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## RADIO TEST REPORT

Report No: STS1511071F02

Issued for

QAT Mobile SA de CV

Iglesia 2, Torre E Desp 201 COL Tizapan Alvaro Obregon,  
Mexico CP 01090

Product Name:	smart phone
Brand Name:	QAT
Model No.:	QM1 Wave
Series Model:	8S5286, 8S5286A, QUE 5.0
FCC ID:	2AGKJQM1
Test Standard:	FCC Part 15.247

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## TEST RESULT CERTIFICATION

**Applicant's name** ..... : QAT Mobile SA de CV  
**Address** ..... : Iglesia 2, Torre E Desp 201 COL Tizapan Alvaro Obregon, Mexico CP 01090  
**Manufacture's Name** ..... : Shenzhen Hexiang Electronics Co., Ltd  
**Address** ..... : Room:3-006AB, 3F., Tianxia IC Industrial Park, No. 133, Yiyuan Road, Nanshan District, Shenzhen, 518052 China

### Product description

**Product name** ..... : smart phone  
**Model and/or type reference** : QM1 Wave  
**Series Model** ..... : 8S5286, 8S5286A, QUE 5.0

**Standards** ..... : FCC Part15.247

**Test procedure** ..... ANSI C63.10-2013

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Date of Test** ..... :

**Date (s) of performance of tests** ..... : 11 Nov. 2015 ~16 Nov. 2015

**Date of Issue** ..... : 17 Nov. 2015

**Test Result** ..... : **Pass**

Testing Engineer :

(Jin Ming)

Technical Manager :

(Vita Li)

Authorized Signatory :

(Bovey Yang)





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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	--
15.247 (a)(2)	6dB Bandwidth	PASS	--
15.247 (b)	Peak Output Power	PASS	--
15.247 (c)	Radiated Spurious Emission	PASS	--
15.247 (d)	Power Spectral Density	PASS	--
15.205	Band Edge Emission	PASS	--
15.203	Antenna Requirement	PASS	--

### NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

### 1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.

Add. : 1/F., Building B, Zhuoke Science Park, No.190,Chongqing Road,

Fuyong Street, Bao'an District, Shenzhen, Guangdong,China

CNAS Registration No.: L7649;

FCC Registration No.: 842334; IC Registration No.: 12108A-1

### 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	$\pm 2.88\text{dB}$
2	Conducted Emission (150KHz-30MHz)	$\pm 2.67\text{dB}$
3	RF power,conducted	$\pm 0.70\text{dB}$
4	Spurious emissions,conducted	$\pm 1.19\text{dB}$
5	All emissions,radiated(<1G) 30MHz-200MHz	$\pm 2.83\text{dB}$
6	All emissions,radiated(<1G) 200MHz-1000MHz	$\pm 2.94\text{dB}$
7	All emissions,radiated(>1G)	$\pm 3.03\text{dB}$
8	Temperature	$\pm 0.5^{\circ}\text{C}$
9	Humidity	$\pm 2\%$



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	smart phone	
Trade Name	QAT	
Model Name	QM1 Wave	
Series Model	8S5286, 8S5286A, QUE 5.0	
Model Difference	The processor is not the same	
Product Description	The EUT is a smart phone	
	Operation Frequency:	2402~2480 MHz
	Modulation Type:	GFSK
	Radio Technology	BLE
	Number Of Channel	40
	Antenna Designation:	Please see Note 3.
	Antenna Gain (dBi)	1.56 dbi
Channel List	Please refer to the Note 2.	
Adapter	Input: AC100-240V, 150mA, 50/60 Hz Output: DC 5V, 1000mA	
Battery	Rated Voltage: 3.7V capacity :2000mAh	
Hardware version number	R7872_MB_V4.0	
Software versioning number	Android 4.4	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2.

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	11	2422	21	2442	31	2462
02	2404	12	2424	22	2444	32	2464
03	2406	13	2426	23	2446	33	2466
04	2408	14	2428	24	2448	34	2468
05	2410	15	2430	25	2450	35	2470
06	2412	16	2432	26	2452	36	2472
07	2414	17	2434	27	2454	37	2474
08	2416	18	2436	28	2456	38	2476
09	2418	19	2438	29	2458	39	2478
10	2420	20	2440	30	2460	40	2480

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	QAT	QM1 Wave	PIFA Antenna	N/A	1.56	BT 4.0 ANT





## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX CH1/CH20/CH40
Mode 2	Keeping TX mode

For Conducted Emission	
Final Test Mode	Description
Mode 2	Keeping TX mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX CH1/CH20/CH40
Mode 2	Keeping TX mode

Note:

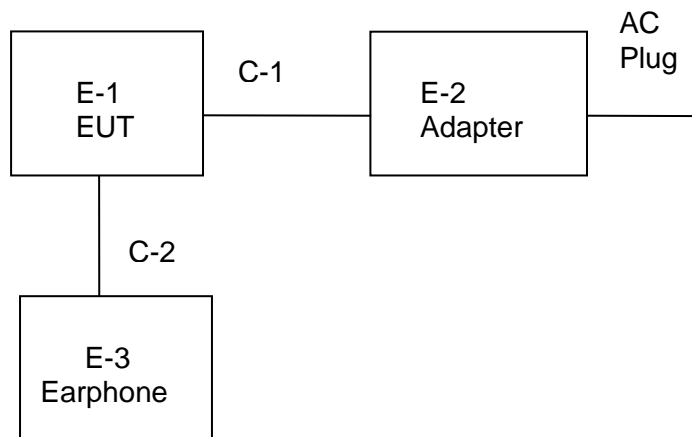
- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported
- (3) We have been tested for all available U.S. voltage and frequencies (For 120V, 50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.



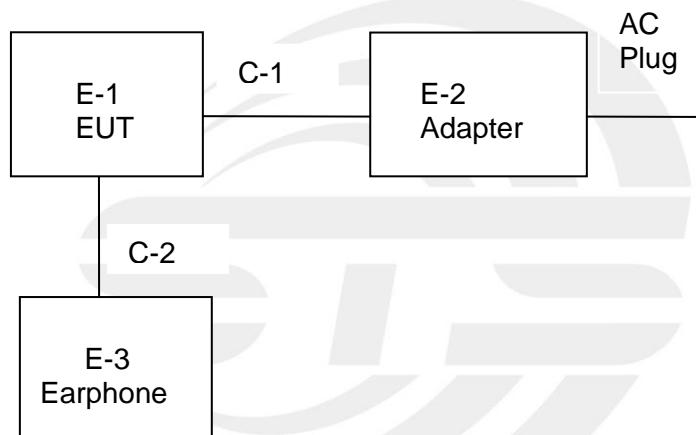


## 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

### Radiated Spurious Emission Test



### Conducted Emission Test





## 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	smart phone	QAT	QM1 Wave	N/A	EUT
E-2	Adapter	QAT	QM1 Wave	N/A	EUT
E-3	Earphone	N/A	N/A	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	unshielded	NO	100cm	N/A
C-2	unshielded	NO	101cm	N/A

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

## Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Spectrum Analyzer	Agilent	E4407B	MY50140340	2015.10.25	2016.10.24
Test Receiver	R&S	ESCI	101427	2015.10.25	2016.10.24
Bilog Antenna	TESEQ	CBL6111D	34678	2014.11.25	2015.11.24
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2015.03.06	2016.03.05
50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.06.06	2016.06.05
PreAmplifier	Agilent	8449B	60538	2015.10.25	2016.10.24
Loop Antenna	ARA	PLA-1030/B	1029	2015.06.08	2016.06.07
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2015.10.25	2016.10.24
STS-E048	MXA SIGNAL Analyzer	Agilent	N9020A	2015.10.25	2016.10.24

## Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	102086	2014.11.20	2015.11.19
LISN	R&S	ENV216	101242	2015.10.25	2016.10.24
LISN	EMCO	3810/2NM	000-23625	2015.10.25	2016.10.24



### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

operating frequency band. In case the emission fall within the restricted band specified on Part 15.247&207(a) limit in the table below has to be followed.

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

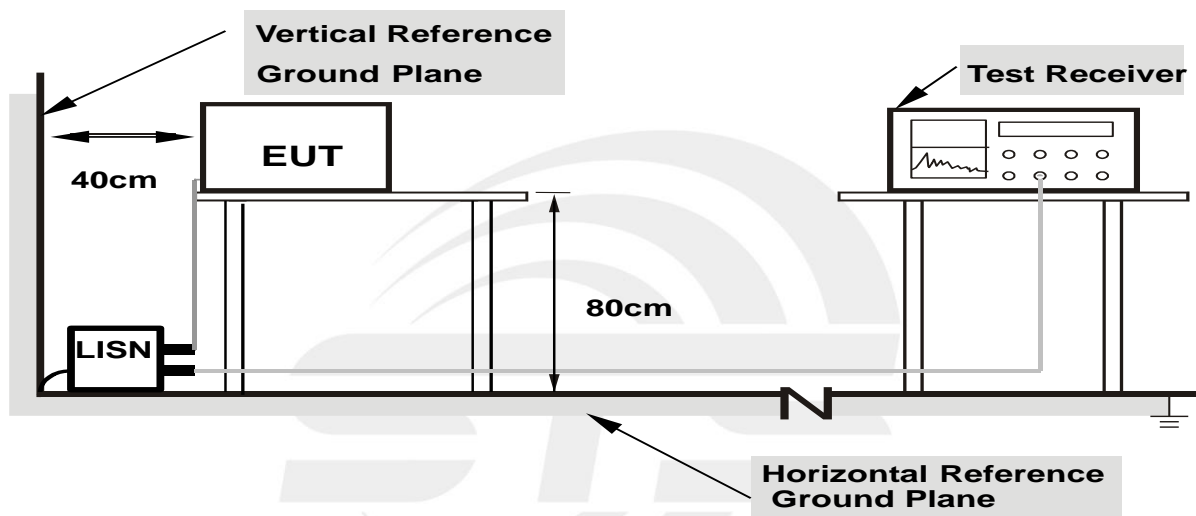
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

### 3.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.3 TEST SETUP



**Note: 1.Support units were connected to second LISN.**

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



## 3.5 TEST RESULTS

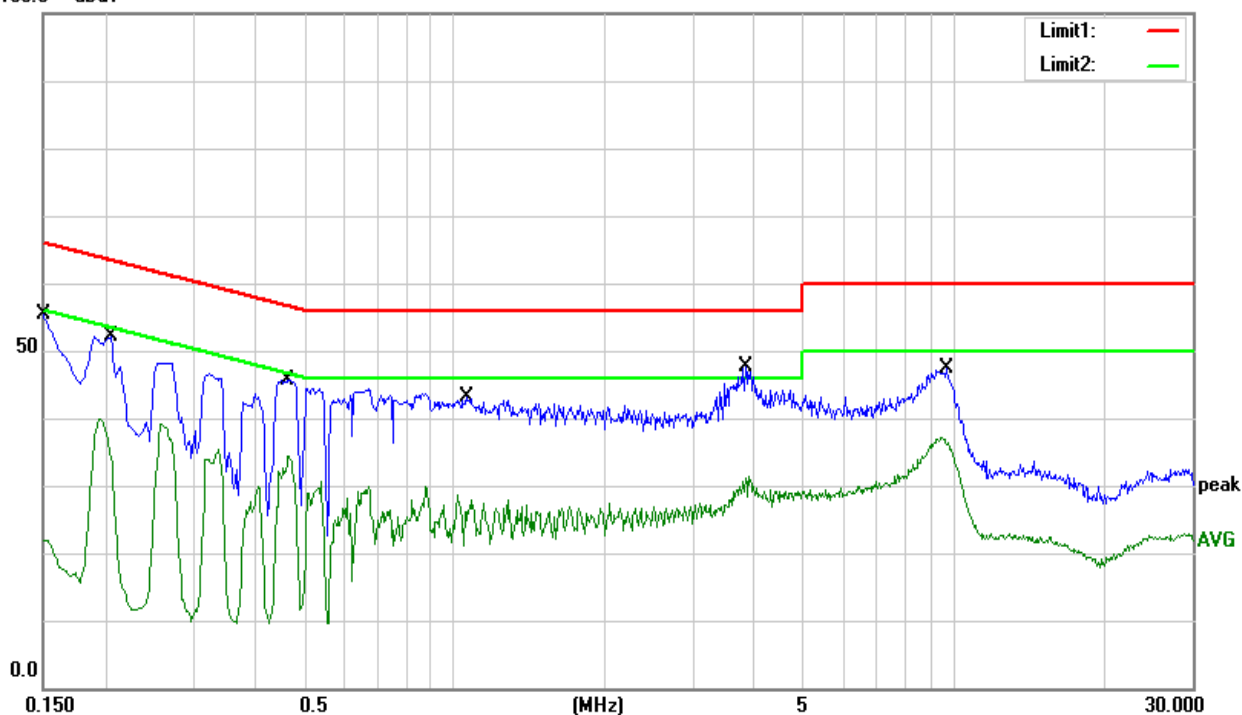
EUT :	smart phone	Model Name. :	QM1 Wave
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V from Adapter AC120V/60Hz	Test Mode :	Mode 2

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1500	44.13	11.20	55.33	66.00	-10.67	QP
0.1500	10.78	11.20	21.98	56.00	-34.02	AVG
0.2060	42.04	9.99	52.03	63.37	-11.34	QP
0.2060	28.37	9.99	38.36	53.37	-15.01	AVG
0.4660	35.57	10.00	45.57	56.58	-11.01	QP
0.4660	24.31	10.00	34.31	46.58	-12.27	AVG
1.0580	33.23	9.91	43.14	56.00	-12.86	QP
1.0580	17.97	9.91	27.88	46.00	-18.12	AVG
3.8300	37.33	10.20	47.53	56.00	-8.47	QP
3.8300	21.11	10.20	31.31	46.00	-14.69	AVG
9.6860	37.13	10.26	47.39	60.00	-12.61	QP
9.6860	26.99	10.26	37.25	50.00	-12.75	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

100.0 dBuV





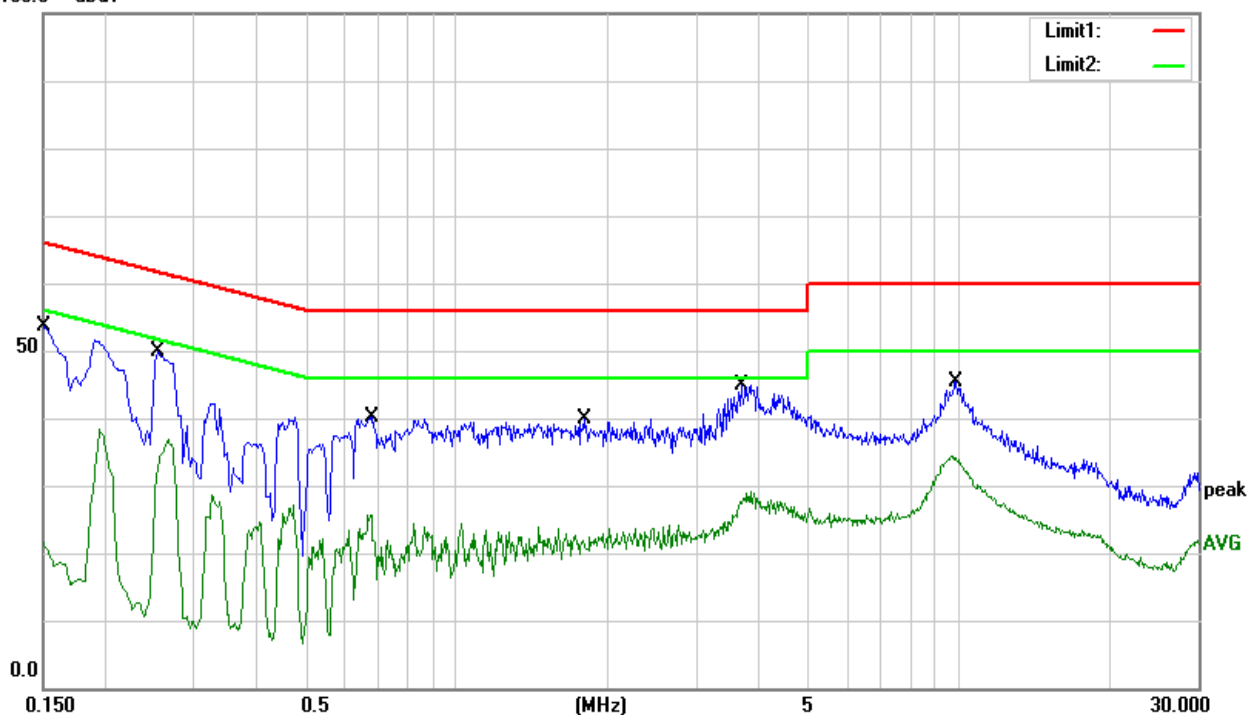
EUT :	smart phone	Model Name. :	QM1 Wave
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V from Adapter AC120V/60Hz	Test Mode :	Mode 2

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1500	42.40	11.20	53.60	66.00	-12.40	QP
0.1500	10.43	11.20	21.63	56.00	-34.37	AVG
0.2540	39.85	9.95	49.80	61.63	-11.83	QP
0.2540	26.89	9.95	36.84	51.63	-14.79	AVG
0.6820	30.26	9.99	40.25	56.00	-15.75	QP
0.6820	15.61	9.99	25.60	46.00	-20.40	AVG
1.7980	29.76	10.00	39.76	56.00	-16.24	QP
1.7980	12.80	10.00	22.80	46.00	-23.20	AVG
3.6980	34.73	10.19	44.92	56.00	-11.08	QP
3.6980	18.06	10.19	28.25	46.00	-17.75	AVG
9.9100	35.29	10.20	45.49	60.00	-14.51	QP
9.9100	24.11	10.20	34.31	50.00	-15.69	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

100.0 dBuV





## 4. RADIATED EMISSION MEASUREMENT

### 4.1 RADIATED EMISSION LIMITS

6dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.247&205(a), then the Part15.247&209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (Frequency Range 9kHz-1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier harmonic(Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=10 Hz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP





#### 4.2 TEST PROCEDURE

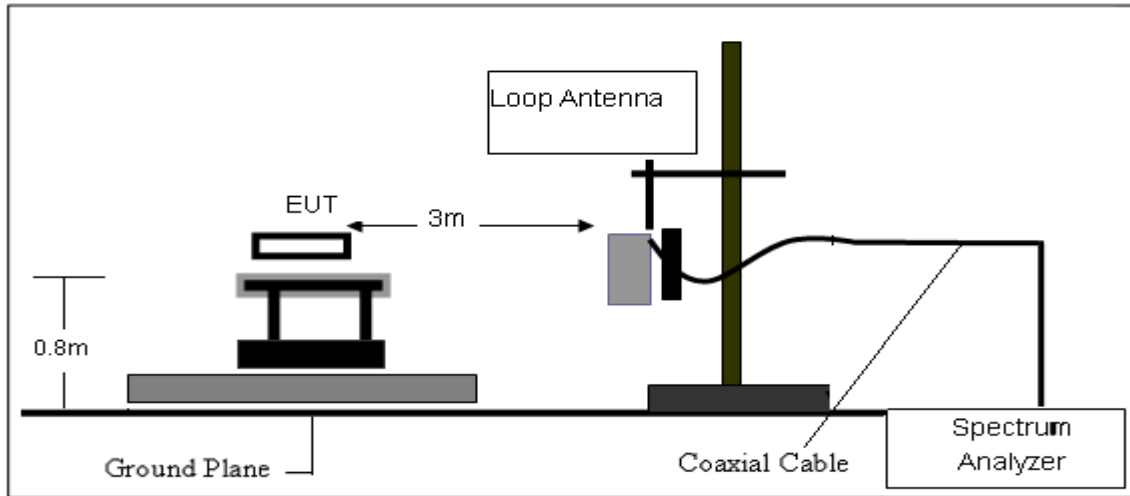
- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters(above 1GHz is 1.5 m) above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

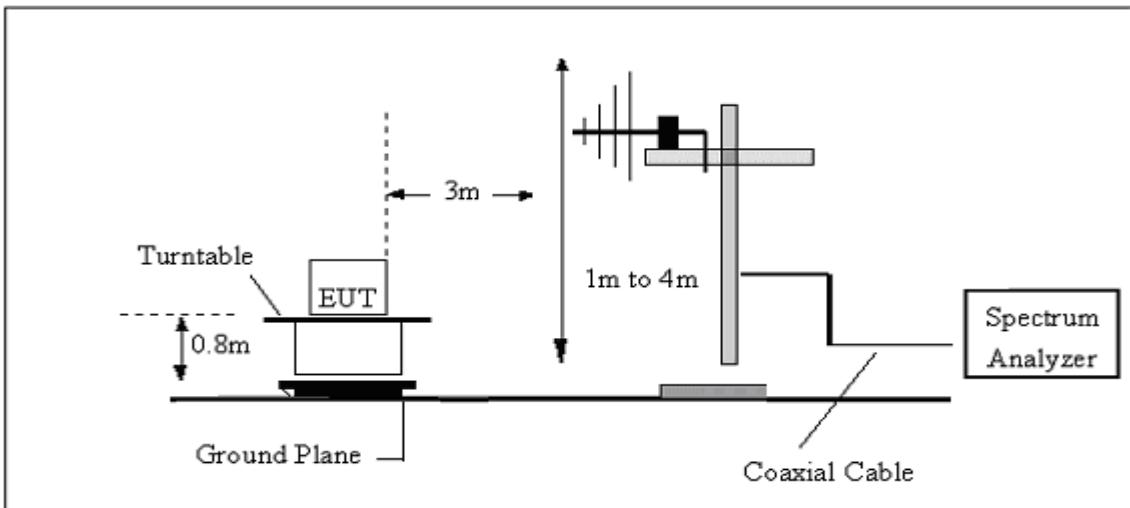
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

### 4.3 TEST SETUP

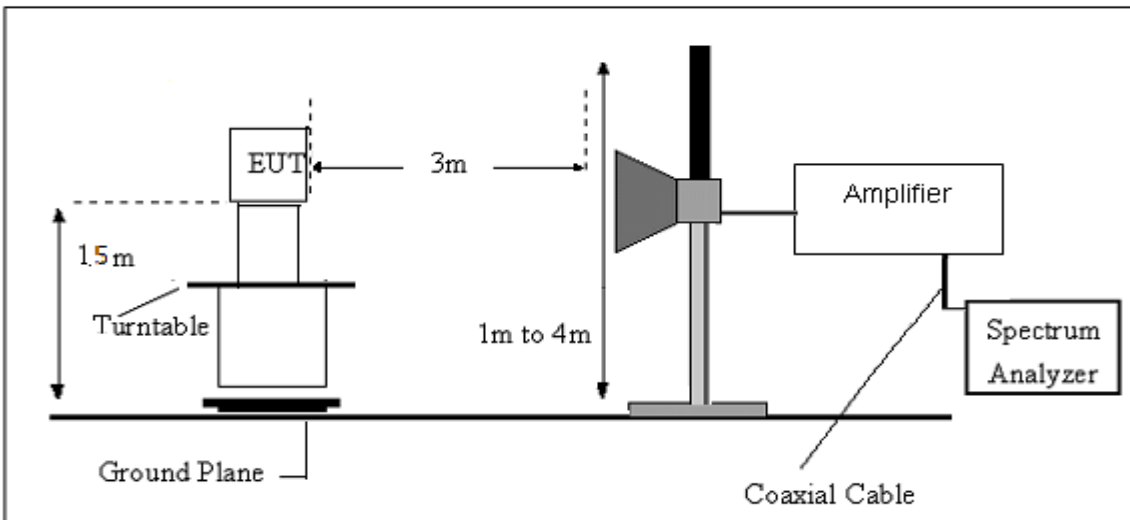
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



#### (C) Radiated Emission Test-Up Frequency Above 1GHz





#### 4.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.5 TEST RESULTS

(Between 9KHz – 30 MHz)

EUT:	smart phone	Model Name. :	QM1 Wave
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V from Adapter AC120V/60Hz
Test Mode :	Link mode	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	--
--	--	--	--	--

#### NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



Between 30-1000MHz

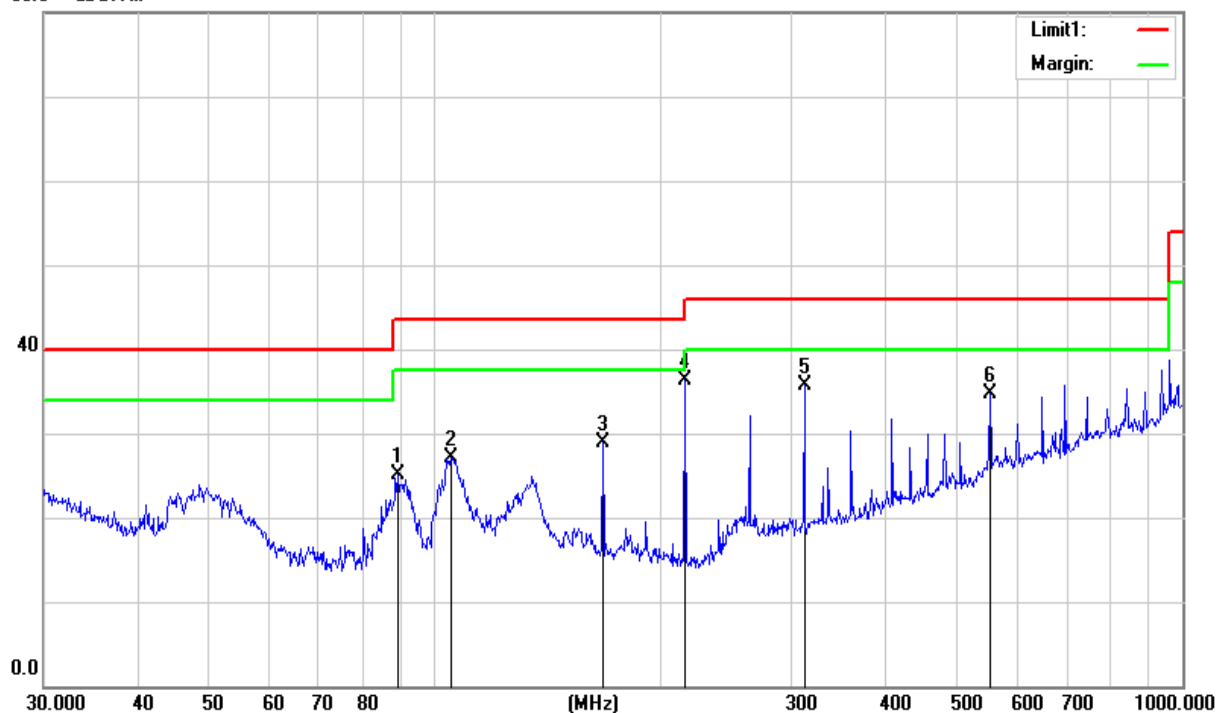
EUT :	smart phone	Model Name. :	QM1 Wave
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	Horizontal
Test Voltage :	DC 5V from Adapter AC120V/60Hz	Test Mode :	Mode 2

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
89.2764	15.65	9.43	25.08	43.50	-18.42	QP
105.2718	15.80	11.22	27.02	43.50	-16.48	QP
167.8243	18.15	10.75	28.90	43.50	-14.60	QP
216.0240	26.18	10.09	36.27	46.00	-9.73	QP
312.1794	20.62	15.10	35.72	46.00	-10.28	QP
552.8832	12.20	22.57	34.77	46.00	-11.23	QP

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

80.0 dBuV/m





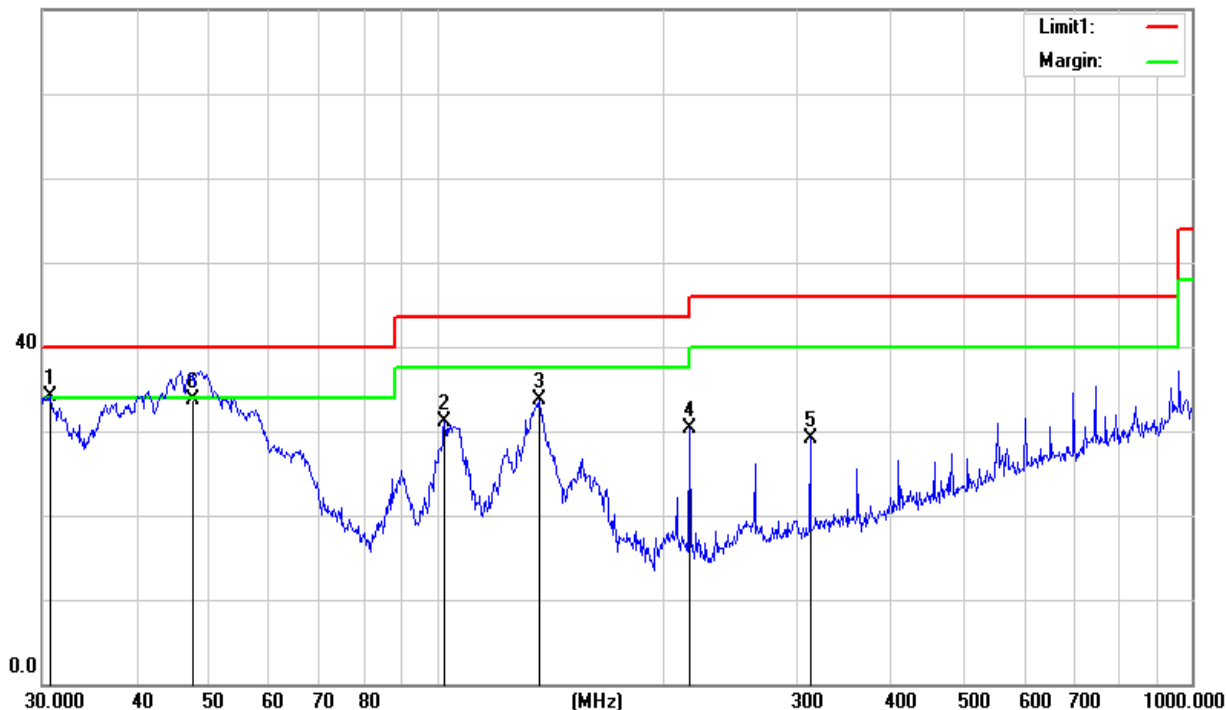
EUT :	smart phone	Model Name. :	QM1 Wave
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	Vertical
Test Voltage :	DC 5V from Adapter AC120V/60Hz	Test Mode :	Mode 2

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
30.7455	15.81	18.31	34.12	40.00	-5.88	QP
102.3597	20.11	10.96	31.07	43.50	-12.43	QP
136.4598	21.25	12.55	33.80	43.50	-9.70	QP
216.0240	20.24	10.09	30.33	46.00	-15.67	QP
312.1794	14.00	15.10	29.10	46.00	-16.90	QP
47.5941	24.24	9.38	33.62	40.00	-6.38	QP

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

80.0 dBuV/m





Above 1000 MHz

EUT :	smart phone	Model Name :	QM1 Wave
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V

Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (GFSK/2402 MHz)							
4804.19	62.56	-3.62	58.94	74	-15.06	PK	Vertical
4804.22	43.37	-3.62	39.75	54	-14.25	AV	Vertical
7206.13	58.05	-0.9	57.15	74	-16.85	PK	Vertical
7206.12	37.48	-0.9	36.58	54	-17.42	AV	Vertical
4804.00	58.76	-3.65	55.11	74	-18.89	PK	Horizontal
4803.99	41.04	-3.65	37.39	54	-16.61	AV	Horizontal
Mid Channel (GFSK/2440 MHz)							
4882.08	63.68	-3.65	60.03	74	-13.97	PK	Vertical
4882.07	47.35	-3.65	43.7	54	-10.3	AV	Vertical
7320.22	59.77	-0.83	58.94	74	-15.06	PK	Vertical
7320.21	42.42	-0.83	41.59	54	-12.41	AV	Vertical
4882.18	60.23	-3.68	56.55	74	-17.45	PK	Horizontal
4882.14	43.71	-3.68	40.03	54	-13.97	AV	Horizontal
High Channel (GFSK/2480 MHz)							
4960.26	60.12	-3.59	56.53	74	-17.47	PK	Vertical
4960.30	44.07	-3.59	40.48	54	-13.52	AV	Vertical
7440.26	59.45	-0.73	58.72	74	-15.28	PK	Vertical
7440.31	44.12	-0.73	43.39	54	-10.61	AV	Vertical
4960.32	59.86	-3.59	56.27	74	-17.73	PK	Horizontal
4960.31	44.17	-3.59	40.58	54	-13.42	AV	Horizontal
Remark: 1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



## 4.6 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

EUT :	smart phone	Model Name :	QM1 Wave
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V

Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
GFSK							
2390.0	66.66	-12.99	53.67	74	-20.33	PK	Vertical
2390.0	54.18	-12.99	41.19	54	-12.81	AV	Vertical
2390.0	65.94	-12.99	52.95	74	-21.05	PK	Horizontal
2390.0	52.08	-12.99	39.09	54	-14.91	AV	Horizontal
2483.6	65.75	-12.78	52.97	74	-21.03	PK	Vertical
2483.6	51.51	-12.78	38.73	54	-15.27	AV	Vertical
2483.6	66.76	-12.78	53.98	74	-20.02	PK	Horizontal
2483.6	52.95	-12.78	40.17	54	-13.83	AV	Horizontal
Remark: 1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.							
Low measurement frequencies is range from 2310 to 2400 MHz, high measurement frequencies is range from 2483.5 to 2500 MHz. Only show the worst point data of the emissions in the frequency 2310-2400 MHz and 2483.5-2500 MHz.							

## 5. CONDUCTED SPURIOUS EMISSIONS

### 5.1 REQUIREMENT

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

### 5.2 TEST PROCEDURE

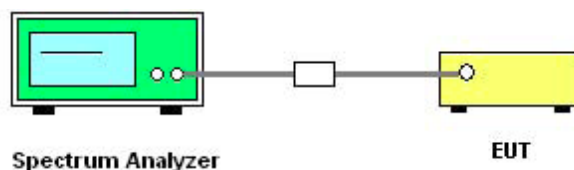
According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2310 – 2404 MHz Upper Band Edge: 2478 – 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

### 5.3 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth(RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

### 5.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

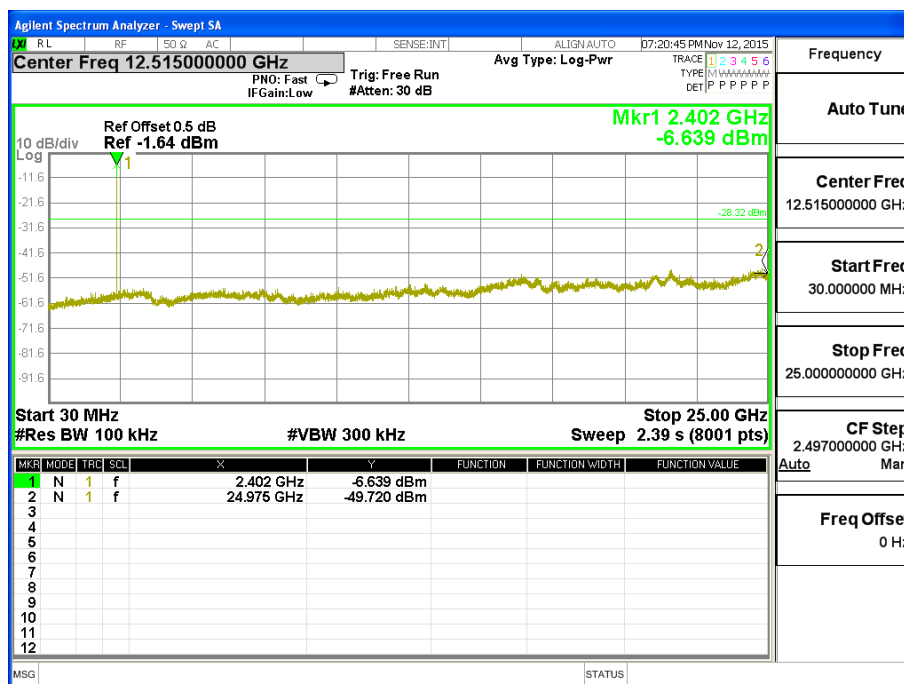




## 5.5 TEST RESULTS

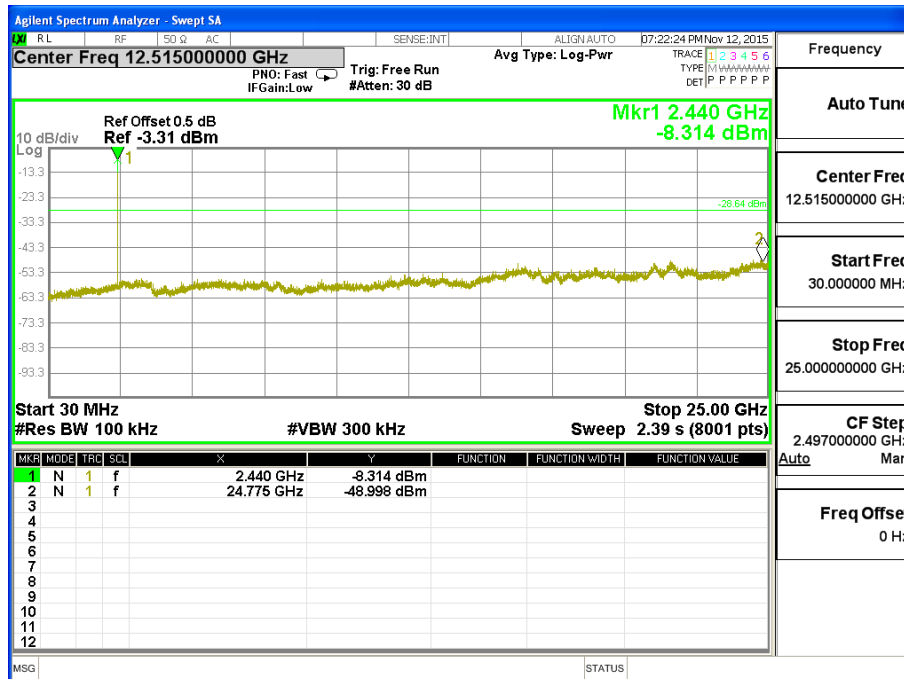
EUT :	smart phone	Model Name :	QM1 Wave
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode /CH01, CH20, CH40		

01 CH

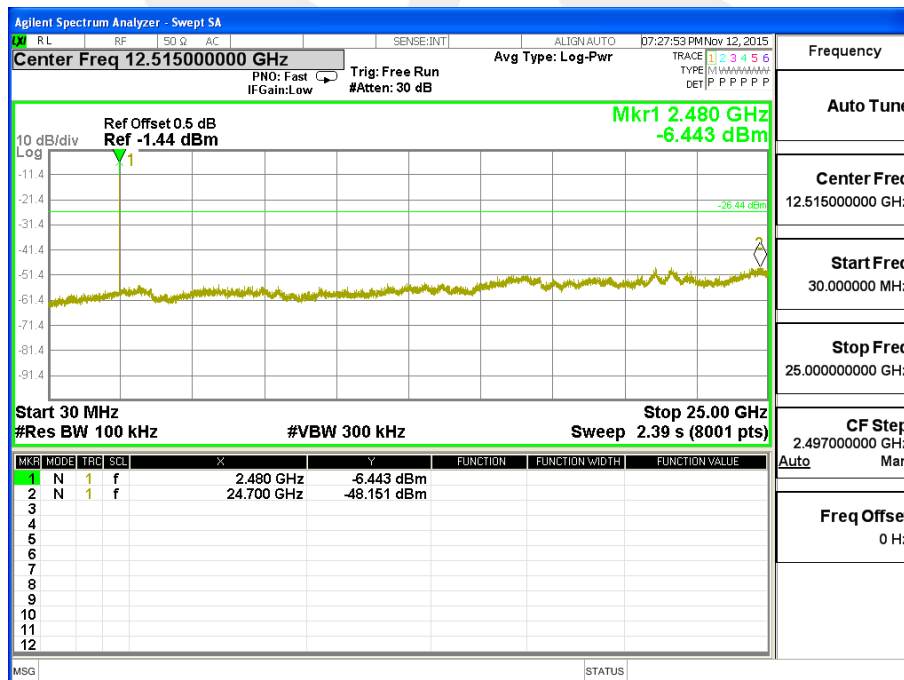




20 CH



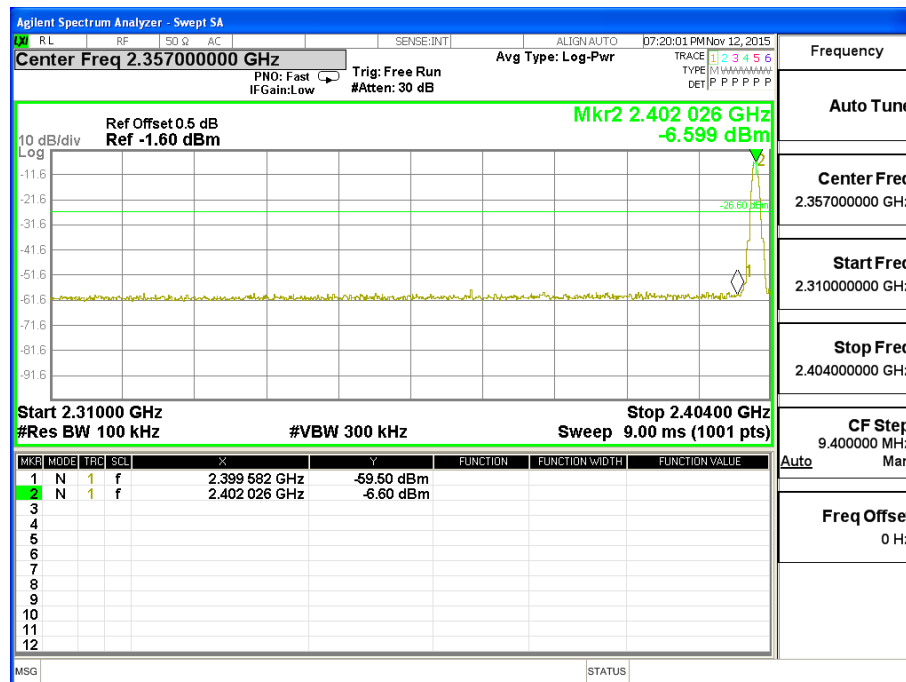
40 CH



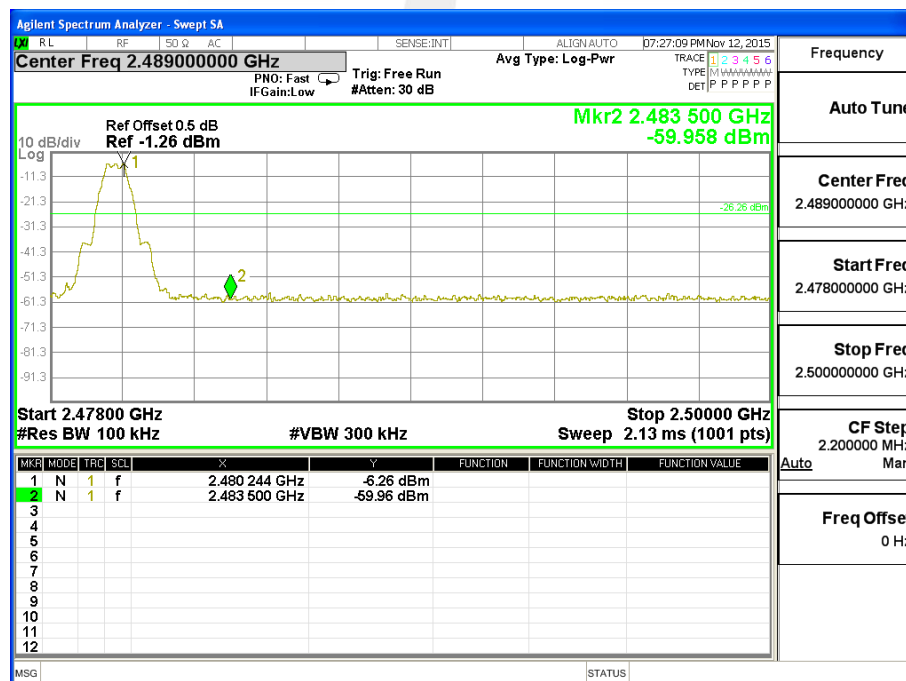


For Band edge

01 CH



40 CH





## 6. POWER SPECTRAL DENSITY TEST

### 6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

### 6.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW to:  $100\text{ kHz} \geq \text{RBW} \geq 3\text{ kHz}$ .
4. Set the VBW  $\geq 3 \times \text{RBW}$ .
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 6.3 TEST SETUP



### 6.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

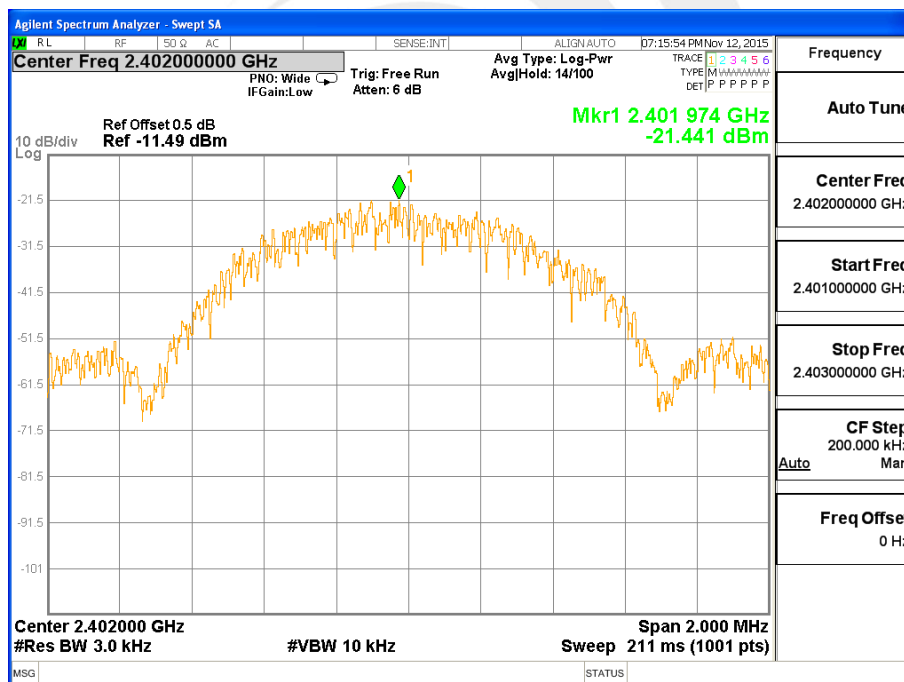


## 6.5 TEST RESULTS

EUT :	smart phone	Model Name :	QM1 Wave
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode /CH01, CH20, CH40		

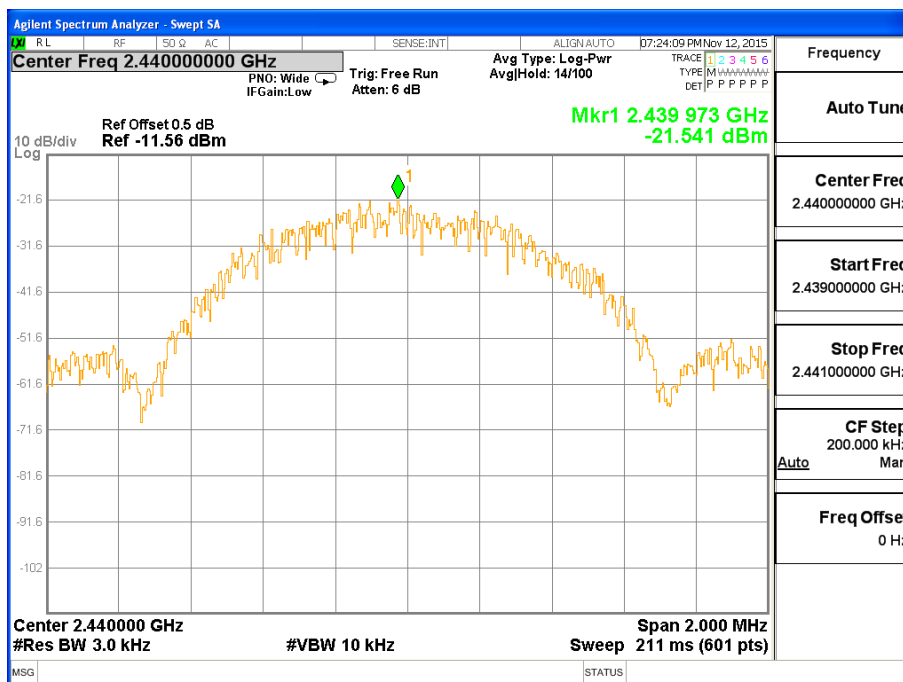
Frequency	Power Density (dBm)	Limit (dBm)	Result
2402 MHz	-21.441	8	PASS
2440 MHz	-21.541	8	PASS
2480 MHz	-20.863	8	PASS

## TX CH01

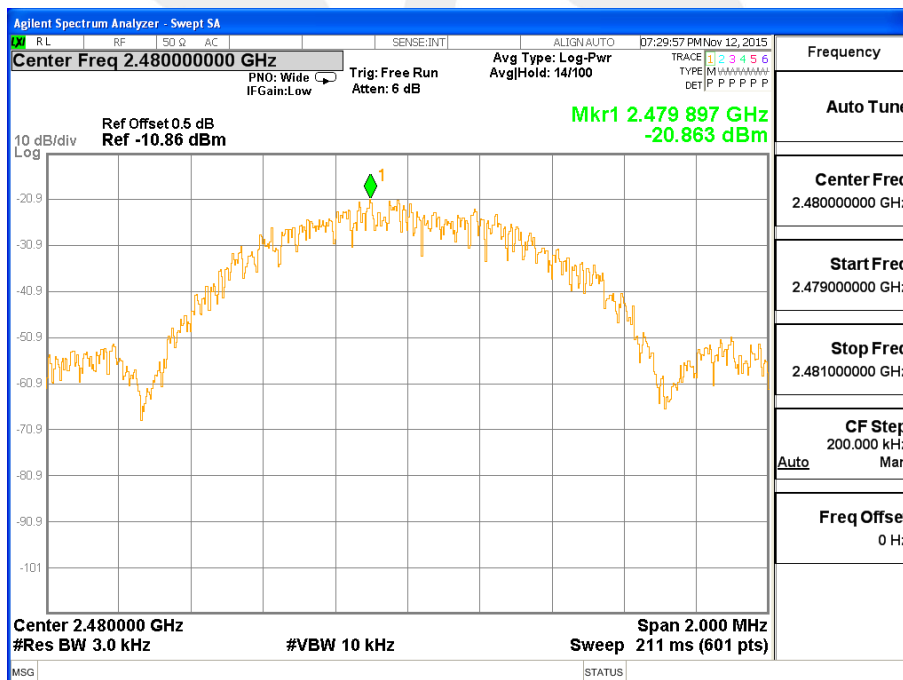




## TX CH20



## TX CH40





## 7. BANDWIDTH TEST

### 7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

### 7.2 TEST PROCEDURE

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW  $\geq 3\text{RBW}$ , peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\geq 6$  dB.

### 7.3 TEST SETUP



### 7.4 EUT OPERATION CONDITIONS

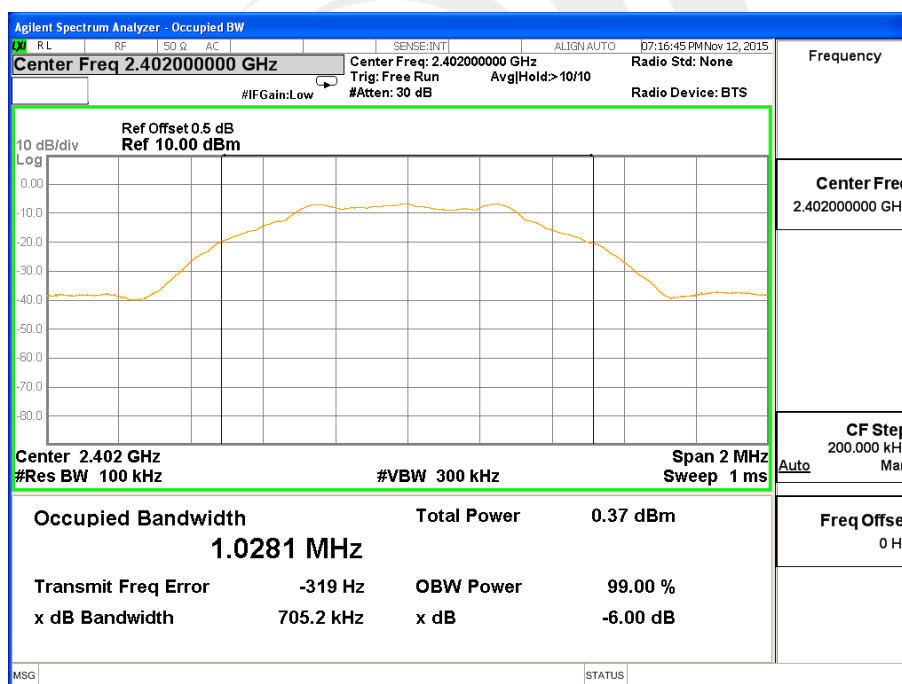
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

## 7.5 TEST RESULTS

EUT :	smart phone	Model Name :	QM1 Wave
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode /CH01, CH20, CH40		

Frequency	6dB Bandwidth (MHz)	Channel Separation (MHz)	Result
2402 MHz	0.705	>=500KHz	PASS
2440 MHz	0.690	>=500KHz	PASS
2480 MHz	0.703	>=500KHz	PASS

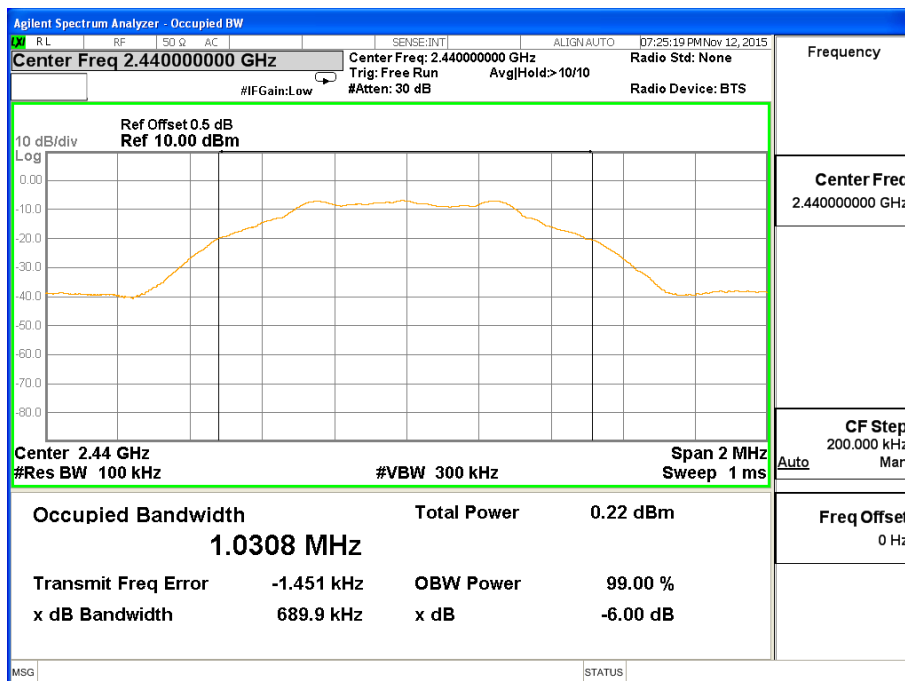
TX CH 01



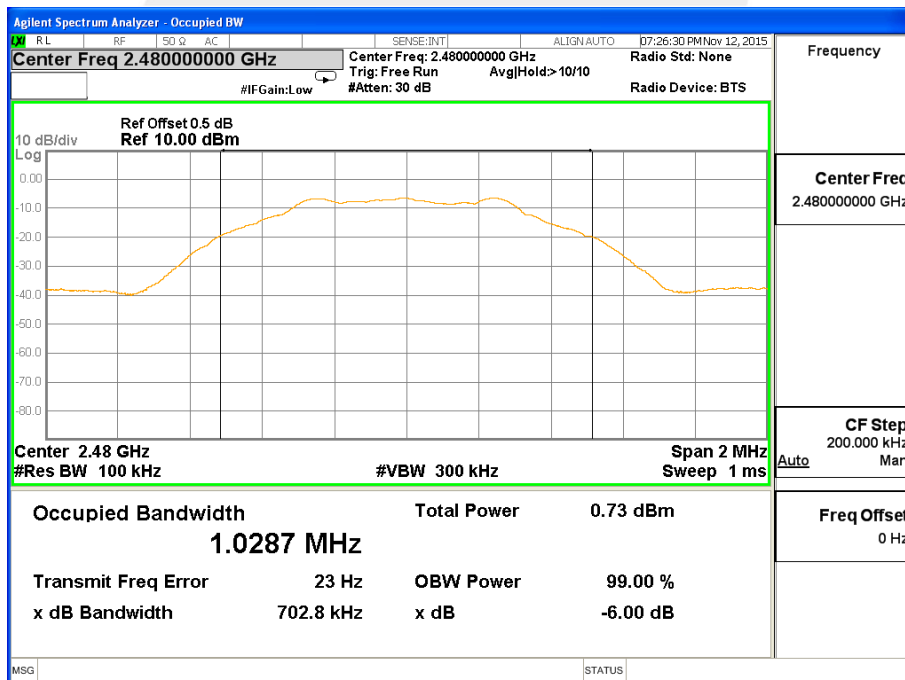




## TX CH 20



## TX CH 40





## 8. PEAK OUTPUT POWER TEST

### 8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

### 8.2 TEST PROCEDURE

- a. The EUT was directly connected to the Power Sensor&Power meter

### 8.3 TEST SETUP



### 8.4 EUT OPERATION CONDITIONS

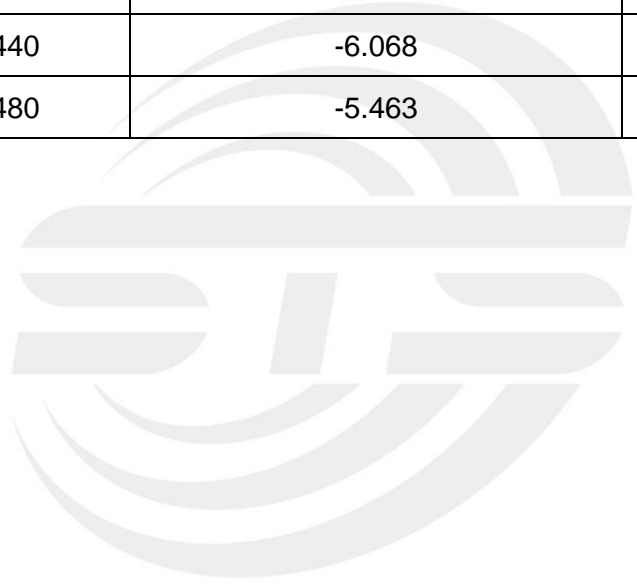
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



## 8.5 TEST RESULTS

EUT :	smart phone	Model Name :	QM1 Wave
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode /CH01, CH20, CH40		

TX Mode			
Test Channe	Frequency	Peak Conducted Output Power	LIMIT
	(MHz)	(dBm)	dBm
CH01	2402	-5.835	30
CH20	2440	-6.068	30
CH40	2480	-5.463	30





## 9. ANTENNA REQUIREMENT

### 9.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### 9.2 EUT ANTENNA

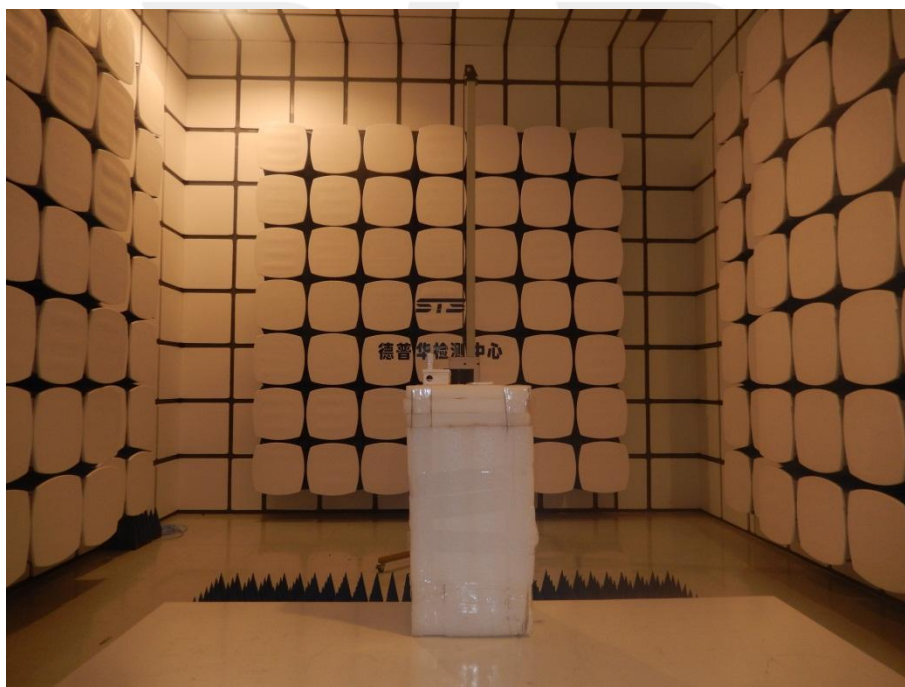
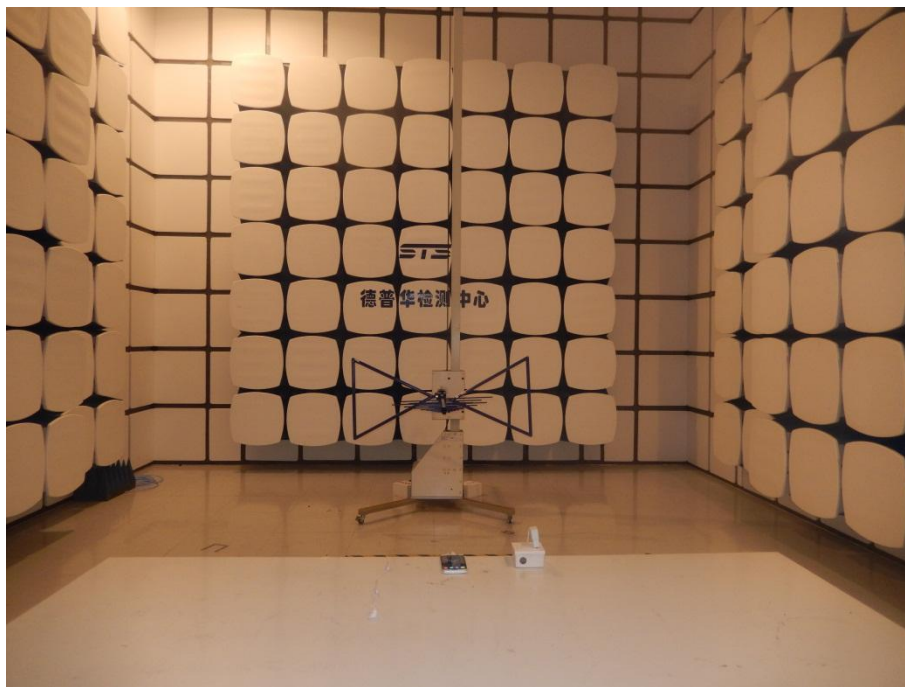
The EUT antenna is PIFA Antenna. It comply with the standard requirement.





## 10. EUT TEST PHOTO

### Radiated Measurement Photos





### Conducted Measurement Photos



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