

Datasheet

OptiSwitch® Modules

The OptiSwitch® chassis based family can host two different module series, each with tens of divers modules, specifically designed to provide the precise solution for a wide variety of applications .

The OptiSwitch® has more than 90 modules available, including a range of speeds from 10 Mbps connections up to Gigabit Ethernet, and media ranging from copper, VDSL , to long reach single fiber or hybrid modules with copper and fiber . All modules independently fit the different OptiSwitch chassis and offer an unprecedented opportunity to optimize port density requirements.

Transmission technologies :

- Ethernet fiber modules
- Fast fiber & copper Ethernet modules
- Gigabit fiber & copper modules
- Gigabit Extender for 2 Km MM fiber modules
- Gigabit redundant modules for msec recovery
- CWDM with GBIC/SFP pluggable optics
- VDSL modules
- Optical Wireless modules
- Voice E1/T1 TDM over Ethernet
- Hybrid modules (copper & fiber)

EM2003 module series

The Layer 2 EM2003 module series has a communication on-board switching engine and supports wire speed non-blocking connections. Management information is collected by the switching engines, which report to the chassis' management card. The built-in management card in the chassis performs the functionality of the SNMP agent, and it communicates with SNMP compliant systems.

EM2004 module QoS series

The OptiSwitch® EM2004 module series features MRV unique Ethernet Circuit Switching technology. These modules are available in a variety of interface types and densities and provide Layer 2-3-4 switching capabilities with QoS techniques . Management information is collected by the switching engines, which report to the chassis' management card. The built-in management card in the chassis performs the functionality of



OptiSwitch® has two module series, with dozens of different modules.

the SNMP Agent, and it communicates with SNMP compliant systems. The on-board switching engines are capable of recognizing a series of frames as belonging to a specific flow ("Ethernet Circuit"), and apply policy based traffic classification and prioritization based on :

- DiffServ - ToS
- 802.1p queue mapping
- per VLAN membership
- per ingress PORT
- per MAC, IP, TCP/UDP or protocol type:
Layer 2-3-4 traffic flows (source, destination)

Each port has 4 hardware queues with two discardability options that implement QoS algorithms WRR, Hybrid , SP.

High-flexibility bandwidth management with EM2004 QoS modules allows rate limiting from 64 Kbps up to 1Gbps on each flow ("Ethernet Circuit") with 1 Kbps granularity. Rate limiting allows multiple bandwidth provisioning policies to be applied and to provide maximum flexibility for network designers to build intelligent networks.

Optical Specifications Table

Protocol	Min. output Power (dBm)	Max. output Power (dBm)	Receiver Sensitivity (dBm)	Receiver Saturation	Wavelength (nm)	F/O power Budget (dB)*	Listed Distance (Km)	Media Att. dB/Km
Ethernet (FL)/M	-19	-14	-34	-8	850	10	0 - 2	3
Fast Ethernet (DSC)/M	-20	-14	-30	-14	1310	5	0 - 2	2
Fast Ethernet (DSC)/S1	-15	-7	-31	-7	1310	13	0 - 25	0.5
Fast Ethernet (MTRJ)/M	-20	-14	-31	-14	1310	6	0 - 2	2
Fast Ethernet (MTRJ)/S1	-20	-14	-31	-8	1310	8	0 - 15	0.5
Fast Ethernet (LC)/M	-19	-8	-30	-8	1310	6	0 - 2	2
Fast Ethernet (LC)/S1	-15	-8	-28	-8	1310	10	0 - 20	0.5
Fast Ethernet/S2	-5	0	-31	-5	1310	23	25 - 50	0.25
Fast Ethernet/S3	-5	0	-34	-4	1550	26	50 - 100	0.25
Fast Ethernet/S4	0	3	-37	-3	1550	34	50 - 150	0.25
Fast Ethernet Single Fiber(13)/S1	-15	-8	-33	-3	1310/1550	13	0 - 20	0.5
Fast Ethernet Single Fiber (15)/S1	-15	-8	-33	-3	1550/1310	13	0 - 20	0.5
Fast Ethernet Single Fiber(13)/S2	-5	0	-35	0	1310/1550	27	0 - 40	0.5
Fast Ethernet Single Fiber(15)/S2	-5	0	-35	0	1550/1310	27	0 - 40	0.5
Gigabit Ethernet/SX/M	-9.5	-4	-17	-3	850	2.5	0 - 0.35	3
Gigabit Ethernet/LX/M	-11.5	-3	-20	-3	1310	3.5	0 - 0.5	2
Gigabit Ethernet/LX/S1	-11	-3	-19	-3	1310	5	0 - 10	0.5
Gigabit Ethernet/LX/S2	-10	-3	-24	-3	1550	11	0 - 32	0.25
Gigabit Ethernet/LX/S3	-3	-0	-24	-3	1550	18	30 - 60	0.25
Gigabit Ethernet/LX/S4	0	5	-24	-3	1550	21	36 - 72	0.25
Gigabit Ethernet/LX/S5	1.8	4.8	-26	-3	1550	24.8	30 - 95	0.25

* Values are calculated according to the following margins: 5 dB for multimode and 3 dB for singlemode

OptiSwitch Modules Physical Specifications

Part Number	Power Consumption		Weight	
	(W) Min.	Max.	(Kg)	(bs.)
Modules Physical Dimension: W x D x H 100.5 x 153.7 x 40.3 mm 3957 x 6.05 x 1.587 Inch				
Gigabit Ethernet Modules				
EM2003-1GE/SX/M, LXS1, S2, S3, S4, S5, MX	4.0	4.0	0.20	0.44
EM2003-GER/SX/M, LXS1, S2, S3, S4	7.0	7.0	0.20	0.44
EM2003-1GE/CO/T	6.1	9.0	0.18	0.44
Fast Ethernet Modules				
EM2003-4T	4.0	5.0	0.20	0.44
EM2003-4T+F/M, S1, S2, S3, S4	5.0	6.0	0.20	0.44
EM2003-4T+2F/M, S1, S2, S3, S4	6.0	7.0	0.20	0.44
EM2003-8TP	4.0	5.2	0.23	0.50
EM2003-2F/M, S1, S2, S3, S4	6.0	6.0	0.19	0.42
EM2003-4FO/M	10.0	10.0	0.24	0.53
EM2003-4MT/M, S1	12.6	12.6	0.23	0.50
EM2003-8MT/M, S1	16.6	16.6	0.28	0.62
Fast Ethernet Single fiber				
EM2004-4T+SF3S1, SF5S1	8	8	0.20	0.44
EM2004-4SF3S1, 4SF5S1	8	8	0.20	0.44
EM2004-4T+SF3S2	12	12	0.23	0.50
EM2004-4T+SF5S2	12	12	0.23	0.50
Ethernet Modules				
EM2003-2FL	5.0	5.0	0.18	0.40
EM2003-4FL	7.3	7.3	0.28	0.62
Classification Modules				
EM2004-4T	5.5	6.0	0.20	0.44
EM2004-8TP	6.0	7.0	0.23	0.50
EM2004-2F/M, S1, S2, S3, S4	8.0	8.0	0.19	0.42
EM2004-4T/F/M, S1, S2, S3, S4	7.0	8.0	0.22	0.44
EM2004-4T/2F/M, S1, S2, S3, S4	8.0	9.0	0.23	0.50
EM2004-1GE/SX/M, LXS1, S2, S3, S4, S5, /MX	5.5	5.5	0.18	0.40
EM2004-GER/SX/M, LXS1, S2, S3	6.9	6.9	0.20	0.44
EM2004-4MT/M, S1	10	10	0.24	0.53
EM2004-8MT/M, S1	18.0	18.0	0.29	0.64
EoV Modules				
EM2003-8EoV/L, /N, -8LEoV/L, /N, -4L+4N	14.0	14.0	0.30	0.66
EM2003-4E+2F/M	12.0	12.0	0.28	0.62
Optical Wireless Modules				
EM2003-2PAL/A, B	10.8	10.8	0.26	0.58
EM2004-2PAL/A, C	8.8	8.8	0.26	0.58
Voice TDM over Ethernet				
EM2004-2E2TF/M, S1, S2, S3, S4	15.3	15.3	0.24	0.53
EM2004-4E1	12.9	12.9	0.28	0.62
EM2004-4E1	17.3	17.3	0.28	0.62

OptiSwitch Layer 2 Modules

Ordering Information

Ethernet Modules

EM2003-4FL 4 port 10Base-FL Uplink for the OptiSwitch Family (MM, 850nm, 0-2km, ST)

Fast Ethernet Modules

EM2003-4T 4-port 10/100Base-TX Uplink for the OptiSwitch Family (RJ45)

EM2003-8TP 8-port 10/100Base-TX Uplink for the OptiSwitch Family (RJ45)

EM2003-2F/M Dual port 100Base-FX Uplink for the OptiSwitch Family (MM, 1310nm, 0-2km, DSC)

EM2003-2F/S1 Dual port 100Base-FX Uplink for the OptiSwitch Family (SM, 1310nm, 0-25km, DSC)

EM2003-2F/S2 Dual port 100Base-FX Uplink for the OptiSwitch Family (SM, 1310nm, 25-50km, DSC)

EM2003-2F/S3 Dual port 100Base-FX Uplink for the OptiSwitch Family (SM, 1550nm, 50-100km, DSC)

EM2003-2F/S4 Dual port 100Base-FX Uplink for the OptiSwitch Family (SM, 1550nm, 50-150km, DSC)

EM2003-4FO/M 4 port 100Base-FX Uplink for the OptiSwitch Family (MM, 1310nm, 0-2km, DSC)

EM2003-4FO/S1 4 port 100Base-FX Uplink for the OptiSwitch Family (SM, 1310nm, 0-25km, DSC)

EM2003-4FO/S2 4 port 100Base-FX Uplink for the OptiSwitch Family (SM, 1310nm, 25-50km, DSC)

EM2003-4FO/S3 4 port 100Base-FX Uplink for the OptiSwitch Family (SM, 1550nm, 50-100km, DSC)

EM2003-4FO/S4 4 port 100Base-FX Uplink for the OptiSwitch Family (SM, 1550nm, 50-150km, DSC)

EM2003-8MT/M 8 port 100Base-FX Uplink for the OptiSwitch Family (MM, 1310nm, 0-2km, MT-RJ)

EM2003-8MT/S1 8 port 100Base-FX Uplink for the OptiSwitch Family (SM, 1310nm, 0-15km, MT-RJ)

Fast Ethernet Modules

EM2003-4T+F/M 4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink for the OptiSwitch Family (MM, 1310nm, 0-2km, DSC)

EM2003-4T+F/S1 4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink for the OptiSwitch Family (SM, 1310nm, 0-25km, DSC)

EM2003-4T+F/S2 4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink for the OptiSwitch Family (SM, 1310nm, 25-50km, DSC)

EM2003-4T+F/S3	4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink for the OptiSwitch Family (SM, 1550nm, 50-100km, DSC)
EM2003-4T+F/S4	4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink for the OptiSwitch Family (SM, 1550nm, 50-150km, DSC)
EM2003-4T+2F/M	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink for the OptiSwitch Family (MM, 1310nm, 0-2km, DSC)
EM2003-4T+2F/S1	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink for the OptiSwitch Family (SM, 1310nm, 0-25km, DSC)
EM2003-4T+2F/S2	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink for the OptiSwitch Family (SM, 1310nm, 25-50km, DSC)
EM2003-4T+2F/S3	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink for the OptiSwitch Family (SM, 1550nm, 50-100km, DSC)
EM2003-4T+2F/S4	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink for the OptiSwitch Family (SM, 1550nm, 50-150km, DSC)

Gigabit Ethernet Modules

EM2003-1GE/SX/M	Single port Gigabit 1000Base-SX Uplink for the OptiSwitch Family (MM, 850nm, 0-350m, DSC)
EM2003-1GE/LX/M	Single port Gigabit 1000Base-LX Uplink for the OptiSwitch Family (MM, 1310nm, 0-500m, DSC)
EM2003-1GE/LXS1	Single port Gigabit 1000Base-LX Uplink for the OptiSwitch Family (SM, 1310nm, 0-10km, DSC)
EM2003-1GE/LXS2	Single port Gigabit 1000Base-LX Uplink for the OptiSwitch Family (SM, 1550nm, 0-32km, DSC)
EM2003-1GE/LXS3	Single port Gigabit 1000Base-LX Uplink for the OptiSwitch Family (SM, 1550nm, 30-60km, DSC)
EM2003-1GE/LXS4	Single port Gigabit 1000Base-LX Uplink for the OptiSwitch Family (SM, 1550nm, 36-72km, DSC)
EM2003-1GE/LXS5	Single port Gigabit 1000Base-LX Uplink for the OptiSwitch Family (SM, 1550nm, 30-95km, DSC)

Redundant Gigabit Ethernet Modules

EM2003-GER/SX/M	Gigabit Redundant Link Module for the OptiSwitch Family 1000Base-SX (MM, 850nm, 0-350m, DSC)
EM2003-GER/LX/M	Gigabit Redundant Link Module for the OptiSwitch Family 1000Base-LX (MM, 1310nm, 0-500m, DSC)
EM2003-GER/LXS1	Gigabit Redundant Link Module for the OptiSwitch Family 1000Base-LX (SM, 1310nm, 0-10km, DSC)
EM2003-GER/LXS2	Gigabit Redundant Link Module for the OptiSwitch Family 1000Base-LX (SM, 1550nm, 0-32km, DSC)
EM2003-GER/LXS3	Gigabit Redundant Link Module for the OptiSwitch Family 1000Base-LX (SM, 1550nm, 30-60km, DSC)

Copper Gigabit Ethernet Modules

EM2003-1GE/CO/T	Single port Gigabit Over Copper 1000Base-TX Uplink for the OptiSwitch Family (100 meter, RJ45)
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Gigabit Multimode Extender Module

EM2003-1GE/MX	Single Port Long Reach Gigabit over Multimode fiber (MM, 850nm, 2km, DSC)
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OptiSwitch Classification Layer (2-3-4) QoS Modules

Fast Ethernet Modules

EM2004-4T	4-port 10/100Base-TX Uplink with QoS support for the OptiSwitch Family (RJ45)
EM2004-8TP	8-port 10/100Base-TX Uplink with QoS support for the OptiSwitch Family (RJ45)
EM2004-2F/M	Dual port 100Base-FX Uplink with QoS support for the OptiSwitch Family (MM, 1310nm, 0-2km, DSC)
EM2004-2F/S1	Dual port 100Base-FX Uplink with QoS support for the OptiSwitch Family (SM, 1310nm, 0-25km, DSC)
EM2004-2F/S2	Dual port 100Base-FX Uplink with QoS support for the OptiSwitch Family (SM, 1310nm, 25-50km, DSC)
EM2004-2F/S3	Dual port 100Base-FX Uplink with QoS support for the OptiSwitch Family (SM, 1550nm, 50-100km, DSC)
EM2004-2F/S4	Dual port 100Base-FX Uplink with QoS support for the OptiSwitch Family (SM, 1550nm, 50-150km, DSC)
EM2004-4MT/M	4 port 100Base-FX Uplink with QoS support for the OptiSwitch Family (MM, 1310nm, 0-2km, MT-RJ)
EM2004-4MT/S1	4 port 100Base-FX Uplink with QoS support for the OptiSwitch Family (SM, 1310nm, 0-15km, MT-RJ)
EM2004-8MT/M	8 port 100Base-FX Uplink with QoS support for the OptiSwitch Family (MM, 1310nm, 0-2km, MT-RJ)
EM2004-8MT/S1	8 port 100Base-FX Uplink with QoS support for the OptiSwitch Family (SM, 1310nm, 0-15km, MT-RJ)

Fast Ethernet Single fiber

EM2004-4T+SF3S1	4-port 10/100Base-TX (RJ45) and 100Base-FX single fiber Uplink for the OptiSwitch Family (SM, Tx 1310nm Rx 1550nm, 0-20km, SC). Operates with EM2004-4SF5S1 and EM2004-4T + SF5S1
EM2004-4T+SF5S1	4-port 10/100Base-TX (RJ45) and 100Base-FX single fiber Uplink for the OptiSwitch Family (SM, Tx 1550nm Rx 1310nm, 0-20km, SC). Operates with EM2004-4SF3S1 and EM2004-4T + SF3S1
EM2004-4T+SF3S2	4-port 100BaseFX single fiber Uplink for the OptiSwitch Family (SM, Tx 1310nm Rx 1550nm, 0-40km, SC). Operates with EM2004-4T+4SF5S2
EM2004-4T+SF5S2	4-port 100BaseFX single fiber Uplink for the OptiSwitch Family (SM, Tx 1550nm Rx 1310nm, 0-40km, SC). Operates with EM2004-4T+4SF3S2
EM2004-4SF3S1	4-port 100BaseFX single fiber Uplink for the OptiSwitch Family (SM, Tx 1310nm Rx 1550nm, 0-20km, SC). Operates with EM2004-4SF5S1 and EM2004-4T + SF5S1
EM2004-4SF5S1	4-port 100BaseFX single fiber Uplink for the OptiSwitch Family (SM, Tx 1550nm Rx 1310nm, 0-20km, SC). Operates with EM2004-4SF3S1 and EM2004-4T + SF3S1

Hybrid Fiber Copper Modules

EM2004-4T+F/M	4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink with QOS support for the OptiSwitch Family (MM, 1310nm, 0-2km, DSC)
EM2004-4T+F/S1	4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink with QOS support for the OptiSwitch Family (SM, 1310nm, 0-25km, DSC)
EM2004-4T+F/S2	4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink with QOS support for the OptiSwitch Family (SM, 1310nm, 25-50km, DSC)
EM2004-4T+F/S3	4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink with QOS support for the OptiSwitch Family (SM, 1550nm, 50-100km, DSC)
EM2004-4T+F/S4	4-port 10/100Base-TX (RJ45) and single port 100Base-FX Uplink with QOS support for the OptiSwitch Family (SM, 1550nm, 50-150km, DSC)
EM2004-4T+2F/M	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink with QOS support for the OptiSwitch Family (MM, 1310nm, 0-2km, DSC)
EM2004-4T+2F/S1	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink with QOS support for the OptiSwitch Family (SM, 1310nm, 0-25km, DSC)
EM2004-4T+2F/S2	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink with QOS support for the OptiSwitch Family (SM, 1310nm, 25-50km, DSC)
EM2004-4T+2F/S3	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink with QOS support for the OptiSwitch Family (SM, 1550nm, 50-100km, DSC)
EM2004-4T+2F/S4	4-port 10/100Base-TX (RJ45) and dual port 100Base-FX Uplink with QOS support for the OptiSwitch Family (SM, 1550nm, 50-150km, DSC)

Gigabit Ethernet Modules

EM2004-1GE/SX/M	Single port Gigabit 1000Base-SX Uplink with QoS support for the OptiSwitch Family (MM, 850nm, 0-350m, DSC)
EM2004-1GE/LX/M	Single port Gigabit 1000Base-LX Uplink with QoS support for the OptiSwitch Family (MM, 1310nm, 0-500m, DSC)
EM2004-1GE/LXS1	Single port Gigabit 1000Base-LX Uplink with QoS support for the OptiSwitch Family (SM, 1310nm, 0-10km, DSC)
EM2004-1GE/LXS2	Single port Gigabit 1000Base-LX Uplink with QoS support for the OptiSwitch Family (SM, 1550nm, 0-32km, DSC)
EM2004-1GE/LXS3	Single port Gigabit 1000Base-LX Uplink with QoS support for the OptiSwitch Family (SM, 1550nm, 30-60km, DSC)
EM2004-1GE/LXS4	Single port Gigabit 1000Base-LX Uplink with QoS support for the OptiSwitch Family (SM, 1550nm, 36-72km, DSC)
EM2004-1GE/LXS5	Single port Gigabit 1000Base-LX Uplink with QoS support for the OptiSwitch Family (SM, 1550nm, 30-95km, DSC)

Redundant Gigabit Ethernet Modules

EM2004-GER/SX/M	Gigabit Redundant Link Module with QoS support for the OptiSwitch Family 1000Base-SX (MM, 850nm, 0-350m, DSC)
EM2004-GER/LX/M	Gigabit Redundant Link Module with QoS support for the OptiSwitch Family 1000Base-LX (MM, 1310nm, 0-500m, DSC)
EM2004-GER/LXS1	Gigabit Redundant Link Module with QoS support for the OptiSwitch Family 1000Base-LX (SM, 1310nm, 0-10km, DSC)
EM2004-GER/LXS2	Gigabit Redundant Link Module with QoS support for the OptiSwitch Family 1000Base-LX (SM, 1550nm, 0-32km, DSC)
EM2004-GER/LXS3	Gigabit Redundant Link Module with QoS support for the OptiSwitch Family 1000Base-LX (SM, 1550nm, 30-60km, DSC)

Copper Gigabit Ethernet Modules

EM2004-1GE/CO/T	Single port Gigabit Over Copper 1000Base-TX Uplink with QoS support for the OptiSwitch Family (100 meter, RJ45)
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Gigabit Multimode Extender Module

EM2004-1GE/MX	Single Port Long Reach Gigabit over Multimode fiber with QoS support (MM, 850nm, 2km, DSC)
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Ethernet over VDSL Solution
Modules with QoS for Central Office side

EM2004-8EOV/L	8 port Ethernet over VDSL Uplink with QoS support for OptiSwitch Family (15Mbps Full duplex/ETSI997/ETSI998 up to 1500m), LT side (Central Office/Switch side)
EM2004-8EOV/SL	8 port Ethernet over VDSL (for Smart Phones) Uplink for OptiSwitch Family (15Mbps Full duplex/ETSI997/ETSI998 up to 1500m), LT side (Central Office/Switch side)

Modules for Central Office side

EM2003-8EOV/L	8 port Ethernet over VDSL Uplink for OptiSwitch Family (15Mbps Full duplex/ETSI997/ETSI998 up to 1500m), LT side (Central Office/Switch side)
EM2003-8EOV/SL	8 port Ethernet over VDSL (for Smart Phones) Uplink with QoS Support for OptiSwitch Family (15Mbps Full duplex/ETSI997/ETSI998 up to 1500m), LT side (Central Office/Switch side)
EM2003-8LEOV/L	8 port Long range Ethernet over VDSL Uplink for OptiSwitch Family (4Mbps full duplex up to 2400m), LT side (Central Office/Switch side)
EM2003-4E+2T	4 port Ethernet over VDSL (LT side) and two ports 10/100Base-TX (RJ45) Uplink for OptiSwitch Family (15Mbps Full duplex/ETSI997/ETSI998 up to 1500m)
EM2003-4E+2F/M	4 port Ethernet over VDSL (LT side) and two ports 100Base-FX (MM, 0-2Km, 1310nm, DSC) Uplink for OptiSwitch Family (15Mbps Full duplex/ETSI997/ETSI998 up to 1500m)
EM2003-4L+4N	4 port Ethernet over VDSL LT side and 4 port Ethernet over VDSL NT side Uplink for OptiSwitch Family (15Mbps Full duplex/ETSI997/ETSI998 up to 1500m)

Modules for Customers Premises side

EM2003-8EOV/N	8 port Ethernet over VDSL Uplink for OptiSwitch Family (15Mbps Full duplex/ETSI997/ETSI998 up to 1500m), NT side (Customer Premises side)
EM2003-8LEOV/N	8 port Long range Ethernet over VDSL Uplink for OptiSwitch Family (4Mbps full duplex up to 2400m), NT side (Customer Premises side)

OptiSwitch Optical Wireless Modules for Fast Ethernet connectivity

EM2003-2PAL/A	Dual port 100 BaseFX Uplink of the OptiSwitch Family (MM, 850nm) for TS1/A/DST
EM2003-2PAL/B	Dual port 100 BaseFX Uplink of the OptiSwitch Family (MM, 850nm) for TS1/B/DST

OptiSwitch Optical Wireless Modules with QoS support for Fast Ethernet connectivity

EM2004-2PAL/A	Dual port 100 BaseFX with QoS Uplink of the OptiSwitch Family (MM, 850nm) for TS1/A/DST
EM2004-2PAL/C	Dual port 100 BaseFX with QoS Uplink of the OptiSwitch Family (MM, 850nm) for TS1/C/DST

OptiSwitch Voice TDM over Ethernet

EM2004-4E1	4 ports E1/T1 voice TDM over Ethernet QoS module
EM2004-8E1	8 ports E1/T1 voice TDM over Ethernet QoS module
EM2004-2E2TF/S1	OS module with QoS support 2E1/T1+2TP+1F/S1 interfaces
EM2004-2E2TF/S2	OS module with QoS support 2E1/T1+2TP+1F/S2 interfaces
EM2004-2E2TF/S3	OS module with QoS support 2E1/T1+2TP+1F/S3 interfaces
EM2004-2E2TF/S4	OS module with QoS support 2E1/T1+2TP+1F/S4 interfaces
EM2004-2E2TF/M	OS module with QoS support 2E1/T1+2TP+1F/M interfaces

GBIC/SFP Module (Real-time optical digital diagnostic enabled)

EM2004-1GE/P	Single port Gigabit 1000Base Uplink with QoS support for the OptiSwitch Family with Combo GBIC/SFP interface (see Plug-Ins)
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