# **FCC RF Test Report**

APPLICANT : FUJITSU LIMITED EQUIPMENT : STYLISTIC Q series

BRAND NAME : FUJITSU MODEL NAME : Q736

FCC ID : EJE-WB0097

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 Oct. 06, 2015 and testing was completed on Oct. 27, 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.

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 District, Tao Yuan City, Taiwan, R.O.C.

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 1 of 25

Report Issued Date: Nov. 06, 2015

Report No.: FR5O0601C

Report Version : Rev. 01

## **TABLE OF CONTENTS**

RE	VISIO	N HISTORY	3
SU	ММА	RY OF TEST RESULT	4
1	GEN	ERAL DESCRIPTION	5
	1.1	Applicant	5
	1.2	Manufacturer	
	1.3	Product Feature of Equipment Under Test	5
	1.4	Product Specification subjective to this standard	6
	1.5	Modification of EUT	6
	1.6	Testing Location	7
	1.7	Applicable Standards	7
2	TES	T CONFIGURATION OF EQUIPMENT UNDER TEST	8
	2.1	Carrier Frequency and Channel	8
	2.2	Pre-Scanned RF Power	9
	2.3	Test Mode	
	2.4	Connection Diagram of Test System	
	2.5	Support Unit used in test configuration and system	
	2.6	EUT Operation Test Setup	13
3	TES	T RESULT	14
	3.1	Radiated Band Edges and Spurious Emission Measurement	14
	3.2	AC Conducted Emission Measurement	18
	3.3	Antenna Requirements	22
4	LIST	OF MEASURING EQUIPMENT	24
5	UNC	ERTAINTY OF EVALUATION	25
ΑP	PEND	DIX A. RADIATED TEST RESULTS	
ΑP	PEND	DIX B. SETUP PHOTOGRAPHS	

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 2 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

## **REVISION HISTORY**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5O0601C	Rev. 01	Initial issue of report	Nov. 06, 2015

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 3 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

## **SUMMARY OF TEST RESULT**

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	RSS-247 5.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 0.97 dB at 216.030 MHz
3.2	15.207	RSS-GEN 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 13.80 dB at 0.190 MHz
3.3	15.203 & 15.247(b)	N/A	Antenna Requirement	N/A	Pass	-

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 4 of 25
Report Issued Date : Nov. 06, 2015

Report No.: FR5O0601C

Report Version : Rev. 01

#### **General Description** 1

### 1.1 Applicant

#### **FUJITSU LIMITED**

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

### 1.2 Manufacturer

### **FUJITSU LIMITED**

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

## 1.3 Product Feature of Equipment Under Test

Product Feature			
Equipment	STYLISTIC Q series		
Brand Name	FUJITSU		
Model Name	Q736		
FCC ID	EJE-WB0097		
Integrated the WLAN Module	Brand Name: Intel Model Name: 8260NGW FCC ID: PD98260NG, PD98260NGU		
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		

Report No.: FR5O0601C

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

SPORTON INTERNATIONAL INC.

Page Number : 5 of 25 TEL: 886-3-327-3456 Report Issued Date: Nov. 06, 2015 FAX: 886-3-328-4978 Report Version : Rev. 01

FCC ID: EJE-WB0097 Report Template No.: BU5-FR15CWL MA Version 1.0

## 1.4 Product Specification subjective to this standard

Product Specification subjective to this standard				
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462	MHz		
Maximum (Peak) Output Power to antenna	<a href="#"><ant. 1=""></ant.></a> 802.11b: 17.66 dBm (0.0583 W) 802.11g: 20.37 dBm (0.1089 W) <ant. 2=""> 802.11b: 17.36 dBm (0.0545 W) 802.11g: 19.83 dBm (0.0962 W)  SISO <ant. 1=""> 802.11n HT20: 20.44 dBm (0.1107 W) 802.11n HT40: 19.20 dBm (0.0832 W)  SISO <ant. 2=""> 802.11n HT20: 19.99 dBm (0.0998 W) 802.11n HT40: 19.11 dBm (0.0815 W)  MIMO <ant. 1+2=""> 802.11n HT20: 23.22 dBm (0.2099 W) 802.11n HT40: 22.26 dBm (0.1683 W)</ant.></ant.></ant.></ant.>		v) v) v) v)	
Antenna Type	<ant 1="">: PIFA Antenna type with gain 0.67 dBi <ant 2="">: PIFA Antenna type with gain -1.79 dBi</ant></ant>			
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)			
Antenna Function for Transmitter	802.11 b 802.11 g 802.11 n SISO 802.11 n MIMO	Ant. 1 V V V V	Ant. 2 V V V	

Report No.: FR5O0601C

### 1.5 Modification of EUT

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

SPORTON INTERNATIONAL INC. TEL: 886-3-327-3456

Report Issued Date: Nov. 06, 2015 Report Version FAX: 886-3-328-4978 : Rev. 01

FCC ID: EJE-WB0097 Report Template No.: BU5-FR15CWL MA Version 1.0

Page Number

: 6 of 25

### 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.

Report No.: FR5O0601C

Test Site	SPORTON INTERNATIONAL INC.		
	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,		
Test Site Location	Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.		
Test Site Location	TEL: +886-3-327-3456		
	FAX: +886-3-328-4978		
Test Site No.	Sporton	Site No.	
rest site No.	TH05-HY	CO05-HY	

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

Test Site	SPORTON INTERNATIONAL INC.	
	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,	
Test Site Location	Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.	
rest Site Location	TEL: +886-3-327-3456	
	FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
rest site No.	03CH11-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 v03r03
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2009

#### Remark:

- 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 for frequency above 1GHz as an alternative in C63.10-2013 through inquiry tracking number 961829.

 SPORTON INTERNATIONAL INC.
 Page Number
 : 7 of 25

 TEL: 886-3-327-3456
 Report Issued Date
 : Nov. 06, 2015

 FAX: 886-3-328-4978
 Report Version
 : Rev. 01

FCC ID : EJE-WB0097 Report Template No.: BU5-FR15CWL MA Version 1.0

#### **Test Configuration of Equipment Under Test** 2

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 plane for Antenna 1; Y plane for Antenna 2 and Antenna 1+2) 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)
	1	2412	7	2442
	2	2417	8	2447
2400-2483.5 MHz	3	2422	9	2452
2400-2463.5 IVITZ	4	2427	10	2457
	5	2432	11	2462
	6	2437		

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 Report Issued Date: Nov. 06, 2015 FAX: 886-3-328-4978 Report Version : Rev. 01 FCC ID: EJE-WB0097

Report Template No.: BU5-FR15CWL MA Version 1.0

Page Number

: 8 of 25

Report No.: FR500601C

### 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.

### <Ant. 1>

802.11b (Data Rate: 1Mbps)					
Channel CH01 CH06 CH11					
Peak Power (dBm)	17.46	17.34	<mark>17.66</mark>		

802.11g (Data Rate: 6Mbps)					
Channel CH01 CH06 CH					
Peak Power (dBm)	19.97	19.92	<mark>20.37</mark>		

#### <Ant. 2>

802.11b (Data Rate: 1Mbps)						
Channel	Channel CH01 CH06 CH11					
Peak Power (dBm)	17.30	<mark>17.36</mark>	17.28			

802.11g (Data Rate: 6Mbps)					
Channel CH01 CH06 CH11					
Peak Power (dBm)	19.81	<mark>19.83</mark>	19.82		

#### SISO <Ant. 1>

2.4GHz 802.11n HT20 (Data Rate: MCS0)					
Channel CH01 CH06 CH11					
Peak Power (dBm)	20.31	20.23	<mark>20.44</mark>		

2.4GHz 802.11n HT40 (Data Rate: MCS0)					
Channel CH03 CH06 CH09					
Peak Power (dBm)	18.07	19.00	<mark>19.20</mark>		

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 9 of 25
Report Issued Date : Nov. 06, 2015

Report No.: FR5O0601C

Report Version : Rev. 01

### SISO <Ant. 2>

2.4GHz 802.11n HT20 (Data Rate: MCS0)					
Channel CH01 CH06 CH11					
Peak Power (dBm)	<mark>19.99</mark>	19.93	19.91		

2.4GHz 802.11n HT40 (Data Rate: MCS0)					
Channel CH03 CH06 CH09					
Peak Power (dBm)	18.95	19.04	<mark>19.11</mark>		

### MIMO<Ant. 1+2>

2.4GHz 802.11n HT20 (Data Rate: MCS8)					
Channel CH01 CH06 CH11					
Peak Power (dBm)	21.54	23.00	<mark>23.22</mark>		

2.4GHz 802.11n HT40 (Data Rate: MCS8)					
Channel CH03 CH06 CH09					
Peak Power (dBm)	19.87	<mark>22.26</mark>	18.76		

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

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 10 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

### 2.3 Test Mode

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

### **Single Antenna**

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

#### **MIMO Antenna**

Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0

Test Cases		
AC Conducted Emission	Mode 1 : WLAN (2.4GHz) Link + TC + TF	

#### Remark:

- 1. TC stands for Test Configuration, and consists of USB HD, SD Card, HDMI Cable, iPod Earphone, and Adapter.
- 2. TF stands for Test Function, and consists of H Pattern, Camera, MPEG4, and Bluetooth Link.

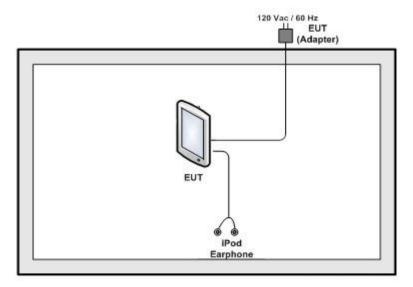
 ${\it SPORTON\ INTERNATIONAL\ INC.}$ 

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 11 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

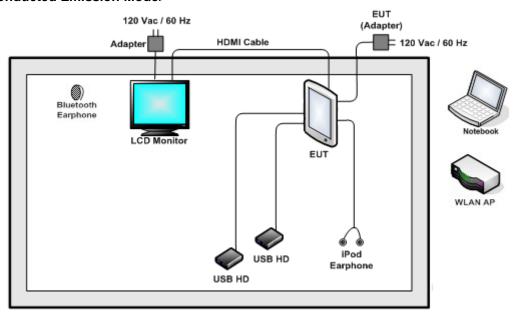
Report No.: FR5O0601C

## 2.4 Connection Diagram of Test System

### <WLAN Tx Mode>



### <AC Conducted Emission Mode>



SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 12 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

## 2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
4.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	USB HD	WD	WDBAAR3200A BK-PESN	FCC DoC	Unshielded, 0.5 m	N/A
6.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
7.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
8.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

### 2.6 EUT Operation Test Setup

The programmed RF utility "DRTU", is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 13 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

### 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.

Report No.: FR500601C

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(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 v03r03.
- 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.
- 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

SPORTON INTERNATIONAL INC.Page Number: 14 of 25TEL: 886-3-327-3456Report Issued Date: Nov. 06, 2015

FAX : 886-3-328-4978 Report Version : Rev. 01
FCC ID : EJE-WB0097 Report Template No.: BU5-FR15CWL MA Version 1.0

- 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 ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW= 3MHz for  $f \ge 1$  GHz for peak measurement. For average measurement:
    - VBW = 10 Hz, when duty cycle is no less than 98 percent.
    - VBW ≥ 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	98.28	-	-	10Hz
2	802.11b	98.26	-	-	10Hz
1	802.11g	98.10	-	-	10Hz
2	802.11g	97.17	2060.00	0.49	1kHz
1	2.4GHz 802.11n HT20	97.96	1920.00	0.52	1kHz
1+2	2.4GHz 802.11n HT20 for Ant 1	95.15	980.00	1.02	3kHz
1+2	2.4GHz 802.11n HT20 for Ant 2	96.12	990.00	1.01	3kHz
1	2.4GHz 802.11n HT40	95.92	940.00	1.06	3kHz
2	2.4GHz 802.11n HT40	95.92	940.00	1.06	3kHz
1+2	2.4GHz 802.11n HT40 for Ant 1	92.54	496.00	2.02	3kHz
1+2	2.4GHz 802.11n HT40 for Ant 2	93.23	496.00	2.02	3kHz

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 15 of 25

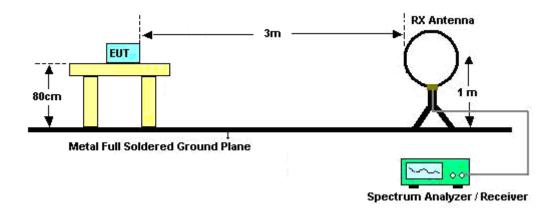
Report Issued Date : Nov. 06, 2015

Report Version : Rev. 01

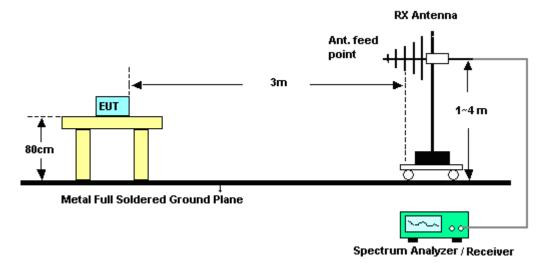
Report No.: FR500601C

### 3.1.4 Test Setup

#### For radiated emissions below 30MHz



#### For radiated emissions from 30MHz to 1GHz

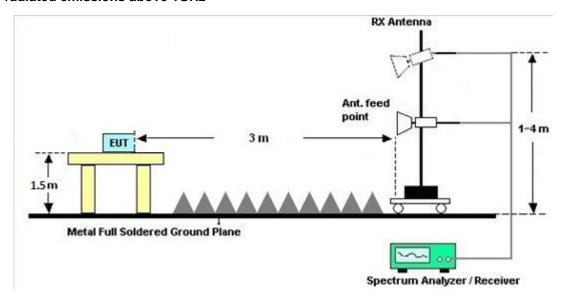


SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 16 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

#### 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 A of this test report.

## 3.1.7 Test Result of Radiated Spurious Emission (30MHz ~ 10<sup>th</sup> Harmonic)

Please refer to Appendix A of this test report.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 17 of 25

Report Issued Date : Nov. 06, 2015

Report Version : Rev. 01

Report No.: FR5O0601C

### 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	Conducted Limit (dBμV)			
(MHz)	Quasi-Peak	Average		
0.15-0.5	66 to 56*	56 to 46*		
0.5-5	56	46		
5-30	60	50		

<sup>\*</sup>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

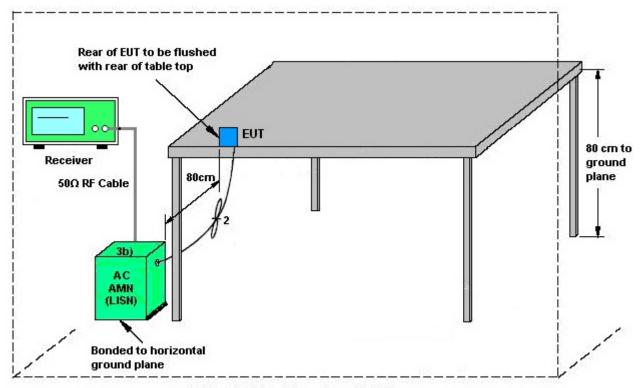
- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to 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.

FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 18 of 25
Report Issued Date : Nov. 06, 2015

Report No.: FR500601C

Report Version : Rev. 01

### 3.2.4 Test Setup



AMN = Artificial mains network (LISN)

AE = Associated equipment

EUT = Equipment under test

ISN = Impedance stabilization network

SPORTON INTERNATIONAL INC.

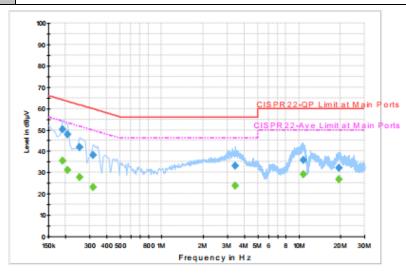
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 19 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

### 3.2.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	<b>21~22</b> ℃
Test Engineer :	Derreck Chen	Relative Humidity :	55~56%
Test Voltage :	120Vac / 60Hz	Phase :	Line

Function Type: WLAN (2.4GHz) Link + TC + TF



#### Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	50.2	Off	L1	19.5	13.8	64.0
0.206000	47.8	Off	L1	19.4	15.6	63.4
0.254000	41.9	Off	L1	19.6	19.7	61.6
0.318000	38.1	Off	L1	19.5	21.7	59.8
3.446000	33.0	Off	L1	19.6	23.0	56.0
10.814000	35.9	Off	L1	19.8	24.1	60.0
19.542000	32.2	Off	L1	19.9	27.8	60.0

### Final Result : Average

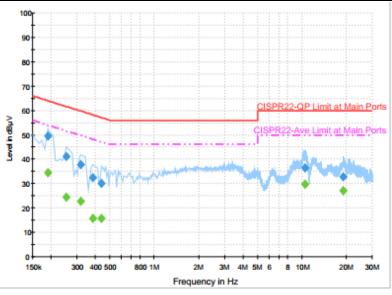
Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	35.4	Off	L1	19.5	18.6	54.0
0.206000	31.1	Off	L1	19.4	22.3	53.4
0.254000	27.7	Off	L1	19.6	23.9	51.6
0.318000	23.1	Off	L1	19.5	26.7	49.8
3.446000	23.9	Off	L1	19.6	22.1	46.0
10.814000	29.3	Off	L1	19.8	20.7	50.0
19.542000	26.7	Off	L1	19.9	23.3	50.0

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 20 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Derreck Chen	Relative Humidity :	55~56%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral

Function Type: WLAN (2.4GHz) Link + TC + TF



### Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	49.5	Off	N	19.5	14.5	64.0
0.254000	41.2	Off	N	19.6	20.4	61.6
0.318000	37.7	Off	N	19.5	22.1	59.8
0.382000	32.4	Off	N	19.6	25.8	58.2
0.438000	30.3	Off	N	19.5	26.8	57.1
10.582000	36.5	Off	N	19.8	23.5	60.0
19.094000	32.9	Off	N	20.0	27.1	60.0

### Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	34.5	Off	N	19.5	19.5	54.0
0.254000	24.5	Off	N	19.6	27.1	51.6
0.318000	22.9	Off	N	19.5	26.9	49.8
0.382000	15.6	Off	N	19.6	32.6	48.2
0.438000	15.8	Off	N	19.5	31.3	47.1
10.582000	29.9	Off	N	19.8	20.1	50.0
19.094000	27.1	Off	N	20.0	22.9	50.0

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 21 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

### 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.

Report No.: FR500601C

### 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.

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

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 kth antenna is being fed by spatial stream j, or zero if it is not;  $G_k$  is the gain in dBi of the kth 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.

SPORTON INTERNATIONAL INC.

Page Number : 22 of 25 TEL: 886-3-327-3456 Report Issued Date: Nov. 06, 2015 FAX: 886-3-328-4978 Report Version : Rev. 01

FCC ID: EJE-WB0097 Report Template No.: BU5-FR15CWL MA Version 1.0

			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	0.67	-1.79	2.54	2.54	0.00	0.00

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

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 23 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

## 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	Jul. 29, 2015	Oct. 06, 2015 ~ Oct. 07, 2015	Jul. 28, 2016	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Jul. 29, 2015	Oct. 06, 2015 ~ Oct. 07, 2015	Jul. 28, 2016	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 18, 2015	Oct. 06, 2015 ~ Oct. 07, 2015	Jun. 17, 2016	Conducted (TH05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz – 2.75GHz	Dec. 01, 2014	Oct. 23, 2015	Nov. 30, 2015	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2014	Oct. 23, 2015	Dec. 01, 2015	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Oct. 23, 2015	N/A	Conduction (CO05-HY)
Bilog Antenna	Teseq GmbH	CBL6112D	35379	30MHz~2GHz	Oct. 15, 2015	Oct. 08, 2015 ~ Oct. 27, 2015	Oct. 14, 2016	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA91705 84	18GHz- 40GHz	Nov. 03, 2014	Oct. 08, 2015 ~ Oct. 27, 2015	Nov. 02, 2015	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Oct. 08, 2015 ~ Oct. 27, 2015	Sep. 01, 2016	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A	MY54130085	20Hz ~ 8.4GHz	Nov. 05, 2014	Oct. 08, 2015 ~ Oct. 27, 2015	Nov. 04, 2015	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 24, 2014	Oct. 08, 2015 ~ Oct. 27, 2015	Nov. 23, 2015	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Oct. 08, 2015	Oct. 08, 2015 ~ Oct. 27, 2015	Oct. 07, 2016	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 20, 2014	Oct. 08, 2015 ~ Oct. 27, 2015	Nov. 19, 2015	Radiation (03CH11-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1902247	1GHz~18GHz	Jul. 01, 2015	Oct. 08, 2015 ~ Oct. 27, 2015	Jun. 30, 2016	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHZ	Sep. 24, 2015	Oct. 08, 2015 ~ Oct. 27, 2015	Sep. 23, 2016	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1~4m	N/A	Oct. 08, 2015 ~ Oct. 27, 2015	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0-360 degree	N/A	Oct. 08, 2015 ~ Oct. 27, 2015	N/A	Radiation (03CH11-HY)
Preamplifier	MITEQ	JS44-180040 00-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	Oct. 08, 2015 ~ Oct. 27, 2015	Jun. 01, 2016	Radiation (03CH11-HY)

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 24 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C

## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of	2.26
Confidence of 95% (U = 2Uc(y))	2.20

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

Measuring Uncertainty for a Level of	4.90
Confidence of 95% (U = 2Uc(y))	4.90

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: EJE-WB0097 Page Number : 25 of 25
Report Issued Date : Nov. 06, 2015
Report Version : Rev. 01

Report No.: FR5O0601C