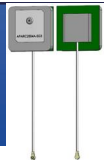


ECN/PCN No.: R0095

For Manufacturer			
<b>Product Description:</b> Active GPS+GLONASS+BEIDOU Patch Antenna	<b>Abracon Part Number / Part Series:</b> APARC2504A-SG3	<input type="checkbox"/> Documentation only <input checked="" type="checkbox"/> ECN <input type="checkbox"/> EOL	<input type="checkbox"/> Series <input checked="" type="checkbox"/> Part Number
<b>Affected Revision:</b> I.R.	<b>New Revision:</b> Rev A	<b>Application:</b> <input type="checkbox"/> Safety <input checked="" type="checkbox"/> Non-Safety	
<b>Prior to Change:</b> <b>14.0 Packaging</b>  1. 390*320*290mm (450pcs/Carton) 2. GW - 7.62KG 3. MSL: Not Applicable			
<b>After Change:</b> <b>14.0 Packaging</b>  1. EPE foam – 52*43*5mm 2. Vacuum bag – 60*45mm/ 365*300*25mm/30pcs/anti-ESD 3. Plastic bag – 420*560*0.12mm/anti-ESD 4. Carton box – 390*320*290mm (450pcs/Carton) 5. GW – 7.62KG 6. MSL: Not Applicable			
<b>Cause/Reason for Change:</b> Enhanced packaging method for improved ESD protection of the active patch antenna			
Change Plan			
<b>Effective Date:</b> 5/18/2022	<b>Additional Remarks:</b> N/A		
<b>Change Declaration:</b> Performance, form and size are not affected			
<b>Issued Date:</b> 5/18/2022	<b>Issued By:</b> <i>Evgenii Filatov</i>	<b>Issued Department:</b> Engineering	
<b>Approval:</b> <i>Syed Raza</i> VP of Engineering	<b>Approval:</b> <i>Reuben Quintanilla</i> Quality Director	<b>Approval:</b> <i>Ying Huang</i> Purchasing Director	
For Abracon EOL only			
<b>Last Time Buy (if applicable):</b>		<b>Alternate Part Number / Part Series:</b>	
<b>Additional Approval:</b>	<b>Additional Approval:</b>	<b>Additional Approval:</b>	
Customer Approval (If Applicable)			
<b>Qualification Status:</b> <div style="text-align: center;"> <input type="checkbox"/> Approved <input type="checkbox"/> Not accepted                     </div> Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.			
<b>Customer Part Number:</b>		<b>Customer Project:</b>	

<b>Company Name:</b>	<b>Company Representative:</b>	<b>Representative Signature:</b>
<b>Customer Remarks:</b>		

# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3



ESD Sensitive



25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## Features

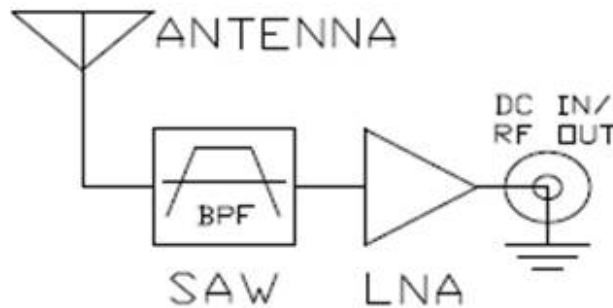
- Multiband GPS/GLONASS/Beidou/GNSS patch
- Active GNSS patch with LNA max gain of 22 dB
- RHCP polarization
- 25.0 x 25.0 x 4.0 mm
- RF coax cable, IPEX connector

## Applications

- GPS/GLONASS/Galileo/Beidou applications
- IoT
- M2M
- Remote technology monitoring
- Geofencing
- Surveying and mapping systems
- Logistics

## System

This antenna system consists of two functional blocks, the LNA portion and the patch antenna.

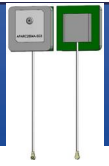


## Electrical Characteristics

Antenna

Item	Spec
Frequency Range	1561.098± 2.046 MHz. 1575.42± 1.023 MHz. 1602± 5 MHz.
Gain	1561MHz: -1dBi Typ.@zenith 1575.42MHz: -2.5dBi Typ. @zenith 1602MHz: -1.5dBi Typ. @zenith
Polarization	RHCP

# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3



ESD Sensitive



25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## LNA

Item	Spec		
Input Voltage	Min: 1.8V	Typ: 3.0V	Max: 5.5V
Frequency Range	1558~1610 MHz		
Output Impedance	50Ω		
Outer Band Attenuation	1584 ± 50MHz 13dB Min 1584 ± 100MHz 20dB Min		
Pout at 1 dB gain Compression point	-6 dBm Min. -2 dBm Typ.		
Output VSWR	2.0 Max		
LNA Gain, Power Consumption and Noise Figure			
Voltage	LNA Gain (Typ.)	Power Consumption (mA) Typ.	Noise Figure (Typ.)
Min 1.8V	12dB	5mA	3.0dB
Typ 3.0V	18dB	10mA	2.8dB
Max 5.5V	22dB	23mA	3.0dB

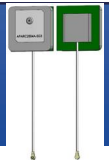
## Combined Electrical Specifications

Item	Spec
Frequency Range	1574~1610 MHz
Gain	At 90° 1561MHz: 17± 3dBi 1575.42MHz: 15.5± 3dBi 1602MHz: 16.5± 3dBi
Output Impedance	50Ω

## Mechanical Specifications

Item	Spec
Antenna Dimensions	25.0 x 25.0 x 4.0 mm
RF Connector	I-PEX
RF Cable	RF Coaxial Cable, $\psi$ 1.13± 0.1mm, (Color: GRAY) L = 69±/- 2 mm

# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3

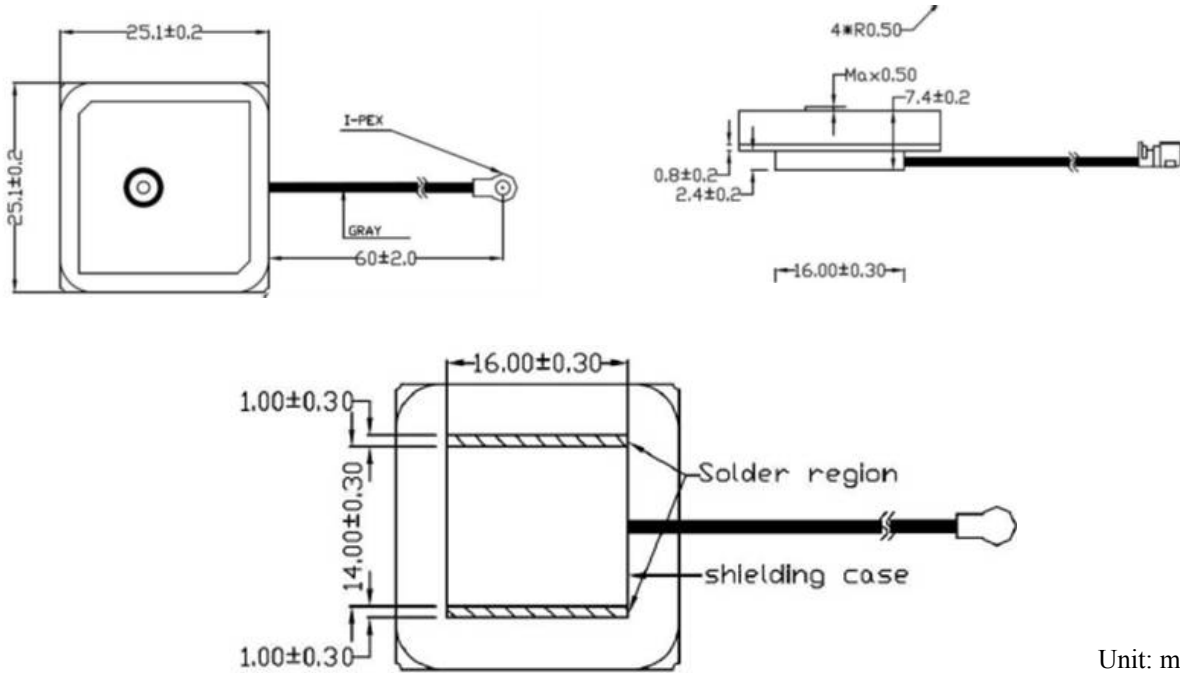


ESD Sensitive



25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## Dimensions



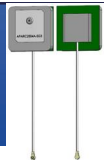
Unit: mm

## LNA Gain and Out Band Rejection



LNA Gain and Out Band Rejection @ 3.0V

# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3

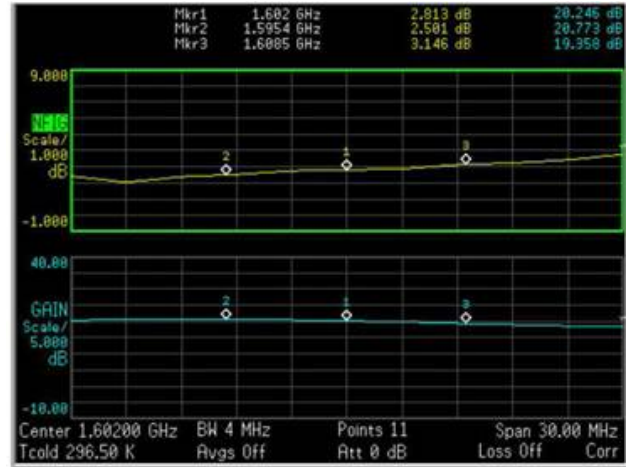
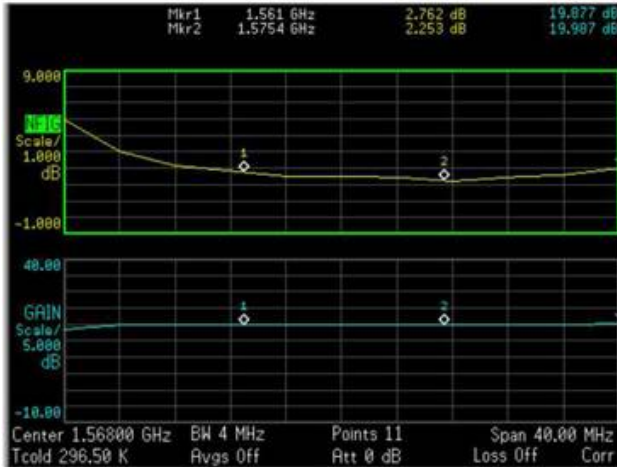


ESD Sensitive



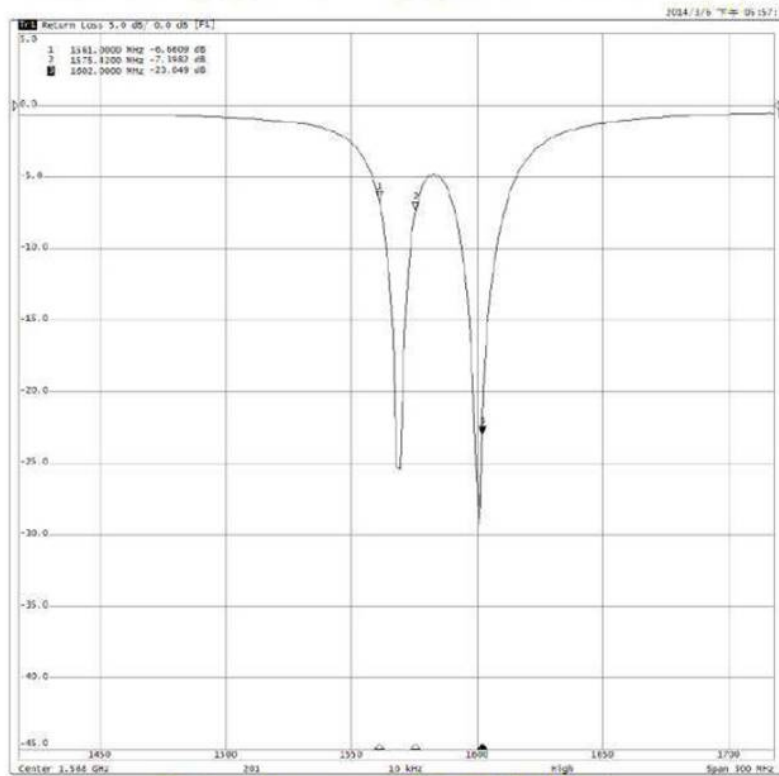
25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## LNA Noise Figure



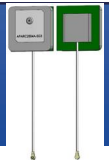
LNA Noise Figure @ 3.0V

## S11/Return Loss Characteristics



Return Loss : -6.66 @1561MHz  
Return Loss : -7.39 @1575.42MHz  
Return Loss : -23.04 @1602MHz

# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3

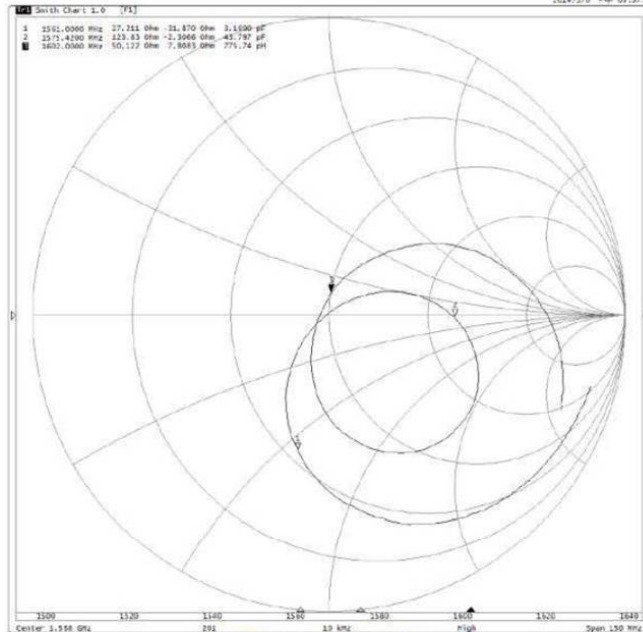


ESD Sensitive



25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## Smith Chart

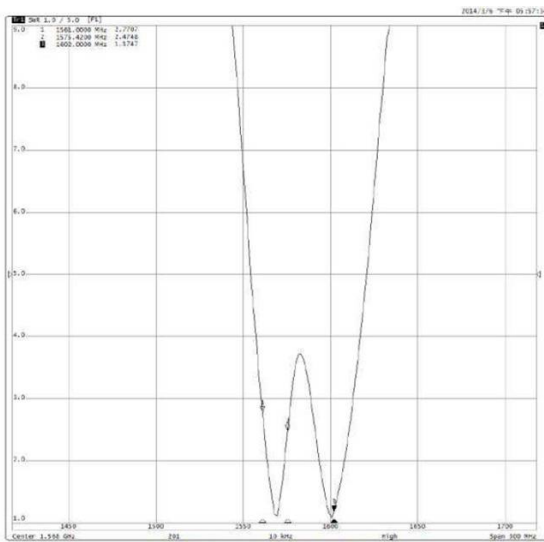


Impedance : 27.21 - j31.87 Ohm

Impedance : 123.83 - j 2.3- Ohm

Impedance : 50.12 + j7.80 Ohm

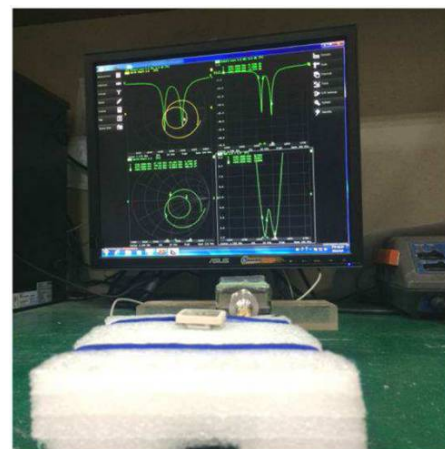
## VSWR



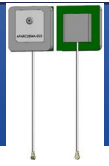
VSWR : 2.77 @1575.42MHz

VSWR : 2.47 @1575.42MHz

VSWR : 1.17 @1575.42MHz



# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3



ESD Sensitive

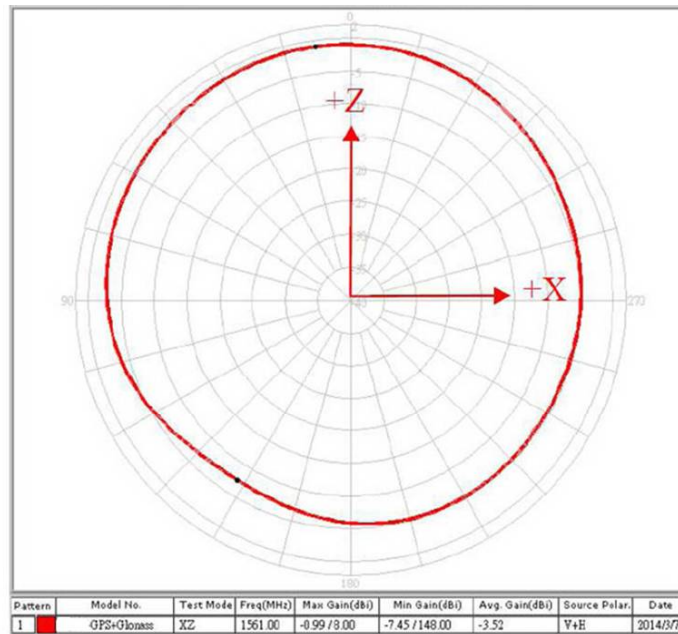
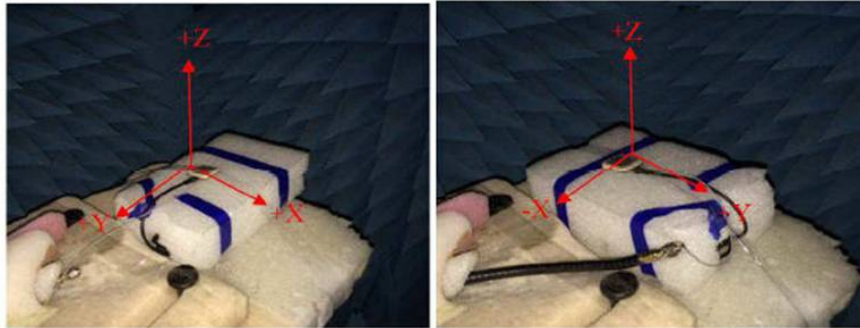


25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## Radiation Patterns

XZ Plane

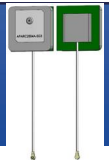
YZ Plane



XZ-Plane@1561MHz



# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3

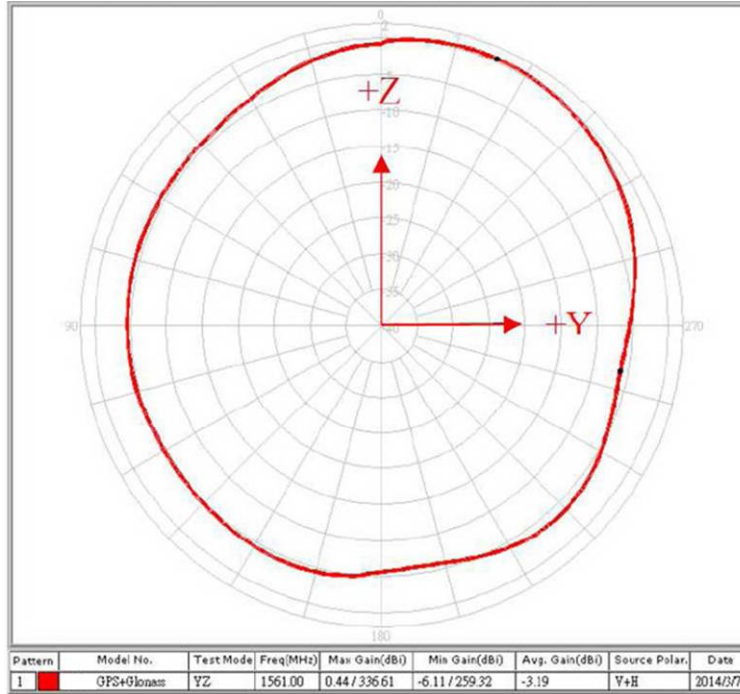


ESD Sensitive

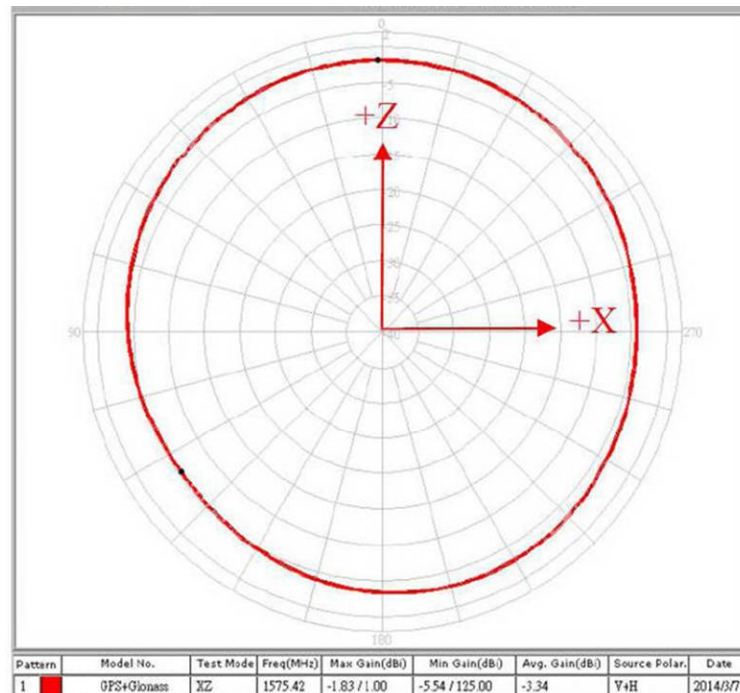


25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## Radiation Patterns

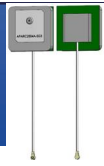


YZ-Plane@1561MHz



XZ-Plane@1575.42MHz

# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3

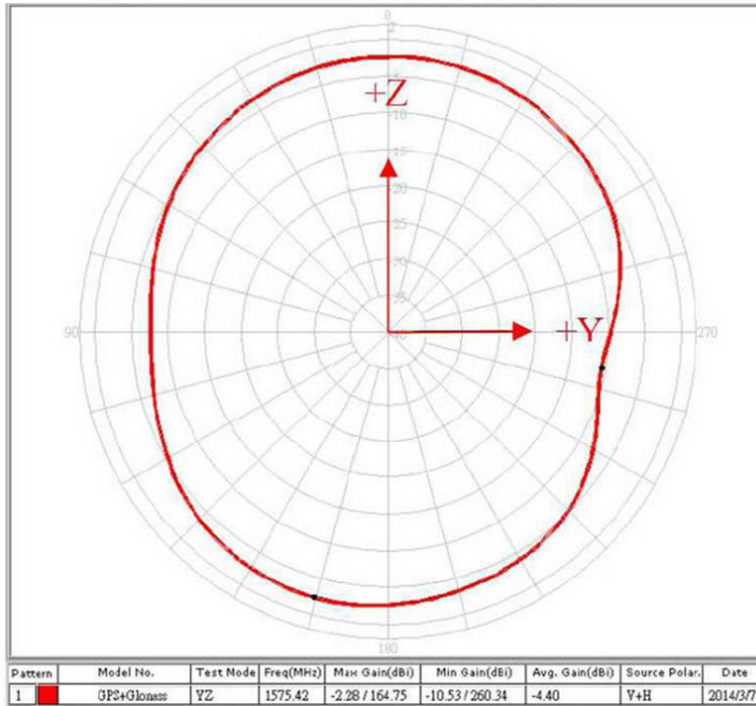


ESD Sensitive

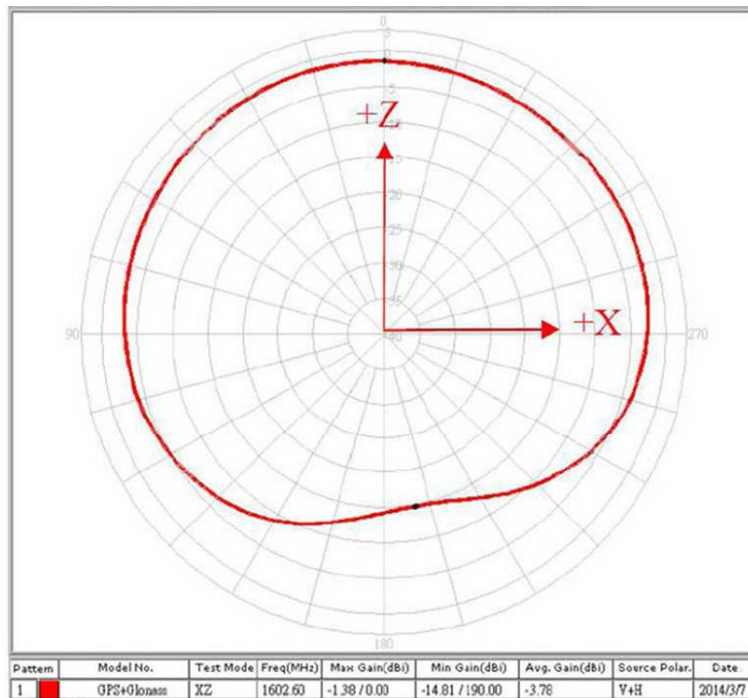


25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## Radiation Patterns

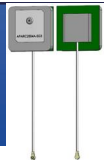


YZ-Plane@1575.42MHz



XZ-Plane@1602MHz

# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3

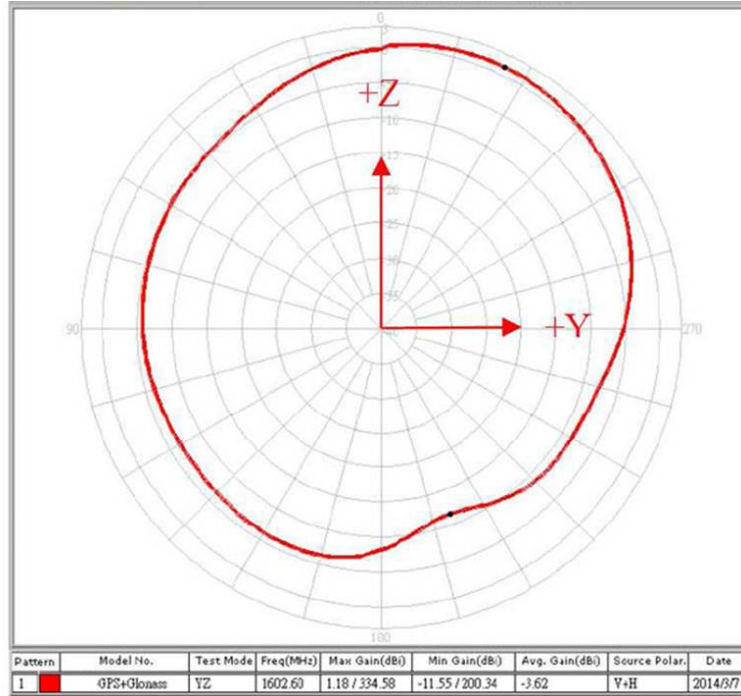


ESD Sensitive



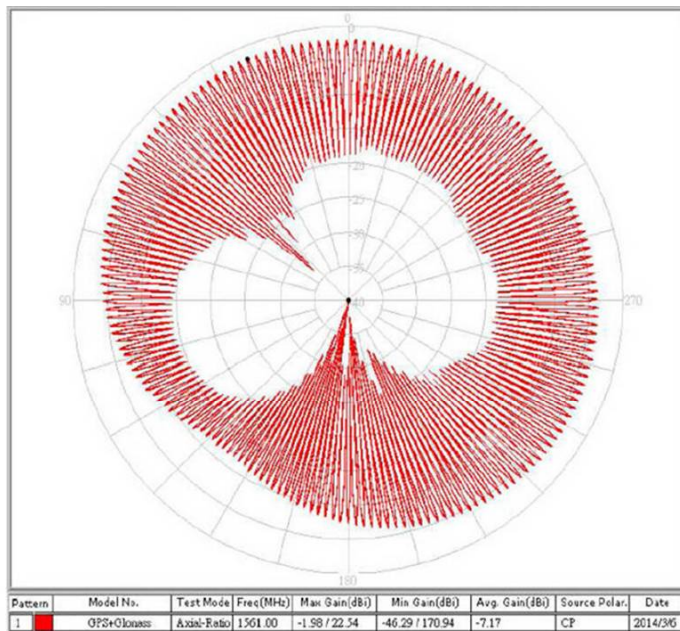
25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## Radiation Patterns

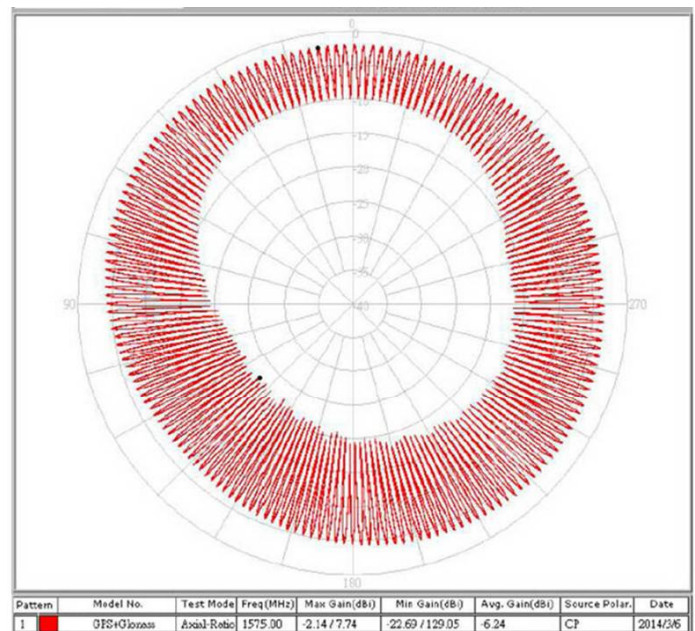


YZ-Plane@1602MHz

## Radiation Patterns

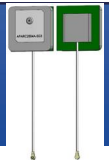


Axial Ratio@1561MHz



Axial Ratio@1575MHz

# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3

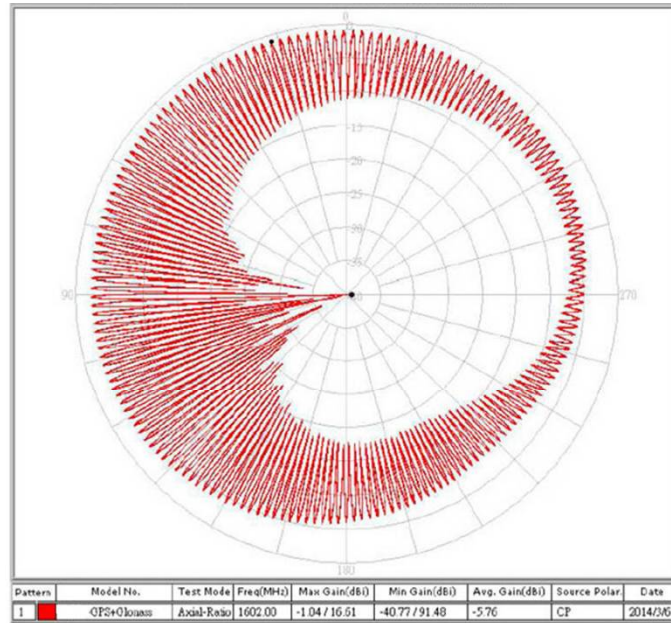


ESD Sensitive



25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## Radiation Patterns



Axial Ratio@1602MHz

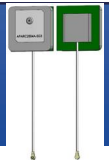
## Environmental Conditions

Item	Spec
Operational Temperature	-40°C to + 85°C
Storage Temperature	-40°C to + 105°C
Relative Humidity	40% to 95%

## Packaging

1. EPE foam – 52\*43\*5mm
2. Vacuum bag – 60\*45mm/ 365\*300\*25mm/30pcs/anti-ESD
3. Plastic bag – 420\*560\*0.12mm/anti-ESD
4. Carton box – 390\*320\*290mm (450pcs/Carton)
5. GW – 7.62KG
6. MSL: Not Applicable

# Active GPS/GLONASS/Beidou Ceramic Patch



APARC2504A-SG3



ESD Sensitive

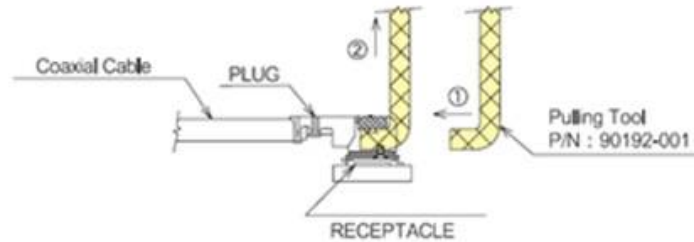


25.0 x 25.0 x 7.4 mm  
RoHS/RoHS II Compliant  
MSL = N/A

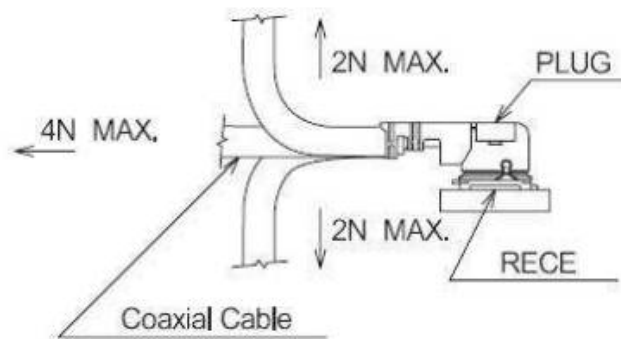
## Plugs Usage Precautions

### Mating / Unmating

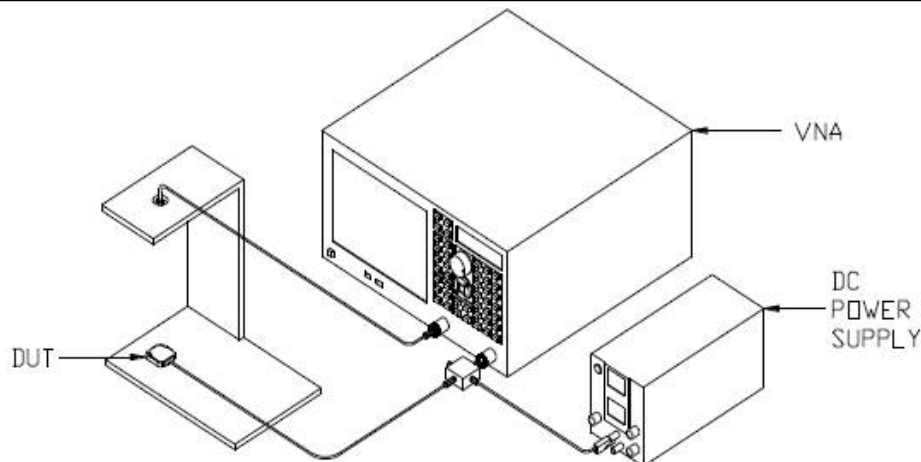
To disconnect connectors, insert the end portion of I-PEX under the connector flanges and pull off vertically, in the direction of the connector mating axis. (2) To mate the connectors, the mating axes of both connectors must be aligned and the connectors can be mated. The “click” will confirm fully mated connection. Do not attempt to insert on an extreme angle



Pull forces on the cable after connectors are mated. After the connectors are mating, do not apply a load to the cable in excess of the values indicated in the diagram below.



## Test Setup and Measurement



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REVISED: 11.12.2018

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