

### APAKM4012-C2G3D



40.0 x 40.0 x 12.2 mm RoHS/RoHS II Compliant MSL = N/A: Not Applicable

#### **Features**

- Stacked ceramic patch antenna
- Multiband GNSS GPS/GLONASS/Beidou/Galileo + SDARS
- RHCP polarization for GNSS
- LHCP polarization for SDARS

### **Applications**

- GPS/GLONASS/Galileo/Beidou/SDAR applications
- IoT
- · Satellite radio
- Remote technology monitoring
- Surveying and mapping systems
- Logistics

### **Electrical Specifications**

Parameters	GNSS			SDARS			TT *4	Nadan
	Min.	Тур.	Max.	Min.	Тур.	Max.	Units	Notes
Operating Frequency		1561			2320		MIL	
		1575			2332			
		1589			22.45		MHz	
		1602			2345			
Return Loss	-20	1561	MHz		2320	MHz		
	-6	1575	MHz	1.5	2332 MHz		GL	
	-6	1589 MHz		-15 2345 M	MII-	dB		
	-30	1602 MHz			MHZ			
Gain		2.7			4.0		dBi	$20^{\circ} \le \varphi \le 0^{\circ}$
		2.3			3.9			$40^{\circ} \le \varphi \le 20^{\circ}$
		1.8			3.5			$60^{\circ} \le \varphi \le 40^{\circ}$
		0.6			2.4			$65^{\circ} \le \varphi \le 60^{\circ}$
		-0.3			2.0			$70^{\circ} \le \varphi \le 65^{\circ}$
Polarization	RHCP			LHCP				

<sup>\*</sup>Above mentioned values are for the ground plane size of 50 x 50 mm

### **Environmental Specifications**

Parameters	Description		
Operating Temperature	-40 °C to +85 °C		
Storage Temperature	-40 °C to +105 °C		
Frequency Temperature Coefficient	20ppm/deg. °C		
Humidity	90 % ~ 95 % R.H.		





## APAKM4012-C2G3D

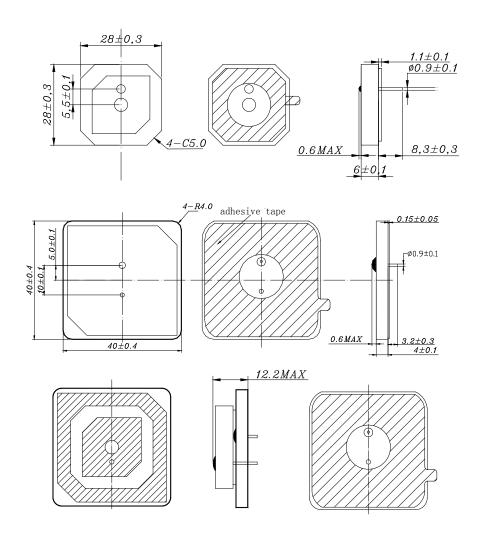


40.0 x 40.0 x 12.2 mm RoHS/RoHS II Compliant MSL = N/A: Not Applicable

### **Product Image**



### **Product Dimensions**



(Unit:mm)



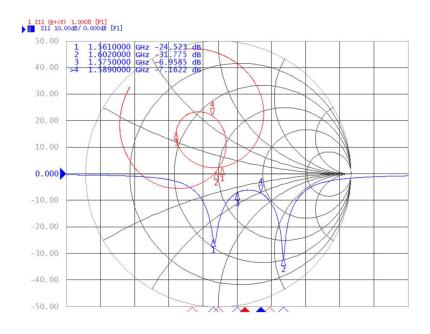


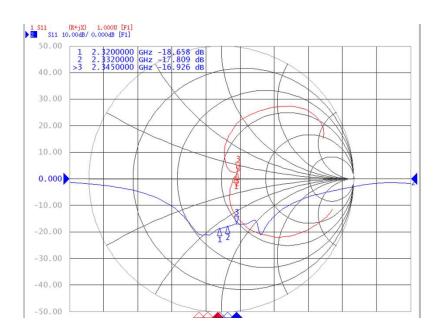
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### **Return Loss and Impedance Characteristics**







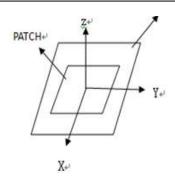


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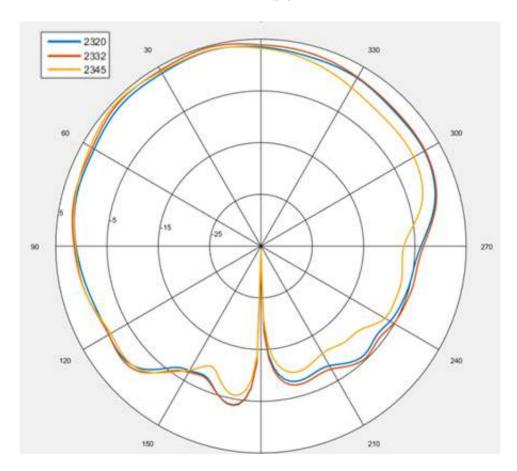


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### **Radiation Pattern - Gain**



XZ - Plane







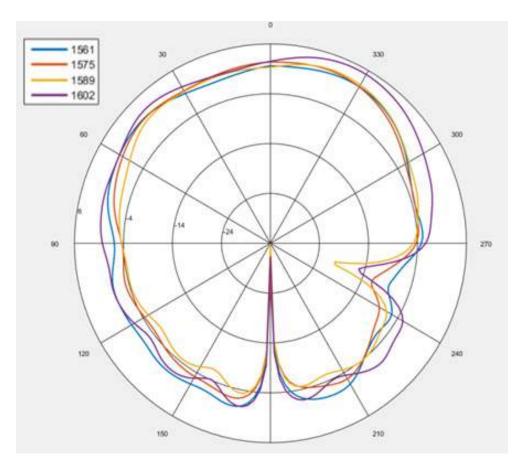
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### **Radiation Pattern - Gain**

### YZ – Plane







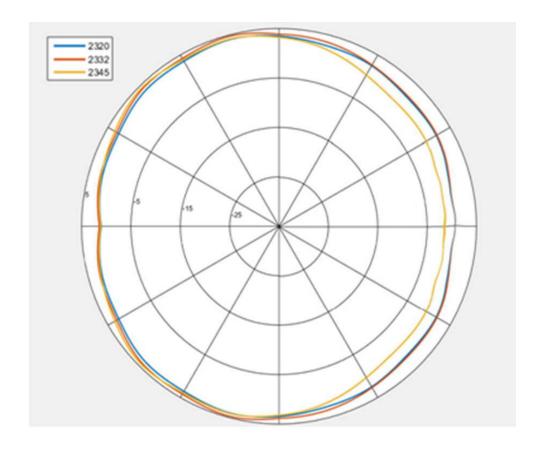
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### **Radiation Pattern - Gain**

### XY - Plane







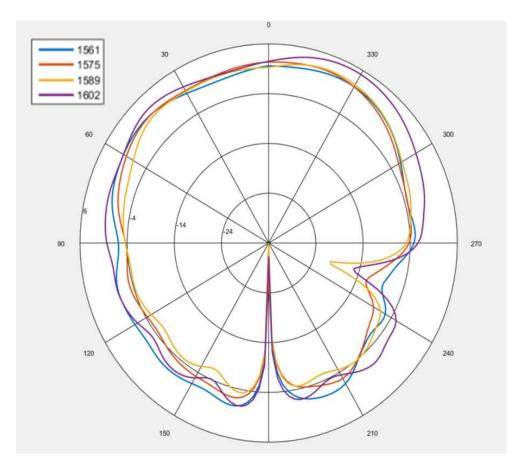
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### **Radiation Pattern - GNSS**

### XZ - Plane







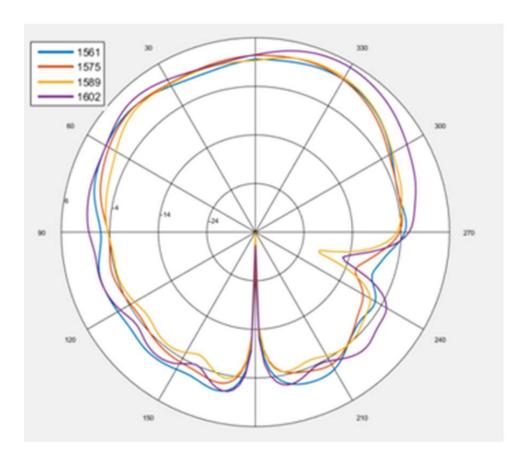
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### **Radiation Pattern - GNSS**

### YZ – Plane







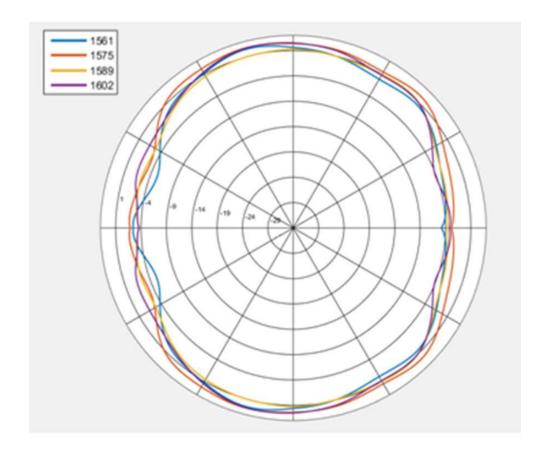
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40.0 x 40.0 x 12.2 mm RoHS/RoHS II Compliant MSL = N/A: Not Applicable

### **Radiation Pattern - GNSS**

### XY - Plane







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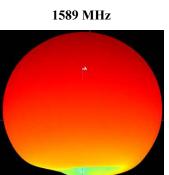


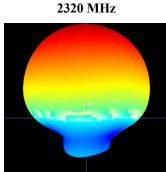
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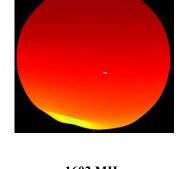
### **Radiation Pattern - 3D Patterns**

1561 MHz 1589 MHz

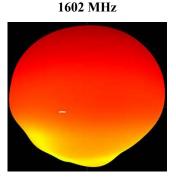


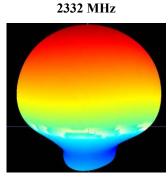


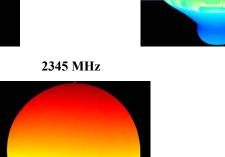




1575 MHz









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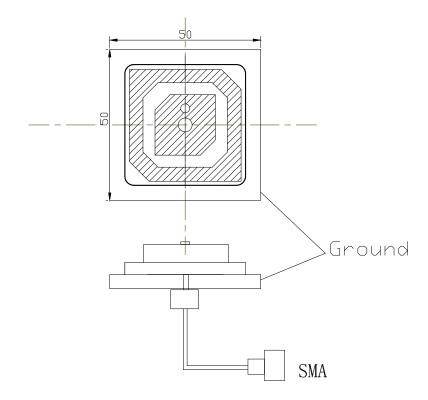


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**Test Jig** 







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### **Reliability Test**

Item	Test Condition	Remark
Humidity Test	Humidity Test  The device is subjected to 90% to 95% relative humidity 60°C ± 3°C for 96 h to 98 h, then dry out at 25 °C ± 5°C and less than 65% relative humidity for 2 h to 4 h. After drying out, the device shall satisfy the specification in Table.1.	
High Temperature Exposure	The device shall satisfy the specification in Table.1. after leaving at 105°C for 96 h to 98 h, provided it would be measured after 2 h to 4 h leaving in 25°C ± 5°C and less than 65% relative humidity.	It shall fulfill the specifications in Table.1.
Low Temperature Exposure	The device shall satisfy the specification in Table.1. after leaving at $-40^{\circ}$ C for 96 h to 98 h, provided it would be measured after 2 h to 4 h leaving in 25°C ± 5°C and less than 65% relative humidity.	It shall fulfill the specifications in Table.1.
Temperature Cycle	Subject the device to -40°C for 30 min followed by a high temperature of 105°C for 30 min cycling shall be repeated 5 times. At the room temperature for 1 h prior to the measurement.	It shall fulfill the specifications in Table.1.
Vibration	Subject the device to vibration for 2 h each in x, y and z axis with the amplitude of 1.5 mm, the frequency shall be varied uniformly between the limits of 10 Hz to 55 Hz.	It shall fulfill the specifications in Table.1.
Soldering Test	Soldering Test Lead terminals are heated up to $350^{\circ}\text{C} \pm 10^{\circ}\text{C}$ for $5 \pm 0.5$ s with brand iron and then element shall be measured after being placed in natural conditions for 1 h. No visible damage and it shall fulfill the specifications in Table.1.	
Solder ability	Lead terminals are immersed in soldering bath of 260°C to 290°C for $3 \pm 0.5$ s . More than 95% of the terminal surface of the device shall be covered with fresh solder.	
Terminal Pressure Strength	$\pm 1$ s (see drawing) No visible damage and it shall fulfill the	

Fig. 1

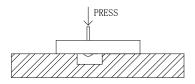


Table 1

Item	Specification After Test (MHz)		
Center Frequency change	±2.0		





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### **Packaging**

A package has 80 antenna elements.

Package Type	Quantity		
1 Package base	10 Antennas		
1 Vacuum bag	2 Package bases		
1 Inner box	1 Vacuum bag		
1 Package	4 Inner boxes		

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