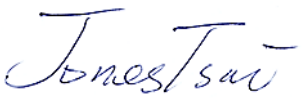
FCC RF Test Report

APPLICANT	:	Mobile Devices Ingénierie
EQUIPMENT	:	Telematics embedded system
BRAND NAME	:	Mobile Devices Ingenierie
MODEL NAME	:	C4DONGLE-3GNA-WBT
MARKETING NAME	:	C4DONGLE-3GNA-WBT
FCC ID	:	A6G-C4DONGLE3G
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Jul. 14, 2015 and testing was completed on Aug. 13, 2015. We, SPORTON INTERNATIONAL (SHENZHEN) 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager

Testing Laboratory
2353

SPORTON INTERNATIONAL (SHENZHEN) INC.
1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR571402C	Rev. 01	Initial issue of report	Aug. 21, 2015

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 3.12 dB at 2483.520 MHz
3.7	15.203 & 15.247(b)	N/A	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Mobile Devices Ingénierie
100 Avenue de Stalingrad 94800 Villejuif FRANCE

1.2 Manufacturer

Mobile Devices Ingénierie
100 Avenue de Stalingrad 94800 Villejuif FRANCE

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Telematics embedded system
Brand Name	Mobile Devices Ingenierie
Model Name	C4DONGLE-3GNA-WBT
Marketing Name	C4DONGLE-3GNA-WBT
FCC ID	A6G-C4DONGLE3G
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/ WLAN2.4GHz 802.11b/g/n HT20/HT40/ Bluetooth v2.1+ EDR/Bluetooth v4.0 LE
IMEI Code	Conducted: 354676055000409 Radiation: 354676055001597
HW Version	SAP00266
SW Version	V1944
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two types of EUT sample 1 and sample 2, the differences is that sample 1 with battery and sample 2 without battery. We only choose sample 1 to perform full tests.

1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to Antenna	802.11b : 14.33 dBm (0.0271 W) 802.11g : 19.12 dBm (0.0817 W) 802.11n HT20 : 18.96 dBm (0.0787 W) 802.11n HT40 : 18.87 dBm (0.0771 W)
99% Occupied Bandwidth	802.11b : 14.65MHz 802.11g : 18.15MHz 802.11n HT20 : 18.90MHz 802.11n HT40 : 36.00MHz
Antenna Type / Gain	Chip Antenna with gain 0.20 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 (SHENZHEN) INC.	
Test Site Location	1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
Test Site No.	**Sporton Site No.**	
	TH01-SZ	

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
Test Site No.	**Sporton Site No.**	**FCC/IC Registration No.**
	03CH01-SZ	831040/4086F

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

1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03
- 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. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

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

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

2.1 Carrier Frequency 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 MHz	14.07	CH 11	14.25	14.23	14.21
CH 06	2437 MHz	14.29				
CH 11	2462 MHz	**14.33**				

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 MHz	18.89	CH 11	19.06	19.07	19.11	19.08	18.97	18.96	18.91
CH 06	2437 MHz	19.06								
CH 11	2462 MHz	**19.12**								

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 MHz	18.73	CH 11	18.89	18.87	18.91	18.84	18.79	18.85	18.81
CH 06	2437 MHz	18.86								
CH 11	2462 MHz	**18.96**								

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 MHz	18.65	CH 09	18.75	18.81	18.74	18.73	18.69	18.72	18.84
CH 06	2437 MHz	18.74								
CH 09	2452 MHz	**18.87**								

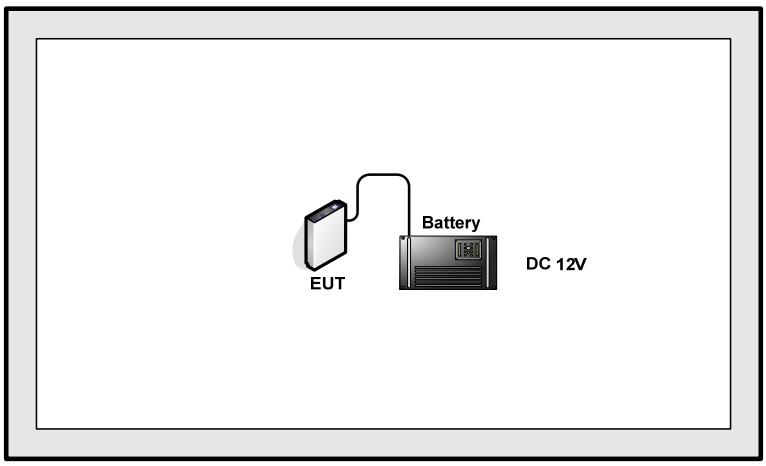
2.3 Test Mode

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
802.11n HT40	MCS0

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Battery	Solie	36B20L	N/A	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.

2.7 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 5.0 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 5.0 + 10 = 15.0 (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.

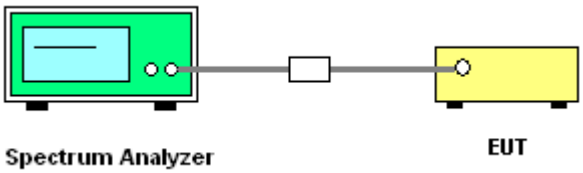
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

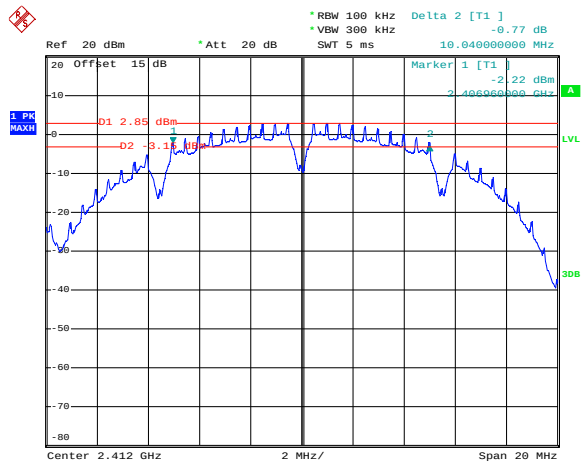
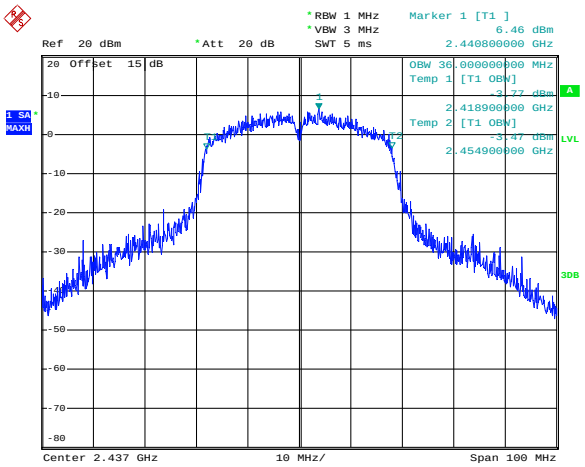
1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r03.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit 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.

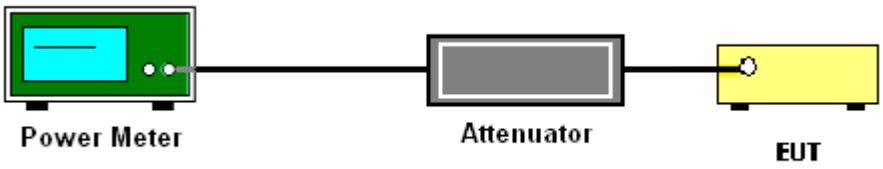
3.2.2 Measuring Instruments

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 v03r03.
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.

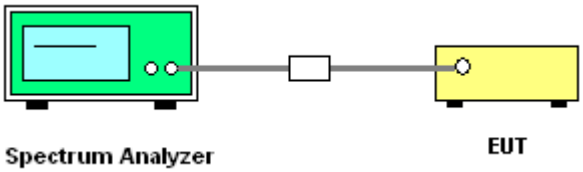
3.3.2 Measuring Instruments

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 v03r03
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.

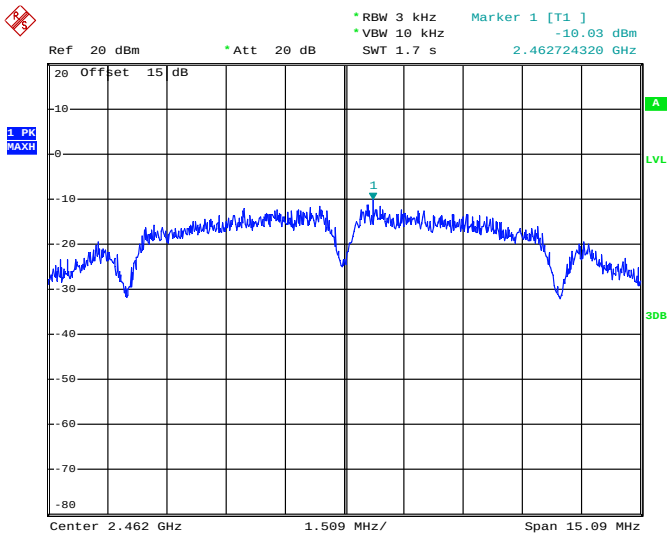
3.3.4 Test Setup



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).

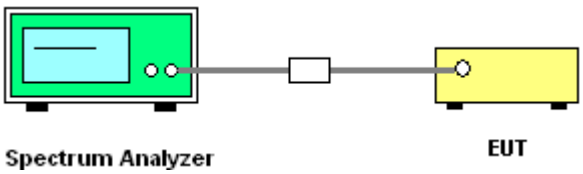
3.4.2 Measuring Instruments

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 v03r03.
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

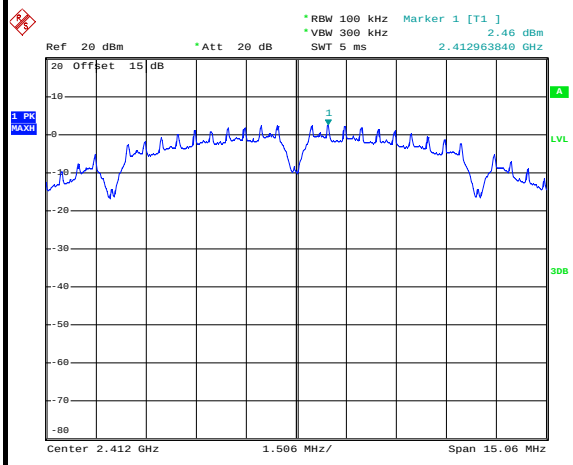


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	50~53%
Test Channel :	01	**Test Engineer :**	Sam Zheng

WLAN 802.11b Channel 01

100kHz PSD reference Level



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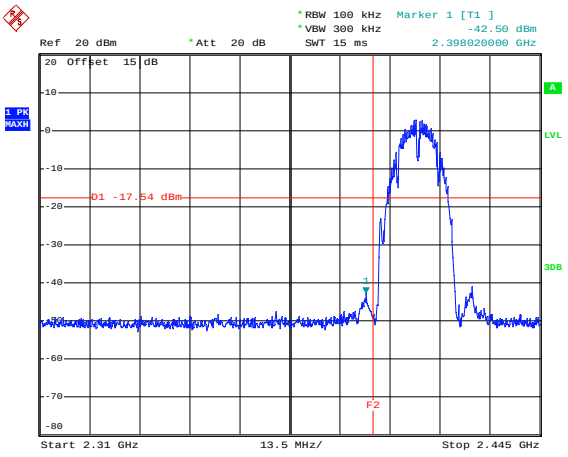
Low Channel Plot



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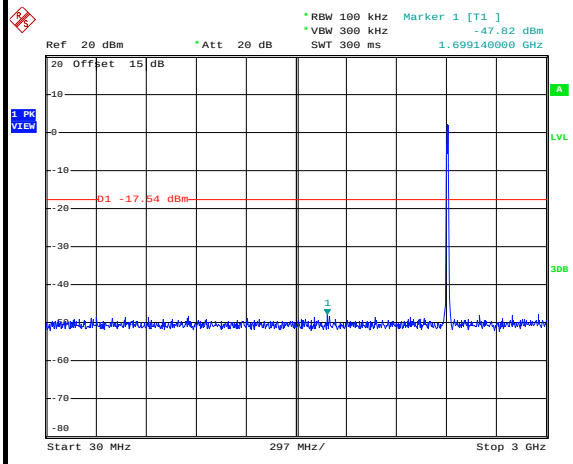
Spurious Emission 30MHz~3GHz



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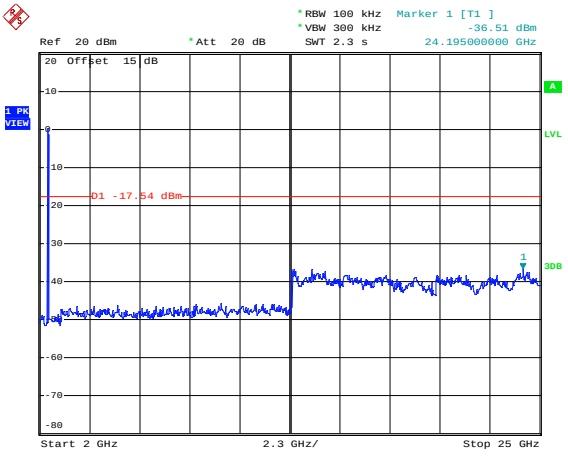
Spurious Emission 2GHz~25GHz

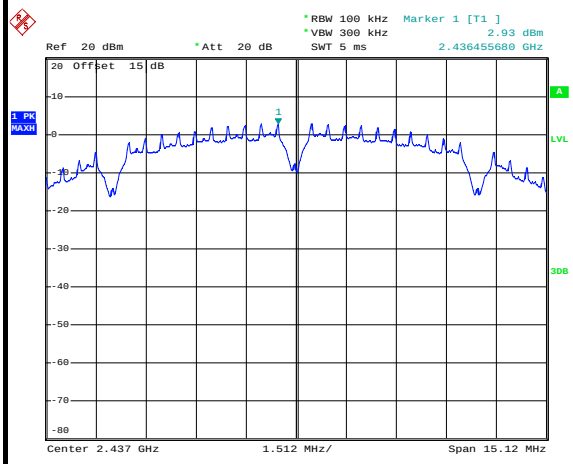


Date: 7.AUG.2015 18:45:14

Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Sam Zheng

WLAN 802.11b Channel 06

100kHz PSD reference Level



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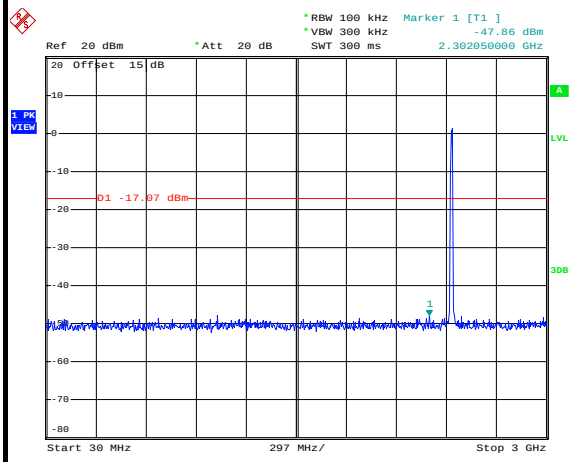
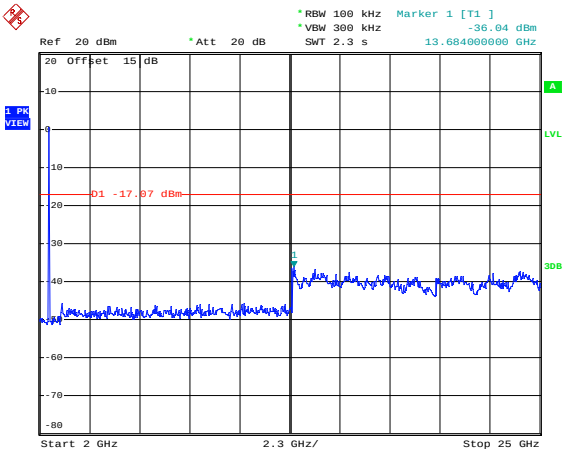
Spurious Emission 30MHz~3GHz



Date: 7.AUG.2015 19:04:11

Spurious Emission 2GHz~25GHz

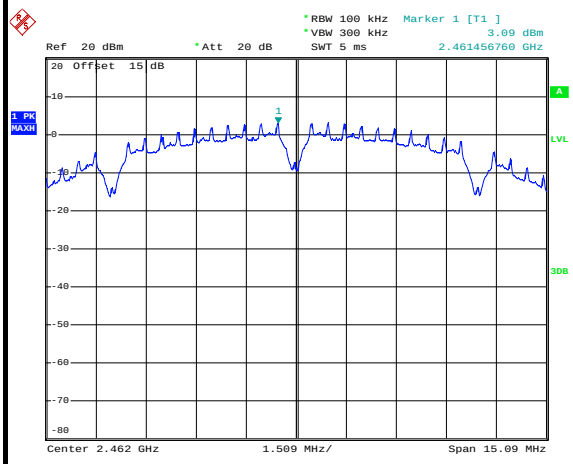


Date: 7.AUG.2015 19:04:29

Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	11	**Test Engineer :**	Sam Zheng

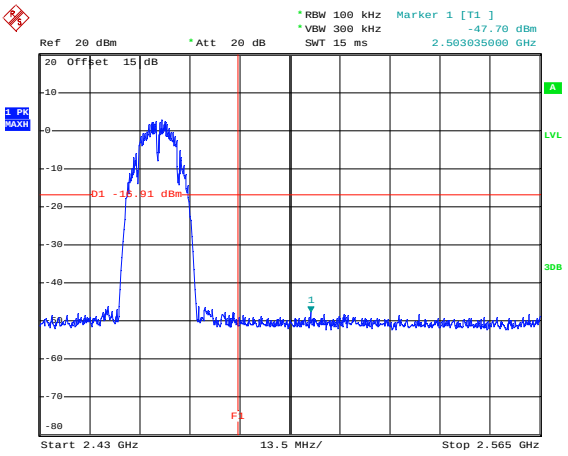
WLAN 802.11b Channel 11

100kHz PSD reference Level



Date: 7.AUG.2015 19:08:17

High Channel Plot



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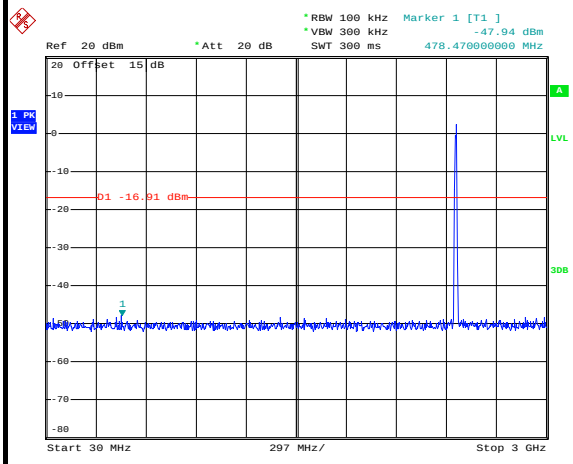
Spurious Emission 30MHz~3GHz



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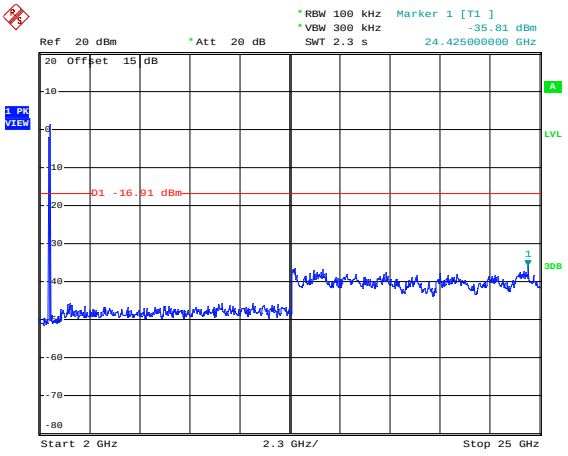
Spurious Emission 2GHz~25GHz

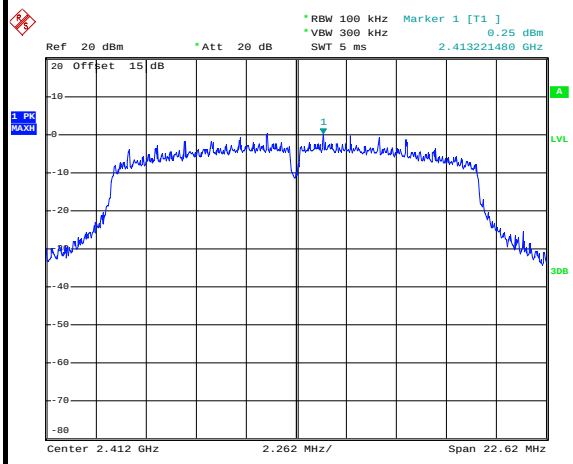


Date: 7.AUG.2015 19:10:12

Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	50~53%
Test Channel :	01	**Test Engineer :**	Sam Zheng

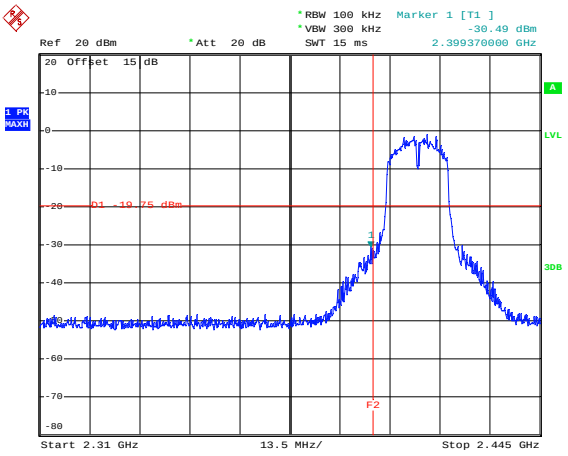
WLAN 802.11g Channel 01

100kHz PSD reference Level



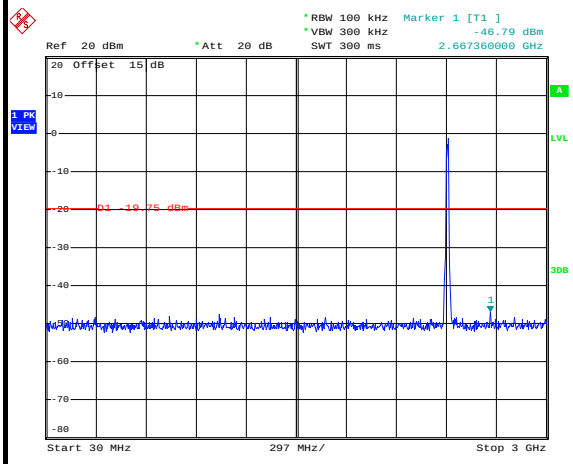
Date: 7.AUG.2015 22:39:57

Low Channel Plot



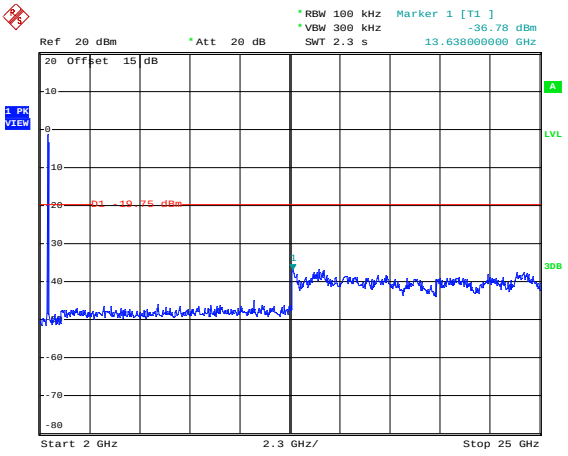
Date: 7.AUG.2015 22:40:14

Spurious Emission 30MHz~3GHz



Date: 7.AUG.2015 22:41:21

Spurious Emission 2GHz~25GHz

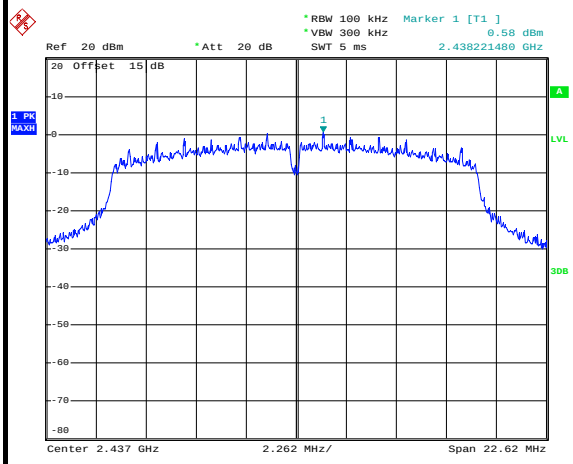


Date: 7.AUG.2015 22:41:39

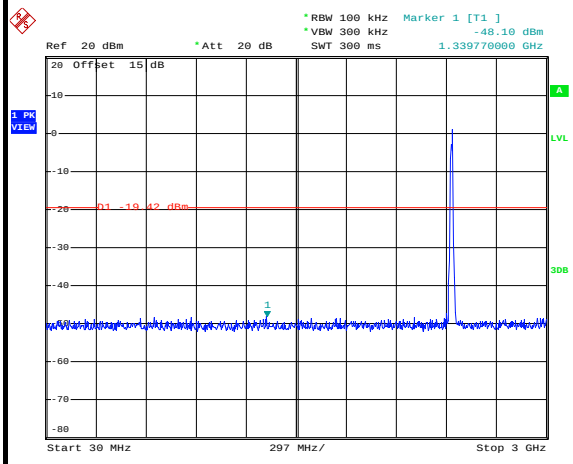
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Sam Zheng

WLAN 802.11g Channel 06

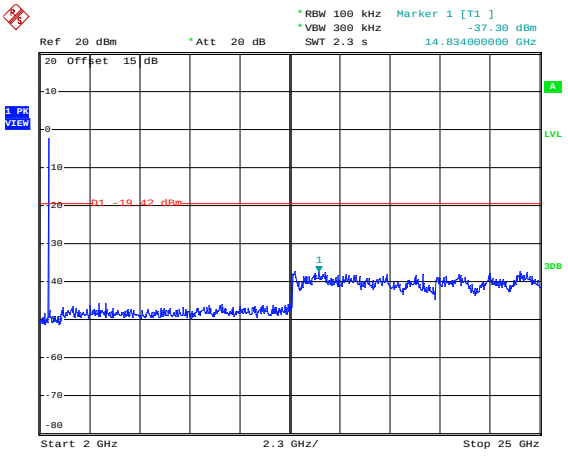
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



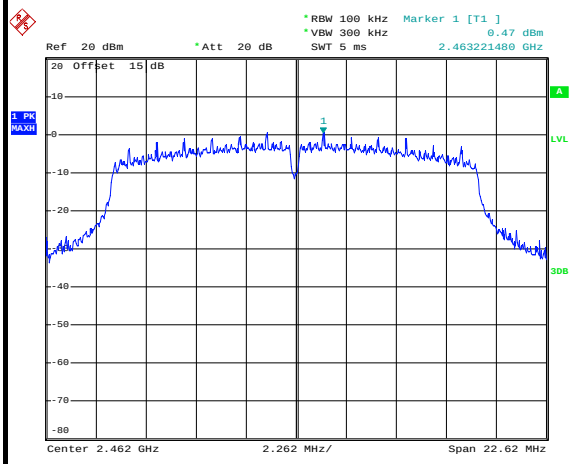
Spurious Emission 2GHz~25GHz



Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	11	**Test Engineer :**	Sam Zheng

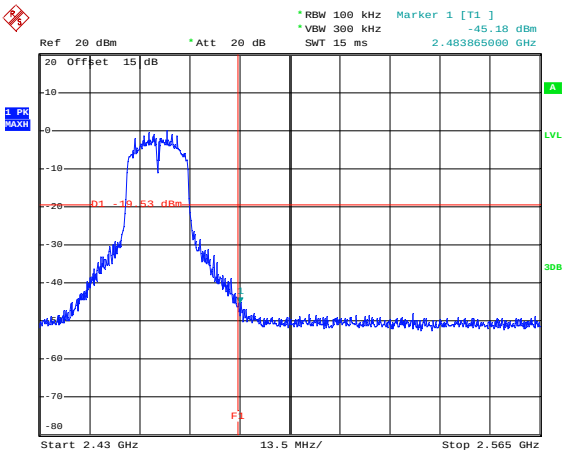
WLAN 802.11g Channel 11

100kHz PSD reference Level



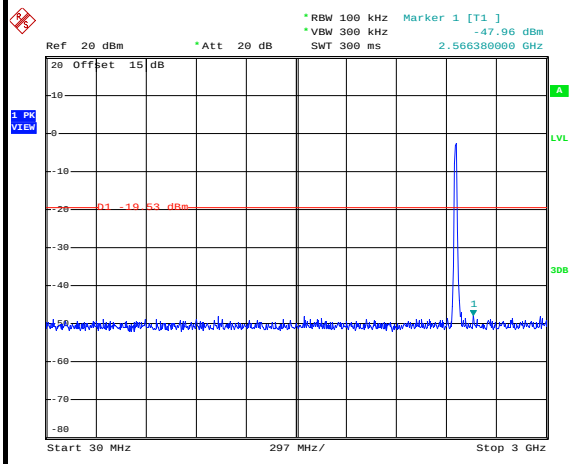
Date: 7.AUG.2015 22:28:37

High Channel Plot



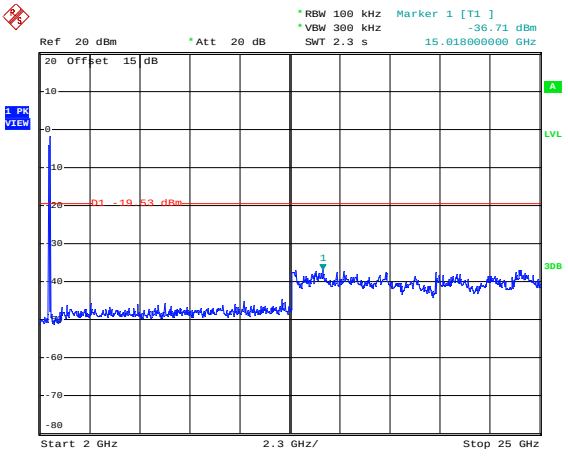
Date: 7.AUG.2015 22:29:37

Spurious Emission 30MHz~3GHz



Date: 7.AUG.2015 22:31:11

Spurious Emission 2GHz~25GHz

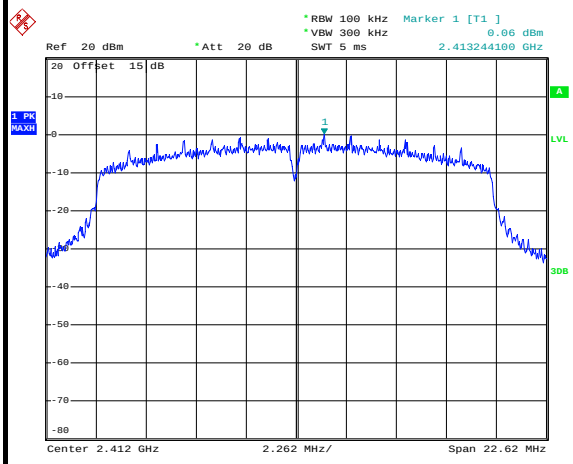


Date: 7.AUG.2015 22:31:29

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Sam Zheng

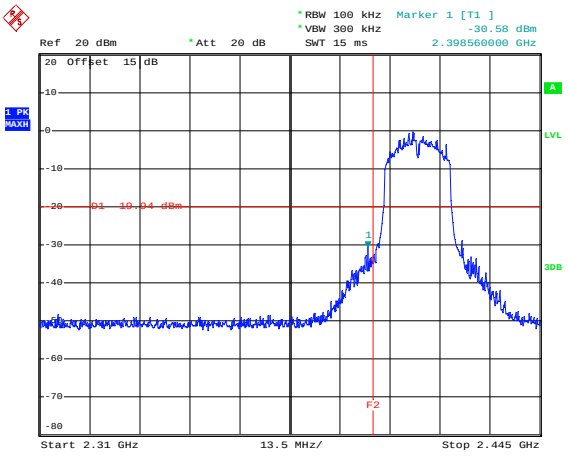
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



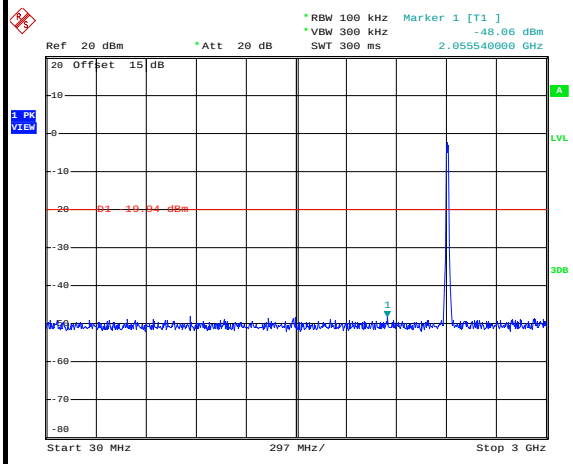
Date: 7.AUG.2015 22:47:00

Low Channel Plot



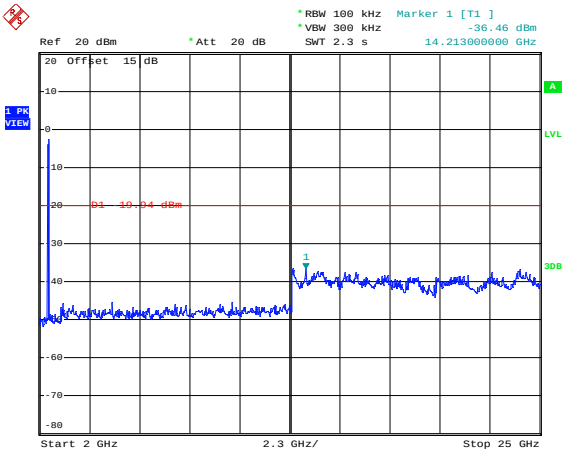
Date: 7.AUG.2015 22:48:55

Spurious Emission 30MHz~3GHz



Date: 7.AUG.2015 22:52:54

Spurious Emission 2GHz~25GHz

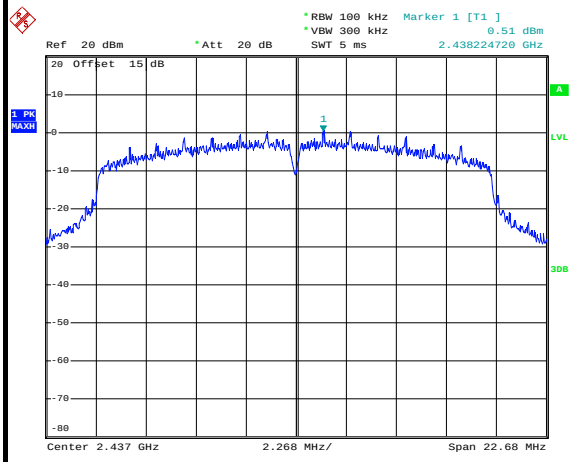


Date: 7.AUG.2015 22:53:12

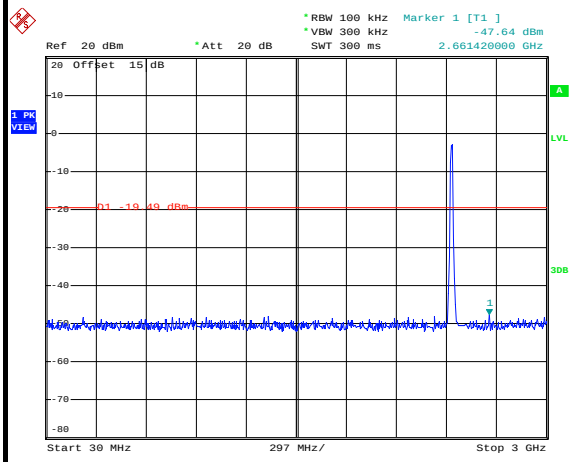
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Sam Zheng

WLAN 802.11n HT20 Channel 06

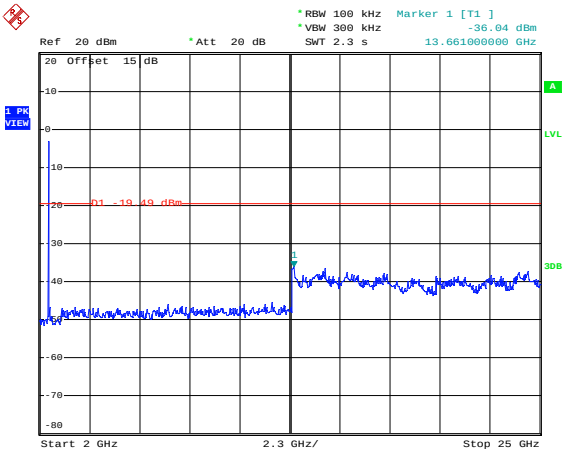
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



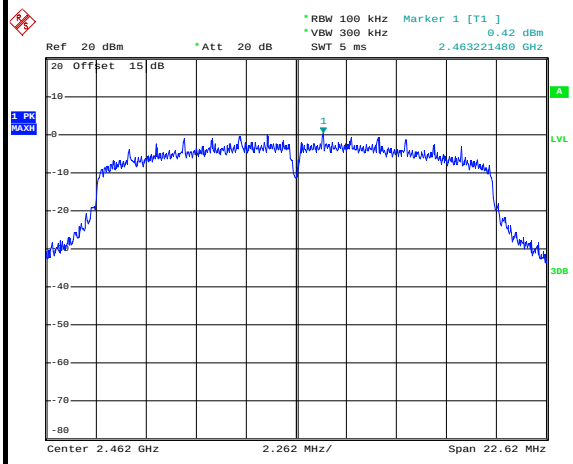
Spurious Emission 2GHz~25GHz



Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	11	**Test Engineer :**	Sam Zheng

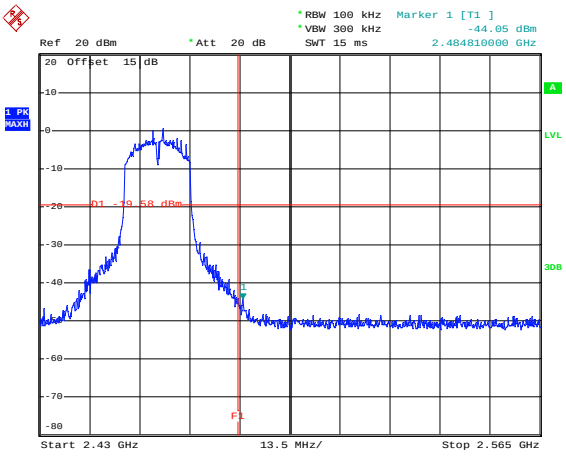
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



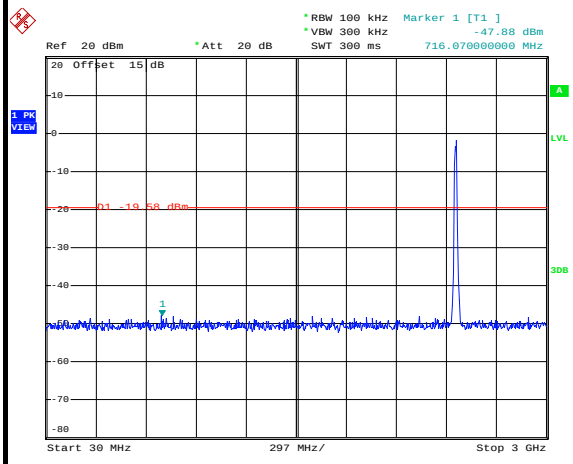
Date: 7.AUG.2015 23:08:30

High Channel Plot



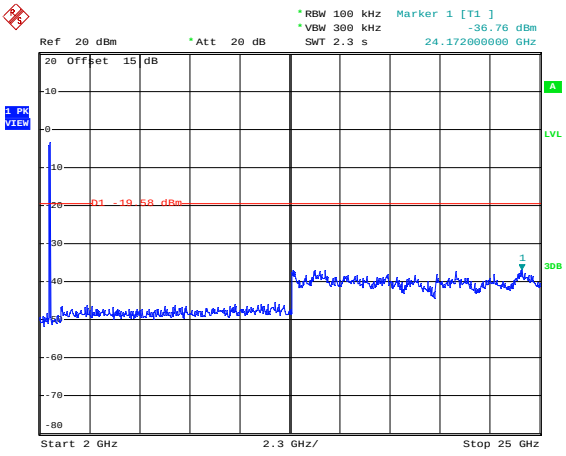
Date: 7.AUG.2015 23:09:57

Spurious Emission 30MHz~3GHz



Date: 7.AUG.2015 23:14:12

Spurious Emission 2GHz~25GHz

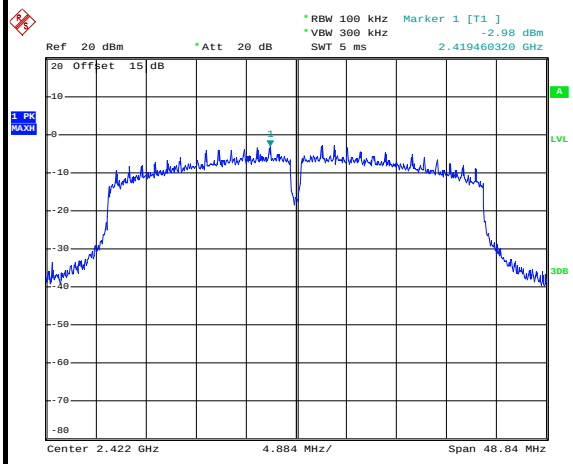


Date: 7.AUG.2015 23:14:30

Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	03	Test Engineer :	Sam Zheng

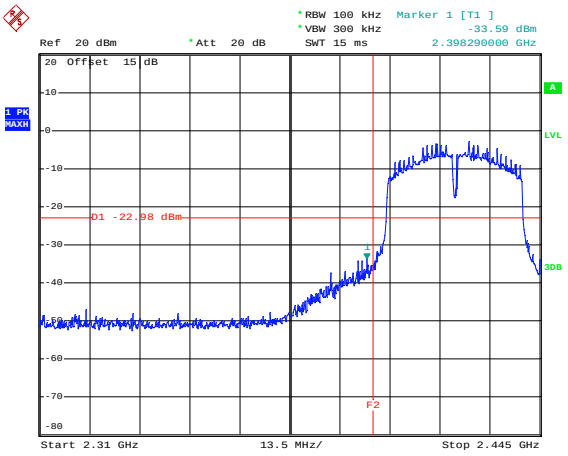
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



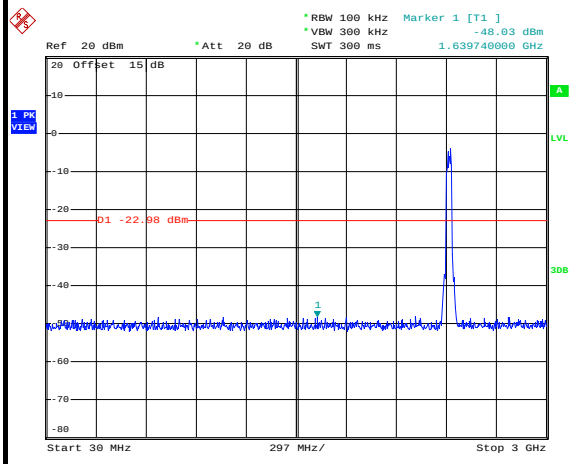
Date: 7.AUG.2015 23:45:03

Low Channel Plot



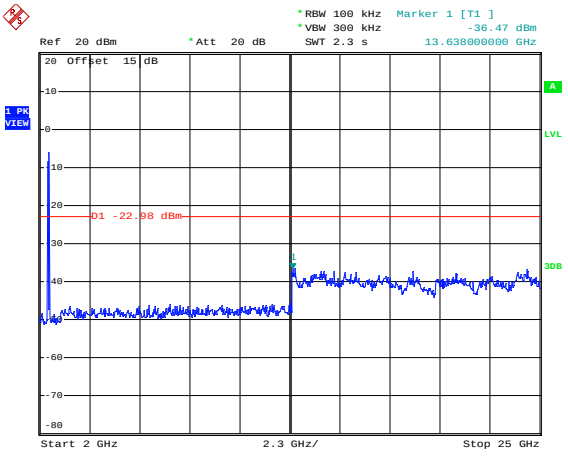
Date: 7.AUG.2015 23:47:30

Spurious Emission 30MHz~3GHz



Date: 7.AUG.2015 23:50:23

Spurious Emission 2GHz~25GHz

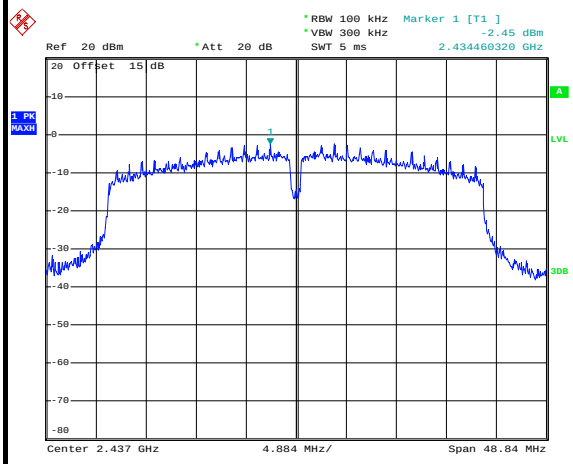


Date: 7.AUG.2015 23:50:41

Test Mode :	802.11n HT40	**Temperature :**	24~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	50~53%
Test Channel :	06	**Test Engineer :**	Sam Zheng

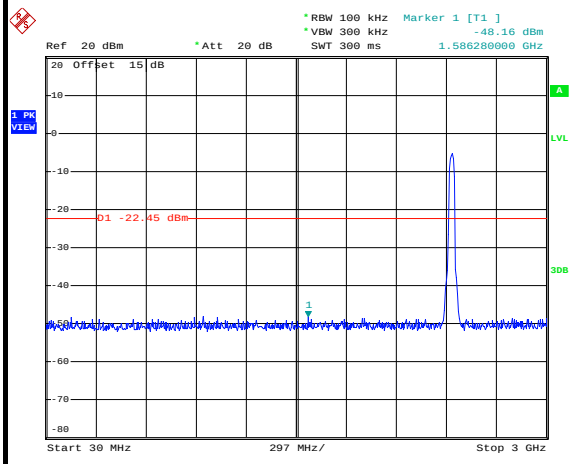
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



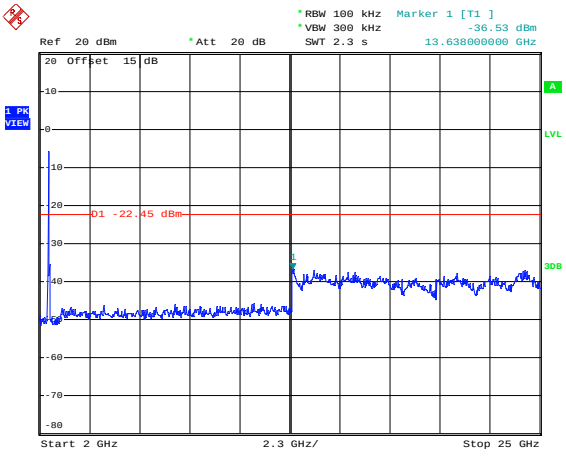
Date: 7.AUG.2015 23:32:42

Spurious Emission 30MHz~3GHz



Date: 7.AUG.2015 23:35:38

Spurious Emission 2GHz~25GHz

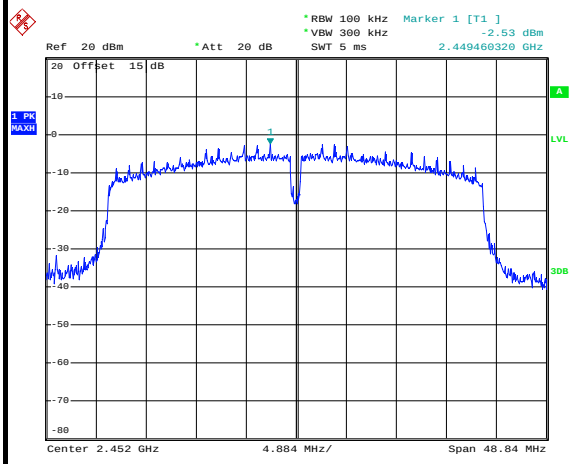


Date: 7.AUG.2015 23:35:56

Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	09	Test Engineer :	Sam Zheng

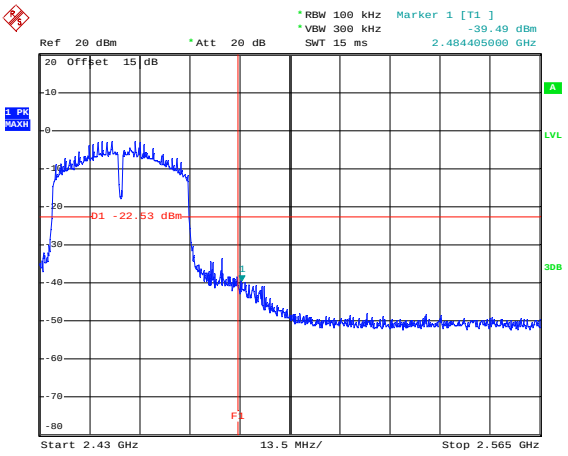
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



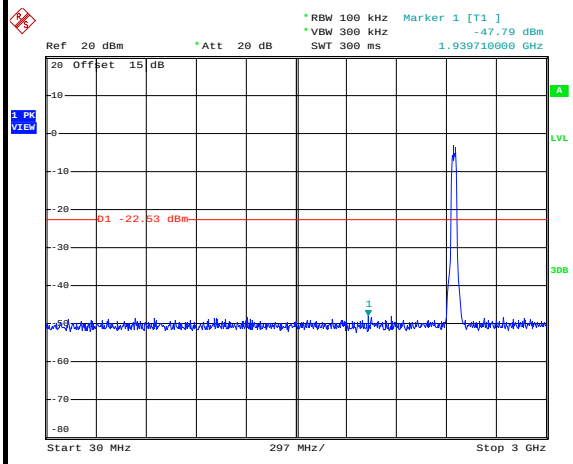
Date: 7.AUG.2015 23:22:42

High Channel Plot



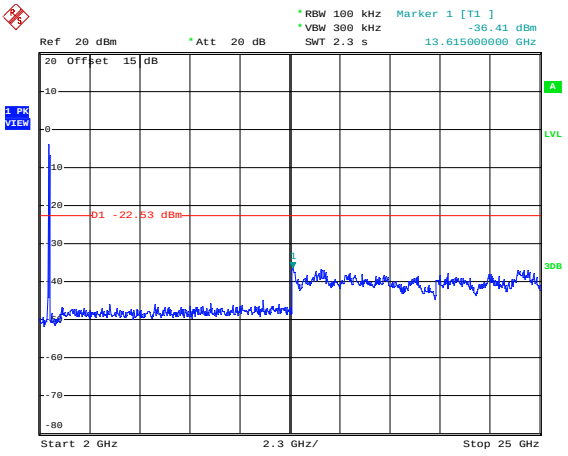
Date: 7.AUG.2015 23:23:55

Spurious Emission 30MHz~3GHz



Date: 7.AUG.2015 23:25:33

Spurious Emission 2GHz~25GHz



Date: 7.AUG.2015 23:25:50

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.

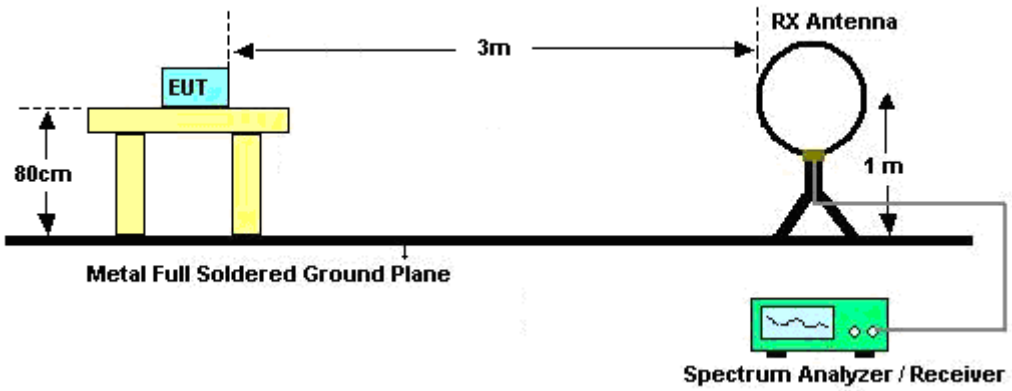
3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
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.

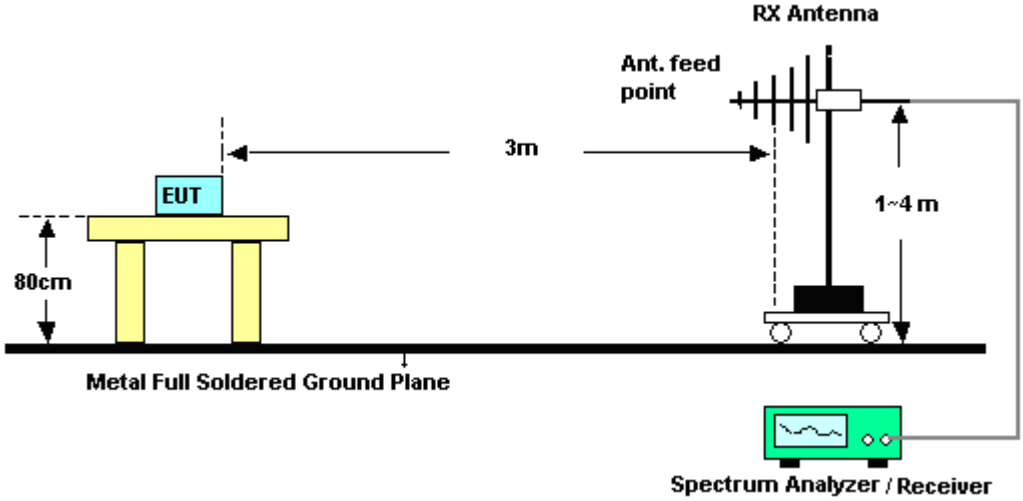
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	98.08	-	-	10Hz
802.11g	91.03	4.06	0.25	300Hz
2.4GHz 802.11n HT20	90.04	3.38	0.30	300Hz
2.4GHz 802.11n HT40	80.21	1.65	0.60	1KHz

3.5.4 Test Setup

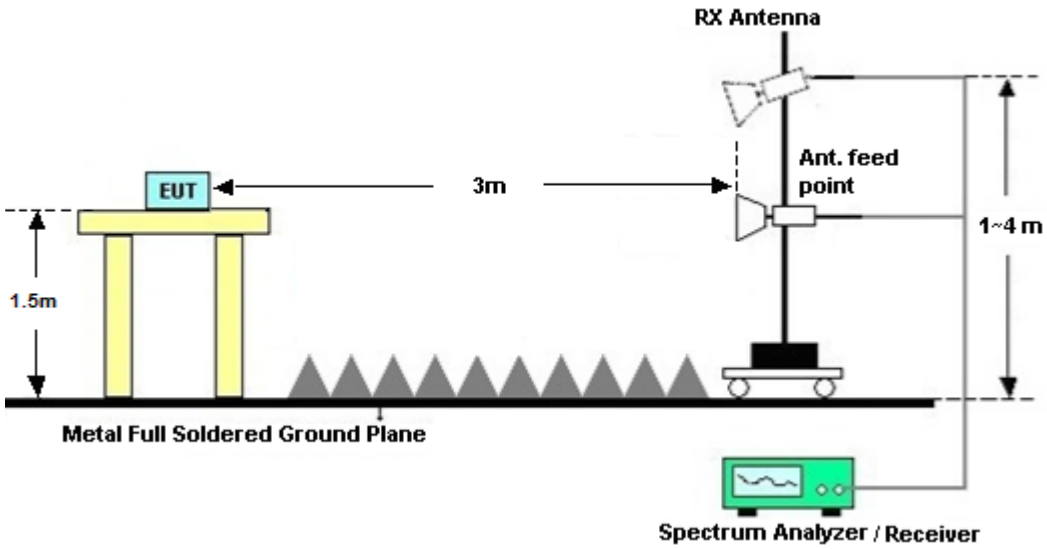
For radiated emissions below 30MHz



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

Please refer to Appendix B.

3.6 Antenna Requirements

3.6.1 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.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 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	FSP30	101400	9kHz~30GHz	Jan. 28, 2015	Aug. 07, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1207253	30MHz~40GHz	Jan. 28, 2015	Aug. 07, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Jan. 28, 2015	Aug. 07, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
EMI Test Receiver&SA	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2015	Aug. 13, 2015	May 25, 2016	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSV40	101041	10kHz~40GHz; Max 30dBm	Sep. 25, 2014	Aug. 13, 2015	Sep. 24, 2015	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 06, 2015	Aug. 13, 2015	May 05, 2016	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	23188	30MHz~2GHz	Nov. 07, 2014	Aug. 13, 2015	Nov. 06, 2015	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Oct. 15, 2014	Aug. 13, 2015	Oct. 14, 2015	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Sep. 04, 2014	Aug. 13, 2015	Sep. 03, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz / 30 dB	Jan. 28, 2015	Aug. 13, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 05, 2015	Aug. 13, 2015	May 04, 2016	Radiation (03CH01-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Jan. 28, 2015	Aug. 13, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Aug. 13, 2015	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Aug. 13, 2015	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Aug. 13, 2015	NCR	Radiation (03CH01-SZ)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.9dB**

Appendix A. Conducted test results

Test Engineer:	Mygai Mo	Temperature:	24~26	°C
Test Date:	2015/8/7	Relative Humidity:	50~53	%

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	14.65	10.04	0.50	Pass
11b	1Mbps	1	6	2437	14.65	10.08	0.50	Pass
11b	1Mbps	1	11	2462	14.65	10.06	0.50	Pass
11g	6Mbps	1	1	2412	17.05	15.08	0.50	Pass
11g	6Mbps	1	6	2437	18.15	15.08	0.50	Pass
11g	6Mbps	1	11	2462	17.10	15.08	0.50	Pass
HT20	MCS0	1	1	2412	18.10	15.08	0.50	Pass
HT20	MCS0	1	6	2437	18.90	15.12	0.50	Pass
HT20	MCS0	1	11	2462	18.10	15.08	0.50	Pass
HT40	MCS0	1	3	2422	36.00	32.56	0.50	Pass
HT40	MCS0	1	6	2437	36.00	32.56	0.50	Pass
HT40	MCS0	1	9	2452	35.90	32.56	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	14.07	30.00	0.20	14.27	36.00	Pass
11b	1Mbps	1	6	2437	14.29	30.00	0.20	14.49	36.00	Pass
11b	1Mbps	1	11	2462	14.33	30.00	0.20	14.53	36.00	Pass
11g	6Mbps	1	1	2412	18.89	30.00	0.20	19.09	36.00	Pass
11g	6Mbps	1	6	2437	19.06	30.00	0.20	19.26	36.00	Pass
11g	6Mbps	1	11	2462	19.12	30.00	0.20	19.32	36.00	Pass
HT20	MCS0	1	1	2412	18.73	30.00	0.20	18.93	36.00	Pass
HT20	MCS0	1	6	2437	18.86	30.00	0.20	19.06	36.00	Pass
HT20	MCS0	1	11	2462	18.96	30.00	0.20	19.16	36.00	Pass
HT40	MCS0	1	3	2422	18.65	30.00	0.20	18.85	36.00	Pass
HT40	MCS0	1	6	2437	18.74	30.00	0.20	18.94	36.00	Pass
HT40	MCS0	1	9	2452	18.87	30.00	0.20	19.07	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	0.08	12.21
11b	1Mbps	1	6	2437	0.08	12.35
11b	1Mbps	1	11	2462	0.08	12.40
11g	6Mbps	1	1	2412	0.41	11.35
11g	6Mbps	1	6	2437	0.41	11.45
11g	6Mbps	1	11	2462	0.41	11.48
HT20	MCS0	1	1	2412	0.46	11.07
HT20	MCS0	1	6	2437	0.46	11.23
HT20	MCS0	1	11	2462	0.46	11.33
HT40	MCS0	1	3	2422	0.96	10.60
HT40	MCS0	1	6	2437	0.96	11.17
HT40	MCS0	1	9	2452	0.96	11.32

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	-11.88	0.20	8.00	Pass
11b	1Mbps	1	6	2437	-11.58	0.20	8.00	Pass
11b	1Mbps	1	11	2462	-10.03	0.20	8.00	Pass
11g	6Mbps	1	1	2412	-14.50	0.20	8.00	Pass
11g	6Mbps	1	6	2437	-13.88	0.20	8.00	Pass
11g	6Mbps	1	11	2462	-13.65	0.20	8.00	Pass
HT20	MCS0	1	1	2412	-13.37	0.20	8.00	Pass
HT20	MCS0	1	6	2437	-14.54	0.20	8.00	Pass
HT20	MCS0	1	11	2462	-14.50	0.20	8.00	Pass
HT40	MCS0	1	3	2422	-17.47	0.20	8.00	Pass
HT40	MCS0	1	6	2437	-16.97	0.20	8.00	Pass
HT40	MCS0	1	9	2452	-17.06	0.20	8.00	Pass

Appendix B. Radiated Spurious Emission

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		2377.59	54.39	-19.61	74	50.72	32.73	4.6	33.66	118	220	P	H
		2386.95	42	-12.00	54	38.26	32.77	4.62	33.65	118	220	A	H
	*	2412	103.3	-	-	99.47	32.81	4.65	33.63	118	220	P	H
	*	2412	98.92	-	-	95.09	32.81	4.65	33.63	118	220	A	H
		2385.51	54.81	-19.19	74	51.07	32.77	4.62	33.65	103	290	P	V
		2387.4	42.52	-11.48	54	38.78	32.77	4.62	33.65	103	290	A	V
	*	2411	107.01	-	-	103.18	32.81	4.65	33.63	103	290	P	V
	*	2411	102.52	-	-	98.69	32.81	4.65	33.63	103	290	A	V
802.11b CH 06 2437MHz		2366.25	54.75	-19.25	74	51.13	32.7	4.6	33.68	115	218	P	H
		2389.56	41.67	-12.33	54	37.93	32.77	4.62	33.65	115	218	A	H
	*	2438	104	-	-	100.03	32.89	4.68	33.6	115	218	P	H
	*	2438	99.57	-	-	95.6	32.89	4.68	33.6	115	218	A	H
		2490.92	55.35	-18.65	74	51.18	33	4.73	33.56	115	218	P	H
		2486.76	42.18	-11.82	54	38.06	32.96	4.73	33.57	115	218	A	H
		2375.61	54.25	-19.75	74	50.58	32.73	4.6	33.66	100	272	P	V
		2389.92	41.89	-12.11	54	38.15	32.77	4.62	33.65	100	272	A	V
	*	2438	106.68	-	-	102.71	32.89	4.68	33.6	100	272	P	V
	*	2438	102.54	-	-	98.57	32.89	4.68	33.6	100	272	A	V
		2483.64	55.92	-18.08	74	51.8	32.96	4.73	33.57	100	272	P	V
		2486.04	42.24	-11.76	54	38.12	32.96	4.73	33.57	100	272	A	V

802.11b CH 11 2462MHz	*	2461	96.84	-	-	92.81	32.92	4.7	33.59	100	65	P	H
	*	2461	92.47	-	-	88.44	32.92	4.7	33.59	100	65	A	H
		2500	55.03	-18.97	74	50.86	33	4.73	33.56	100	65	P	H
		2484.64	42.11	-11.89	54	37.99	32.96	4.73	33.57	100	65	A	H
	*	2464	104.02	-	-	99.99	32.92	4.7	33.59	100	272	P	V
	*	2464	99.25	-	-	95.22	32.92	4.7	33.59	100	272	A	V
		2487.72	55.6	-18.40	74	51.43	33	4.73	33.56	100	272	P	V
		2485.4	42.37	-11.63	54	38.25	32.96	4.73	33.57	100	272	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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	46.59	-27.41	74	63.63	35.03	6.54	58.61	100	0	P	H
		4824	40.81	-33.19	74	57.85	35.03	6.54	58.61	100	0	P	V
802.11b CH 06 2437MHz		4875	42.39	-31.61	74	59.33	35.02	6.56	58.52	100	0	P	H
		7311	41.05	-32.95	74	54.58	36.39	8.24	58.16	100	0	P	H
		4875	40.28	-33.72	74	57.22	35.02	6.56	58.52	100	0	P	V
		7311	41.72	-32.28	74	55.25	36.39	8.24	58.16	100	0	P	V
802.11b CH 11 2462MHz		4926	47.26	-26.74	74	64.07	35.01	6.6	58.42	100	0	P	H
		7386	41.03	-32.97	74	54.59	36.44	8.31	58.31	100	0	P	H
		4923	40.41	-33.59	74	57.23	35.01	6.59	58.42	100	0	P	V
		7386	41.93	-32.07	74	55.49	36.44	8.31	58.31	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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		2389.2	67	-7.00	74	63.26	32.77	4.62	33.65	100	17	P	H
		2390	46.57	-7.43	54	42.83	32.77	4.62	33.65	100	17	A	H
	*	2414	100.46	-	-	96.63	32.81	4.65	33.63	100	17	P	H
	*	2414	90.69	-	-	86.86	32.81	4.65	33.63	100	17	A	H
		2389.92	68.92	-5.08	74	65.18	32.77	4.62	33.65	100	253	P	V
		2390	49.75	-4.25	54	46.01	32.77	4.62	33.65	100	253	A	V
	*	2414	106.45	-	-	102.62	32.81	4.65	33.63	100	253	P	V
	*	2414	95.48	-	-	91.65	32.81	4.65	33.63	100	253	A	V
802.11g CH 06 2437MHz		2340.24	55.02	-18.98	74	51.48	32.66	4.57	33.69	115	222	P	H
		2385.24	42.15	-11.85	54	38.46	32.73	4.62	33.66	115	222	A	H
	*	2439	103.72	-	-	99.75	32.89	4.68	33.6	115	222	P	H
	*	2439	93.08	-	-	89.11	32.89	4.68	33.6	115	222	A	H
		2499.28	55.73	-18.27	74	51.56	33	4.73	33.56	115	222	P	H
		2488.72	42.41	-11.59	54	38.24	33	4.73	33.56	115	222	A	H
		2380.02	55	-19	74	51.31	32.73	4.62	33.66	100	264	P	V
		2384.88	42.33	-11.67	54	38.64	32.73	4.62	33.66	100	264	A	V
	*	2439	106.6	-	-	102.63	32.89	4.68	33.6	100	264	P	V
	*	2439	96.3	-	-	92.33	32.89	4.68	33.6	100	264	A	V
		2488.16	54.8	-19.2	74	50.63	33	4.73	33.56	100	264	P	V
		2489	42.62	-11.38	54	38.45	33	4.73	33.56	100	264	A	V

802.11g CH 11 2462MHz	*	2460	96.95	-	-	92.92	32.92	4.7	33.59	100	51	P	H
	*	2460	86.46	-	-	82.43	32.92	4.7	33.59	100	51	A	H
		2483.52	59.58	-14.42	74	55.46	32.96	4.73	33.57	100	51	P	H
		2483.56	43.22	-10.78	54	39.1	32.96	4.73	33.57	100	51	A	H
	*	2464	103.47	-	-	99.44	32.92	4.7	33.59	100	261	P	V
	*	2464	93.24	-	-	89.21	32.92	4.7	33.59	100	261	A	V
		2483.52	67.07	-6.93	74	62.95	32.96	4.73	33.57	100	261	P	V
		2483.52	46.27	-7.73	54	42.15	32.96	4.73	33.57	100	261	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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	41.76	-32.24	74	58.8	35.03	6.54	58.61	100	0	P	H
		4824	39.34	-34.66	74	56.38	35.03	6.54	58.61	100	0	P	V
802.11g CH 06 2437MHz		4878	50.55	-23.45	74	67.47	35.02	6.58	58.52	100	0	P	H
		7311	41.51	-32.49	74	55.04	36.39	8.24	58.16	100	0	P	H
		4875	42.97	-31.03	74	59.91	35.02	6.56	58.52	100	0	P	V
		7311	41.87	-32.13	74	55.4	36.39	8.24	58.16	100	0	P	V
802.11g CH 11 2462MHz		4923	41.59	-32.41	74	58.41	35.01	6.59	58.42	100	0	P	H
		7386	41.5	-32.50	74	55.06	36.44	8.31	58.31	100	0	P	H
		4923	40.67	-33.33	74	57.49	35.01	6.59	58.42	100	0	P	V
		7386	40.88	-33.12	74	54.44	36.44	8.31	58.31	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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)
		2389.56	66.11	-7.89	74	62.37	32.77	4.62	33.65	119	224	P	H
		2390	48.22	-5.78	54	44.48	32.77	4.62	33.65	119	224	A	H
802.11n	*	2414	101.78	-	-	97.95	32.81	4.65	33.63	119	224	P	H
HT20	*	2414	91.52	-	-	87.69	32.81	4.65	33.63	119	224	A	H
CH 01		2389.2	69.15	-4.85	74	65.41	32.77	4.62	33.65	100	242	P	V
2412MHz		2390	49.23	-4.77	54	45.49	32.77	4.62	33.65	100	242	A	V
	*	2414	104.61	-	-	100.78	32.81	4.65	33.63	100	242	P	V
	*	2414	93.85	-	-	90.02	32.81	4.65	33.63	100	242	A	V
		2382.81	54.92	-19.08	74	51.23	32.73	4.62	33.66	116	219	P	H
		2386.5	42.09	-11.91	54	38.35	32.77	4.62	33.65	116	219	A	H
	*	2438	101.84	-	-	97.87	32.89	4.68	33.6	116	219	P	H
	*	2438	91.3	-	-	87.33	32.89	4.68	33.6	116	219	A	H
802.11n		2488.64	55.08	-18.92	74	50.91	33	4.73	33.56	116	219	P	H
HT20		2489.04	42.43	-11.57	54	38.26	33	4.73	33.56	116	219	A	H
CH 06		2330.25	54.84	-19.16	74	51.37	32.62	4.55	33.7	100	268	P	V
2437MHz		2385.24	42.15	-11.85	54	38.46	32.73	4.62	33.66	100	268	A	V
	*	2438	104.09	-	-	100.12	32.89	4.68	33.6	100	268	P	V
	*	2438	93.59	-	-	89.62	32.89	4.68	33.6	100	268	A	V
		2493.72	54.62	-19.38	74	50.45	33	4.73	33.56	100	268	P	V
		2488.8	42.41	-11.59	54	38.24	33	4.73	33.56	100	268	A	V

	*	2460	96.07	-	-	92.04	32.92	4.7	33.59	100	81	P	H
	*	2460	85.63	-	-	81.6	32.92	4.7	33.59	100	81	A	H
802.11n		2483.64	59.54	-14.46	74	55.42	32.96	4.73	33.57	100	81	P	H
HT20		2483.6	43.06	-10.94	54	38.94	32.96	4.73	33.57	100	81	A	H
CH 11	*	2464	102.67	-	-	98.64	32.92	4.7	33.59	100	304	P	V
2462MHz	*	2464	92.37	-	-	88.34	32.92	4.7	33.59	100	304	A	V
		2483.56	66.03	-7.97	74	61.91	32.96	4.73	33.57	100	304	P	V
		2483.6	45.4	-8.6	54	41.28	32.96	4.73	33.57	100	304	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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	41.58	-32.42	74	58.62	35.03	6.54	58.61	100	0	P	H
		4824	39.25	-34.75	74	56.29	35.03	6.54	58.61	100	0	P	V
802.11n HT20 CH 06 2437MHz		4875	39.85	-34.15	74	56.79	35.02	6.56	58.52	100	0	P	H
		7311	41.84	-32.16	74	55.37	36.39	8.24	58.16	100	0	P	H
		4875	39.82	-34.18	74	56.76	35.02	6.56	58.52	100	0	P	V
		7311	42.44	-31.56	74	55.97	36.39	8.24	58.16	100	0	P	V
802.11n HT20 CH 11 2462MHz		4924	40.22	-33.78	74	57.03	35.01	6.6	58.42	100	0	P	H
		7386	41.56	-32.44	74	55.12	36.44	8.31	58.31	100	0	P	H
		4926	41.21	-32.79	74	58.02	35.01	6.6	58.42	100	0	P	V
		7386	41.03	-32.97	74	54.59	36.44	8.31	58.31	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (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)
		2389.02	64.54	-9.46	74	60.8	32.77	4.62	33.65	115	220	P	H
		2389.92	49.18	-4.82	54	45.44	32.77	4.62	33.65	115	220	A	H
	*	2424	98.76	-	-	94.88	32.85	4.65	33.62	115	220	P	H
	*	2424	88.56	-	-	84.68	32.85	4.65	33.62	115	220	A	H
802.11n		2498.36	55.03	-18.97	74	50.86	33	4.73	33.56	115	220	P	H
HT40		2496.4	42.95	-11.05	54	38.78	33	4.73	33.56	115	220	A	H
CH 03		2388.66	65.57	-8.43	74	61.83	32.77	4.62	33.65	100	289	P	V
2422MHz		2389.74	50.63	-3.37	54	46.89	32.77	4.62	33.65	100	289	A	V
	*	2424	102.52	-	-	98.64	32.85	4.65	33.62	100	289	P	V
	*	2424	92.48	-	-	88.6	32.85	4.65	33.62	100	289	A	V
		2493.84	55.49	-18.51	74	51.32	33	4.73	33.56	100	289	P	V
		2485.72	42.98	-11.02	54	38.86	32.96	4.73	33.57	100	289	A	V
		2388.12	60.84	-13.16	74	57.1	32.77	4.62	33.65	115	218	P	H
		2389.74	44.95	-9.05	54	41.21	32.77	4.62	33.65	115	218	A	H
	*	2439	100.6	-	-	96.63	32.89	4.68	33.6	115	218	P	H
	*	2439	90.39	-	-	86.42	32.89	4.68	33.6	115	218	A	H
802.11n		2483.64	61	-13	74	56.88	32.96	4.73	33.57	115	218	P	H
HT40		2484.08	44	-10	54	39.88	32.96	4.73	33.57	115	218	A	H
CH 06		2389.74	66.89	-7.11	74	63.15	32.77	4.62	33.65	101	279	P	V
2437MHz		2389.92	47.28	-6.72	54	43.54	32.77	4.62	33.65	101	279	A	V
	*	2438	104.1	-	-	100.13	32.89	4.68	33.6	101	279	P	V
	*	2438	94.14	-	-	90.17	32.89	4.68	33.6	101	279	A	V
		2483.84	62.41	-11.59	74	58.29	32.96	4.73	33.57	101	279	P	V
		2483.64	46.46	-7.54	54	42.34	32.96	4.73	33.57	101	279	A	V

802.11n HT40 CH 09 2452MHz		2348.43	55.07	-18.93	74	51.53	32.66	4.57	33.69	100	142	P	H
		2388.48	42.56	-11.44	54	38.82	32.77	4.62	33.65	100	142	A	H
	*	2450	94.58	-	-	90.61	32.89	4.68	33.6	100	142	P	H
	*	2450	84.45	-	-	80.48	32.89	4.68	33.6	100	142	A	H
		2487.36	56.51	-17.49	74	52.39	32.96	4.73	33.57	100	142	P	H
		2483.96	44.17	-9.83	54	40.05	32.96	4.73	33.57	100	142	A	H
		2385.42	54.73	-19.27	74	51.04	32.73	4.62	33.66	100	286	P	V
		2388.66	42.78	-11.22	54	39.04	32.77	4.62	33.65	100	286	A	V
	*	2450	102.44	-	-	98.47	32.89	4.68	33.6	100	286	P	V
	*	2450	92.32	-	-	88.35	32.89	4.68	33.6	100	286	A	V
		2483.6	68.2	-5.8	74	64.08	32.96	4.73	33.57	100	286	P	V
		2483.52	50.88	-3.12	54	46.76	32.96	4.73	33.57	100	286	A	V

Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (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		4842	39.93	-34.07	74	56.93	35.03	6.55	58.58	100	0	P	H
HT40		7266	40.79	-33.21	74	54.32	36.37	8.2	58.1	100	0	P	H
CH 03		4842	39.49	-34.51	74	56.49	35.03	6.55	58.58	100	0	P	V
2422MHz		7266	41.3	-32.7	74	54.83	36.37	8.2	58.1	100	0	P	V
802.11n		4872	41.4	-32.6	74	58.34	35.02	6.56	58.52	100	0	P	H
HT40		7308	41.65	-32.35	74	55.18	36.39	8.24	58.16	100	0	P	H
CH 06		4872	39.92	-34.08	74	56.86	35.02	6.56	58.52	100	0	P	V
2437MHz		7308	42.65	-31.35	74	56.18	36.39	8.24	58.16	100	0	P	V
802.11n		4902	41.36	-32.64	74	58.21	35.02	6.59	58.46	100	0	P	H
HT40		7356	42.7	-31.3	74	56.24	36.42	8.29	58.25	100	0	P	H
CH 09		4902	40.76	-33.24	74	57.61	35.02	6.59	58.46	100	0	P	V
2452MHz		7356	41.27	-32.73	74	54.81	36.42	8.29	58.25	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11n HT40 (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 802.11n HT40 LF		120.72	19.63	-23.87	43.5	38.7	11.52	1.19	31.78	-	-	P	H
		164.19	26	-17.5	43.5	46.5	9.94	1.34	31.78	100	74	P	H
		189.3	14.11	-29.39	43.5	35.63	8.82	1.44	31.78	-	-	P	H
		554.1	17.86	-28.14	46	27.64	19.86	2.33	31.97	-	-	P	H
		716.5	20.03	-25.97	46	28.09	21.28	2.68	32.02	-	-	P	H
		878.9	22.36	-23.64	46	27.92	23	2.97	31.53	-	-	P	H
		126.12	25.13	-18.37	43.5	44	11.7	1.21	31.78	100	65	P	V
		153.66	21.53	-21.97	43.5	41.23	10.8	1.28	31.78	-	-	P	V
		210.63	17.04	-26.46	43.5	38.11	9.2	1.51	31.78	-	-	P	V
		549.9	18.49	-27.51	46	28.42	19.7	2.33	31.96	-	-	P	V
		751.5	21.21	-24.79	46	28.24	22.2	2.75	31.98	-	-	P	V
		913.2	24.22	-21.78	46	28.87	23.65	3.02	31.32	-	-	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.
!	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	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		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".