GPS + Iridium Multiband Ceramic Patch Antenna

APARM2504-C2GR

Features

- GPS (L1) + Iridium multiband patch antenna
- Low VSWR of 1.8
- Gain of 2 dBi (GPS L1) and 3 dBi (Iridium)

Applications

- IoT
- Handheld devices
- Telematics
- Transportation
- Remote Monitoring
- Satellite telephony
- Tracking
- Fleet and asset monitoring

Electrical Specifications

<table>
<thead>
<tr>
<th>Parameters</th>
<th>GPS</th>
<th>Iridium</th>
<th>Units</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Frequency</td>
<td>1575.42 ± 1.023</td>
<td>1610 ~ 1625</td>
<td>MHz</td>
<td></td>
</tr>
<tr>
<td>Center Frequency</td>
<td>1586 ± 3</td>
<td></td>
<td>MHz</td>
<td></td>
</tr>
<tr>
<td>Bandwidth</td>
<td>44</td>
<td></td>
<td>MHz</td>
<td>Min. @ RL : -10 dB</td>
</tr>
<tr>
<td>VSWR</td>
<td>1.8</td>
<td></td>
<td></td>
<td>Max.</td>
</tr>
<tr>
<td>Gain</td>
<td>2.0</td>
<td>3.0</td>
<td>dBi</td>
<td>Typ. @ Zenith</td>
</tr>
<tr>
<td>Impedance</td>
<td>50</td>
<td></td>
<td>Ω</td>
<td></td>
</tr>
</tbody>
</table>

Note: The above-mentioned values apply only for the standard ground plane size of 65.0 x 50.9 mm.

Environmental Specifications

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Specification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +105°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°C to +105°C</td>
<td></td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>0 ~ 95 %</td>
<td></td>
</tr>
<tr>
<td>Frequency Temperature Coefficient (Tf)</td>
<td>-40°C to +105°C</td>
<td>0 ± 20 ppm / °C</td>
</tr>
<tr>
<td>Soldering Feed Pin Temperature</td>
<td>+290°C</td>
<td>Max. for 3 second</td>
</tr>
</tbody>
</table>

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**Product Dimensions**

![Diagram of the product dimensions with dimensions: 25.1 x 25.1 x 4.0 mm, RoHS/RoHS II Compliant, MSL = Not Applicable, and part number APARM2504-C2GR.]

**Unit:** mm

**Layout Dimensions**

![Diagram of the layout dimensions, showing top and bottom sides with thru holes, ground, and TOL: ±0.2, UNIT:mm.]

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Tape Dimensions

1. NITTO NO. 5015
2. Double-coated adhesive tape for industrial use
3. Thickness: 0.12mm
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25.1 x 25.1 x 4.0 mm
RoHS/RoHS II Compliant
MSL = Not Applicable

Test Fixture Dimension

![Diagram of the antenna dimensions](image)

Bottom side

Top side

Unit: mm

Test Fixture Set-up and Measurement

![Diagram of the test fixture set-up](image)
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Return Loss

![Return Loss Graph](https://www.abracon.com)

25.1 x 25.1 x 4.0 mm
RoHS/RoHS II Compliant
MSL = Not Applicable
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VSWR

25.1 x 25.1 x 4.0 mm
RoHS/RoHS II Compliant
MSL = Not Applicable

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Impedance Characteristics
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Radiation Pattern

Measurement Plane

25.1 x 25.1 x 4.0 mm
RoHS/RoHS II Compliant
MSL = Not Applicable

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Radiation Pattern

GPS : 1575.42 MHz

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Model No.</th>
<th>Test Mode</th>
<th>Freq(MHz)</th>
<th>Max Gain(dB)</th>
<th>Min Gain(dB)</th>
<th>Avg. Gain(dB)</th>
<th>Source Polar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>APARM2504-C2GR</td>
<td>XZ</td>
<td>1575.42</td>
<td>3.56/0.00</td>
<td>-8.44/116.00</td>
<td>-1.19</td>
<td>V+H</td>
</tr>
<tr>
<td>2</td>
<td>APARM2504-C2GR</td>
<td>YZ</td>
<td>1575.42</td>
<td>3.49/0.00</td>
<td>-8.62/122.00</td>
<td>-1.21</td>
<td>V+H</td>
</tr>
</tbody>
</table>
Radiation Pattern

Iridium: 1621 MHz

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Model No.</th>
<th>Test Mode</th>
<th>Freq (MHz)</th>
<th>Max Gain (dB)</th>
<th>Min Gain (dB)</th>
<th>Avg. Gain (dB)</th>
<th>Source Polar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>APARM2504-C2GR</td>
<td>XZ</td>
<td>1621.00</td>
<td>4.48 / 359.00</td>
<td>-7.91 / 122.00</td>
<td>-0.38</td>
<td>V+H</td>
</tr>
<tr>
<td>2</td>
<td>APARM2504-C2GR</td>
<td>YZ</td>
<td>1621.00</td>
<td>4.32 / 359.00</td>
<td>-8.01 / 116.00</td>
<td>-0.36</td>
<td>V+H</td>
</tr>
</tbody>
</table>
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**APARM2504-C2GR**

**Reliability Test**

<table>
<thead>
<tr>
<th>Test Condition</th>
<th>Test Exposure and Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Temperature test</td>
<td>Expose the specimen to -40°C for 400 hours and then to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.</td>
</tr>
<tr>
<td>High-temperature test</td>
<td>Expose the specimen to +105°C for 400 hours and then to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.</td>
</tr>
<tr>
<td>High-temperature/high-humidity test</td>
<td>Subject the object to the environmental conditions of +60°C and 90-95% relative humidity for 96 hours, then expose it to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.</td>
</tr>
<tr>
<td>Thermal shock test</td>
<td>Subject the object to cyclic temperature change (-40°C for 2 hours, then +85°C for 2 hours) for 100 cycles, then expose to normal temperature/humidity for 24 hours or more.</td>
</tr>
<tr>
<td>Sinusoidal vibration test</td>
<td>Subject the object to vibrations of 5 to 200 to 5 Hz swept in 10 minutes, 4.5 G at maximum (2 mm amplitude), in X and Y directions for two hours each and in Z direction for four hours. After this test, examine its appearance functions.</td>
</tr>
<tr>
<td>Vibration test in packaged condition</td>
<td>Subject the object, which is packaged as illustrated, to vibrations of 15 to 60 to 15 Hz swept in 6 minutes, 4 G at maximum (2 mm amplitude at maximum), applied in X, Y and Z directions for two hours each, i.e. six hours in total. After this test, examine its appearance and functions.</td>
</tr>
<tr>
<td>Free fall test in packaged condition</td>
<td>Drop the object, which is packaged as illustrated, to a concrete surface from the height of 90 cm, on one corner, three edges and six faces once each, i.e. 10 times in total. After this test, examine its appearance and functions.</td>
</tr>
<tr>
<td>Soldering heat resistance test</td>
<td>After the lead pins of the unit are soaked in solder bath at 260 ± 5°C for 10 seconds. After this test, examine its appearance and functions.</td>
</tr>
<tr>
<td>Adhesion test</td>
<td>The device is subjected to be soldered on test PCB. Then apply 0.5 Kg (5 N) of force for 5±1 second in the direction of parallel to the substrate (the soldering should be done by reflow and be conducted with care so that the soldering is uniform and free of defect by stress such as heat shock).</td>
</tr>
</tbody>
</table>
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Packaging

Each carton holds pieces of antennas and is of dimension 330 x 280 x 254 mm.

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