



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
PRODUCT ID : 10644
FCC ID : IHDT56WD1
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Mar. 27, 2017 and testing was completed on Apr. 23, 2017. 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.

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Approved by: Jones Tsai / Manager

Sporton International (KunShan) INC.
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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 5.06 dB at 2483.560 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 11.66 dB at 0.644 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Motorola Mobility LLC
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Product ID	10644
FCC ID	IHDT56WD1
EUT supports Radios application	CDMA/EV-DO/GSM/GPRS/EGPRS/ WCDMA/HSPA/DC-HSDPA HSPA+(16QAM uplink is not supported)/LTE WLAN2.4GHz 802.11b/g/n HT20 WLAN5GHz 802.11a/n HT20/HT40 Bluetooth v3.0+EDR/ Bluetooth v4.0 LE/ Bluetooth v4.1 LE/ Bluetooth v4.2 LE
IMEI Code	Conducted: 355668080019974 Radiation: 355668080019602 Conduction: 355668080020477
HW Version	DVT1
SW Version	NPR26.7
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

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	802.11b : 21.65 dBm (0.1462 W) 802.11g : 23.54 dBm (0.2259 W) 802.11n HT20 : 23.62 dBm (0.2301 W)
Antenna Type / Gain	IFA Antenna with gain -1.50 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)



1.5 Specification of Accessory

Specification of Accessory				
AC Adapter 1	Brand Name	Motorola (Acbel)	Model Name	C-P35 SPN5945A
	Power Rating	I/P: 100 - 240 Vac, 300 mA, O/P: 5.2 Vdc, 2000 mA		
AC Adapter 2	Brand Name	Motorola (Salom)	Model Name	SSW-2919UMTJ C-P35 SPN5945A
	Power Rating	I/P: 100 - 240 Vac, 300 mA, O/P: 5.2 Vdc, 2000 mA		
Battery	Brand Name	Motorola (Amperex)	Model Name	HE50
	Power Rating	3.8Vdc, 5000mAh	Type	Li-ion
USB Cable	Brand Name	Motorola	Model Name	SKN6462A
	Signal Line Type	1.00 meter, shielded cable, without ferrite core		

1.6 Modification of EUT

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



1.7 Testing Location

Test Site	Sporton International (KunShan) INC.			
Test Site Location	No.3-2, Pingxiang Road, Kunshan Development Zone, Jiangsu, China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC Registration No.
	TH01-KS	03CH02-KS	CO01-KS	418269

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

1.8 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 v04
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases were recorded in this report.

2.1 Carrier Frequency and Channel

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



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.

802.11b mode Peak Power (dBm)					
Channel	Freq. (MHz)	Data Rate (MHz)			
		1M bps	2M bps	5.5M bps	11M bps
CH 01	2412 MHz	20.57	20.42	20.51	20.54
CH 06	2437 MHz	20.08	20.03	20.04	20.07
CH 11	2462 MHz	21.65	21.55	21.59	21.63

802.11g mode Peak Power (dBm)									
Channel	Freq. (MHz)	Data Rate (MHz)							
		6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
CH 01	2412 MHz	23.54	23.42	23.45	23.51	23.48	23.25	22.85	22.16
CH 06	2437 MHz	23.48	23.38	23.42	23.45	23.46	23.21	22.78	22.11
CH 11	2462 MHz	22.82	22.62	22.65	22.73	22.76	22.75	22.78	22.27

802.11n HT20 mode Peak Power (dBm)									
Channel	Freq. (MHz)	Data Rate (MHz)							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	23.62	23.41	23.44	23.47	23.54	22.97	22.91	22.04
CH 06	2437 MHz	23.08	22.92	23.02	22.98	23.05	22.75	22.64	21.97
CH 11	2462 MHz	22.36	22.21	22.24	22.19	22.31	22.27	22.33	22.26



2.3 Test Mode

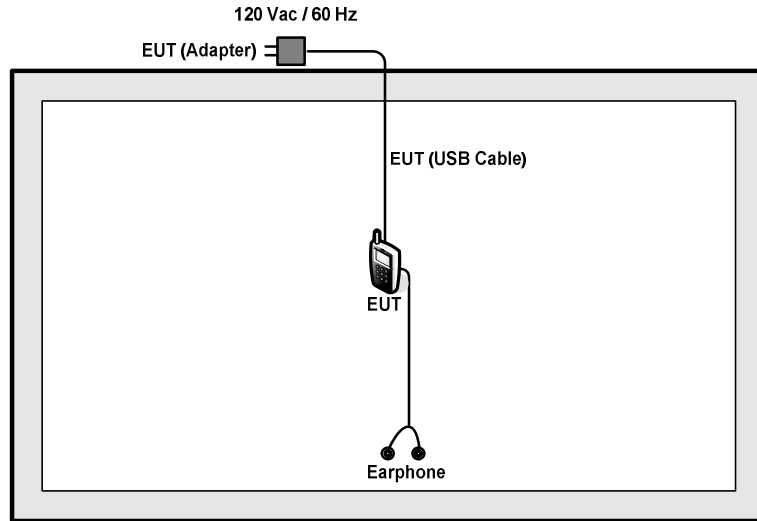
Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

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

Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN(2.4G) Link + Earphone + Battery + USB Cable (Charging from Adapter 1)
	Mode 2 : GSM850 Idle + Bluetooth Link + WLAN(2.4G) Link + Earphone + Battery + USB Cable (Charging from Adapter 2)
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.	

2.4 Connection Diagram of Test System

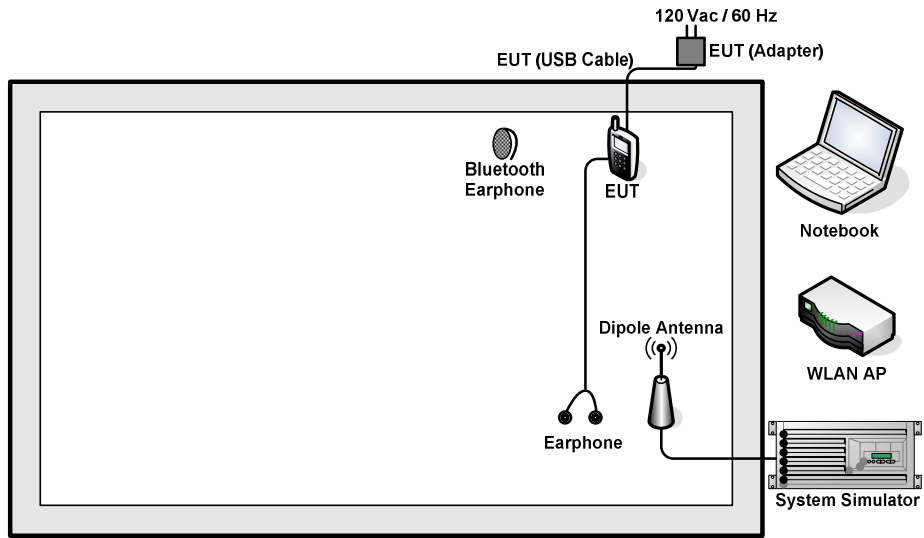
<WLAN 802.11b Tx Mode>



<WLAN 802.11g/n 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	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	FCC DoC	N/A	Shielded cable DC O/P 1.8 m Unshielded AC I/P cable 1.2 m
4.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	Unshielded, 0.53 m
5.	SD Card	Kingston	4GB	N/A	N/A	N/A
6.	Earphone	Lenovo	SH100	N/A	N/A	Unshielded, 1.8 m

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 Notebook 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 derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 5.8 dB.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)}. \\ &= 5.8 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

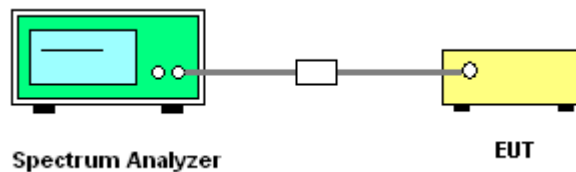
3.1.2 Measuring Instruments

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 v04.
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. Measure and record the results in the test report.

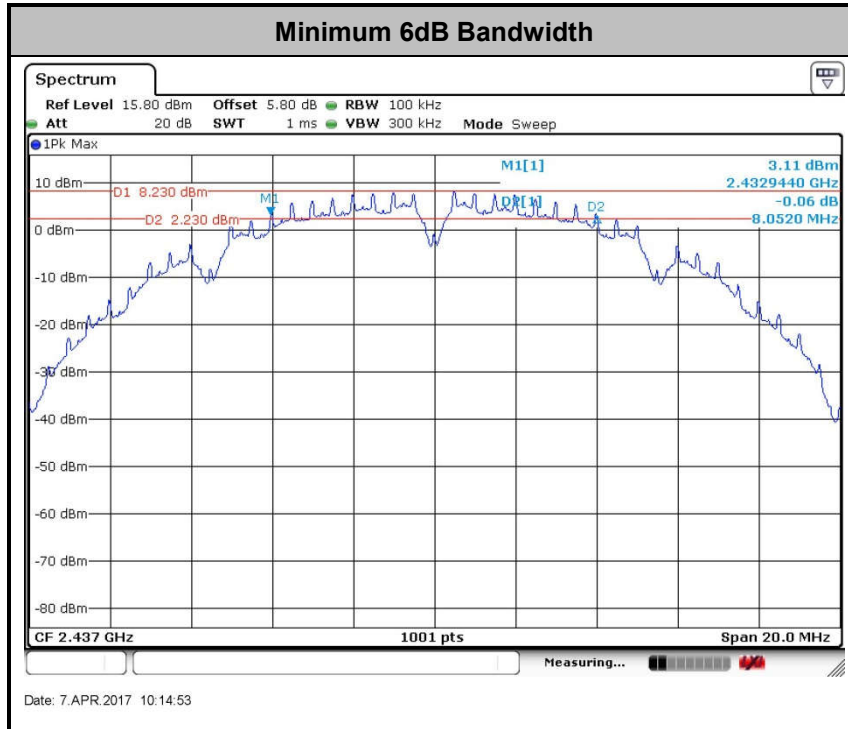
3.1.4 Test Setup





3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.



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.

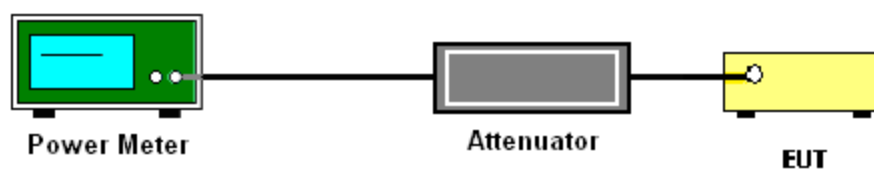
3.2.2 Measuring Instruments

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 v04 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.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.

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.

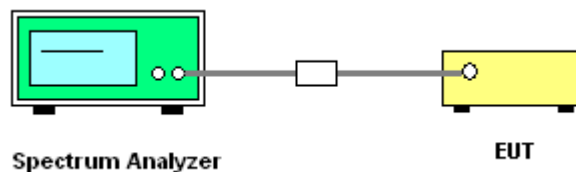
3.3.2 Measuring Instruments

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 v04
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.

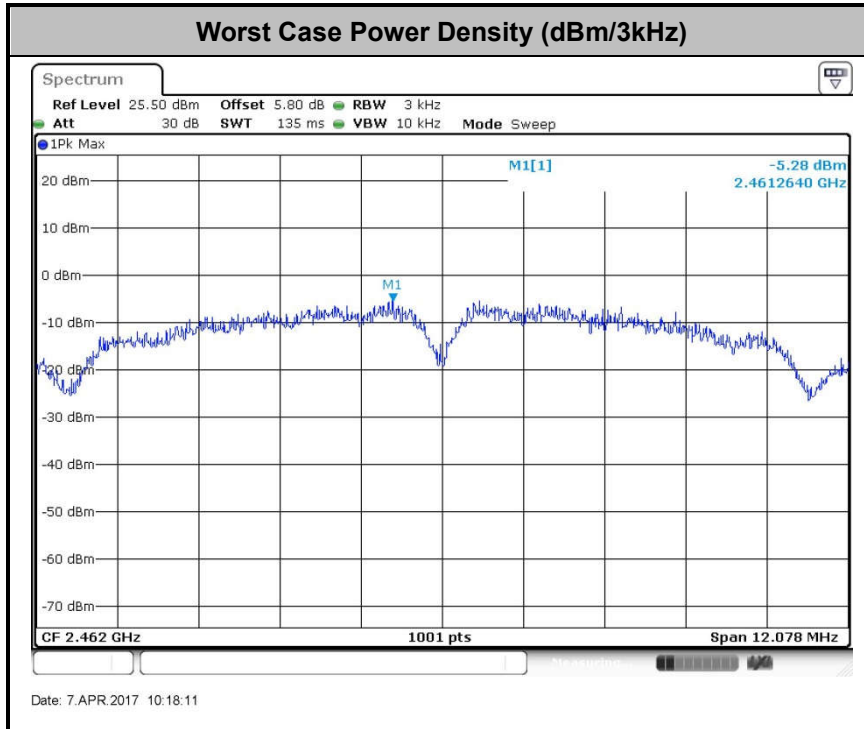
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



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.

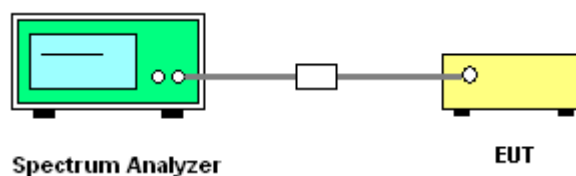
3.4.2 Measuring Instruments

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 v04.
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.
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.

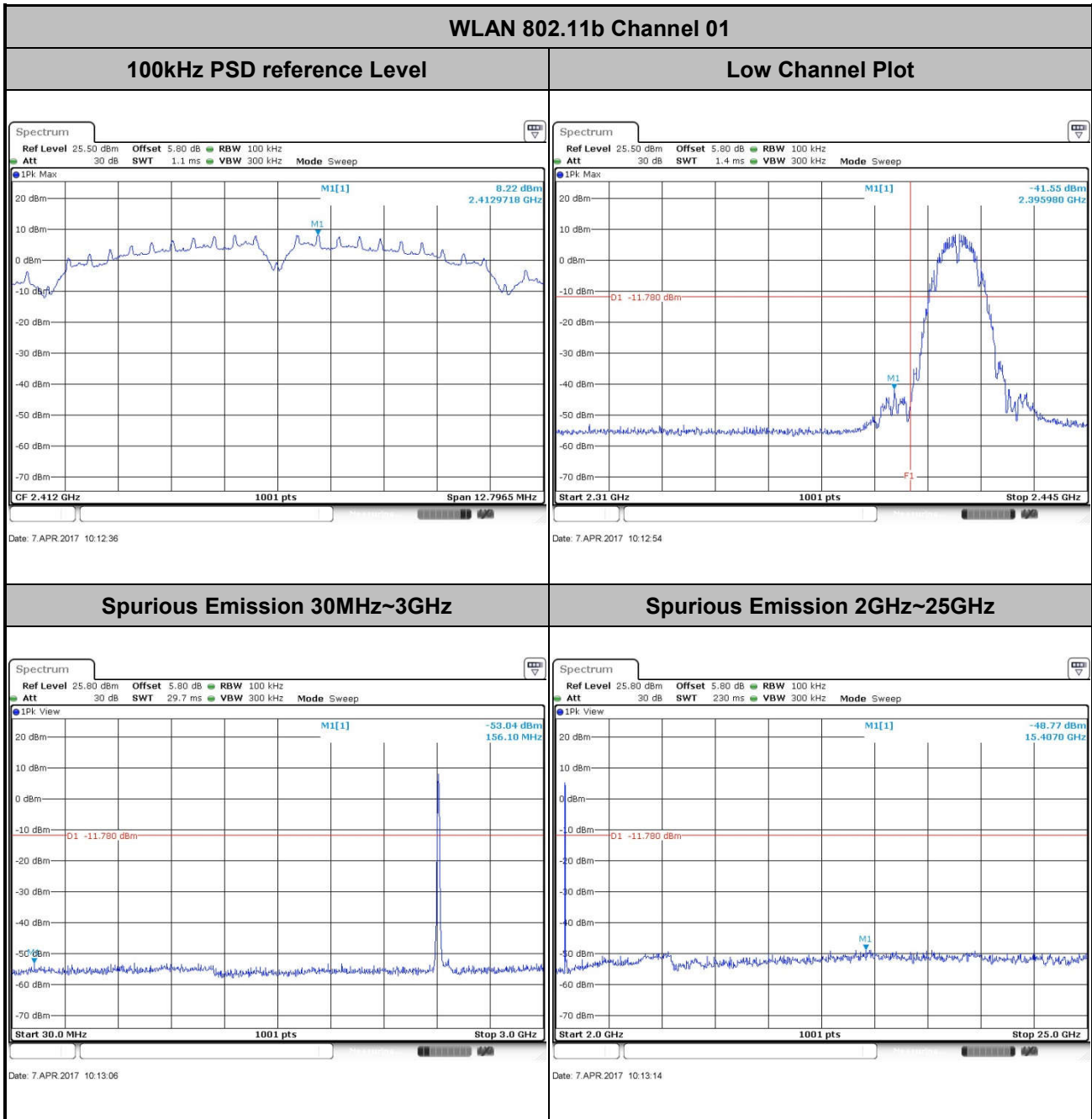
3.4.4 Test Setup





3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~55%
Test Channel :	01	Test Engineer :	Silent Hai

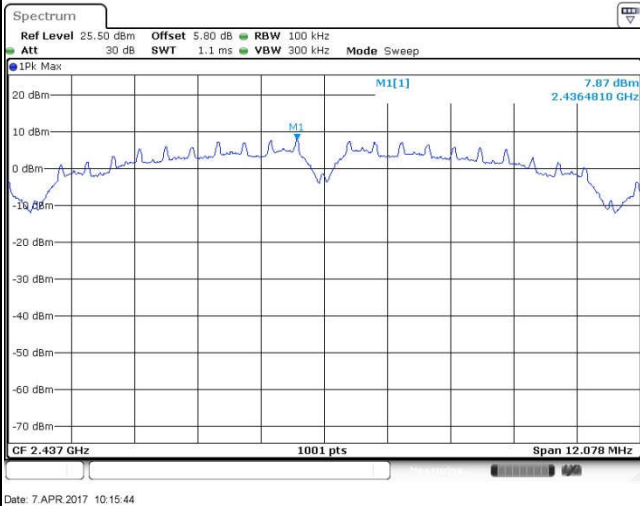




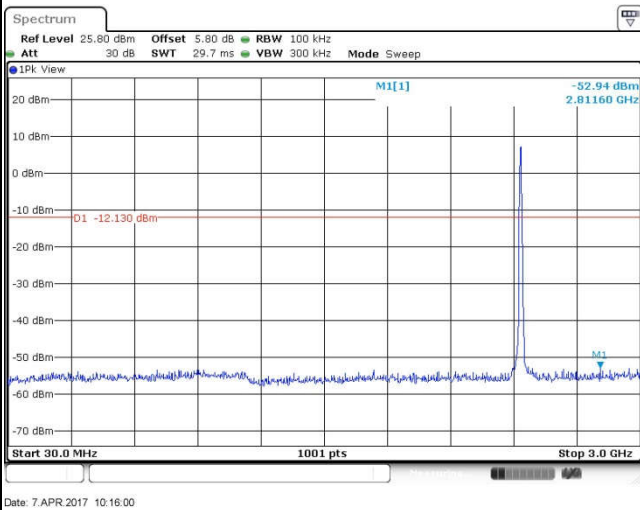
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~55%
Test Channel :	06	Test Engineer :	Silent Hai

WLAN 802.11b Channel 06

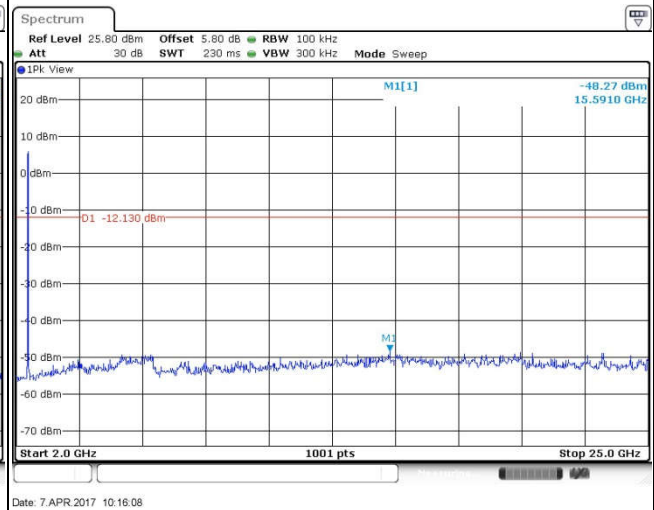
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

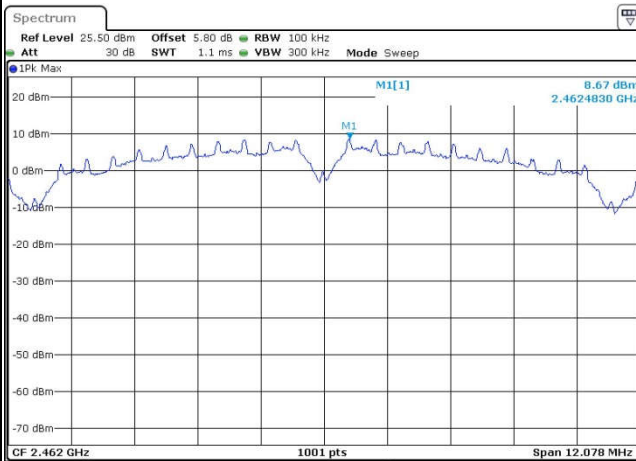




Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~55%
Test Channel :	11	Test Engineer :	Silent Hai

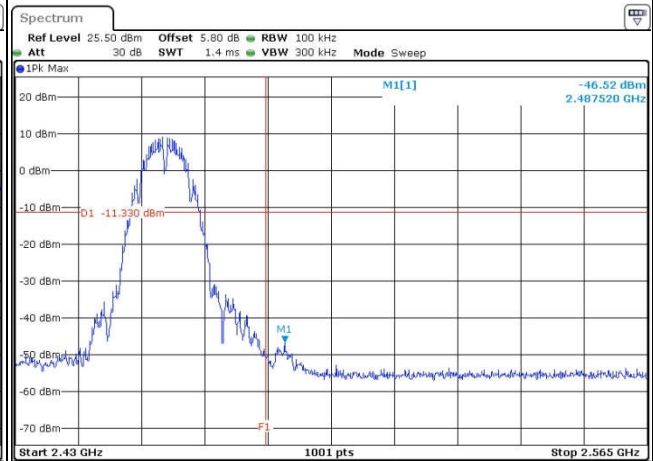
WLAN 802.11b Channel 11

100kHz PSD reference Level



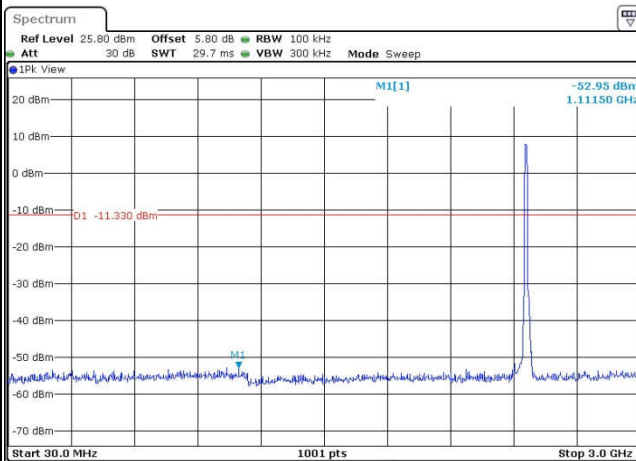
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High Channel Plot



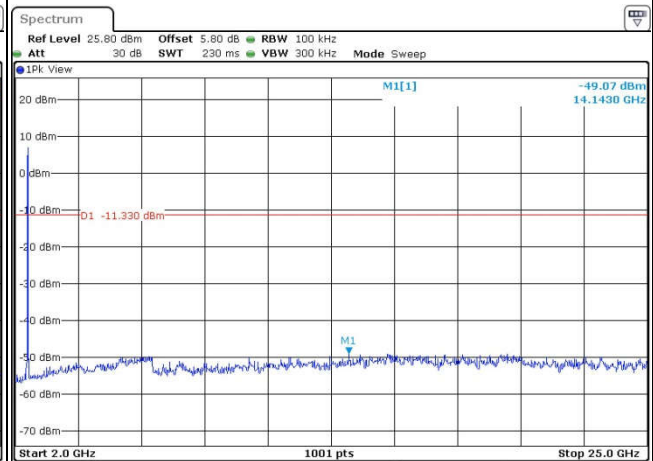
Date: 7.APR.2017 10:18:36

Spurious Emission 30MHz~3GHz



Date: 7.APR.2017 10:18:47

Spurious Emission 2GHz~25GHz



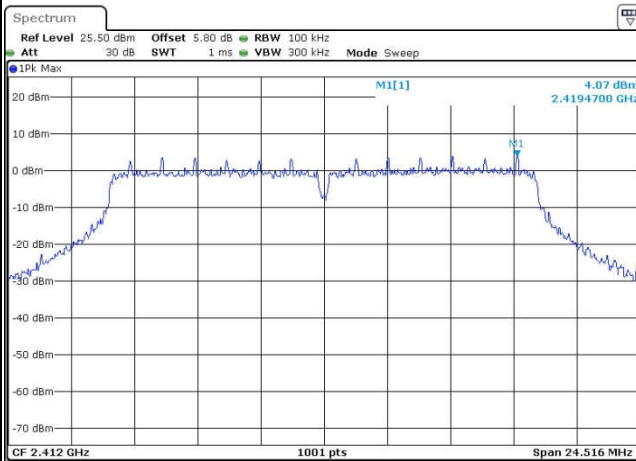
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Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~55%
Test Channel :	01	Test Engineer :	Silent Hai

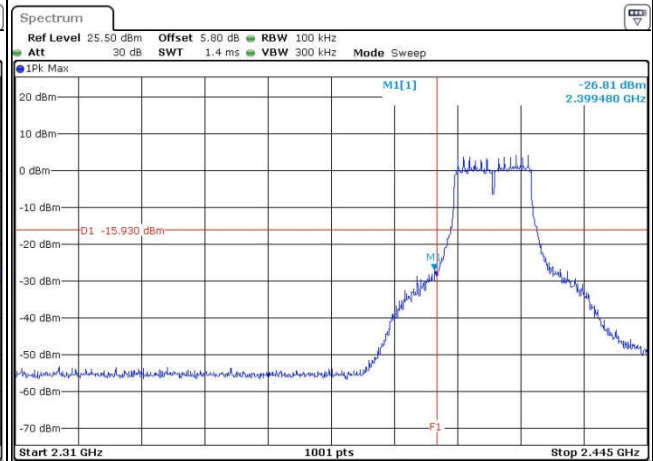
WLAN 802.11g Channel 01

100kHz PSD reference Level



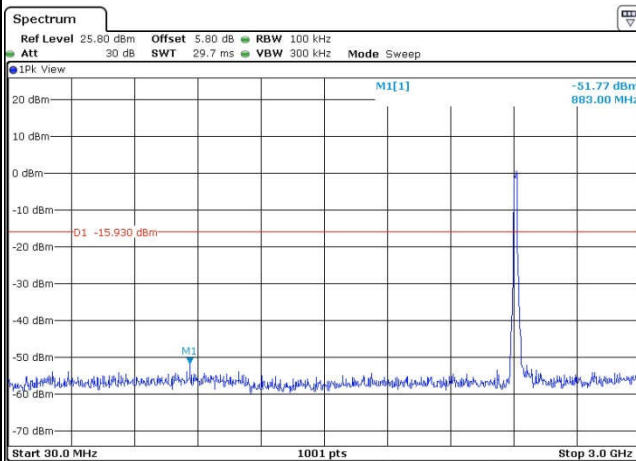
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Low Channel Plot



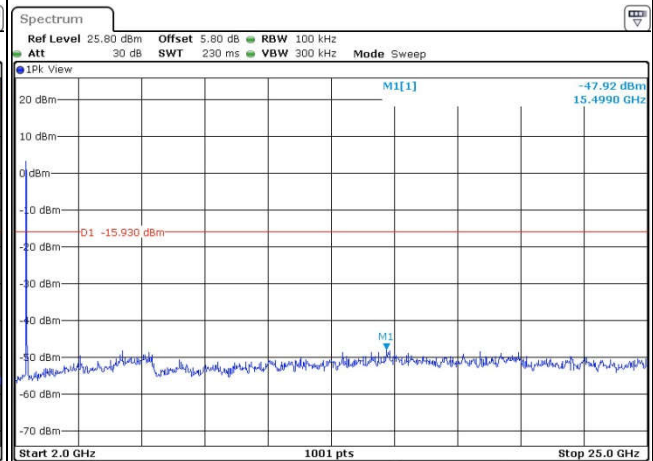
Date: 7.APR.2017 10:22:16

Spurious Emission 30MHz~3GHz



Date: 7.APR.2017 10:24:01

Spurious Emission 2GHz~25GHz



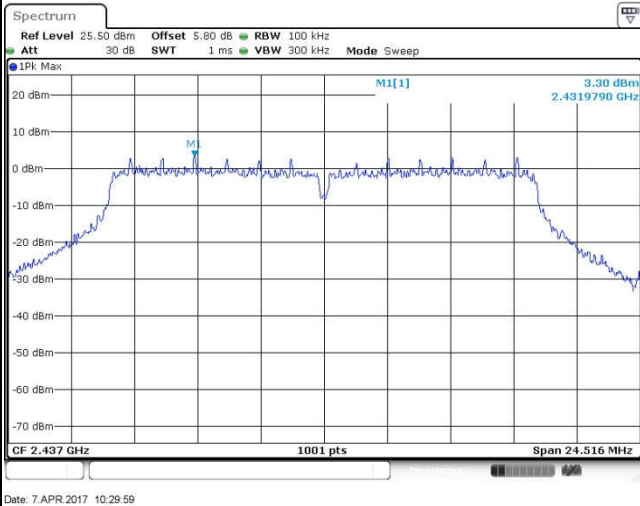
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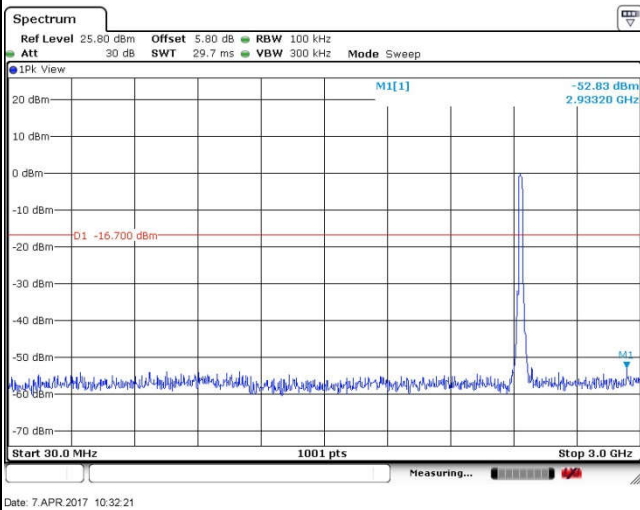
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~55%
Test Channel :	06	Test Engineer :	Silent Hai

WLAN 802.11g Channel 06

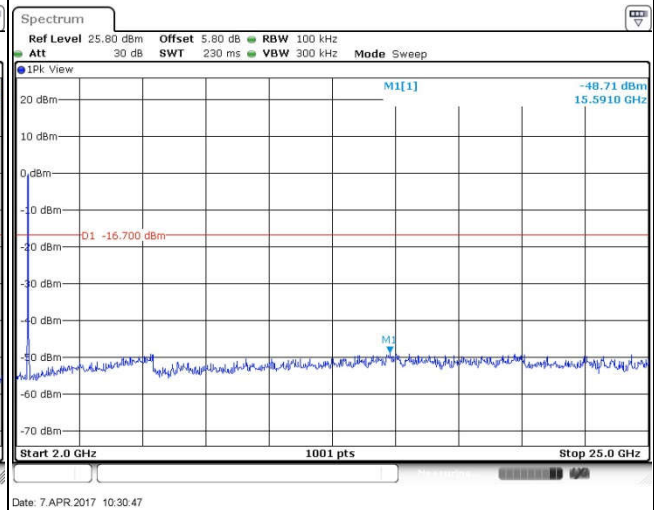
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

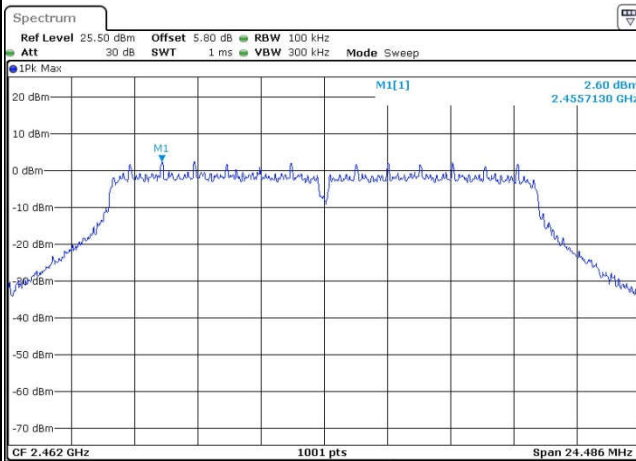




Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~55%
Test Channel :	11	Test Engineer :	Silent Hai

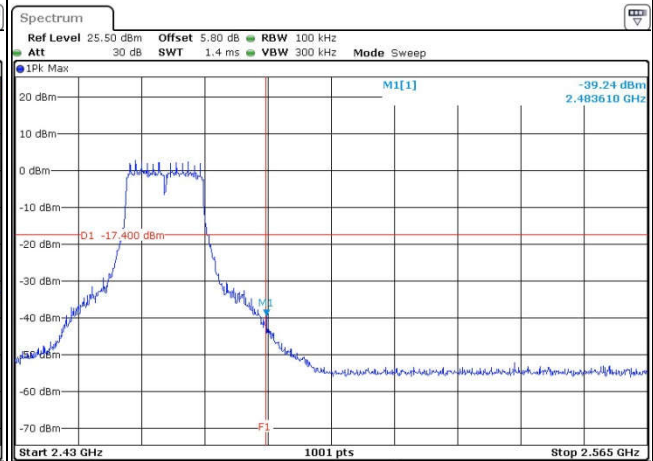
WLAN 802.11g Channel 11

100kHz PSD reference Level



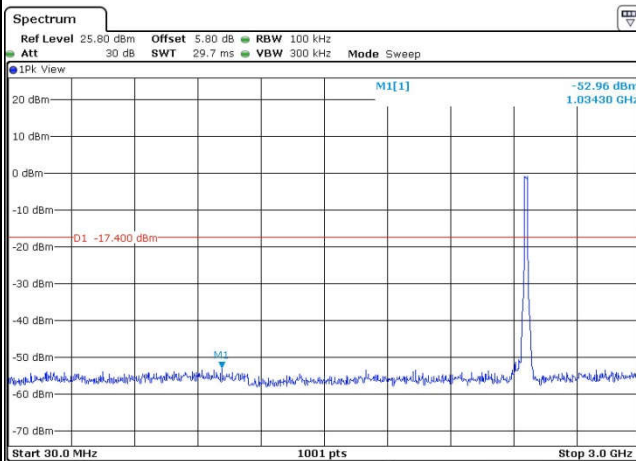
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High Channel Plot



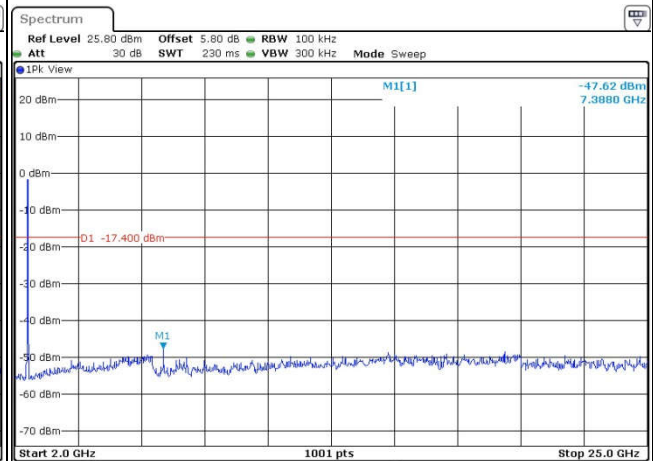
Date: 10.APR.2017 16:55:44

Spurious Emission 30MHz~3GHz



Date: 10.APR.2017 16:57:34

Spurious Emission 2GHz~25GHz



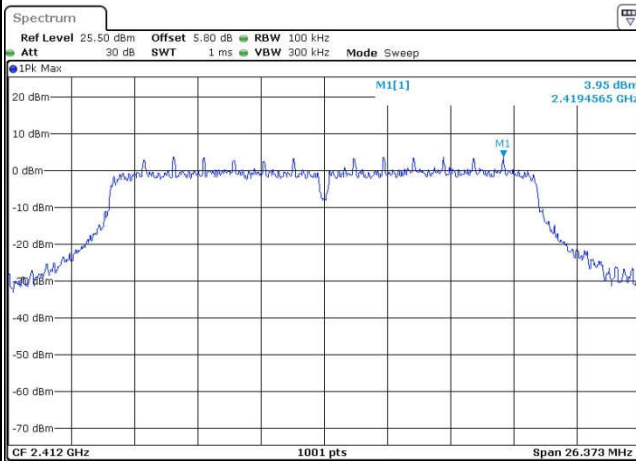
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Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~55%
Test Channel :	01	Test Engineer :	Silent Hai

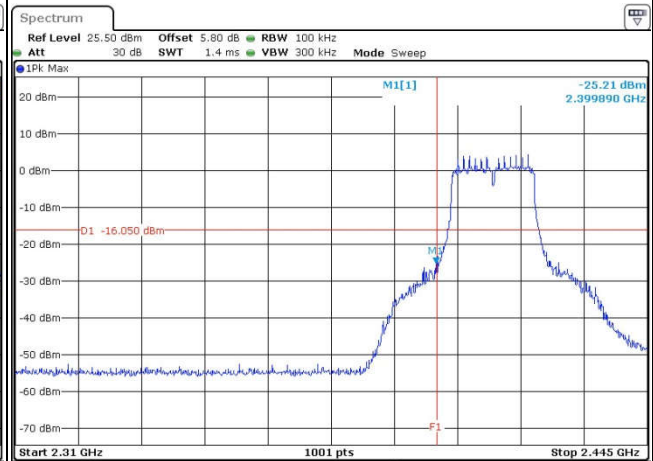
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



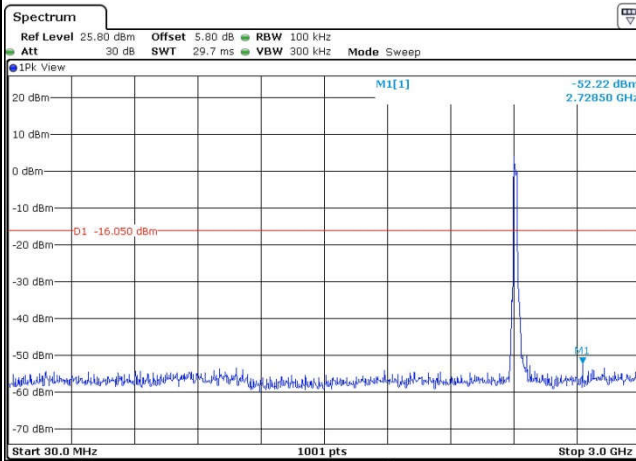
Date: 10.APR.2017 17.04.24

Low Channel Plot



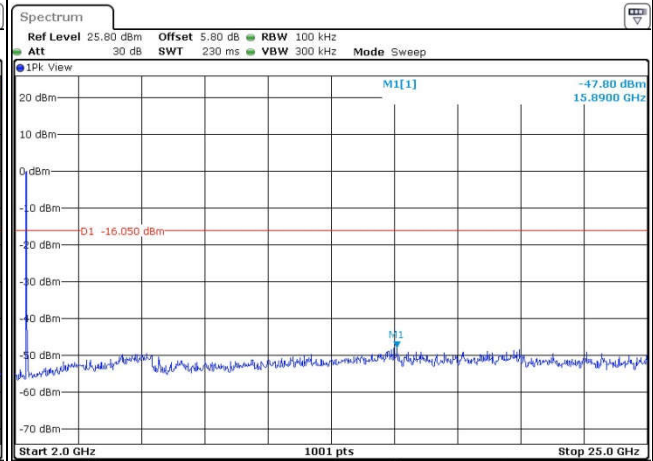
Date: 10.APR.2017 17.05.16

Spurious Emission 30MHz~3GHz



Date: 10.APR.2017 17.08.44

Spurious Emission 2GHz~25GHz



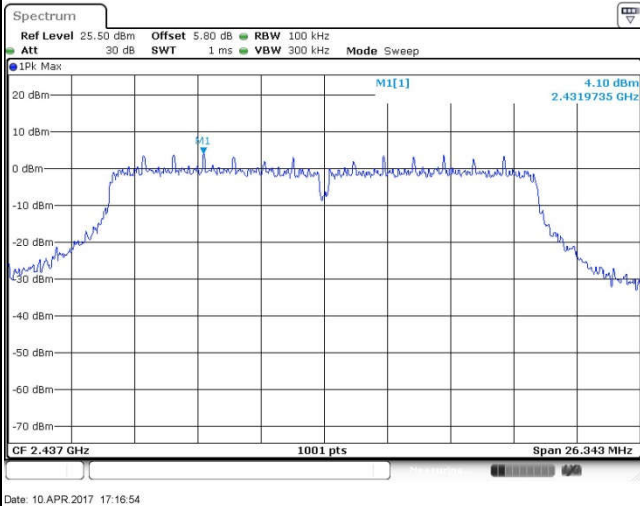
Date: 10.APR.2017 17.06.20



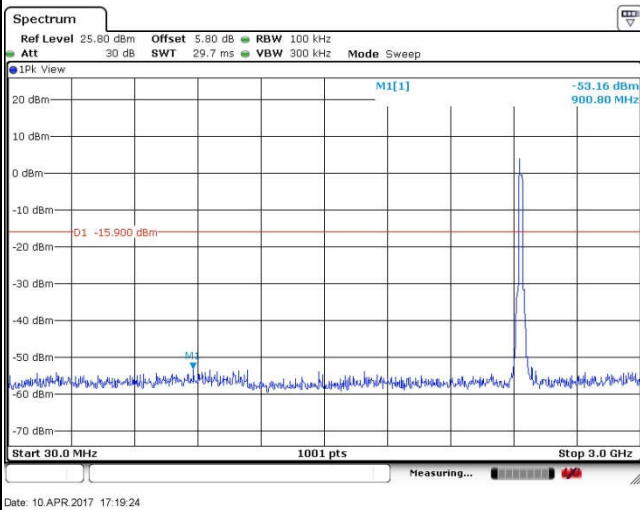
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~55%
Test Channel :	06	Test Engineer :	Silent Hai

WLAN 802.11n HT20 Channel 06

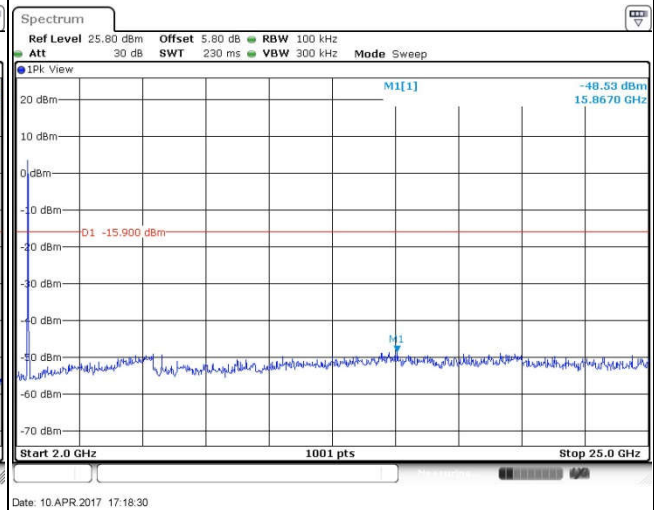
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

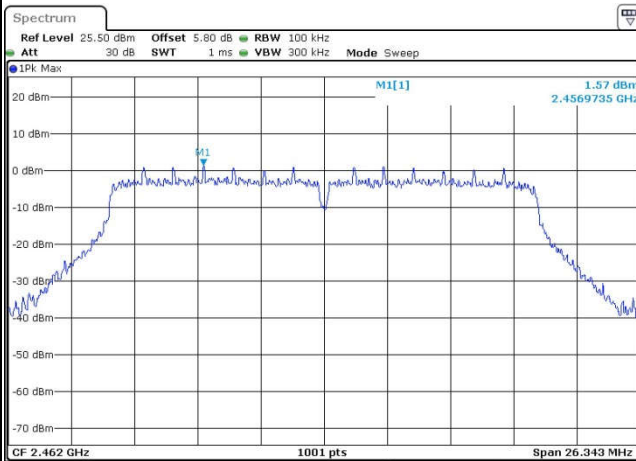




Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~55%
Test Channel :	11	Test Engineer :	Silent Hai

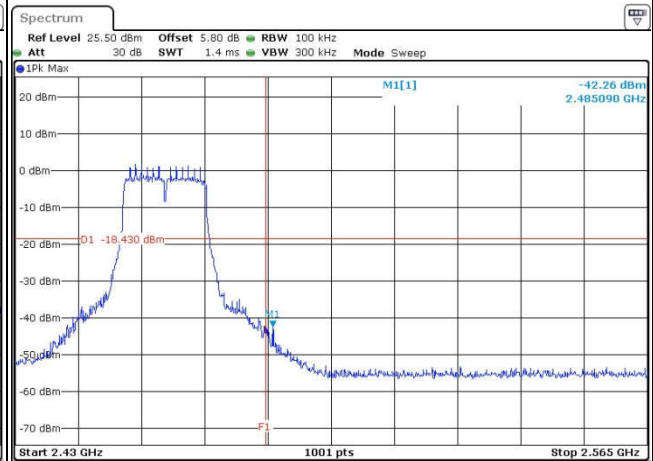
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



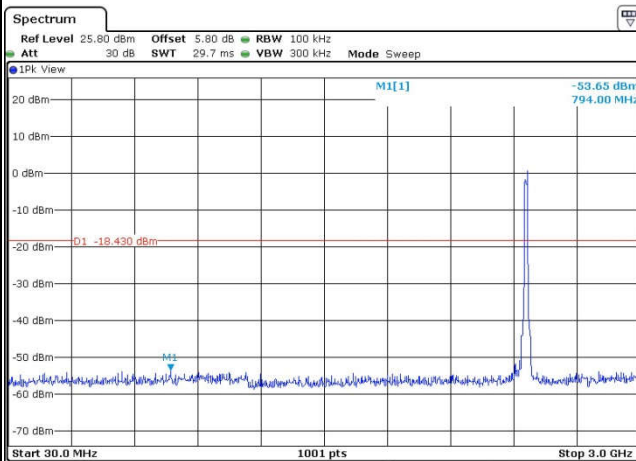
Date: 10.APR.2017 17:22:59

High Channel Plot



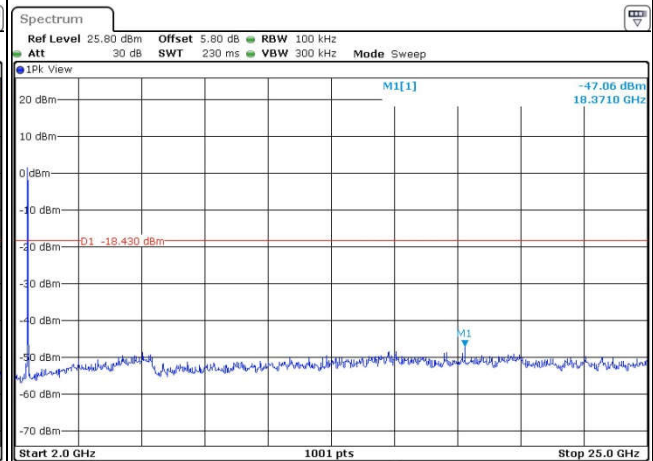
Date: 10.APR.2017 17:23:14

Spurious Emission 30MHz~3GHz



Date: 10.APR.2017 17:24:38

Spurious Emission 2GHz~25GHz



Date: 10.APR.2017 17:24:14



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 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.

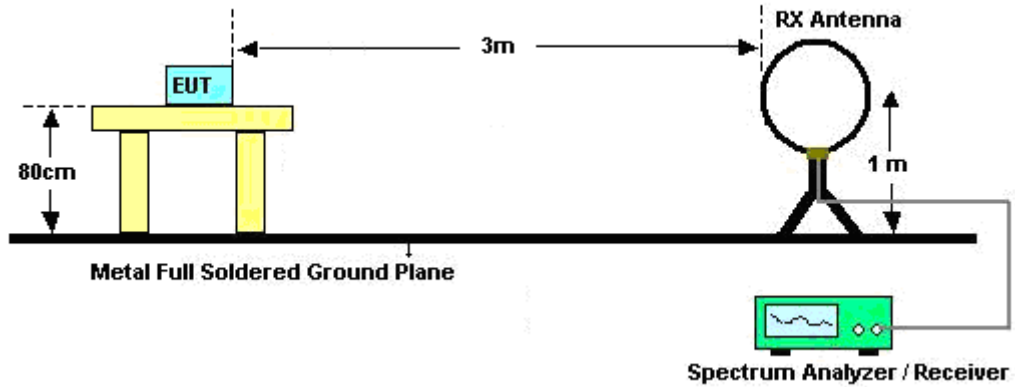


3.5.3 Test Procedures

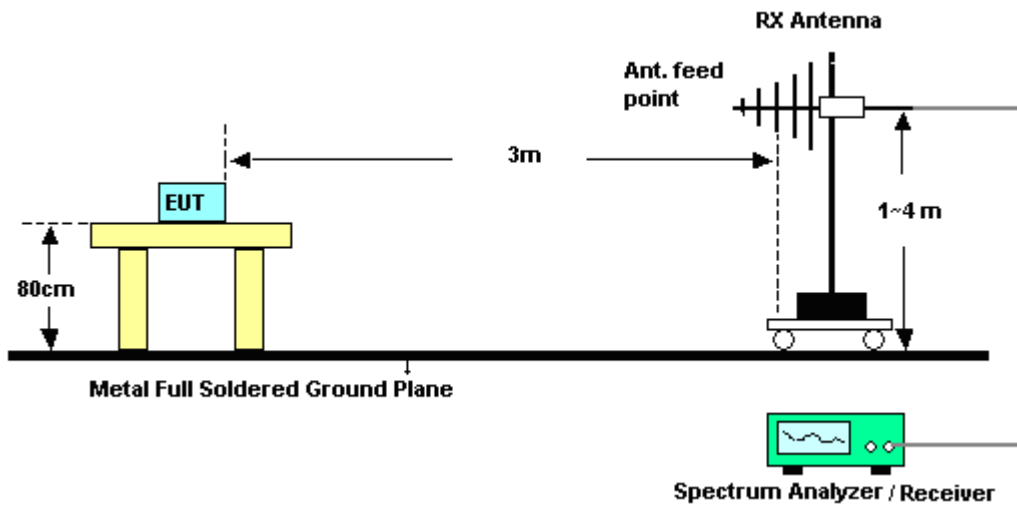
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

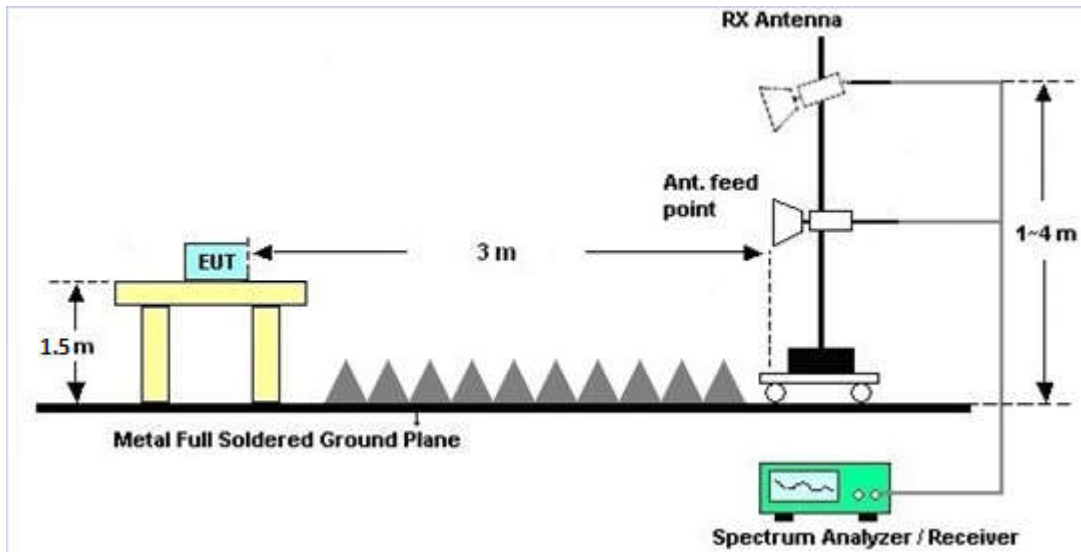
For radiated emissions below 30MHz



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 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.

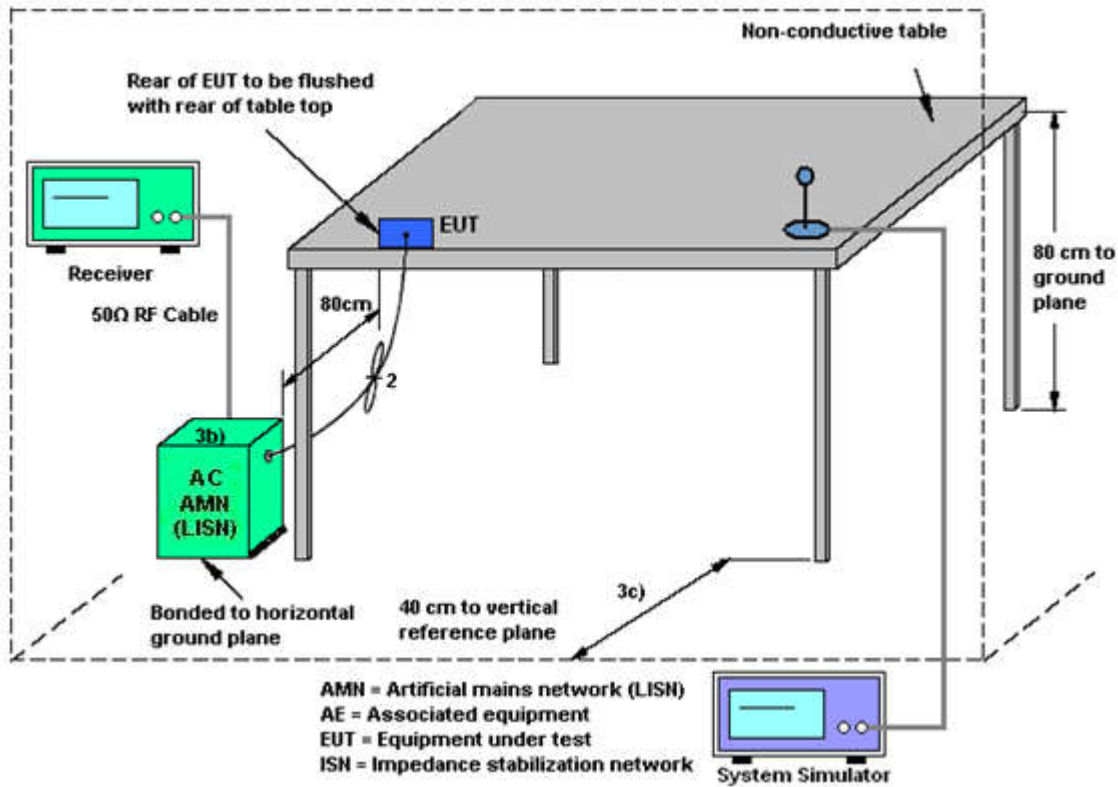
3.6.2 Measuring Instruments

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.

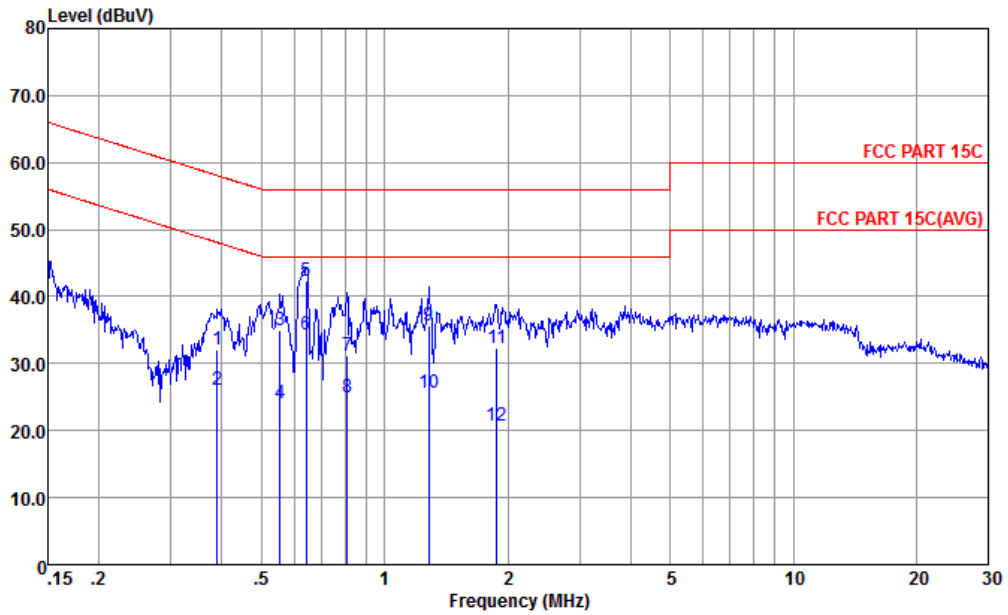
3.6.4 Test Setup





3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	22~24°C
Test Engineer :	Eligah Wang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN(2.4G) Link + Earphone + Battery + USB Cable (Charging from Adapter 2)		

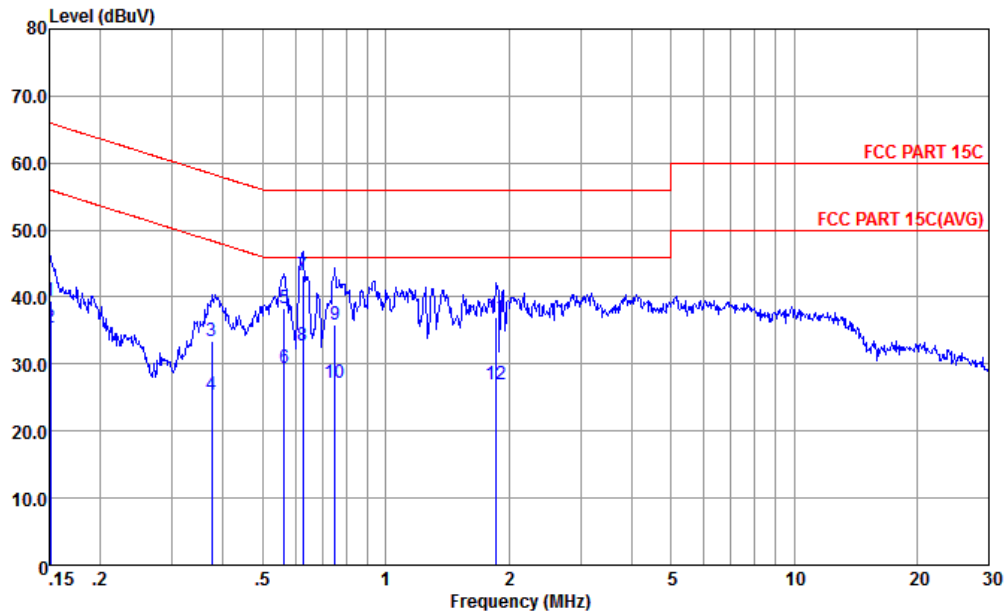


Site : CO01-KS
 Condition : FCC PART 15C LISN-L-161017-060103 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.389	32.08	-26.00	58.08	21.60	0.27	10.21	QP
2	0.389	26.08	-22.00	48.08	15.60	0.27	10.21	Average
3	0.555	35.05	-20.95	56.00	24.61	0.26	10.18	QP
4	0.555	24.05	-21.95	46.00	13.61	0.26	10.18	Average
5	0.644	42.34	-13.66	56.00	31.90	0.26	10.18	QP
6 *	0.644	34.34	-11.66	46.00	23.90	0.26	10.18	Average
7	0.809	31.23	-24.77	56.00	20.81	0.25	10.17	QP
8	0.809	25.03	-20.97	46.00	14.61	0.25	10.17	Average
9	1.282	35.73	-20.27	56.00	25.30	0.24	10.19	QP
10	1.282	25.73	-20.27	46.00	15.30	0.24	10.19	Average
11	1.878	32.30	-23.70	56.00	21.90	0.21	10.19	QP
12	1.878	20.70	-25.30	46.00	10.30	0.21	10.19	Average



Test Mode :	Mode 2	Temperature :	22~24°C
Test Engineer :	Eligah Wang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN(2.4G) Link + Earphone + Battery + USB Cable (Charging from Adapter 2)		



Site : CO01-KS
 Condition : FCC PART 15C LISN-N-161017-060103 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.151	39.33	-26.63	65.96	28.60	0.34	10.39	QP
2	0.151	35.33	-20.63	55.96	24.60	0.34	10.39	Average
3	0.375	33.48	-24.91	58.39	22.91	0.36	10.21	QP
4	0.375	25.48	-22.91	48.39	14.91	0.36	10.21	Average
5	0.564	38.36	-17.64	56.00	27.80	0.38	10.18	QP
6	0.564	29.46	-16.54	46.00	18.90	0.38	10.18	Average
7 *	0.627	43.16	-12.84	56.00	32.60	0.38	10.18	QP
8	0.627	32.86	-13.14	46.00	22.30	0.38	10.18	Average
9	0.751	35.86	-20.14	56.00	25.30	0.38	10.18	QP
10	0.751	27.16	-18.84	46.00	16.60	0.38	10.18	Average
11	1.868	36.90	-19.10	56.00	26.30	0.41	10.19	QP
12	1.868	26.90	-19.10	46.00	16.30	0.41	10.19	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. 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 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	FSV30	101338	10Hz~30GHz	Apr. 22, 2016	Apr. 07, 2017~ Apr. 10, 20177	Apr. 21, 2017	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 19, 2017	Apr. 07, 2017~ Apr. 10, 20177	Jan. 18, 2018	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 19, 2017	Apr. 07, 2017~ Apr. 10, 2017	Jan. 18, 2018	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max x 30dBm	Aug. 09, 2016	Apr. 07, 2017	Aug. 08, 2017	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY551502 08	10Hz~44G,MAX 30dB	Apr. 22, 2016	Apr. 07, 2017	Apr. 21, 2017	Radiation (03CH02-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 23, 2016	Apr. 07, 2017	Nov. 22, 2017	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Aug. 20, 2016	Apr. 07, 2017	Aug. 19, 2017	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 22, 2016	Apr. 07, 2017	Oct. 21, 2017	Radiation (03CH02-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA1702 49	15GHz ~40GHz	Feb. 15, 2017	Apr. 07, 2017	Feb. 14, 2018	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Aug. 09, 2016	Apr. 07, 2017	Aug. 08, 2017	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A023 84	1GHz~26.5GHz	Oct. 13, 2016	Apr. 07, 2017	Oct. 12, 2017	Radiation (03CH02-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	1943529	100MHz-18GHz	Jan. 19, 2017	Apr. 07, 2017	Jan. 18, 2018	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002 473	N/A	NCR	Apr. 07, 2017	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Apr. 07, 2017	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Apr. 07, 2017	NCR	Radiation (03CH02-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 20, 2017	Apr. 23, 2017	Apr. 19, 2018	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2016	Apr. 23, 2017	Oct. 13, 2017	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2016	Apr. 23, 2017	Oct. 13, 2017	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Oct. 13, 2016	Apr. 23, 2017	Oct. 13, 2017	Conduction (CO01-KS)

NCR: No Calibration Required



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2 dB
---	--------

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.7 dB
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Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.3 dB
---	--------



Appendix A. Conducted Test Results

A1 - DTS Part

Test Engineer:	Silent Hai	Temperature:	21~25	°C
Test Date:	2017/4/7~2017/4/10	Relative Humidity:	51~55	%

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	13.34	8.53	0.50	Pass
11b	1Mbps	1	6	2437	13.39	8.05	0.50	Pass
11b	1Mbps	1	11	2462	13.44	8.05	0.50	Pass
11g	6Mbps	1	1	2412	18.53	16.34	0.50	Pass
11g	6Mbps	1	6	2437	18.78	16.34	0.50	Pass
11g	6Mbps	1	11	2462	18.48	16.32	0.50	Pass
HT20	MCS0	1	1	2412	19.28	17.58	0.50	Pass
HT20	MCS0	1	6	2437	19.48	17.56	0.50	Pass
HT20	MCS0	1	11	2462	19.03	17.56	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	20.57	30.00	-1.50	19.07	36.00	Pass
11b	1Mbps	1	6	2437	20.08	30.00	-1.50	18.58	36.00	Pass
11b	1Mbps	1	11	2462	21.65	30.00	-1.50	20.15	36.00	Pass
11g	6Mbps	1	1	2412	23.54	30.00	-1.50	22.04	36.00	Pass
11g	6Mbps	1	6	2437	23.48	30.00	-1.50	21.98	36.00	Pass
11g	6Mbps	1	11	2462	22.82	30.00	-1.50	21.32	36.00	Pass
HT20	MCS0	1	1	2412	23.62	30.00	-1.50	22.12	36.00	Pass
HT20	MCS0	1	6	2437	23.08	30.00	-1.50	21.58	36.00	Pass
HT20	MCS0	1	11	2462	22.36	30.00	-1.50	20.86	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

2.4GHz Band						
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.11	17.72
11b	1Mbps	1	6	2437	0.11	17.29
11b	1Mbps	1	11	2462	0.11	18.25
11g	6Mbps	1	1	2412	0.58	15.75
11g	6Mbps	1	6	2437	0.58	15.57
11g	6Mbps	1	11	2462	0.58	14.16
HT20	MCS0	1	1	2412	0.64	15.71
HT20	MCS0	1	6	2437	0.64	15.22
HT20	MCS0	1	11	2462	0.64	13.25

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	-6.03	-1.50	8.00	Pass
11b	1Mbps	1	6	2437	-5.97	-1.50	8.00	Pass
11b	1Mbps	1	11	2462	-5.28	-1.50	8.00	Pass
11g	6Mbps	1	1	2412	-10.56	-1.50	8.00	Pass
11g	6Mbps	1	6	2437	-11.22	-1.50	8.00	Pass
11g	6Mbps	1	11	2462	-11.60	-1.50	8.00	Pass
HT20	MCS0	1	1	2412	-9.86	-1.50	8.00	Pass
HT20	MCS0	1	6	2437	-10.28	-1.50	8.00	Pass
HT20	MCS0	1	11	2462	-12.16	-1.50	8.00	Pass



Appendix B. Radiated Spurious Emission

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2389.95	46.46	-27.54	74	47.82	25.4	4.76	31.52	136	106	P	H
		2389.95	38.63	-15.37	54	39.99	25.4	4.76	31.52	136	106	A	H
	*	2412	102.05	-	-	103.23	25.54	4.78	31.5	128	247	P	H
	*	2410	98.62	-	-	99.8	25.54	4.78	31.5	136	106	A	H
		2389.95	44.95	-29.05	74	46.31	25.4	4.76	31.52	116	239	P	V
		2389.95	35.85	-18.15	54	37.21	25.4	4.76	31.52	116	239	A	V
	*	2412	99.34	-	-	100.52	25.54	4.78	31.5	116	239	P	V
	*	2410	96.08	-	-	97.26	25.54	4.78	31.5	116	239	A	V
802.11b CH 06 2437MHz		2388	43.31	-30.69	74	44.67	25.4	4.76	31.52	100	245	P	H
		2389.95	32.8	-21.2	54	34.16	25.4	4.76	31.52	100	245	A	H
	*	2438	103.43	-	-	104.26	25.83	4.82	31.48	100	245	P	H
	*	2438	100.36	-	-	101.19	25.83	4.82	31.48	100	245	A	H
		2484.34	47.25	-26.75	74	47.74	26.11	4.86	31.46	100	245	P	H
		2483.68	36.44	-17.56	54	36.93	26.11	4.86	31.46	100	245	A	H
		2389.3	42.37	-31.63	74	43.73	25.4	4.76	31.52	300	258	P	V
		2389.56	31.23	-22.77	54	32.59	25.4	4.76	31.52	300	258	A	V
	*	2438	99.59	-	-	100.42	25.83	4.82	31.48	300	258	P	V
	*	2438	96.57	-	-	97.4	25.83	4.82	31.48	300	258	A	V
		2485.18	43.5	-30.5	74	43.99	26.11	4.86	31.46	300	258	P	V
	2483.51	32.55	-21.45	54	33.04	26.11	4.86	31.46	300	258	A	V	



802.11b CH 11 2462MHz	*	2462	103.76	-	-	104.42	25.97	4.84	31.47	120	247	P	H
	*	2460	100.47	-	-	101.13	25.97	4.84	31.47	120	247	A	H
		2483.68	51.63	-22.37	74	52.12	26.11	4.86	31.46	120	247	P	H
		2487.46	42.8	-11.2	54	43.29	26.11	4.86	31.46	120	247	A	H
	*	2462	100.04	-	-	100.7	25.97	4.84	31.47	100	242	P	V
	*	2460	96.82	-	-	97.48	25.97	4.84	31.47	100	242	A	V
		2486.14	47.47	-26.53	74	47.96	26.11	4.86	31.46	100	242	P	V
		2486.26	38.06	-15.94	54	38.55	26.11	4.86	31.46	100	242	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	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		4824	45.64	-28.36	74	67.25	30.9	6.87	59.38	150	360	P	H
		4824	42.24	-31.76	74	63.85	30.9	6.87	59.38	150	360	P	V
802.11b CH 06 2437MHz		4872	43.72	-30.28	74	64.99	31.01	6.86	59.14	150	360	P	H
		7308	40.67	-33.33	74	55.41	35.34	8.47	58.55	150	360	P	H
		4872	41.54	-32.46	74	62.81	31.01	6.86	59.14	150	360	P	V
		7308	40.61	-33.39	74	55.35	35.34	8.47	58.55	150	360	P	V
802.11b CH 11 2462MHz		4926	43.94	-30.06	74	64.88	31.12	6.84	58.9	150	360	P	H
		7386	41.02	-32.98	74	55.96	35.55	8.49	58.98	150	360	P	H
		4926	41.37	-32.63	74	62.31	31.12	6.84	58.9	150	360	P	V
		7386	41.46	-32.54	74	56.4	35.55	8.49	58.98	150	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	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		2389.82	61.91	-12.09	74	63.27	25.4	4.76	31.52	113	14	P	H
		2389.95	47.1	-6.9	54	48.46	25.4	4.76	31.52	113	14	A	H
	*	2418	103.59	-	-	104.77	25.54	4.78	31.5	113	14	P	H
	*	2418	95.68	-	-	96.86	25.54	4.78	31.5	113	14	A	H
		2389.82	65.76	-8.24	74	67.12	25.4	4.76	31.52	324	246	P	V
	!	2389.95	48.31	-5.69	54	49.67	25.4	4.76	31.52	324	246	A	V
	*	2418	103.33	-	-	104.51	25.54	4.78	31.5	324	246	P	V
	*	2418	94.84	-	-	96.02	25.54	4.78	31.5	324	246	A	V
802.11g CH 06 2437MHz		2384.75	41.88	-32.12	74	43.31	25.35	4.75	31.53	141	17	P	H
		2389.69	32.24	-21.76	54	33.6	25.4	4.76	31.52	141	17	A	H
	*	2432	101.85	-	-	102.85	25.69	4.8	31.49	141	17	P	H
	*	2430	94.09	-	-	95.09	25.69	4.8	31.49	141	17	A	H
		2489.38	46.82	-27.18	74	47.13	26.26	4.88	31.45	141	17	P	H
		2489.32	38.08	-15.92	54	38.39	26.26	4.88	31.45	141	17	A	H
		2389.95	41.44	-32.56	74	42.8	25.4	4.76	31.52	266	76	P	V
		2389.82	31.84	-22.16	54	33.2	25.4	4.76	31.52	266	76	A	V
	*	2434	102.18	-	-	103.18	25.69	4.8	31.49	266	76	P	V
	*	2432	93.84	-	-	94.84	25.69	4.8	31.49	266	76	A	V
		2489.38	47.48	-26.52	74	47.79	26.26	4.88	31.45	266	76	P	V
		2489.2	38.92	-15.08	54	39.23	26.26	4.88	31.45	266	76	A	V



802.11g CH 11 2462MHz	*	2468	101.15	-	-	101.81	25.97	4.84	31.47	100	21	P	H
	*	2468	93.13	-	-	93.79	25.97	4.84	31.47	100	21	A	H
		2485	65.23	-8.77	74	65.72	26.11	4.86	31.46	100	21	P	H
	!	2483.86	48.07	-5.93	54	48.56	26.11	4.86	31.46	100	21	A	H
	*	2466	101.28	-	-	101.94	25.97	4.84	31.47	274	223	P	V
	*	2466	93.49	-	-	94.15	25.97	4.84	31.47	274	223	A	V
		2483.98	65.43	-8.57	74	65.92	26.11	4.86	31.46	274	223	P	V
	!	2483.56	48.94	-5.06	54	49.43	26.11	4.86	31.46	274	223	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	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		4824	38.21	-35.79	74	59.82	30.9	6.87	59.38	150	360	P	H
		4824	38.21	-35.79	74	59.82	30.9	6.87	59.38	150	360	P	V
802.11g CH 06 2437MHz		4872	37.52	-36.48	74	58.79	31.01	6.86	59.14	150	360	P	H
		7308	41.39	-32.61	74	56.13	35.34	8.47	58.55	150	360	P	H
		4872	37.55	-36.45	74	58.82	31.01	6.86	59.14	150	360	P	V
		7308	41.59	-32.41	74	56.33	35.34	8.47	58.55	150	360	P	V
802.11g CH 11 2462MHz		4926	39.23	-34.77	74	60.17	31.12	6.84	58.9	150	360	P	H
		7386	41.75	-32.25	74	56.69	35.55	8.49	58.98	150	360	P	H
		4926	37.82	-36.18	74	58.76	31.12	6.84	58.9	150	360	P	V
		7386	40.65	-33.35	74	55.59	35.55	8.49	58.98	150	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	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		2389.69	64.48	-9.52	74	65.84	25.4	4.76	31.52	117	22	P	H
		2389.95	47.84	-6.16	54	49.2	25.4	4.76	31.52	117	22	A	H
	*	2420	102.51	-	-	103.51	25.69	4.8	31.49	117	22	P	H
	*	2420	94.64	-	-	95.64	25.69	4.8	31.49	117	22	A	H
		2389.17	64.97	-9.03	74	66.33	25.4	4.76	31.52	289	256	P	V
		2389.95	47.5	-6.5	54	48.86	25.4	4.76	31.52	289	256	A	V
	*	2418	102.97	-	-	104.15	25.54	4.78	31.5	289	256	P	V
	*	2420	95.01	-	-	96.01	25.69	4.8	31.49	289	256	A	V
802.11n HT20 CH 06 2437MHz		2388.52	42.15	-31.85	74	43.51	25.4	4.76	31.52	100	18	P	H
		2389.82	32.19	-21.81	54	33.55	25.4	4.76	31.52	100	18	A	H
	*	2432	101.5	-	-	102.5	25.69	4.8	31.49	100	18	P	H
	*	2432	93.69	-	-	94.69	25.69	4.8	31.49	100	18	A	H
		2483.51	48.92	-25.08	74	49.41	26.11	4.86	31.46	100	18	P	H
		2488.78	39.75	-14.25	54	40.06	26.26	4.88	31.45	100	18	A	H
		2387.09	42.48	-31.52	74	43.84	25.4	4.76	31.52	282	258	P	V
		2389.95	32.21	-21.79	54	33.57	25.4	4.76	31.52	282	258	A	V
	*	2430	101.71	-	-	102.71	25.69	4.8	31.49	282	258	P	V
	*	2430	93.9	-	-	94.9	25.69	4.8	31.49	282	258	A	V
		2488.3	48.09	-25.91	74	48.4	26.26	4.88	31.45	282	258	P	V
	2488.6	39.46	-14.54	54	39.77	26.26	4.88	31.45	282	258	A	V	



802.11n HT20 CH 11 2462MHz	*	2468	100.3	-	-	100.96	25.97	4.84	31.47	100	12	P	H
	*	2468	91.62	-	-	92.28	25.97	4.84	31.47	100	12	A	H
		2484.1	63.87	-10.13	74	64.36	26.11	4.86	31.46	100	12	P	H
		2483.62	44.21	-9.79	54	44.7	26.11	4.86	31.46	100	12	A	H
	*	2466	99.35	-	-	100.01	25.97	4.84	31.47	262	117	P	V
	*	2466	91.5	-	-	92.16	25.97	4.84	31.47	262	117	A	V
		2484.64	61.35	-12.65	74	61.84	26.11	4.86	31.46	262	117	P	V
		2483.68	44.1	-9.9	54	44.59	26.11	4.86	31.46	262	117	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	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		4824	39.75	-34.25	74	61.36	30.9	6.87	59.38	150	360	P	H
		4824	37.41	-36.59	74	59.02	30.9	6.87	59.38	150	360	P	V
802.11n HT20 CH 06 2437MHz		4872	37.78	-36.22	74	59.05	31.01	6.86	59.14	150	360	P	H
		7308	41.29	-32.71	74	56.03	35.34	8.47	58.55	150	360	P	H
		4872	39.19	-34.81	74	60.46	31.01	6.86	59.14	150	360	P	V
		7308	41.29	-32.71	74	56.03	35.34	8.47	58.55	150	360	P	V
802.11n HT20 CH 11 2462MHz		4926	37.48	-36.52	74	58.42	31.12	6.84	58.9	150	360	P	H
		7386	40.92	-33.08	74	55.86	35.55	8.49	58.98	150	360	P	H
		4926	37.85	-36.15	74	58.79	31.12	6.84	58.9	150	360	P	V
		7386	40.96	-33.04	74	55.9	35.55	8.49	58.98	150	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

15C Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11g LF		30.97	25.68	-14.32	40	30.94	25.74	0.08	31.08	100	0	P	H
		131.85	18.42	-25.08	43.5	30.94	17.48	0.83	30.83	-	-	P	H
		303.54	20.74	-25.26	46	30.26	19.72	2.26	31.5	-	-	P	H
		631.4	27.91	-18.09	46	29.87	26	2.98	30.94	-	-	P	H
		849.65	29.87	-16.13	46	30.13	28.5	2.44	31.2	-	-	P	H
		920.46	31.62	-14.38	46	30.05	29.55	3.2	31.18	-	-	P	H
		30	24.6	-15.4	40	29.31	26.3	0.09	31.1	-	-	P	V
		43.58	22.21	-17.79	40	34.84	18.26	0.47	31.36	-	-	P	V
		73.65	22.1	-17.9	40	38.32	14.38	0.8	31.4	-	-	P	V
		348.16	22.51	-23.49	46	30.6	21.14	2.27	31.5	-	-	P	V
		544.1	26.17	-19.83	46	30.13	24.72	2.83	31.51	-	-	P	V
	885.54	31.52	-14.48	46	30.81	28.93	2.91	31.13	100	360	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	Peak or Average
H/V	Horizontal or Vertical



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

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

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

For Peak Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- 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)
- 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”.

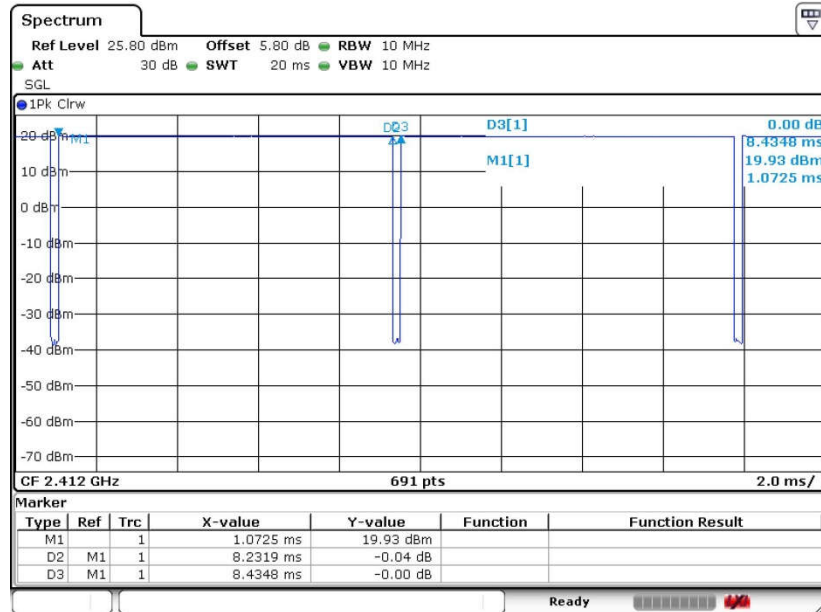


Appendix C. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
1	802.11b	97.59	8.232	0.121	300Hz
1	802.11g	87.44	1.362	0.734	1kHz
1	802.11n HT20	86.27	1.275	0.784	1kHz

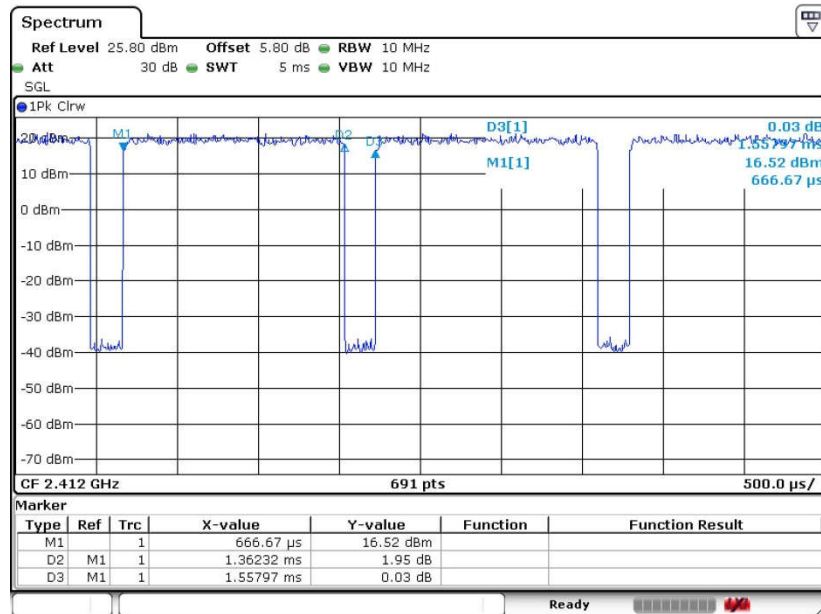


802.11b



Date: 7.APR.2017 14:21:45

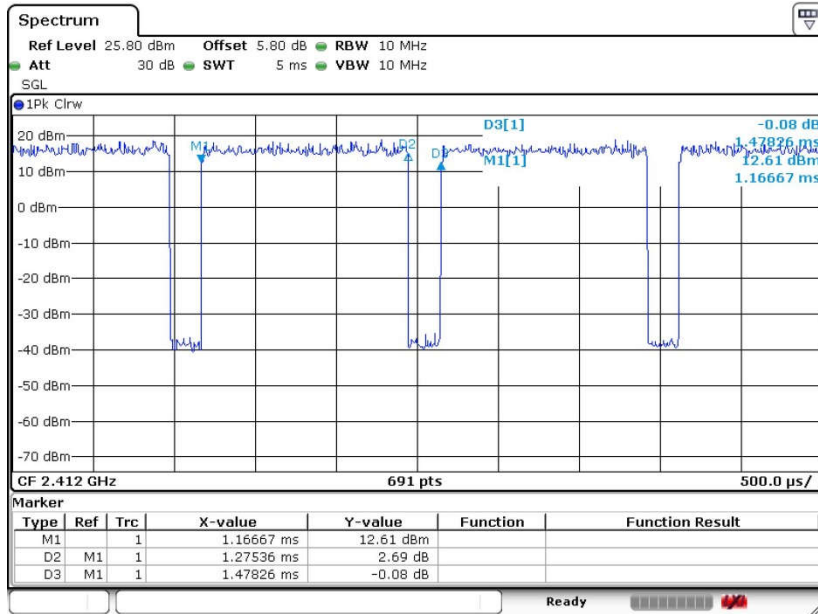
802.11g



Date: 7.APR.2017 14:22:54



802.11n20



Date: 7.APR.2017 14:23:48