FCC RF Test Report

APPLICANT	:	Acer Incorporated
EQUIPMENT	:	Smart HandHeld
BRAND NAME	:	Acer
MODEL NAME	:	T06
MARKETING NAME	:	Liquid Zest
FCC ID	:	HLZDMZ525
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Mar. 05, 2016 and testing was completed on May 06. 2016. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

James Huang

Prepared by: James Huang / Manager

Jones Tsai

Approved by: Jones Tsai / Manager

Testing Laboratory
2627

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

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR630501C	Rev. 01	Initial issue of report	May 16, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-247 5.2(1)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	RSS-Gen 6.6	99% Bandwidth	-	Pass	-
3.2	15.247(b)	RSS-247 A5.4(4)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	RSS-247 5.2(2)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	RSS-247 5.5	Conducted Band Edges	≤ 20dBc	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	RSS-247 5.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.00 dB at 2484.360 MHz
3.6	15.207	RSS-GEN 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 8.54 dB at 0.480 MHz
3.7	15.203 & 15.247(b)	N/A	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Acer Incorporated
8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan (R.O.C)

1.2 Manufacturer

Huaqin Telecom Technology Co., Ltd.
No.1 Building, 399 Keyuan Road, Zhangjiang Hi-Tech Park, Pudong New Area, Shanghai, China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smart HandHeld
Brand Name	Acer
Model Name	T06
Marketing Name	Liquid Zest
FCC ID	HLZDMZ525
EUT supports Radios application	GSM/GPRS/EGPRS/ WCDMA/HSPA/HSPA+(16QAM uplink is not supported)/ WLAN2.4GHz 802.11b/g/n HT20/HT40/ Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
IMEI Code	Conducted: 357966070000204/357966070000501 Conduction: 357966070000188/357966070000485 Radiation: 357966070000105/357966070000402
EUT Stage	Identical Prototype

Remark:

1. 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

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to Antenna	802.11b : 18.28 dBm (0.0673 W) 802.11g : 21.06 dBm (0.1276 W) 802.11n HT20 : 21.02 dBm (0.1265 W) 802.11n HT40 : 19.38 dBm (0.0867 W)
99% Occupied Bandwidth	802.11b : 12.59MHz 802.11g : 17.78MHz 802.11n HT20 : 18.48MHz 802.11n HT40 : 36.66MHz
Antenna Type / Gain	IFA Antenna with gain 1.97 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

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

1.6 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH01-KS	03CH03-KS	CO01-KS	306251/4086E

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 C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05
- ANSI C63.10-2013
- IC RSS-247 Issue 1
- IC RSS-Gen Issue 4

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). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X/Z plane) were recorded in this report.

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

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

2.1 Carrier Frequency Channel

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

2.2 Pre-Scanned RF Power

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

2.4GHz 802.11b RF Output Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate 1Mbps	Channel	2Mbps	5.5Mbps	11Mbps
CH 01	2412	17.27	CH 11	18.19	17.22	18.12
CH 06	2437	17.73				
CH 11	2462	18.28				

2.4GHz 802.11g RF Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate 6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 01	2412	20.48	CH 11	20.98	20.78	20.63	20.57	20.86	20.94	20.88
CH 06	2437	20.71								
CH 11	2462	21.06								

2.4GHz 802.11n HT20 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	20.63	CH 11	20.67	20.63	20.78	20.72	20.96	20.82	20.91
CH 06	2437	20.81								
CH 11	2462	21.02								

2.4GHz 802.11n HT40 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	19.38	CH 03	17.98	17.78	17.65	17.78	17.82	17.97	17.69
CH 06	2437	19.17								
CH 09	2452	19.32								

2.3 Test Mode

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

<2.4GHz>

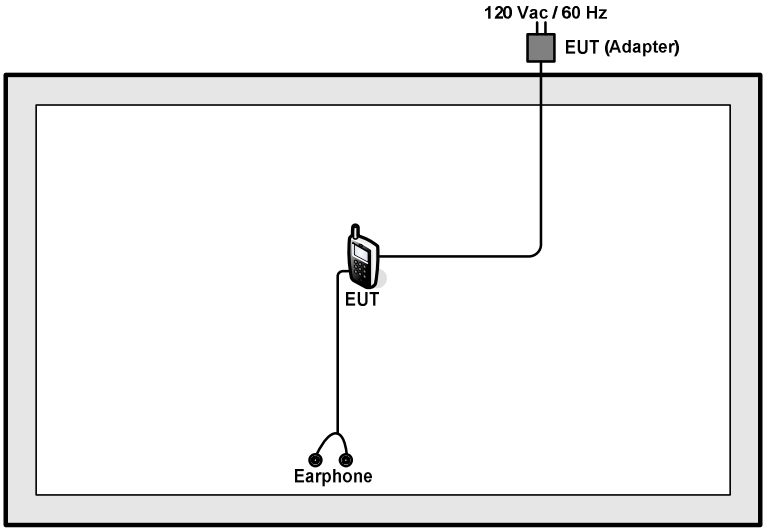
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

Test Cases	
AC Conducted Emission	**Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable 1 (Charging from Adapter 1) + Earphone + SIM 1** Mode 2 : GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable 2 (Charging from Adapter 2) + Earphone + SIM 1
Remark: 1. For radiated TCs, the tests were performance with adapter, USB cable and earphone. 2. For conducted emission test cases, only the test worse data in bold of these modes was reported.	

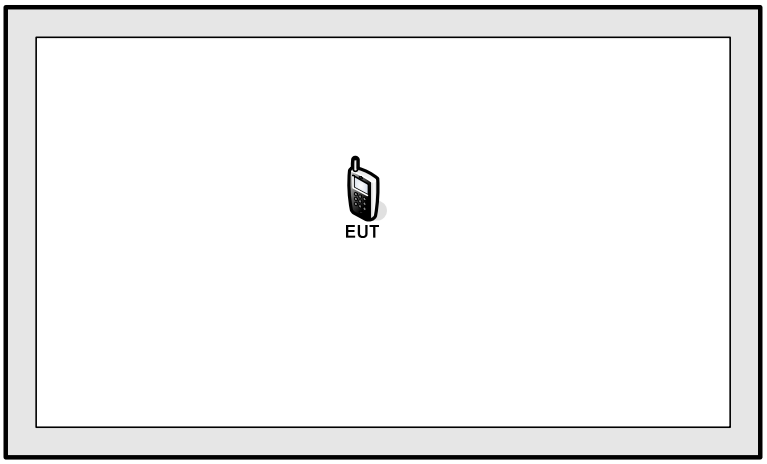
2.4 Connection Diagram of Test System

<WLAN Tx Mode>

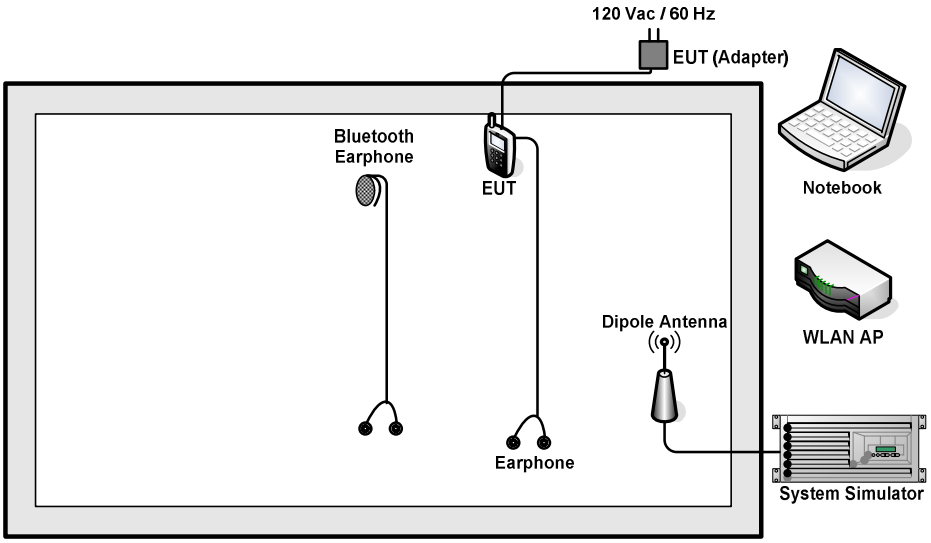
For 802.11n b/g



For 802.11n HT20/HT40



<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	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	LINKSYS	WRT600N	Q87-WRT600NV11	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	G480	PRC4	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN function, the 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 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 RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 5.5 dB.

Offset(dB) = RF cable loss(dB).

= 5.5 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

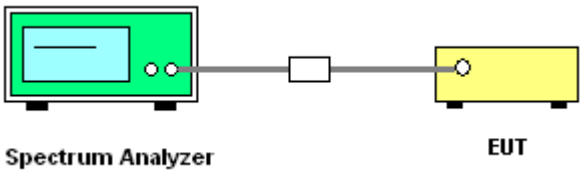
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

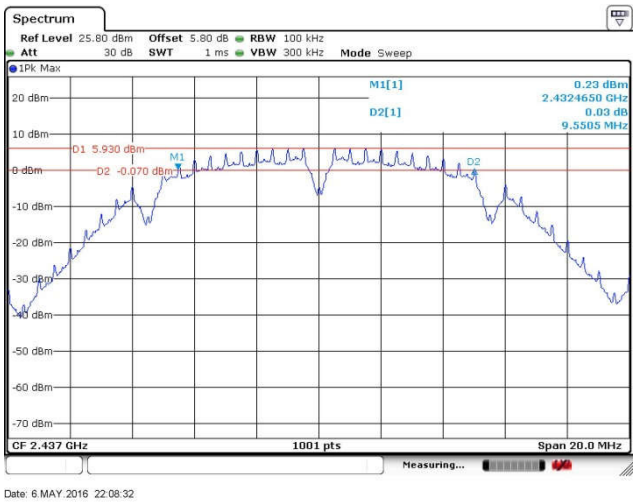
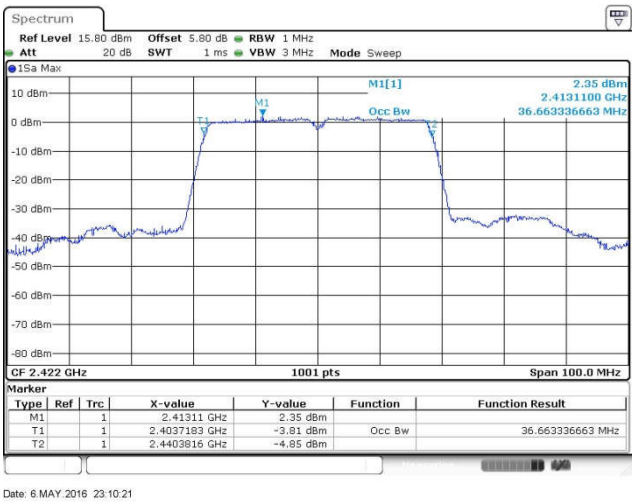
1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A of this test report.

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	

Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting Antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the Antenna exceeds 6dBi.

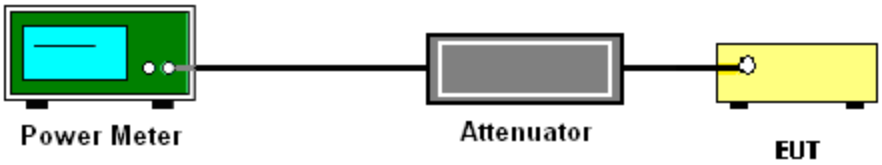
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r05 section 9.1.2 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A of this test report.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A of this test report.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

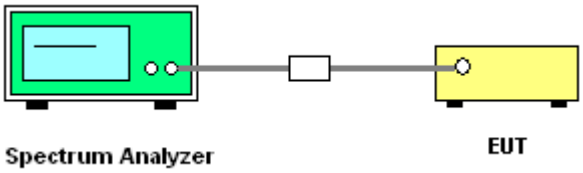
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

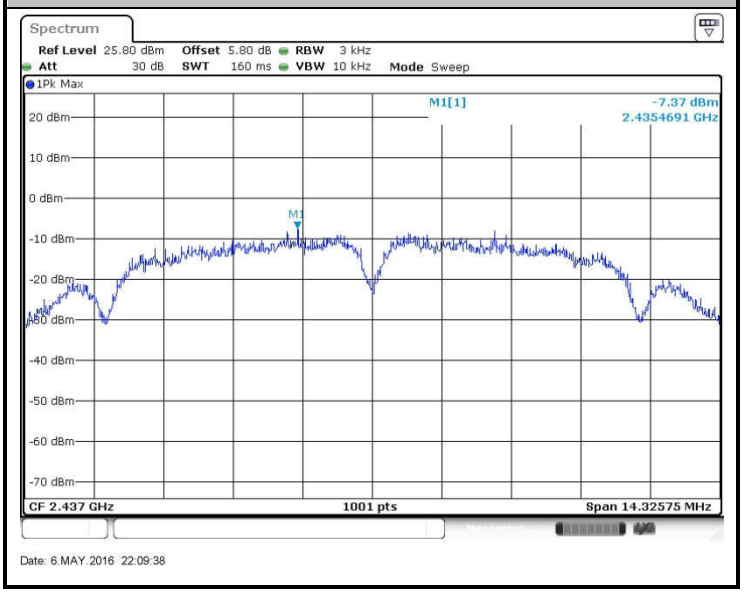
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A of this test report.

Worst Case Power Density (dBm/3kHz)



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

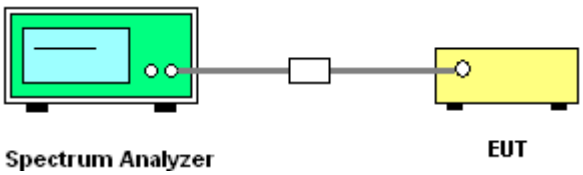
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup

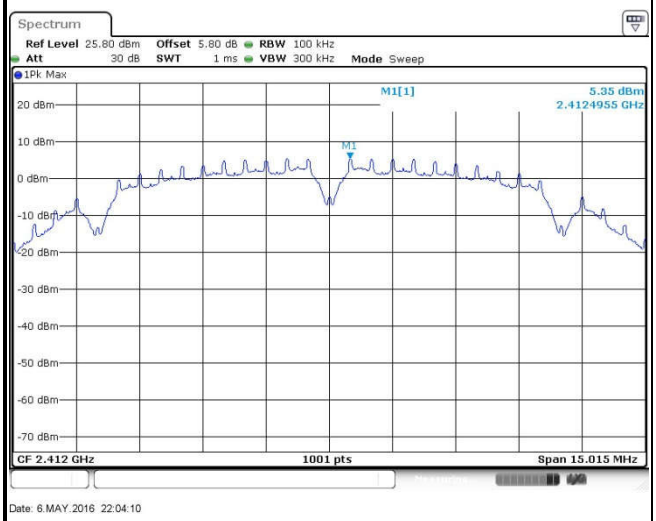


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

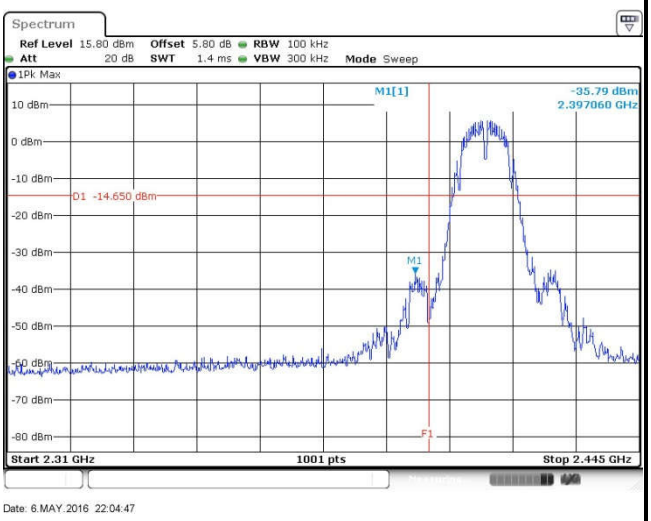
Test Mode :	802.11b	**Temperature :**	24~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	49~51%
Test Channel :	01	**Test Engineer :**	Issac Song

WLAN 802.11b Channel 01

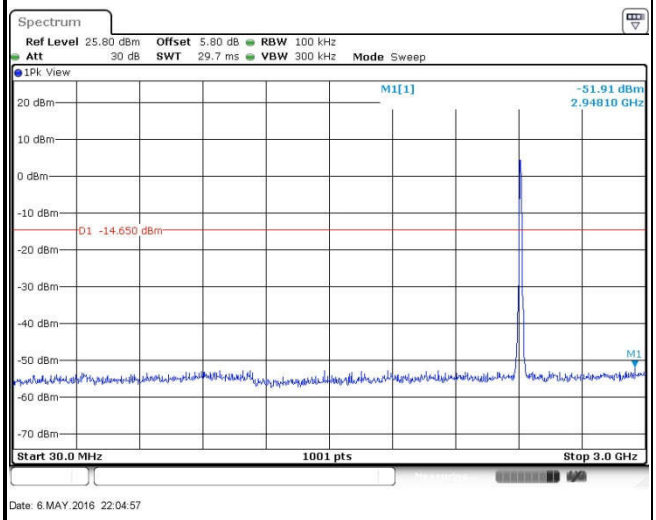
100kHz PSD reference Level



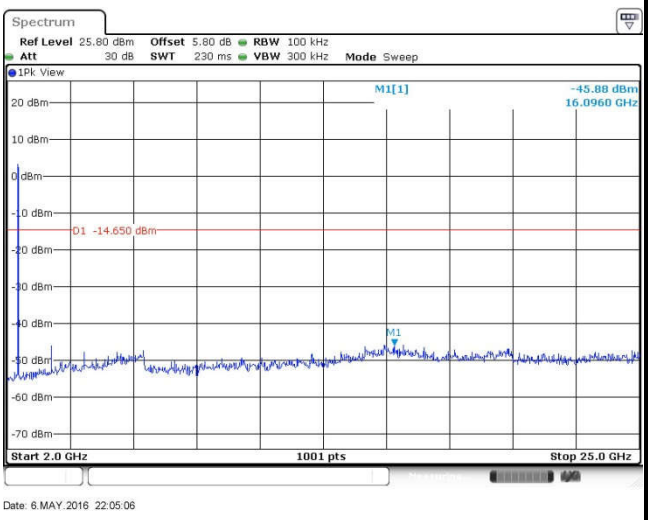
Low Channel Plot



Spurious Emission 30MHz~3GHz



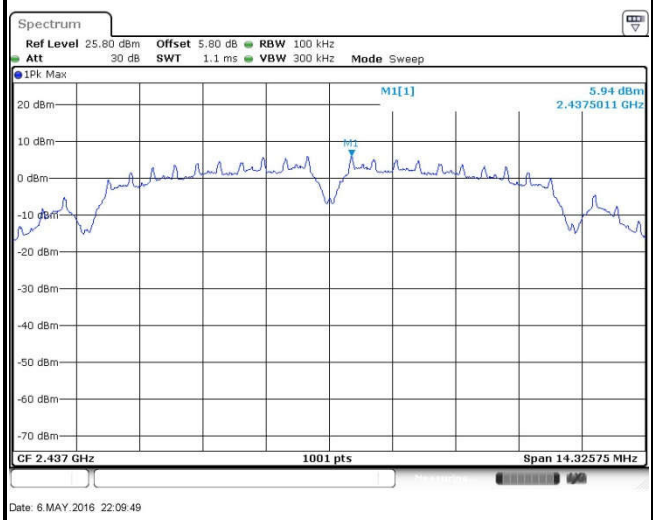
Spurious Emission 2GHz~25GHz



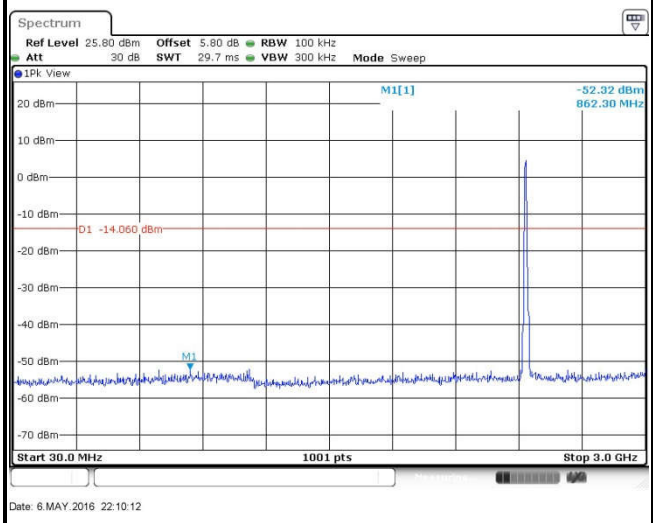
Test Mode :	802.11b	**Temperature :**	24~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	49~51%
Test Channel :	06	**Test Engineer :**	Issac Song

WLAN 802.11b Channel 06

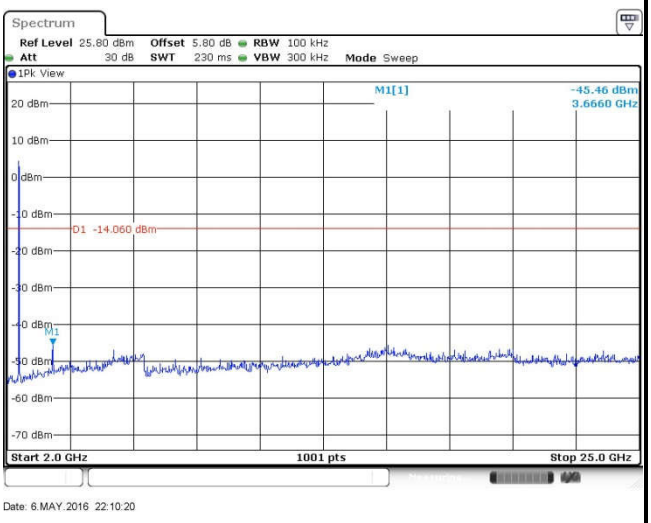
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



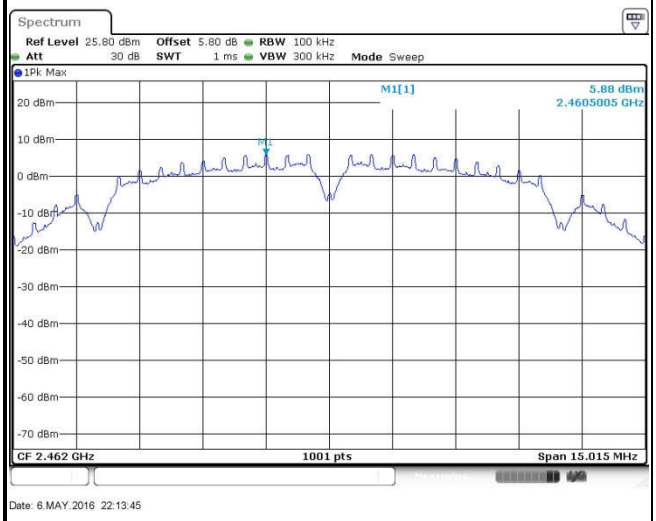
Spurious Emission 2GHz~25GHz



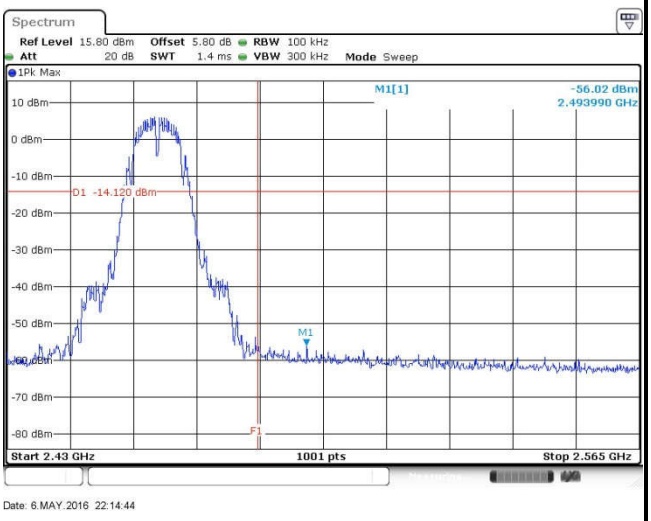
Test Mode :	802.11b	**Temperature :**	24~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	49~51%
Test Channel :	11	**Test Engineer :**	Issac Song

WLAN 802.11b Channel 11

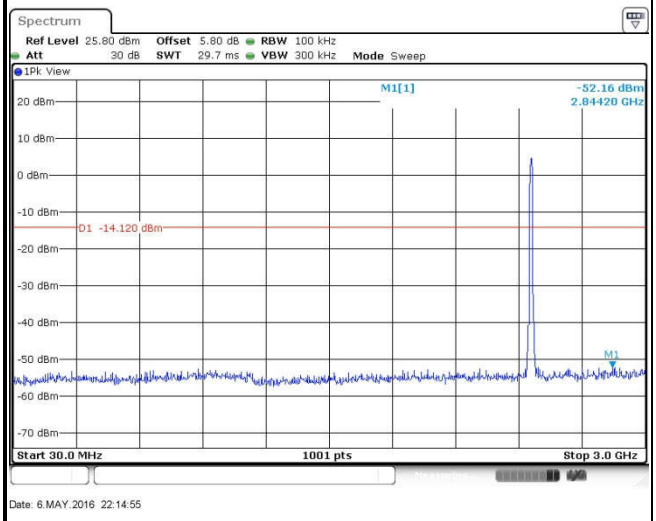
100kHz PSD reference Level



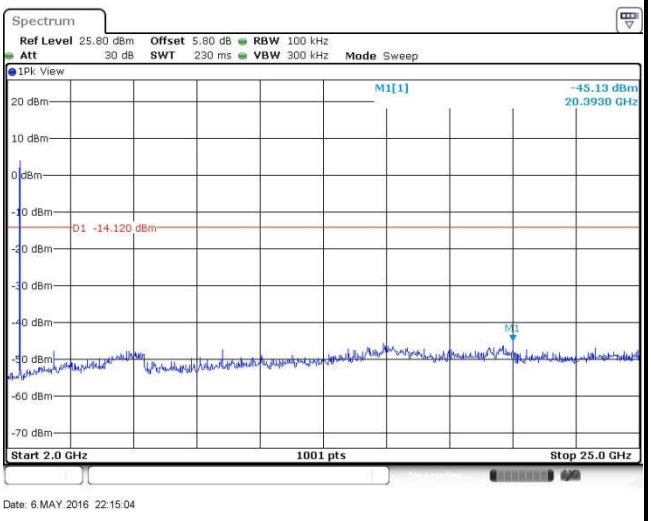
High Channel Plot



Spurious Emission 30MHz~3GHz



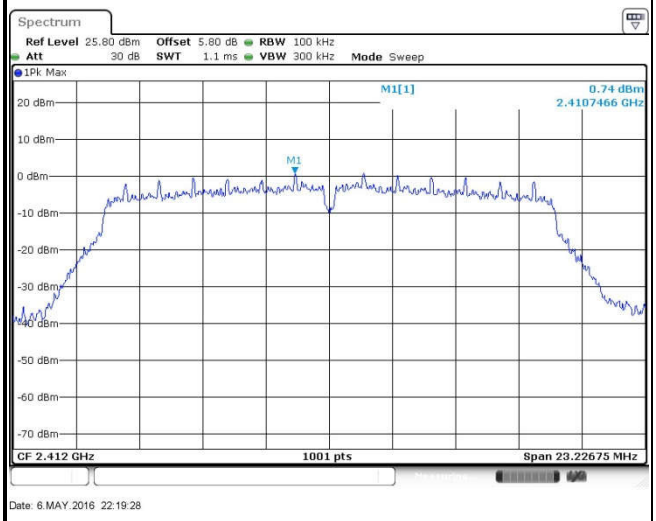
Spurious Emission 2GHz~25GHz



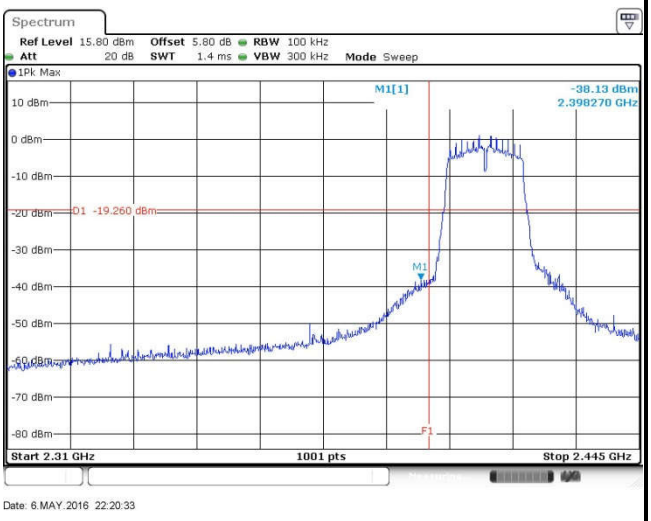
Test Mode :	802.11g	**Temperature :**	24~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	49~51%
Test Channel :	01	**Test Engineer :**	Issac Song

WLAN 802.11g Channel 01

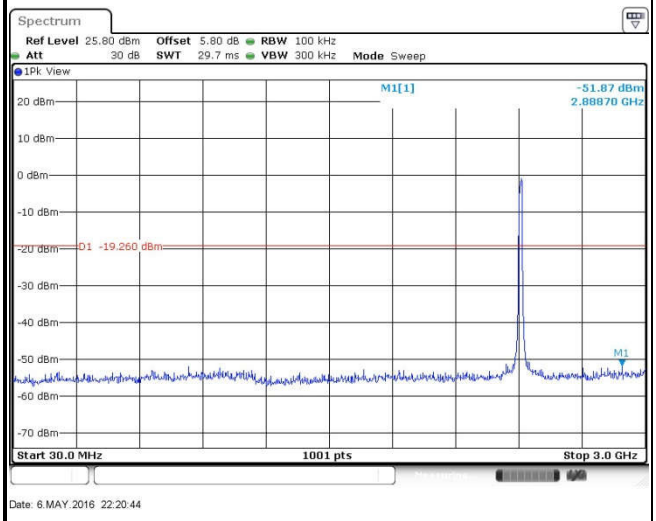
100kHz PSD reference Level



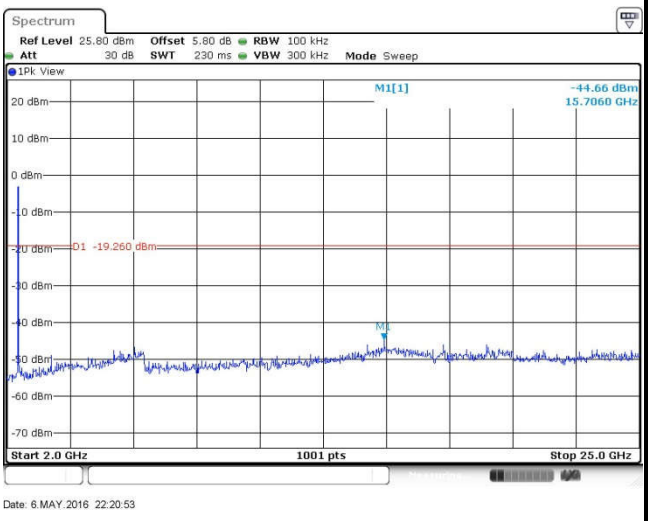
Low Channel Plot



Spurious Emission 30MHz~3GHz



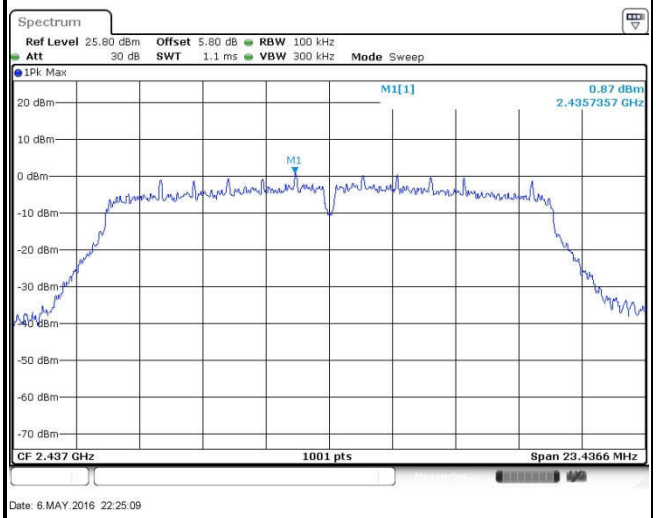
Spurious Emission 2GHz~25GHz



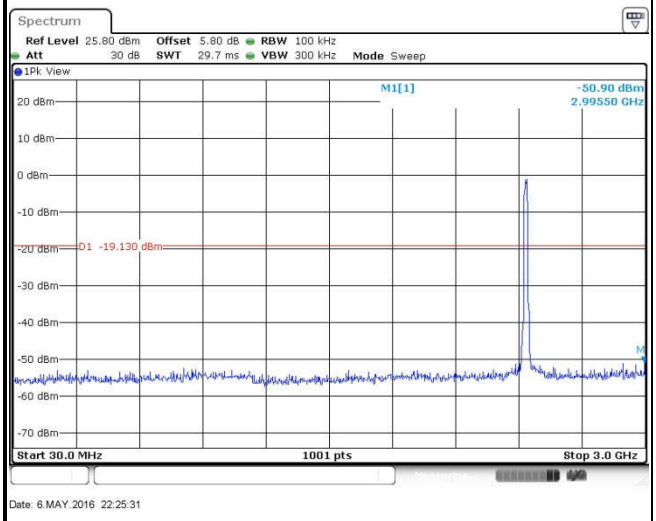
Test Mode :	802.11g	**Temperature :**	24~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	49~51%
Test Channel :	06	**Test Engineer :**	Issac Song

WLAN 802.11g Channel 06

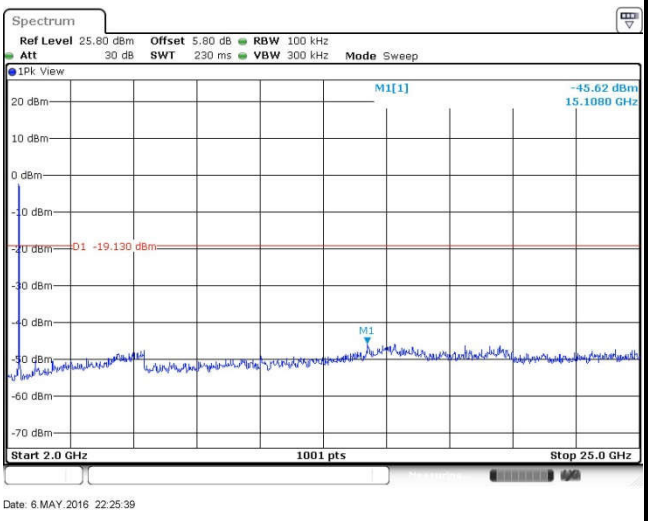
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



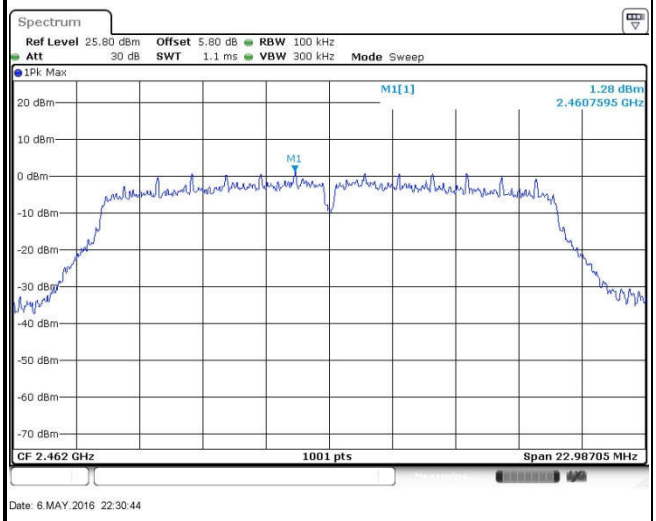
Spurious Emission 2GHz~25GHz



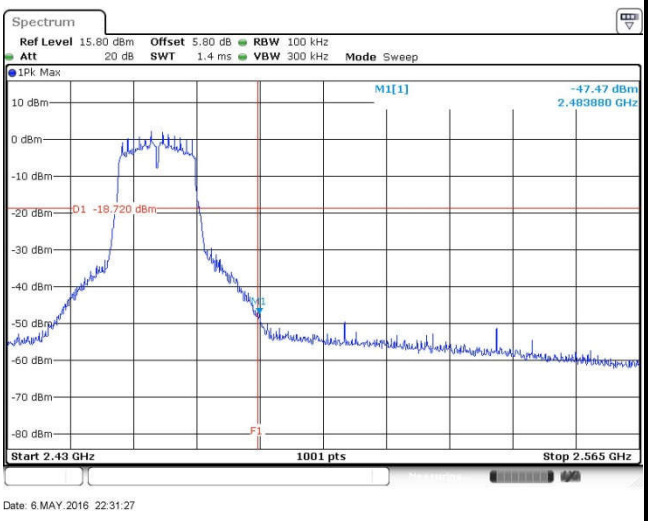
Test Mode :	802.11g	**Temperature :**	24~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	49~51%
Test Channel :	11	**Test Engineer :**	Issac Song

WLAN 802.11g Channel 11

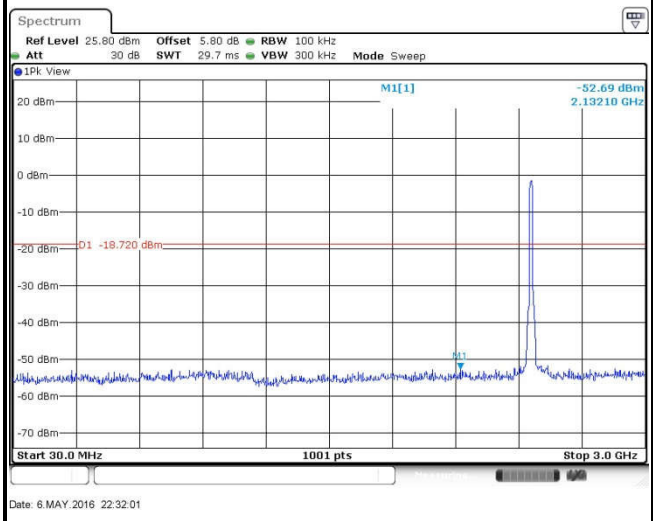
100kHz PSD reference Level



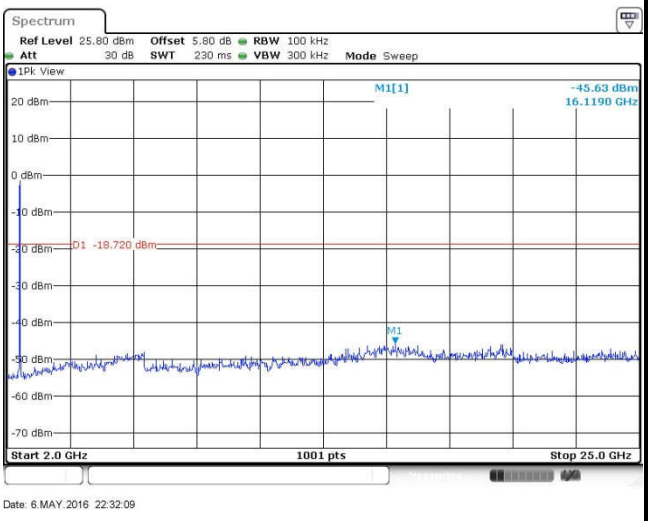
High Channel Plot



Spurious Emission 30MHz~3GHz



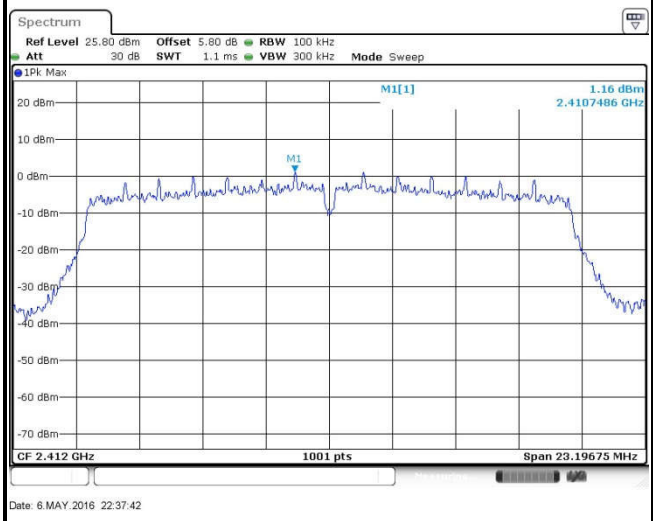
Spurious Emission 2GHz~25GHz



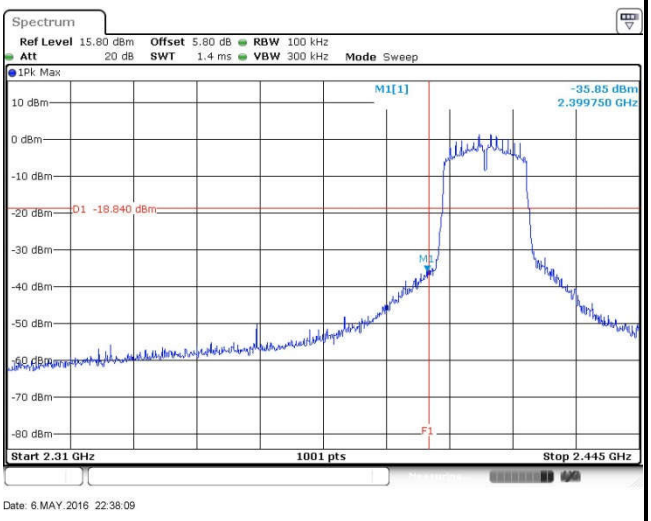
Test Mode :	802.11n HT20	**Temperature :**	24~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	49~51%
Test Channel :	01	**Test Engineer :**	Issac Song

WLAN 802.11n HT20 Channel 01

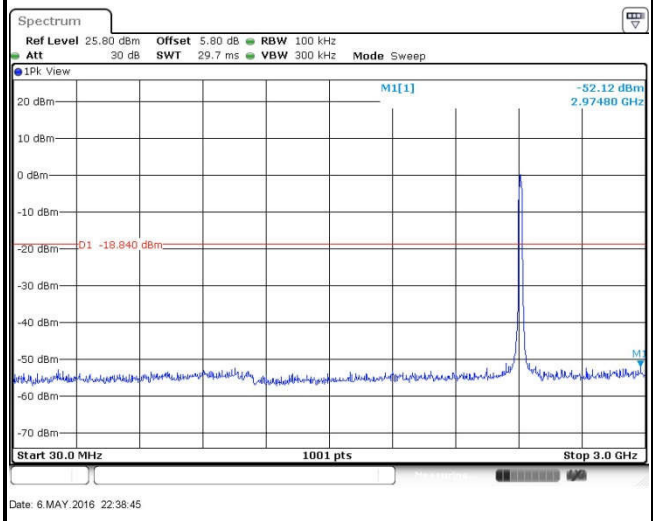
100kHz PSD reference Level



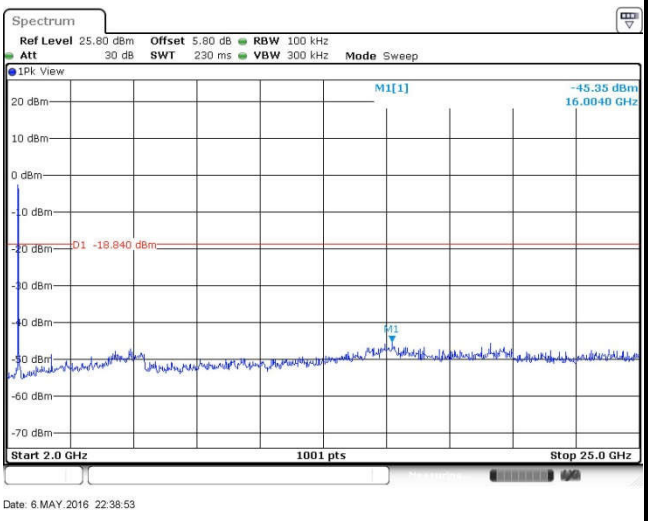
Low Channel Plot



Spurious Emission 30MHz~3GHz



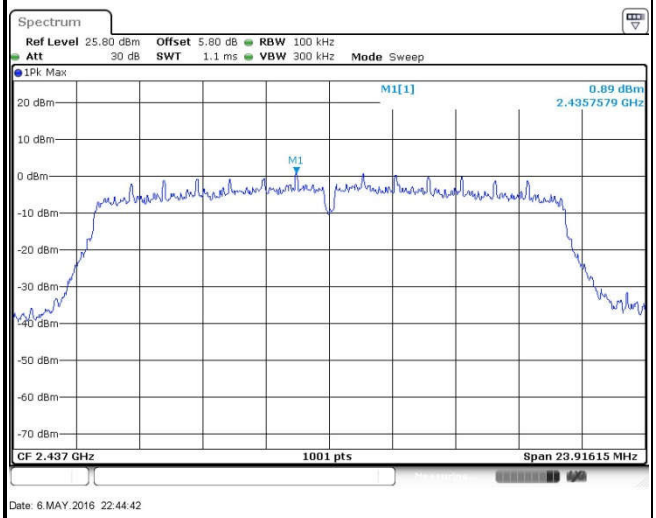
Spurious Emission 2GHz~25GHz



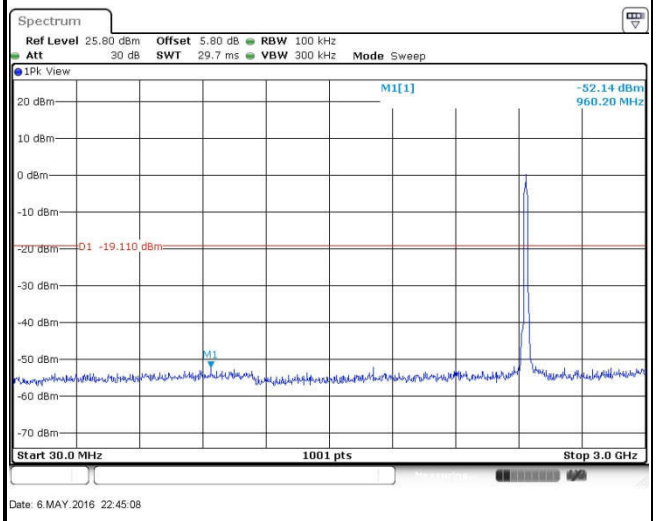
Test Mode :	802.11n HT20	**Temperature :**	24~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	49~51%
Test Channel :	06	**Test Engineer :**	Issac Song

WLAN 802.11n HT20 Channel 06

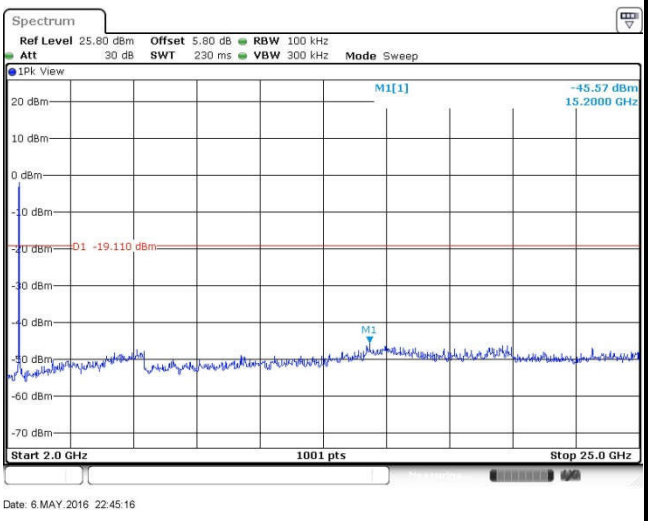
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



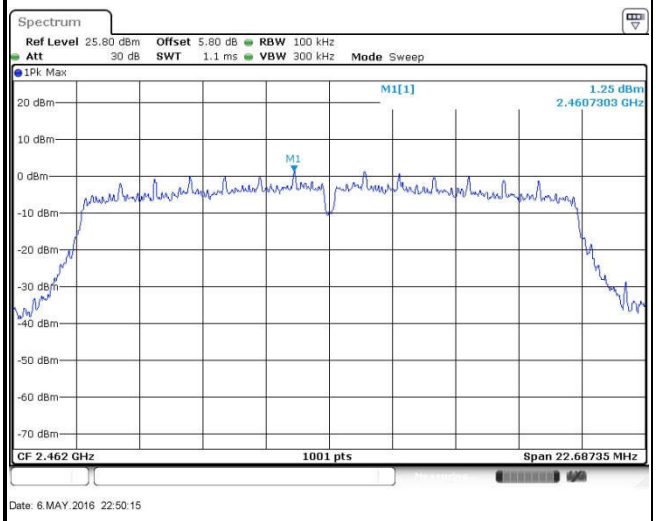
Spurious Emission 2GHz~25GHz



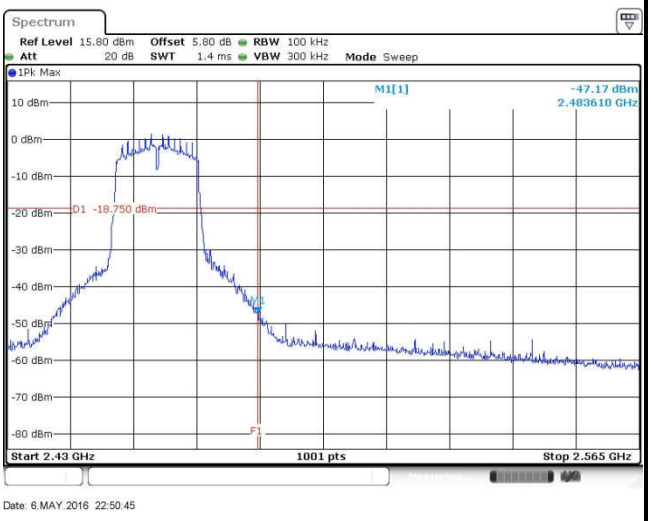
Test Mode :	802.11n HT20	**Temperature :**	24~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	49~51%
Test Channel :	11	**Test Engineer :**	Issac Song

WLAN 802.11n HT20 Channel 11

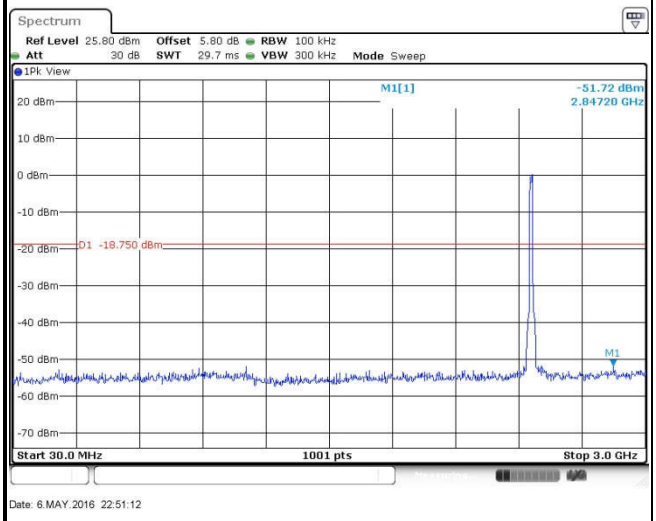
100kHz PSD reference Level



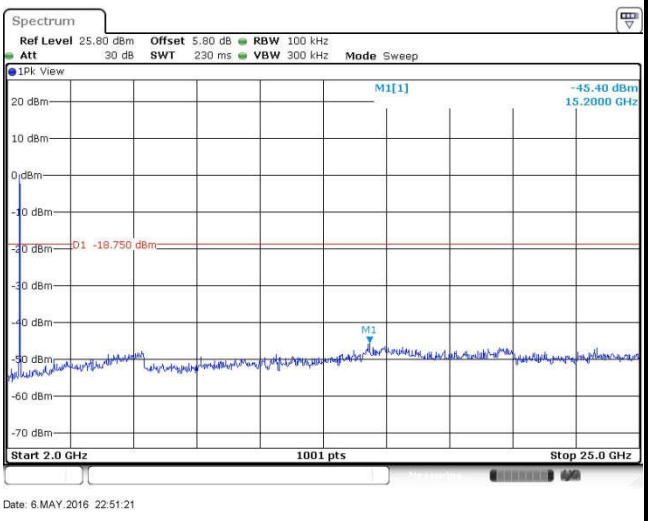
High Channel Plot



Spurious Emission 30MHz~3GHz



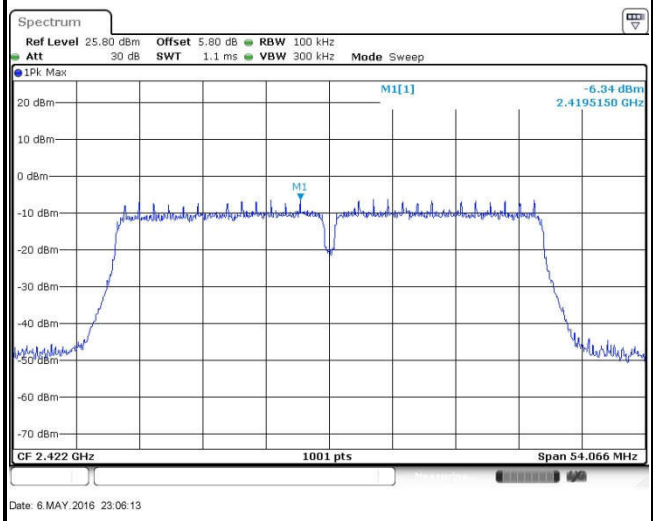
Spurious Emission 2GHz~25GHz



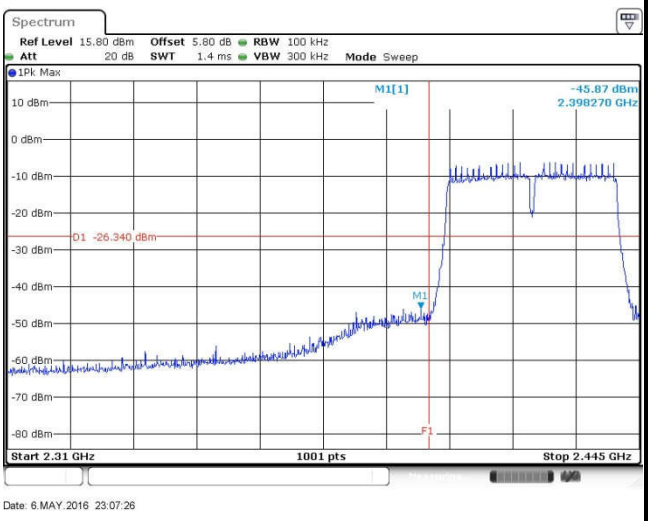
Test Mode :	802.11n HT40	**Temperature :**	24~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	49~51%
Test Channel :	03	**Test Engineer :**	Issac Song

WLAN 802.11n HT40 Channel 03

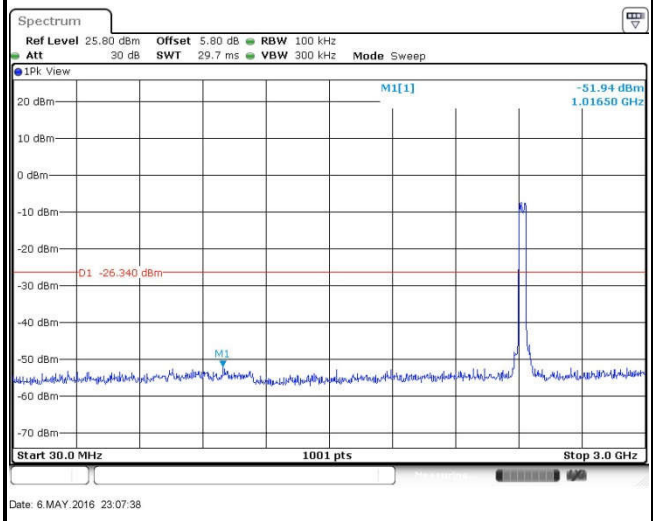
100kHz PSD reference Level



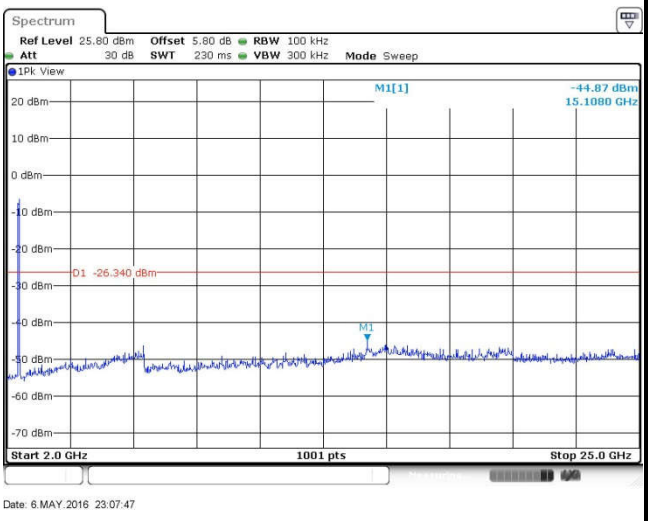
Low Channel Plot



Spurious Emission 30MHz~3GHz



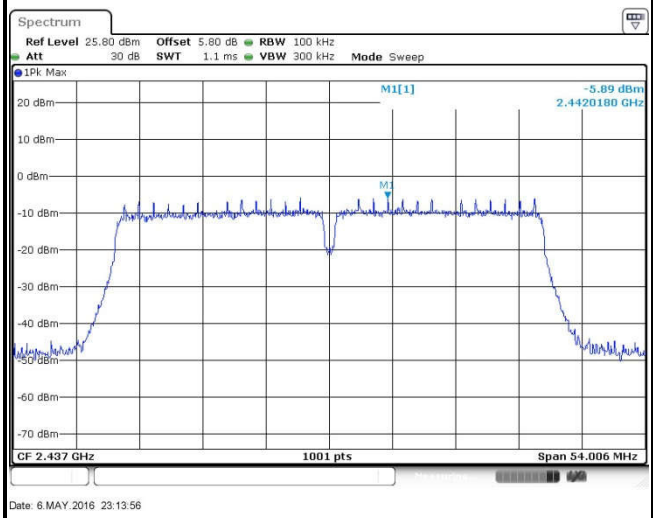
Spurious Emission 2GHz~25GHz



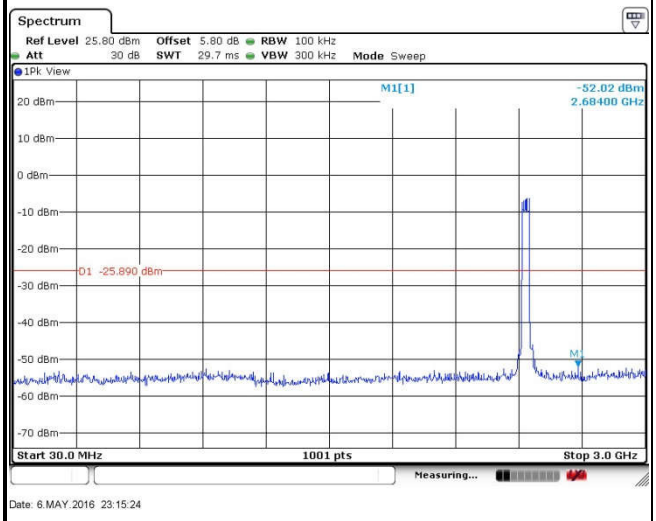
Test Mode :	802.11n HT40	**Temperature :**	24~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	49~51%
Test Channel :	06	**Test Engineer :**	Issac Song

WLAN 802.11n HT40 Channel 06

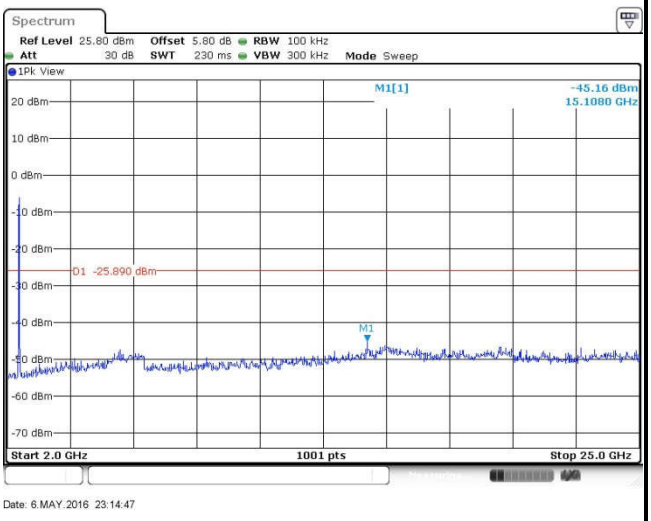
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



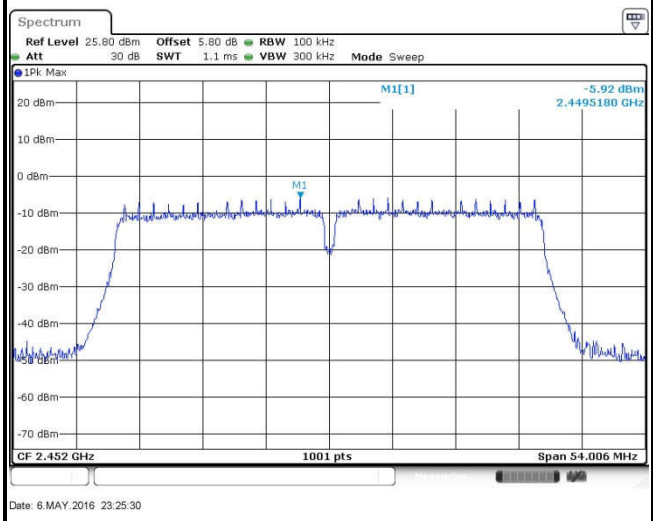
Spurious Emission 2GHz~25GHz



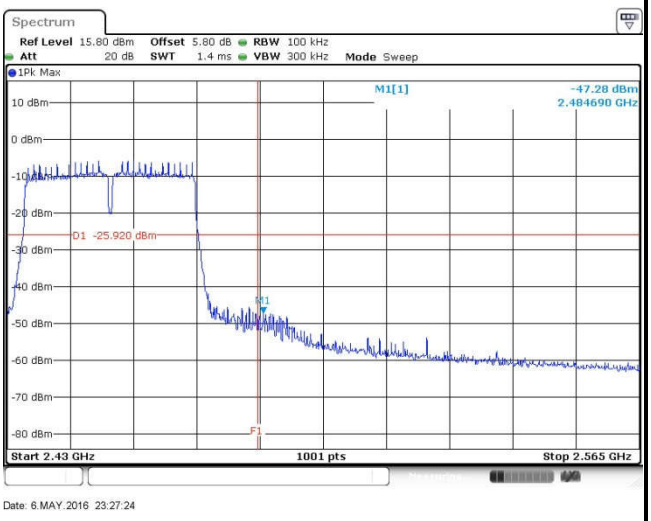
Test Mode :	802.11n HT40	**Temperature :**	24~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	49~51%
Test Channel :	09	**Test Engineer :**	Issac Song

WLAN 802.11n HT40 Channel 09

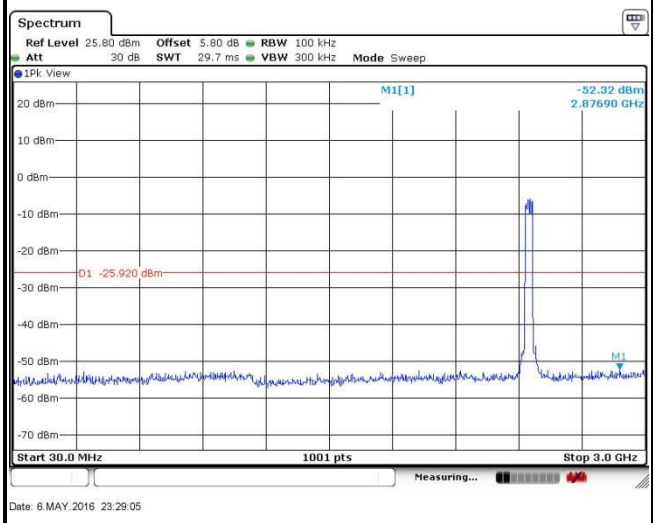
100kHz PSD reference Level



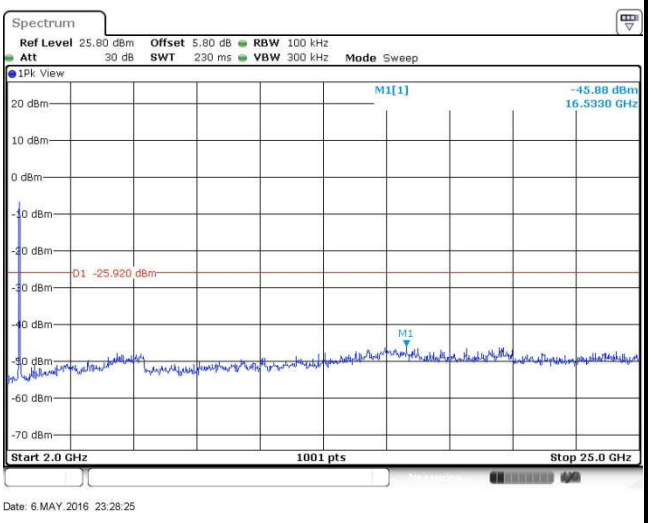
High Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz



3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

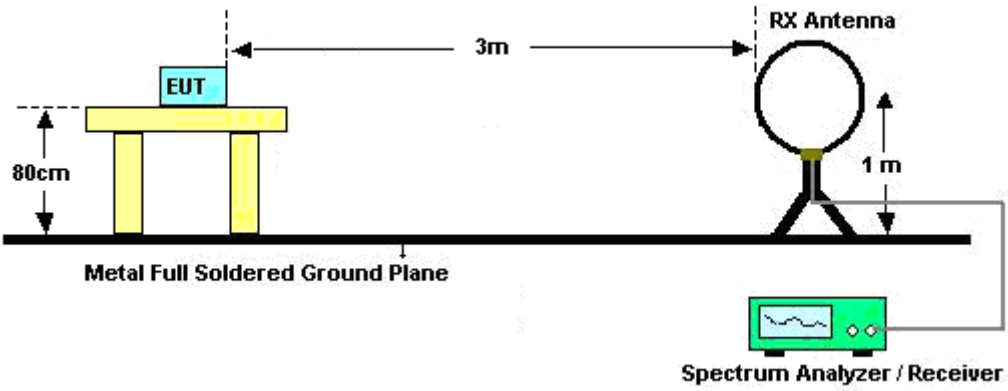
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

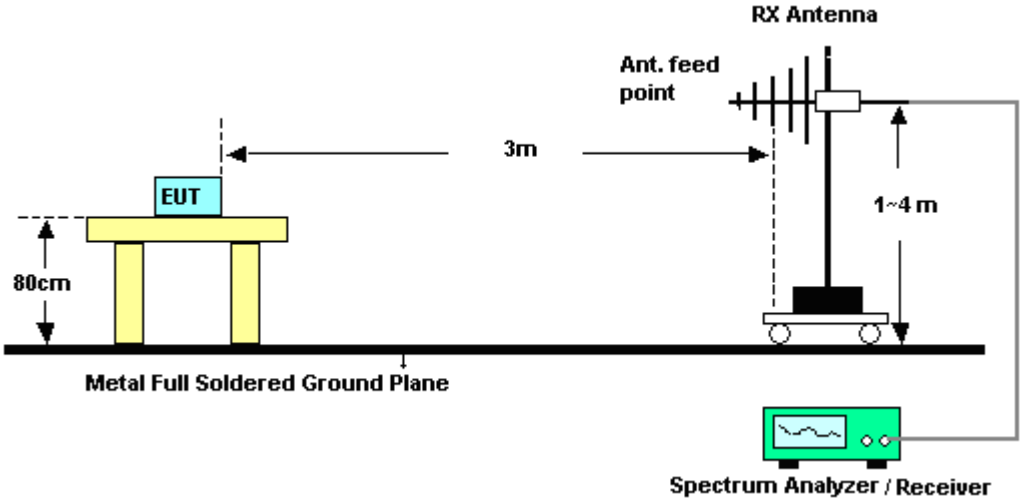
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

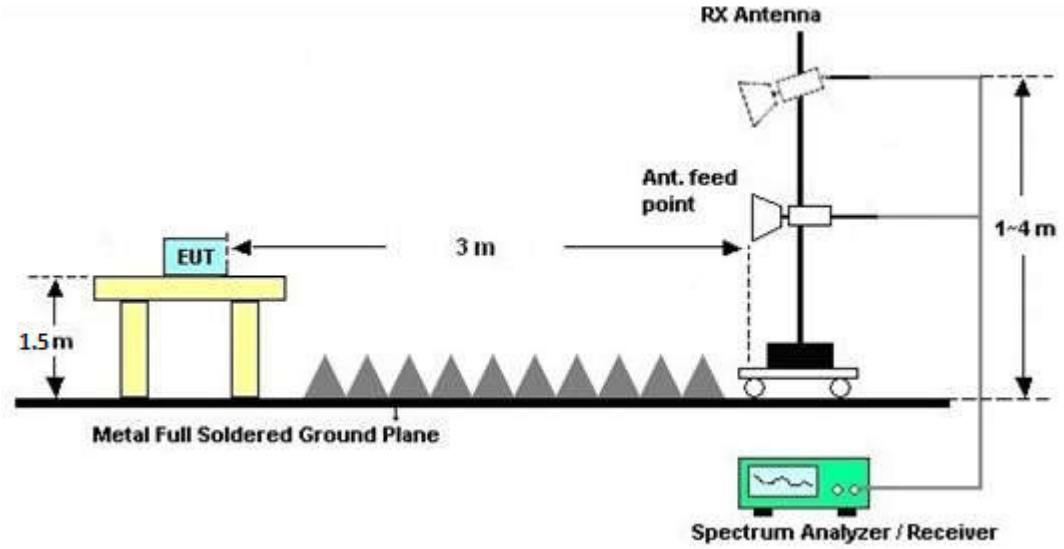
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.5.7 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix B.

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

*Decreases with the logarithm of the frequency.

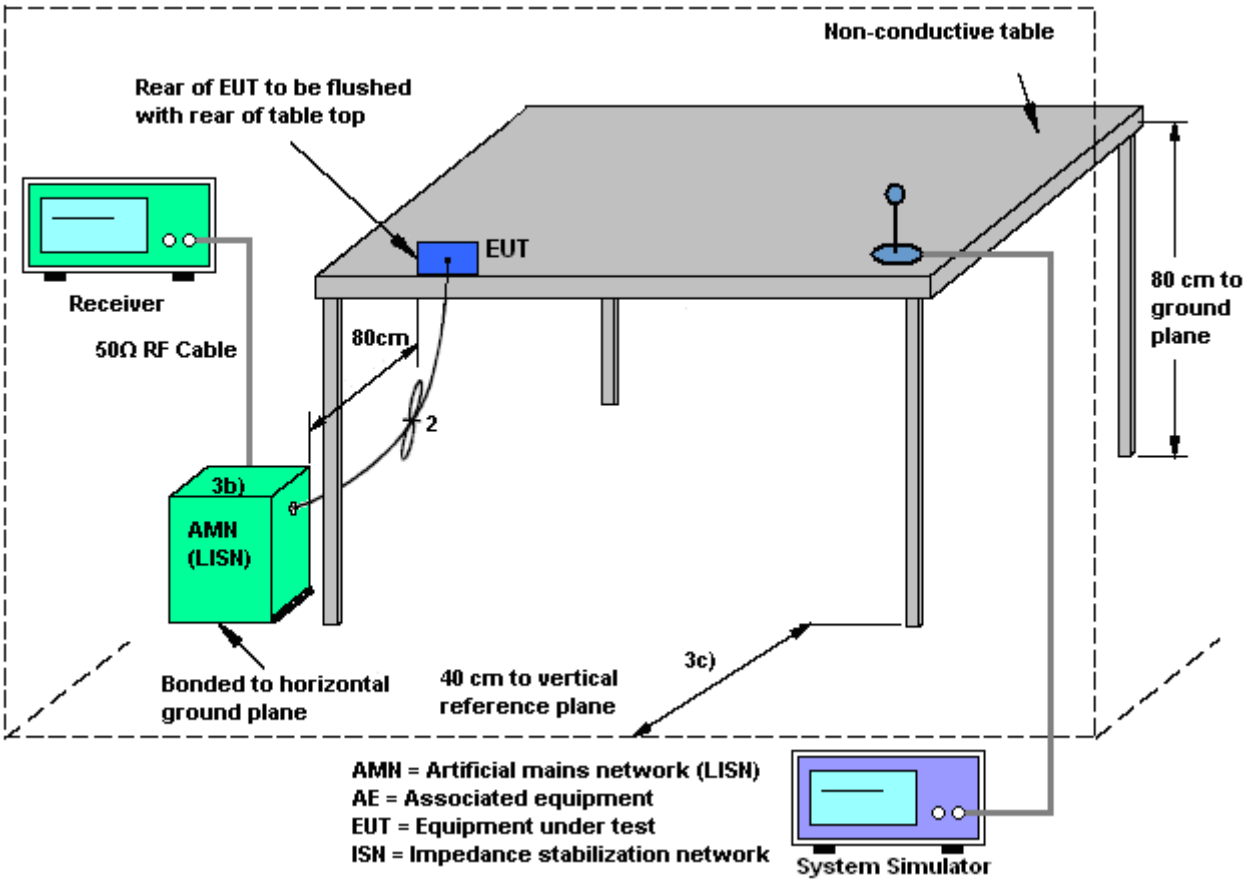
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

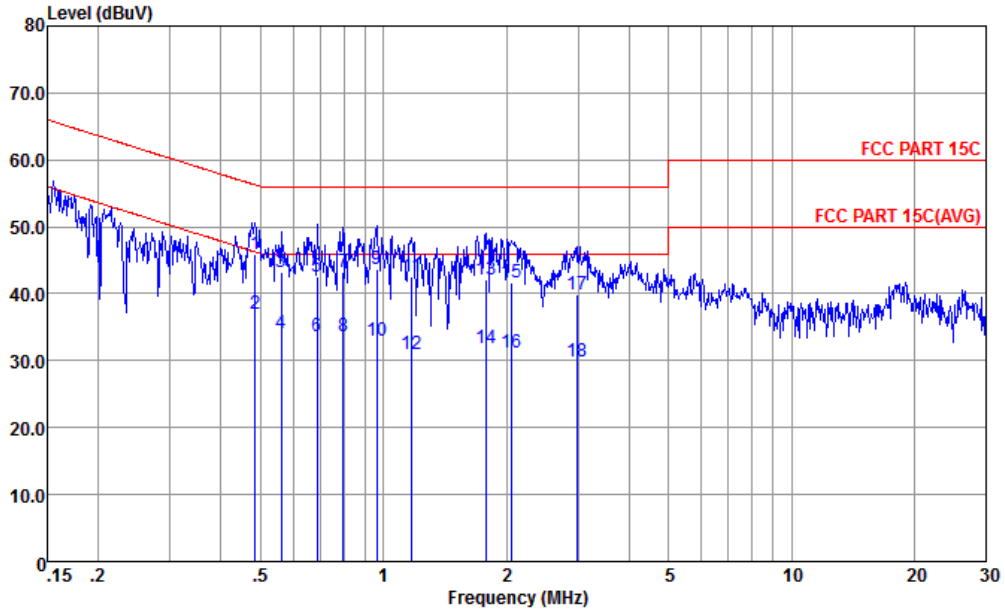
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Amos Mo	**Relative Humidity :**	44~46%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable 1 (Charging from Adapter 1) + Earphone + SIM 1		

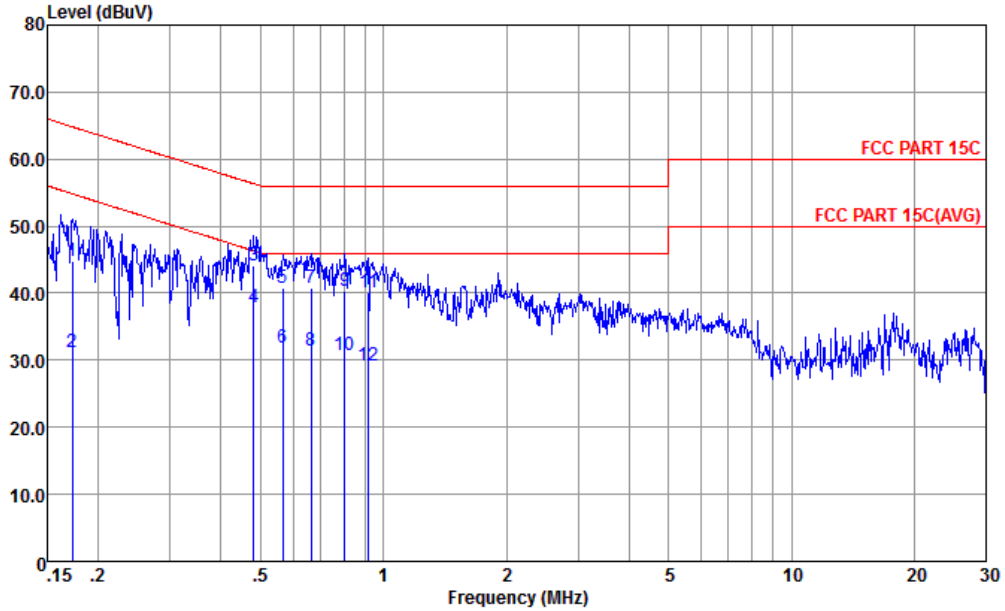


Site : CO01-KS
Condition : FCC PART 15C LISN-L-20151024 LINE

mode : Mode 1
: 357966070000188/357966070000485 #4

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.48	45.99	-10.28	56.27	35.60	0.23	10.16	QP
2 *	0.48	36.99	-9.28	46.27	26.60	0.23	10.16	Average
3	0.56	43.29	-12.71	56.00	32.90	0.23	10.16	QP
4	0.56	33.99	-12.01	46.00	23.60	0.23	10.16	Average
5	0.69	42.49	-13.51	56.00	32.10	0.24	10.15	QP
6	0.69	33.59	-12.41	46.00	23.20	0.24	10.15	Average
7	0.80	43.19	-12.81	56.00	32.80	0.24	10.15	QP
8	0.80	33.59	-12.41	46.00	23.20	0.24	10.15	Average
9	0.96	43.69	-12.31	56.00	33.30	0.25	10.14	QP
10	0.96	32.99	-13.01	46.00	22.60	0.25	10.14	Average
11	1.17	42.47	-13.53	56.00	32.10	0.23	10.14	QP
12	1.17	30.97	-15.03	46.00	20.60	0.23	10.14	Average
13	1.78	42.13	-13.87	56.00	31.80	0.19	10.14	QP
14	1.78	31.93	-14.07	46.00	21.60	0.19	10.14	Average
15	2.07	41.62	-14.38	56.00	31.30	0.18	10.14	QP
16	2.07	31.22	-14.78	46.00	20.90	0.18	10.14	Average
17	2.99	39.94	-16.06	56.00	29.61	0.18	10.15	QP
18	2.99	29.84	-16.16	46.00	19.51	0.18	10.15	Average

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Amos Mo	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable 1 (Charging from Adapter 1) + Earphone + SIM 1		



Site : CO01-KS
Condition : FCC PART 15C LISN-N-20151024 NEUTRAL

mode : Mode 1
: 357966070000188/357966070000485 #4

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17	44.72	-20.09	64.81	34.30	0.30	10.12	QP
2	0.17	31.22	-23.59	54.81	20.80	0.30	10.12	Average
3	0.48	44.08	-12.24	56.32	33.60	0.32	10.16	QP
4 *	0.48	37.78	-8.54	46.32	27.30	0.32	10.16	Average
5	0.57	40.69	-15.31	56.00	30.20	0.33	10.16	QP
6	0.57	31.79	-14.21	46.00	21.30	0.33	10.16	Average
7	0.66	40.69	-15.31	56.00	30.20	0.34	10.15	QP
8	0.66	31.39	-14.61	46.00	20.90	0.34	10.15	Average
9	0.80	40.40	-15.60	56.00	29.90	0.35	10.15	QP
10	0.80	30.80	-15.20	46.00	20.30	0.35	10.15	Average
11	0.92	40.10	-15.90	56.00	29.60	0.36	10.14	QP
12	0.92	29.10	-16.90	46.00	18.60	0.36	10.14	Average

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Sep. 10, 2015	Apr. 26, 2016~ May 06. 2016	Sep. 09, 2016	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 20, 2016	Apr. 26, 2016~ May 06. 2016	Jan. 19, 2017	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 20, 2016	Apr. 26, 2016~ May 06. 2016	Jan. 19, 2017	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Oct. 24, 2015	Apr. 26, 2016~ May 04, 2016	Oct. 23, 2016	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44GHz	Jun. 05, 2015	Apr. 26, 2016~ May 04, 2016	Jun. 04, 2016	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 07, 2015	Apr. 26, 2016~ May 04, 2016	Nov. 06, 2016	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	25MHz-2GHz	Mar. 12, 2016	Apr. 26, 2016~ May 04, 2016	Mar. 11, 2017	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1356	1GHz~18GHz	Jun. 25, 2015	Apr. 26, 2016~ May 04, 2016	Jun. 24, 2016	Radiation (03CH03-KS)
Amplifier	Burgeon	BPA-530	102212	0.01MHz~3000MHz	Aug. 10, 2015	Apr. 26, 2016~ May 04, 2016	Aug. 09, 2016	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	1889560	1GHz~18GHz	Aug. 10, 2015	Apr. 26, 2016~ May 04, 2016	Aug. 09, 2016	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Aug. 10, 2015	Apr. 26, 2016~ May 04, 2016	Aug. 09, 2016	Radiation (03CH03-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18~40GHz	Aug. 10, 2015	Apr. 26, 2016~ May 04, 2016	Aug. 09, 2016	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Apr. 26, 2016~ May 04, 2016	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Apr. 26, 2016~ May 04, 2016	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Apr. 26, 2016~ May 04, 2016	NCR	Radiation (03CH03-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 30, 2015	Apr. 27, 2016	Apr. 29, 2016	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 24, 2015	Apr. 27, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 24, 2015	Apr. 27, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000 811	AC 0V~300V, 45Hz~1000Hz	Oct. 24, 2015	Apr. 27, 2016	Oct. 23, 2016	Conduction (CO01-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.3dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.5dB

Appendix A. Conducted Test Results

Report Number : FR630501C

A1 - DTS Part

Test Engineer:	Issac Song	Temperature:	24~25	°C
Test Date:	Apr. 26, 2016~May 06. 2016	Relative Humidity:	49~51	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	12.54	10.01	0.50	Pass
11b	1Mbps	1	6	2437	12.59	9.55	0.50	Pass
11b	1Mbps	1	11	2462	12.59	10.01	0.50	Pass
11g	6Mbps	1	1	2412	17.78	15.48	0.50	Pass
11g	6Mbps	1	6	2437	17.53	15.62	0.50	Pass
11g	6Mbps	1	11	2462	17.53	15.32	0.50	Pass
HT20	MCS0	1	1	2412	18.48	15.46	0.50	Pass
HT20	MCS0	1	6	2437	18.48	15.94	0.50	Pass
HT20	MCS0	1	11	2462	18.43	15.12	0.50	Pass
HT40	MCS0	1	3	2422	36.66	36.04	0.50	Pass
HT40	MCS0	1	6	2437	36.56	36.00	0.50	Pass
HT40	MCS0	1	9	2452	36.46	36.00	0.50	Pass

TEST RESULTS DATA
Peak Power Table

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
11b	1Mbps	1	1	2412	17.27	30.00	1.97	19.24	36.00	Pass
11b	1Mbps	1	6	2437	17.73	30.00	1.97	19.70	36.00	Pass
11b	1Mbps	1	11	2462	18.28	30.00	1.97	20.25	36.00	Pass
11g	6Mbps	1	1	2412	20.48	30.00	1.97	22.45	36.00	Pass
11g	6Mbps	1	6	2437	20.71	30.00	1.97	22.68	36.00	Pass
11g	6Mbps	1	11	2462	21.06	30.00	1.97	23.03	36.00	Pass
HT20	MCS0	1	1	2412	20.63	30.00	1.97	22.60	36.00	Pass
HT20	MCS0	1	6	2437	20.81	30.00	1.97	22.78	36.00	Pass
HT20	MCS0	1	11	2462	21.02	30.00	1.97	22.99	36.00	Pass
HT40	MCS0	1	3	2422	19.38	30.00	1.97	21.35	36.00	Pass
HT40	MCS0	1	6	2437	19.17	30.00	1.97	21.14	36.00	Pass
HT40	MCS0	1	9	2452	19.32	30.00	1.97	21.29	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

2.4GHz Band						
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.00	14.18
11b	1Mbps	1	6	2437	0.00	14.74
11b	1Mbps	1	11	2462	0.00	15.24
11g	6Mbps	1	1	2412	0.11	11.75
11g	6Mbps	1	6	2437	0.11	12.03
11g	6Mbps	1	11	2462	0.11	12.37
HT20	MCS0	1	1	2412	0.12	11.33
HT20	MCS0	1	6	2437	0.12	11.94
HT20	MCS0	1	11	2462	0.12	12.03
HT40	MCS0	1	3	2422	0.22	8.28
HT40	MCS0	1	6	2437	0.22	7.93
HT40	MCS0	1	9	2452	0.22	8.16

TEST RESULTS DATA
Peak Power Density

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	-8.58	1.97	8.00	Pass
11b	1Mbps	1	6	2437	-7.37	1.97	8.00	Pass
11b	1Mbps	1	11	2462	-8.46	1.97	8.00	Pass
11g	6Mbps	1	1	2412	-12.80	1.97	8.00	Pass
11g	6Mbps	1	6	2437	-13.41	1.97	8.00	Pass
11g	6Mbps	1	11	2462	-12.25	1.97	8.00	Pass
HT20	MCS0	1	1	2412	-13.05	1.97	8.00	Pass
HT20	MCS0	1	6	2437	-13.54	1.97	8.00	Pass
HT20	MCS0	1	11	2462	-13.07	1.97	8.00	Pass
HT40	MCS0	1	3	2422	-20.18	1.97	8.00	Pass
HT40	MCS0	1	6	2437	-19.99	1.97	8.00	Pass
HT40	MCS0	1	9	2452	-20.23	1.97	8.00	Pass

Appendix B. Radiated Spurious Emission

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	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)
802.11b CH 01 2412MHz		2389.29	51.59	-22.41	74	56.02	27	5.59	37.02	300	63	P	H
		2388.03	41.79	-12.21	54	46.22	27	5.59	37.02	300	63	A	H
	*	2413.277	100.17	-	-	104.43	27.13	5.61	37	300	63	P	H
	*	2413.527	97.58	-	-	101.84	27.13	5.61	37	300	63	A	H
		2385.51	52.85	-21.15	74	57.28	27	5.59	37.02	102	66	P	V
		2388.03	43.18	-10.82	54	47.61	27	5.59	37.02	102	66	A	V
	*	2413.277	103.68	-	-	107.94	27.13	5.61	37	102	66	P	V
	*	2413.277	101.06	-	-	105.32	27.13	5.61	37	102	66	A	V
802.11b CH 06 2437MHz	*	2438.243	99.16	-	-	103.09	27.39	5.65	36.97	100	49	P	H
	*	2438.159	96.65	-	-	100.58	27.39	5.65	36.97	100	49	A	H
	*	2438.243	101.8	-	-	105.73	27.39	5.65	36.97	300	50	P	V
	*	2438.243	99.23	-	-	103.16	27.39	5.65	36.97	300	50	A	V
802.11b CH 11 2462MHz	*	2460.788	100.53	-	-	104.31	27.51	5.67	36.96	304	40	P	H
	*	2460.872	97.94	-	-	101.72	27.51	5.67	36.96	304	40	A	H
		2488.84	52.45	-21.55	74	55.9	27.77	5.71	36.93	304	40	P	H
		2483.92	41.66	-12.34	54	45.27	27.64	5.69	36.94	304	40	A	H
	*	2463.46	102.21	-	-	105.99	27.51	5.67	36.96	328	95	P	V
	*	2463.293	99.68	-	-	103.46	27.51	5.67	36.96	328	95	A	V
		2486.4	52.79	-21.21	74	56.4	27.64	5.69	36.94	328	95	P	V
		2484.04	42.06	-11.94	54	45.67	27.64	5.69	36.94	328	95	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	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)
802.11b CH 01 2412MHz		3618	43.36	-30.64	74	68.34	29.12	7.83	61.93	100	360	P	H
		4824	48.28	-25.72	74	69.74	31.51	9.13	62.1	100	360	P	H
		7236	47.08	-33.09	80.17	61.14	33.82	11.31	59.19	100	0	P	H
		3618	40.72	-33.28	74	65.7	29.12	7.83	61.93	100	0	P	V
		4824	43.13	-30.87	74	64.59	31.51	9.13	62.1	100	0	P	V
		7236	44.27	-39.41	83.68	58.33	33.82	11.31	59.19	100	360	P	V
802.11b CH 06 2437MHz		3657	41.43	-32.57	74	66.37	29.17	7.87	61.98	100	360	P	H
		4875	44.67	-29.33	74	65.91	31.59	9.2	62.03	100	360	P	H
		7311	46.48	-27.52	74	60.31	34.03	11.3	59.16	100	0	P	H
		3657	38.97	-35.03	74	63.91	29.17	7.87	61.98	100	0	P	V
		4875	37.8	-36.2	74	59.04	31.59	9.2	62.03	100	0	P	V
		7311	41.53	-32.47	74	55.36	34.03	11.3	59.16	100	360	P	V
802.11b CH 11 2462MHz		3690	39.75	-34.25	74	64.65	29.21	7.92	62.03	100	360	P	H
		4923	41.13	-32.87	74	62.16	31.67	9.27	61.97	100	360	P	H
		7386	45.92	-28.08	74	59.46	34.29	11.29	59.12	100	0	P	H
		3693	39.01	-34.99	74	63.91	29.21	7.92	62.03	100	0	P	V
		4923	39.11	-34.89	74	60.14	31.67	9.27	61.97	100	0	P	V
		7386	41.67	-32.33	74	55.21	34.29	11.29	59.12	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

WIFI	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)
802.11g CH 01 2412MHz		2383.08	54.03	-19.97	74	58.53	26.95	5.57	37.02	327	45	P	H
		2390	42.72	-11.28	54	47.15	27	5.59	37.02	327	45	A	H
	*	2414.78	100.44	-	-	104.7	27.13	5.61	37	327	45	P	H
	*	2413.193	92.66	-	-	96.92	27.13	5.61	37	327	45	A	H
		2386.5	58.25	-15.75	74	62.68	27	5.59	37.02	237	99	P	V
		2390	45.91	-8.09	54	50.34	27	5.59	37.02	237	99	A	V
	*	2415.03	103.07	-	-	107.33	27.13	5.61	37	237	99	P	V
	*	2412.942	95.4	-	-	99.66	27.13	5.61	37	237	99	A	V
802.11g CH 06 2437MHz	*	2438.827	101.21	-	-	105.14	27.39	5.65	36.97	100	51	P	H
	*	2436.072	93.11	-	-	97.21	27.26	5.63	36.99	100	51	A	H
	*	2436.239	103.19	-	-	107.29	27.26	5.63	36.99	269	94	P	V
	*	2438.159	95.83	-	-	99.76	27.39	5.65	36.97	269	94	A	V
802.11g CH 11 2462MHz	*	2463.209	100.37	-	-	104.15	27.51	5.67	36.96	100	55	P	H
	*	2463.042	93.23	-	-	97.01	27.51	5.67	36.96	100	55	A	H
		2483.72	59.76	-14.24	74	63.37	27.64	5.69	36.94	100	55	P	H
		2483.52	45	-9	54	48.61	27.64	5.69	36.94	100	55	A	H
	*	2460.872	103.91	-	-	107.69	27.51	5.67	36.96	246	99	P	V
	*	2460.872	96.36	-	-	100.14	27.51	5.67	36.96	246	99	A	V
		2483.88	61.61	-12.39	74	65.22	27.64	5.69	36.94	246	99	P	V
		2483.52	46.82	-7.18	54	50.43	27.64	5.69	36.94	246	99	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI	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)
802.11g CH 01 2412MHz		3621	43.68	-30.32	74	68.66	29.12	7.83	61.93	100	360	P	H
		4824	41.53	-32.47	74	62.99	31.51	9.13	62.1	100	360	P	H
		3618	41.05	-32.95	74	66.03	29.12	7.83	61.93	100	0	P	V
		4824	37.14	-36.86	74	58.6	31.51	9.13	62.1	100	0	P	V
802.11g CH 06 2437MHz		3651	42.68	-31.32	74	67.62	29.17	7.87	61.98	100	360	P	H
		4875	37.11	-36.89	74	58.35	31.59	9.2	62.03	100	360	P	H
		7311	44.16	-29.84	74	57.99	34.03	11.3	59.16	100	0	P	H
		3657	40.29	-33.71	74	65.23	29.17	7.87	61.98	100	0	P	V
		4875	35.1	-38.9	74	56.34	31.59	9.2	62.03	100	0	P	V
		7311	40	-34	74	53.83	34.03	11.3	59.16	100	360	P	V
802.11g CH 11 2462MHz		3690	43.02	-30.98	74	67.92	29.21	7.92	62.03	100	360	P	H
		4923	34.41	-39.59	74	55.44	31.67	9.27	61.97	100	360	P	H
		7386	41.5	-32.5	74	55.04	34.29	11.29	59.12	100	0	P	H
		3693	40.09	-33.91	74	64.99	29.21	7.92	62.03	100	0	P	V
		4923	35	-39	74	56.03	31.67	9.27	61.97	100	0	P	V
		7386	39.62	-34.38	74	53.16	34.29	11.29	59.12	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	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)
802.11n HT20 CH 01 2412MHz		2389.74	58.82	-15.18	74	63.25	27	5.59	37.02	100	84	P	H
		2389.92	46.11	-7.89	54	50.54	27	5.59	37.02	100	84	A	H
	*	2413.11	101.98	-	-	106.24	27.13	5.61	37	100	84	P	H
	*	2413.193	93.92	-	-	98.18	27.13	5.61	37	100	84	A	H
		2389.92	55.64	-18.36	74	60.07	27	5.59	37.02	381	132	P	V
		2390.00	44.4	-9.6	54	48.83	27	5.59	37.02	381	132	A	V
	*	2412.191	100.22	-	-	104.48	27.13	5.61	37	381	132	P	V
	*	2413.193	92.18	-	-	96.44	27.13	5.61	37	381	132	A	V
802.11n HT20 CH 06 2437MHz	*	2439.913	104.35	-	-	108.28	27.39	5.65	36.97	330	91	P	H
	*	2438.076	96.62	-	-	100.55	27.39	5.65	36.97	330	91	A	H
	*	2438.493	101.57	-	-	105.5	27.39	5.65	36.97	373	118	P	V
	*	2436.072	93.77	-	-	97.87	27.26	5.63	36.99	373	118	A	V
802.11n HT20 CH 11 2462MHz	*	2462.625	104.29	-	-	108.07	27.51	5.67	36.96	100	82	P	H
	*	2463.293	96.85	-	-	100.63	27.51	5.67	36.96	100	82	A	H
	!	2483.96	68.78	-5.22	74	72.39	27.64	5.69	36.94	100	82	P	H
	!	2483.52	50.69	-3.31	54	54.3	27.64	5.69	36.94	100	82	P	H
	*	2462.959	102.68	-	-	106.46	27.51	5.67	36.96	400	132	P	V
	*	2463.126	93.96	-	-	97.74	27.51	5.67	36.96	400	132	A	V
		2484.12	66.57	-7.43	74	70.18	27.64	5.69	36.94	400	132	P	V
	!	2483.76	48.93	-5.07	54	52.54	27.64	5.69	36.94	400	132	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	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)
802.11n HT20 CH 01 2412MHz		3618	42.9	-31.1	74	67.88	29.12	7.83	61.93	100	360	P	H
		4824	38.92	-35.08	74	60.38	31.51	9.13	62.1	100	360	P	H
		4824	36.14	-37.86	74	57.6	31.51	9.13	62.1	100	0	P	V
802.11n HT20 CH 06 2437MHz		3660	43.78	-30.22	74	68.72	29.17	7.87	61.98	100	360	P	H
		4875	35.89	-38.11	74	57.13	31.59	9.2	62.03	100	360	P	H
		7311	39.89	-34.11	74	53.72	34.03	11.3	59.16	100	0	P	H
		4875	33.35	-40.65	74	54.59	31.59	9.2	62.03	100	0	P	V
		7311	41.99	-32.01	74	55.82	34.03	11.3	59.16	100	360	P	V
802.11n HT20 CH 11 2462MHz		3696	42.03	-31.97	74	66.92	29.23	7.94	62.06	100	360	P	H
		4923	34.73	-39.27	74	55.76	31.67	9.27	61.97	100	360	P	H
		7386	39.98	-34.02	74	53.52	34.29	11.29	59.12	100	0	P	H
		4923	33.31	-40.69	74	54.34	31.67	9.27	61.97	100	0	P	V
		7386	42.67	-31.33	74	56.21	34.29	11.29	59.12	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	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)
802.11n HT40 CH 03 2422MHz		2388.3	60.91	-13.09	74	65.34	27	5.59	37.02	326	81	P	H
		2387.94	46.98	-7.02	54	51.41	27	5.59	37.02	326	81	A	H
	*	2438.493	98.48	-	-	102.41	27.39	5.65	36.97	326	81	P	H
	*	2438.66	90.57	-	-	94.5	27.39	5.65	36.97	326	81	A	H
		2485.4	55.41	-18.59	74	59.02	27.64	5.69	36.94	326	81	P	H
		2490.72	43.47	-10.53	54	46.92	27.77	5.71	36.93	326	81	A	H
		2387.94	58.01	-15.99	74	62.44	27	5.59	37.02	375	128	P	V
		2388.3	44.4	-9.6	54	48.83	27	5.59	37.02	375	128	A	V
	*	2431.479	94.7	-	-	98.8	27.26	5.63	36.99	375	128	P	V
	*	2432.064	86.89	-	-	90.99	27.26	5.63	36.99	375	128	A	V
		2490.32	53.11	-20.89	74	56.56	27.77	5.71	36.93	375	128	P	V
		2484.68	42.46	-11.54	54	46.07	27.64	5.69	36.94	375	128	A	V
802.11n HT40 CH 06 2437MHz		2389.38	52.23	-21.77	74	56.66	27	5.59	37.02	325	88	P	H
		2389.11	41.99	-12.01	54	46.42	27	5.59	37.02	325	88	A	H
	*	2439.162	98.51	-	-	102.44	27.39	5.65	36.97	325	88	P	H
	*	2446.593	90.49	-	-	94.42	27.39	5.65	36.97	325	88	A	H
		2490.8	56.98	-17.02	74	60.43	27.77	5.71	36.93	325	88	P	H
		2484.4	44.31	-9.69	54	47.92	27.64	5.69	36.94	325	88	A	H
		2386.14	51.59	-22.41	74	56.02	27	5.59	37.02	329	123	P	V
		2388.75	41.62	-12.38	54	46.05	27	5.59	37.02	329	123	A	V
	*	2439.579	93.62	-	-	97.55	27.39	5.65	36.97	329	123	P	V
	*	2439.83	85.24	-	-	89.17	27.39	5.65	36.97	329	123	A	V
		2491.28	53.69	-20.31	74	57.14	27.77	5.71	36.93	329	123	P	V
		2483.76	42.71	-11.29	54	46.32	27.64	5.69	36.94	329	123	A	V

802.11n HT40 CH 09 2452MHz		2387.13	51.02	-22.98	74	55.45	27	5.59	37.02	285	84	P	H
		2385.87	41.28	-12.72	54	45.71	27	5.59	37.02	285	84	A	H
	*	2458.45	99.47	-	-	103.25	27.51	5.67	36.96	285	84	P	H
	*	2458.366	91.5	-	-	95.28	27.51	5.67	36.96	285	84	A	H
	!	2485.08	68.11	-5.89	74	71.72	27.64	5.69	36.94	285	84	P	H
	!	2484.36	51	-3	54	54.61	27.64	5.69	36.94	285	84	A	H
		2340.96	50.69	-23.31	74	55.32	26.86	5.52	37.01	290	101	P	V
		2388.57	41.22	-12.78	54	45.65	27	5.59	37.02	290	101	A	V
	*	2461.874	92.47	-	-	96.25	27.51	5.67	36.96	290	101	P	V
	*	2458.116	84.49	-	-	88.27	27.51	5.67	36.96	290	101	A	V
		2484.8	62.73	-11.27	74	66.34	27.64	5.69	36.94	290	101	P	V
		2483.84	46.71	-7.29	54	50.32	27.64	5.69	36.94	290	101	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	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)
802.11n HT40 CH 03 2422MHz		4845	36.73	-37.27	74	58.13	31.53	9.15	62.08	100	360	P	H
		7266	40.55	-33.45	74	54.48	33.93	11.31	59.17	100	0	P	H
		4845	36.99	-37.01	74	58.39	31.53	9.15	62.08	100	0	P	V
		7266	40.17	-33.83	74	54.1	33.93	11.31	59.17	100	360	P	V
802.11n HT40 CH 06 2437MHz		4875	36.11	-37.89	74	57.35	31.59	9.2	62.03	100	360	P	H
		7311	39.66	-34.34	74	53.49	34.03	11.3	59.16	100	0	P	H
		4875	35.97	-38.03	74	57.21	31.59	9.2	62.03	100	0	P	V
		7311	39.25	-34.75	74	53.08	34.03	11.3	59.16	100	360	P	V
802.11n HT40 CH 09 2452MHz		4905	37.25	-36.75	74	58.35	31.64	9.25	61.99	100	360	P	H
		7356	39.41	-34.59	74	53.06	34.19	11.29	59.13	100	0	P	H
		4905	37.41	-36.59	74	58.51	31.64	9.25	61.99	100	0	P	V
		7356	38.61	-35.39	74	52.26	34.19	11.29	59.13	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Emission below 1GHz

2.4GHz WIFI 802.11n HT40 (LF)

WIFI	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)
2.4GHz 802.11n HT40 LF		31.94	17	-23	40	29.02	18.32	0.68	31.02	-	-	P	H
		133.79	15.88	-27.62	43.5	31.32	13.57	1.39	30.4	-	-	P	H
		323.91	19.45	-26.55	46	32.46	15.33	2.21	30.55	-	-	P	H
		547.98	19.89	-26.11	46	28.68	18.59	2.92	30.3	-	-	P	H
		692.51	21.45	-24.55	46	28.25	20.26	3.32	30.38	-	-	P	H
		825.4	24.2	-21.8	46	28.99	22.01	3.65	30.45	200	14	P	H
		45.52	23.26	-16.74	40	41.01	12.22	0.83	30.8	100	69	P	V
		252.13	20.72	-25.28	46	36.2	13.27	1.75	30.5	-	-	P	V
		288.02	24.91	-21.09	46	38.87	14.5	2.04	30.5	-	-	P	V
		323.91	26.02	-19.98	46	39.03	15.33	2.21	30.55	-	-	P	V
		765.26	23.19	-22.81	46	29.1	21.08	3.51	30.5	-	-	P	V
		928.22	24.92	-21.08	46	28.29	23.25	3.92	30.54	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency per 15.209(c).
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

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

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)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		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)

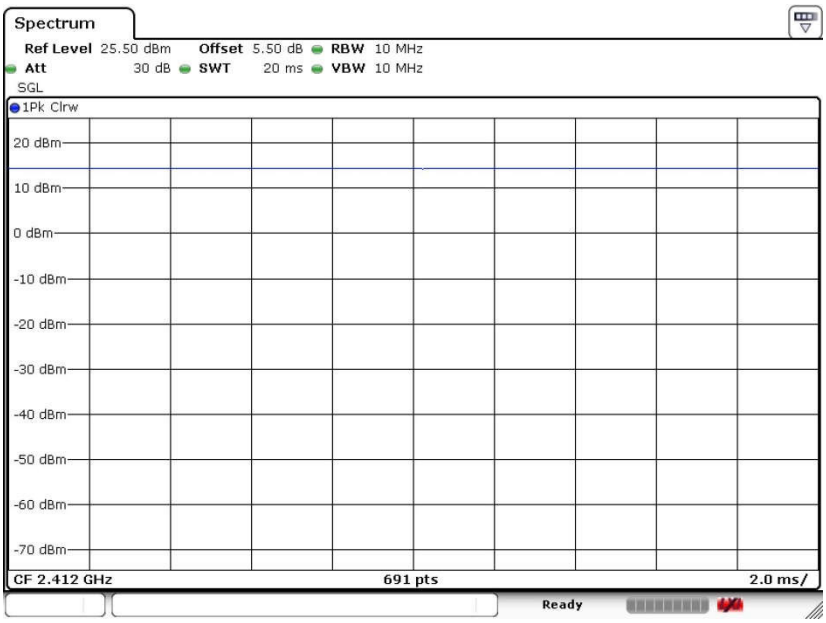
= -10.46(dB)

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

Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	97.46	1.391	0.719	1kHz
2.4GHz 802.11n HT20	97.30	1.306	0.766	1kHz
2.4GHz 802.11n HT40	95.11	0.648	1.544	3kHz

802.11b



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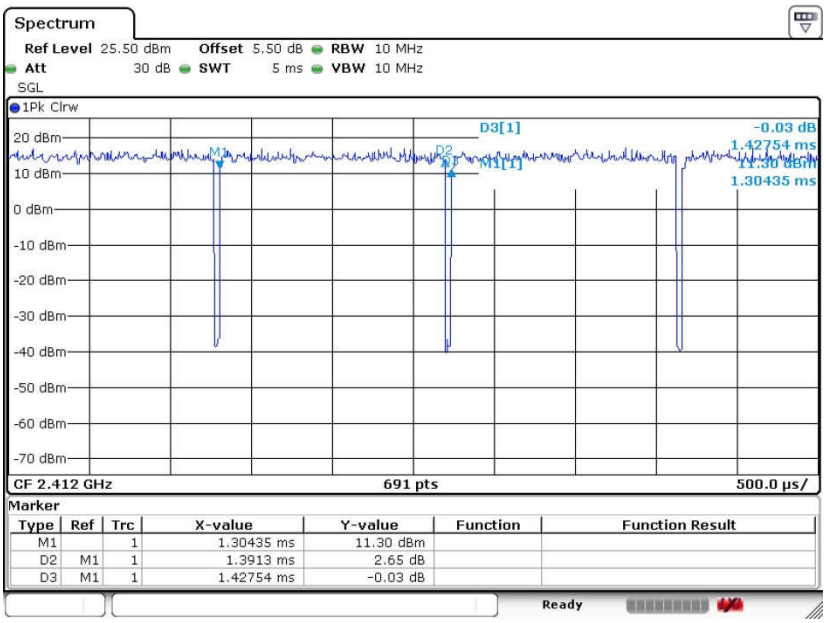
802.11g



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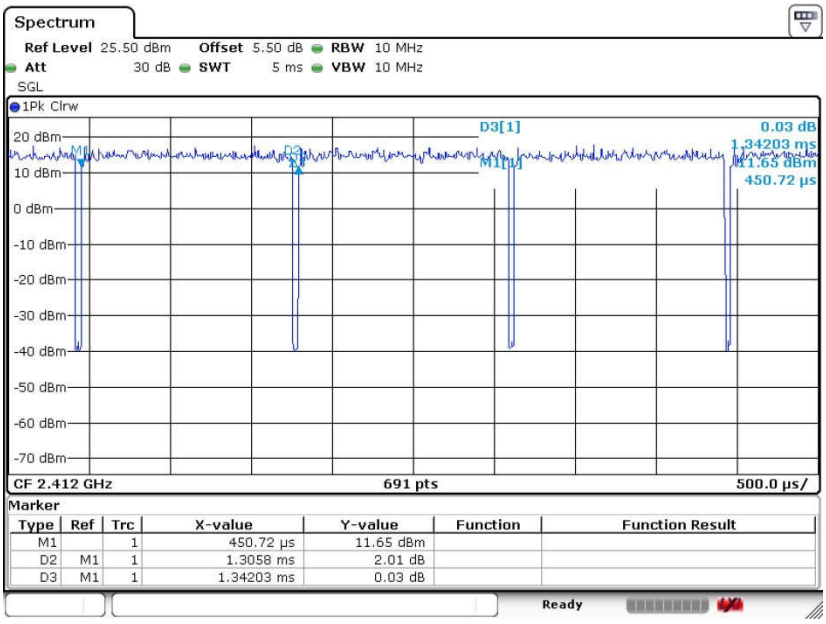
2.4GHz 802.11n HT20



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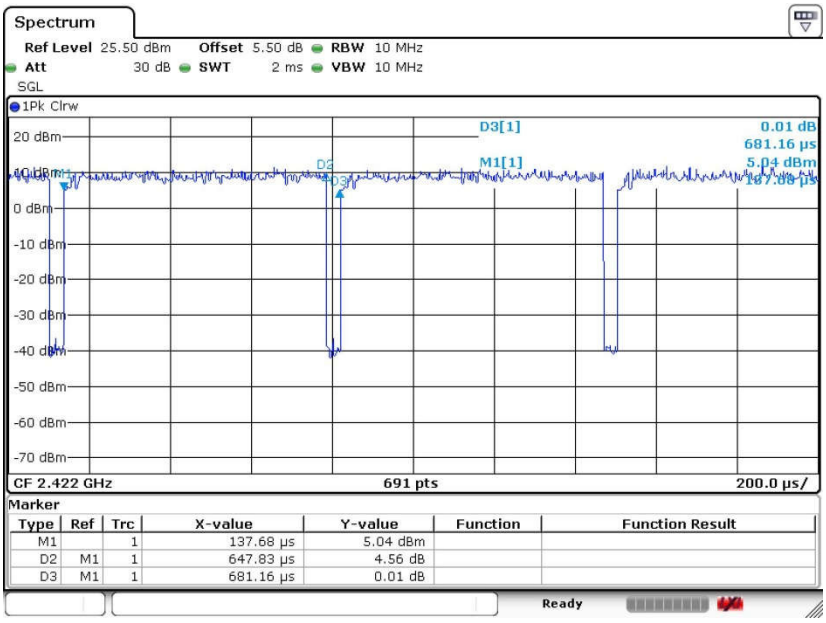
2.4GHz 802.11n HT40



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