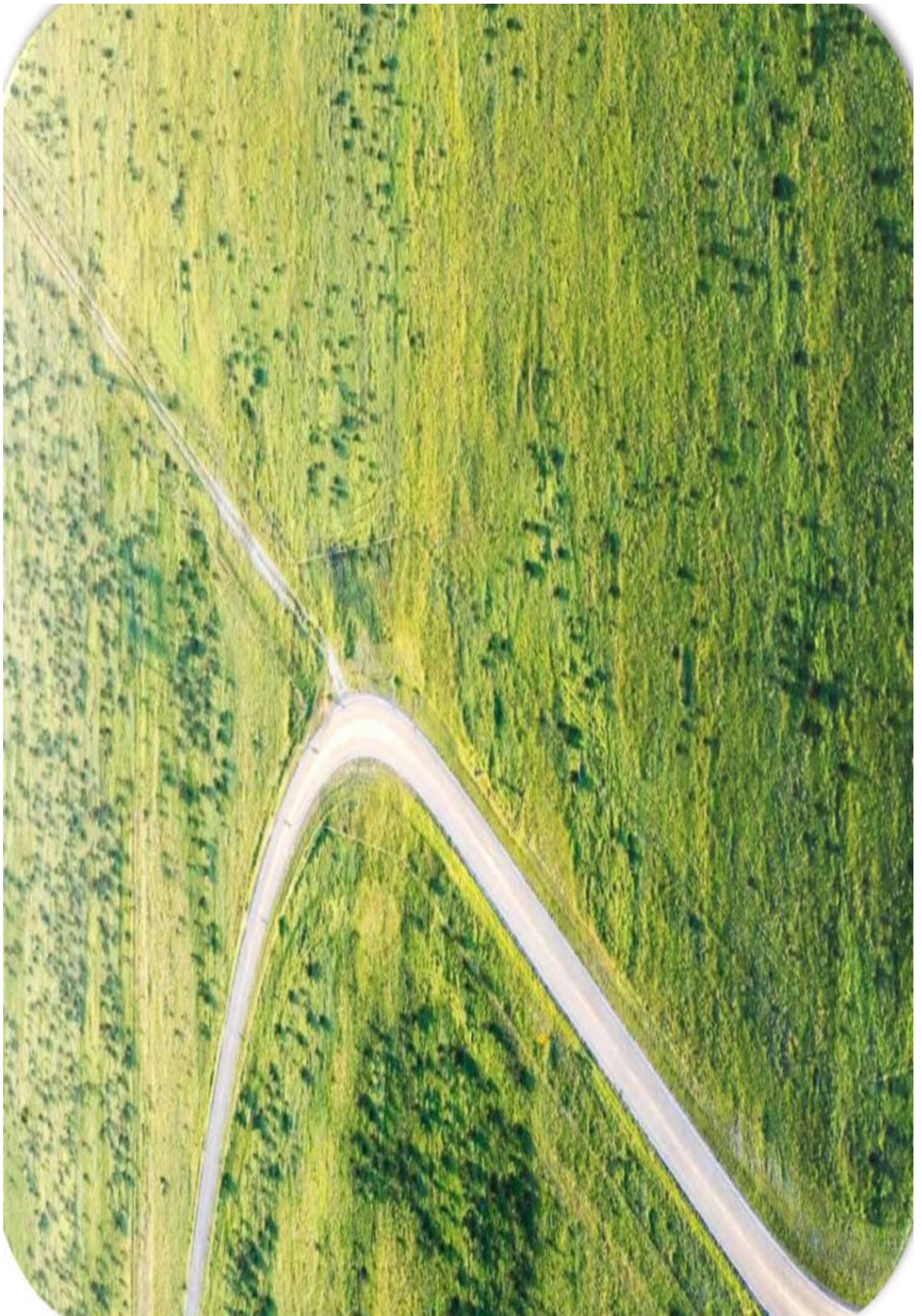![3C-LINK logo — Creative Clever Cool]

3C-OTNS8600 100G Packet Optical Solution

OTN transmission and switching platforms utilizing WDM communications for video, SAN, and data center backups with high-availability

3C-LINK
Creative Clever Cool

OTNS Platform

Scalable Optical Transport
3C-OTNS 8600
Optical Services Transport Platform

Product Highlights

DWDM Integrated on Switch Line card
* High density DWDM solution for Cloud Data Centers
* Cost and performance optimized for Data Center Interconnect (DCI) to transport massive volumes of traffic through metro or long haul networks.
* Ethernet over DWDM: Transparent to Layer2 and Layer3 applications

Wire-speed Encryption
* IEEE 802.1AE MACsec encryption
* 100G Wire Speed encryption on every port Metro and Long Haul Applications
* Full system 10* 100G capacity(40* 25G)
* 40G,25G, 16G,10G, 8G, 2.5G,1G Compatible
* 200km+ amplified reach

Stong Managment
* Web Managment
* SNMP Management

Proven Architecture and technology
* Utilizes industry adopted and deployed 100G
* Best in class switch silicon
* Proven to be the most reliable

Overview

The phenomenal growth in demand for bandwidth, driven by mobile, videostreaming and cloud applications, is driving the need for connecting severalgeographically dispersed data centers to maintain seamless content delivery andprovide application agility. To keep up with the global trend of price reduction forbandwidth, interconnecting these geographically dispersed data centers has to beoperationally simple and economically efficient. Traditional transport infrastructure does not meet the density challenge and is not economically viable for bulk data center interconnect. !

The 3C-LINK 100G DWDM solution is integrated to a OTNS 8600 Series line card offeringhigh-density with un-compromised performance at an efficient cost point. Itutilizes proven coherent optical technology to enable simple, reliable and scalabledata center interconnect solutions for both metro and long haul applications !
One of the major challenges for data center operators is to protect the data frompassive wire tapping, intrusion and other attacks when it leaves the data centerpremise. Most of the existing encryption solutions require additional systems thatare expensive to deploy and manage.

The 3C-LINK launched the OTNS8600 series optical transmission network system, which creatively extends the expansion of the WDM technology from the backbone networks to the metro area or access layer and provides a reliable, flexible and efficient high bandwidth carrying solution for the operators, Broadcast and TV, IDC, finance, government, cloud, massive data and other industries.

RESIDENTIAL, MOBILE BACKHAUL, METRO AGGREGATION

10G SONET/SDH, OTN OR PACKET RINGS

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Scalable Optical Transport
3C-OTNS 8600
Optical Services Transport Platform

3C-OTNS8600II,2U Chassis

1 : Management Card	4 : Power 1 Card
2 : Bussiness Card	5 : GND Card
3 : Fan Card	6 : Power 2 Card

INCREASING BANDWIDTH DEMAND

3C-OTNS8600 withWavelength Division Multiplexing (WDM) features offer a cost-efficient way to expand fiber capacity in access, metro and regional networks using Coarse Wavelength Division Multiplexing (CWDM) and/or Dense Wavelength Division Multiplexing (DWDM). The WDM nodes help keep start-up costs at a minimum and at the same time offer a carrier-class solution with extensive OAM and performance monitoring capabilities for easy and reliable operation and maintenance.

EFFICIENT TRANSPORT

To minimize transport cost and optimize effi ciency in all network areas, the modular architecture of the 3C-OTNS8600 comprises a family of hot-swappable modules to meet network application requirements and make convergence practical.

SUPERIOR NETWORK FLEXIBILITY

The 3C-OTNS8600 supports static and confi gurable photonic components, including different card(OEO, OLP,EDFA) To achieve superior fl exibility service, multiplexing options include innovative add/drop and switching capability.

LONG DISTANCES

DWDM versions of multiplexers can be applied and the line signal amplified using cost-efficient booster and pre-amp lifiers. Using this design, 3C-OTNS8600 can reach up to 200 km on a single span with up to 100G x 10 Gbps DWDM channels

END-TO-END MANAGEMENT

The 3C-OTNS are true carrier-class products that offer full end-to-end management for both traffic provisioning as well as Fault and Performance Management. As both client and line signals are monitored, it is easy to track failures or degradations of the network.
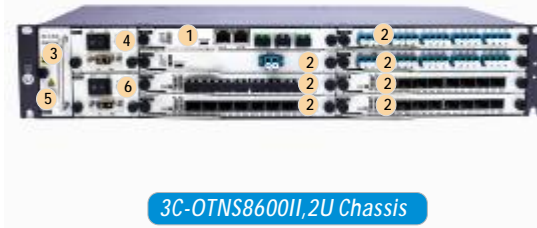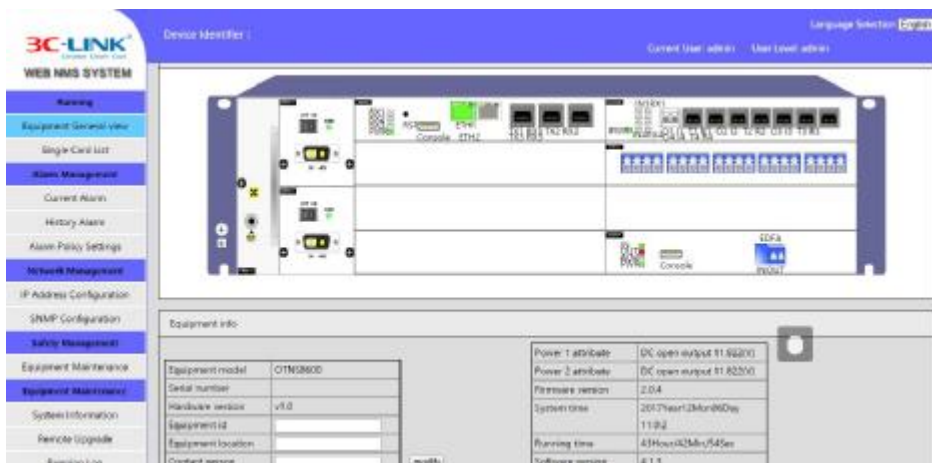
Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

3C-LINK
Creative Clever Cool

Scalable Optical Transport
3C-OTNS 8600
Optical Services Transport Platform

Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

System Card

Chassis and NMS cards:
* 3C-OTNS8600I , 19inch 1U chassis
* 3C-OTNS8600II , 19inch 2U chassis
* 3C-OTNS8600 v , 19inch 5U chassis
* 3C-FAN I , Fan card for OTNS 8600I
* 3C-FAN II , Fan card for OTNS 8600II
* 3C-FAN V , Fan card for OTNS 8600V
* 3C-NCP,Managed card
* 3C-DPU I, DC 48V Power Card for 8600I
* 3C-APU I, AC220V Power Card for 8600I
* 3C-DPU II, DC 48V Power Card for 8600II
* 3C-APU II, AC220V Power Card for 8600II
* 3C-DPU V, DC 48V Power Card for 8600V
* 3C-APU V, AC220V Power Card for 8600V

Optical cards:
* 3C-OTDC:100G service card
* 3C-OTDX:4x10G Any service access card
* 3C-OTDS:4x2.5G Any service access card
* 3C-OTDP:4xpon service access card
* 3C-OTMT:10x10G OTN convergence board
* 3C-OTMX:8x1.25G OTN convergence board
* 3C-SOA:100G SOA Card
* 3C-EDFA:EDFACard
* 3C-OLP: Optical line protection card
* 3C-OBP: Bypass protection card
* 3C-MDU: CWDM/DWDM Card
* 3C-DCF: Dispersion compensation card
* 3C-NCP: Network management card
* 3C-NMS: Network management system

Chassis slots

The 3C-OTNS 8600 Series including three types chassis.
It is standard 19inch chassis.

3C-OTNS8600I (1U)

| SLOT7 | SLOT5 | SLOT1 | SLOT2 |
| | SLOT6 | SLOT3 | SLOT4 |

* Slot7 is FAN Card   * Slot5 ,6 Power Card(AC&DC)
* Slot1 Managed Card(NCP)
* Slot2,3,4 Data Card

3C-OTNS8600II (2U)

SLOT11	SLOT5	SLOT1	SLOT2
		SLOT3	SLOT4
	SLOT5	SLOT5	SLOT6
		SLOT7	SLOT8

* Slot11 is FAN Card   * Slot9 ,10 Power Card(AC&DC)
* Slot1 Managed Card(NCP)
* Slot2-8 Data Card

3C-OTNS8600V (5U)

SLOT19	SLOT1	SLOT2
	SLOT3	SLOT4
	SLOT5	SLOT6
	SLOT7	SLOT8
	SLOT9	SLOT10
	SLOT11	SLOT12
	SLOT13	SLOT14
	SLOT15	SLOT16
	SLOT17	SLOT18

* Slot21 is FAN Card   * Slot17,18Power Card(AC&DC)
* Slot1 Managed Card(NCP)
* Slot2-16 Data Card

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

3rd Management System
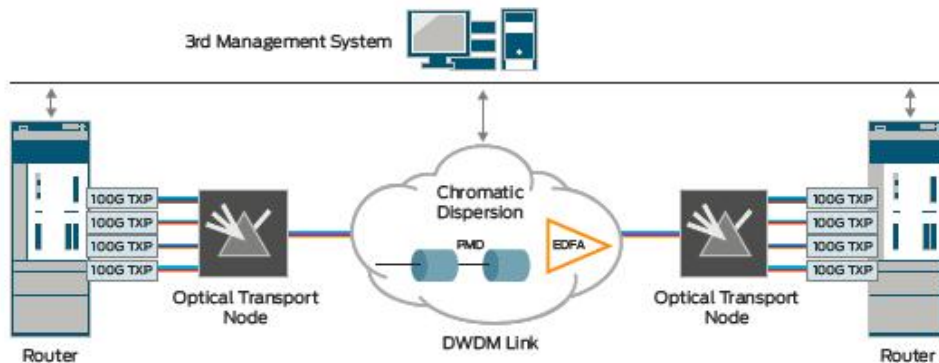
100G TXP
100G TXP
100G TXP
100G TXP

Optical Transport Node

Chromatic Dispersion
PMD   EDFA

Optical Transport Node

100G TXP
100G TXP
100G TXP
100G TXP

Router

DWDM Link

Router

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100G OTDC Card
3C-ONC-OTMQ
For 3C-OTNS-8600 Optical Services Transport Platform

100G OTMQ Card

OTMQ is a single channel 100Gbit/s wavelength conversion card, its main function is to access the 1 100GE, 100G OTN optical signals are converted to 4*25G SFP28 DWDM standard wavelength optical signal with ITU-T G.694.1 recommendations, in order to facilitate the wave coupling element light signalof different wavelength by wavelength division multiplexing, 3C-LINK OPTO is One of the few 100G high speed wave transmission solutions provider.

OTNS System

04

Product Model	3C-ONC-OTMQ
Basic funcation	Support 1CH 100G transparent to 4*25G Standard DWDM Wavelength
Access service type	100G Ethernet or 100G OTN
WDM technology	Support DWDM: C -BAND 100GHZ or 50G HZ(Offer DWDM Module)
3R Technology	100Support 3R function : Re-amplifying, Re-timing, Re-shaping
Network Managment	SNMP and WEB managment
Client -side interface	Support one pluggable QSFP28 Moduel(3C-LINK QSFP28 DAC Cable)
WDM-side interface	100G CFP module or DWDM 4*25G LC interface(3C-LINK Offer DWDM)
Power consumption	20W
MTBF	>100000Hour
Occupted Slot	Occupy 1 slots, applicable 3C-OTNS8600II or 3C-OTNS8660V

3C-LINK
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100G OTDC Card
3C-ONC-OTMQ
For 3C-OTNS-8600 Optical Services Transport Platform

APPLICATION

100G QSFP28 Slot	QSFP28 DAC Cable	100G 3C-ONC-OTMQ CARD		100G 3C-ONC-OTMQ CARD	QSFP28 DAC Cable	100G QSFP28 Slot
		DWDM 4CH DX 3C-ONC-X04DA	Upto 100km	DWDM 4CH DX 3C-ONC-X04DA		
		EDFA BACard 3C-ONC-B2017		EDFA BACard 3C-ONC-B2017		
		EDFA PA Card 3C-ONC-P1625		EDFA PA Card 3C-ONC-P1625		
		3C-OTNS8600		3C-OTNS8600		
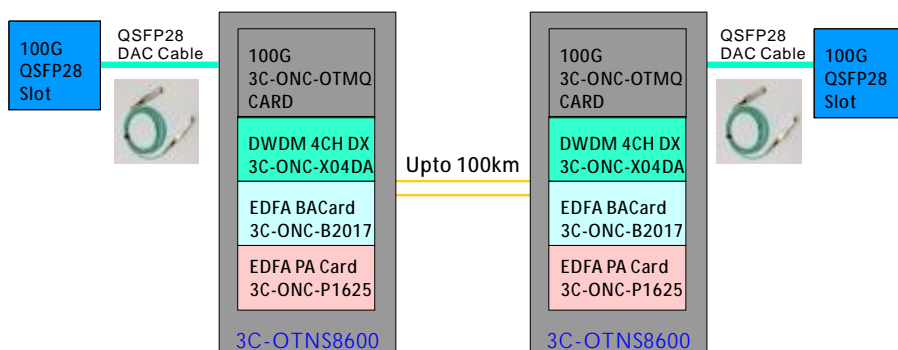
Transmitting 1ch 100G data rate upto 100km
* EDFA PA Card and BA card based on project fact distanceneed or not..
* since OTDC Card need 2 slots , so only support 3C-OTNS8600II or 8600V.

Transmitting 10ch 100G data rate upto 100km
* EDFA PA Card and BA card based on project fact distanceneed or not..
* since OTDC Card need 2 slots , so only support 3C-OTNS8600II or 8600V.
* If in fact have 10CH 100G data, we recommend 2pcs 3C-OTNS8600V.

The 3C-mCloud 6632 supports full line-rate switching at L2 or L3 across 32 x QSFP28 ports that can support 100GE/40GE or 2 x 50GE or 4 x 25GE/10GE via breakout cables.

Remark: 3C-LINK can offer QSFP28 to QSFP28 DAC/AOC Cable

Creative Clever Cool

OTDT: 100G Card

100G OTDT Card
3C-ONC-OTDT
For 3C-OTNS-8600 Optical Services Transport Platform

100G OTDT Card

OTDT is a access single-board for services of 1-channel 100Gbit/s rate launched by 3C-LINK OPTO. it adopts the key advanced technology such as DP-QPSK modulation formats and coherent reception, overcomes the challenge of the high-speed transmission system in the physical transmission effect on the aspects of OSNR requirements, CD tolerance, PMD tolerance and nonlinear, and it provides the transmission network with a solution of large capacity and bandwidth 100G coherent system.

CFP2 Slot   QSFP28 Slot

Client-side   WDM-side

100GE/OTU4   →   QSFP28   ↔   Mapping   ↔   CSFP2 Slot   ←   OTU4

SFP+Slot
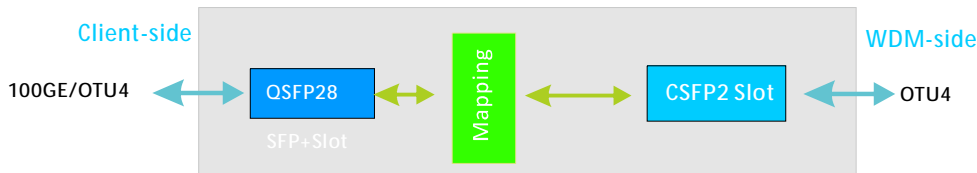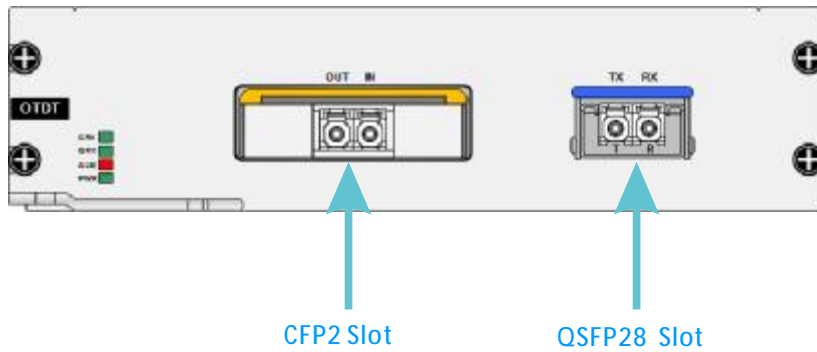
Product Model	3C-ONC-OTDT
Basic funcation	Support 1CH 100G QSFP28 Slot transparent to CFP2 Slot
Access service type	100G Ethernet or 100G OTN
WDM technology	Support DWDM: C-BAND 100GHZ or 50G HZ(Offer DWDM Module)
3R Technology	100Support 3R function : Re-amplifying, Re-timing, Re-shaping
Network Managment	SNMP and WEB managment
Client-side interface	Support one pluggable QSFP28 Moduel(3C-LINK QSFP28 DAC Cable)
WDM-side interface	100G CFP2 module
Power consumption	30W
MTBF	>100000Hour
Occupted Slot	Occupy 2 slots, applicable 3C-OTNS8600II or 3C-OTNS8660V

OTMT: 100G Card

100G OTMT Card
3C-ONC-OTMT
For 3C-OTNS-8600 Optical Services Transport Platform

Applications
- 100G Core Data
- FTTB
- WAN Networks
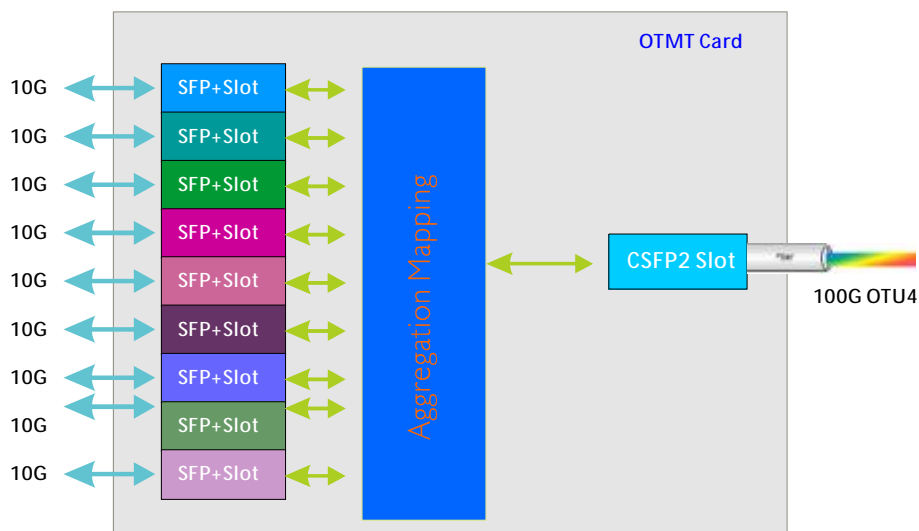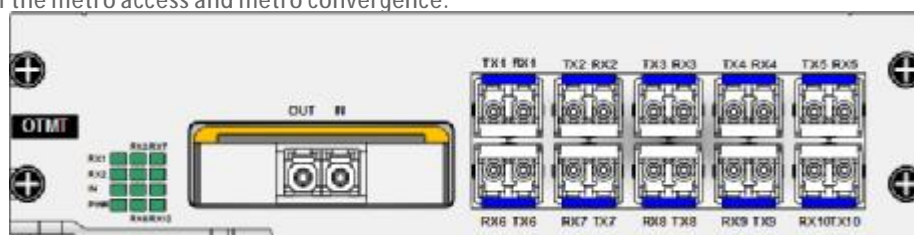- SDH Networks
- CATV Networks
- Telecom
- ISP

100G OTMT Card

OTMT is a 10x10G service convergence single-board launched by 3C-LINK OPTO.; it uses industry-leading chip technology, supports OTN related standards and can converge any 10-channel 10G services into 1-channel 100G services, and then convert them to OTU4 optical signals of a standard DWDM wavelength, and also achieve the inverse process of the above process. It's applicable to the application of the optical transmission network of the metro access and metro convergence.

Features
- Cost effective
- *C*ompact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

Product Model	3C-ONC-OTMT
Basic funcation	Support 1CH 100G CSFP2 Slot to 10-CH 10G SFP+ Slots
Access service type	10G LAN/WAN ,STM64, Oc192, FC8G, OTU2,OTU2e
WDM technology	Support DWDM: C -BAND 100GHZ or 50G HZ(Offer DWDM Module)
3R Technology	100Support 3R function : Re-amplifying, Re-timing, Re-shaping
Network Managment	SNMP and WEB managment
Client -side interface	Support one pluggable CFP2 Module
WDM-side interface	10G SFP+ moudle (3C-LINK Offer DWDM SFP+, CWDM SFP+, SFP+ DAC)
Power consumption	30W
MTBF	>100000Hour
Occupted Slot	Occupy 2 slots, applicable 3C-OTNS8600II or 3C-OTNS8660V

3C-LINK
Creative Clever Cool

2*100G OTDQ Card
3C-ONC-OTDQ
For 3C-OTNS-8600 Optical Services Transport Platform

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

CONVERT Normal Wavelength to CWDM/DWDM Wavelength

3C-ONC-OTDQ Series card main function is convert common
wavelength to the standard CWDM/DWDM wavelength.
And also improve fiber singnal noise when long distance
transmitting.
The 3C-ONC-OTDQ series card support 40G to 100G, Etherent/
SDH/ATM network are availiable. One Card support 8pcs
SFP+ Slots. So that can convert 4channels two-way at
the time or 8channles one way data.
The ONC-OTDQ Card with 4 slots QSFP28 also can be as repeater in the
middle side can expend the fiber distance.

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

Datarate	Max Distance
40G bps	80Km
100G bps	100Km

* This Card support QSFP+ or QSFP28 module transceiver.

OTNS System

08

APPLICATION:
* Convert normal wavelength to DWDM Standard wavelength
* Put in the middle side extend the fiber distance

Client		Line		Client		Line
100G ↔ QSFP28	100G Transponder	QSFP28 ↔ 100G		40G ↔ QSFP+	40G Transponder	QSFP+ ↔ 40G
100G ↔ QSFP28		QSFP28 ↔ 100G		40G ↔ QSFP+		QSFP+ ↔ 40G

2*100G ↔2*WDM   2*40G ↔2*WDM

ORDERING INFORMATION(CARD)

3C-ONC-OTDQ	4 QSFP28 Slots (max support 2 channles two-way 100G OEO)

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4*25G OTDS Card
3C-ONC-OTDE
For 3C-OTNS-8600 Optical Services Transport Platform

CONVERT Normal Wavelength to CWDM/DWDM Wavelength

3C-ONC-OTDE Series card main function is convert common wavelength to the standard CWDM/DWDM wavelength. And also improve fiber singnal noise when long distance transmitting.

The 3C-ONC-OTDE series card support 16G to 32G, Etherent/SDH/ATM network are availiable. One Card support 8pcs SFP Slots. So that can convert 4channels two-way at the time or 8channles one way data.

The ONC-OTDS with 8* SFP28 Slots Card also can be as repea middle side can expend the fiber distance.
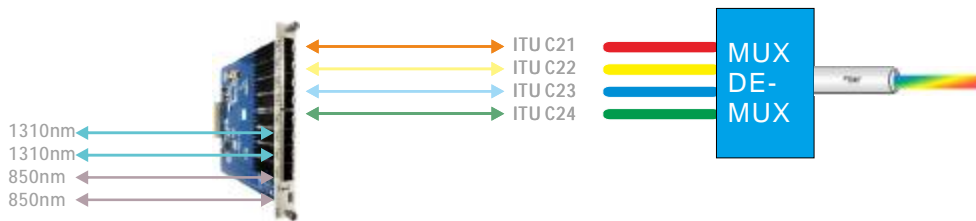
Datarate	Max Distance
16G bps	120Km
25G bps	120Km
32G bps	120Km

* This Card support 16G~32G SFP+ or SFP28 module transceiver.

APPLICATION:

A:Convert normal wavelength to DWDM Standard wavelength

ITU C21
ITU C22
ITU C23
ITU C24

1310nm
1310nm
850nm
850nm

MUX DE-MUX

B:Expend the fiber distance

RouterA

1550nm 80km
1550nm 80km
1550nm 80km
1550nm 80km

1550nm 80km
1550nm 80km
1550nm 80km
1550nm 80km

RouterB

Between RouterA and Router B have 4channels 160Km distance
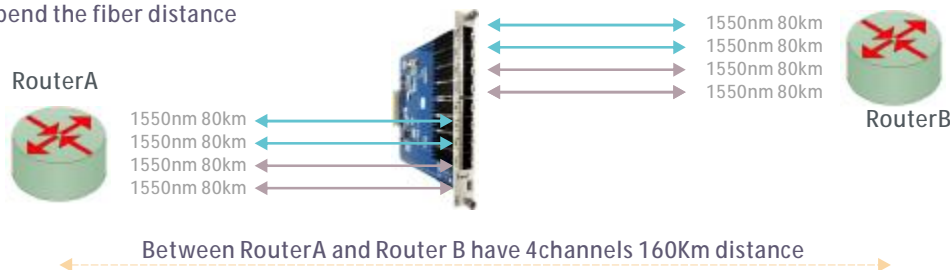
ORDERING INFORMATION(CARD)

3C-ONC-OTDE	8 SFP Slots (max support 4 channles two-way 16G~32G OEO)

3C-LINK
Creative Clever Cool

4*10G OTDX Card
3C-ONC-OTDX
For 3C-OTNS-8600 Optical Services Transport Platform

CONVERT Normal Wavelength to CWDM/DWDM Wavelength

3C-ONC-OTDX Series card main function is convert common wavelength to the standard CWDM/DWDM wavelength. And also improve fiber singnal noise when long distance transmitting.

The 3C-ONC-OTDX series card support 155M to 10G, Etherer SDH/ATM network are availiable. One Card support 8pcs SFP+ Slots. So that can convert 4channels two-way at the time or 8channles one way data.

The ONC-OTDX Card also can be as repeater in the middle side can expend the fiber distance.

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

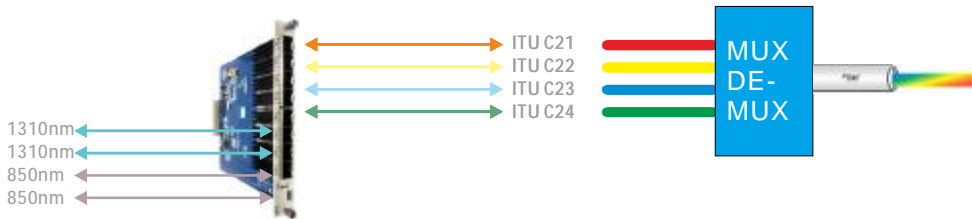| Datarate	Max Distance
9.95 to 11.3G bps	80Km
2.5G bps	120Km
1.25G bps	120Km
622M bps	120Km
155Mbps	120Km

* This Card support SFP & SFP+ module transceiver.

APPLICATION:

A:Convert normal wavelength to DWDM Standard wavelength

ITU C21
ITU C22
ITU C23
ITU C24

MUX DE-MUX

1310nm
1310nm
850nm
850nm

B:Expend the fiber distance

RouterA

1550nm 80km
1550nm 80km
1550nm 80km
1550nm 80km

1550nm 80km
1550nm 80km
1550nm 80km
1550nm 80km
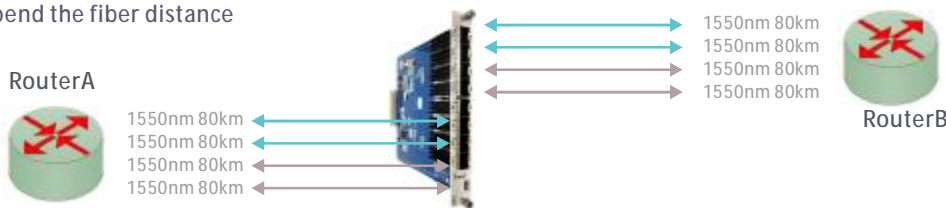
RouterB

Between RouterA and Router B have 4channels 160Km distance

ORDERING INFORMATION(CARD)

3C-ONC-OTDX	8 SFP+ Slots (max support 4 channles two-way 10G OEO)

OTNS System

O

3C-LINK
Creative Clever Cool

4*2.5G OTDS Card
3C-ONC-OTDS
For 3C-OTNS-8600 Optical Services Transport Platform

CONVERT Normal Wavelength to CWDM/DWDM Wavelength

3C-ONC-OTDS Series card main function is convert common wavelength to the standard CWDM/DWDM wavelength. And also improve fiber singnal noise when long distance transmitting.

The 3C-ONC-OTDS series card support 42M to 2.5G, Etheren SDH/ATM network are availiable. One Card support 8pcs SFP Slots. So that can convert 4channels two-way at the time or 8channles one way data.

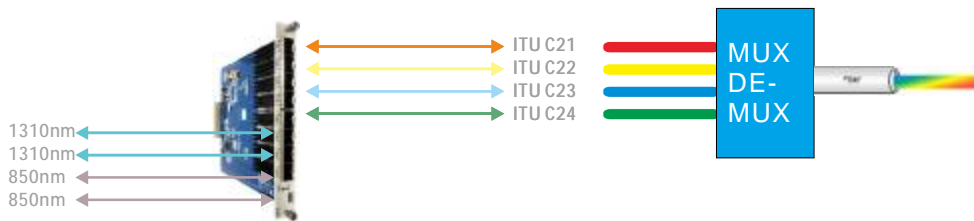The ONC-OTDS Card also can be as repeater in the middle side can expend the fiber distance.

Datarate	Max Distance
2.5G/2.67 bps	120Km
1.25G bps	120Km
622M bps	120Km
155Mbps	120Km
42Mbps	120Km

* This Card support 42M ~ 2.67G SFP module transceiver.

APPLICATION:

A:Convert normal wavelength to DWDM Standard wavelength

ITU C21
ITU C22
ITU C23
ITU C24

MUX DE-MUX

1310nm
1310nm
850nm
850nm

B:Expend the fiber distance

RouterA

1550nm 80km
1550nm 80km
1550nm 80km
1550nm 80km

1550nm 80km
1550nm 80km
1550nm 80km
1550nm 80km

RouterB

Between RouterA and Router B have 4channels 160Km distance
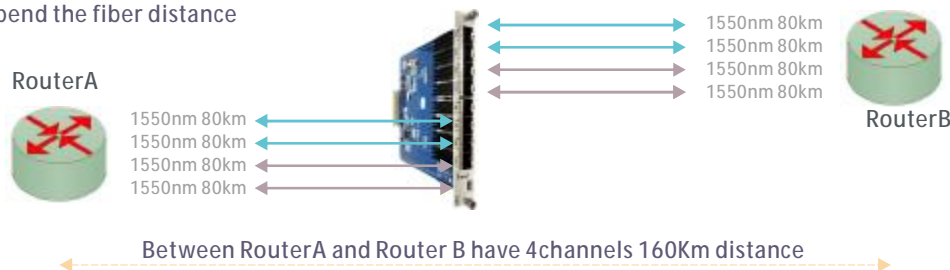
ORDERING INFORMATION(CARD)

3C-ONC-OTDS	8 SFP Slots (max support 4 channles two-way 42M~2.5GG OEO)

3C-LINK

Creative Clever Cool

8*1.25G OTDX Card
3C-ONC-OTMX
For 3C-OTNS-8600 Optical Services Transport Platform

Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

10G OTMX Card

3C-LINK 10G TMUX card can convert 10G data rate
to 8*1.25G or 4*2.5G data rate.
It provides eight standardSFP slot for gathering
customer signal.
It can real time monitor the performance of each
client port and statistic by using time-division
multiplexing technology.GE port is independent on each other.
Support front error correction FEC function,
Enhance the equipment performance,
Support customer side and line side loopback.
.

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

OTNS System

2
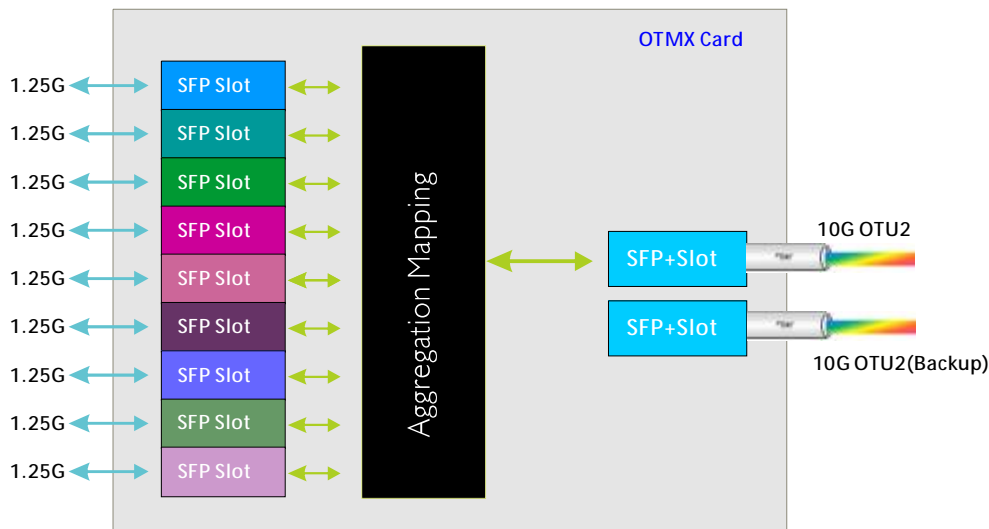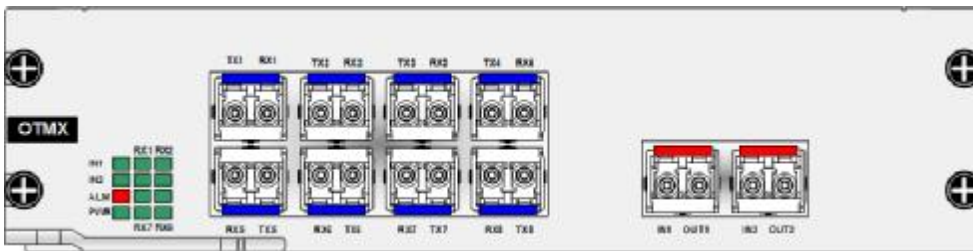
Type application:

the max capacity is 40CH DWDM 10G Card, each 10G converter 8*1.25G ETH Data, so one pair
fiber can transmitting 320CH 1.25G Datarate by 3C-LINK OTN8600 series system , the max
distance can reach 200km. If in the middle can add our Line-EDFA, the max distance can reach
1000km.

ORDERING INFORMATION(CARD)

3C-ONC-OTMX	10G SFP+ to 8 GE SFP Slot card or 10G SFP+ to 4*2.5G SFP Slot card

3C-LINK
Creative Clever Cool

4*PON OTDP Card
3C-ONC-OTDP
For 3C-OTNS-8600 Optical Services Transport Platform

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

CONVERT G/EPON Normal Wavelength to CWDM/DWDM Wavelength

3C-ONC- OTDP is a 4-channel PON (EPON or GPON) service access card launched by 3C-LINK OPTO ; its main function is to finish the 3R regeneration of any 4-channel PON signal to be accessed, and then converts them to optical signals of a standard DWDM wavelength or standard CWDM wavelength, so that the multiplexing unit can conduct WDM for optical signals of different wavelengths and also achieve the inverse process of the above process. It's applicable to the application scene of PON over WDM..
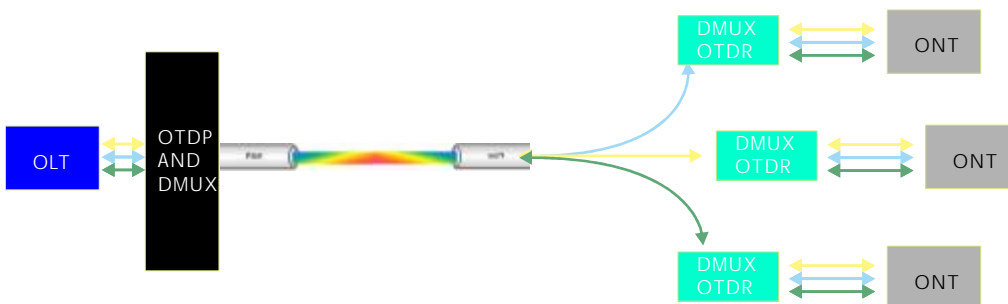
Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment
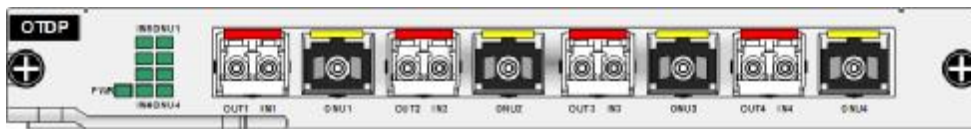
APPLICATION:

A:Convert PON normal wavelength to DWDM Standard wavelength

B:Expend PON ports over one fiber and Expend the PON transmitting distance

* Use 3C-LINK DWDM-PON Technology, one fiber can transmitting 40ch PON Data. Each GPON normally can support 1* 64 split, so one fiber can afford 40*64=2560 enduser.

ORDERING INFORMATION(CARD)

3C-ONC-OTDP	PON OEO Card, one side is Link OLT/ONU, one side link DWDM/CWDM

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CWDM CARD
# 3C-ONC-CWDM
For 3C-OTNS Optical Services Transport Platform

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

OTNS System

4

INCREASING BANDWIDTH DEMAND

3C-OTNS withWavelength Division Multiplexing (WDM) features offer a cost-efficient way to expand fiber capacity in access, metro and regional networks using Coarse Wavelength Division Multiplexing (CWDM) and/or Dense Wavelength Division Multiplexing (DWDM). The WDM nodes help keep start-up costs at a minimum and at the same time offer a carrier-class solution with extensive OAM and performance monitoring capabilities for easy and reliable operation and maintenance.

Parameter	MUX / DeMUX
Channel Wavelength (nm)	1270 / 1290 / ˇ 1590/ 1610
Channel Passband (nm)	¦c ˇ 7.5
Channel Spacing (nm)	20nm
Channel Passband (@-0.5dB bandwidth (nm)	>0.22
Insertion Loss (dB)	< 4.0 (When 16CH) <5.4(32CH to 44CH)
Channel Ripple (dB)	0.3
Isolation (dB) Adjacent	>30
Isolation (dB) Not-Adjacent	>40
Inertion Loss Temperature Sensitivity (dB/ˇ)	<0.005
Wavelength Temperature Shifting (nm/ˇ)	<0.002
Inertion Loss Temperature Sensitivity (dB/ˇ)	<0.005
Polarization Dependent Loss (dB)	<0.15
Polarization Mode Dispersion (dB)	<0.1
Directivity (dB)	>50
Return Loss (dB⌐	>45
Maximum Power Handling (mW)	300
Operating Temperature (ˇ)	-5~+75
Storage Temperature (ˇ)	-40~+85
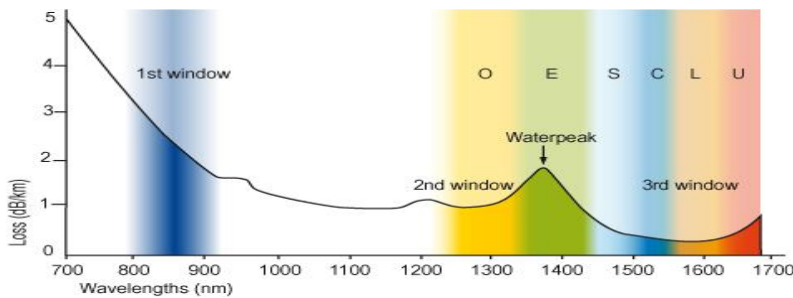
*If the fiber is G.652D, we recommend not use 1390/1410nm, since water peak will increse the Insert Loss

ORDER INFORMATION(CARD)

3C-ONC-X04CA	4 ch. CWDM Mux and Demux,1470-1530, duplex LC/UPC
3C-ONC-X04CB	4 ch. CWDM Mux and Demux,1550-1610, duplex LC/UPC
3C-ONC-X08CA	8 ch. CWDM Mux and Demux,1310-1450, duplex LC/UPC
3C-ONC-X08CB	8 ch. CWDM Mux and Demux,1470-1610, duplex LC/UPC
3C-ONC-M16C	16 ch. CWDM Mux , 1310-1610, Simplex LC/UPC
3C-ONC-D16C	16 ch. CWDM DeMux , 1310-1610, Simplex LC/UPC
3C-ONC-M18C	18 ch. CWDM Mux , 1270-1610, Simplex LC/UPC
3C-ONC-D18C	18 ch. CWDM DeMux , 1270-1610, Simplex LC/UPC

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DWDM CARD

3C-ONC-DWDM(2-16CH)
For 3C-OTNS Optical Services Transport Platform

INCREASING BANDWIDTH DEMAND

3C-OTNS withWavelength Division Multiplexing (WDM) features offer a cost-efficient way to expand fiber capacity in access, metro and regional networks using Dense Wavelength Division Multiplexing (DWDM).

DWDM adopt DWDM plate wavelength technology normally from2ch to 16ch. More than 16ch will be adopt AWG technology.

The WDM nodes help keep start-up costs at a minimum and at the same time offer a carrier-class solution with extensive OAM and performance monitoring capabilities for easy and reliable operation and maintenance.

Parameter	MUX	DeMUX
Channel Wavelength (nm)	ITU 100GHZ Grid	
Center wavelength Accuracy (nm)	ˇ0.05	
Channel Spacing (nm)	100(0.8nm)	
Channel Passband (@-0.5dB bandwidth (nm)	>0.22	
Insertion Loss (dB)	< 1.0(2ch) <2.0(4ch) <2.8(8ch) <5.2(16ch)	
Channel Ripple (dB)	0.3	
Isolation (dB) Adjacent	>30	
Isolation (dB) Not-Adjacent	>45	
Inertion Loss Temperature Sensitivity (dB/ˇ)	<0.005	
Wavelength Temperature Shifting (nm/ˇ)	<0.002	
Inertion Loss Temperature Sensitivity (dB/ˇ)	<0.005	
Polarization Dependent Loss (dB)	<0.15	
Polarization Mode Dispersion (dB)	<0.1	
Directivity (dB)	>50	
Return Loss (dBȽ	>45	
Maximum Power Handling (mW)	300	
Operating Temperature (ˇ)	-5~+75	
Storage Temperature (ˇ)	-40~+85	

ITU C21		ITU C21
ITU C22	MUX ────── DEMUX	ITU C22
ITU C23		ITU C23
ITU C24		ITU C24
...		...

ORDER INFORMATION (CARD)

3C-ONC-X08DA	8 ch. DWDM Mux and Demux,C21-C28, duplex LC/UPC
3C-ONC-X08DB	8 ch. DWDM Mux and Demux,C29-C36, duplex LC/UPC
3C-ONC-X08DC	8 ch. DWDM Mux and Demux,C45-C52, duplex LC/UPC
3C-ONC-X08DD	8 ch. DWDM Mux and Demux,C53-C60, duplex LC/UPC
3C-ONC-M16DA	16 ch. DWDM Mux or Demux,C21-C36, Simplex MUX LC/UPC
3C-ONC-D16DA	16 ch. DWDM Mux or Demux,C21-C36, Simplex DeMUX LC/UPC
3C-ONC-M16DB	16 ch. DWDM Mux or Demux,C45-C60, Simplex MUX LC/UPC
3C-ONC-M16DB	16 ch. DWDM Mux or Demux,C45-C60, Simplex DeMUX LC/UPC
3C-ONC-B08DA	8 ch. DWDM Mux / Demux,C21-C27 OM, C53-C60OD, SX,LC/UPC
3C-ONC-B08DB	8 ch. DWDM Mux / Demux,C53-C60 OM, C21-C28 OD, SX,LC/UPC

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DWDM AWG CARD
3C-ONC-AWG
For 3C-OTNS Optical Services Transport Platform

Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

100GHz ITU grid. 16-44Channels Wavelengths

3C-LINK has specialized on optical wavelength division multiplexing from C17 to C60, 0.8nm spaced. Any channels up to 44 channels are available, No external power supply is needed. We offer various housing types for DWDM Mux Demux, flexible plug-and-play module can plug into 3C-OTNS8600-1U/2U/5U Chassis Default Connector is LC/UPC. Different external functions could be combined, like cascade several muxes, by special service port with monitor/expansion/1310nm port.

EFFICIENT UTILIZATION OF FIBERS

The AWG technology enables operators to expand the capacity of their existing fiber infrastructure in a smooth and cost-efficient way. This is especially beneficial for operators leasing fibers from third parties or those with network elements that cannot expand to higher capacity cost-efficiently. Leasing additional fibers or inducing more network elements may be much more costly than adding just another wavelength to the existing fibers.

PARAMETER

Parameter	MUX	DeMUX
Channel Wavelength (nm)	ITU 100GHZ Grid	
Center wavelength Accuracy (nm)	ˇ0.05	
Channel Spacing (nm)	100(0.8nm)	
Channel Passband (@-0.5dB bandwidth (nm)	>0.22	
Insertion Loss (dB)	< 4.0 (When 16CH)	<5.4(32CH to 44CH)
Channel Ripple (dB)	0.3	
Isolation (dB) Adjacent	>30	
Isolation (dB) Not-Adjacent	>40	
Inertion Loss Temperature Sensitivity (dB/ˇ)	<0.005	
Wavelength Temperature Shifting (nm/ˇ)	<0.002	
Inertion Loss Temperature Sensitivity (dB/ˇ)	<0.005	
Polarization Dependent Loss (dB)	<0.15	
Polarization Mode Dispersion (dB)	<0.1	
Directivity (dB)	>50	
Return Loss (dBℓ	>45	
Maximum Power Handling (mW)	300	
Operating Temperature (ˇ)	-5~+75	
Storage Temperature (ˇ)	-40~+85	

ORDER INFORMATION(CARD)

3C-ONC-M40	40 ch. DWDM Mux , 100GHz, C21-C60, Simplex LC/UPC
3C-ONC-D40	40 ch. DWDM DeMux , 100GHz, C21-C60, Simplex LC/UPC

3C-LINK
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Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

EDFA CARD
3C-ONC-P/L/B
For 3C-OTNS8600 Optical Services Transport Platform

DWDM Full Band EDFA

3C-LINK LA/PA/BA series are specially designed for DWDM transmission system. And can be integrated into EDFA card or sub rack according to customer application requirements.
* High output optical power with low noise figure
* Wide operating wavelength range
* Card modole size
* Low power consumption

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

EFFICIENT UTILIZATION OF FIBERS

3c-link EDFA adopting optimal design of optical path, it can amplify the C-Band signal with or w/o middle stage access (MSA), at fixed gain or variable gain, which brings great flexibility for the network application. Besides, for adopting high quality GFF and reasonable design of optical path, it achieves very good gain flatness and very low noise figure. Optical supervisory channel (OSC) is optional function integrated in the rack. It can be dropped /added outside, or bypass internal, or amplified by OSC OEO module. The EDFA has the world's top class pump laser and erbium-doped optical fiber. Perfect AGC, APC and ACC control, excellent design in ventilation and heat-dissipation ensure the long life and high reliable work of pump laser. The laser will switch off automatically if optical power is missing.

PARAMETER

Parameter	Min	Typic	Max
Wavelength(nm)	1529	1550	1564
Saturation Output Power(dBm)	-	-	20
Input Power(dBm)	-35	-	+6
Gain(dB)	-	20	33
Gain Flatness(dB)	-	1	-
Noise Figure(dB)	-	4.5	6
Gain ripple(dB)	-	-	+/-0.75
Optical Isolation at the output /Output(dB)	30	-	-
Return Loss(dB)	-	-	-45
PMD(ps)	-	-	0.5
PGD(dB)	-	-	0.3
Operating Temperature (˚)	-5	-	+65
Voltage(V)		220VAC/48VDC	

ORDER INFORMATION CARD

3C-ONC-	TYPE	Output Power(dBm)	Gain(dB)	VOA
	B	13=+17dBm	10=10	NV: With VOA
	L	17=+17dBm	20=20	N/A: Without
	P	20=+20dBm	33=33	

3C-ONC-B2017NV: Bosster Card, the Max power is + 20dBm, the Max Gain is 17dB,With VOA
3C-ONC-L2025N: Line Card, the max power is + 20dBm, The max Gain is 25dB
3C-ONC-P1626N: Pre Card, The max power out is +16dBm, the max Gain is 26dB

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EDFA CARD
3C-ONC-P/L/B
For 3C-OTNS8600 Optical Services Transport Platform

Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
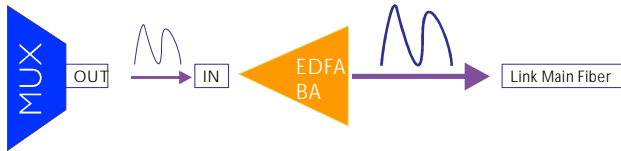- High Stability
- Strong managment

Convenience design managed

3C-LINK 3C-ONC-P/L/B EDFA Card the managment have two configuation.
A: You can choice the Gain Power. For example: the EDFA card max Gain is 25dB. And you configuation range is 0-25dB, if you set is 28dB gain. When input is -10dBm, after EDFA is 18dBm.
B: you can choice the power output. For example: the EDFA card max output is 30dBm, you can set range is 30dBm-Gain to 30dBm any vaule. For example: you can set 20dBm output, no matter input change, the output still keep the 20dBm output.
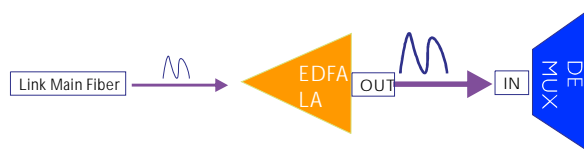
Three type card avaiable
BA Card: Normal near MUX side, Use increae the TX power output

MUX — OUT → IN — EDFA BA → Link Main Fiber

LA Card: normal stay in the middle side.

MUX — Link Main Fiber → EDFA LA → Link Main Fiber — DE MUX
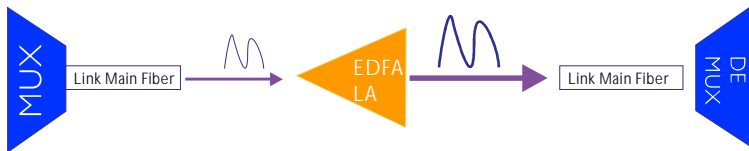
PA Card: Normal near DEMUX side, Use increase the RX SEN.

Link Main Fiber → EDFA LA — OUT → IN — DE MUX

Parameter	BA Card	LA Card	PA Card
Wavelength(nm)	1528~1568		
Saturation Output Power(dBm)	+3	-5	-10
MaxInput Power(dBm)	+20	+20	+17
Gain(dB)	17	25	30
Input Power (dB)	- 10	-30	-34

Sometime , we will meet the input power is very higher, more the saturation power , so we have another card can offer VOA . EVOA range is 1.5dB ~ 21dB, can set by our managment.

VOA
Console   VI   VOUT

EDFA
VI   VOUT

OTNS System

8

3C-LINK
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100G Semiconductor Optical Aamplification
3C-ONC-SOA
For 3C-OTNS8600 Optical Services Transport Platform

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

1260~1360nm Optical Amplify

3C-LINK SOA is an O-band semiconductor optical
amplification board launched by 3C-LINK OPTO;
its main function is to amplify the optical signal
within the range of 1260~1360nm, with the maximum
rate support of 160Gb/s. It has characteristics such as
stable output power, low output noise and low
polarization dependent gain.
The single-board supports the access to
2-channel independent optical signals.
It' suitable for the amplification for 40G or 100G
small power signals in the construction of security system.

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment
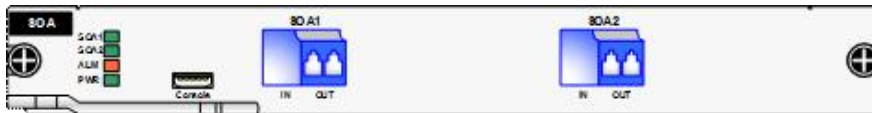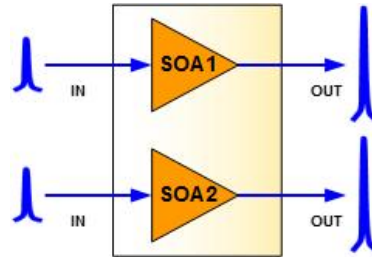
PARAMETER

Parameter	Min	Typic	Max
Wavelength(nm) @ 40G	1260		1340
Wavelength(nm) @ 40G	1290		1320
Input Power(dBm)	-20	-	-10
Gain(dB)	-	14	-
Saturated output power (dBm)		10	-
Noise Figure(dB)	-	7.5	-
Power consumption(W)		20	-
PGD(dB)	-	-	0.3
Operating Temperature (˚)	-5	-	+65
Voltage(V)		220VAC/48VDC	

-

0.5

ORDER INFORMATION CARD

3C-ONC-SOA	40G/100G Semiconductor Optical Aamplification Card, LC/UPC

3C-LINK
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Optical line Protection Board Card
3C-ONC-OLP
## For 3C-OTNS8600 Optical Services Transport Platform

Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

Optical Line Protection Board Card

3C-LINK OLP is a optical wavelength/line protection board launched by 3c-link OptoCo.,Ltd. ;
its main function is to perform a real-time monitoring on the state of the signals in the main and standby fiber core optical path. In the event that the fiber core is blocked or degraded in performance, it can implement the secure rearrangement automatically in the main and standby fiber core, so as to guarantee optical signals in the system line to recover quickly.OLP technology is to complete the routing switch operation in optical layer. The optical layer protection has the incomparable advantages over the protection of upper services, and it is the best solution to provide the user with an uninterrupted communication.
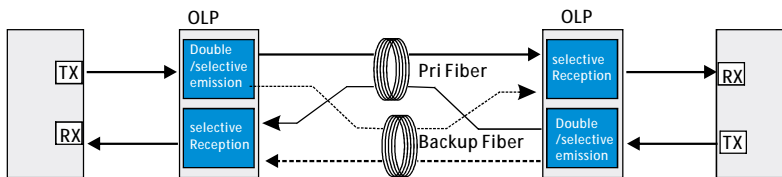
Parameter	Specifications	
Mode	1+1	1:1
Operating Wavelength(nm)	1260nm~1610nm	1260nm~1610nm
Insertion Loss(dB)	TX<3.5 , RX<0.8	TX<0.8,RX<0.8
Switch speed(ms)	<35	<15
Monitoring optical power range(dBm)	+23 ~-50	
Monitoring optical power accuracy(dB)	+/- 0.25	
Optical power resolution(dB)	+/- 0.01	
PDL(dB)	<0.05	
WDL(dB)	<0.1	
Consumption(W)	<3	

ORDER INFORMATION CARD

3C-ONC-OLP 1+1	OLP Card, TX is 1:2 Splitter, RX is optical switch Card, LC/UPC
3C-ONC-OLP 1:1	OLP Card, TX is optical switch, RX is optical switch Card, LC/UPC

OTNS System

3C-LINK
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Bypass Protection Board Board Card
3C-ONC-OBP
For 3C-OTNS8600 Optical Services Transport Platform

Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
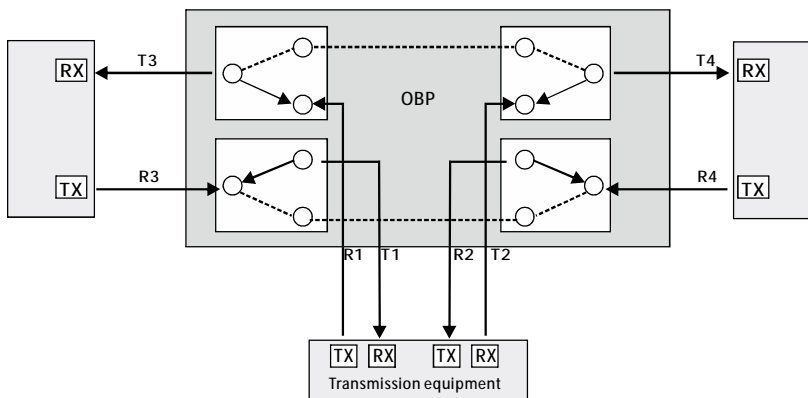- CATV Networks
- Telecom
- ISP

Bypass Protection Board Card

OBP is an optical bypass protection board launched by3C-LINK Opto Co.,Ltd. ;
OBP is a kind of intelligent optical path switching system, which belongs to the equipment
at the physical layer and applies to pure optical network environment. It can automatically
identify the power supply state and optical signal output state of the network nodes.
When the local optical equipment encounters malfunction (including power supply breakdown,
hardware or software failure, etc.), it can instantly switch to the bypass optical path. In this way，
the communications line will bypass the local devices (i. e. , the fault node), thus avoiding full
blocking obstacle due to the malfunction node, so as to ensure system connection to be normal.

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

Parameter	Specifications	
Mode	1+1	1:1
Operating Wavelength(nm)	1310+/-50	1550+/-50
Insertion Loss(dB)	TX<1.2, RX<1.2	TX<3.8,RX<1.2
Switch speed(ms)	<35	<15
Monitoring optical power range(dBm)	+23 ~-50	
Monitoring optical power accuracy(dB)	+/- 0.25	
Optical power resolution(dB)	+/- 0.01	
PDL(dB)	<0.05	
WDL(dB)	<0.1	
Consumption(W)	<3	

Optical Bypass Protection Equipment

3C-LINK Optical by-pass protection system is a
kind of intelligent optical switch system which
can bypass fault node in optical transmission
network to avoid breakdown of whole network
communication. It can automatically switch by
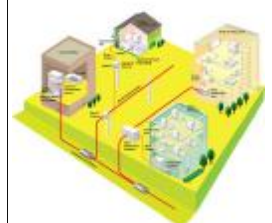detecting the nodes optical power supply or
signal failure

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DCF CARD
3C-ONC-DCF
For 3C-OTNS8600 Optical Services Transport Platform

Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

DCF Card

3C-LINK DCF model is a negative dispersion optical fiber launched 3c-Link Opto Co,.Ltd , which is a new type of single mode optical fiber designed for presently laid G.652& G.655 standard single-mode optical fiber; the dispersion of G.652 optical fiber in the vicinity of 1550nm wavelength is positive (17-20) ps/nm (km), and the dispersion of G.655 standard optical fiber in the vicinity of 1550nm wavelength is positive (4-6) ps/nm (km), with a positive dispersion slope. So we need to add dispersion compensation fiber with negative dispersion into the optical fiber then conduct the dispersion compensation and make sure that the total dispersion of the whole optical fiber links is near zero, so as to realize high speed, large capacity and long distance communication.

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

Dispersion Compensation Principle

Dispersion is one of the transmission properties of the optical fiber, and the optical pulse signal will be broadened in time after transmission in the optical fiber for a distance, which produces intersymbol interference, thus increasing the error rate and affecting the quality of communication.
* The higher the data rate is, more easily the intersymbol interference will present
* The longer the transmission distance is, more easily the intersymbol interference will present
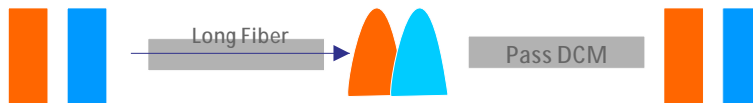
Parameter	DCF20A Card	DCF40A Card	DCF60A Card
G.652 compensation length(Km)	20	40	60
1545nm wavelength dispersion(ps/nm)	340+-20	670+-30	1000+-40
Insertion loss(dB)	3.6	4.6	6.8
PMD(ps)	0.6	0.9	1.0
Input Power (dB)	0	0	0

ORDER INFORMATION CARD

3C-ONC-DCF20A	DCM Card,20km Card, LC/UPC
3C-ONC-DCF40A	DCM Card,40km Card, LC/UPC
3C-ONC-DCF60A	DCM Card,60km Card, LC/UPC
3C-ONC-DCF80A	DCM Card,80km Card, LC/UPC
3C-ONC-DCF100A	DCM Card,100km Card, LC/UPC

OTNS System

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Network Management Card
3C-ONC-NCP
For 3C-OTNS8600 Optical Services Transport Platform

Applications

- FTTC
- FTTB
- WAN Networks
- SDH Networks
- CATV Networks
- Telecom
- ISP

Features

- Cost effective
- Compact platform
- Flexible Deployment
- SNMP Funcation
- High Reliability
- High Stability
- Strong managment

Network Management Card

NCP is a network management function module launched by 3C-LINK Opto Co. , Ltd.
which is specially designed for OTNS 8600 series products; its main function is to provide
interfaces for equipment and network management systems. The module, together with the
OTNS8600 series NMS network management system, completes each single-board management
and transmission of various maintenance and management signal for each network element,
realize the real-time monitoring, maintenance and management for equipment network
elements and the whole synchronous equipment network, thus offering a good solution for e
quipment monitoring.
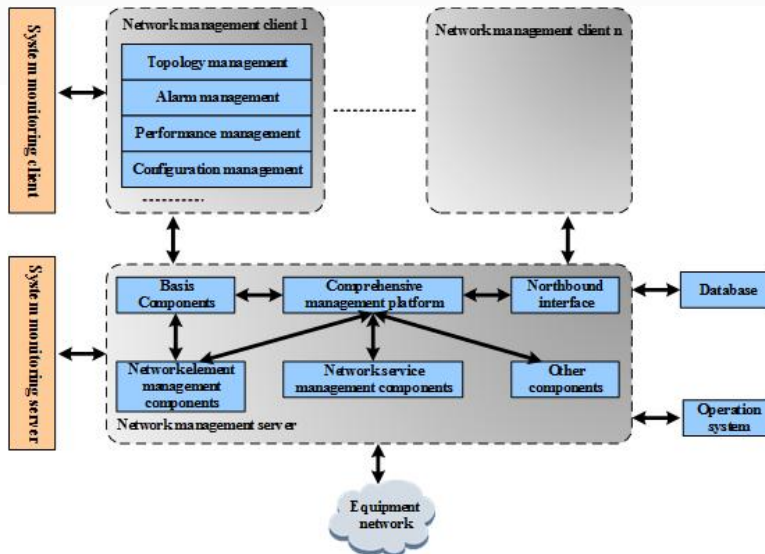
Product features
* Adopt the high speed ARM processor, provide the powerful data processing ability,
  collect state information, alarm events and performance parameters of all single-board
  functional modules, and conduct transformation, processing and storage, and also transmit
  the control and management information to other each functional modules of the equipment
  at the same time;
* Provide a Console interface, support simulation terminal operation;
* Provide 2 SNMP interfaces, support graphical SNMP support based on IP modes;
* Provide 3 SFP optical transceiver interfaces, support equipment in-band management,
  realize processing of 3 optical monitoring channels;
* Network management module supports hot plug, and it also does not affect the normal
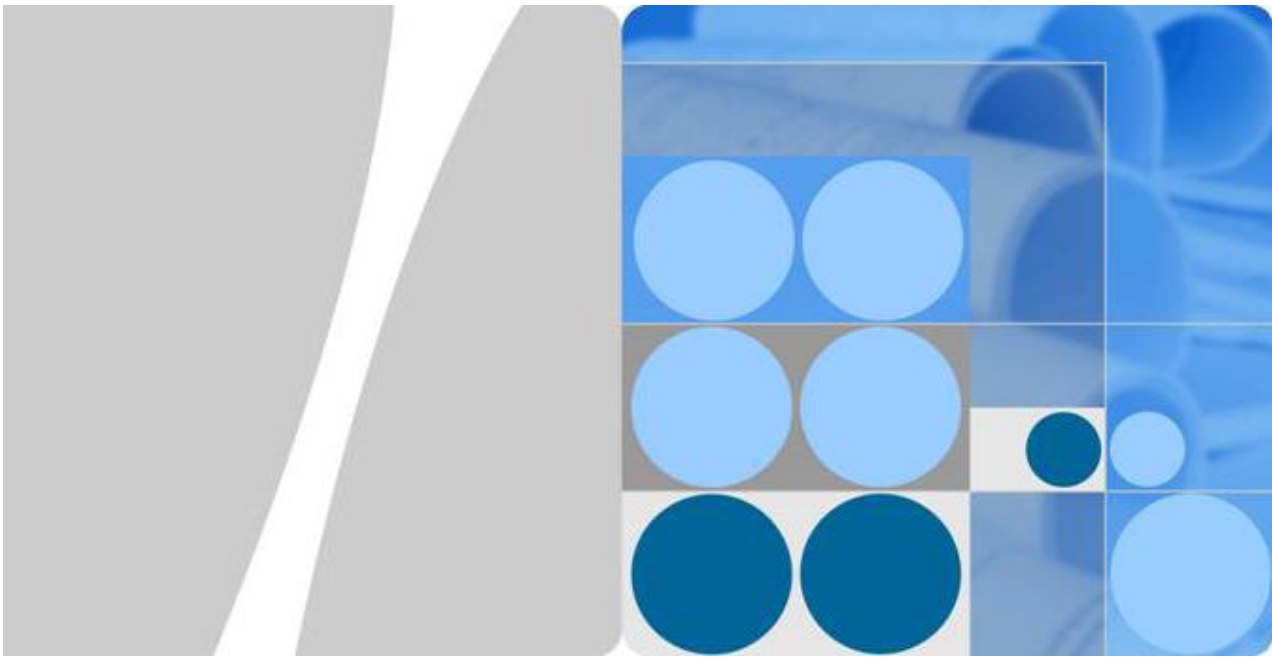 working of the current service module upon the failure.