LANCOM L-320agn Wireless (White)

Single-radio business-class 11n WLAN access point with up to 300 Mbps

The LANCOM L-320agn Wireless is a powerful 11n WLAN business-class access point. It optionally provides professional and reliable WLAN to 11n clients in the 2.4-GHz or 5-GHz band. An ideal combination for professional 300 Mbps WLAN in the business field. Thanks to its integrated antennas and optional white housing it is additionally ideal for an inconspicuous application in modern environments.

- Single operation WLAN – optional operation at 2.4 or 5 GHz with up to 300 Mbps with IEEE 802.11n
- Dynamic WLAN optimization thanks to LANCOM Active Radio Control (ARC)
- Powerful WLAN diagnostics with Spectral Scan
- Operation via LANCOM Management Cloud, WLAN controller or stand-alone
- Easy and secure integration of external users with the Public Spot Option
- Optionally in "classic" or "white" housing with integrated antennas

LANCOM
Systems

LANCOM L-320agn Wireless (White)

Single Operation Wi-Fi with up to 300 Mbps

The LANCOM L-320agn Wireless is a powerful 11n WLAN business-class access point. It provides 11n clients optionally in the 2.4-GHz frequency band or 5-GHz band with 300 Mbps WLAN.

Active Radio Control for dynamic radio-field optimization

The LANCOM L-320agn Wireless supports the WLAN optimization concept LANCOM Active Radio Control. This intelligent combination of innovative features included with the LCOS operating system – such as Adaptive Noise Immunity, RF Optimization, and Client Steering – sustainably increases WLAN performance and supports administrators with professional tools for WLAN management.

Powerful WLAN diagnostics with Spectral Scan

The LANCOM L-320agn Wireless uses Spectral Scan to search the surrounding radio field for sources of interference. This professional tool for efficient WLAN troubleshooting is a combination of hardware and software features. It identifies and graphically represents sources of interference, so helping the administrator to initiate countermeasures.

LANCOM security for wireless networks

With numerous integrated security features, such as IEEE 802.1X, the LANCOM L-320agn Wireless provides optimal security for networks. As a result, employees and visitors all benefit from security policies in the network.

Zero-touch deployment

The LANCOM L-320agn Wireless can be versatilely operated: Managed via the LANCOM Management Cloud it is integrated into a comprehensive, automated network orchestration, based on Software-defined Networking technology. It can also be operated via a LANCOM WLAN controller or be applied in stand-alone operation.

Secure integration of external users

In combination with the LANCOM Public Spot Option, the LANCOM L-320agn Wireless is ideal for operating hotspots. Users benefits from a hotspot that is secure and easy-to-use, while hotspot operators can be sure that their own network remains separate from the hotspot.

Modern housing with integrated antennas

The LANCOM L-320agn Wireless offers integrated antennas and is available in two different designs: classic and white. Especially with the white housing, the LANCOM L-320agn Wireless is ideal for the application in exclusive, modern environments, such as hotels, restaurants, and medical institutions.

Maximum future viability

LANCOM products are designed for a service life of several years and are equipped with hardware dimensioned for the future. Even reaching back to older product generations, updates to the LANCOM Operating System – LCOS – are available several times a year, free of charge and offering major features.

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LCOS 10.00 (HW Rel. R2)

WLAN product specifications	
Frequency band 2.4 GHz or 5 GHz	2400-2483.5 MHz (ISM) or 5150-5825 MHz (depending on country-specific restrictions)
Integrated Antenna Gain (per antenna (2))	up to 3 dBi in 2.4 GHz, up to 4.5 dBi in 5 GHz
Data rates IEEE 802.11n	300 Mbps according to IEEE 802.11n with MCS15 (fallback to 6,5 Mbps with MCS0). Compatible to IEEE 802.11a/n, IEEE 802.11g/n, IEEE 802.11b/g/n or IEEE 802.11b/g compatibility mode or pure IEEE 802.11n, pure IEEE 802.11a, IEEE 802.11g or pure IEEE 802.11b mode and data rates selectable
Data rates IEEE 802.11a/ h	54 Mbps (fallback to 48, 36 , 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection), fully compatible with TPC (adjustable power output) and DFS (automatic channel selection, radar detection) and data rates selectable
Data rates IEEE 802.11b/g	54 Mbps to IEEE 802.11g (fallback to 48, 36, 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection) compatible to IEEE 802.11b (11, 5.5, 2, 1 Mbps, Automatic Rate Selection), IEEE 802.11b/g compatibility mode or pure IEEE 802.11g or pure IEEE 802.11b and data rates selectable
Range IEEE 802.11a/b/g *	Up to 150 m (up to 30 m in buildings)
Output power at radio module, 5 GHz	IEEE 802.11a/h: +15 dBm @ 6 up to 36 Mbps, +14 dBm @ 48 Mbps, +12 dBm @ 54 Mbps IEEE 802.11n: +15 dBm @ (MCS0/8, 20 MHz), +7 up to +10 dBm @ (MCS7/15, 20 MHz), +14 dBm @ (MCS0/8, 40 MHz), +6 up to +9 dBm @ (MCS7/15, 40 MHz)
Output power at radio module, 2.4 GHz	IEEE 802.11b: +14dBm @ 1, 2, 5.5 and 11 Mbps, IEEE 802.11g: +17dBm @ 6 up to 36 Mbps, +16dBm @ 48 and 54 Mbps, IEEE 802.11n: +16dBm @ (MCS0/8, 20 MHz), +15 dBm @ (MCS7/15, 20 MHz), +15 dBm @ (MCS0/8, 40 MHz), +14 dBm @ (MCS7/15, 40 MHz)
Minimum transmission power	Transmission power reduction in software in 1 dB steps to min. 0.5 dBm
Receiver sensitivity 5 GHz	IEEE 802.11a/h: -98 dBm @ 6 Mbps, -81 dBm @ 54 Mbps, IEEE 802.11n: -94 dBm @ (MCS0, 20 MHz), -76dBm @ (MCS 7, 20 MHz), -92 dBm @ (MCS0, 40 MHz), -72 dBm @ (MCS7, 40 MHz)
Receiver sensitivity 2.4 GHz	IEEE 802.11b: -97 dBm @ 1 MBit/s, -93 dBm @ 11 MBit/s, IEEE 802.11g: -95dBm @ 6 MBit/s, -81dBm @ 54 MBit/s IEEE 802.11n: -94 dBm @ 6,5MBit/s (MCS0, 20 MHz), -77 dBm @ 65 MBit/s (MCS7, 20 MHz), -91 dBm @ 15 MBit/s (MCS0, 40 MHz), -74 dBm @ 150 MBit/s (MCS7, 40 MHz)
Radio channels 5 GHz	Up to 26 non-overlapping channels (available channels and further obligations such as automatic DFS dynamic channel selection depending on national regulations)
Radio channels 2.4 GHz	Up to 13 channels, max. 3 non-overlapping (depending on country-specific restrictions)
Multi-SSID	Up to 16 independent WLAN networks
Concurrent WLAN clients	Up to 256 clients (recommended)
Note	The effective distances and transmission rates that can be achieved are depending of the onsite RF conditions
Supported WLAN standards	
IEEE standards	IEEE 802.11n, IEEE 802.11a, IEEE 802.11g, IEEE 802.11b, IEEE 802.11i, IEEE 802.1X, IEEE 802.11u, IEEE 802.11r (Fast Roaming), IEEE 802.11w (Protectet Management Frames), WME and U-APSD/WMM Power Save as defined in IEEE 802.11e, IEEE 802.11h, IEEE 802.11d
Standard IEEE 802.11n	
Supported features	2x2 MIMO, 40 MHz channel, 20/40MHz coexistence mechanisms in the 2.4 GHz band, MAC aggregation, Block Acknowledgement, STBC (Space Time Block Coding), LDPC (Low Density Parity Check), MRC (Maximal Ratio Combining), Short Guard Interval
WLAN operating modes	
Modes	WLAN access point (standalone, WLC or LANCOM Management Cloud managed), WLAN bridge (P2P or P2MP) (standalone or AutoWDS*), (standalone, WLC or LANCOM Management Cloud managed), WLAN client mode, transparent WLAN client mode
*) Note	Only in installations with WLAN controller
Security	
Encryption options	IEEE 802.1X (WPA2-Enterprise), IEEE 802.11i (WPA2-Personal), Wi-Fi Certified™ WPA2™, WPA, WEP, IEEE 802.11w (Protected Management Frames), LEPS (LANCOM Enhanced Passphrase Security)
Encryption	AES:CCMP (Advanced Encryption Standard with Counter Mode and Cipher Block Chaining Message Authentication Code Protocol), TKIP (Temporal Key Integrity Protocol), RC4 (only used by WEP)
EAP types (authenticator)	EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0/EAP-MSCHAPv2, PEAPv1/EAP-GTC, EAP-FAST

LANCOM L-320agn Wireless (White)

LCOS 10.00 (HW Rel. R2)

Security	
RADIUS/EAP-server	User administration MAC-based, rate limiting, passphrases, VLAN user based, authentication of IEEE 802.1X clients via EAP-TLS, EAP-TTLS, EAP-MD5, EAP-GTC, PEAP, MSCHAP or MSCHAPv2
Others	WLAN protocol filters, IP-redirection of any packet received over the WLAN interface, IEEE 802.1X supplicant, background scanning, client detection ("rogue WLAN client detection"), Wireless Intrusion Detection System (WIDS), RADIUS CoA (Change of Authorization)
LANCOM Active Radio Control	
Client Steering*	Steering of WLAN clients to the ideal access point
Managed RF Optimization*	Selection of optimal WLAN channels by the administrator
Adaptive Noise Immunity	Better WLAN throughput due to immunity against interferences
Spectral Scan	Monitoring your WLAN for sources of interference
Adaptive RF Optimization	Dynamic selection of the optimal WLAN channel
Airtime Fairness	Improved utilization of the WLAN bandwidth
Adaptive Transmission Power	Automatic adjustment of the transmission power for Wi - Fi backup scenarios
*) Note	Only in installations with WLAN controller
Roaming	
Roaming	IAPP (Inter Access Point Protocol), IEEE 802.11r (Fast Roaming), OKC (Opportunistic Key Caching), Fast Client Roaming (only in operating mode client modus)
Layer 2 features	
VLAN	4.096 IDs based on IEEE 802.1q, dynamic assignment, Q-in-Q tagging
Quality of Service	WME based on IEEE 802.11e, Wi-Fi Certified™ WMM®
Rate limiting	SSID based, WLAN client based
Multicast	IGMP-Snooping, Multicast-to-Unicast-conversion on WLAN interfaces
Protocols	Ethernet over GRE-Tunnel (EoGRE), ARP-Lookup, LLDP, DHCP option 82, IPv6-Router-Advertisement-Snooping, DHCPv6-Snooping, LDRA (Lightweight DHCPv6 Relay Agent), Spanning Tree, Rapid Spanning Tree, ARP, Proxy ARP, BOOTP, DHCP
Layer 3 features	
Firewall	Stateful inspection firewall including paket filtering, extended port forwarding, N:N IP address mapping, paket tagging, user-defined rules and notifications
Quality of Service	Traffic shaping, bandwidth reservation, DiffServ/TOS, packetsize control, layer-2-in-layer-3 tagging
Security	Intrusion Prevention, IP spoofing, access control lists, Denial of Service protection, detailed settings for handling reassembly, session-recovery, PING, stealth mode and AUTH port, URL blocker, password protection, programmable reset button
PPP authentication mechanisms	PAP, CHAP, MS-CHAP, and MS-CHAPv2
High availability / redundancy	VRRP (Virtual Router Redundancy Protocol), analog/GSM modem backup
Router	IPv4-, IPv6-, NetBIOS/IP multiprotokoll router, IPv4/IPv6 dual stack
Router virtualization	ARF (Advanced Routing and Forwarding) up to separate processing of 16 contexts
IPv4 services	HTTP and HTTPS server for configuration by web interface, DNS client, DNS server, DNS relay, DNS proxy, dynamic DNS client, DHCP client, DHCP relay and DHCP server including autodetection, NetBIOS/IP proxy, NTP client, SNTP server, policy-based routing, Bonjour-Proxy, RADIUS
IPv6 services	HTTP and HTTPS server for configuration by web interface, DHCPv6 client, DHCPv6 server, DHCPv6 relay, DNS client, DNS server, dynamic DNS client, NTP client, SNTP server, Bonjour-Proxy, RADIUS
IPv6 compatible LCOS applications	WEBconfig, HTTP, HTTPS, SSH, Telnet, DNS, TFTP, firewall, RAS dial-in
Dynamic routing protocols	RIPv2
IPv4 protocols	DNS, HTTP, HTTPS, ICMP, NTP/SNTP, NetBIOS, PPPoE (server), RADIUS, RADSEC (secure RADIUS), RTP, SNMPv1,v2c,v3, TFTP, TACACS+
IPv6 protocols	NDP, stateless address autoconfiguration (SLAAC), stateful address autoconfiguration (DHCPv6), router advertisements, ICMPv6, DHCPv6, DNS, HTTP, HTTPS, PPPoE, RADIUS, SMTP, NTP, Syslog, SNMPv1,v2c,v3

LANCOM Systems

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Layer 3 features	
WAN operating mode	VDSL, ADSL1, ADSL2 or ADSL2+ additional with external DSL modem at an ETH port
WAN protocols	PPPoE, Multi-PPPoE, ML-PPP, GRE, EoGRE, PPTP (PAC or PNS), L2TPv2 (LAC or LNS) and IPoE (using DHCP or no DHCP), RIP-1, RIP-2, VLAN, IPv6 over PPP (IPv6 and IPv4/IPv6 dual stack session), IP(v6)oE (autokonfiguration, DHCPv6 or static)
Tunneling protocols (IPv4/IPv6)	6to4, 6in4, 6rd (static and over DHCP), Dual Stack Lite (IPv4-in-IPv6-Tunnel)
Interfaces	
Ethernet port	1 x 10/100/1000BASE-T autosensing (RJ-45), PoE (Power over Ethernet)
Serial interface	Serial configuration interface / COM port (8 pin Mini-DIN): 9,600 - 115,000 baud, suitable for optional connection of analog/GPRS modems. Supports internal COM port server and allows for transparent asynchronous transmission of serial data via TCP
Internal antenna	Radio module uses two internal antennas.
Hardware	
Power supply	12 V DC, external power adapter (230 V) with bayonet cap. PoE (Power over Ethernet), compliant with IEEE 802.3af
Environment	Temperature range 0° to +45°C; humidity up to 95%; non-condensing
Power consumption (max)	Approx. 4.5 watt with 12 V/ 1,5 A power supply adapter (total power consumption of access point and power supply adapter), approx. 5.1 watt via PoE
Housing	Robust synthetic housing, rear connectors, ready for wall mounting, Kensington lock; 210 x 45 x 140 mm (W x H x D)
Management and monitoring	
Management	LANCOM Management Cloud, LANconfig, WEBconfig, WLAN controller, LANCOM Layer 2 management (emergency management)
Management functions	Alternative boot configuration, voluntary automatic updates for LCMS and LCOS, individual access and function rights up to 16 administrators, RADIUS and RADSEC user management, remote access (WAN or (W)LAN, access rights (read/write) adjustable seperately), SSL, SSH, HTTPS, Telnet, TFTP, SNMP, HTTP, access rights via TACACS+, scripting, timed control of all parameters and actions through cron job
FirmSafe	Two stored firmware versions, incl. test mode for firmware updates
Monitoring	LANCOM Management Cloud, LANmonitor, WLANmonitor
Monitoring functions	Device SYSLOG, SNMPv1,v2c,v3 incl. SNMP-TRAPS, extensive LOG and TRACE options, PING and TRACEROUTE for checking connections, internal logging buffer for firewall events
Monitoring statistics	Extensive Ethernet, IP and DNS statistics; SYSLOG error counter, accounting information exportable via LANmonitor and SYSLOG
iPerf	iPerf is a tool for measurements of the bandwidth on IP networks (integrated client and server)
SLA-Monitor (ICMP)	Performance monitoring of connections
SD-WLAN	SD-WLAN – automatic WLAN configuration via the LANCOM Management Cloud
SD-LAN	SD-LAN – automatic LAN configuration via the LANCOM Management Cloud
Declarations of conformity*	
CE	EN 60950-1, EN 301 489-1, EN 301 489-17
Wi-Fi Alliance Certification	Wi-Fi Certified
5 GHz WLAN	EN 301 893
2.4 GHz WLAN	EN 300 328
Medical	Medical conformity with EN 60601-1-2
IPv6	IPv6 Ready Gold
Country of Origin	Made in Germany
*) Note	You will find all declarations of conformity in the products section of our website at www.lancom-systems.eu
Scope of delivery	
Manual	Installation Guide (DE/EN/FR/ES/IT/PT/NL)
CD/DVD	Data medium with management software (LANconfig, LANmonitor, WLANmonitor, LANCAPI) and documentation

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Scope of delivery	
Cable	1 Ethernet cable, 3 m
Power supply unit	External power adapter (230 V), NEST 12 V/1.5 A DC/S, coaxial power connector 2.1/5.5 mm bayonet, temperature range from -5 to +45° C, LANCOM item no. 111140 (EU) (not included in bulk delivery)
Support	
Warranty	3 years support
Software updates	Regular free updates (LCOS operating system and LANtools) via Internet
Options	
LANCOM Warranty Basic Option S	Option to extend the manufacturer´s warranty from 3 to 5 years, item no. 10710
LANCOM Warranty Advanced Option S	Option to extend the manufacturer´s warranty from 3 to 5 years and replacement of a defective device, item no. 10715
LANCOM Public Spot	Hotspot option for LANCOM access points, LANCOM 17xx and LANCOM 19xx series for user authentication (up to 64), versatile access (via voucher, e-mail, SMS), including a comfortable setup wizard, secure separation of guest access and internal network, item no. 60642
LANCOM Management Cloud	
LANCOM LMC-A-1Y LMC License	LANCOM LMC-A-1Y License (1 Year), enables the management of one category A device for one year via the LANCOM Management Cloud, item no. 50100
LANCOM LMC-A-3Y LMC License	LANCOM LMC-A-3Y License (3 Years), enables the management of one category A device for three years via the LANCOM Management Cloud, item no. 50101
LANCOM LMC-A-5Y LMC License	LANCOM LMC-A-5Y License (5 Years), enables the management of one category A device for five years via the LANCOM Management Cloud, item no. 50102
Accessories	
LANCOM WLAN controllers	LANCOM WLC-4006+, item no. 62035 (EU), item no. 62036 (UK) and item no. 62037 (US), LANCOM WLC-4025+, item no. 61378, item no. 61379 and item no. 61384 (US), LANCOM WLC-4100, item no. 61369 (EU) and item no. 61377 (UK), LANCOM WLC Basic Option for Routers, item no. 61639
LANCOM Wall Mount	For simple, theft-proof mounting of LANCOM devices with plastic housings, item no. 61349
LANCOM Wall Mount (White)	For simple, theft-proof mounting of LANCOM devices with plastic housings, item no. 61345
LANCOM Serial Adapter Kit	For the connection of V.24 modems with AT command set and serial interface for the connection to the LANCOM COM interface, incl. serial cable and connection plug, item no. 61500
Power over Ethernet Injector	1-port PoE injector with Gigabit support, integrated power supply, compatible with the standard IEEE 802.3af/at, item no. 61738 (EU) and 61739 (UK)
Item number(s)	
LANCOM L-320agn Wireless (White, EU)	61564
LANCOM L-320agn Wireless (White, UK)	61565

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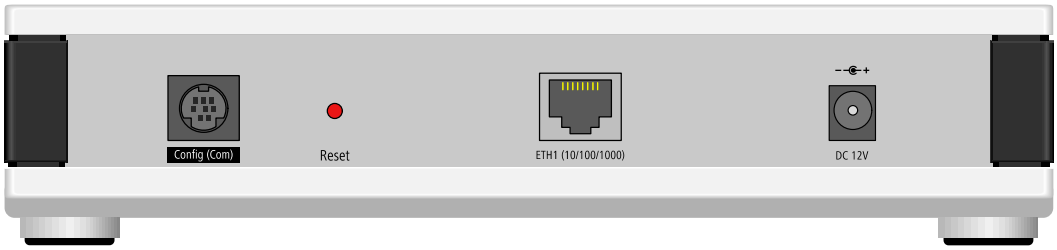
LCOS 10.00 (HW Rel. R2)

Item number(s)	
LANCOM L-320agn Wireless (White) 10-piece bulk	61569



Antenna Gain

Overview Antenna Gain in different Frequencies

AUT \ Frequency (GHz)		2.4	2.45	2.5	5.1	5.3	5.5	5.7	5.9
Front side	H-plane Peak Gain (dBi)	2.00	1.93	2.04	4.86	3.51	2.87	3.42	2.52
	H-plane AVG. Gain (dBi)	-2.29	-2.47	-2.88	-2.24	-2.69	-3.08	-2.48	-3.14
Right side	H-plane Peak Gain (dBi)	2.31	2.71	3.37	1.48	0.84	0.97	2.80	2.62
	H-plane AVG. Gain (dBi)	-3.12	-3.28	-2.99	-2.59	-3.57	-3.97	-3.01	-3.60

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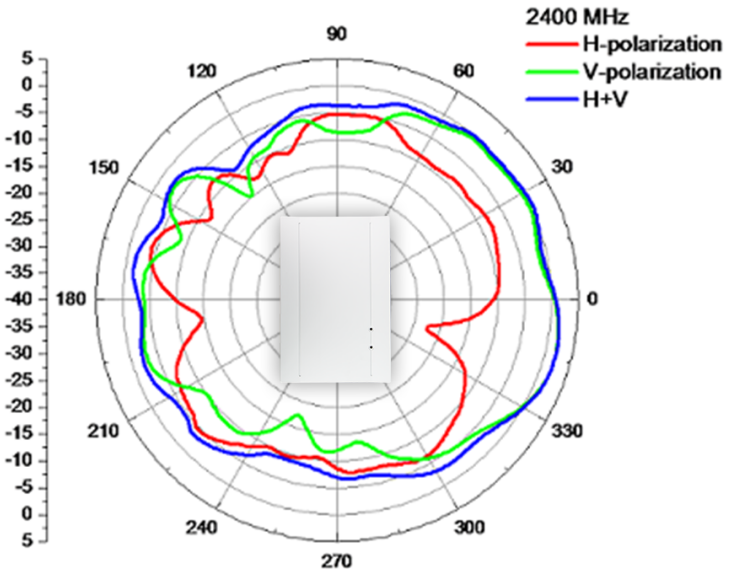
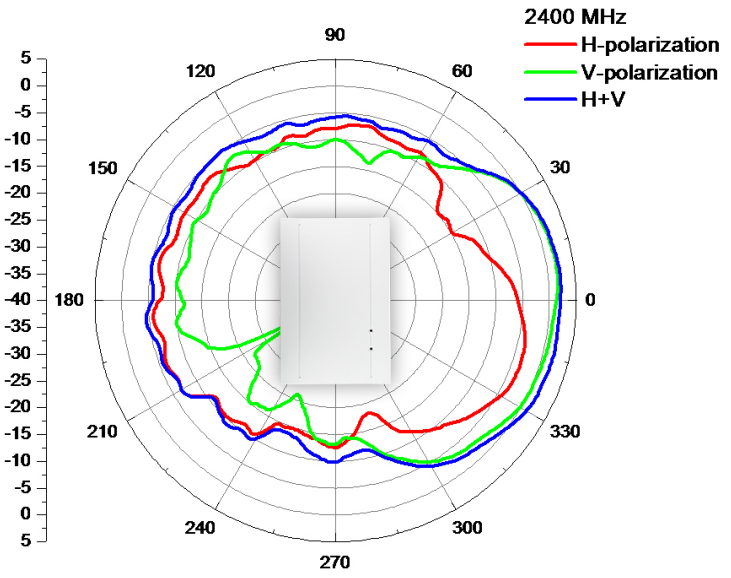
Antenna Gain	
2.4 GHz, antenna pattern, front side	
2.4 GHz, antenna pattern, right side	

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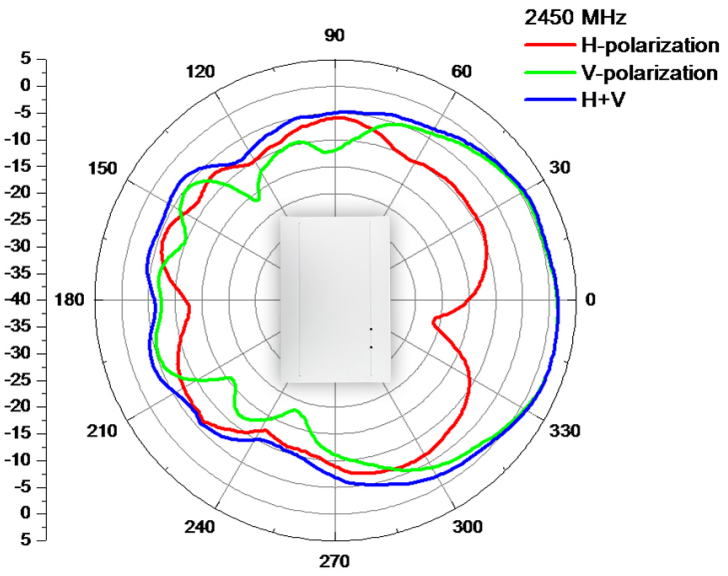
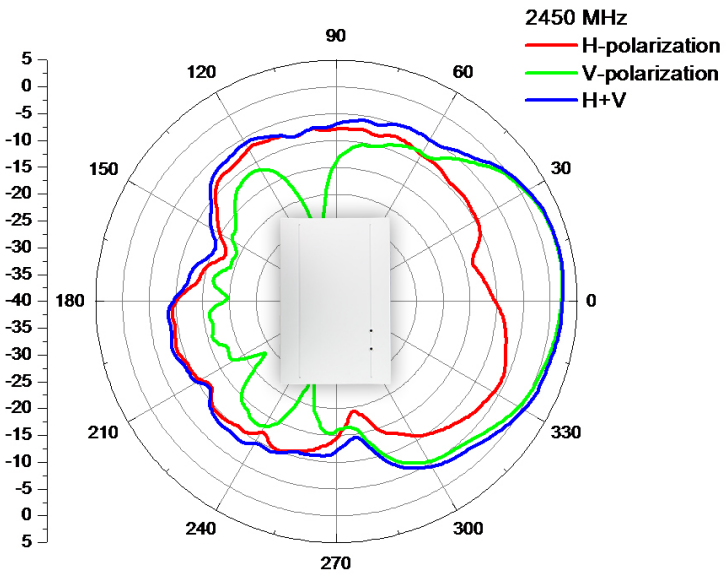
Antenna Gain	
2.45 GHz,antenna pattern, front side	
2.45 GHz, antenna pattern, right side	

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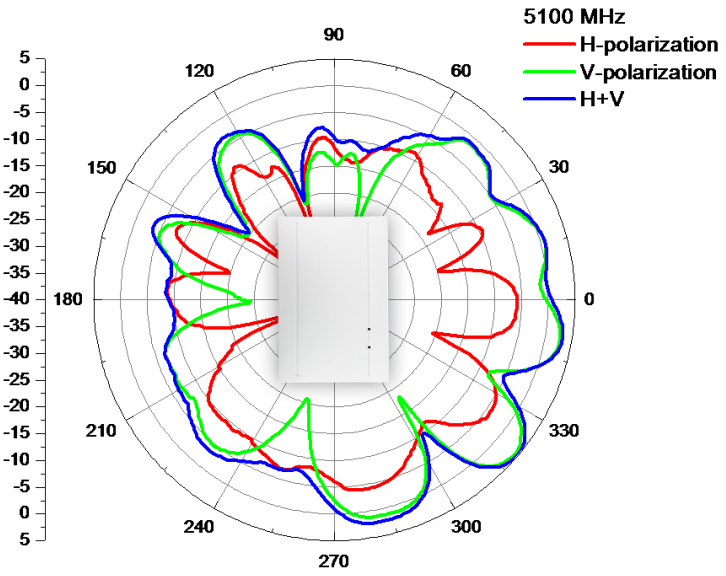
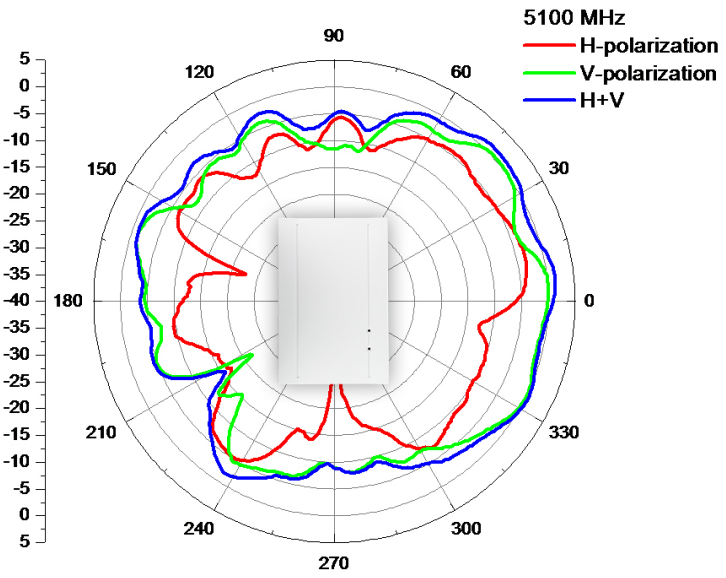
Antenna Gain	
5.1 GHz, antenna pattern, front side	
5.1 GHz, antenna pattern, right side	

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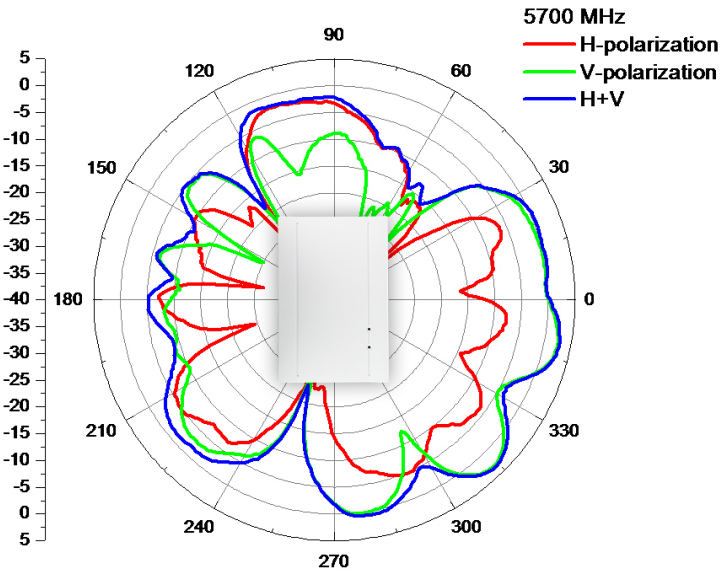
Antenna Gain	
5.7 GHz, antenna pattern, front side	
5.7 GHz, antenna pattern, front side