ADMINISTRATIVE REVIEW APPLICATION

(Code Section 99.06, 153.037)

CITY OF DUBLIN.

Land Use and
Long Range Planning
5800 Shier-Rings Road
Dublin, Ohio 43016-1236

Phone/ TDD: 614-410-4600
Fax: 614-410-4747
Web Site: www.dublin.oh.us

I. PLEASE CHECK THE TYPE OF APPLICATION:

COIC Districts
Select District:

- ☐ HDP
- ☐ LDP
- ☐ I-VC
- ☐ I-CC

Application Type
(COIC Only)

- ☐ Pre-Application Review
- ☐ Development Plan Review
- ☐ Administrative Review
- ☐ Administrative Departures

☒ Wireless Communication Facility

Please utilize the applicable *Supplemental Application Requirements* sheet for additional submittal requirements.

II. PROPERTY INFORMATION: This section must be completed.

Property Address(es): 6013 Glick Road, Shawnee Hills, OH 43017	
Tax ID/Parcel Number(s): 60043229001000	Parcel Size(s) (Acres): 1.19 Acres
Existing Land Use/Development: Existing 150' monopole tower and associated equip. Peggy Inn - Restaurant & Pub	Existing Zoning: EU - Exceptional Use

PLEASE COMPLETE THE FOLLOWING:

Describe the Existing Land Use/Development:

Existing 150' monopole tower and associated equip.

Describe the Request:

This is a request to modify equipment on the top of the tower. Replacing six (6) existing panel antennas with six (6), new, panel

III. CURRENT PROPERTY OWNER(S): Please attach additional sheets if needed.

Name (Individual or Organization): South Heidelberg, Inc.	
Mailing Address: (Street, City, State, Zip Code) 6013 Glick Road, Powell, OH	
Daytime Telephone: 614 207 2459	Fax:
Email or Alternate Contact Information:	

IV. APPLICANT(S): This is the person(s) who is submitting the application if different than the property owner(s) listed in part III. Please complete if applicable.

Name: New Par, a Delaware partnership, dba Verizon Wireless	Applicant is also property owner: yes ☐ no ☑
Organization (Owner, Developer, Contractor, etc.): Wireless Carrier	
Mailing Address: (Street, City, State, Zip Code) 7575 Commerce Ct., Lewis Center, OH 43035	
Daytime Telephone: 614-738-9028	Fax: N/A
Email or Alternate Contact Information: todd.barhorst@verizonwireless.com	

V. REPRESENTATIVE(S) OF APPLICANT / PROPERTY OWNER: This is the person(s) who is submitting the application on behalf of the applicant listed in part IV or property owner listed in part III. Please complete if applicable.

Name: Michael K. Hennon	
Organization (Owner, Developer, Contractor, etc.): United Acquisition Services, Inc.	
Mailing Address: (Street, City, State, Zip Code) 3960 Brown Park Drive, Suite I	
Daytime Telephone: 614-850-8966	Fax: 614-850-8230
Email or Alternate Contact Information: mhennon@uas.biz	

VI. AUTHORIZATION FOR OWNER'S APPLICANT or REPRESENTATIVE(S): If the applicant is not the property owner, this section must be completed and notarized.

I South Heidelberg, Inc., the owner, hereby authorize Michael K. Hennon, on behalf of New Par a delaware partnership, dba Verizon Wireless to act as my applicant or representative(s) in all matters pertaining to the processing and approval of this application, including modifying the project. I agree to be bound by all representations and agreements made by the designated representative.

Signature of Current Property Owner: South Heidelberg Inc. By: James J. Byan Jr pres.	Date: 6-11-14

☐ Check this box if the Authorization for Owner's Applicant or Representative(s) is attached as a separate document

Subscribed and sworn before me this 11 day of June, 20 14

State of Ohio

County of Franklin

Notary Public Carmela M Ryan

Stamp or Seal

My Commission Expires 9-26-2015

VII. AUTHORIZATION TO VISIT THE PROPERTY: Site visits to the property by City representatives are essential to process this application. The Owner/Applicant, as noted below, hereby authorizes City representatives to visit, photograph and post a notice on the property described in this application.

I South Heidelberg, Inc., the owner or authorized representative, hereby authorize City representatives to visit, photograph and post a notice on the property described in this application.

Signature of applicant or authorized representative: James J Byan Jr pres.	Date: 6-11-14

VIII. UTILITY DISCLAIMER: The Owner/Applicant acknowledges the approval of this request for review by the Dublin Planning and Zoning Commission and/or Dublin City Council does not constitute a guarantee or binding commitment that the City of Dublin will be able to provide essential services such as water and sewer facilities when needed by said Owner/Applicant.

I N/A, the owner or authorized representative, acknowledge that approval of this request does not constitute a guarantee or binding commitment that the City of Dublin will be able to provide essential services such as water and sewer facilities when needed by said Owner/Applicant.

Signature of applicant or authorized representative:	Date: N/A

IX. APPLICANT'S AFFIDAVIT: This section must be completed and notarized.

I Michael K. Hennon, the owner or authorized representative, have read and understand the contents of this application. The information contained in this application, attached exhibits and other information submitted is complete and in all respects true and correct, to the best of my knowledge and belief.

Signature of applicant or authorized representative:	Date: 8/7/2014

Subscribed and sworn to before me this 7th day of August, 20 14

State of Ohio

County of Franklin Notary Public Eric S. Keener

Stamp or Seal

NOTARY PUBLIC STATE OF OHIO

ERIC S. KEENER
Notary Public, State of Ohio
My Comm. Expires 03-25-2015
Recorded in Franklin County

FOR OFFICE USE ONLY			
Amount Received:	Application No:	ART Decision:	ART Action:
Receipt No:	Map Zone:	Date Received:	Received By:
Type of Request:			
N, S, E, W (Circle) Side of:			
N, S, E, W (Circle) Side of Nearest Intersection:			
Distance from Nearest Intersection:			
Existing Zoning District:			

CITY OF DUBLIN.

WIRELESS COMMUNICATION FACILITY

Application Requirement Checklist

Application & Supporting Materials

1 APPLICATION FEE COLLOCATION FEE $1835

2 CD - ONE (1) DIGITAL COPY CONTAINING ALL APPLICATION MATERIALS REQUIRED FOR SUBMISSION. YES
Files must be labeled and submitted as PDFs or JPEGs, or other appropriate electronic format.

3 ORIGINAL SIGNED AND NOTARIZED ADMINISTRATIVE REVIEW TEAM APPLICATION FORM - ONE (1) ORIGINAL YES

4 LEGAL DESCRIPTION AND/OR PROPERTY SURVEY FOR EACH PARCEL INCLUDED - ONE (1) COPY N/A - EXISTING TOWER

5 LIST OF PROPERTY OWNERS AND REGISTERED HOMEOWNERS ASSOCIATIONS WITHIN 300 FEET - ONE (1) COPY THAT INCLUDES: N/A - EXISTING TOWER

- A Parcel number
- B Owner name
- C Complete address

6 APPLICATION STATEMENT THAT INCLUDES THE FOLLOWING: N/A - EXISTING TOWER & EQUIPMENT

- A Describe the proposed wireless communication facility, including type, height, location, and other relevant details.
- B State how the proposal is compliant with the requirements of Code Section 99.06(B)(4) and all applicable federal, state or local laws.
- C Explain the applicant's ability or inability to use existing towers, other structures or alternative technology not requiring the use of towers or structures, to provide the services planned for the use of the proposed new tower.

7 NOTARIZED STATEMENT BY THE APPLICANT AFFIRMING THAT THE CONSTRUCTION OF THE TOWER WILL ACCOMMODATE CO-LOCATION OF ADDITIONAL ANTENNAS FOR FUTURE USERS N/A - EXISTING TOWER

8 24-HOUR EMERGENCY CONTACT INFORMATION
For entities providing the backhaul network for the tower(s) described in the application and other wireless communications sites owned or operated by the applicant in the municipality.

9 AN INVENTORY OF THE EXISTING AND APPROVED TOWERS, ANTENNAS, AND ALTERNATIVE TOWER STRUCTURES
Must include towers, antennas, and alternative tower structures within the jurisdiction or within two miles of the border of the city. (The City may share this information with other applicants or other organizations seeking to locate towers or antennas within the jurisdiction of Dublin or other communities. However, the City is not, by sharing this information, in any way representing or warranting that the sites are available or suitable.) THE INVENTORY SHALL SHOW EACH TOWER AND ANTENNA AND INCLUDE: N/A - EXISTING TOWER

- A A map showing each location, by address, including straight-line distances between each tower.
- B Height and design of each existing tower.
- C Tower operator/owner.
- D Co-location capability of each tower, including alternative tower structures.

Land Use and Long Range Planning | 5800 Shier Rings Road Dublin, Ohio 43016 | **Phone:** 614-410-4600 | **Fax:** 614-410-4747 | Web Site: www.dublin.oh.us

Plans & Maps

All plans require ONE (1) large (24 x 36) and TEN (10) small (11 x 17) copies to scale and dimensioned unless otherwise noted. The scale may not be less than 1" = 50'. Plans must be stapled, collated, and folded. Additional copies of plans may be requested prior to the case being placed on a meeting agenda.

1 SITE PLAN - INCLUDE THE FOLLOWING: N/A - EXISTING TOWER, NO CHANGE TO GROUND EQUIPMENT

- **A** The location, type and height of the proposed tower (height of the structure and overall height from grade)
- **B** Existing land uses and existing zoning districts.
- **C** Adjacent land uses and zoning districts (including other municipalities).
- **D** Adjacent roadways and access.
- **E** Setbacks between the proposed tower and auxiliary structures and the nearest property lines.
- **F** The separation distance from other towers described in the inventory of existing sites. The applicant shall also identify the type of construction of the existing tower(s) and the owner/operator fo the existing tower(s), if known.
- **G** Existing and proposed topography.

2 LANDSCAPE PLAN - INCLUDE THE FOLLOWING: N/A - EXISTING TOWER, NO CHANGE TO LANDSCAPING

- **A** Specific landscape materials, locations and installation sizes in accordance with the landscape code provisions of zoning code section 153.130, and 153.133(c) in particular.
- **B** Location and method of fencing, if any, including height, material, style and color.
- **C** If applicable, the method of camouflage and illumination.

3 ELEVATIONS NEW ELEVATION DRAWING
Show the proposed tower and any other associated structures.

4 MATERIALS - TEN (10) 8.5 x 11 CUT-SHEETS AND DESCRIPTIONS OF PROPOSED MATERIALS CUT SHEETS FOR NEW EQUIPMENT
Any materials relevant to the proposal.

5 PROPOSED SIGNS N/A - NO NEW SIGNAGE
Include dimensions, colors, and text.

Alcatel-Lucent RRH2x40-07-L

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-07-L is a high-power, small form-factor Remote Radio Head (RRH) operating in the North American Digital Dividend / 700MHz frequency band (3GPP Bands 12 and 17). The Alcatel-Lucent RRH2x40-07-L is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.

A distributed eNodeB expands deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-07-L is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-07-L has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to two-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 15 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-07-L is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-07-L installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-07-L is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-07-L is compact and weights less than 27 kg (60 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

Excellent RF performance

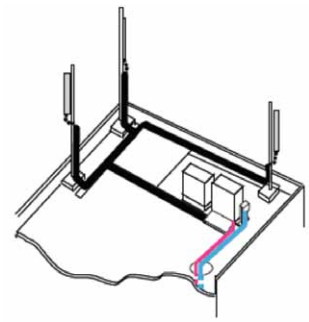
Because of its small size and weight, the Alcatel-Lucent RRH2x40-07-L can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-07-L where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-07-L provides more RF power while at the same time consuming less electricity.

Features

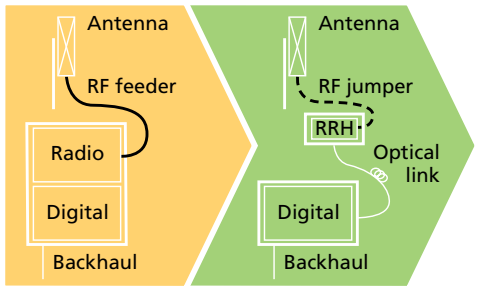
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless), noise-free, and heaterless unit
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

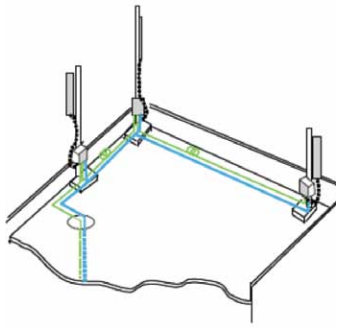
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 520 mm (20.5 in.)
- Width: 270 mm (10.63 in.)
- Depth: 226m (8.9 in.)
- Weight (without mounting kit): less than 27 kg (60 lb)

Power

- Power supply: -48V

Operating environment

- Outdoor temperature range:
  - ¬ With solar load: -40°C to +50°C (-40°F to +122°F)
  - ¬ Without solar load: -40°C to +55°C (-40°F to +131°F)
- Passive convection cooling (no fans)
- Enclosure protection
  - ¬ IP65 (International Protection rating)

RF characteristics

- Frequency band: 700 MHz; 3GPP Band 12 (incl Band 17)
- Bandwidth: up to 15 MHz
- RF output power at antenna port:
  - ¬ 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way
- Noise figure: below 2.5 dB typical
- ALD features
  - ¬ TMA
  - ¬ Remote electrical tilt (RET) support (AISG v2.0)

Optical characteristics

Type/number of fibers

- Up to 3.12 Gb/s line bit rate
- Single-mode variant
  - ¬ One SM fiber (9/125 µm) per RRH2x, carrying UL and DL using CWDM (at 1550/1310 nm)
- Multi-mode variant
  - ¬ Two MM fibers (50/125 µm) per RRH2x: one carrying UL, the other carrying DL (at 850 nm)

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Alarms and ports

- Six external alarms
- Two optical ports to support daisy-chaining

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ALCATEL-LUCENT
WIRELESS PRODUCT DATASHEET
RRH2X60-1900 (BAND 2)

The Alcatel-Lucent RRH2x60-1900 is a high power, small form factor Remote Radio Head operating in the 1900MHz frequency band (3GPP Band 2) for WCDMA and LTE technologies. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.

A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.
The Alcatel-Lucent RRH2x60-1900 is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information.

SUPERIOR RF PERFORMANCES

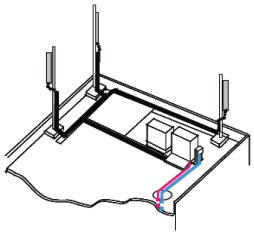
The Alcatel-Lucent RRH2x60-1900 integrates all the latest technologies. This allows to offer best-in-class characteristics.
It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.
It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation for LTE.
For non-MIMO transmission the two RF chains can operate independently to provide access to two blocks of 20MHz each, anywhere in the band, which makes its perfect for RAN sharing.
The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

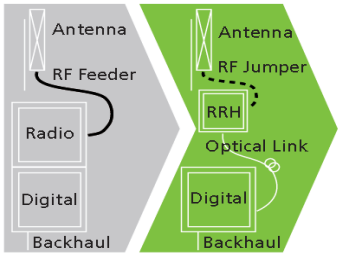
The Alcatel-Lucent RRH2x60-1900 is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).
The Alcatel-Lucent RRH2x60-1900 is a very cost-effective solution to deploy LTE MIMO.

EASY INSTALLATION

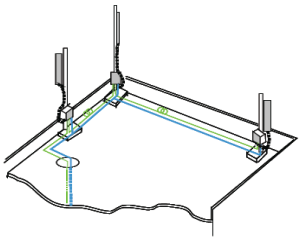
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-1900 installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.
The Alcatel-Lucent RRH2x60-1900 is a zero-footprint solution and is convection cooled for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-1900 is compact and weighs less than 20 kg, eliminating the need for a crane to host the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-1900 integrates two power amplifiers of 60W each at antenna connector
- RRH2x60-1900 can operate WCDMA, LTE or a mix of WCDMA and LTE
- RRH2x60-1900 offers the possibility for WCDMA (non MIMO) to operate the two radio chains independently (2 blocks of 20MHz anywhere in the band)
- RRH2x60-1900 is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control or second PA path switch-off

BENEFITS

- MIMO deployment and/or WCDMA and LTE simultaneous operation with only one single unit per sector
- possibility to operate the radio-chains independently (2x20MHz anywhere in the band) addresses nearly all operators' spectrum configurations, which is especially useful in case of disaggregated spectrum or RAN sharing
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-T

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 510x285x183mm (26.6l)
- Weight : 19.5kg (43lbs)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 110W for @1x20W; 250W @2x60W

RF Characteristics

- Frequency band: 1900 (3GPP band 2)
- Output power: 2x60W at antenna connectors
- Technologies supported: W-CDMA and LTE
- Instantaneous bandwidth: 20MHz (MIMO) or 2x20MHz (non MIMO)
- Rx diversity: 2-way uplink reception
- Typical sensitivity without Rx diversity (3GPP 25.104): -125.7 dBm for W-CDMA and -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisy-chaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- 6 external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089
- Safety : IEC60950-1, EN 60825-1
- Regulatory : CE Mark - European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

AT THE SPEED OF IDEAS™

Alcatel·Lucent

DATA SHEET

DC Surge Protection for RRH/Integrated Antenna Radio Head

RxxDC-4750-PF-48 • RxxDC-3315-PF-48

Tower / Base / Rooftop / Rooftop Distribution Models

Raycap's flexible Tower, Base Stations and Rooftop protection and Distribution products provide protection for up to 6 Remote Radio Heads/Integrated Antennas. The solutions mitigate the risk of damage due to lightning and provide high levels of availability and reliability to radio equipment.

Shown with optional 90˚ elbow for side entry. Can be installed on left or right side of unit.

Mounting Bracket Included

Features

- Employs the Strikesorb® 30-V1-HV Surge Protective Device (SPD) specifically designed for the Remote Radio Head (RRH) installation environment and certified for use in DC applications and at low DC operating voltages (48V).
- The Strikesorb 30-V1-HV is a Class I SPD, certified by VDE per the IEC 61643-1 standard as suitable for installation in areas where direct lightning exposure is expected. Strikesorb 30-V1-HV is able to withstand direct lightning currents of up to 5kA (10/350) and induced surge currents of up to 60kA (8/20).
- Provides very low let through / clamping voltage - unique for a Class I product - as it does not employ spark gaps or other switching elements. Strikesorb offers unique protection levels to the RRH equipment as well as the Base Band Units.
- Alarms for SPD sacrifice, Moisture detection and Intrusion.
- Fully recognized to the UL 1449 3rd Edition Safety Standard.
- Patent pending design

Benefits

- Offers unique maintenance-free protection against direct lightning currents.
- Protects up to 6 Remote Radio Heads and connects up to 12 fiber pairs.
- Utilizes an IP 67 rated enclosure, allowing for indoor or outdoor installation on a roof or tower top.
- Configurable cable ports are designed to accommodate varying diameters of hybrid (combined power and fiber optic) or standard cables with diameters up to 2" (will fit most standard 1⅝" coax class cables) depending upon port configuration.
- Lightweight aerodynamic design provides maximum flexibility for tower top installation.
- Companion to the RxxDC-1064-PF-48 (Sector) model.

Tower / Base / Rooftop / Rooftop Distribution Models:
RxxDC-4750-PF-48
RxxDC-3315-PF-48

Companion Sector Model:
RxxDC-1064-PF-48

DC1-48-60-18U

G02-00-236 130129

Raycap

www.raycapsurgeprotection.com

SPECIFICATIONS

DC Surge Protection for RRH/Integrated Antenna Radio Head

RxxDC-4750-PF-48 • RxxDC-3315-PF-48

Tower / Base / Rooftop / Rooftop Distribution Models

Electrical

Model Numbers	RxxDC-4750-PF-48	RxxDC-3315-PF-48
Nominal Operating Voltage	48 VDC	48 VDC
Nominal Discharge Current [I_n]	n/a	20 kA 8/20 µs
Maximum Surge Current [I_{max}]	n/a	60 kA 8/20 µs
Maximum Impulse (Lightning) Current per IEC 61643-1	n/a	5 kA 10/350 µs
Maximum Continuous Operating Voltage [U_c]	n/a	75 VDC
Voltage Protection Rating (VPR) per UL 1449 3rd Edition	n/a	400V
Protection Class as per IEC 61643-1	n/a	Class I
SPD Alarm	n/a	upon sacrifice
Intrusion Sensor	microswitch	microswitch
Moisture Sensor	infrared moisture detector	infrared moisture detector
Strikesorb Module Type	**No Strikesorb modules installed** *(used as Distribution Unit only)*	30-V1-HV **Strikesorb modules installed to protect 6 Remote Radio Heads**

Mechanical

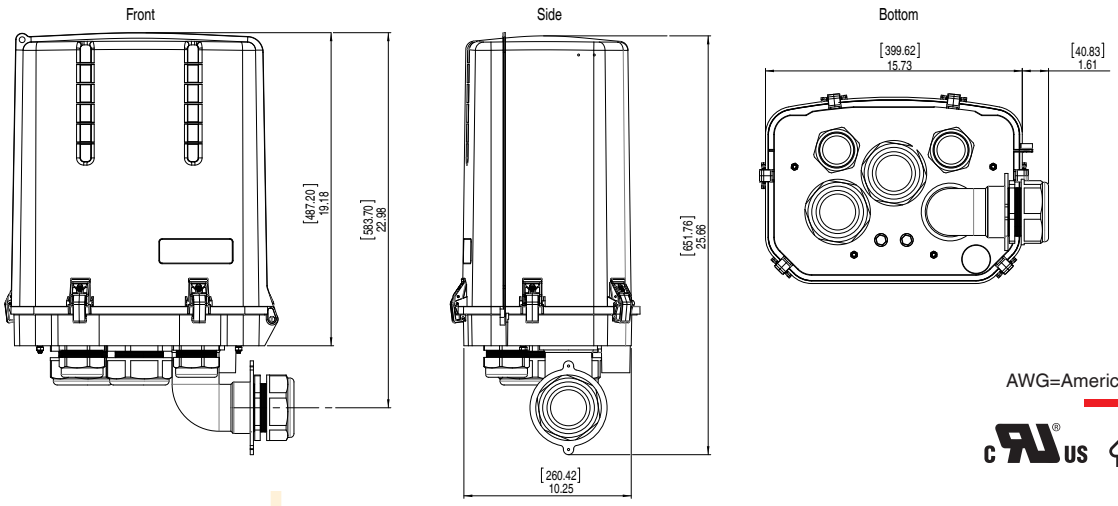
Suppression Connection Method	Compression lug, #20 - #6 AWG (0.5 mm² - 16 mm²)	
Fiber Connection Method	LC-LC Single mode	
Pressure Equalizing Vent	Gore™ Vent	
Environmental Rating	IP 67	
Operating Temperature	-40° C to +80° C	
UV Resistant	Yes	
Weight	System: 26 lbs (11.80 kg)	System: 32 lbs (14.51 kg)
Combined Wind Loading	150mph (sustained): 185 lbs (823 N)	

Standards Compliance

Strikesorb modules are compliant to the following Surge Protective Device (SPD) Standards	
Standards	ANSI/UL 1449 3rd Edition
	IEEE C62.41
	NEMA LS-1, IEC 61643-1:2005 2nd Edition (Class I Protection)
	IEC 61643-12
	EN 61643-11:2002 (including A11:2007)

Product Diagram

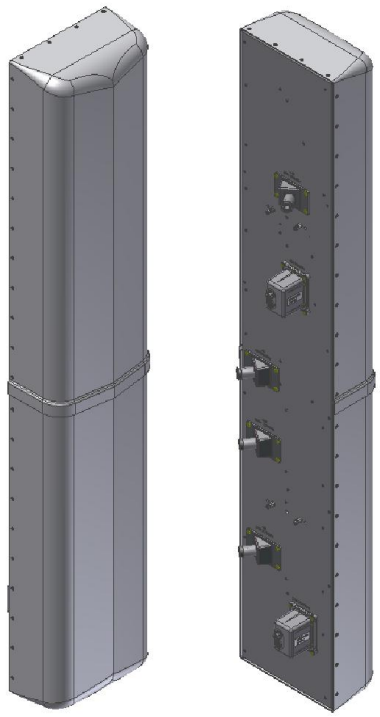
[mm]
inches



AWG=American Wire Gauge

X7CAP-665-V

X-Pol Dual Band Antenna, 698-896/1710-2170MHz, 72"L, 65°Azimuth RET/MET



(Antenna shown with RET option)

- Broadband radiator
- Macro Cell, high gain antenna
- Suitable for LTE/CDMA/UMTS/GSM
- AISG 2.0 RET or manual MET tilt control

Electrical Specifications

Frequency Band, MHz	**698-824**	**824-896**	**1710-1880**	**1850-1990**	**1920-2170**
Horizontal Beamwidth, 3dB points	69°	62°	65°	64°	61°
Gain, dBi	15.6	16.5	17.7	18.1	17.4
Vertical Beamwidth, 3dB points	12.0°	10.0°	6.1°	5.9°	5.7°
Front-to-Back Ratio at 180°, dB	<28		<28		
Upper Sidelobe Suppression, Typical, dB	<-16		<-16		
Polarization	+/-45°		+/-45°		
Electrical Downtilt	0-10° or 4-14°		0-6° or 4-10°		
VSWR/Return Loss, dB, Maximum	1.5:1/14.0		1.5:1/14.0		
VSWR/Return Loss, dB, Max. "**ip" Option**	1.6:1/-12.7		1.6:1/-12.7		
Isolation Between Ports, dB, Minimum	<28		<28		
Intermodulation (2x20w), IM3, dBc, Maximum	-150		-150		
Impedance, ohms	50		50		
Maximum Power Per Connector, CW	500		250		

X7CAP-665-V

X-Pol Dual Band Antenna, 698-896/1710-2170MHz, 72"L, 65°Azimuth RET/MET

Mechanical Specifications

Dimensions, Length/Width/Depth	72.0/12.5/7.1 in (1829/318/180mm)
Connector (Quantity) Type	(2 or 4) 7-16 DIN Female
Connector Torque	220-265 lbf-in (23-30 N-m)
Connector Location	Back or Bottom
Antenna Weight	39.5 lbs (17.91 Kg) *may vary slightly based on options*
Bracket Weight	13.2 lbs (5.99 Kg)
Standard Bracket Kit	CSS P/N 919011
Mechanical Downtilt Range	0-12°
Radome Material	High Strength Luran, UV Stabilized, ASTM D1925
Wind Survival	150 mph (241 km/h)
Front Wind Load @100mph	181.34 lbf (806.7 N)
Equivalent Flat Plate @ 100mph	3.61 sq-ft (c=2)

RET Information

Model	CSS-RET-200
Mounting Location	Back
Weight	1.2 lb (0.54 kg)
Communication Standard	AISG 2.0
Control System	CSS-PCU-220

Order Information

Model	***Description***
X7CAP-665-VM0	Manual adjust variable e-tilt (MET), EDT 0-12° low band and 0-6° high band
X7CAP-665-VM4	Manual adjust variable e-tilt (MET), EDT 4-16° low band and 4-10° high band
X7CAP-665-VR0	Remote motor adjust variable e-tilt (RET), EDT 0-12° low band and 0-6° high band
X7CAP-665-VR4	Remote motor adjust variable e-tilt (RET), EDT 4-16° low band and 4-10° high band

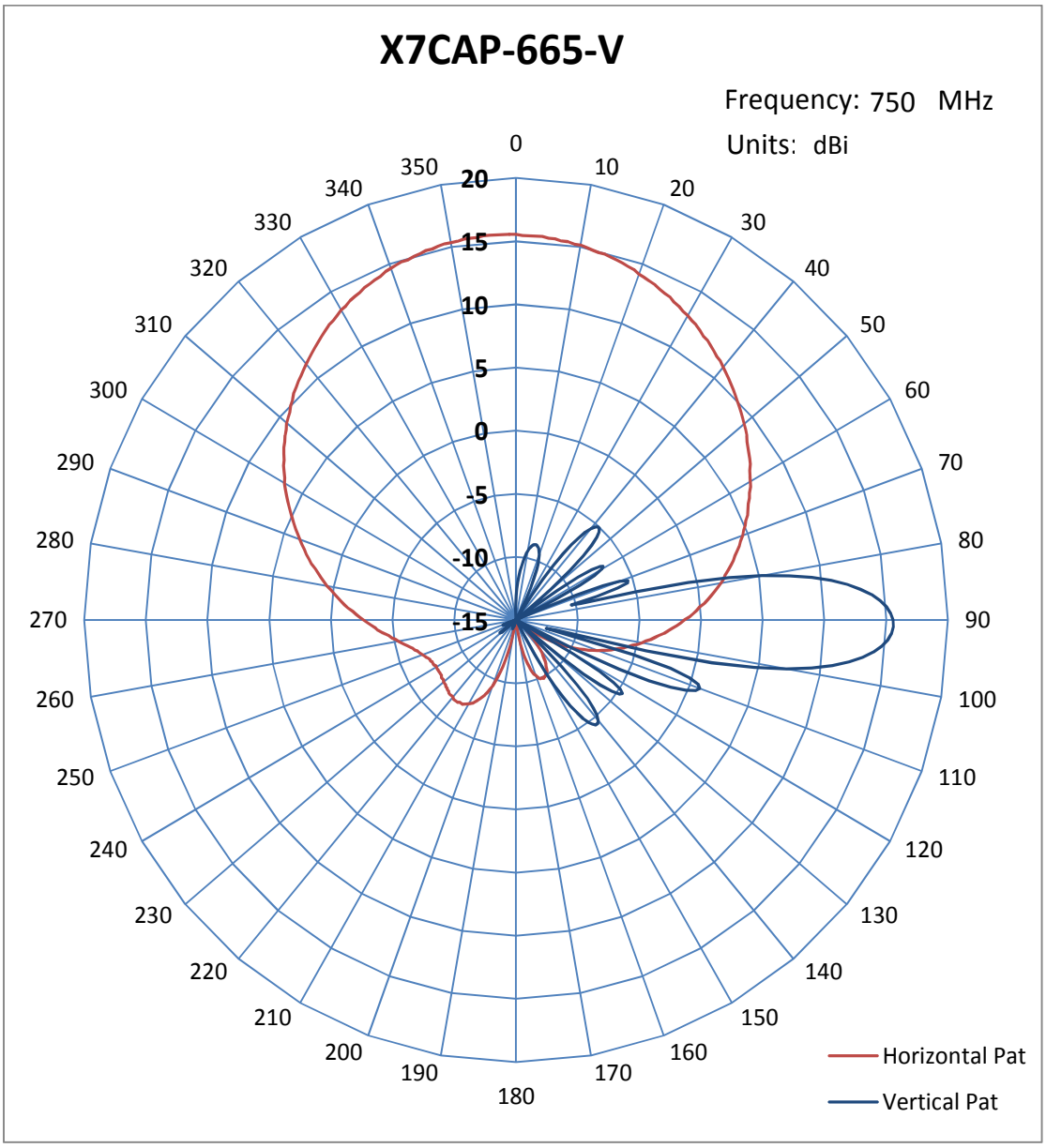
Optional Bracket Kit

919036	Bracket Kit, 2-Point, 12deg D-tilt, For 4.5" OD Pole

Patterns Measured @ 750MHz

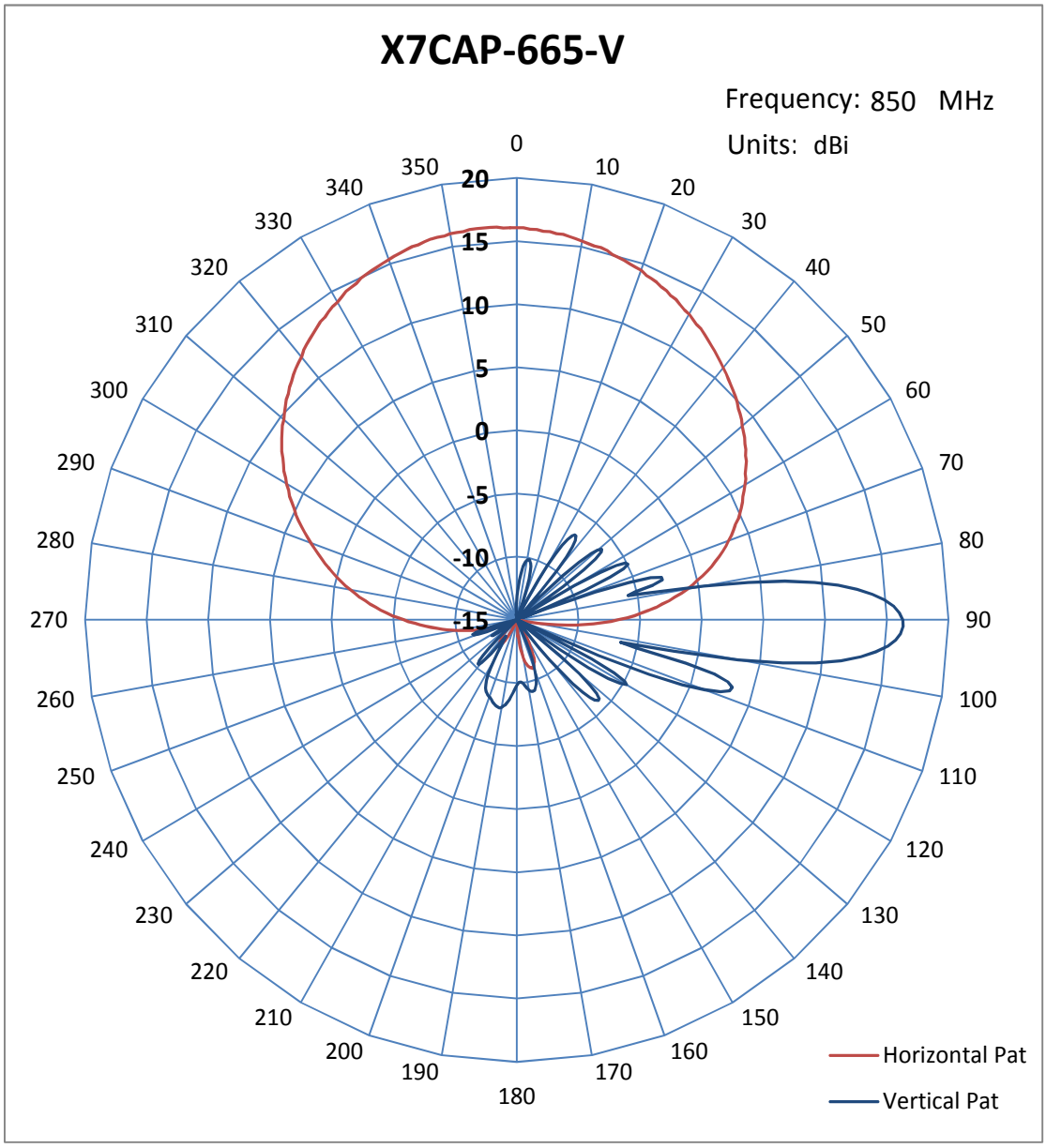
X7CAP-665-V

X-Pol Dual Band Antenna, 698-896/1710-2170MHz, 72"L, 65°Azimuth RET/MET



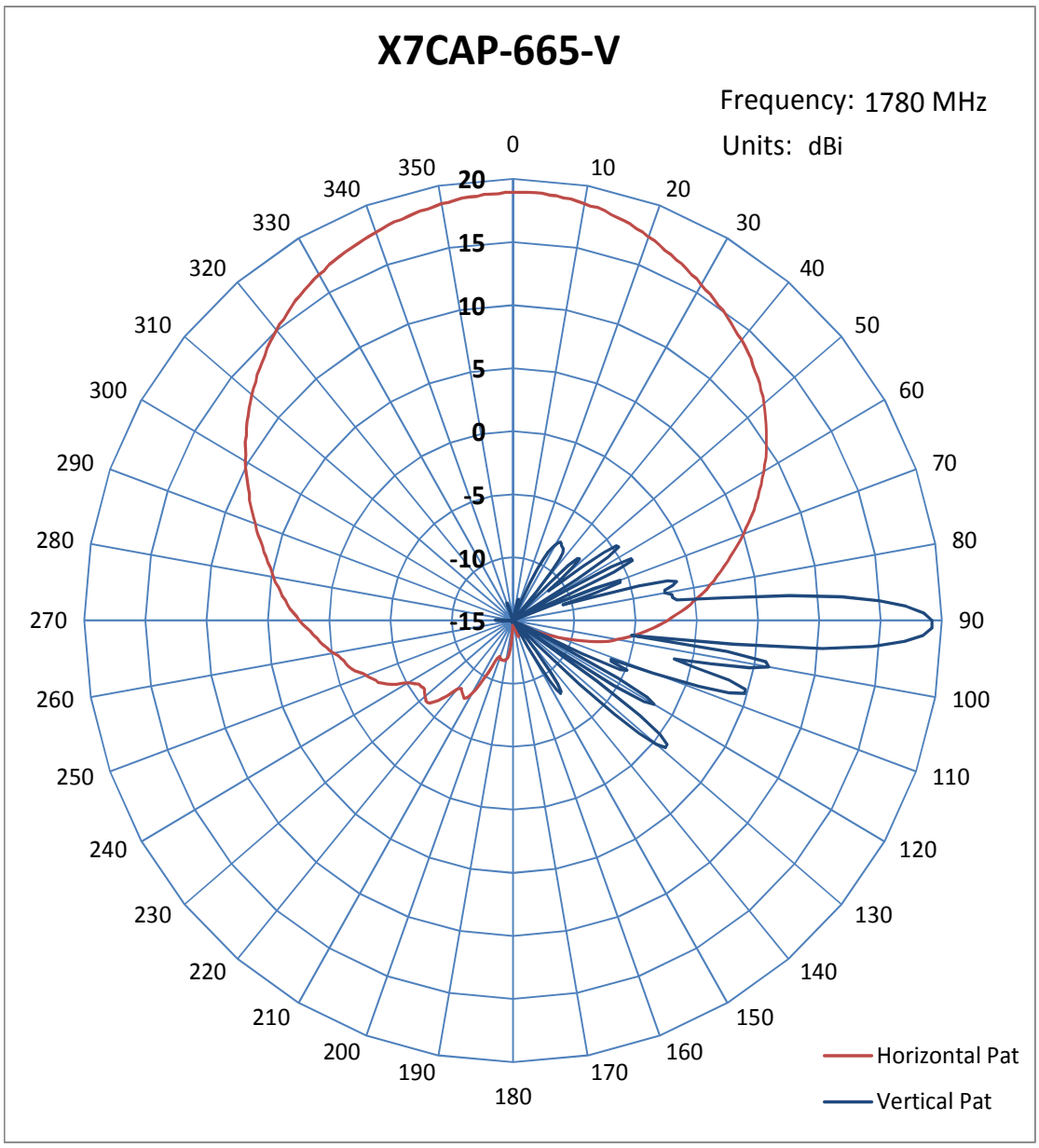
Center = -15dB, with 5 dB/radial division and 10° angular division

Patterns Measured @ 850MHz



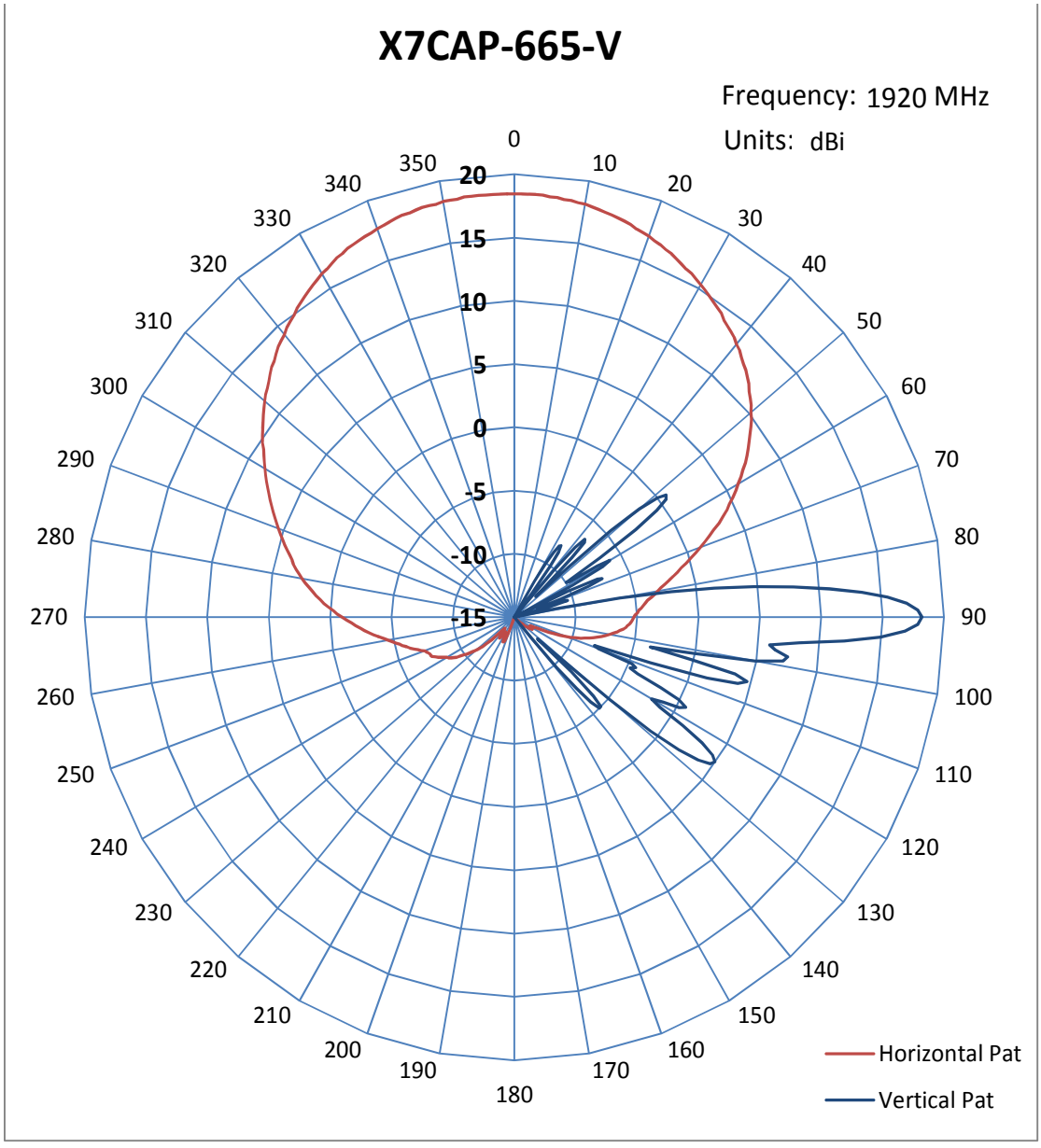
Center = -15dB, with 5 dB/radial division and 10° angular division

Patterns Measured @ 1780MHz



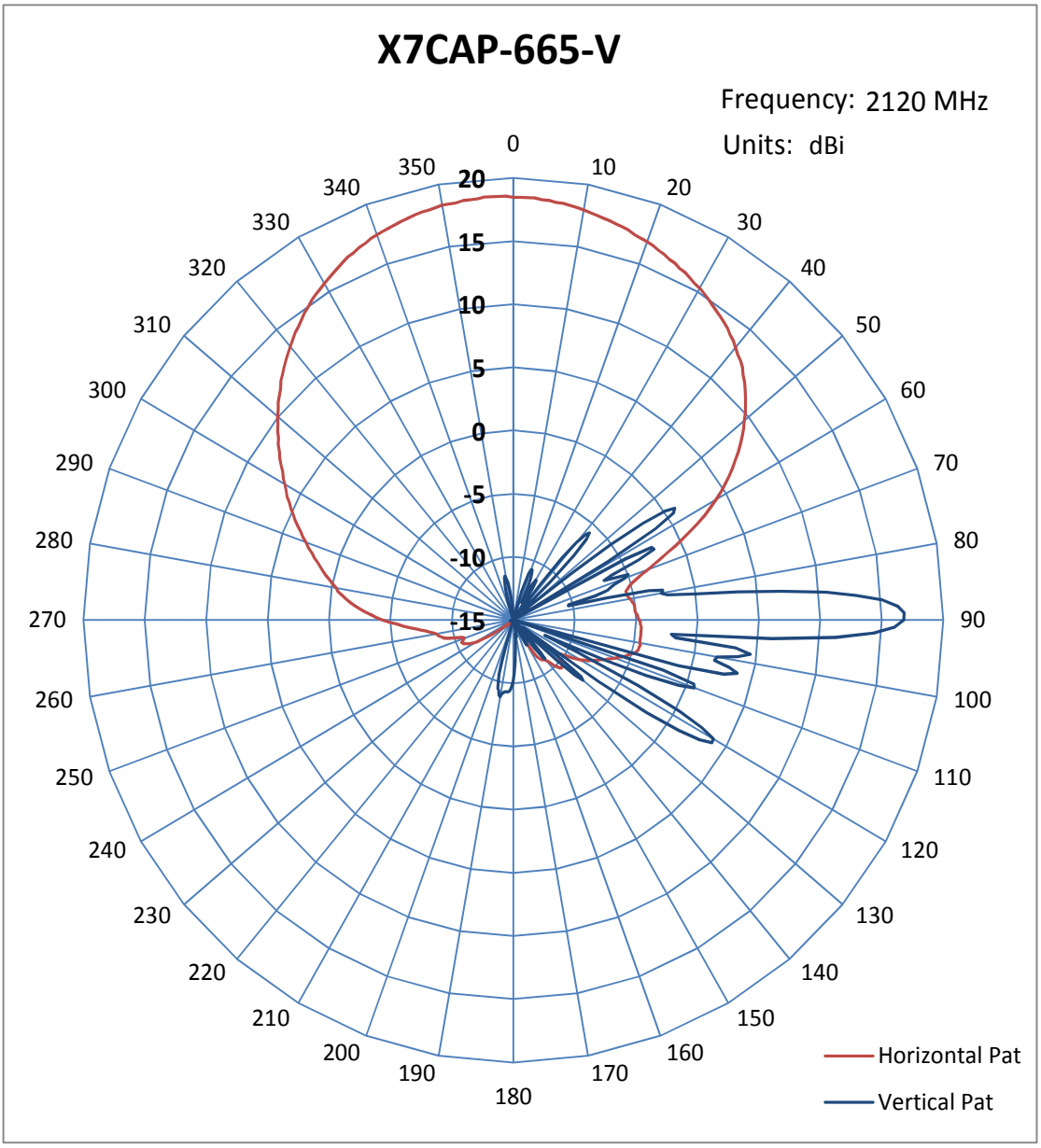
Center = -15dB, with 5 dB/radial division and 10° angular division

Patterns Measured @ 1920MHz



Center = -15dB, with 5 dB/radial division and 10° angular division

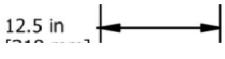
Patterns Measured @ 2120MHz

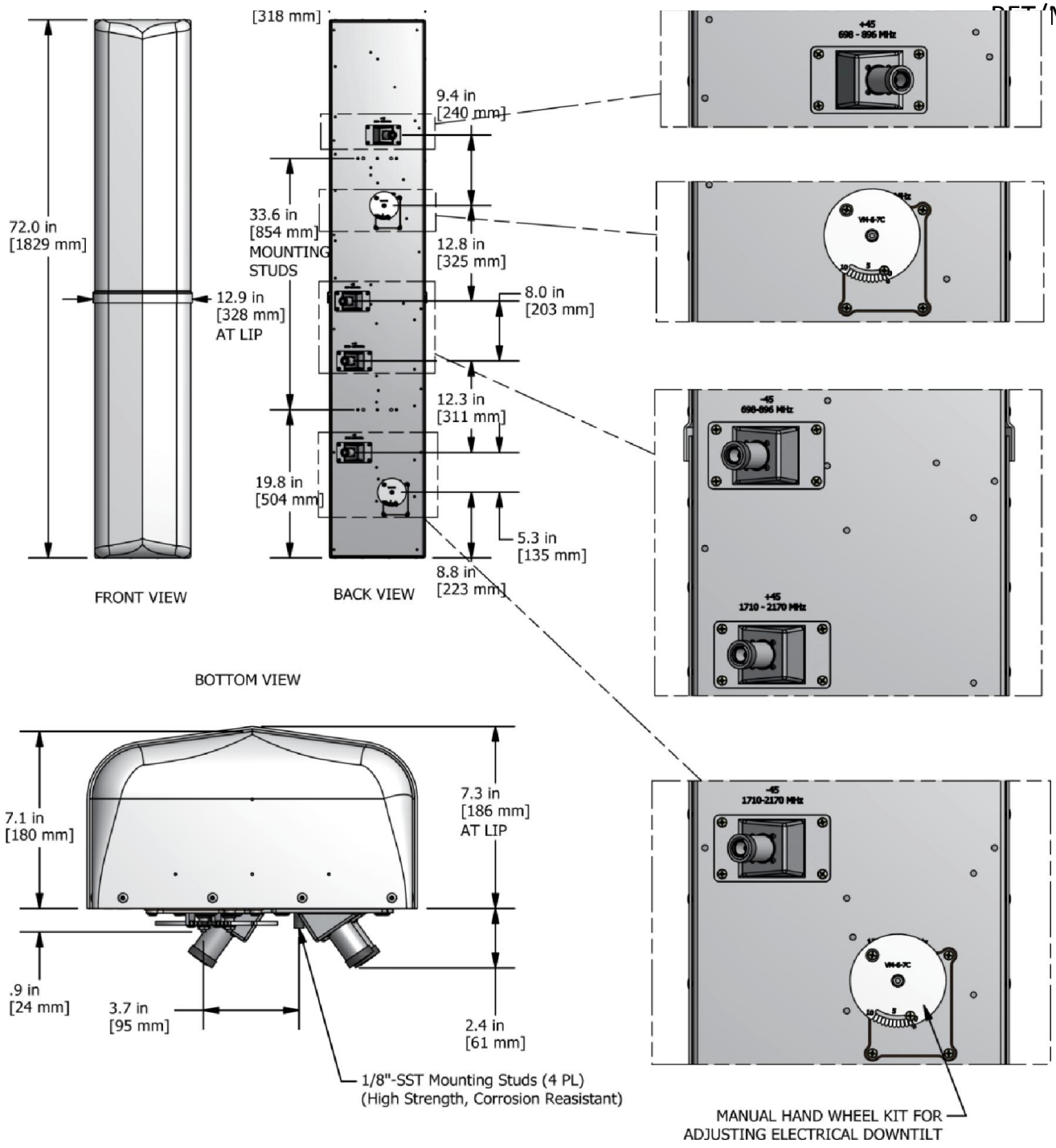


Center = -15dB, with 5 dB/radial division and 10° angular division

Mechanical Outline Drawing

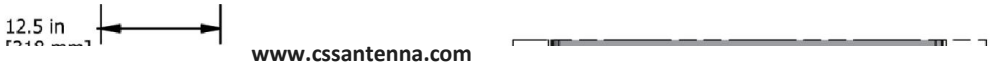
X7CAP-665-VM

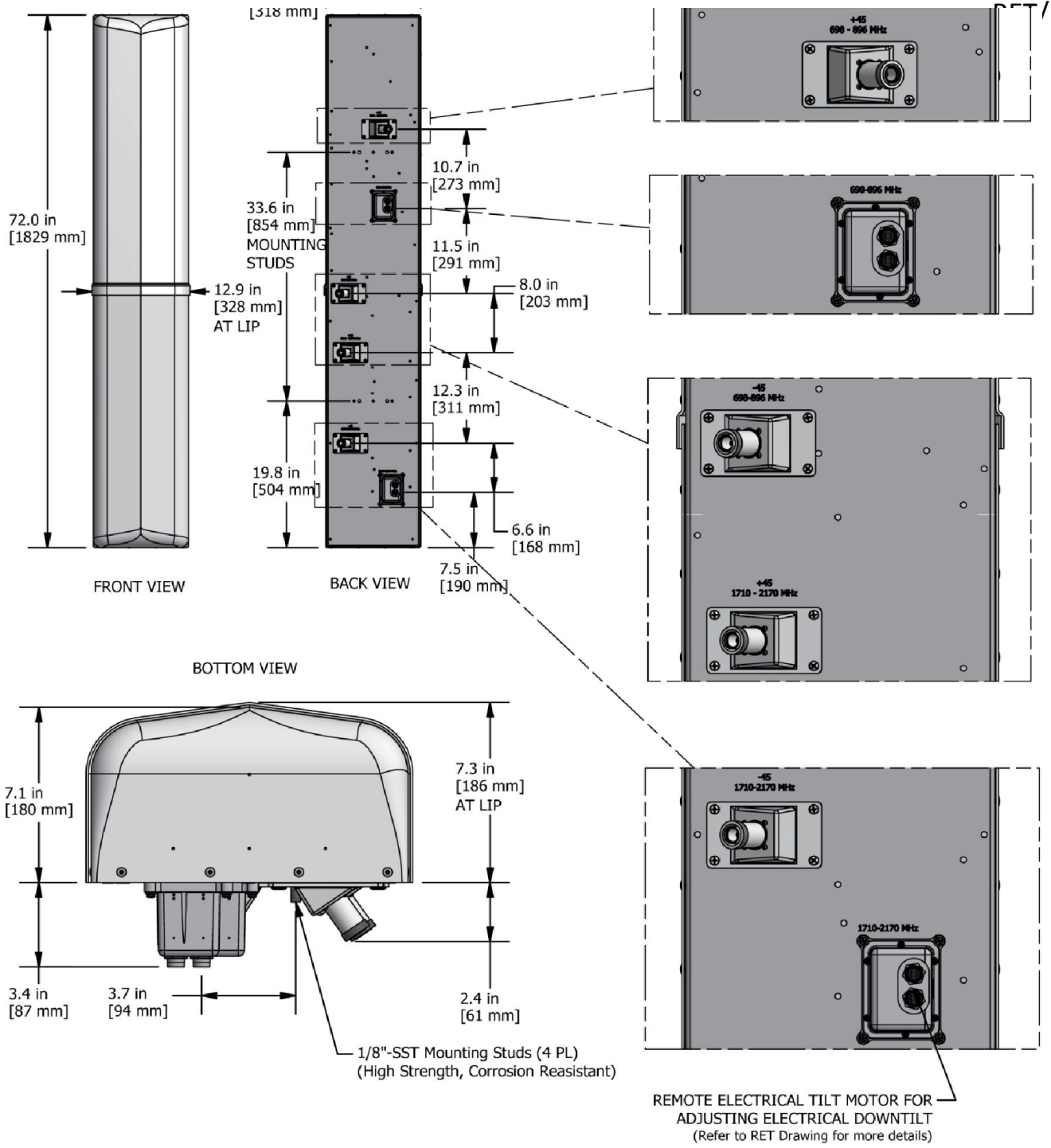




Mechanical Outline Drawing

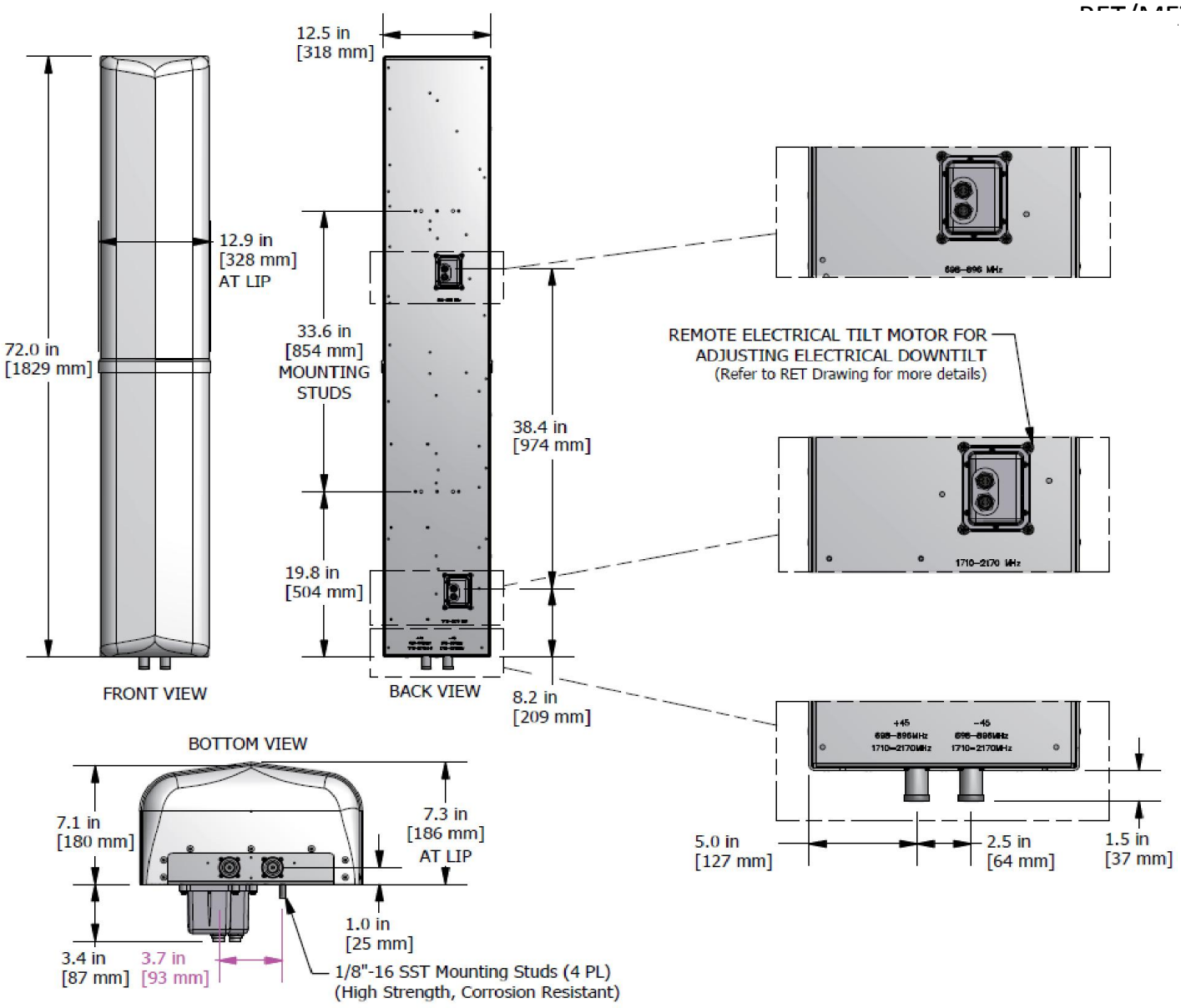
X7CAP-665-VR





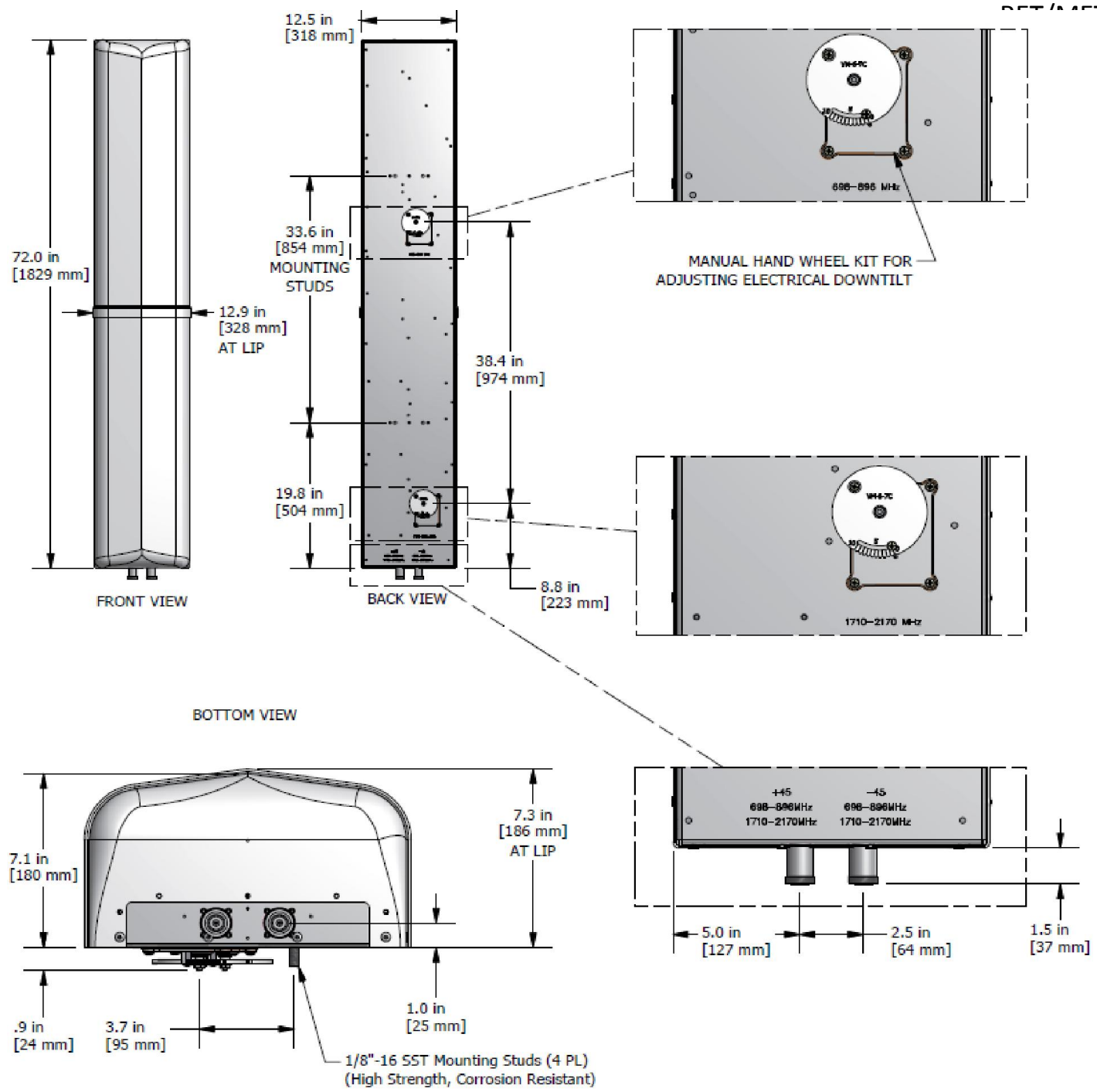
Mechanical Outline Drawing

X7CAP-665-VMx-ip

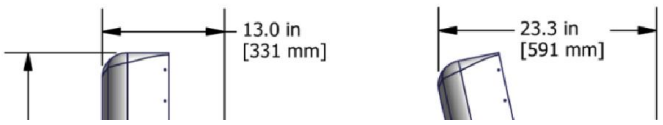


Mechanical Outline Drawing

X7CAP-665-VRx-ip



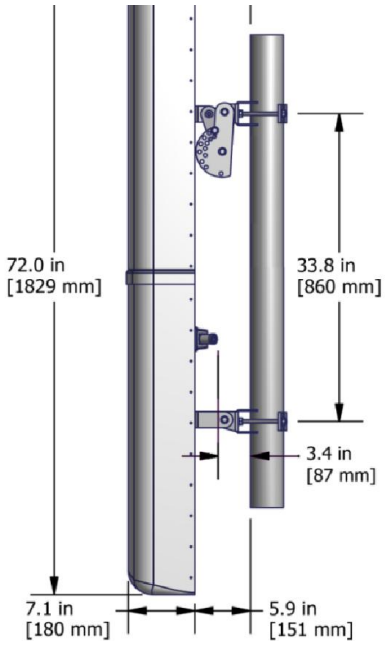
Standard Bracket Kit

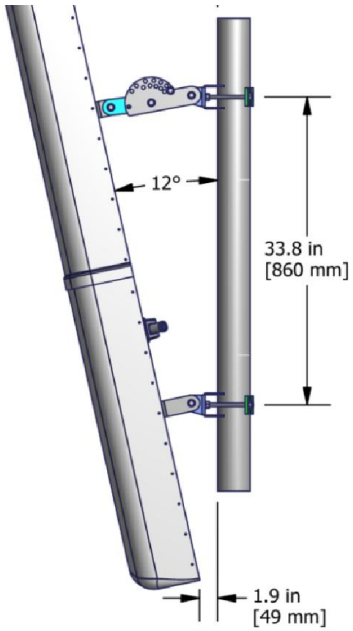


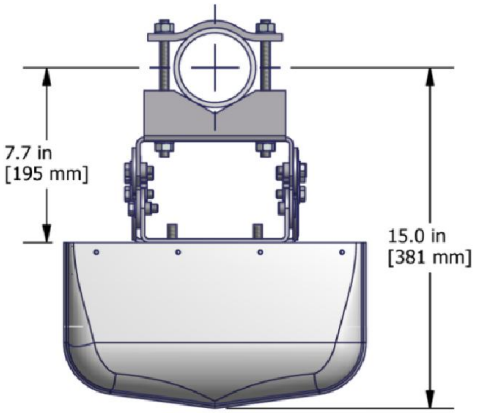
STANDARD (0-12 DEG MDT)
CSS P/N: 919011
(SHOWN MOUNTED ON 3.5" O.D.POLE 3.5" O.D. MAX)

X7CAP-665-V

X-Pol Dual Band Antenna, 698-896/1710-2170MHz, 72"L, 65°Azimuth

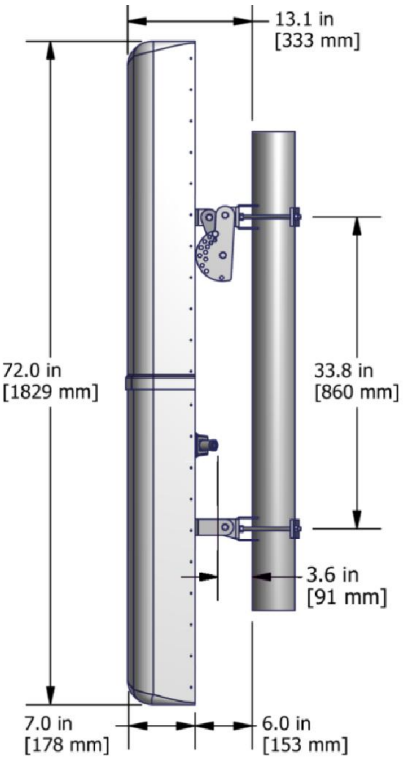


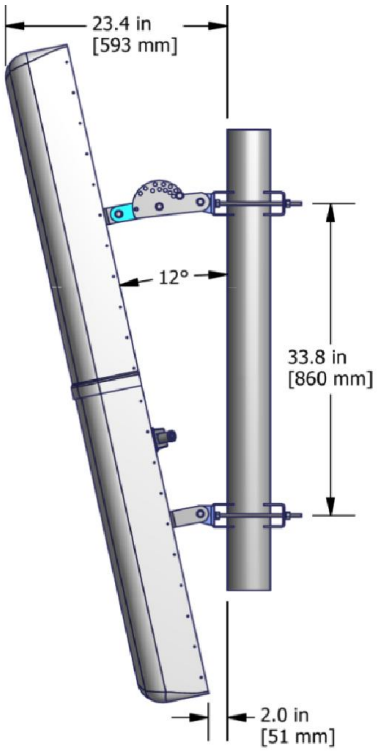




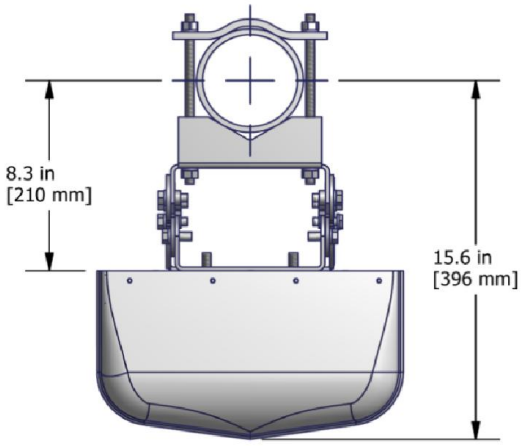
NOTE: DIMENSIONS ARE FOR REFERENCE ONLY.
MAY VARY WITH POLE O.D.

Optional Bracket Kit





OVERSIZED (0-12 DEG MDT)
CSS P/N: 919036
(SHOWN MOUNTED ON 4.5" O.D.POLE 4.5" O.D. MAX)



NOTE: DIMENSIONS ARE FOR REFERENCE ONLY.
MAY VARY WITH POLE O.D.

X7CAP-680

Dual Band Xpol, 80° H-Beams

698-896 MHz
1710-2170 MHz

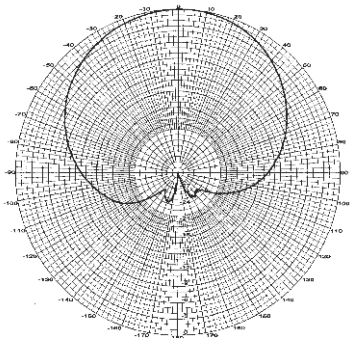
Electrical Specifications

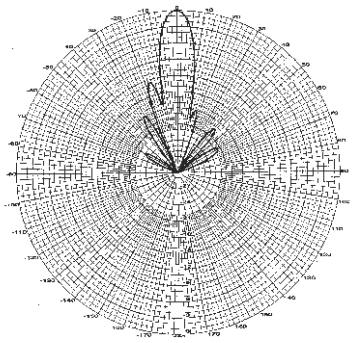
Frequency	698-896 & 1710-2170 MHz
Polarization	Slant +/- 45
Gain @ 698 MHz	14.4 dBi
Gain @ 896 MHz	15.4 dBi
Gain @ 1710 MHz	16.8 dBi
Gain @ 2155 MHz	17.8 dBi
Horizontal Beam (3dB Points)	80º & 80º
Vertical Beam (3dB Points)	11º & 5º
Elect. Downtilt Range, 2º Increments	0-10º low, 0-6º high band
VSWR / Return Loss	<1.40:1 / 15.6 dB
VSWR / Return Loss w/ip	<1.50:1 / 14.0 dB
Front-to-Back at Horizon	>27 dB & >27 dB
Upper Side Lobe Suppression	<-18 dB & <-18 dB
Impedance	50 Ohms
Power Input Per Connector ("ip")	500 CW at 800 MHz
Power Input Per Connector (no "ip")	500 CW at 800 MHz and 250 CW at 1900 MHz
Isolation	< -27 dB
Intermodulation (2x20W)	<-150 dBc

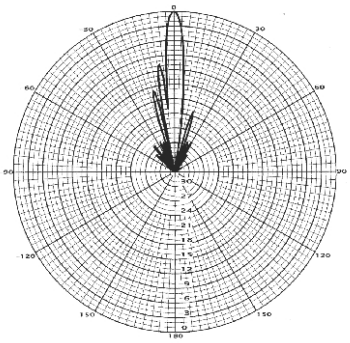
Mechanical Specifications

Link to Mechanical Drawing

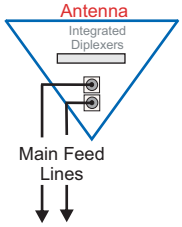
Input Connector (female)	Back 7/16 DIN or w/bot. opt.
Antenna Dimensions (LxWxD)	72.0 x 14.6 x 7.9 in (1829x371x201mm)
*Antenna Weight	44 lbs
Bracket Weight	13.2 lbs
RF Distribution	Printed Microstrip Substrate
Radome	Ultra High-Strength Luran
Weatherability	UV Stabilized, ASTM D1925
Radome Water Absorption	ASTM D570, 0.45%
Environmental	MIL-STD-810E
Wind Survival	150 mph
Front Wind Load @100mph	208 lbf
Equivalent Flat Plate @100mph	4.23 sq-ft. (c=2)
Mounting Brackets	Fits 3.5 Inch Max. O.D. Pipe
Mechanical Downtilt Range	0-12°
Clamps/Bolts	Galvanized Steel/Stainless Steel







Available with Integrated Diplexers to reduce mainline cables and eliminate separate external devices



Recommended Connector Coupling Torque
7/16 DIN: 220-265 lbf-in (25-30 N-m)

Ordering Information & Options

X7CAP-680-xy	"xy" is a placeholder for the built-in fixed electrical downtilt in degrees, "x" for low band, y for high band.
X7CAP-680-xyip	to add the option for integrated diplexers, add "ip" to model number
X7CAP-680-xyip-bot	for bottom mounted connectors, add "-bot" (otherwise antenna comes standard with back mounted connectors)

*Antenna Weight may vary slightly with options.

Published 120512
Subject to alteration.

Made in USA