### Specification

<table>
<thead>
<tr>
<th>Part No.</th>
<th>PC104.07.0165C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name</td>
<td>Penta-Band PCB Antenna</td>
</tr>
<tr>
<td>Feature</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GSM / CDMA / DCS / PCS / WCDMA / UMTS / HSDPA / GPRS / EDGE 850/900/1800/1900/2100 MHz bands High Efficiency 164.9mm Ø 1.37 coaxial cable with IPEX connector 80mm * 20.8mm * 1mm Low profile With 3M adhesive, easy stick on client enclosure RoHS Compliant</td>
</tr>
</tbody>
</table>
1. Introduction

The high efficiency PC104 Penta-band PCB antenna’s slim-line design allows for convenient installation inside the customer device. Omni-directional gain across all bands ensures constant reception and transmission.

With its unique dipole design, the PC104 has exceptional industry performance characteristics considering its very low profile at 2.4mm and has a compact size 80mm*20mm. It is suitable for clients that appreciate highest performance with lower price.

This antenna has 3M adhesive on the back, and is tuned and designed to be mounted on 2mm thickness plastic (not on metal).

Cable lengths and connectors are fully customizable. However for good efficiency performance the shortest cable length should not be less than 100mm, for requirements with shorter cable lengths the alternative product the FXP.14 can be used.

2. Specification

### Electrical

<table>
<thead>
<tr>
<th>GSM Band</th>
<th>Frequency (MHz)</th>
<th>Peak Gain (dBi)*</th>
<th>Average Gain (dBi)*</th>
<th>Efficiency (%)*</th>
<th>Return Loss (dB)*</th>
<th>Polarization</th>
<th>Impedance</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSM 850</td>
<td>824~896</td>
<td>0.77</td>
<td>-3.26</td>
<td>47</td>
<td>&lt; -7</td>
<td>Linear</td>
<td>50Ω</td>
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<tr>
<td>GSM 900</td>
<td>880~960</td>
<td>0.99</td>
<td>-2.92</td>
<td>51</td>
<td>&lt; -5</td>
<td></td>
<td></td>
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<tr>
<td>DCS</td>
<td>1710~1880</td>
<td>2.26</td>
<td>-1.32</td>
<td>73</td>
<td>&lt; -10</td>
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<td></td>
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<tr>
<td>PCS</td>
<td>1850~1990</td>
<td>2.13</td>
<td>-1.59</td>
<td>69</td>
<td>&lt; -10</td>
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<td></td>
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<tr>
<td>WCDMA I</td>
<td>1920~2170</td>
<td>2.39</td>
<td>-1.52</td>
<td>70</td>
<td>&lt; -10</td>
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</tbody>
</table>

### Mechanical

- **Antenna Dimensions**: 80mm x 20mm x 1mm
- **Material**: FR4
- **Cable type**: Ø1.37 Coaxial Cable
- **Cable length**: 164.9mm
- **Connector type**: IPEX
- **Adhesive**: 3M 467

### Environmental

- **Operation Temp.**: -40°C ~ +85°C
- **Storage Temp.**: -40°C ~ +85°C

* Antenna is tested on a 2mm thickness ABS material base substrate.
3. Antenna Characteristics

3.1 Return Loss

![Return Loss Graph](image)

3.2 Maximum Gain

![Maximum Gain Graph](image)
3. Antenna Characteristics

3.3 Average Gain

![Average Gain Graph]

3.4 Efficiency

![Efficiency Graph]
4. Antenna Radiation Patterns

4.1 Antenna setup in 3D Anechoic chamber
Radiation Patterns

XY Plane

- 824MHz
- 880MHz
- 960MHz
- 1710MHz
- 1880MHz
- 1990MHz
- 2170MHz

(dBi)
Radiation Patterns

XZ Plane

- 824MHz
- 880MHz
- 960MHz
- 1710MHz
- 1880MHz
- 1990MHz
- 2170MHz

(dBi)
## 5. Technical Drawing

### Technical Details

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>P/N</th>
<th>Material</th>
<th>Finish</th>
<th>QTY</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>PC104 PCB</td>
<td>100212K0100XXA</td>
<td>FR4 1t</td>
<td>Black</td>
<td>1</td>
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<tr>
<td>2</td>
<td>1.37 Coaxial Cable</td>
<td>OD.137.AD</td>
<td>FEP</td>
<td>Black</td>
<td>1</td>
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<tr>
<td>3</td>
<td>IPEX MHFI</td>
<td>IPEX.MHFHT.137</td>
<td>Brass</td>
<td>Gold</td>
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<tr>
<td>4</td>
<td>Heat Shrink Tube</td>
<td>001313E0000002A</td>
<td>PE</td>
<td>Black</td>
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<td>5</td>
<td>3M Adhesive</td>
<td>001012K000000XXA</td>
<td>3M 9448</td>
<td>N/A</td>
<td>1</td>
</tr>
</tbody>
</table>

### Diagrams

- **Top View**
- **Side View**
- **Bottom View**
6. Application Note

We measured PC.104 antenna with different cable length, the results as below,

Return Loss

![Return Loss graph]

Antenna Efficiency

![Antenna Efficiency graph]
7. Packaging

100 pcs antenna per small PE bag
5 small PE bags per big PE bag
500 pcs antennas per big PE bag

Unit: mm

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