# Hybrid FDD/TDD Panel Antenna

14 Ports FDD (2x) 694-960, (2x) 1427-2200, (2x) 2495-2690, (1x) 1427-2690 MHz (65°)
8T8R 3300-3800 MHz (90° Unit Beam)

HYBRID FDD/TDD | 2307 mm | INTEGRATED RET | MQ4/MQ5 CONNECTORS

# FT-BBJJMMUTY23-I0

## Features

This antenna provides a hybrid FDD/TDD configuration with 14-port FDD and 8T8R beamforming 3.5 GHz for advanced use in low and high bands with the support of L-Band (1.4 GHz) and 5G introduction.

- 4 ports / 2 cross pol systems in low band (700/800/900 MHz)
- 4 ports / 2 cross pol systems in high band with L-Band support (1427-2200 MHz)
- 4 ports / 2 cross pol systems in 2.6 GHz (2495-2690 MHz)
- 2 ports / 1 cross pol system in very wide high band (1427-2690 MHz)
- 8 ports 3300-3800 MHz +1 calibration port for TDD 8T8R beamforming support (MQ4/MQ5 connectors)
- Horizontal spacing between 8T8R columns: 42 mm
- SRET (default) and MRET (configurable on site) support
- Integrated and field replaceable SRET
- ACU HW version: JD6L00001
- Compliant with AISG v2.0 and 3GPP
- Site sharing support (dual primary)

Image
Coming Soon

| PRODUCT OVERVIEW | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | FDD | | | | | | | | TDD |
| | Frequency Range (MHz) | (2x) 694-960 | | (2x) 1427-2200 | | (2X) 2495-2690 | | (1X) 1427-2690 | | (8T8R) 3300-3800 |
| | Array | R1 | R2 | B1 | B2 | Y1 | Y3 | Y2 | | P1 |
| | CONNECTORS | 4 PORTS | | 4 PORTS | | 4 PORTS | | 2 PORTS | | 2 CLUSTER CONNECTORS - 8 PORTS |
| | | 4.3-10 Female | | 4.3-10 Female | | 4.3-10 Female | | 4.3-10 Female | | MQ4/MQ5 |
| | Polarization | XPOL | | XPOL | | XPOL | | XPOL | | XPOL |
| | Azimuth Beamwidth (avg) | 65° | | 65° | | | | 65° | | 90° Unit Beam |
| | Electrical Downtilt | 2-12° | | 2-12° | | | | 2-12° | | 2-12° |
| | Dimensions | 2307 x 475 x 242 mm (90.8 x 18.7 x 9.5 in) | | | | | | | | |

**ORDERING OPTIONS** Select from the following ordering options

| ANTENNA MODEL NUMBER | CONFIGURATION | MOUNTING HARDWARE | MOUNTING PIPE DIAMETER | SHIPPING WEIGHT |
|---|---|---|---|---|
| FT-BBJJMMUTY23-I0 | ACU-X20<br>Internal RET Included | APM40-5E<br>Beam Tilt Kit Included | 60-120 mm (2.4-4.7 in) | 71 kg (156.5 lbs) |

# FT-BBJJMMUTY23-I0

## ELECTRICAL SPECIFICATIONS — R1

| | | | | | |
|---|---|---|---|---|---|
| Frequency Range | | MHz | 694-960 | | |
| | | MHz | 694-793 | 790-896 | 880-960 |
| Polarization | | --- | ±45° | | |
| Gain | Over all Tilts | dBi | 14.8 ± 0.5 | 15.1 ± 0.4 | 15.1 ± 0.5 |
| | Max Gain | dBi | 15.3 | 15.5 | 15.6 |
| Azimuth Beamwidth (3 dB) | | degrees | 65.4° ± 7.8° | 61.9° ± 6° | 56.4° ± 8.6° |
| Elevation Beamwidth (3 dB) | | degrees | 10.9° ± 0.8° | 9.8° ± 0.8° | 8.8° ± 0.7° |
| Electrical Downtilt | | degrees | 2-12° | | |
| Impedance | | Ohms | 50Ω | | |
| VSWR (Return Loss) | | --- | 1.5:1 (-14 dB) | | |
| Passive Intermodulation | | dBc | -153 (3rd Order for 2x20 W Carriers) | | |
| Front-to-Back Ratio, Total Power, ± 30° | | dB | 21.6 | 22 | 21.3 |
| First Upper Side Lobe Suppression | | dB | 17.9 | 18.9 | 14.9 |
| Cross-Pol Over Sector | | dB | 6.1 | 6.1 | 7.4 |
| Cross Polar Discrimination (XPD) at Mechanical Boresight (0°) | | dB | 15.4 | 15.4 | 16.2 |
| Maximum Effective Power Per Port | | Watts | 300 W | | |
| Cross Polar Isolation | | dB | 25 | | |
| Interband Isolation | | dB | 20 | | |

*Specifications follow BASTA guidelines.*

## ELECTRICAL SPECIFICATIONS — R2

| | | | | | |
|---|---|---|---|---|---|
| Frequency Range | | MHz | 694-960 | | |
| | | MHz | 694-793 | 790-896 | 880-960 |
| Polarization | | --- | ±45° | | |
| Gain | Over all Tilts | dBi | 14.7 ± 0.4 | 15 ± 0.5 | 15 ± 0.4 |
| | Max Gain | dBi | 15.1 | 15.5 | 15.4 |
| Azimuth Beamwidth (3 dB) | | degrees | 65.7° ± 4.5° | 62.5° ± 5.7° | 57.4° ± 9.1° |
| Elevation Beamwidth (3 dB) | | degrees | 10.8° ± 0.7° | 9.8° ± 0.7° | 8.7° ± 0.5° |
| Electrical Downtilt | | degrees | 2-12° | | |
| Impedance | | Ohms | 50Ω | | |
| VSWR (Return Loss) | | --- | 1.5:1 (-14 dB) | | |
| Passive Intermodulation | | dBc | -153 (3rd Order for 2x20 W Carriers) | | |
| Front-to-Back Ratio, Total Power, ± 30° | | dB | 20.9 | 22.3 | 21.1 |
| First Upper Side Lobe Suppression | | dB | 17.2 | 17.1 | 13.9 |
| Cross-Pol Over Sector | | dB | 6.7 | 6.8 | 6.7 |
| Cross Polar Discrimination (XPD) at Mechanical Boresight (0°) | | dB | 15.8 | 15.5 | 16 |
| Maximum Effective Power Per Port | | Watts | 300 W | | |
| Cross Polar Isolation | | dB | 25 | | |
| Interband Isolation | | dB | 20 | | |

*Specifications follow BASTA guidelines.*

# Hybrid FDD/TDD Panel Antenna

14 Ports FDD (2x) 694-960, (2x) 1427-2200, (2x) 2495-2690, (1x) 1427-2690 MHz (65°)
8T8R 3300-3800 MHz (90° Unit Beam)

HYBRID FDD/TDD | 2307 mm | INTEGRATED RET | MQ4/MQ5 CONNECTORS

# FT-BBJJMMUTY23-I0

**ELECTRICAL SPECIFICATIONS** SIDE COLUMNS — **B1 / Y1 FILTERED**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency Range | | MHz | 1427-2200 / 2495-2690 | | | | |
| | | MHz | 1427-1518 | 1695-1880 | 1850-1990 | 1920-2200 | 2490-2690 |
| Polarization | | --- | ±45° | | | | |
| Gain | Over all Tilts | dBi | 14.7 ± 0.5 | 15.9 ± 0.9 | 16.3 ± 0.8 | 16.8 ± 1 | 16.5 ± 0.4 |
| | Max Gain | dBi | 15.2 | 16.8 | 17.1 | 17.8 | 16.9 |
| Azimuth Beamwidth (3 dB) | | degrees | 72.4° ± 4.7° | 64.1° ± 7.8° | 57.1° ± 3.8° | 53.9° ± 5° | 50.9° ± 3.2° |
| Elevation Beamwidth (3 dB) | | degrees | 8.8° ± 0.5° | 7.1° ± 0.4° | 6.7° ± 0.4° | 6.1° ± 0.6° | 5.3° ± 0.4° |
| Electrical Downtilt | | degrees | 2-12° | | | | |
| Impedance | | Ohms | 50Ω | | | | |
| VSWR (Return Loss) | | --- | 1.5:1 (-14 dB) | | | | |
| Passive Intermodulation | | dBc | -153 (3rd Order for 2x20 W Carriers) | | | | |
| Front-to-Back Ratio, Total Power, ± 30° | | dB | 20.6 | 22.1 | 23.9 | 22.7 | 21.6 |
| First Upper Side Lobe Suppression | | dB | 19.8 | 23.5 | 19.9 | 19.6 | 17.3 |
| Cross-Pol Over Sector | | dB | 6.6 | 5 | 0.5 | 0.5 | 0.9 |
| Cross Polar Discrimination (XPD) at Mechanical Boresight (0°) | | dB | 23.3 | 15.7 | 15.5 | 15.6 | 16 |
| Maximum Effective Power Per Port | | Watts | 300 W | | | | |
| Cross Polar Isolation | | dB | 25 | | | | |
| Interband Isolation | | dB | 22 | | | | |

*Specifications follow BASTA guidelines.*

**ELECTRICAL SPECIFICATIONS** SIDE COLUMNS — **B2 / Y3 FILTERED**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency Range | | MHz | 1427-2200 / 2495-2690 | | | | |
| | | MHz | 1427-1518 | 1695-1880 | 1850-1990 | 1920-2200 | 2490-2690 |
| Polarization | | --- | ±45° | | | | |
| Gain | Over all Tilts | dBi | 14.6 ± 0.4 | 15.9 ± 0.7 | 16.4 ± 0.7 | 16.9 ± 1 | 16.4 ± 0.5 |
| | Max Gain | dBi | 15 | 16.6 | 17.1 | 17.9 | 16.9 |
| Azimuth Beamwidth (3 dB) | | degrees | 72.3° ± 3.9° | 63.9° ± 7.8° | 56.4° ± 3.5° | 53.7° ± 4.7° | 50.7° ± 2.7° |
| Elevation Beamwidth (3 dB) | | degrees | 8.8° ± 0.4° | 7.1° ± 0.4° | 6.6° ± 0.4° | 6.1° ± 0.6° | 5.2° ± 0.5° |
| Electrical Downtilt | | degrees | 2-12° | | | | |
| Impedance | | Ohms | 50Ω | | | | |
| VSWR (Return Loss) | | --- | 1.5:1 (-14 dB) | | | | |
| Passive Intermodulation | | dBc | -153 (3rd Order for 2x20 W Carriers) | | | | |
| Front-to-Back Ratio, Total Power, ± 30° | | dB | 21.6 | 23.3 | 25.1 | 23.6 | 21.8 |
| First Upper Side Lobe Suppression | | dB | 18.5 | 22.6 | 19.6 | 19.2 | 17.9 |
| Cross-Pol Over Sector | | dB | 7 | 4.4 | 0.5 | 0.7 | 0.9 |
| Cross Polar Discrimination (XPD) at Mechanical Boresight (0°) | | dB | 22.1 | 16.9 | 17 | 16.1 | 15.1 |
| Maximum Effective Power Per Port | | Watts | 300 W | | | | |
| Cross Polar Isolation | | dB | 25 | | | | |
| Interband Isolation | | dB | 22 | | | | |

*Specifications follow BASTA guidelines.*

# FT-BBJJMMUTY23-I0

**ELECTRICAL SPECIFICATIONS** CENTRAL COLUMN — **Y2**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency Range | | MHz | 1427-2690 | | | | | |
| | | MHz | 1427-1518 | 1695-1880 | 1850-1990 | 1920-2200 | 2300-2500 | 2490-2690 |
| Polarization | | --- | ±45° | | | | | |
| Gain | Over all Tilts | dBi | 15.7 ± 0.4 | 17.1 ± 0.5 | 17.4 ± 0.3 | 17.6 ± 0.5 | 17.5 ± 0.4 | 18.2 ± 0.4 |
| | Max Gain | dBi | 16.1 | 17.6 | 17.7 | 18.1 | 17.9 | 18.6 |
| Azimuth Beamwidth (3 dB) | | degrees | 71° ± 6.1° | 60.2° ± 6.4° | 59.9° ± 5.2° | 63.1° ± 7.3° | 59.1° ± 4.1° | 53° ± 2.9° |
| Elevation Beamwidth (3 dB) | | degrees | 8.5° ± 0.3° | 7.1° ± 0.5° | 6.5° ± 0.2° | 6° ± 0.5° | 5.3° ± 0.2° | 5° ± 0.2° |
| Electrical Downtilt | | degrees | 2-12° | | | | | |
| Impedance | | Ohms | 50Ω | | | | | |
| VSWR (Return Loss) | | --- | 1.5:1 (-14 dB) | | | | | |
| Passive Intermodulation | | dBc | -153 (3rd Order for 2x20 W Carriers) | | | | | |
| Front-to-Back Ratio, Total Power, ± 30° | | dB | 27.7 | 28 | 29.5 | 28.7 | 28.8 | 29.3 |
| First Upper Side Lobe Suppression | | dB | 18.7 | 17.5 | 18.8 | 19.3 | 24.1 | 21.9 |
| Cross-Pol Over Sector | | dB | 12.5 | 11.4 | 9.5 | 2.8 | 0.4 | 1.6 |
| Cross Polar Discrimination (XPD) at Mechanical Boresight (0°) | | dB | 21.9 | 20.4 | 19.3 | 19.3 | 19.2 | 16.1 |
| Maximum Effective Power Per Port | | Watts | 300 W | | | | | |
| Cross Polar Isolation | | dB | 25 | | | | | |
| Interband Isolation | | dB | 28 | | | | | |

*Specifications follow BASTA guidelines.*

**ELECTRICAL SPECIFICATIONS** — **P1-P4**
**TDD Beamforming - Cal. Board**

| | | | | |
|---|---|---|---|---|
| Frequency Range | MHz | 3300-3800 | | |
| | MHz | 3300-3400 | 3400-3600 | 3600-3800 |
| Vertical Spacing Between Dipoles | mm | 65 (0.77 Lambda) | 65 (0.77 Lambda) | 65 (0.77 Lambda) |
| Horizontal Spacing Between Arrays | dB | 42 (0.5 Lambda) | 42 (0.5 Lambda) | 42 (0.5 Lambda) |
| Coupling Factor | dB | 26 ± 2 | 26 ± 2 | 26 ± 2 |
| Amplitude Error Between Any Two Columns Ports and Calibration Port | dB | 0.9 | 0.9 | 0.9 |
| Phase Error Between Any Two Columns Ports and Calibration Port | degrees | 9 | 9 | 9 |

*Specifications follow BASTA guidelines.*

# FT-BBJJMMUTY23-I0

| ELECTRICAL SPECIFICATIONS | | | ■ P1-P4 TDD Beamforming - Unit Beam | | |
|---|---|---|---|---|---|
| Frequency Range | | MHz | 3300-3800 | | |
| | | MHz | 3300-3400 | 3400-3600 | 3600-3800 |
| Polarization | | --- | ±45° | | |
| Gain | Over all Tilts | dBi | 15.4 ± 0.3 | 15.5 ± 0.3 | 15.8 ± 0.5 |
| | Max Gain | dBi | 15.7 | 15.8 | 16.3 |
| Azimuth Beamwidth (3 dB) | | degrees | 100.3° ± 5.5° | 101.2° ± 5.6° | 81° ± 43.3° |
| Elevation Beamwidth (3 dB) | | degrees | 6.5° ± 0.2° | 6° ± 0.5° | 5.7° ± 0.3° |
| Electrical Downtilt | | degrees | 2-12° | | |
| Impedance | | Ohms | 50Ω | | |
| VSWR (Return Loss) | | --- | 1.5:1 (-14 dB) | | |
| Front-to-Back Ratio, Total Power, ± 30° | | dB | 24.6 | 25.5 | 25.9 |
| First Upper Side Lobe Suppression | | dB | 18.7 | 15.1 | 17.8 |
| Cross-Pol Over Sector | | dB | 12.6 | 11.5 | 2.5 |
| Cross Polar Discrimination (XPD) at Mechanical Boresight (0°) | | dB | 24.3 | 16.8 | 16 |

*Specifications follow BASTA guidelines.*

| ELECTRICAL SPECIFICATIONS | | | ■ P1-P4 TDD Beamforming - Broadcasting Beam | | |
|---|---|---|---|---|---|
| Frequency Range | | MHz | 3300-3800 | | |
| | | MHz | 3300-3400 | 3400-3600 | 3600-3800 |
| Polarization | | --- | ±45° | | |
| Gain | Over all Tilts | dBi | 16.2 ± 0.5 | 16.3 ± 0.5 | 16.5 ± 0.5 |
| | Max Gain | dBi | 16.7 | 16.8 | 17 |
| Azimuth Beamwidth (3 dB) | | degrees | 63.3° ± 2.6° | 60.6° ± 3.2° | 55° ± 6° |
| Elevation Beamwidth (3 dB) | | degrees | 6.5° ± 0.2° | 6.1° ± 0.4° | 5.8° ± 0.3° |
| Electrical Downtilt | | degrees | 2-12° | | |
| Impedance | | Ohms | 50Ω | | |
| VSWR (Return Loss) | | --- | 1.5:1 (-14 dB) | | |
| Front-to-Back Ratio, Total Power, ± 30° | | dB | 28.8 | 28.6 | 30.5 |

*Specifications follow BASTA guidelines.*

# FT-BBJJMMUTY23-I0

| ELECTRICAL SPECIFICATIONS | | | ■ P1-P4 TDD Beamforming - Working Beam | | |
|---|---|---|---|---|---|
| Frequency Range | | MHz | 3300-3800 | | |
| | | MHz | 3300-3400 | 3400-3600 | 3600-3800 |
| Polarization | | --- | ±45° | | |
| Gain | Over all Tilts | dBi | 19.7 ± 0.5 | 20 ± 0.5 | 20 ± 0.5 |
| | Max Gain | dBi | 20.2 | 20.5 | 20.5 |
| Azimuth Beamwidth (3 dB) | | degrees | 25.9° ± 1.2° | 24.7° ± 0.9° | 24.3° ± 1.2° |
| Electrical Downtilt | | degrees | 2-12° | | |
| Impedance | | Ohms | 50Ω | | |
| VSWR (Return Loss) | | --- | 1.5:1 (-14 dB) | | |
| Front-to-Back Ratio, Total Power, ± 30° | | dB | 34.6 | 34.7 | 34.4 |

*Specifications follow BASTA guidelines.*

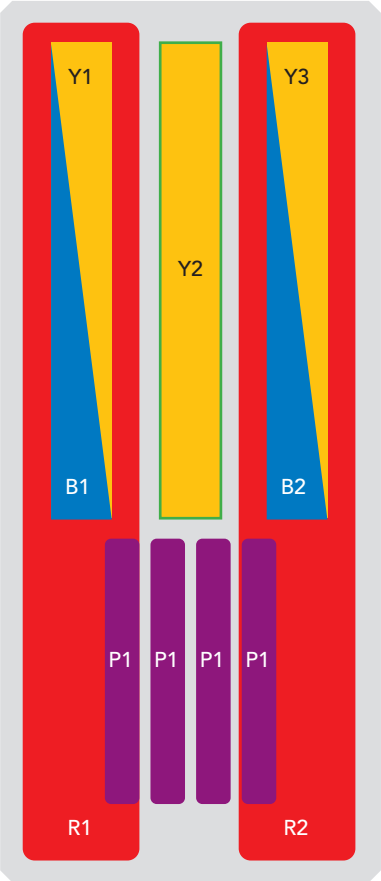
# FT-BBJJMMUTY23-I0

**BOTTOM VIEW - LABELING**

Image Coming Soon

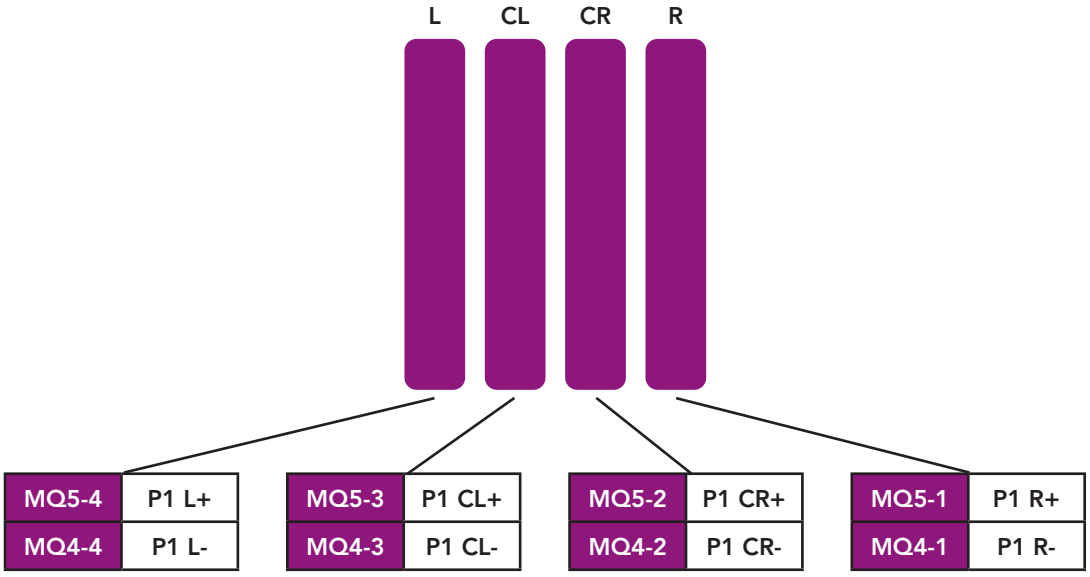
**ARRAY LAYOUT**

| ARRAY | FREQUENCY | CONNECTOR TYPE |
|---|---|---|
| R1 | 694-960 MHz | (2x) 4.3-10 Female |
| R2 | 694-960 MHz | (2x) 4.3-10 Female |
| B1 | 1427-2200 MHz | (2x) 4.3-10 Female |
| B2 | 1427-2200 MHz | (2x) 4.3-10 Female |
| Y1 | 2495-2690 MHz | (2x) 4.3-10 Female |
| Y2 | 1427-2690 MHz | (2x) 4.3-10 Female |
| Y3 | 2495-2690 MHz | (2x) 4.3-10 Female |
| P1 | 3300-3800 MHz | (2x) Cluster Connectors MQ4/MQ5 |
| | 3300-3800 MHz | |
| | 3300-3800 MHz | |
| | 3300-3800 MHz | |




*The illustration is not shown to scale.*

# FT-BBJJMMUTY23-I0




Physical array and port mapping according to AISG naming convention:
Left - Center Left - Center Right - Right (seen from front of antenna)

# FT-BBJJMMUTY23-I0

## MECHANICAL SPECIFICATIONS

| | | | |
|---|---|---|---|
| Length | | mm (in) | 2307 (90.8) |
| Width | | mm (in) | 475 (18.7) |
| Depth | | mm (in) | 242 (9.5) |
| Net Weight - Antenna Only | | kg (lbs) | 50 (110.2) |
| Net Weight - Mounting Hardware Only | | kg (lbs) | 12 (26.5) |
| Wind Load<br>Rated at<br>150 km/h (93 mph) | Front | N (lbf) | 607 (136) |
| | Side | N (lbf) | 577 (130) |
| | Rear | N (lbf) | 592 (133) |
| Survival Wind Speed / Rated Wind Speed | | km/h (mph) | 240 (150) |
| Connector Type | | -- | (14x) 4.3-10 Female, (2x) Cluster Connectors MQ4/MQ5,<br>Site Sharing Support: (4x) AISG Connectors (2 Male, 2 Female) at Bottom |
| Radome Color | | --- | Light Grey RAL7035 |
| Radome Material | | --- | ASA |
| Lightning Protection | | --- | Direct Ground |
| **Shipping** | Packing Size (Length x Width x Depth) | mm (in) | 2450 x 560 x 390 (96.5 x 22.0 x 15.4) |
| | Shipping Weight | kg (lbs) | 71 (156.5) |

## ENVIRONMENTAL SPECIFICATIONS

| | | |
|---|---|---|
| Environmental Standard | --- | ETS 300 019 |
| Operating Temperature | degrees | -40° to +60° C (-40° to +140° F) |
| Product Environmental Compliance | --- | Product is RoHS Compliant |

# FT-BBJJMMUTY23-I0

## ACCESSORIES

Accessories may be ordered separately unless otherwise indicated.

| ITEM | MODEL NUMBER | WEIGHT |
|---|---|---|
| Beam Tilt Mounting Bracket Kit for Pole Diameter 60-120 mm (2.4-4.7 in)<br>*Shipped with antenna* | APM40-5E | 12 kg (26.5 lbs) |

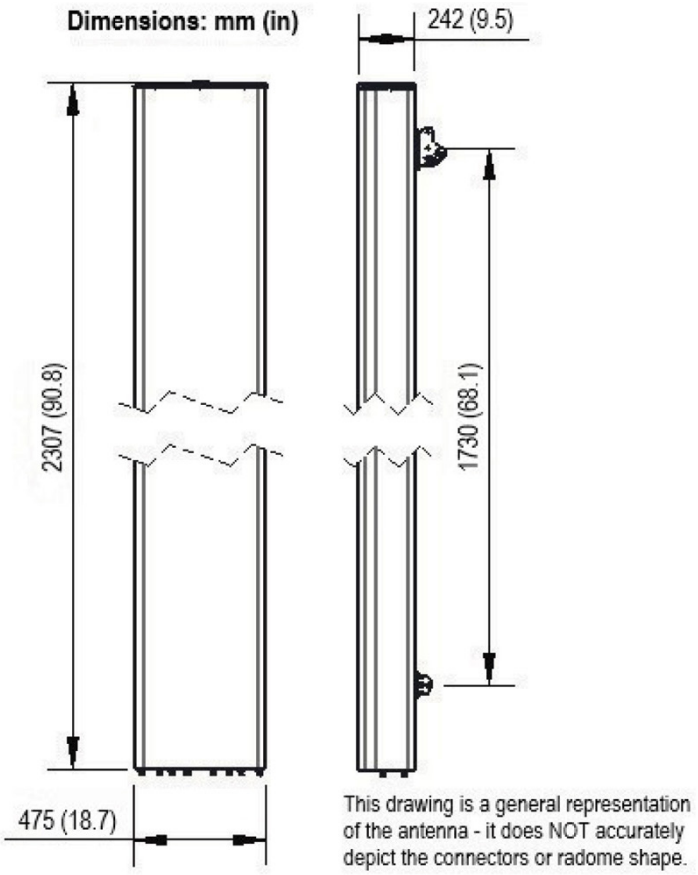
## INSTALLATION

Please read all installation notes before installing product.

| | |
|---|---|
|  | Always attach the antenna using all mounting points. |
| | Do not install antenna with the connectors facing upwards. |

## EXTERNAL DOCUMENT LINKS

APM40 Mounting Kit Series Installation Instructions




## NOTES

Specifications follow BASTA guidelines.

For additional mounting information, please check **External Document Links**.

For Radiating Patterns: Request pattern files