



FCC PART 15C TEST REPORT

BLUETOOTH LOW ENERGY (BLE) RADIATED PART

No. I15Z40514-SRD11

for

Sony Mobile Communications Inc.

GSM/WCDMA/LTE Device

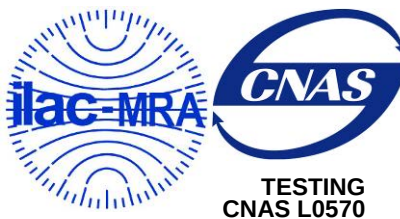
FCC ID: PY7-PM0796

with

Hardware Version: A

Software Version: 1292-7201,s_atp_1_41_5_2

Issued Date: 2015-05-19



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 CTTL.

Test Laboratory:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I15Z40514-SRD11	Rev.0	1st edition	2015-05-04
I15Z40514-SRD11	Rev.1	Revised the description of EUT	2015-05-19

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1. Test Laboratory

1.1. Testing Location

Location 1:CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China100191

Location 2:CTTL(Shouxiang)

Address: No. 51 Shouxiang Science Building, Xueyuan Road,
Haidian District, Beijing, P. R. China100191

1.2. Testing Environment

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

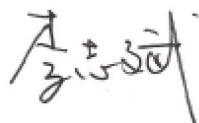
1.3. Project data

Testing Start Date: 2015-03-20
Testing End Date: 2015-04-27

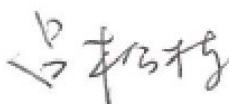
1.4. Signature



Xu Zhongfei
(Prepared this test report)



Li Zhibin
(Reviewed this test report)



Lv Songdong
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: Sony Mobile Communications (China) Co. Ltd
Address /Post: Sony Mobile R&D Center, No. 16, Guangshun South
Street, Chaoyang District
Contact Ma, Gang
Email /
Telephone: +86-10-58656312
Fax: +86-10-58659049

2.2. Manufacturer Information

Company Name: Sony Mobile Communications Inc.
Address /Post: 1-8-15 Konan, Minato-ku, Tokyo, 108-0075, Japan
Contact Ma, Gang
Email /
Telephone: /
Fax: /

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

3.1. About EUT

Description	GSM/WCDMA/LTE Device
FCC ID	PY7-PM0796
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation(LE mode)	GFSK (Bluetooth Low Energy)
Number of Channels(LE mode)	40
Power Supply	3.8V DC by Battery

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	004402148063096	A	1292-7201,s_atp _1_41_5_2

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

3.3. Internal Identification of AE

AE ID*	Description	Type	SN
AE1	Travel Charger	/	/
AE3	USB Cable	1447A7PC000350C	/

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

3.4. Normal Accessory setting

Fully charged battery is used during the test.

3.5. General Description

The Equipment Under Test (EUT) is a model of GSM/WCDMA/LTE Device with integrated antenna and embedded battery.

It has MP3, camera, USB memory, FM radio, GPS receiver, NFC, Bluetooth (EDR, BLE), ANT+, WLAN (802.11 a/ac/b/g/n) and Wi-Fi hotspot functions.

It consists of normal options: USB cable and travel charger.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. 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;	2014
	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	
ANSI C63.10	American National Standard for Testing Unlicensed Wireless Devices	2009

5. Test Facilities Utilized

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESCI 7	100948	Rohde & Schwarz	1 year	2015-07-16
2	Loop antenna	HFH2-Z2	829324/00 7	Rohde & Schwarz	3 year	2017-12-16
3	BiLog Antenna	VULB9163	234	Schwarzbeck	3 year	2016-09-15
4	Dual-Ridge Waveguide Horn Antenna	3115	6914	EMCO	3 year	2017-12-15
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	3 year	2017-06-30
6	Vector Signal Analyzer	FSV	101047	Rohde & Schwarz	1 year	2015-07-03
7	Semi-anechoic chamber	/	CT000332 -1074	Frankonia German	/	/

ANNEX A: Detailed Test Results

A.1. Measurement Method

A.1.1. Radiated Emission Measurements

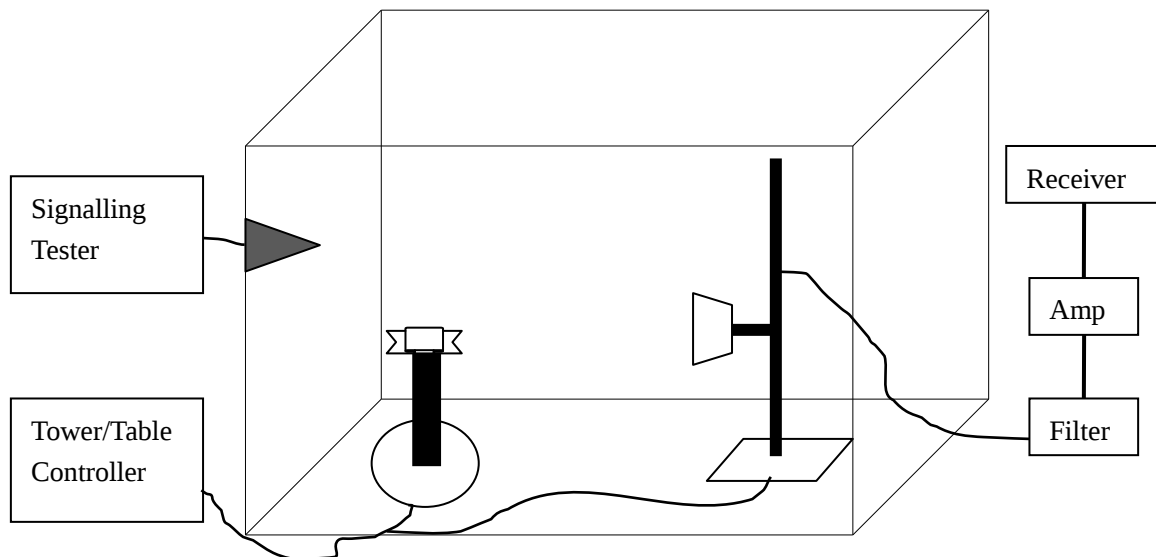
The measurement is made according to ANSI C63.10.

The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 1MHz;



A.2. Transmitter Spurious Emission - Radiated**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)).

The measurement is made according to ANSI C63.10

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

Test Condition

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

Measurement Results:

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable los.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}}$$

For GFSK

Frequency	Frequency Range	Test Results	Conclusion
2402 MHz	1 GHz ~ 3 GHz	Fig.1	P
	3 GHz ~ 18 GHz	Fig.2	P
2441 MHz	9 kHz ~ 30 MHz	Fig.3	P
	30 MHz ~ 1 GHz	Fig.4	P
	1 GHz ~ 3 GHz	Fig.5	P
	3 GHz ~ 18 GHz	Fig.6	P
2480 MHz	1 GHz ~ 3 GHz	Fig.7	P
	3 GHz ~ 18 GHz	Fig.8	P
Power	2.38GHz~2.4GHz---L	Fig.9	P
Power	2.45GHz~2.5GHz---H	Fig.10	P
For all channels	18 GHz ~ 26.5 GHz	Fig.11	P

GFSK 2402MHz-Average

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2389.994	34.7	-11.1	45.8	H
17891.250	46.1	27.1	19.0	H
17881.875	46.1	27.1	19.0	V
17879.063	46.1	27.1	19.0	H
17895.000	46.1	27.1	19.0	H
17872.031	46.1	27.1	19.0	V

GFSK 2440MHz-Average

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17905.313	46.3	27.1	19.2	V
17890.781	46.1	27.1	19.0	H
17875.313	46.1	27.1	19.0	V
17901.094	46.0	27.1	18.9	H
17881.875	46.0	27.1	18.9	V
17863.125	46.0	27.1	18.9	H

GFSK 2480MHz-Average

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2483.500	45.6	-11.2	56.8	V
17905.523	46.2	27.1	19.1	V
17890.585	46.1	27.1	19.0	H
17876.313	46.1	27.1	19.0	V
17901.094	46.0	27.1	18.9	H
17881.875	46.0	27.1	18.9	V

Conclusion: PASS

Test graphs as below:

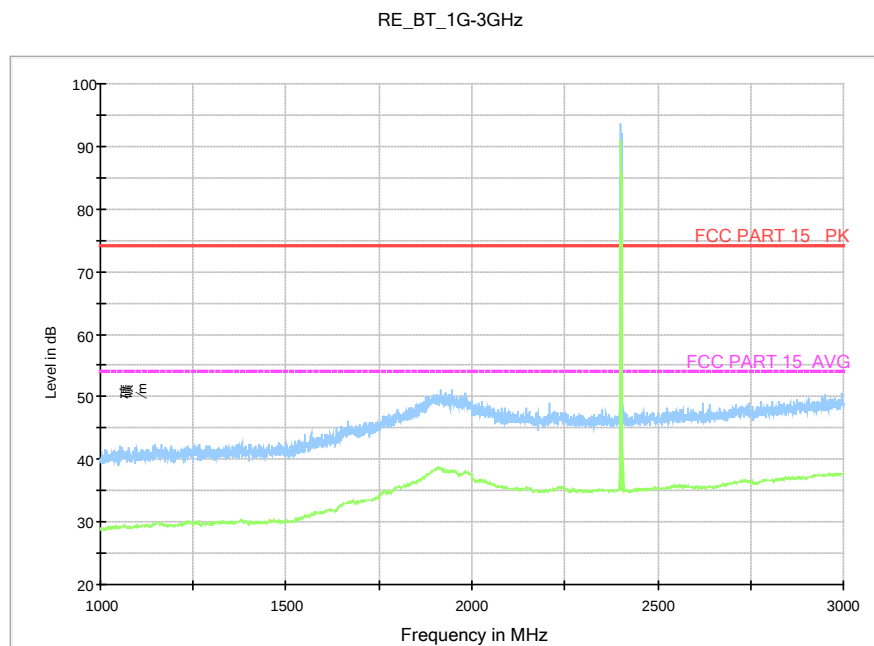


Fig.1. Transmitter Spurious Emission - Radiated: GFSK, 2402MHz, 1 GHz - 3GHz

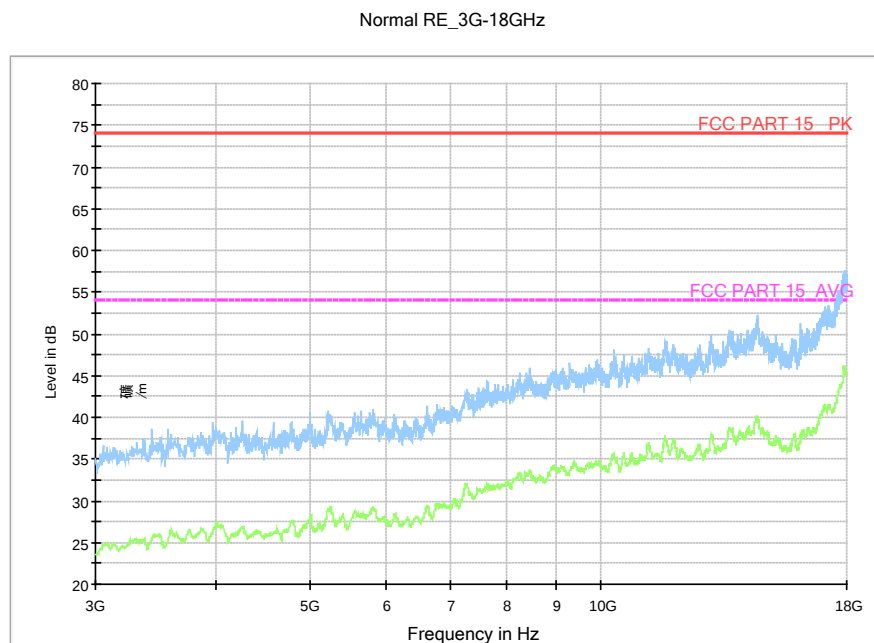


Fig.2. Transmitter Spurious Emission - Radiated: GFSK, 2402MHz, 3 GHz - 18 GHz

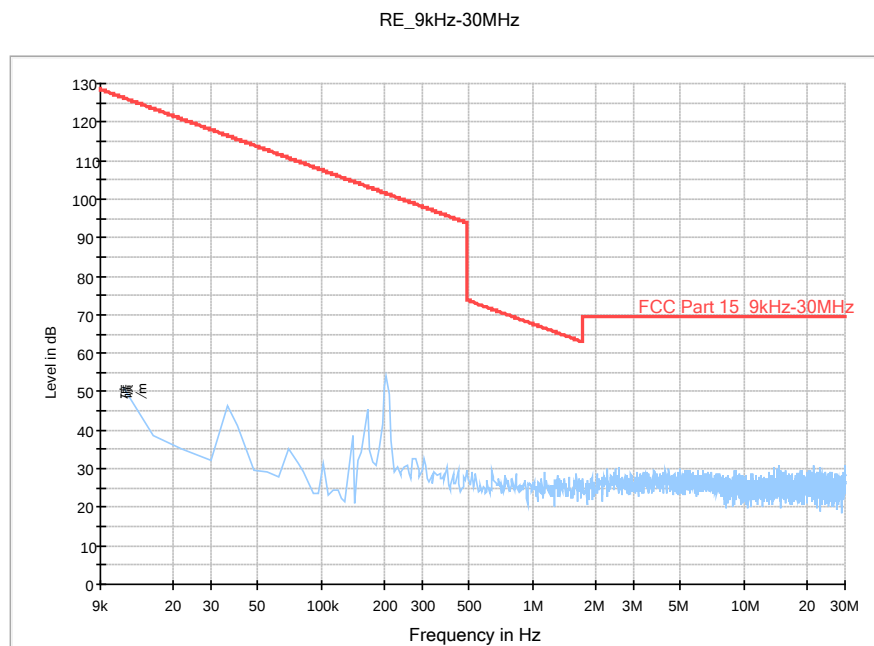


Fig.3. Transmitter Spurious Emission - Radiated: GFSK, 2440MHz, 9 kHz - 30 MHz

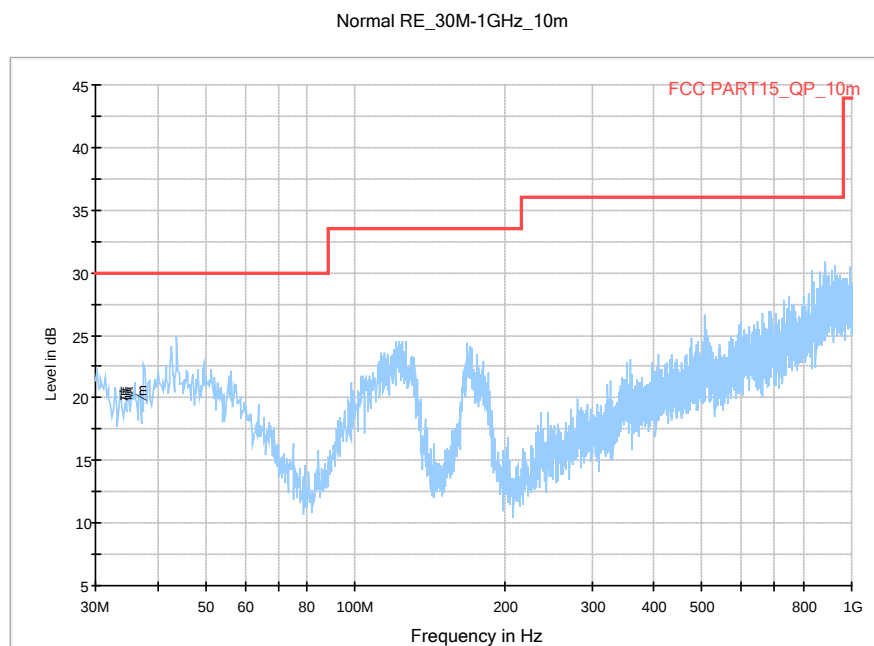


Fig.4. Transmitter Spurious Emission - Radiated: GFSK, 2440MHz, 30 MHz - 1 GHz

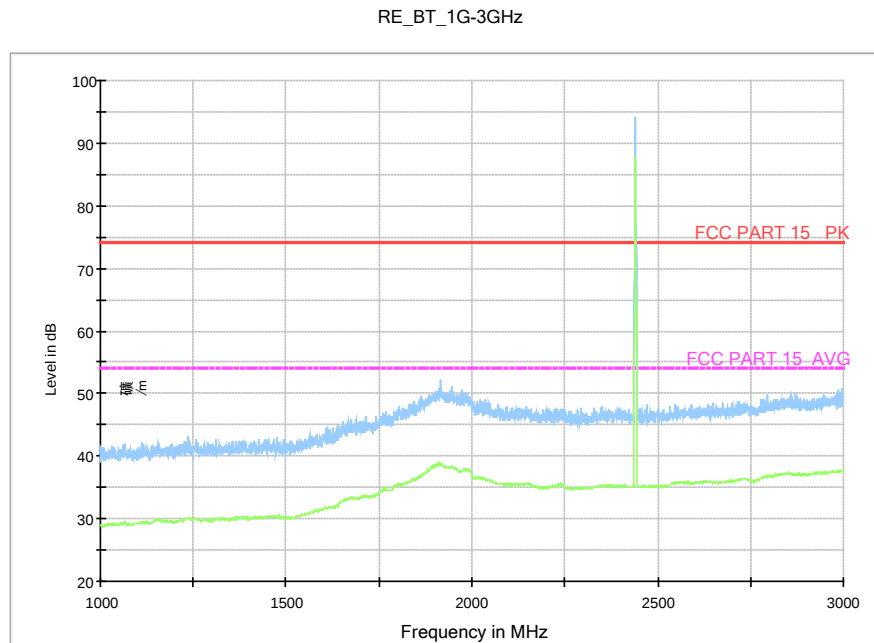


Fig.5. Transmitter Spurious Emission - Radiated: GFSK, 2440MHz, 1 GHz - 3 GHz

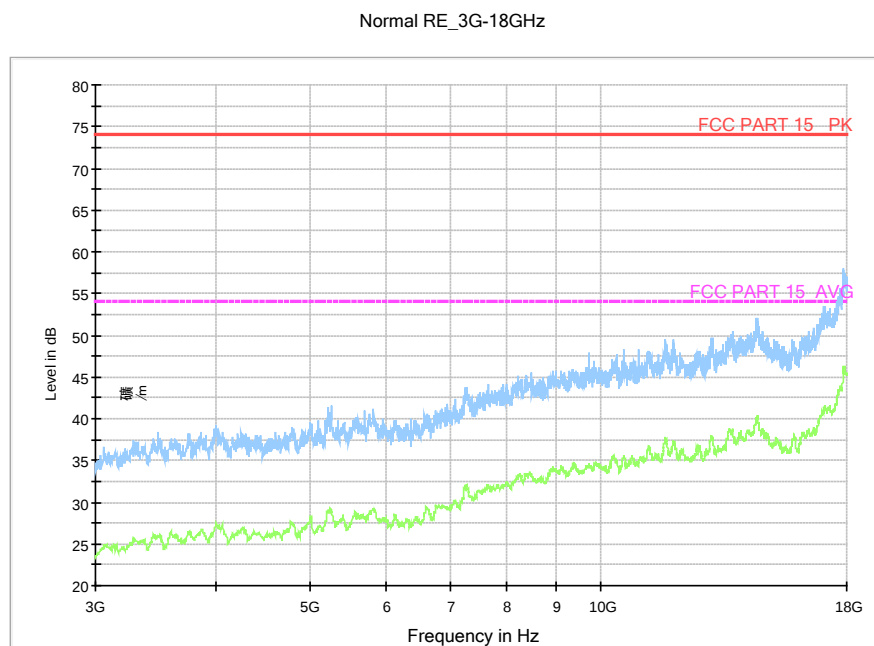


Fig.6. Transmitter Spurious Emission - Radiated: GFSK, 2440MHz, 3 GHz - 18 GHz

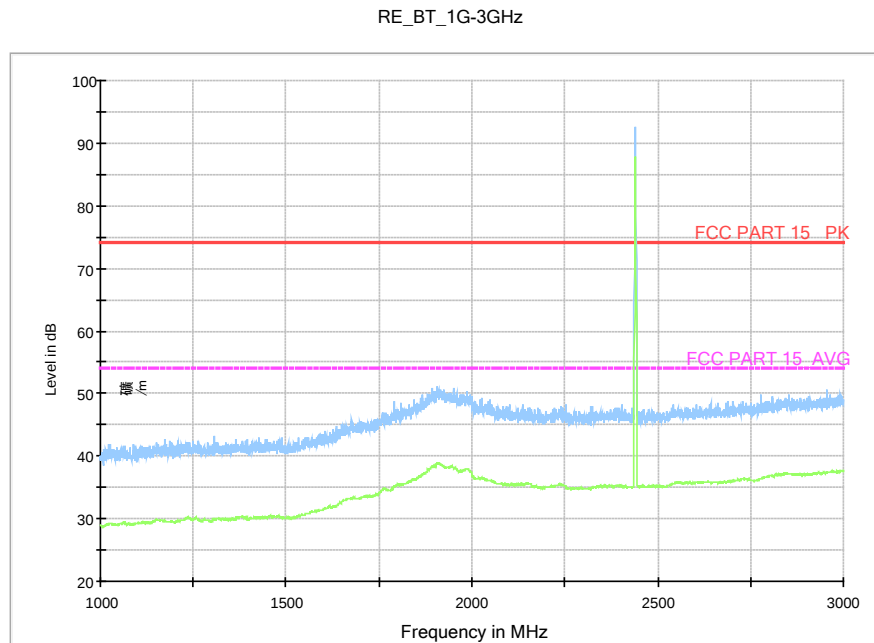


Fig.7. Transmitter Spurious Emission - Radiated: GFSK, 2480MHz, 1 GHz - 3 GHz

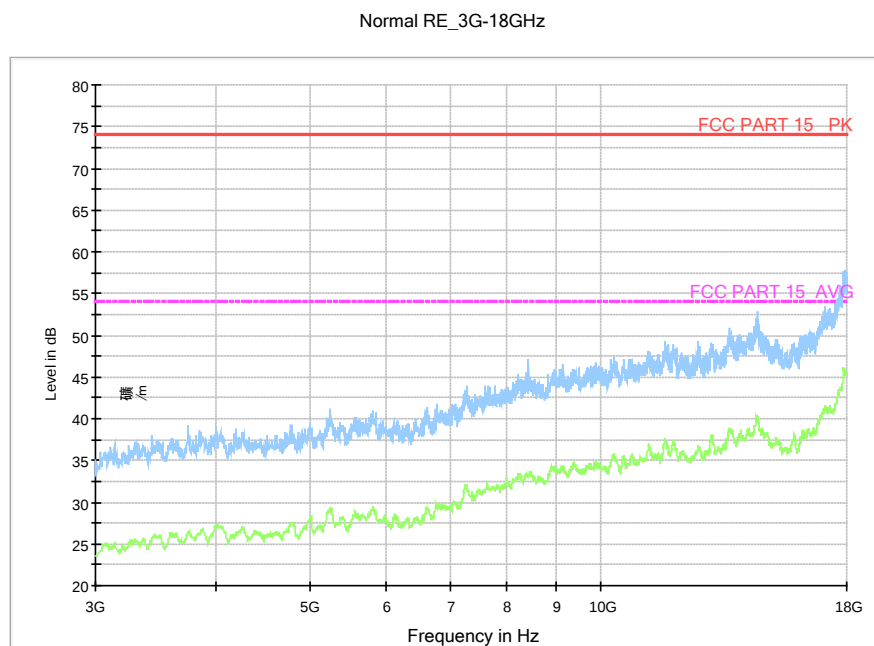


Fig.8. Transmitter Spurious Emission - Radiated: GFSK, 2480MHz, 3 GHz - 18 GHz

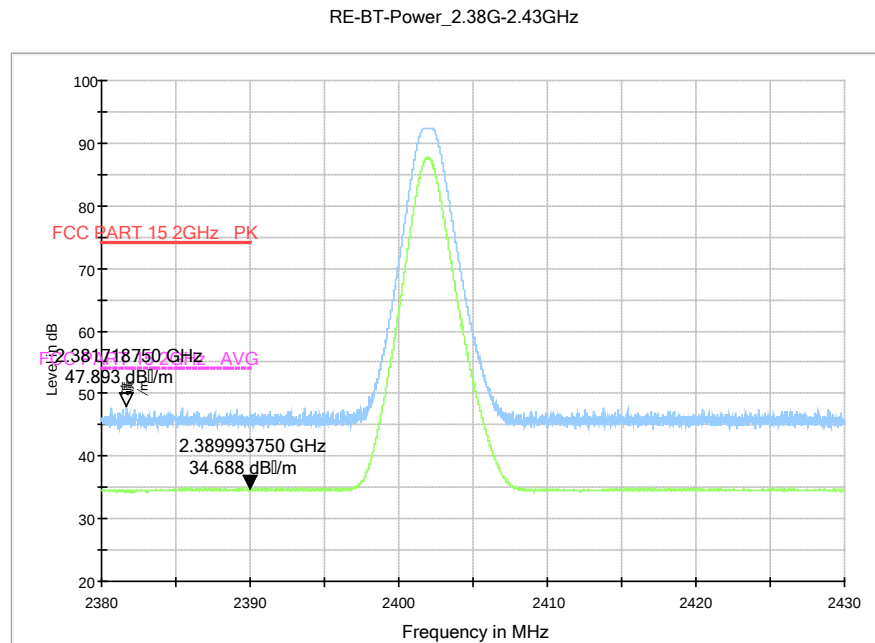


Fig.9. Transmitter Spurious Emission - Radiated (Power): GFSK low channel

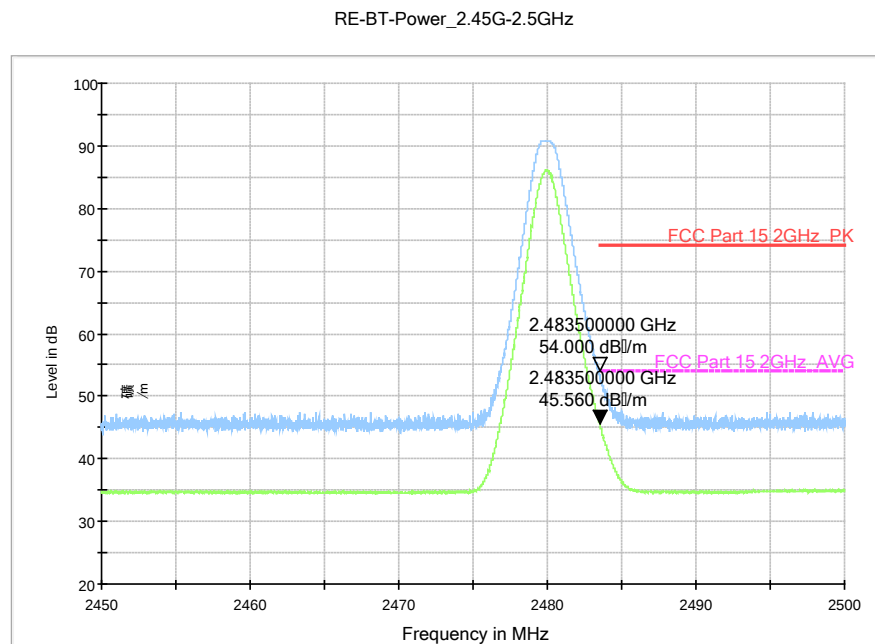


Fig.10. Transmitter Spurious Emission - Radiated (Power): GFSK high channel

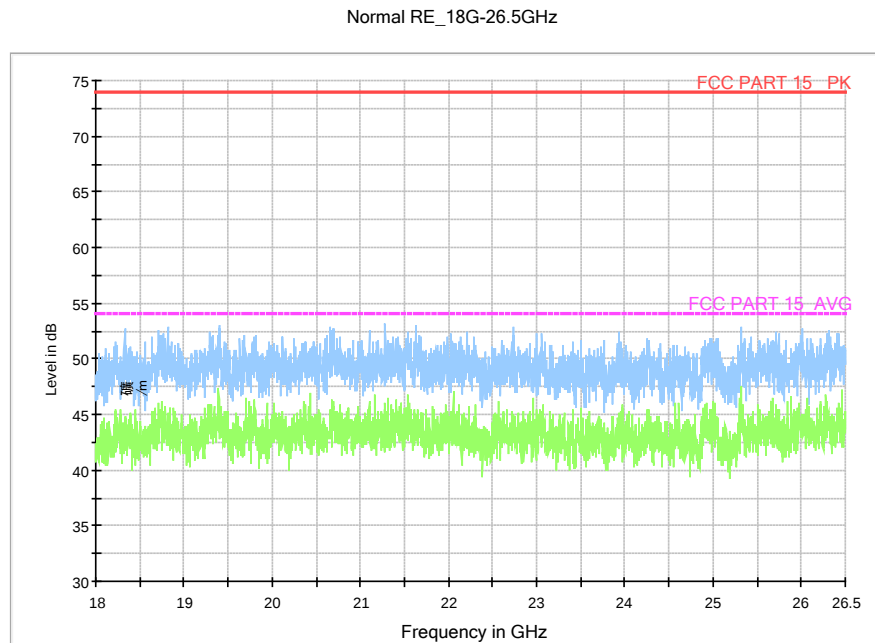


Fig.11. Transmitter Spurious Emission - Radiated: GFSK, 18 GHz - 26 GHz

A.3. AC Powerline Conducted Emission

Method of Measurement: See ANSI C63.10-clause 6.2

1. the one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.
2. If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.
3. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.
4. If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.
5. If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.³⁶ Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

Test Condition

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Conclusion
0.15 to 0.5	66 to 56	P
0.5 to 5	56	
5 to 30	60	

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Bluetooth (Average Limit)

Frequency range (MHz)	Average Limit (dB μ V)	Conclusion
0.15 to 0.5	56 to 46	P
0.5 to 5	46	
5 to 30	50	

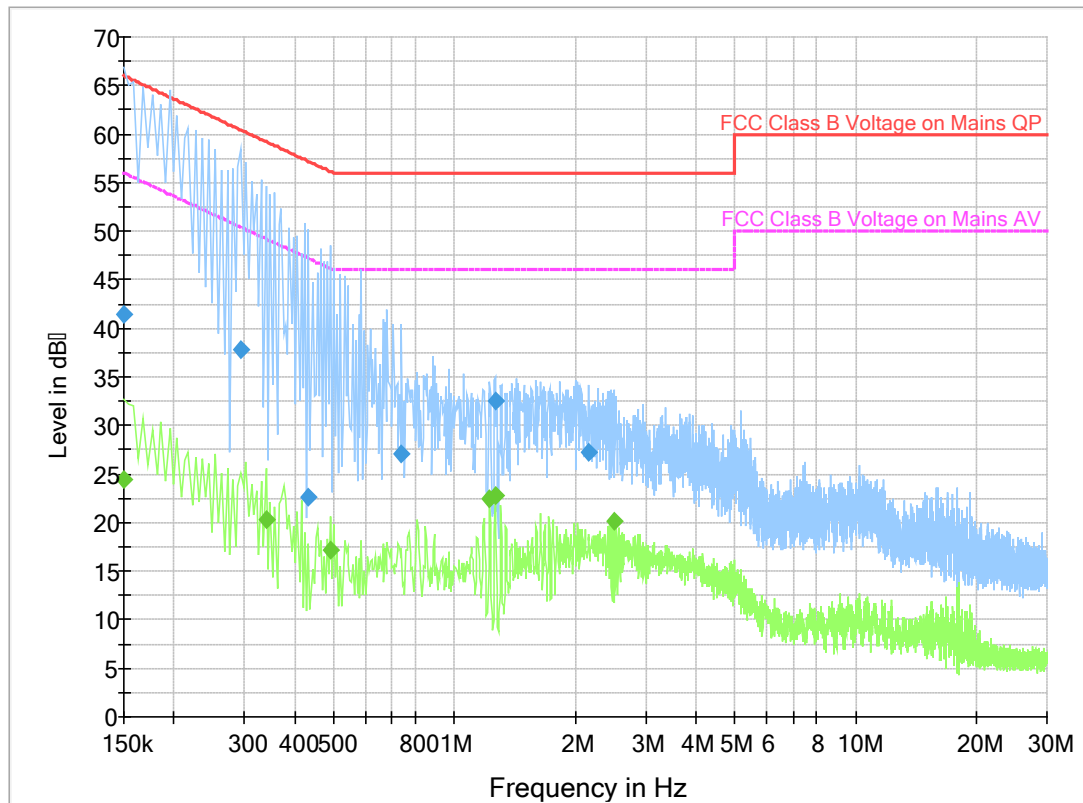
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

The measurement is made according to ANSI C63.10

Conclusion: PASS

Test graphs as below:

Traffic:



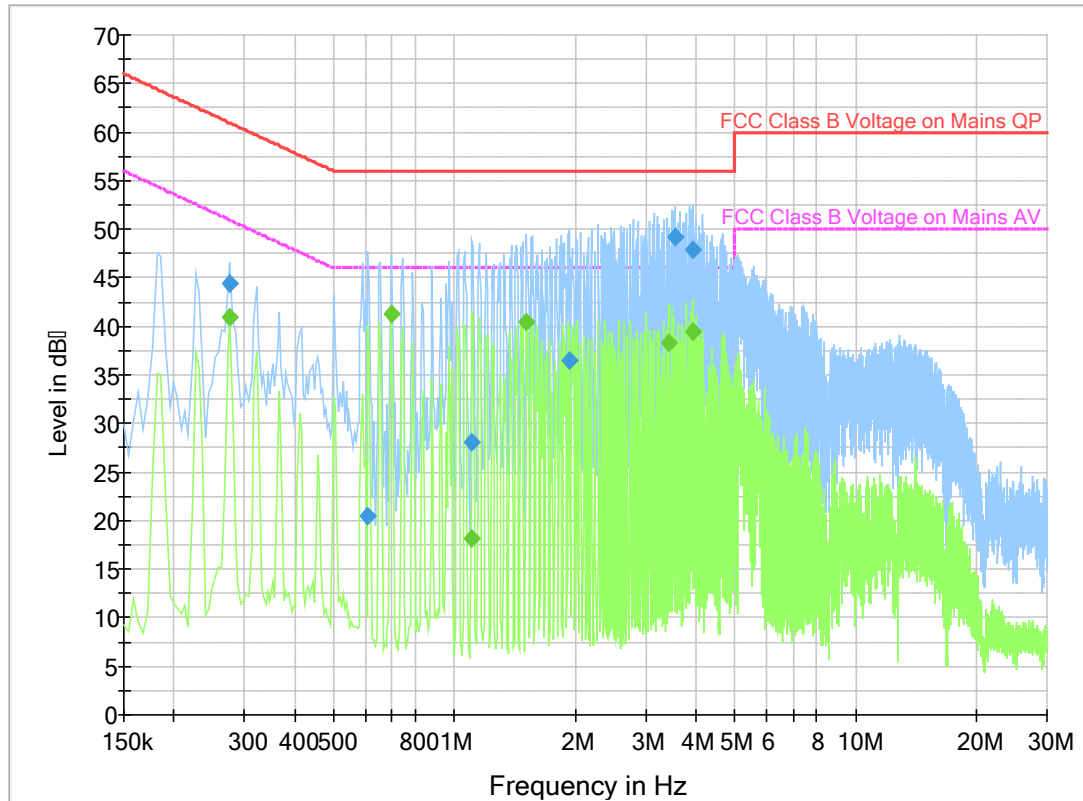
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	41.4	2000.	9.000	On	L1	20.1	24.6	66.0	
0.294000	37.7	2000.	9.000	On	L1	19.7	22.7	60.4	
0.433500	22.6	2000.	9.000	On	L1	19.8	34.6	57.2	
0.739500	27.1	2000.	9.000	On	L1	19.8	28.9	56.0	
1.266000	32.5	2000.	9.000	On	N	19.7	23.5	56.0	
2.157000	27.3	2000.	9.000	On	L1	19.6	28.7	56.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	24.4	2000.	9.000	On	L1	20.1	31.6	56.0	
0.339000	20.4	2000.	9.000	On	L1	19.8	28.8	49.2	
0.492000	17.1	2000.	9.000	On	L1	19.8	29.0	46.1	
1.225500	22.4	2000.	9.000	On	L1	19.7	23.6	46.0	
1.266000	22.7	2000.	9.000	On	L1	19.7	23.3	46.0	
2.494500	20.1	2000.	9.000	On	L1	19.6	25.9	46.0	

Idle1:



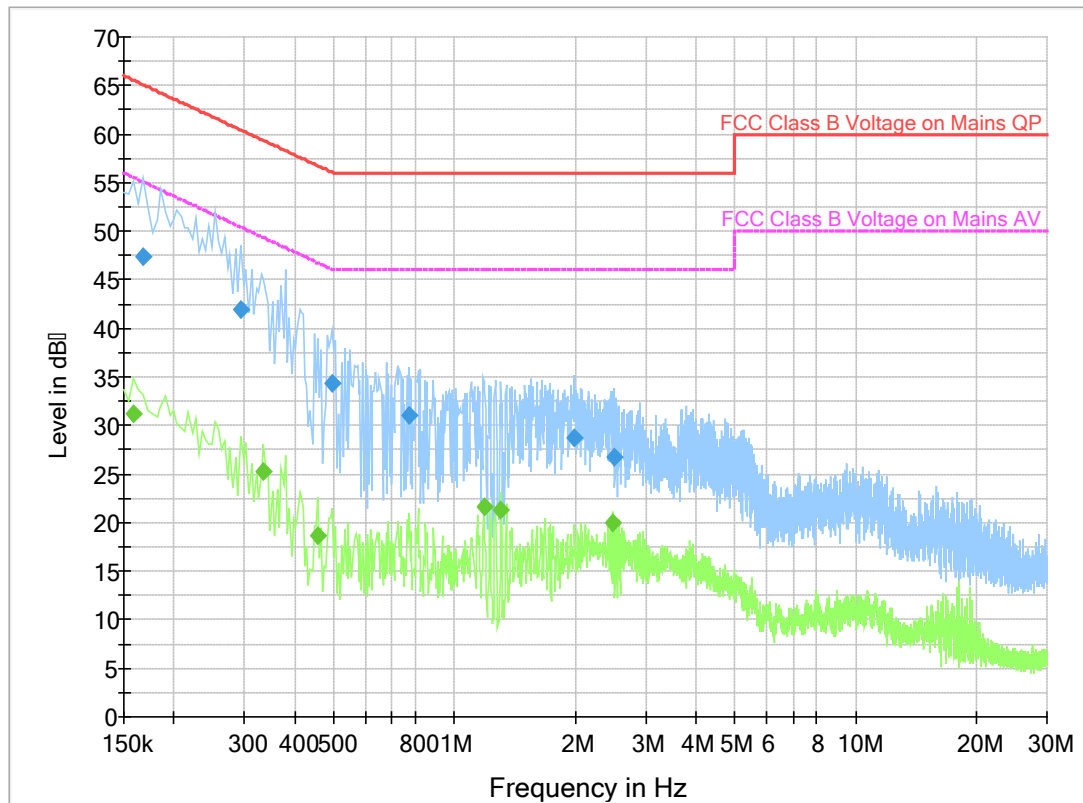
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Measurement Time	Bandwidth (kHz)	Filter	Line	Correction (dB)	Margin (dB)	Limit (dBμV)	Comment
0.276000	44.4	2000.	9.000	On	N	19.8	16.6	60.9	
0.609000	20.4	2000.	9.000	On	L1	19.8	35.6	56.0	
1.108500	28.1	2000.	9.000	On	L1	19.7	27.9	56.0	
1.932000	36.5	2000.	9.000	On	N	19.6	19.5	56.0	
3.561000	49.2	2000.	9.000	On	L1	19.7	6.8	56.0	
3.930000	47.8	2000.	9.000	On	L1	19.7	8.2	56.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Measurement Time (ms)	Bandwidth (kHz)	Filter	Line	Correction (dB)	Margin (dB)	Limit (dBμV)	Comment
0.276000	41.0	2000.	9.000	On	N	19.8	9.9	50.9	
0.694500	41.3	2000.	9.000	On	L1	19.8	4.7	46.0	
1.108500	18.2	2000.	9.000	On	L1	19.7	27.8	46.0	
1.513500	40.5	2000.	9.000	On	L1	19.6	5.5	46.0	
3.430500	38.3	2000.	9.000	On	L1	19.7	7.7	46.0	
3.934500	39.5	2000.	9.000	On	L1	19.7	6.5	46.0	

Idle2:



Final Result 1

Frequency (MHz)	QuasiPea k (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.168000	47.3	2000.	9.000	On	L1	19.7	17.8	65.1	
0.294000	41.9	2000.	9.000	On	L1	19.7	18.5	60.4	
0.496500	34.4	2000.	9.000	On	L1	19.8	21.7	56.1	
0.771000	31.0	2000.	9.000	On	N	19.8	25.0	56.0	
1.995000	28.7	2000.	9.000	On	N	19.6	27.3	56.0	
2.499000	26.8	2000.	9.000	On	N	19.6	29.2	56.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.159000	31.1	2000.	9.000	On	L1	19.7	24.4	55.5	
0.334500	25.2	2000.	9.000	On	N	19.8	24.1	49.3	
0.456000	18.7	2000.	9.000	On	L1	19.8	28.1	46.8	
1.185000	21.7	2000.	9.000	On	N	19.7	24.3	46.0	
1.306500	21.3	2000.	9.000	On	N	19.6	24.7	46.0	
2.490000	20.0	2000.	9.000	On	N	19.6	26.0	46.0	

ANNEX B: Accreditation Certificate

 China National Accreditation Service for Conformity Assessment LABORATORY ACCREDITATION CERTIFICATE (No. CNAS L0570) Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT <u>No.52, Huayuan North Road, Haidian District, Beijing, China</u> <u>No.51, Xueyuan Road, Haidian District, Beijing, China</u> <i>to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing and calibration.</i> <i>The scope of accreditation is detailed in the attached schedule bearing the same accreditation number as above. The schedule forms an integral part of this certificate.</i> Date of Issue: 2014-10-29 Date of Expiry: 2017-06-19 Date of Initial Accreditation: 1998-07-03  Signed on behalf of China National Accreditation Service for Conformity Assessment China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA) and Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).
No.CNAS AL 2 0011149

END OF REPORT