

FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : LTE Ufi
BRAND NAME : ZTE
MODEL NAME : MF97A
FCC ID : SRQ-ZTEMF97A
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Jan. 26, 2014 and testing was completed on Apr. 02, 2014. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.



TABLE OF CONTENTS

REVISION HISTORY..... 3

SUMMARY OF TEST RESULT 4

1 GENERAL DESCRIPTION 5

1.1 Applicant 5

1.2 Manufacturer..... 5

1.3 Feature of Equipment Under Test 5

1.4 Product Specification of Equipment Under Test..... 5

1.5 Modification of EUT 6

1.6 Testing Site..... 6

1.7 Applied Standards 6

2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST 7

2.1 Carrier Frequency and Channel 7

2.2 Pre-Scanned RF Power..... 8

2.3 Test Mode..... 9

2.4 Connection Diagram of Test System..... 11

2.5 Support Unit used in test configuration and system..... 12

2.6 EUT Operation Test Setup 12

2.7 Measurement Results Explanation Example..... 13

3 TEST RESULT..... 14

3.1 26dB Bandwidth Measurement 14

3.2 Maximum Conducted Output Power Measurement 17

3.3 Power Spectral Density Measurement 19

3.4 Peak Excursion Ratio Measurement 23

3.5 Unwanted Emissions Measurement..... 25

3.6 AC Conducted Emission Measurement..... 48

3.7 Frequency Stability Measurement..... 52

3.8 Automatically Discontinue Transmission 54

3.9 Antenna Requirements 55

4 LIST OF MEASURING EQUIPMENT 56

5 UNCERTAINTY OF EVALUATION 57

APPENDIX A. SETUP PHOTOGRAPHS

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	26dB Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	$\leq 17\text{dBm}$	Pass	-
3.3	15.407(a)	Power Spectral Density	$\leq 4\text{ dBm}$	Pass	-
3.4	15.407(a)(6)	Peak Excursion Ratio	$\leq 13\text{dB}$	Pass	-
3.5	15.407(b)	Unwanted Emissions	$\leq -17, -27\text{ dBm}$ (depend on band)&15.209(a)	Pass	Under limit 5.14 dB at 5149.950 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 12.68 dB at 0.330 MHz
3.7	15.407(g)	Frequency Stability	Within Operation Band	Pass	-
3.8	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.9	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	LTE Ufi
Brand Name	ZTE
Model Name	MF97A
FCC ID	SRQ-ZTEMF97A
EUT supports Radios application	CDMA/EV-DO/LTE/WLAN 802.11a/b/g/n HT20/HT40 Bluetooth v3.0 + EDR/Bluetooth v4.0
HW Version	MF97AV1.0.0B01
SW Version	xs9B
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 Product Specification of Equipment Under Test

Product Specification subjective to this standard			
Tx/Rx Channel Frequency Range	5180 MHz ~ 5240 MHz		
Maximum Output Power	802.11a : 9.20 dBm / 0.0083 W 802.11n HT20 : 11.46 dBm / 0.0140 W 802.11n HT40 : 11.44 dBm / 0.0139 W		
Antenna Type	Chain Port 0 : Dipole Antenna with gain 3.50 dBi Chain Port 1 : PCB Antenna with gain 3.50 dBi		
Type of Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)		
Antenna Function Description		Chain Port 0	Chain Port 1
	802.11 a	V	V
	802.11 n SISO	V	V
	802.11 n MIMO	V	V



1.5 Modification of EUT

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

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC Registration No.
	TH01-KS	03CH01-KS	CO01-KS	149928

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 E
- FCC KDB 789033 D01 General UNII Test Procedures v01r03
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.4-2003

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).

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)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240

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

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 in the following tables.

5GHz 802.11a Peak Power (dBm)								
Data Rate (MHz)	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Chain Port 0	9.20	9.16	9.18	9.08	9.14	8.95	9.18	9.10
Chain Port 1	8.47	8.38	8.27	8.44	8.41	8.25	8.39	8.36

5GHz 802.11n HT20 Peak Power (dBm)								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Chain Port 0	7.82	7.67	7.77	7.25	7.70	7.77	7.66	7.56
Chain Port 1	8.52	8.19	8.22	8.20	8.37	8.35	8.37	8.44
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Chain Port 0+1(0)	8.51	8.22	8.29	7.91	8.21	8.39	8.48	8.36
Chain Port 0+1(1)	8.38	8.20	8.24	8.28	8.15	8.01	8.14	8.33
Chain Port 0+1	11.46	11.22	11.27	11.11	11.19	11.22	11.33	11.36

5GHz 802.11n HT40 Peak Power (dBm)								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Chain Port 0	8.00	7.79	7.93	7.78	7.96	7.90	7.95	7.99
Chain Port 1	8.36	7.84	8.06	7.84	8.06	8.15	8.11	8.24
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Chain Port 0+1(0)	8.36	7.99	8.23	8.02	8.29	8.35	8.07	8.14
Chain Port 0+1(1)	8.50	8.09	8.32	8.24	8.36	8.26	8.37	8.19
Chain Port 0+1	11.44	11.05	11.29	11.14	11.33	11.31	11.24	11.18

Note:

- Chain Port 0+1 is a calculated result from sum of the power Chain Port 0+1(0) and Chain Port 0+1(1).
- The data rates of WLAN 802.11a/n were set in 6Mbps for 802.11a (Chain Port 0), MCS0 for 802.11n HT20 (Chain Port 1), MCS8 for 802.11n HT20 (Chain Port 0+1), MCS0 for 802.11n HT40 (Chain Port 1), MCS8 for 802.11n HT40 (Chain Port 0+1) due to the highest RF output power.



2.3 Test Mode

Final results of test modes, data rates and test channels are shown as following table.

Test Cases					
	Test Items	Mode	Data rate	Test Channel	Remark
Conducted TCs	26dB BW Power Spectral Density	802.11a	6 Mbps	L/M/H	Chain Port 0
		802.11n HT20	MCS0	L/M/H	Chain Port 1
		802.11n HT20	MCS8	L/M/H	Chain Port 0+1 (0)
		802.11n HT20	MCS8	L/M/H	Chain Port 0+1 (1)
		802.11n HT40	MCS0	L/M/H	Chain Port 1
		802.11n HT40	MCS8	L/M/H	Chain Port 0+1 (0)
		802.11n HT40	MCS8	L/M/H	Chain Port 0+1 (1)
	Output Power	802.11a	6 Mbps	L/M/H	Chain Port 0
		802.11a	6 Mbps	L/M/H	Chain Port 1
		802.11n HT20	MCS0	L/M/H	Chain Port 0
		802.11n HT20	MCS0	L/M/H	Chain Port 1
		802.11n HT20	MCS8	L/M/H	Chain Port 0+1 (0)
		802.11n HT20	MCS8	L/M/H	Chain Port 0+1 (1)
		802.11n HT40	MCS0	L/M/H	Chain Port 0
		802.11n HT40	MCS0	L/M/H	Chain Port 1
		802.11n HT40	MCS8	L/M/H	Chain Port 0+1 (0)
		802.11n HT40	MCS8	L/M/H	Chain Port 0+1 (1)
	Peak Excursion	802.11a	6 Mbps	L/M/H	Chain Port 0
		802.11n HT20	MCS0	L/M/H	Chain Port 1
		802.11n HT40	MCS0	L/M/H	Chain Port 1
	Frequency Stability	802.11a	6 Mbps	L/M/H	Chain Port 0

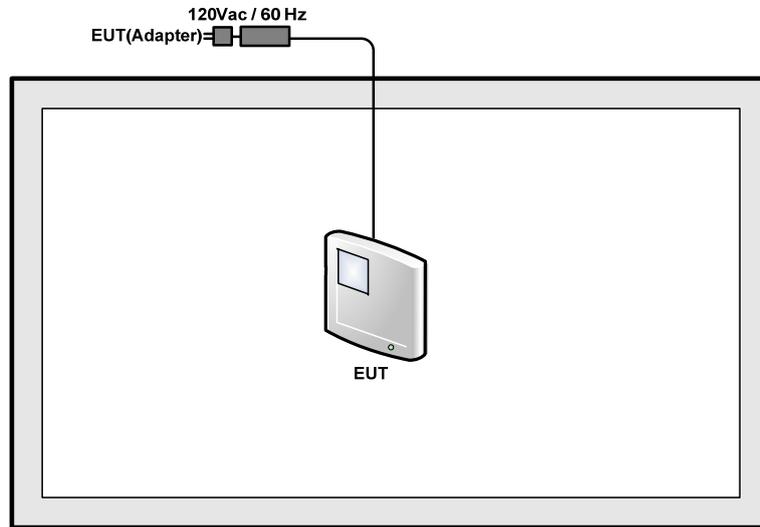


Test Cases					
Radiated TCs	Radiated Band Edge	802.11a	6 Mbps	L/H	Chain Port 0
		802.11n HT20	MCS0	L/H	Chain Port 1
		802.11n HT20	MCS8	L/H	Chain Port 0+1
		802.11n HT40	MCS0	L/H	Chain Port 1
		802.11n HT40	MCS8	L/H	Chain Port 0+1
	Radiated Spurious Emission	802.11a	6 Mbps	L/M/H	Chain Port 0
		802.11n HT20	MCS0	L/M/H	Chain Port 1
		802.11n HT20	MCS8	L/M/H	Chain Port 0+1
		802.11n HT40	MCS0	L/M/H	Chain Port 1
		802.11n HT40	MCS8	L/M/H	Chain Port 0+1
AC Conducted Emission	Mode 1 : CDMA2000 BC0 Idle + Bluetooth Link + WLAN 5GHz Link + Adapter				

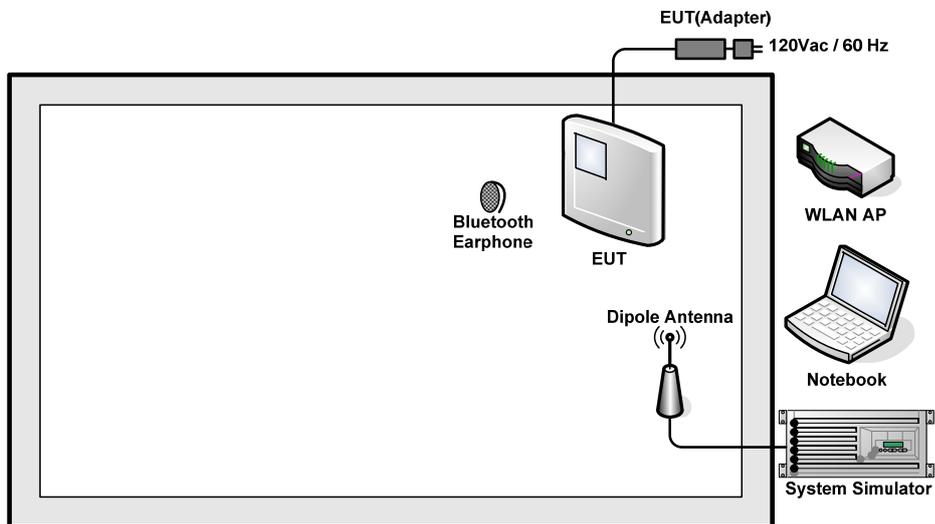
Ch. #		Band I : 5150-5250 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	36	36	38
M	Middle	44	44	-
H	High	48	48	46

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.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
4.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.



2.7 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 7.3 dB and 10dB attenuator.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 7.3 + 10 = 17.3 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 26dB Bandwidth Measurement

3.1.1 Description of 26dB Bandwidth

There is no restriction limits for bandwidth. The maximum conducted output power can be limited by measured emission bandwidth (B).

For the band 5150-5250 MHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B.

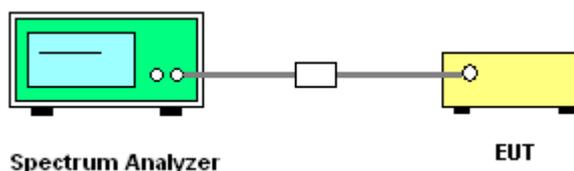
3.1.2 Measuring Instruments

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 D01 General UNII Test Procedures v01r03.
Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.
Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. Measure and record the results in the test report.

3.1.4 Test Setup

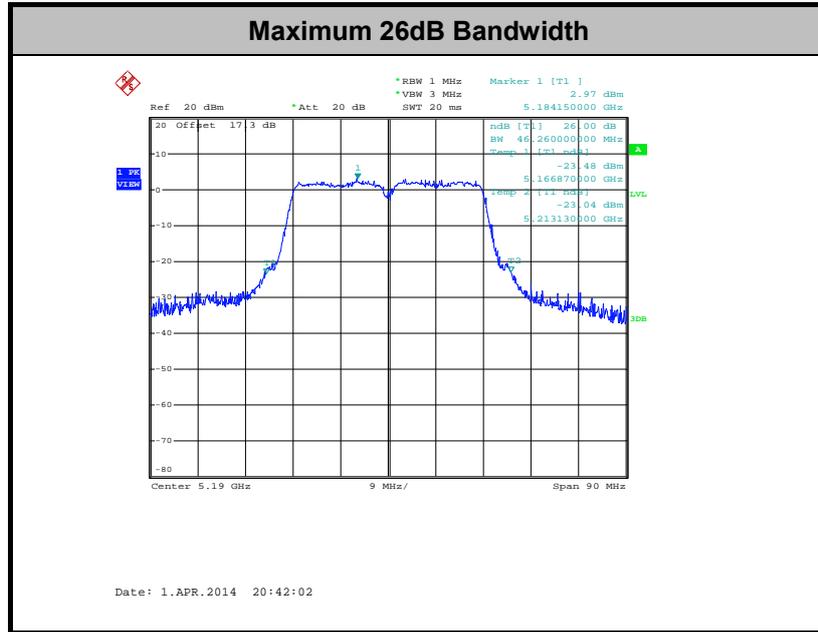




3.1.5 Test Result of 26dB Bandwidth

Test Band :	5GHz band 1	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	26dB Bandwidth (MHz)		FCC 26dB Bandwidth Power Limit (dBm)	
					Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1
11a	6Mbps	1	36	5180	19.80	-	16.97	-
11a	6Mbps	1	44	5220	19.70	-	16.94	-
11a	6Mbps	1	48	5240	20.00	-	16.99	-
HT20	MCS0	1	36	5180	-	20.45	-	16.99
HT20	MCS0	1	44	5220	-	20.40	-	16.99
HT20	MCS0	1	48	5240	-	20.50	-	16.99
HT40	MCS0	1	38	5190	-	44.55	-	16.99
HT40	MCS0	1	46	5230	-	44.10	-	16.99
HT20	MCS8	2	36	5180	19.85	20.05	22.98	
HT20	MCS8	2	44	5220	20.35	20.05	23.01	
HT20	MCS8	2	48	5240	20.65	20.05	23.01	
HT40	MCS8	2	38	5190	46.26	43.92	23.01	
HT40	MCS8	2	46	5230	42.48	44.01	23.01	



3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5150-5250 MHz, the maximum conducted output power shall not exceed the lesser of 50 mW (17dBm) or $4 \text{ dBm} + 10 \log B$, where B is the 26 dB emissions bandwidth in 1-MHz. If transmitting antenna directional gain is greater than 6 dBi, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Measuring Instruments

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

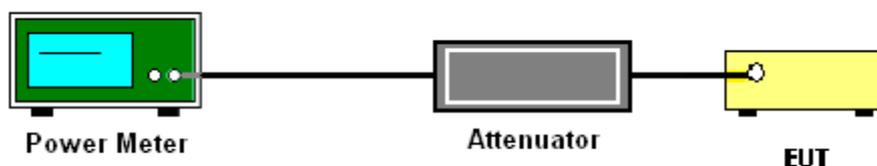
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, $10 \log(1/x)$, where x is the duty cycle.

3.2.4 Test Setup





3.2.5 Test Result of Maximum Conducted Output Power

Test Band :	5GHz band 1	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Power Limit (dBm)		DG (dBi)		Pass /Fail
					Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	Sum Power	Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	
11a	6Mbps	1	36	5180	0.20	0.19	8.99	7.97		16.97	-	3.50	3.50	Pass
11a	6Mbps	1	44	5220	0.20	0.19	9.01	8.24		16.94	-	3.50	3.50	Pass
11a	6Mbps	1	48	5240	0.20	0.19	9.20	8.47		16.99	-	3.50	3.50	Pass
HT20	MCS0	1	36	5180	0.22	0.22	7.52	8.14		-	16.99	3.50	3.50	Pass
HT20	MCS0	1	44	5220	0.22	0.22	7.62	8.30		-	16.99	3.50	3.50	Pass
HT20	MCS0	1	48	5240	0.22	0.22	7.82	8.52		-	16.99	3.50	3.50	Pass
HT40	MCS0	1	38	5190	0.40	0.44	7.75	7.98		-	16.99	3.50	3.50	Pass
HT40	MCS0	1	46	5230	0.40	0.44	8.00	8.36		-	16.99	3.50	3.50	Pass
HT20	MCS8	2	36	5180	0.41	0.41	6.89	7.75	10.35	22.98		3.50		Pass
HT20	MCS8	2	44	5220	0.41	0.41	8.18	8.28	11.24	23.01		3.50		Pass
HT20	MCS8	2	48	5240	0.41	0.41	8.51	8.38	11.46	23.01		3.50		Pass
HT40	MCS8	2	38	5190	0.77	0.79	8.09	8.01	11.06	23.01		3.50		Pass
HT40	MCS8	2	46	5230	0.77	0.79	8.36	8.50	11.44	23.01		3.50		Pass

Note:

- Final Output Power equals to Measured Output Power adds the duty factor.
- Sum Power is a calculated result from sum of the Chain Port 0 and Chain Port 1.
- For the band 5150-5250 MHz, the maximum average conducted output power shall not exceed lesser of 50 mW (17dBm) or 4 dBm + 10log (B), where B is 26dB BW for FCC.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5150-5250 MHz, peak power spectral density shall not exceed 4 dBm in any 1-MHz.

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Section F) Peak power spectral density (PPSD).

Note: Though the rule refers to “peak power spectral density”, the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission.

Method SA-2

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

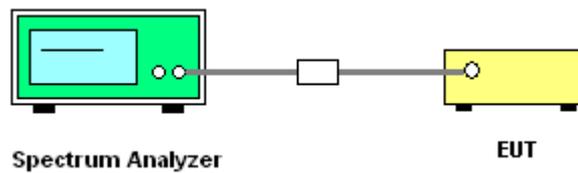
1. The testing follows Method SA-2 of FCC KDB 789033 D01 General UNII Test Procedures v01r03.
 - Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW \geq 3 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

4. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (1): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

3.3.4 Test Setup



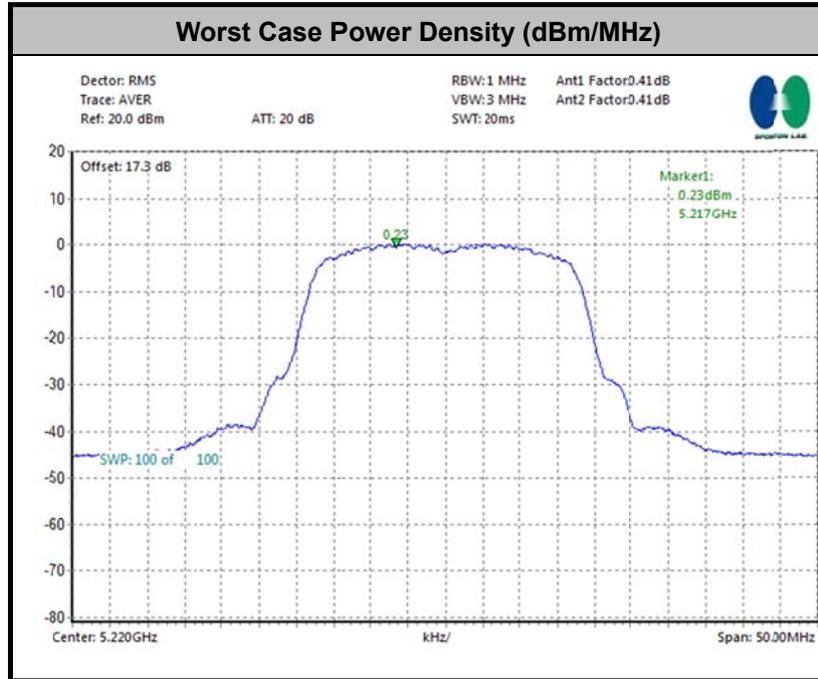


3.3.5 Test Result of Power Spectral Density

Test Band :	5GHz band 1	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Duty Factor (dB)		Average Power Density (dBm/MHz)			Average PSD Limit (dBm)		DG (dBi)		Pass /Fail
					Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	Sum Power	Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	
11a	6Mbps	1	36	5180	0.20	-	-1.68	-	-	4.00	4.00	3.50	3.50	Pass
11a	6Mbps	1	44	5220	0.20	-	-1.48	-	-	4.00	4.00	3.50	3.50	Pass
11a	6Mbps	1	48	5240	0.20	-	-1.53	-	-	4.00	4.00	3.50	3.50	Pass
HT20	MCS0	1	36	5180	-	0.22	-	-2.20	-	4.00	4.00	3.50	3.50	Pass
HT20	MCS0	1	44	5220	-	0.22	-	-1.09	-	4.00	4.00	3.50	3.50	Pass
HT20	MCS0	1	48	5240	-	0.22	-	-1.06	-	4.00	4.00	3.50	3.50	Pass
HT40	MCS0	1	38	5190	-	0.44	-	-5.68	-	4.00	4.00	3.50	3.50	Pass
HT40	MCS0	1	46	5230	-	0.44	-	-5.01	-	4.00	4.00	3.50	3.50	Pass
HT20	MCS8	2	36	5180	0.41	0.41	-	-	-1.15	3.49	3.49	6.51	6.51	Pass
HT20	MCS8	2	44	5220	0.41	0.41	-	-	0.23	3.49	3.49	6.51	6.51	Pass
HT20	MCS8	2	48	5240	0.41	0.41	-	-	-2.54	3.49	3.49	6.51	6.51	Pass
HT40	MCS8	2	38	5190	0.77	0.79	-	-	-4.30	3.49	3.49	6.51	6.51	Pass
HT40	MCS8	2	46	5230	0.77	0.79	-	-	-4.15	3.49	3.49	6.51	6.51	Pass

Note: Sum PSD is a bin-by-bin combined result of Chain Port 0 and Chain Port 1.



3.4 Peak Excursion Ratio Measurement

3.4.1 Limit of Peak Excursion Ratio

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

3.4.2 Measuring Instruments

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

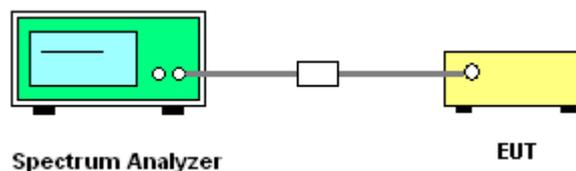
3.4.3 Test Procedures

The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Section G) Peak excursion measurement

1. The transmitter output is connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emission bandwidth.
3. Find the maximum of the peak-max-hold spectrum.
 - *Set RBW = 1MHz.
 - *Set VBW \geq 3MHz.
 - *Detector = peak.
 - *Trace mode = max-hold.
 - *Allow the sweeps to continue until the trace stabilizes.
 - *Use the peak search function to find the peak of the spectrum.
4. Use the procedure found under section 3.3 to measure the PPSD.
5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

3.4.4 Test Setup

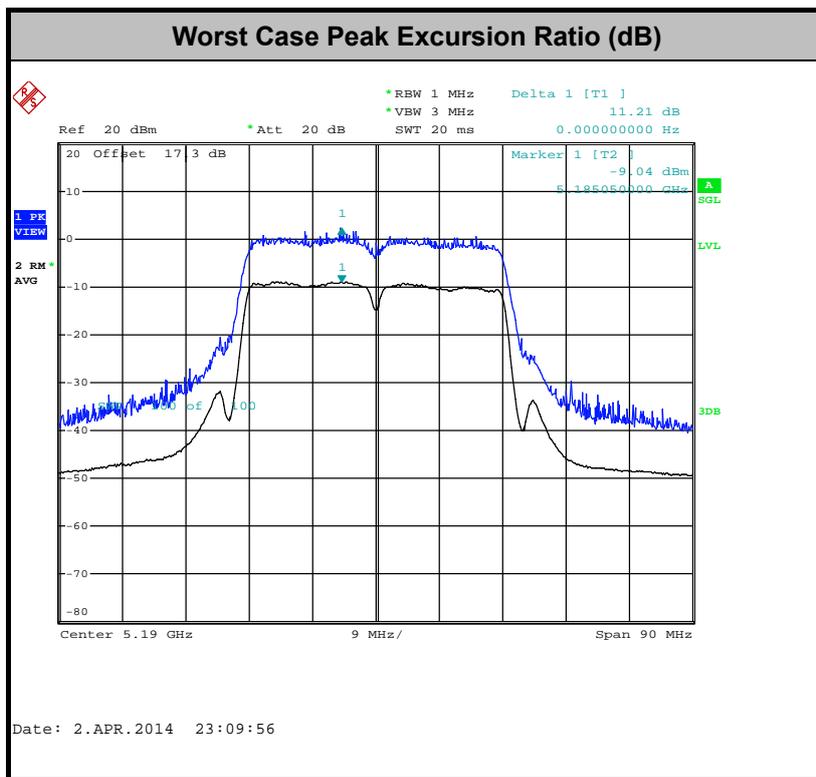


3.4.5 Test Result of Peak Excursion Ratio

Test Band :	5GHz band 1	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	N _{TX}	Channel	Freq. (MHz)	Peak Excursion Ratio (dB)					Max. Limits (dB)	Pass/Fail
				BPSK	QPSK	16QAM	64QAM	256QAM		
11a	1	36	5180	8.81	9.36	8.86	9.56	-	13	Pass
HT20	1	36	5180	9.46	9.52	9.75	9.41	-	13	Pass
HT40	1	38	5190	8.74	10.42	9.62	9.83	-	13	Pass

Note: All modulation measured based on the minimum data rate setting.



Note: Peak Excursion Ratio (dB) = Peak – (Average + Duty Cycle Offset)
 Duty Cycle Offset: 0.79 dB

3.5 Unwanted Emissions 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.

3.5.1 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.
- (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.

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

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

- (3) KDB789033 v01r03 H)2)c)(i) 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.

3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

1. The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Section H) 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

- The setting follows the H) 5) of FCC KDB 789033.
- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

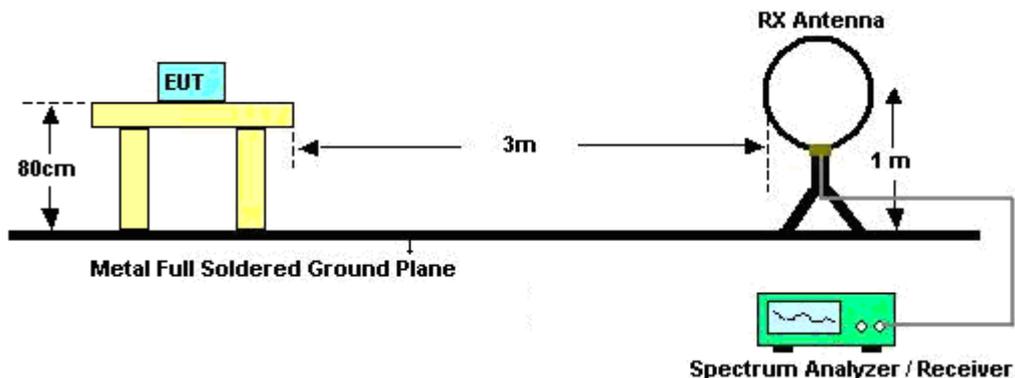
- The setting follows H) 6) of FCC KDB 789033.
- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Antenna	Band	Duty Cycle (%)	T(ms)	1/T(kHz)	VBW Setting
0	802.11a	95.39	2.070	0.483	1kHz
1	802.11n HT20	95.14	1.918	0.521	1kHz
1	802.11n HT40	90.46	0.948	1.055	3kHz
0+1	802.11n HT20	90.99	0.990	1.010	3kHz
0+1	802.11n HT40	83.72	0.504	1.984	3kHz

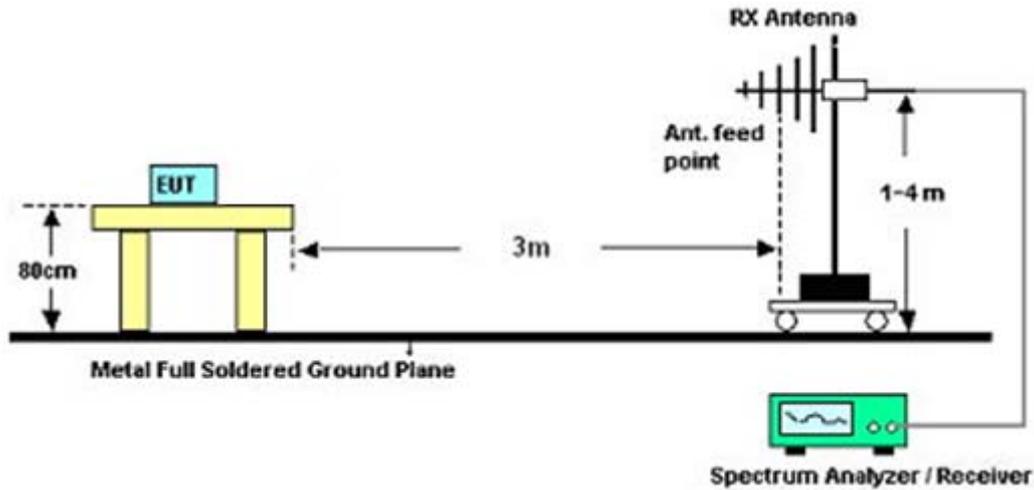
2. The EUT was placed on a rotatable table top 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters 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.

3.5.4 Test Setup

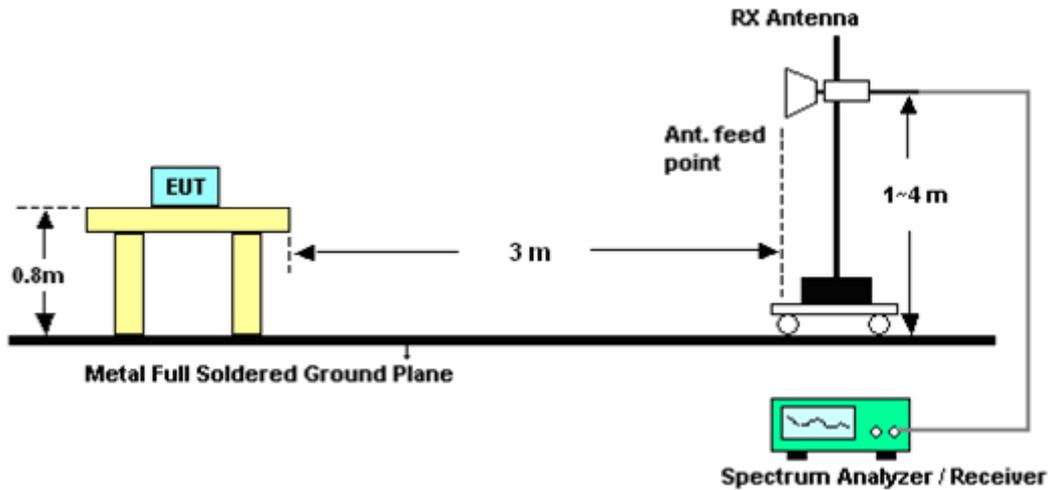
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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



3.5.6 Test Result of Radiated Band Edges

Test Mode :	802.11a – Chain Port 0	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5145.2	64.52	-9.48	74	57.66	35.25	5.38	33.77	157	186	Peak
5142.6	45.19	-8.81	54	38.33	35.25	5.38	33.77	157	186	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
5142.5	55.11	-18.89	74	48.25	35.25	5.38	33.77	128	115	Peak
5131.3	38.77	-15.23	54	31.93	35.24	5.38	33.78	128	115	Average

Test Mode :	802.11a – Chain Port 0	Temperature :	23~24°C
Test Channel :	48	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5372.1	52.82	-21.18	74	45.76	35.33	5.45	33.72	100	172	Peak
5352.25	40.59	-13.41	54	33.55	35.32	5.45	33.73	100	172	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
5387.1	52.35	-21.65	74	45.28	35.34	5.45	33.72	100	162	Peak
5353.65	39.13	-14.87	54	32.09	35.32	5.45	33.73	100	162	Average



Test Mode :	802.11n HT20 – Chain Port 1	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5149.15	56.42	-17.58	74	49.56	35.25	5.38	33.77	100	95	Peak
5149.95	40.76	-13.24	54	33.9	35.25	5.38	33.77	100	92	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
5149.65	56.6	-17.4	74	49.74	35.25	5.38	33.77	189	213	Peak
5149.45	41.72	-12.28	54	34.86	35.25	5.38	33.77	189	213	Average

Test Mode :	802.11n HT20 – Chain Port 1	Temperature :	23~24°C
Test Channel :	48	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5356.8	52.41	-21.59	74	45.37	35.32	5.45	33.73	100	345	Peak
5352.15	39.17	-14.83	54	32.13	35.32	5.45	33.73	100	345	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
5363.25	52.8	-21.2	74	45.74	35.33	5.45	33.72	152	200	Peak
5351.05	39.56	-14.44	54	32.52	35.32	5.45	33.73	152	200	Average



Test Mode :	802.11n HT40 – Chain Port 1	Temperature :	23~24°C
Test Channel :	38	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5148.4	61.05	-12.95	74	54.19	35.25	5.38	33.77	100	270	Peak
5149.85	40.98	-13.02	54	34.12	35.25	5.38	33.77	100	270	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
5149.3	63.95	-10.05	74	57.09	35.25	5.38	33.77	160	208	Peak
5146.45	41.65	-12.35	54	34.79	35.25	5.38	33.77	100	208	Average

Test Mode :	802.11n HT40 – Chain Port 1	Temperature :	23~24°C
Test Channel :	46	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5369.8	52.62	-21.38	74	45.56	35.33	5.45	33.72	100	254	Peak
5351.65	39.91	-14.09	54	32.87	35.32	5.45	33.73	100	254	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
5351.5	52.65	-21.35	74	45.61	35.32	5.45	33.73	100	275	Peak
5351.9	40.1	-13.9	54	33.06	35.32	5.45	33.73	100	275	Average



Test Mode :	802.11n HT20 – Chain Port 0+1	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5149.9	60.19	-13.81	74	53.33	35.25	5.38	33.77	100	175	Peak
5148.05	44.71	-9.29	54	37.85	35.25	5.38	33.77	100	175	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
5149.6	57.22	-16.78	74	50.36	35.25	5.38	33.77	200	310	Peak
5148.7	42.52	-11.48	54	35.66	35.25	5.38	33.77	200	310	Average

Test Mode :	802.11n HT20 – Chain Port 0+1	Temperature :	23~24°C
Test Channel :	48	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5351.95	53.34	-20.66	74	46.3	35.32	5.45	33.73	100	301	Peak
5353.45	40.97	-13.03	54	33.93	35.32	5.45	33.73	100	301	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
5376.35	53.11	-20.89	74	46.05	35.33	5.45	33.72	102	112	Peak
5358.5	40.09	-13.91	54	33.05	35.32	5.45	33.73	100	112	Average



Test Mode :	802.11n HT40 – Chain Port 0+1	Temperature :	23~24°C
Test Channel :	38	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5148.15	68.09	-5.91	74	61.23	35.25	5.38	33.77	100	166	Peak
5149.95	48.86	-5.14	54	42	35.25	5.38	33.77	100	166	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
5146.55	62.91	-11.09	74	56.05	35.25	5.38	33.77	100	205	Peak
5149.85	47.19	-6.81	54	40.33	35.25	5.38	33.77	100	205	Average

Test Mode :	802.11n HT40 – Chain Port 0+1	Temperature :	23~24°C
Test Channel :	46	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5353.6	53.47	-20.53	74	46.43	35.32	5.45	33.73	100	162	Peak
5350.4	40.99	-13.01	54	33.95	35.32	5.45	33.73	100	162	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
5352.75	53.86	-20.14	74	46.82	35.32	5.45	33.73	134	125	Peak
5352.8	40.28	-13.72	54	33.24	35.32	5.45	33.73	134	125	Average

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

Note: Below 1GHz for radiated emission measurement, pre-scanned all test modes and only choose the worst case mode was recorded in the report.

Test Mode :	802.11a - Chain Port 0	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10359 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5180	110.11	-	-	103.23	35.26	5.39	33.77	100	173	Peak
5180	97.91	-	-	91.03	35.26	5.39	33.77	100	173	Average
10359	32.39	-35.91	68.3	57.7	1.46	7.72	34.49	100	162	Peak

Test Mode :	802.11a - Chain Port 0	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10360 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5180	99.9	-	-	93.02	35.26	5.39	33.77	101	152	Peak
5180	88.16	-	-	81.28	35.26	5.39	33.77	101	152	Average
10360	33.01	-35.29	68.3	58.32	1.46	7.72	34.49	133	215	Peak



Test Mode :	802.11a - Chain Port 0	Temperature :	23~24°C
Test Channel :	44	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5220	108.44	-	-	101.53	35.27	5.4	33.76	125	172	Peak
5220	97.12	-	-	90.21	35.27	5.4	33.76	125	172	Average
10440	31.38	-36.92	68.3	56.53	1.53	7.76	34.44	120	113	Peak

Test Mode :	802.11a - Chain Port 0	Temperature :	23~24°C
Test Channel :	44	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5220	100.95	-	-	94.04	35.27	5.4	33.76	144	227	Peak
5220	88.83	-	-	81.92	35.27	5.4	33.76	144	227	Average
10440	31.55	-36.75	68.3	56.7	1.53	7.76	34.44	101	106	Peak



Test Mode :	802.11a - Chain Port 0	Temperature :	23~24°C
Test Channel :	48	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10479 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5240	108.17	-	-	101.23	35.28	5.41	33.75	100	203	Peak
5240	97.05	-	-	90.11	35.28	5.41	33.75	100	203	Average
10479	31.02	-37.28	68.3	56.08	1.56	7.79	34.41	100	162	Peak

Test Mode :	802.11a - Chain Port 0	Temperature :	23~24°C
Test Channel :	48	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10479 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5240	100.15	-	-	93.21	35.28	5.41	33.75	174	226	Peak
5240	87.93	-	-	80.99	35.28	5.41	33.75	174	226	Average
10479	31.76	-36.54	68.3	56.82	1.56	7.79	34.41	100	231	Peak



Test Mode :	802.11n HT20 - Chain Port 1	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10359 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5180	101.9	-	-	95.02	35.26	5.39	33.77	100	91	Peak
5180	90.33	-	-	83.45	35.26	5.39	33.77	100	91	Average
10359	33.36	-34.94	68.3	58.67	1.46	7.72	34.49	145	200	Peak

Test Mode :	802.11n HT20 - Chain Port 1	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10359 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5180	102.89	-	-	96.01	35.26	5.39	33.77	172	219	Peak
5180	92.89	-	-	86.01	35.26	5.39	33.77	172	219	Average
10359	33.44	-34.86	68.3	58.75	1.46	7.72	34.49	120	115	Peak



Test Mode :	802.11n HT20 - Chain Port 1	Temperature :	23~24°C
Test Channel :	44	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5220	102.53	-	-	95.62	35.27	5.4	33.76	100	94	Peak
5220	91.06	-	-	84.15	35.27	5.4	33.76	100	94	Average
10440	31.63	-36.67	68.3	56.78	1.53	7.76	34.44	100	122	Peak

Test Mode :	802.11n HT20 - Chain Port 1	Temperature :	23~24°C
Test Channel :	44	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5220	103.35	-	-	96.44	35.27	5.4	33.76	100	216	Peak
5220	92.12	-	-	85.21	35.27	5.4	33.76	100	216	Average
10440	30.81	-37.49	68.3	55.96	1.53	7.76	34.44	100	102	Peak



Test Mode :	802.11n HT20 - Chain Port 1	Temperature :	23~24°C
Test Channel :	48	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10480 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5240	101.38	-	-	94.44	35.28	5.41	33.75	100	353	Peak
5240	89.86	-	-	82.92	35.28	5.41	33.75	100	353	Average
10480	31.76	-36.54	68.3	56.82	1.56	7.79	34.41	120	155	Peak

Test Mode :	802.11n HT20 - Chain Port 1	Temperature :	23~24°C
Test Channel :	48	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10359 MHz is not within restricted bands, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5240	102.9	-	-	95.96	35.28	5.41	33.75	108	260	Peak
5240	90.96	-	-	84.02	35.28	5.41	33.75	108	260	Average
10359	33.44	-34.86	68.3	58.75	1.46	7.72	34.49	120	115	Peak



Test Mode :	802.11n HT40 - Chain Port 1	Temperature :	23~24°C
Test Channel :	38	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5190 MHz is fundamental signal which can be ignored. 2. 10380 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5190	98.29	-	-	91.41	35.26	5.39	33.77	100	251	Peak
5190	86.44	-	-	79.56	35.26	5.39	33.77	100	251	Average
10380	31.97	-36.33	68.3	57.24	1.48	7.73	34.48	145	122	Peak

Test Mode :	802.11n HT40 - Chain Port 1	Temperature :	23~24°C
Test Channel :	38	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5190 MHz is fundamental signal which can be ignored. 2. 10380 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5190	99.69	-	-	92.81	35.26	5.39	33.77	145	211	Peak
5190	89.53	-	-	82.65	35.26	5.39	33.77	145	211	Average
10380	32.44	-35.86	68.3	57.71	1.48	7.73	34.48	141	122	Peak



Test Mode :	802.11n HT40 - Chain Port 1	Temperature :	23~24°C
Test Channel :	46	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5230 MHz is fundamental signal which can be ignored. 2. 10461 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5230	96.63	-	-	89.69	35.28	5.41	33.75	100	254	Peak
5230	85.94	-	-	79	35.28	5.41	33.75	100	254	Average
10461	31.23	-37.07	68.3	56.32	1.55	7.78	34.42	120	100	Peak

Test Mode :	802.11n HT40 - Chain Port 1	Temperature :	23~24°C
Test Channel :	46	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5230 MHz is fundamental signal which can be ignored. 2. 10461 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5230	98.64	-	-	91.7	35.28	5.41	33.75	100	219	Peak
5230	87.07	-	-	80.13	35.28	5.41	33.75	100	219	Average
10461	31.15	-37.15	68.3	56.24	1.55	7.78	34.42	100	133	Peak



Test Mode :	802.11n HT20 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10360 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5180	108.84	-	-	101.96	35.26	5.39	33.77	100	182	Peak
5180	97.01	-	-	90.13	35.26	5.39	33.77	100	182	Average
10360	33.1	-35.2	68.3	58.41	1.46	7.72	34.49	145	112	Peak

Test Mode :	802.11n HT20 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10360 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5180	104.05	-	-	97.17	35.26	5.39	33.77	142	213	Peak
5180	93.52	-	-	86.64	35.26	5.39	33.77	142	213	Average
10360	33.6	-34.7	68.3	58.91	1.46	7.72	34.49	100	52	Peak



Test Mode :	802.11n HT20 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	44	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5220	108.61	-	-	101.7	35.27	5.4	33.76	100	197	Peak
5220	96.47	-	-	89.56	35.27	5.4	33.76	100	197	Average
10440	32.15	-36.15	68.3	57.3	1.53	7.76	34.44	120	162	Peak

Test Mode :	802.11n HT20 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	44	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5220	104.1	-	-	97.19	35.27	5.4	33.76	155	213	Peak
5220	93.12	-	-	86.21	35.27	5.4	33.76	155	213	Average
10440	31.53	-36.77	68.3	56.68	1.53	7.76	34.44	120	223	Peak



Test Mode :	802.11n HT20 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	48	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10479 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5240	107.86	-	-	100.92	35.28	5.41	33.75	100	287	Peak
5240	96.2	-	-	89.26	35.28	5.41	33.75	100	287	Average
10479	31.68	-36.62	68.3	56.74	1.56	7.79	34.41	145	221	Peak

Test Mode :	802.11n HT20 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	48	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10479 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5240	102.98	-	-	96.04	35.28	5.41	33.75	100	258	Peak
5240	90.95	-	-	84.01	35.28	5.41	33.75	100	258	Average
10479	30.86	-37.44	68.3	55.92	1.56	7.79	34.41	104	112	Peak



Test Mode :	802.11n HT40 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	38	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5190 MHz is fundamental signal which can be ignored. 2. 10380 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	25.56	-14.44	40	40.65	18	0.48	33.57	100	119	Peak
71.71	22.52	-17.48	40	49.86	5.46	0.79	33.59	-	-	Peak
190.05	20.12	-23.38	43.5	43.93	8.5	1.25	33.56	-	-	Peak
222.06	20.18	-25.82	46	42.07	10.25	1.37	33.51	-	-	Peak
306.45	21.16	-24.84	46	39.77	13.15	1.61	33.37	-	-	Peak
363.68	19.51	-26.49	46	36.31	14.83	1.72	33.35	-	-	Peak
5190	104.43	-	-	97.55	35.26	5.39	33.77	100	184	Peak
5190	92.91	-	-	86.03	35.26	5.39	33.77	100	184	Average
10380	33.91	-34.39	68.3	59.18	1.48	7.73	34.48	100	132	Peak



Test Mode :	802.11n HT40 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	38	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5190 MHz is fundamental signal which can be ignored. 2. 10380 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
42.61	27.42	-12.58	40	49.95	10.48	0.62	33.63	100	111	Peak
128.94	17.46	-26.04	43.5	38.3	11.71	1.04	33.59	-	-	Peak
238.55	17.3	-28.7	46	37.87	11.46	1.43	33.46	-	-	Peak
363.68	19.5	-26.5	46	36.3	14.83	1.72	33.35	-	-	Peak
531.49	18.41	-27.59	46	31.29	18.08	2.09	33.05	-	-	Peak
632.37	19.58	-26.42	46	31.42	18.81	2.3	32.95	-	-	Peak
5190	100.52	-	-	93.64	35.26	5.39	33.77	100	213	Peak
5190	88.36	-	-	81.48	35.26	5.39	33.77	100	213	Average
10380	33.11	-35.19	68.3	58.38	1.48	7.73	34.48	152	221	Peak



Test Mode :	802.11n HT40 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	46	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5230 MHz is fundamental signal which can be ignored. 2. 10461 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5230	105.18	-	-	98.24	35.28	5.41	33.75	100	187	Peak
5230	92.95	-	-	86.01	35.28	5.41	33.75	100	187	Average
10461	32.55	-35.75	68.3	57.64	1.55	7.78	34.42	100	162	Peak

Test Mode :	802.11n HT40 - Chain Port 0+1	Temperature :	23~24°C
Test Channel :	46	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5230 MHz is fundamental signal which can be ignored. 2. 10461 MHz is not within a restricted band, and satisfies 68.3 dB μ V /m peak emission limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5230	99.67	-	-	92.73	35.28	5.41	33.75	100	222	Peak
5230	88.62	-	-	81.68	35.28	5.41	33.75	100	222	Average
10461	30.95	-37.35	68.3	56.04	1.55	7.78	34.42	100	102	Peak

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (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.

3.6.2 Measuring Instruments

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

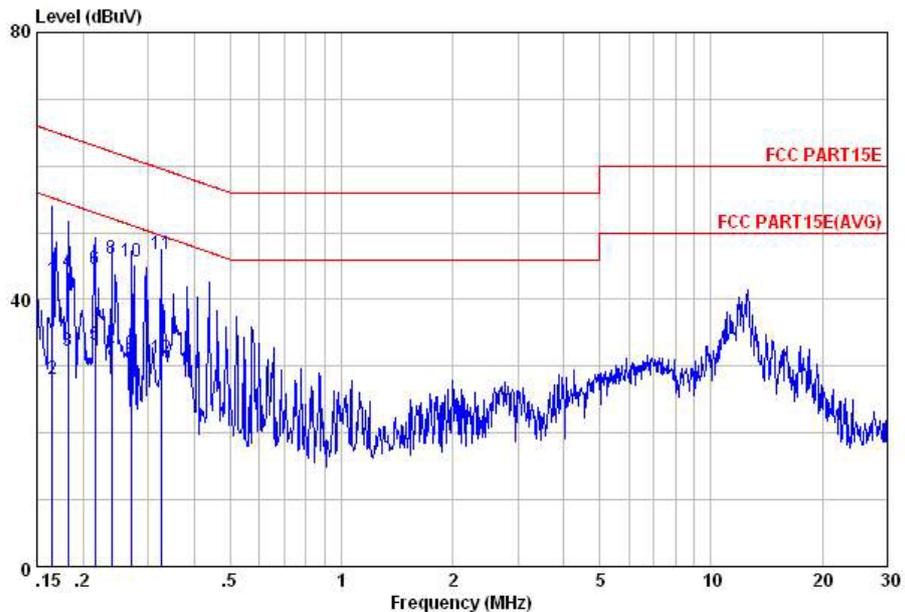
3.6.3 Test Procedures

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.



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	19~21°C
Test Engineer :	Eligah Wang	Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	CDMA2000 BC0 Idle + Bluetooth Link + WLAN 5GHz Link + Adapter		

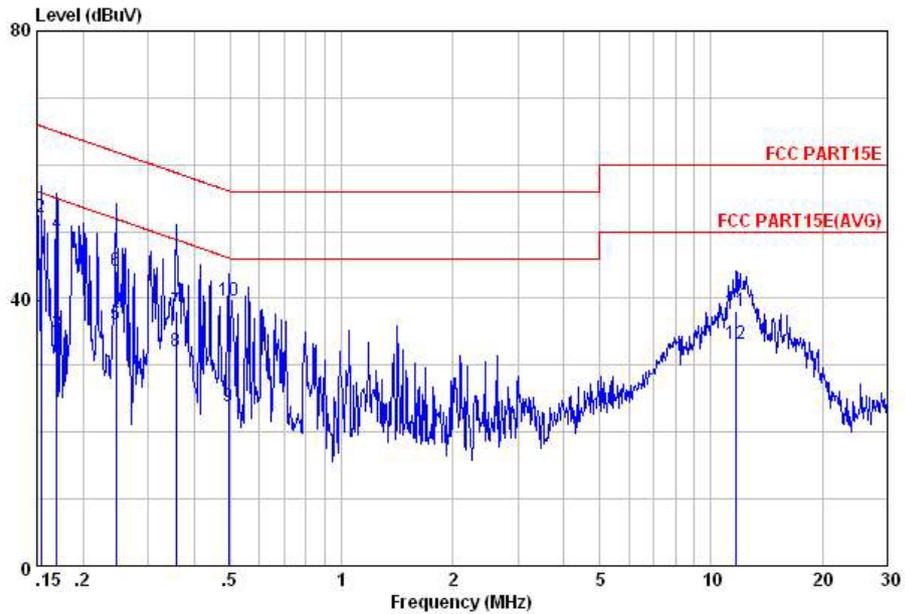


Site : C001-KS
 Condition: FCC PART15E LISN-L20130306 LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
		dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17	43.04	-22.17	65.21	30.70	1.68	10.66	QP
2	0.17	28.04	-27.17	55.21	15.70	1.68	10.66	Average
3	0.18	32.36	-22.01	54.37	20.50	1.25	10.61	Average
4	0.18	44.06	-20.31	64.37	32.20	1.25	10.61	QP
5	0.22	33.23	-19.78	53.01	21.70	0.97	10.56	Average
6	0.22	44.63	-18.38	63.01	33.10	0.97	10.56	QP
7	0.24	31.03	-21.10	52.13	19.60	0.91	10.52	Average
8	0.24	46.23	-15.90	62.13	34.80	0.91	10.52	QP
9	0.27	31.88	-19.24	51.12	20.61	0.81	10.46	Average
10	0.27	45.58	-15.54	61.12	34.31	0.81	10.46	QP
11	0.33	46.89	-12.68	59.57	36.00	0.54	10.35	QP
12	0.33	31.09	-18.48	49.57	20.20	0.54	10.35	Average



Test Mode :	Mode 1	Temperature :	19~21°C
Test Engineer :	Eligah Wang	Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	CDMA2000 BC0 Idle + Bluetooth Link + WLAN 5GHz Link + Adapter		



Site : C001-KS
 Condition: FCC PART15E LISN-M20130306 NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	37.14	-18.64	55.78	24.60	1.84	10.70	Average
2	0.15	52.24	-13.54	65.78	39.70	1.84	10.70	QP
3	0.17	34.79	-20.20	54.99	22.60	1.55	10.64	Average
4	0.17	49.79	-15.20	64.99	37.60	1.55	10.64	QP
5	0.25	36.01	-15.90	51.91	24.60	0.90	10.51	Average
6	0.25	44.01	-17.90	61.91	32.60	0.90	10.51	QP
7	0.36	38.20	-20.58	58.78	27.40	0.49	10.31	QP
8	0.36	32.10	-16.68	48.78	21.30	0.49	10.31	Average
9	0.49	23.77	-22.33	46.10	13.21	0.30	10.26	Average
10	0.49	39.67	-16.43	56.10	29.11	0.30	10.26	QP
11	11.68	38.19	-21.81	60.00	27.61	0.23	10.35	QP
12	11.68	33.19	-16.81	50.00	22.61	0.23	10.35	Average

3.7 Frequency Stability Measurement

3.7.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

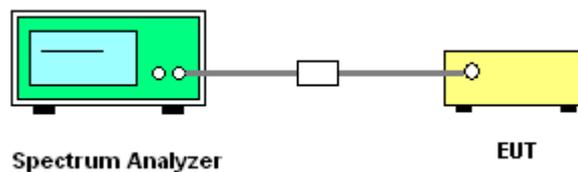
3.7.2 Measuring Instruments

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

3.7.3 Test Procedures

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.7.4 Test Setup





3.7.5 Test Result of Frequency Stability

Test Band :	5GHz band 1	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Frequency (MHz)	Center Frequency (Hz)	Frequency Deviation (Hz)	Frequency Stability (ppm)
11a	6Mbps	1	36	5180	5179975000.00	-25000.00	-4.83
11a	6Mbps	1	48	5240	5240000000.00	0.00	0.00

Note: Center Frequency = (Low Frequency + High Frequency) / 2.

3.8 Automatically Discontinue Transmission

3.8.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.8.2 Measuring Instruments

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

3.8.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

3.9 Antenna Requirements

3.9.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.9.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.9.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = $G_{ANT} + \text{Array Gain}$, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT}/N_{SS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

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)
Band I	3.50	3.50	3.50	6.51	0.00	0.51

Power limit reduction = Composite gain – 6dBi, (min = 0)

PSD limit reduction = Composite gain + PSD Array gain – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 28, 2013	Apr. 01, 2014~ Apr. 02, 2014	Dec. 27, 2014	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	30MHz~40GHz	Feb. 27, 2014	Apr. 01, 2014~ Apr. 02, 2014	Feb. 26, 2015	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Feb. 27, 2014	Apr. 01, 2014~ Apr. 02, 2014	Feb. 26, 2015	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 05, 2013	Apr. 01, 2014	Nov. 04, 2014	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 23, 2013	Apr. 01, 2014	May 22, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Jan. 08, 2014	Apr. 01, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 08, 2014	Apr. 01, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Nov. 22, 2013	Apr. 01, 2014	Nov. 21, 2014	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 18, 2013	Apr. 01, 2014	Nov. 17, 2014	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	May 23, 2013	Apr. 01, 2014	May 22, 2014	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02371	1GHz~26.5GHz	Dec. 10, 2013	Apr. 01, 2014	Dec. 09, 2014	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Apr. 01, 2014	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Apr. 01, 2014	NCR	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	May 23, 2013	Mar. 13, 2014	May 22, 2014	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Dec. 10, 2013	Mar. 13, 2014	Dec. 09, 2014	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Dec. 10, 2013	Mar. 13, 2014	Dec. 09, 2014	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	May 25, 2013	Mar. 13, 2014	May 24, 2014	Conduction (CO01-KS)



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% ($U = 2Uc(y)$)	2.54
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