

# Combined Antenna Module

**APAMSJ-147**

 **ESD Sensitive**

**RoHS/ RoHS II compliant**



Ø 77.0mm x 12mm

**MSL level: Not Applicable**

**FEATURES:**

- Twin cable solution
- Cable 1 covering GSM850, GSM900, DCS, PCS, & UMTS
- Cable 2 covering GPS/GLONASS
- Peak Gain - 824 ~ 960MHz (1.5dBi), 1710 ~ 2170MHz (0.5dBi)
- VSWR – Low band 1.6:1, High band 2.4:1
- Impedance 50 Ohms
- Linear Polarization
- GNSS band 1592 ~ 1610MHz
- GNSS Gain 26dB (3V), 27dB (5V)
- Noise figure 1.2dB
- RHCP Polarization
- RoHS/RoHS II compliant

**TYPICAL APPLICATIONS:**

- GSM and Active GNSS
- Vehicle Tracking
- Vehicle window mount

**STANDARD SPECIFICATIONS:**

The APAMSJ-147 is an active GPS/GLONASS and passive cellular antenna with dual feeders. It has an adhesive mount for non-metallic surfaces, and is suited to window applications in vehicles.

**Mobile (Cable 1)**

Parameters	Min.	Typ.	Max.	Units	Note
<b>Low Band</b>	<b>850</b>		<b>900</b>	<b>MHz</b>	<b>AMPS / GSM</b>
Frequency	824		960	MHz	
VSWR		~1.6:1			
Return Loss		-12.7		dB	
Peak Gain		1.5		dBi	
Average Gain		-3.7		dB	
Efficiency		43		%	
<b>High Band</b>	<b>1700</b>		<b>2100</b>	<b>MHz</b>	<b>DCS/PCS/UMTS</b>
Frequency	1710		2170	MHz	
VSWR		2.4:1			
Return Loss		-7.7		dB	
Peak Gain		0.5		dBi	
Average Gain		-5.0		dB	
Efficiency		32		%	
Polarization Model	Linear				
Radiation Pattern	Omni-Directional				
Impedance		50		Ω	
Maximum Input Power		25		W	
Operating Temperature	-40		+85	°C	

**Navigation (Cable 2)**

Parameters	Min.	Typ.	Max.	Units	Note
Receiving Frequency		1575.42		MHz	GPS
	1592.00		1610.00	MHz	GLONASS
Impedance		50		Ω	
VSWR			1.5:1		
Return Loss			-14	dB	
Polarization Model	RHCP				
Radiation Pattern	Hemispherical			mm	
Operating Temperature	-40		+85	°C	



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## Low Noise Amplifier (LNA)

Parameters	Min.	Typ.	Max.	Units	Note
DC Voltage	2.7		5.5	V	
Gain			26	dB	at 3.0V
			27	dB	at 5.0V
Noise Figure			1.2	dB	
Current	15		25	mA	
Power Consumption	40		137	mW	
Operating Temperature	-40		+85	°C	

### Antenna Measurement Conditions:

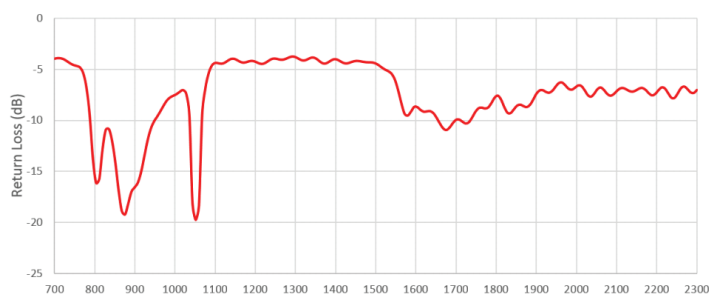
Antenna mounted on a 30 x 30 x 0.25 cm ABS Plate.

200 cm Cable Length (30 cm of RG174 + 170 cm of LMR195).

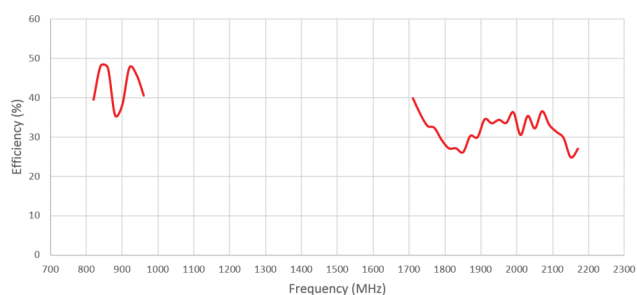
Measured in certified CTIA 3D anechoic chamber.

## MEASUREMENTS

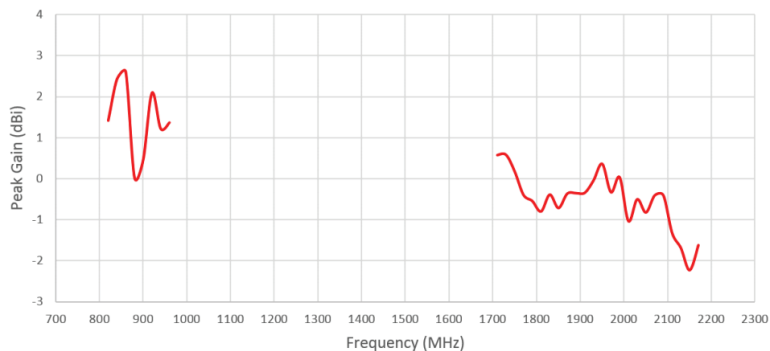
### Return Loss



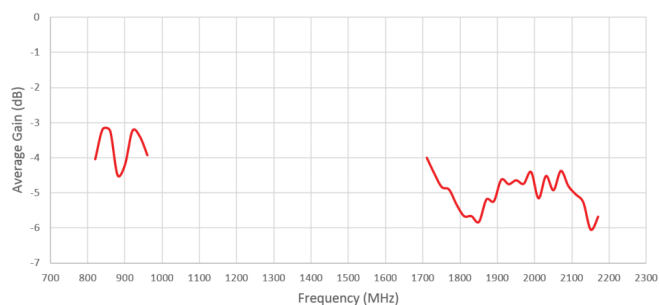
### Efficiency



### Peak Gain (dBi)



### Average Gain (dB)

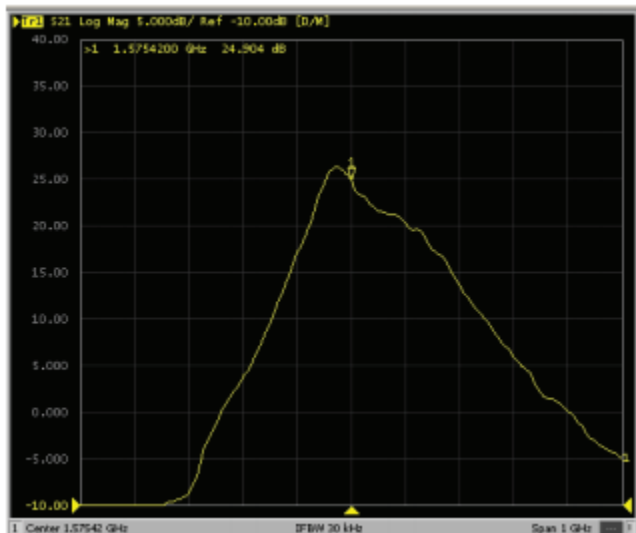




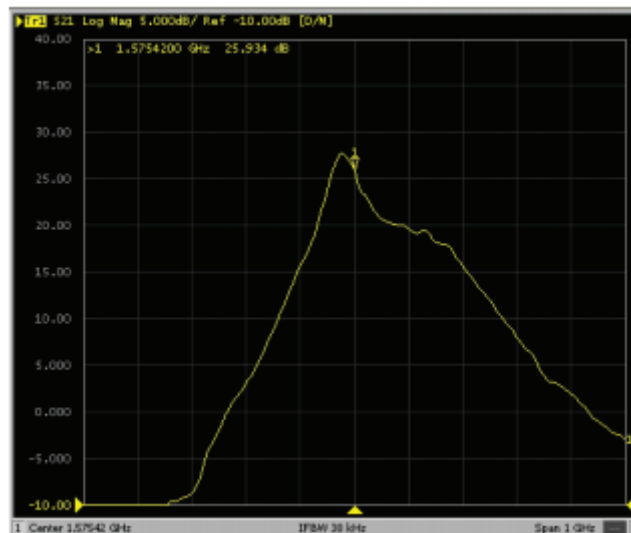
Ø 77.0mm x 12mm

### MEASUREMENTS

#### GNSS Log Mag - 1575.42MHz



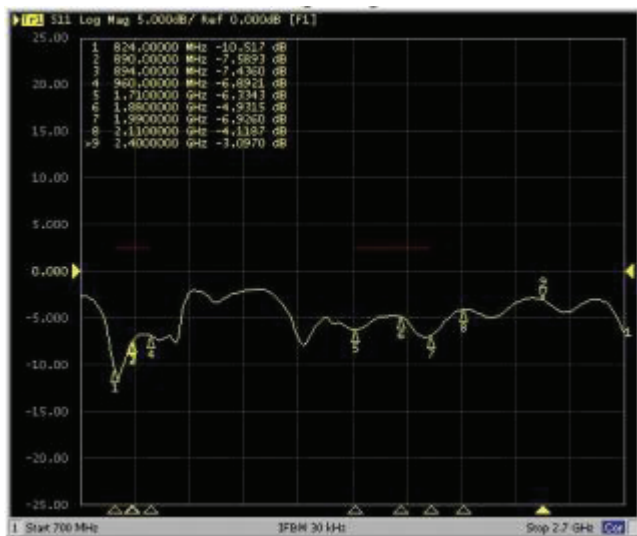
Gain at 5V



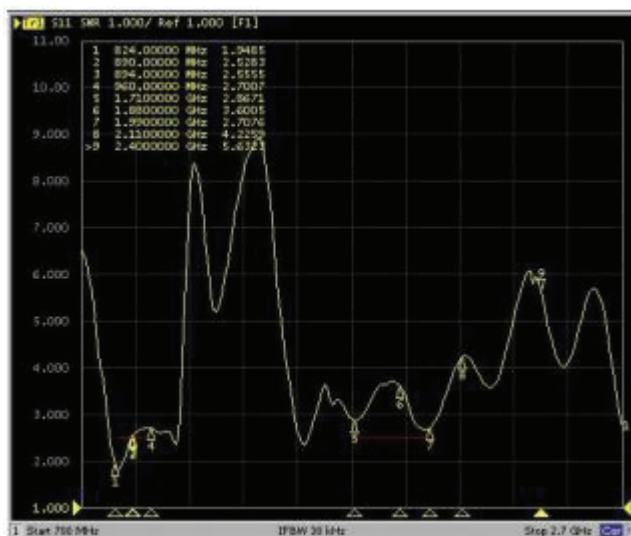
Gain at 3.0V

Note: Measurements made with Antenna mounted on 6mm thin glass with 30cm cable length (RG174).

#### GSM Responses



GSM S11 (Log Mag)



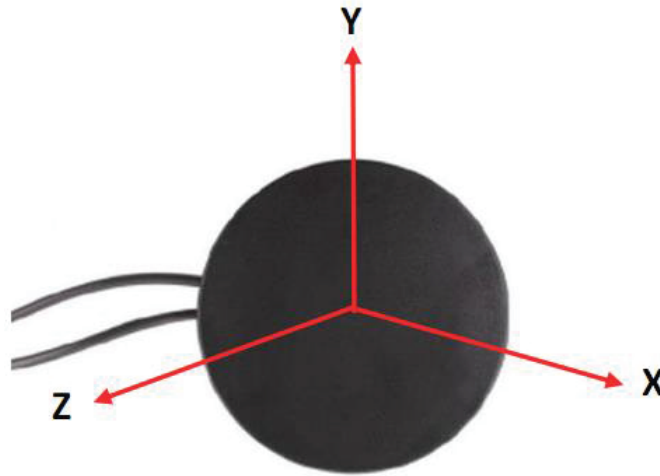
GSM S11 (VSWR)



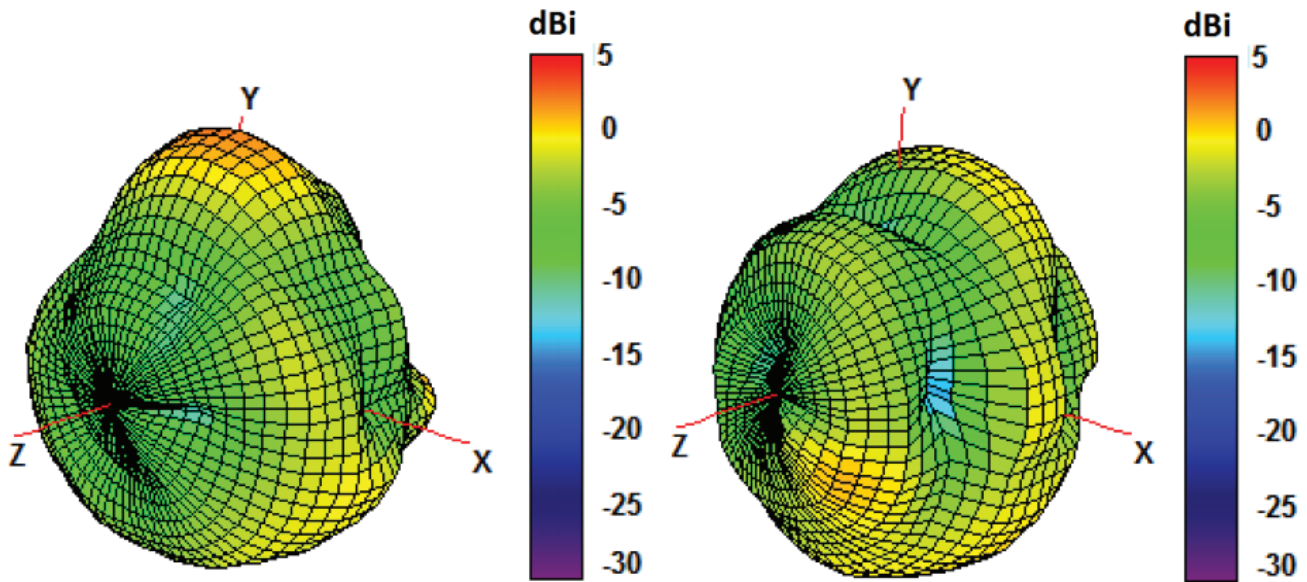
Ø 77.0mm x 12mm

### MEASUREMENTS

#### Radiation Patterns (Reference)



#### Radiation Pattern (850MHz & 940MHz)



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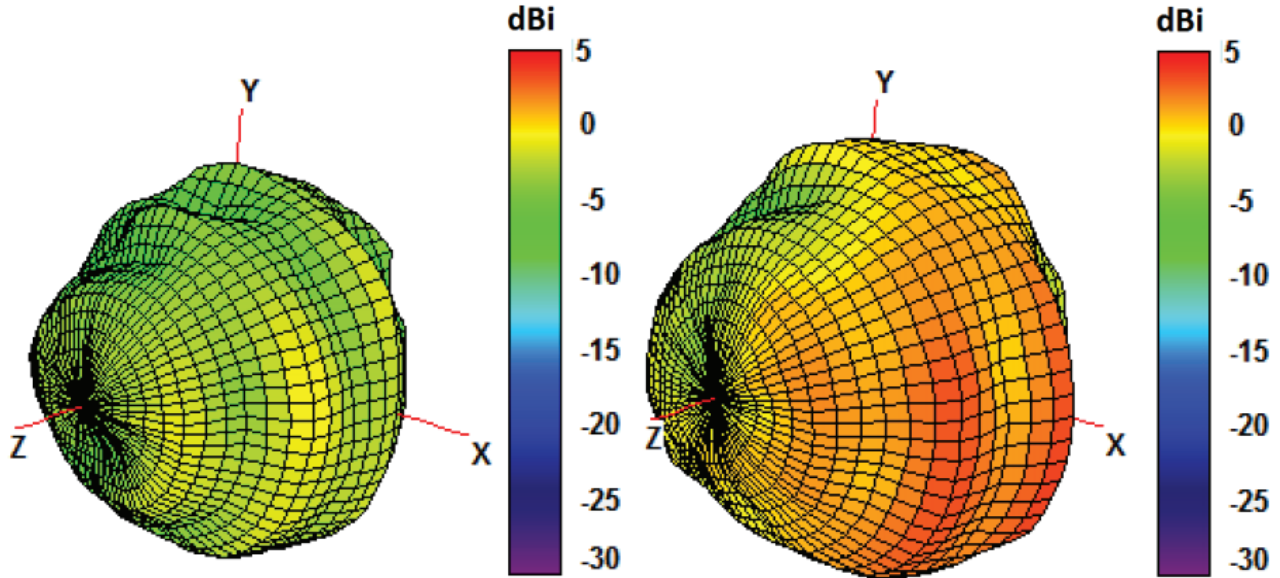
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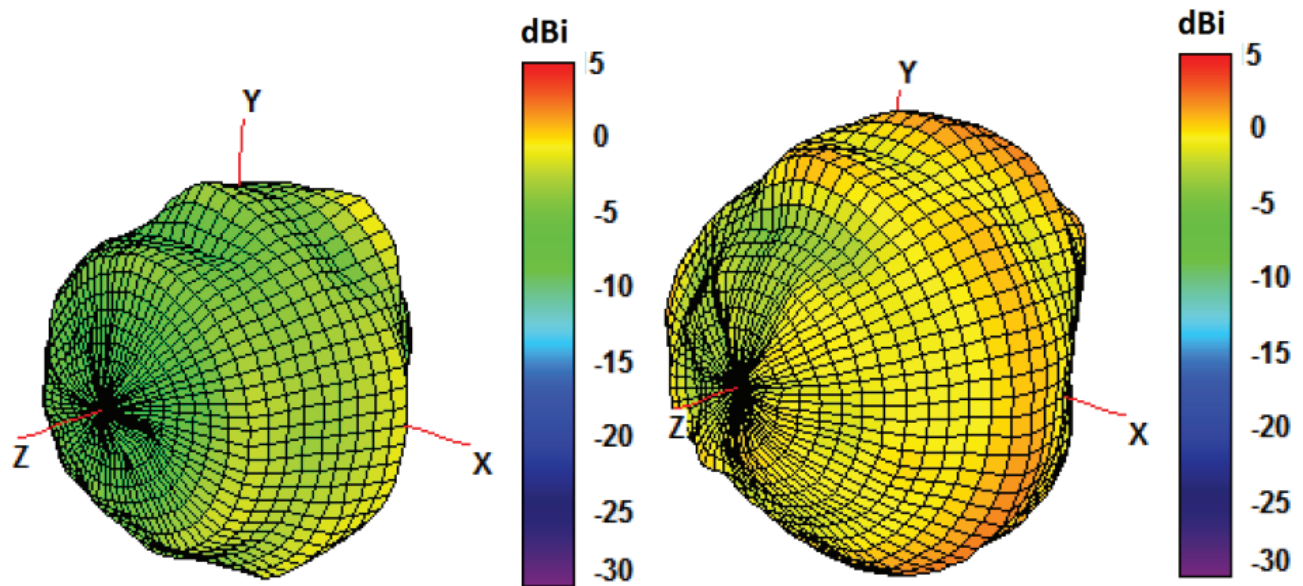
Ø 77.0mm x 12mm

## MEASUREMENTS

Radiation Patterns (1750MHz & 1850MHz)



Radiation Patterns (1950MHz & 2100MHz)



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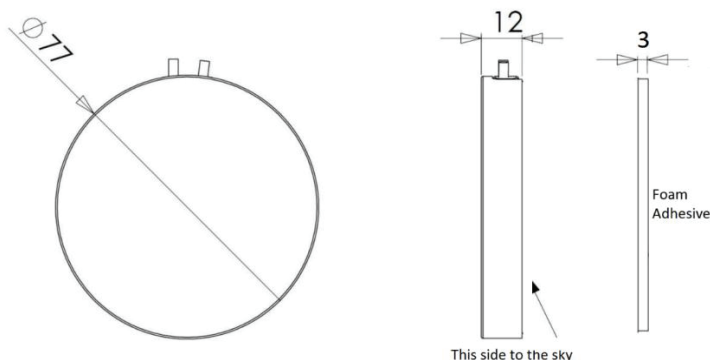
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## OUTLINE DIMENSION:



Parameters	Description
RF Connector	GNSS (Cable 1) - SMA male
	Cellular (Cable 2) - SMA male
Weight	150g
Cable Type	Cable 1 – RG174U Cable 2 - RG174U
Cable Length	Standard (300cm RG174 + 270cm LMR195)
Lid	PC/ABS UV Stable
Base	Zamak / Adhesive Sticker
Color	Black (standard)
Ingress Protection	IP67
Test Condition	Tested on 6mm Glass with 30cm cable

Unit: mm

## PACKAGING:

Antenna is packaged in 100x200x0.1mm size poly bag. There are 300pcs in 465 x 310 x 250mm size box.



Antennas are packing singularly in an individual plastic bag, then into cardboard box holding up to 100pcs. Box dimensions are 47 x 31 x 25cm

### CAUTION:

- (1) Do not apply excess mechanical stress to the component body or terminations.  
Do not attempt to re-form or bend the components as this will cause damage to them.
- (2) Do not expose the component to open flame.
- (3) This specification applies to the functionality of the component as a single unit.  
Please evaluate your specifications before mounting this product.

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