MX14FRO445-01

NWAV™ X-Pol 14-Port Antenna

X-Pol 14-Port 4 ft, 45° Fast Roll Off with Smart Bias Ts, 698-4200 MHz:

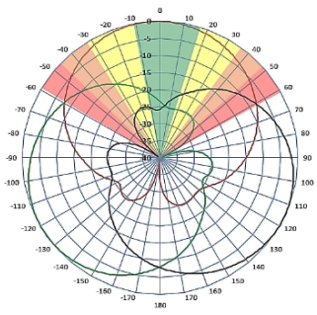
2 ports 698-894 MHz, 4 ports 1695-2200 MHz, and 8 ports 3700-4200 MHz

- Fast Roll Off (FRO™) azimuth beam pattern improves Intra- and Inter-cell SINR
- Combination of Hex Port Antenna with integrated 5G 3.5 GHz 8T8R beamforming capability
- Optimized antenna array design for all 3.5 GHz beamforming combinations
- Maintains existing low and mid band RF performance
- New optimized form factor for reduced wind loading
- Lower antenna weight with new Integrated RF distribution design
- Excellent passive intermodulation (PIM) performance reduces harmful interference.
- Fully integrated internal (iRETs) with SBT for independent RET control on all bands

Fast Roll-Off antennas increase data throughput without compromising coverage

The horizontal beam produced by Fast Roll-Off (FRO) technology increases the Signal to Interference & Noise Ratio (SINR) by eliminating overlap between sectors .

Non-FRO antenna



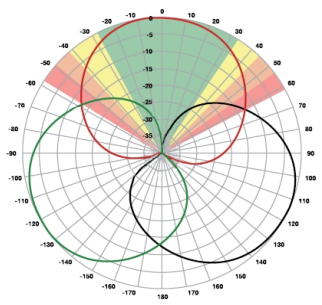
Large traditional antenna pattern overlap creates harmful interference.

JMA's FRO antenna pattern minimizes overlap, thereby minimizing interference.

LTE throughput	SINR	Speed (bps/Hz)	Speed increase	CQI
Excellent	>18	>4.5	333+%	8-10
Good	15-18	3.3-4.5	277%	6-7
Fair	10-15	2-3.3	160%	4-6
Poor	<10	<2	0%	1-3

The LTE radio automatically selects the best throughput based on measured SINR.

JMA FRO antenna



Electrical specification (minimum/maximum)	Ports 1, 2		Ports 3, 4, 5, 6		
Frequency bands, MHz	698-806	806-894	1695-1880	1850-1990	1920-2200
Polarization	± 45°		± 45°		
Gain over all tilts, dBi	14.1	15.1	17.2	17.6	18.1
Horizontal beamwidth (HBW), degrees[1]	52	46	48	44	41
Front-to-back ratio, @180°, dB	>30.0	>29.0	>28.0	>26.0	>25.0
X-Pol discrimination (CPR) at boresight, dB	>20.0	>17.0	>19.0	>21.0	>21.0
Vertical beamwidth (VBW), degrees[1]	18.3	16.1	8.0	7.2	7.0
Electrical downtilt (EDT) range, degrees	2-16		0-9		
First upper side lobe (USLS) suppression, dB[1]	≤-16.0	≤-16.0	≤-16.0	≤-16.0	≤-16.0
Cross-polar isolation, port-to-port, dB[1]	25	25	25	25	25
Max VSWR / return loss, dB	1.5:1 / -14.0		1.5:1 / -14.0		
Max passive intermodulation (PIM), 2x20W carrier, dBc	-153		-153		
Max input power per any port, watts	300		250		
Total composite power all ports (1-14), watts	1500				

[1] Typical value over frequency and tilt

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Electrical specification (minimum/maximum)	Ports 7, 8, 9, 10, 11, 12, 13, 14
Frequency bands, MHz	3700-4200
Gain over all tilts, dBi	15.7
Horizontal beamwidth (HBW), degrees[1]	85
Horizontal beam width tolerance, degrees	±5
Front-to-back ratio, @180°, dB	27
Vertical beamwidth (VBW), degrees[1]	7.5
Vertical beam width tolerance, degrees	±0.3
Beam tilt, degrees	2-12
First upper side lobe (USLS) suppression, dB[1]	15
Coupling level, Amp, Antenna port to Cal port, dB	26
Coupling level, max Amp Δ, Antenna port to Cal port, dB	±0.7
Coupler, max Amp Δ, Antenna port to Cal port, dB	0.65
Coupler, max Phase Δ, Antenna port to Cal port, degrees	4
Cross-polar isolation, port-to-port, dB[1]	25
Isolation, Inter-band, dB	25
Max VSWR / return loss, dB	1.5 / -14.0
PIM, 3rd Order, 2 x 20 W, dBc	-145
Max input power per any port at 50 °C, watts	75

[1] Typical value over frequency and tilt

Electrical specification, Broadcast 65°	Ports 7, 8, 9, 10, 11, 12, 13, 14
Frequency bands, MHz	3700-4200
Gain over all tilts, dBi	21.2
Horizontal beamwidth (HBW), degrees1	65
Horizontal beamwidth tolerance, degrees	±4
Vertical beamwidth (VBW), degrees[1]	7.5
Vertical beamwidth tolerance, degrees	±0.3
First upper side lobe (USLS) suppression, dB[1]	<-16

Electrical specification, Service Beam	Ports 7, 8, 9, 10, 11, 12, 13, 14
Frequency bands, MHz	3700-4200
Steered 0° gain, dBi	21.2
Steered 0° Gain tolerance, dBi	±0.6
Steered 0° Beamwidth, Horizontal, degrees	24
Steered 0° CPR at beampeak, dB	18
Steered 0° Horizontal Sidelobe, dB	12
Steered 30° Gain, dBi (max)	20.5
Steered 30° Gain tolerance, dBi	±0.6

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Electrical specification, Service Beam	Ports 7, 8, 9, 10, 11, 12, 13, 14
Steered 30° Gain, dBi	20.7
Steered 30° Beamwidth, Horizontal, degree	22
Steered 30° CPR at beampeak, dB	18
Steered 30° Horizontal Sidelobe, dB	10

Electrical specification, Soft Split	Ports 7, 8, 9, 10, 11, 12, 13, 14
Frequency bands, MHz	3700-4200
Gain over all tilts, dBi	19.8
Horizontal beamwidth (HBW), degrees[1]	33
First upper side lobe (USLS) suppression, dB[1]	15

Beamforming weighting table available upon request

Ordering information	
Antenna model	**Description**
MX14FRO445-01	4F X- Pol 14 Port FRO 45º 2-16º/ 0-9º/ 2-12º RET, 4.3-10 & SBT
Optional accessories	
AISG cables	M/F cables for AISG connections
PCU-1000 RET controller	Stand-alone controller for RET control and configurations
91900314-03	Dual Mount Bracket (see 91900314 bracket document for details)

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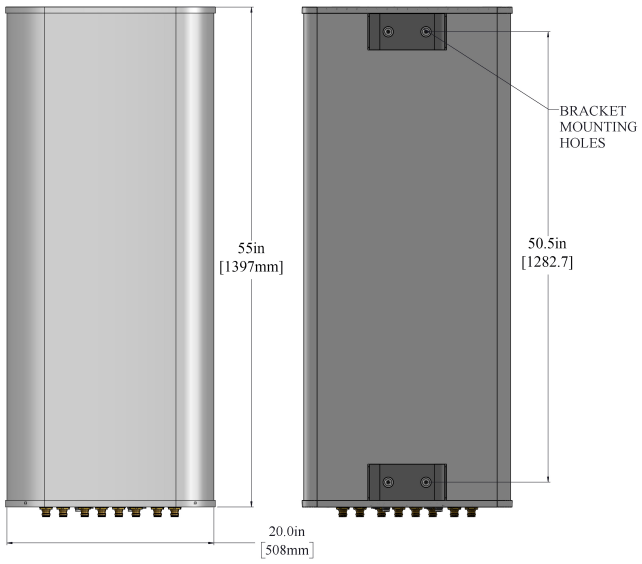
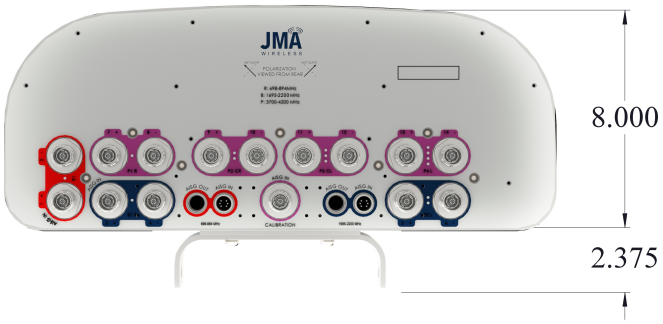
MX14FRO445-01

NWAV™ X-Pol 14-Port Antenna

Mechanical specifications	
Dimensions height/width/depth, inches (mm)	55.0/ 20.0/ 8.0 (1397/ 508.0/ 203.2)
Shipping dimensions length/width/height, inches (mm)	65/ 23.8/ 14.5 (1651/ 605/ 368)
No. of RF input ports, connector type, and location	14 x 4.3-10 female, bottom
Calibration interface port, connector type, and location	1 x 4.3-10 female, bottom
RF connector torque	96 lbf·in (10.85 N·m or 8 lbf·ft)
Net antenna weight, lb (kg)	65 (29.5)
Shipping weight, lb (kg)	103 (46.7)
Antenna mounting and downtilt kit included with antenna	91900318
Net weight of the mounting and downtilt kit, lb (kg)	18 (8.18)
Range of mechanical up/down tilt	-2° to 12°
Rated wind survival speed, mph (km/h)	150 (241)
Frontal and lateral wind loading @ 150 km/h, lbf (N)	98.7 (439.0), 45.7 (203.3)
EPA frontal and lateral, ft^2, (m^2)	4.4 (0.41), 2.1 (0.20)

Front view **Back view** **Bottom view**





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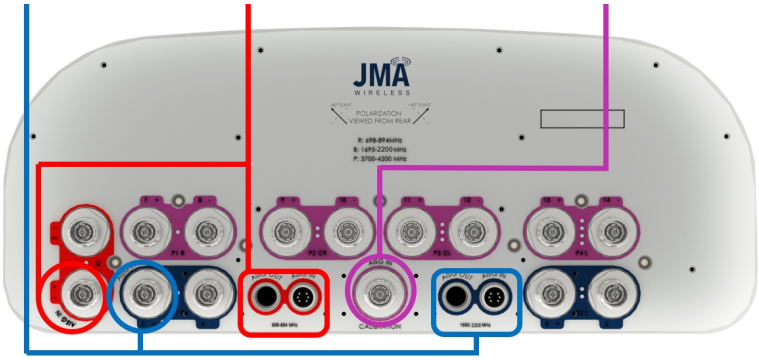
Remote electrical tilt (RET 1000) information	
RET location	Integrated into antenna
RET interface connector type	8-pin AISG connector per IEC 60130-9 or RF port bias-t
RET connector torque	Min 0.5 N·m to max 1.0 N·m (hand pressure & finger tight)
RET interface connector quantity	2 pairs of AISG male/female connectors and 3 RF port bias-ts
RET interface connector location	Bottom of the antenna
Total no. of internal RETs 698-894 MHz	1
Total no. of internal RETs 1695-2200 MHz	1
Total no. of internal RETs 3700-4200 MHz	1
RET input operating voltage, vdc	10-30
RET max power consumption, idle state, W	≤ 2.0
RET max power consumption, normal operating conditions, W	≤ 13.0
RET communication protocol	AISG 2.0 / 3GPP

RET and RF connector topology

The R1 and B1/B2 RET devices can be controlled via either the designated external AISG connectors or the RF smart bias-t ports. The P1 RET devices can be controlled via the RF smart bias-t port only as shown below:

Band	RF port	Band	RF port	Band	RF port
1695-2200	3-6	698-894	1-2	3700-4200	7-14

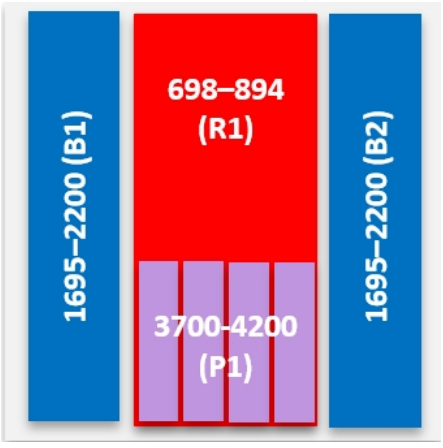


Array topology

4 sets of radiating arrays

R1: 698-894 MHz
B1: 1695-2200 MHz
B2: 1695-2200 MHz
P1: 3700-4200 MHz

Band	RF port
698-894	1-2
1695-2200	3-4
1695-2200	5-6
3700-4200	7-14



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