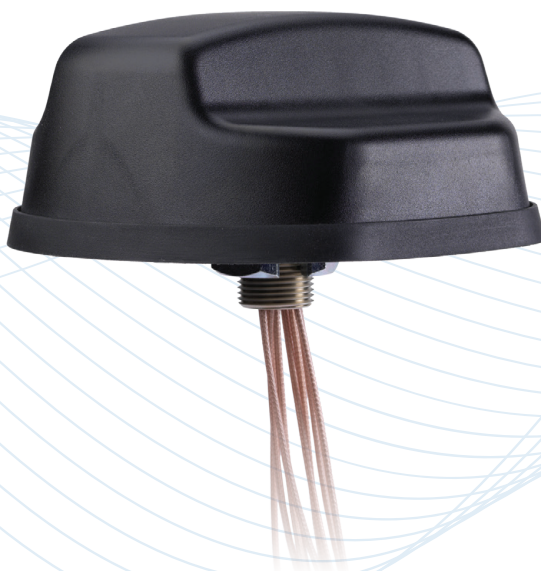


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

Combination Antennas - 5G Cellular, Wi-Fi and GNSS

GL9X1AX-SF, GL7X1AX-SF, GL4X4-SF-PLK, GL6X1AX-SF



Description

Multiband combination antenna offers a rugged design and is configurable up to 9x1 ports (4x4 Cellular, 4x4 Wi-Fi 7 and GNSS). The Cellular 4x4 MIMO ports cover the LTE/5G sub 6 GHz bands down to 600 MHz. The Wi-Fi 6E 4x4 MIMO port up to 7150 MHz. This antenna platform can also be equipped with a pre-filtered GNSS antenna.

The platform meets EN 50155:2007 and AAR requirements for ITS rail and roadway applications.

Technologies

- MIMO Cellular
- MIMO Wi-Fi
- LTE
- 5G
- NB-IoT
- Wi-Fi 6E, 7
- V2X
- GNSS

Features

- Compatible with the world's leading multi-carrier cellular routers
- Superior out-of-band rejection
- Easy installation and/or replacement
- Withstands severe environmental conditions
- EN 50155:2007; AAR compliant

PCTEL, Inc.

471 Brighton Drive, Bloomington, IL 60108-3102

 **PCTEL**
an Amphenol company



Coach™ II 4G/5G FR1 GNSS Multiband Antenna

Combination Antennas - 5G Cellular, Wi-Fi and GNSS

The Coach™ II multiband combination antenna offers a rugged design and it is configurable up to 9x1 ports (4x4 Cellular, 4x4 Wi-Fi 7 and GNSS). The Cellular 4x4 MIMO ports cover the LTE/5G sub 6 GHz bands down to 600 MHz. The Wi-Fi 6E 4x4 MIMO port up to 7150 MHz. This antenna platform can also be equipped with a pre-filtered GNSS antenna.

The Coach™ II platform supports the high speed requirements of complex RF communication systems used for Intelligent Transportation Systems (ITS) and Industrial IoT applications. These low-profile, high endurance antennas feature four 5G elements compatible with the world's leading multi-carrier cellular routers that support 600 MHz to 6 GHz frequencies.

The platform meets EN 50155:2007 and AAR requirements for ITS rail and roadway applications.

Features

- Wideband coverage – 4G LTE, 5G and dual-band 802.11ac Wi-Fi coverage in a single, low-profile housing
- Superior out-of-band rejection – Proprietary filtering design allows wideband coverage for all GNSS frequencies
- Easy installation and/or replacement – Metal stud mount with slotted jam nut provides single cable exit
- Withstands severe environmental conditions – IP67 compliant design with overmolded gasket protects against water or dust ingress (when installed on sealed surface)
- Meets EN 50155:2007 and AAR certification requirements for rail applications

Certifications



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pctel.com/antenna-products 2

Coach™ II 4G/5G FR1 GNSS Multiband Antenna

Combination Antennas - 5G Cellular, Wi-Fi and GNSS

Standard Configurations

Coach™ II Model Numbers	Ports			Cable Type			Connector Type			Cable Length (ft)	Mount
	LTE	Wi-Fi	GPS/ GNSS	LTE	Wi-Fi	GPS/ GNSS	LTE	Wi-Fi	GPS/ GNSS		
GL7X1AX-SF	4	2	1	RG58	RG58	RG316/ RG174	SMA-Male	RPSMA-Male	SMA-Male	17	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)
GL7X1AX-SF-1.5FT	4	2	1	RG316/ RG174	RG316/ RG174	RG316/ RG174	SMA-Male	RPSMA-Male	SMA-Male	1.5	
GL9X1AX-SF	4	4	1	RG58	RG58	RG316/ RG174	SMA-Male	RPSMA-Male	SMA-Male	17	
GL9X1AX-SF-1.5FT	4	4	1	RG316/ RG174	RG316/ RG174	RG316/ RG174	SMA-Male	RPSMA-Male	SMA-Male	1.5	
GL4X4-SF-PLK	4	0	1	RG58		RG316/ RG174	SMA-Male		SMA-Male	17	
GL4X4-SF-PLK-1.5FT	4	0	1	RG58		RG316/ RG174	SMA-Male		SMA-Male	1.5	

Electrical Specifications – RF Antennas

F1 (MHz)	F2 (MHz)	SWR ²	Gain (dB) ¹			Efficiency ¹		Polarization	Nominal Impedance
			Max	Typical	Range (±)	Avg	Range (±)		
LTE Primary (1&3)									
617	698	2.5	1.0	0.5	0.5	36%	3%	Linear	50 ohms
698	802	1.9	1.3	0.8	0.6	36%	4%		
824	960	2.0	1.4	1.0	1.0	40%	5%		
1710	2200	1.6	4.9	4.3	1.1	55%	5%		
2300	2690	1.4	6.0	4.7	1.5	62%	3%		
3200	4200	1.4	6.5	5.5	1.0	65%	4%		
4200	4900	1.5	6.8	5.9	1.0	65%	4%		
5150	5950	1.3	7.8	6.5	1.3	60%	9%		
LTE Secondary (2&4)									
617	698	3.4	-2.0	-4.0	2.0	16%	8%	Linear	50 ohms
698	802	2.0	0.5	-1.0	0.9	31%	4%		
824	960	2.7	1.2	0.6	0.6	28%	8%		
1710	1805	2.2	4.8	3.9	0.9	37%	3%		
1805	2200	1.6	5.0	4.0	1.0	50%	4%		
2300	2690	2.0	3.6	3.0	0.6	38%	10%		
3200	3800	1.9	7.2	5.2	2.0	48%	12%		
4200	4900	1.9	6.2	4.8	1.4	41%	6%		
5150	5950	1.4	6.2	5.6	0.6	48%	8%		
Wi-Fi									
2400	2500	1.3	6.2	5.4	0.7	62%	2%	Linear	50 ohms
4900	5900	1.5	7.7	6.7	1.1	59%	14%		

¹ Gain and efficiency measured with 1.5 ft. cables, on 2 ft. diameter ground plane for a typical sample.

² SWR measured with 17-ft cables and no ground plane for a typical sample.

Coach™ II 4G/5G FR1 GNSS Multiband Antenna

Combination Antennas - 5G Cellular, Wi-Fi and GNSS

Electrical Specifications – RF Antennas (continued)

Minimum Isolation (dB)³

Elements	LTE Primary (1&3)		LTE Secondary (2&4)		Wi-Fi	
LTE Primary (1&3)	617-960 MHz	14.0	698-960 MHz	14.0	698-960 MHz	20.0
	1.71-2.7 GHz	25.0	1.71-2.7 GHz	25.0	1.71-2.7 GHz	17.0
	3.3-3.59 GHz	35.0	3.3-3.59 GHz	27.0	3.3-5.9 GHz	35.0
LTE Secondary (2&4)			698-960 MHz	18.0	698-960 MHz	22.0
			1.71-2.7 GHz	30.0	1.71-2.7 GHz	16.0
			3.3-3.59 GHz	32.0	4.9-5.9 GHz	32.0
Wi-Fi					2.4-2.5 GHz	25.0
					4.9-5.9 GHz	32.0

Electrical Specifications – GNSS Antenna

Specification	Measurement
Frequency Band	1565-1608 MHz
Amplifier Gain	@ 3.0 VDC: 26 dB (typical)
Output VSWR	2.0:1 (maximum)
DC Current	25 mA (typical)
DC Voltage	2.8-6.0 V (operating) ≤ 12.0 V (survivability)
Noise Figure	< 2.0 dB (typical)
Out-of-Band Rejection	f ₀ = 1586 MHz f ₀ ± 50 MHz: ≥ 60 dBc f ₀ ± 60 MHz: ≥ 70 dBc
Nominal Gain	3 dBic @ 90° -2 dBic @ 20°
Polarization	Right hand circular
Nominal Impedance	50 ohms

Mechanical and Environmental Specifications

All Models

Dimensions (L x W x H)	6.93 L x 6.09 W x 3.01 H in (176.0 x 154.8 x 76.5 mm)
Weight (9 ports)	4.8 lbs (2.2 kg)
Housing Material	Black or White ⁴ , UV-Stable Rugged Thermoplastics
Temperature Range	-40°C to +85°C
Gasket Design & Construction	Contour matching, conformable, thermoplastic-elastomer gasket designed to seal between radome and baseplate. Gasket flexes and conforms to contoured surfaces. Baseplate has a 3M® VHB mounting pad for anti-rotation.

³ Isolation measured with 17-ft cables and no ground plane.

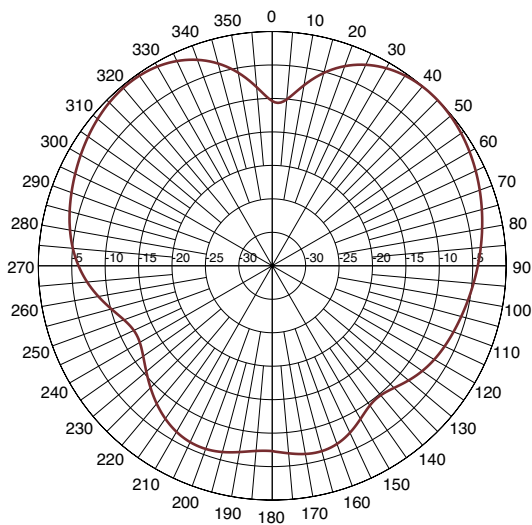
⁴ For black radome, order P/N GL9X1AX-SF; for white radome, order P/N GL9X1AX-SFW.

Coach™ II 4G/5G FR1 GNSS Multiband Antenna

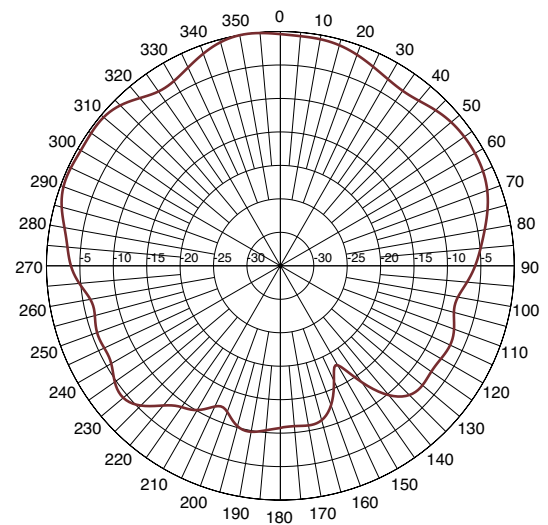
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE1 (Primary)

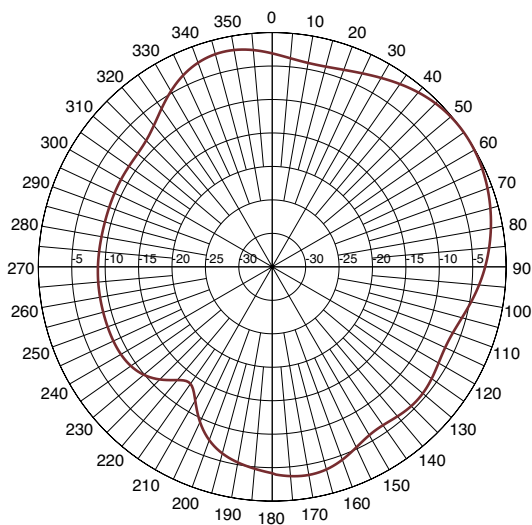
Elevation Pattern at 750 MHz



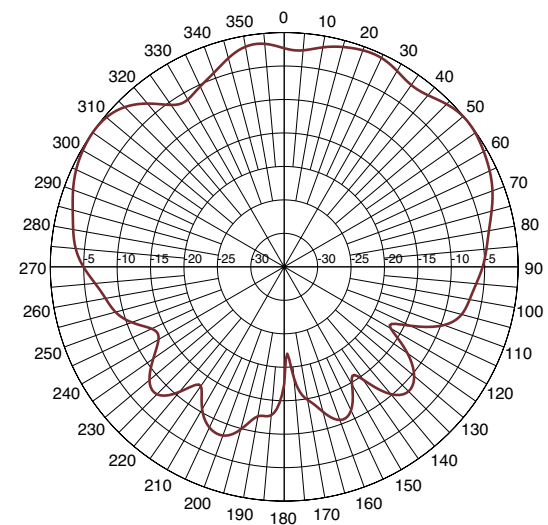
Elevation Pattern at 960 MHz



Elevation Pattern at 850 MHz



Elevation Pattern at 1.75 GHz

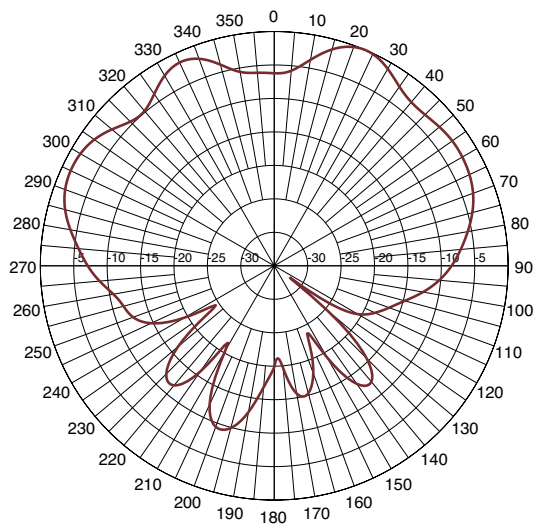


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

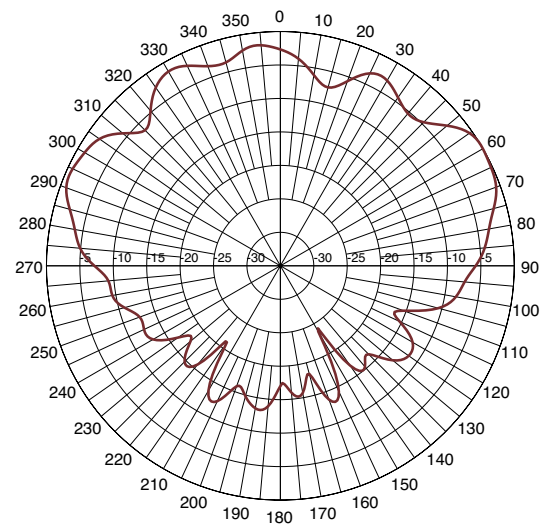
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE1 (Primary)

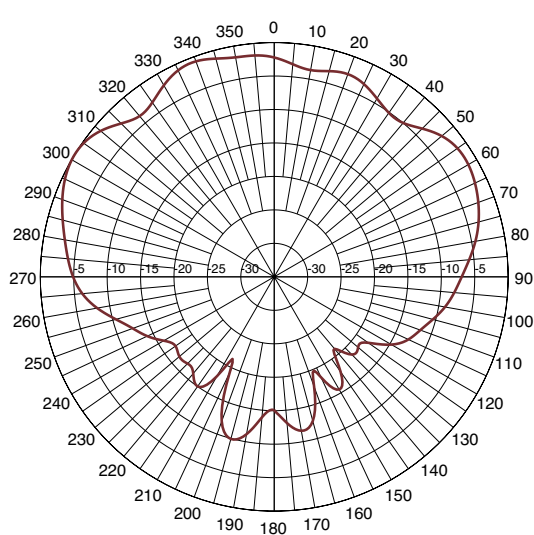
Elevation Pattern at 1.9 GHz



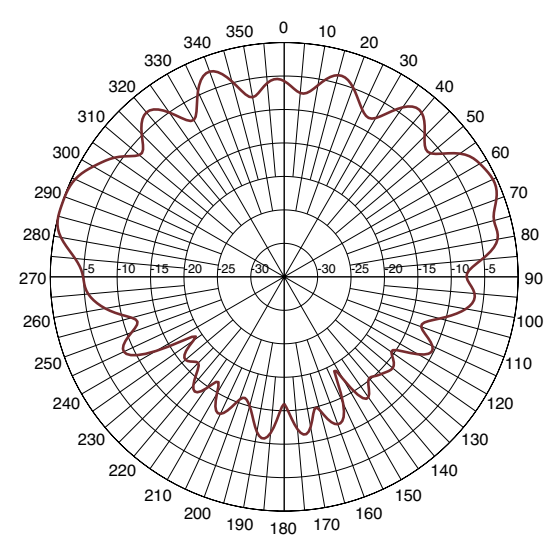
Elevation Pattern at 2.6 GHz



Elevation Pattern at 2.2 GHz



Elevation Pattern at 3.6 GHz

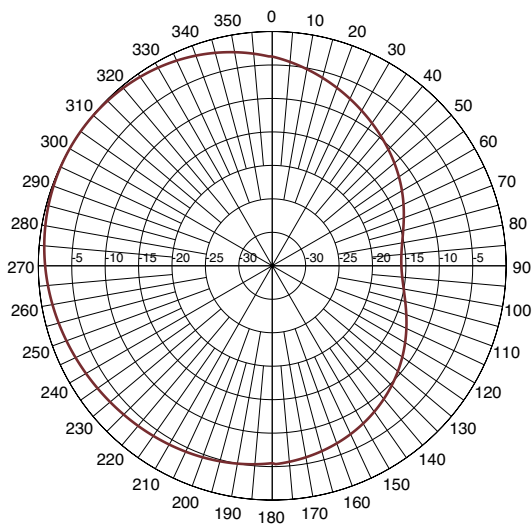


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

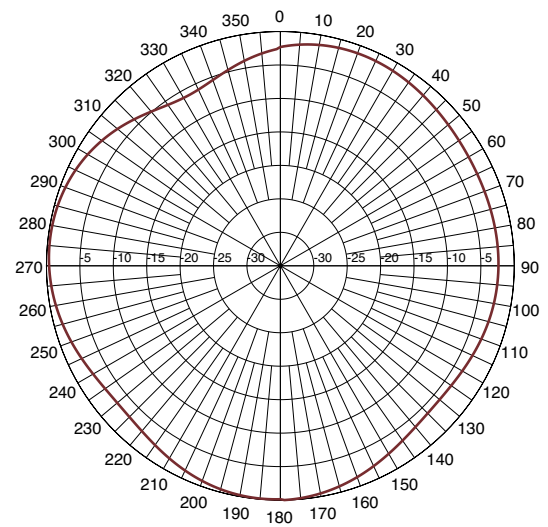
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE1 (Primary)

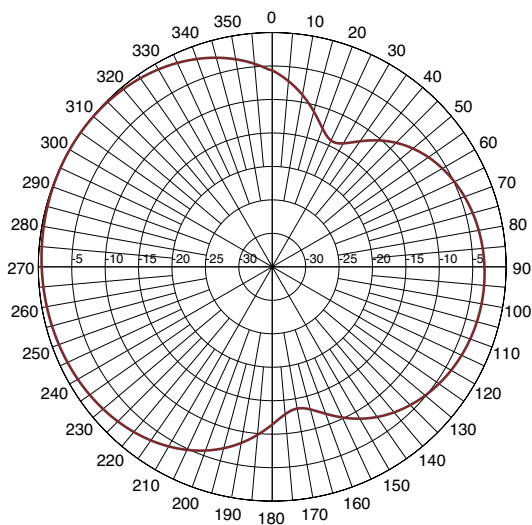
Azimuth Pattern at 750 MHz



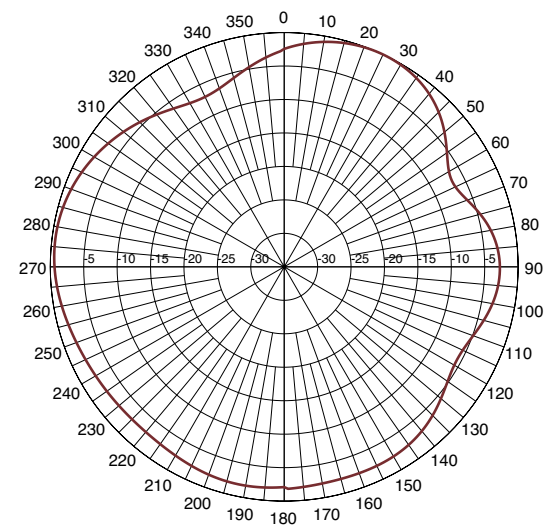
Azimuth Pattern at 960 MHz



Azimuth Pattern at 850 MHz



Azimuth Pattern at 1.75 GHz

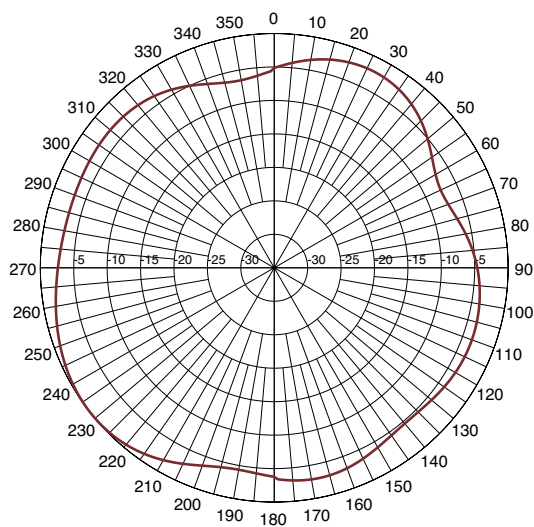


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

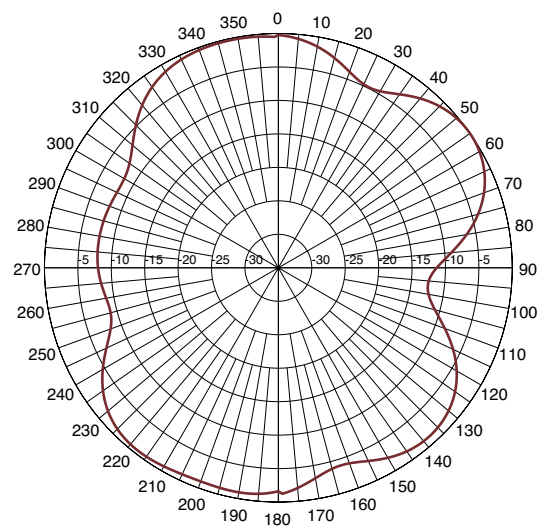
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE1 (Primary)

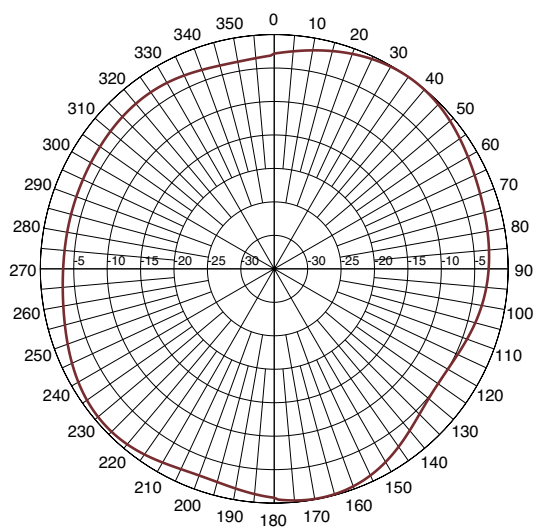
Azimuth Pattern at 1.9 GHz



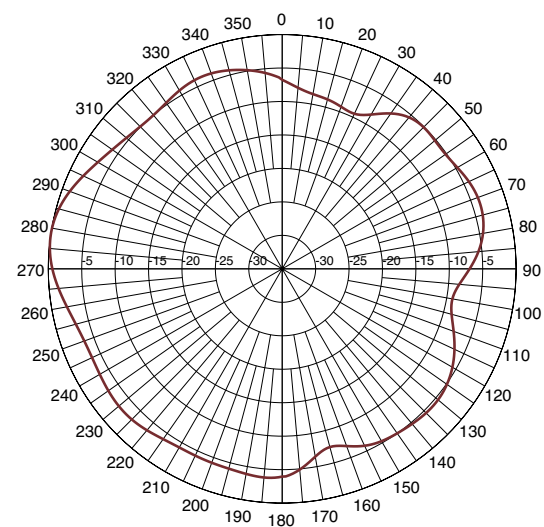
Azimuth Pattern at 2.6 GHz



Azimuth Pattern at 2.2 GHz



Azimuth Pattern at 3.6 GHz

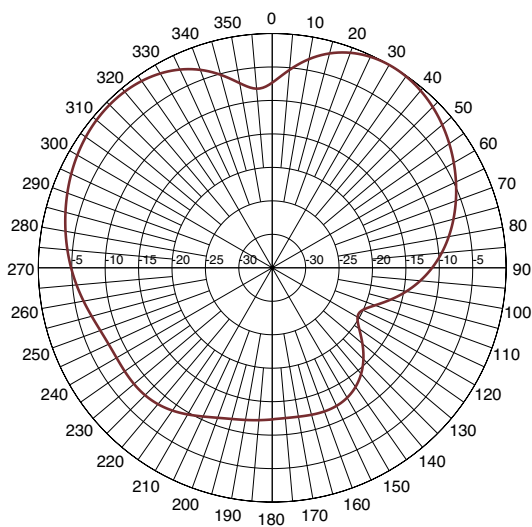


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

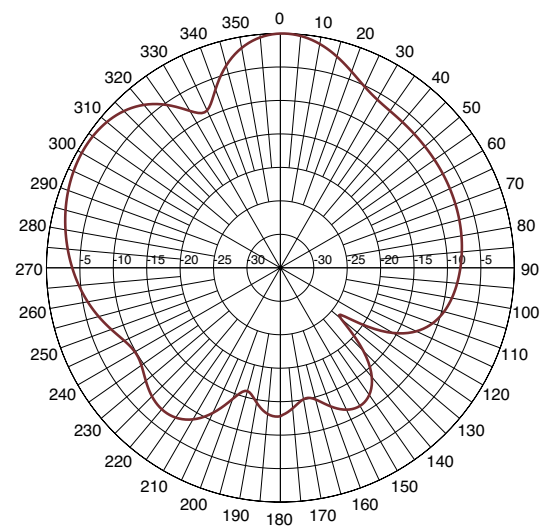
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE2 (Secondary)

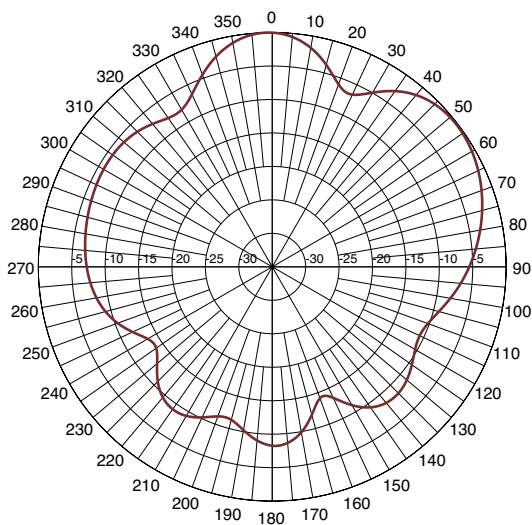
Elevation Pattern at 750 MHz



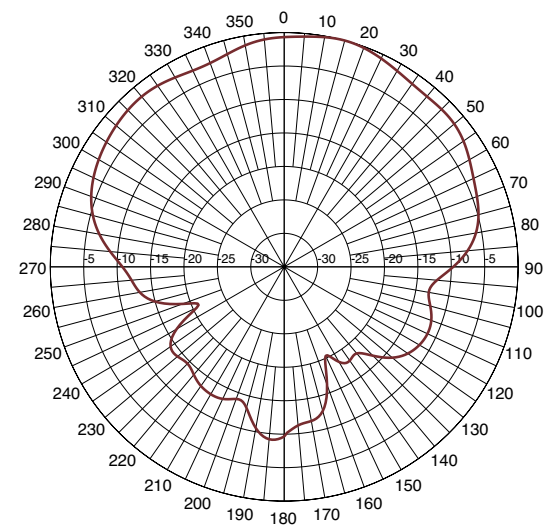
Elevation Pattern at 960 MHz



Elevation Pattern at 850 MHz



Elevation Pattern at 1.9 GHz

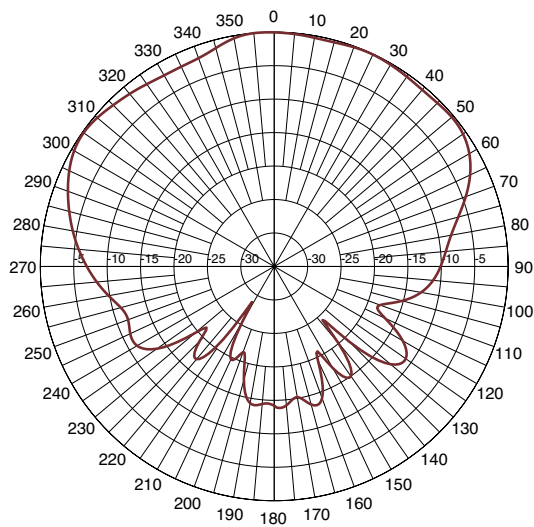


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

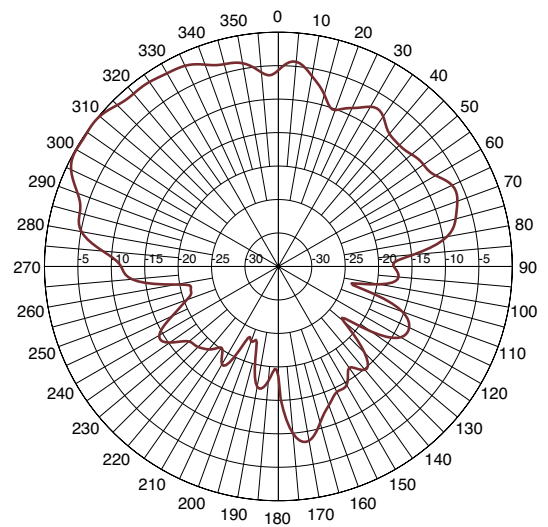
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE2 (Secondary)

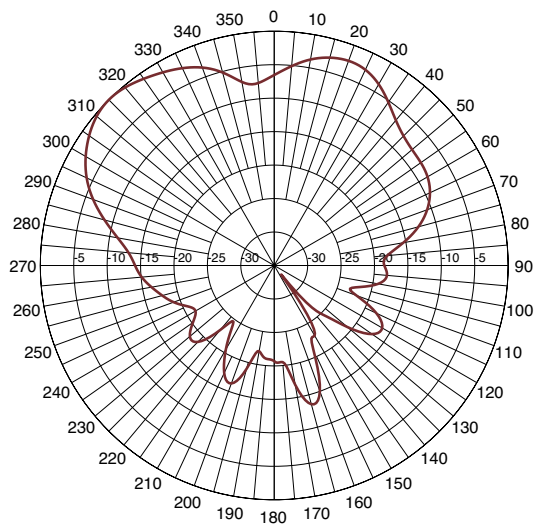
Elevation Pattern at 2.2 GHz



Elevation Pattern at 3.6 GHz



Elevation Pattern at 2.6 GHz

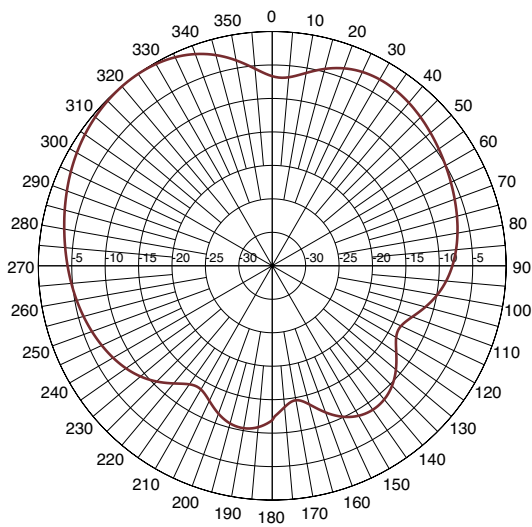


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

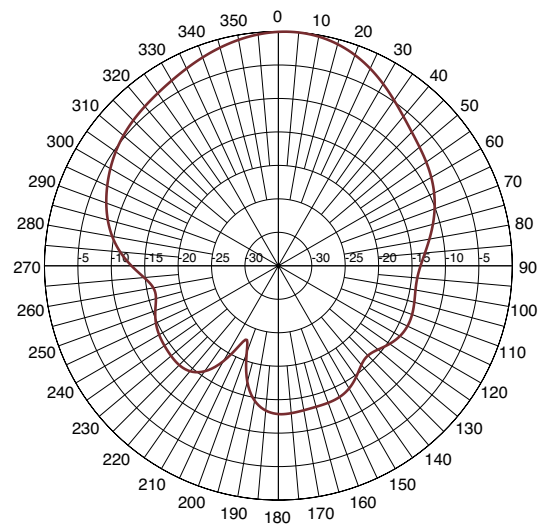
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE2 (Secondary)

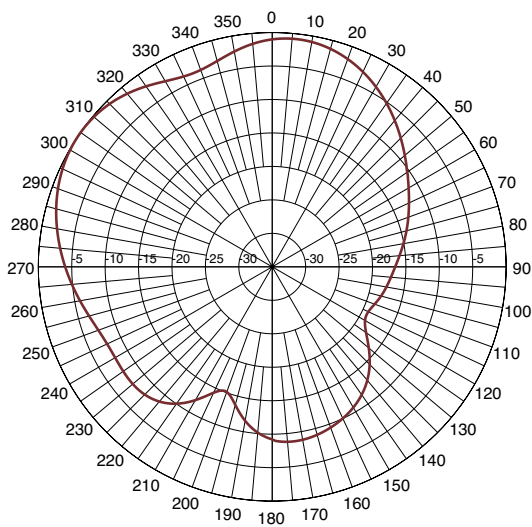
PHI-90 Azimuth Pattern at 750 MHz



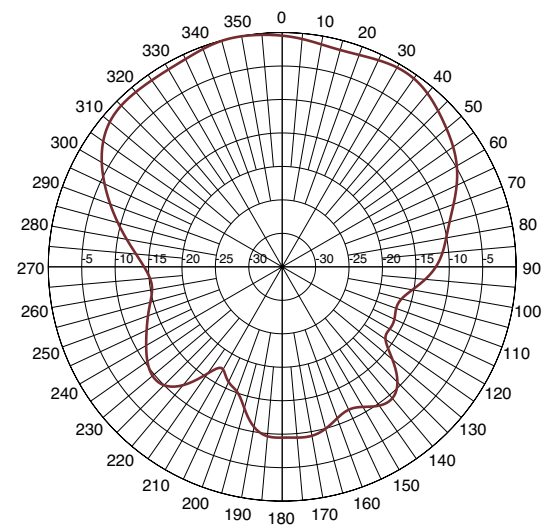
PHI-90 Azimuth Pattern at 960 MHz



PHI-90 Azimuth Pattern at 850 MHz



PHI-90 Azimuth Pattern at 1.9 GHz

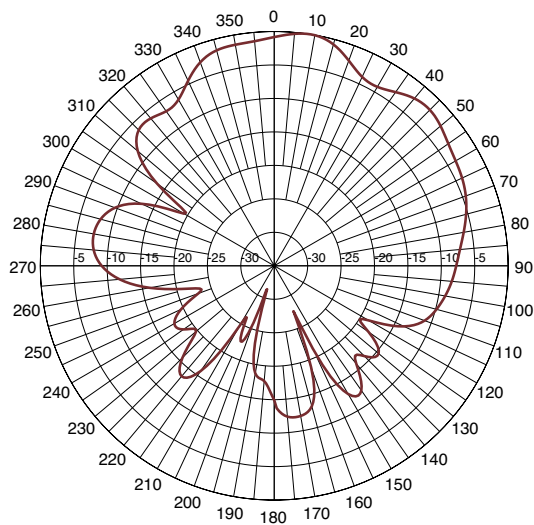


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

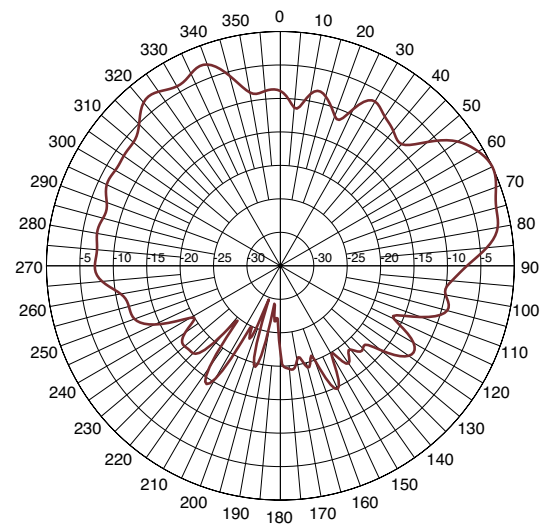
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE2 (Secondary)

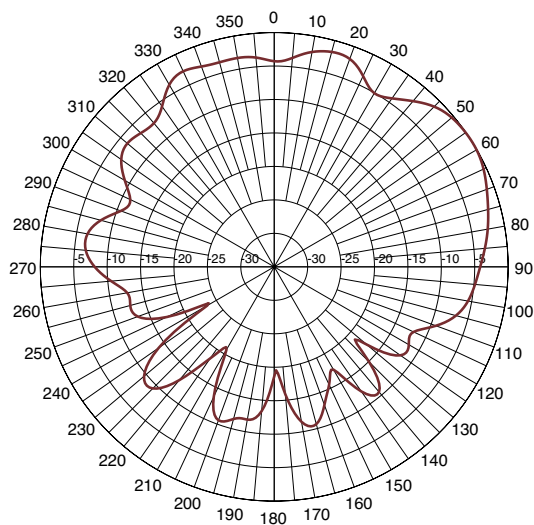
PHI-90 Azimuth Pattern at 2.2 GHz



PHI-90 Azimuth Pattern at 3.6 GHz



PHI-90 Azimuth Pattern at 2.6 GHz

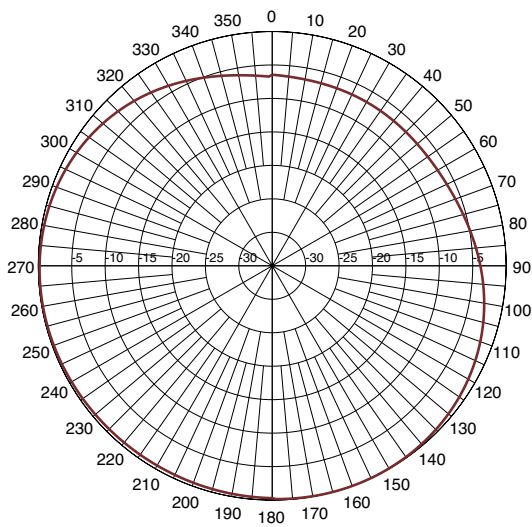


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

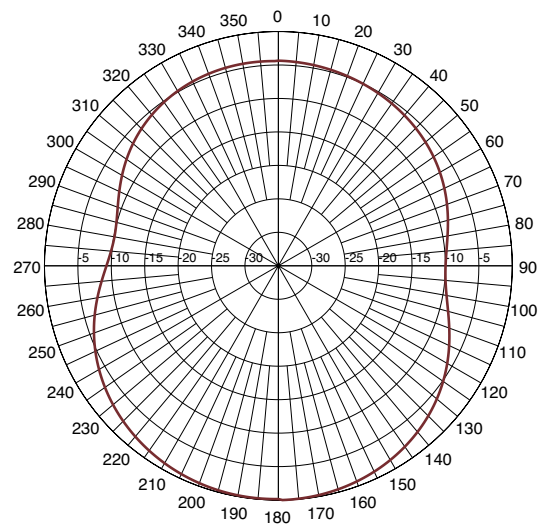
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE2 (Secondary)

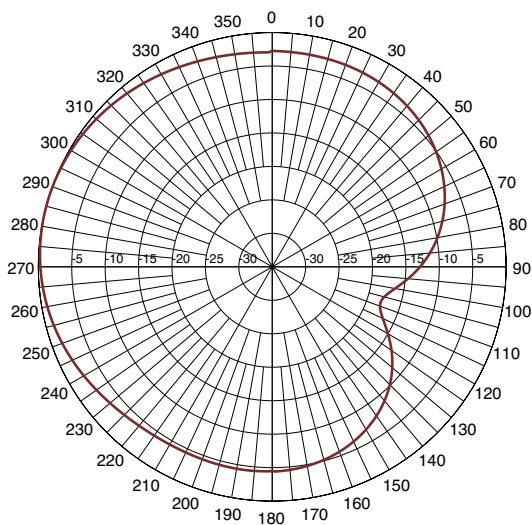
THETA-90 Azimuth Pattern at 750 MHz



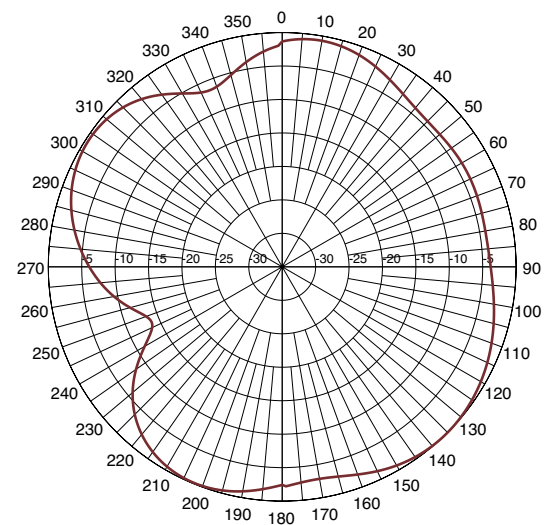
THETA-90 Azimuth Pattern at 960 MHz



THETA-90 Azimuth Pattern at 850 MHz



THETA-90 Azimuth Pattern at 1.9 GHz

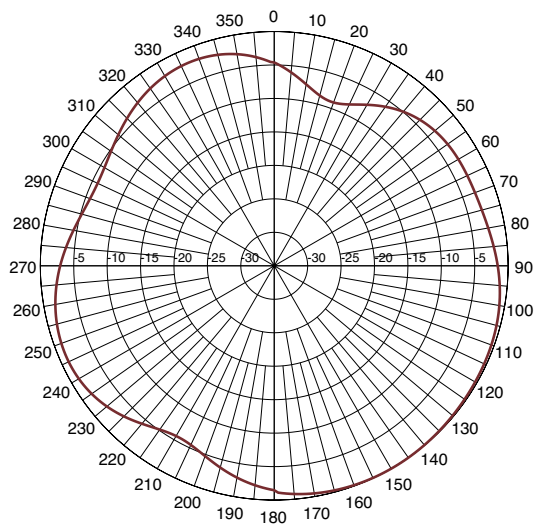


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

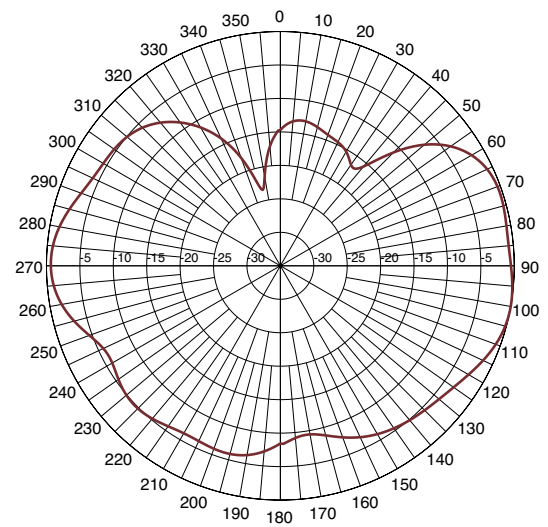
Combination Antennas - 5G Cellular, Wi-Fi and GNSS

LTE2 (Secondary)

THETA-90 Azimuth Pattern at 2.2 GHz



THETA-90 Azimuth Pattern at 3.6 GHz

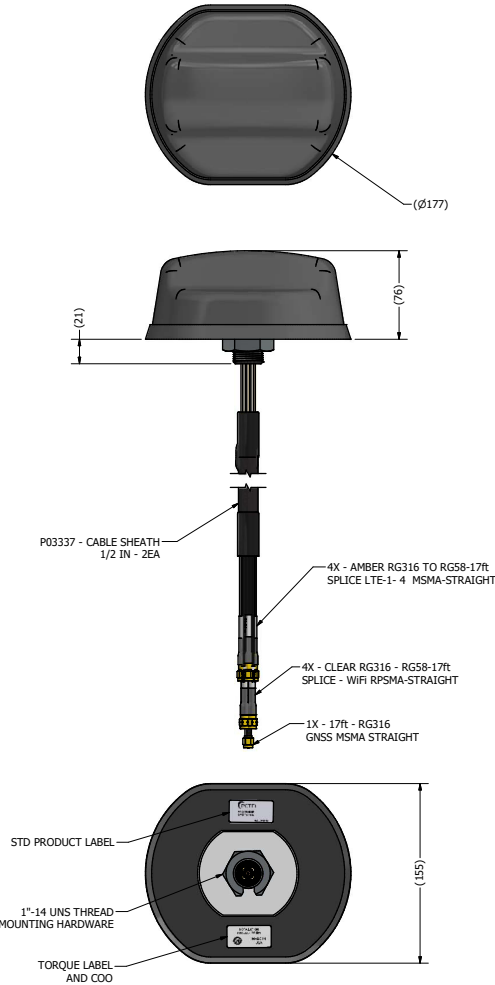


Coach™ II 4G/5G FR1 GNSS Multiband Antenna

Combination Antennas - 5G Cellular, Wi-Fi and GNSS

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
-	ODD RELEASE	4/20/22	MP

- NOTES: UNLESS OTHERWISE SPECIFIED
1. INTERPRET DRAWING PER ANSI/ASME Y14.5
 2. MATERIAL: SEE COMPONENT PRINTS
 3. FINISH: PER PCTEL COSMETIC SPEC
PARTS SHALL BE CLEAN AND FREE OF FOREIGN MATTER.
ALL DIMENSIONS APPLY AFTER PLATING.
 4. ALL MATERIALS SHALL BE ROHS COMPLIANT.
 5. PARTS SHALL BE PACKAGED TO PREVENT DAMAGE IN SHIPMENT AND HANDLING.
 6. AN (X) DIM IDENTIFIES A KEY CHARACTERISTIC AND MAY REQUIRE Cpk STUDY AS OUTLINED IN PCTEL CQR. A COMPLETE 1ST ARTICLE LAYOUT SHALL BE SUBMITTED WITH INITIAL ORDER. A (REF) DIMENSION IS FOR INFORMATION PURPOSES ONLY AND NO TOLERANCE IS IMPLIED.
 7. SUPPLIER SHALL REVIEW AND COMPLETE AND SIGN SUPPLIER INPUT/PRINT ACCEPTANCE BLOCK.



SUPPLIER PRINT ACCEPTANCE: ☐ I Accept drawing/specification: No changes needed. ☐ This part is RoHS compliant ☐ This part is REACH compliant ☐ I Accept drawing/specification Name/Mark-ups added ☐ I Cannot accept drawing/spec. Name/Mark-ups added Supplier Projected Outgoing Quality: SIGMA LEVEL: _____ or PPM: _____ Signature: _____ Date: _____	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS OR TOLERANCES NOT SPECIFIED USE: (X.XX min & 0.25mm) ANGULARS: ° (X.XX min & 13 mm) 	DRAWING: FXG DATE: 9/19/2017 CHECKED: _____ DATE: _____ MATERIAL: _____ FINISH: _____	 PCTEL, INC. 471 BRIGHTON DRIVE BLOOMINGDALE, IL 60108 PH: 630-372-6800 FAX: 630-372-8077	
		DESCRIPTION: ANTENNA, SUBBAND, MULTIBAND, 4X LTE, 4X WIFI, GNSS, COACH II		
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DRAWING NO: GL9X1AX-SF-ODD				
SIZE: C SCALE: NA SHEET: 1 OF 1				

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this product contact your
sales representative or visit
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Solving Complex Wireless Challenges

PCTEL, an Amphenol company, is a leading global provider of wireless technology solutions, including purpose-built antenna systems and test and measurement products. Trusted by our customers for decades, we solve complex wireless challenges to help organizations stay connected, transform, and grow.



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