



AP329

Datasheet

Aiming to create better and safer working environments and life experiences through the products we deliver.



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Cellular Router and 24V Boost PoE Switch in One LTE/Wi-Fi PoE Routing Switch for BUS/Vehicle

AP329

Industrial 8 PoE+ with 1G WAN and Dual Radio LTE/Wi-Fi Routing Switch for BUS/Vehicle

The Innovative LTE routing switch AP329 combines functionalities of LTE/Wi-Fi router and 8-Port 8~32VDC Power boost PoE+ switch for Smart Bus applications. It can also be used in roadside cabinets or other industrial applications for high-speed Wi-Fi & multi-port Ethernet ports to LTE routing. The modular design allows project customizations of enable/disable POE ports, LTE/Wi-Fi. The embedded MQTT and RESTful API enables public cloud integration such as AWS or Azure. The private cloud platform ATMS can also be setup for instant and secured access to track location and video surveillance over cloud.



High speed 4G LTE & Wi-Fi Network

- LTE Cat.4, 2x2 MIMO, 150M downlink and 50M uplink
- LTE Cat.6 with 2CA, 2T2R MIMO provides 300M downlink and 50M uplink
- 4G/3G/2G full cellular network compatibility
- Support GPS for location services
- IEEE 802.11ac compliant & backward compatible with 802.11a/b/g/n
- Selectable 5G/2.4G Wi-Fi for local coverage, upto 866Mbps bandwidth

Multiple Ethernet ports

- Supports 8x Fast Ethernet PoE+ ports, provides 100M wire-speed switching
- Supports 1x Gigabit Ethernet WAN port for uplink or NVR
- LAN Switch port to LTE or WAN port routing
- WAN to LTE Redundant

Rugged Design for Bus, Wayside Surveillance, ITS Application

- Railway EMC: EN50121-4 compliance
- IEC61000-6-2/IEC61000-6-4 heavy industrial EMC
- Vehicle: E-mark compliance
- Radio RED for CE Marking
- Emission: FCC part 15 B Class A
- Effective heat dissipation design for operating in -40~75°C environments

Extreme PoE Capability

- Provides 8-port IEEE 802.3af/at compliance PoE+, up to 30W per port
- 12/24V to 54VDC Booster PoE
- Up to 120W PoE power budget
- Complete PoE management including per-port Power Budget Control, PoE Scheduling and PoE Status

Enhanced Cyber Security for Critical Application

- Firewall for traffic classification, port forwarding
- Support NAT, DMZ for LAN protection
- Support OpenVPN, IPsec, L2TP for secure connection
- Support HTTPs/SSH secure login

Cloud Management Service

- Support Amazon AWS & Microsoft Azure cloud service
- Support proprietary ATMS cloud service
- Interactive monitoring dashboard and map shows the status, signal strength, location etc.

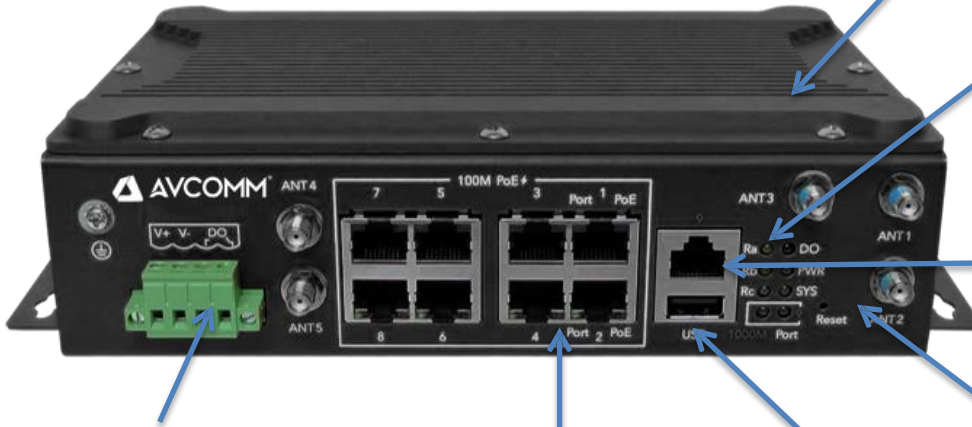
Management Features

- Various configuration paths, including WebGUI, CLI, SNMP, LAN Utility (AIAS), and NMS (ANMS)
- Support AIAS Utility, Remote configuration software utility
- Redundancy: WAN to LTE redundancy, wireless auto-offload
- Diagnostic tool includes Radio LED, Ping, TFTP, SNMP Trap, E-mail Alert and System Log
- LTE watchdog, auto-reconnect cellular connection
- OPCuA by request



Function interface

	AP329-LTE	AP329-WLAN	AP329-2xWLAN	AP329-WLAN+LTE
ANT 1	LTE-Main	Wi-Fi 1	Wi-Fi 1	LTE-Main
ANT 2	LTE-Aux	Wi-Fi 2	Wi-Fi 2	LTE-Aux
ANT 3	GPS	-	-	GPS
ANT 4	-	-	Wi-Fi 1	Wi-Fi 1
ANT 5	-	-	Wi-Fi 2	Wi-Fi 2



Outstanding Heat Sink
 · Industrial Fin-Type Design

System LED

- 1 x DO
- 1 x Power
- 1 x System Status
- 3 x Radio status
- 1 x Ethernet Port (Port 9)
- 1 x Speed (Port 9)

Gigabit Ethernet WAN

- 1-port 100/1000M RJ45

SMA Antenna Socket

- Up to 5 SMA

Integrated Power Connector

- 1 x 4-pin terminal block
- 2 pin booster power input
- 2 pin DO
- Easy installation

PoE Power Feeding

- 8-port 10/100M PoE RJ45
- IEEE 802.3af/at

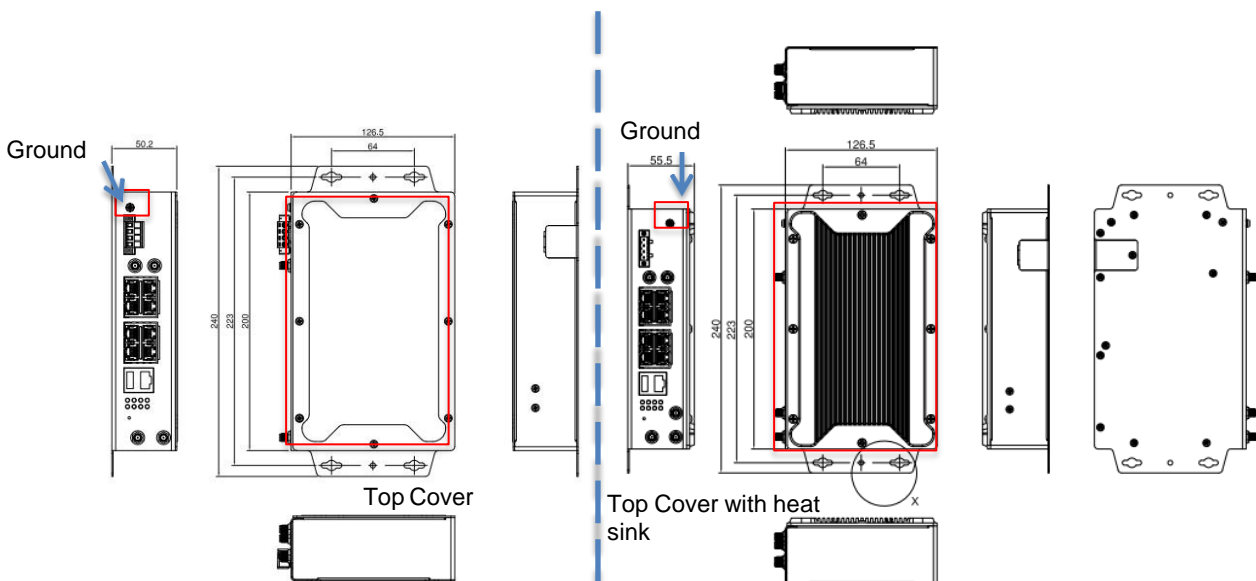
USB Extension Port

- USB for Configuration/Firmware update
- External Storage



Installation dimensions

(mm)



**AP329
(without
PoE)**

**AP329
(with
PoE)**

Technology	
Standard	3GPP Release 11 Long Term Evolution (LTE), fallback 3GPP Release 7,8,9 for HSPA/UMTS IEEE 802.11ac wireless local area network (WLAN), Backward support 802.11a/b/g/n Wireless LAN IEEE 802.3 10Base-TX Ethernet IEEE 802.3u 100Base-TX Fast Ethernet IEEE 802.3ab 1000Base-T Gigabit Ethernet Copper IEEE 802.3af/at Power-over-Ethernet IEEE 802.1Q for VLAN
Interface	
Ethernet Port	LAN: 8 x 10/100Base-TX RJ45, Auto Negotiation, Auto MDI/MDI-X, IEEE 802.3af/at PoE/PoE+ WAN: 1 x 100/1000Base-T RJ45, Auto Negotiation, Auto MDI/MDI-X
System LED	1 x DO: Red On 1 x Power: Green On 1 x SYS: Ready: Green On, Firmware Updating: Green Blinking 1 x WAN: Link: Green On, Activity: Green Blinking 1 x 1000M: WAN port speed, 1000M: Green On, Not 1000M: Off AP329: 3 x Radio (Ra, Rb, Rc): Reserved AP329-WLAN: 3 x Radio (Ra, Rb, Rc): Radio status Ra: Reserved Rb: Reserved Rc: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off AP329-2xWLAN: 3 x Radio (Ra, Rb, Rc): Radio status Ra: Reserved Rb: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off Rc: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off AP329-LTE: 3 x Radio (Ra, Rb, Rc): Radio status Ra: SIM detected: Green On, SIM not inserted: Off Rb: 4G connection: Green On, 2/3G connection: Green blinking, Disconnected: Off Rc: Reserved AP329-WLAN+LTE: 3 x Radio (Ra, Rb, Rc): Radio status Ra: SIM detected: Green On, SIM not inserted: Off Rb: 4G connection: Green On, 2/3G connection: Green blinking, Disconnected: Off Rc: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off
Ethernet Port LED	Link: Green On, Activity: Green Blinking, PoE power feeding: Amber on, PoE power not feeding: Off
USB	1 x USB for Configuration/Firmware Update
Reset	System Reset(2~6 Seconds) / Default Settings Reset(over 7 Seconds)
SMA Connector	Up to 5x RP-SMA Female, check product interface for installation (Page2)
SIM Socket	AP329-LTE/AP329-WLAN+LTE: 2x Nano SIM tray with redundancy
Power Input, Digital Output	4-Pin Removable Terminal Block Connector 2 Pin for Power Input 2 Pin for DO (Relay Alarm) DO: Dry Relay Output with 0.5A/24V DC
Optional Expansion Board	RS232/422/485, Digital Input/Digital Output, MicroSD card for field application, by request
Cellular Properties (LTE Cat. 4)	
Standard	GSM/GPRS/EDGE 3GPP Release 6 UMTS/HSPA 3GPP Release 8 LTE 3GPP Release 11
Data Rate	GPRS: DL: max. 85.6 kbps, UL: max. 85.6 kbps EDGE: DL: max. 236.8 kbps, UL: max. 236.8 kbps HSPA: DL: max. 42 Mbps, UL: max. 5.76 Mbps LTE-FDD Cat.4: DL: max. 150 Mbps, UL: max. 50 Mbps, 2x2 DL MIMO LTE-TDD Cat.4: DL: max. 130 Mbps, UL: max. 35 Mbps, 2x2 DL MIMO
Band Information: LTE-E	LTE: FDD B1/B3/B5/B7/B8/B20 (2100/1800/850/2600/900/800MHz) LTE: TDD B38/B40/B41 (2600/2300/2500MHz) WCDMA: FDD B1/B5/B8 (2100/850/900MHz) GSM: B3/B8 (1800/900MHz)

Band Information: LTE-AU	LTE: FDD B1/B2/B3/B4/B5/B7/B8/B28 (2100/1900/1800/1700/850/2600/900/700MHz) LTE: TDD B40 (2300MHz) WCDMA: FDD B1/B2/B5/B8 (2100/1900/850/900MHz) GSM: B2/B3/B5/B8 (1900/1800/850/900MHz)							
Band Information: LTE-U	FDD LTE: B2/B4/B12 (1900/1700/700MHz) WCDMA: B2/B4/B5 (1900/1700/850MHz)							
Band Information: LTE-CN	LTE FDD: B1/B3/B5/B8 (2100/1800/850/900MHz) LTE TDD: B38/B39/B40/B41 (2600/1900/2300/2500MHz) TD-SCDMA: B34/B39 (2000/1900MHz) WCDMA: B1/B8 (2100/900MHz) CDMA: BC0 GSM: 900/1800MHz							
Band Information: LTE-V (Verizon Certified)	FDD LTE: B4/B13 (1700/700MHz)							
Cellular Properties (LTE Cat. 6)								
Standard	UMTS/HSPA 3GPP Release 8 LTE 3GPP Release 12 (LTE Cat.6)							
Data Rate	TD-SCDMA: DL Max 4.2Mbps, UL: Max 2.2Mbps HSPA: DL: Max. 42 Mbps, UL: Max. 5.76 Mbps WCDMA: DL: Max 384Kbps, UL: Max 384Kbps LTE-FDD: DL: Max. 300 Mbps, UL: Max. 50 Mbps, 2x2 DL MIMO LTE-TDD: DL: Max. 226 Mbps, UL: Max. 28 Mbps, 2x2 DL MIMO							
Band Information: LTE-E	LTE-FDD: B1/B3/B5/B7/B8/B20/B28/B32 (2100/1800/850/2600/900/800/700/1500MHz) LTE-TDD: B38/B40/B41 (2600/2300/2500MHz) WCDMA: B1/B3/B5/B8 (2100/1800/850/900MHz)							
Band Information: LTE-U	LTE-FDD: B2/B4/B5/B7/B12/B13/B17/B25/B26/B29/B30/B66 (1900/1700/700/2600/700/700/700/1900/850/700/2300/1700MHz)) LTE-TDD: B41 (2500MHz) WCDMA: B2/B4/B5 (1900/1700/850MHz)							
Band Information: LTE-AP	LTE-FDD: B1/B3/B5/B7/B8/B18/B19/B21/B26 (2100/1800/850/2600/900/850/850/1500/850MHz) LTE-TDD: B38/B39/B40/B41 (2600/1900/2300/2500MHz) WCDMA: B1/B5/B6/B8/B9/B19 (2100/850/UMTS only/900/1800/850MHz) TD-SCDMA: B39 (1900MHz)							
Wi-Fi Properties								
Standard	IEEE 802.11ac/a/b/g/n (2T2R) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)							
Data Rate	802.11ac: MCS0 ~ 9, max. 866Mbps 802.11b: 11Mbps / 802.11a/g: 54Mbps / 802.11n: MCS0 ~ 15, max. 300Mbps							
Frequency	IISM Band, 2.412GHz ~ 2.472GHz, 5.180MHz ~ 5.825MHz(Band 1,4)							
MIMO	2T2R, 2xAntennas (Optional Accessory)							
RSSI	≤20db, compliant with CE request							
Output Power & Receive Sensitivity	Operating Frequency: 2.412~2.472GHz				Operating Frequency: 5.180G~5.825GHz Max. MIMO: 2T2R			
	Standard	Bandwidth	TX (dBm)	RX (dBm)	Standard	Bandwidth	TX (dBm)	RX (dBm)
	802.11b	1Mbps	20	-95	802.11a	6Mbps	20	-94
		11Mbps	20	-90		54Mbps	15	-80
	802.11g	6Mbps	21	-94	802.11an/ac HT20	MCS0	19	-93
		54Mbps	18	-80		MCS8	13	-71
	802.11n HT20	MCS0	21	-93	802.11an/ac HT40	MCS0	18	-90
		MCS7	16	-76		MCS9	13	-66
	802.11n HT40	MCS0	20	-92	802.11an/ac HT80	MCS0	18	-88
		MCS7	16	-73		MCS9	13	-65

GPS Properties	
GNSS	GPS/GLONASS/BeiDou/Galileo
Performance	Cold start: 18s, Warm start: 2.2s, Hot start: 1.8s
Sensitivity	Cold start: -146dBm, Reacquisition: -157dBm, Tracking: -157dBm
Accuracy	<1.5M
GNSS Frequency	GPS/Galileo: 1575.42±1.023 MHz GLONASS: 1597.5~1605.8 MHz BeiDou: 1561.098±2.046 MHz
Antenna (Optional Accessory- A-GPS-27-RSM-3M)	Frequency range: 1561~1615MHz Polarization: RHCP or linear VSWR: <2 (Typ.) Passive antenna gain: >0dBi
Software	
Management Interface	CGI WebGUI, Command Line Interface (CLI), Telnet, SNMP
User Management	Radius client, TACACS+, Multi-User Authentication
Time Management	SNTP, Cellular Time
IoT	AWS Agent, Azure Agent, ThingsMaster Agent
Network Management	802.1Q VLAN, IPv4/IPv6, DDNS, SNMP v1/v2c/v3/Trap, MIB II, Entity MIB, MIBs, DHCP server/client, DHCP relay*, TFTP, System Log, ARP response over 802.2 LLC SNAP, Proxy ARP, DNS (client/proxy)
Traffic Management	NAT Routing, Traffic shaping, 1:1 NAT, NAPT(SNAT/DNAT)
Routing	RIPv2*, Static Route
Security	Firewall, DMZ, Port Forwarding, HTTPs, SSH, First login password management
Redundancy Protocol	WAN/LTE Redundancy, VRRP
VPN	IPsec, OpenVPN, L2TP, GRE
Cellular Configuration	Radio on/off, 4G LTE/3G HSPA Configuration, SIM Security, Connection Status, Cellular to Eth-WAN Redundancy, GPS positioning
WLAN Configuration	WLAN Basic Settings: Radio on/off, 2.4G 11n/5G 11ac Band and Frequency selection, SSID/Multi-SSID configuration, SSID broadcast, Cellular to WLAN Auto Offload and advanced WLAN settings, 802.1X
Utility	AIAS, ANMS, Ping, Traceroute
Power Requirement	
Input Voltage	Model with PoE: 12/24VDC (8~32VDC with booster to 54V) min. 8V low-peak auxiliary voltage Model without PoE: 12/24VDC (8~32VDC)
Reverse Polarity Protect	Yes
Input Current	AR329P: 5.67A@24VDC, 10.76A@8VDC/60W\
Power Consumption	Max. 4.8W@24VDC full traffic without PD loading, suggest to reserve 15% tolerance
PoE	
Power forwarding mode	Alternative A
PoE Power Budget	System: Max. 120W@70°C/12VDC, Max.60W@70°C/8VDC Per Port: Max. 30W
PoE Standard	IEEE 802.3af/at
Management	PoE Enable/Disable, System/Port Power Budget Control, PD Alive Check, PoE Scheduling, PoE Status
Mechanical	
Installation	Wall mount
Enclosure Material	Steel Metal with Aluminum
Dimension	Model with PoE: 200x 55 x 126 (W x H x D) / without Mounting Clip Model without PoE: 200x 51 x 126 (W x H x D) / without Mounting Clip
Ingress Protection	IP30
Weight	~1350g without package

Environmental	
Operating Temperature & Humidity	-40°C~75°C , 5%~95% Non- Condensing
Storage Temperature	-40°C~85°C
MTBF	>200,000 hours
Warranty	5 years
Approval	
Safety	EN60950-1 Compliance
EMC	EN61000-6-2/EN61000-6-4
EMI	CISPR 22, FCC part 15B Class A
Radio	RED Compliance Safety: EN 62368-1 EN 50385/EN62311 MPE assessment EN 301 489-1/17/19/52, EN 55032/55024 EN 300 328/EN 301 893 EN 301 908-1 FCC Part 15B
Railway	EN50121-4 Compliance

Ordering Information

Model Name	Description
AP329-LTE	Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 1×USB, 2×SIM, WLAN, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC
AP329-WLAN	Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 1×USB, WLAN 802.11ac/n, 8-32VDC
AP329-WLAN-LTE	Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 1×USB, 2×SIM, 1×eSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC
AP329A-LTE	Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 3×DI,1×DO, 1×USB, 2×SIM, WLAN, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC
AP329A-WLAN	Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 3×DI,1×DO, 1×USB, WLAN 802.11ac/n, 8-32VDC
AP329A-WLAN-LTE	Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 3×DI,1×DO, 1×USB, 2×SIM, 1×eSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC
AP329-PoE-LTE	Industrial wireless IIoT secure routing POE gateway,1xGbE WAN+8xFE LAN, 1×USB, 2×SIM, WLAN, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC
AP329-PoE-WLAN	Industrial wireless IIoT secure routing POE gateway1xGbE WAN+8xFE LAN, 1×USB, WLAN 802.11ac/n, 8-32VDC
AP329-PoE-WLAN-LTE	Industrial wireless IIoT secure routing POE gateway,1xGbE WAN+8xFE LAN, 1×USB, 2×SIM, 1×eSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC
AP329A-PoE-LTE	Industrial wireless IIoT secure routing POE gateway,1xGbE WAN+8xFE LAN, 1×USB, 2×SIM, 1×eSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC
AP329A-PoE-WLAN	Industrial wireless IIoT secure routing POE gateway, 1xGbE WAN+8xFE LAN, 3×DI,1×DO, 1×USB, WLAN 802.11ac/n, 8-32VDC
AP329A-PoE-WLAN-LTE	Industrial wireless IIoT secure routing POE gateway, 1xGbE WAN+8xFE LAN, 3×DI,1×DO, 1×USB, 2×SIM, 1×eSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC
	Package List
	1 x Product Unit
	1 x 4-pin Removable Terminal Block Connector
	1 x Quick Installation Guide
	NOTE: Antennas are not included in the package. Please order the antennas from the optional accessories.

Ordering Information	
A-LTE_WLAN_G-4_4-RSM-2M	Combo IP67 Antenna, LTE WW 4dBi, Wi-Fi 2.4/5GHz dual band Omni-directional 4/4dBi, GPS 1561- 1670MHz 28dBi, RP-SMA male, 2M
A-LTE_WLAN_G-3_2-RSM-2M	Combo IP67 Antenna, LTE WW 3dBi, Wi-Fi 2.4/5GHz dual band Omni-directional 2/2dBi, GPS 1575- 1610MHz 28dBi, RP-SMA male, 2M
A-LTE-2-RSM	LTE Antenna, LTE WW 2dBi, RP-SMA male
A-WLAN-3-RSM	Wi-Fi Antenna, 2.4/5GHz Dual Band Omni-directional 2.5/3dBi, RP-SMA male
A-GPS-27-RSM-3M	GPS Antenna, GPS 1575MHz 27dBi, RP-SMA male, 3M
A-LTE-3-NM	LTE Antenna, LTE WW 3dBi, N-type male
A-WLAN-6-NM	Wi-Fi Antenna, Wi-Fi 2.4/5GHz dual band Omni-directional 4/6dBi, N-type male
A-GPS-2-NM	GPS Antenna, GPS 2dBi, N-type male
C-RF-R-RSF_RSM-1M	RF cable, RP-SMA female to RP-SMA male, 1M
C-RF-C2-NF_RSM-2M	RF cable, N-type female to RP-SMA male, CFD200, 2M