SE5904D (SDK) Series

4-Port Industrial Ethernet to Serial Embedded Computer

FEATURE HIGHLIGHTS

- Ideal for IoT and IIoT applications; supports NodeRED and dashboard
- Wide -40°C~85°C temperature range for Industrial-grade reliability
- High-performance IPsec VPN throughput; data-rate up to 37.9Mbps*
- 2 x 10/100Mbps Ethernet port
- 4 x RS-232/422/485 port – models available with or without isolation
- 1 x USB2.0 high speed OTG port
- Optional 802.3af PoE models can be powered by Ethernet cable
- ATOP customized Linux SDK environment with reliable APIs
- Rugged metal housing with wall or DIN-Rail mount support
- Industrial EMC protection

PRODUCT DESCRIPTION

Providing connectivity for the Internet of Things

SE5904D (SDK), Atop's Industrial Embedded Computer is your ideal flexible Gateway to the Internet of Things. It provides Serial and Ethernet connectivity in a reliable and powerful Industrial Grade platform that can unlock your potential. Based on your specific application, it allowing almost any serial device to be connected, providing and retrieving the data you need to and from the cloud, no matter what provider you're using.

Programmability

Write your customized application in C language and Run it on its powerful Industrial low-power 800MHz ARM Cortex A8 TI Sitara AM3354 CPU. Make flexible use of your peripherals, no matter storage, Serial, Relays and USB are needed.

And if C Programming bothers you, just add the Atop-Customized NodeRED environment USB Stick to be ready to Go. NodeRED is an open source Building-Block programming environment based on Node.js that will allow you to build your IoT application from an user-friendly, hardware-tailored application design environment.And if also need a user-friendly application dashboard, forget the burden of a HTML-based interface. NodeRED has already all you need.

SDK Layer		
User Application Layer		Your Application
	User Layer	3P Applications: NodeRED / Apache — Atop Utilities: FW utility / ... — Atop APIs: Hw control / Examples
	Kernel Layer	Atop Customized Linux / TCP/UDP / IP
	Driver Layer	Serial Ports / Ethernet / I/Os / Wireless / ...
Hardware Layer		Atop Hardware - ARM Cortex A8 + Peripherals

Rugged and flexible for advanced developments

SE5904D embeds *high EMC protection, wide temperature operation*, programming and installation flexibility in one device. A dedicated _PoE version_ allows you to power on the device through Power over Ethernet (IEEE802.3af) without the need of separate and space consuming power supply. _SFP version_ enhances the device providing long range fiber optic connectivity capability, in the need of a stable and remote fiber connection.

* : test carried out with one VPN-IPsec Tunnel, Peer-to-Peer mode, Ethernet cable.

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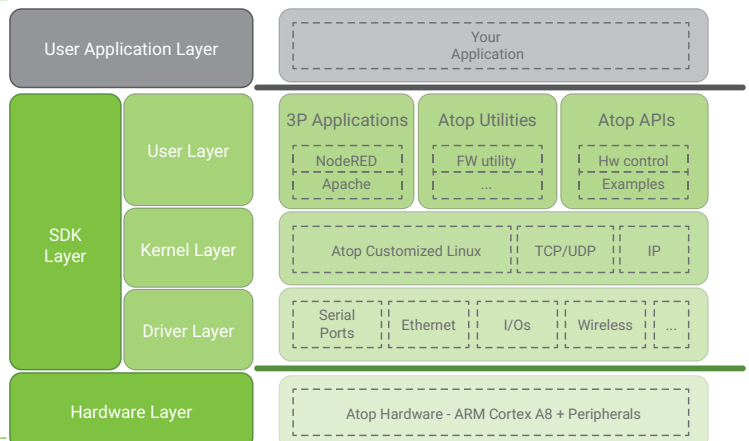
APPLICATION

The **IoT** (Internet of Things) or **IIoT** (Industrial Internet of Things) is a trending topic these days. It's all about bringing devices, sensors, actuators, data and commands to the cloud, with the ultimate goal to improve the quality of life, the services Smart Cities can offer, saving energy or saving money. This requires two things: to vehiculate the collected data to the cloud in a format that can be recognized and processed and to process, compute and analyze all this amount of data in real time.

It is not a concept far from reality. Imagine you'd like to bridge a Modbus Sensor to the cloud. And you'd like to have the application running on the cloud to be able to process multiple sensors' data, and to trigger some event in some specific stations along the network. You may also have the need to override the cloud control and manage the application locally. Any application has its story.

Here at Atop, we understand these different needs and we are providing you different working models, based on what your needs are.

Use the Pure-SDK, programmable embedded computer if:

- You are familiar with Linux OS
- You have ANSI C programming skills
- Your application is strictly time/ performance sensitive
- Your application has very critical exception handling requirements

Our SDK products provide:

- *Ported, proven and tested peripherals (such as I/Os, Ethernet, Serial, Wireless) and integrated drivers*
- *Atop customized Linux Kernel and network protocols*
- *Ported, debugged and proven third party applications (such as Apache webserver)*
- *Utilities and APIs to control the hardware in an easy and effective way*
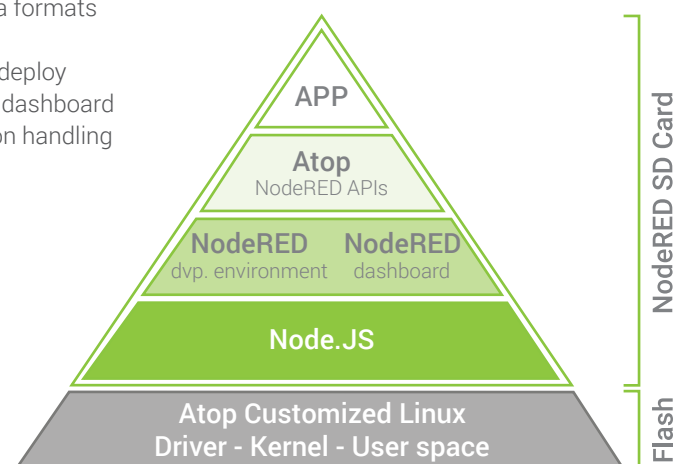- *Example of source code*
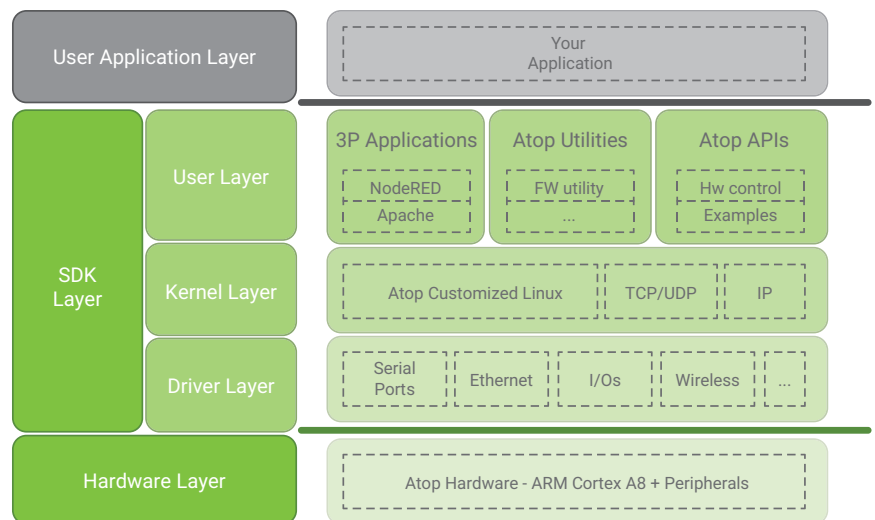
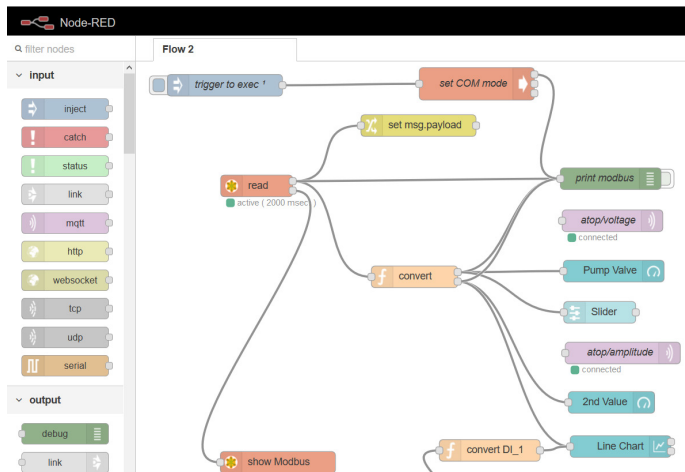## Use Atop's Standard SDK programmable ARM computer with NodeRED Add-ON USB Stick if:

- You're hands-on, with a good understanding of protocols, data formats
- You have some basic Javascript knowledge
- You're looking for a simple, user-friendly and effective way to deploy your applications to the cloud, with a user friendly monitoring dashboard
- You don't have strict performance requirements, and exception handling is not critical
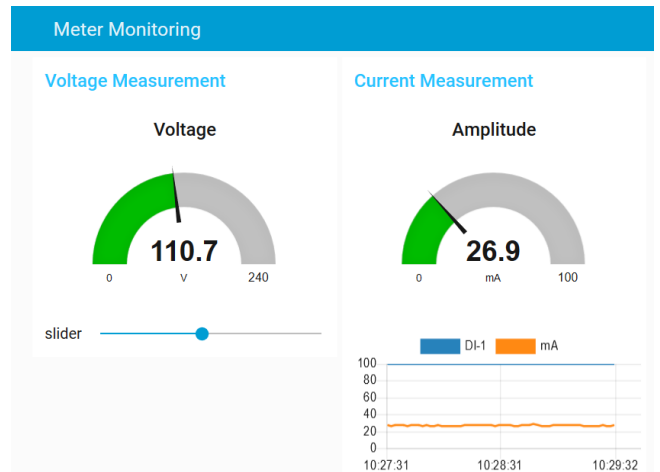
Our NodeRED USB Stick provides:

- *NodeRED visual application development environment and dashboard, with automatic start on device boot-up, Node.JS based*
- *Different level of security to allow developers to access development environment and users to access dashboard only*
- *Customized NodeRED APIs (blocks) that will allow you to fully control Atop powerful hardware and control inputs, relays, SMS, COM ports, Buzzer, diagnostics and much more*
- *Integrated Modbus and MQTT stacks, for seamless communication with field devices and cloud*
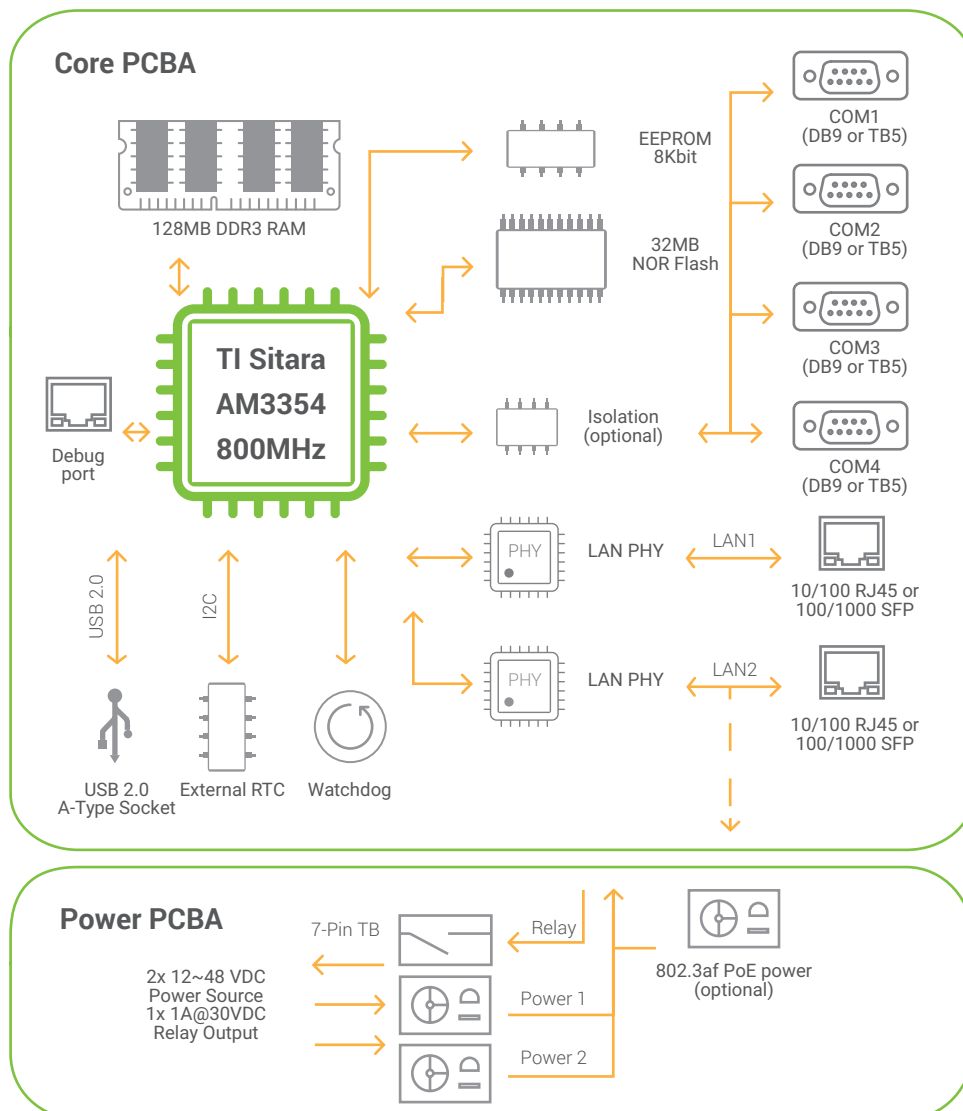
NodeRED development enrivonment

NodeRED dashboard

BLOCK DIAGRAM

Core PCBA

128MB DDR3 RAM

TI Sitara
AM3354
800MHz

Debug port

EEPROM 8Kbit

32MB NOR Flash

Isolation (optional)

COM1 (DB9 or TB5)

COM2 (DB9 or TB5)

COM3 (DB9 or TB5)

COM4 (DB9 or TB5)

LAN PHY — LAN1 — 10/100 RJ45 or 100/1000 SFP

LAN PHY — LAN2 — 10/100 RJ45 or 100/1000 SFP

USB 2.0

I2C

USB 2.0 A-Type Socket

External RTC

Watchdog

Power PCBA

7-Pin TB

2x 12~48 VDC Power Source
1x 1A@30VDC Relay Output

Relay

Power 1

Power 2

802.3af PoE power (optional)
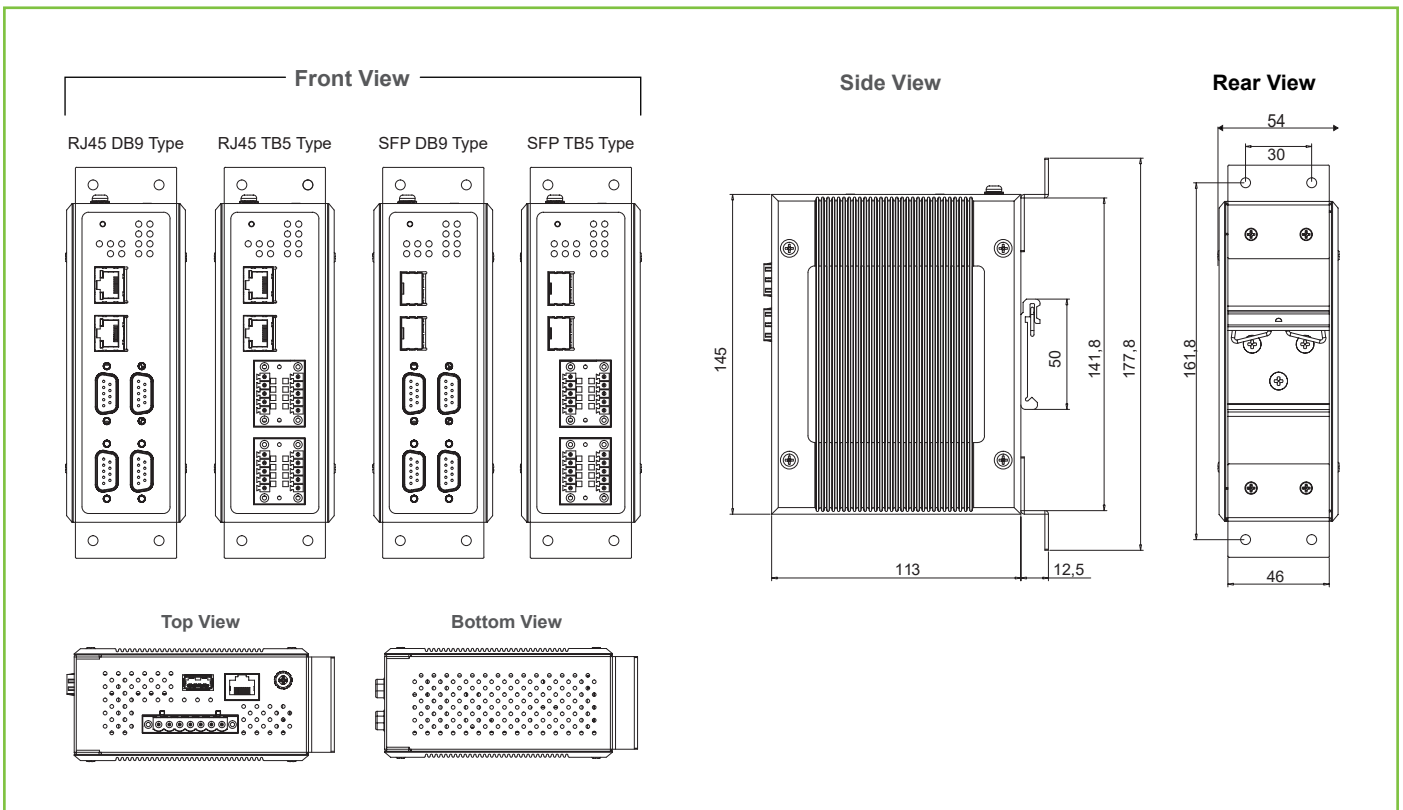
SPECIFICATIONS

Hardware Specifications	
CPU	Texas Instruments Sitara ARM Cortex A8 AM3354 800MHz
Flash	32 MB NOR Flash (customizable upon request up to 128 MB)
RAM	128 MB DDR3 (customizable upon request up to 512 MB)
EEPROM	24LC64
Watchdog	ADM706
Real Time Clock (RTC)	Yes - with external chip
Buzzer	Yes
Console port	Yes - on-board connector
Reset button	Yes
Network Interface	
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseF(X) IEEE 802.3z for 1000Base-X
Ethernet Ports	2x 10/100 Mbps RJ-45 or 2x 100/1000 Mbps SFP slot (SFP version)
Power over Ethernet	IEEE 802.3af on LAN2 (PoE version only)
Serial Interface	
Connector	D-Sub9 RS-232/485 software selectable (DB model) 5-Pin 5.08mm Terminal Block (TB and SiS model)
Ports	4 port RS-232/422/485 (2 and 4-wire) + 1 RJ45 console port
Serial Port Isolation	3 kV (SiS version only)
Pull-high / Pull-low /Term. resistors	Software selectable.
Configuration	Baud Rate — 50 ~ 921,600bps Data Bits — 7, 8 Stop Bits — 1, 2 Flow Control — None, Xon/Xoff, RTS/CTS (RS-232 only)
Other interfaces	
USB ports	1 x USB A Type (USB 2.0) - High-Speed OTG + power
Software	
Bootloader	U-boot 2014.07
Linux kernel	Linux 3.14.26
Linux toolchain	Linux 32 bits toolchain gcc (C/C++ PC cross compiler), glibc
Linux sample code	RS232, RS485, RTC, watchdog, LED, Relay, Buzzer, Button, network socket
Visual development environment	NodeRED (optional on USB card)
Power	
Input Voltage	12~48 VDC IEEE802.3 af (PoE) through LAN 2 - PoE version only
Power Redundancy	Yes, 2 independent power inputs

Relay Output	1x 1A @30 VDC (normal open)
Connector	7-Pin 5.08mm Lockable Terminal Block
Power Consumption	0.65A @ 9VDC (6 W Max)
Reverse Polarity Protection	Yes
Environmental limits	
Operating Temperature Storage Temperature Ambient Relative Humidity	-40°C~85°C (-40°F~185°F) -40°C~85°C (-40°F~185°F) 5%~95%, (Non-condensing)
Mechanicals	
Housing	IP30 protection, SPCC metal housing
Dimensions(W x H x D)	55 x 145 x 113 mm
Installation	DIN-Rail or Wall-Mount (optional kit)
Weight	400 g
Reset Button	Yes

DIMENSIONS & LAYOUT

Front View

RJ45 DB9 Type   RJ45 TB5 Type   SFP DB9 Type   SFP TB5 Type

Side View

Rear View

54

30

145

50

141,8

177,8

161,8

113

12,5

46

Top View

Bottom View

REGULATORY APPROVALS

Regulatory Approvals	
Safety	UL61010-2-201
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	Radiated (enclosure)	10 V/m	3
IEC 61000-4-4	EFT	AC Power Port Signal Port	±2.0KV ±2.0KV	3 4
IEC 61000-4-5	Surge	AC Power Port AC Power Port Signal Port	Line-to Line±1.0KV Line-to Earth±2.0KV Line-to Earth±2.0KV	3 3 3
IEC 61000-4-6	CS	Conducted (enclosure)	10 V rms	3
IEC 61000-4-8	PFMF	Enclosure	10 A/m	3
IEC 61000-4-11	DIP	Power Port	-	-
Shock Drop (Freefall) /Vibration	IEC 60068-2-27 IEC 60068-2-32 /IEC 60068-2-64			
RoHS II	Yes			
MTBF	TBD			
Warranty	5 years			

ORDERING INFORMATION

Ordering information					
Model name	Description	Ethernet	Serial	Remarks	
SE5904D-4P-DB (SDK)	Ind. 4-Port Serial Device Server, 10/100BASET(X), DB9	2 (RJ45)	4 (DB9)		
SE5904D-4P-TB (SDK)	Ind. 4-Port Serial Device Server, 10/100BASET(X), TB5	2 (RJ45)	4 (TB)		
SE5904D-4P-Sis (SDK)	Ind. 4-Port Ser. Dev. Serv,10/100BASET(X), 3kV Isolated	2 (RJ45)	4 (TB)	3kV isolation	
SE5904D-4P-PoE-DB (SDK)	Ind. 4-Port Ser. Dev. Serv, 10/100BASET(X)with PoE, DB9	2 (RJ45)	4 (DB9)	PoE PD	
SE5904D-4P-PoE-TB (SDK)	Ind. 4-Port Ser. Dev. Serv, 10/100BASET(X)with PoE, TB5	2 (RJ45)	4 (TB)	PoE PD	
SE5904D-4P-PoE-Sis (SDK)	Ind. 4-Port Ser. Dev. Serv, RJ45, PoE, 3kV Isolated	2 (RJ45)	4 (TB)	PoE, 3kV isol.	
SE5904D-4P-G-DB-SFP (SDK)	Ind. 4-Port Ser. Device Server, 100/1000BASEX SFF, DB9	2 (SFP)	4 (DB9)	SFP Gigabit	
SE5904D-4P-G-TB-SFP (SDK)	Ind. 4-Port Serial Device Server, 100/1000BASEX SFP, TB5	2 (SFP)	4 (TB)	SFP Gigabit	
SE5904D-4P-G-Sis-SFP (SDK)	Ind. 4-Port Serial Serv,100/1000BASEX SFP,3kV Isolated	2 (SFP)	4 (TB)	SFP, 3kV isol.	

Optional Accessories

Model name	Part Number	Description
USB_NodeRED	-	USB 2.0 Flash Drive, 4GB, NodeRED Libraries included
SDR-75-24	50500752240001G	75W/3.2A DIN-Rail 24VDC power supply with 88~264VAC / 124~370VDC input
CBL-RJ45(8P)-DB9(F)-90-C	50891971G	8-pin RJ45-DB9 debug cable, 90cm
GDC-120	59906861G	120mm copper woven grounding cable
ADP-DB9(F)-TB5	59906231G	Female DB9 to Female 3.81mm TB5 Converter
WMK-450-Black	70100000000052G	Aluminum wall mount kit
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