

FCC RF Test Report

APPLICANT : HTC Corporation
EQUIPMENT : Smartphone
MODEL NAME : PL80120
FCC ID : NM8PL80120
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Aug. 16, 2012 and completely tested on Sep. 27, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR281609B	Rev. 01	Initial issue of report	Oct. 31, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)(1)	A8.1(b)	Peak Output Power	$\leq 30\text{dBm}$	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges and Spurious Emission	$\leq 20\text{dBc}$	Pass	-
3.5	15.247(d)	A8.5	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 6.19 dB at 31.890 MHz
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 12.50 dB at 0.566 MHz
3.7	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

HTC Corporation

No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.

1.2 Manufacturer

HTC Corporation

No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Smartphone
Model Name	PL80120
FCC ID	NM8PL80120
Sample 1	EUT with LCM 1 and Main Camera 1
Sample 2	EUT with LCM 2 and Main Camera 2
EUT supports Radios application	CDMA/EV-DO /LTE/ WLAN 11abgn / Bluetooth / NFC
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)
Maximum Output Power to Antenna	Bluetooth 4.0 - LE : 2.60 dBm (0.0018 W)
Antenna Type	PIFA Antenna type with gain -0.20 dBi
Type of Modulation	Bluetooth 4.0 - LE : GFSK

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.			
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH02-HY	CO05-HY	03CH06-HY	722060/4086B-1

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01
- ♦ FCC TCB Workshop 2012, April
- ♦ ANSI C63.4-2003 and ANSI C63.10-2009
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 3

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Output Power

The RF output power was recorded in the following table:

Channel	Frequency	Bluetooth 4.0 – LE RF Output Power
		Data Rate / Modulation
		GFSK
		1Mbps
Ch00	2402MHz	2.39 dBm
Ch19	2440MHz	2.43 dBm
Ch39	2480MHz	2.60 dBm

2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and ANSI C63.10-2009 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

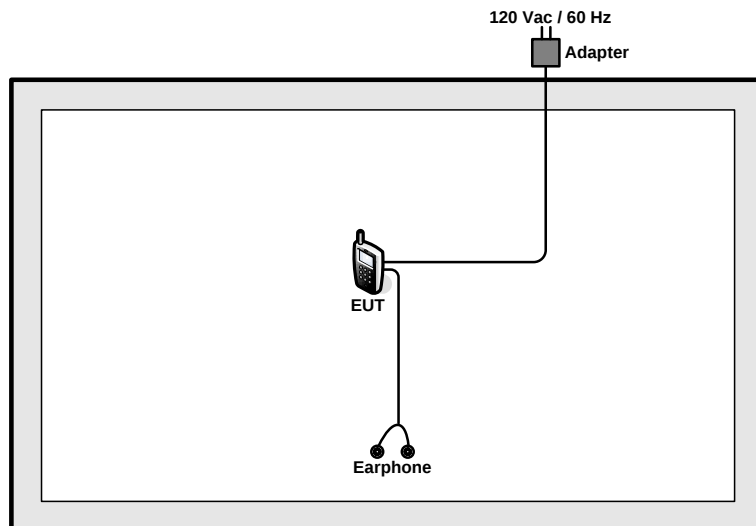
The following tables are showing the test modes as the worst cases (Y plane) and recorded in this report.

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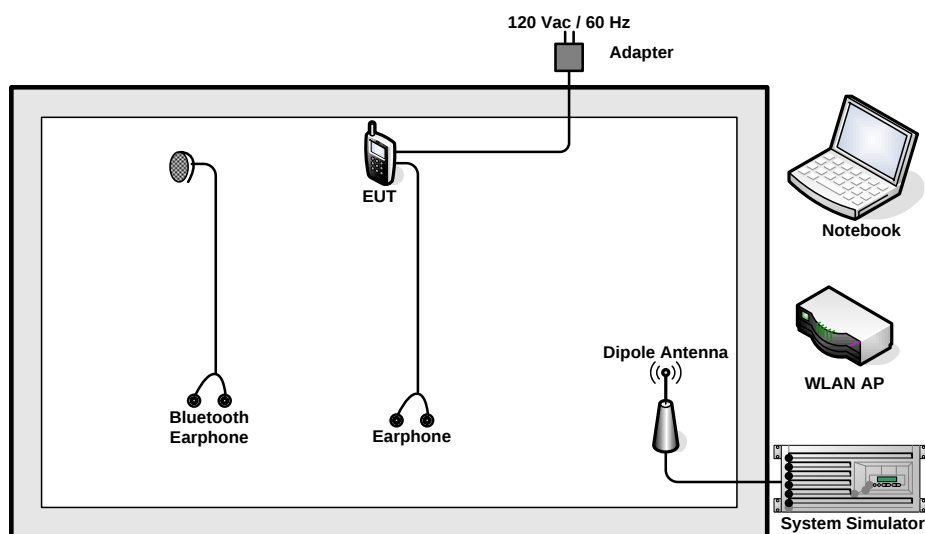
Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth 4.0 – LE / GFSK
Conducted TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
Radiated TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps for Sample 1 Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps for Sample 1 Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps for Sample 1 Mode 4: Bluetooth Tx CH39_2480 MHz_1Mbps for Sample 2
AC Conducted Emission	Mode 1 :CDMA2000 BC15 Idle + Bluetooth Link + WLAN (2.4G) Link + MPEG4 + Earphone 1 + Battery 1 + USB Cable 1 (Charging from Adapter 1) for Sample 1 Mode 2 :CDMA2000 BC15 Idle + Bluetooth Link + WLAN (2.4G) Link + MPEG4 + Earphone 1 + Battery 1 + USB Cable 1 (Charging from Adapter 1) for Sample 2

2.3 Connection Diagram of Test System

<Bluetooth 4.0 – LE Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

For Bluetooth 4.0 – LE function, programmed RF utility, “Remote 432X controller (P2.01)” installed in the notebook make the EUT provides functions like channel selection and power level for continuous transmitting and receiving signals.

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 KHz.

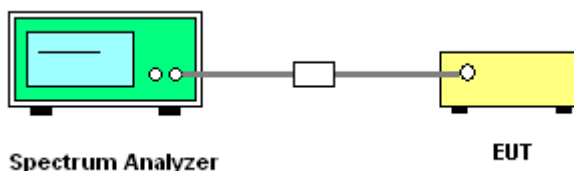
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.

3.1.4 Test Setup

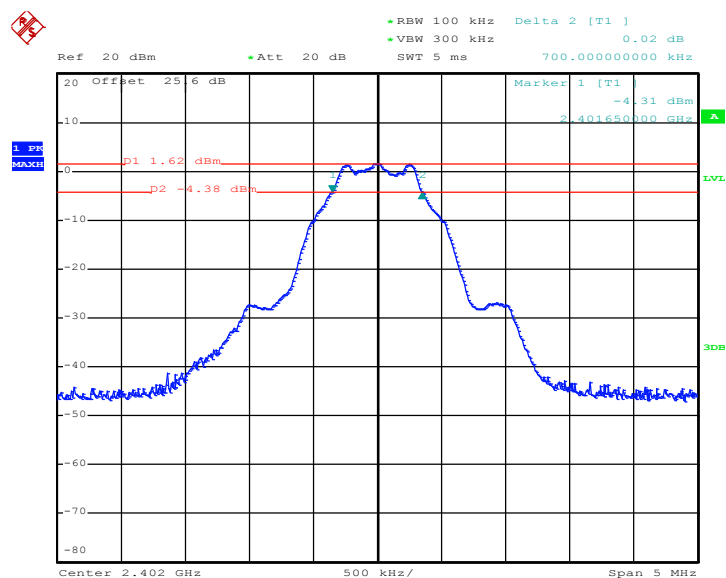


3.1.5 Test Result of 6dB Bandwidth

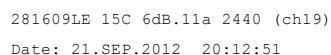
Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	58~61%

Channel	Frequency (MHz)	6dB Bandwidth (MHz)
00	2402	0.70
19	2440	0.70
39	2480	0.70

6 dB Bandwidth Plot on Channel 00



281609LE 15C 6dB.11a 2402 (ch00)
Date: 21.SEP.2012 20:05:03



6 dB Bandwidth Plot on Channel 39



3.2 Peak Output Power Measurement

3.2.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

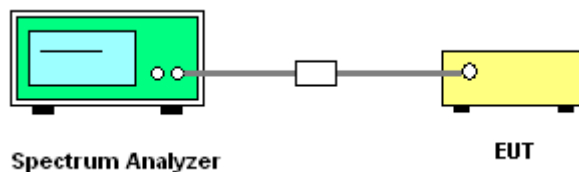
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup

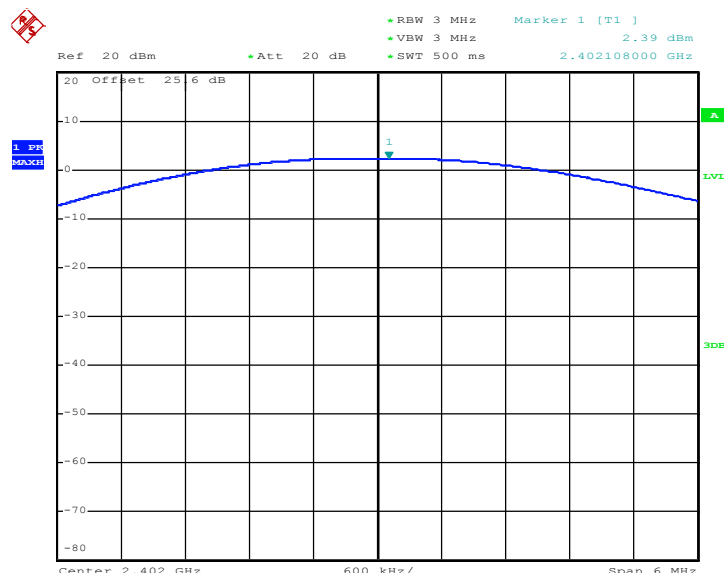


3.2.5 Test Result of Peak Output Power

Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	58~61%

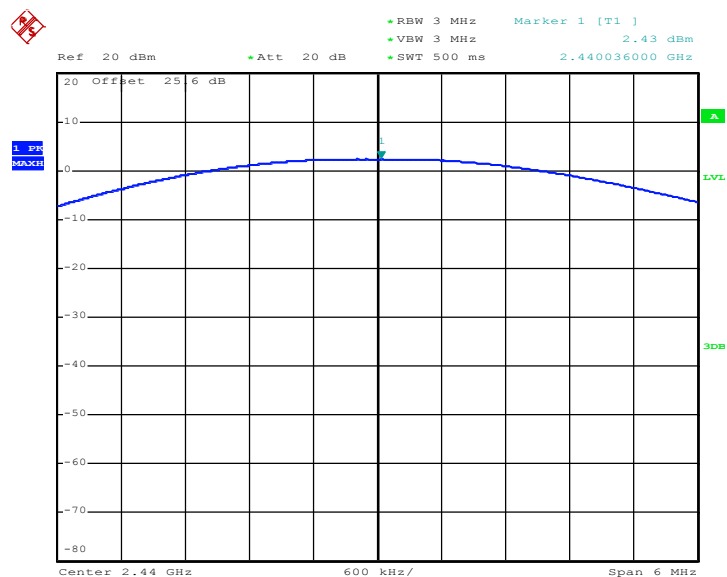
Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	2.39	30.00	Pass
19	2440	2.43	30.00	Pass
39	2480	2.60	30.00	Pass

Peak Output Power Plot on Channel 00



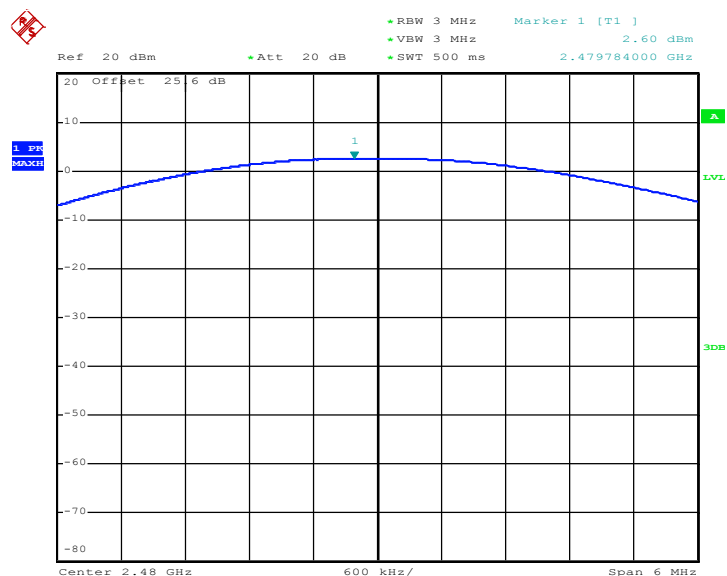
Date: 7.SEP.2012 21:54:09

Peak Output Power Plot on Channel 19



Date: 7.SEP.2012 21:54:34

Peak Output Power Plot on Channel 39



Date: 7.SEP.2012 21:54:58

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3KHz band at any time interval of continuous transmission.

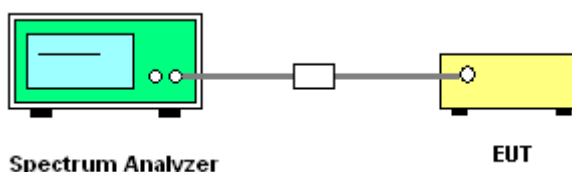
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Video bandwidth (VBW) $\geq$ 300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Record the measurement data derived from spectrum analyzer.
7. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3\text{ kHz}/100\text{ kHz}) = -15.2\text{ dB}$.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

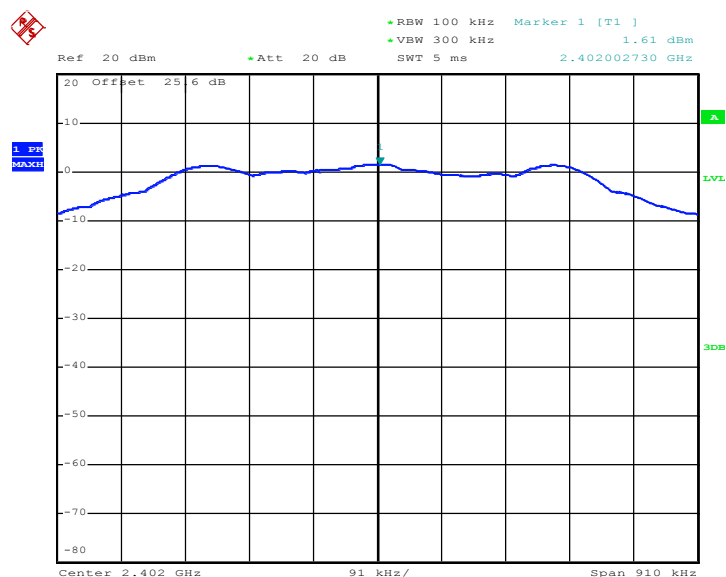
Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	58~61%

Channel	Frequency (MHz)	Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
00	2402	1.61	-13.59	8	Pass
19	2440	1.82	-13.38	8	Pass
39	2480	1.96	-13.24	8	Pass

Note:

1. Measured power density (dBm) has offset with cable loss.
2. $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3. $\text{Power Density/ 3kHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

PSD Plot on Channel 00

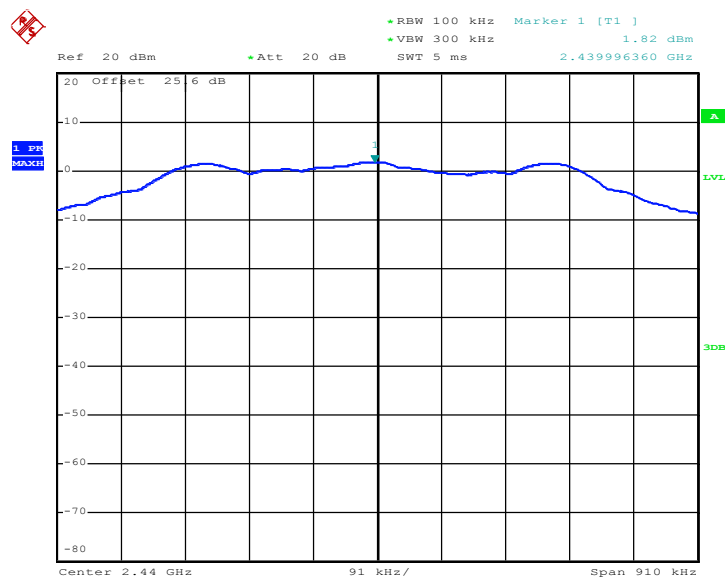


281609LE 15C PSD 802.11a 2402 (ch00)

Date: 21.SEP.2012 20:05:41



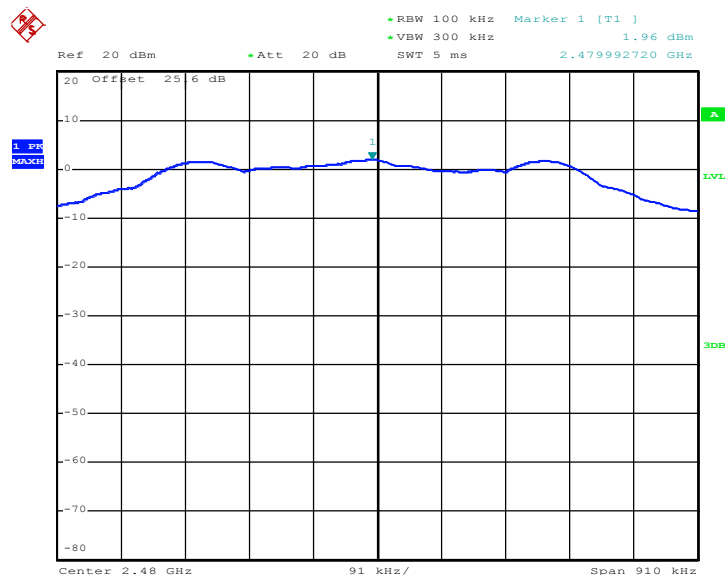
PSD Plot on Channel 19



281609LE 15C PSD 802.11a 2440 (ch19)

Date: 21.SEP.2012 20:13:12

PSD Plot on Channel 39



281609LE 15C PSD 802.11a 2480 (ch39)

Date: 21.SEP.2012 20:17:59

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

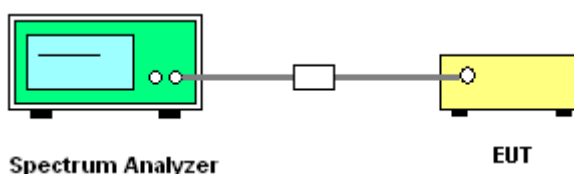
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009 and the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The transmitter output was connected to the spectrum analyzer via a low lose cable.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 KHz, Video bandwidth (VBW) $\geq$ RBW. Out of the authorized frequency band emissions must be at least 20 dB lower than the highest emission level within the authorized band as measured with a 100 KHz RBW. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).

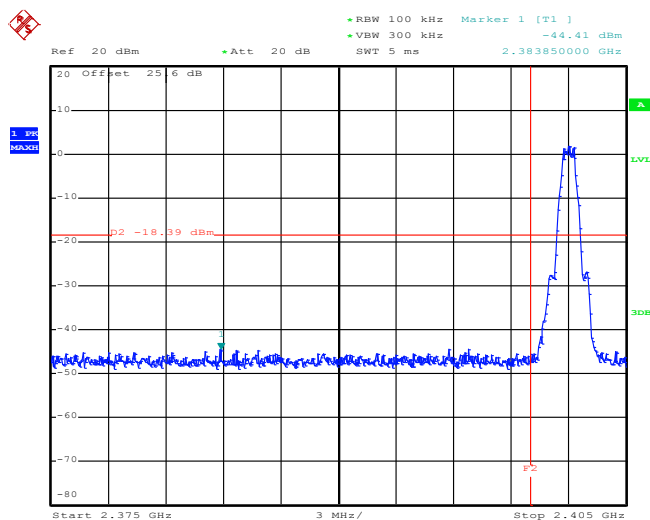
3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges

Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Channel :	00 and 39	Relative Humidity :	58~61%
		Test Engineer :	Book Lin

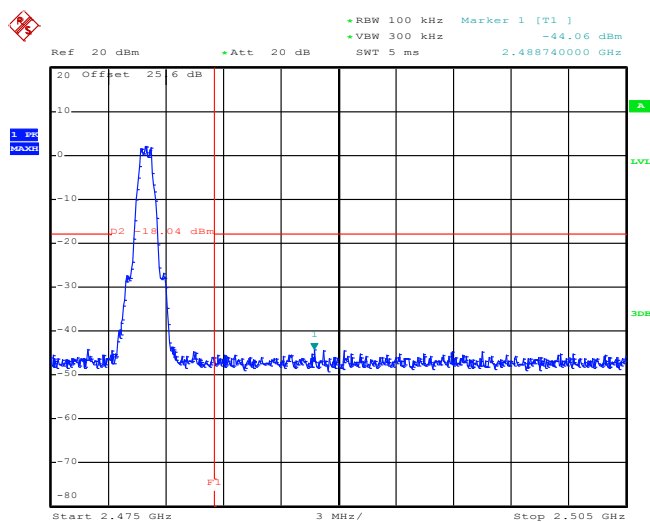
Low Band Edge Plot on Channel 00



281609LE 15C BandEdge 802.11a 2402 (ch00)

Date: 21.SEP.2012 20:09:29

High Band Edge Plot on Channel 39



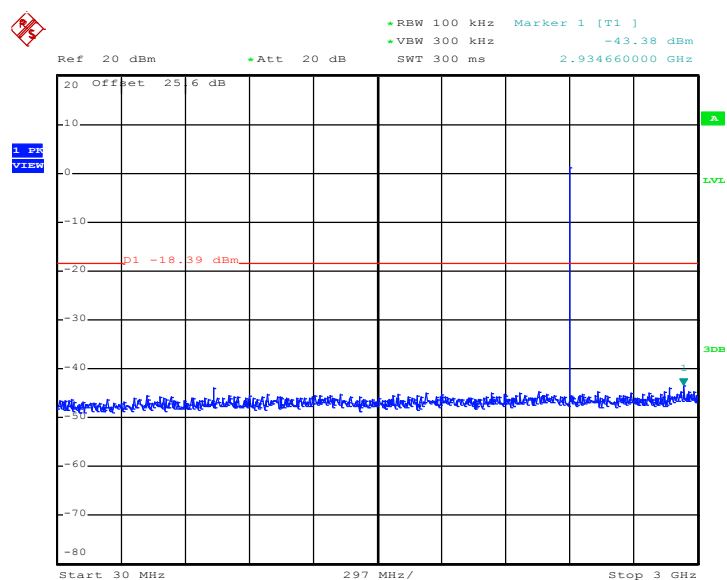
281609LE 15C BandEdge 802.11a 2480 (ch39)

Date: 21.SEP.2012 20:19:01

3.4.6 Test Result of Conducted Spurious Emission

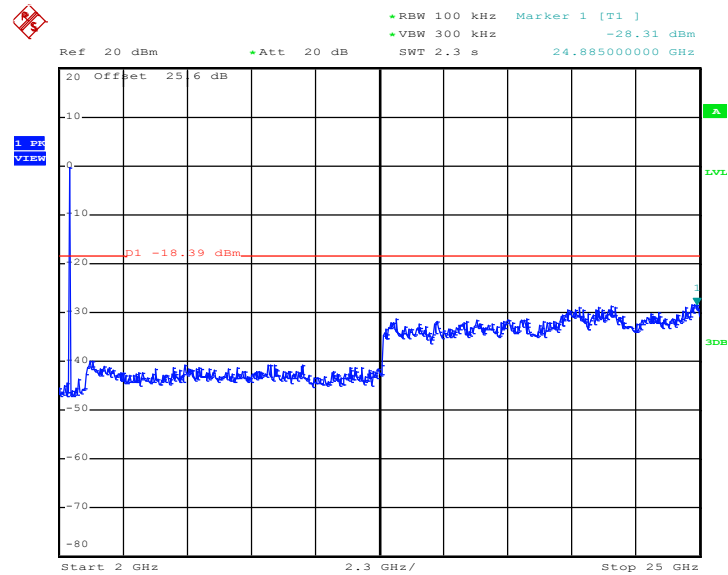
Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Channel :	00	Relative Humidity :	58~61%
		Test Engineer :	Book Lin

**Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 00**



281609LE 15C Spurious 802.11a 2402 (ch00)
Date: 21.SEP.2012 20:09:48

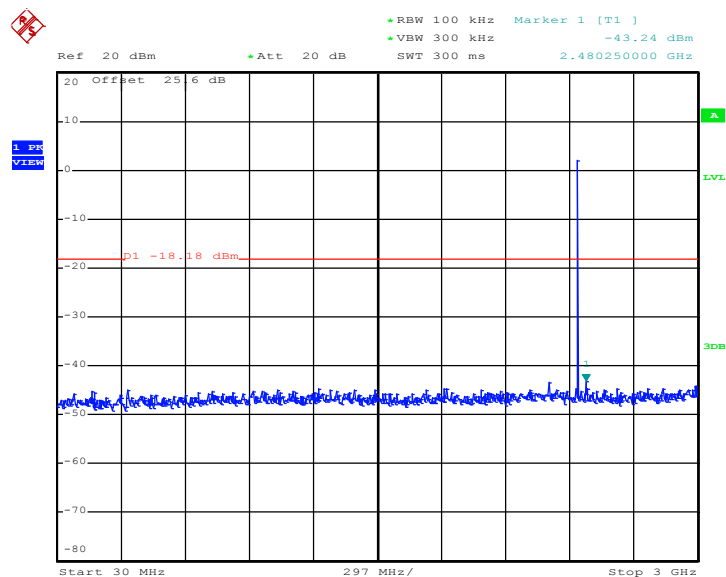
**Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 00**



281609LE 15C Spurious 802.11a 2402 (ch00)
Date: 21.SEP.2012 20:10:06

Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26°C
Test Channel :	19	Relative Humidity :	58~61%
		Test Engineer :	Book Lin

**Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 19**

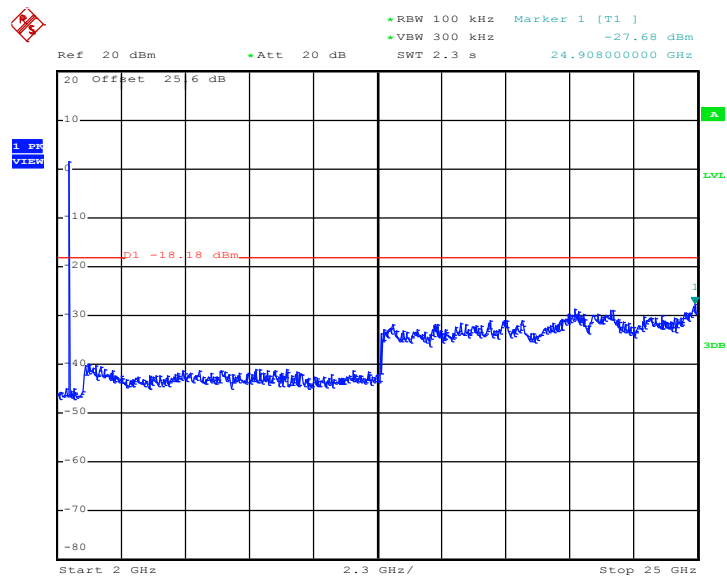


281609LE 15C Spurious 802.11a 2440 (ch19)

Date: 21.SEP.2012 20:13:42



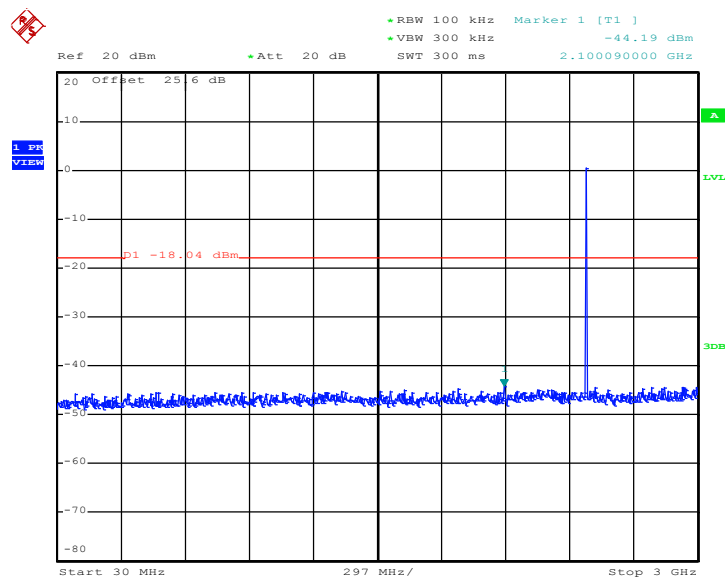
Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 19



281609LE 15C Spurious 802.11a 2440 (ch19)
Date: 21.SEP.2012 20:14:00

Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26°C
Test Channel :	39	Relative Humidity :	58~61%
		Test Engineer :	Book Lin

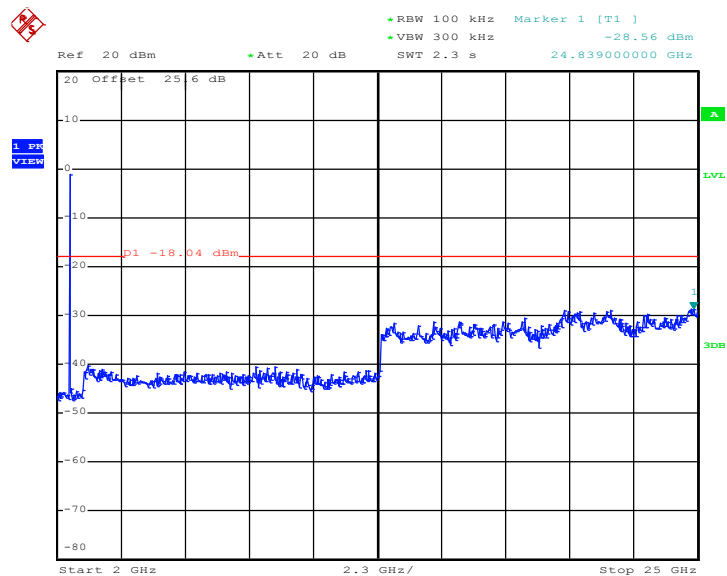
**Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 39**



281609LE 15C Spurious 802.11a 2480 (ch39)
Date: 21.SEP.2012 20:19:59



Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 39



281609LE 15C Spurious 802.11a 2480 (ch39)
Date: 21.SEP.2012 20:20:16

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/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

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The testing follows the guidelines in ANSI C63. 10-2009
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 KHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

For average measurement:

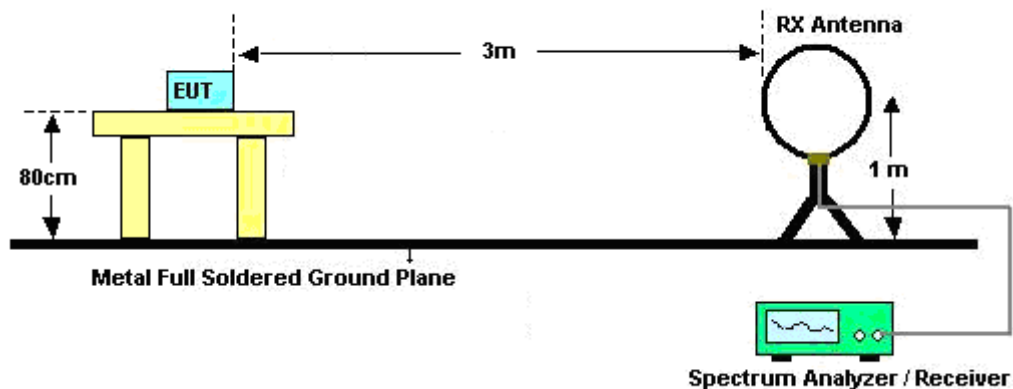
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(us)	1/T(KHz)	VBW Setting
Bluetooth 4.0 - LE	70.25	444	2.25	3KHz

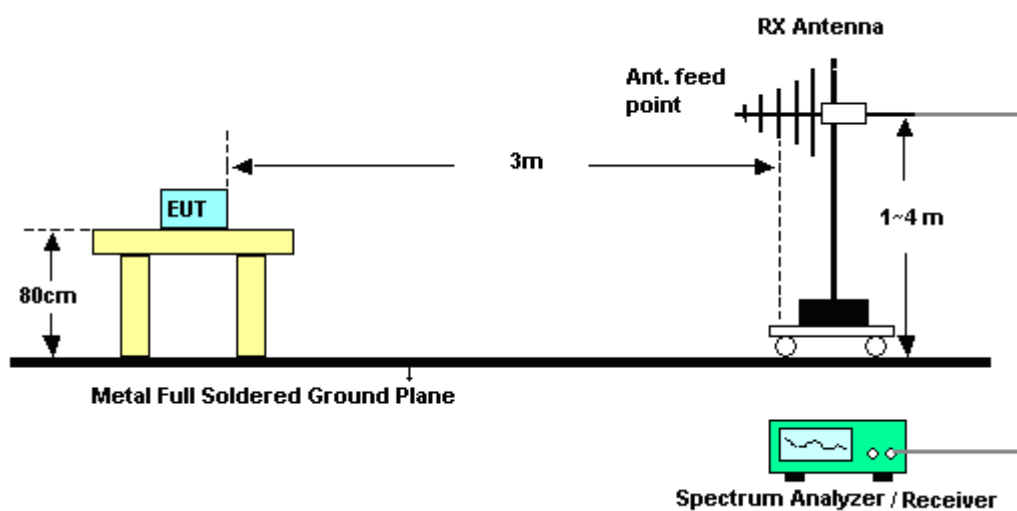
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

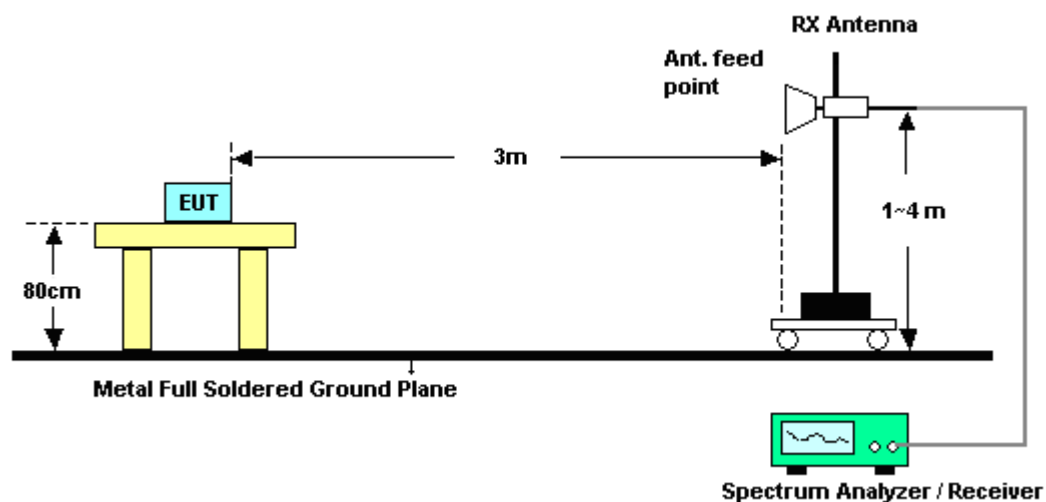
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Band Edges

<Sample 1>

Test Mode :	Mode 1	Temperature :	30~31°C
Test Channel :	00	Relative Humidity :	42~43%
		Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2363.46	49.04	-24.96	74	44.87	32.31	6.42	34.56	194	32	Peak
2389.74	37.12	-16.88	54	32.87	32.36	6.45	34.56	194	32	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2338.53	47.04	-26.96	74	42.95	32.28	6.38	34.57	122	45	Peak
2384.43	36.55	-17.45	54	32.33	32.33	6.45	34.56	122	45	Average

Test Mode :	Mode 3	Temperature :	30~31°C
Test Channel :	39	Relative Humidity :	42~43%
		Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.6	48.16	-25.84	74	43.64	32.48	6.59	34.55	180	20	Peak
2483.5	38.25	-15.75	54	33.73	32.48	6.59	34.55	180	20	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2494.48	47.22	-26.78	74	42.68	32.5	6.59	34.55	200	258	Peak
2483.5	36.86	-17.14	54	32.34	32.48	6.59	34.55	200	258	Average

<Sample 2>

Test Mode :	Mode 4	Temperature :	30~31°C
Test Channel :	39	Relative Humidity :	42~43%
		Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	48.85	-25.15	74	44.33	32.48	6.59	34.55	123	20	Peak
2483.5	39.12	-14.88	54	34.6	32.48	6.59	34.55	123	20	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.72	48.29	-25.71	74	43.77	32.48	6.59	34.55	114	141	Peak
2487.16	36.98	-17.02	54	32.46	32.48	6.59	34.55	114	141	Average

3.5.7 Test Result of Radiated Emission (30 MHz ~ 10th Harmonic)

<Sample 1>

Test Mode :	Mode 1	Temperature :	30~31°C
Test Channel :	00	Relative Humidity :	42~43%
Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	100.88	-	-	96.63	32.36	6.45	34.56	194	32	Average
2402	101.92	-	-	97.67	32.36	6.45	34.56	194	32	Peak

Test Mode :	Mode 1	Temperature :	30~31°C
Test Channel :	00	Relative Humidity :	42~43%
Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang	Polarization :	Vertical
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	96.26	-	-	92.01	32.36	6.45	34.56	122	45	Average
2402	97.27	-	-	93.02	32.36	6.45	34.56	122	45	Peak

Test Mode :	Mode 2	Temperature :	30~31°C
Test Channel :	19	Relative Humidity :	42~43%
Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2440	100.53	-	-	96.14	32.43	6.52	34.56	127	30	Average
2440	101.55	-	-	97.16	32.43	6.52	34.56	127	30	Peak

Test Mode :	Mode 2	Temperature :	30~31°C
Test Channel :	19	Relative Humidity :	42~43%
Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang	Polarization :	Vertical
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2440	95.12	-	-	90.73	32.43	6.52	34.56	116	104	Average
2440	96.09	-	-	91.7	32.43	6.52	34.56	116	104	Peak

Test Mode :	Mode 3	Temperature :	30~31°C
Test Channel :	39	Relative Humidity :	42~43%
Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
115.86	26.49	-17.01	43.5	45.14	11.82	1.24	31.71	-	-	Peak
138.54	26.93	-16.57	43.5	46.04	11.18	1.41	31.7	-	-	Peak
215.76	26.98	-16.52	43.5	47.61	9.02	2.01	31.66	100	77	Peak
562.5	22.16	-23.84	46	32.24	18.87	2.99	31.94	-	-	Peak
707.4	23.44	-22.56	46	32.85	19.07	3.55	32.03	-	-	Peak
832	25.18	-20.82	46	33.15	20.22	3.74	31.93	-	-	Peak
2480	101.59	-	-	97.07	32.48	6.59	34.55	180	20	Average
2480	102.57	-	-	98.05	32.48	6.59	34.55	180	20	Peak

Test Mode :	Mode 3	Temperature :	30~31°C
Test Channel :	39	Relative Humidity :	42~43%
Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang	Polarization :	Vertical
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
51.6	32.57	-7.43	40	55.52	8.1	0.65	31.7	100	27	Peak
115.86	25.52	-17.98	43.5	44.17	11.82	1.24	31.71	-	-	Peak
192.54	19.73	-23.77	43.5	40.53	8.96	1.9	31.66	-	-	Peak
569.5	22.09	-23.91	46	32.26	18.81	3	31.98	-	-	Peak
650	22.43	-23.57	46	31.79	19.2	3.41	31.97	-	-	Peak
821.5	24.08	-21.92	46	32.26	20.12	3.64	31.94	-	-	Peak
2480	95.46	-	-	90.94	32.48	6.59	34.55	200	258	Average
2480	96.47	-	-	91.95	32.48	6.59	34.55	200	258	Peak

<Sample 2>

Test Mode :	Mode 3	Temperature :	30~31°C
Test Channel :	39	Relative Humidity :	42~43%
Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
40.26	25.25	-14.75	40	43.89	12.12	0.74	31.5	-	-	Peak
121.8	28.75	-14.75	43.5	46.95	11.86	1.23	31.29	-	-	Peak
211.44	29.64	-13.86	43.5	50.3	8.92	1.58	31.16	100	185	Peak
386.1	16.18	-29.82	46	30.18	15.18	2.15	31.33	-	-	Peak
749.4	22	-24	46	29.99	19.8	3.05	30.84	-	-	Peak
930.7	23.78	-22.22	46	30.29	20.71	3.36	30.58	-	-	Peak
2480	102.86	-	-	98.34	32.48	6.59	34.55	123	20	Average
2480	103.89	-	-	99.37	32.48	6.59	34.55	123	20	Peak

Test Mode :	Mode 3	Temperature :	30~31°C
Test Channel :	39	Relative Humidity :	42~43%
Test Engineer :	Kai Wang, Timberland Lin and Ivan Chiang	Polarization :	Vertical
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per 15.31.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.89	33.81	-6.19	40	47.44	17.24	0.66	31.53	100	54	Peak
46.2	32.58	-7.42	40	54.04	9.33	0.77	31.56	-	-	Peak
192.54	25.73	-17.77	43.5	46.64	8.96	1.5	31.37	-	-	Peak
350.4	16.96	-29.04	46	31.62	14.3	2.05	31.01	-	-	Peak
595.4	21.4	-24.6	46	31.8	18.8	2.75	31.95	-	-	Peak
912.5	24.1	-21.9	46	31.18	20.7	3.36	31.14	-	-	Peak
2480	97.6	-	-	93.08	32.48	6.59	34.55	114	141	Average
2480	98.55	-	-	94.03	32.48	6.59	34.55	114	141	Peak

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (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 the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

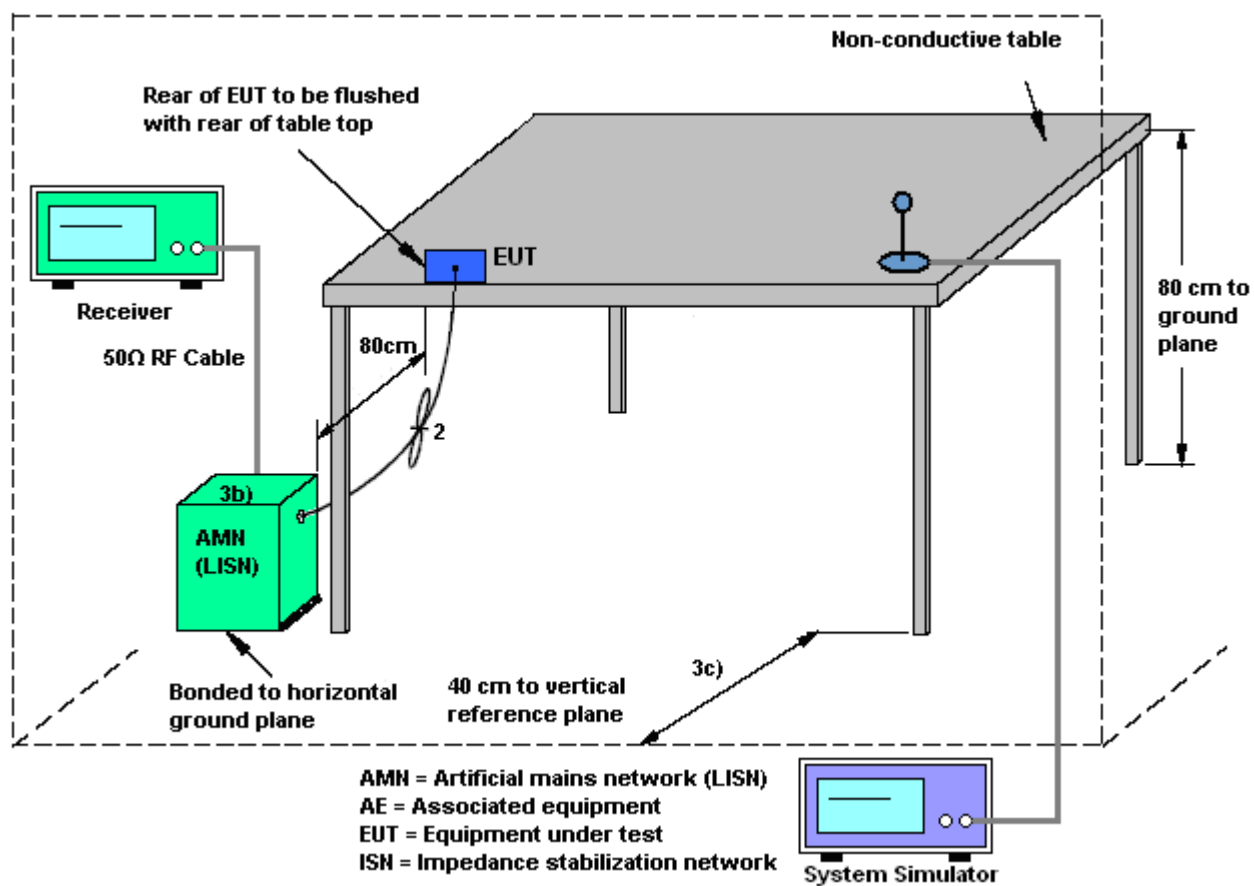
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

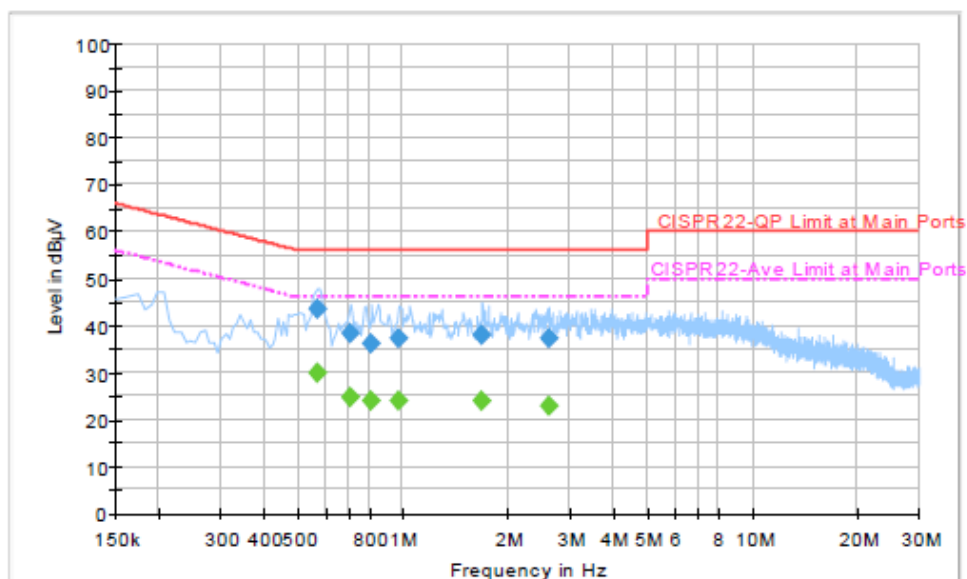
1. Please follow the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	20~21℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	CDMA2000 BC15 Idle + Bluetooth Link + WLAN (2.4G) Link + MPEG4 + Earphone 1 + Battery 1 + USB Cable 1 (Charging from Adapter 1) for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



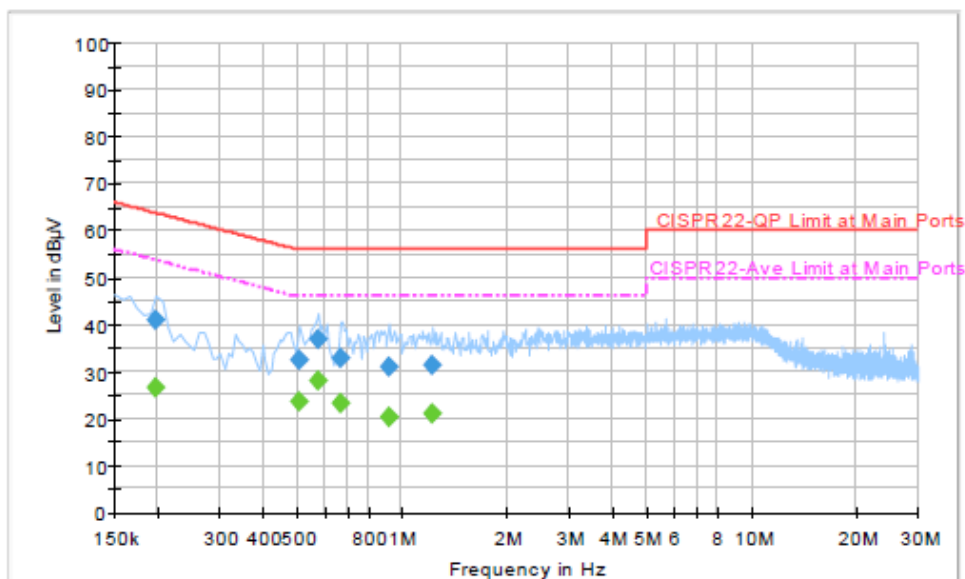
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.566000	43.5	Off	L1	19.4	12.5	56.0
0.710000	38.4	Off	L1	19.5	17.6	56.0
0.814000	36.3	Off	L1	19.5	19.7	56.0
0.974000	37.2	Off	L1	19.4	18.8	56.0
1.686000	37.9	Off	L1	19.5	18.1	56.0
2.606000	37.1	Off	L1	19.6	18.9	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.566000	29.7	Off	L1	19.4	16.3	46.0
0.710000	24.6	Off	L1	19.5	21.4	46.0
0.814000	23.8	Off	L1	19.5	22.2	46.0
0.974000	23.9	Off	L1	19.4	22.1	46.0
1.686000	23.9	Off	L1	19.5	22.1	46.0
2.606000	22.8	Off	L1	19.6	23.2	46.0

Test Mode :	Mode 2	Temperature :	20~21℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	CDMA2000 BC15 Idle + Bluetooth Link + WLAN (2.4G) Link + MPEG4 + Earphone 1 + Battery 1 + USB Cable 1 (Charging from Adapter 1) for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.198000	40.8	Off	N	19.3	22.9	63.7
0.510000	32.6	Off	N	19.4	23.4	56.0
0.574000	36.8	Off	N	19.4	19.2	56.0
0.670000	32.9	Off	N	19.5	23.1	56.0
0.918000	30.9	Off	N	19.4	25.1	56.0
1.222000	31.5	Off	N	19.5	24.5	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.198000	26.7	Off	N	19.3	27.0	53.7
0.510000	23.6	Off	N	19.4	22.4	46.0
0.574000	27.9	Off	N	19.4	18.1	46.0
0.670000	23.1	Off	N	19.5	22.9	46.0
0.918000	20.2	Off	N	19.4	25.8	46.0
1.222000	20.9	Off	N	19.5	25.1	46.0

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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 FCC rule.

3.7.2 Antenna Connected Construction

Non-standard connector used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Sep. 07, 2012 ~ Sep. 21, 2012	Jun. 05, 2013	Conducted (TH02-HY)
EMI Test Receiver	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Sep. 18, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Sep. 18, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Sep. 18, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Sep. 18, 2012	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Sep. 18, 2012	Jul. 27, 2013	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz ~ 26.5GHz	Nov. 23, 2011	Sep. 18, 2012 ~ Sep. 27, 2012	Nov. 22, 2012	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz-30GHz	Nov. 03, 2011	Sep. 18, 2012 ~ Sep. 27, 2012	Nov. 02, 2012	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz ~ 1000MHz	May 04, 2012	Sep. 18, 2012 ~ Sep. 27, 2012	May. 03, 2013	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz ~ 2GHz	Oct. 22, 2011	Sep. 18, 2012 ~ Sep. 27, 2012	Oct. 21, 2012	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2012	Sep. 18, 2012 ~ Sep. 27, 2012	Jul. 31, 2013	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Oct. 20, 2011	Sep. 18, 2012 ~ Sep. 27, 2012	Oct. 19, 2012	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 13, 2012	Sep. 18, 2012 ~ Sep. 27, 2012	Apr. 12, 2013	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz ~ 1GHz	Apr. 11, 2012	Sep. 18, 2012 ~ Sep. 27, 2012	Apr. 10, 2013	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 21, 2012	Sep. 18, 2012 ~ Sep. 27, 2012	Jul. 20, 2013	Radiation (03CH06-HY)
Pre Amplifier	MITEQ	AMF-7D-00101800-30-10P	159087	1GHz~18GHz	Feb. 27, 2012	Sep. 18, 2012 ~ Sep. 27, 2012	Feb. 26, 2013	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz ~ 30MHz	Jul. 03, 2012	Sep. 18, 2012 ~ Sep. 27, 2012	Jul. 02, 2014	Radiation (03CH06-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.26
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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