atop Technologies

RHG7628 Series

INDUSTRIAL Rack-Mount Layer-3 MANAGED Modular Gigabit Ethernet PoE SWITCH

FEATURE HIGHLIGHTS

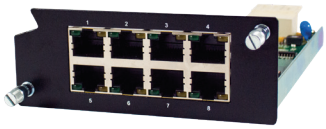
- Maximum 128Gbps switching capacity, 95.24Mpps throughput
- Rugged industrial design for -40~75°C harsh environment operation
- Flexible modular configuration, 3 Module-dedicated slots
- Up to 24 PoE ports, with maximum 720W of PoE power budget
- 4 x 1 Gigabit or 4 x 10 Gigabit SFP Uplink slots
- Up to 54 possible configurations in 4 power input versions
- ITU-T G.8032 ERPS Ring, RSTP, or MRP (client) redundancy
- RIP, OSPF, Static Routing, PIM supported Layer-3 switching
- EN50155 / EN50121-4 Certified for Railway applications
- PROFINET CC-B v2.33 Conformance, Provides GSD Description file

PRODUCT DESCRIPTION

Flexible: Atop's high-density RHG7628 Managed Rack-mount switch will provide you the flexibility your application needs. You will be able to choose among 8 different Layer-3 Routing Core versions (based on power supply and uplink port configurations) and five different 4/8-Port modules and customize your device in a very simple way.

Designed for PoE, in wide temperature: RHG7628 supports *up to* ***24 Gigabit ports in any 8 or 4-port multiple configuration***. Specifically designed for bringing power through Ethernet cable virtually anywhere, a ***maximum output Power over Ethernet of 720W over the 24 ports is allowed*** (PoE/PoE+ configuration - 802.3af/at). Available in ***4 power input variants***, it is EN 60950-1:2006 certified and designed to handle the harshest environments. Its fanless design and EMC Level 3 protection guarantee ***operations within -40 and +75°C.***

Powerul and versatile: RHG7628 supports ***IPv4 and IPv6 Static Routing, RIPv1/v2, OSPFv2, PIM-DM, PIM-SM, PIM-SSM, DVMRP and VRRP for Routing Redundancy***. Then, it embeds all features of RHG7528 (layer-2 version), allowing (through ERPS) network self-recovery down to 20ms on full load. Almost any redundant ring topology is supported, such as ITU-T G.8032 ERPS Ring, IEEE802.1D-2004 RSTP, STP, MSTP, MRP (Client), iA-Ring, iA-Chain and many compatible rings.



Automation and IoT ready: Conforming with Profinet CC-B v2.33 makes RHG7628 the perfect candidate for being the backbone of your Industrial automation network.

The RHG7628 Series is fully **EN50155-certified** to ensure reliable performance under a wide range of power supply conditions, and it complies with essential sections of **EN50121-4** for ground equipment.

Secure: The first Industrial Managed Secure Switch! Protect your LAN from Eavesdropping and impesronation through 802.1AE MACsec. With no additional latency and 100% Gigabit Throughput guarantee, dedicated modules can provide you the internal ultimate security solution.

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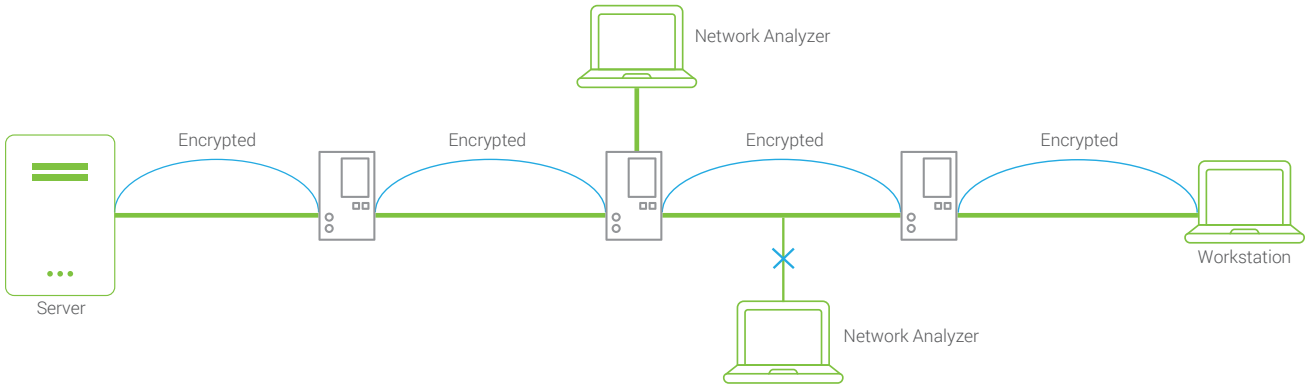
L3 c UL LISTED CE FC EN50155 EN50121-4 RoHS COMPLIANT

APPLICATION CASE

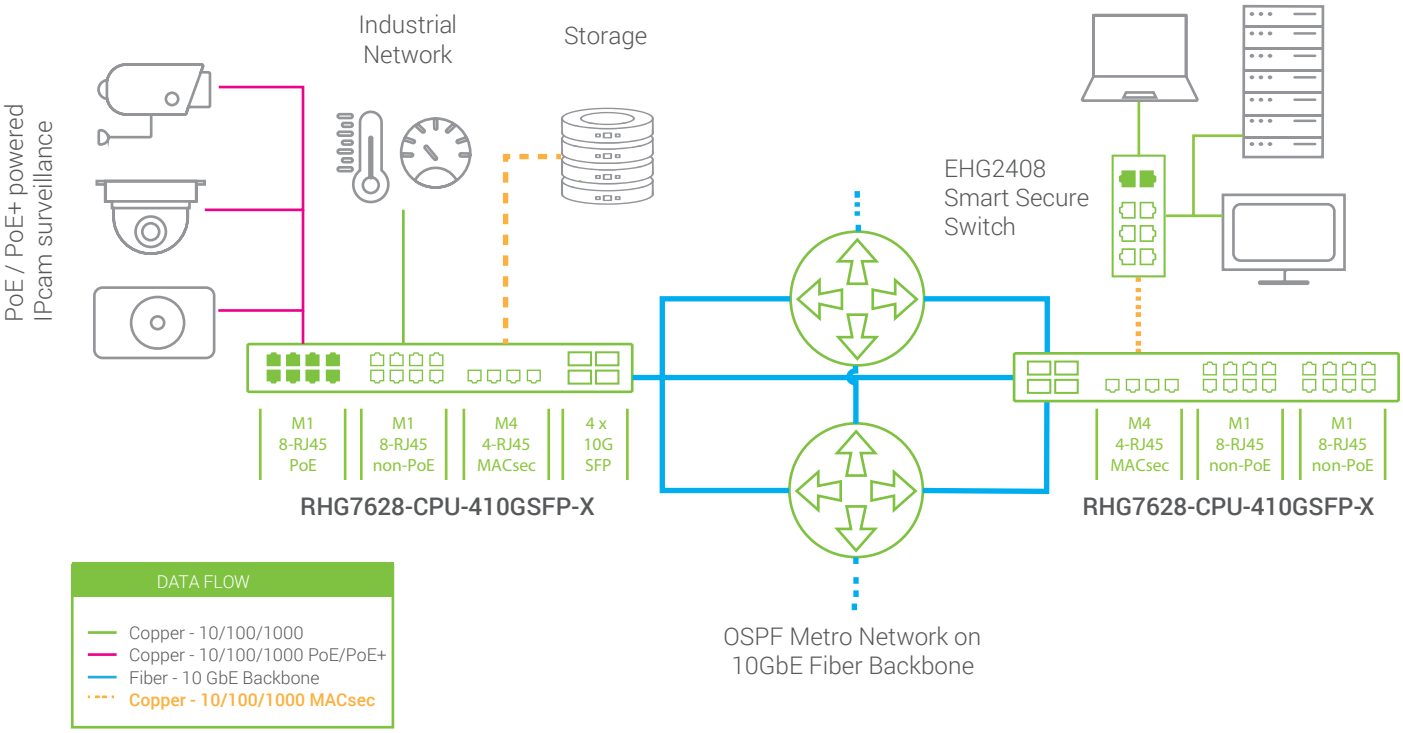
What is MACsec?

IEEE 802.1AE protocol (MACsec) provides –to the components that support it- authentication, integrity and confidentiality using strong crypto (AES-128 bit). Being the communication encrypted from hop-to-hop (so, decrypted upon receipt and encrypted again –with a different key- before forwarding), it can protect your network not only for wiretapping, masquerading, man-in-the-middle attacks and denial-of-service, but also from impersonation and replay attacks.
And that's not all. ***Being the encryption carried out by hardware, the full Gigabit Bandwidth is preserved and no additional latency is added to the network!***



Application example

In the below network diagram you can see how easy it is to exploit all features of RHG7628. Different Switches are interconnected through a 10 Gigabit Ethernet Fiber backbone in an OSPFv2 Mesh. The device on the left for example powers through PoE/PoE+ IP-cam surveillance System, provides Industrial-Grade connectivity to the Factory and -through a secured, encrypted, connection- guarantees confidentiality to the information. The device on the right bridges the secure connection to the office, ensuring Gigabit-speed, no latency data security.



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CONFIGURATION EXAMPLE

How does it work?

RHG7628 configuration is as easy and immediate as you can imagine: pick any Core CPU unit from the catalogue, choosing among different power supply configurations and uplink speeds (RHG7628 provides 3 module-slots and 4 SFP uplinks, in either 1GbE or 10GbE speed). Then, choose the modules you want based on your needs. Install the modules and Power on!
It's all done. Just jump to Web, Console or Telnet configuration!

RHG7628-CPU-410GSFP-R Layer-3 Core unit, with 4 x 10 Gigabit SFP uplink slots and redundant AC power input

RHG7X28-M1
8-port Gigabit RJ45 PoE module

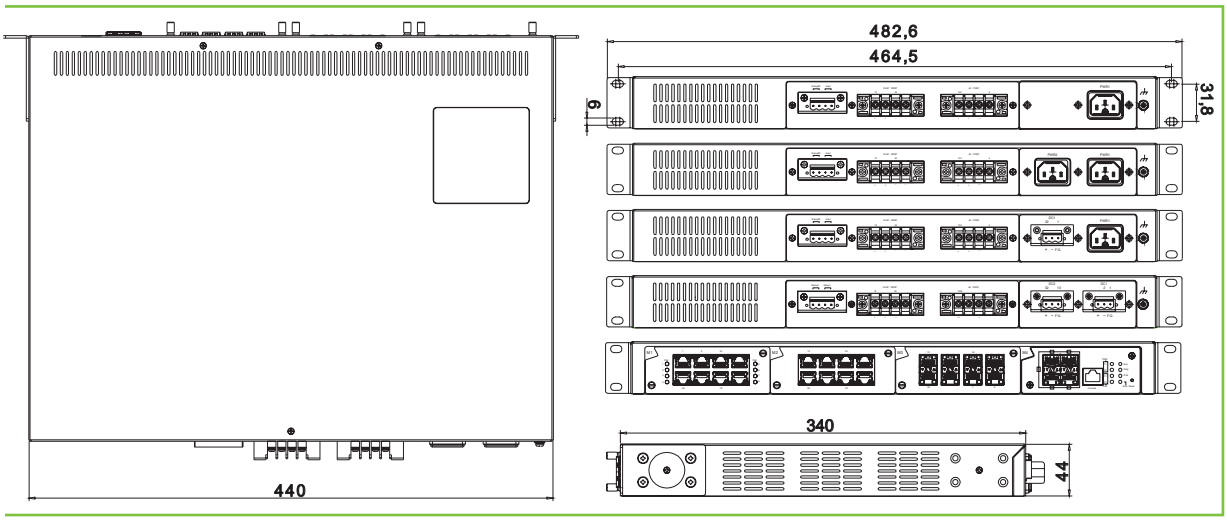
RHG7X28-M2
8-port Gigabit RJ45 module

RHG7X28-M5
4 port 100/1000 SFP MACsec module

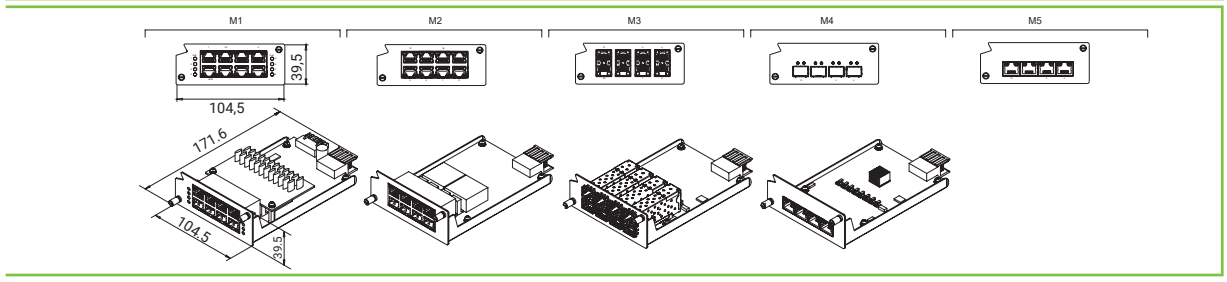
24 port Layer-3 Managed Switch, with 8 Gigabit PoE ports, 8 Gigabit RJ45 ports, 4 100/1000 MACsec secure SFP slots and 4 x 1/10 GbE SFP uplink slots

DIMENSIONS & LAYOUT

Switch core module



Modules



SPECIFICATIONS

Switch core

Technical Specifications

Model Name	RHG7628

Switch Properties

Priority Queues	8
VLAN Table	4096
MAC-Based VLAN	512
VLAN ID Range	VID 1 to 4094
Static IGMP Groups	128
Dynamic IGMP Groups	256
MAC Table Size	16k
Packet Buffer Size	1.5 MB
Jumbo Frame	9216 Byte
Switching Fabric Capacity	56 Gbps (1G uplinks) / 128 Gbps (10G uplinks)
Maximum throughput	41.67 Mpps (1G uplinks) / 95.24 Mpps (10G uplinks)

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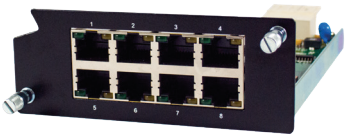
Ethernet		
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3ab for 1000BaseT(X) IEEE 802.3z for 1000BaseX IEEE 802.3ae For 10 Gigabit Ethernet Fiber IEEE 802.3x for Flow Control, back pressure flow control IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.1w for Rapid Spanning Tree Protocol IEEE 802.1s for Multiple Spanning Tree Protocol IEEE 802.1Q for VLAN Tagging IEEE 802.1p for Class of Service IEEE 802.1X for Authentication IEEE 802.1ae for MAC security (MACsec) – on RHG7X28-M4 & RHG7X28-M5 IEEE 802.3ad for Port Trunk with LACP IEEE 802.3az for Energy Efficient Ethernet	
Protocols	IPv4, IPv6, IGMPv1/v2/v3, IGMP Snooping, GARP, GMRP, GVRP, SNMPv1/v2c/v3, SNMP Inform, ICMP, Telnet, SSH, DHCP Server/Relay/Client, DHCP Option 66/67/82, BootP, RARP, TFTP, SMTP, SMTP (Gmail), RMON, HTTP, HTTPS, Syslog, MRP (Client),LLDP,802.1x,EAP,RADIUS,TACACS+,Mirror port, QoS, ACL	
Layer-3 Switching Protocols	Routing: IPv4 and IPv6 Unicast static routing, RIP v1/v2, OSPFv2, Multicast: IGMPv1/v2/v3, DVMRP, PIM-DM, PIM-SM, PIM-SSM Routing Redundancy: VRRP (Virtual Router Redundancy Protocol)	
Redundancy	ITU-T G.8032 ERPS Ring, STP, RSTP, MSTP, Compatible Ring/Chain, U-Ring	
Time Synchronization	Network Synchronization	NTP Server/Client, SNTP
	Precision Network Synchronization	IEEE1588v1 OC/BC (Software) IEEE1588v2 E2E TC (Hardware) IEEE1588v2 OC/BC (Software)
Automation Profiles	Profinet v2.33 CC-B conformance, Modbus/TCP status registers	
MIB	MIB II, IF-MIB, SNMPv2 MIB, BRIDGE-MIB, RMON MIB Group 1,2,3,9, RFC RFC 1157, RFC 1213, RFC 1215, RFC 1493, RFC 1643, RFC 1757, RFC 2011, RFC 2012, RFC 2013, RFC 2233, RFC 2571, RFC 2742, RFC 2819, RFC 2863, RFC 3411, RFC 3412, RFC 3413, RFC 3414, RFC 3415, RFC 2674	
Power		
Input Voltage	Switch Core:	DC version: redundant 48~57 VDC AC version: single 110~220 VAC Redundant AC version: dual 110~220 VAC Mixed AC/DC -Redundant: 1x110~220VAC & 48~57VDC
	PoE:	2 x 48-57 VDC (each power input max 360W)
Input Current (Max)	CPU board AC/ redundant AC: 110-220 VAC, 0.58 A Max, 64W Max CPU board redundand DC 48-57 VDC , 0.68A Max, 32.7W Max 802.3af PoE full loading: 45-57 VDC, 8.4A Max, 370W Max 802.3at PoE+ full loading: 51-57 VDC, 14.4A Max, 720W Max	
Connectors	2 x Lockable 5-pin terminal blocks for PoE power input (all vers.) 2 x Lockable 3-pin terminal blocks for DC power input (DC vers.) 1-2 x AC power inlet (non-redundant(x1) / -MR version(x1) / -R(x2)) 1 x Lockable 3-pin terminal blocks for DC power input (-MR version)	
Physical Characteristics		
Housing Dimension (W x H x D) Weight Installation	IP30 SPCC metal housing 440 x 44 x 340 mm (not including screws and rack-mount kit) 5Kg (not including module but module cover only) 1U Rack-mount, Rack-mount kit included	

Environmental Limits	
Operating Temperature	-40°C~75°C (-40°F~167°F)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Ambient Relative Humidity	5%~95%, 55°C (Non-condensing)

Switching Modules



Technical Specifications			
Description	8-Port RJ45 PoE module	8-Port RJ45 module	8-Port SFP module
Model Name	RHG7X28-M1	RHG7X28-M2	RHG7X28-M3
Properties			
PoE Power per port	15.4/30W (802.3af/at)	-	-
Total Max Power	240 W	-	-
Number of ports	8	8	8
Port speed	10/100/1000 BASE-T(X)	10/100/1000 BASE-T(X)	100/1000 BASE-F(X)
Interface	RJ45	RJ45	SFP slot
Dimensions	104.5 x 171.6 x 39.5mm	104.5 x 171.6 x 39.5mm	104.5 x 171.6 x 39.5mm
Weight	550 g	500 g	450 g
Fixing	2 x screws (included)	2 x screws (included)	2 x screws (included)

Secure Modules

Technical Specifications		
Description	4-Port RJ45 MACsec Secure module	4-Port SFP MACsec Secure module
Model Name	RHG7X28-M4	RHG7X28-M5
Properties		
PoE Power per port	-	-
Total Max Power	-	-
Number of ports	4	4
Port speed	10/100/1000 BASE-T(X)	100/1000 BASE-F(X)
Interface	RJ45	SFP
Dimensions	104.5 x 171.6 x 39.5mm	104.5 x 171.6 x 39.5mm
Weight	500g	500g
Fixing	2 x screws (included)	2 x screws (included)

REGULATORY APPROVALS

Regulatory Approvals				
Safety	UL 60950-1 2nd Ed. /CSA C22.2 No.60950-1-07 2nd Ed. / EN 60950-1 / UL 62368-1 / IEC 62368-1			
EMC	FCC Part 15, Subpart B, Class A EN 55032, EN 55024, EN 61000-3-2, EN 61000-3-3, EN 61000-6-2, EN 61000-6-4			
Test	**Item**		**Value**	**Level**
IEC 61000-4-2	ESD	Contact Discharge Air Discharge	±8KV ±15KV	4 4
IEC 61000-4-3	RS	Enclosure Port	10(V/m), 80-1000MHz	3 *
IEC 61000-4-4	EFT	AC Power Port DC Power Port Signal Port	±2.0KV ±2.0KV ±2.0KV	3 3 4
IEC 61000-4-5	Surge	AC Power Port AC Power Port DC Power Port DC Power Port Signal Port	Line-to Line±1.0KV Line-to Earth±2.0KV Line-to Line±1.0KV Line-to Earth±2.0KV Line-to Earth±2.0KV	3 3 3 3 3
IEC 61000-4-6	CS	0.15-80MHz	10V rms	3 *
IEC 61000-4-8	PFMF	(Enclosure)	AC 50Hz 10A/m	3
IEC 61000-4-11	DIP	AC Power Port	-	-
Shock Drop Vibration	MIL-STD-810G Method 516.5 MIL-STD-810F Method 516.5 MIL-STD-810F Method 514.5 C-1 & C-2			
Rail Traffic	EN50155 / EN50121-4 Certified			
RoHS2	Yes			
MTBF	12.20 years			
Warranty	5 years			

** EMC level 3 on CS/RS pass conditional to the use of Shielded Ethernet Cable*

ORDERING INFORMATION

Main core switch ordering information

Model Name	Part Number	Slots	Uplink ports	Power supply
RHG7628-CPU-4SFP	1P1RHG7628CPU1G	3	4 x 1 Gb SFP	Single 110~220 VAC + Dual 48~57 VDC PoE
RHG7628-CPU-4SFP-R	1P1RHG7628CPU2G	3	4 x 1 Gb SFP	Dual 110~220 VAC + Dual 48~57 VDC for PoE
RHG7628-CPU-4SFP-MR	1P1RHG7628CPU7G	3	4 x 1 Gb SFP	Single 110~220 VAC + Single 48~57 VDC (CPU) and Dual 48~57 VDC for PoE
RHG7628-CPU-4SFP-DC	1P1RHG7628CPU3G	3	4 x 1 Gb SFP	Dual 48~57 VDC + Dual 48~57 VDC for PoE
RHG7628-CPU-410GSFP	1P1RHG7628CPU4G	3	4 x 10 Gb SFP	Single 110~220 VAC + Dual 48~57 VDC PoE
RHG7628-CPU-410GSFP-R	1P1RHG7628CPU5G	3	4 x 10 Gb SFP	Dual 110~220 VAC + Dual 48~57 VDC for PoE
RHG7628-CPU-410GSFP-MR	1P1RHG7628CPU8G	3	4 x 10 Gb SFP	Single 110~220 VAC + Single 48~57 VDC (CPU) and Dual 48~57 VDC for PoE
RHG7628-CPU-410GSFP-DC	1P1RHG7628CPU6G	3	4 x 10 Gb SFP	Dual 48~57 VDC + Dual 48~57 VDC for PoE

Modules ordering information

Model name	Part Number	RJ45 PoE ports	RJ45 non-PoE ports	SFP ports	RJ45 MACsec	SFP MACsec
RHG7X28-M1	1P1RHG7X28M101G	8	-	-	-	-
RHG7X28-M2	1P1RHG7X28M201G	-	8	-	-	-
RHG7X28-M3	1P1RHG7X28M301G	-	-	8	-	-
RHG7X28-M4	1P1RHG7X28M401G	-	-	-	4	-
RHG7X28-M5	1P1RHG7X28M501G	-	-	-	-	4

Optional Accessories

Model name	Part Number	Description
AC power cable for RHG7X28 (US)	50801341G	RHG7X28 US AC Power Cable (SS004-240)
AC power cable for RHG7X28 (EU)	50801351G	RHG7X28 EU AC Power Cable (SS004-241)
SDR-240-48	50502401480001G	DIN RAIL POWER SUPPLY / T;AC 100~240V to 48V~55V DC 5A;240W
SDR-480-48	50504801480001G	DIN RAIL POWER SUPPLY / T;AC 100~240V to 48V~55V DC 10A;480W
LM38-A3S-TI-N	50708051G	SFP Transceiver, 155Mbps, 1310nmFP, Multi-mode, 2km, 3.3V, -40~85°C
LS38-A3S-TI-N	50709431G	SFP Transceiver, 155Mbps, 1310nmFP, Single-mode, 30km, 3.3V, -40~85°C
LM28-C3S-TI-N	50708031G	SFP Transceiver, 1250Mbps, 850nmVCSEL, Multi-mode, 550m, 3.3V, -20~85°C
LM38-C3S-TI-N	50709411G	SFP Transceiver, 1250Mbps, 1310nmFP, Multi-mode, 2km, 3.3V, -40~85°C
LS38-C3S-TI-N	50709391G	SFP Transceiver, 1250Mbps, 1310nmFP, Single-mode, 10km, 3.3V, -40~85°C
LS38-C3L-TI-N	50709441G	SFP Transceiver, 1250Mbps, 1310nmDFB, Single-mode, 30km, 3.3V, -40~85°C
LM28-H3S-TI-N	50710061G	SFP Transceiver, 10.3Gbps, 850nmFP, Multi-mode, 33M(OM1 Fiber)/82M(OM2 Fiber)/300M(OM3 Fiber), 3.3V, -10~85°C

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