*Full*

# TEST REPORT

## No. I17D00009-RFB

*For*

**Client : Hisense International Co., Ltd**

**Production : Smartphone**

**Model Name : Hisense F102**

**FCC ID: 2ADOBF102**

**Hardware Version: V1.00**

**Software Version: L1307.6.01.05.MX06**

**Issued date: 2017-02-20**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

**Test Laboratory:**

ECIT Shanghai, East China Institute of Telecommunications

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**Revision Version**

| Report Number | Revision | Date | Memo |
|---|---|---|---|
| I17D00009-RFB | 00 | 2017-02-20 | Initial creation of test report |

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# 1. Test Laboratory

## 1.1. Testing Location

| | |
|---|---|
| Company Name: | ECIT Shanghai, East China Institute of Telecommunications |
| Address: | 7-8F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China |
| Postal Code: | 200001 |
| Telephone: | (+86)-021-63843300 |
| Fax: | (+86)-021-63843301 |

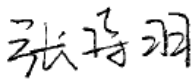
## 1.2. Testing Environment

| | |
|---|---|
| Normal Temperature: | 15-35℃ |
| Extreme Temperature: | -10/+55℃ |
| Relative Humidity: | 20-75% |

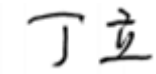
## 1.3. Project data

| | |
|---|---|
| Project Leader: | Yu Anlu |
| Testing Start Date: | 2017-01-10 |
| Testing End Date: | 2017-02-10 |

## 1.4. Signature



**Zhang Shiyu**
**(Prepared this test report)**



**Ding Li**
**(Reviewed this test report)**

**Zheng Zhongbin**
**Director of the laboratory**
**(Approved this test report)**

# 2. Client Information

## 2.1. Applicant Information

| | |
|---|---|
| Company Name: | Hisense International Co., Ltd |
| Address: | Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China |
| Postcode: | 266010 |
| Email: | zhangkelin@hisense.com |

## 2.2. Manufacturer Information

| | |
|---|---|
| Company Name: | Hisense Communications Co., Ltd. |
| Address: | 218 Qianwangang Road, Economic & Technological Development Zone, Qingdao, Shandong Province, P.R. China |
| Postcode: | 266510 |
| Email: | Xuxin2@hisense.com |

# 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

## 3.1. About EUT

| | |
|---|---|
| EUT Description | Smartphone |
| Model name | Hisense F102 |
| UMTS Frequency Band | WCDMA Band 2/4/5 |
| GSM Frequency Band | GSM850/900/1800/1900 |
| E-UTRA Frequency Band | FDD 2/4/5/7 |
| WLAN Frequency | 2412MHz-2472MHz |
| WLAN Channel | Channel1-Channel13 |
| WLAN type of modulation | 802.11b:DSSS<br>802.11g/n: OFDM |
| Extreme Temperature | -10/+55℃ |
| Nominal Voltage | 3.8V |
| Extreme High Voltage | 4.35V |
| Extreme Low Voltage | 3.5 V |

Note: Photographs of EUT are shown in ANNEX A of this test report.

## 3.2. Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version | Date of receipt |
|---|---|---|---|---|
| N10 | 008601601621565 | V1.00 | L1307.6.01.05.MX06 | 2017-01-10 |

*EUT ID: is used to identify the test sample in the lab internally.

## 3.3. Internal Identification of AE used during the test

| AE ID* | Description | SN |
|---|---|---|
| AE1 | RF cable | --- |
| AE2 | --- | --- |

*AE ID: is used to identify the test sample in the lab internally.

# 4. Reference Documents

## 4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

| Reference | Title | Version |
|---|---|---|
| FCC Part15 | FCC CFR 47, Part 15,Subpart C:<br>15.205 Restricted bands of operation;<br>15.209 Radiated emission limits, general requirements;<br>15.247 Operation within the bands 902-928MHz,<br>2400-2483.5MHz, and 5725-5850MHz. | Jun,2016 Edition |
| ANSI C63.10 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices | 2013 |

## 5. Summary of Test Results

A brief summary of the tests carried out is shown as following.

| Measurement Items | Sub-clause of Part15C | Sub-clause of IC | Verdict |
|---|---|---|---|
| Transmitter Spurious Emission-Radiated | 15.247,15.209, | / | P |

Please refer to part 5 for detail.

The measurements are according to and ANSI C63.10.

Terms used in Verdict column

| | |
|---|---|
| P | Pass, the EUT complies with the essential requirements in the standard. |
| NP | Not Perform, the test was not performed by ECIT. |
| NA | Not Applicable, the test was not applicable. |
| F | Fail, the EUT does not comply with the essential requirements in the standard. |

Test Conditions

| | |
|---|---|
| Tnom | Normal Temperature |
| Tmin | Low Temperature |
| Tmax | High Temperature |
| Vnom | Normal Voltage |
| Vmin | Low Voltage |
| Vmax | High Voltage |
| Hnom | Norm Humidity |
| Anom | Norm Air Pressure |

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

| | | |
|---|---|---|
| Temperature | Tnom | 22℃ |
| Voltage | Vnom | 3.7V |
| Humidity | Hnom | 32% |
| Air Pressure | Anom | 1010hPa |

**Note:**

a. All the test data for each data were verified, but only the worst case was reported.

b.The GFSK, π/4 DQPSK and 8DPSK were set in DH1 for GFSK, 2-DH1 for π/4 DQPSK,

3-DH1 for 8DPSK.

c.The DC and low frequency voltages' measurement uncertainty is ±2%.

## 5.1. Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with section 3.

The test results of this test report relate exclusively to the item(s) tested as specified in section 5.

The following deviation from, additions to, or exclusions from the test specifications have been made. See section 3.

## 5.2. Statements

The product name Hisense F102, supporting GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA/HSPA+/LTE/WLAN/BT/BLE, manufactured by Hisense International Co., Ltd. is a variant product for testing. According to the variant description, there is no case to be retested except RSE. The other test results please refer to I16D00249-RFB which is the test report for the initial product of Hisense F102.

ECIT has verified that the compliance of the tested device specified in section 5 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 5 of this test report.

# 6. Test result

## 6.1. Radiated Emission

### 6.1.1 Measurement Limit:

| Standard | Limit |
|---|---|
| FCC 47 CFR Part 15.247, 15.205, 15.209 | 20dB below peak output power |

In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see 15.205(c)).

**Limit in restricted band:**

| Frequency of emission (MHz) | Field strength (uV/m) | Field strength (dBuV/m) |
|---|---|---|
| 30~88 | 100 | 40 |
| 88~216 | 150 | 43.5 |
| 216~960 | 200 | 46 |
| Above 960 | 500 | 54 |

### 6.1.2 Test Method

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a non-conducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m, but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also ANSI C63.10-2013 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

| Frequency of emission (MHz) | RBW/VBW | Sweep Time (s) |
|---|---|---|
| 30~1000 | 100KHz/300KHz | 5 |

| | | |
|---|---|---|
| 1000~4000 | 1MHz/1MHz | 15 |
| 4000~18000 | 1MHz/1MHz | 40 |
| 18000~26500 | 1MHz/1MHz | 20 |

**6.1.3 Measurement Results:**

A "reference path loss" is established and $A_{Rpi}$ is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss. The measurement results are obtained as described below:

$A_{Rpi}$ = Cable loss + Antenna Gain-Preamplifier gain

Result=$P_{Mea}$ + $A_{Rpi}$

**For GFSK**

| Channel | Frequency Range | Test Results | Conclusion |
|---|---|---|---|
| Ch0 2402MHz | 30MH~1GHz | Fig.40 | P |
| | 1GHz~3GHz | Fig.41 | P |
| | 3GHz~18GHz | Fig.42 | P |

**For π/4 DQPSK**

| Channel | Frequency Range | Test Results | Conclusion |
|---|---|---|---|
| Ch0 2402MHz | 30MH~1GHz | Fig.43 | P |
| | 1GHz~3GHz | Fig.44 | P |
| | 3GHz~18GHz | Fig.45 | P |

**For 8DPSK**

| Channel | Frequency Range | Test Results | Conclusion |
|---|---|---|---|
| Ch0 2402MHz | 30MH~1GHz | Fig.46 | P |
| | 1GHz~3GHz | Fig.47 | P |
| | 3GHz~18GHz | Fig.48 | P |

**GFSK Ch0 30MHz-1GHz**

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|---|---|---|---|---|
| 32.859152 | 29.42 | -26.9 | 56.32 | V |
| 35.060704 | 28.13 | -26.8 | 54.93 | V |
| 39.774568 | 31.48 | -25.8 | 57.28 | V |

| | | | | |
|---|---|---|---|---|
| 52.878652 | 16.5 | -25.9 | 42.4 | V |
| 88.805896 | 19.07 | -26.5 | 45.57 | H |
| 903.964432 | 20.83 | -8 | 28.83 | H |

**GFSK Ch0 1GHz-3GHz**

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|---|---|---|---|---|
| 2757.076923 | 52.43 | 9.4 | 43.03 | H |
| 2832.821539 | 53.57 | 10.5 | 43.07 | H |
| 2885.6375 | 54.19 | 10.8 | 43.39 | H |
| 2915.922885 | 53.53 | 10.7 | 42.83 | H |
| 2967.094423 | 54.13 | 10.9 | 43.23 | V |
| 2992.366539 | 54.48 | 11.3 | 43.18 | V |

**GFSK Ch0 3GHz-18GHz**

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|---|---|---|---|---|
| 14307.84307 | 55.03 | 20.7 | 34.33 | V |
| 14947.56093 | 56.15 | 21.9 | 34.25 | V |
| 15385.9058 | 57.28 | 23 | 34.28 | V |
| 15971.9816 | 59.17 | 25.2 | 33.97 | V |
| 16575.2088 | 59 | 25.9 | 33.1 | V |
| 17439.18307 | 61.18 | 28.6 | 32.58 | V |

**π/4 DQPSK Ch0 30MHz-1GHz**

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|---|---|---|---|---|
| 33.828076 | 27.11 | -26.8 | 53.91 | V |
| 35.914624 | 24.73 | -26.6 | 51.33 | V |
| 39.502804 | 30.74 | -25.9 | 56.64 | V |
| 42.279336 | 26.77 | -25.8 | 52.57 | V |

| | | | | |
|---|---|---|---|---|
| 51.927348 | 16.01 | -25.9 | 41.91 | V |
| 58.06394 | 6.49 | -25.9 | 32.39 | V |

**π/4 DQPSK Ch0 1GHz-3GHz**

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|---|---|---|---|---|
| 2755.784808 | 52.76 | 9.4 | 43.36 | H |
| 2829.508654 | 53.15 | 10.4 | 42.75 | V |
| 2860.072116 | 54.4 | 10.8 | 43.6 | H |
| 2937.076539 | 53.08 | 10.7 | 42.38 | H |
| 2951.826154 | 53.91 | 10.7 | 43.21 | H |
| 2996.363076 | 53.79 | 11.4 | 42.39 | V |

**π/4 DQPSK Ch0 3GHz-18GHz**

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|---|---|---|---|---|
| 15465.53193 | 57.49 | 23.3 | 34.19 | V |
| 15729.30593 | 57.67 | 24.1 | 33.57 | V |
| 16179.6474 | 59.51 | 25.5 | 34.01 | V |
| 16510.70587 | 59.86 | 26.8 | 33.06 | V |
| 16830.1238 | 59.95 | 27.3 | 32.65 | V |
| 17560.20093 | 61.6 | 29.4 | 32.2 | V |

**8DPSK 30MHz-1GHz**

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|---|---|---|---|---|
| 33.281076 | 27.97 | -26.8 | 54.77 | V |
| 35.079372 | 27.78 | -26.8 | 54.58 | V |
| 38.728232 | 30.71 | -26 | 56.71 | V |
| 41.185252 | 27.26 | -25.8 | 53.06 | V |
| 42.824 | 25.3 | -25.8 | 51.1 | V |
| 79.1821 | 8.54 | -29.1 | 37.64 | V |

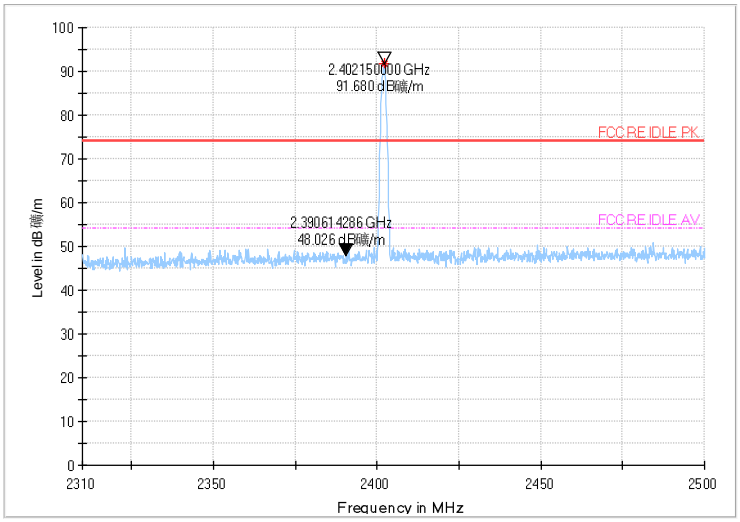
**8DPSK 1GHz-3GHz**

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|---|---|---|---|---|
| 2835.454808 | 53.01 | 10.5 | 42.51 | V |
| 2877.777885 | 53.75 | 10.8 | 42.95 | H |
| 2914.983077 | 53.51 | 10.7 | 42.81 | V |
| 2958.746154 | 53.75 | 10.8 | 42.95 | H |
| 2987.331154 | 54.23 | 11.2 | 43.03 | V |
| 2998.147885 | 53.9 | 11.4 | 42.5 | H |

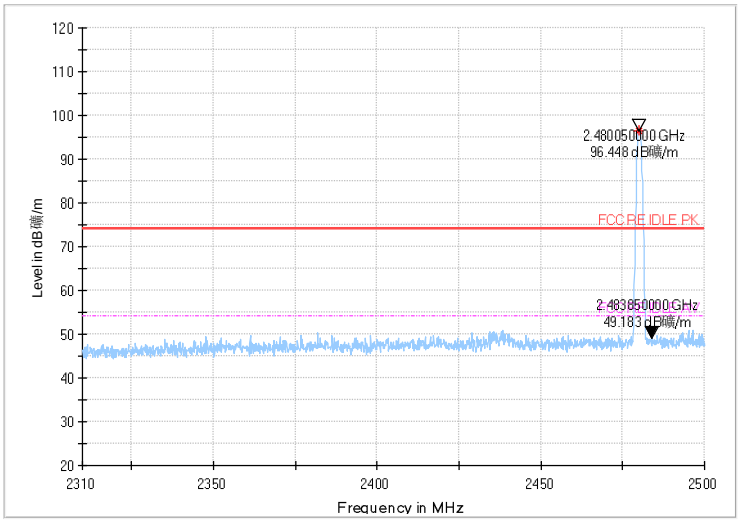
**8DPSK 3GHz-18GHz**

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|---|---|---|---|---|
| 14901.0138 | 56.19 | 22.2 | 33.99 | V |
| 15463.5584 | 57.44 | 23.3 | 34.14 | V |
| 15890.9954 | 58.56 | 24.7 | 33.86 | V |
| 16497.91433 | 59.34 | 26.9 | 32.44 | H |
| 17123.9374 | 59.49 | 27 | 32.49 | H |
| 17613.7246 | 62.51 | 29.4 | 33.11 | V |

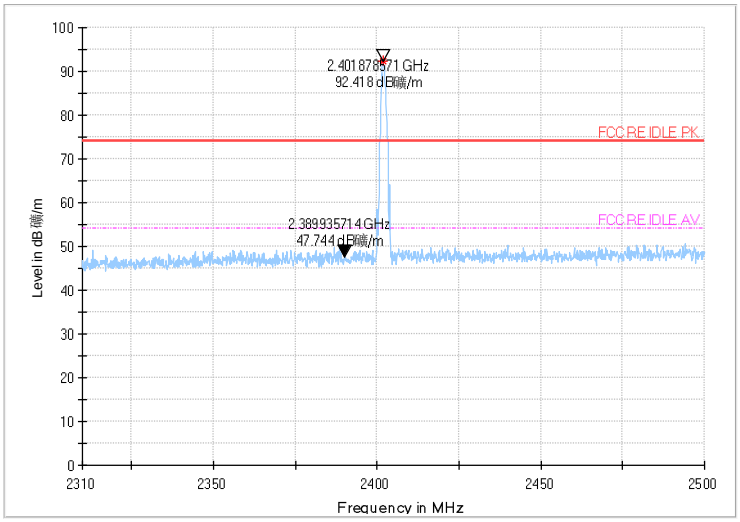
**Note: all the test data shown was peak detected.**
**Conclusion: PASS**
**Test graphs as below:**



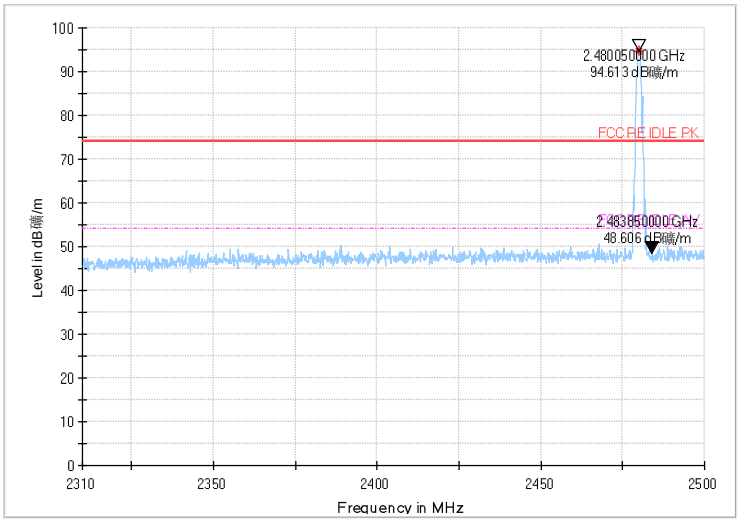

**BANDEDGE: GFSK, Ch0,PK**



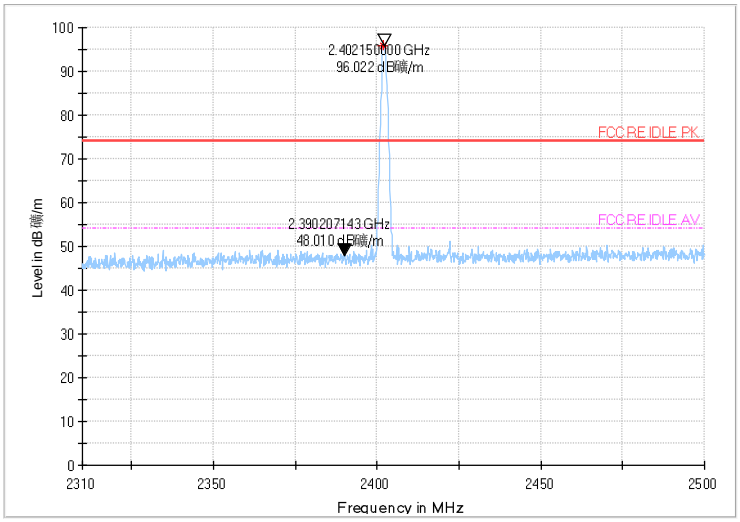

**BANDEDGE: GFSK, Ch78,PK**



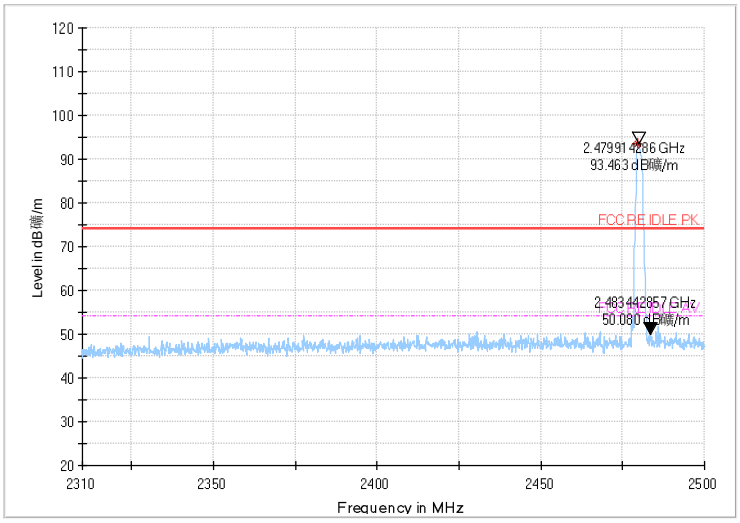

**BANDEDGE: π/4 DQPSK, Ch0,PK**




**BANDEDGE: π/4 DQPSK, Ch78,PK**




**BANDEDGE: 8DPSK, Ch0,PK**




**BANDEDGE: 8DPSK, Ch78,PK**

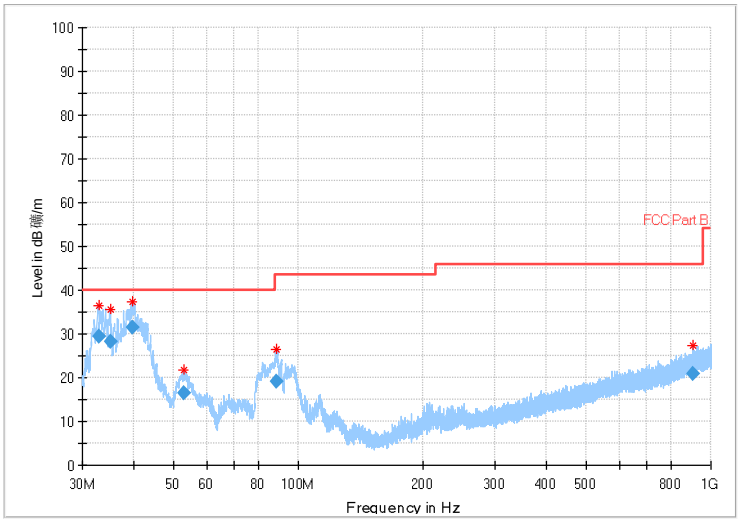



Fig.40 Radiated emission: GFSK, Ch0, 30MHz~1GHz

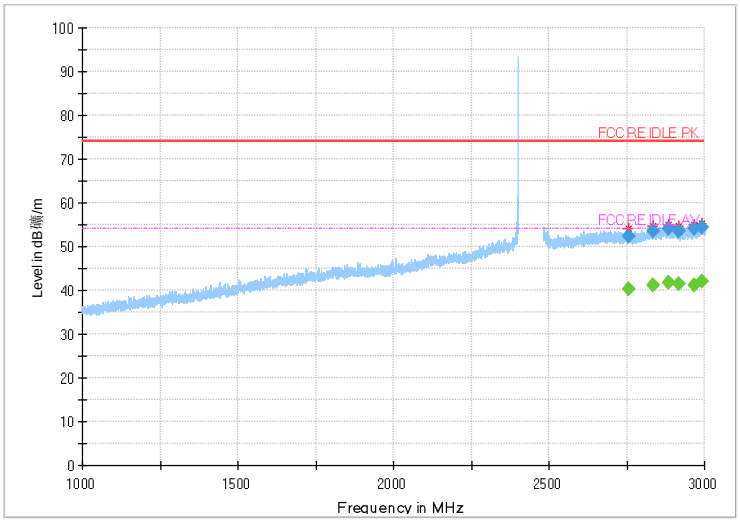



Fig.41 Radiated emission: GFSK, Ch0, 1GHz~3GHz

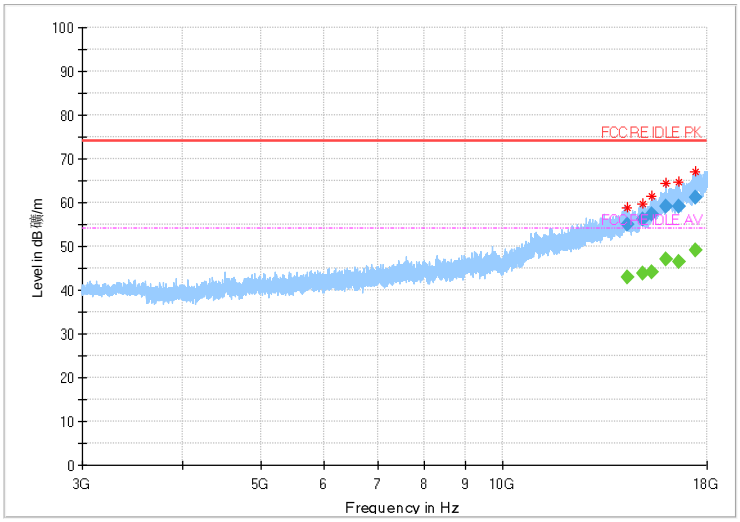



Fig.42 Radiated emission: GFSK, Ch0, 3GHz~18GHz

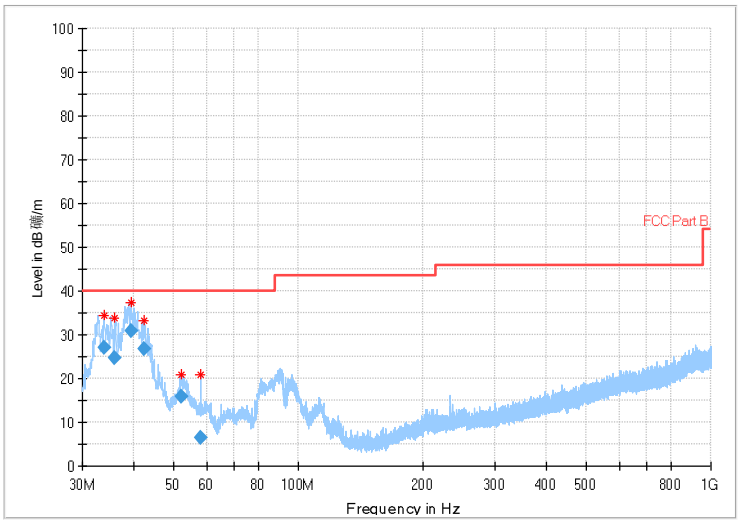



Fig.43 Radiated emission: π/4 DQPSK, Ch0, 30MHz~1GHz

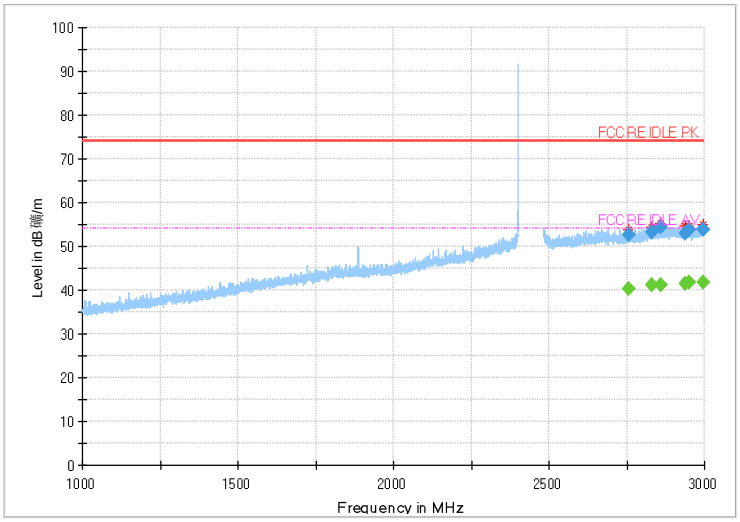



Fig.44 Radiated emission: π/4 DQPSK, Ch0, 1GHz~3GHz

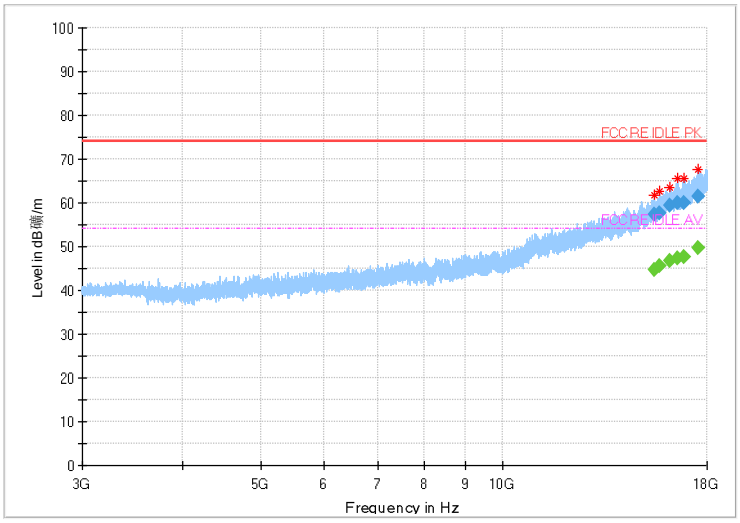



Fig.45 Radiated emission: π/4 DQPSK, Ch0, 3GHz~18GHz

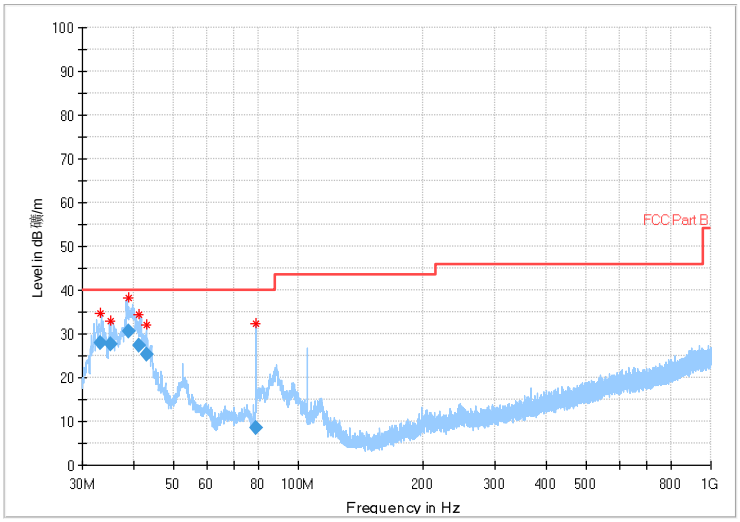



Fig.46 Radiated emission: 8DPSK, Ch0, 30MHz~1GHz

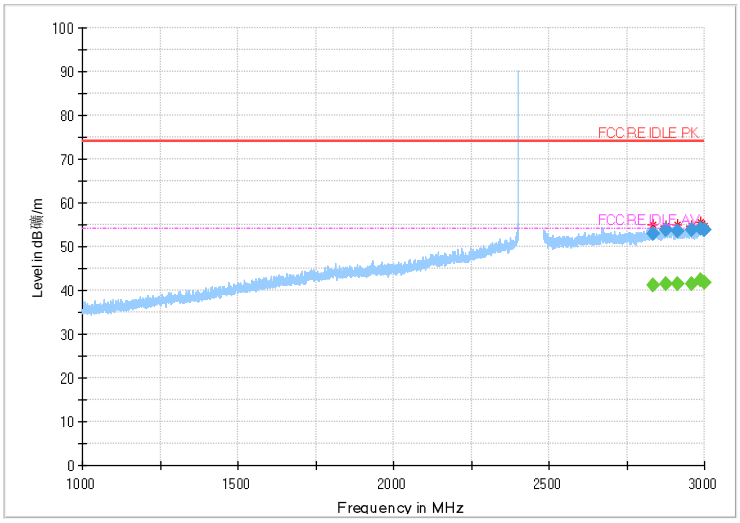



Fig.47 Radiated emission: 8DPSK, Ch0, 1GHz~3GHz

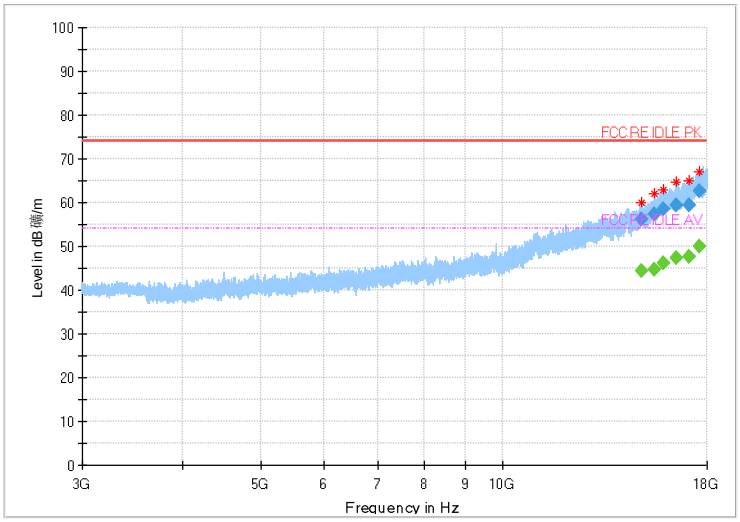



Fig.48 Radiated emission: 8DPSK, Ch0, 3GHz~18GHz

# 7. Test Equipment and Ancillaries Used For Tests

The test equipment and ancillaries used are as follows.

**Conducted test system**

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration date | Cal.interval |
|---|---|---|---|---|---|---|
| 1 | Vector Signal | FSQ26 | 101096 | Rohde&Schwarz | 2016-05-12 | 1 Year |
| 2 | DC Power Supply | ZUP60-14 | LOC-220Z006 | TDL-Lambda | 2016-05-12 | 1 Year |
| 3 | Bluetooth Tester | CBT32 | 100785 | Rohde&Schwarz | 2016-05-12 | 1 Year |

**Radiated emission test system**

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration date | Cal.interval |
|---|---|---|---|---|---|---|
| 1 | Universal Radio Communication Tester | CMU200 | 123101 | R&S | 2016-05-12 | 1 Year |
| 3 | Test Receiver | ESU40 | 100307 | R&S | 2016-05-12 | 1 Year |
| 4 | Trilog Antenna | VULB9163 | VULB9163-515 | Schwarzbeck | 2014-11-05 | 3 Year |
| 5 | Double Ridged Guide Antenna | ETS-3117 | 135885 | ETS | 2014-05-06 | 3 Year |
| 8 | 2-Line V-Network | ENV216 | 101380 | R&S | 2016-05-12 | 1 Year |

## Anechoic chamber

Fully anechoic chamber by Frankonia German.

# 8. Test Environment

**Shielding Room1** (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. = 25 %, Max. = 75 % |
| Shielding effectiveness | > 110 dB |
| Ground system resistance | < 0.5 Ω |

**Control room** did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. =30 %, Max. = 60 % |
| Shielding effectiveness | > 110 dB |
| Electrical insulation | > 10 kΩ |
| Ground system resistance | < 0.5 Ω |

**Fully-anechoic chamber1** (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. = 25 %, Max. = 75 % |
| Shielding effectiveness | > 100 dB |
| Electrical insulation | > 10 kΩ |
| Ground system resistance | < 0.5 Ω |
| VSWR | Between 0 and 6 dB, from 1GHz to 18GHz |
| Site Attenuation Deviation | Between -4 and 4 dB,30MHz to 1GHz |
| Uniformity of field strength | Between 0 and 6 dB, from 80MHz to 3000 MHz |

# ANNEX A. Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

## ANNEX B. Product Change Description

As the applicant of the below model, [Hisense International Co., Ltd.] declares that the product,

Product description: Smartphone
Brand name: Hisense
Model name: Hisense F102

is the variant of the initial certified product,

Product description: Smartphone
Brand name: Hisense
Model name: Hisense F102

## SOFTWARE MODIFICATIONS:

Protocol Stack changes: NO
MMS/STK changes: NO
JAVA changes: NO
Other changes detailed: NO

## HARDWARE MODIFICATION:

Band changes: NO
Power Amplifier changes: NO
Antenna changes: NO
PCB Layout changes: NO
Components on PCB changes: NO
LCD+CTP changes: Yes, only increased a new supplier.
Speaker changes: Yes, only increased a new supplier.
Camera changes: NO
Vibrator changes: Yes, only increased a new supplier.
Bluetooth changes: NO
FM changes: NO
Memory changes: Yes, only increased a new supplier.
Other changes: NO

## MECHANICAL MODIFICATIONS:

Use new metal front/back cover or keypad: NO
Mechanical shell changes: NO.
Other changes detailed: NO

# ACCESSORY MODIFICATIONS:

Battery changes: Yes, only increased a new supplier.
AC Adaptor changes: NO
USB Cable changed: NO
Earphone changes: NO

Original Client:

| |
|---|
| Name：Hisense International Co., Ltd. |
| Address：Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China |

Original manufacturer：

| |
|---|
| Name: Hisense Communications Co., Ltd. |
| Address ： No.218, Qianwangang Road, Economic & Technological Development Zone, Qingdao, China |

New Client:

| |
|---|
| Name: Hisense International Co., Ltd.<br>Address: Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China |

New manufacturer：

| |
|---|
| Name: Hisense Communications Co., Ltd. |
| Address ： No.218, Qianwangang Road, Economic & Technological Development Zone, Qingdao, China |

APPROVED BY: 

Date:2017/2/14

Company: Hisense International Co., Ltd.

Address: Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China

Tel: +86-532-80875571

# ANNEX C. Accreditation Certificate

Accredited Laboratory

A2LA has accredited

EAST CHINA INSTITUTE OF TELECOMMUNICATIONS

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of any additional program requirements in the field of Electrical. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 10th day of December 2014.

President & CEO
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2017

*For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

************End The Report************