TEST REPORT

No. I14Z47765-EMC02

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone

Model Name: Yaris-4.5 US 1SIM ATV

Marketing Name: ONE TOUCH 5036A

FCC ID: RAD412

with

Hardware Version: Lot1

Software Version: v4F16

Issued Date: 2014-12-01

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:

FCC 2.948 Listed: No. 525429

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I14Z47765-EMC02	Rev.0	1st edition	2014-12-01

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location 1: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191

1.2. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

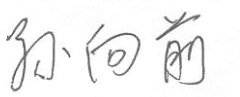
1.3. Project data

Testing Start Date: 2014-10-23

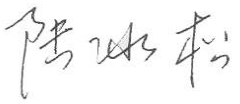
Testing End Date: 2014-11-05

1.4. Signature

Qu Pengfei
(Prepared this test report)



Sun Xiangqian
(Reviewed this test report)



Lu Bingsong
Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China.
City:	Shanghai
Postal Code:	201203
Country:	China
Contact Person:	Gong Zhizhou
Contact Email	zhizhou.gong@jrdcom.com
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

2.2. Manufacturer Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China.
City:	Shanghai
Postal Code:	201203
Country:	China
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

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

3.1. About EUT

Description	HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone
Model Name	Yaris-4.5 US 1SIM ATV
Marketing Name	ONE TOUCH 5036A
FCC ID	RAD412
Antenna	Integrated
Output power	31.11dBm maximum EIRP measured for PCS1900
Extreme vol. Limits	3.5VDC to 4.2VDC (nominal: 3.8VDC)
Extreme temp. Tolerance	-30°C to +50°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	014170009146049	Lot1	v4F16

*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	Remarks
AE1	Battery	/	14TCT-BA-0973
AE2	Battery	/	14TCT-BA-0971
AE3	Battery	/	14TCT-BA-0961
AE4	Battery	/	14TCT-BA-0841
AE5	Battery	/	14TCT-BA-0819
AE6	Battery	/	14TCT-BA-0813
AE7	USB cable	/	14TCT-DC-0679
AE8	USB cable	/	14TCT-DC-0613
AE9	Travel	/	14TCT-CH-1520
AE10	Travel	/	14TCT-CH-0590
AE11	Travel	/	14TCT-CH-1867
AE12	Travel	/	14TCT-CH-1876

AE1,AE2,AE3

Model	CAB32E0000C1
Manufacturer	BYD
Capacitance	1800 mAh
Nominal voltage	3.7 V

AE4,AE5,AE6

Model	CAB32E0000C2
Manufacturer	SCUD
Capacitance	1800 mAh
Nominal voltage	3.7 V

AE7

Model	CDA3122002C2
Manufacturer	Shenhua
Length of cable	98cm

AE8

Model	CDA3122002C1
Manufacturer	JUWEI
Length of cable	99cm

AE9,AE10

Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	/

AE11,AE12

Model	CBA3007AG0C2
Manufacturer	TEN PAO
Length of cable	/

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

3.4. Normal Accessory setting

Fully charged battery was used during the test.

3.5. General Description

The Equipment Under Test (EUT) is a model of HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone with integrated antenna. Manual and specifications of the EUT were provided to fulfil the test.

4. Reference Documents

4.1. Reference Documents for testing

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

Reference	Title	Version
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-13 Edition
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-13 Edition
ANSI/TIA-603-C	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2004
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2009
KDB 971168 D01	Measurement Guidance for Certification of Licensed Digital Transmitters	v02r01

5. LABORATORY ENVIRONMENT

Fully-anechoic chamber FAC-3 (9 meters×6.5 meters×4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

Shielded room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

6. SUMMARY OF TEST RESULTS

Items	List	Clause in FCC rules	Verdict
1	Output Power	22.913(a)/24.232(c)	P
2	Emission Limit	2.1051/22.917/24.238	P

7. Test Equipments Utilized

NO.	Description	TYPE	series number	MANUFACTURE	CAL DUE DATE	Calibration interval
1	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-15	3 year
2	Universal Radio Communication Tester	E5515C	MY48363198	Agilent	2015-07-06	1 year
3	Spectrum Analyzer	E4440A	MY48250642	Agilent	2015-02-27	1 year
4	EMI Antenna	9117	167	Schwarzbeck	2016-04-01	3 year
5	EMI Antenna	3117	00058889	ETS-Lindgren	2014-12-20	3 year
6	Signal Generator	N5183A	MY49060052	Agilent	2015-03-02	1 year
7	Power Amplifier	5S1G4	0341863	AR	/	/

ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) to ensure max power transmission and proper modulation.
This result contains output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits.

A.1.2 Radiated

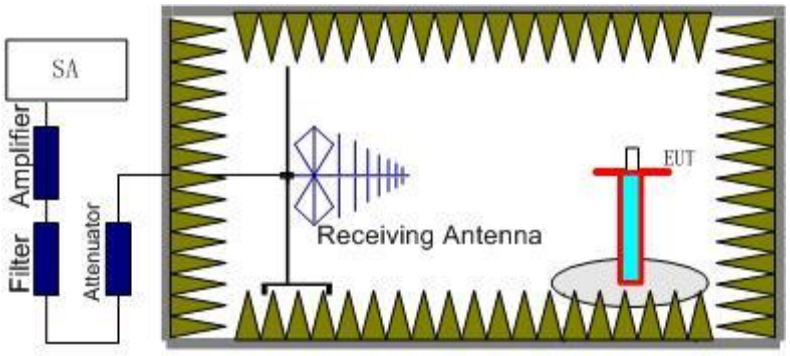
A.1.2.1 Description

This is the test for the maximum radiated power from the EUT.
Rule Part 24.232(c) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."
Rule Part 22.913(a) specifies “The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

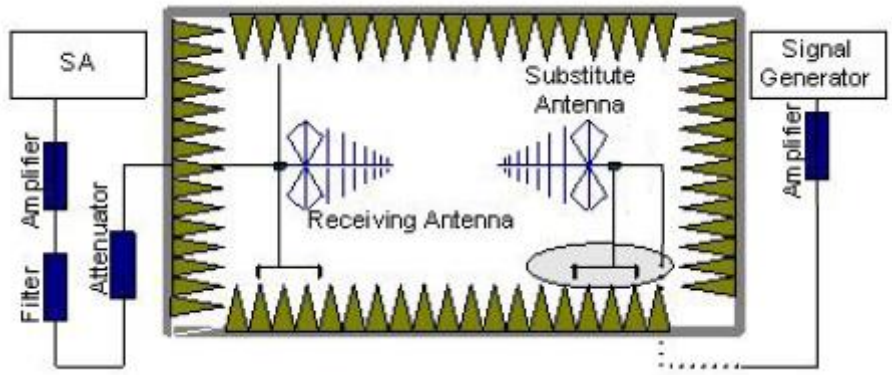
A.1.2.2 Method of Measurement

The measurements procedures in TIA-603C-2004 are used.

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna.
   The cable loss (P_{cl}) ,the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
   The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea}- P_{Ag} - P_{cl} - G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

GSM 850-ERP 22.913(a)

Limits

	Power Step	Burst Peak ERP (dBm)
GSM	5	≤38.45dBm (7W)
GPRS	3	≤38.45dBm (7W)
EGPRS	6	≤38.45dBm (7W)

Measurement result

GSM

Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg(dB)	Ga Antenna Gain(dB)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
824.20	-9.62	2.26	-45.79	0.84	2.15	30.92	38.45	7.53	H
836.60	-9.96	2.26	-45.66	0.90	2.15	30.39	38.45	8.06	H
848.80	-10.37	2.28	-45.54	0.95	2.15	29.79	38.45	8.66	H

GPRS

Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg(dB)	Ga Antenna Gain(dB)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
824.20	-9.70	2.26	-45.79	0.84	2.15	30.84	38.45	7.61	H
836.60	-10.03	2.26	-45.66	0.90	2.15	30.32	38.45	8.13	H
848.80	-10.39	2.28	-45.54	0.95	2.15	29.77	38.45	8.68	H

EGPRS

Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg(dB)	Ga Antenna Gain(dB)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
824.20	-9.56	2.26	-45.79	0.84	2.15	30.98	38.45	7.47	H
836.60	-9.90	2.26	-45.66	0.90	2.15	30.45	38.45	8.00	H
848.80	-10.35	2.28	-45.54	0.95	2.15	29.81	38.45	8.64	H

Frequency: 824.20MHz

Peak ERP(dBm)=P_{Mea}(-9.56dBm)-P_{cl}(2.26dB)-P_{Ag}(-45.79 dB)-G_a (0.84dB)-2.15dB=30.98dBm

ANALYZER SETTINGS: RBW = VBW = 3MHz

PCS1900-EIRP 24.232(c)

Limits

	Power Step	Burst Peak EIRP (dBm)
GSM	0	≤33dBm (2W)
GPRS	3	≤33dBm (2W)
EGPRS	5	≤33dBm (2W)

Measurement result

GSM

Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1850.20	-17.58	2.93	-43.75	-4.56	27.80	33.00	5.20	H
1880.00	-14.65	2.85	-43.75	-4.43	30.68	33.00	2.32	H
1909.80	-14.12	2.89	-43.77	-4.30	31.06	33.00	1.94	H

GPRS

Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1850.20	-17.57	2.93	-43.75	-4.56	27.81	33.00	5.19	H
1880.00	-14.64	2.85	-43.75	-4.43	30.69	33.00	2.31	H
1909.80	-14.08	2.89	-43.77	-4.30	31.10	33.00	1.90	H

EGPRS

Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1850.20	-17.56	2.93	-43.75	-4.56	27.82	33.00	5.18	H
1880.00	-14.63	2.85	-43.75	-4.43	30.70	33.00	2.30	H
1909.80	-14.07	2.89	-43.77	-4.30	31.11	33.00	1.89	H

Frequency**:** 1909.80MHz

Peak EIRP(dBm)= P_{Mea}(-14.07dBm) - P_{cl}(2.89dB) - P_{Ag}(-43.77dB) - G_a (-4.30dB) =31.11dBm

ANALYZER SETTINGS: RBW = VBW = 3MHz

A.2 EMISSION LIMIT

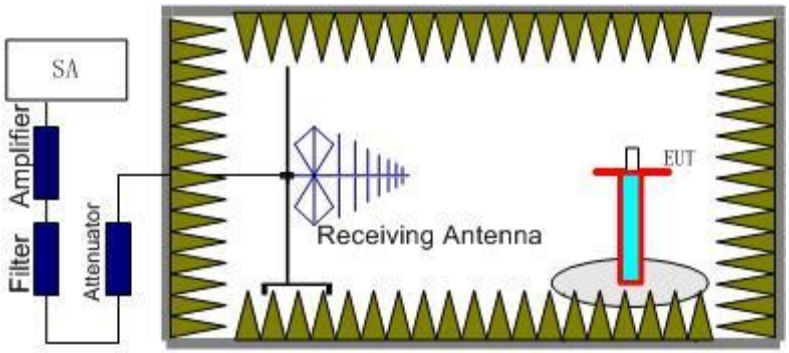
A.2.1 Measurement Method

The measurement procedures in TIA-603C-2004 are used.

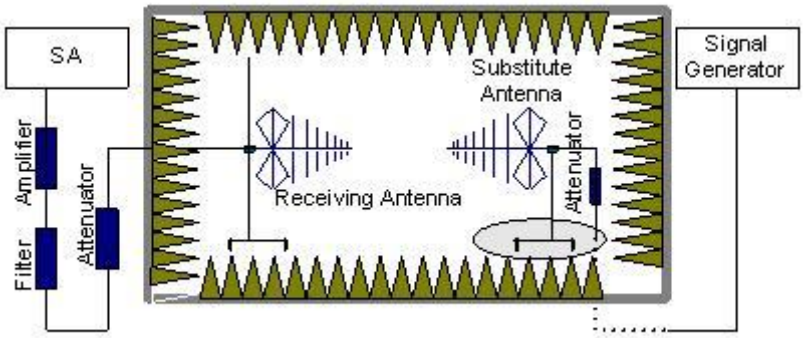
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. The resolution bandwidth is set as outlined in Part 24.238 and Part 22.917. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of PCS1900 and GSM850.

The procedure of radiated spurious emissions is as follows:

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere

with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (G_a) should be recorded after test.
   A amplifier should be connected in for the test.
   The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.
   The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea} - P_{pl} - G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

A.2.2 Measurement Limit

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) and GSM850 band (824.2MHz, 836.6MHz, 848.8MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the PCS1900 ,GSM850 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

A.2.4 Measurement Results Table

Frequency	Channel	Frequency Range	Result
GSM 850MHz	Low	30MHz-10GHz	Pass
	Middle	30MHz-10GHz	Pass
	High	30MHz-10GHz	Pass
GSM 1900MHz	Low	30MHz-20GHz	Pass
	Middle	30MHz-20GHz	Pass
	High	30MHz-20GHz	Pass

A.2.5 Sweep Table

Working Frequency	Subrange (GHz)	RBW	VBW	Sweep time (s)
850MHz	0.03~1	100KHz	300KHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~10	1 MHz	3 MHz	3
1900MHz	0.03~1	100KHz	300KHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
	18~20	1 MHz	3 MHz	2

GSM Mode Channel 128/824.2MHz

Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit （dBm）	Margin(dB)	Polarization
1648.39	-42.75	2.91	-5.45	2.15	-42.36	-13.00	29.36	V
3300.46	-58.69	4.20	-7.42	2.15	-57.62	-13.00	44.62	H
4138.83	-60.14	4.67	-8.58	2.15	-58.38	-13.00	45.38	V
4967.30	-58.80	5.11	-9.64	2.15	-56.42	-13.00	43.42	H
5768.84	-54.92	5.69	-10.11	2.15	-52.65	-13.00	39.65	H
7418.08	-55.80	6.40	-11.35	2.15	-53.00	-13.00	40.00	H

GSM Mode Channel 190/836.6MHz

Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit （dBm）	Margin(dB)	Polarization
1672.98	-42.21	2.97	-5.34	2.15	-41.99	-13.00	28.99	V
3342.60	-58.69	4.21	-7.52	2.15	-57.53	-13.00	44.53	H
4205.96	-59.20	4.74	-8.62	2.15	-57.47	-13.00	44.47	V
5025.17	-58.88	5.16	-9.72	2.15	-56.47	-13.00	43.47	V
5838.94	-57.50	5.73	-10.14	2.15	-55.24	-13.00	42.24	V
6706.63	-58.00	6.08	-10.81	2.15	-55.42	-13.00	42.42	V

GSM Mode Channel 251/848.8MHz

Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit （dBm）	Margin(dB)	Polarization
1697.60	-47.22	2.95	-5.23	2.15	-47.09	-13.00	34.09	V
3395.48	-57.11	4.22	-7.65	2.15	-55.83	-13.00	42.83	V
4259.44	-59.04	4.79	-8.66	2.15	-57.32	-13.00	44.32	H
5082.86	-59.06	5.20	-9.75	2.15	-56.66	-13.00	43.66	H
5941.81	-51.15	5.52	-10.18	2.15	-48.64	-13.00	35.64	H
7639.46	-59.23	6.72	-11.54	2.15	-56.56	-13.00	43.56	H

GSM Mode Channel 512/1850.2MHz

Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Margin(dB)	Polarization
3729.47	-58.31	4.43	-8.18	-54.56	-13.00	41.56	H
5563.11	-59.87	5.43	-10.03	-55.27	-13.00	42.27	V
7433.22	-59.81	6.40	-11.36	-54.85	-13.00	41.85	H
9329.39	-59.29	7.68	-12.60	-54.37	-13.00	41.37	H
11253.64	-53.24	8.40	-12.40	-49.24	-13.00	36.24	V
12980.78	-54.52	8.92	-13.28	-50.16	-13.00	37.16	V

GSM Mode Channel 661/1880.0MHz

Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Margin(dB)	Polarization
3760.15	-50.92	4.52	-8.21	-47.23	-13.00	34.23	H
5639.85	-55.08	5.45	-10.06	-50.47	-13.00	37.47	H
7519.85	-53.50	6.81	-11.42	-48.89	-13.00	35.89	H
9419.77	-58.41	7.43	-12.60	-53.24	-13.00	40.24	H
11269.11	-57.02	8.44	-12.40	-53.06	-13.00	40.06	H
13184.66	-53.88	9.34	-13.48	-49.74	-13.00	36.74	H

GSM Mode Channel 810/1909.8MHz

Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Margin(dB)	Polarization
3819.53	-54.23	4.49	-8.28	-50.44	-13.00	37.44	H
5729.13	-52.24	5.55	-10.09	-47.70	-13.00	34.70	V
7625.71	-58.13	6.84	-11.53	-53.44	-13.00	40.44	H
9549.43	-56.38	7.79	-12.58	-51.59	-13.00	38.59	H
11390.44	-56.14	8.66	-12.40	-52.40	-13.00	39.40	V
13294.53	-53.12	9.06	-13.59	-48.59	-13.00	35.59	V

*****END OF REPORT*****