	4 Channels CWDM Mux Demux, 1270-1330nm, 1.0dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module#42972
	FMU-MC09B	9 Channels CWDM Mux Demux, 1290-1610nm, 2.4dB Typical IL, LC/UPC, Single Fiber, Side-B, FMU Plug-in Module#43699
	FMU-MC09A	9 Channels CWDM Mux Demux, 1270-1590nm, 2.4dB Typical IL, LC/UPC, Single Fiber, Side-A, FMU Plug-in Module#43711
	FMU-MC084761EM	8 Channels CWDM Mux Demux, 1470-1610nm, with Monitor and Expansion Port, 2.0dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module#78163
	FMU-C182761M	18 Channels CWDM Mux Demux, 1270-1610nm, with Monitor Port, 2.2dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#123533
	FMU-D60OCMW5	60 Odd Channels DWDM Mux Demux, Super C-band 100GHz 1524.50-1571.65nm, with Monitor Port, 6.0dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#166000
	FMU-D60ECMW5	60 Even Channels DWDM Mux Demux, Super C-band 100GHz 1524.89-1572.06nm, with Monitor Port, 6.0dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#166001
	FMU-D40ODMW5	40 Odd Channels Super C-band 150GHz 190.7875-196.6375THz, with Monitor Port, 5.5dB Typical IL, LC/UPC, Dual Fiber DWDM Mux Demux, 1U Rack Mount#166002
	FMU-D40EDMW5	40 Even Channels Super C-band 150GHz 190.7125-196.5625THz, with Monitor Port, 5.5dB Typical IL, LC/UPC, Dual Fiber DWDM Mux Demux, 1U Rack Mount#166003
	FMU-D64BMW5	64 Channels DWDM Mux Demux, Super C-band 75GHz 1528.87-1566.62nm, with Monitor Port, 5.8dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#166004
	FMU-MD082128EMS	8 Channels DWDM Mux or Demux, 100GHz C21-C28, with Monitor and Expansion Port, 2.75dB Typical IL, LC/UPC, Single Fiber, FMU Plug-in Module#214969
	FMU-MD042124EMA	4 Channels DWDM Mux Demux, 100GHz C21-C24, with Monitor and Expansion Port, 2.75dB Typical IL, LC/UPC, Single Fiber, Side A, FMU Plug-in Module#214971

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Mux Demux & OADM

FMU Series Mux Demux	FMU-MD045760EMB	4 Channels DWDM Mux Demux, 100GHz C57-C60, with Monitor and Expansion Port, 2.75dB Typical IL, LC/UPC, Single Fiber, Side B, FMU Plug-in Module#214973
	FMU-MD042023EMD	4 Channels DWDM Mux Demux, 100GHz C20-C23, with Monitor and Expansion Port, 1.6dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module#214975
	FMU-D402160M3	40 Channels DWDM Mux Demux, 100GHz C21-C60, with 1310nm and Monitor Port, 3.5dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#35887
	FMU-D162136EM3	16 Channels DWDM Mux Demux, 100GHz C21-C36, with Monitor, Expansion and 1310nm Port, 4.4dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#72430
	FMU-D162136A	16 Channels DWDM Mux Demux, 100GHz C21-C36, 4.0dB Typical IL, LC/UPC, Single Fiber, Side-A, 1U Rack Mount#78535
	FMU-D164560B	16 Channels DWDM Mux Demux, 100GHz C45-C60, 4.0dB Typical IL, LC/UPC, Single Fiber, Side-B, 1U Rack Mount#78536
	FMU-FD402160M3	40 Channels DWDM Mux Demux, 100GHz C21-C60, with 1310nm Port and Monitor Port, 4.5dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#84492
	FMU-MD085360E	8 Channels DWDM Mux Demux, C53-C60, with Expansion Port, 2.8dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module, CWDM/DWDM Hybrid Solution#30568
	FMU-D402160M	40 Channels DWDM Mux Demux, 100GHz C21-C60, with Monitor Port, 3.0dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#33485
	FMU-MD08EB	8 Channels DWDM Mux Demux, 100GHz C22-C36, with Expansion Port, 4.2dB Typical IL, LC/UPC, Single Fiber, Side-B, FMU Plug-in Module#50116
	FMU-MD08EA	8 Channels DWDM Mux Demux, 100GHz C21-C35, with Expansion Port, 4.2dB Typical IL, LC/UPC, Single Fiber, Side-A, FMU Plug-in Module#50117
	FMU-MD085360EM3	8 Channels DWDM Mux Demux, 100GHz C53-C60, with Monitor, Expansion and 1310nm Port, 3.0dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module, CWDM/DWDM Hybrid Solution#72433
	FMU-L042728B	4 Channels 1273.55-1286.66nm, Single Fiber LAN-WDM Mux Demux, Side-B, FMU Plug-in Module, LC/UPC#244655
	FMU-L042930A	4 Channels 1295.56-1309.14nm, Single Fiber LAN-WDM Mux Demux, Side-A, FMU Plug-in Module, LC/UPC#244657
Customized Mux Demux	MUX-DWDM	Customized Dual and Single Fiber DWDM Mux Demux#322911
	MUX-CWDM	Customized Dual and Single Fiber CWDM Mux Demux#70410
	MUX-CCWDM	Customized Dual and Single Fiber Low-loss Compact CWDM Mux Demux#73961

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Mux Demux & OADM		
OADM	DOADM-EAW	Customized Dual and Single Fiber DWDM OADM, East and West#70427
	DOADM-EOW	Customized Dual and Single Fiber DWDM OADM, East or West#73795
	COADM-EAW	Customized Dual and Single Fiber CWDM OADM, East and West#70425
	COADM-EOW	Customized Dual and Single Fiber CWDM OADM, East or West#73794
Chassis	FMU-1UFMX-N	FMU 2-Slot 1U 19" Rack Chassis Unloaded, Holds up to 2 Units FMU Plug-in Module#30408
Optical Line System		
Amplifiers	FMT20PA-EDFA	FMT20PA-EDFA, 20dB Gain C-band DWDM EDFA Pre-amplifier for FMT Managed Chassis, 13dBm Output#72284
	FMT26PA-EDFA	FMT26PA-EDFA, 26dB Gain C-band DWDM EDFA Pre-amplifier for FMT Managed Chassis, 16dBm Output#36524
	FMT17BA-EDFA	FMT17BA-EDFA, 17dB Gain C-band DWDM EDFA Booster Amplifier for FMT Managed Chassis, 17dBm Output#72283
	FMT26PA-51EDFA	FMT26PA-51EDFA, 26dB Gain Extended C-Band DWDM EDFA Pre-amplifier for FMT Managed Chassis, 20dBm Output#248135
	FMT17BA-51EDFA	FMT17BA-51EDFA, 17dB Gain Extended C-Band DWDM EDFA Booster Amplifier for FMT Managed Chassis, 20dBm Output#248133
	FMT-EDFA	Customized C-band DWDM EDFA Amplifier for DWDM Solution#322907
	FMT-ARRAY-OA	Customized Multiports DWDM Array EDFA Amplifier#322909
Dispersion Compensation	FMT40-DCM	FMT40-DCM, C-Band 40km DCF-based Passive Dispersion Compensation Module for FMT Managed Chassis#65781
	FMT80-DCM	FMT80-DCM, C-Band 80km DCF-based Passive Dispersion Compensation Module for FMT Managed Chassis#65779
	FS-DCM	Customized C-Band DCF-based Dispersion Compensation Module for FMT Managed Chassis#65783
Line Protection	FMT-OLP2	FMT-OLP2, 1+1 Optical Line Protection Switch for FMT Managed Chassis#66010
	FMT-OLP	FMT-OLP, 1:1 Optical Line Protection Switch for FMT Managed Chassis#192620
TRANSPONDERS & MUXPONDERS		
25G	FMT4DL-OEO25GSFP28	FMT4DL-OEO25GSFP28, 4 Channels 25G WDM Transponder (Converter) for FMT Managed Chassis, 8 SFP28/SFP+ Slots#92056
10G	FMT4DL-OEO10GSFP	FMT4DL-OEO10GSFP, 4 Channels WDM Transponder (Converter) for FMT Managed Chassis, 8 SFP/SFP+ Slots#30515
Chassis	FMT04-CH1U	FMT04-CH1U, 4 Slots 1U Managed Chassis Unloaded Platform, Redundant AC PSUs, Support SNMP V1 Network Management#39214
	FMT-CH	FMT-CH, Customized 4/8/16 Slots 1U/2U/4U Managed Chassis Unloaded Platform, Redundant AC/DC PSUs, Support SNMP Network Management#70413

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WDM TRANSCEIVERS

100G/200G CFP2	CFP2-DCO-200G-M	C14 1566.31nm CFP2-DCO 100G/200G DWDM C-band Tunable 96Chs ITU CH13-CH60 50GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#120128
25G SFP28	DW-SFP25G10-17	Cisco C17 DWDM-SFP25G-63.86 Compatible SFP28 25G DWDM 1563.86nm 100GHz 10km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#87000
	CW-SFP25G30-27	Cisco CWDM-SFP25G-1270-30 Compatible SFP28 25G CWDM 1270nm 30km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#100112
	CW-SFP25G10-27	Cisco CWDM-SFP25G-1270-10 Compatible SFP28 25G CWDM 1270nm 10km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#76003
	LW-SFP25G40-86	Cisco LWDM-SFP25G-86.66 Compatible SFP28 25G LWDM 1286.66nm 40km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#93786
10G SFP+	DW-SFP10G80-21-I	Cisco C21 DWDM-SFP10G-60.61-I Compatible SFP+ 10G DWDM 1560.61nm 100GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission (Industrial)#113562
	DW-SFP10G40-21-I	Cisco C21 DWDM-SFP10G-60.61-I Compatible SFP+ 10G DWDM 1560.61nm 100GHz 40km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission (Industrial)#113511
	CW-SFP10G80-47	Cisco CWDM-SFP10G-1470 Compatible SFP+ 10G CWDM 1470nm 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#19367
	CW-SFP10G40-27-I	Cisco CWDM-SFP10G-1270-I Compatible SFP+ 10G CWDM 1270nm 40km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission (Industrial)#112392
1G SFP	DWDM-SFP1G-EZX	Cisco C17 DWDM-SFP-6386 Compatible SFP 1000BASE-DWDM 1563.86nm 100GHz 100km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#54150
	DWDM-SFP1G-ZX	Cisco C17 DWDM-SFP-6386-80 Compatible SFP 1000BASE-DWDM 1563.86nm 100GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#47697
	CWDM-SFP1G-ZX	Cisco CWDM-SFP-1270 Compatible SFP 1000BASE-CWDM 1270nm 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#33234

*Standard products are listed above. Customized specifications are available upon request.

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