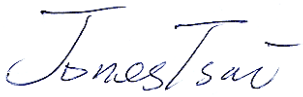
Partial FCC RF Test Report

APPLICANT	:	FUJITSU LIMITED
EQUIPMENT	:	Fujitsu Stylistic Q Series Tablet PC
BRAND NAME	:	Fujitsu
MODEL NAME	:	Q704
FCC ID	:	EJE-WB0087
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DSS) Spread Spectrum Transmitter

This is a partial report which is included conducted power, radiated band edges, radiated spurious emission, and AC conducted emission measurement. The product was received on Sep. 17, 2013 and testing was completed on Oct. 31, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant 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: Joseph Lin / Supervisor



Approved 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
FR391724A	Rev. 01	Initial issue of report	Nov. 12, 2013
FR391724A	Rev. 02	Added data of Dwell Time Measurement in section 3.1	Nov. 20, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(1)	RSS-210 A8.1(d)	Dwell Time of Each Channel	≤ 0.4sec in 31.6sec period	Pass	-
3.2	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 9.80 dB at 41.340 MHz
3.3	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 13.80 dB at 0.198 MHz
3.4	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

FUJITSU LIMITED

1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki, 211-8588 Japan

1.2 Manufacturer

FUJITSU LIMITED

1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki, 211-8588 Japan

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Fujitsu Stylistic Q Series Tablet PC
Brand Name	Fujitsu
Model Name	Q704
FCC ID	EJE-WB0087
Integrated Module	Brand Name: Intel Model Name: 7260HMW FCC ID: PD97260H
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 Bluetooth v3.0 + EDR / v4.0-LE
EUT Stage	Pre-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.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Maximum Output Power to Antenna	Bluetooth BR(1Mbps) : 5.12 dBm (0.0033 W) Bluetooth EDR (2Mbps) : 5.30 dBm (0.0034 W) Bluetooth EDR (3Mbps) : 1.71 dBm (0.0015 W)
Antenna Type	PIFA Antenna type with gain -0.95 dBi
Type of Modulation	Bluetooth BR (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π/4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL INC.			
Test Site Location	No. 52, Hwa Ya 1st 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	03CH08-HY	636805/4086B-2

Note: The test site complies with ANSI C63.4 2003 requirement.

1.7 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 Public Notice DA 00-705
- ANSI C63.4-2003

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

Preliminary tests were performed in different data rates and recorded the RF output power in the following table:

Channel	Frequency	Bluetooth RF Output Power		
		Data Rate / Modulation		
		GFSK	π/4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	3.96 dBm	4.14 dBm	0.48 dBm
Ch39	2441MHz	4.65 dBm	4.86 dBm	1.22 dBm
Ch78	2480MHz	5.12 dBm	**5.30** dBm	1.71 dBm

Remark: The data rate was set in 2Mbps for all the test items due to the highest RF output power.

a. The EUT has been associated with peripherals 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, and different data rates were conducted to determine the final configuration (X plane as worst plane) from all possible combinations, and the worst mode of radiated spurious emissions is Bluetooth 2Mbps mode, and recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

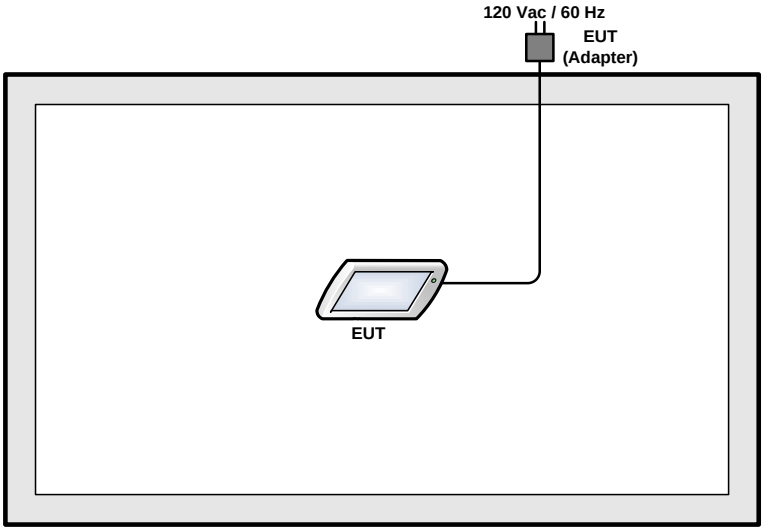
2.2 Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

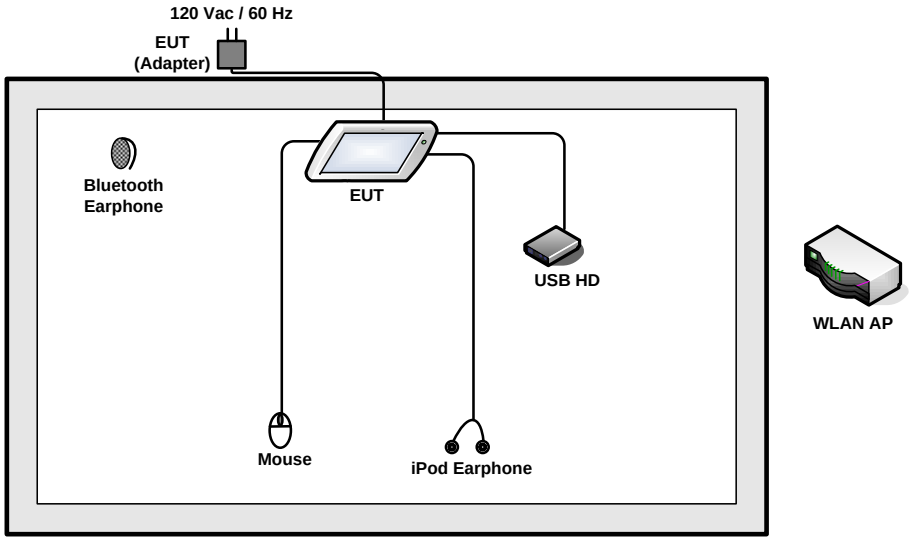
Summary table of Test Cases	
Test Item	**Data Rate / Modulation**
	Bluetooth EDR 2Mbps π/4-DQPSK
Radiated Test Cases	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz
AC Conducted Emission	Mode 1 :WLAN (2.4GHz) Link + Bluetooth Link + MPEG4 + Earphone + Mouse + Adapter + USB HD + H Pattern
Remark: For radiated test cases, the worst mode data rate 2Mbps was reported only, because this data rate has the highest RF output power at preliminary tests.	

2.3 Connection Diagram of Test System

<Bluetooth Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
3.	iPod Earphone	Apple	N/A	verification	Unshielded, 1.0 m	N/A
4.	(USB) Mouse	Lenovo	MO20BOL	FCC DoC	Shielded, 1.3 m	N/A
5.	USB HD	WD	WDBAAR3200ABK-PESN	FCC DoC	Unshielded, 0.5 m	N/A
6.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

For Bluetooth function, the RF utility, “DRTU” was installed in EUT which was programmed in order to make the EUT get into the engineering modes for continuous transmitting and receiving signals.

3 Test Result

3.1 Dwell Time Measurement

3.1.1 Limit of Dwell Time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

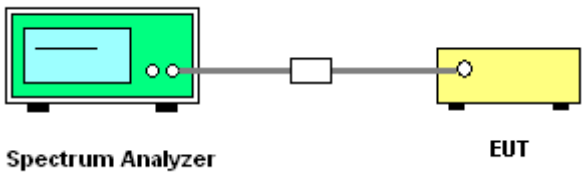
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. 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. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of Dwell Time

Test Mode :	DH5	Temperature :	24~26℃
Test Engineer :	Jim Yang	Relative Humidity :	50~53%

Mode	Hopping Channel Number	Hops Over Occupancy Time(hops)	Package Transfer Time (msec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
Normal	79	106.67	2.87	0.31	0.4	Pass
AFH	20	53.33	2.87	0.15	0.4	Pass

Remark:

1. In normal mode, hopping rate is 1600 hops/s with 6 slots in 79 hopping channels.

With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4 x 79) (s),

Hops Over Occupancy Time comes to (1600 / 6 / 79) x (0.4 x 79) = 106.67 hops.

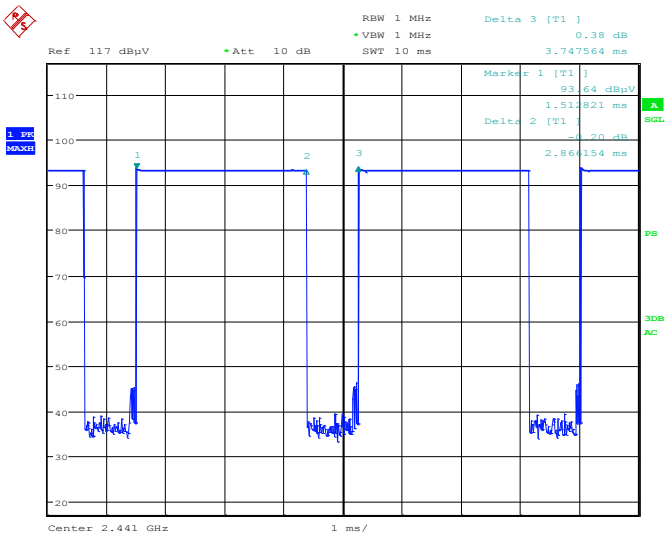
2. In AFH mode, hopping rate is 800 hops/s with 6 slots in 20 hopping channels.

With channel hopping rate (800 / 6 / 20) in Occupancy Time Limit (0.4 x 20) (s),

Hops Over Occupancy Time comes to (800 / 6 / 20) x (0.4 x 20) = 53.33 hops.

3. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time

Package Transfer Time Plot



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3.2 Radiated Band Edges and Spurious Emission Measurement

3.2.1 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

3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

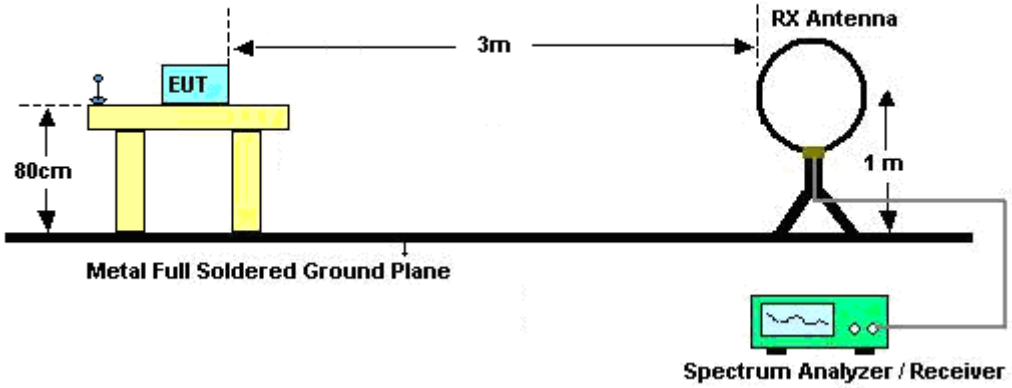
3.2.3 Test Procedures

1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, 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 to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. 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, RBW=1MHz for f>1GHz ; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
   (3) For average measurement: use duty cycle correction factor method per 15.35(c).
   Duty cycle = On time/100 milliseconds
   On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+N_n*L_n$
   Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.
   Average Emission Level = Peak Emission Level + 20*log(Duty cycle)
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

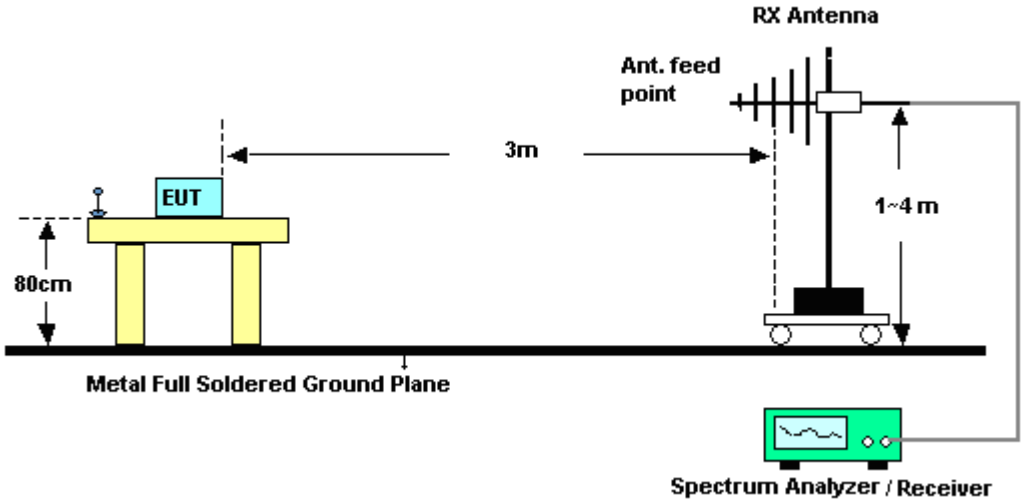
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.85dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

3.2.4 Test Setup

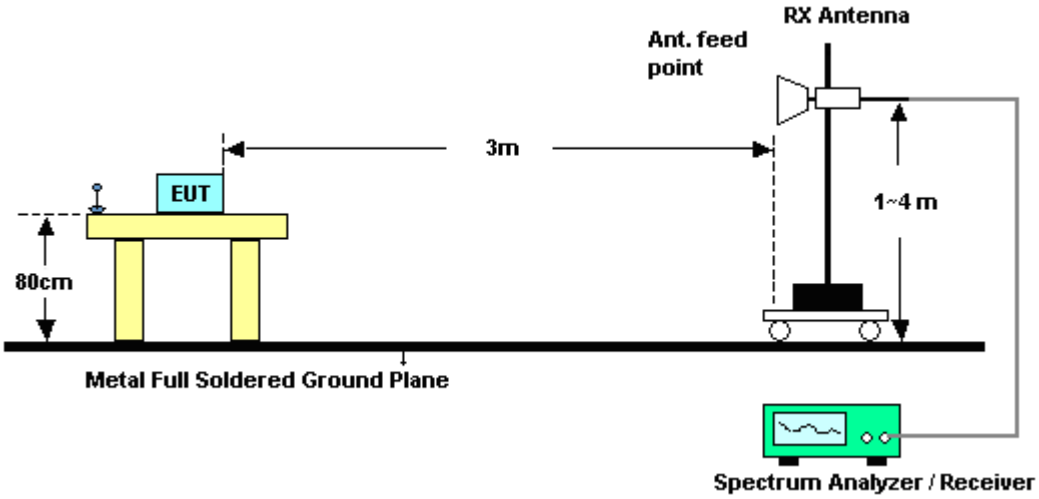
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

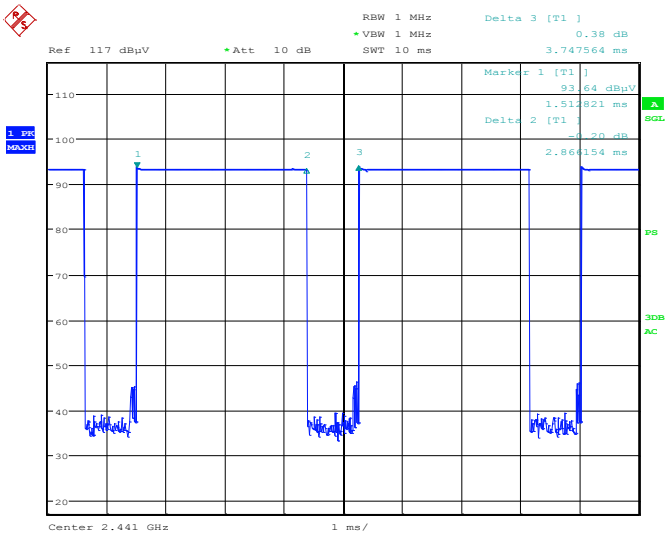


3.2.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

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.

3.2.6 Duty cycle correction factor for average measurement

DH5 on time (One Pulse) Plot on Channel 39



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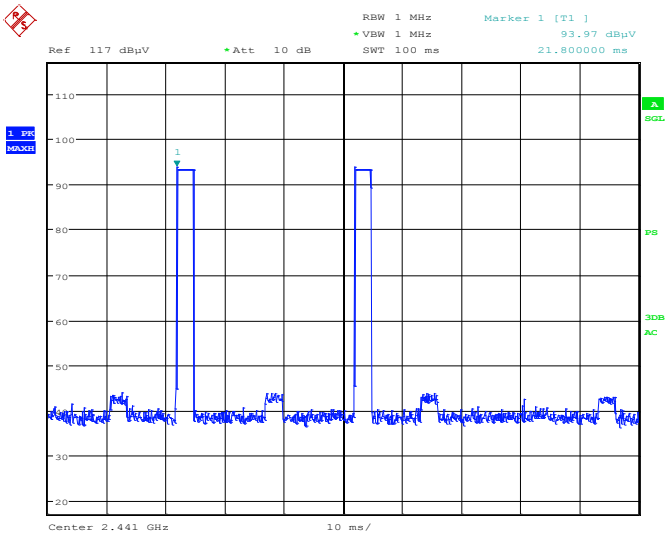
DH5 on time (Count Pulses) Plot on Channel 39



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Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.86 / 100 = 5.72 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = - 24.85 dB
3. DH5 has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

2.86 ms x 20 channels = 57.2 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100ms / 57.6ms] = 2 hops

Thus, the maximum possible ON time:

2.86 ms x 2 = 5.72 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.72 ms/100ms) = -24.85 dB

3.2.7 Test Result of Radiated Spurious at Band Edges

Test Mode :	2Mbps	**Temperature :**	23~24°C
Test Channel :	00	**Relative Humidity :**	50~51%
		Test Engineer :	Jet Lui

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2362.29	51.61	-22.39	74	46.76	32.13	6.21	33.49	100	71	Peak
2362.29	26.76	-27.24	54	-	-	-	-	-	-	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2362.29	48.07	-25.93	74	43.51	31.84	6.21	33.49	100	242	Peak
2362.29	23.22	-30.78	54	-	-	-	-	-	-	Average

Test Mode :	2Mbps	**Temperature :**	23~24°C
Test Channel :	78	**Relative Humidity :**	50~51%
		Test Engineer :	Jet Lui

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2483.53	58.4	-15.6	74	52.78	32.63	6.45	33.46	100	60	Peak
2483.53	33.55	-20.45	54	-	-	-	-	-	-	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2483.5	54.07	-19.93	74	48.49	32.59	6.45	33.46	100	109	Peak
2483.5	29.22	-24.78	54	-	-	-	-	-	-	Average

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

Note: Pre-scanned all test modes and only choose the worst case mode recorded in the test report for radiated spurious emission below 1GHz.

Test Mode :	2Mbps	**Temperature :**	23~24°C
Test Channel :	00	**Relative Humidity :**	50~51%
Test Engineer :	Jet Lui	**Polarization :**	Horizontal
Remark :	2403 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2403	100.51	-	-	95.5	32.27	6.22	33.48	100	71	Peak
2403	75.66	-	-	-	-	-	-	-	-	Average
4803	38.83	-35.17	74	55.34	34.46	8	58.97	100	0	Peak
4803	13.98	-40.02	54	-	-	-	-	-	-	Average

Note: Other harmonics are lower than background noise.

Test Mode :	2Mbps	**Temperature :**	23~24°C
Test Channel :	00	**Relative Humidity :**	50~51%
Test Engineer :	Jet Lui	**Polarization :**	Vertical
Remark :	2403 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2403	94.74	-	-	89.84	32.16	6.22	33.48	100	242	Peak
2403	69.89	-	-	-	-	-	-	-	-	Average
4803	38.85	-35.15	74	55.36	34.46	8	58.97	100	0	Peak
4803	14	-40	54	-	-	-	-	-	-	Average

Note: Other harmonics are lower than background noise.

Test Mode :	2Mbps	Temperature :	23~24°C
Test Channel :	39	Relative Humidity :	50~51%
Test Engineer :	Jet Lui	Polarization :	Horizontal
Remark :	2441 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2441	101.96	-	-	96.6	32.49	6.34	33.47	100	62	Peak
2441	77.11	-	-	-	-	-	-	-	-	Average
4881	39.09	-34.91	74	55.41	34.4	8.15	58.87	100	0	Peak
4881	14.24	-39.76	54	-	-	-	-	-	-	Average
7323	40.36	-33.64	74	52.75	35.63	10.47	58.49	100	0	Peak
7323	15.51	-38.49	54	-	-	-	-	-	-	Average

Note: Other harmonics are lower than background noise.

Test Mode :	2Mbps	Temperature :	23~24°C
Test Channel :	39	Relative Humidity :	50~51%
Test Engineer :	Jet Lui	Polarization :	Vertical
Remark :	2441 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2441	96.29	-	-	91.04	32.38	6.34	33.47	184	117	Peak
2441	71.44	-	-	-	-	-	-	-	-	Average
4881	40.16	-33.84	74	56.48	34.4	8.15	58.87	100	0	Peak
4881	15.31	-38.69	54	-	-	-	-	-	-	Average
7323	40.57	-33.43	74	53.05	35.54	10.47	58.49	100	0	Peak
7323	15.72	-38.28	54	-	-	-	-	-	-	Average

Note: Other harmonics are lower than background noise.

Test Mode :	2Mbps	Temperature :	23~24°C
Test Channel :	78	Relative Humidity :	50~51%
Test Engineer :	Jet Lui	Polarization :	Horizontal
Remark :	2481 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
68.88	29.18	-10.82	40	54.77	5.38	0.98	31.95	-	-	Peak
109.11	31.65	-11.85	43.5	51.16	11.18	1.22	31.91	-	-	Peak
268.68	35.56	-10.44	46	52.82	12.54	1.91	31.71	154	213	Peak
359.5	28.84	-17.16	46	43.69	14.67	2.19	31.71	-	-	Peak
446.3	31.7	-14.3	46	44.38	16.16	2.44	31.28	-	-	Peak
495.3	29.09	-16.91	46	40.74	16.95	2.57	31.17	-	-	Peak
2481	102.25	-	-	96.63	32.63	6.45	33.46	100	60	Peak
2481	77.4	-	-	-	-	-	-	-	-	Average
4959	38.66	-35.34	74	54.82	34.33	8.26	58.75	100	0	Peak
4959	13.81	-40.19	54	-	-	-	-	-	-	Average
7440	39.38	-34.62	74	51.94	35.68	10.47	58.71	100	0	Peak
7440	14.53	-39.47	54	-	-	-	-	-	-	Average

Note: Other harmonics are lower than background noise.

Test Mode :	2Mbps	Temperature :	23~24°C
Test Channel :	78	Relative Humidity :	50~51%
Test Engineer :	Jet Lui	Polarization :	Vertical
Remark :	2481 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
41.34	30.2	-9.8	40	50.34	11.1	0.76	32	165	343	Peak
150.15	29.2	-14.3	43.5	48.32	11.24	1.44	31.8	-	-	Peak
268.41	31.86	-14.14	46	49.02	12.64	1.91	31.71	-	-	Peak
453.3	28.09	-17.91	46	40.87	16.01	2.46	31.25	-	-	Peak
600.3	28.12	-17.88	46	37.56	18.91	2.83	31.18	-	-	Peak
800.5	28.24	-17.76	46	36.01	19.93	3.26	30.96	-	-	Peak
2481	98.04	-	-	92.46	32.59	6.45	33.46	100	109	Peak
2481	73.19	-	-	-	-	-	-	-	-	Average
4959	39.11	-34.89	74	55.27	34.33	8.26	58.75	100	0	Peak
4959	14.26	-39.74	54	-	-	-	-	-	-	Average
7440	39.14	-34.86	74	51.94	35.44	10.47	58.71	100	0	Peak
7440	14.29	-39.71	54	-	-	-	-	-	-	Average

Note: Other harmonics are lower than background noise.

3.3 AC Conducted Emission Measurement

3.3.1 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 (dBμV)	
	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.

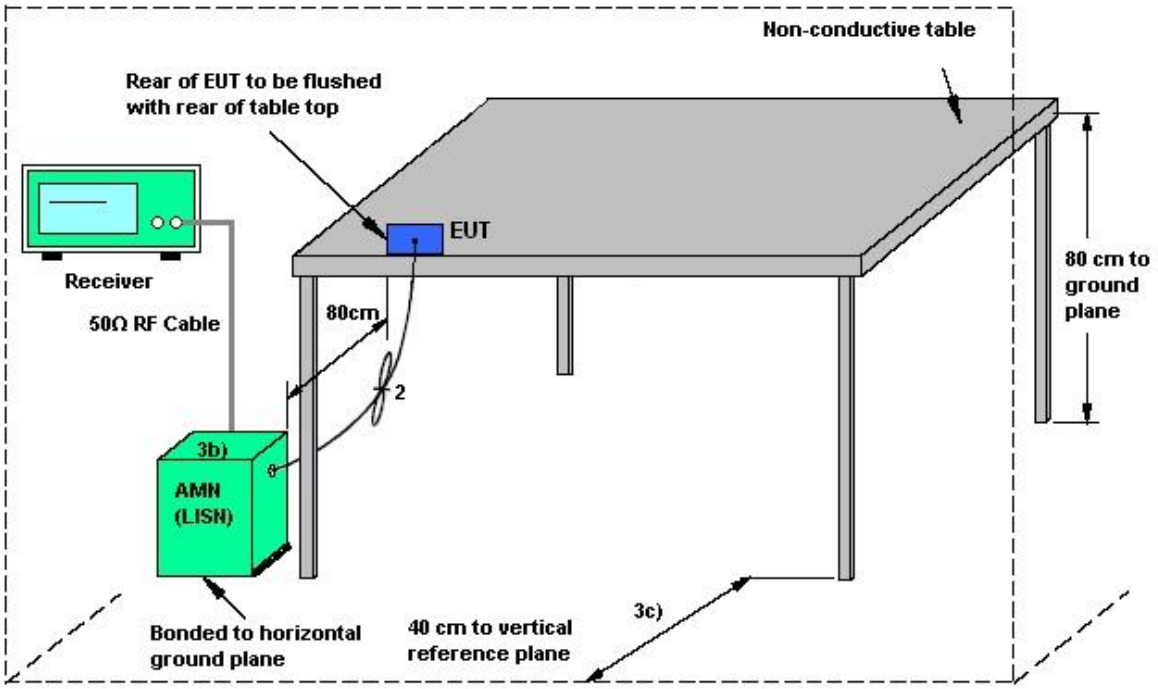
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. 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.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

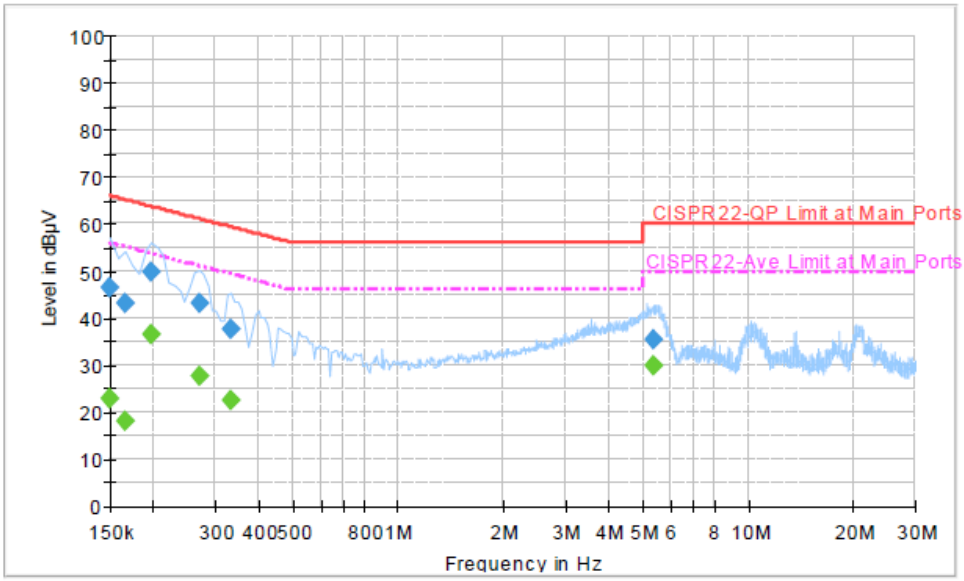
3.3.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.3.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (2.4GHz) Link + Bluetooth Link + MPEG4 + Earphone + Mouse + Adapter + USB HD + H Pattern		



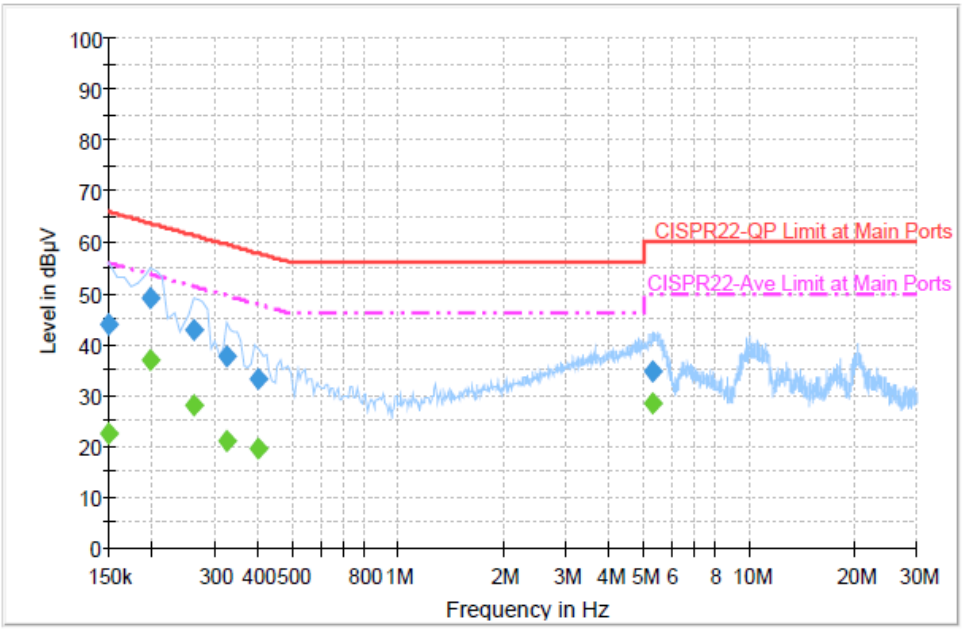
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	46.4	Off	L1	19.4	19.6	66.0
0.166000	43.2	Off	L1	19.4	22.0	65.2
0.198000	49.9	Off	L1	19.3	13.8	63.7
0.270000	43.1	Off	L1	19.3	18.0	61.1
0.334000	37.7	Off	L1	19.4	21.7	59.4
5.374000	35.5	Off	L1	19.6	24.5	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	23.0	Off	L1	19.4	33.0	56.0
0.166000	18.0	Off	L1	19.4	37.2	55.2
0.198000	36.5	Off	L1	19.3	17.2	53.7
0.270000	27.5	Off	L1	19.3	23.6	51.1
0.334000	22.4	Off	L1	19.4	27.0	49.4
5.374000	29.8	Off	L1	19.6	20.2	50.0

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (2.4GHz) Link + Bluetooth Link + MPEG4 + Earphone + Mouse + Adapter + USB HD + H Pattern		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	43.8	Off	N	19.4	22.2	66.0
0.198000	49.1	Off	N	19.3	14.6	63.7
0.262000	42.7	Off	N	19.4	18.7	61.4
0.326000	37.5	Off	N	19.4	22.1	59.6
0.398000	33.0	Off	N	19.5	24.9	57.9
5.326000	34.6	Off	N	19.6	25.4	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	22.4	Off	N	19.4	33.6	56.0
0.198000	37.0	Off	N	19.3	16.7	53.7
0.262000	28.2	Off	N	19.4	23.2	51.4
0.326000	21.0	Off	N	19.4	28.6	49.6
0.398000	19.5	Off	N	19.5	28.4	47.9
5.326000	28.5	Off	N	19.6	21.5	50.0

3.4 Antenna Requirements

3.4.1 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.

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.4.3 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	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 07, 2013	Oct. 22, 2013	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	300MHz~40GHz	Feb. 05, 2013	Oct. 22, 2013	Feb. 04, 2014	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	300MHz~40GHz	Feb. 05, 2013	Oct. 22, 2013	Feb. 04, 2014	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz – 26.5GHz	Jan. 23, 2013	Oct. 31, 2013	Jan. 22, 2014	Radiation (03CH08-HY)
Bilog Antenna	Teseq GmbH	CBL6112D	35379	30MHz~2GHz	Oct. 10, 2013	Oct. 31, 2013	Oct. 09, 2014	Radiation (03CH08-HY)
Horn Antenna	ESCO	3117	000143261	1GHz~18GHz	Jan. 08, 2013	Oct. 31, 2013	Jan. 07, 2014	Radiation (03CH08-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Oct. 03, 2013	Oct. 31, 2013	Oct. 02, 2014	Radiation (03CH08-HY)
Amplifier	SONOMA	310N	187231	9kHz~1GHz	May 15, 2013	Oct. 31, 2013	May 14, 2014	Radiation (03CH08-HY)
Pre Amplifier	EMC INSTRUMENT	EMC011830	980148	100MHz~18GHz	Jun. 21, 2013	Oct. 31, 2013	Jun. 20, 2014	Radiation (03CH08-HY)
Pre Amplifier	Agilent	8449B	3008A02665	1GHz~26.5GHz	Sep. 04, 2013	Oct. 31, 2013	Sep. 03, 2014	Radiation (03CH08-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/0001	9 kHz~30 MhZ	Jul. 03, 2012	Oct. 31, 2013	Jul. 03, 2014	Radiation (03CH08-HY)
Turn Table	Chaintek	Chaintek 3000	N/A	0~360 Degree	N/A	Oct. 31, 2013	N/A	Radiation (03CH08-HY)
Antenna Mast	MF	MFA520BS	N/A	1m~4m	N/A	Oct. 31, 2013	N/A	Radiation (03CH08-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 13, 2012	Oct. 18, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Oct. 18, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Oct. 18, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Oct. 18, 2013	N/A	Conduction (CO05-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**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.3**