



SHENZHEN SUNWAY COMMUNICATION CO., LTD

Test Report

TS20130403001

Test Report

Product Name: PCB ANT

Model: BLE-(02540)

Client: /

Test category: Sample submission testing



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| | | | |
|-----------------|---|------------------|---------------------------|
| Product Name | PCB ANT | Model | / |
| Client | / | Test category | Sample submission testing |
| Factory | / | DATE | 2013-04-03 |
| Quantity | 1PCS | Sample Submitter | / |
| No. | TS20130403001 | | |
| Test Item | 1. Passive | | |
| Test Conclusion | The test results are presented in the table below | | |
| Note | | | |

Approved by:

Reviewed by:

Primary inspector:

Position: Director of the Testing Center



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1. General testing conditions:

- 1) This report is only valid for the tested sample.
- 2) This report does not represent the appraisal of this product by the certification body or authorized institution.
- 3) This document is only valid as a whole. Without the written permission of this testing center, no part of this report may be reproduced.

2 Test items and requirements:

2.1 Antenna efficiency test (Passive): The test frequency is 2600~2700MHZ, with points taken every 10MHz.

3 Test equipment:

3.1 Environmental conditions in the testing area:

| | | |
|-------------------------------------|--|---------|
| Temperature: | Temperature: Minimum: 20°C, Maximum: 25°C | |
| Relative humidity: | Relative humidity: Minimum: 40%, Maximum: 70% | |
| Darkroom dimensions: | Darkroom dimensions: 10m (L) × 3.6m (W) × 3.6m (H) | |
| Shielding effect $\geq 90\text{dB}$ | frequency range: | 0.45-6G |
| Impedance of the grounding system | $<1\Omega$ | |

3.2 Information of the device under test:

| | | | |
|---------------------------|--------------|--------|---|
| Name: | PCB Antenna; | Brand: | / |
| Model: | BLE-(02540) | | |
| Operating frequency band: | 2400~2500MHZ | | |



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4 Test conditions:

4.1 Outline of the device under test:

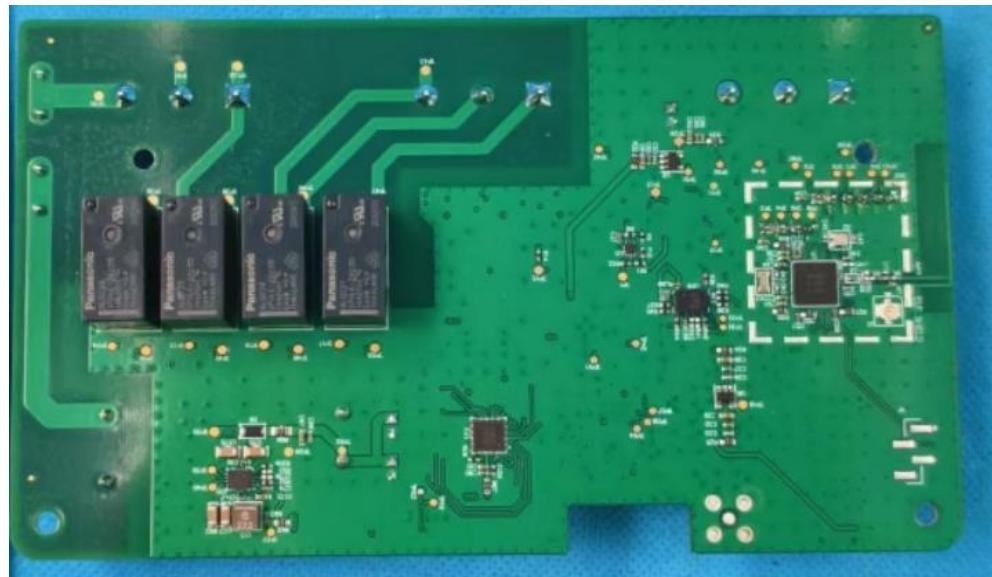
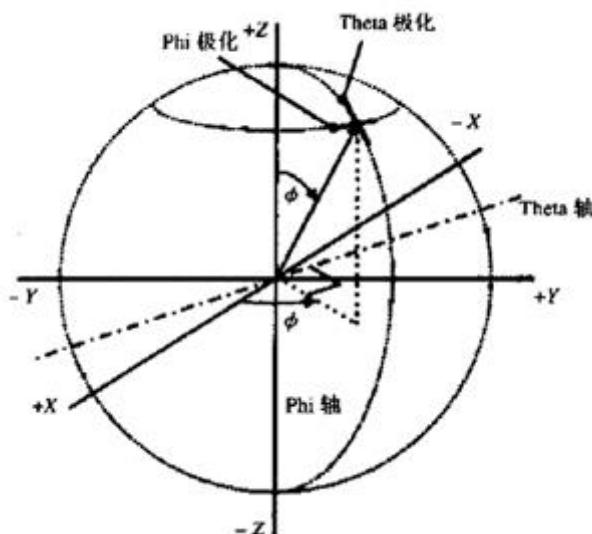


Figure 1 Appearance of the sample

4.2 Coordinate system:



Z-axis/Phi-axis: Aligned with the direction of the antenna of the mobile phone under test.

Theta angle: The angle formed with the positive direction of the Z axis, with a rotation range of 0~180°.

Y-axis: perpendicular to the side of the phone

X-axis/Theta-axis: Perpendicular to the front of

Figure 3 Coordinate system

5 Test method:

5.1 Antenna efficiency test (Passive):

The radio frequency radiation performance of the EUT is measured by measuring its effective isotropic radiating efficiency at different positions on a 3-dimensional sphere. The rotation steps for the Theta and Phi axes are 30°, and tests are not required when the



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Theta angle is at 0° and 180°. That is, there are a total of 60 measurement points on a 3-dimensional spherical surface. The EUT is the EUT are tested using horizontally polarized and vertically polarized antennas, respectively. Then, all measured values are integrated over the spherical surface to obtain the total antenna efficiency and antenna gain.

6 Test results:

6.1 Antenna efficiency (Passive):

| Model | Test Mode | Frequency (MHz) | Efficiency (dB) | Efficiency (%) | Gain (dBi) |
|-------------|------------|-----------------|-----------------|----------------|------------|
| BLE-(02540) | free space | 2400 | -4.6 | 34.7 | 2.96 |
| | | 2410 | -4.6 | 34.5 | 2.96 |
| | | 2420 | -4.8 | 33.3 | 2.86 |
| | | 2430 | -4.6 | 34.4 | 2.96 |
| | | 2440 | -4.4 | 36.0 | 3.16 |
| | | 2450 | -4.6 | 34.4 | 2.96 |
| | | 2460 | -4.5 | 35.2 | 3.06 |
| | | 2470 | -4.7 | 33.6 | 2.86 |
| | | 2480 | -4.8 | 33.4 | 2.86 |
| | | 2490 | -4.6 | 35.0 | 3.06 |
| | | 2500 | -4.4 | 36.0 | 3.26 |

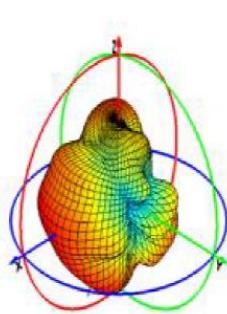


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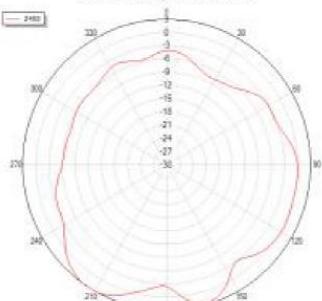
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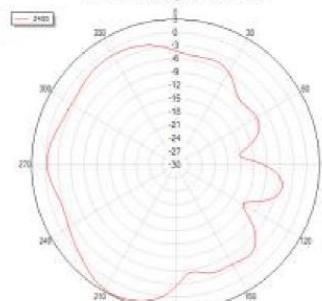
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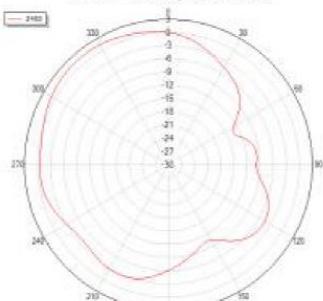
Phi=0 freq=2400MHz



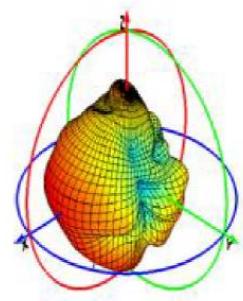
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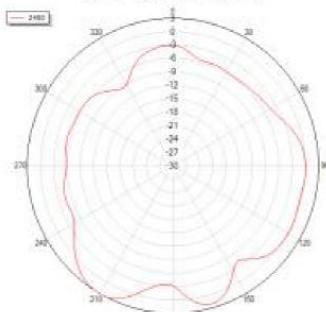
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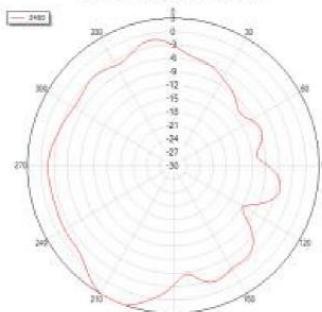
XOY



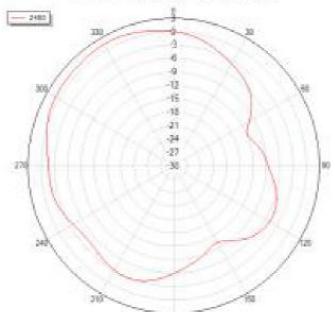
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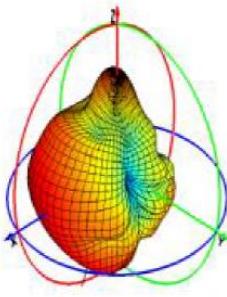
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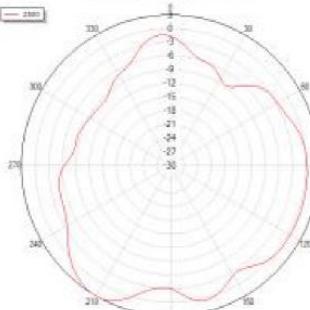
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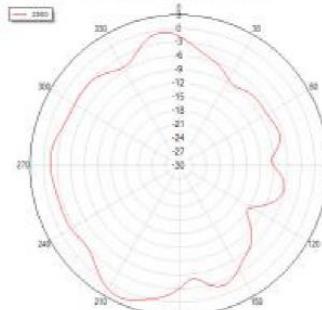
XOZ



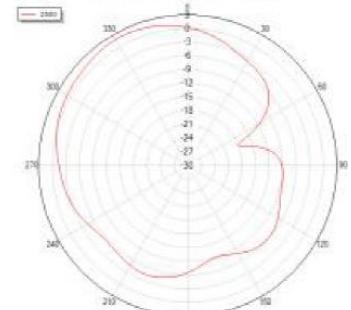
Phi=0 freq=2500MHz



Phi=90 freq=2500MHz



Theta=90 freq=2500MHz



YOZ



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7 Main testing equipment:

| Serial number | Name | Model | Equipment serial number | Calibration validity period |
|---------------|----------------------|-------------|-------------------------|-----------------------------|
| 1 | Anechoic Chamber | ETS-8600 | CT-0000464 | December 22, 2013 |
| 2 | Comprehensive tester | 8960-E5515C | MY50267249 | December 27, 2013 |
| 3 | Network Analyzer | E5071C | MY46213550 | March 22, 2014 |

8 Test time: April 3, 2013.

9 Test location: This testing activity was completed on the first floor of the north wing of Building A, Special Development Information Port, High-tech Industrial Park, Nanshan District, Shenzhen, Guangdong Province.

*****This report ends here*****