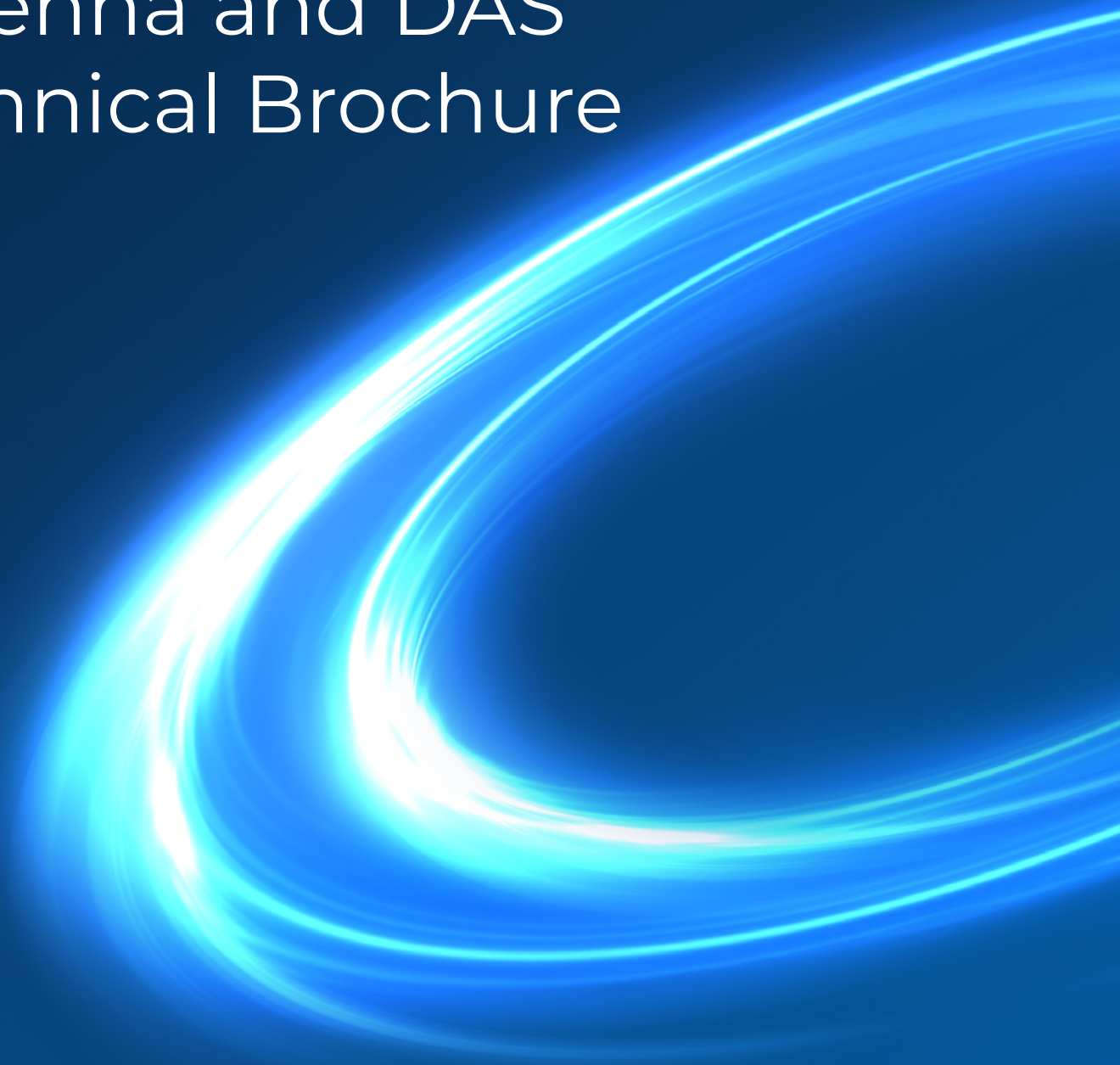




High-Performance Antenna and DAS Technical Brochure



High-Performance Antennas

JMA antennas are designed to meet the challenges in increased network capacity and coverage with current available spectrum and sites, driven by higher user demand and population migration.

These products and solutions are optimized to provide the most effective performance from dense urban environments to rural scenarios.

Field-proven performance delivering real network benefits



15%+

Coverage footprint



20%+ DL

Throughput



4X UL

Throughput

=

**Up to
\$16.5 Million
in savings
per cluster***

*Average JMA Swap Site

High-density and high-capacity venue antennas for a great user experience

Popular venues and private networks present unique aesthetic, functional, and performance challenges. JMA Wireless venue antennas are the choice in these high sector and dense user environments.

- ✓ **Full FR1 Band high-density antennas provide high-performance in high sector designs for dense seating environments.**
 - Satisfying and uniform user experience through matching the RF performance to the environment.
 - Easy installation through flexible design.
 - Public safety assured through SAR testing.
- ✓ **JMA Wireless SX panel antennas provide vast performance improvements relative to alternative lens technology products.**
 - Sixty percent volume reduction by using multi-band overlay.
 - Forty percent improvement in SINR performance through tight RF pattern control.
 - Improved throughput using JMA enhanced beamforming.
- ✓ **JMA Wireless Enhanced OMNI-MIMO Antennas satisfies the drive for aesthetics and performance in private 5G networks.**
 - Better aesthetics through small and unobtrusive form factor.
 - Easy and adjustable installation options.
 - Improve network capacity and reduce deployment costs with higher SINR.



Macro antennas to fit all RF environments

JMA Macro antennas overcome the challenges presented by today's carrier network needs, from the interference characteristics of the dense, highly populated urban areas to the vast areas requiring coverage in rural areas.

✓ Fast Roll-Off (FRO) for use where throughput and spectral efficiency are critical.

- Improved throughput due to sharper sector roll-off that reduces sector-to-sector interference.
- Increased spectral efficiency using advanced higher order beamforming.
- Increase capacity without degrading RSRP by converting a 3-sector to a 4-sector.
- Reduce structural infrastructure demand with reduced wind load and weight.

✓ Form in Tighter (FIT) for urban/suburban environments.

- Extend sector coverage and reduce low-band link imbalance with optimal gain for the lowest CAPEX.
- Easy deployment in standard urban/suburban-urban environments with like replacement form factor compared to competition.

✓ New Form in High Gain (FHG) antennas for use where coverage and RF efficiency are king.

- Reduce capacity triggers (sub-1/sub-3 triggers) and increase network coverage using high efficiency antenna technology coupled with an incremental increase in low-band (7%) and mid-band gain (17%).
- Ease of deployment in suburban and rural areas due to reduced form factor (size, weight, wind load) as compared to traditional high gain antennas.
- More efficient use of AWS/PCS spectrum.

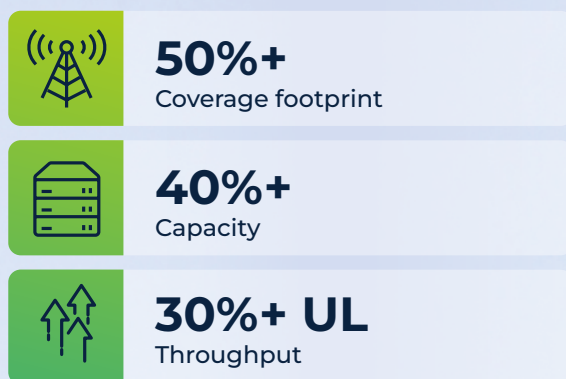
✓ Form Split Sector (FSS).

- Ability to convert traditional 3-sector sites to 6-sector sites in standard panel technology.
- Helps to alleviate sub-1 and sub-3 triggers in high-density traffic areas.
- Improved SINR (10%) when compared to standard split-sector or lens-based solutions.
- Lower CAPEX solutions when compared to lens-based or multi-beam-based solutions.





Real network benefits of beamforming Small Cell cylinder



= **60%**
in savings

Advanced Small Cell provides superior coverage and throughput

JMA Small Cell antennas fill the gaps of coverage between macro cells and help offload mid-band traffic from the network. Their high omnidirectionality provides outstanding coverage patterns proven to boost capacity and throughput in the network.

- ✓ **New 8T8R Beamforming Small Cell Cylinder provides significant increase in throughput over traditional 4T4R antennas and comparable coverage to 16T16R antennas.**
 - Large coverage area due to power of beamforming.
 - Throughput increases using higher order modulation schemes.
 - Efficient mid-band offloading due to superior building penetration.
 - Capital savings of up to 60% over 16T16R antennas.
- ✓ **JMA Wireless Small Cell antenna portfolio has antennas to meet your need.**
 - Reduced network interference through excellent sidelobe control across entire upper sector.
 - Near-omnidirectionality (~.85) is achieved through symmetrical port patterns.
 - MIMO performance enhanced through excellent cx-pol discrimination across all sectors.
 - Easy deployment using common form factors include cylinder and panel.
 - Ready for 5G deployment with all FR1 band options available.
 - Beam coverage patterns to meet your need including Quasi-OMNI, Tri-sector, Heart, and Peanut configurations.
 - High throughput, all antennas capable of 4x4 MIMO on all bands.
 - High coverage areas due to increased gain on mid-band and high-band.

Distributed Antenna Systems (DAS)





As the wireless telecommunications landscape evolves to 5G technology and wide-band spectrum, JMA is leading the market in delivering high-performance 5G DAS systems.

JMA upholds some fundamental design tenets that influence every product or solution that we offer. These tenets reflect our commitment to performance, longevity, sustainability, technological innovation, efficient network utilization, and cybersecurity. They guide our everyday decision-making and strategic planning, ensuring that we continue to deliver value to our clients and lead in our evolving industry.

JMA DAS **Headend** evolution

	80% Co-ax cable reduction
	75% Headend footprint savings
	60% Fiber count reduction
	50% Weight reduction
	30% Power consumption reduction

JMA DAS **Remote** evolution

	40% Installation cost reduction
	50 - 65% Remote footprint savings
	50% Fiber count reduction
	50 - 75% Weight reduction
	45% Power consumption reduction



Higher performing high-density headend, POI's and digital remotes

In pursuit of driving down the Total Cost of Ownership (TCO) of DAS systems, JMA is introducing new headend and remote units that provide full support for 5G applications, including full band support (for example, C-band 280MHz), high output power (for example, 40W), and ultra-reliable, low-latency communication (URLLC) with an impressive 2 μ s delay, and the smallest remote form factor available.

- ✓ Multi-Band Compact NG POIs provide space savings of up to 75%, while eliminating much of the related coax cabling.
- ✓ The 1RU multi-band NG OTRX provides flexibility and scalability with O&M configurable simulcast options and output power supporting up to eight MIMO multi-band remotes in up to four sectors.
- ✓ Realize reductions of up to 80% of space requirements and 70% of coax cable requirements when combining use of NG POIs with NG OTRXs in the unique JMA back-to-back rack mounting configuration.

NG Remotes

JMA is introducing multi-band, multi-power (5W to 40W) NG remotes that reduce remote footprints, weight, and power consumption. These remotes also improve RF performance while lowering overall installation costs.



About JMA Wireless

JMA Wireless is the leading global innovator in mobile wireless connectivity solutions that ensure infrastructure reliability, streamline service operations, and maximize wireless performance. Employing powerful, patented innovations, their solutions portfolio is proven to lower the cost of operations while ensuring lifetime quality levels in equipment and unrivaled performance for coverage and high-speed mobile data.

JMA Wireless solutions cover macro infrastructure, outdoor and indoor distributed antenna systems, small cell solutions, and virtualized RAN software. JMA Wireless corporate headquarters are located in Syracuse, NY, with manufacturing, R&D, and sales operations in over 20 locations worldwide.

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