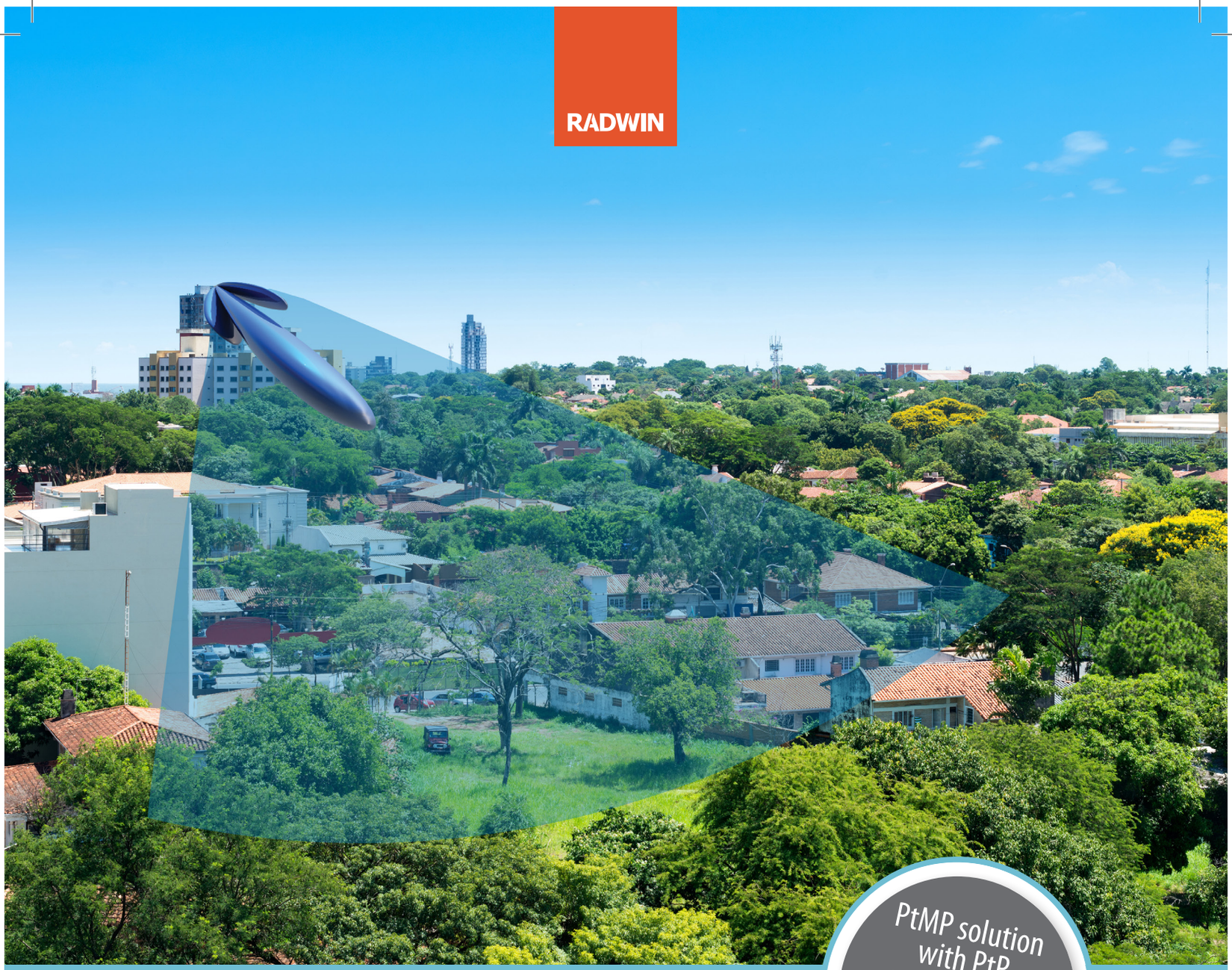
RADWIN



RADWIN JET Point-to-MultiPoint for Service Providers Product Brochure

PtMP solution with PtP performance

750 Mbps

RADWIN JET PtMP

Beamforming solution delivers fiber-like connectivity for residential and enterprise

RADWIN JET is a disruptive Point-to-MultiPoint smart beamforming solution, excellent for operation in heavily congested unlicensed and licensed bands where spectrum resources are scarce. Offering up to 750 Mbps per sector, RADWIN JET ensures revenue growth for residential and enterprise service providers by delivering fiber-like connectivity with incomparable resiliency.

Watch Clip

JET highlights

Market-leading PtMP beamforming base station series for triple-play services

» Base Station with smart beamforming antenna
» Up to 750 Mbps per sector, 3 Gbps per cell
» Guaranteed SLA for enterprises & best-effort for residential
» Low latency and jitter
» Long range – up to 40 km / 25 miles
» Radio synchronization for greater network capacity with built-in GPS
» Dynamic channel bandwidth selection - 80/40/20 MHz

Powerful Subscriber Units (SUs)

» High-capacity SUs – up to 250 Mbps
» Pay-as-you-grow capacity
» Multiple antenna configuration (internal/external)
» Small form factor for low visual impact
» Innovative operational simplicity for mass deployment

Multi-band radio

» 3.3-3.8 / 3.65 GHz or 4.9-5.9 GHz in the same unit

Bi-Beam™ beamforming solution

RADWIN Bi-Beam highlights

» Active beamforming antenna in both uplink and downlink directions
» Antenna steering for best link performance over a 90° sector
» Effective narrow beam of 8° @ 5.x GHz, 15° @ 3.x GHz
» OFDM & MIMO 2x2 / diversity

RADWIN Bi-Beam benefits

» High interference immunity similar to Point-to-Point
» Industry's highest throughput and range
» Optimized frequency reuse -2
» Robust operation in nLOS / NLOS
» Simplified network planning

Fixed IP traffic doubles in volume every 5 years, generating greater demand for more capacity on the subscriber side. RADWIN JET offers a future-proof solution that enables Service Providers to keep pace with the ever-growing demand, and increase revenue through fiber-like wireless access in licensed and unlicensed sub-6GHz bands.

JET applications for service providers

Wireless Internet Service Providers (ISPs)

» Last mile connectivity

Fixed / Incumbent Service Providers

» xDSL replacement
» Sub-urban and rural FTTH alternative
» FTTH backup
» WiMAX access network replacement
» DSLAMs backhaul

Cellular Operators

» Small Cell Backhaul - RADWIN JET NLOS solution is available to support complex urban NLOS backhaul scenarios

JET benefits for service providers

Grow your ARPU

» Deliver higher capacity packages to residential subscribers
» Expand services to lucrative enterprise subscribers

Lower TCO

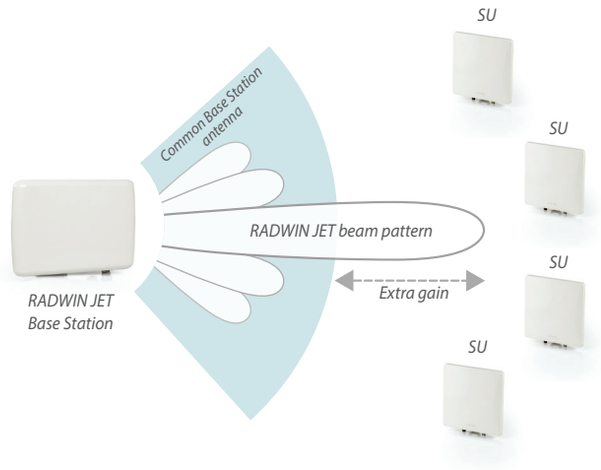
» Single PtMP series providing multiple services
» Save on tower and backhaul costs

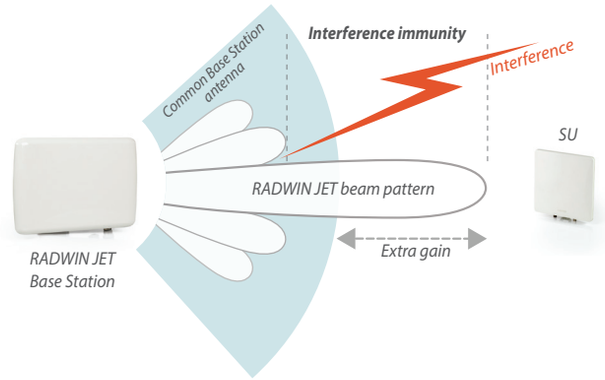
Bi-Beam™ technology

RADWIN JET incorporates unique Bi-Beam™ technology: A disruptive beamforming MIMO antenna at the Base Station, together with an intelligent air interface that redefines the performance of Broadband Wireless Access. RADWIN JET beamforming antenna is formed from an array of antenna elements which are combined to generate a narrow and steerable beam. The beamforming antenna is utilized both for uplink and downlink directions to deliver the following unique advantages:

» **Increase antenna and system gain in uplink & downlink directions**
Boost capacity, range and link robustness

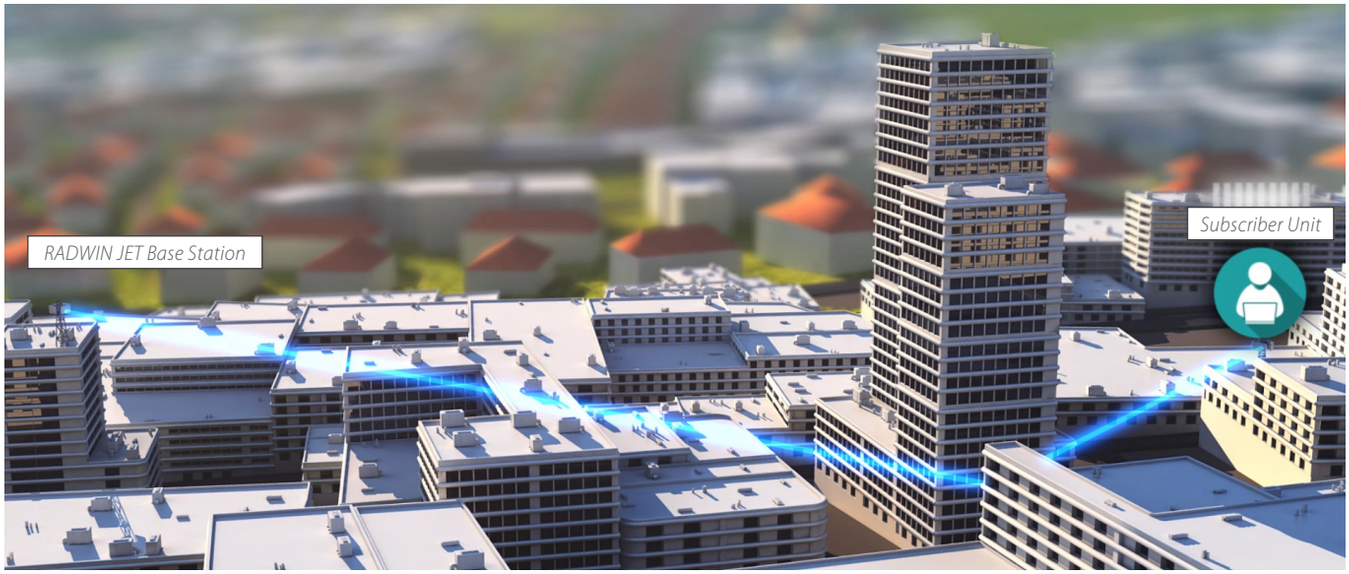
» **Improve interference immunity, similar to PtP**
A result of the narrow beam replacing the wide beam of common sector antennas.





» **Greater frequency reuse**
The narrow beam created by the Bi-Beam antenna reduces the level of mutual interference between adjacent sectors and sites. Less spectrum is required and network planning is simplified.

» **Excellent operation in nLOS / NLOS conditions**
The Bi-Beam antenna can be steered to an optimal reflection point to obtain the best possible link.



RADWIN JET base stations with Bi-Beam technology

» JET *AIR* (5.x GHz):

› Designed for residential networks and service providers with a limited budget.

» JET *PRO* (5.x GHz) / JET (3.xGHz):

› Designed for mixed enterprise and residential networks. The Base Station enables service providers to offer SLA for bandwidth-demanding applications based on CIR (Committed Information Rate).

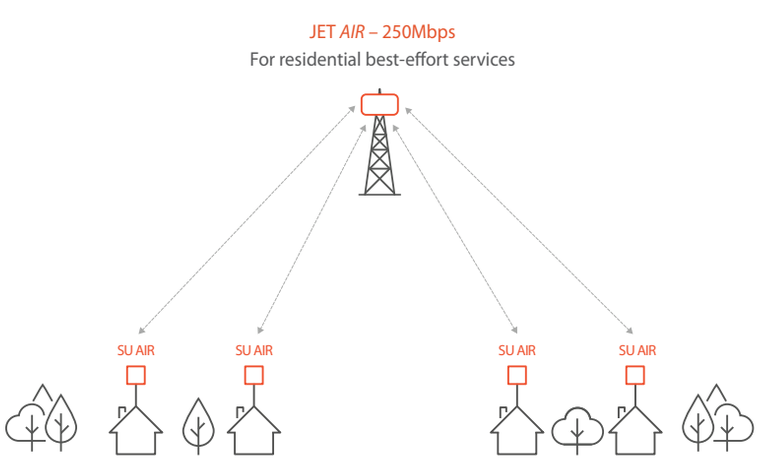
All JET solutions fully support QoS.

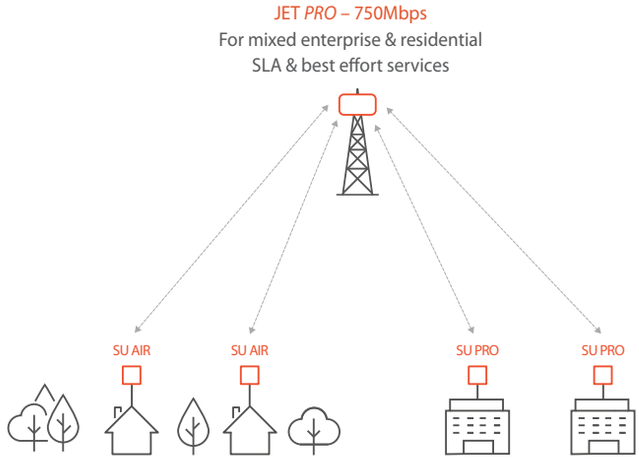
Laptop 13"

RADWIN JET:
Light, compact & IP 67 compliant

Attributes	JET *PRO* (5.x GHz)	JET *AIR* (5.x GHz)	JET (3.5 GHz)
Capacity (up to)	750Mbps	250Mbps	250Mbps
Service type per SU	CIR or Best Effort	Best Effort	CIR or Best Effort

Easily mix-and-match between Base Station models to deliver the best possible service with the lowest TCO.





Powerful, carrier-grade subscriber units

RADWIN's powerful Subscriber Units (SUs) deliver fiber-like connectivity with high Packet-Per-Second (PPS) processing power to maintain the highest capacity even in small packet applications.

Designed for low visual impact, RADWIN's ruggedized SUs assure long-lasting operation even in the harshest conditions. Innovative operational simplicity concepts and cuting-edge technology streamline operations and maintenance procedures.

High-capacity subscriber units (4.9-5.9 GHz)

- Pay-as-you-grow (up to 250Mbps)
- 22dBi integrated antenna or 16dBi embedded antenna (connectorized)
- High durability – IP66/IP67 enclosure
- Compatible with all RADWIN base stations
- Available versions:
  - SU *AIR*: Designed for residential subscribers (best effort)
  - SU *PRO*: Offers SLA for enterprise and bandwidth-demanding applications, based on CIR

SU Embedded (16dBi) *SU Integrated (22dBi)*

High-capacity subscriber units (3.3-3.8 GHz / 3.65 GHz)

- Pay-as-you-grow (up to 100Mbps)
- Available as connectorized unit or with integrated antenna
- High durability – IP67 enclosure
- Available versions:
  - HSU-R: Designed for residential subscribers
  - HSU: Offers SLA for enterprise and bandwidth-demanding applications, based on CIR

Innovative operational simplicity

Smartphone installation application

RADWIN SU series includes a smartphone app designed to speed up and simplify installation

WINTouch App

Enables automated installation, alignment & commissioning

Simple, fast and precise installation

Android & iOS

Multiple antenna configurations

RADWIN SU series includes an embedded antenna and is compatible with RADWIN's new and innovative slide-on antenna to achieve greater range.
An option for third-party external antennas is also available.

TurboGain™ antenna

Slide-on antenna

Doubles the service range

Key product benefits

More capacity, less infrastructure

RADWIN JET uniquely delivers fixed and high transmission power across all modulations. When combined with increased gain and an interference-immune Bi-Beam antenna, RADWIN JET delivers greater downlink and uplink capacity and a longer range than conventional PtMP solutions or PtMP with beamforming in an uplink-only direction.

Greater network capacity per given spectrum

Only two frequency channels are required to deploy a multiple JET cell network - with each cell comprising 4 sectors. As a result, two channels of 80 MHz can yield tremendous cell capacity of up to 3 Gbps!

Unique air interface for highly robust link performance

RADWIN JET Bi-Beam technology ensures best link performance by managing the individual transmission scheme of each SU: Channel bandwidth (80, 40 or 20MHz) and antenna configuration (MIMO or diversity mode) are dynamically selected per SU to achieve the highest possible capacity. Fast ARQ (Automatic Repeat upon reQuest) is used to guarantee error-free transmission, even in adverse spectrum conditions.

Full span of asymmetric traffic

RADWIN JET can be configured to deliver more than 90% of traffic in either an uplink or downlink direction.

Secured service level agreement (SLA) for bandwidth demanding applications

RADWIN's Dynamic Bandwidth Allocation (DBA) optimally maximizes throughput for active users demanding various service levels, e.g. Committed Information Rate (CIR) or Best Effort.

TDD synchronization enables dense deployments with maximum performance

RADWIN JET features TDD synchronization between sectors and sites, using a built-in GPS. This synchronization prevents mutual interference and increases network capacity and range.

Product specifications (See individual Product Data Sheets for detailed spec.)

Maximum Net Aggregate Capacity

	Base Station			High-Capacity Subscriber Units
	JET *PRO*	JET *AIR*	JET	
4.9 - 5.9 GHz	750 Mbps	250 Mbps	-	SU *AIR* – Up 100 Mbps, SU *PRO* – Up to 250Mbps
3.3 - 3.8 GHz, 3.65 GHz	-	-	250 Mbps	10, 25, 50 Mbps, upgradable to 100Mbps

Antenna Configurations

4.9 - 5.9 GHz	Beamforming antenna: 20 dBi (5.1 - 5.9 GHz), 17 dBi (4.9 GHz)	22dBi (integrated), 16dBi (embedded) and connectors for external antenna (eg. TurboGain)
3.3 - 3.8 GHz, 3.65 GHz	Beamforming antenna 17dBi	13dBi, 20dBi, Connectorized

Radio

Number of SUs / HBS	Up to 64 SUs simultaneously
Range	Up to 40 km / 25 miles
Frequency Bands	Multiband radio supporting 4.9 - 5.9 GHz or 3.3-3.8 / 3.65 GHz
Channel Bandwidth	5.x GHz- Configurable: 10, 20, 40, 80 MHz, Dynamic Channel BW selection: 20/40/80 MHz 3.x GHz: 5, 7, 10, 14, 20, 40MHz
Radio Access scheme	OFDM, Auto MIMO 2x2 or Diversity per SU
Adaptive Modulation & Coding	BPSK /QPSK / QAM16 / QAM64 / QAM256[1]
SLA management	CIR, MIR, Best-Effort
End to End Latency	Typical: 3.5msec
Duplex Technology	TDD, Configurable Uplink / Downlink ratio
Max Tx Power	HBS : 25dBm @ 5.x GHz, 23dBm@ 3.x GHz (in all modulation schemes) HSU: 25dBm, SU (embedded): 24dBm, SU (integrated): 26dBm
DFS (FCC & ETSI)	Supported
Spectrum Viewer	Supported at HBS & SU/ HSU
TDD Synchronization	Inter & Intra site synchronization, Embedded GPS receiver and antenna
Encryption	AES 128

Interfaces

Ethernet Interface	HBS: Single port for Data & management, 10/100/1000BaseT, SU: 10/100/1000BaseT

Networking

Sub convergence layer	Layer 2
QoS	Packet classification to 4 queues according to 802.1p and Diffserv, Strict Priority, TTL
VLAN	802.1Q, QinQ, 4094 VLANs

Management

Management Application	HBS: RADWIN Manager & Web based management, SU: Smartphone App.
Protocol	SNMPv1, SNMPv3, Telnet, HTTP, IPv4 & IPv6, RADIUS for AAA Server
NMS Application	RADWIN NMS (WINManage) or integration with 3rd party NMS system via standard MIBs

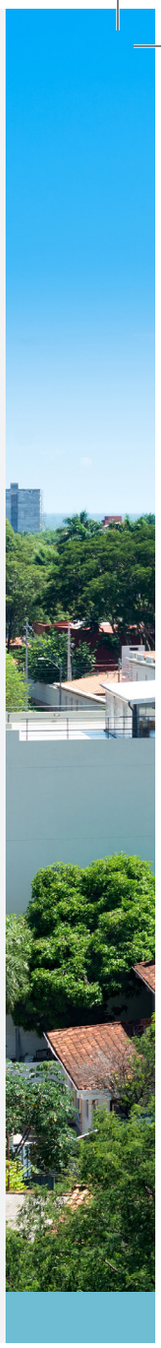
Power

Power Feeding	Provided over PoE interface
Power Consumption	HBS < 25W, SU (embedded) & HSU < 12W, SU (integrated) < 9W

Environmental

Operating Temperatures	-35°C to 60°C / -31°F to 140°F
Humidity	100% condensing | HBS, HSU & SU (integrated): IP67, SU (embedded): IP66
Radio Regulations	FCC, IC, ETSI, WPC, MII, Universal
Safety	FCC/IC (cTUVus), ETSI
EMC	FCC, ETSI, CAN/CSA, AS/NZS

[1] QAM 256 only in 5.x band



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