



Antennas

DATA SHEET

Single Band Beamforming Antenna

BFA4R-V5A



- Five foot (1.5 m), Beamforming Antenna, deploying a high performing 8T8R Beamforming array covering 2300-2690 MHz
- Eight wide mid band ports covering 2300-2690 MHz
- Full Spectrum Compliance for 2300-2690 MHz
- Provides an 8T8R Beamforming array, with a calibration port, for RRU controlled Azimuth beam control and beamforming, for increased 5G services data throughput and decreased latency, by minimizing interference and increasing signal strength at directed users
- Beamforming array can be deployed with tapering (or without tapering), for improved Azimuth SLL performance
- Exceeds minimum PIM performance requirements
- Equipped with new 4.3-10 connector, which is 40% smaller than traditional 7/16 DIN connector
- Equipped with One Field Replaceable, integrated AISG 2.0 compliant Remote Electrical Tilt (RET)

Overview

The CCI Beamforming Array is an Eight port antenna, deploying a high performance array across four single columns, covering 2300-2690 MHz. The CCI Beamforming Antenna utilizes One Type 17 RET controller, with RET control for the 8T8R Beamforming array, across all four columns.

CCI antennas are designed and produced to ISO 9001 certification standards for reliability and quality in our state-of-the-art manufacturing facilities.

Applications

- 8T8R Beamforming, supporting 2.3 - 2.7 GHz, with calibration port
- With CCI's Beamforming Antennas, wireless providers can deploy 8T8R Beamforming for increased throughput and capacity, using multiple high gain and narrow beams to connect to multiple users, within a single adaptive beamforming array



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SPECIFICATIONS

Single Band Beamforming Antenna

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Electrical

Ports	8 x High Band Ports for 2300-2690 MHz	
	Single Column	
Frequency Range	2300-2400 MHz	2496-2690 MHz
Gain ¹	17.0 dBi	17.3 dBi
Gain (Average) ²	15.7 dBi	15.9 dBi
Azimuth Beamwidth (-3dB)	91.3° ±21.1°	93.3° ±18.3°
Elevation Beamwidth (-3dB)	5.4°	4.9°
Electrical Downtilt	2° to 12°	2° to 12°
Elevation Sidelobes (1st Upper)	< -17 dB	< -18 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB
Front-to-Back Ratio ±20°	> 32 dB	> 32 dB
Cross-Polar Discrimination at Peak	> 22 dB	> 20 dB
CoPol Isolation between Columns	> 20 dB	> 22 dB
Cross-Polar Isolation	> 20 dB	> 22 dB
Coupling level, antenna port to cal port	26 ±2 dB	26 ±2 dB
Max Amplitude difference between antenna ports and Cal port (dB)	1 dB	1 dB
Max phase difference between antenna ports and Cal port (deg)	< ±8°	< ±8°
Voltage Standing Wave Ratio (VSWR)	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -153 dBc	≤ -153 dBc
Input Power Continuous Wave (CW)	300 watts	300 watts
Polarization	Dual Linear 45°	Dual Linear 45°
Input Impedance	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground

¹Peak gain across sub-bands.

²Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V11.1.

Ports	Broadcast and Service Beams			
	Broadcast		Service Beam at 0°*	
Frequency Range	2300-2400 MHz	2496-2690 MHz	2300-2400 MHz	2496-2690 MHz
Gain ¹	18.3 dBi	18.8 dBi	21.6 dBi	22.3 dBi
Gain (Average) ²	17.6 dBi	17.6 dBi	21.1 dBi	21.4 dBi
Azimuth Beamwidth (-3dB)	60.9° ±4.1°	61.4° ±6.1°	25.8° ±0.5°	23.0° ±0.9°
Elevation Beamwidth (-3dB)	5.4°	4.9°	5.4°	4.9°
Electrical Downtilt	2° to 12°	2° to 12°	2° to 12°	2° to 12°
Elevation Sidelobes (1st Upper)	< -17 dB	< -17 dB	< -17 dB	< -18 dB
Front-to-Back Ratio @180°	> 40 dB	> 40 dB	> 40 dB	> 40 dB
Front-to-Back Ratio ±20°	> 40 dB	> 38 dB	> 38 dB	> 38 dB

¹Peak gain across sub-bands.

²Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V11.1.

* Performance is based on no tapering applied



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Single Band Beamforming Antenna

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Electrical

Ports	Broadcast and Service Beams			
	Service Beam at 30°*		Service Beam Soft BiSector	
Frequency Range	2300-2400 MHz	2496-2690 MHz	2300-2400 MHz	2496-2690 MHz
Gain ¹	20.9 dBi	21.5 dBi	20.3 dBi	21.2 dBi
Gain (Average) ²	20.3 dBi	20.8 dBi	19.8 dBi	20.4 dBi
Azimuth Beamwidth (-3dB)	28.9° ±0.6°	26.2° ±1.0°	33.3° ±1.1°	30.2° ±1.5°
Elevation Beamwidth (-3dB)	5.4°	4.9°	5.3°	4.9°
Electrical Downtilt	2° to 12°	2° to 12°	2° to 12°	2° to 12°
Elevation Sidelobes (1st Upper)	< -18 dB	< -18 dB	< -18 dB	< -18 dB
Front-to-Back Ratio @180°	> 40 dB	> 38 dB	> 38 dB	> 38 dB
Front-to-Back Ratio ±20°	> 38 dB	> 35 dB	> 38 dB	> 37 dB

¹Peak gain across sub-bands.

²Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V11.1.

* Performance is based on no tapering applied

Mechanical

Dimensions (LxWxD)	58.2x12.0x6.9 in (1478x304x175 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	74 lbf @ 100 mph 329 N @ 161 kph
Side Wind Load	47 lbf @ 100 mph 209 N @ 161 kph
Equivalent Flat Plate Area	2.9 ft ² (0.3 m ²)
Weight *	48.2 lbs (21.9 kg)
RF Connector	8 x 4.3-10 female
Calibration Interface	4.3-10 female
RET Connectors	1 female / 1 male
RET Interface	8-pin D female / 8-pin D male
Mounting Pole	2 to 5 in (5 to 12 cm)

* Weight excludes mounting kit



Antennas

SPECIFICATIONS

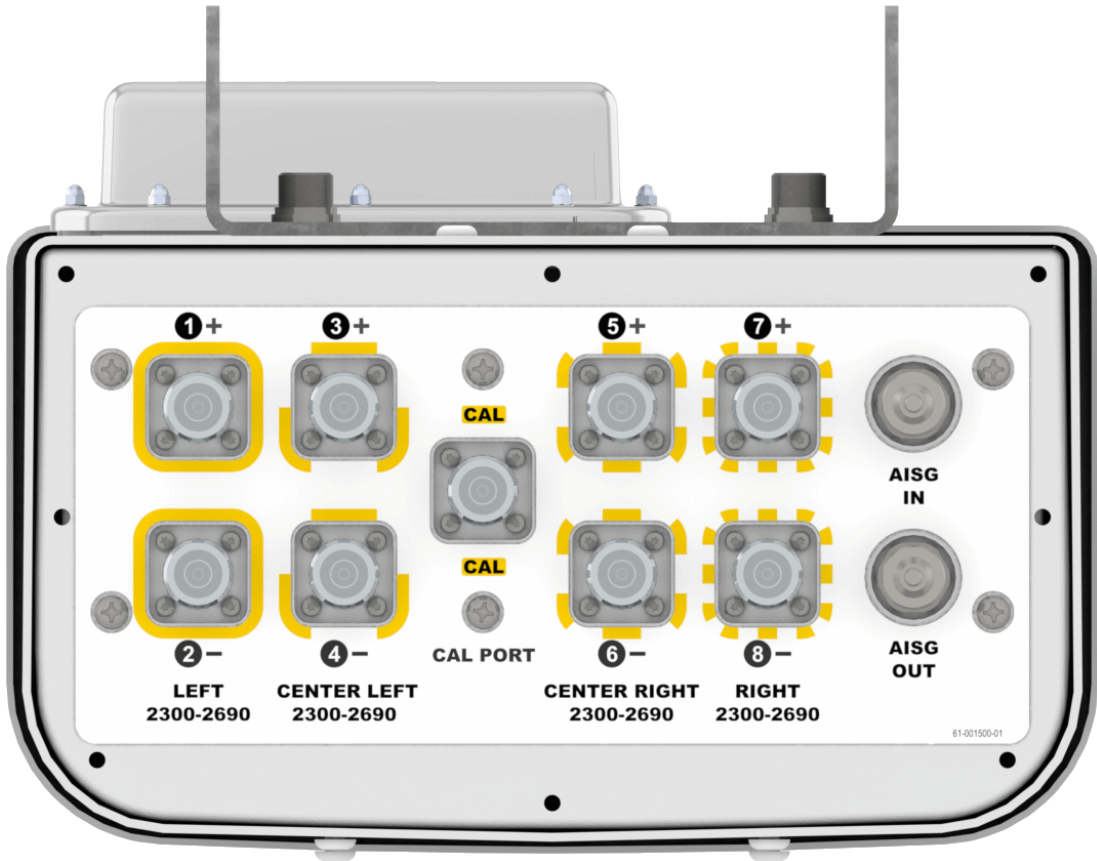
Single Band Beamforming Antenna

BFA4R-V5A

Mechanical

Bottom View

BFA4R-V5AA





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SPECIFICATIONS

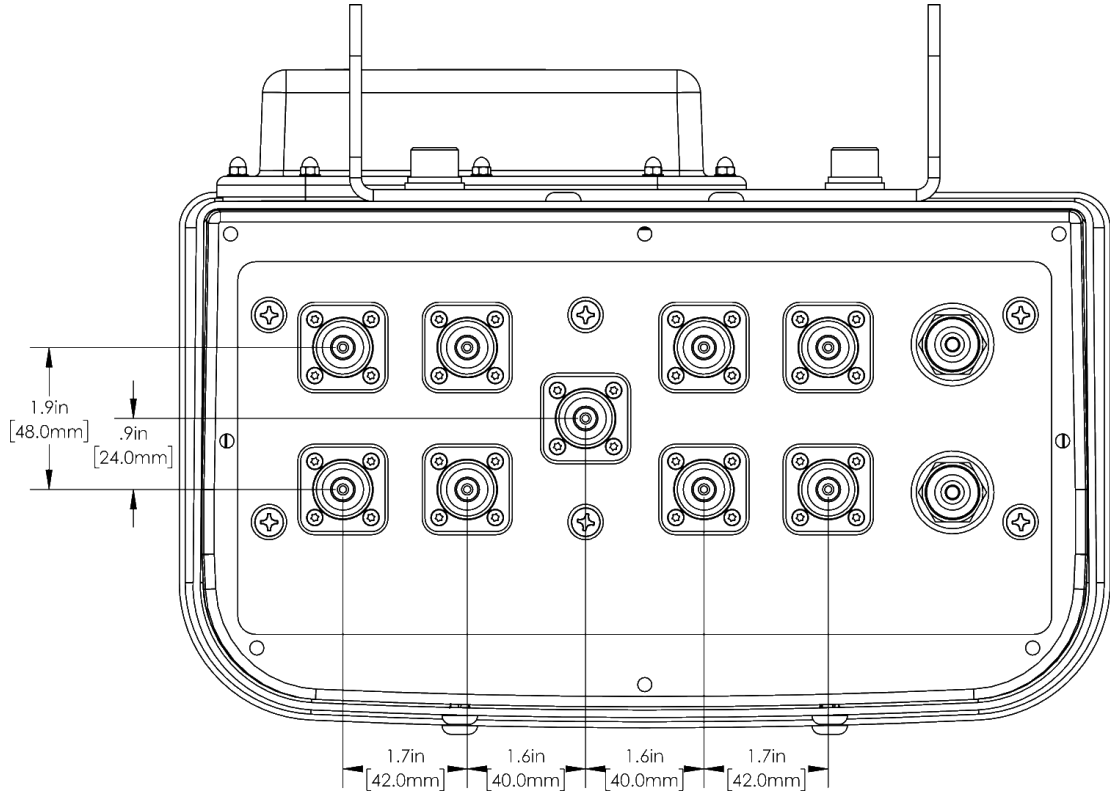
Single Band Beamforming Antenna

BFA4R-V5A

Mechanical

Connector Spacing

BFA4R-V5AA





Antennas

SPECIFICATIONS

Single Band Beamforming Antenna

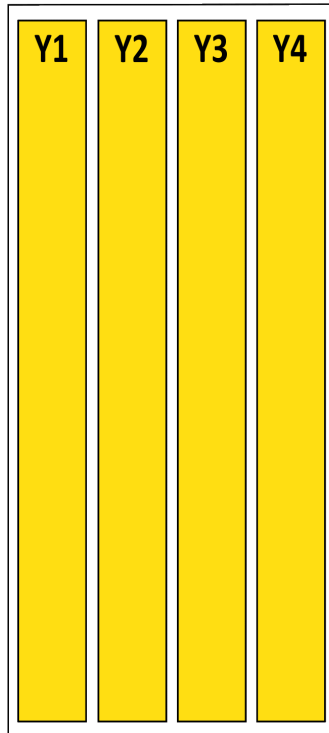
BFA4R-V5A

Mechanical

RET to Element Configuration

BFA4R-V5AA Element and RET configuration (Type 17 Internal RET)

Element arrays as viewed from rear of antenna



RET placement as viewed from rear of antenna

Top of antenna



MM.1

Array	Ports	Freq (MHz)	Ports controlled by common RET	AISG RET UID
Y1	1, 2	2300-2690	1, 2, 3, 4, 5, 6, 7, 8	C1xxxxxxMM.1
Y2	3, 4	2300-2690		
Y3	5, 6	2300-2690		
Y4	7, 8	2300-2690		



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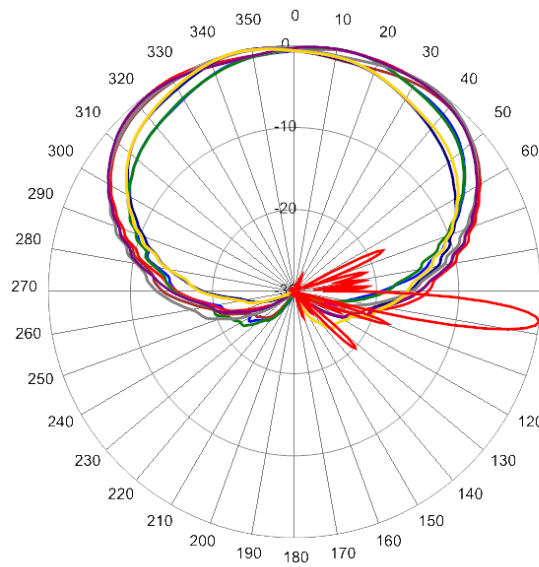
SPECIFICATIONS

Single Band Beamforming Antenna

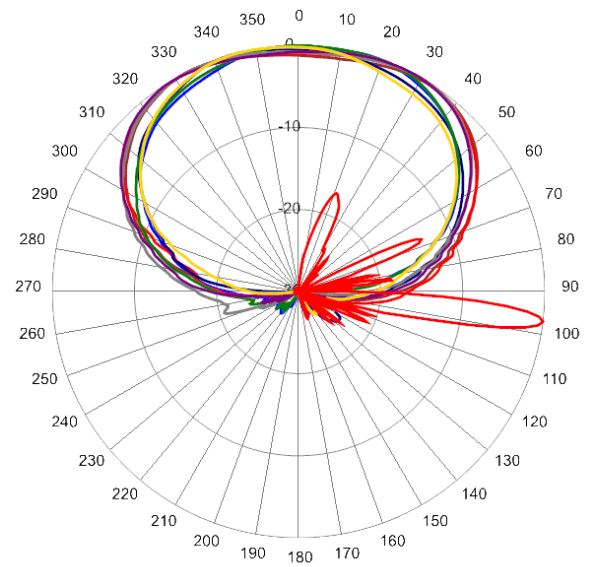
BFA4R-V5A

Typical Antenna Patterns

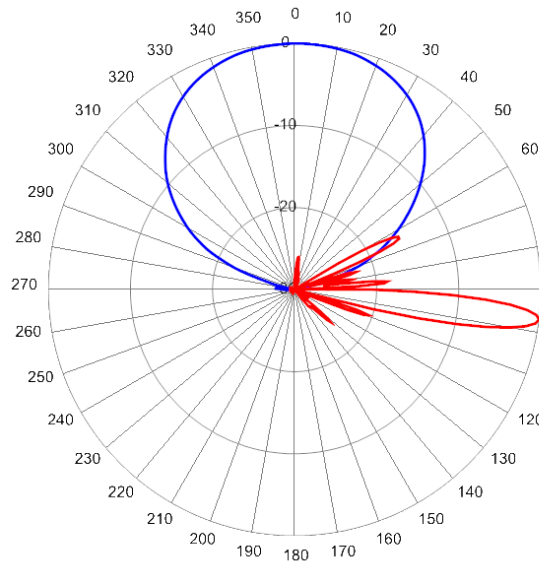
For detailed information on additional antenna patterns, contact customer support at support@cciproducts.com



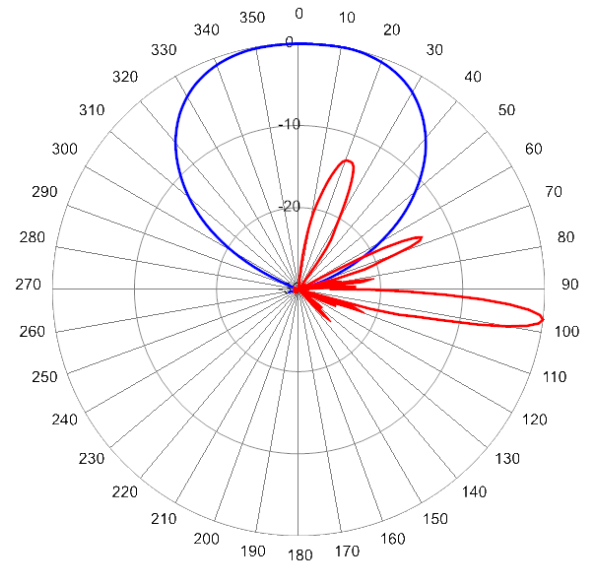
2400 MHz Azimuth with Elevation 7° Single Columns



2650 MHz Azimuth with Elevation 7° Single Columns



2400 MHz Azimuth with Elevation 7° Broadcast Beam



2650 MHz Azimuth with Elevation 7° Broadcast Beam



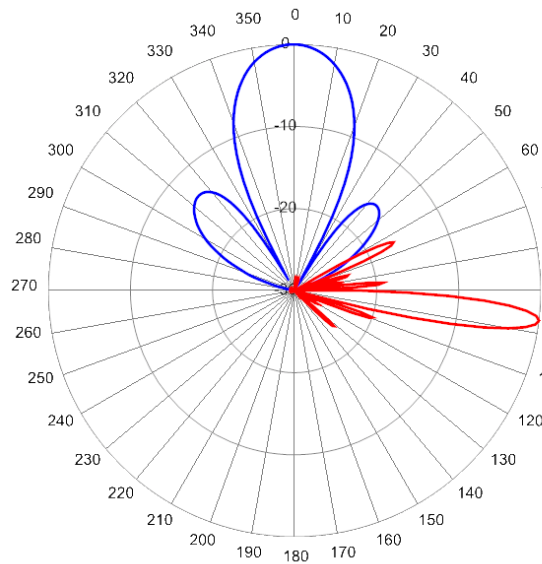
Antennas

SPECIFICATIONS

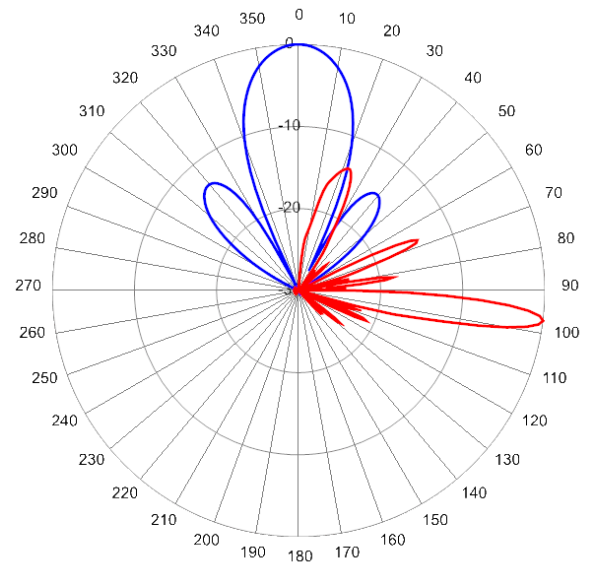
Single Band Beamforming Antenna

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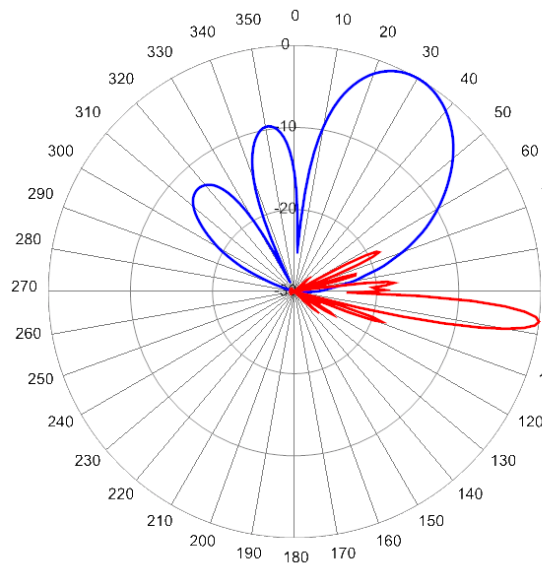
Typical Antenna Patterns



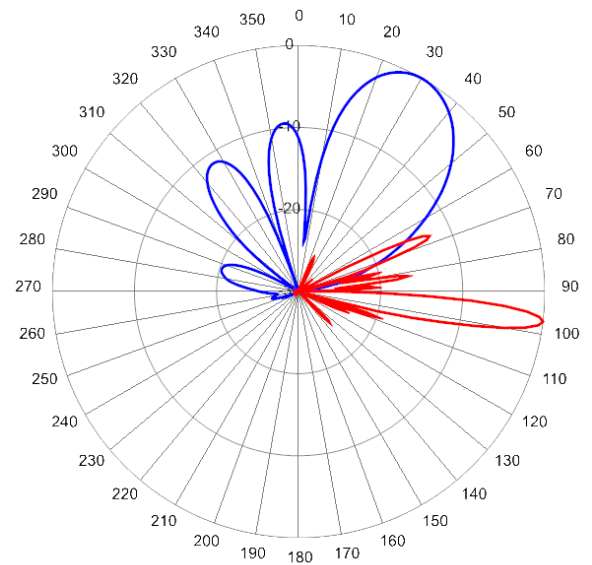
2400 MHz Azimuth 0° with Elevation 7° Service Beam



2650 MHz Azimuth 0° with Elevation 7° Service Beam



2400 MHz Azimuth 30° with Elevation 7° Service Beam



2650 MHz Azimuth 30° with Elevation 7° Service Beam



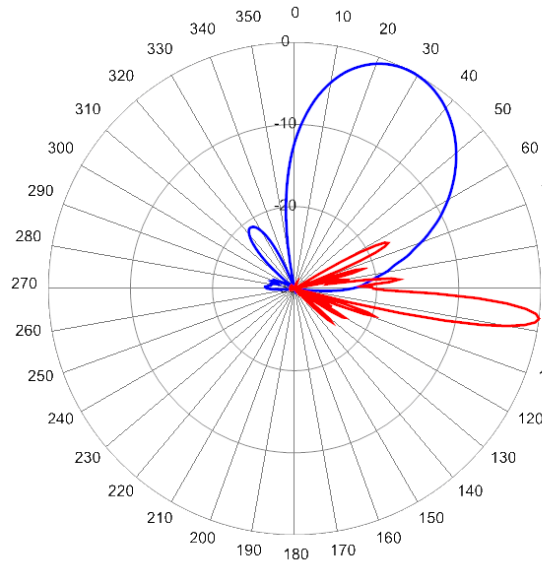
Antennas

SPECIFICATIONS

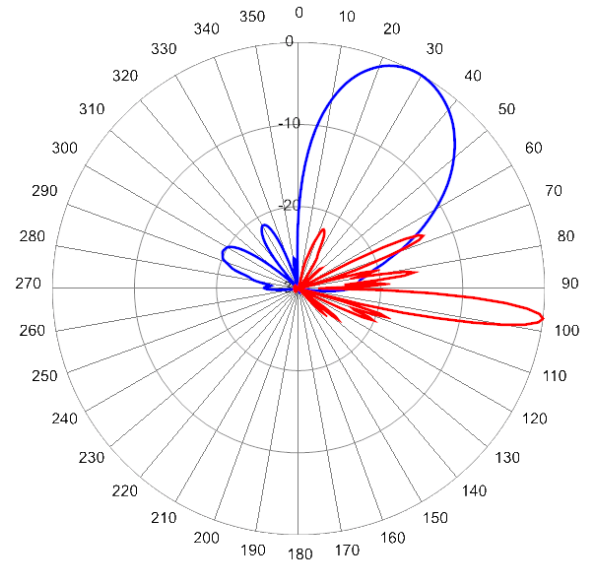
Single Band Beamforming Antenna

BFA4R-V5A

Typical Antenna Patterns



2400 MHz Azimuth with Elevation 7° Soft Split Beam



2650 MHz Azimuth with Elevation 7° Soft Split Beam



Antennas

ORDERING

Single Band Beamforming Antenna

BFA4R-V5A

Parts & Accessories

BFA4R-V5AA-K	Five foot (1.5 m) beam forming antenna with 90° azimuth single column beamwidth, 9x 4.3-10 female connectors (including 1 calibration port), 1 factory installed BSA-RET400 RET actuators (Type 17 Internal) and MBK-01 mounting bracket
MBK-01	Mounting bracket kit (top and bottom) with 0° to 10° mechanical tilt adjustment
MBK-16	Mounting bracket kit (top and bottom) with fixed 0° mechanical tilt
BSA-RET400	Type 17 remote electrical tilt actuator
AISGC-M-F-10FT	10 Ft (3 m) Male/Female RRU to Antenna AISG cable



Antennas

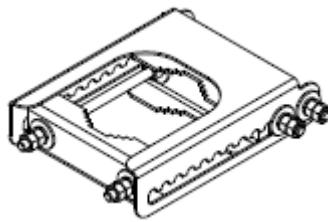
ACCESSORIES

Mounting Bracket Kit

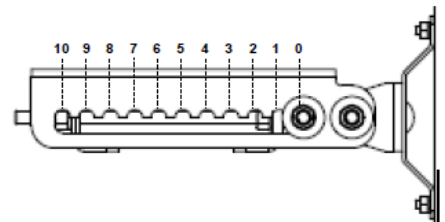
MBK-01

Mechanical

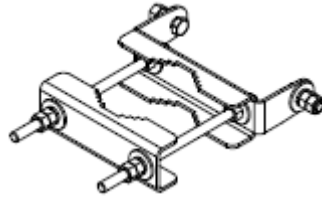
Weight	12.6 lbs (5.7 kg)
Hinge Pitch	47.25 in (1200 mm)
Mounting Pole Dimension	2 to 5 in (5 to 12 cm)
Fastener Size	M12
Installation Torque	40 ft·lb (54 N·m)
Mechanical Tilt Adjustment	0° - 10°



MBK-01 Top Adjustable Bracket



MBK-01 Top Adjustable Bracket Side View



MBK-01 Bottom Fixed Bracket



Antennas

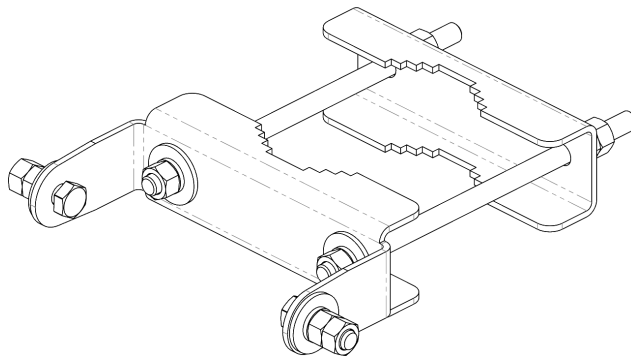
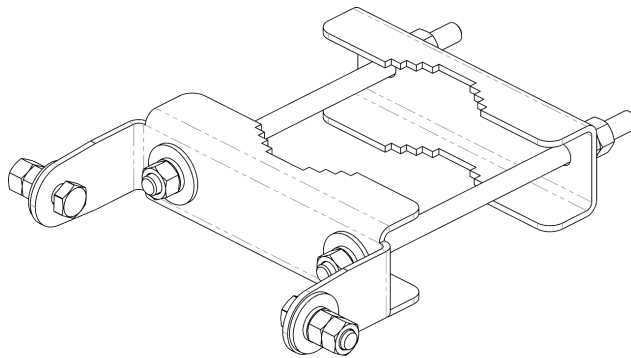
ACCESSORIES

Mounting Bracket Kit

MBK-16

Mechanical

Weight	9.9 lbs (4.5 kg)
Hinge Pitch	47.25 in (1200 mm)
Mounting Pole Dimension	2 to 5 in (5 to 12 cm)
Fastener Size	M12
Installation Torque	40 ft·lbs (54 N·m)
Mechanical Tilt	0°



MBK-16 Top and Bottom Bracket



Antennas

ACCESSORIES

Internal Remote Electrical Tilt (iRET)

BSA-RET400

General Specifications

Part Number	BSA-RET400
Protocols	AISG 2.0
RET Type	Type 17
Adjustment Cycles	>10,000 cycles
Tilt Accuracy	±0.1°
Temperature Range	-40° C to 70° C

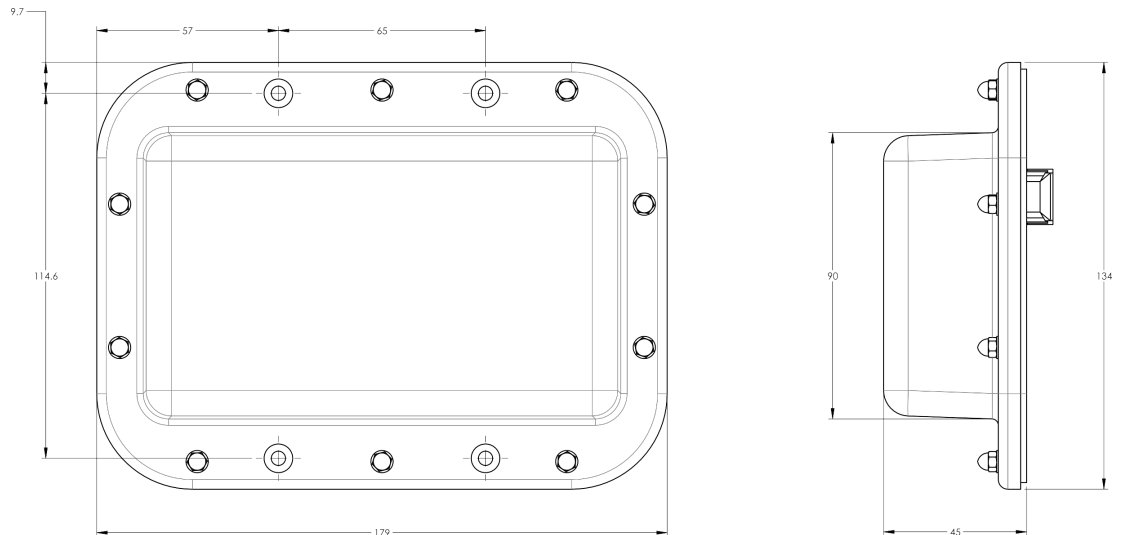
Electrical

Data Interface Signal	DC
Input Voltage	10-30 Vdc
Current Consumption Tilt	100 mA at $V_{in}=24$ (500 mA MAX)
Current Consumption Idle	10 mA at $V_{in}=24$

Mechanical

Dimensions (LxWxD)	7.0x5.3x1.8 in. (179x134x45 mm)
Housing	ASA/ABS/Aluminum
Weight	1.3 lbs (0.6 kg)

ASA= Acrylic Styrene Acrylonitrile
ABS=Acrylonitrile Butadiene Styrene





Antennas

ACCESSORIES

AISG Cable

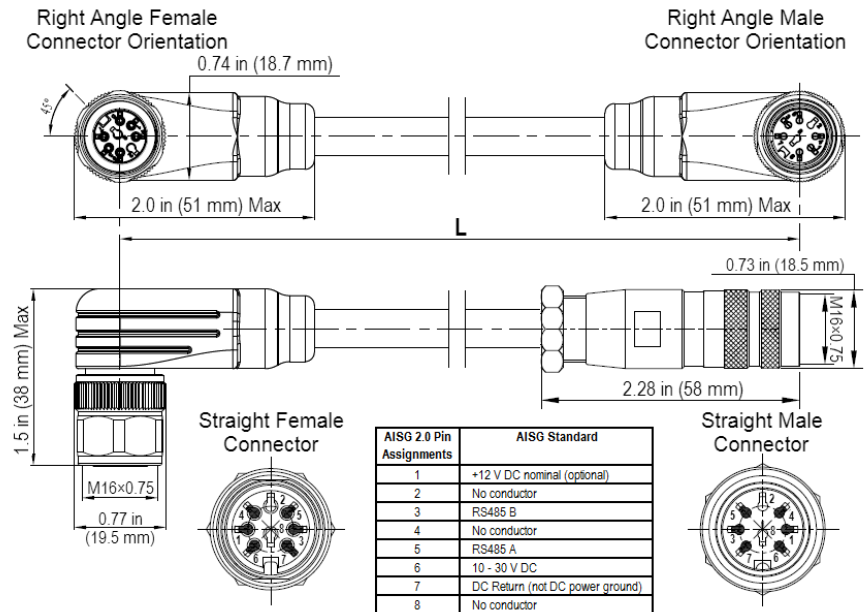
AISGC-M-F-xFT

Electrical Specifications

Individual Cable Part Number	AISGC-M-F-x(FT)
Cable style	UL2464
Protocol	AISG 1.1 and AISG 2.0
Maximum voltage	300 V
Rated current	5 A at 104° F (40° C)

Mechanical Specifications

Individual Cable Part Number	AISGC-M-F-x(FT)
Cables per kit	1
Connectors	2 x 8 pin IEC 60130-9 Straight male/straight female
Tightening torque	Hand tighten only \approx 1.84 ft-lbs (2.5 Nm)
Construction	Shielded (Tinned Copper Braid)
Braid coverage	85%
Jacket Material	Matte Polyurethane (Black)
Conductors	1 twisted pair - 24 AWG 3 conductors - 19 AWG AWM style 2464
Cable Diameter	0.307 in (7.8 mm)
Length	See order details
Minimum bend radius	3.15 in (80 mm)



AISG-Male to AISG-Female Jumper Cable



Antennas

ACCESSORIES

AISG Cable

AISGC-M-F-xFT

Environmental Specifications

Individual Cable Part Number	AISGC-M-F-xFT
Temperature Range	-40° to 80° C
Flammability	UL 1581 VW-1
Ingress Protection	IEC 60529:2001, IP67



Antennas

STANDARDS & CERTIFICATIONS

Single Band Beamforming Antenna

BFA4R-V5A

Standards & Compliance

Safety	EN 60950-1, UL 60950-1
Emission	EN 55022
Immunity	EN 55024
Environmental	IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-5, IEC 60068-2-6, IEC-60068-2-11, IEC 60068-2-14, IEC 60068-2-18, IEC 60068-2-27, IEC 60068-2-29, IEC 60068-02-30, IEC 60068-2-52, IEC 60068-2-64, GR-63-CORE 4.3.1, EN 60529, IP 24

Certifications

Antenna Interface Standards Group (AISG), Federal Communication Commission (FCC) Part 15 Class B, CE, CSA US, ISO 9001

