

# Huawei OptiX OSN 7500 II and Boards Datasheet



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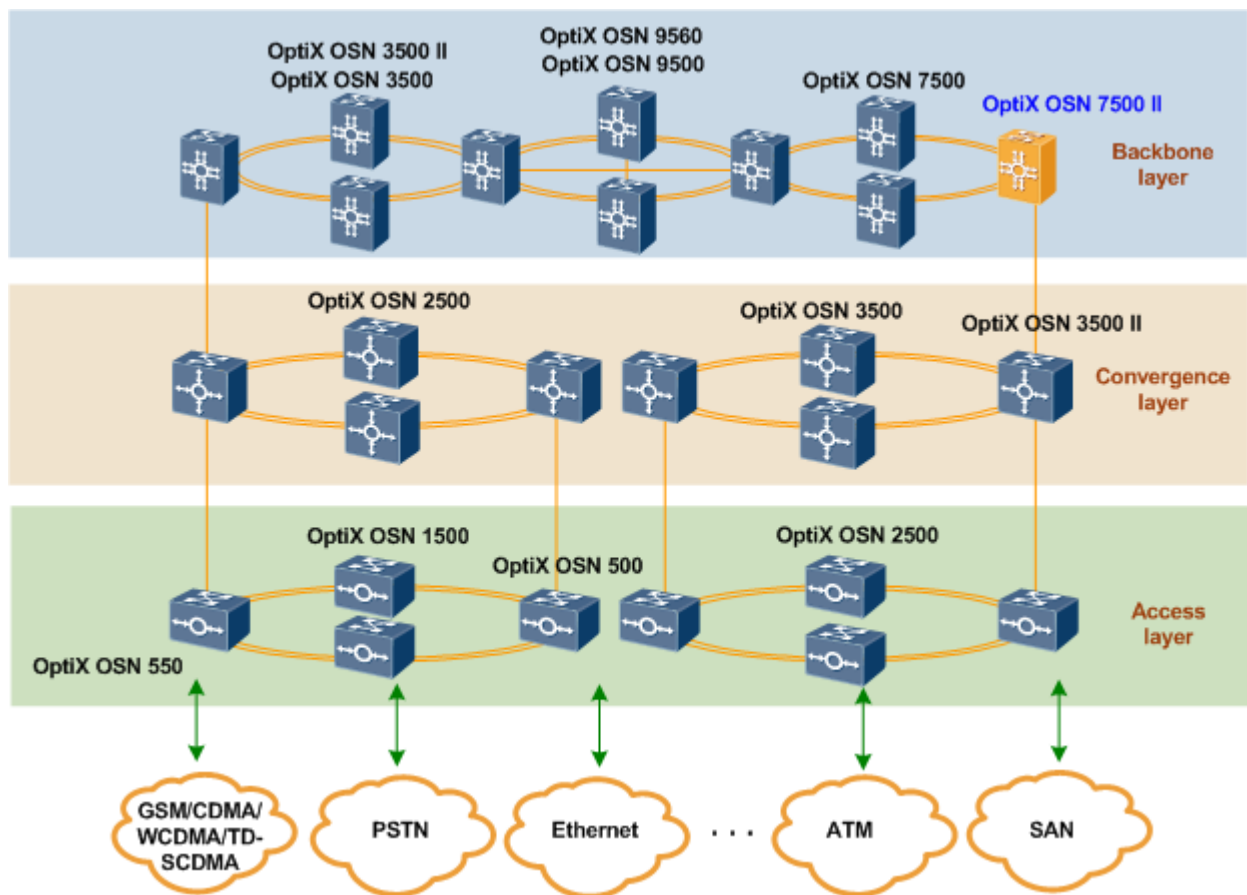
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## Overview

Huawei OptiX OSN 7500 II intelligent optical switching system (the OptiX OSN 7500 II for short) is the next-generation intelligent optical core switching (OCS) equipment and is developed by Huawei on the basis of the current situation and development trend of the metropolitan area network (MAN). The OptiX OSN 7500 II is mainly used as a service scheduling node at the backbone layer of the MAN. That is, it functions as optical core switching equipment (OCS). As an intelligent optical transmission platform and core optical transmission system, the OptiX OSN 7500 II is located at the metropolitan backbone layer to schedule and transmit services of different types and granularities. The OptiX OSN 7500 II is of a "universal switch" architecture. That is, the OptiX OSN 7500 II can be used in packet mode or in TDM mode. When used with the other equipment of Huawei, the OptiX OSN 7500 II supports various networking applications, such as the pure packet mode application, hybrid networking application (overlay networking of the packet mode and TDM mode), and pure TDM mode application. By using a proper networking solution, the data service and conventional SDH service can be processed in the optimal manner.



OptiX OSN 7500 II



Application of the [OptiX OSN 7500 II](#) in the transmission network

#### OptiX OSN 7500 II Highlight:

##### ★ Universal Switch Architecture for Multiservice Grooming

OptiX OSN equipment uses a universal switch architecture for unified grooming of packet services and TDM services. OptiX OSN equipment can work in packet mode, TDM mode, or dual-domain (packet+TDM) mode.

##### ★ Hierarchical OAM Facilitating Fault Detection

The Hybrid MSTP equipment supports hierarchical OAM to rapidly detect and locate various faults, thereby improving network reliability. In addition, the Hybrid MSTP equipment supports distributed OAM and centralized OAM.

##### ★ TP-Assist Solution Facilitating the O&M of Packet Services

Like the SDH equipment, Huawei Hybrid MSTP equipment supports a hierarchical operating & maintenance (O&M) system by using the TP-Assist solution, so packet services can be configured, commissioned, or maintained in an end-to-end manner.

### ★ Built-In WDM, Flexible Networking

The OptiX OSN equipment uses the built-in WDM technology to transmit several wavelengths over one optical fiber. In this manner, the OptiX OSN equipment can be interconnected with the WDM equipment.

## Specification

**Table 1. OptiX OSN 7500 II Specification.**

Indicator and Specifications		<a href="#">OptiX OSN 7500II</a>
Dimensions (H x W x D)		800 mm x 496 mm x 295 mm
Number of valid slots		16 for processing boards and 16 for interface boards
Equipment capacity	Packet	320 Gbit/s
	TDM	360 Gbit/s higher order cross-connections and 40 Gbit/s lower order cross-connections
	OTN	560 Gbit/s cross-connections
Service type supported		SDH, PDH, ATM, CES, Ethernet, PCM, video, OTN, and others
Smart line board		HUNS3: 40 Gbit/s for a single optical port HUNQ2: 10 Gbit/s for a single optical port HSNQ2: 10 Gbit/s for a single optical port
Network topology		Point-to-point, chain, star, ring, ring with chain, intersecting rings, tangent rings
Backup and protection	Network-level protection (packet)	Tunnel 1:1/1+1 APS, PW 1:1/1+1 APS, packet linear MSP, LPT, MSTP, MRPS

	<b>Network-level protection (TDM)</b>	SDH protection: subnet connection protection, linear MSP, ring MSP, DNI protection, E1 SNCP, optical-path-shared MSP  EoS protection: LCAS, LPT, STP/RSTP, MSTP, ERPS
	<b>Network-level protection (OTN)</b>	Tributary SNCP and ODUk SNCP
	<b>Device-level protection</b>	Packet: LAG, MC-LAG  TDM: TPS, BPS, PPS, LAG, DLAG  1+1 hot backup for cross-connect and timing units  1+1 hot backup for SCC units  1+1 hot backup for power input units  1:N protection for +3.3 V power supply of the board  Intelligent fan  Board protection modes under abnormal conditions
<b>Maintenance</b>	<b>MPLS OAM</b>	CV, FFD, BDI, FDI, Ping, Traceroute
	<b>MPLS-TP OAM</b>	CC, RDI, AIS, LB, LT, LM (only single-ended LM), DM, TST, LCK, CSF (only PW CSF)
	<b>ETH OAM (packet)</b>	Ethernet service OAM: CC, LB, LT, LM (only single-ended LM), DM (only two-way DM)  Ethernet port OAM: OAM auto-discovery, link performance monitoring, remote loopback, fault detection, self-loop detection
	<b>ETH OAM (TDM)</b>	Ethernet service OAM: CC, LB, LT, OAM_Ping  Ethernet port OAM: OAM auto-discovery, link performance monitoring, remote loopback, fault detection, self-loop detection

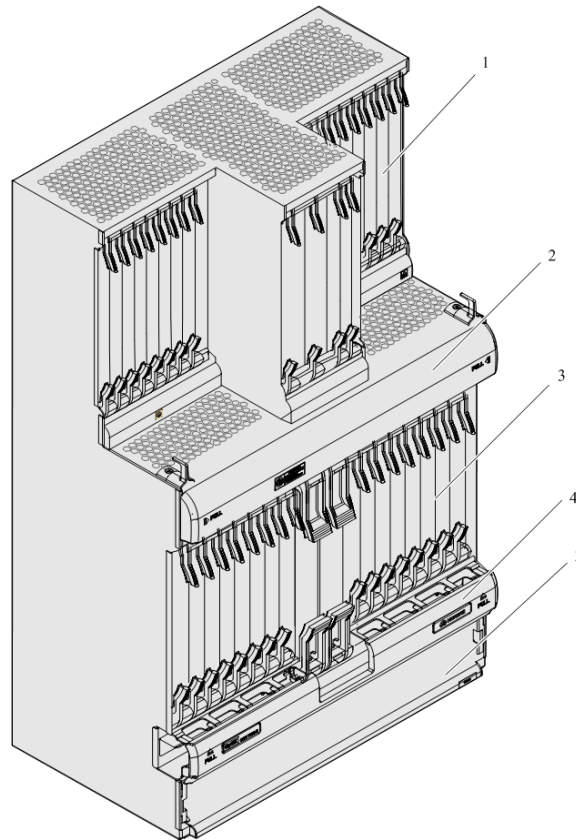
<b>Synchronization</b>	<b>Packet</b>	Physical-layer clock  Synchronous Ethernet  IEEE 1588v2  CES ACR
	<b>TDM</b>	Physical-layer clock
	<b>OTN</b>	Physical-layer clock  Synchronous Ethernet
<b>DCN</b>	<b>Outband DCN</b>	HWECC, IP over DCC, OSI over DCC
	<b>Inband DCN</b>	HWECC, IP
<b>TP-Assist</b>		Service configuration: supports end-to-end service configuration and automatic deployment of alarm management.  Service commissioning: supports the one-click service connectivity test, one-click service performance test, and automatic test without any instrument.  Routine maintenance: supports performance statistics and monitoring and E-Line and E-LAN service path visualization.  Fault diagnosis: supports intelligent fault locating, IP ping initiation and response, and service loopback detection.
<b>Standard working voltage</b>		If the standard voltage of the input power is -48 V, the power voltage ranges from -38.4 V to -57.6 V.  If the standard voltage of the input power is -60 V, the power voltage ranges from -48 V to -72 V.
<b>Installation method</b>		ETSI cabinet

<b>Equipment running environment</b>	<b>Subrack temperature</b>	Long-time operation: 0°C to 45°C Short-time operation: -5°C to +55°C
	<b>Subrack humidity (relatively)</b>	Long-time operation: 5-85% Short-time operation: 5-95%
<b>Reliability specifications</b>	<b>System availability</b>	0.999997487
	<b>Mean time to resolution (MTTR)</b>	1 h
	<b>Mean time between failures (MTBF)</b>	45.42 years

## Hardware Description

An OptiX OSN 7500 II subrack has a two-layer structure. The subrack consists of a processing board area, an interface board area, a fan area, and a cable routing area.





**Table 2. Note of Areas**

1. Interface board area	2. Fan area
3. Processing board area	4. Cable routing area

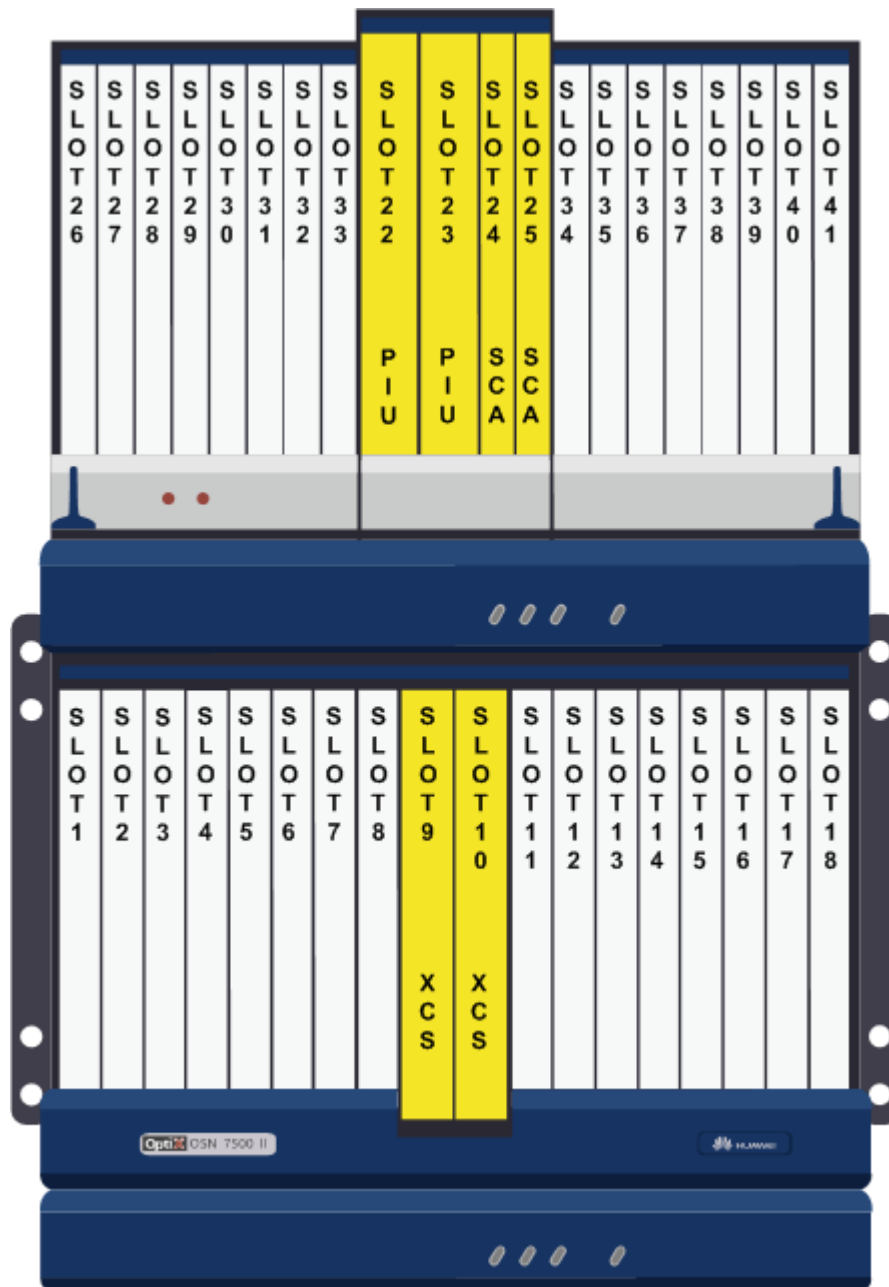
The functions of the areas are as follows:

- Interface board area: This area houses the interface boards of the OptiX OSN 7500 II.
- Cable routing area: This area houses fiber jumpers in a subrack.
- Processing board area: This area houses the processing boards of the OptiX OSN 7500 II.
- Fan area: This area houses one fan module, which dissipates heat generated by the equipment.

NOTE:

An interface board is also called an access board or a transit board. An interface board provides physical interfaces for optical signals and electrical signals, and transmits the optical signals or electrical signals to the corresponding processing board.

An OptiX OSN 7500 II subrack consists of an upper layer and a lower layer, wherein 40 slots are available. There are 20 slots at the upper layer and 18 slots at the lower layer. In addition, there are two slots for fan boards.



The slots in an OptiX OSN 7500 II subrack are allocated as follows:

- Slots for service interface boards: slots 26-33 and 34-41
- Slots for service processing boards: slots 1-8 and 11-18

- Slots for cross-connect and timing boards: slots 9-10
- Slots for power interface boards: slots 22-23
- Slots for system control and communication boards: slots 24-25

<b>Table 3. Mapping between slots for interface boards and slots for processing boards</b>	
Slot for Processing Board	Slot for Interface Board
Slot 1	Slots 26-27
Slot 2	Slots 28-29
Slot 3	Slots 30-31
Slot 4	Slots 32-33
Slots 5-8	-
Slots 11-14	-
Slot 15	Slots 34-35
Slot 16	Slots 36-37
Slot 17	Slots 38-39
Slot 18	Slots 40-41

If overhead bytes pass through the backplane bus between two slots, the two slots are called paired slots. Paired slots achieve automatic transparent transmission of overhead bytes such as K bytes, D bytes, and E1 overhead bytes. This improves multiplex section protection (MSP) switching performance and DCC communication with other NEs even after the system control board on the local NE cannot be detected.

**Table 4. Paired slots for boards each of which occupies one slot:** If overhead bytes pass through the backplane bus between two slots, the two slots are called paired slots. Paired slots achieve automatic transparent transmission of overhead bytes such as K bytes, D bytes, and E1 overhead bytes. This improves multiplex section protection (MSP) switching performance and DCC communication with other NEs even after the system control board on the local NE cannot be detected.

Slot	Paired Slot
Slot 1	Slot 2
Slot 3	Slot 4
Slot 5	Slot 6
Slot 7	Slot 8
Slot 11	Slot 12
Slot 13	Slot 14
Slot 15	Slot 16
Slot 17	Slot 18



**Table 5. Paired slots for boards each of which occupies two slots:** If overhead bytes pass through the backplane bus between two slots, the two slots are called paired slots. Paired slots achieve automatic transparent transmission of overhead bytes such as K bytes, D bytes, and E1 overhead bytes. This improves multiplex section protection (MSP) switching performance and DCC communication with other NEs even after the system control board on the local NE cannot be detected.

Slot	Paired Slot
Slot (2, 3)	Slot (4, 5)
Slot (4, 5)	Slot (6, 7)

Slot (12, 13)	Slot (14, 15)
Slot (14, 15)	Slot (16, 17)

## Boards Description

**Table 6. Boards List of the [OptiX OSN 7500 II](#).**

Model	Description
<b>N1DM12</b> 	<p>The N1DM12 board is a service interface board used in the OptiX OSN series to transmit and receive and framed E1 electrical signals, as well as sub-rate services.</p>
<b>N3DX1</b> 	<p>The N3DX1 board is used in the OptiX OSN series for service access and aggregation, and implements 64 kbit/s cross-connection for E1 signals on the system side.</p>
<b>TNH1HSNQ2</b>	<p>A TNH1HSNQ2 board can receive/transmit 4×10 Gbit/s services (hybrid transmission of SDH and OTN services, with the proportions of the SDH and OTN services being specified at STM-</p>

	<p>16/STM-64/OTU2/OTU2e granularities), boosting network bandwidths and implementing flexible grooming of large-granularity services.</p>
<p><b>TNN1HUNQ2</b></p> 	<p>A TNN1HUNQ2 board can receive/transmit 4×10 Gbit/s services (hybrid transmission of SDH and OTN services, with the proportions of the SDH and OTN services being specified at STM-16/STM-64/GE/nGE/10GE granularities), boosting network bandwidths and implementing flexible grooming of large-granularity services.</p>
<p><b>TNN1HUNS3</b></p> 	<p>A TNN1HUNS3 board can receive/transmit 40 Gbit/s services (hybrid transmission of SDH and packet services, with the proportions of the SDH and packet services being specified at STM-16/STM-64/GE/nGE/10GE granularities), boosting network bandwidths and implementing flexible grooming of large-granularity services.</p>

## Basic Ordering Information

**Table 7. Ordering information of Huawei OptiX OSN 7500 II chassis.**

Model	Description
<a href="#">Huawei Optix OSN 7500 II</a>	Huawei OptiX OSN 7500 II, mainly used as a service scheduling node at the backbone layer of the MAN, located at the metropolitan backbone layer to schedule and transmit services of different types and granularities

## Where to Buy

**Want to buy this series of products? please contact:**

- Tel: +1-626-239-8066 (USA)/ +852-3050-1066 / +852-3174-6166
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<a href="#">Huawei OptiX OSN 9800</a>	<a href="#">Huawei OptiX OSN 8800</a>
<a href="#">Huawei OptiX OSN 6800</a>	<a href="#">Huawei OptiX OSN 580</a>

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## Sources

<https://support.huawei.com/enterprise/en/transmission-network/optix-osn-7500-ii-pid-6029355>