T301
Outdoor 802.11ac 2x2:2 Wi-Fi Access Point

RUCKUS™
an ARRIS company

DATA SHEET

BENEFITS

GOOD OUTDOOR WI-FI
Industrial-grade IP-67 hardened enclosures (-20°C to +65°C).

GREAT WI-FI PERFORMANCE
Mitigate interference and extend coverage with patented BeamFlex+™ adaptive antenna technology utilizing multi-directional antenna patterns for the T301s.

AUTOMATE OPTIMAL THROUGHPUT
Improve performance automatically with ChannelFly and machine learning, which finds less congested Wi-Fi channels with dynamic RF channel selection.

MORE THAN WI-FI
Support services beyond Wi-Fi with Ruckus IoT Suite, Cloudpath security and onboarding software, SPoT Wi-Fi locationing engine, and SCI network analytics.

At stadiums, transit hubs, and other crowded outdoor public venues, users want the same fast, reliable Wi-Fi connectivity they expect in their homes or offices. Delivering it, however, can be immensely challenging—and expensive. How can you navigate the noise, interference, and other challenges of high-density outdoor locations to give your users the high-performance Wi-Fi they expect?

The Ruckus T301 Series of 802.11ac access points delivers industry-leading Ruckus wireless performance in an economical, industrial-grade form factor designed for crowded outdoor locations. These ultra-lightweight, low-profile APs feature internal high-gain directional antennas to direct coverage, eliminating the need for bulky panel antennas and confusing and expensive external RF cabling. Choose from either 30-degree narrow beam or 120-degree sectorized antennas to enable fast, lower-cost installation, extended range, and improved throughput in the most challenging RF environments.

The T301 Series is designed for high-density outdoor environments such as stadiums, arenas, train stations, convention centers, and major metro areas. Using directed coverage, you can deploy these APs in close proximity without getting bogged down by co-channel interference—essential when deploying large numbers of APs within a fixed space.

The Ruckus T301 Series incorporates patented technologies found only in the Ruckus Wi-Fi portfolio.

- Extended coverage with patented BeamFlex+ utilizing multi-directional antenna patterns.
- Improve throughput with ChannelFly, which dynamically finds less congested Wi-Fi channels to use.

The T301 Series also features an IP 67-rated enclosure to withstand harsh outdoor conditions, as well as an 802.3af Power-over-Ethernet (PoE) input.

Whether you're deploying ten or ten thousand APs, the T301 is easy to manage through Ruckus' appliance, virtual, and cloud management options.
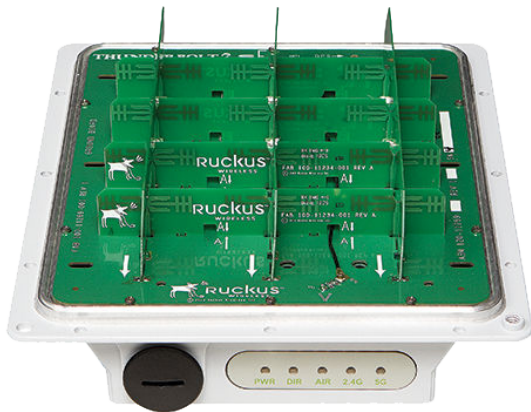

BeamFlex+ Adaptive Antenna Technology

RUCKUS T301N: DUAL-BAND 802.11AC 2X2:2, 1167MBPS

Internal narrow beam antenna for 2.4GHz and 5GHz, 30º narrow sector coverage
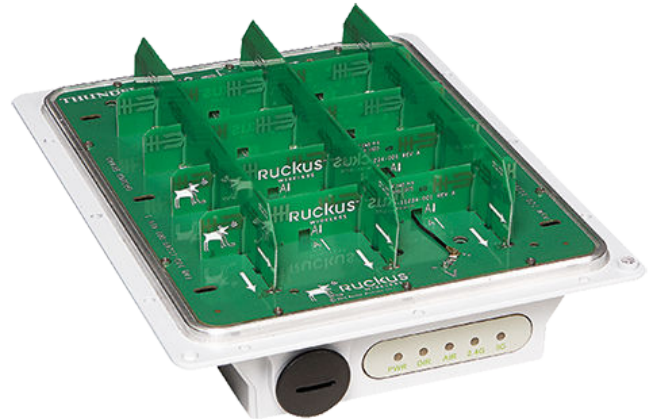- Well suited to

  extremely high-density deployments
- Best coverage and capacity at 30º x 30º

RUCKUS T301S: DUAL-BAND 802.11AC 2X2:2, 1167MBPS

Internal sector adaptive antenna for 2.4GHz and 5GHz, 120º sector coverage
- Well suited to high-density deployments
- Best coverage and capacity at 120º x 30º

19.5 cm / 7.6"

23.9 cm / 9.4"

11 cm / 4.3"

1 kg / 2.1 lbs

Integrated Adaptive Antennas[1]

Protective vent to equalize pressure

Two-way fully adjustable mounting bracket

802.3af Power over Ethernet (PoE)

LED Indicators

ACCESS POINT ANTENNA PATTERN

Ruckus' BeamFlex+ adaptive antennas allow the T301 AP to dynamically choose among a host of antenna patterns in real-time to establish the best possible connection with every device. This leads to:

- Better Wi-Fi coverage

- Reduced RF interference

Traditional omni-directional antennas, found in generic access points, oversaturate the environment by needlessly radiating RF signals in all directions. In contrast, the Ruckus BeamFlex+ adaptive antenna directs the radio signals per-device on a packet-by-packet basis to optimize Wi-Fi coverage and capacity in real-time to support high device density environments. BeamFlex+ operates without the need for device feedback and hence can benefit even devices using legacy standards.

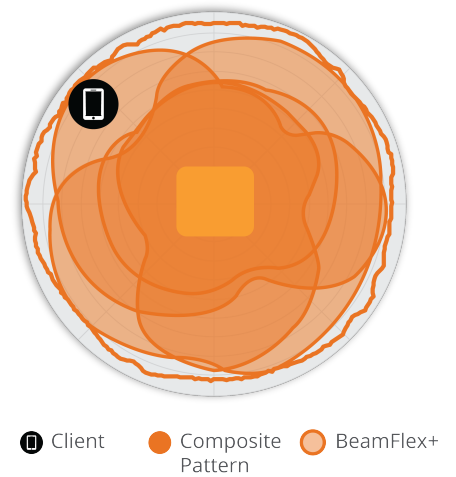**Figure 1. Example of BeamFlex+ pattern**

⬛ Client　　🟠 Composite Pattern　　🟠 BeamFlex+

Figure 2. T301n 2.4GHz Azimuth Antenna Patterns

Figure 3. T301n 5GHz Azimuth Antenna Patterns

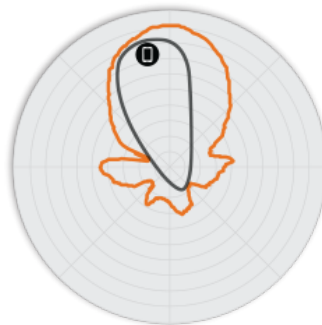**Figure 4. T301n 2.4GHz Elevation Antenna Patterns**

Figure 5. T301n 5GHz Elevation Antenna Patterns

Note: The T301n 30° antenna pattern does not have a Beamflex pattern.

Note: The outer trace represents the composite RF footprint of all possible BeamFlex+ antenna patterns, while the inner trace represents one BeamFlex+ antenna pattern within the composite outer trace.

WI-FI	
Wi-Fi Standards	• IEEE 802.11a/b/g/n/ac
Supported Rates	• 802.11ac: 6.5 to 867Mbps (MCS0 to MCS9, NSS = 1 to 2 for VHT20/40/80) • 802.11n: 6.5 Mbps to 300Mbps (MCS0 to MCS15) • 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6Mbps • 802.11b: 11, 5.5, 2 and 1 Mbps
Supported Channels	• 2.4GHz: 1-13 • 5GHz: 36-64, 100-144, 149-165
MIMO	• 2x2 SU-MIMO
Spatial Streams	• 2 SU-MIMO
Radio Chains and Streams	• 2x2:2
Channelization	• 20, 40, 80MHz
Security	• WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, Dynamic PSK • WIPS/WIDS
Other Wi-Fi Features	• WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v • Hotspot • Hotspot 2.0 • Captive Portal • WISPr

RF	
Antenna Type	• BeamFlex+ adaptive antennas with polarization diversity • Adaptive antenna that provides 64 unique antenna patterns per band
Antenna Gain (max)	• T301s: Up to 8dBi • T301n: Up to 15 dBi
Peak Transmit Power (aggregate across MIMO chains)	• 2.4GHz: 26dBm • 5GHz: 25dBm
BeamFlex+ SINR Transmit Power Gain*	• Up to 6 dB
BeamFlex+ SINR Receive Power Gain*	• Up to 4 dB
Minimum Receive Sensitivity[1]	• -104dBm
Frequency Bands	• ISM (2.4-2.484GHz) • U-NII-1 (5.15-5.25GHz) • U-NII-2A (5.25-5.35GHz) • U-NII-2C (5.47-5.725GHz) • U-NII-3 (5.725-5.85GHz)

2.4GHZ RECEIVE SENSITIVITY

HT20		HT40	
MCS0	MCS7	MCS0	MCS7
-96	-79	-94	-74

5GHZ RECEIVE SENSITIVITY

VHT20		VHT40		VHT80	
MCS0	MCS7	MCS0	MCS7	MCS0	MCS7
-96	-78	-94	-76	-90	-74

2.4GHZ TX POWER TARGET

Rate	Pout (dBm)
MCS0 HT20	22
MCS7 HT20	19

5GHZ TX POWER TARGET

Rate	Pout (dBm)
MCS0 VHT20	22
MCS7 VHT20	19
MCS0 VHT40, VHT80	22
MCS7 VHT40, VHT80	19

PERFORMANCE AND CAPACITY

Peak PHY Rates	• 2.4GHz: 300Mbps • 5GHz: 867Mbps
Client Capacity	• Up to 512 clients per AP
SSID	• Up to 43 per AP

RUCKUS RADIO MANAGEMENT

Antenna Optimization	• BeamFlex+ • Polarization Diversity with Maximal Ratio Combining (PD-MRC)
Wi-Fi Channel Management	• ChannelFly • Background Scan Based
Client Density Management	• Adaptive Band Balancing • Client Load Balancing • Airtime Fairness • Airtime-based WLAN Prioritization
SmartCast Quality of Service	• QoS-based scheduling • Directed Multicast • L2/L3/L4 ACLs
Mobility	• SmartRoam
Diagnostic Tools	• Spectrum Analysis • SpeedFlex

* BeamFlex gains are statistical system level effects translated to enhanced SINR based on observations over time in real-world conditions with multiple APs and many clients.
[1] Rx sensitivity varies by band, channel width and MCS rate.

NETWORKING

Controller Platform Support	• SmartZone • ZoneDirector • Cloud Wi-Fi • Unleashed[2] • Standalone
Mesh	• SmartMesh™ wireless meshing technology. Self-healing Mesh
IP	• IPv4, IPv6
VLAN	• 802.1Q (1 per BSSID or dynamic per use based on RADIUS) • VLAN Pooling • Port-based
802.1x	• Authenticator & Supplicant
Tunnel	• L2TP, GRE, Soft-GRE
Policy Management Tools	• Application Visibility and Control • Access Control Lists • Device Fingerprinting • Rate Limiting

PHYSICAL INTERFACES

Ethernet	• 1 x 1GbE port, RJ-45

PHYSICAL CHARACTERISTICS

Physical Size	• 23.0(L) x 19.5 (H) x 11 (W) cm • 9.4 (L) x 5.6 (W) x 4.3 (H) in
Weight	• 2.5kg (5.5lbs) with adjustable bracket
Ingress Protection	• IP-67
Mounting	• Wall • Pole Mount 1" to 2.5" diameter
Physical Security	• Hidden latching mechanism • Kensington lock • T-bar Torx
Operating Temperature	• -20°C (-40°F) to 65°C (149°F)
Operating Humidity	• Up to 95%, non-condensing
Wind Survivability	• Up to 266 km/h (165 mph)

POWER [3]

Power Supply	Max Power Consumption
802.3af	• 11W

CERTIFICATIONS AND COMPLIANCE

Wi-Fi Alliance[4]	• Wi-Fi CERTIFIED™ a, b, g, n, ac • Passpoint®, Vantage
Standards Compliance[5]	• EN 60950-1 Safety • EN 60601-1-2 Medical • EN 61000-4-2/3/5 Immunity • EN 50121-1 Railway EMC • EN 50121-4 Railway Immunity • IEC 61373 Railway Shock & Vibration • UL 2043 Plenum • EN 62311 Human Safety/RF Exposure • WEEE & RoHS • ISTA 2A Transportation

SOFTWARE AND SERVICES

Location Based Services	• SPoT
Network Analytics	• SmartCell Insight (SCI)
Security and Policy	• Cloudpath

ORDERING INFORMATION

901-T301-XX61	• T301n, 30x30 deg. Outdoor 802.11ac 2x2:2 narrow sector, dual-band concurrent access point, one Ethernet port, PoE input includes adjustable mounting bracket and one year warranty. Does not include PoE injector
901-T301-XX51	• T301s, 120x30 deg. Outdoor 802.11ac 2x2:2 120 sector, dual-band concurrent access point, one Ethernet port, PoE input includes adjustable mounting bracket and one year warranty. Does not include PoE injector

See Ruckus Price List for country-specific ordering information.
Warranty: Sold with a limited one year warranty.
For details see: http://support.ruckuswireless.com/warranty.

OPTIONAL ACCESSORIES

902-0162-XXYY	• PoE injector (24W) (Sold in quantities of 1, 10 or 100)
902-0183-0000	• Spare Weatherizing Cable Gland with 1 hole
902-0125-0000	• Secure articulating mounting bracket
902-0182-0003	• Spare, Outdoor Mounting Bracket, AnyAngle

PLEASE NOTE: When ordering Indoor APs, you must specify the destination region by indicating -US, -WW, or -Z2 instead of XX. When ordering PoE injectors or power supplies, you must specify the destination region by indicating -US, -EU, -AU, -BR, -CN, -IN, -JP, -KR, -SA, -UK, or -UN instead of -XX.

For access points, -Z2 applies to the following countries: Algeria, Egypt, Israel, Morocco, Tunisia, and Vietnam.

[2] Refer to Unleashed datasheets for SKU ordering information
[3] Max power varies by country setting, band, and MCS rate
[4] For complete list of WFA certifications, please see the Wi-Fi Alliance website
[5] For current certification status, please see the price list.

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