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DCI/OTN SYSTEM

Data Center Interconnect System

400G · 200G · 100G · 10G

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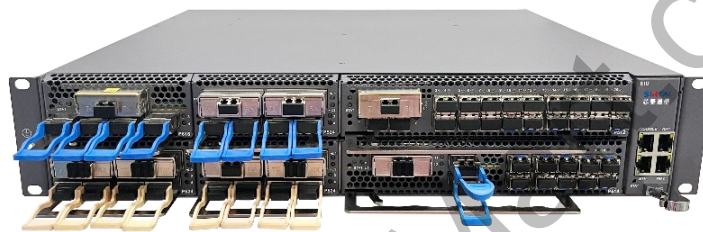
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DCI/OTN Platform: FM8600-DCI8 2U

FM8600-DCI8 is an optoelectronic integrated WDM transmission platform designed for Data Centre Interconnect (DCI), features high integration (optoelectronic integration), large bandwidth (25.6Tbits / Fiber), simple deployment (no complicated tuning), easy operation and maintenance (NETCONF / YANG) and safety and reliability. It can meet the rapidly growing bandwidth demand between DCs, achieve flexible deployment of equipment, create an open optical network architecture and lead the DCI market into a new era of high-speed all-optical interconnection.

Product view



FM8600-DCI8

Product features

- Adopt optoelectronic integrated, pluggable modular design; components support hot-plugging, deploy and expand on demand.
- Front inlet air and rear outlet air cooling design, 2+1 FRU fan units available, automatic speed adjustment supported.
- 19" / 600mm Depth cabinet can be installed, suitable for data center rooms and can be deployed with IT equipment in common cabinets.
- Transmission capacity up to 25.6Tbit/s per pair @ C+ band 400G*64λ, up to 3.2Tbit/s per subrack.
- Single wave capacity up to 400G, continuous evolution towards 600G & 800G & 1.2T.
- Optical layer card highly integrated with OA, WSS, VOA, OSC, OTDR, OCM, OLP, etc. to simplify internal fiber connectivity.
- Supports 10GE, 100GE, 100GE FlexE(Unaware) , 400GE, STM-64, 10GE_WAN, FC800, FC1600, FC3200, OTU2, OTU2e, OTU4 and other service access.
- Supports 9-degree ROADM networking and FlexGrid.
- Supports comprehensive performance monitoring and quality visibility at the service, OTN and optical layers.
- Provides multiple multi-layer network-level and device-level protection solutions. Protection reversal delay < 50ms, ensuring superior protection performance.
- Supports SNMP, NETCONF/YANG standard open interface and GUI management platform based on B/S architecture

Product specifications

Parameter		Description
Chassis	Dimensions (H x W x D)	2U: 88 mm (H)×446 mm (W)×450 mm (D)
	Maximum capacity	3.2Tbit/s
	Number of service card slots	8
	Applicable cabinets	19" cabinet 600mm or deeper
Line-side port	Rate	<ul style="list-style-type: none"> ● 100G (PDM_QPSK) programmable ● 200G (PDM_QPSK) programmable ● 200G (PDM_8QAM) programmable ● 200G (PDM_16QAM) programmable ● 300G (PDM_8QAM) programmable ● 400G (PDM_16QAM) programmable
	Optical module	Pluggable QSFP28 / QSFP-DD / CFP2, wavelength adjustable
Client-side port	Service type	10GE, 100GE, 100GE FlexE(Unware) , 400GE, STM-64, 10GE_WAN, FC800, FC1600, FC3200, OTU2, OTU2e, OTU4
	Optical module	Pluggable SFP+ / SFP28 / QSFP28 / QSFP-DD
Optical power management		ALS, AGC
Max. number of wavelengths		Fixed grid: 96 wavelengths @50 GHz
Channel spacing		Fixed grid: 50 GHz / 75 GHz / 100 GHz / 150 GHz
Central frequency range		191.35 THz ~ 196.1 THz
Central wavelength range		1528.77 nm ~ 1566.73 nm
Protection function		<ul style="list-style-type: none"> ● Optical line protection (OLP) ● Optical multiplexed segment protection (OMSP) ● Optical channel protection (OCHP) ● Line-side port 1+1 protection (only P422 muxponder support)
Network management		<ul style="list-style-type: none"> ● Supports main controller 1+1 backup (optional) ● Support CLI, Web LCT, SNMP, NETCONF, GUI management platform based on B/S architecture ● Support DCN communication based on OSC
Power supply	Back-up	Standard CRPS power supply 1+1 backup
	AC	<ul style="list-style-type: none"> ● Rated voltage range: 100 V AC~130 V AC (50/60Hz) or 200 V AC~240 V AC (50/60Hz) ● Max. voltage range: 90 V AC~264 V AC (45Hz~65Hz)
	HVDC	<ul style="list-style-type: none"> ● Rated voltage range: 240 V HVDC ● Max. voltage range: 192 V HVDC~288 V HVDC
	DC	<ul style="list-style-type: none"> ● Rated voltage range: -48 V DC/-60 V DC ● Max. voltage range: -40 V DC~-72 V DC
Heat dissipation		<ul style="list-style-type: none"> ● Front inlet air and rear outlet air ● 2+1 Fan unit backup
Typical power consumption		<800W (Electrical layer full match)
Environment	Operating temperature	Short-term: -5℃~+45℃; Long-term: 0℃~40℃
	Storage temperature	-40℃~+70℃
	Humidity	5%~95% (no condensation)

DCI/OTN Platform: FM8600-DCI4 1U

FM8600-DCI4 is an optoelectronic integrated WDM transmission platform designed for Data Centre Interconnect (DCI), features high integration (optoelectronic integration), large bandwidth (25.6Tbits / Fiber), simple deployment (no complicated tuning), easy operation and maintenance (NETCONF / YANG) and safety and reliability. It can meet the rapidly growing bandwidth demand between DCs, achieve flexible deployment of equipment, create an open optical network architecture and lead the DCI market into a new era of high-speed all-optical interconnection.

Product view



FM8600-DCI4

Product features

- Adopt optoelectronic integrated, pluggable modular design; components support hot-plugging, deploy and expand on demand.
- Front inlet air and rear outlet air cooling design, 1+1 FRU fan units available, automatic speed adjustment supported.
- 19" / 800mm depth cabinet can be installed, suitable for data center rooms and can be deployed with IT equipment in common cabinets.
- Transmission capacity up to 25.6Tbit/s per pair @ C+ band 400G*64λ, up to 1.6 Tbit/s per subrack.
- Single wave capacity up to 400G, continuous evolution towards 600G & 800G & 1.2T.
- Optical layer card highly integrated with OA, WSS, VOA, OSC, OTDR, OCM, OLP, etc. to simplify internal fiber connectivity.
- Supports 10GE, 100GE, 100GE FlexE(Unaware) , 400GE, STM-64, 10GE_WAN, FC800, FC1600, FC3200, OTU2, OTU2e, OTU4 and other service access.
- Supports 9-degree ROADM networking and FlexGrid.
- Supports comprehensive performance monitoring and quality visibility at the service, OTN and optical layers.
- Provides multiple multi-layer network-level and device-level protection solutions. Protection reversal delay < 50ms, ensuring superior protection performance.
- Supports SNMP, NETCONF/YANG standard open interface and GUI management platform based on B/S architecture.

Product specifications

Parameter		Description
Chassis	Dimensions (H x W x D)	1U: 44 mm (H)×444 mm (W)×490 mm (D)
	Maximum capacity	1.6Tbit/s
	Number of service card slots	4
	Applicable cabinets	19" cabinet 800mm or deeper
Line-side port	Rate	<ul style="list-style-type: none"> ● 100G (PDM_QPSK) programmable ● 200G (PDM_QPSK) programmable ● 200G (PDM_8QAM) programmable ● 200G (PDM_16QAM) programmable ● 300G (PDM_8QAM) programmable ● 400G (PDM_16QAM) programmable
	Optical module	Pluggable QSFP28 / QSFP-DD / CFP2, wavelength adjustable
Client-side port	Service type	10GE, 100GE, 100GE FlexE(Unware) , 400GE, STM-64, 10GE_WAN, FC800, FC1600, FC3200, OTU2, OTU2e, OTU4
	Optical module	Pluggable SFP+ / SFP28 / QSFP28 / QSFP-DD
Optical power management		ALS, AGC
Max. number of wavelengths		Fixed grid: 96 wavelengths @50 GHz
Channel spacing		Fixed grid: 50 GHz / 75 GHz / 100 GHz / 150 GHz
Central frequency range		191.35 THz ~ 196.1 THz
Central wavelength range		1528.77 nm ~ 1566.73 nm
Protection function		<ul style="list-style-type: none"> ● Optical line protection (OLP) ● Optical multiplexed segment protection (OMSP) ● Optical channel protection (OCHP) ● Line-side port 1+1 protection (only P422 muxponder support)
Network management		<ul style="list-style-type: none"> ● Support 1 main controller hot-swapping ● Support CLI, Web LCT, SNMP, NETCONF, GUI management platform based on B/S architecture ● Support DCN communication based on OSC
Power supply	Back-up	Standard CRPS power supply 1+1 backup
	AC	<ul style="list-style-type: none"> ● Rated voltage range: 100 V AC~130 V AC (50/60Hz) or 200 V AC~240 V AC (50/60Hz) ● Max. voltage range: 90 V AC~264 V AC (45Hz~65Hz)
	HVDC	<ul style="list-style-type: none"> ● Rated voltage range: 240 V HVDC ● Max. voltage range: 192 V HVDC~288 V HVDC
	DC	<ul style="list-style-type: none"> ● Rated voltage range: -48 V DC/-60 V DC ● Max. voltage range: -40 V DC~-72 V DC
Heat dissipation		<ul style="list-style-type: none"> ● Front inlet air and rear outlet air ● 1+1 Fan unit backup
Typical power consumption		<550W (Electrical layer full match)
Environment	Operating temperature	Short-term: -5℃~+45℃; Long-term: 0℃~40℃
	Storage temperature	-40℃~+70℃
	Humidity	5%~95% (no condensation)

System Control Unit: SCU

The system control unit (SCU) also known as main controller card introduced is to provide the interface between the system and the network management system, cooperating with the network management system to manage the various single boards of the equipment, and realizing the mutual communication between the equipment to complete the processing of the corresponding overhead and optical monitoring channels.

Product view



Function features

- Support dual main control board 1+1 redundancy, and support automatic and manual switching of the main control.
- Support hot-plugging and this action has no impact on the service.
- After the failure of dual main controller, the device can continue to work normally, and the new on-line main controller can passively obtain all the configurations of all functional units, and doesn't affect the normal operation of the device.
- The original configuration will not be lost after the device is powered down, it will be restored automatically after powered up; when the service boards, fans, etc. are pulled out and replaced with the same type of boards, the main controller will automatically send the configuration of the original boards to the new boards.
- Provide main controller board operation status indicator, main and standby status indicators.
- Provide command-line based CLI control.
- Provide Web-based LCT control.
- Provide GUI control platform based on B/S architecture.
- Provide SNMP, NETCONF/YANG open API interface.
- Support remote online upgrade
- Provide USB interface to support on-site software upgrade, log export and other functions.

Product Specification

SCU	
Protection function	Support main controller 1+1 backup
Network management	<ul style="list-style-type: none"> ● Support CLI command line management. ● Support Web LCT management ● Support GUI management platform based on B/S architecture ● Support OSC-based DCN communication ● Support SNMP, NETCONF/YANG open API interface
Environment	Operating temperature
	Storage temperature
	Humidity level

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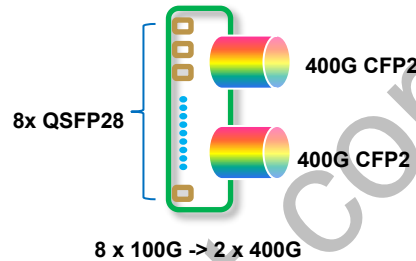
2*400G Muxponder (CFP2): P624

The 2*400G Muxponder service card (P624) launched supports mapping 8x100G optical signals received on the client side into 2 OTUC4 signals and interconverting OTUC4 signals with optical signals of WDM wavelengths conforming to ITU-T standards. The line side adopts pluggable CFP2-DCO to achieve ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view



Function structure



Application case

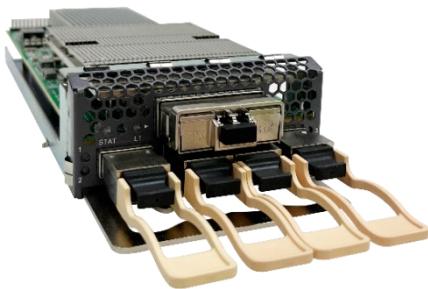
- Suitable for transmission over metropolitan networks and long-distance networks up to 600 km
- Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.
- Suitable for 400G links in existing OTN/DWDM infrastructures

2*400G Muxponder (P624)	
Function	Support 8x100G service signals mapping to 2 OTUC4 signal
Slot number	2 slots
Line side	<ul style="list-style-type: none"> ● 2 CFP2 optical ports: adopts 400G CFP2-DCO module, hot-pluggable ● Support wavelength adjustable, range covers 191.35~196.1 THz ● Support adjustable light-emitting power ● Support 100G~400G rate adjustable ● Support single fiber bidirectional transmission (optional)
Client side	Support 8 QSFP28 modules, hot-pluggable
OTN function	<ul style="list-style-type: none"> ● Frame format and overhead handling using ITU-T G709 recommendations ● ODUk (k=4, C4) layer support PM and other functions ● OTUk (k=C4, C4) layer support SM functions
Support services	100GE, 100GE FlexE(Unware), OTU4
Time delay measurement	Support line-side online delay measurement based on ODU layer
Loopback	Support line side and client-side loopbacks
LLDP	100GE service support
ALS	Client side support when accessing non-OTN services
Alarm delay insertion	Support Local Fault alarm delay insertion and delay time setting
Performance monitoring and alarm monitoring	<ul style="list-style-type: none"> ● Support OTN performance monitoring and alarm monitoring functions ● Support optical module temperature, current, optical power monitoring, etc. ● Support Ethernet RMON monitoring ● Support Telemetry

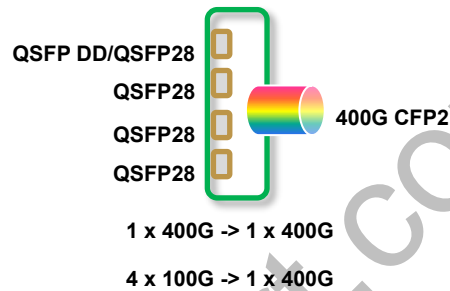
400G Muxponder (CFP2): P616

The 400G Muxponder service card (P616) launched supports mapping 1x400G optical signal or 4x100G optical signals received on the client side to 1 OTUC4 signal and interconverting OTUC4 signals with optical signals of WDM wavelengths conforming to ITU-T standards. The line side adopts pluggable CFP2-DCO to achieve ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view



Function structure



Application case

- Suitable for transmission over metropolitan networks and long-distance networks up to 600 km
- Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.
- Suitable for 400G links in existing OTN/DWDM infrastructures

400G Muxponder (P616)	
Function	Support 1x400G or 4x100G service signal mapping to 1 OTUC4 signal
Slot number	1 slot
Line side	<ul style="list-style-type: none"> ● Support 1 CFP2 port: adopts 400G CFP2-DCO module, hot-pluggable ● Support wavelength adjustable, the range covers 191.35~196.1 THz ● Support light-emitting power adjustable ● Support 100G~400G rate adjustable ● Support single fiber bidirectional transmission (optional)
Client side	Support 1 QSFP-DD/ QSFP28, 3 QSFP28 modules, hot-pluggable
OTN function	<ul style="list-style-type: none"> ● Frame format and overhead handling using ITU-T G709 recommendations ● ODUk (k=4, C4) layer support PM and other functions ● OTUk (k=4, C4) layer support SM functions
Support services	100GE, 100GE FlexE(Unware), 400GE, OTU4
Time delay measurement	Support line-side online delay measurement based on ODU layer
Loopback	Support line side and client-side loopbacks
LLDP	100GE, 400GE service support
Alarm delay insertion	Support Local Fault alarm delay insertion and delay time setting
Performance monitoring and alarm monitoring	<ul style="list-style-type: none"> ● Support OTN performance monitoring and alarm monitoring functions ● Support optical module temperature, current, optical power monitoring, etc. ● Support Ethernet RMON monitoring ● Support Telemetry

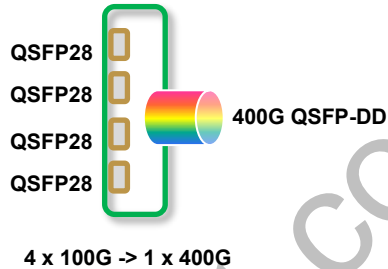
400G Muxponder (QSFP-DD): P614

The 400G Muxponder service card (P614) launched supports mapping 4x100G signals received on the client side into 1 OTUC4 signal and interconverting the OTUC4 signal with ITU-T compliant WDM wavelength optical signals. The line side adopts pluggable QSFP-DD DCO to realize ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view



Function structure



Application case

- Suitable for transmission over metropolitan networks and long-distance networks up to 450 km
- Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.
- Suitable for 400G links in existing OTN/DWDM infrastructures

400G Muxponder (P614)	
Function	Support 4x100G service signal mapping to 1 OTUC4 signal
Slot number	1 slot
Line side	<ul style="list-style-type: none"> ● Support QSFP-DD port: adopts 400G QSFP-DD DCO module, hot-pluggable ● Support wavelength adjustable, the range covers 191.35~196.1 THz ● Support light-emitting power adjustable (-13 to -9dBm range) ● Support 100G/200G/400G rate adjustable
Client side	Support 4 QSFP28 modules, hot-pluggable
OTN function	<ul style="list-style-type: none"> ● Frame format and overhead handling using ITU-T G709 recommendations ● ODUk (k=C4) layer support PM and other functions ● OTUk (k=C4) layer support SM functions
Support services	100GE, 100GE FlexE(Unware)
Loopback	Support line side and client-side loopbacks
LLDP	Support
ALS	Support
Alarm delay insertion	Support Local Fault alarm delay insertion and delay time setting
Performance monitoring and alarm monitoring	<ul style="list-style-type: none"> ● Support OTN performance monitoring and alarm monitoring functions ● Support optical module temperature, current, optical power monitoring, etc. ● Support Ethernet RMON monitoring ● Support Telemetry

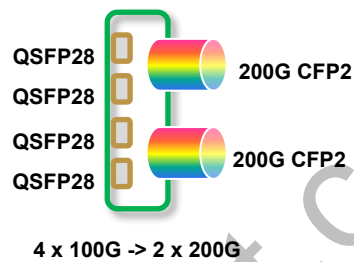
2*200G Muxponder: P524

The 2*200G Muxponder service card (P524) supports mapping 4x100G optical signals received on the client side into 2 OTUC2 signals and interconverting OTUC2 signals with optical signals of WDM wavelengths conforming to ITU-T standards. The line side adopts pluggable CFP2-DCO to achieve ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view



Function structure



Application case

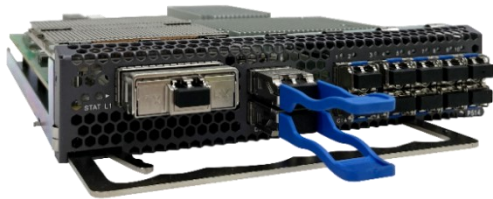
- Suitable for transmission over metropolitan networks and long-distance networks up to 1000 km
- Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.
- Suitable for 200G links in existing OTN/DWDM infrastructures

2*200G Muxponder (P524)	
Function	Support 4x100G service signals mapping to 2 OTUC2 signals
Slot number	1 slot
Line side	<ul style="list-style-type: none"> ● 2 CFP2 ports: adopts 200G & 400G CFP2-DCO modules, hot-pluggable ● Support wavelength adjustable, covering 191.35~196.1 THz. ● Support light-emitting power adjustable ● Support 100G/200G rate adjustable ● Support single fiber bidirectional transmission (optional)
Client side	Support 4 QSFP28 modules, hot-pluggable
OTN function	<ul style="list-style-type: none"> ● Frame format and overhead handling using ITU-T G709 recommendations ● ODUk (k=4, C2) layer: support for PM and other functions. ● OTUk (k=4, C2) layer: support for SM functions
Support services	100GE, 100GE FlexE(Unware), OTU4
Time delay measurement	Support line-side online delay measurement based on ODU layer
Loopback	Support line side and client-side loopbacks
LLDP	100GE service support
ALS	Client side support when accessing non-OTN services
Alarm delay insertion	Support Local Fault alarm delay insertion and delay time setting
Performance monitoring and alarm monitoring	<ul style="list-style-type: none"> ● Support OTN performance monitoring and alarm monitoring functions ● Support optical module temperature, current, optical power monitoring, etc. ● Support Ethernet RMON monitoring ● Support Telemetry

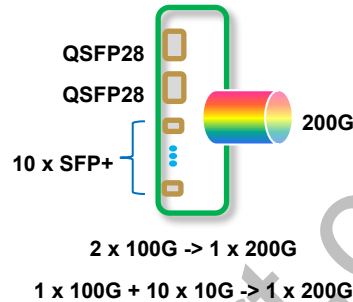
2*100G+10*10G Muxponder: P514

The 2*100G+10*10G+ Muxponder service card (P514) supports mapping 2x100G optical signals or 1x100G+10x10G optical signals received on the client side to 1 OTUC2 signal and interconverting OTUC2 signals with optical signals of WDM wavelengths conforming to ITU-T standards. The line side adopts pluggable CFP2-DCO to achieve ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view



Function structure



Application case

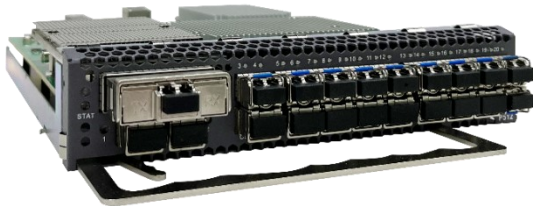
- Suitable for transmission over metropolitan networks and long-distance networks up to 1000 km
- Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.
- Suitable for 200G links in existing OTN/DWDM infrastructures

200G Muxponder (P514)	
Function	<ul style="list-style-type: none"> • Support 2x100G service signals mapping to 1 OTUC2 signal • Support 1x100G + 10x10G service signals mapping to 1 OTUC2 signal
Slot number	2 slots
Line side	<ul style="list-style-type: none"> • 1 CFP2 port: adopts 200G & 400G CFP2-DCO module, hot-pluggable • Support wavelength adjustable, covering 191.35~196.1 THz • Support light-emitting power adjustable • Support single fiber bidirectional transmission (optional)
Client side	Support 2 QSFP28, 10 SFP+ modules, hot-pluggable
OTN function	<ul style="list-style-type: none"> • Frame format and overhead handling using ITU-T G709 recommendations • ODUk (k=2, 2e, 4, C2) layer: support for PM and other functions. • OTUk (k=2, 2e, 4, C2) layer: support for SM functions
Support service types	10GE, 100GE, 100GE FlexE(Unware) , STM-64, 10GE_WAN, FC800, FC1600, FC3200, OTU2, OTU2e, OTU4
Time delay measurement	Support line-side online delay measurement based on ODU layer
Loop back	Support line side and client side loopbacks
LLDP	10GE, 100GE service support
ALS	Client side support when accessing non-OTN services
Performance monitoring and alarm monitoring	<ul style="list-style-type: none"> • Support OTN performance monitoring and alarm monitoring • Support temperature, current and power monitoring of optical module • Support Ethernet RMON monitoring • Support Telemetry

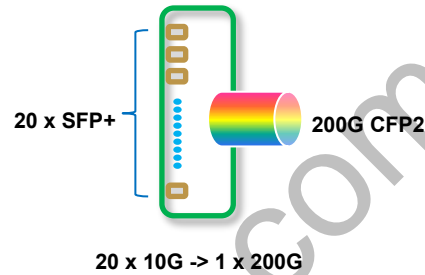
20*10G Muxponder: P512

The 20*10G Muxponder service card (P512) supports mapping the 20x10G optical signal received on the client side to a 1 OTUC2 signal and interconverting the OTUC2 signal with the optical signal of WDM wavelength in compliance with ITU-T standards. The line side adopts pluggable CFP2-DCO to realize ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view



Function structure



Application case

- Suitable for transmission over metropolitan networks and long-distance networks up to 1000 km
- Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.
- Suitable for 200G links in existing OTN/DWDM infrastructures

200G Muxponder (P512)	
Function	Support 20x10G service signals mapping to 1 OTUC2 signal
Slot number	2 slots
Line side	<ul style="list-style-type: none"> ● 2 CFP2 ports: adopts 200G & 400G CFP2-DCO modules, hot-pluggable ● Support wavelength adjustable, covering 191.35~196.1 THz. ● Support light-emitting power adjustable ● Support 100G/200G rate adjustable Support single fiber bidirectional transmission (optional)
Client side	Support 20 SFP+ modules, hot-pluggable
OTN function	<ul style="list-style-type: none"> ● Frame format and overhead handling using ITU-T G709 recommendations ● ODUk (k=2, 2e, 4, C2) layer: support PM and other functions ● OTUk (k=2, 2e, 4, C2) layer: support SM functions
Support service types	10GE, STM-64, 10GE_WAN, FC800, FC1600, OTU2, OTU2e
Time delay measurement	Support line-side online delay measurement based on ODU layer
Loop back	Support line side and client side loopbacks
LLDP	10GE service support
ALS	Client side support when accessing non-OTN services
Performance monitoring and alarm monitoring	<ul style="list-style-type: none"> ● Support OTN performance monitoring and alarm monitoring ● Support temperature, current and power monitoring of optical module ● Support Ethernet RMON monitoring ● Support Telemetry

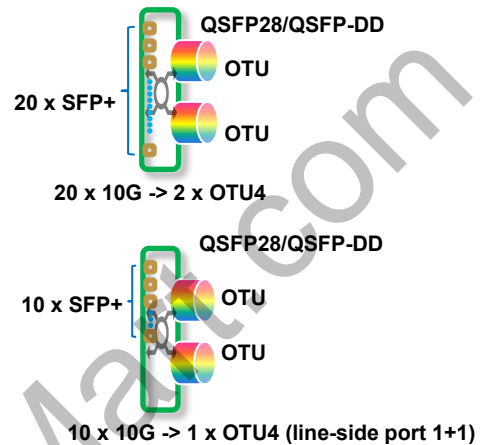
100G Muxponder: P422

The 100G Muxponder service card (P422) supports mapping the 20x10G optical signal received by the client side into 2 independent OTU4 signals or 10x10G optical signals into 1x OTU4 signal (line-side port 1+1 protection). The line side supports QSFP28 gray optical module or QSFP28/QSFP-DD DCO coherent module to achieve transmission requirements for different distances and diverse networks.

Product view



Function structure



Application case

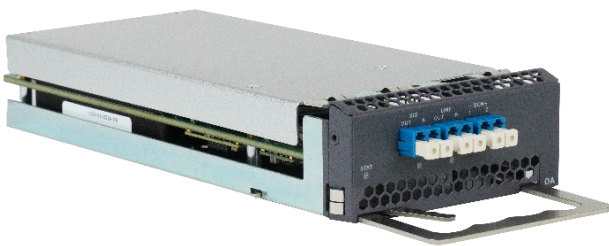
- For metro and long-haul network transmission up to 1500 km.
- For high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.
- 100G links for existing OTN/DWDM infrastructure

100G Muxponder (P422)	
Function	<ul style="list-style-type: none"> ● Support 20x10G service signal signals mapping to 2 xOTU4 signals ● Support 10x10G service signal signals mapping to 1 xOTU4 signal (with line-side port 1+1 protection)
Slot number	2 slots
Line side	<ul style="list-style-type: none"> ● 2 QSFP28 / QSFP-DD ports: adopts 100G QSFP28 / QSFP-DD DCO module, hot-pluggable ● Support wavelength adjustable, range covers 191.35~196.1THz (DCO module)
Client side	Support 20 SFP+ modules, hot-pluggable
OTN function	<ul style="list-style-type: none"> ● Frame format and overhead handling using ITU-T G709 recommendations ● ODUk (k=2, 2e, 4) layer: support PM and other functions ● OTUk (k=2, 2e, 4) layer: support SM functions
Support service types	10GE, STM-64, 10GE_WAN, FC800, FC1600, OTU2, OTU2e
Loop back	Support line side and client side loopback
LLDP	10GE service support
ALS	Client side support when accessing non-OTN services
Protection function	Support line-side port 1+1 protection (10*10G on client side)
Performance monitoring and alarm monitoring	<ul style="list-style-type: none"> ● Supports OTN performance monitoring and alarm monitoring. ● Support optical module temperature, current, optical power monitoring, etc. ● Support Ethernet RMON monitoring ● Support Telemetry

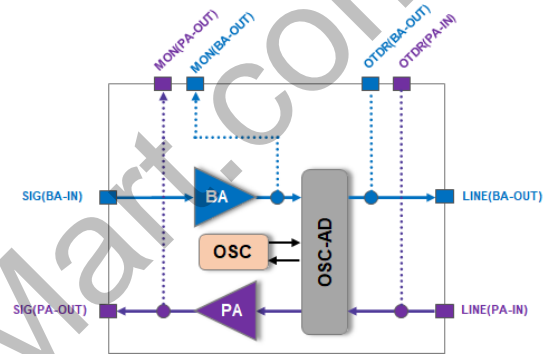
Optical Amplifier Card: OA

The main function of OA (Optical Amplifier) card is to compensate the power of signal light in the transmission link, it can amplify the optical signals of up to 48 channels in C-band (channel spacing of 100GHz) or 96 channels (channel spacing of 50GHz) at the same time, and has the features of gain flatness, adjustable gain and small noise index. Meanwhile, the card has built-in OSC optical monitoring channel to support OSC-based DCN communication, which is an indispensable part of DWDM system and future high-speed system, all-optical network long-distance transmission.

Product view



Function structure



Application case

- Suitable for optical terminal stations (OTM), used as booster amplifier for multiplexed signals and pre-amplifier for demultiplexed signals
- Suitable for optical relay stations (OLA) to amplify bi-directional transmission signals and extend the transmission distance

Product specification

Optical Amplifier Card (OA)	
Slot number	1 slot
EDFA	<ul style="list-style-type: none"> ● Optional built-in 1*EDFA (BA, PA, LA parameters optional) ● Optional built-in 2*EDFA (BA, PA, LA parameters optional)
OSC	<ul style="list-style-type: none"> ● Optional without OSC ● Optional built-in 1*OSC ● Optional built-in 2*OSC ● Working wavelength: 1510nm ● Working rate: 1.25Gb/s
VOA	<ul style="list-style-type: none"> ● Optional built-in VOA, the same number as EDFA ● Location: EDFA front input ● Inherent insertion loss: <1dB ● Adjustment range: 0 ~ 15dB ● Power down state is inherent insertion loss
MON Monitoring port	Standard, optical power difference between MON and main optical channel 21~23dB
OTDR Measurement port	<ul style="list-style-type: none"> ● Optional, the number of ports is the same as the line interface

	<ul style="list-style-type: none"> OTDR signal wavelength: 1625nm OTDR channel loss: <1dB 		
EDFA Parameter			
	20G17	20G25	20G30
Wavelength range(nm)	1528~1568	1528~1568	1528~1568
Gain range(dB)	14 ~ 20	22 ~ 28	27 ~ 33
Maximum total output optical power(dBm)	≥20	≥20	≥20
Noise(dB)	< 5.5	< 5.5	< 5.5
Gain flatness(dB)	< 1.5	< 1.5	< 1.5
Polarization correlation loss(dB)	< 0.5	< 0.5	< 0.5
Input optical power detection range(dBm)	-23 ~ 8	-31 ~ 0	-36 ~ -5
Output optical power detection range(dBm)	-6 ~ 20	-6 ~ 20	-6 ~ 20
Reflection coefficient(dB)	< -30	< -30	< -30
Gain stability(dB)	±0.5	±0.5	±0.5

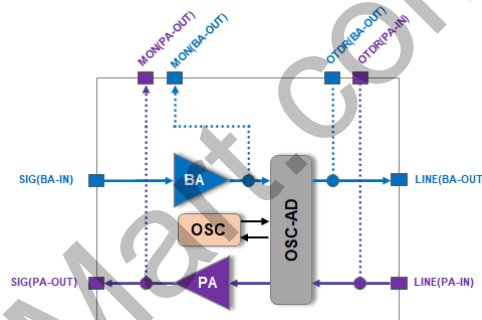
Optical Terminal Station Amplifier Card: OTA

The main function of OTA (Optical Terminal Amplifier) card is to compensate the power of the optical signal in the transmission link, and it can simultaneously amplify the optical signals of up to 48 channels in C-band (100GHz channel spacing) or 96 channels (50GHz channel spacing), with the features of flat gain, adjustable gain, small noise index, and so on. Meanwhile, the board has built-in OSC optical monitoring channel and supports DCN communication based on OSC, which is an indispensable part of DWDM system and future high-speed system and all-optical network for long-distance transmission.

Product view



Function structure



Application case

- Suitable for Optical Terminal Stations (OTM), booster amplification and preamplification for combined wave signals.

Product Specification

Optical Terminal Station Amplifier Card (OTA)	
Function	Support booster amplification and preamplification of the combined signals with built-in 1 directional OSC channel
Slot number	2 slots
Integration level	Built-in 1*BA, 1*PA, unidirectional OSC, VOA, passive filter, etc.
Safety	Support Automatic Power Reduction (APR) technology
Monitoring port	Reserved OCM and OTDR monitoring port for line side transmit and receive directions, can be connected to external OCM and OTDR board
Line side VOA location	PA front input (BA without VOA)
VOA Intrinsic insertion loss	< 1dB
VOA Adjustment range	0 ~ 15dB
OSC Operating wavelength	1510nm
OSC Operating rate	1.25Gb/s
OTDR Channel wavelength	1625nm
OTDR Channel loss	< 1dB
EDFA Parameter	
	BA: 21G13V PA: 21G20V PA: 21G30V

Wavelength range(nm)	1528 ~1568	1528~1568	1528~1568
Operating mode	AGC or APC configurable	AGC or APC configurable	AGC or APC configurable
Gain range(dB)	8 ~ 18 configurable	15 ~ 25 configurable	22 ~ 35 configurable
Maximum total optical power output(dBm)	≥ 21	≥ 21	≥ 21
Gain flatness(dB)	< 1.5	< 1.5	< 1.5
Gain slope(dB)	-3 ~ 0	-3 ~ 0	-3 ~ 0
Polarization-related losses(dB)	< 0.5	< 0.5	< 0.5
Input optical power measurement range(dB)	-18 ~ 13	-28 ~ 6	-35 ~ 0
Output optical power measurement range(dB)	-2 ~ 22	-2 ~ 22	-2 ~ 22
Reflection coefficient(dB)	< -30	< -30	< -30
Gain stability(dB)	± 0.5	± 0.5	± 0.5

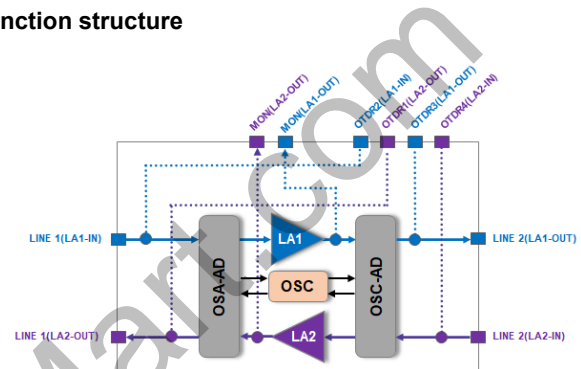
Optical Line Station Amplifier Card: OLA

The main function of OLA (Optical Line Amplifier) card is used at the intermediate optical amplifier station in the line, to periodically compensate for the loss of each section of the optical fiber, and to extend the transmission distance. It can simultaneously amplify the optical signals of up to 48 channels in C-band (100GHz channel spacing) or 96 channels (50GHz channel spacing), with the features of flat gain, adjustable gain, small noise index, and so on. Meanwhile, the board has built-in OSC optical monitoring channel and supports DCN communication based on OSC, which is an indispensable part of DWDM system and future high-speed system and all-optical network for long-distance transmission.

Product view



Function structure



Application case

- Suitable for Optical Line Stations (OLA), to amplify bidirectional transmission signals and extend transmission distance

Product Specification

Optical Line Station Amplifier Card (OLA)		
Function	Support bidirectional relay amplification of combined signals from optical relay stations, with built-in OSC channels in both east and west directions	
Slot number	2 slots	
Integration level	Built-in 2*LA, bidirectional OSC, VOA, passive filter, etc.	
Safety	Support Automatic Power Reduction (APR) technology	
Monitoring port	Reserved OCM and OTDR monitoring port for line side transmit and receive directions, can be connected to external OCM and OTDR board	
Line side VOA location	LA front input	
VOA Intrinsic insertion loss	< 1dB	
VOA Adjustment range	0 ~ 15dB	
OSC Operating wavelength	1510nm	
OSC Operating rate	1.25Gb/s	
OTDR Channel wavelength	1625nm	
OTDR Channel loss	< 1dB	
EDFA Parameter		
	LA: 21G20V	LA: 21G30V
Wavelength range(nm)	1528~1568	1528~1568
Operating mode	AGC or APC configurable	AGC or APC configurable
Gain range(dB)	15 ~ 25 configurable	22 ~ 35 configurable

Maximum total optical power output(dBm)	≥ 21	≥ 21
Gain flatness(dB)	< 1.5	< 1.5
Gain slope(dB)	$-3 \sim 0$	$-3 \sim 0$
Polarization-related losses(dB)	< 0.5	< 0.5
Input optical power measurement range(dB)	$-28 \sim 6$	$-35 \sim 0$
Output optical power measurement range(dB)	$-2 \sim 22$	$-2 \sim 22$
Reflection coefficient(dB)	< -30	< -30
Gain stability(dB)	± 0.5	± 0.5

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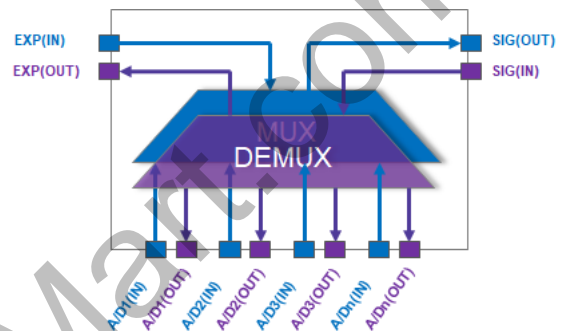
Dual Fiber Fixed OADM Card: TFF

The dual fiber fixed OADM (optical add-drop multiplexer) card (TFF) is specially designed for multi-wavelength DWDM network applications. It can multiplex different wavelengths of optical onto one optical fiber or separate multiple optical channels multiplexed on the same optical fiber by wavelength. Based on thin film filter (TFF) technology, it works on ITU grid with 100GHz channel spacing. DWDM wavelength range is 1528nm to 1568nm, and ITU channel wavelength is optional. It has a series of advantages such as low insertion loss and high channel isolation.

Product view



Function structure



Application case

- It is applicable to 4-channel and 8-channel DWDM optical signal MUX and DEMUX in dual fiber transmission

Product specification

Dual Fiber Fixed MuxDemux Card		
Specs	4-channel	8-channel
Function	Support Mux&Deux of 4 DWDM optical signals	Support Mux&Deux of 8 DWDM optical signals
Chanel number	4λ@100 GHz (191.4THz~196.1THz, board model as table 1)	8λ@100 GHz (191.4THz~196.1THz, board model as table 2)
Insertion loss	≤2 dB	≤3 dB
3dB spectral width	>75GHz	>75GHz
Adjacent channels isolation	>25dB	>25dB
Non-adjacent channels isolation	>35dB	>35dB
Slot number	1 slot	
Power monitoring	Support optical power monitoring of Mux port (SIG)	
Indicator light	Support optical power indicator light of Mux port (SIG)	
Extended function	Support extended cascading, and use EXP port for docking during cascading	

Table 1: Dual Fiber 4CH Fixed OADM Card

Card model	Port	Center frequency (THz)
TFF5659	A56/D56~A59/D59	195.60~195.90
TFF5255	A52/D52~A55/D55	195.20~195.50
TFF4750	A47/D47~A50/D50	194.70~195.00
TFF4346	A43/D43~A46/D46	194.30~194.60
TFF3841	A38/D38~A41/D41	193.80~194.10
TFF3437	A34/D34~A37/D37	193.40~193.70
TFF2932	A29/D29~A32/D32	192.90~193.20
TFF2528	A25/D25~A28/D28	192.50~192.80
TFF2023	A20/D20~A23/D23	192.00~192.30
TFF1619	A16/D16~A19/D19	191.60~191.90

Table 2: Dual Fiber 8CH Fixed OADM Card

Card model	Port	Center frequency (THz)
TFF5360	A53/D53~A60/D60	195.30~196.00
TFF4552	A45/D45~A52/D52	194.50~195.20
TFF3744	A37/D37~A44/D44	193.70~194.40
TFF2936	A29/D29~A36/D36	192.90~193.60
TFF2128	A21/D21~A28/D28	192.10~192.80

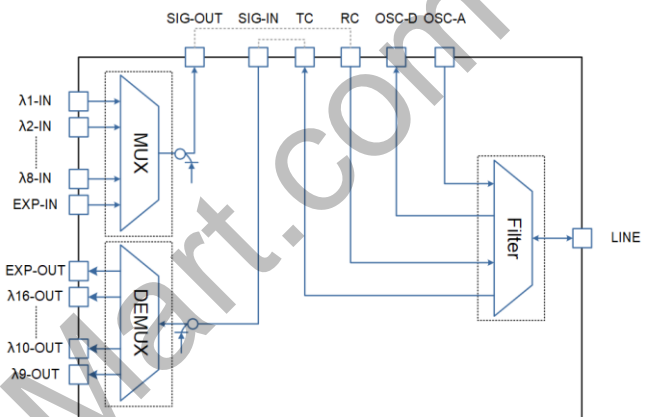
Single Fiber Fixed OADM Card: SBM

The single fiber fixed OADM (optical add-drop multiplexer) card (SBM) is specially designed for single-fiber bi-directional DWDM network applications, can be different wavelengths of light multiplexed into a single fiber or multiplexed in the same optical fiber multiple optical channels separated by wavelength; it is based on thin-film filter technology, works in an ITU grid with 100GHz channel spacing, the ITU channel wavelength is optional, supports serial connection of EDFA to achieve single-fiber bidirectional long-distance transmission, and has a built-in OSC monitoring channel.

Product view



Function structure



Application case

- It is applicable to 4-channel and 8-channel DWDM optical signal MUX and DEMUX in single fiber transmission

Product specification

Single Fiber Fixed MUX DEMUX Board		
Specs	4 channel	8 channel
Function	Support Mux&Deux of 4 DWDM optical signals	Support Mux&Deux of 8 DWDM optical signals
Chanel number	4 λ @100 GHz (board model as table 1)	8 λ @100 GHz (board model as table 2)
Insertion loss	≤ 2 dB (λ -IN to SIG-OUT/SIG-IN to λ -OUT)	≤ 3 dB (λ -IN to SIG-OUT/SIG-IN to λ -OUT)
3dB spectral width	>75GHz	>75GHz
Adjacent channels isolation	>25dB	>25dB
Non-adjacent channels isolation	>35dB	>35dB
OSC channel	1491nm/1511nm	
Single fiber bidirectional coupling insertion loss	≤ 1.5 dB (RC to LINE/LINE to TC) ≤ 1.5 dB (OSC-A to LINE/LINE to OSC-D)	
Slot number	1 slot	
Power monitoring	Support optical power monitoring of Mux port (SIG)	
Indicator light	Support optical power indicator light of Mux port (SIG)	
Extended function	Support extended cascading, and use EXP port for docking during cascading	Not support

Table 1: Single Fiber 4CH Fixed OADM Card

Card model	Port	Center frequency (THz)	
SBM2242	A22/D39, A23/D40, A24/D41, A25/D42	Add: 192.20~192.50 Drop: 193.90~194.20	Used in pairs
SBM4222	A39/D22, A40/D23, A41/D24, A42/D25	Add: 193.90~194.20 Drop: 192.20~192.50	
SBM2646	A26/D43, A27/D44, A28/D45, A29/D46	Add: 192.60~192.90 Drop: 194.30~194.60	
SBM4626	A43/D26, A44/D27, A45/D28, A46/D29	Add: 194.30~194.60 Drop: 192.60~192.90	

Table 2: Single Fiber 8CH Fixed OADM Card

Card model	Port	Center frequency (THz)	
SBM2246	A22/D39, A23/D40, A24/D41, A25/D42 A26/D43, A27/D44, A28/D45, A29/D46	Add: 192.20~192.90 Drop: 193.90~194.60	Used in pairs
SBM4622	A39/D22, A40/D23, A41/D24, A42/D25 A43/D26, A44/D27, A45/D28, A46/D29	Add: 193.90~194.60 Drop: 192.20~192.90	

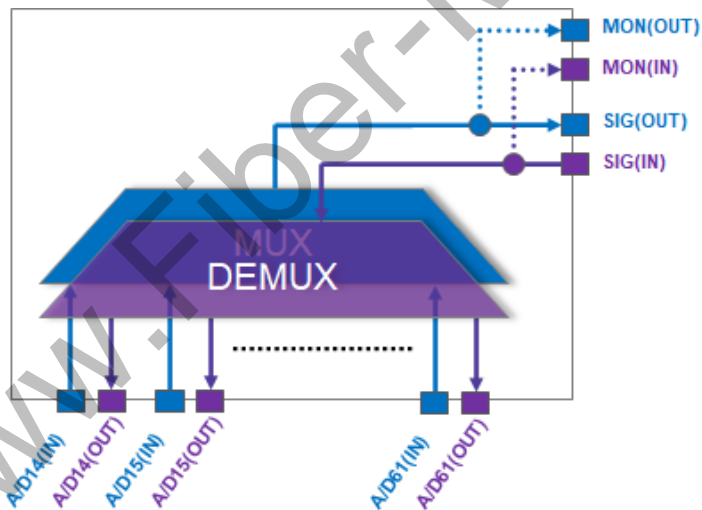
48CH Passive MuxDemux Rack: MUX48

The 48-channel passive MuxDemux rack (MUX48) is mainly used in DWDM wavelength division system to complete the multiplexing or demultiplexing function of 48 optical wavelengths in the C-band range. It can multiplex different optical wavelengths to one optical fiber or separate multiple optical channels multiplexed in the same optical fiber by wavelength. Based on the waveguide grating technology on silicon substrate, it adopts a unique heat free packaging design, which can achieve accurate channel coupling, low insertion loss, high channel isolation and high stability. It is suitable for 48 wave high-capacity DWDM system.

Product view



Function structure



Application case

- Suitable for multiplexing and demultiplexing 48 channels of DWDM optical signals in C-band

Product specification

48CH Passive MuxDemux Rack (MUX48)	
Function	Support multiplexing and demultiplexing of 48 DWDM optical signals in C-band
Size (HxWxD)	1U: 44 mm (Height)×442 mm (Width)×220 mm (Depth)
Spectral type	Flat-top type
ITU passband frequency	±12.5GHz
Channel spacing	0.8nm (100GHz)
Channel number	48
Wavelength accuracy	≤0.04nm
Channel insertion loss	≤5.5 dB
Insertion loss uniformity	≤1.5dB
1dB bandwidth	≥0.38nm
3dB bandwidth	≥0.56nm
20dB bandwidth	≤1.2nm
Adjacent channels isolation	≥25dB
Non-adjacent channels isolation	≥30dB
Total crosstalk	≥22dB
Return loss	≥40dB
Polarization dependent loss	≤0.5dB
Polarization mode dispersion	≤0.5ps
Dispersion	±20ps
Working temperature	-5 ~ +65°C
Storage temperature	-40 ~ +85°C
MON port splitting ratio	21dB (splitting ratio 1%)
Management	Provide RJ-45 management interface to connect with the rear interface card of OTNS8600-DCI8 equipment, read the SN / model / PN and other information of the equipment through the network management system, and report the on / off status at the same time, with dumb resource management ability

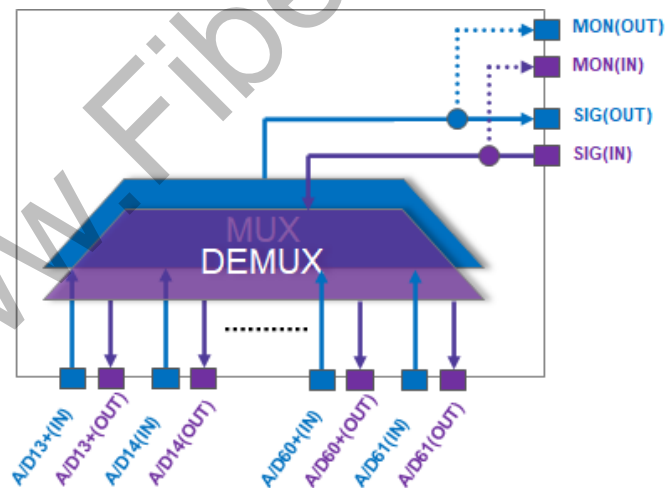
96CH Passive MuxDemux Rack: MUX96

The 96-channel passive MuxDemux rack (MUX96) is mainly used in DWDM wavelength division system to complete the multiplexing or demultiplexing function of 96 optical wavelengths in the C-band range. It can multiplex different optical wavelengths to one optical fiber or separate multiple optical channels multiplexed in the same optical fiber by wavelength. Based on the waveguide grating technology on silicon substrate, it adopts a unique heat free packaging design, which can achieve accurate channel coupling, low insertion loss, high channel isolation and high stability. It is suitable for 96 wave high-capacity DWDM system.

Product view



Function structure



Application case

- Suitable for multiplexing and demultiplexing 96 channels of DWDM optical signals in C-band

Product specification

96CH Passive MuxDemux Rack (MUX96)	
Function	Support multiplexing and demultiplexing of 96 DWDM optical signals in C-band
Size (HxWxD)	2U: 88 mm (Height)×442 mm (Width)×220 mm (Depth)
Spectral type	Flat-top type
ITU passband frequency	±6.25GHz
Channel spacing	0.4nm (50GHz)
Channel number	96
Wavelength accuracy	≤0.04nm
Channel insertion loss	≤6.5 dB
Insertion loss uniformity	≤1.5dB
1dB bandwidth	≥0.18nm
3dB bandwidth	≥0.28nm
20dB bandwidth	≤0.7nm
Adjacent channels isolation	≥25dB
Non-adjacent channels isolation	≥25dB
Total crosstalk	≥20dB
Return loss	≥ 40dB
Polarization dependent loss	≤0.5dB
Polarization mode dispersion	≤1.0ps
Dispersion	±35ps
Working temperature	-5 ~ +65°C
Storage temperature	-40 ~ +85°C
MON port splitting ratio	21dB (splitting ratio 1%)
Management	Provide RJ-45 management interface to connect with the rear interface card of OTNS8600-DC18 equipment, read the SN / model / PN and other information of the equipment through the network management system, and report the on / off status at the same time, with dumb resource management ability

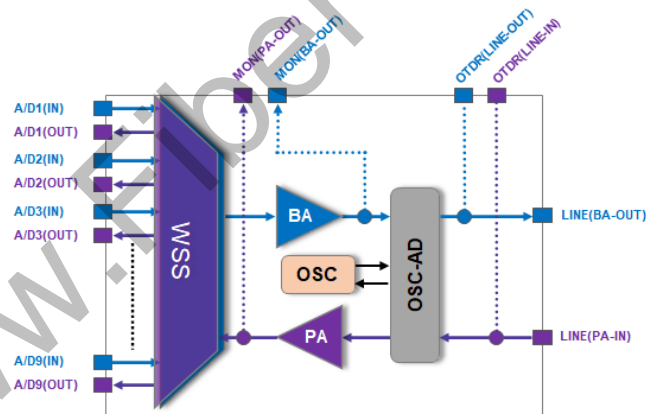
9-degree ROADM Card: WSS

The 9-degree ROADM card (WSS) launched supports the integration of key functions WSS, BA, PA and OSC into one card, has built-in dual 1x9 WSS components and has 9 ports for wavelength multiplexing and demultiplexing. It supports a DWDM Network with 96 channels (50GHz wavelength interval) in the frequency range of 191.35THz ~ 196.10THz in the C-band. It also supports the flexible grid function, realizes the flexible adjustment of channel bandwidth, and improves the spectrum utilization of the whole network.

Product view



Function structure



Application case

- Suitable for dynamic add/drop and pass-through of optical wavelength in OADM station
- Suitable for dynamic pass-through and scheduling of multi-degree optical wavelengths in ROADM station

Product specification

9-degree ROADM Card (WSS)	
Function	Support 9-port wavelength selective MUX and DEMUX to realize the dynamic penetration and scheduling of wavelength. It also supports the power amplification and pre amplification of the line side MUX signal
Slot number	2 slots
Integration	Built-in Twin 1x9 WSS, BA, PA, OSC, VOA, passive filter, etc.
Security	Support Automatic Power Reduction (APR) technology
Monitoring port	Reserve OCM and OTDR monitoring ports in the transmitting and receiving directions on the line side, which can be externally connected to OCM card and OTDR card
Channel range	191.35 THz~196.1 THz, support Flexible Grid spectral width N*3.125 GHz adjustment
Max number of channels	96 channels (50GHz interval)
Power regulation	Support the power adjustment of each channel, the attenuation range of each wavelength is 0 ~ 15dB, and the attenuation setting step is 0.1 dB
Port isolation	>25dB
Extinction ratio	≥25dB
Polarization dependent loss	≤1.5
Attenuation accuracy per wavelength	≤1dB
Reconstruction time	≤3s
Variable gain	BA supports 15 ~ 25dB gain range adjustable PA supports 15 ~ 25dB or 25 ~ 35dB, and the gain range is adjustable (optional according to the application scenario)
Output optical power	Maximum total output optical power ≥21 dBm
Line side VOA position	PA front input (BA without VOA)
VOA inherent insertion loss	< 1dB
VOA adjustment range	0 ~ 15dB
OSC working wavelength	1510nm
OSC working rate	1.25Gb/s
OTDR channel wavelength	1625nm
OTDR channel loss	< 1dB

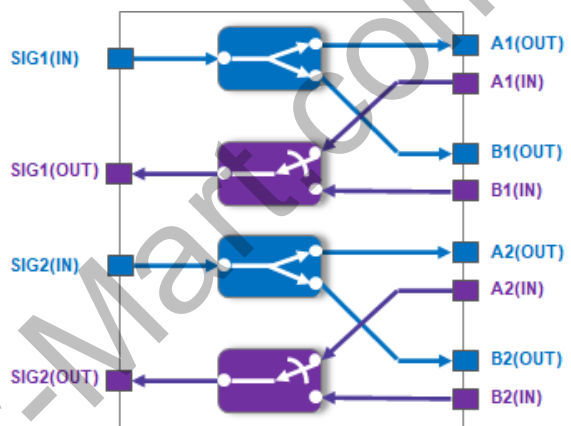
Optical Protection Card: OLP

The main function of the optical protection card (OLP) is to assist the WDM system to complete optical layer protection solutions such as optical line 1+1 protection, optical wavelength 1+1 protection. etc.. It can monitor the optical signal status of the main and standby routes in real time. Once the optical signal is interrupted or the performance is degraded, it can automatically make a safe switch on the main and standby routes to ensure the rapid recovery of the optical signal of the system. OLP technology is to complete the route switching operation in the optical layer. Optical layer protection has incomparable advantages over upper layer service protection, and is the best solution to provide users with non-blocking communication.

Product view



Function structure



Application case

- Suitable for optical line 1+1 protection (OLP)
- Suitable for optical multiplexing section 1+1 protection (OMSP)
- Suitable for optical channel 1+1 Protection (OCHP)

Product specification

Optical Protection Card (OLP)	
Function	Support optical signal 1+1 protection, double transmitting and selective receiving, single terminal switching
Slot number	1 slot
Integration	Support 1 or 2 groups of optical protection modules (optional according to the application scenario)
Working wavelength range	1528nm ~ 1568nm
Insertion loss	TX≤4 dB, RX≤1.5 dB
Switching time	<5 ms (switching time of pure optical switch)
Input optical power	-25dBm ~ +21 dBm
Optical power detection accuracy	±0.5 dBm (@>-25 dBm or above)
Polarization dependent loss	≤0.1dB
Isolation degree	>50dB
Return loss	>45dB
Switching time	>(10) ⁷
Switching condition	Relative power difference and absolute power value
Switching method	Support locking, forced switching, manual switching and automatic switching
Reliability	Power down / power on latch, hot pluggable, and main controller card(SCU) failure does not affect protection switching

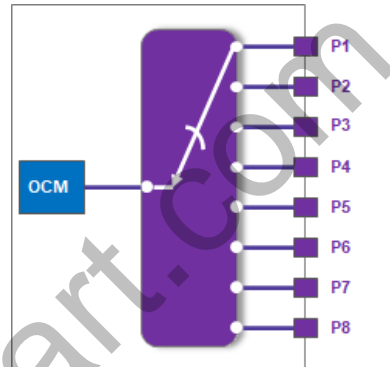
Optical Channel Monitoring Card: OCM

The optical channel monitoring card (OCM) is mainly used to analyze the performance of the MUX signal spectrum, channel optical power, wavelength and other transmission signals in the wavelength range of 1528nm-1567nm of DWDM system. It has the characteristics of high stability, high sensitivity, accuracy, high dynamic range and short scanning time. It is an indispensable and important part of optical performance monitoring in DWDM system.

Product view



Function structure



Application case

- Suitable for end-to-end monitoring of optical performance

Product specification

Optical Channel Monitoring Card (OCM)	
Function	Supports the testing of central wavelength, optical power and other parameters of each channel in the MUX optical signal
Slot number	1 slot
Port	Provide 8 test interfaces (selected by optical switch), which can be connected to 8-core MUX optical signal test
Working wavelength range	1528.57 nm ~1567.34 nm (191.27THz~196.15THz)
Channel spacing	50/100 GHz, support Flexible Grid
Center wavelength detection accuracy	±0.1 nm
Central wavelength resolution	0.02 nm
Channel power monitoring range	-40 ~ -10 dBm
Absolute power accuracy	≤1 dB
Relative power accuracy	±0.8 dB
Optical power resolution	0.1 dB
Return loss	≥40dB
Scanning time	≤1 s
Scanning times	>(10) ⁹

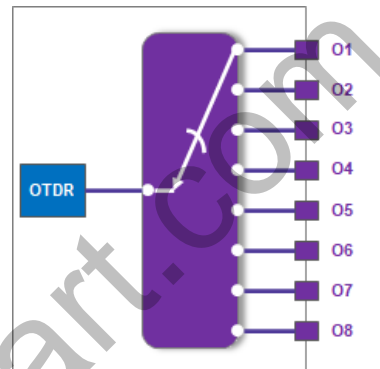
Optical Line Monitoring Card: OTDR

The optical line monitoring card (OTDR) launched supports the monitoring of 8-core optical fiber links, which is used to transmit probe light, analyze the power of the detection signal reflected by the optical reflector, and carry out fault location and performance statistics of optical fiber lines. With the outstanding characteristics of high dynamic range and high-level resolution, it is an essential core device in optical transmission system.

Product view



Function structure



Application case

- Suitable for rapid diagnosis and centralized management of optical fiber faults

Product specification

Optical Line Monitoring Card (OTDR)	
Function	Support the testing of parameters such as distance, attenuation and total loss of optical fiber links
Slot number	1 slot
Port	Provide 8 test interfaces (selected by optical switch), which can be connected to 8-core optical fiber link for test
Working wavelength	1625 nm
Dynamic range	≥30 dB
Pulse width range	0.02 ~ 20 us
Max detection distance	≥80 km
Loss test accuracy	±0.5 dB
Distance test accuracy	<20 m
Event blind zone	<10 m
Attenuation blind zone	<20 m