

Test Report of FCC CFR 47 Part 15 Subpart C

On Behalf of

i-Mobile Technology Corporation

FCC ID: XZOIC-8
Product Description: Tablet PC
Model No.: IC-8
Supplementary Model: N/A
Brand Name: @MOBILE

Prepared for: i-Mobile Technology Corporation

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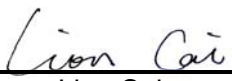
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Report No.: BCT12FR189E-3

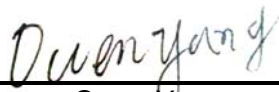
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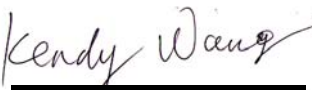

Kendy Wang

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	i-Mobile Technology Corporation
Address of Applicant:	3F #8 Alley 15 Lane 120 Sec.1 Neihu Road Neihu District, Taipei City 114, Taiwan
Manufacturer:	i-Mobile Technology Corporation
Address of Manufacturer:	3F #8 Alley 15 Lane 120 Sec.1 Neihu Road Neihu District, Taipei City 114, Taiwan

General Description of E.U.T

Items	Description
EUT Description:	Tablet PC
Model No.:	IC-8
Supplementary Model:	N/A
Trade Name:	@MOBILE
Transmit Frequency:	13.56MHz
Number of Channels:	1
Duty cycle:	100%
Antenna Type:	Built-in Antenna
Power Supply:	Input: 16VDC 4.0A from AC/DC adapter
Adapter Information:	Model:STD-16040 Input: AC 100-240V 47-63Hz 1.4A MAX Output: 16VDC 4.0A

Remark: * The test data gathered are from the production sample provided by the manufacturer.

1.2 Test Standards

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.207, 15.209 and 15.225 rules. Test was carried out according to the above mentioned FCC rules.

1.3 Test Facility

All measurement required was performed at laboratory of Shenzhen CTL Testing Technology Co., Ltd. at Floor 1-A, Baisha Technology Park, No. 3011, Shahe Xi Road, Nanshan District, Shenzhen, China 518055.

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, December, 2013.

2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions: The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2003 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions: The EUT is placed on a turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

Uncertainty figures are valid to a confidence level of 95%.

2.5 Test Equipment List and Details

Test equipments list of Shenzhen CTL Testing Technology Co., Ltd

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	BCT-EMC001	EMI Test Receiver	R&S	ESCI	100687	2013-4-25	2014-4-24
2	BCT-EMC002	EMI Test Receiver	R&S	ESPI	100097	2013-11-1	2014-10-31
3	BCT-EMC003	Amplifier	HP	8447D	1937A02492	2013-4-25	2014-4-24
4	BCT-EMC018	TRILOG Broadband Test- Antenna	SCHWARZBECK	VULB9163	9163-324	2013-4-25	2014-4-24
5	BCT-EMC021	Triple-Loop Antenna	EVERFINE	LLA-2	711002	2013-11-1	2014-10-31
6	BCT-EMC026	RF POWER AMPLIFIER	FRANKONIA	FLL-75	1020A1109	2013-4-25	2014-4-24
7	BCT-EMC029	6DB Attenuator	FRANKONIA	N/A	1001698	2013-4-25	2014-4-24
8	BCT-EMC032	10dB attenuator	ELECTRO- METRICS	EM-7600	836	2013-4-25	2014-4-24
9	BCT-EMC036	Spectrum Analyzer	R&S	FSP	100397	2013-11-1	2014-10-31
10	BCT-EMC037	Broadband preamplifier	SCH WARZBECK	BBV9718	9718-182	2013-4-25	2014-4-24
11	BCT-EMC039	Horn Antenna	SCHWARZBECK	BBHA 9120D	0437	2013-4-25	2014-4-24
12	BCT-EMC038	Horn Antenna	SCHWARZBECK	BBHA9170	0483	2013-4-5	2014-4-4

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.207	AC Power Line Conducted Emission	Pass
FCC §15.225(a)(b)(c)(d)	Radiated Emission (9kHz ~ 30MHz)	Pass
FCC §15.225(d), 15.209	Radiated Emission (30MHz ~ 1GHz)	Pass
FCC §15.225(e)	Frequency stability	Pass

4. TEST OF AC POWER LINE CONDUCTED EMISSION

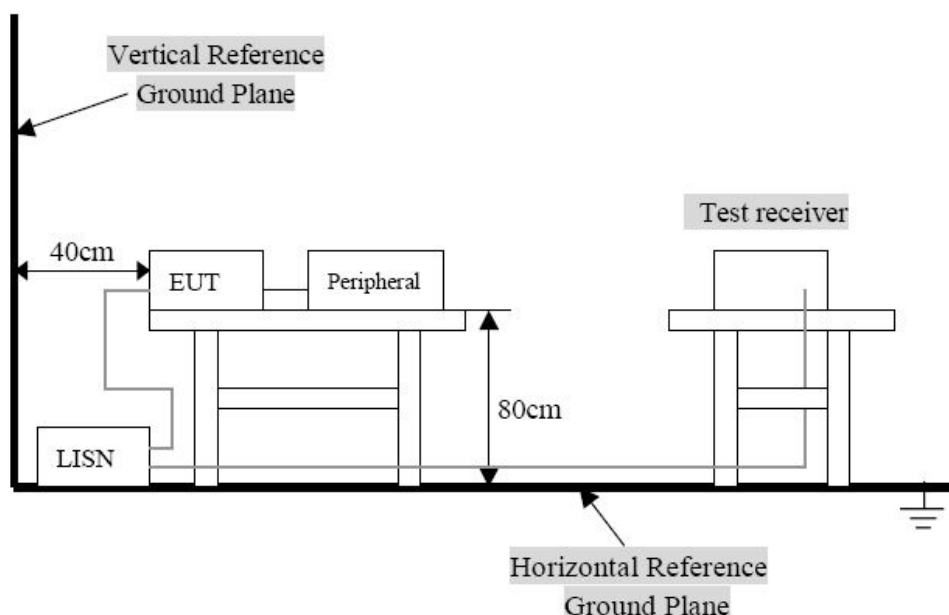
4.1 Applicable Standard

Refer to FCC §15.207.

For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150~0.500	66~56	56~46
0.500~5.000	56	46
5.000~30.00	60	50

4.2 Test Setup Diagram



Remark: The EUT was connected to a 120VAC/ 60Hz power source.

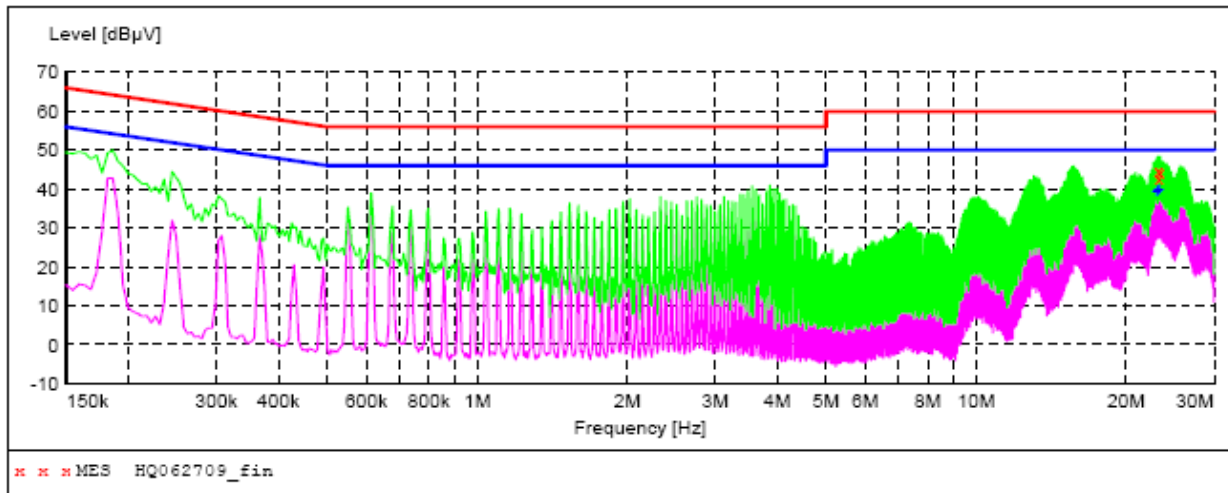
4.3 Test Result

Temperature (°C) : 23~25	EUT: Tablet PC
Humidity (%RH) : 45~58	M/N: IC-8
Barometric Pressure (mbar) : 950~1000	Operation Condition: Normal Operation

Conducted Emission Test Data

EUT: Tablet PC
Operating Condition: Tx mode
Test Site: Shielded Room
Operator: Andy
Test Specification: AC/DC adapter (AC 120V/60Hz)
Comment: Live Line

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HQ062709_fin"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
23.208000	44.90	10.8	60	15.1	QP	L1	GND
23.257500	42.80	10.8	60	17.2	QP	L1	GND
23.392500	44.40	10.8	60	15.6	QP	L1	GND

MEASUREMENT RESULT: "HQ062709_fin2"

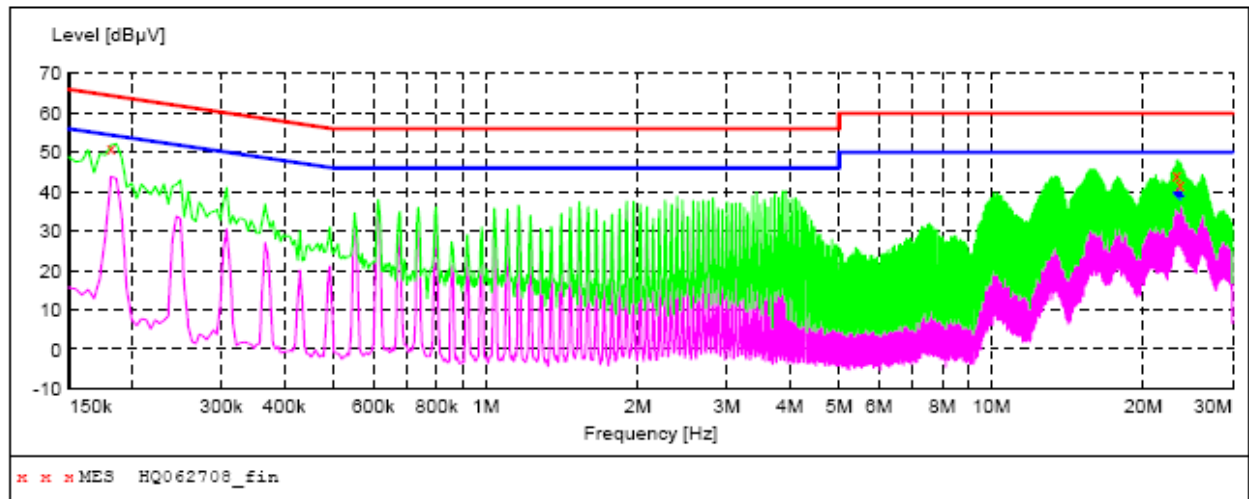
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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
23.086500	39.40	10.8	50	10.6	AV	L1	GND
23.203500	40.10	10.8	50	9.9	AV	L1	GND
23.208000	39.80	10.8	50	10.2	AV	L1	GND

Conducted Emission Test Data

EUT: Tablet PC
Operating Condition: Tx mode
Test Site: Shielded Room
Operator: Andy
Test Specification: AC/DC adapter (AC 120V/60Hz)
Comment: Neutral Line

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HQ062708_fin"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.181500	51.40	12.0	64	13.0	QP	N	GND
23.275500	44.50	10.8	60	15.5	QP	N	GND
23.590500	42.10	10.8	60	17.9	QP	N	GND

MEASUREMENT RESULT: "HQ062708_fin2"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
23.338500	39.70	10.8	50	10.3	AV	N	GND
23.397000	39.30	10.8	50	10.7	AV	N	GND
23.586000	38.70	10.8	50	11.3	AV	N	GND

5. Test of Radiated Emission

5.1 Applicable Standard

Section 15.225 (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

Section 15.225 (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

Section 15.225 (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

Section 15.225 (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

5.2 Limit of Radiated Disturbances

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength @30m (uV/m)	Field strength @30m (dBuV/m)	Field strength @3m (dBuV/m)
Below 13.110	30	29.5	69.5
13.110 ~13.410	106	40.5	80.5
13.410~13.553	334	50.5	90.5
13.553~13.567	15,848	84	124
13.567~13.710	334	50.5	90.5
13.710~14.010	106	40.5	80.5
Above 14.010	30	29.5	69.5

Note:

(1) The tighter limit shall apply at the edge between two frequency bands.

(2) $\text{dBuV/m} = 20 \cdot \log(\text{uV/m})$

(3) Distance factor = 40dB / decade(15.31(f))

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)
0.009 -0.490	300	2400/F(KHz)
0.490 -1.705	30	24000/F(KHz)
1.705 -30	30	30
30 -88	3	40.0
88 -216	3	43.5
216 -960	3	46.0
Above 960	3	54.0

Note:

(1) The tighter limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

5.3 EUT Setup

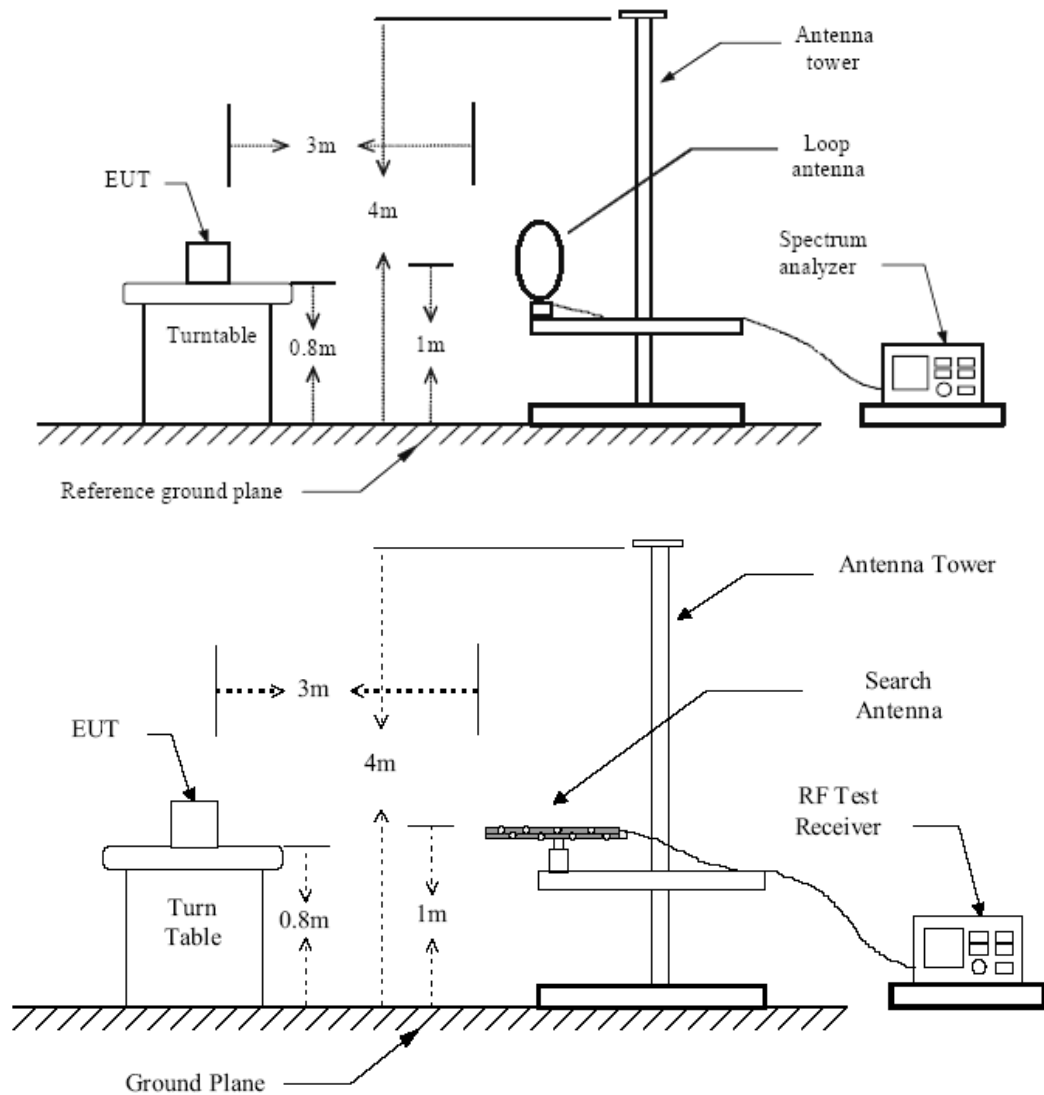


Figure 1 : Frequencies measured below 1 GHz configuration

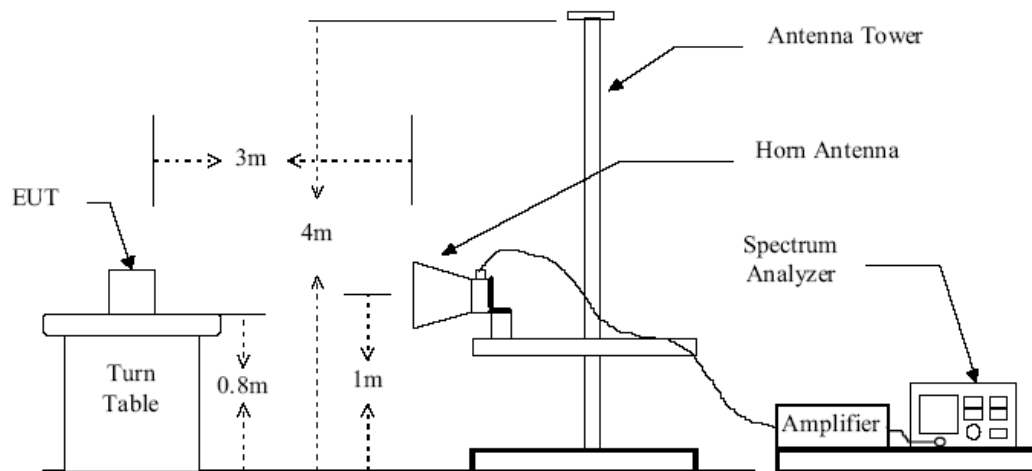


Figure 2 : Frequencies measured above 1 GHz configuration

5.4 Test Equipment List and Details

See section 2.5.

5.5 Test Procedure

1. Configure the EUT according to ANSI C63.4-2003
2. The EUT was placed on the top of the turntable 0.8 meter above ground.
3. Receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable. When the frequency spectrum measured started from 9 kHz to 30 MHz, a loop antenna is used. When the frequency spectrum measured started from 30 MHz to 1000 MHz or above 1000 MHz, a broadband receiving antenna or the horn antenna are used.
4. Power on the EUT and all the supporting units.
5. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
6. The height of the receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak, CISPR quasi-peak or Average detect function with specified bandwidth according to different frequency spectrum measured under Maximum Hold Mode.

5.6 Test Result

Temperature (°C) : 22~23	EUT: Tablet PC
Humidity (%RH) : 50~54	M/N: IC-8
Barometric Pressure (mbar) : 950~1000	Operation Condition: Normal Operation

Indicated		Transfer factor	Table	Test Antenna		Convert Level dBuV/m	Limit dBuV/m at 3m	Margin dB
Frequency MHz	Ampl./ dBuV	dB	Angle Degree	Height Meter	Polar H/V			
13.56	83.45	18.75	125	1.0	V	16.63	124	103.37
13.553	---	18.75	125	1.0	V	---	70	---
13.557	---	18.75	125	1.0	V	---	70	---
Remark: 1. Transd.=Antenna Factor+Cable Loss-Pre-amplifier Margin = Level-Limit Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value 2. Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. 3. The test limit distance is 3m limit								

WORST-CASE RADIATED EMISSION BELOW 30 MHz

Normal operating Mode:

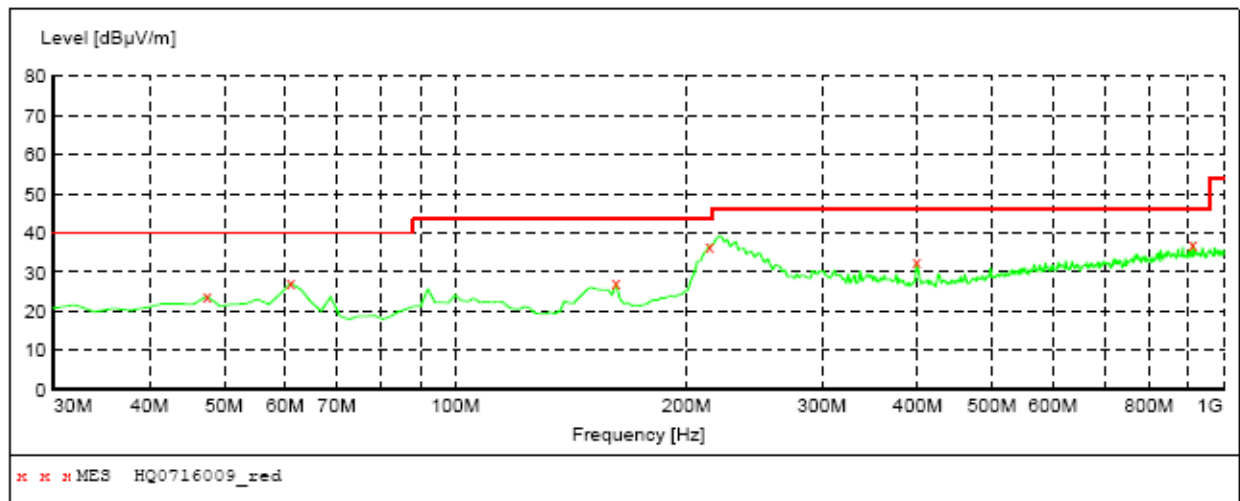
Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Levels	Limits	Margin	Detector Mode
(MHz)	(dBμV)	(dB/M)	(dB)	(dBμV/M)	(dB μV/M)	(dB)	PK/QP
6.57	23.67	8.15	1.03	32.85	67	-34.15	QP
15.22	20.83	9.04	1.19	31.06	49.5	-18.44	QP
20.06	21.34	9.13	1.08	31.55	49.5	-17.95	QP
25.23	20.69	8.22	1.66	30.57	49.5	-18.93	QP

Radiated Emission Test Data Below 1G:

EUT: Tablet PC
M/N: IC-8
Operating Condition: Normal Operation
Test Site: 3m CHAMBER
Operator: Chen
Test Specification: AC 120V/60Hz
Comment: Polarization: Horizontal

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VULB9163 NEW



MEASUREMENT RESULT: "HQ0716009_red"

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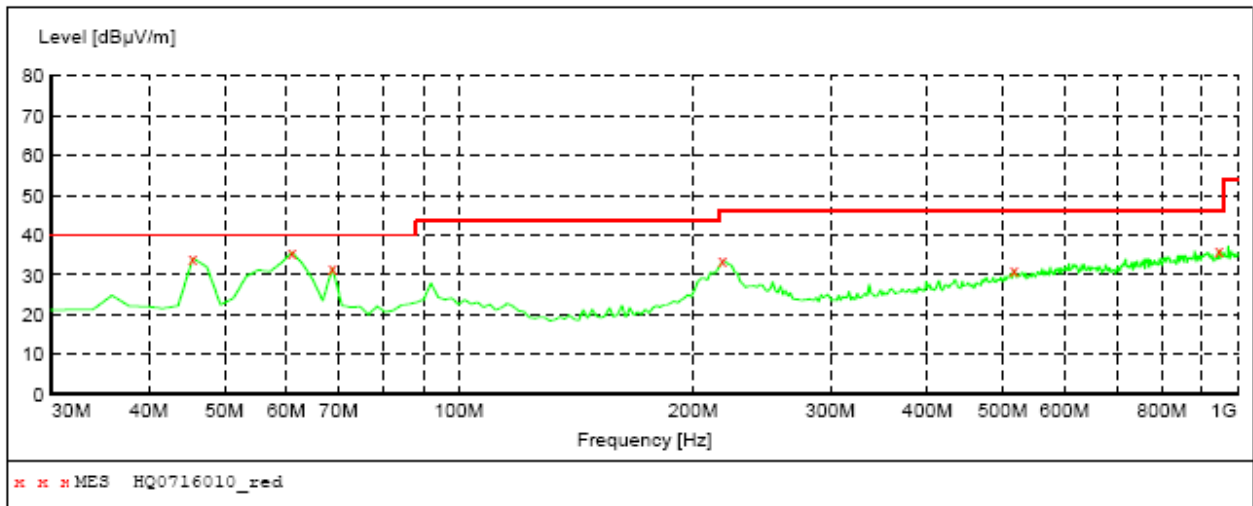
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	23.90	15.8	40.0	16.1	QP	100.0	0.00	HORIZONTAL
61.040000	27.20	14.2	40.0	12.8	QP	100.0	0.00	HORIZONTAL
161.920000	27.20	12.8	43.5	16.3	QP	100.0	0.00	HORIZONTAL
214.300000	36.80	15.2	43.5	6.7	QP	100.0	0.00	HORIZONTAL
398.600000	32.50	21.4	46.0	13.5	QP	100.0	0.00	HORIZONTAL
912.700000	37.30	29.3	46.0	8.7	QP	100.0	0.00	HORIZONTAL

Radiated Emission Test Data Below 1G:

EUT: Tablet PC
M/N: IC-8
Operating Condition: Normal Operation
Test Site: 3m CHAMBER
Operator: Chen
Test Specification: AC 120V/60Hz
Comment: Polarization: Vertical

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency				
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VULB9163 NEW



MEASUREMENT RESULT: "HQ0716010_red"

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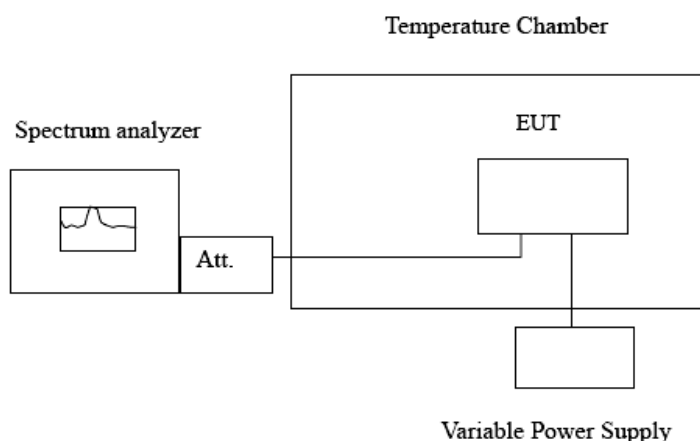
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.520000	34.20	15.9	40.0	5.8	QP	100.0	0.00	VERTICAL
61.040000	35.70	14.2	40.0	4.3	QP	100.0	0.00	VERTICAL
68.800000	31.80	12.7	40.0	8.2	QP	100.0	0.00	VERTICAL
218.180000	33.50	15.3	46.0	12.5	QP	100.0	0.00	VERTICAL
516.940000	31.30	24.2	46.0	14.7	QP	100.0	0.00	VERTICAL
947.620000	36.20	29.5	46.0	9.8	QP	100.0	0.00	VERTICAL

6. Frequency Tolerance

6.1 Applicable Standard

Section 15.225(e): The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

6.2 EUT Setup



6.3 Test Equipment List and Details

See section 2.5.

6.4 Test Procedure

The frequency stability of the transmitter is measured by:

- (a) Temperature: The temperature is varied from -20 to $+50^{\circ}\text{C}$ using an environmental chamber.
- (b) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally input to the device or at the power supply terminals if cables are not normally supplied.

The frequency tolerance of the carrier shall be maintained within $\pm 0.01\%$ of the operating frequency.

6.5 Test Result

Temperature ($^{\circ}\text{C}$) : 22~23	EUT: Tablet PC
Humidity (%RH) : 50~54	M/N: IC-8
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

Voltage (%)	Power (VDC)	Temperature (°C)	Frequency (MHz)	Deviation (%)
100	120	+20°C(Ref)	13.559576	0.003126
100	120	-20	13.559688	0.002301
100	120	-10	13.559675	0.002397
100	120	0	13.559657	0.002529
100	120	10	13.559624	0.002772
100	120	25	13.559583	0.003075
100	120	30	13.559559	0.003252
100	120	40	13.559547	0.003341
100	120	50	13.559553	0.003297
85	102	20	13.559578	0.003112
115	138	20	13.559596	0.002979

7. ANTENNA REQUIREMENT

7.1 Standard Applicable

Section 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

7.2 Antenna Connected Construction

The antenna connector is designed with permanent attachment and no consideration of replacement. The antenna used in this product is complied with Standard. The maximum Gain of the antenna lower than 6.0dBi and have the definite antenna Specification.