

# FCC RF Test Report

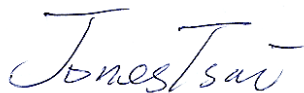
**APPLICANT** : Motorola Mobility, LLC  
**EQUIPMENT** : Mobile Cellular Phone  
**BRAND NAME** : Motorola  
**MODEL NAME** : 7524  
**FCC ID** : IHDT56VC2  
**STANDARD** : FCC Part 15 Subpart E §15.407  
**CLASSIFICATION** : (NII) Unlicensed National Information Infrastructure

The product was received on Jul. 28, 2016 and testing was completed on Jul. 30, 2016. 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.**

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FCC ID : IHDT56VC2

Page Number : 1 of 23

Report Issued Date : Aug. 05, 2016

Report Version : Rev. 01

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## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR651612-16D	Rev. 01	This is a variant report. All the test cases were performed base on the worst case identified in the original report. The test purpose is to verify the influence caused by additional accessory applied, hence only RSE and AC conducted emission need to be considered. Please referred to appendix D for the original report.(Sporton Report Number FR651612-02D)	Aug. 05, 2016



## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.407(b)	Unwanted Emissions	$\leq -17, -27$ dBm (depend on band)&15.209(a)	Pass	Under limit 3.80 dB at 42.690 MHz
3.2	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 4.10 dB at 0.246 MHz



# 1 General Description

## 1.1 Applicant

**Motorola Mobility, LLC**

222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

## 1.2 Manufacturer

**Motorola Mobility, LLC**

222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	7524
FCC ID	IHDT56VC2
IMEI Code	Radiation      IMEI 1: 354131070010793 IMEI 2: 354131070010801
	Conduction      IMEI 1: 354131070017814 IMEI 2: 354131070017822
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/NFC WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 Bluetooth v3.0 EDR Bluetooth v4.0 LE
HW Version	DVT2
EUT Stage	Identical Prototype

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

Accessory List	
WPC Cover	Brand Name : INCIPIO
	Model Name : MT-043-CASE



## 1.4 Product Specification of Equipment Under Test

Standards-related Product Specification			
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz		
	5260 MHz ~ 5320 MHz		
	5500 MHz ~ 5580 MHz		
	5660 MHz ~ 5700 MHz		
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)		
Antenna Type	ILA Antenna (The antenna peak gain of EUT is less than 6 dBi)		
Antenna Function Description		Ant.1	Ant.2
	802.11 a/n 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.

<b>Test Site</b>	SPORTON INTERNATIONAL INC.
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> 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
<b>Test Site No.</b>	<b>Sporton Site No.</b>
	CO05-HY

**Note:** The test site complies with ANSI C63.4 2014 requirement.

<b>Test Site</b>	SPORTON INTERNATIONAL INC.
<b>Test Site Location</b>	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
<b>Test Site No.</b>	<b>Sporton Site No.</b>
	03CH11-HY

**Note:** The test site complies with ANSI C63.4 2014 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 E
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ KDB 648474 D03 Handset Wireless Chargers Battery Covers v01r04
- ♦ 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. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



## 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).

### 2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	<b>38</b>	<b>5190</b>	<b>46</b>	<b>5230</b>
	40	5200	48	5240

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5250-5350 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	<b>54</b>	<b>5270</b>	<b>62</b>	<b>5310</b>
	56	5280	64	5320

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5470-5600 MHz and 5650-5725 MHz Band 3 (U-NII-2C)	100	5500	116	5580
	<b>102</b>	<b>5510</b>	132	5660
	104	5520	<b>134</b>	<b>5670</b>
	108	5540	136	5680
	<b>110</b>	<b>5550</b>	140	5700
	112	5560		

**Note:** The above Frequency and Channel in boldface were 802.11n HT40.



## 2.2 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

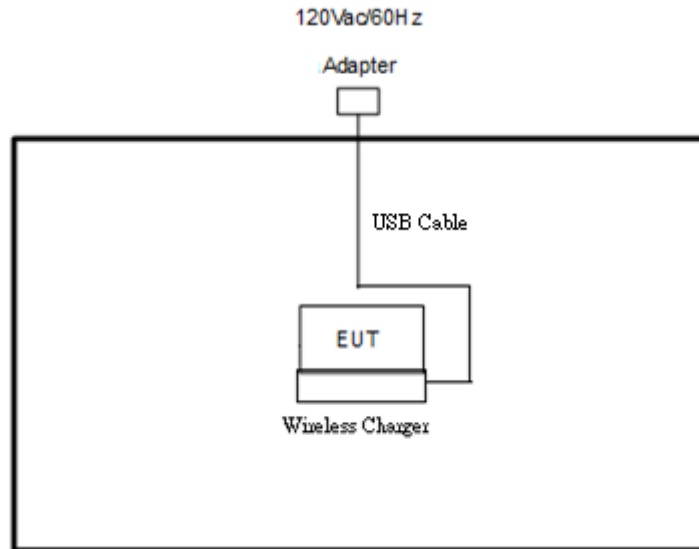
Modulation	Data Rate
802.11a	6 Mbps

<b>AC Conducted Emission</b>	Mode 1 : GSM1900 Idle + Bluetooth Link + WLAN (5GHz) Link + Camera + WPC Back Cover + WPC Charging Pad + USB Cable (Charging from Adapter) Mode 2 : WCDMA Band V Idle + Bluetooth Link + WLAN (5GHz) Link + MPEG4 + WPC Back Cover + PMA Charging Pad + Adapter
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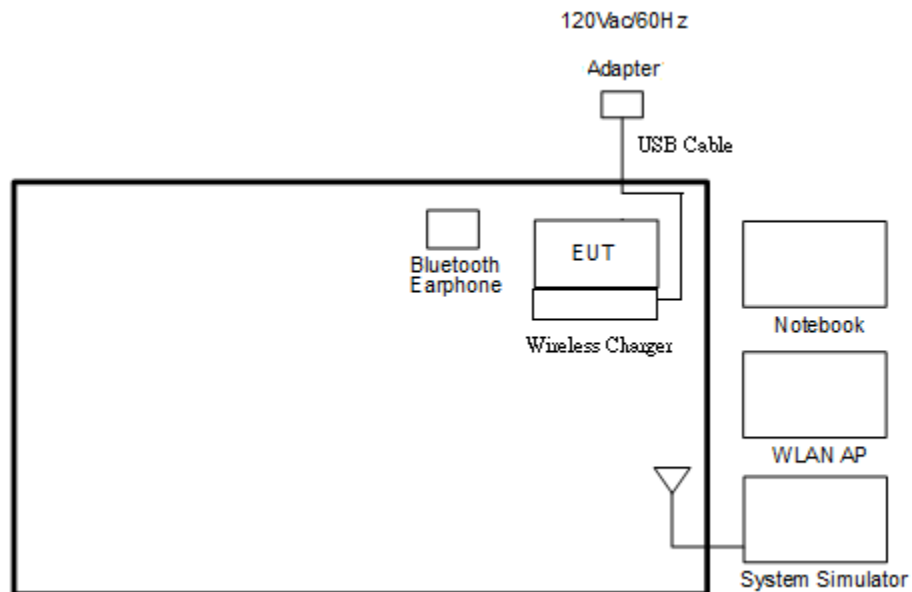
Ch. #		Band III : 5470-5600 MHz and 5650-5725MHz
		802.11a
L	Low	100
M	Middle	-
H	High	-

## 2.3 Connection Diagram of Test System

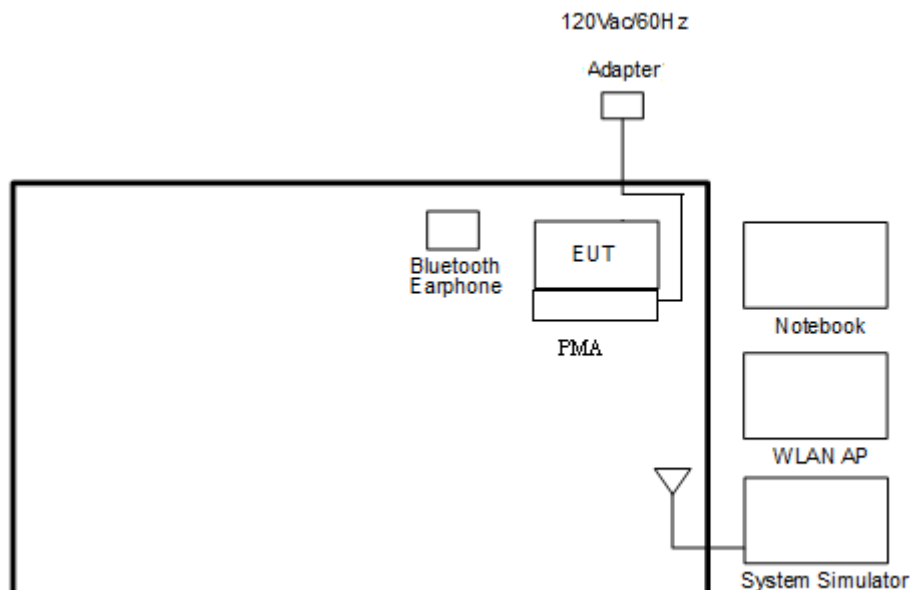
### <WLAN Tx with WPC Charging Mode>



### <AC Conducted Emission with WPC Charging Mode>



### <AC Conducted Emission with PMA Charging Mode>



## 2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	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
4.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
6.	Wireless Charger	LG	WCD-100	FCC DoC	N/A	N/A
7.	PMA	DURACELL	M-018B-518A	FCC DoC	N/A	N/A
8.	USB Cable	Motorola	SKN6461A	N/A	USB Cable	Motorola
9.	Adapter	Motorola	SPN5865A	N/A	Adapter	Motorola

## 2.5 EUT Operation Test Setup

For WLAN function, programmed RF utility, “QRCT” 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 Unwanted Radiated Emission Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

##### 3.1.1 Limit of Unwanted Emissions

- (1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

- (2) Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,

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

**Note:** The following formula is used to convert the EIRP to field strength.

$$E = \frac{1000000\sqrt{30P}}{3} \text{ } \mu\text{V/m, where P is the eirp (Watts)}$$

EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3

- (3) KDB789033 D01 v01r02 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

### **3.1.2 Measuring Instruments**

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

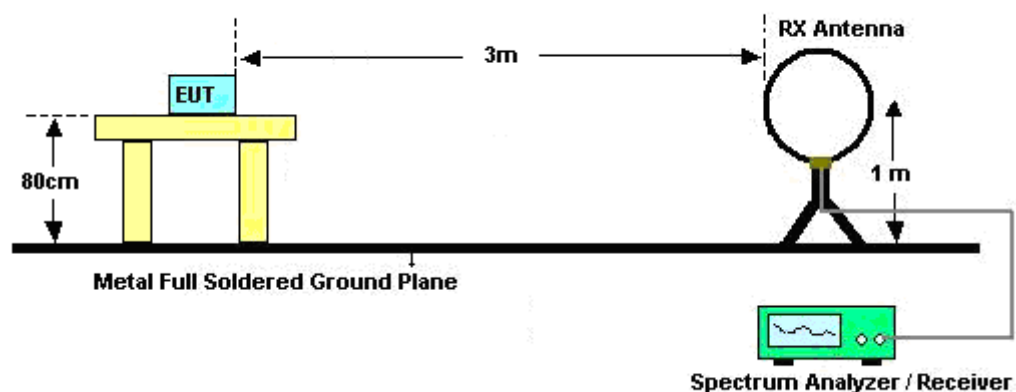
### **3.1.3 Test Procedures**

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02. Section G) Unwanted emissions measurement.
  - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
    - RBW = 120 kHz
    - VBW = 300 kHz
    - Detector = Peak
    - Trace mode = max hold
  - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
    - RBW = 1 MHz
    - VBW  $\geq$  3 MHz
    - Detector = Peak
    - Sweep time = auto
    - Trace mode = max hold
  - (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
    - RBW = 1 MHz
    - 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.

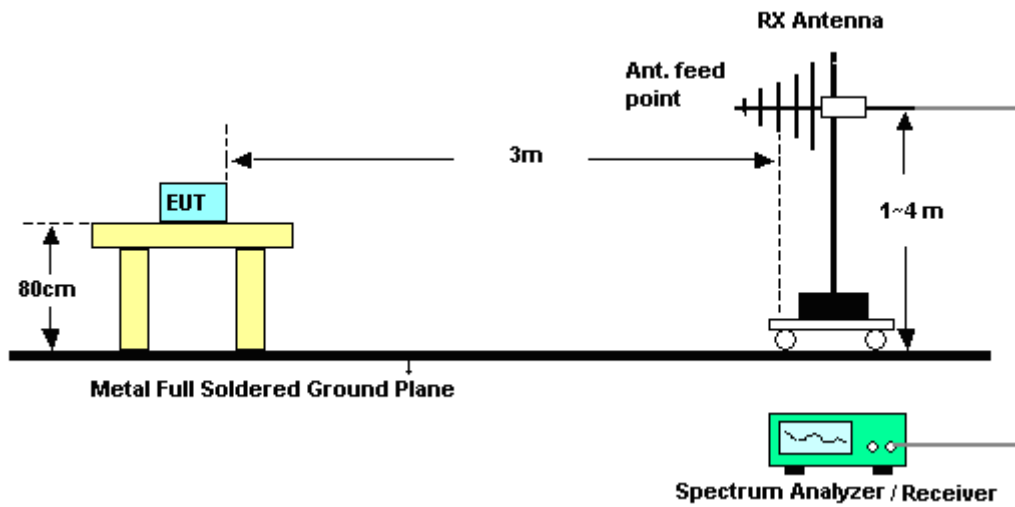
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

### 3.1.4 Test Setup

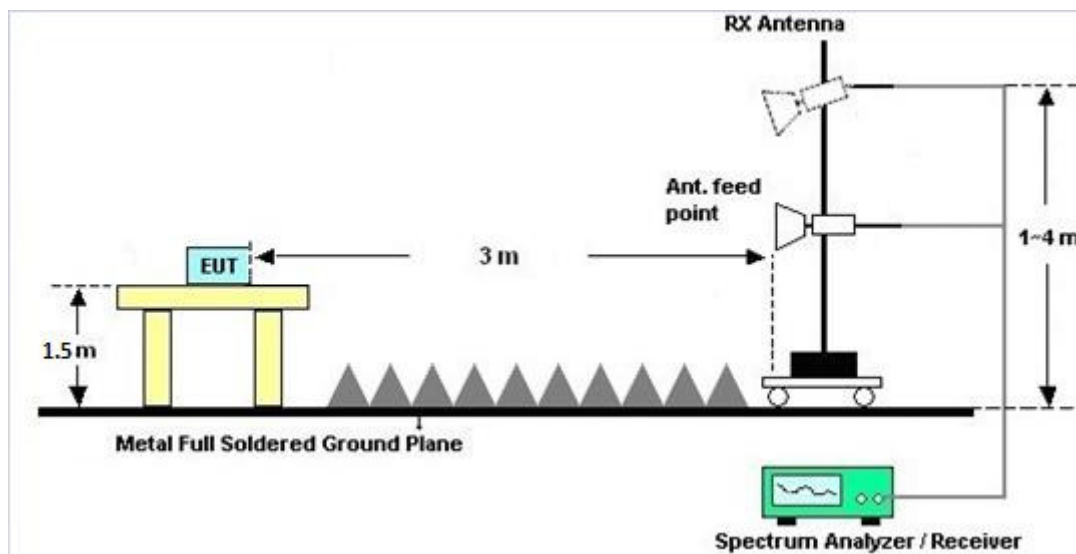
**For radiated emissions below 30MHz**



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz







### **3.1.5 Test Results of Radiated Emissions (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.

### **3.1.6 Test Result of Radiated Band Edges**

Please refer to Appendix A and B.

### **3.1.7 Duty Cycle**

Please refer to Appendix C.

### **3.1.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)**

Please refer to Appendix A and B.

## 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 $\mu$ 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.

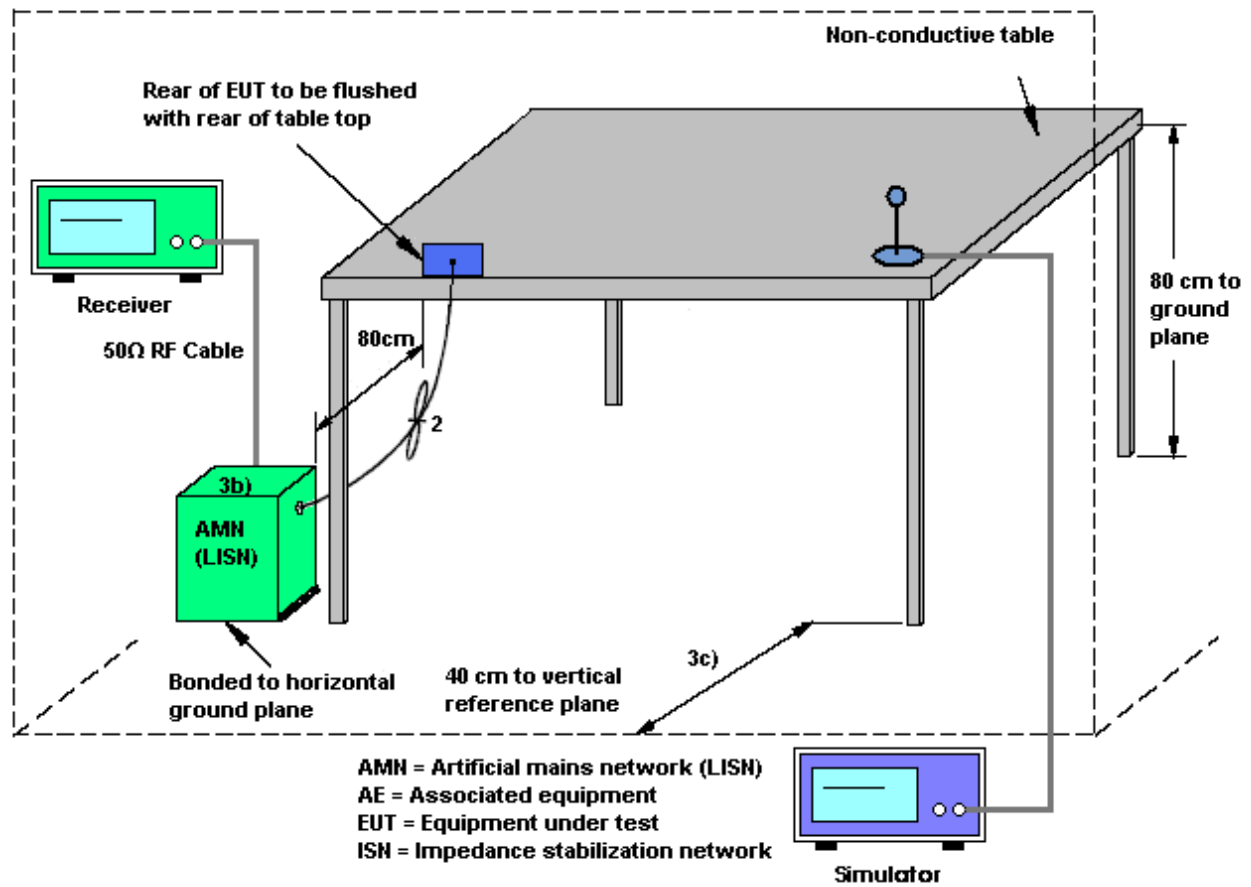
### 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

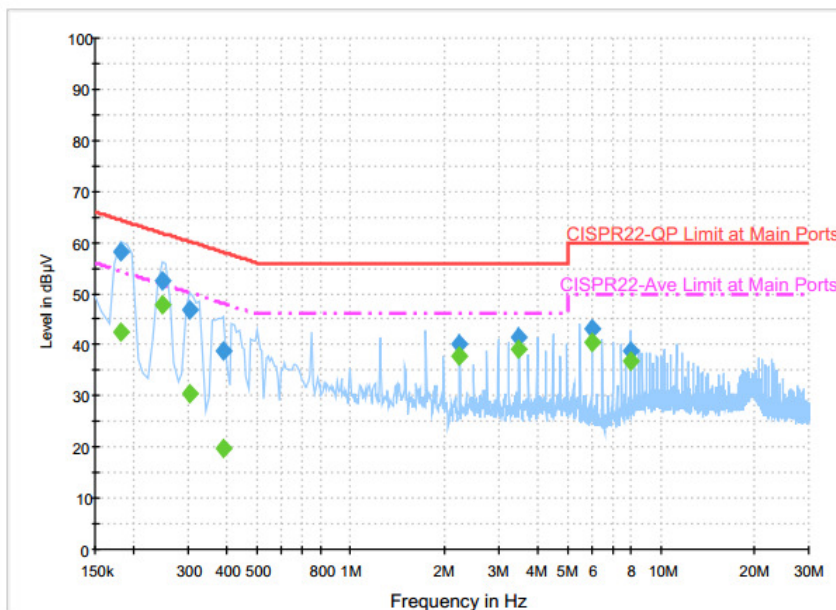
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.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

### 3.2.4 Test Setup



### 3.2.5 Test Result of AC Conducted Emission

<b>Test Mode :</b>	Mode 2	<b>Temperature :</b>	22~23°C
<b>Test Engineer :</b>	Arthur Hsieh	<b>Relative Humidity :</b>	51~52%
<b>Test Voltage :</b>	120Vac / 60Hz	<b>Phase :</b>	Line
<b>Function Type :</b>	WCDMA Band V Idle + Bluetooth Link + WLAN (5GHz) Link + MPEG4 + WPC Back Cover + PMA Charging Pad + Adapter		



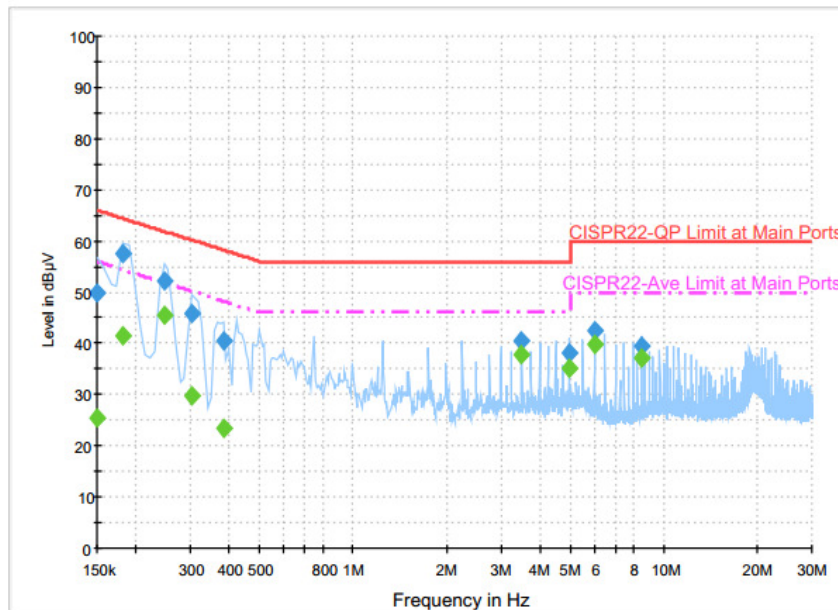
#### Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.182000	58.3	Off	L1	19.6	6.1	64.4
0.246000	52.6	Off	L1	19.6	9.3	61.9
0.302000	47.0	Off	L1	19.6	13.2	60.2
0.390000	38.8	Off	L1	19.6	19.3	58.1
2.246000	40.2	Off	L1	18.4	15.8	56.0
3.494000	41.6	Off	L1	19.7	14.4	56.0
5.990000	43.0	Off	L1	19.9	17.0	60.0
7.990000	38.9	Off	L1	20.0	21.1	60.0

#### Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.182000	42.5	Off	L1	19.6	11.9	54.4
0.246000	47.8	Off	L1	19.6	4.1	51.9
0.302000	30.5	Off	L1	19.6	19.7	50.2
0.390000	19.7	Off	L1	19.6	28.4	48.1
2.246000	37.6	Off	L1	18.4	8.4	46.0
3.494000	39.3	Off	L1	19.7	6.7	46.0
5.990000	40.4	Off	L1	19.9	9.6	50.0
7.990000	36.6	Off	L1	20.0	13.4	50.0

<b>Test Mode :</b>	Mode 2	<b>Temperature :</b>	22~23°C
<b>Test Engineer :</b>	Arthur Hsieh	<b>Relative Humidity :</b>	51~52%
<b>Test Voltage :</b>	120Vac / 60Hz	<b>Phase :</b>	Neutral
<b>Function Type :</b>	GSM1900 Idle + Bluetooth Link + WLAN (5GHz) Link + Camera + WPC Back Cover + WPC Charging Pad + USB Cable (Charging from Adapter)		


**Final Result : QuasiPeak**

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	49.9	Off	N	19.6	16.1	66.0
0.182000	57.6	Off	N	19.6	6.8	64.4
0.246000	52.2	Off	N	19.6	9.7	61.9
0.302000	45.9	Off	N	19.6	14.3	60.2
0.382000	40.4	Off	N	19.6	17.8	58.2
3.494000	40.4	Off	N	19.7	15.6	56.0
4.990000	38.2	Off	N	19.8	17.8	56.0
5.990000	42.3	Off	N	19.9	17.7	60.0
8.486000	39.5	Off	N	20.1	20.5	60.0

**Final Result : Average**

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	25.5	Off	N	19.6	30.5	56.0
0.182000	41.6	Off	N	19.6	12.8	54.4
0.246000	45.5	Off	N	19.6	6.4	51.9
0.302000	29.8	Off	N	19.6	20.4	50.2
0.382000	23.4	Off	N	19.6	24.8	48.2
3.494000	37.9	Off	N	19.7	8.1	46.0
4.990000	35.2	Off	N	19.8	10.8	46.0
5.990000	39.9	Off	N	19.9	10.1	50.0
8.486000	37.1	Off	N	20.1	12.9	50.0



## 4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Jul. 29, 2016 ~ Jul. 30, 2016	Sep. 01, 2016	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 20, 2015	Jul. 29, 2016 ~ Jul. 30, 2016	Nov. 19, 2016	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D	35414	30MHz~1GHz	Nov. 17, 2015	Jul. 29, 2016 ~ Jul. 30, 2016	Nov. 16, 2016	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Oct. 08, 2015	Jul. 29, 2016 ~ Jul. 30, 2016	Oct. 07, 2016	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 19, 2015	Jul. 29, 2016 ~ Jul. 30, 2016	Nov. 18, 2016	Radiation (03CH11-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1902247	1GHz~18GHz	Jul. 22, 2016	Jul. 29, 2016 ~ Jul. 30, 2016	Jun. 21, 2017	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHz	Sep. 24, 2015	Jul. 29, 2016 ~ Jul. 30, 2016	Sep. 23, 2016	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jul. 29, 2016 ~ Jul. 30, 2016	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Jul. 29, 2016 ~ Jul. 30, 2016	N/A	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 02, 2015	Jul. 29, 2016 ~ Jul. 30, 2016	Nov. 01, 2016	Radiation (03CH11-HY)
Preamplifier	MITEQ	TTA0204	1872107	2GHz~40GHz	Feb. 15, 2016	Jul. 29, 2016 ~ Jul. 30, 2016	Feb. 14, 2017	Radiation (03CH11-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 29, 2016	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 26, 2015	Jul. 29, 2016	Aug. 25, 2016	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2015	Jul. 29, 2016	Dec. 01, 2016	Conduction (CO05-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
---	------

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.37
---	------



## Appendix A. Radiated Spurious Emission

Test Engineer :	J.C. Liang, Jacky Su, and Ken Wu	Temperature :	20~23°C
		Relative Humidity :	50~54%

### Band 3 - 5470~5725MHz

#### WIFI 802.11a (Band Edge @ 3m)

#### <WPC Charging Mode>

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11a CH 100 5500MHz		5469.76	57.6	-16.4	74	48.31	31.96	10.81	33.48	297	86	P	H
		5470	48.01	-5.99	54	38.72	31.96	10.81	33.48	297	86	A	H
	*	5500	102.62	-	-	93.29	32	10.81	33.48	297	86	P	H
	*	5500	95.05	-	-	85.72	32	10.81	33.48	297	86	A	H
		5740.15	47.83	-26.17	74	38.43	32.34	10.63	33.57	297	86	P	H
		5759.75	39.5	-14.5	54	30.09	32.36	10.63	33.58	297	86	A	H
		5468.32	52.31	-21.69	74	43.02	31.96	10.81	33.48	121	153	P	V
		5469.28	44.19	-9.81	54	34.9	31.96	10.81	33.48	121	153	A	V
	*	5500	98.35	-	-	89.02	32	10.81	33.48	121	153	P	V
	*	5500	90.71	-	-	81.38	32	10.81	33.48	121	153	A	V
		5734.725	49.02	-24.98	74	39.6	32.34	10.65	33.57	121	153	P	V
		5763.6	39.35	-14.65	54	29.94	32.36	10.63	33.58	121	153	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												





**Band 3 - 5470~5725MHz**  
**WIFI 802.11a (Harmonic @ 3m)**

**<WPC Charging Mode>**

WIFI Ant. 1+2	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level (dBμV)	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. (P/A)	Pol. (H/V)
<b>802.11a CH 100 5500MHz</b>		11000	43.37	-30.63	74	38.83	40.3	15.27	51.03	100	0	P	H
		16500	44.52	-29.48	74	39.2	38.9	18.29	51.87	100	0	P	H
													H
													H
		11000	43.9	-30.1	74	39.36	40.3	15.27	51.03	100	0	P	V
		16500	43.16	-30.84	74	37.84	38.9	18.29	51.87	100	0	P	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

### Band 3 - 5470~5725MHz

## Emission below 1GHz

## WIFI 802.11a (LF @ 3m)

## <WPC Charging Mode>

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11a  LF		99.39	34.5	-9	43.5	49.01	16.1	1.17	31.78			P	H
		205.77	36.61	-6.89	43.5	50.54	16.11	1.74	31.78			P	H
		214.41	37.28	-6.22	43.5	51.12	16.2	1.74	31.78	179	265	P	H
		386.8	36.3	-9.7	46	43.44	22.07	2.58	31.79			P	H
		615	27.6	-18.4	46	30.63	25.85	3.16	32.04			P	H
		881	32.55	-13.45	46	31.15	29.08	3.84	31.52			P	H
													H
													H
													H
													H
													H
													H
													H
		42.69	36.2	-3.8	40	48.46	18.62	0.93	31.81	212	164	P	V
		179.85	31.23	-12.27	43.5	46.07	15.26	1.68	31.78			P	V
		269.76	30.83	-15.17	46	41.17	19.3	2.13	31.77			P	V
		391	31.56	-14.44	46	38.61	22.17	2.58	31.8			P	V
		686.4	27.93	-18.07	46	29.95	26.57	3.45	32.04			P	V
		867.7	32.12	-13.88	46	30.86	29.01	3.84	31.59			P	V
													V
												V	
												V	
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



**Note symbol**

*	<b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is <b>over limit</b> line.
P/A	<b>Peak</b> or <b>Average</b>
H/V	<b>Horizontal</b> or <b>Vertical</b>

**A calculation example for radiated spurious emission is shown as below:**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

**Both peak and average measured complies with the limit line, so test result is “PASS”.**



## Appendix B. Radiated Spurious Emission

<b>Test Engineer :</b>	J.C. Liang, Jacky Su, and Ken Wu	<b>Temperature :</b>	20~23°C
		<b>Relative Humidity :</b>	50~54%

### Note symbol

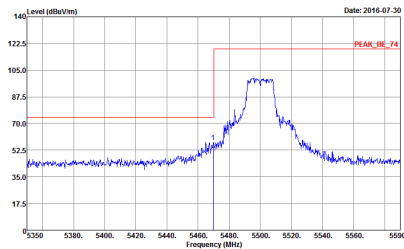
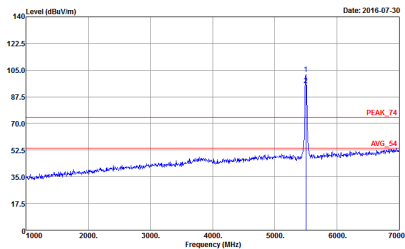
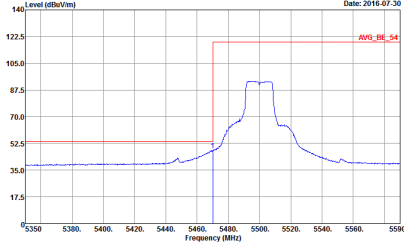
-L	Low channel location
-R	High channel location



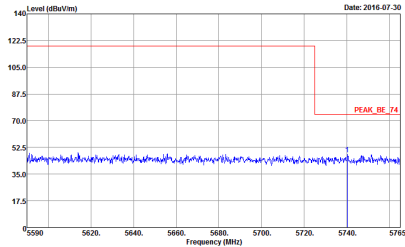
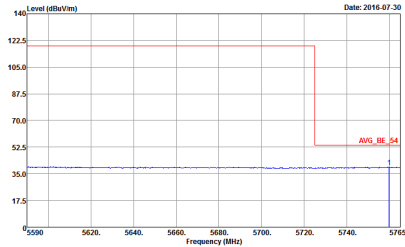
## Band 3 - 5470~5725MHz

## WIFI 802.11a (Band Edge @ 3m)

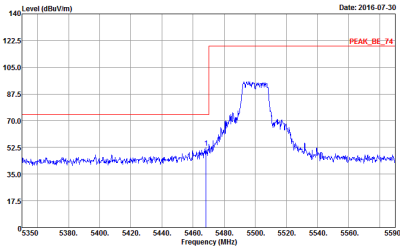
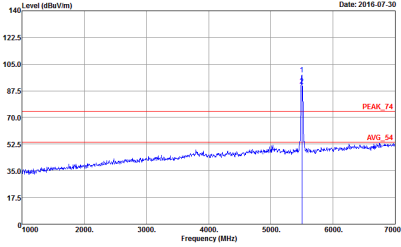
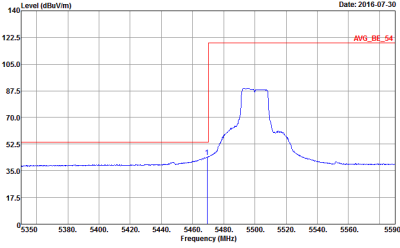
## &lt;WPC Charging Mode&gt;

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH100 5500MHz	
1+2	Horizontal	Fundamental
Peak	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p>
Avg.	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p>	



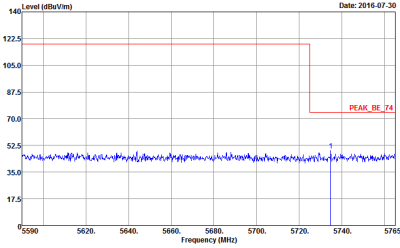
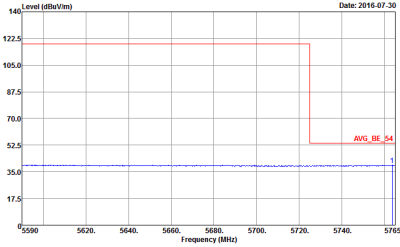
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH100 5500MHz	
1+2	Horizontal	
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>	
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>	



WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH100 5500MHz	
1+2	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>	





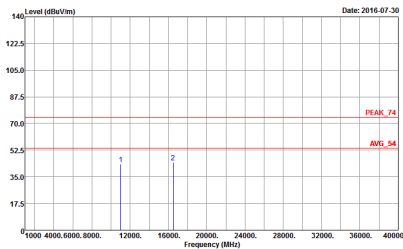
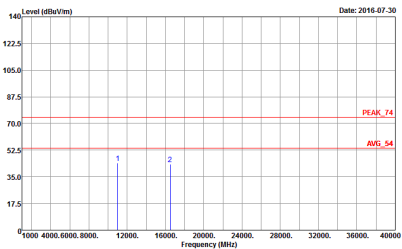
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH100 5500MHz	
1+2	Vertical	
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>	
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>	



Band 3 - 5470~5725MHz

WIFI 802.11a (Harmonic @ 3m)

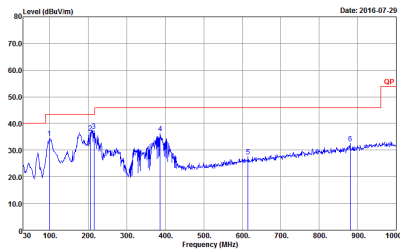
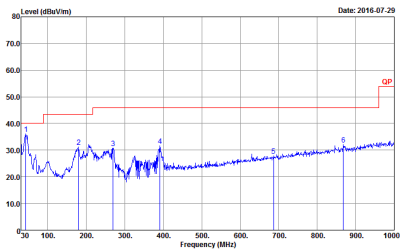
<WPC Charging Mode>

WIFI	Band 3 5470~5725MHz Harmonic @ 3m	
ANT	802.11a CH100 5500MHz	
1+2	Horizontal	Vertical
Peak Avg.	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m 9170 SHF HORM_150809 HORIZONTAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m 9170 SHF HORM_150809 VERTICAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>



Emission below 1GHz  
5GHz WIFI 802.11a (LF)

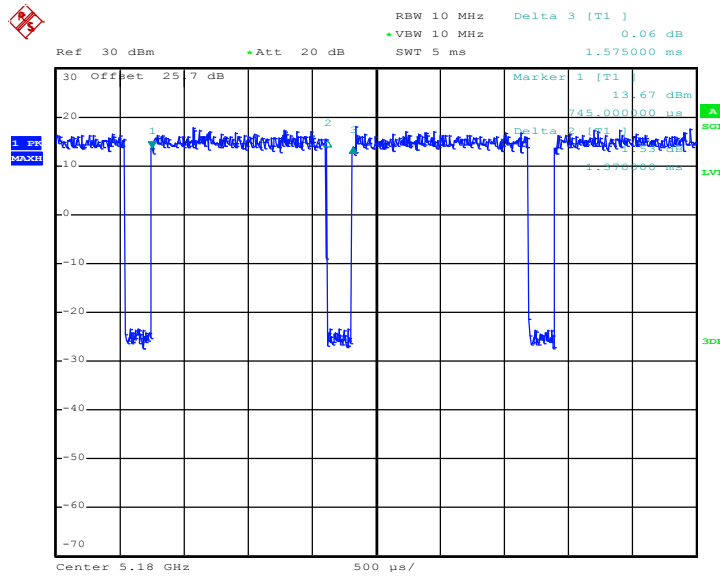
<WPC Charging Mode>

WIFI	5GHz WIFI	
ANT	802.11a LF	
1+2	Horizontal	Vertical
QP / Peak	<div><p>Site : 03CH11-HY Condition : QP 3m BE-LOG 6111D-LF_ETC HORIZONTAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>	<div><p>Site : 03CH11-HY Condition : QP 3m BE-LOG 6111D-LF_ETC VERTICAL Detector : Peak Project : 651612-16 Mode : 1 WPC cover + LG</p></div>

## Appendix C. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	802.11a	86.984	1370	0.730	1kHz

### 802.11a



Date: 22.MAY.2016 09:02:32



## **Appendix D. Original Report**

Please refer to Sporton report number FR651612-02D as below.



# FCC RF Test Report

**APPLICANT** : Motorola Mobility, LLC  
**EQUIPMENT** : Mobile Cellular Phone  
**BRAND NAME** : Motorola  
**MODEL NAME** : 7524  
**FCC ID** : IHDT56VC2  
**STANDARD** : FCC Part 15 Subpart E §15.407  
**CLASSIFICATION** : (NII) Unlicensed National Information Infrastructure

This is a variant report which is only valid together with the original test report. The product was received on May 16, 2016. 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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Reviewed by: Joseph Lin / Supervisor

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Approved by: Jones Tsai / Manager



## **SPORTON INTERNATIONAL INC.**

**No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.**



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<b>APPENDIX A. ORIGINAL REPORT</b>	



## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR651612-02D	Rev. 01	Initial issue of report	Jun. 30, 2016





# 1 General Description

## 1.1 Applicant

**Motorola Mobility, LLC**

222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

## 1.2 Manufacturer

**Motorola Mobility, LLC**

222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	7524
FCC ID	IHDT56VC2
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/NFC WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 Bluetooth v3.0 EDR Bluetooth v4.0 LE
HW Version	DVT2
EUT Stage	Identical Prototype

**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 Re-use of Measured Data**

### **1.4.1 Introduction Section**

This application re-uses data collected on a similar device. The subject device of this application (Model 7524, FCC ID IDHT56VC2) is electrically identical to the reference device (Model 5892, FCC ID IDHT56VC1) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 178919 D01.

### **1.4.2 Difference Section**

For details concerning the similarity with respect to component placement, mechanical/electrical design etc., please refer to the Operational Description.

The re-used RF data includes the following bands provided in Appendix A (Sporton RF Report No. FR651612D for the reference device Model 5892, FCC ID IDHT56VC1):

- 5GHz WLAN

### **1.4.3 Spot Check Verification Data Section**

In order to confirm hardware similarity of the subject device with the reference device, spot check measurements were performed on the subject device for radiated spurious emission, the test result were consistent with FCC ID IDHT56VC1.

Assertions concerning the similarity of these devices are based on representations by the applicant. The applicant accepts full responsibility for the validity of the similarity claim, and for the determination that verification test data are sufficient to support it.

### **1.4.4 Reference detail Section:**

Equipment Class	Reference FCC ID	Folder Test/RF Exposure	Report Title/Section
NII	IDHT56VC1	Part15E (FR651612D)	All sections applicable

## **1.5 Modification of EUT**

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



## **Appendix A. Original Report**

Please refer to Sporton report number FR651612D.