

## RADIO TEST REPORT

For

SHENZHEN SAMHOO SCI&TECH CO.,LTD

Digital Two Way Radio

Test Model: SPM6015

Prepared for : SHENZHEN SAMHOO SCI&TECH CO.,LTD  
Address : Room 401, Building 2th, Huaqiangyun Industrial Park, Meixiu Road, Meilin, Futian District, Shenzhen, China

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Date of receipt of test sample : April 25, 2016  
Number of tested samples : 1  
Serial number : Prototype  
Date of Test : April 25, 2016 ~ June 08, 2016  
Date of Report : June 08, 2016

**RADIO TEST REPORT**  
**FCC Per 47 CFR 2.1091(b)****Report Reference No.** ..... : **LCS1606231832E**

Date of Issue ..... : June 08, 2016

**Testing Laboratory Name** ..... : **Shenzhen LCS Compliance Testing Laboratory Ltd.**Address ..... : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,  
Bao'an District, Shenzhen, Guangdong, ChinaTesting Location/ Procedure ..... : Full application of Harmonised standards ☒  
Partial application of Harmonised standards ☐  
Other standard testing method ☐**Applicant's Name** ..... : **SHENZHEN SAMHOO SCI&TECH CO.,LTD**Address ..... : Room 401, Building 2th, Huaqiangyun Industrial Park, Meixiu  
Road, Meilin, Futian District, Shenzhen, China**Test Specification**

Standard ..... : FCC Per 47 CFR 2.1091(b)

Test Report Form No. .... : LCSEMC-1.0

TRF Originator ..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF ..... : Dated 2011-03

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**Test Item Description.** ..... : **Digital Two Way Radio**

Trade Mark ..... : Samhoo

Test Model ..... : SPM6015

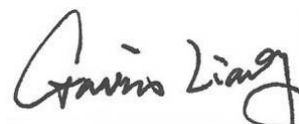
Ratings ..... : DC 13.6V by External DC power supply

**Result** ..... : **Positive****Compiled by:**

Aking Jin/ File administrators

**Supervised by:**

Glin Lu/ Technique principal

**Approved by:**

Gavin Liang/ Manager

**RADIO -- TEST REPORT****Test Report No. : LCS1606231832E**June 08, 2016  
Date of issue

Test Model..... : SPM6015

EUT..... : Digital Two Way Radio

**Applicant..... : SHENZHEN SAMHOO SCI&TECH CO.,LTD**Address..... : Room 401, Building 2th, Huaqiangyun Industrial Park, Meixiu  
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Road, Meilin, Futian District, Shenzhen, China

Telephone..... : /

Fax..... : /

**Test Result****Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**Revision History**

| Revision | Issue Date | Revisions     | Revised By  |
|----------|------------|---------------|-------------|
| 00       | 2016-06-08 | Initial Issue | Gavin Liang |
|          |            |               |             |
|          |            |               |             |

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## 1. GENERAL INFORMATION

### 1.1. Product Description for Equipment Under Test (EUT)

EUT : Digital Two Way Radio  
Test Model : SPM6015  
Power Supply : DC 13.6V by External DC power supply  
Hardware Version : SPM6000V2.0  
Software Version : V1.02.01.007  
Frequency Range : 136MHz-174MHz  
Channel Separation : Analog Voice 12.5KHz  
Digital Voice/Data 12.5KHz  
Digital Data 12.5KHz  
Modulation Type : FM for Analog Voice  
4FSK for Digital Voice/Digital Data  
4FSK for Digital Data  
Emission Designator : 11K0F3E for FM Modulation at 12.5KHz Channel Separation  
7K60FXD for Digital Data only at 12.5KHz Channel Separation  
7K60FXW for Digital Data & Digital Voice at 12.5KHz Channel Separation  
Antenna Description : External, 3.65dBi (Max)  
Rated Power : 50Watt/5Watts  
GPS Receiver :  
Receive Frequency : 1575.42MHz  
Channel Number : 1

**Note:** The product has the same digital working characters when operating in both two digitized voice/data mode. So only one set of test results for digital modulation modes are provided in this test report.

### 1.2. Objective

The tests were performed according to following standards:

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[KDB447498 v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

### 1.3. Related Submittal(s)/Grant(s)

No Related Submittals.

### 1.4. Description of Test Facility

CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

### 1.5. Support equipment List

| Manufacturer | Description | Model | Serial Number | Certificate |
|--------------|-------------|-------|---------------|-------------|
| --           | --          | --    | --            | --          |

### 1.6. External I/O

| I/O Port Description                 | Quantity | Cable |
|--------------------------------------|----------|-------|
| Micro SD Card Slot                   | 1        | N/A   |
| Handheld Microphone Interface        | 1        | N/A   |
| Accessories Interface                | 1        | N/A   |
| RF Antenna Base                      | 1        | N/A   |
| Power Interface                      | 1        | N/A   |
| Positioning Module Antenna Interface | 1        | N/A   |

### 1.7. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Description            | Error |
|------------------------|-------|
| ETS Filed Meter        | ± 3%  |
| Repeatability Accuracy | ± 7%  |

### 1.8. Test Environment

| Items                      | Required (IEC 68-1) | Actual   |
|----------------------------|---------------------|----------|
| Temperature (°C)           | 15-35               | 21       |
| Humidity (%RH)             | 25-75               | 50       |
| Barometric pressure (mbar) | 860-1060            | 950-1000 |

### 1.9. Description Of Test Modes

The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

| EUT operation mode no. | Description of operation mode | Additional information                                                                                                     |
|------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Op 1                   | FM+BW12.5KHz+TX               | The equipment is set with FM modulation and 12.5KHz bandwidth at maximum rated power for transmitter, powered by DC 13.60V |
| Op 2                   | FM+BW12.5KHz+TX               | The equipment is set with FM modulation and 12.5KHz bandwidth at minimum rated power for transmitter, powered by DC 13.60V |

|      |                                |                                                                                                                              |
|------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Op 3 | 4FSK+BW12.5KHz+TX              | The equipment is set with 4FSK modulation and 12.5KHz bandwidth at maximum rated power for transmitter, powered by DC 13.60V |
| Op 4 | 4FSK+BW12.5KHz+TX              | The equipment is set with 4FSK modulation and 12.5KHz bandwidth at minimum rated power for transmitter, powered by DC 13.60V |
| Op 5 | FM+BW12.5KHz+RX<br>(Standby)   | The equipment is set with FM modulation and 12.5KHz bandwidth at Receiver/Standby mode, powered by DC 13.60V                 |
| Op 6 | 4FSK+BW12.5KHz+RX<br>(Standby) | The equipment is set with 4FSK modulation and 12.5KHz bandwidth at Receiver/Standby mode, powered by DC 13.60V               |

### Test frequency list

| Modulation Type | Channel Separation | Test Channel | Test Frequency (MHz) |          |
|-----------------|--------------------|--------------|----------------------|----------|
|                 |                    |              | TX                   | RX       |
| Analog/FM       | 12.5KHz            | Ch1          | 150.825              | 150.825  |
|                 |                    | Ch2          | 158.55               | 158.55   |
|                 |                    | Ch3          | 173.3875             | 173.3875 |
| Digital/4FSK    | 12.5KHz            | Ch7          | 150.825              | 150.825  |
|                 |                    | Ch8          | 158.55               | 158.55   |
|                 |                    | Ch9          | 173.3875             | 173.3875 |

## **2. SYSTEM TEST CONFIGURATION**

### **2.1. Justification**

The system was configured for testing in engineering mode.

### **2.2. EUT Exercise Software**

N/A.

### **2.3. Special Accessories**

N/A.

### **2.4. Block Diagram/Schematics**

Please refer to the related document.

### **2.5. Equipment Modifications**

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

### **2.6. Configuration of Test Setup**

Please refer to the test setup photo.

### 3. Method of measurement

#### 3.1. EME measurements made on trunk mounted antennas

##### 3.1.1. External/Bystander vehicle EME measurement

(Antenna mounted in trunk center)

With the field meter and probe, take ten (10) measurements, at the standard test distance of 60 cm to the antenna, from the back of the vehicle in a vertical line and then average the results. These measurements are taken and recorded at every twenty (20) centimeters over a range starting at twenty (20) centimeters above ground and ending at 2.0 meters.

The offered antennas mounted at the center of the trunk were assessed at the rear of the vehicle while maintaining a minimum of twenty (20) centimeter separation distance between the probe sensor and vehicle body. The worst case tested at a 45° radial at the corner of the trunk, and 90° radial at the side of the trunk.

##### 3.1.2. Internal /Passenger vehicle EME measurement

(Antenna mounted in trunk center)

While rotating field meter probe through 180 degrees to ensure that the highest level is found, scan the inside of the vehicle, both front and back seating areas, for the highest level in each location. After the highest level is found, scan vertically making two (2) additional measurements within an area approximately 40 cm wide (representing the width of a person) so as to have a total of three (3) measured points as indicated below that will be averaged.

- a) Head area
- b) Chest area
- c) Lower Trunk area

#### 3.2. EME measurements made on center roof mounted antennas

##### 3.2.1. External/Bystander vehicle EME measurement

With the field meter and probe, take ten (10) measurements, at the standard test distance of 110 cm from the vehicle-mounted antenna, The measurement probe is positioned orthogonal to antenna (typically parallel to ground with a vertically mounted antenna) and tested around the car in 35 degree steps among 180 degree, aimed directly at the antenna's axis. Recorded worst case at positioned orthogonal to antenna (typically parallel to ground with a vertically mounted antenna); Then average the results. These measurements are taken and recorded at every twenty (20) centimetres over a range starting at twenty (20) centimetres above ground and ending at 2.0 meters; this would be representative of a person standing next to a vehicle during a mobile radio transmission.

##### 3.2.2. Internal/Passenger vehicle EME measurement

The probe handle is oriented parallel (horizontal) to the ground and pointed towards the back of the vehicle. The probe handle is not oriented normal to the seat surface. The probe head (incorporating the field sensors) is scanned continuously (using the max-hold function available in the meter) along three test axes which are parallel to the seat angle (intended as the line determined by the intersection of the plane of the seat and the plane of the backrest) and are 20 cm from the seat surface. One test axis is at the Head height, another is at the Chest height, and another is at the Lower Trunk height. The maximum field level value recorded for each test axis is logged. The MPE is determined by averaging these three maximum values regardless of the

geometrical location where they were observed. For instance, the locations of the three maxima may lie on different vertical (relative to ground) lines.

While rotating field meter probe through 180 degrees to ensure that the highest level is found, scan the inside of the vehicle, both front and back seating areas, for the highest level in each location. After the highest level is found, scan vertically making two (2) additional measurements within an area approximately 40 cm wide (representing the width of a person) so as to have a total of three (3) measured points as indicated below that will be averaged.

- a) Head area
- b) Chest area
- c) Lower Trunk area

## 4. Approved Accessories

**Antenna:****Model:** TQC-150DII**Roof Mount:** 136MHz-174MHz**Gain:** 3.65dBi**Vehicle:****Band:** BYD**Model:** F6

## 5. Test Result

The following table's present detailed MPE measurement information for each test configuration; person external or internal to the vehicle, TX frequency, antenna (location, model and gain), distance from antenna to probe sensor, E/H field measurements, calibration factor, MPE average over body, initial power, power density calc, power density max calc, IEEE controlled and uncontrolled limits and maximum output power.

The Average over Body test methodology is consistent with IEEE/ANSI C95.3-2002 guidelines

MPE results are based on a 50% duty cycle which is in accordance with the User Manual instructions.

Below is an explanation of how the MPE results are calculated.

External to vehicle - 10 measurements are averaged over the body (Body\_Avg).

Internal to vehicle - 3 measurements are averaged over the body (Body\_Avg).

ETS Field Meter measures in percent of the controlled limit. Therefore the averages over the body used in the calculations below reflect percentages

MPE results are based on a Push-To-Talk (PTT) 50% duty cycle in CW mode.

Therefore;

$$\text{Average \_ over \_ Body} = \text{Body \_ Avg} * \text{Controlled \_ Limit}$$

$$\text{Pwr \_ Density \_ Calc} = \text{Average \_ over \_ Body} * \text{Duty \_ Cycle}$$

$$\text{Pwr\_Density\_Max\_Calc} = \text{Pwr\_Density\_Calc} * \frac{\text{Max\_Output\_Power}}{\text{Initial\_Output\_Power}}$$

Note; For Initial Output Power > Max\_Output\_Power, Max\_Output\_Power / Initial Output Power = 1

| Measurement Information                  |                                 |             |             |
|------------------------------------------|---------------------------------|-------------|-------------|
| Measurement Frequency (MHz)              | 150.825                         | 158.550     | 173.3875    |
| Raw Data Power(W)                        | 48.7528                         | 48.4172     | 50.9331     |
| Controlled Limit(mW/cm <sup>2</sup> )    | 1.0000                          | 1.0000      | 1.0000      |
| Uncontrolled Limit(mW/cm <sup>2</sup> )  | 0.2000                          | 0.2000      | 0.2000      |
| Calibration                              | 1.00                            | 1.00        | 1.00        |
| Antenna / gain(dBi)                      | Whip / 3.65                     | Whip / 3.65 | Whip / 3.65 |
| External Vehicle Power Density(50% duty) | Average over body/2             |             |             |
| Internal Vehicle Power Density(50% duty) | Average over (head/chest/leg)/2 |             |             |

| External Vehicle MPE Assessment at 150.825 MHz |               |                           |               |                    |                       |                                    |
|------------------------------------------------|---------------|---------------------------|---------------|--------------------|-----------------------|------------------------------------|
| Antenna Location                               | Antenna/ gain | Measurement Distance (cm) | E/H Field     | Calibration Factor | Average Over Body     | Pwr. Density (mW/cm <sup>2</sup> ) |
| Trunk                                          | Whip / 3.65   | 60                        | E             | 1.00               | 0.108                 | 0.054                              |
| Measurement Grid                               |               |                           |               |                    |                       |                                    |
| Test position                                  | Height (cm)   | % of controlled limit     | Test position | Height (cm)        | % of controlled limit |                                    |
| 1                                              | 20            | 7.74%                     | 6             | 120                | 34.45%                |                                    |
| 2                                              | 40            | 12.36%                    | 7             | 140                | 29.16%                |                                    |
| 3                                              | 60            | 17.17%                    | 8             | 160                | 21.41%                |                                    |
| 4                                              | 80            | 23.23%                    | 9             | 180                | 18.08%                |                                    |
| 5                                              | 100           | 29.19%                    | 10            | 200                | 14.42%                |                                    |

| External Vehicle MPE Assessment at 158.550 MHz |               |                           |               |                    |                       |                                    |
|------------------------------------------------|---------------|---------------------------|---------------|--------------------|-----------------------|------------------------------------|
| Antenna Location                               | Antenna/ gain | Measurement Distance (cm) | E/H Field     | Calibration Factor | Average Over Body     | Pwr. Density (mW/cm <sup>2</sup> ) |
| Trunk                                          | Whip / 3.65   | 60                        | E             | 1.00               | 0.188                 | 0.094                              |
| Measurement Grid                               |               |                           |               |                    |                       |                                    |
| Test position                                  | Height (cm)   | % of controlled limit     | Test position | Height (cm)        | % of controlled limit |                                    |
| 1                                              | 20            | 7.01%                     | 6             | 120                | 35.56%                |                                    |
| 2                                              | 40            | 12.22%                    | 7             | 140                | 30.07%                |                                    |
| 3                                              | 60            | 18.81%                    | 8             | 160                | 25.25%                |                                    |
| 4                                              | 80            | 24.04%                    | 9             | 180                | 19.99%                |                                    |
| 5                                              | 100           | 30.32%                    | 10            | 200                | 15.05%                |                                    |

## External Vehicle MPE Assessment at 173.3875 MHz

| Antenna Location | Antenna/gain | Measurement Distance (cm) | E/H Field | Calibration Factor | Average Over Body | Pwr. Density (mW/cm <sup>2</sup> ) |
|------------------|--------------|---------------------------|-----------|--------------------|-------------------|------------------------------------|
| Trunk            | Whip / 3.65  | 60                        | E         | 1.00               | 0.152             | 0.076                              |

## Measurement Grid

| Test position | Height (cm) | % of controlled limit | Test position | Height (cm) | % of controlled limit |
|---------------|-------------|-----------------------|---------------|-------------|-----------------------|
| 1             | 20          | 7.64%                 | 6             | 120         | 36.06%                |
| 2             | 40          | 11.82%                | 7             | 140         | 31.31%                |
| 3             | 60          | 19.64%                | 8             | 160         | 23.16%                |
| 4             | 80          | 26.56%                | 9             | 180         | 21.02%                |
| 5             | 100         | 30.23%                | 10            | 200         | 12.13%                |

## External Vehicle MPE Assessment at 158.550 MHz

| Antenna Location | Antenna/gain | Measurement Distance (cm) | E/H Field | Calibration Factor | Average Over Body | Pwr. Density (mW/cm <sup>2</sup> ) |
|------------------|--------------|---------------------------|-----------|--------------------|-------------------|------------------------------------|
| Roof             | Whip / 3.65  | 60                        | E         | 1.00               | 0.177             | 0.089                              |

## Measurement Grid

| Test position | Height (cm) | % of controlled limit | Test position | Height (cm) | % of controlled limit |
|---------------|-------------|-----------------------|---------------|-------------|-----------------------|
| 1             | 20          | 6.16%                 | 6             | 120         | 33.24%                |
| 2             | 40          | 11.00%                | 7             | 140         | 29.34%                |
| 3             | 60          | 23.37%                | 8             | 160         | 26.01%                |
| 4             | 80          | 27.76%                | 9             | 180         | 18.86%                |
| 5             | 100         | 30.20%                | 10            | 200         | 12.24%                |

## Internal Vehicle MPE Assessment at 150.825 MHz

| Antenna Location | Antenna Gain | Measurement Distance (cm) | E/H Field | Calibration Factor | Average over Head, Chest, Leg Back/Front Seats (mW/cm <sup>2</sup> ) | Pwr. Density of Higher Level (mW/cm <sup>2</sup> ) |
|------------------|--------------|---------------------------|-----------|--------------------|----------------------------------------------------------------------|----------------------------------------------------|
| Trunk            | Whip / 3.65  | Highest Reading           | E         | 1.00               | 0.122/0.062                                                          | 0.061/0.031                                        |

## Measurement Grid

| Test position | % of controlled limit Head | % of controlled limit Chest | % of controlled limit Leg |
|---------------|----------------------------|-----------------------------|---------------------------|
| Back Seat     | 17.74%                     | 14.75%                      | 11.33%                    |
| Front Sea     | 10.34%                     | 8.79%                       | 6.51%                     |

| Internal Vehicle MPE Assessment at 158.550 MHz |              |                            |           |                             |                                                                      |                                                    |
|------------------------------------------------|--------------|----------------------------|-----------|-----------------------------|----------------------------------------------------------------------|----------------------------------------------------|
| Antenna Location                               | Antenna Gain | Measurement Distance (cm)  | E/H Field | Calibration Factor          | Average over Head, Chest, Leg Back/Front Seats (mW/cm <sup>2</sup> ) | Pwr. Density of Higher Level (mW/cm <sup>2</sup> ) |
| Trunk                                          | Whip / 3.65  | Highest Reading            | E         | 1.00                        | 0.161/0.087                                                          | 0.081/0.044                                        |
| Measurement Grid                               |              |                            |           |                             |                                                                      |                                                    |
| Test position                                  |              | % of controlled limit Head |           | % of controlled limit Chest |                                                                      | % of controlled limit Leg                          |
| Back Seat                                      |              | 29.11%                     |           | 23.03%                      |                                                                      | 18.98%                                             |
| Front Sea                                      |              | 14.44%                     |           | 12.07%                      |                                                                      | 8.82%                                              |

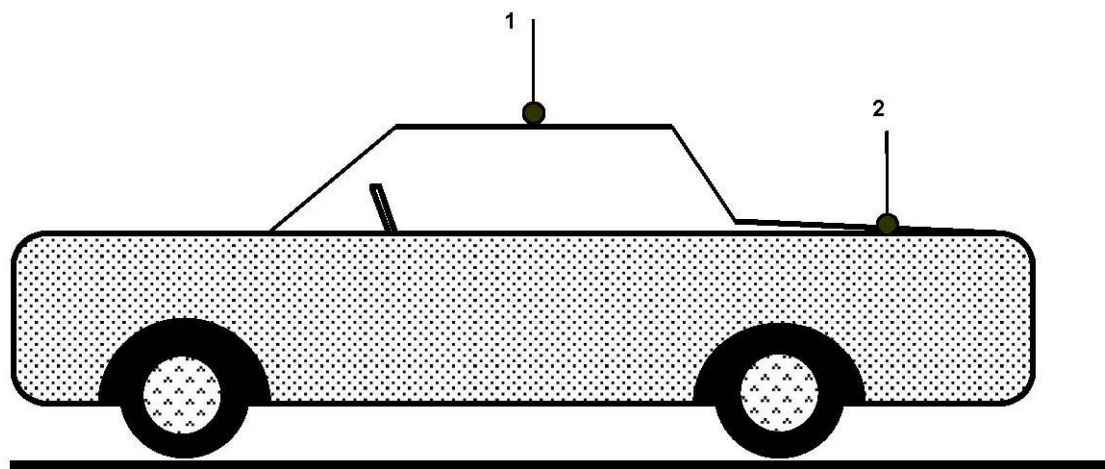
| Internal Vehicle MPE Assessment at 173.3875 MHz |              |                            |           |                             |                                                                      |                                                    |
|-------------------------------------------------|--------------|----------------------------|-----------|-----------------------------|----------------------------------------------------------------------|----------------------------------------------------|
| Antenna Location                                | Antenna Gain | Measurement Distance (cm)  | E/H Field | Calibration Factor          | Average over Head, Chest, Leg Back/Front Seats (mW/cm <sup>2</sup> ) | Pwr. Density of Higher Level (mW/cm <sup>2</sup> ) |
| Trunk                                           | Whip / 3.65  | Highest Reading            | E         | 1.00                        | 0.149/0.074                                                          | 0.075/0.037                                        |
| Measurement Grid                                |              |                            |           |                             |                                                                      |                                                    |
| Test position                                   |              | % of controlled limit Head |           | % of controlled limit Chest |                                                                      | % of controlled limit Leg                          |
| Back Seat                                       |              | 26.55%                     |           | 19.79%                      |                                                                      | 13.06%                                             |
| Front Sea                                       |              | 13.72%                     |           | 11.23%                      |                                                                      | 9.01%                                              |

| Internal Vehicle MPE Assessment at 158.550 MHz |              |                            |           |                             |                                                                      |                                                    |
|------------------------------------------------|--------------|----------------------------|-----------|-----------------------------|----------------------------------------------------------------------|----------------------------------------------------|
| Antenna Location                               | Antenna Gain | Measurement Distance (cm)  | E/H Field | Calibration Factor          | Average over Head, Chest, Leg Back/Front Seats (mW/cm <sup>2</sup> ) | Pwr. Density of Higher Level (mW/cm <sup>2</sup> ) |
| Roof                                           | Whip / 3.65  | Highest Reading            | E         | 1.00                        | 0.158/0.082                                                          | 0.079/0.041                                        |
| Measurement Grid                               |              |                            |           |                             |                                                                      |                                                    |
| Test position                                  |              | % of controlled limit Head |           | % of controlled limit Chest |                                                                      | % of controlled limit Leg                          |
| Back Seat                                      |              | 34.74%                     |           | 28.88%                      |                                                                      | 20.07%                                             |
| Front Sea                                      |              | 19.09%                     |           | 14.63%                      |                                                                      | 10.54%                                             |

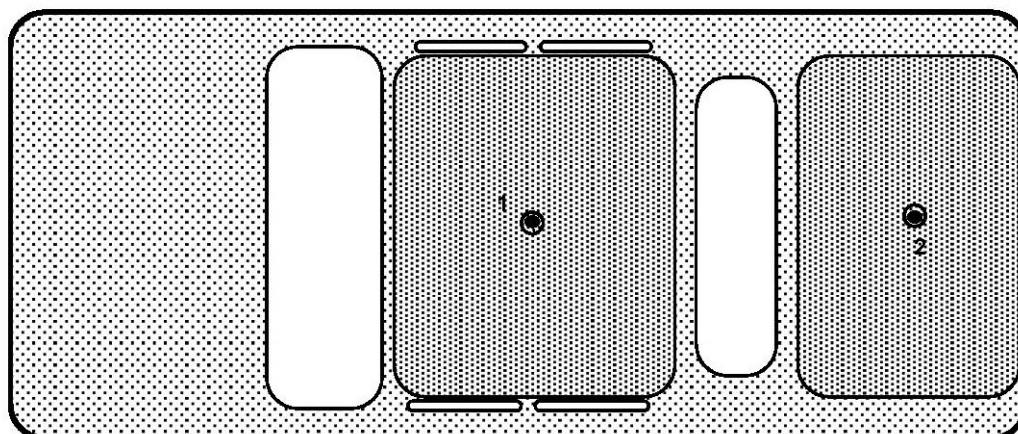
## 6. Conclusion

The measurement results comply with the FCC Limit Per 47 CFR 2.1091 (b) for the controlled RF Exposure.

## 7. Antenna Location Drawing



- 1 - Roof (center)  
2 - Trunk (center)



## 8. Probe Calibration Certificates



中国赛宝实验室  
(工业和信息化部电子第五研究所)  
CHINA CEPREI LABORATORY

# 校准证书

## CALIBRATION CERTIFICATE

证书编号: 2GB14003170-0001  
Certificate No.



委托单位: 广东省惠州市质量计量监督检测所

Client

委托方地址: 惠州市惠城区江北文明二路质监检测大楼

Address

仪器名称: 激光场强探头

Description

型号规格: HI-6105

Model/Type

制造商: ETS

Manufacturer

机身号: 00156104

Serial No.

校准日期: 2014-05-04

Cal. Date

结论: 按校准结果使用(Performance Tested Only)

Conclusion

校准:  
Calibrated by

刘君荣

核验:  
Inspected by

黄帅

签发:  
Approved by

杨桥新

无线电室主任  
Director of Radio  
Lab

印章:  
Stamp

赛宝计量检测中心

广州总部地址: 广州天河区东莞庄路110号

客服电话: 020-87237633 传真: 020-87236189

投诉电话: 020-87236896, 020-87236789

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CEPREI Calibration and Testing Center

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Website: www.ceprei-cal.com

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## 说 明

### DIRECTIONS

证书编号(Certificate No.) 2GB14003170-0001

1. 本机构是国家质量监督检验检疫总局授权的国家法定计量技术机构，授权证编号：(国)法计(2012)00068号。质量管理体系符合ISO/IEC 17025的要求，获得中国合格评定国家认可委员会(CNAS)认可，认可证书号为：CNAS L0462。

This laboratory is the legal metrological institute authorized by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, No. (国)法计(2012)00068. Its quality management system meets the ISO/IEC 17025 and is accredited by the China National Accreditation Service for Conformity Assessment, No. CNAS L0462.

2. 本机构出具的数据均可溯源到国家计量基准和国际单位制(SI)。

The data issued by this laboratory is traceable to national primary standards and International system of Units (SI).

3. 本次校准的技术依据(Reference documents):

IEEE 1309-2005、JJG 561-1988

4. 本次校准所使用的主要测量标准(Main measurement standards used during the calibration):

| 名 称<br>Description                                         | 技术指标<br>Specification                                                                                                                                                                                                                   | 有效期至<br>Due Date | 证书编号<br>Certificate No. |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------|
| 电场探头                                                       | $\pm 2.5\text{dB}$                                                                                                                                                                                                                      | 2014-08-16       | XDdj2013-2663           |
| 封闭式50 $\Omega$ 带状线<br>(TEM小室)                              | VSWR: $U_r=5.0\%(k=2)$ , 插入损耗: $U_r=0.01\text{dB}(k=2)$ , 阻抗: $U_r=10\%(k=2)$ ,                                                                                                                                                         | 2014-08-21       | XDdj2013-2701           |
| 功率放大器                                                      | Gain: $\geq 47\text{dB}$ ; Gain Flatness: $\pm 1.5\text{dB}$                                                                                                                                                                            | 2015-01-17       | 4GC14000016-0004        |
| EPM-P系列双通道功率计/<br>EPM-P Series Dual<br>Channel Power Meter | P: $\pm 0.5\%$                                                                                                                                                                                                                          | 2014-11-05       | 4GC13000316-0002        |
| ESG矢量信号发生器/ESG<br>Vector Signal Generator                  | f: $\pm 1 \times 10^{-7}$ ; L: $\pm 0.5\text{dB}$ ; AM: $\pm 5\%$ ;<br>FM: $\pm 3.5\%$ ; $\phi M$ : $\pm 5\%$ ; EVM: $0.5\%\text{rms}$<br>s ( $k=2$ ); 幅度误差: $0.35\%\text{rms}$ ( $k=2$ )<br>) ; 相位误差: $0.25^\circ\text{rms}$ ( $k=2$ ) | 2014-08-07       | 4GC13000245-0001        |

5. 校准地点(The location where the calibrations were carried out):

赛宝计量检测中心广州实验室

6. 环境条件(Environmental condition):

温度(Temperature): 23  $^{\circ}\text{C}$

相对湿度(Relative Humidity): 60 %

7. 证书数据页中"P"代表"合格", "F"代表"不合格", "N/A"代表"不适用".

(In the data sheet, "P" stands for "Pass", "F" stands for "Fail", "N/A" stands for "Not applicable".)

注: 1. 本证书未经本机构书面授权, 不得部分复制。

(The certificate shall not be partly reproduced without written approval of the laboratory.)

2. 本次校准结果仅与被校物有关。(The results are only related to the items calibrated.)



赛宝计量检测中心

CEPREI

CEPREI CALIBRATION &amp; TESTING CENTER

证书编号 (Certificate No.): 2GB14003170-0001

## 1 外观检查(Appearance Check)

结论  
(Pass/Fail)  
P

## 2 幅值线性(Amplitude Linearity)

| 频率<br>(Frequency)<br>(MHz) | 标准场强<br>(Reference)<br>(V/m) | 指示值<br>(Indicated)<br>(V/m) | 校准因子<br>Cal Factor<br>( ) |
|----------------------------|------------------------------|-----------------------------|---------------------------|
| 30                         | 2.00                         | 2.54                        | 0.787                     |
| 30                         | 10.00                        | 11.76                       | 0.850                     |
| 30                         | 20.00                        | 22.78                       | 0.878                     |
| 30                         | 30.00                        | 34.29                       | 0.875                     |
| 30                         | 50.00                        | 55.43                       | 0.902                     |
| 30                         | 80.00                        | 89.89                       | 0.890                     |
| 30                         | 100.00                       | 112.23                      | 0.891                     |

## 3 校准因子(Calibration Factor)

| 频率<br>(Frequency)<br>(MHz) | 标准场强<br>(Reference)<br>(V/m) | 指示值<br>(Indicated)<br>(V/m) | 校准因子<br>Cal Factor<br>( ) |
|----------------------------|------------------------------|-----------------------------|---------------------------|
| 10                         | 20.00                        | 21.93                       | 0.912                     |
| 30                         | 20.00                        | 22.78                       | 0.878                     |
| 50                         | 20.00                        | 22.15                       | 0.903                     |
| 100                        | 20.00                        | 22.65                       | 0.883                     |
| 200                        | 20.00                        | 22.03                       | 0.908                     |
| 300                        | 20.00                        | 22.10                       | 0.905                     |
| 400                        | 20.00                        | 20.77                       | 0.963                     |
| 500                        | 20.00                        | 25.61                       | 0.781                     |
| 600                        | 20.00                        | 27.06                       | 0.739                     |
| 700                        | 20.00                        | 29.20                       | 0.685                     |
| 800                        | 20.00                        | 34.42                       | 0.581                     |
| 900                        | 20.00                        | 22.22                       | 0.900                     |
| 1000                       | 20.00                        | 29.11                       | 0.687                     |



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## 3 校准因子(Calibration Factor) (Cont'd)

| 频率<br>(Frequency) | 标准场强<br>(Reference) | 指示值<br>(Indicated) | 校准因子<br>Cal Factor |
|-------------------|---------------------|--------------------|--------------------|
| (GHz)             | (V/m)               | (V/m)              | ( )                |
| 2                 | 20.00               | 19.92              | 1.004              |
| 3                 | 20.00               | 19.14              | 1.045              |
| 4                 | 20.00               | 18.52              | 1.080              |
| 5                 | 20.00               | 17.64              | 1.134              |
| 6                 | 20.00               | 18.52              | 1.080              |

## 附(Appendix):

关于测量结果不确定度的说明

(Directions of measurement uncertainty)

## 1 依据 (Reference Document)

JJF 1059.1-2012 测量不确定度评定与表示

( JJF 1059.1-2012 Evaluation and Expression of Uncertainty in Measurement)

2 本次测量结果的扩展不确定度(The expanded uncertainty of the measurement results)( $k=2$ )

## 2.1 校准因子(Calibration Factor)

1.1dB@(DC~300MHz)

1.4dB@(300MHz~1GHz)

1.8dB@(1GHz~18GHz)

以下空白/No data hereafter

.....The End of Report.....