

### Features:

-  Ultra low noise 30dB amplifiers
-  Stacked L1 / L5 patch antenna
-  Single RF input with DC bias
-  High rejection filters to suppress out of band interference
-  ESD Protected
-  For 15dB version use P/N: GNSSL1L5182515

### Applications:

-  GPS, Glonass, Galileo, Beidou, IRNSS
-  Multiband satellite navigation receivers
-  L1 and L5 band devices

### Electrical specifications<sup>1</sup> @ 25° C

| Antenna type | Nominal Impedance | Polarization | Radiation pattern |
|--------------|-------------------|--------------|-------------------|
| Patch        | 50Ω               | RHCP         | Directional       |

|                                        |               |               |
|----------------------------------------|---------------|---------------|
| Frequency (MHz)                        | L1: 1561-1602 | L5: 1164-1214 |
| Return Loss (dB)                       | < -10         | < -13         |
| Radiating Element Peak Gain (dBi/dBic) | >4/4          | >1.2/-4.6     |
| Avg. Efficiency (%)                    | >80           | >50           |
| LNA Gain (dB) Typical                  | 28            | 30            |
| Noise Figure (dB)                      | 1.7 @1575MHz  | 2.2 @1164MHz  |
| Operating Voltage <sup>2</sup> (V)     | 2.5 - 18      |               |
| Power Consumption                      | Max. 16mA     |               |

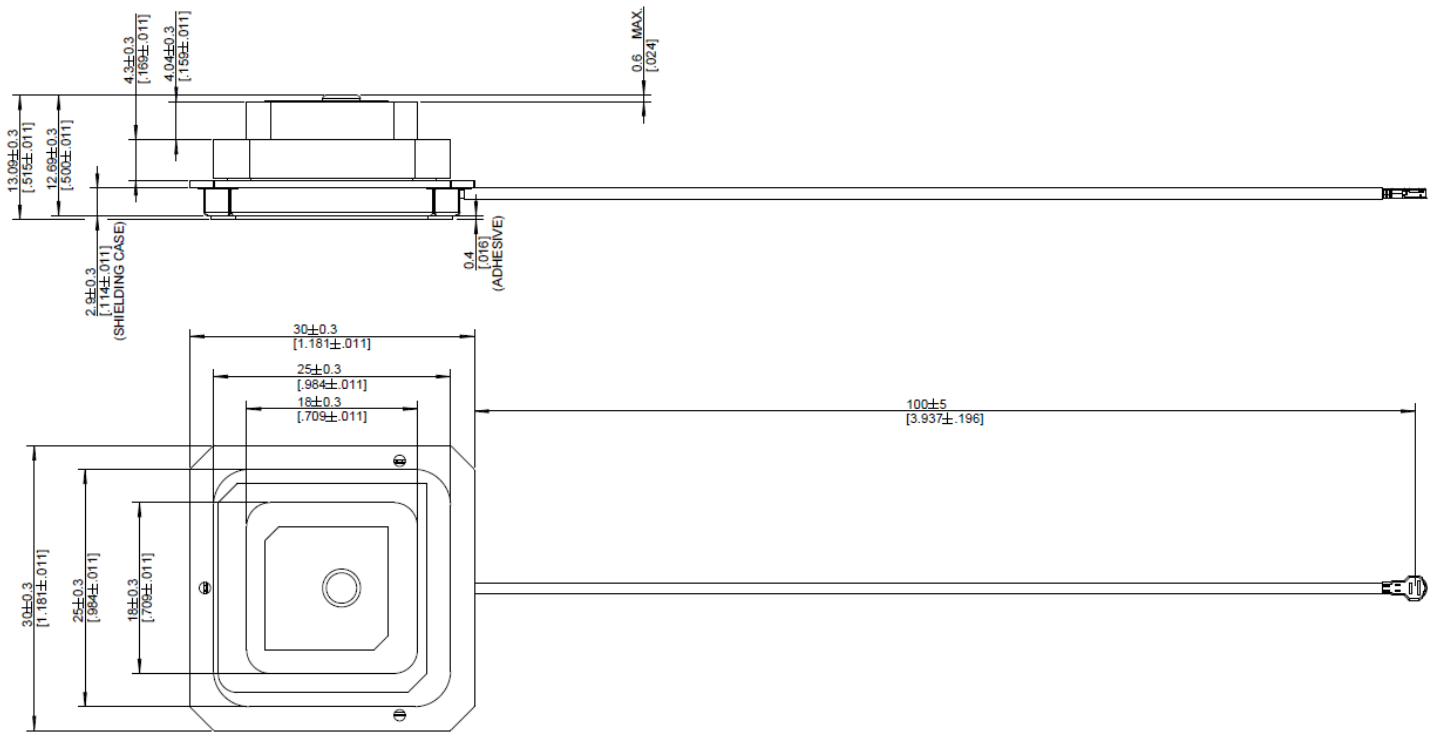
### Mechanical Specifications

| Dimension                             | Color    | Antenna Material  | Connector Type                     | Cable Type |
|---------------------------------------|----------|-------------------|------------------------------------|------------|
| Length x Width x Height (w/o cable)   |          |                   |                                    |            |
| 30mm*30mm*12.69mm/1.181"x1.181"x.500" | Gray     | Ceramic+PCB+cable | I-PEX MHF                          | Ø1.13mm    |
| Cable Length                          | Weight   | RoHS- Compliant   | Storage and operating Temperature: |            |
| 100mm/3.937"                          | 12 grams | Yes               | -40°C to 85°C                      |            |

#### Notes:

- The product is ESD sensitive, must be handled carefully and strictly according to the ESD requirements.
- LNA internal voltage stabilized by LDO (Low dropout regulator)

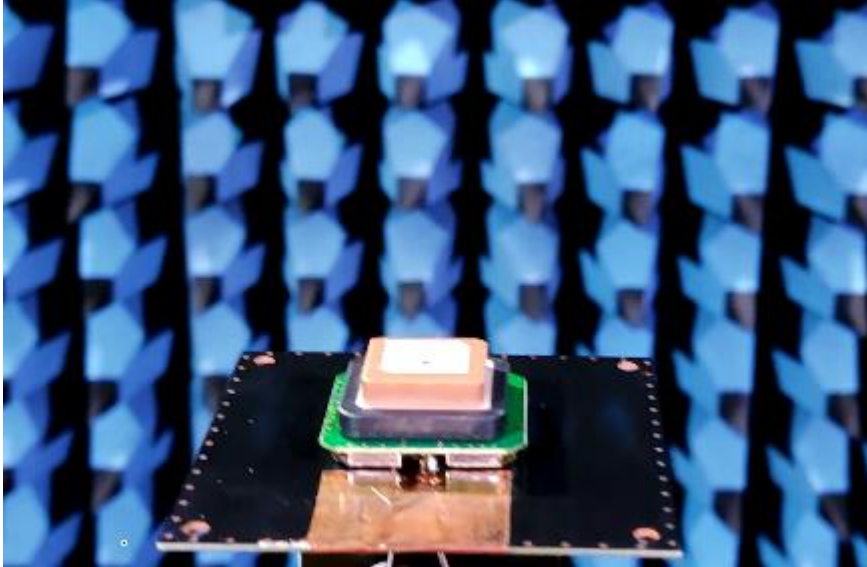
Mechanical Drawing



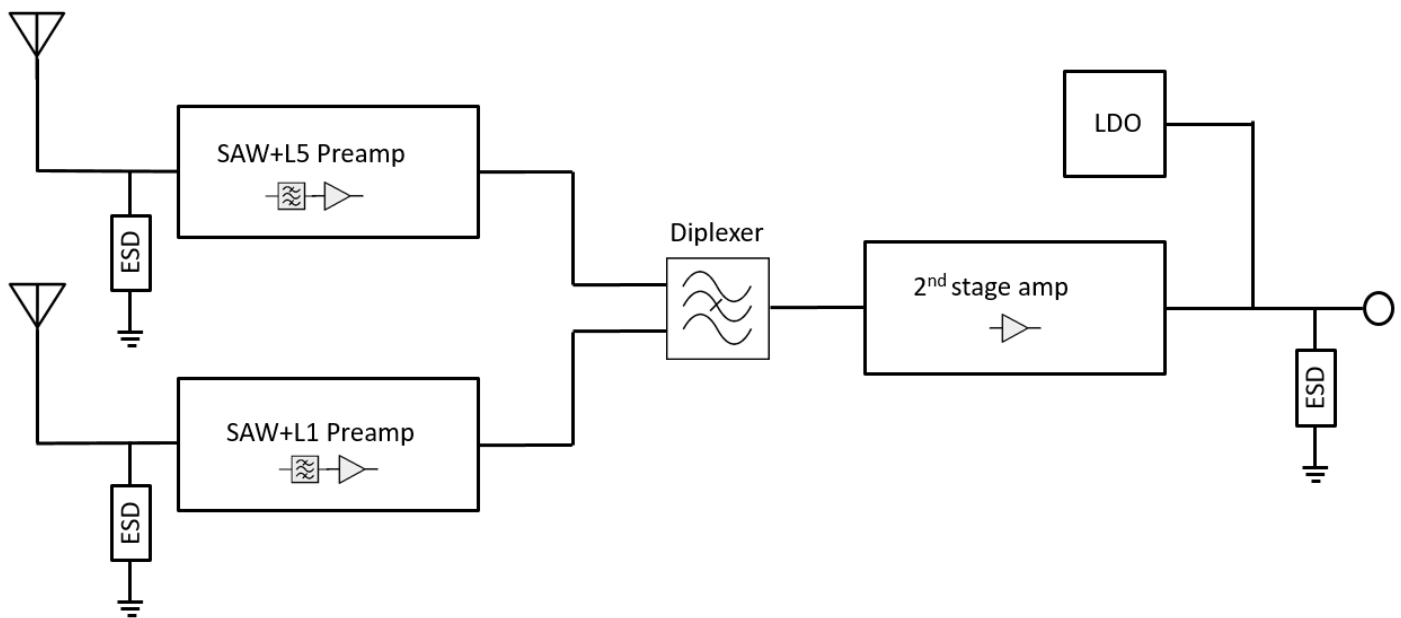
All dimensions are in mm / inches

## Testing Setup

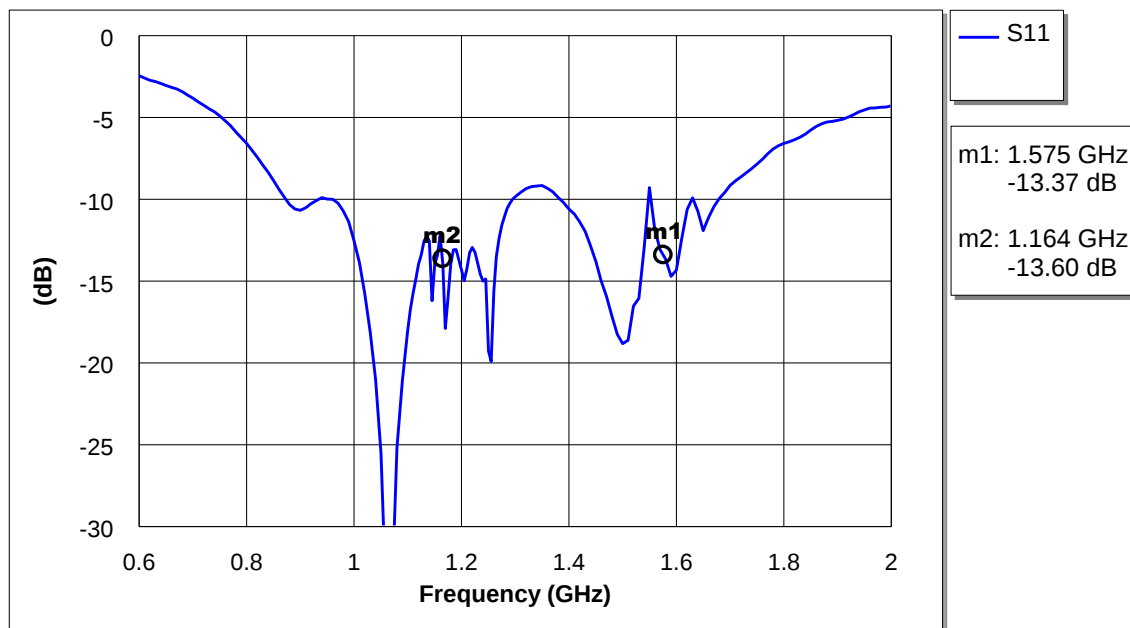
Module is tested on 80\*80mm ground plane.



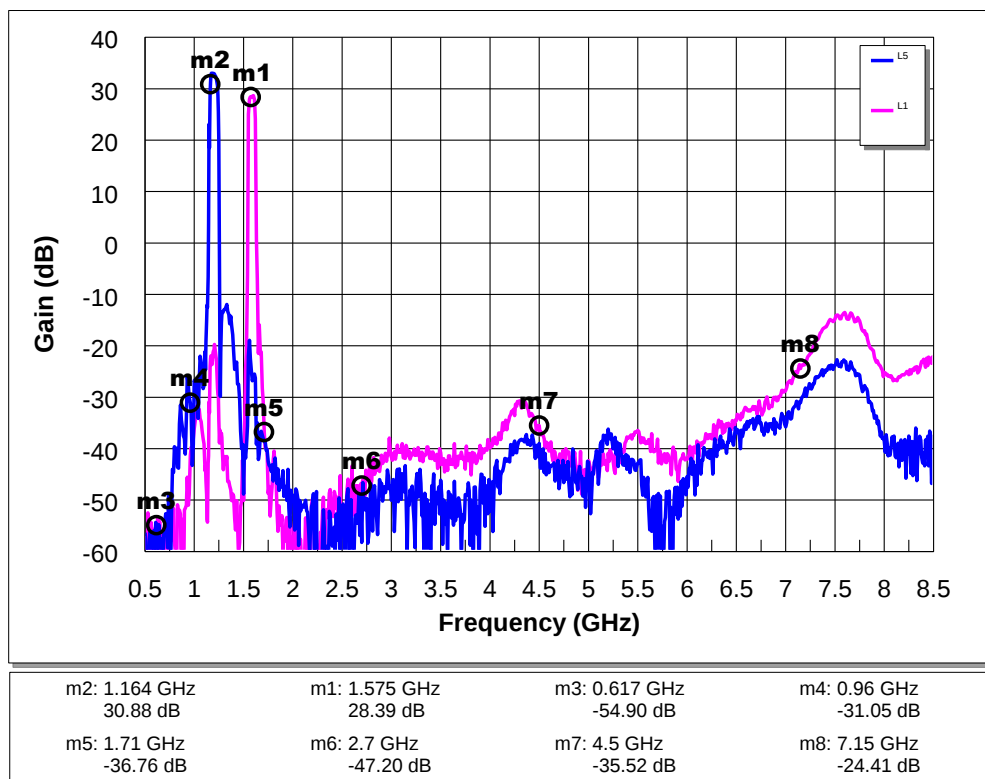
## Active Antenna Block Diagram



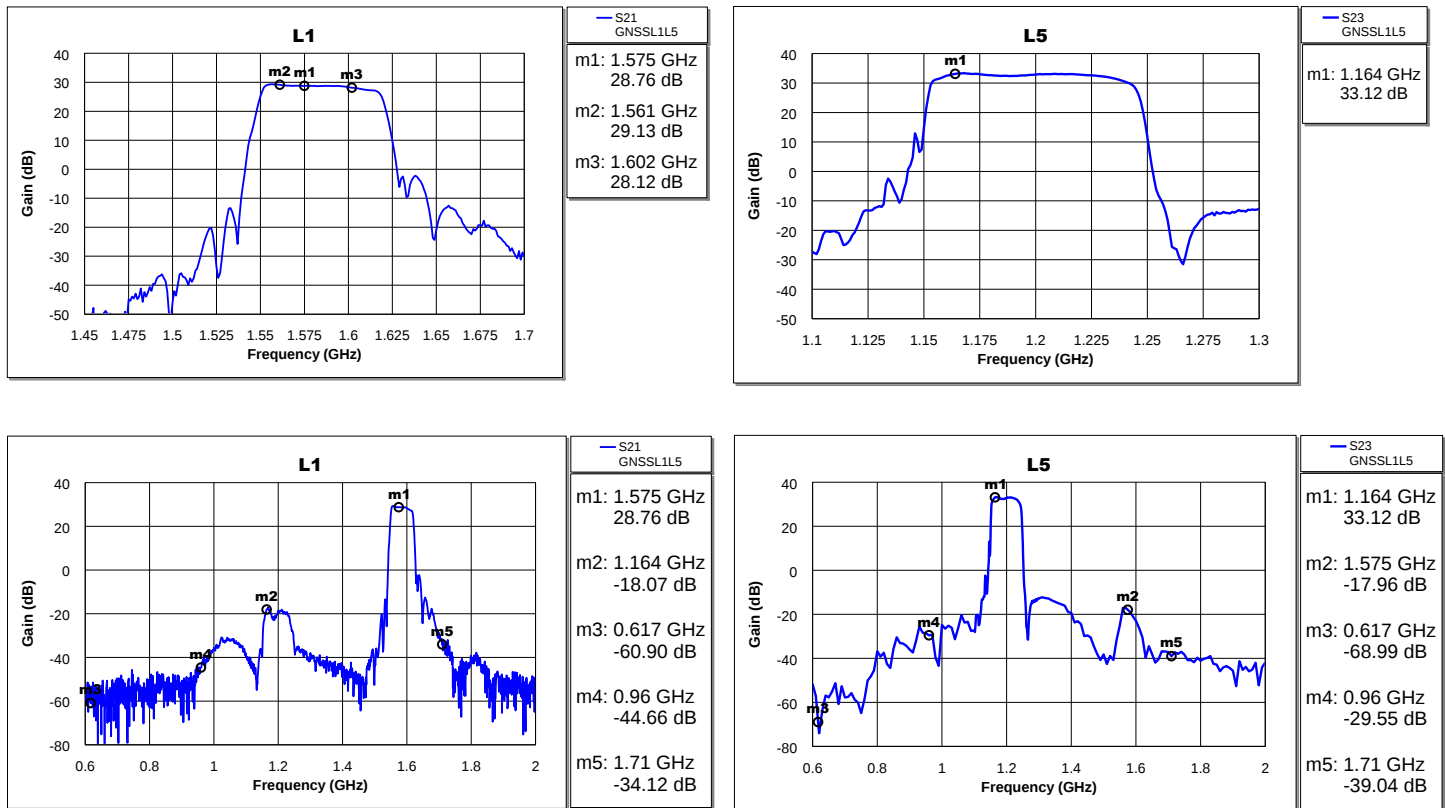
## Return Loss



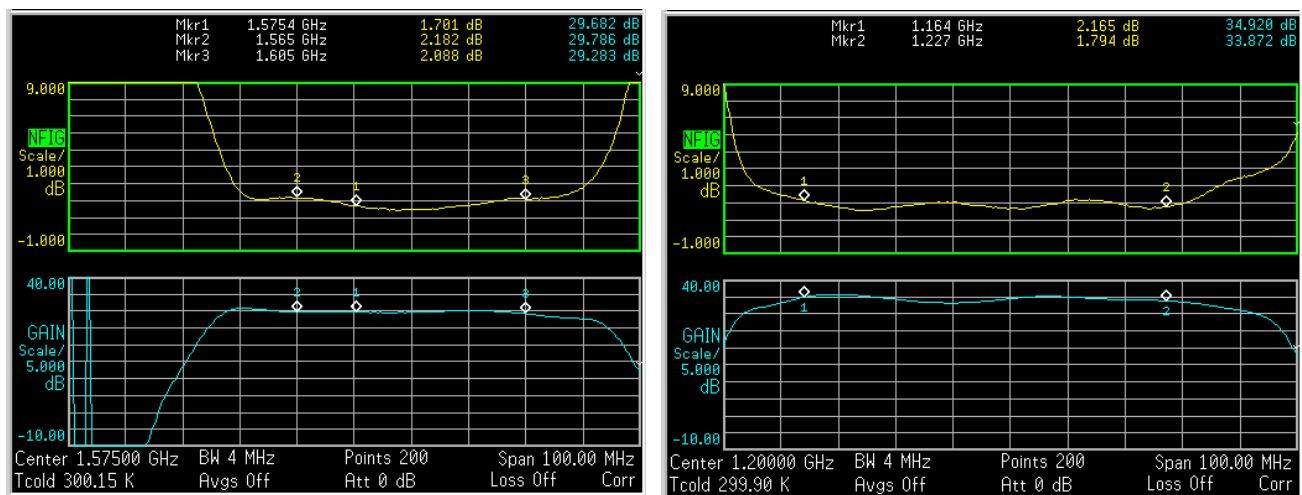
## LNA Out of band rejection



## LNA Gain



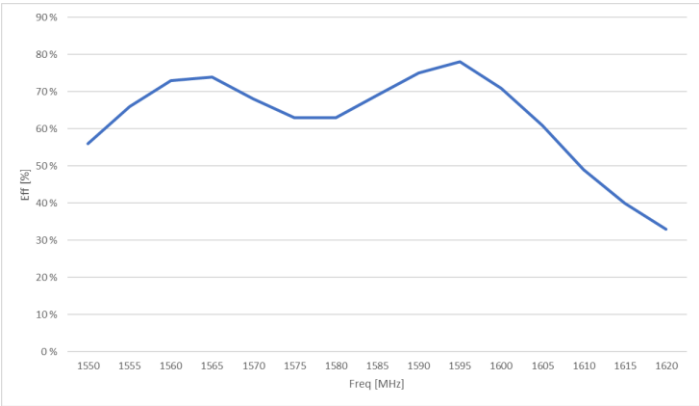
## LNA Noise Figure



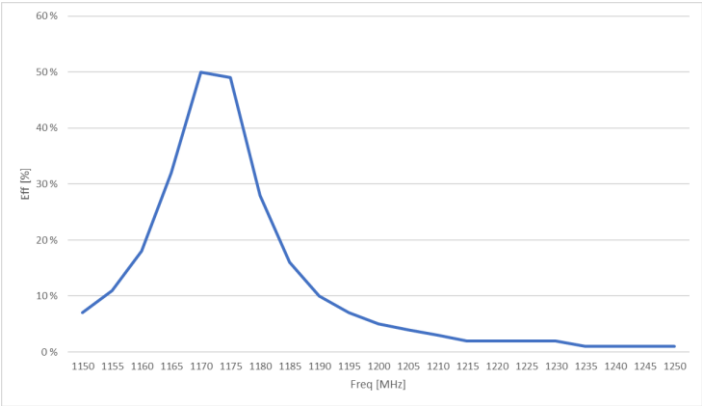
L1 Noise Figure

L5 Noise Figure

Radiating Element Efficiency

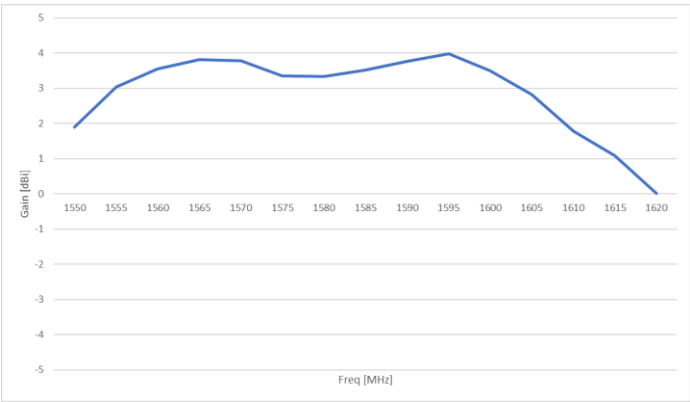


L1 Band

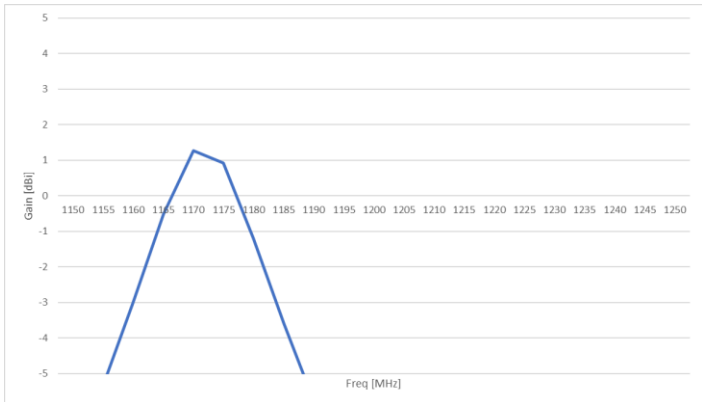


L5 Band

Radiating Element Peak Gain (Linear)

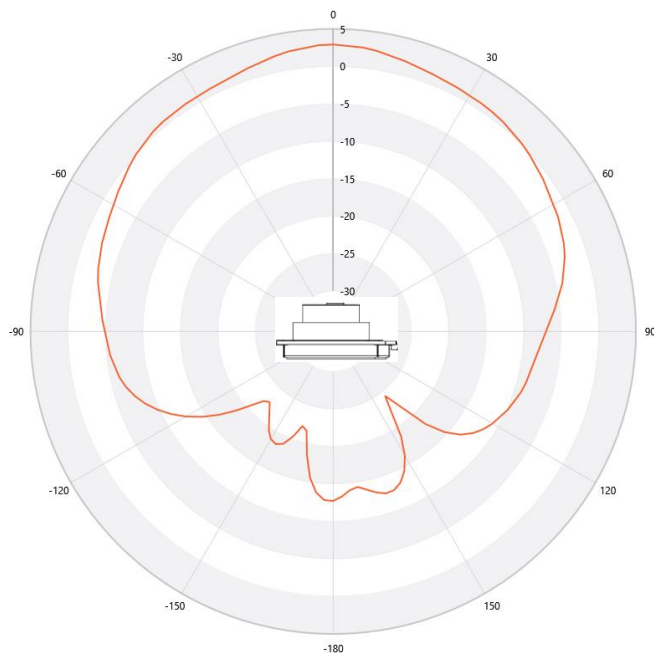


L1 Band

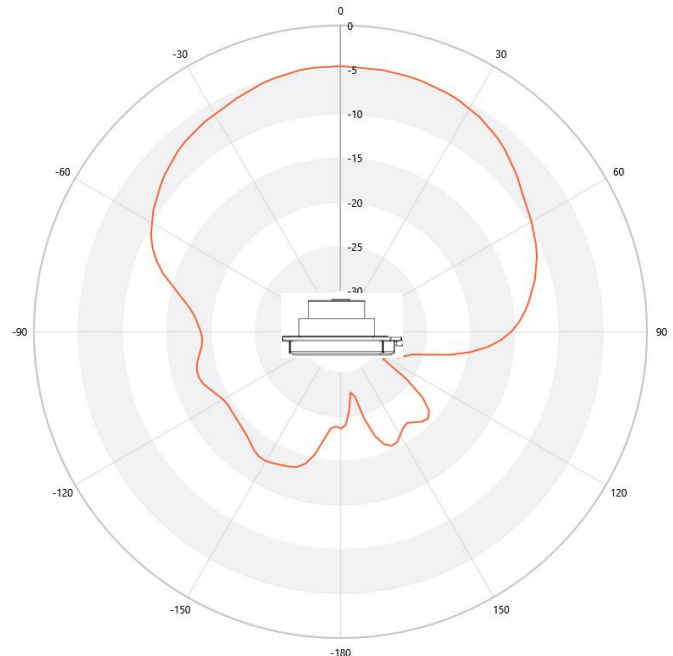


L5 Band

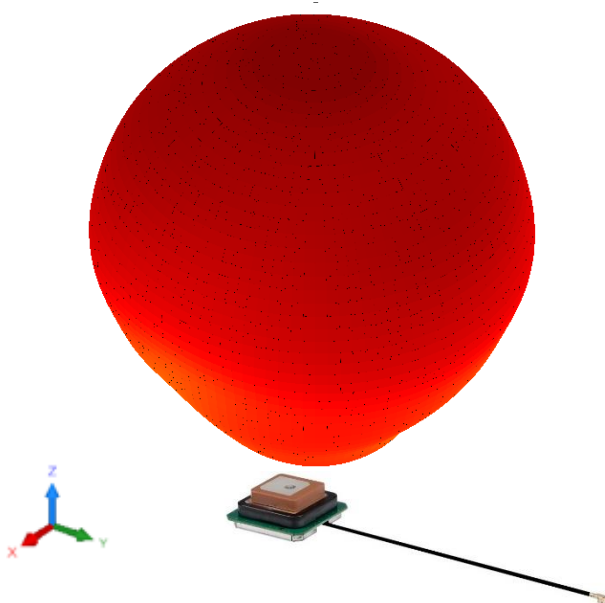
## Radiation Patterns RHCP (dBic)



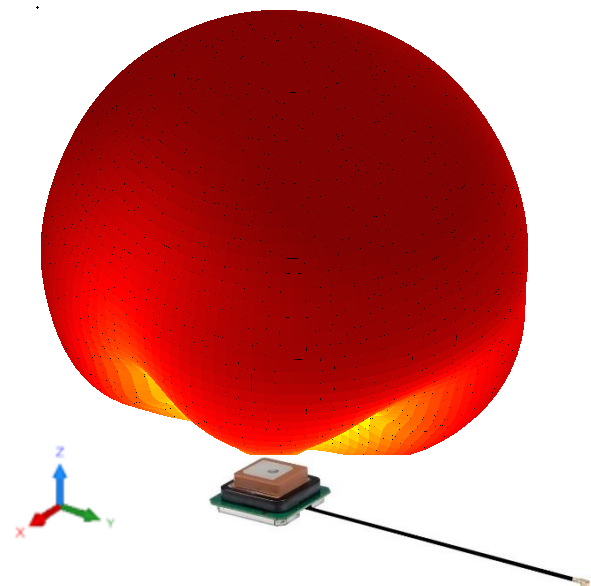
L1 RHCP Pattern @1575 MHz



L5 RHCP Pattern @1164 MHz



L1 3D RHCP Pattern @1575 MHz



L5 3D RHCP Pattern @1164 MHz

## Reliability Tests

|                    |                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature change | -40°C to +85 °C, MIL-STD 810G Method 503.5.<br>1.Room Temperature to -40 °C (2hours) 2.Storage for 2 hours at -40 °C 3. -40 °C to 85 °C (2hours) 4. Storage for 2 hours at 85 °C 5. 85 °C to -40 °C ( 2hours) 6.Repeat from 2 to 5 for 5 times 7. -40 °C increase to room temperature within 2 hours (Total 44 Hrs)<br>No loss of function after tests.             |
| Storage test       | -40°C to +85°C, MIL STD 810G Method 501.5 (high) Method 502.5 (low)<br>1.Room Temperature to -40°C within 2 hours 2.Storage for 24 hours at -40°C; 3. -40°C to room temperature within 2 hours 4.Room Temperature to +85°C within 2 hours 5.Storage for 24 hours at 85°C; 6. 85°C room temperature within 2 hours(Total 56 Hrs)<br>No loss of function after tests. |
| Shock test         | 1.Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks) 2.Peak value: 1,500g's 3.Duration: 0.5ms 4.Waveform: Half si. No loss of function after tests.                                                                                                                                       |
| Drop test          | Drop test (single device) for mounted device, the antenna needs to be fixed to PCB and then assemble PCBA into the covers for the test, please do the test with Armadillo antenna, only need the PCB and top/bottom cover for the tests.                                                                                                                            |
| Vibration test     | Random vibration input of 60 min/axis, all three perpendicular axis. Transportation frequency 5-500 Hz using Fig 514.6C-I and Table 514.6-II of MIL STD 810G section 514.6, performed only upon customer request., no loss of function after tests.                                                                                                                 |
| ESD Test           | According to IEC/EN 61000-4-2 Electromagnetic compatibility<br>Test voltage ±2KV, voltage polarity: + and - Discharge times: 3 times per polarity, discharge frequency: 1 time/second                                                                                                                                                                               |

## Package

### Antennas packed in tray (ESD requirements according to DIN EN 61340-5.1) and carton box

Each antenna wrapped in foam bag  
240 PCS/ carton box  
Carton box dimensions (MM): 405x300x180

#### For More Information:

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