**FS**

# 200G Multirate Transponder / Muxponder

Up to 200G Rate, QSFP28/QSFP+ to CFP2, M6500 Series Pluggable Module

## Description

The 200G transponder/muxponder provides a high transport capacity of 200G over a single wavelength, and it supports a flexible mix of 10GbE, 40GbE, and 100GbE services in various muxponder and transponder operation modes, combining different protocols and rates over a single 100/200G uplink.

The transponder/muxponder meets market demands for low power consumption and rack space savings, enabling to easily and cost-effectively roll-out service and increasing capacity of enterprise DCI (data center interconnect) and metro networks.

## Highlight

• User-configurable muxponder and transponder operation modes
• Supports 10GbE, 40GbE, and 100GbE services and protocol mix
• Attached CFP2 coherent optic module provides superior optical performance
• Coherent detection removes the need for dispersion
• Highly integrated in M6500 Series managed chassis

## Application

• Metro/Regional transport into/from OTN transport network
• 100/200G link to bolster existing OTN/DWDM infrastructure
• High capacity DCI for enterprise, campus and cloud computing networks

## Technical Specifications

### Line Interface

| Parameter | Description |
| --- | --- |
| Line Interface Type | 1x CFP2 |
| Line Interface Protocol | Coherent CFP2 |
| Coherent Modulation Technology | 8/16QAM |
| Transmit Rate | 100G/200G (User-Configurable) |
| OSNR Sensitivity | 20dB  8/16QAM |
| Wavelength Range of Input Signal | 1528~1568nm |
| Channel Spacing | 50GHz & 100GHz |
| Dispersion Tolerance | 20000 ps/nm 8QAM<br>16000ps/nm 16QAM |
| FEC Support | G.709 Regular FEC or SD-FEC (100G)<br>Soft-Decision FEC (200G) |

### Client Interface

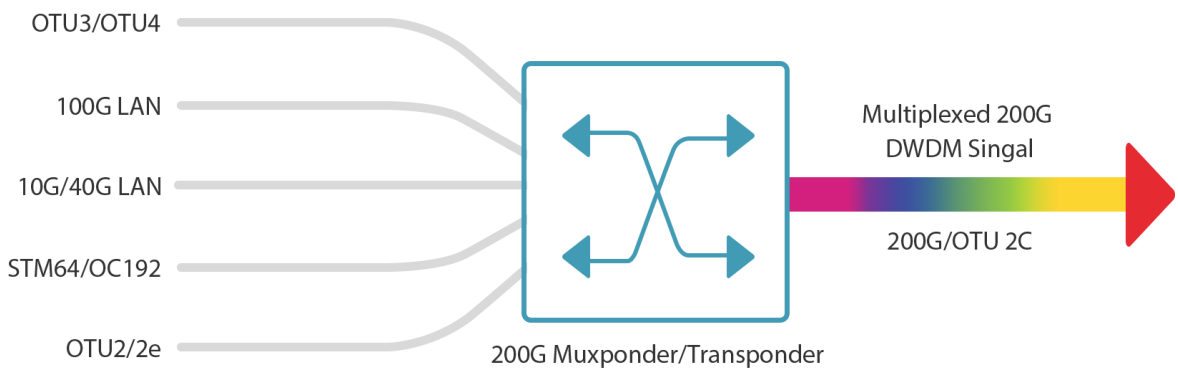| Parameter | Description |
| --- | --- |
| Client Interface Type | 5x QSFP28/QSFP+ |
| Client Interface Protocol | 10G, 40G, 100G,  OTU3, OTU4 |
| FEC Support | I.4  and 1.7Super FEC  or G.709 Regular FEC(10G OTU2/2e) |

### Management

| Parameter | Description |
| --- | --- |
| Management Interface | RJ45/SFP Port |
| Out-band Management | WEB, SNMP v2 |
| In-band Management | GCC 0/1/2 |

## Physical Specification

| Parameter | Description |
|---|---|
| Chassis Type | M6500-CH5U |
| Chassis Power Supply | Dual power, -40VDC~-72VDC |
| Power Consumption | Max.1100W |
| Operating Temperature | 0 to 40°C |
| Storage Temperature | -40 to 70°C |
| Chassis Dimension(H*W*D) | 8.74"x17.5"x9.51" (222x 444.5x 241.5mm) |

## Function Diagram

The M6500 200G transponder/muxponder provides a high transport capacity of 200G over a single wavelength, it can aggregate 10GbE, 40GbE, and 100GbE, STM-64/OC-192, OTU2/OTU2e/OTU3/OTU4 OTN multi-protocol services into a single 200G /OTU2C standard OTN trunk.
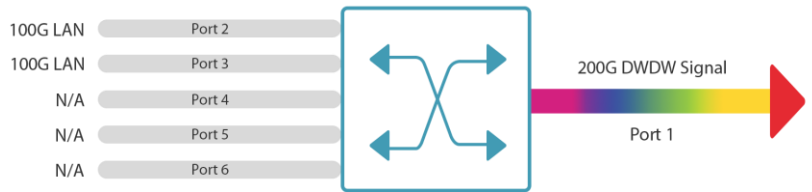
# Flexible and Versatile 200G Muxponder/Transponder

The M6500 200G transponder/muxponder can be flexibly deployed in five operation mode via M Series NMS managed software.

**Mode 1: 2x 100G to 200G**
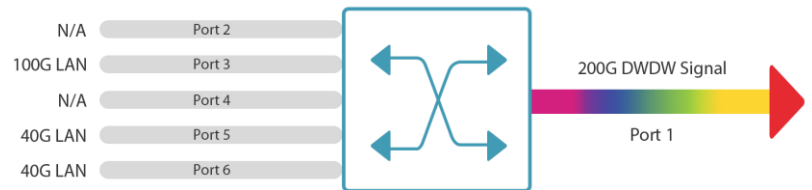
2x 100G QSFP28 on Port 2/3
1x 200G CFP2 on Port 1

Port 4~6 is spare.

| | |
|---|---|
| 100G LAN | Port 2 |
| 100G LAN | Port 3 |
| N/A | Port 4 |
| N/A | Port 5 |
| N/A | Port 6 |

200G DWDW Signal
Port 1

**Mode 2: 1x 100G + 2x 40G to 200G**

1x 100G QSFP28 on Port 3
2x 40G QSFP+ on Port 5/6
1x 200G CFP2 on Port 1

Port 2/4 is spare.

| | |
|---|---|
| N/A | Port 2 |
| 100G LAN | Port 3 |
| N/A | Port 4 |
| 40G LAN | Port 5 |
| 40G LAN | Port 6 |

200G DWDW Signal
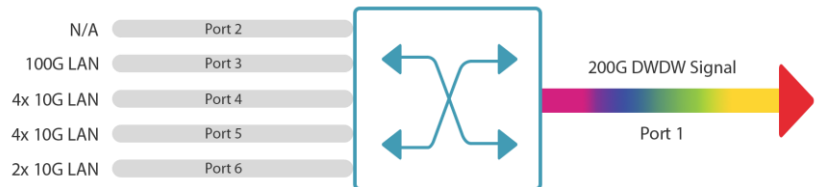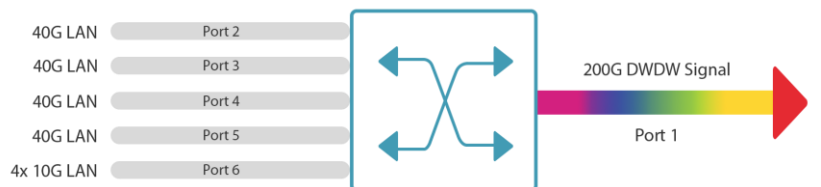Port 1

**Mode 3: 1x 100G + 10x 10G to 200G**

1x 100G QSFP28 on Port 3
2x (4x10G)* QSFP+ on Port 4/5
(2x 10G)* QSFP+ on Port 6
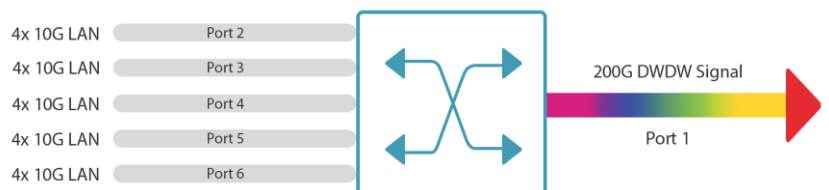1x 200G CFP2 on Port 1

Port 2 is spare.

| | |
|---|---|
| N/A | Port 2 |
| 100G LAN | Port 3 |
| 4x 10G LAN | Port 4 |
| 4x 10G LAN | Port 5 |
| 2x 10G LAN | Port 6 |

200G DWDW Signal
Port 1

**Mode 4: 4x 40G + 4x 10G to 200G**

4x 40G QSFP+ on Port 2~5
(4x 10G)* QSFP+ on Port 6
1x 200G CFP2 on Port 1

| | |
|---|---|
| 40G LAN | Port 2 |
| 40G LAN | Port 3 |
| 40G LAN | Port 4 |
| 40G LAN | Port 5 |
| 4x 10G LAN | Port 6 |

200G DWDW Signal
Port 1

**Mode 5: 20x 10G to 200G**

(4x10G)* QSFP+ on Port 2~6
1x 200G CFP2 on Port 1

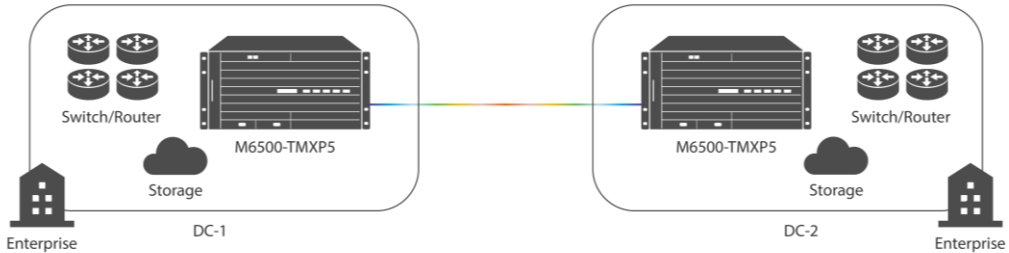| | |
|---|---|
| 4x 10G LAN | Port 2 |
| 4x 10G LAN | Port 3 |
| 4x 10G LAN | Port 4 |
| 4x 10G LAN | Port 5 |
| 4x 10G LAN | Port 6 |

200G DWDW Signal
Port 1

* Note:
1. MTP-LC breakout patch cable should be used with QSFP+ port for 10G rate (4x 10G).
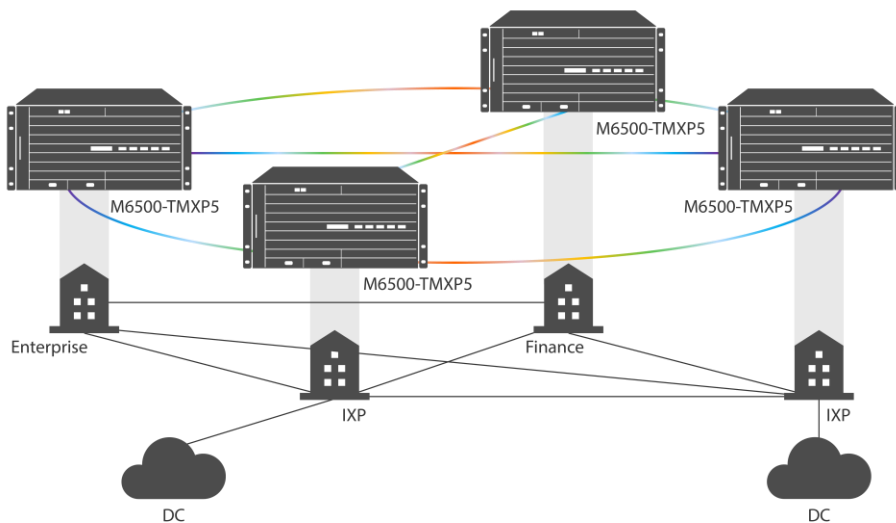2. When MTP-LC breakout patch cable is used to transmit 4x10G, the not used branches can be spared.

# Applications

M6500 TMXP5 is a 200G multi-protocol multi-rate transponder/muxponder for building high capacity optical transport networks. It delivers carrier grade, high-end 200G solutions, capable of serving multiple applications and protocols for enterprise and data center networks and long-haul DWDM OTN solutions.
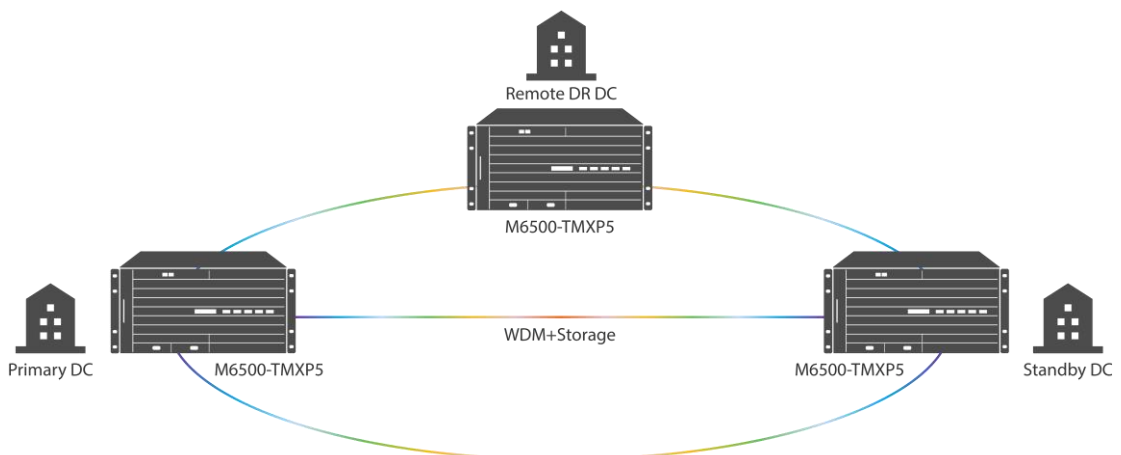
## 1. Small-sized Networks---Point-to-point
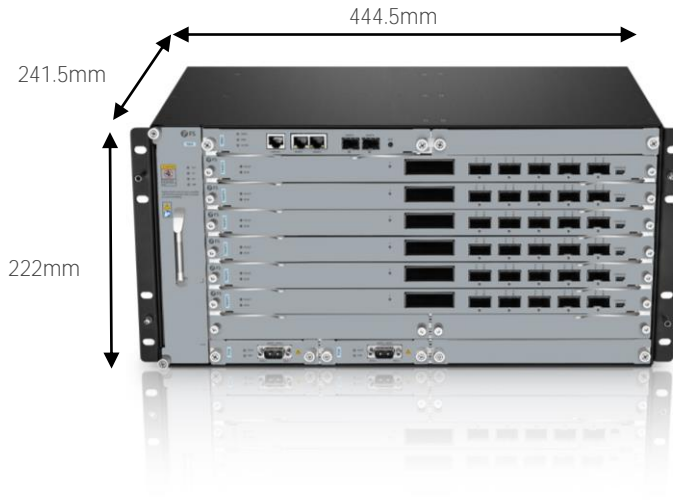


## 2. Medium and Large-sized Networks---Mesh



## 3. Disaster recovery---Three centers in two cities

## Matching Managed Chassis

M6500-TMXP5 200G transponder/muxponder pluggable module occupies one slot in M6500 5U Managed Chassis



444.5mm

241.5mm

222mm

## Ordering Information

| Mux Demux & OADM | | |
|---|---|---|
| DWDM MUX DEMUX | FMU-D402160M3 | 40 Channels 100GHz C21-C60, with 1310nm and Monitor Port, 3.5dB Typical IL, LC/UPC, Dual Fiber DWDM Mux Demux, 1U Rack Mount #35887 |
| | M6200-D2160M | 40 Channels 100GHz C21-C60 Dual Fiber DWDM Mux and Demux with Monitor Port, Pluggable Module, LC/UPC, Integrated with M6200 Series Managed Chassis #120424 |
| | FMU-D162136EM3 | 16 Channels 100GHz C21-C36, with Monitor, Expansion and 1310nm Port, LC/UPC, Dual Fiber DWDM Mux Demux, 1U Rack Mount #72430 |
| | FMU-MD085360EM3 | CWDM/DWDM Hybrid Solution, 8 Channels 100GHz C53-C60, with Monitor, Expansion and 1310nm Port, LC/UPC, Dual Fiber DWDM Mux Demux, FMU Plug-in Module #72433 |
| CWDM MUX DEMUX | FMU-C182761M | 18 Channels 1270-1610nm, with Monitor Port, LC/UPC, Dual Fiber CWDM Mux Demux, 1U Rack Mount #33489 |
| | FMU-MC084761EM | 8 Channels 1470-1610nm, with Monitor and Expansion Port, LC/UPC, Dual Fiber, Low Insertion Loss CWDM Mux Demux, FMU Plug-in Module #78163 |
| LWDM MUX DEMUX | ABS-L042930A | 4 Channels 1295.56-1309.14nm, Single Fiber LAN-WDM Mux Demux, Side-A, ABS Pigtailed Module, LC/UPC #97782 |
| | ABS-C062737A | 6 Channels 1271-1371nm, Single Fiber CWDM Mux Demux, Side-A, ABS Pigtailed Module, LC/UPC #97784 |
| OADM | DOADM-DF | Customized Dual Fiber & Single Fiber DWDM OADM #70427 |
| | COADM-DF | Customized Dual Fiber & Single Fiber CWDM OADM #70425 |
| Chassis | FMU-1UFMX-N | FMU 2-Slot 1U 19" Rack Chassis Unloaded, holds up to 2 Units FMU Plug-in Module #30408 |
| | FUD-1UFMX-N | FUD 4-Slot 1U 19" Rack Chassis Unloaded, holds up to 4 Units FUD Plug-in Module #106578 |

## TRANSPONDERS & MUXPONDERS

| | | |
|---|---|---|
| 8x 200G | M6800-TSP16 | 16x 100G QSFP28 to 8x 200G CFP2 OTN Managed Transport Platform#111053 |
| 100G/200G | M6500-TMXP5 | 2x 100G QSFP28/4x 40G QSFP+ to 1x 200G CFP2 Transponder/Muxponder#111049 |
| 10G | M6200-OEO10G | 5 Channels WDM Transponder (Converter), 10 SFP/SFP+ Slots#107365 |
| Chassis | M6500-CH2U | 2U Managed Chassis Unloaded Platform, Supports 2x 200G Transponder/Muxponder #96454 |
| | M6500-CH5U | 5U Managed Chassis Unloaded Platform, Supports 6x 200G Transponder/Muxponder #111050 |
| | M6200-CH2U | 2U Managed Chassis Unloaded Platform, Supports 7x Mux/DEMUX/EDFA/OEO/OLP/DCM Cards #107371 |
| | M6200-CH5U | 5U Managed Chassis Unloaded Platform, Supports 15x MUX/DEMUX/EDFA/OEO/OLP/DCM Cards #111052 |

## OPEN LINE SYSTEM

| | | |
|---|---|---|
| Amplifiers | M6200-25PA | 25dB Gain DWDM EDFA Pre-Amplifier, 16dBm Output#107367 |
| | M6200-20BA | 20dBm Output DWDM EDFA Booster Amplifer, 16dB Gain#107366 |
| Dispersion Compensation | M6200-DCM40 | 40KM DCF-based Passive Dispersion Compensation Module#107370 |
| | M6200-DCM80 | 80KM DCF-based Passive Dispersion Compensation Module#119071 |
| Line Protection | M6200-OLP2 | 1+1 Optical Line Protection Switch (OLP)#107368 |
| Red/Blue Filter | M6200-RB | 1x2 Single Fiber DWDM Red/Blue Filter#107369 |
| VOA Units | M6200-SFPVOA | SFP Variable Optical Attenuator Module#107373 |
| | AT-M-LCU | Fixed Fiber Optic Attenuators #70009 |
| Chassis | M6200-CH2U | 2U Managed Chassis Unloaded Platform, Supports 7x Mux/DEMUX/EDFA/OEO/OLP/DCM Cards #107371 |
| | M6200-CH5U | 5U Managed Chassis Unloaded Platform, Supports 15x MUX/DEMUX/EDFA/OEO/OLP/DCM Cards #111052 |

## WDM TRANSCEIVERS

| | | |
|---|---|---|
| 100G/200G CFP2 | M-CFP2-DCO | C14 1566.31nm 100G/200G Tunable CFP2-DCO Coherent Transceiver, up to 1000km #120128 |
| 25G SFP28 | DWDM-SFP25G-10 | 25G DWDM SFP28 100GHz 1563.86nm 10km DOM LC SMF Optical Transceiver Module #87000 |
| | CWDM-SFP25G-40S | 25G 1270nm CWDM SFP28 40km DOM LC SMF Optical Transceiver Module #100112 |
| | CWDM-SFP25G-10SP | 25G 1270nm CWDM SFP28 10km DOM LC SMF Optical Transceiver Module #76003 |
| | LWDM-SFP25G-40 | 25G LWDM SFP28 1286.66nm 40km DOM LC SMF Optical Transceiver Module #93786 |
| 16G/8G FC | DWDM-SFP16G-40 | Customized 16G DWDM SFP+ C20-C61 100GHz 40km DDM LC SMF Transceiver Module#73084 |
| | DWDM-SFP16GH-40 | Customized 16G DWDM SFP+ 50GHz 40km DDM LC SMF Transceiver Module #73085 |
| | CWDM-SFP16G-40 | Customized 16G Fiber Channel CWDM SFP+ 1470-1610nm 40km DDM LC SMF Transceiver Module #80765 |
| 10G SFP+ | DWDM-SFP10G-80 | 10G DWDM SFP+ 1559.79nm 80km DOM LC SMF Transceiver Module, Commercial Temperature#31237, Industrial Temperature#113562 |
| | DWDM-SFP10G-40 | 10G DWDM SFP+ 1560.61nm 40km DOM LC SMF Transceiver Module, Commercial Temperature#38731, Industrial Temperature#113511 |
| | DWDM-SFP10G-C | 10G DWDM C-band Tunable SFP+ 50GHz 80km DOM LC SMF Transceiver Module #69267 |
| | CWDM-SFP10G-80L | 10G CWDM SFP+ 1470nm 80km DOM LC SMF Transceiver Module #19367 |
| | CWDM-SFP10G-40S | 10G CWDM SFP+ 1270nm 40km DOM LC SMF Transceiver Module, Commercial Temperature#22168, Industrial Temperature#112392 |
| 1G SFP | DWDM-SFP1G-EZX | 1000BASE-DWDM SFP 100GHz 1563.86nm 100km DOM LC SMF Transceiver Module #54150 |
| | DWDM-SFP1G-ZX | 1000BASE-DWDM SFP 1563.86nm 80km DOM LC SMF Transceiver Module #47697 |
| | CWDM-SFP1G-EZX | 1000BASE-CWDM SFP 1270nm 120km DOM LC SMF Transceiver Module #102776 |
| | CWDM-SFP1G-ZX | 1000BASE-CWDM SFP 1270nm 80km DOM LC SMF Transceiver Module #33234 |

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

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