

FCC Test Report

FCC ID:2AFA3RLTP4028

Product : smartphone

Trade Name : N/A

Model Number : RLTP4028-BLACK

Serial Model : V41

Report No. : ISOT15070054E

Prepared for

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Prepared by

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TEST RESULT CERTIFICATION**Applicant's name** : Shenzhen Vastking Electronic Co.,LTD.Address : 2/F, Building 6, ZhengZhong Industrial Park, Qiaotou Community,
Fuyong, Baoan, Shenzhen, China**Manufacturer's Name** : Shenzhen Vastking Electronic Co.,LTD.Address : 2/F, Building 6, ZhengZhong Industrial Park, Qiaotou Community,
Fuyong, Baoan, Shenzhen, China**Product description**

Product name : smartphone

Model and/or type reference : RLTP4028-BLACK

Standards : FCC Part15B:01 Oct.2014
ANSI C63.4:2014

This device described above has been tested by ISOTek, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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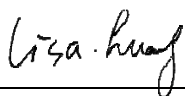
Date of Test

Date (s) of performance of tests : 06 July. 2015 ~21 July. 2015

Date of Issue..... : 22 July. 2015

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

Compiled by:



Lisa Huang/ Project Engineer

Approved by:



Richard Chen/ Manager

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B:2014 ANSI C63.4: 2014	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

Shenzhen ISOTek Standards Technical Services Co.,Ltd.

Add.: 13/F, HuaFengRui Building, XinHu Rd., XiXiang, Bao'an District,Shenzhen,China

FCC Registration No.: **918037**

1.2 MEASUREMENT UNCERTAINTY

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

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
ISOTekC01	ANSI	150 KHz ~ 30MHz	3.2	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
ISOTekA01	ANSI	30MHz ~ 1000MHz	4.7	
		1GHz ~12.4GHz	5.0	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	smartphone	
Model Name	RLTP4028-BLACK	
Additional Model Number(s)	V41	
Model Difference	All the model are the same circuit and RF module, except the model name and colour.	
Product Description	The EUT is a smartphone.	
	Connecting I/O port:	USB, Earphone
	Operation Frequency:	BT:2402~2480 MHz WIFI: 802.11b/g/n(20MHz): 2412~2462MHz 802.11n(40MHz):2422~2452MHz GSM: 824.2-848.8MHz/1850.2-1909.8MHz WCDMA: 826.4-846.6MHz/ 1852.4-1907.6MHz/1712.6-1752.4MHz
	Modulation Type:	BT(1Mbps): GFSK BT EDR(2Mbps): $\pi/4$ -DQPSK BT EDR(3Mbps): 8-DPSK IEEE 802.11b : DSSS (CCK, QPSK, DBPSK) IEEE 802.11g/n (HT20/HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK) GSM / DCS: GMSK WCDMA:QPSK,16QAM
	highest operating frequency	2480 MHz
	Hardware version:	MB0MBA4C1-1(WUZHU)
	Software version:	HQD_D133_271_0000_4.4.2_1.1_0721_T05
Power Source	DC Voltage	
Adapter	Input: 100-240V~, 50/60Hz, 0.15A Output: 5V $\overline{\text{---}}$, 0.5A	
Battery	DC 3.7V ,1500mAh	

2.1.1 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	Data Exchange Mode
Mode 2	REC Mode
Mode 3	TF Card Playing Mode+Charging
Mode 4	GPS

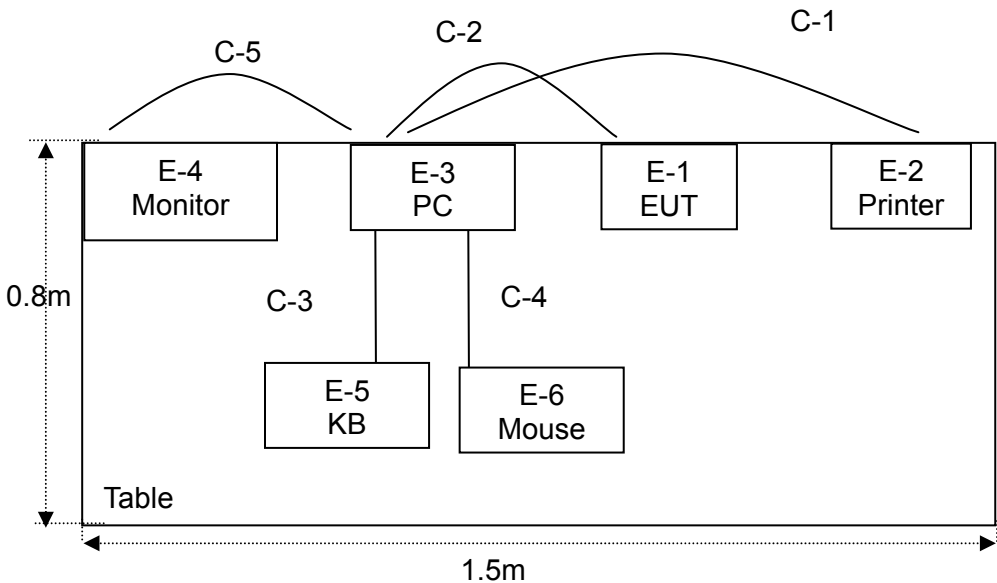
For Conducted Test	
Final Test Mode	Description
Mode 1	Data Exchange Mode

For Radiated Test	
Final Test Mode	Description
Mode 1	Data Exchange Mode

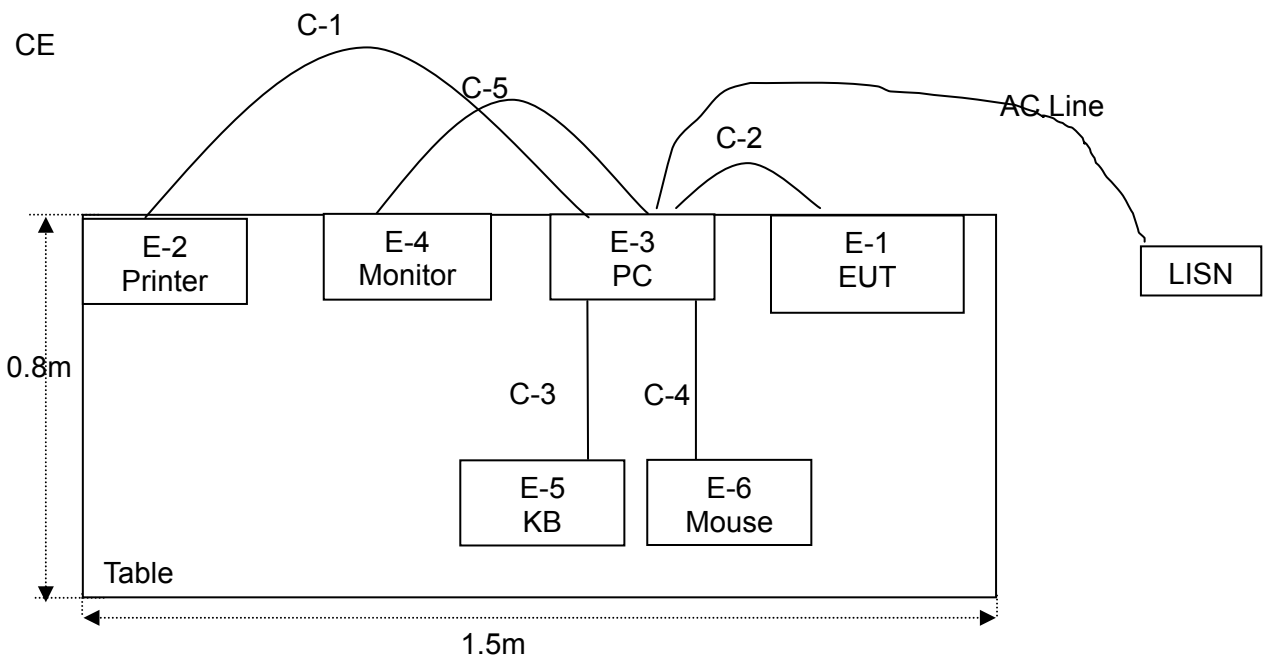
Note: Final Test Mode: Through Pre-scan, find the mode 1 is the worse case.
Only the worst case mode is recorded in the report.

2.2 DESCRIPTION OF TEST SETUP

RE



CE



2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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	Brand	Model/Type No.	Series No.	Note
E-1	smartphone	N/A	RLTP4028-BLACK	N/A	EUT
E-2	Printer	Canon	L11121E	LBP2900	
E-3	Personal computer	DELL	FT4Y23X	34413561645	
E-4	Monitor	DELL	IN2020MB	cn-0y6mhx-74261-11f-67es	
E-5	Keyboard	DELL	SK-8185	OY526KUS	
E-6	Mouse	DELL	MS111-P	cn-011d3v-71581-11e-1th7	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.2m	
C-2	NO	NO	1.0m	
C-3	NO	NO	1.0m	
C-4	NO	NO	1.0m	
C-5	NO	NO	1.0m	

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.
- (3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

2.4 MEASUREMENT INSTRUMENTS LIST

2.4.1 Radiatio Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Aglient	E4446A	US44300451	2015.07.06	2016.07.05	1 year
2	EMI Test Receiver	R&S	ESCI	101165	2015.07.06	2016.07.05	1 year
3	Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2015.07.06	2016.07.05	1 year
4	Horn Antenna	Schwarzbeck	BBHA 9120D	9170-182	2015.07.06	2016.07.05	1 year
5	Amplifier	Schwarzbeck	BBV9743	9743-019	2015.07.06	2016.07.05	1 year
6	Test Cable Below 1GHz	ATM	R-01	3564	2015.07.06	2016.07.05	1 year
7	Test Cable Above 1GHz	ATM	R-02	3565	2015.07.06	2016.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	LISN	messtec	AN3019	NO.1	Jul. 06, 2015	Jul. 05, 2016	1 year
2	LISN	SCHWARZBECK	NNLK 8129	8126466	Jul. 06, 2015	Jul. 05, 2016	1 year
3	Pulse Limiter	SCHWARZBECK	VTSD9596F	9618	Jul. 06, 2015	Jul. 05, 2016	1 year
4	EMI Test Receiver	R&S	ESCI	100843	Jul. 06, 2015	Jul. 05, 2016	1 year
5	Switch	Schwarzbeck	CX - 210	100196	Jul. 06, 2015	Jul. 05, 2016	1 year
6	Test Cable 9KHz-300MHz	ATM	C01	3566	Jul. 06, 2015	Jul. 05, 2016	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

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.

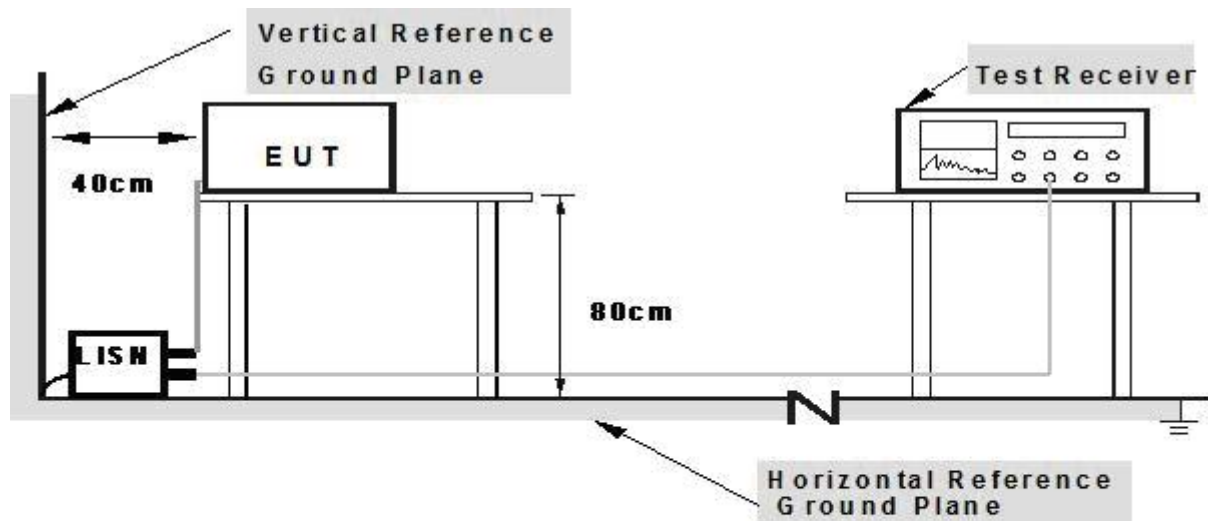
The following table is the setting of the receiver

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

3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 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.

3.1.3 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

3.1.4 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.

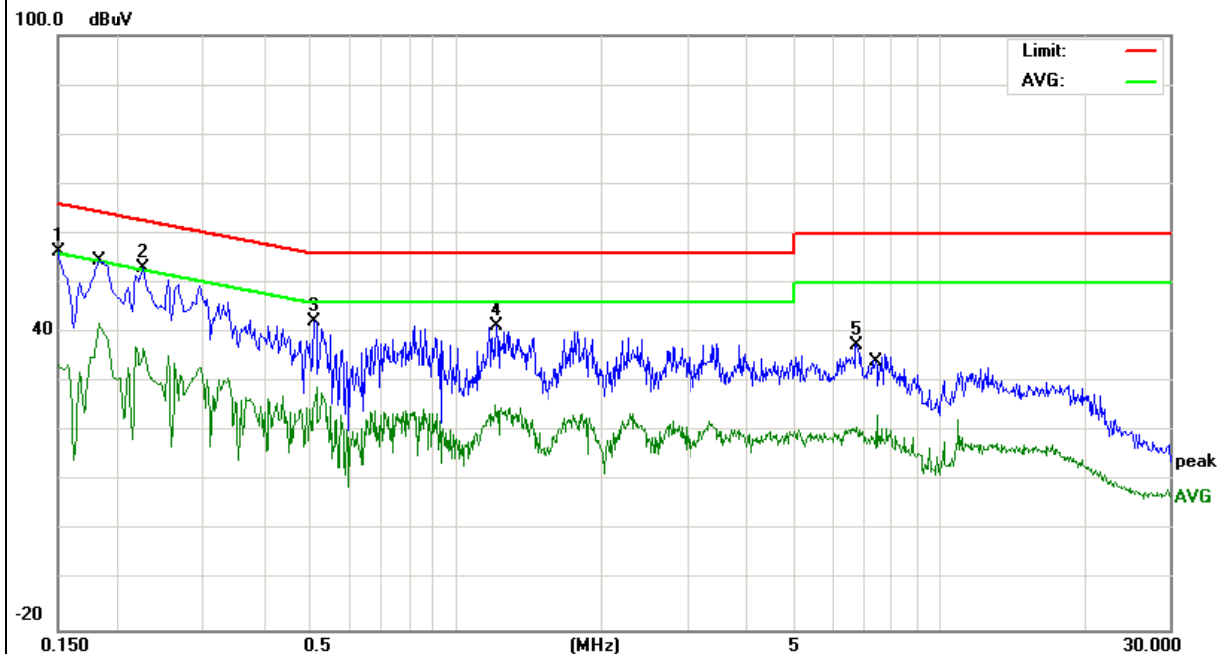
3.1.5 TEST RESULTS

EUT :	smartphone	Model Name. :	RLTP4028-BLACK
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2015-07-15
Test Mode :	Mode 1	Phase :	L
Test Voltage :	DC 5V From PC AC 120V/60Hz		

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1499	46.60	9.63	56.23	66.00	-9.77	QP
0.2260	43.52	9.64	53.16	62.59	-9.43	QP
0.5100	32.53	9.77	42.30	56.00	-13.70	QP
1.2140	31.55	9.72	41.27	56.00	-14.73	QP
6.7619	27.83	9.70	37.53	60.00	-22.47	QP
0.1819	32.27	9.61	41.88	54.39	-12.51	AVG
0.5140	19.37	9.77	29.14	46.00	-16.86	AVG
7.4219	13.65	9.70	23.35	50.00	-26.65	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

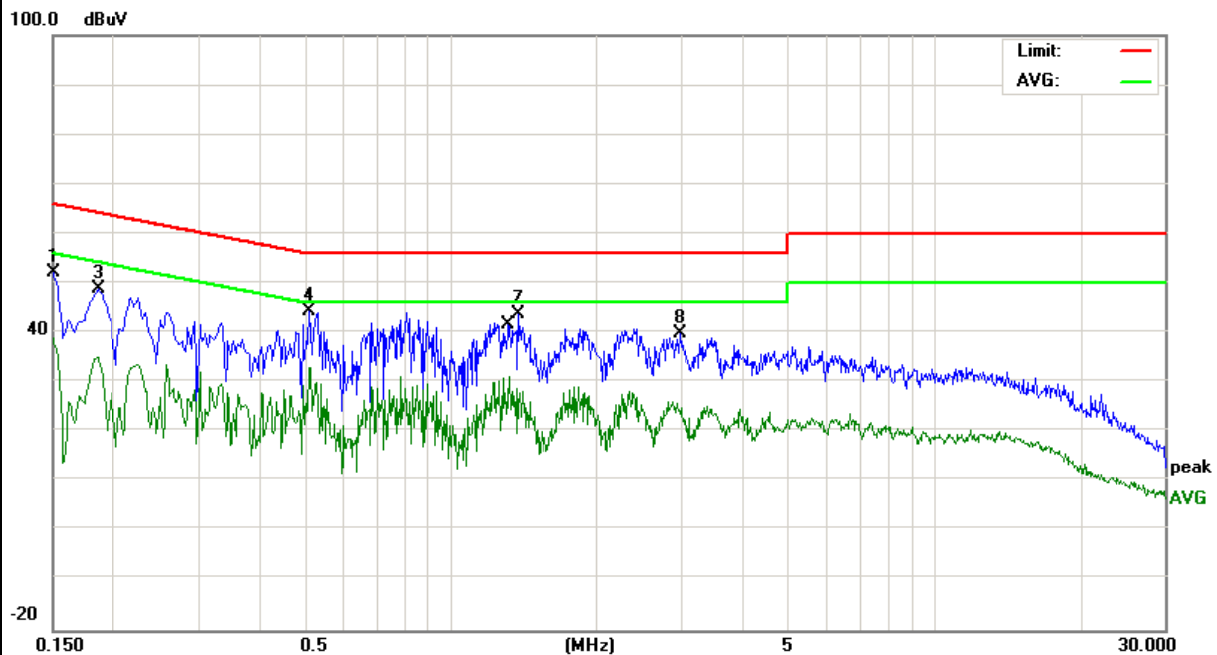


EUT :	smartphone	Model Name. :	RLTP4028-BLACK
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2015-07-15
Test Mode :	Mode 1	Phase :	N
Test Voltage :	DC 5V From PC AC 120V/60Hz		

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1499	42.64	9.60	52.24	66.00	-13.76	QP
0.1499	29.33	9.60	38.93	56.00	-17.07	AVG
0.1859	39.14	9.61	48.75	64.21	-15.46	QP
0.5100	34.71	9.68	44.39	56.00	-11.61	QP
0.5100	23.32	9.68	33.00	46.00	-13.00	AVG
1.3220	21.41	9.59	31.00	46.00	-15.00	AVG
1.3779	34.26	9.58	43.84	56.00	-12.16	QP
2.9660	30.39	9.52	39.91	56.00	-16.09	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

Test Arrangement for Radiated Emissions up to 1 GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited test facility. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency below 1GHz.

Test Arrangement for Radiated Emissions above 1 GHz.

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

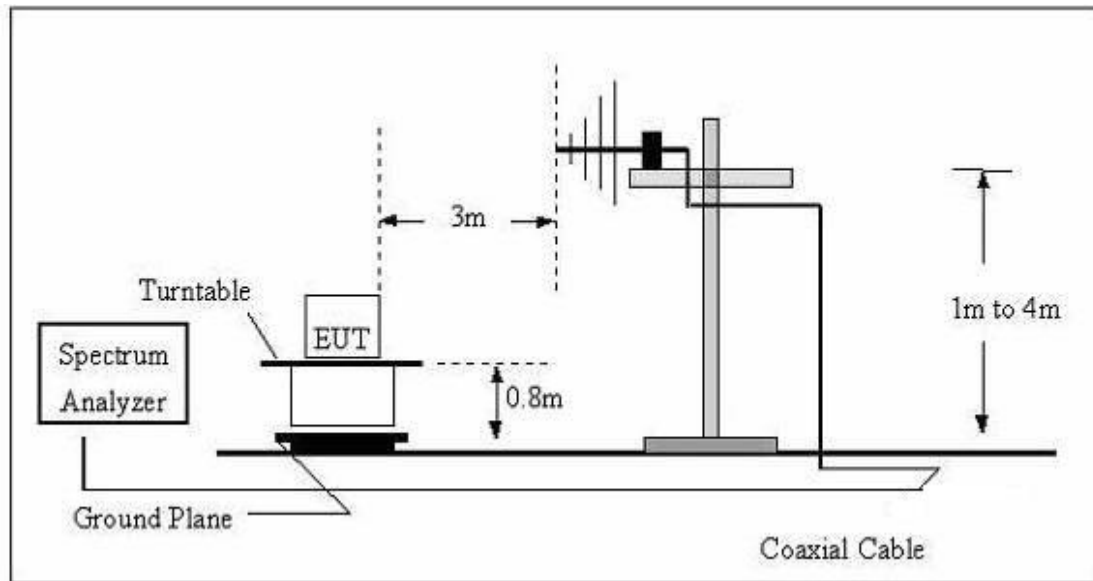
Note: For the hand-held device, the EUT should be measured for all 3 axes and only the worst case is recorded in the report

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

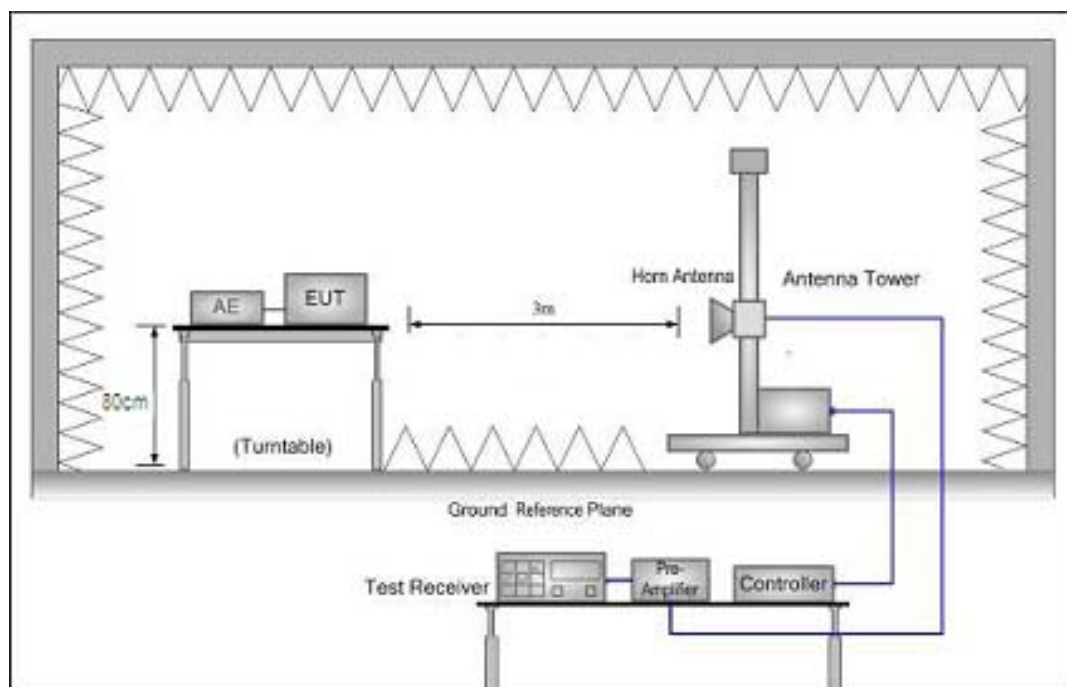
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Peak	1 MHz	10 Hz

3.2.3 TEST SETUP

For Radiated Emission 30~1000MHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz



3.2.4 TEST RESULTS

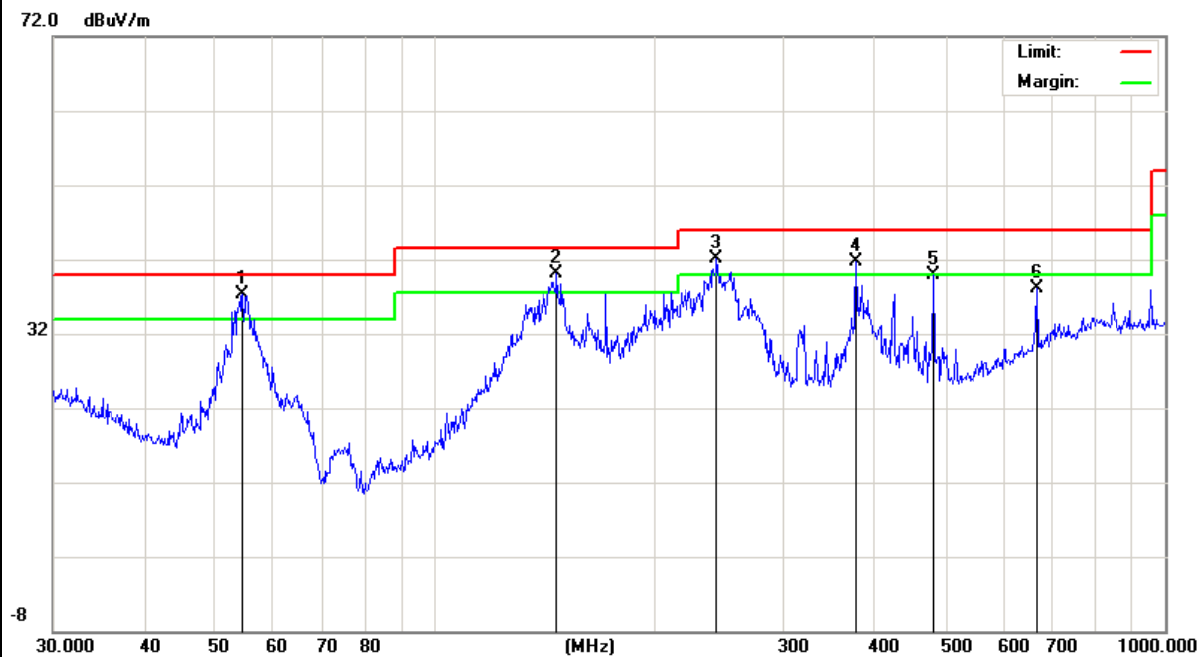
TEST RESULTS (30~1000 MHz)

EUT :	smartphone	Model Name :	RLTP4028-BLACK
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2015-07-15
Test Mode :	Mode 1	Polarization :	Horizontal
Test Power :	DC 5V From PC AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Remark
54.4516	27.80	9.42	37.22	40.00	-2.78	QP
146.8877	29.32	10.72	40.04	43.50	-3.46	QP
243.3771	28.58	13.52	42.10	46.00	-3.90	QP
377.259	24.40	17.37	41.77	46.00	-4.23	QP
480.5276	19.92	19.91	39.83	46.00	-6.17	QP
665.8034	14.32	23.85	38.17	46.00	-7.83	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

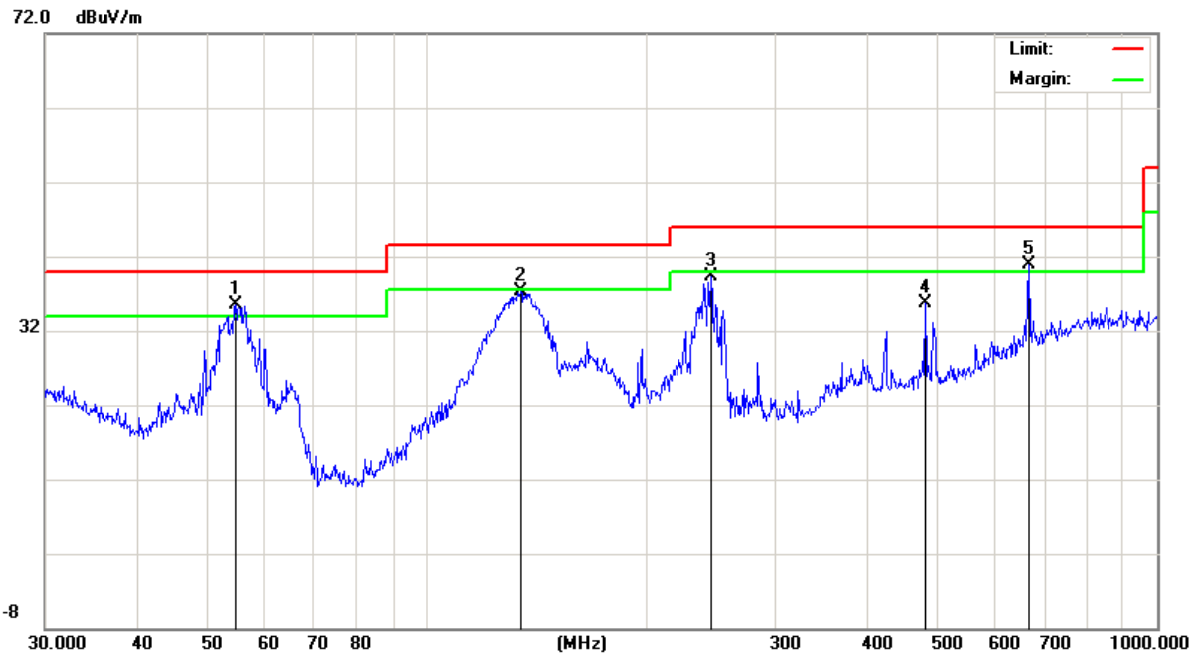


EUT :	smartphone	Model Name :	RLTP4028-BLACK
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2015-07-15
Test Mode :	Mode 1	Polarization :	Vertical
Test Power :	DC 5V From PC AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Remark
54.6428	26.23	9.37	35.60	40.00	-4.40	QP
134.0882	25.52	11.70	37.22	43.50	-6.28	QP
245.0900	25.72	13.54	39.26	46.00	-6.74	QP
480.5276	15.77	19.91	35.68	46.00	-10.32	QP
668.1422	17.04	23.91	40.95	46.00	-5.05	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.



3.2.5 TEST RESULTS(1000~12400MHz)

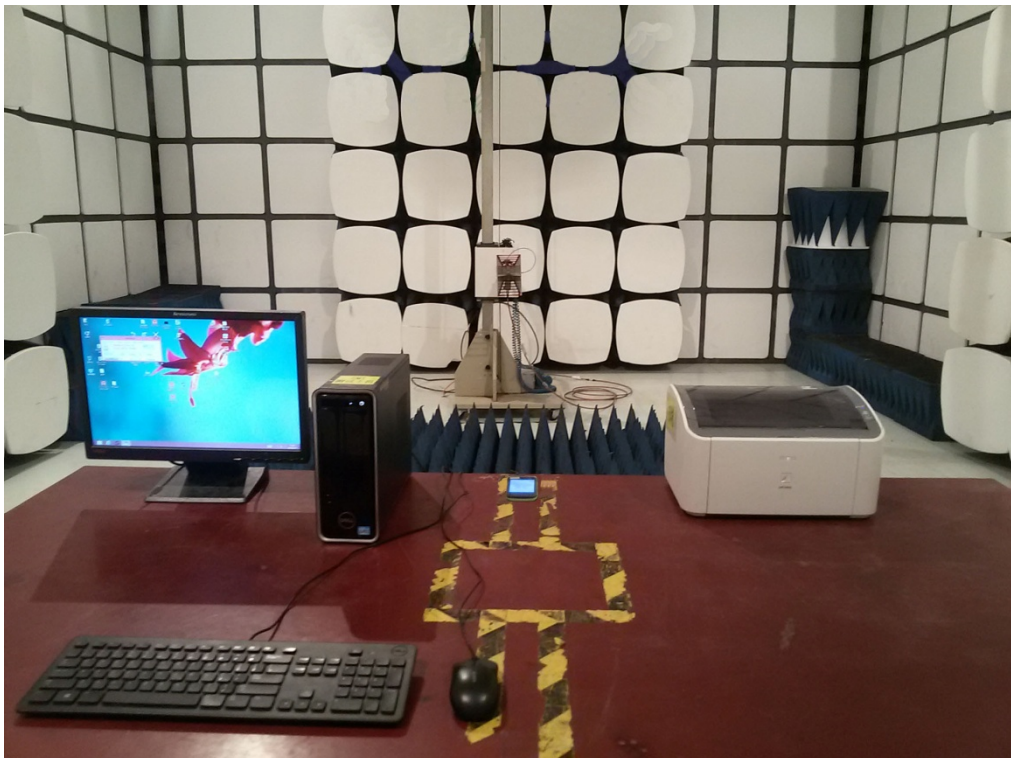
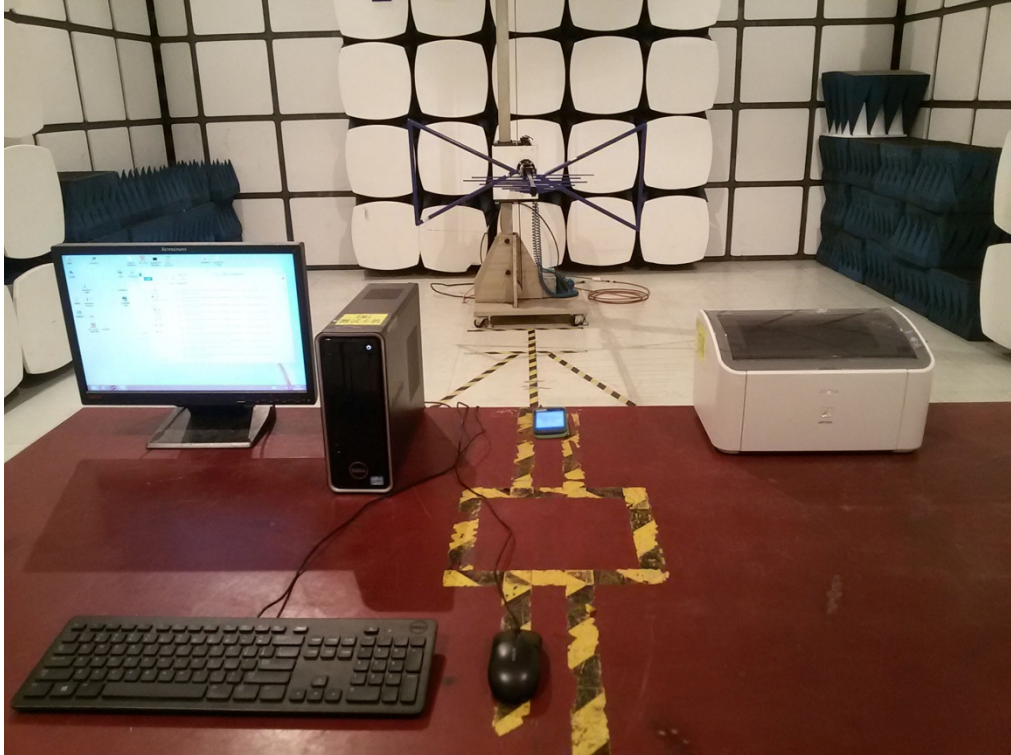
Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
V	1894.621	85.96	-17.15	68.81	74.00	-5.19	peak
V	1894.621	60.82	-17.15	43.67	54.00	-10.33	AVG
V	2657.389	82.37	-15.76	66.61	74.00	-7.39	peak
V	2657.389	59.34	-15.76	43.58	54.00	-10.42	AVG
V	4013.629	76.71	-11.22	65.49	74.00	-8.51	peak
V	4013.629	53.98	-11.22	42.76	54.00	-11.24	AVG
H	1896.351	81.81	-17.14	64.67	74.00	-9.33	peak
H	1896.351	58.40	-17.14	41.26	54.00	-12.74	AVG
H	3116.378	82.03	-15.54	66.49	74.00	-7.51	peak
H	3116.378	58.51	-15.54	42.97	54.00	-11.03	AVG
H	4361.254	75.44	-10.13	65.31	74.00	-8.69	peak
H	4361.254	51.49	-10.13	41.36	54.00	-12.64	AVG

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

4. EUT TEST PHOTO

Radiated Measurement Photos



Conducted Measurement Photos

