



FCC RF Test Report

APPLICANT : FUJITSU LIMITED
EQUIPMENT : FUJITSU STYLISTIC Q series
BRAND NAME : FUJITSU
MODEL NAME : Q665
FCC ID : EJE-WB0093
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

This is a partial report which is included the RF conducted power, radiated emission and AC conducted emission test items. The product was received on Mar. 25, 2015 and testing was completed on Apr. 28, 2015. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in 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.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR532514C	Rev. 01	Initial issue of report	May 05, 2015



SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 0.26 dB at 2389.380 MHz
3.2	15.207	RSS-GEN 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 14.10 dB at 0.198 MHz
3.3	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

FUJITSU LIMITED

1-1, Kamikonadaka 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 Product Feature of Equipment Under Test

Product Feature	
Equipment	FUJITSU STYLISTIC Q series
Brand Name	FUJITSU
Model Name	Q665
FCC ID	EJE-WB0093
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth v4.0 EDR/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 subjective to this standard

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5745~5825MHz.
Maximum Output Power to antenna	<SISO Ant. 1> <2412 MHz ~ 2462 MHz > 802.11b : 17.59 dBm (0.0574 W) 802.11g : 20.41 dBm (0.1099 W) 802.11n HT20 : 20.38 dBm (0.1091 W) 802.11n HT40 : 19.88 dBm (0.0973 W) <5745 MHz ~ 5825 MHz > 802.11a : 18.82 dBm (0.0762 W) 802.11n HT20 : 18.75 dBm (0.0750 W) 802.11n HT40 : 17.92 dBm (0.0619 W) 802.11ac VHT20 : 18.73 dBm (0.0746 W) 802.11ac VHT40 : 18.15 dBm (0.0653 W) 802.11ac VHT80 : 21.02 dBm (0.1265 W) <SISO Ant. 2> <2412 MHz ~ 2462 MHz > 802.11b : 17.55 dBm (0.0569 W) 802.11g : 20.34 dBm (0.1081 W) 802.11n HT20 : 20.59 dBm (0.1146 W) 802.11n HT40 : 20.03 dBm (0.1007 W) <5745 MHz ~ 5825 MHz > 802.11a : 18.63 dBm (0.0729 W) 802.11n HT20 : 18.76 dBm (0.0752 W) 802.11n HT40 : 17.73 dBm (0.0593 W) 802.11ac VHT20 : 18.64 dBm (0.0731 W) 802.11ac VHT40 : 17.99 dBm (0.0630 W) 802.11ac VHT80 : 20.94 dBm (0.1242 W) <MIMO Ant. 1+2> <2412 MHz ~ 2462 MHz > 802.11b : 17.67 dBm (0.0585 W) 802.11g : 19.79 dBm (0.0953 W) 802.11n HT20 : 20.34 dBm (0.1081 W) 802.11n HT40 : 19.42 dBm (0.0875 W) <5745 MHz ~ 5825 MHz > 802.11a : 20.21 dBm (0.1050 W) 802.11n HT20 : 20.32 dBm (0.1076 W) 802.11n HT40 : 20.17 dBm (0.1040 W) 802.11ac VHT20 : 20.31 dBm (0.1074 W) 802.11ac VHT40 : 20.05 dBm (0.1012 W) 802.11ac VHT80 : 22.87 dBm (0.1936 W)

Product Specification subjective to this standard			
Antenna Type	<Ant 1> 802.11b/g/n : PIFA Antenna type with gain -2.60 dBi 802.11a/n/ac : PIFA Antenna type with gain -0.92 dBi		
	<Ant 2> 802.11b/g/n : PIFA Antenna type with gain -1.36 dBi 802.11a/n/ac : PIFA Antenna type with gain -4.22 dBi		
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)		
Antenna Function for Transmitter		Ant. 1	Ant. 2
	802.11 a/b/g/n/ac SISO	V	V
	802.11 a/b/g/n/ac MIMO	V	V

1.5 Modification of EUT

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

1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	CO05-HY	03CH07-HY

Note: The test site complies with ANSI C63.4 2009 requirement.

1.7 Applicable 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 v03r02
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ FCC KDB 644545 D03 Guidance for IEEE 802.11ac New Rules v01
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.

2 Test Configuration of Equipment Under Test

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: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X and Y plane) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4	149	5745	157	5785
	151	5755	159	5795
	153	5765	161	5805
	155	5775	165	5825



2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test shown in the following tables.

SISO<Ant. 1>

802.11b (Data Rate: 1Mbps)			
Channel	CH01	CH06	CH11
Peak Power (dBm)	17.40	17.59	17.22

802.11g (Data Rate: 6Mbps)			
Channel	CH01	CH06	CH11
Peak Power (dBm)	17.48	20.41	15.82

2.4GHz 802.11n HT20 (Data Rate: MCS0)			
Channel	CH01	CH06	CH11
Peak Power (dBm)	17.54	20.38	16.18

2.4GHz 802.11n HT40 (Data Rate: MCS0)			
Channel	CH03	CH06	CH09
Peak Power (dBm)	16.17	19.88	15.15

802.11a (Data Rate: 6Mbps)			
Channel	CH149	CH157	CH165
Peak Power (dBm)	18.82	18.51	18.45

5GHz 802.11n HT20 (Data Rate: MCS0)			
Channel	CH149	CH157	CH165
Peak Power (dBm)	18.75	18.43	18.35

5GHz 802.11n HT40 (Data Rate: MCS0)			
Channel	CH151	CH159	
Peak Power (dBm)	17.89	17.92	

5GHz 802.11ac VHT20 (Data Rate: MCS0)			
Channel	CH149	CH157	CH165
Peak Power (dBm)	18.65	18.73	18.30



5GHz 802.11ac VHT40 (Data Rate: MCS0)		
Channel	CH151	CH159
Peak Power (dBm)	18.15	18.08

5GHz 802.11ac VHT80 (Data Rate: MCS0)	
Channel	CH155
Peak Power (dBm)	21.02

SISO<Ant. 2>

802.11b (Data Rate: 1Mbps)			
Channel	CH01	CH06	CH11
Peak Power (dBm)	17.37	17.55	17.28

802.11g (Data Rate: 6Mbps)			
Channel	CH01	CH06	CH11
Peak Power (dBm)	18.27	20.34	15.91

2.4GHz 802.11n HT20 (Data Rate: MCS0)			
Channel	CH01	CH06	CH11
Peak Power (dBm)	18.15	20.59	16.53

2.4GHz 802.11n HT40 (Data Rate: MCS0)			
Channel	CH03	CH06	CH09
Peak Power (dBm)	16.06	20.03	14.58

802.11a (Data Rate: 6Mbps)			
Channel	CH149	CH157	CH165
Peak Power (dBm)	18.62	18.28	18.63

5GHz 802.11n HT20 (Data Rate: MCS0)			
Channel	CH149	CH157	CH165
Peak Power (dBm)	18.49	18.76	18.59

5GHz 802.11n HT40 (Data Rate: MCS0)		
Channel	CH151	CH159
Peak Power (dBm)	17.66	17.73



5GHz 802.11ac VHT20 (Data Rate: MCS0)			
Channel	CH149	CH157	CH165
Peak Power (dBm)	18.53	18.64	18.54

5GHz 802.11ac VHT40 (Data Rate: MCS0)		
Channel	CH151	CH159
Peak Power (dBm)	17.99	17.75

5GHz 802.11ac VHT80 (Data Rate: MCS0)	
Channel	CH155
Peak Power (dBm)	20.94

MIMO<Ant. 1+2>

802.11b (Data Rate: 1Mbps)			
Channel	CH01	CH06	CH11
Peak Power (dBm)	17.36	17.43	17.67

802.11g (Data Rate: 6Mbps)			
Channel	CH01	CH06	CH11
Peak Power (dBm)	18.31	19.79	18.65

2.4GHz 802.11n HT20 (Data Rate: MCS8)			
Channel	CH01	CH06	CH11
Peak Power (dBm)	18.51	20.34	18.66

2.4GHz 802.11n HT40 (Data Rate: MCS8)			
Channel	CH03	CH06	CH09
Peak Power (dBm)	15.46	19.42	15.44

802.11a (Data Rate: 6Mbps)			
Channel	CH149	CH157	CH165
Peak Power (dBm)	20.19	20.11	20.21

5GHz 802.11n HT20 (Data Rate: MCS8)			
Channel	CH149	CH157	CH165
Peak Power (dBm)	20.32	20.08	19.92



5GHz 802.11n HT40 (Data Rate: MCS8)			
Channel	CH151		CH159
Peak Power (dBm)	20.11		20.17

5GHz 802.11ac VHT20 (Data Rate: MCS0)			
Channel	CH149	CH157	CH165
Peak Power (dBm)	20.25	20.20	20.31

5GHz 802.11ac VHT40 (Data Rate: MCS0)		
Channel	CH151	CH159
Peak Power (dBm)	19.97	20.05

5GHz 802.11ac VHT80 (Data Rate: MCS0)	
Channel	CH155
Peak Power (dBm)	22.87

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

2.3 Test Mode

Final test mode of radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

Single Antenna

<2.4GHz>

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

<5GHz>

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT80	MCS0

MIMO Antenna

<2.4GHz>

Modulation	Data Rate
802.11n HT20	MCS8
802.11n HT40	MCS8

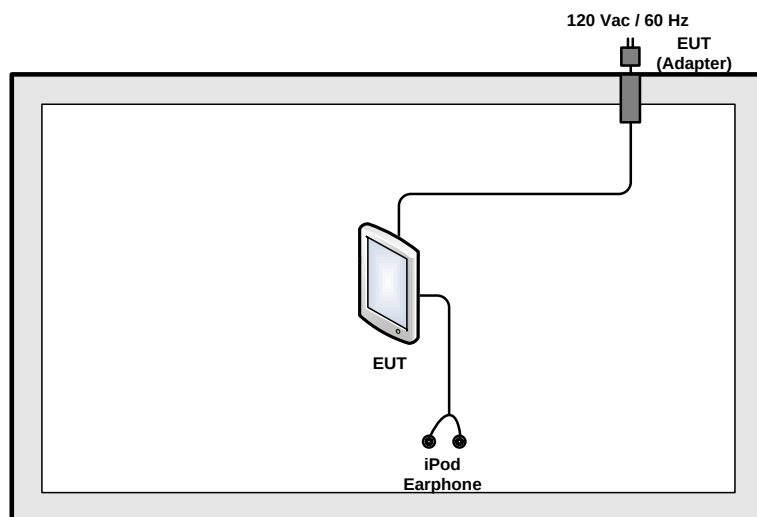
<5GHz>

Modulation	Data Rate
802.11ac VHT80	MCS8

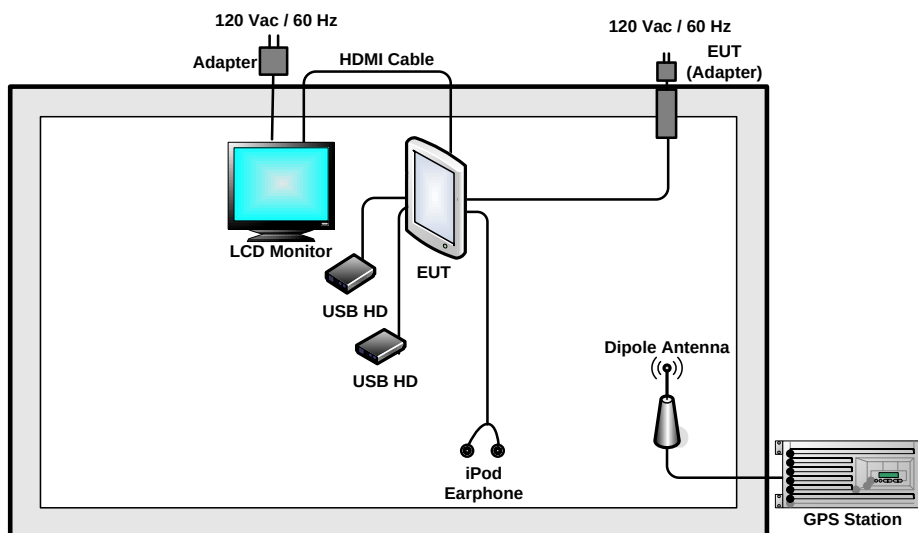
Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Tx + TF + TC Mode 2 : WLAN (2.4GHz) Tx + TF + TC
Remark: - The worst case of conducted emission is mode 1; only the test data of it was reported. - TC stands for Test Configuration, and consists of USB HD, HDMI Cable, Adapter, SD Card, and Earphone. - TF stands for Test Configuration, and consists of MPEG4, Camera, GPS Rx, and H-Pattern.	

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>





2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
2.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
3.	USB HD	DigiFusion	HD-326U3S	FCC DoC	Unshielded, 0.5 m	N/A
4.	USB HD	WD	WDBKXH5000ARD-NESN	FCC DoC	Unshielded, 0.5 m	N/A
5.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
6.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN function, programmed RF utility, "DRTU" installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.



3 Test Result

3.1 Radiated Band Edges and Spurious Emission Measurement

3.1.1 Limit of Radiated band edge and Spurious Emission Measurement

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. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. 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

3.1.2 Measuring Instruments

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



3.1.3 Test Procedure

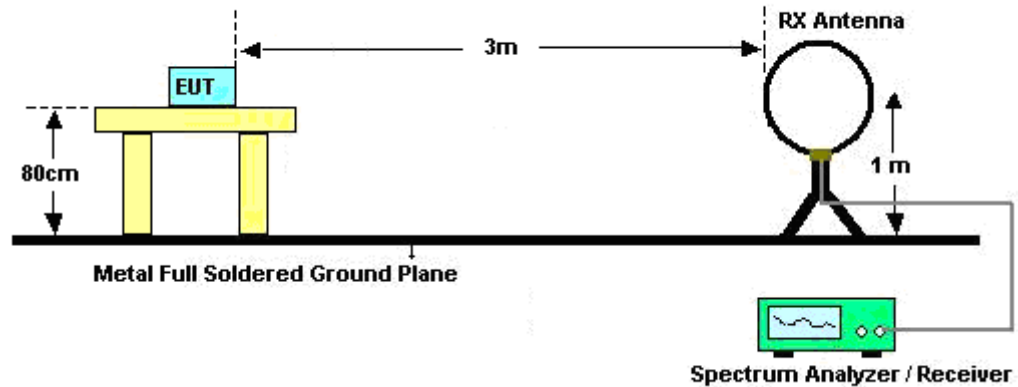
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively 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.



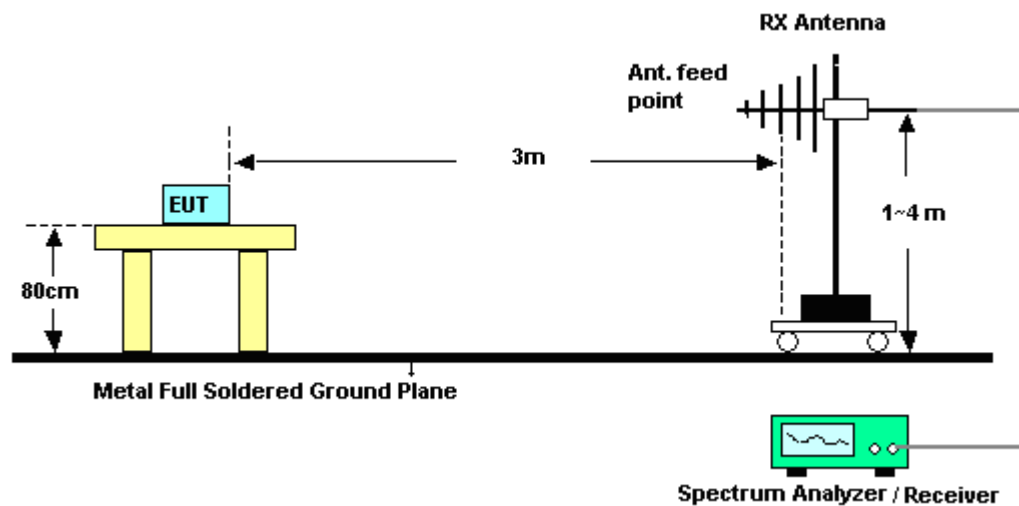
Antenna	Band	Duty Cycle(%)	T(us)	1/T(KHz)	VBW Setting
1	802.11b	98.96	-	-	10Hz
1+2	802.11b for Ant 1	98.96	-	-	
1+2	802.11b for Ant 2	98.96	-	-	
1	802.11g	98.57	-	-	
1+2	802.11g for Ant 1	98.57	-	-	
1+2	802.11g for Ant 2	98.57	-	-	
1	2.4GHz 802.11n HT20	98.97	-	-	3kHz
1	2.4GHz 802.11n HT40	96.93	948	1.05	
1+2	2.4GHz 802.11n HT20 for Ant 1	97.63	990	1.01	
1+2	2.4GHz 802.11n HT20 for Ant 2	97.63	990	1.01	
1+2	2.4GHz 802.11n HT40 for Ant 1	94.7	500	2	
1+2	2.4GHz 802.11n HT40 for Ant 2	94.7	500	2	10Hz
1	802.11a	98.57	-	-	
1+2	802.11a for Ant 1	98.66	-	-	
1+2	802.11a for Ant 2	98.67	-	-	3kHz
1	5GHz 802.11n HT20	98.47	-	-	
1	5GHz 802.11n HT40	96.93	500	2	
1+2	5GHz 802.11n HT20 for Ant 1	97.06	990	1.01	
1+2	5GHz 802.11n HT20 for Ant 2	97.06	990	1.01	
1+2	5GHz 802.11n HT40 for Ant 1	94.7	500	2	
1+2	5GHz 802.11n HT40 for Ant 2	94.7	500	2	10Hz
1	5GHz 802.11n VHT20	98.47	-	-	
1	5GHz 802.11n VHT40	96.95	954	1.05	3kHz
1	5GHz 802.11n VHT80	94.07	444	2.25	
1+2	5GHz 802.11n VHT20 for Ant 1	97.08	996	1.00	
1+2	5GHz 802.11n VHT20 for Ant 2	97.08	996	1.00	
1+2	5GHz 802.11n VHT40 for Ant 1	94.74	504	1.98	
1+2	5GHz 802.11n VHT40 for Ant 2	94.74	504	1.98	10kHz
1+2	5GHz 802.11n VHT80 for Ant 1	90.21	258	3.88	
1+2	5GHz 802.11n VHT80 for Ant 2	90.14	256	3.91	

3.1.4 Test Setup

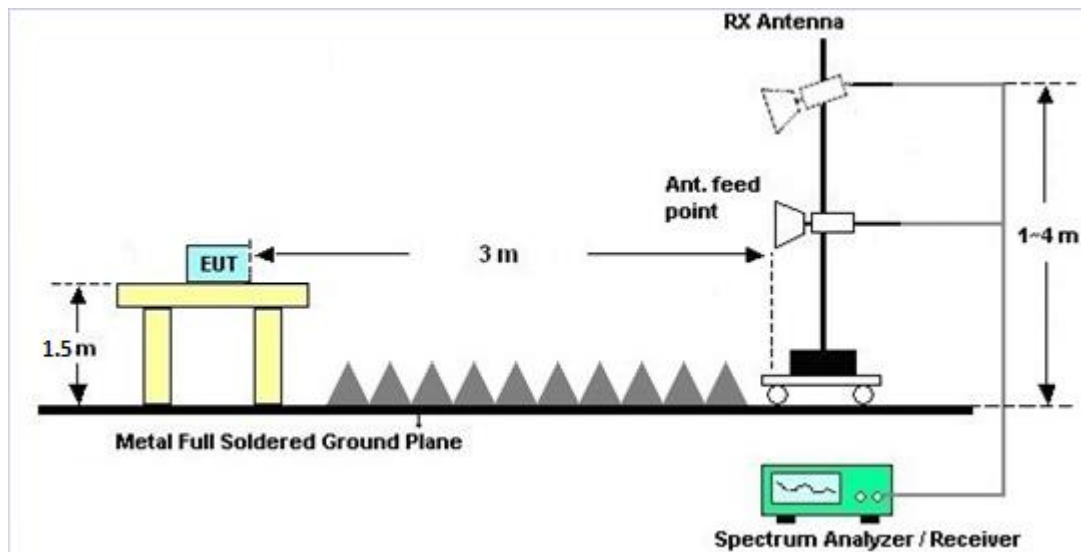
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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.

3.1.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B of this report.

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

Please refer to Appendix B of this report.

3.2 AC Conducted Emission Measurement

3.2.1 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 (dB μ V)	
	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.

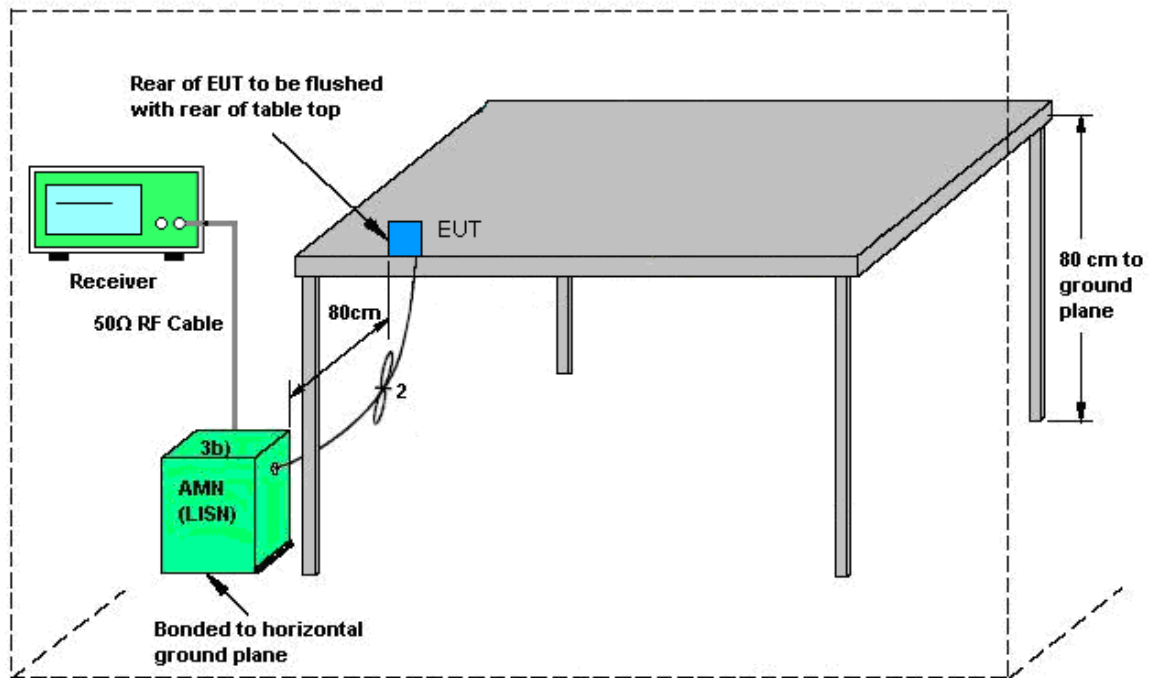
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it 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 (IF bandwidth = 9kHz) with Maximum Hold Mode.

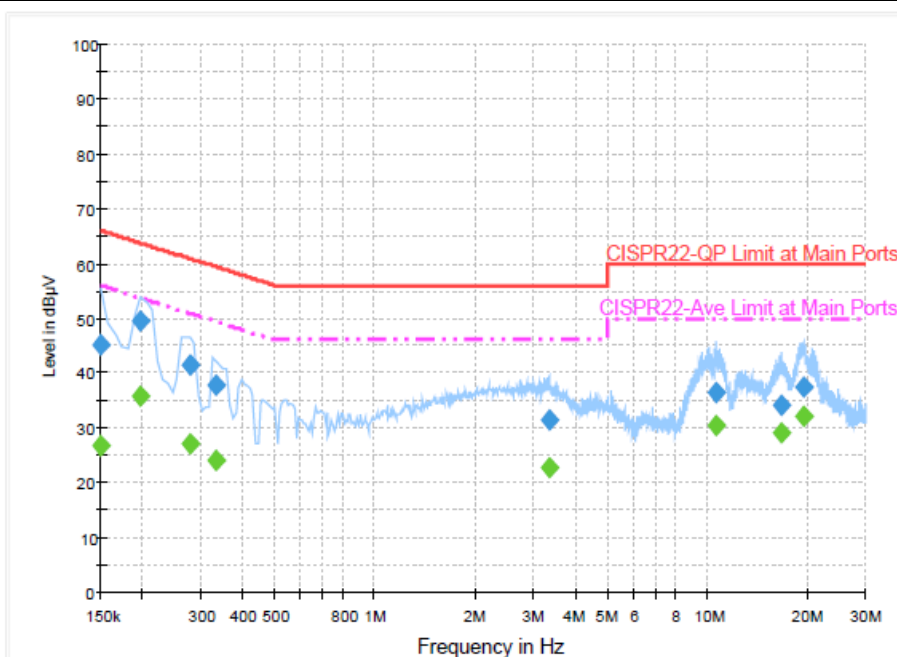
3.2.4 Test Setup



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

3.2.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	23~25°C
Test Engineer :	Eric Jeng	Relative Humidity :	50~52%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Tx + TF + TC		



Final Result : QuasiPeak

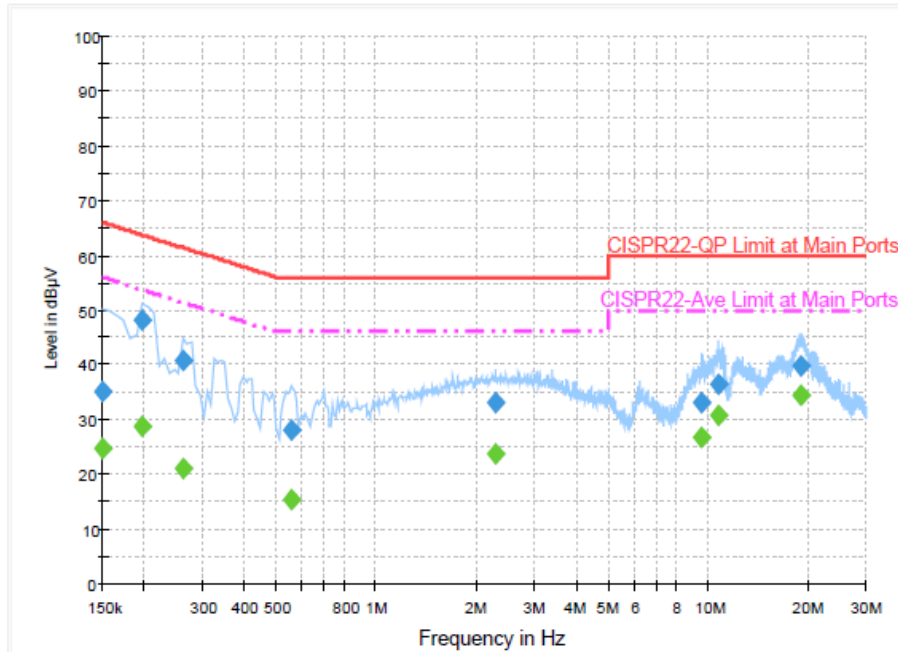
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	45.2	Off	L1	19.5	20.8	66.0
0.198000	49.6	Off	L1	19.4	14.1	63.7
0.278000	41.5	Off	L1	19.4	19.4	60.9
0.334000	37.7	Off	L1	19.4	21.7	59.4
3.342000	31.4	Off	L1	19.7	24.6	56.0
10.622000	36.5	Off	L1	19.8	23.5	60.0
16.718000	34.2	Off	L1	19.9	25.8	60.0
19.550000	37.4	Off	L1	20.0	22.6	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	26.6	Off	L1	19.5	29.4	56.0
0.198000	35.8	Off	L1	19.4	17.9	53.7
0.278000	27.2	Off	L1	19.4	23.7	50.9
0.334000	24.1	Off	L1	19.4	25.3	49.4
3.342000	22.9	Off	L1	19.7	23.1	46.0
10.622000	30.6	Off	L1	19.8	19.4	50.0
16.718000	29.0	Off	L1	19.9	21.0	50.0
19.550000	32.0	Off	L1	20.0	18.0	50.0



Test Mode :	Mode 1	Temperature :	23~25°C
Test Engineer :	Eric Jeng	Relative Humidity :	50~52%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Tx + TF + TC		

**Final Result : QuasiPeak**

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	35.0	Off	N	19.5	31.0	66.0
0.198000	48.0	Off	N	19.4	15.7	63.7
0.262000	40.9	Off	N	19.5	20.5	61.4
0.558000	28.2	Off	N	19.4	27.8	56.0
2.294000	33.2	Off	N	19.7	22.8	56.0
9.622000	33.0	Off	N	19.9	27.0	60.0
10.830000	36.5	Off	N	19.9	23.5	60.0
19.174000	39.7	Off	N	20.1	20.3	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	24.8	Off	N	19.5	31.2	56.0
0.198000	28.7	Off	N	19.4	25.0	53.7
0.262000	21.0	Off	N	19.5	30.4	51.4
0.558000	15.5	Off	N	19.4	30.5	46.0
2.294000	23.6	Off	N	19.7	22.4	46.0
9.622000	26.8	Off	N	19.9	23.2	50.0
10.830000	30.7	Off	N	19.9	19.3	50.0
19.174000	34.4	Off	N	20.1	15.6	50.0



3.3 Antenna Requirements

3.3.1 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. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the Antenna exceeds 6 dBi. 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.

3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.3.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

For CDD transmissions, directional gain is calculated as

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

The EUT supports CDD mode.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain "DG" is calculated as following table.

			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant. 1	Ant. 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
2.4 GHz	-2.60	-1.36	1.05	1.05	0.00	0.00
5 GHz	-0.92	-4.22	0.60	0.60	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 09, 2014	Mar. 26, 2015	Aug. 08, 2015	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 09, 2014	Mar. 26, 2015	Aug. 08, 2015	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Dec. 01, 2014	Apr. 28, 2015	Nov. 30, 2015	Conduction (CO05-HY)
LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 08, 2014	Apr. 28, 2015	Dec. 07, 2015	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 02, 2014	Apr. 28, 2015	Dec. 01, 2015	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Apr. 28, 2015	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9 kHz~7 GHz	Aug. 30, 2014	Apr. 11, 2015 ~ Apr. 18, 2015	Aug. 29, 2015	Radiation (03CH07-HY)
Signal Analyzer	Rohde & Schwarz	FSV 30	101749	10Hz ~ 30GHz	Mar. 10, 2015	Apr. 11, 2015 ~ Apr. 18, 2015	Mar. 09, 2016	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	100315	9 kHz~30 MHz	Jul. 28, 2014	Apr. 11, 2015 ~ Apr. 18, 2015	Jul. 27, 2015	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Sep. 27, 2014	Apr. 11, 2015 ~ Apr. 18, 2015	Sep. 26, 2015	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz~18GHz	Aug. 19, 2014	Apr. 11, 2015 ~ Apr. 18, 2015	Aug. 18, 2015	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Oct. 02, 2014	Apr. 11, 2015 ~ Apr. 18, 2015	Oct. 01, 2015	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10 MHz ~ 1000MHz	Mar. 12, 2015	Apr. 11, 2015 ~ Apr. 18, 2015	Mar. 11, 2016	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1 GHz~26.5 GHz	Oct. 21, 2014	Apr. 11, 2015 ~ Apr. 18, 2015	Oct. 20, 2015	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	DC~18 GHz	Jul. 07, 2014	Apr. 11, 2015 ~ Apr. 18, 2015	Jul. 06, 2015	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590075	DC~18 GHz	Apr. 21, 2014	Apr. 11, 2015 ~ Apr. 18, 2015	Apr. 20, 2015	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Apr. 11, 2015 ~ Apr. 18, 2015	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	ChainTek 3000	N/A	N/A	N/A	Apr. 11, 2015 ~ Apr. 18, 2015	N/A	Radiation (03CH07-HY)



5 Uncertainty of Evaluation

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

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% ($U = 2Uc(y)$)	4.50
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