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

Add: 7-8F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

Tel: (+86)-021-63843300, E-Mail: welcome@ecit.org.cn

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

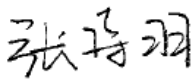
1.2. Testing Environment

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

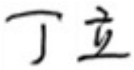
1.3. Project data

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 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: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 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

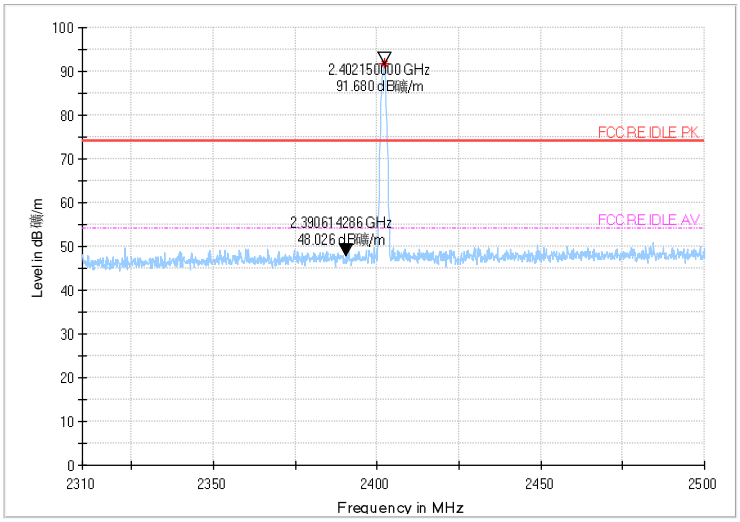
8DPSK 1GHz-3GHz

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

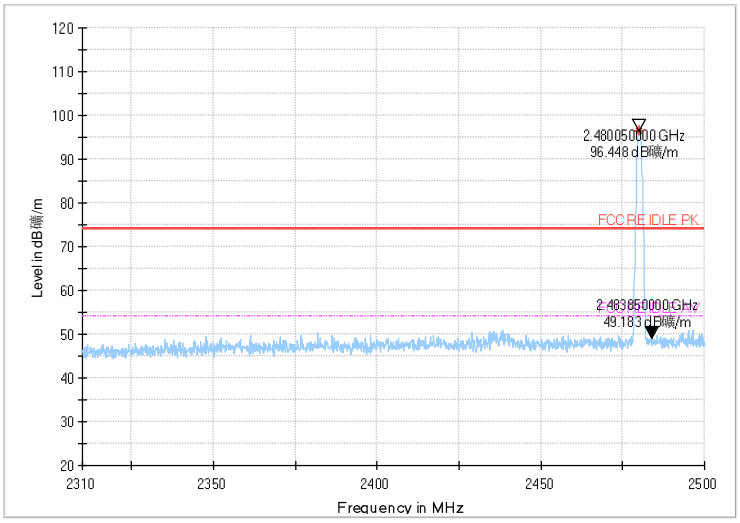
8DPSK 3GHz-18GHz

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

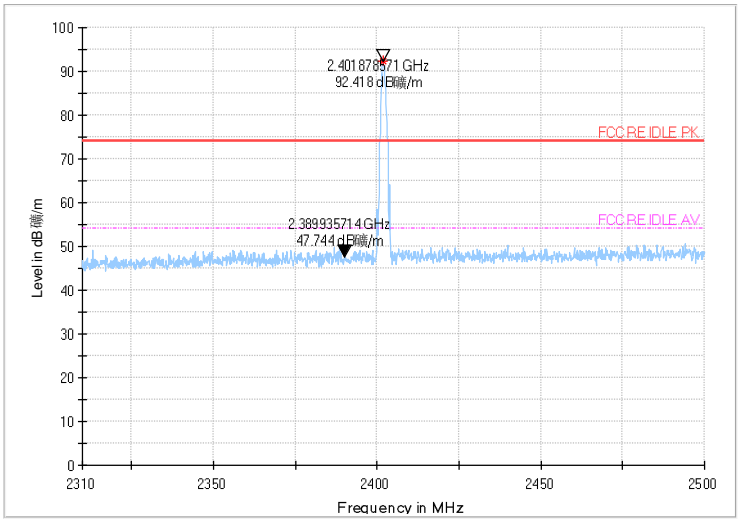
Note: all the test data shown was peak detected.
Conclusion: PASS
Test graphs as below:



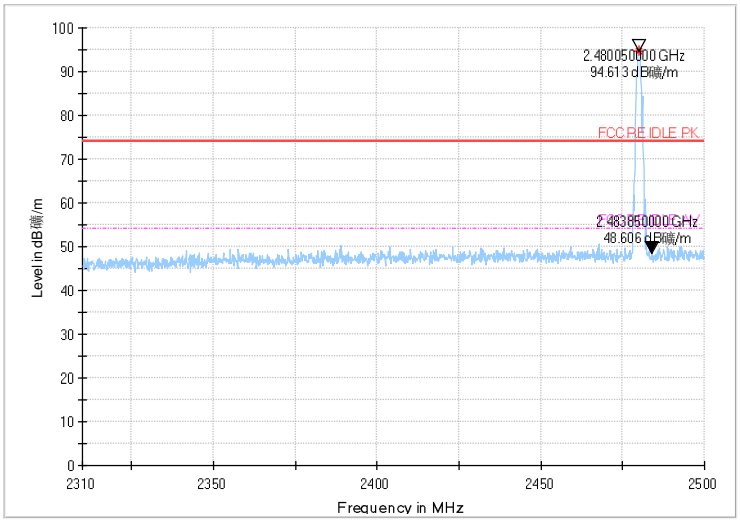
BANDEDGE: GFSK, Ch0,PK



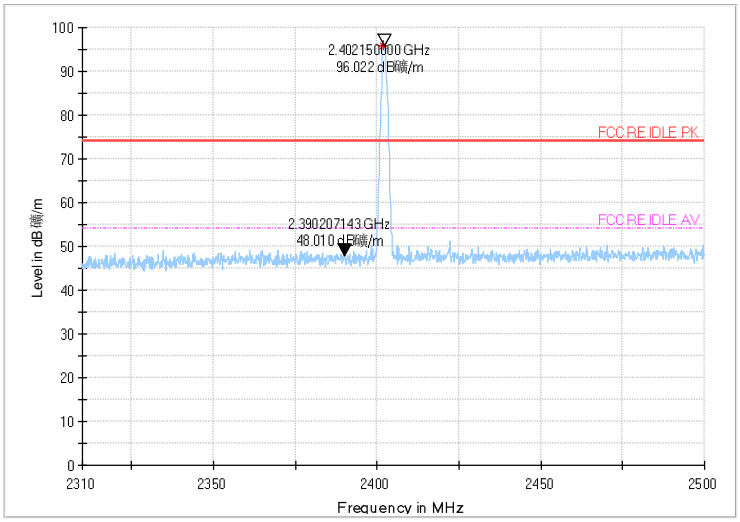
BANDEDGE: GFSK, Ch78,PK



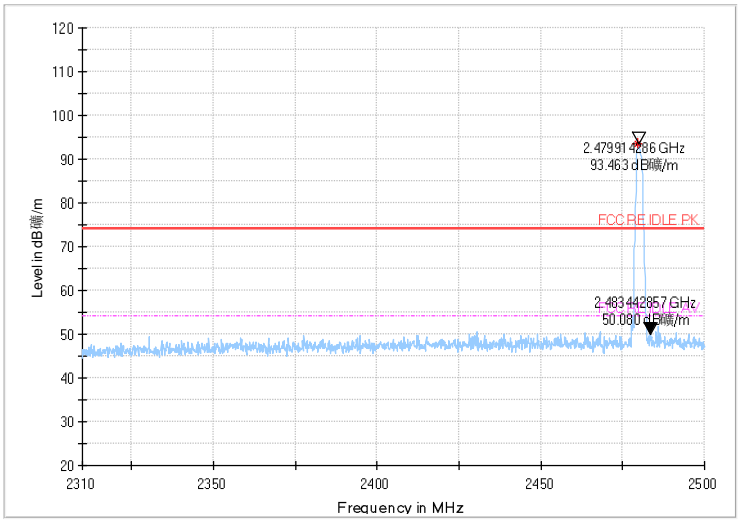
BANDEDGE: π/4 DQPSK, Ch0,PK



BANDEDGE: π/4 DQPSK, Ch78,PK



BANDEDGE: 8DPSK, Ch0,PK



BANDEDGE: 8DPSK, Ch78,PK

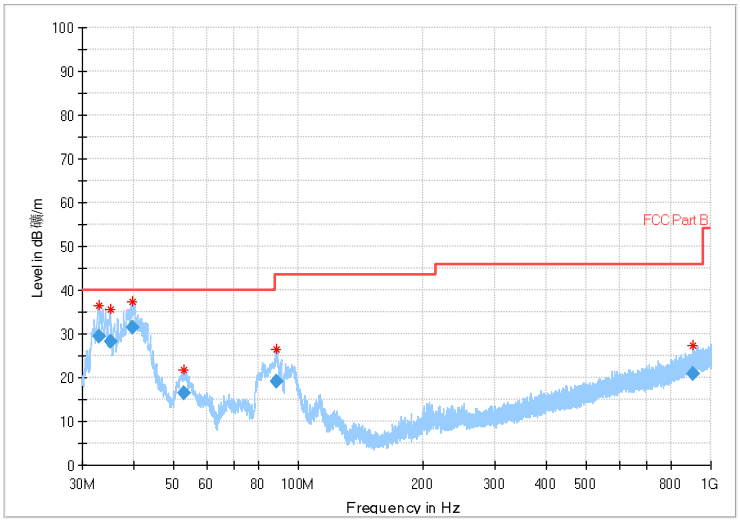


Fig.40 Radiated emission: GFSK, Ch0, 30MHz~1GHz

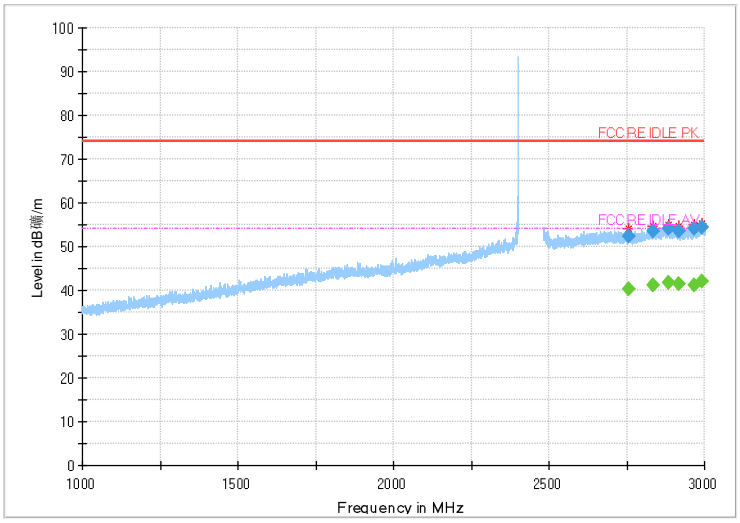


Fig.41 Radiated emission: GFSK, Ch0, 1GHz~3GHz

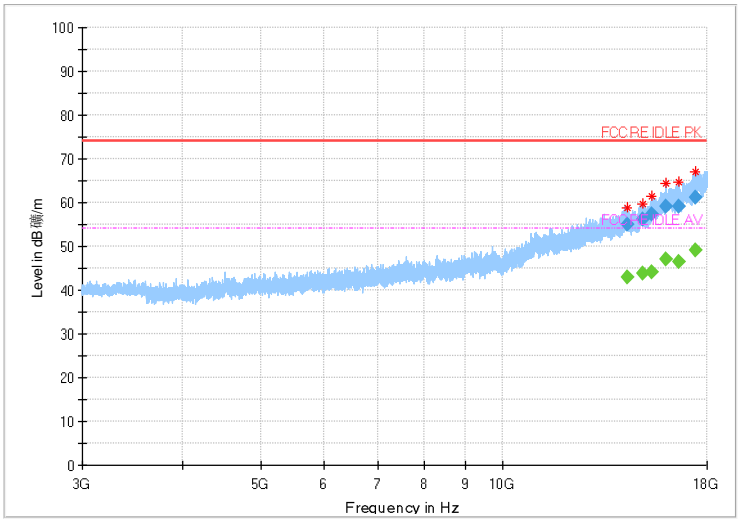


Fig.42 Radiated emission: GFSK, Ch0, 3GHz~18GHz

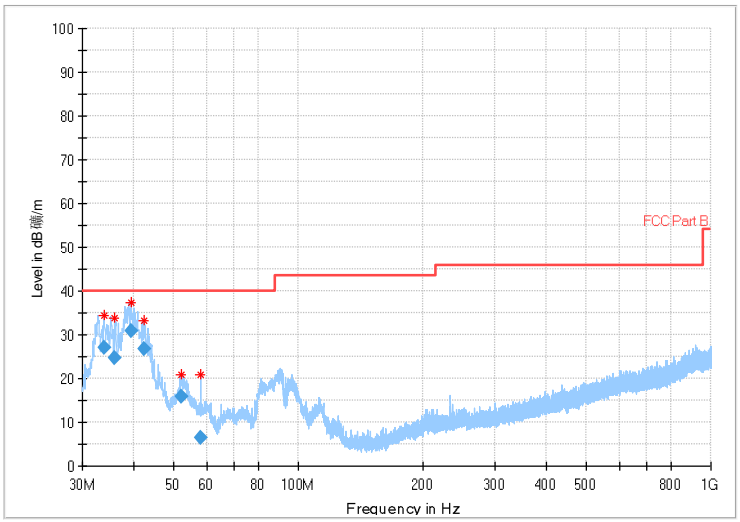


Fig.43 Radiated emission: π/4 DQPSK, Ch0, 30MHz~1GHz

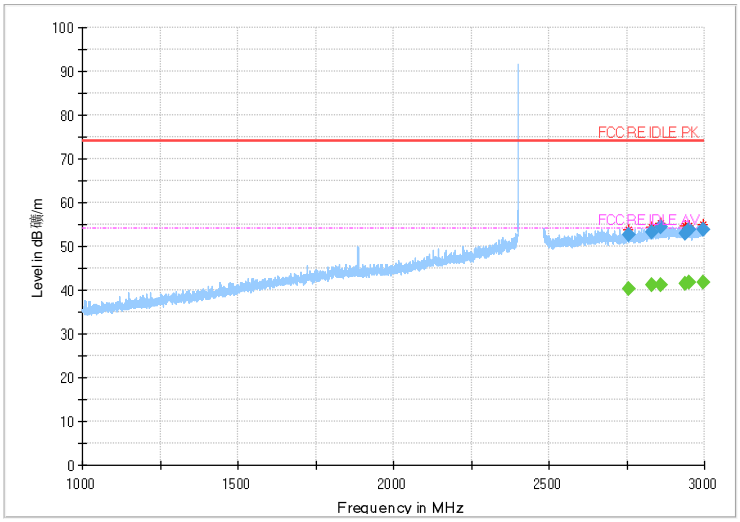


Fig.44 Radiated emission: π/4 DQPSK, Ch0, 1GHz~3GHz

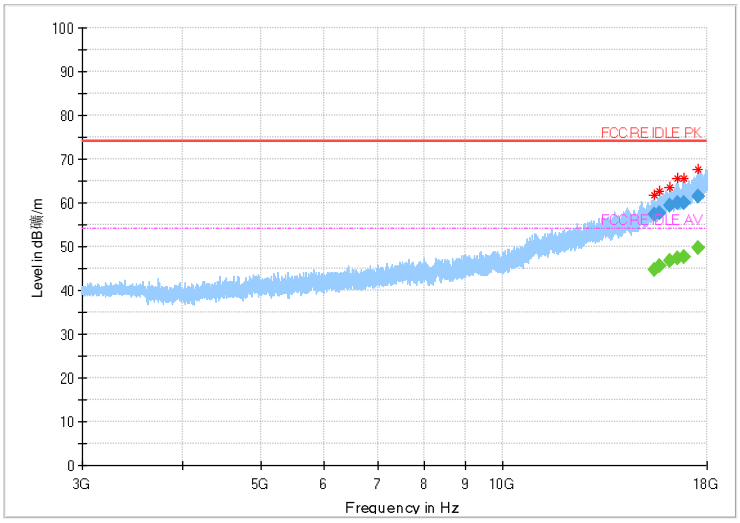


Fig.45 Radiated emission: π/4 DQPSK, Ch0, 3GHz~18GHz

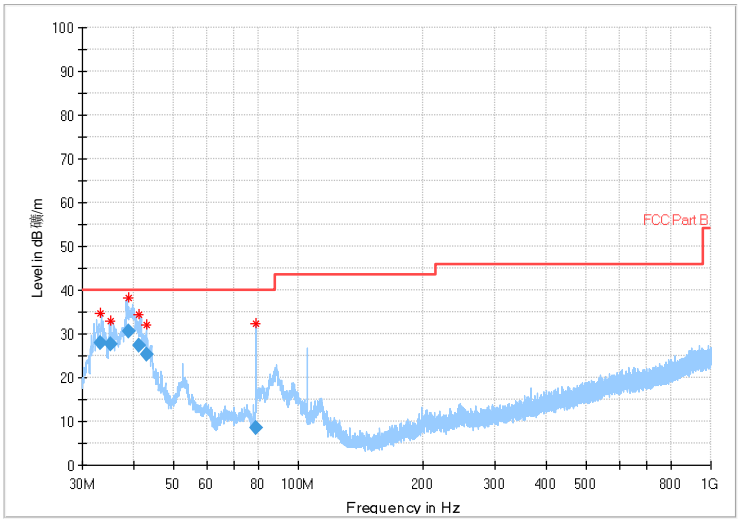


Fig.46 Radiated emission: 8DPSK, Ch0, 30MHz~1GHz

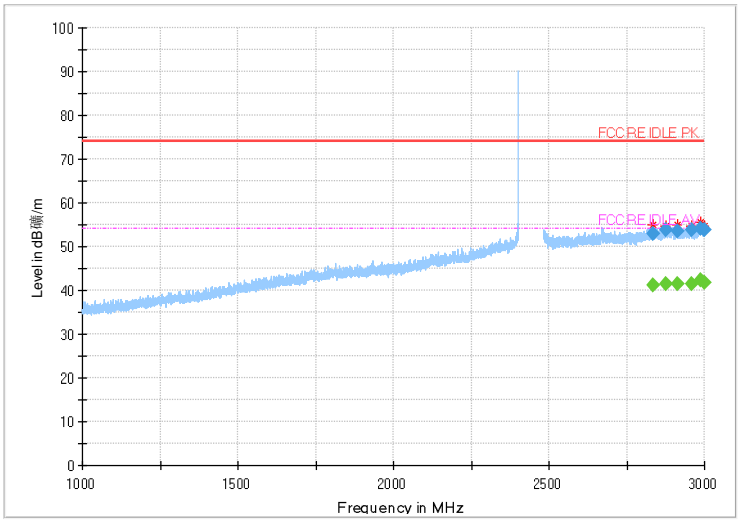


Fig.47 Radiated emission: 8DPSK, Ch0, 1GHz~3GHz

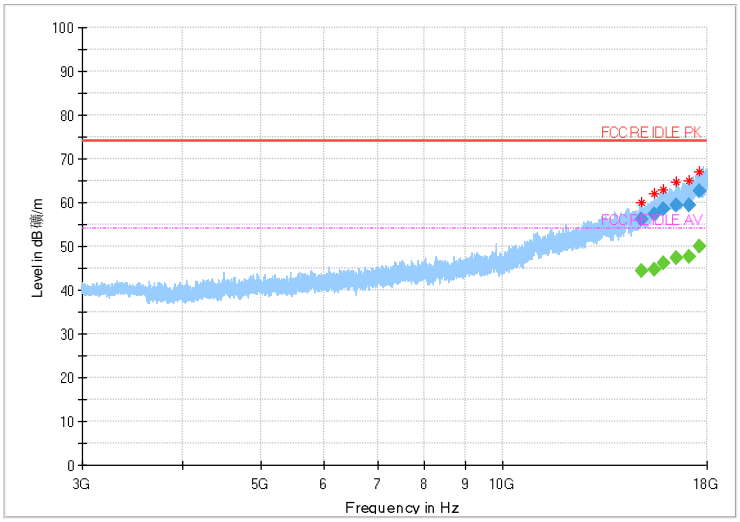


Fig.48 Radiated emission: 8DPSK, Ch0, 3GHz~18GHz

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. 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************