

FCC RF Test Report

APPLICANT : Zebra Technologies Corporation
EQUIPMENT : Enterprise Digital Assistant
BRAND NAME : Zebra
MODEL NAME : MC55E0
MARKETING NAME : MC55E0
FCC ID : UZ7MC55E0
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jul. 11, 2017 and testing was completed on Aug. 10, 2017. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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

SPORTON INTERNATIONAL INC.
TEL : 886-3-327-3456
FAX : 886-3-328-4978
FCC ID : UZ7MC55E0

Page Number : 1 of 38
Report Issued Date : Sep. 12, 2017
Report Version : Rev. 01
Report Template No.: BU5-FR15CWL Version 2.0



TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Product Feature of Equipment Under Test	5
1.4 Product Specification of Equipment Under Test	6
1.5 Modification of EUT	6
1.6 Testing Location	7
1.7 Applicable Standards	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Carrier Frequency and Channel	8
2.2 Test Mode	9
2.3 Connection Diagram of Test System	10
2.4 Support Unit used in test configuration and system	11
2.5 EUT Operation Test Setup	11
2.6 Measurement Results Explanation Example	12
3 TEST RESULT	13
3.1 6dB and 99% Bandwidth Measurement	13
3.2 Output Power Measurement	15
3.3 Power Spectral Density Measurement	17
3.4 Conducted Band Edges and Spurious Emission Measurement	19
3.5 Radiated Band Edges and Spurious Emission Measurement	29
3.6 AC Conducted Emission Measurement	33
3.7 Requirements	35
4 LIST OF MEASURING EQUIPMENT	36
5 UNCERTAINTY OF EVALUATION	38
APPENDIX A. AC CONDUCTED EMISSION TEST RESULT	
APPENDIX B. RADIATED SPURIOUS EMISSION	
APPENDIX C. RADIATED SPURIOUS EMISSION PLOTS	
APPENDIX D. DUTY CYCLE PLOTS	
APPENDIX E. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR771121B	Rev. 01	Initial issue of report	Sep. 12, 2017

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	-
3.1	-	99% Bandwidth	-	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 1.64 dB at 2390.000 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 4.40 dB at 0.782 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Zebra Technologies Corporation
1 Zebra Plaza Holtsville, NY 11742

1.2 Manufacturer

Zebra Technologies Corporation
1 Zebra Plaza Holtsville, NY 11742

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Enterprise Digital Assistant
Brand Name	Zebra
Model Name	MC55E0
FCC ID	UZ7MC55E0
EUT supports Radios application	WLAN 11a/b/g/n HT20 Bluetooth BR/EDR
HW Version	EV2
SW Version	1.57.0000
FW Version	FUSION X_2.03.0.0.018R
MFD	26JUN17
EUT Stage	Engineering sample

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

Specification of Accessories				
Adapter (5.4V/1.2A)	Brand Name	Zebra	Part Number	PWR-BUA5V16W0WW
Battery 1 (White)	Brand Name	Zebra	Part Number	82-111094-02
Battery 2 (Black)	Brand Name	Zebra	Part Number	82-111094-01
USB Cable	Brand Name	Zebra	Part Number	25-108022-04R
DC Cable Line	Brand Name	Zebra	Part Number	CBL-DC-383A1-01
Holster 1	Brand Name	Zebra	Part Number	SG-MC5511110-01R
Holster 2	Brand Name	Zebra	Part Number	SG-MC5521110-01R



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 : 17.94 dBm (0.0622 W) 802.11g : 23.12 dBm (0.2051 W) 802.11n HT20 : 23.11 dBm (0.2046 W)
99% Occupied Bandwidth	802.11b : 14.05MHz 802.11g : 18.00MHz 802.11n HT20 : 19.10MHz
Antenna Type / Gain	Fixed Internal Antenna with gain 2.7 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

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		
	TH05-HY	CO05-HY	03CH07-HY

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

1.7 Applicable Standards

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

- ♦ FCC Part 15 Subpart 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 (X plane) 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 Test Mode

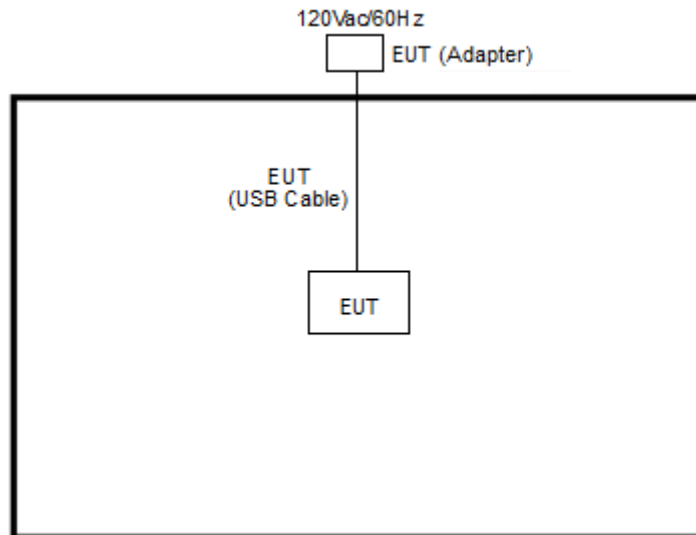
Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

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

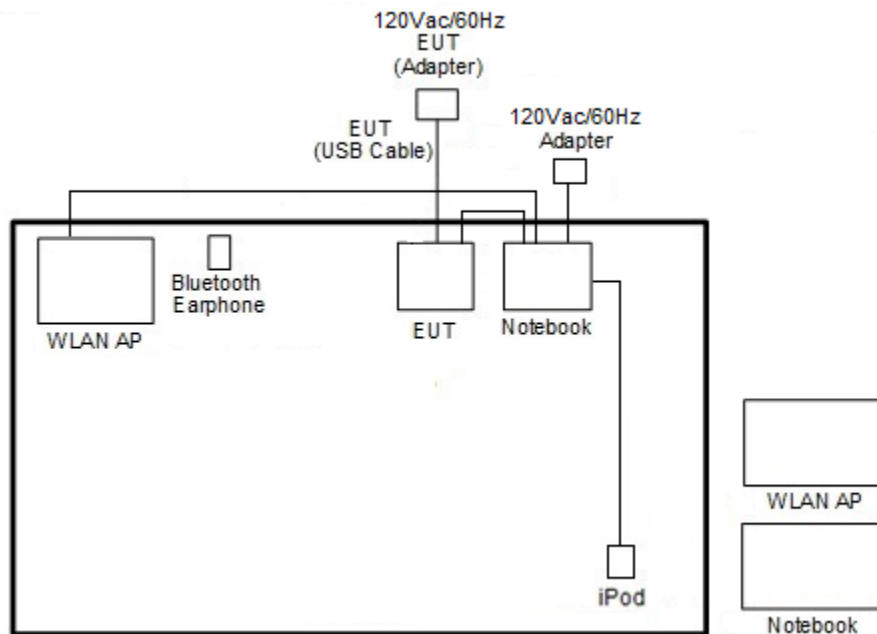
Test Cases	
AC Conducted Emission	Mode 1: WLAN Link (2.4GHz) + Bluetooth Link + Qwerty Keypad + USB link (Senrial) with AC power + MP3 + Camera Mode 2: WLAN Link (2.4GHz) + Bluetooth Link + Numeric Keypad + USB link (Senrial) with AC power + MP3 + without camera sample + Scanner

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,1.8m
3.	iPod	Apple	A1285	DoC	Shielded, 1.0m	N/A
4.	NOTE BOOK	Dell	Latitude E6320	FCC DoC	AC I/P: Unshielded, 1.2m DC O/P: Shielded, 1.8m	
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, programmed RF utility, "XW2DMT" installed in the EUT make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.



2.6 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 4.2 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

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.

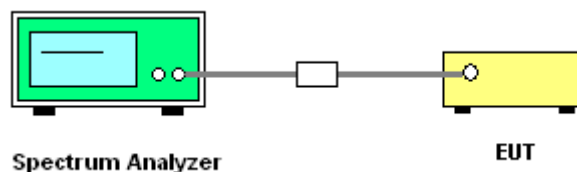
3.1.2 Measuring Instruments

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 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. 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.

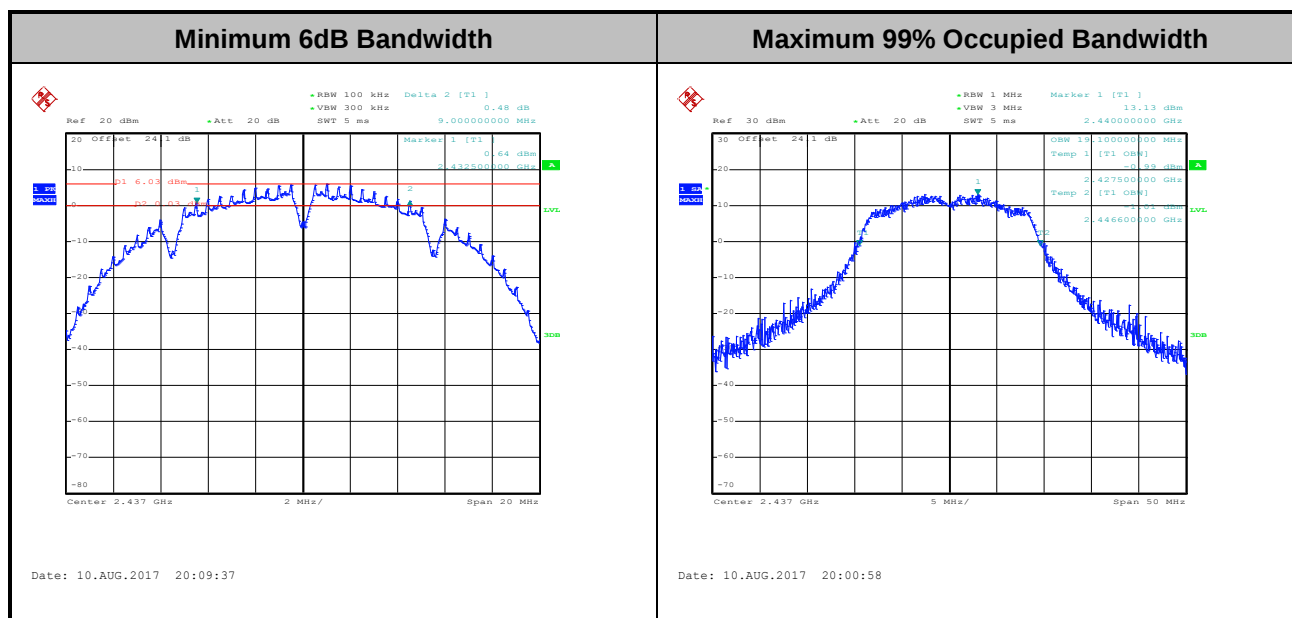
3.1.4 Test Setup





3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

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	14.00	9.52	0.50	Pass
11b	1Mbps	1	6	2437	14.05	9.00	0.50	Pass
11b	1Mbps	1	11	2462	14.05	9.00	0.50	Pass
11g	6Mbps	1	1	2412	17.55	15.12	0.50	Pass
11g	6Mbps	1	6	2437	18.00	15.10	0.50	Pass
11g	6Mbps	1	11	2462	17.95	15.02	0.50	Pass
VHT20	MCS0	1	1	2412	18.90	15.08	0.50	Pass
VHT20	MCS0	1	6	2437	19.10	15.08	0.50	Pass
VHT20	MCS0	1	11	2462	18.95	15.10	0.50	Pass



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

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
11b	1Mbps	1	1	2412	17.40	30.00	2.70	20.10	36.00	Pass
11b	1Mbps	1	6	2437	17.50	30.00	2.70	20.20	36.00	Pass
11b	1Mbps	1	11	2462	17.94	30.00	2.70	20.64	36.00	Pass
11g	6Mbps	1	1	2412	22.50	30.00	2.70	25.20	36.00	Pass
11g	6Mbps	1	6	2437	23.12	30.00	2.70	25.82	36.00	Pass
11g	6Mbps	1	11	2462	22.87	30.00	2.70	25.57	36.00	Pass
HT20	MCS0	1	1	2412	22.81	30.00	2.70	25.51	36.00	Pass
HT20	MCS0	1	6	2437	23.11	30.00	2.70	25.81	36.00	Pass
HT20	MCS0	1	11	2462	22.15	30.00	2.70	24.85	36.00	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

2.4GHz Band						
Mod.	Data Rate	NTX	CH.	Freq.(MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.00	15.17
11b	1Mbps	1	6	2437	0.00	15.24
11b	1Mbps	1	11	2462	0.00	15.69
11g	6Mbps	1	1	2412	0.06	12.78
11g	6Mbps	1	6	2437	0.06	15.55
11g	6Mbps	1	11	2462	0.06	13.63
HT20	MCS0	1	1	2412	0.09	14.87
HT20	MCS0	1	6	2437	0.09	15.32
HT20	MCS0	1	11	2462	0.09	12.06

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.

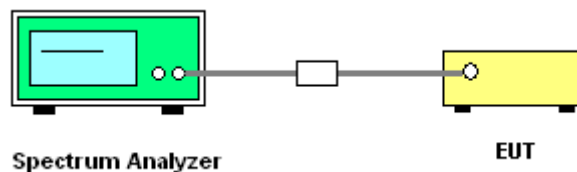
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

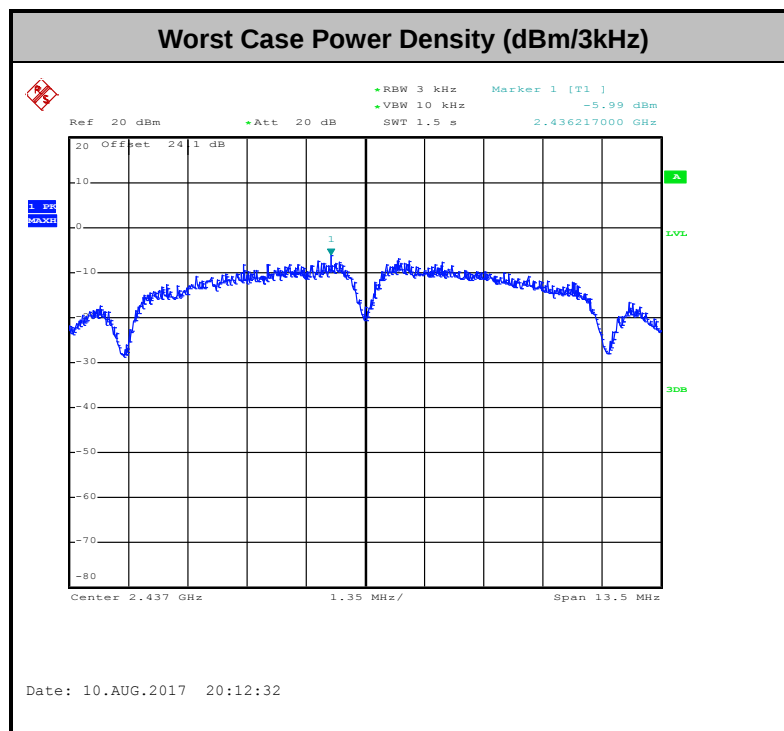
1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum 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

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	-7.49	2.70	8.00	Pass
11b	1Mbps	1	6	2437	-5.99	2.70	8.00	Pass
11b	1Mbps	1	11	2462	-7.49	2.70	8.00	Pass
11g	6Mbps	1	1	2412	-11.78	2.70	8.00	Pass
11g	6Mbps	1	6	2437	-10.62	2.70	8.00	Pass
11g	6Mbps	1	11	2462	-11.86	2.70	8.00	Pass
VHT20	MCS0	1	1	2412	-10.74	2.70	8.00	Pass
VHT20	MCS0	1	6	2437	-10.01	2.70	8.00	Pass
VHT20	MCS0	1	11	2462	-12.88	2.70	8.00	Pass



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.

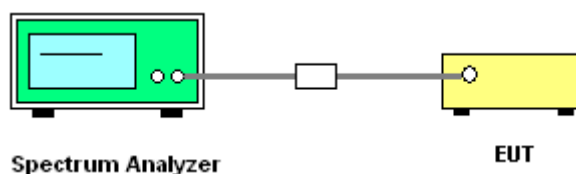
3.4.2 Measuring Instruments

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.

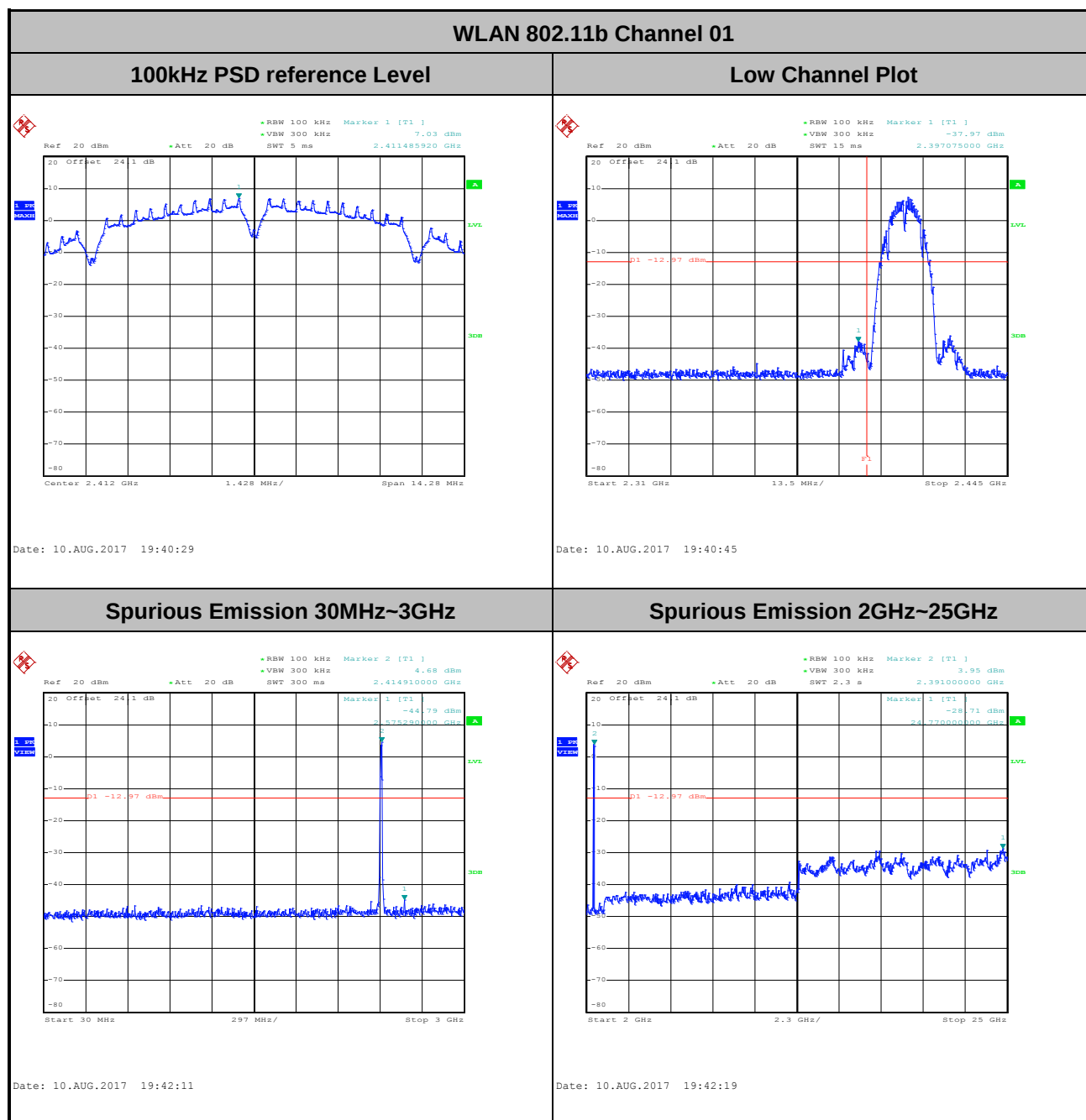
3.4.4 Test Setup





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 :	51~54%
Test Channel :	01	Test Engineer :	Kai Liao

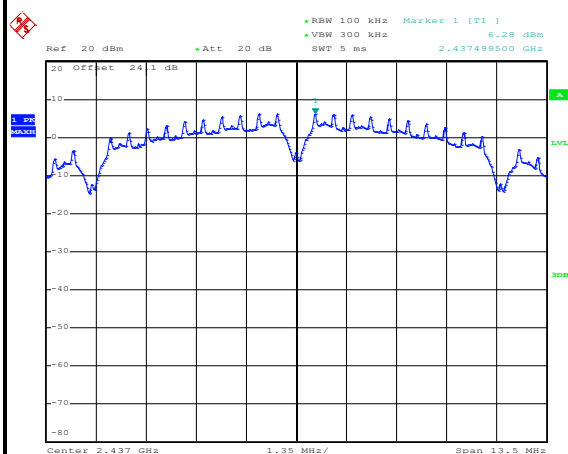




Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Kai Liao

WLAN 802.11b Channel 06

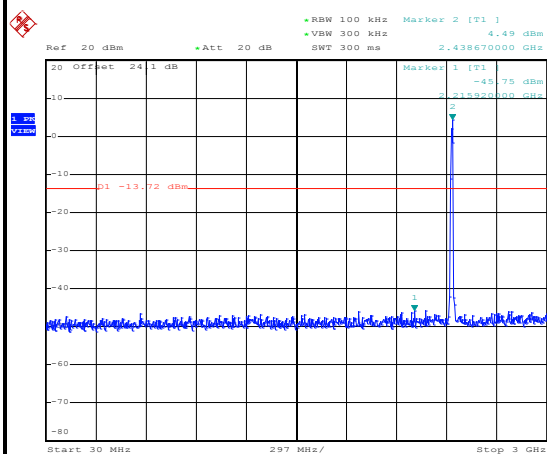
100kHz PSD reference Level



Date: 10.AUG.2017 20:13:38

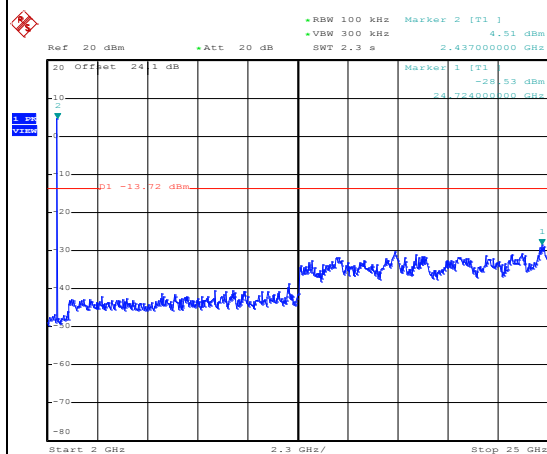
Mid Channel Plot

Spurious Emission 30MHz~3GHz



Date: 10.AUG.2017 20:14:02

Spurious Emission 2GHz~25GHz



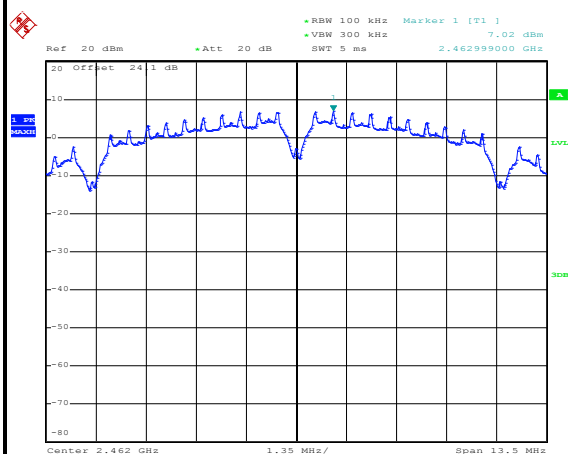
Date: 10.AUG.2017 20:14:10



Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Kai Liao

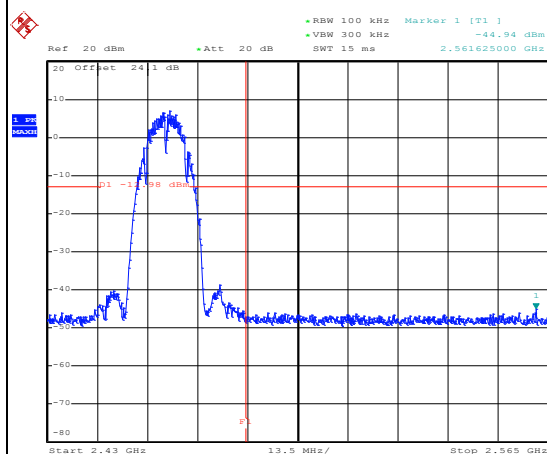
WLAN 802.11b Channel 11

100kHz PSD reference Level



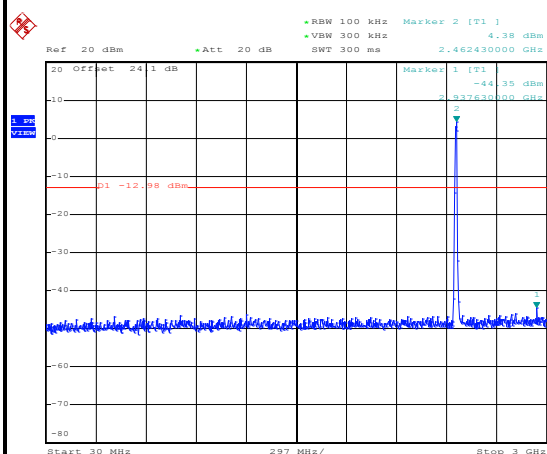
Date: 10.AUG.2017 20:17:22

High Channel Plot



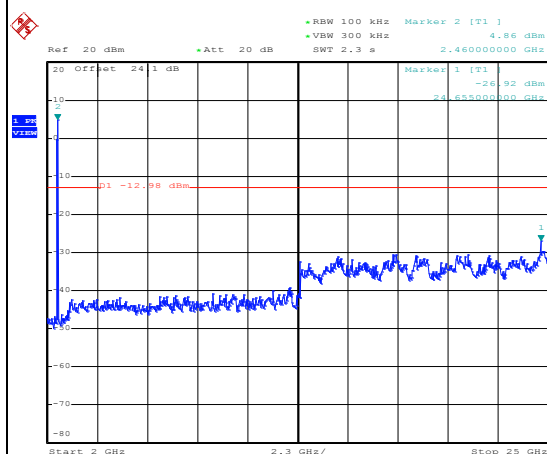
Date: 10.AUG.2017 20:18:05

Spurious Emission 30MHz~3GHz



Date: 10.AUG.2017 20:18:25

Spurious Emission 2GHz~25GHz



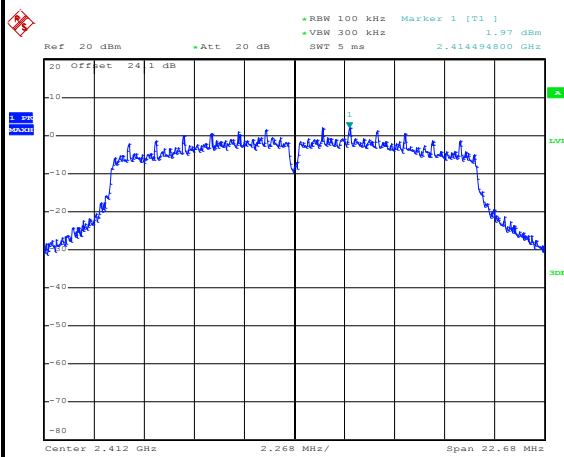
Date: 10.AUG.2017 20:18:34



Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Kai Liao

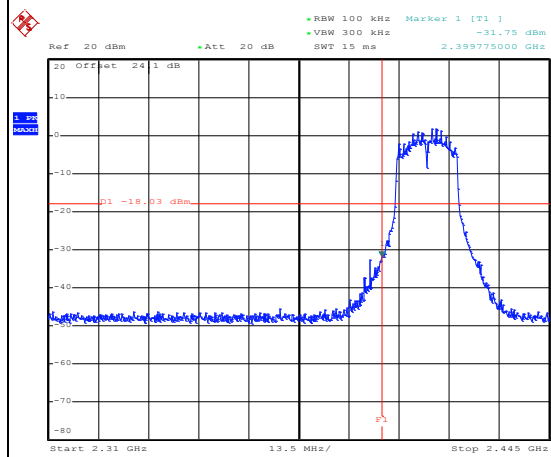
WLAN 802.11g Channel 01

100kHz PSD reference Level



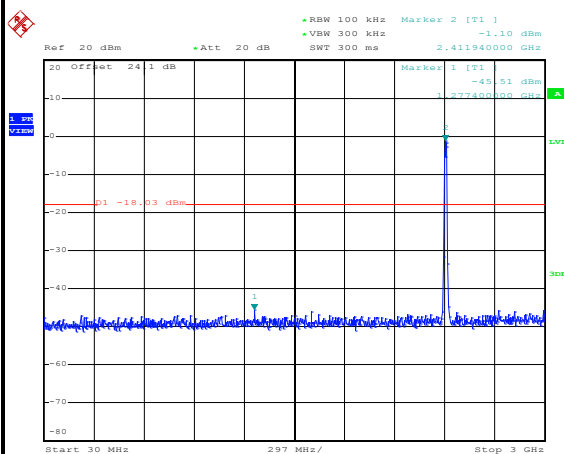
Date: 10.AUG.2017 19:46:28

Low Channel Plot



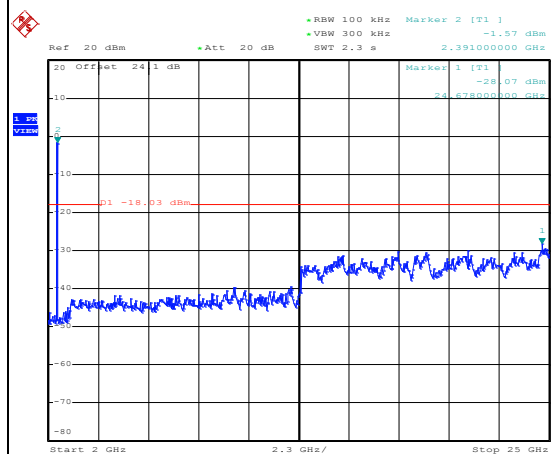
Date: 10.AUG.2017 19:46:56

Spurious Emission 30MHz~3GHz



Date: 10.AUG.2017 19:47:30

Spurious Emission 2GHz~25GHz



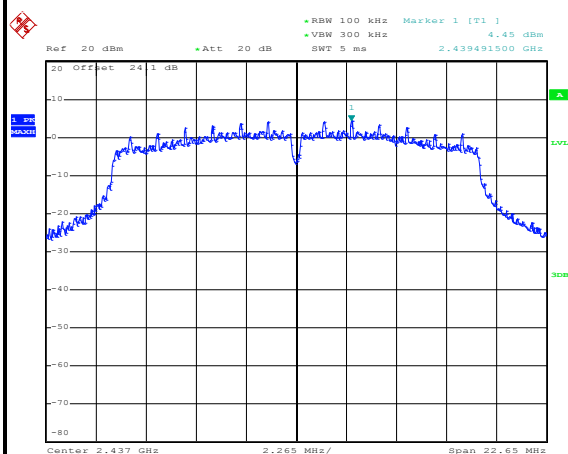
Date: 10.AUG.2017 19:47:38



Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Kai Liao

WLAN 802.11g Channel 06

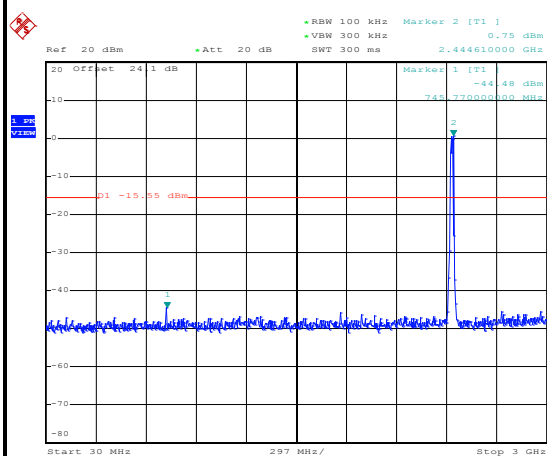
100kHz PSD reference Level



Date: 10.AUG.2017 20:06:45

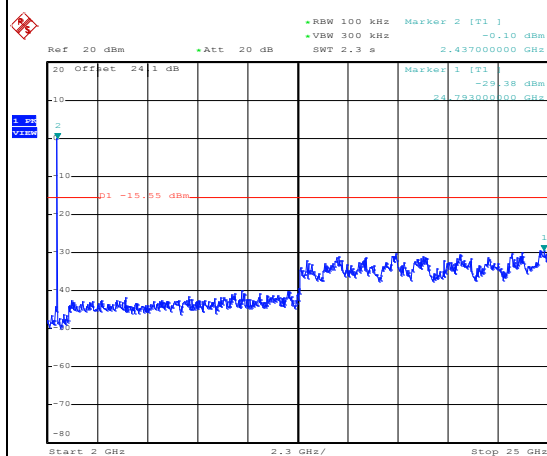
Mid Channel Plot

Spurious Emission 30MHz~3GHz



Date: 10.AUG.2017 20:07:01

Spurious Emission 2GHz~25GHz



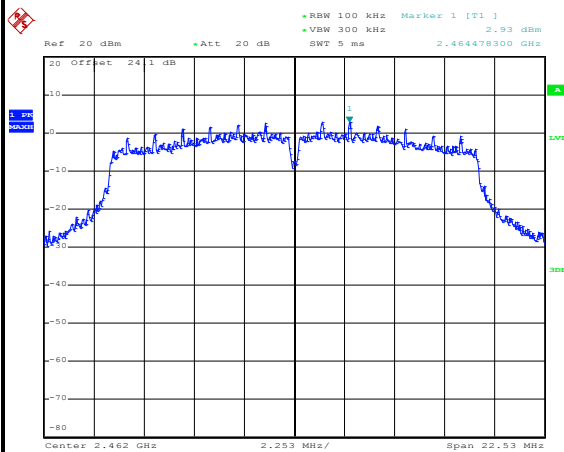
Date: 10.AUG.2017 20:07:10



Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Kai Liao

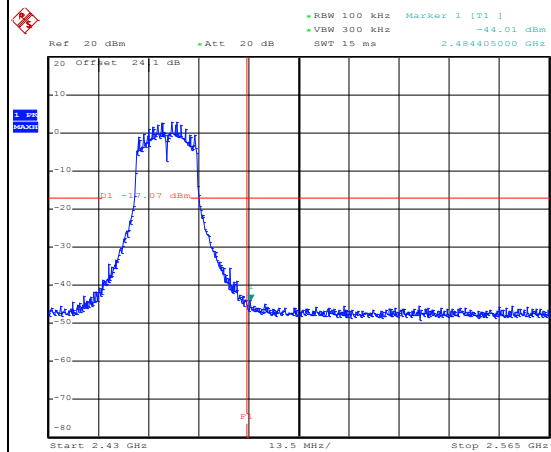
WLAN 802.11g Channel 11

100kHz PSD reference Level



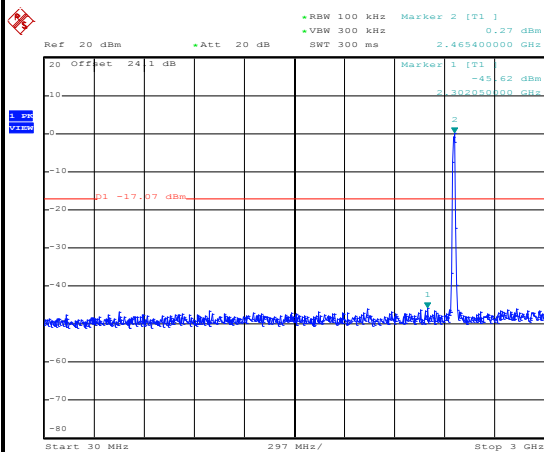
Date: 10.AUG.2017 20:22:28

High Channel Plot



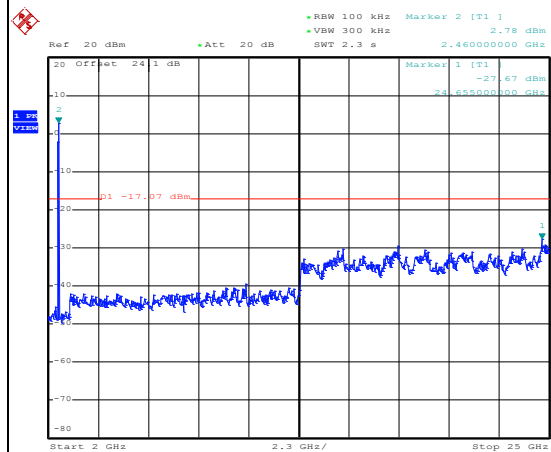
Date: 10.AUG.2017 20:23:30

Spurious Emission 30MHz~3GHz



Date: 10.AUG.2017 20:23:55

Spurious Emission 2GHz~25GHz



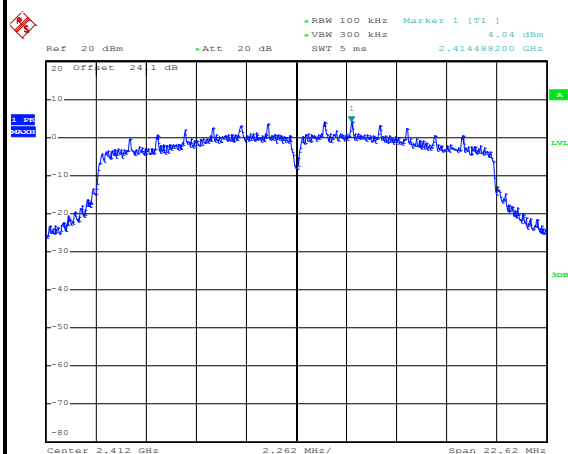
Date: 10.AUG.2017 20:24:04



Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Kai Liao

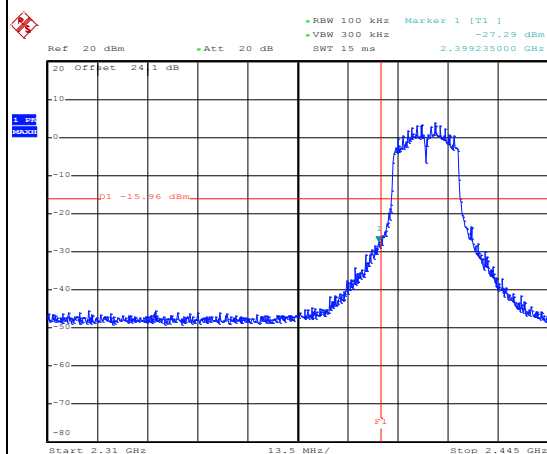
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



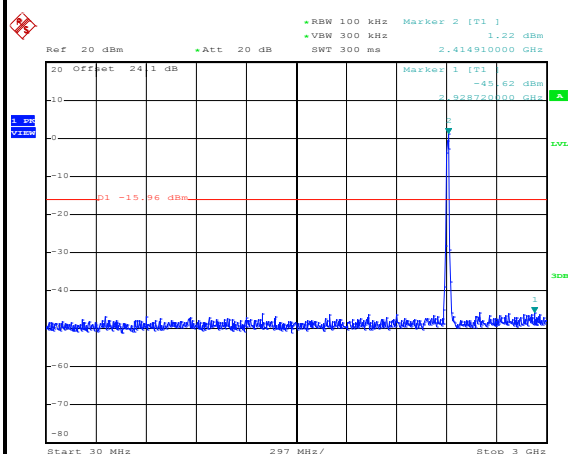
Date: 10.AUG.2017 19:51:53

Low Channel Plot



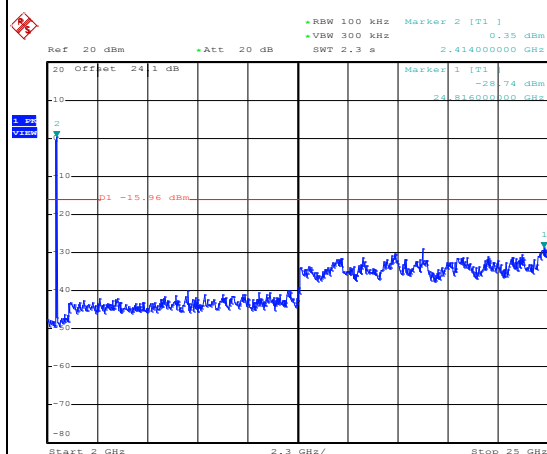
Date: 10.AUG.2017 19:52:19

Spurious Emission 30MHz~3GHz



Date: 10.AUG.2017 19:52:31

Spurious Emission 2GHz~25GHz



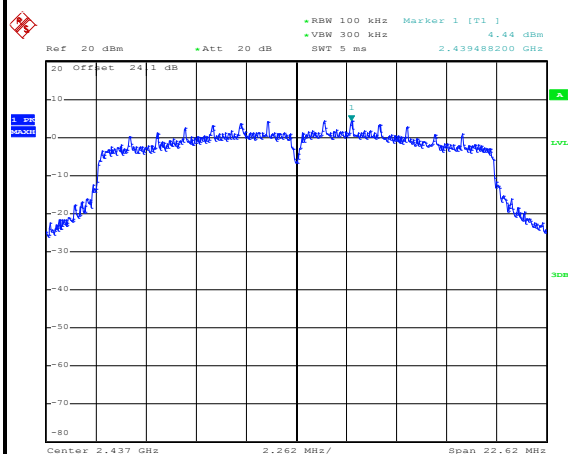
Date: 10.AUG.2017 19:52:40



Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Kai Liao

WLAN 802.11n HT20 Channel 06

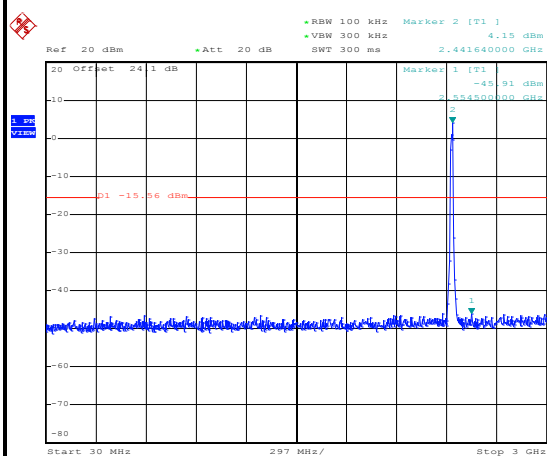
100kHz PSD reference Level



Date: 10.AUG.2017 19:57:55

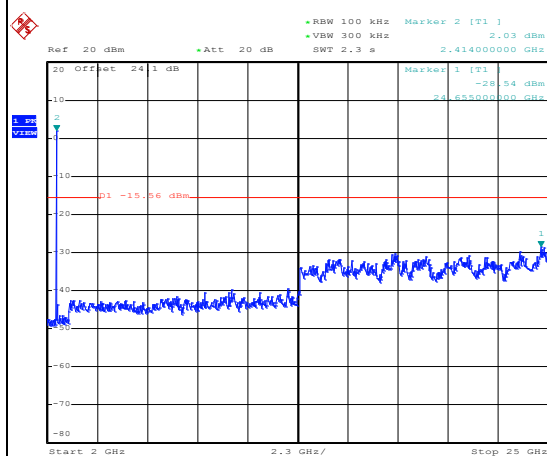
Mid Channel Plot

Spurious Emission 30MHz~3GHz



Date: 10.AUG.2017 19:58:17

Spurious Emission 2GHz~25GHz



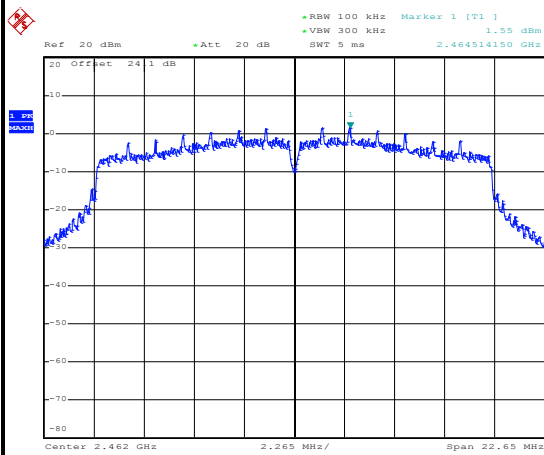
Date: 10.AUG.2017 19:58:25



Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Kai Liao

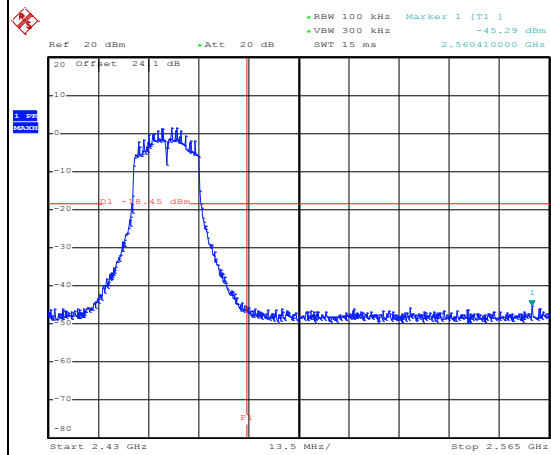
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



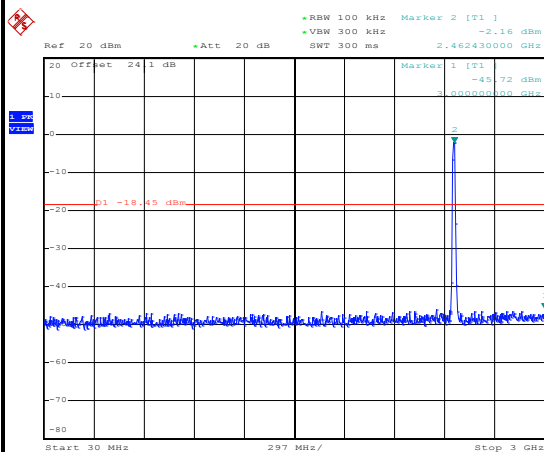
Date: 10.AUG.2017 20:27:37

High Channel Plot



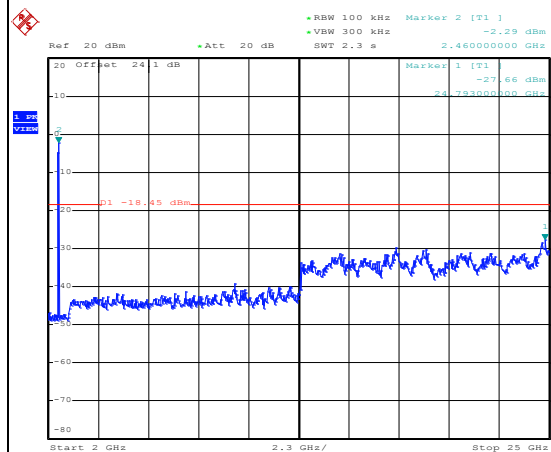
Date: 10.AUG.2017 20:28:03

Spurious Emission 30MHz~3GHz



Date: 10.AUG.2017 20:28:28

Spurious Emission 2GHz~25GHz



Date: 10.AUG.2017 20:28:37



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.

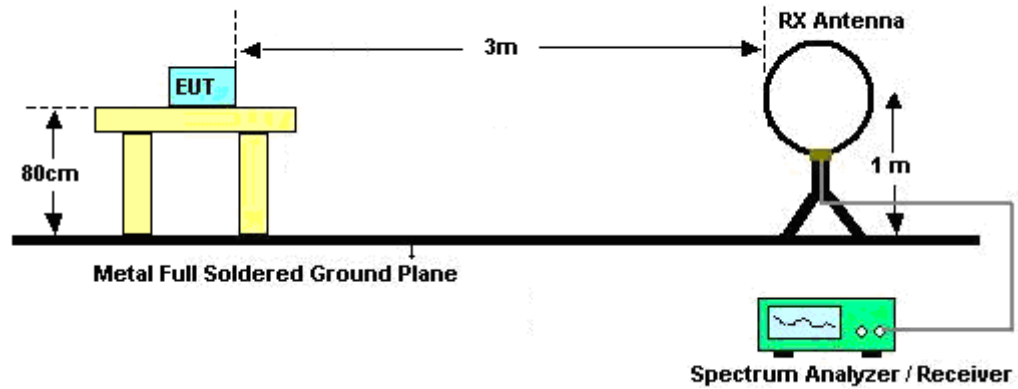


3.5.3 Test Procedures

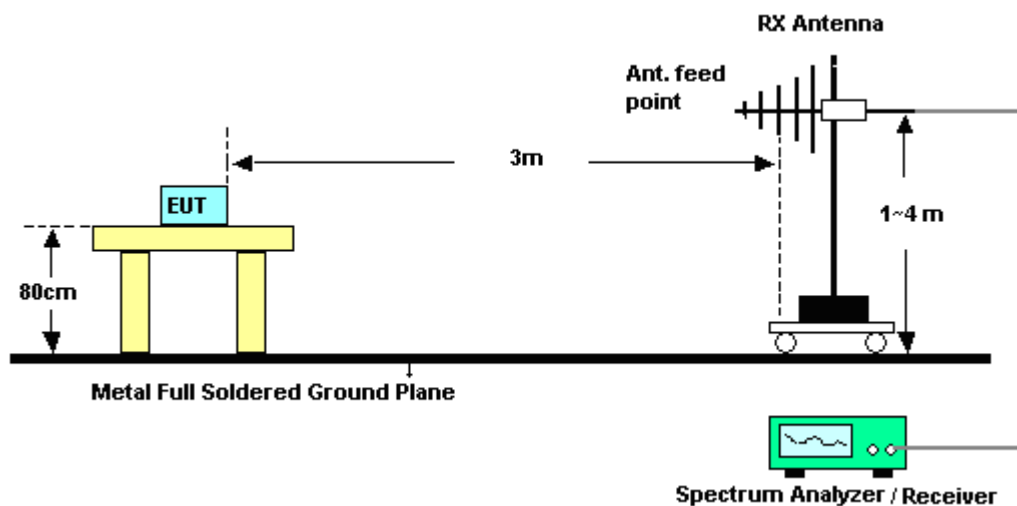
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test 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 = 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

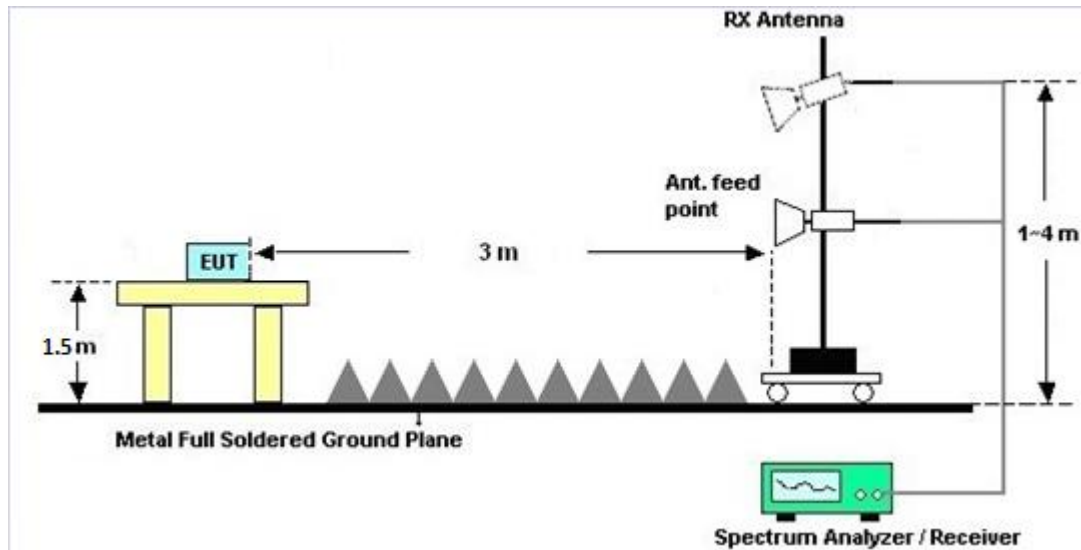
For radiated emissions below 30MHz



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 A and 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 A and 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 (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

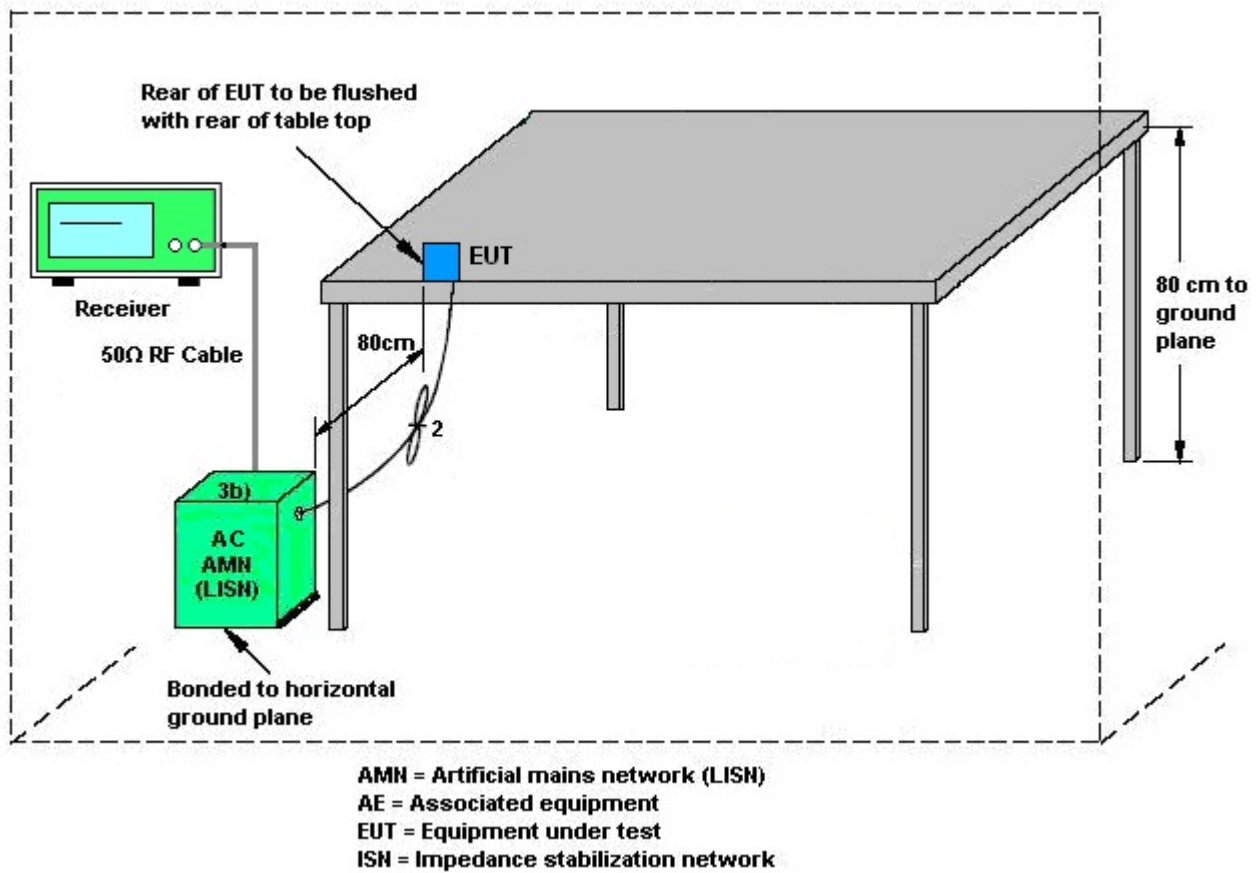
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, 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

Please refer to Appendix A.



3.7 Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the 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
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 29, 2016	Jul. 18, 2017 ~ Aug. 10, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GHz	Sep. 29, 2016	Jul. 18, 2017 ~ Aug. 10, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 25, 2016	Jul. 18, 2017 ~ Aug. 10, 2017	Nov. 24, 2017	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 19, 2017	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 30, 2016	Jul. 19, 2017	Aug. 29, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 29, 2016	Jul. 19, 2017	Nov. 28, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 06, 2016	Jul. 19, 2017	Dec. 05, 2017	Conduction (CO05-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	35419&0 3	30MHz to 1GHz	Jan. 07, 2017	Aug. 03, 2017 ~ Aug. 07, 2017	Jan. 06, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	0007596 2	1GHz ~ 18GHz	Aug. 19, 2016	Aug. 03, 2017 ~ Aug. 07, 2017	Aug. 18, 2017	Radiation (03CH07-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY5413 0085	20Hz ~ 8.4GHz	Oct. 26, 2016	Aug. 03, 2017 ~ Aug. 07, 2017	Oct. 25, 2017	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	May 15, 2017	Aug. 03, 2017 ~ Aug. 07, 2017	May 14, 2019	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz ~ 18GHz	Apr. 25, 2017	Aug. 03, 2017 ~ Aug. 07, 2017	Apr. 24, 2018	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	Mar. 14, 2017	Aug. 03, 2017 ~ Aug. 07, 2017	Mar. 13, 2018	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02 362	1GHz~ 26.5GHz	Oct. 12, 2016	Aug. 03, 2017 ~ Aug. 07, 2017	Oct. 11, 2017	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY5347 0118	10Hz~44GHz	Apr. 17, 2017	Aug. 03, 2017 ~ Aug. 07, 2017	Apr. 16, 2018	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF7802 08368	Control Ant Mast	N/A	Aug. 03, 2017 ~ Aug. 07, 2017	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Aug. 03, 2017 ~ Aug. 07, 2017	N/A	Radiation (03CH07-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Aug. 03, 2017 ~ Aug. 07, 2017	N/A	Radiation (03CH07-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz,V SWR : 2.5:1 max	Jul. 18, 2017	Aug. 03, 2017 ~ Aug. 07, 2017	Jul. 17, 2018	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 08, 2016	Aug. 03, 2017 ~ Aug. 07, 2017	Nov. 07, 2017	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.70
--	------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.70
--	------

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.50
--	------

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.20
--	------



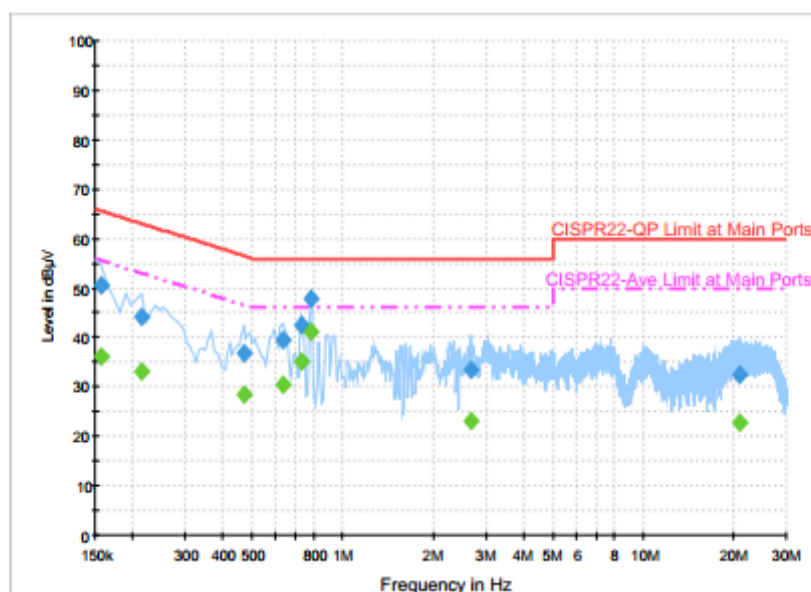
Appendix A. AC Conducted Emission Test Result

Test Engineer :	Poching Li	Temperature :	26°C
		Relative Humidity :	40%

EUT Information

Report NO : 771121
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Line

ENV216 Auto Test-L



Final Result 1

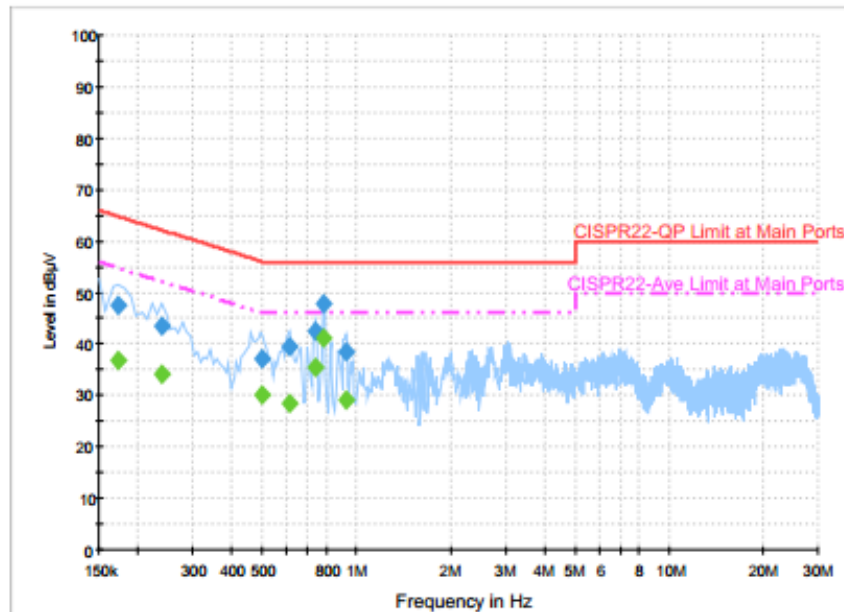
Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	50.5	Off	L1	19.5	15.1	65.6
0.214000	44.2	Off	L1	19.5	18.8	63.0
0.470000	36.9	Off	L1	19.5	19.6	56.5
0.630000	39.4	Off	L1	19.5	16.6	56.0
0.734000	42.5	Off	L1	19.5	13.5	56.0
0.782000	47.8	Off	L1	19.5	8.2	56.0
2.662000	33.5	Off	L1	19.3	22.5	56.0
21.078000	32.4	Off	L1	19.8	27.6	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	36.0	Off	L1	19.5	19.6	55.6
0.214000	33.0	Off	L1	19.5	20.0	53.0
0.470000	28.5	Off	L1	19.5	18.0	46.5
0.630000	30.3	Off	L1	19.5	15.7	46.0
0.734000	35.2	Off	L1	19.5	10.8	46.0
0.782000	41.2	Off	L1	19.5	4.8	46.0
2.662000	23.0	Off	L1	19.3	23.0	46.0
21.078000	22.6	Off	L1	19.8	27.4	50.0

EUT Information

Report NO : 771121
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Neutral

ENV216 Auto Test-N

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	47.6	Off	N	19.5	17.2	64.8
0.238000	43.5	Off	N	19.5	18.7	62.2
0.502000	37.0	Off	N	19.5	19.0	56.0
0.614000	39.6	Off	N	19.5	16.4	56.0
0.742000	42.4	Off	N	19.5	13.6	56.0
0.782000	47.7	Off	N	19.5	8.3	56.0
0.926000	38.4	Off	N	19.5	17.6	56.0

Final Result 2

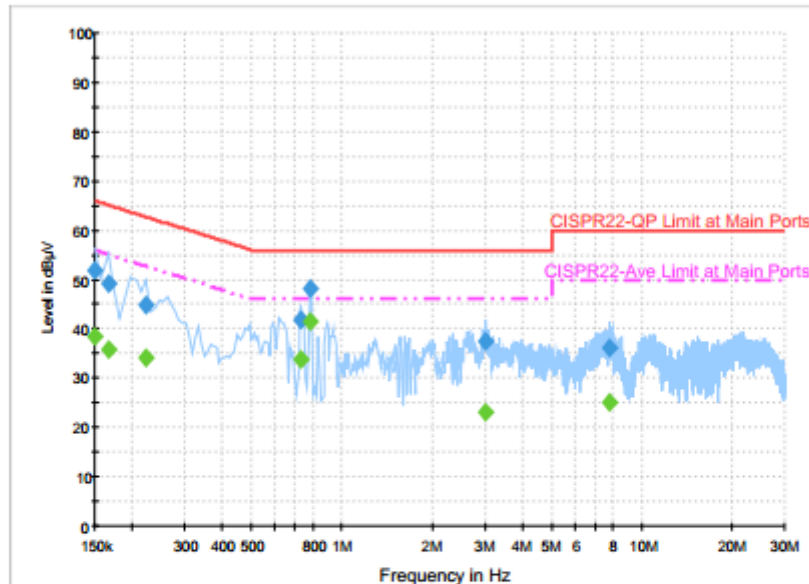
Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	36.7	Off	N	19.5	18.1	54.8
0.238000	34.1	Off	N	19.5	18.1	52.2
0.502000	30.0	Off	N	19.5	16.0	46.0
0.614000	28.3	Off	N	19.5	17.7	46.0
0.742000	35.4	Off	N	19.5	10.6	46.0
0.782000	41.2	Off	N	19.5	4.8	46.0
0.926000	28.9	Off	N	19.5	17.1	46.0



EUT Information

Report NO : 771121
Test Mode : Mode 2
Test Voltage : 120Vac/60Hz
Phase : Line

ENV216 Auto Test-L



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	51.9	Off	L1	19.6	14.1	66.0
0.166000	49.3	Off	L1	19.5	15.9	65.2
0.222000	44.7	Off	L1	19.5	18.0	62.7
0.734000	41.9	Off	L1	19.5	14.1	56.0
0.782000	48.0	Off	L1	19.5	8.0	56.0
3.030000	37.6	Off	L1	19.5	18.4	56.0
7.814000	36.0	Off	L1	19.6	24.0	60.0

Final Result 2

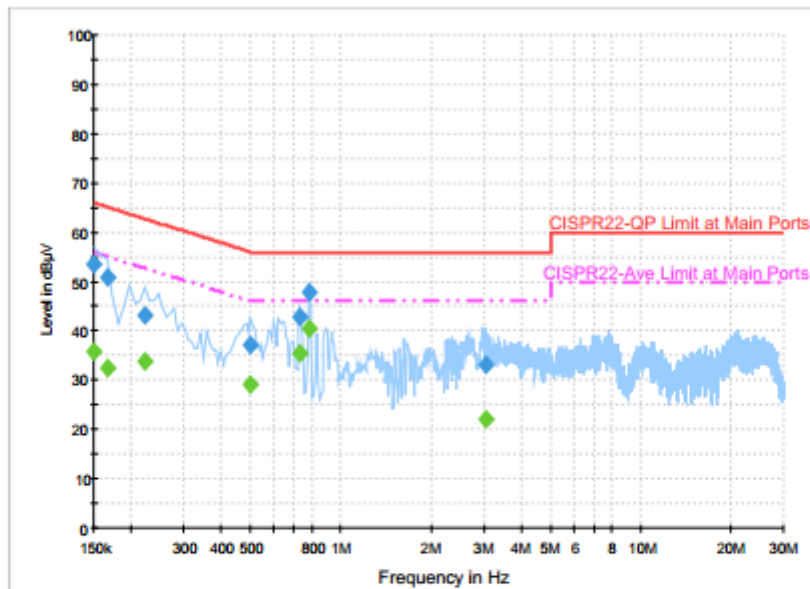
Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	38.3	Off	L1	19.6	17.7	56.0
0.166000	35.7	Off	L1	19.5	19.5	55.2
0.222000	34.0	Off	L1	19.5	18.7	52.7
0.734000	33.9	Off	L1	19.5	12.1	46.0
0.782000	41.6	Off	L1	19.5	4.4	46.0
3.030000	23.0	Off	L1	19.5	23.0	46.0
7.814000	25.1	Off	L1	19.6	24.9	50.0



EUT Information

Report NO : 771121
Test Mode : Mode 2
Test Voltage : 120Vac/60Hz
Phase : Neutral

ENV216 Auto Test-N



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	53.4	Off	N	19.5	12.6	66.0
0.166000	51.0	Off	N	19.5	14.2	65.2
0.222000	43.2	Off	N	19.5	19.5	62.7
0.502000	37.0	Off	N	19.5	19.0	56.0
0.734000	42.8	Off	N	19.5	13.2	56.0
0.782000	47.7	Off	N	19.5	8.3	56.0
3.046000	33.2	Off	N	19.5	22.8	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	35.8	Off	N	19.5	20.2	56.0
0.166000	32.5	Off	N	19.5	22.7	55.2
0.222000	33.8	Off	N	19.5	18.9	52.7
0.502000	29.1	Off	N	19.5	16.9	46.0
0.734000	35.4	Off	N	19.5	10.6	46.0
0.782000	40.6	Off	N	19.5	5.4	46.0
3.046000	22.2	Off	N	19.5	23.8	46.0



Appendix B. Radiated Spurious Emission

Test Engineer :	Jesse Wang, James Chiu and Potter Liu	Temperature :	22~26°C
		Relative Humidity :	52~57%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		2377.41	56.53	-17.47	74	51.1	32.14	8.26	34.97	318	179	P	H
		2385.39	46.97	-7.03	54	41.56	32.14	8.24	34.97	318	179	A	H
	*	2412	106.11	-	-	100.61	32.24	8.24	34.98	318	179	P	H
	*	2412	103.11	-	-	97.61	32.24	8.24	34.98	318	179	A	H
													H
													H
		2384.865	56.21	-17.79	74	50.8	32.14	8.24	34.97	100	91	P	V
		2385.495	45.57	-8.43	54	40.16	32.14	8.24	34.97	100	91	A	V
	*	2412	103.26	-	-	97.76	32.24	8.24	34.98	100	91	P	V
	*	2412	100.31	-	-	94.81	32.24	8.24	34.98	100	91	A	V
													V
													V
802.11b CH 06 2437MHz		2389.1	56.41	-17.59	74	50.95	32.19	8.24	34.97	200	180	P	H
		2389.1	45.3	-8.7	54	39.84	32.19	8.24	34.97	200	180	A	H
	*	2437	105.49	-	-	99.87	32.34	8.27	34.99	200	180	P	H
	*	2437	102.33	-	-	96.71	32.34	8.27	34.99	200	180	A	H
		2485.16	55.95	-18.05	74	50.2	32.45	8.3	35	200	180	P	H
		2484.53	45.54	-8.46	54	39.79	32.45	8.3	35	200	180	A	H
		2357.6	55.96	-18.04	74	50.58	32.09	8.26	34.97	360	155	P	V
		2388.68	44.99	-9.01	54	39.53	32.19	8.24	34.97	360	155	A	V
	*	2437	105.22	-	-	99.6	32.34	8.27	34.99	360	155	P	V
	*	2437	102.09	-	-	96.47	32.34	8.27	34.99	360	155	A	V
		2484.81	55.93	-18.07	74	50.18	32.45	8.3	35	360	155	P	V
		2489.43	45.29	-8.71	54	39.49	32.5	8.3	35	360	155	A	V



802.11b CH 11 2462MHz	*	2462	108.02	-	-	102.31	32.4	8.3	34.99	340	70	P	H
	*	2462	104.85	-	-	99.14	32.4	8.3	34.99	340	70	A	H
		2487.44	58	-16	74	52.25	32.45	8.3	35	340	70	P	H
		2487.72	48.09	-5.91	54	42.29	32.5	8.3	35	340	70	A	H
													H
													H
	*	2462	104.33	-	-	98.62	32.4	8.3	34.99	380	144	P	V
	*	2462	101.23	-	-	95.52	32.4	8.3	34.99	380	144	A	V
		2490.4	57.32	-16.68	74	51.52	32.5	8.3	35	380	144	P	V
		2487.72	47.19	-6.81	54	41.39	32.5	8.3	35	380	144	A	V
													V
													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 Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	41.85	-32.15	74	55.66	33.64	11.93	59.38	100	0	P	H
													H
													H
													H
		4824	40.75	-33.25	74	54.56	33.64	11.93	59.38	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	41.39	-32.61	74	55.24	33.54	11.9	59.29	100	0	P	H
		7311	40.98	-33.02	74	49.4	34.69	14.94	58.05	100	0	P	H
													H
													H
		4874	40.1	-33.9	74	53.95	33.54	11.9	59.29	100	0	P	V
		7311	41.03	-32.97	74	49.45	34.69	14.94	58.05	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	42.91	-31.09	74	56.81	33.44	11.87	59.21	100	0	P	H
		7386	41.72	-32.28	74	50.29	34.47	15.08	58.12	100	0	P	H
													H
													H
		4924	41.3	-32.7	74	55.2	33.44	11.87	59.21	100	0	P	V
		7386	41.77	-32.23	74	50.34	34.47	15.08	58.12	100	0	P	V
													V
													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 Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.38	56.94	-17.06	74	51.48	32.19	8.24	34.97	346	117	P	H
		2390	45.91	-8.09	54	40.46	32.19	8.24	34.98	346	117	A	H
	*	2412	105.94	-	-	100.44	32.24	8.24	34.98	346	117	P	H
	*	2412	98.42	-	-	92.92	32.24	8.24	34.98	346	117	A	H
													H
													H
		2389.485	56.17	-17.83	74	50.71	32.19	8.24	34.97	101	98	P	V
		2390	45.37	-8.63	54	39.92	32.19	8.24	34.98	101	98	A	V
	*	2412	103.61	-	-	98.11	32.24	8.24	34.98	101	98	P	V
	*	2412	95.95	-	-	90.45	32.24	8.24	34.98	101	98	A	V
													V
													V
802.11g CH 06 2437MHz		2387.42	55.57	-18.43	74	50.11	32.19	8.24	34.97	274	39	P	H
		2388.54	45.16	-8.84	54	39.7	32.19	8.24	34.97	274	39	A	H
	*	2437	108.22	-	-	102.6	32.34	8.27	34.99	274	39	P	H
	*	2437	101.25	-	-	95.63	32.34	8.27	34.99	274	39	A	H
		2484.11	56.13	-17.87	74	50.38	32.45	8.3	35	274	39	P	H
		2488.87	45.42	-8.58	54	39.62	32.5	8.3	35	274	39	A	H
		2324.84	55.48	-18.52	74	50.18	31.98	8.28	34.96	352	147	P	V
		2387.98	45.11	-8.89	54	39.65	32.19	8.24	34.97	352	147	A	V
	*	2437	108.03	-	-	102.41	32.34	8.27	34.99	352	147	P	V
	*	2437	100.42	-	-	94.8	32.34	8.27	34.99	352	147	A	V
		2484.88	55.97	-18.03	74	50.22	32.45	8.3	35	352	147	P	V
		2484.18	45.46	-8.54	54	39.71	32.45	8.3	35	352	147	A	V



802.11g CH 11 2462MHz	*	2462	106.85	-	-	101.14	32.4	8.3	34.99	280	115	P	H
	*	2462	99.17	-	-	93.46	32.4	8.3	34.99	280	115	A	H
		2484.76	62.8	-11.2	74	57.05	32.45	8.3	35	280	115	P	H
		2483.52	47.68	-6.32	54	41.93	32.45	8.3	35	280	115	A	H
													H
													H
	*	2462	107.58	-	-	101.87	32.4	8.3	34.99	320	146	P	V
	*	2462	100.01	-	-	94.3	32.4	8.3	34.99	320	146	A	V
		2483.92	57.89	-16.11	74	52.14	32.45	8.3	35	320	146	P	V
		2483.52	46.2	-7.8	54	40.45	32.45	8.3	35	320	146	A	V
													V
													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 Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	40.79	-33.21	74	54.6	33.64	11.93	59.38	100	0	P	H
													H
													H
													H
		4824	41.1	-32.9	74	54.91	33.64	11.93	59.38	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	40.59	-33.41	74	54.44	33.54	11.9	59.29	100	0	P	H
		7311	41.33	-32.67	74	49.75	34.69	14.94	58.05	100	0	P	H
													H
													H
		4874	40.03	-33.97	74	53.88	33.54	11.9	59.29	100	0	P	V
		7311	41.62	-32.38	74	50.04	34.69	14.94	58.05	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	40.49	-33.51	74	54.39	33.44	11.87	59.21	100	0	P	H
		7386	42.37	-31.63	74	50.94	34.47	15.08	58.12	100	0	P	H
													H
													H
		4924	40.58	-33.42	74	54.48	33.44	11.87	59.21	100	0	P	V
		7386	42.47	-31.53	74	51.04	34.47	15.08	58.12	100	0	P	V
													V
													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 Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2387.595	67.51	-6.49	74	62.05	32.19	8.24	34.97	205	179	P	H
		2390	52.36	-1.64	54	46.91	32.19	8.24	34.98	205	179	A	H
	*	2412	108.94	-	-	103.44	32.24	8.24	34.98	205	179	P	H
	*	2412	100.24	-	-	94.74	32.24	8.24	34.98	205	179	A	H
													H
													H
		2388.96	63.36	-10.64	74	57.9	32.19	8.24	34.97	100	90	P	V
		2390	48.11	-5.89	54	42.66	32.19	8.24	34.98	100	90	A	V
	*	2412	105.62	-	-	100.12	32.24	8.24	34.98	100	90	P	V
	*	2412	98.02	-	-	92.52	32.24	8.24	34.98	100	90	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2389.94	55.73	-18.27	74	50.28	32.19	8.24	34.98	355	110	P	H
		2389.94	45.15	-8.85	54	39.7	32.19	8.24	34.98	355	110	A	H
	*	2437	107.77	-	-	102.15	32.34	8.27	34.99	355	110	P	H
	*	2437	100.25	-	-	94.63	32.34	8.27	34.99	355	110	A	H
		2491.39	55.76	-18.24	74	49.96	32.5	8.3	35	355	110	P	H
		2488.52	45.37	-8.63	54	39.57	32.5	8.3	35	355	110	A	H
		2327.5	55.88	-18.12	74	50.58	31.98	8.28	34.96	380	148	P	V
		2388.82	45.01	-8.99	54	39.55	32.19	8.24	34.97	380	148	A	V
	*	2437	106.16	-	-	100.54	32.34	8.27	34.99	380	148	P	V
	*	2437	98.66	-	-	93.04	32.34	8.27	34.99	380	148	A	V
		2490.13	56.62	-17.38	74	50.82	32.5	8.3	35	380	148	P	V
		2486.42	45.44	-8.56	54	39.69	32.45	8.3	35	380	148	A	V



802.11n HT20 CH 11 2462MHz	*	2462	106.2	-	-	100.49	32.4	8.3	34.99	300	70	P	H
	*	2462	98.43	-	-	92.72	32.4	8.3	34.99	300	70	A	H
		2483.64	59.85	-14.15	74	54.1	32.45	8.3	35	300	70	P	H
		2483.52	48.91	-5.09	54	43.16	32.45	8.3	35	300	70	A	H
													H
													H
	*	2462	103.18	-	-	97.47	32.4	8.3	34.99	380	145	P	V
	*	2462	95.53	-	-	89.82	32.4	8.3	34.99	380	145	A	V
		2484.04	59.13	-14.87	74	53.38	32.45	8.3	35	380	145	P	V
		2483.52	47.83	-6.17	54	42.08	32.45	8.3	35	380	145	A	V
													V
													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 Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4824	41.65	-32.35	74	55.46	33.64	11.93	59.38	100	0	P	H
													H
													H
													H
		4824	40.54	-33.46	74	54.35	33.64	11.93	59.38	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	40.36	-33.64	74	54.21	33.54	11.9	59.29	100	0	P	H
		7311	41.91	-32.09	74	50.33	34.69	14.94	58.05	100	0	P	H
													H
													H
		4874	40.04	-33.96	74	53.89	33.54	11.9	59.29	100	0	P	V
		7311	41.68	-32.32	74	50.1	34.69	14.94	58.05	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4924	40.81	-33.19	74	54.71	33.44	11.87	59.21	100	0	P	H
		7386	41.61	-32.39	74	50.18	34.47	15.08	58.12	100	0	P	H
													H
													H
		4924	40.03	-33.97	74	53.93	33.44	11.87	59.21	100	0	P	V
		7386	41.93	-32.07	74	50.5	34.47	15.08	58.12	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (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 HT20 LF		30	27.37	-12.63	40	31.01	26	1.71	31.35	-	-	P	H
		140.43	30.56	-12.94	43.5	41.49	17.97	2.62	31.52	-	-	P	H
		263.82	27.94	-18.06	46	36.25	19.76	3.28	31.35	-	-	P	H
		356	30.6	-15.4	46	36.9	21.34	3.57	31.21	-	-	P	H
		893.6	33.71	-12.29	46	30	28.96	5.27	30.52	-	-	P	H
		957.3	34.72	-11.28	46	29.61	30.22	5.4	30.51	100	77	P	H
													H
													H
													H
													H
													H
													H
		31.08	30.83	-9.17	40	35.02	25.46	1.71	31.36	100	247	P	V
		136.38	33.16	-10.34	43.5	44.25	18.09	2.34	31.52	-	-	P	V
		217.65	25.73	-20.27	46	38.06	16.37	2.72	31.42	-	-	P	V
		372.1	29.67	-16.33	46	35.54	21.74	3.57	31.18	-	-	P	V
		906.9	33.12	-12.88	46	29.15	29.16	5.33	30.52	-	-	P	V
		955.2	34.56	-11.44	46	29.46	30.21	5.4	30.51	-	-	P	V
													V
													V
												V	
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

*	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	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		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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



Appendix C. Radiated Spurious Emission Plots

Test Engineer :	Jesse Wang, James Chiu and Potter Liu	Temperature :	22~26℃
		Relative Humidity :	52~57%

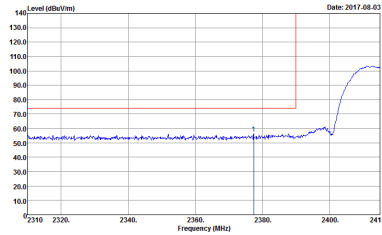
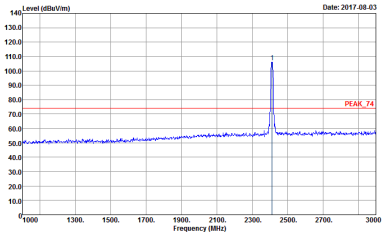
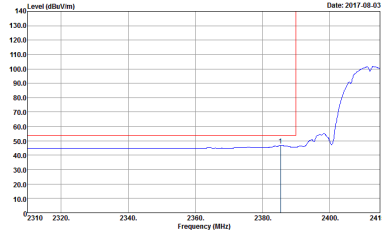
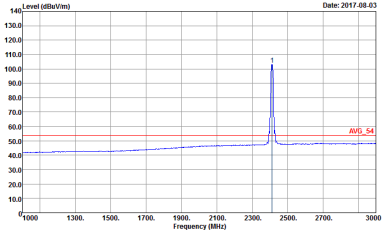
Note symbol

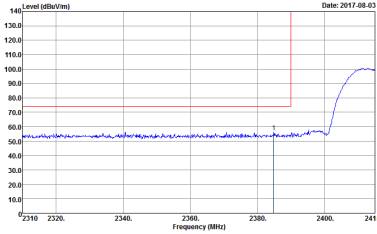
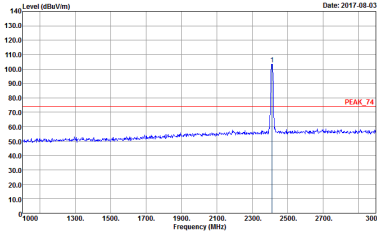
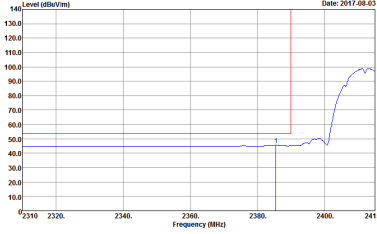
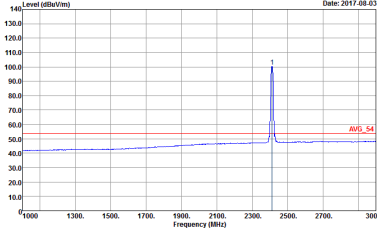
-L	Low channel location
-R	High channel location



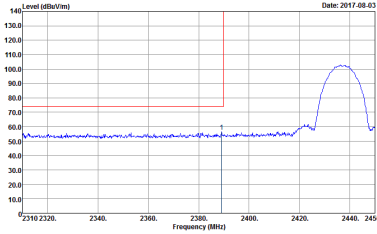
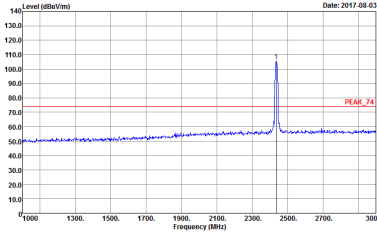
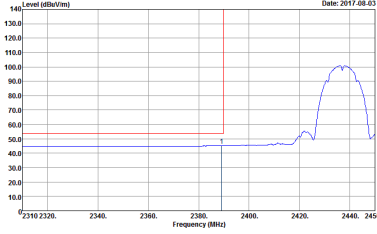
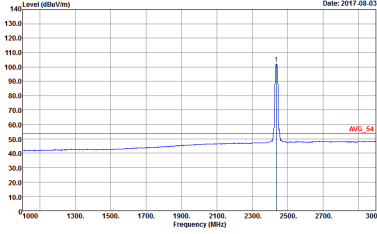
2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

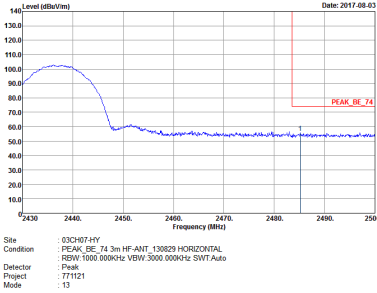
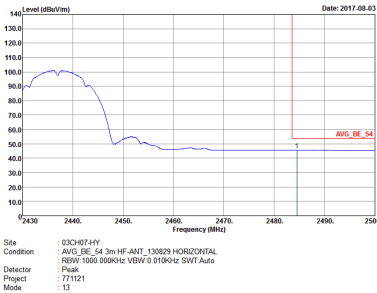
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000 000kHz VBW:3000 000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 12	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 HORIZONTAL RBW:1000 000kHz VBW:3000 000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 12
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000 000kHz VBW:0 0100kHz SWT:Auto Detector : Peak Project : 771121 Mode : 12	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 HORIZONTAL RBW:1000 000kHz VBW:0 0100kHz SWT:Auto Detector : Peak Project : 771121 Mode : 12

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 12	 Site : 03CH07-4Y Condition : PEAK_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 12
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 12	 Site : 03CH07-4Y Condition : AVG_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 12

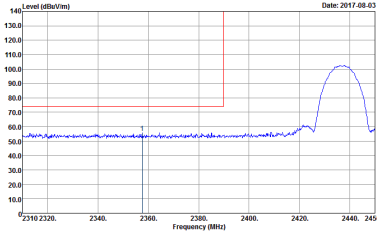
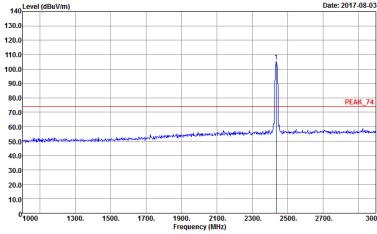
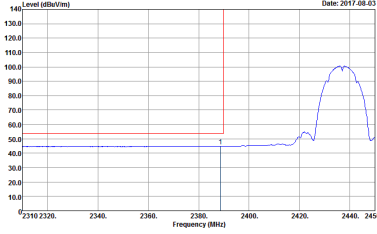
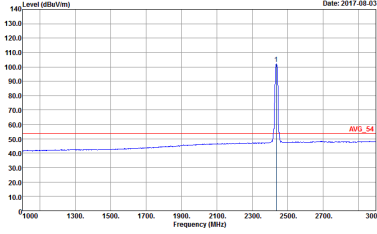


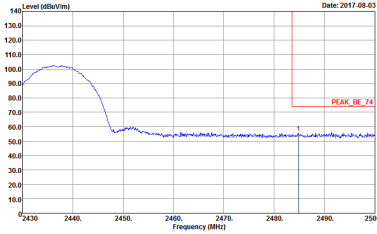
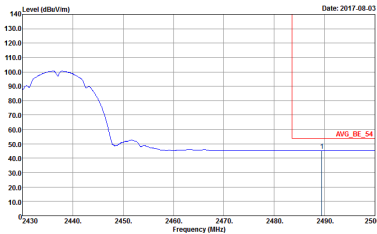
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 13	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 13
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 13	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 13



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank



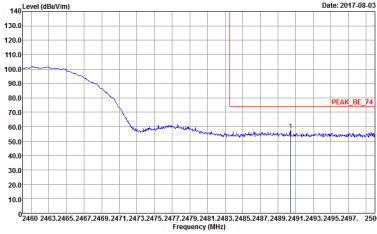
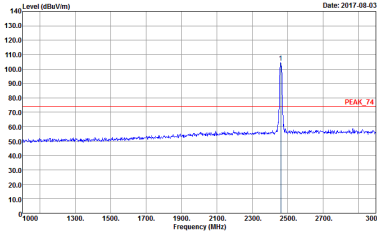
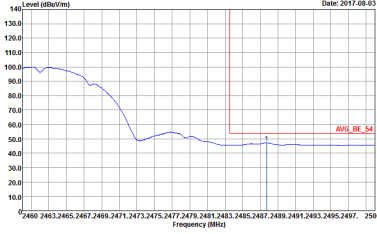
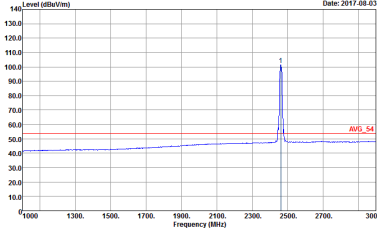
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 13	 Site : 03CH07-4Y Condition : PEAK_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 13
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 13	 Site : 03CH07-4Y Condition : AVG_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 13

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL RBW: 1000.000kHz VBW: 3000.000kHz SWT: Auto Detector : Peak Project : 771121 Mode : 13	Left blank
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL RBW: 1000.000kHz VBW: 0.010kHz SWT: Auto Detector : Peak Project : 771121 Mode : 13	Left blank

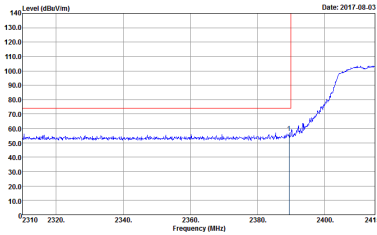
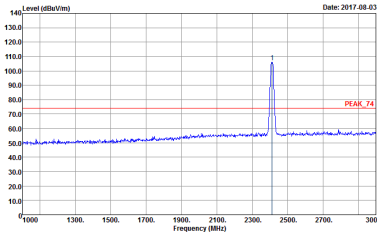
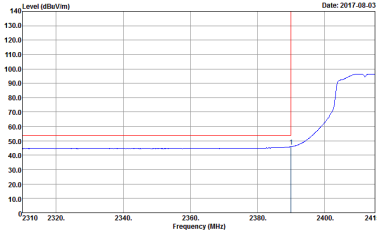
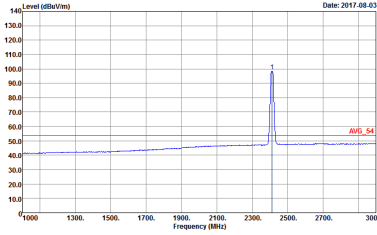


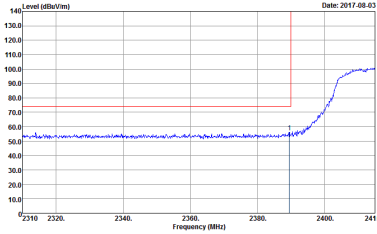
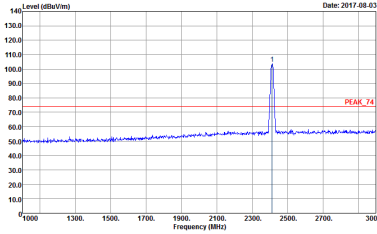
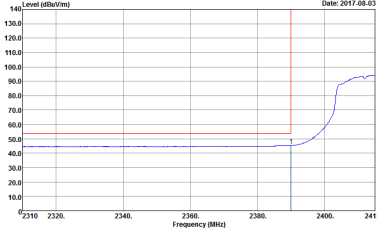
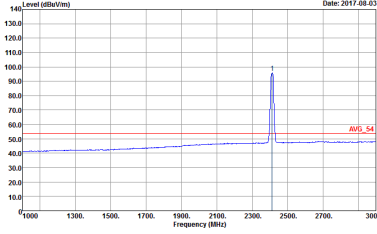
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 14	Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 14
Avg.	Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 14	Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 14

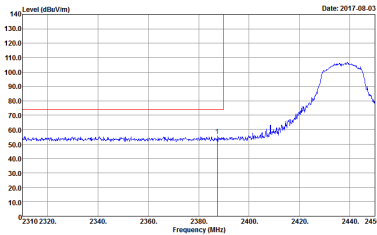
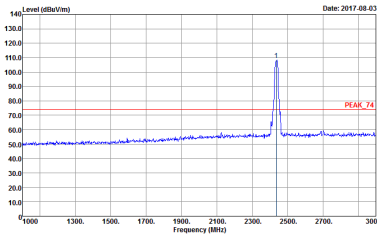
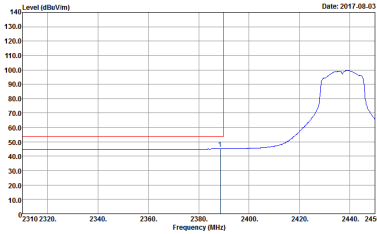
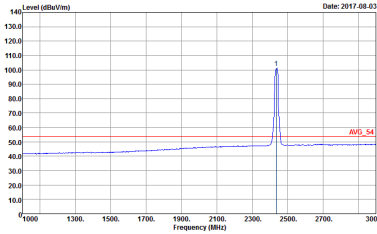


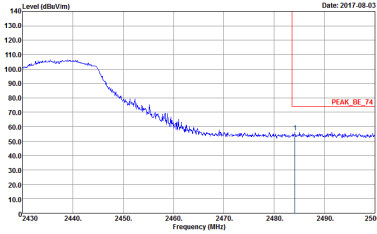
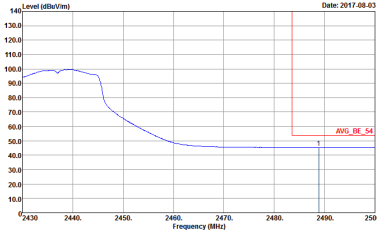
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 14	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 14
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 14	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 14

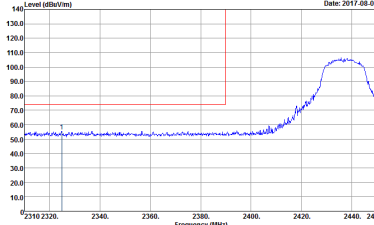
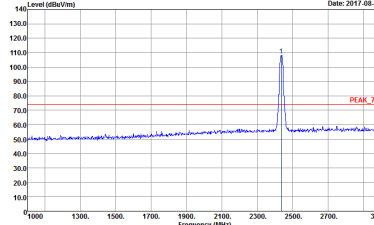
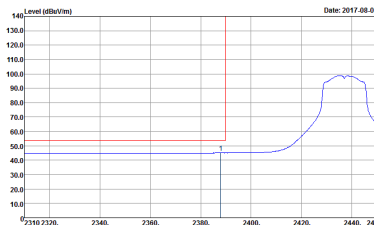
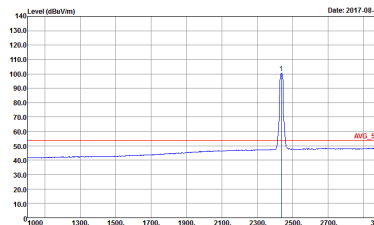
2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000 000kHz VBW:3000 000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 15	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 HORIZONTAL RBW:1000 000kHz VBW:3000 000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 15
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000 000kHz VBW:0 010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 15	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 HORIZONTAL RBW:1000 000kHz VBW:0 010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 15

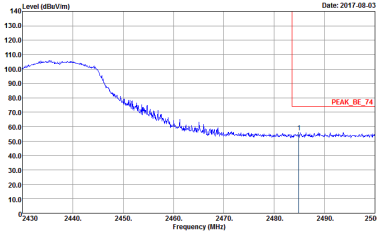
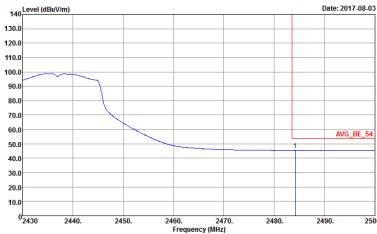
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 15	 Site : 03CH07-4Y Condition : PEAK_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 15
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 15	 Site : 03CH07-4Y Condition : AVG_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 15

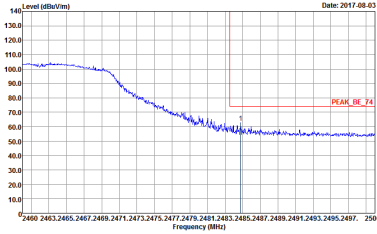
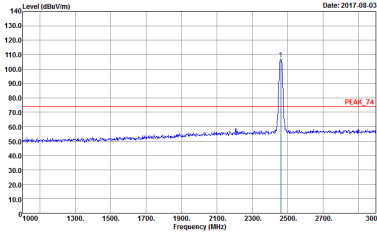
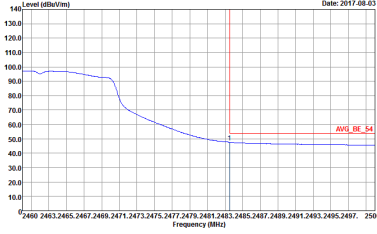
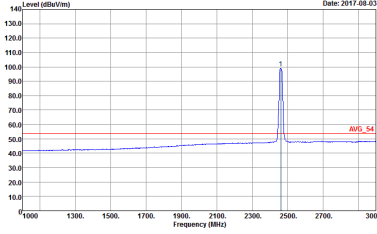
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 16	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 16
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 16	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 16

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW: 1000.000kHz VBW: 3000.000kHz SWT: Auto Detector : Peak Project : 771121 Mode : 16	Left blank
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW: 1000.000kHz VBW: 0.010kHz SWT: Auto Detector : Peak Project : 771121 Mode : 16	Left blank

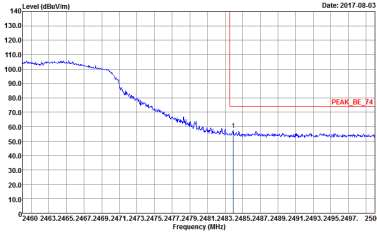
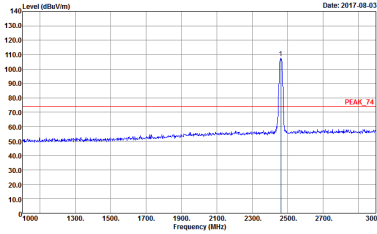
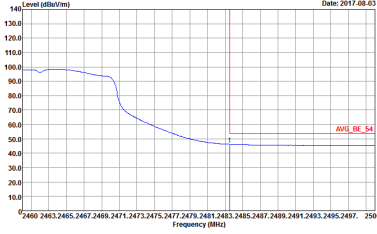
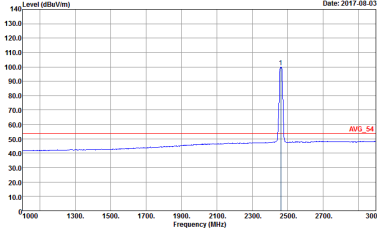
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 16	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 16
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 16	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 16



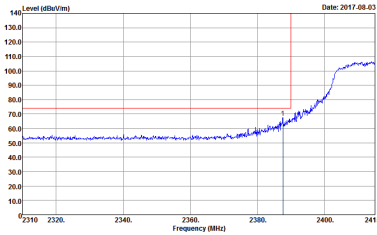
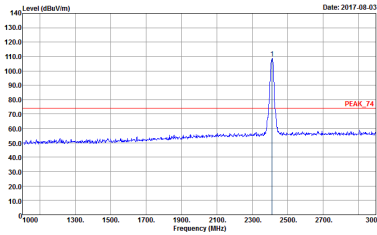
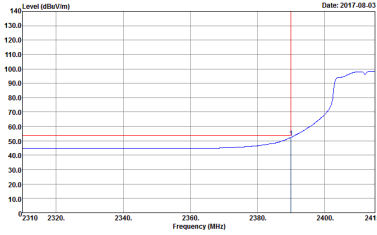
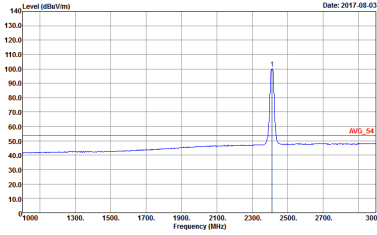
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 771121 Mode : 16	Left Blank
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 771121 Mode : 16	Left Blank

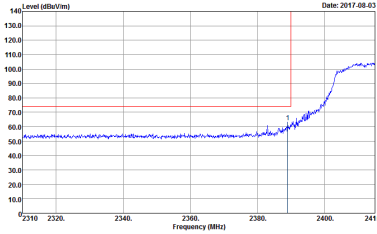
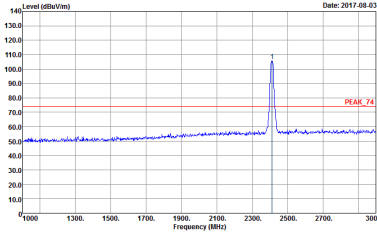
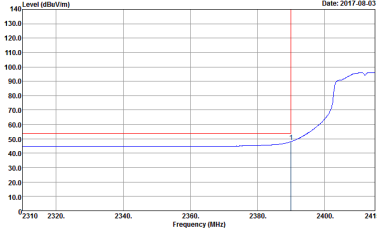
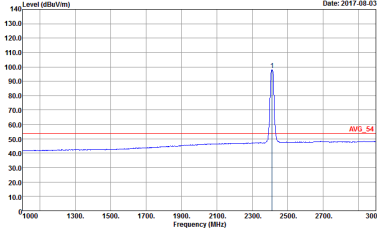
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 17	 Site : 03CH07-4Y Condition : PEAK_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 17
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 17	 Site : 03CH07-4Y Condition : AVG_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 17



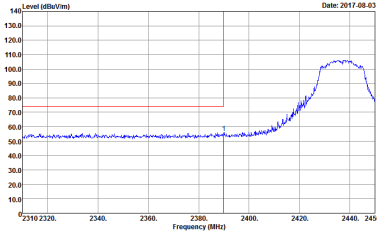
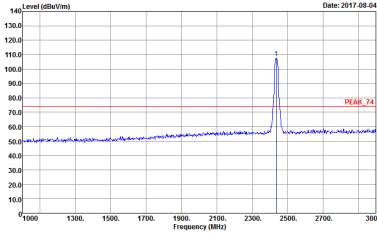
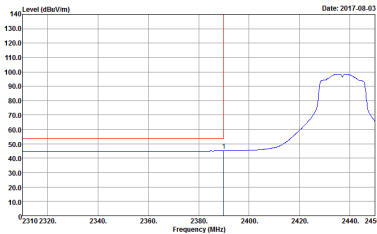
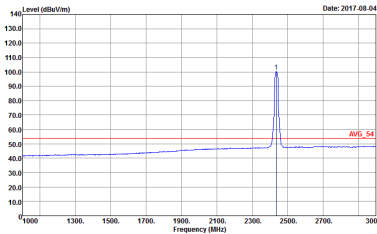
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 17	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 17
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 17	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 17

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

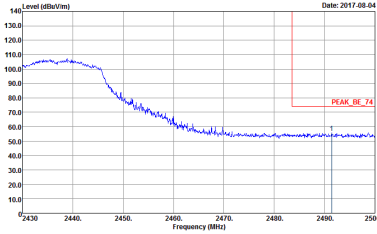
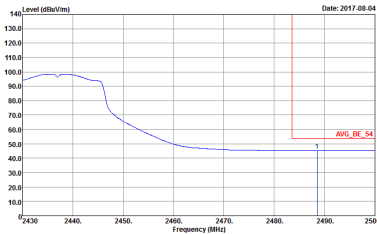
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000 000KHz VBW:3000 000KHz SWT:Auto Detector : Peak Project : 771121 Mode : 18	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 HORIZONTAL RBW:1000 000KHz VBW:3000 000KHz SWT:Auto Detector : Peak Project : 771121 Mode : 18
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000 000KHz VBW:0 010KHz SWT:Auto Detector : Peak Project : 771121 Mode : 18	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 HORIZONTAL RBW:1000 000KHz VBW:0 010KHz SWT:Auto Detector : Peak Project : 771121 Mode : 18

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 18	 Site : 03CH07-4Y Condition : PEAK_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 18
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 18	 Site : 03CH07-4Y Condition : AVG_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 18

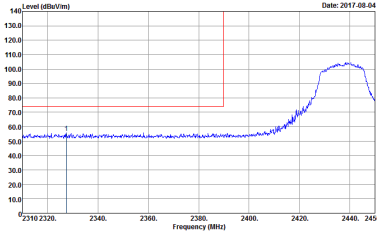
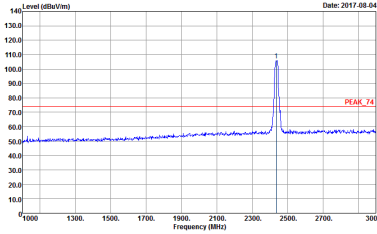
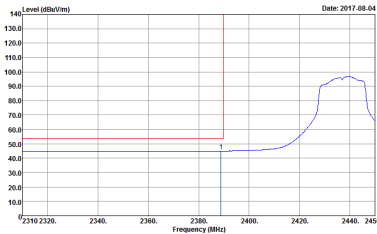
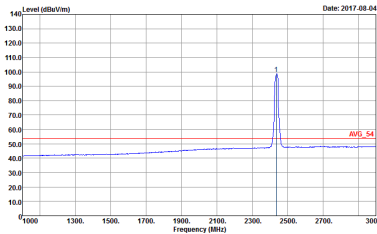


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 19	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 19
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 19	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 19

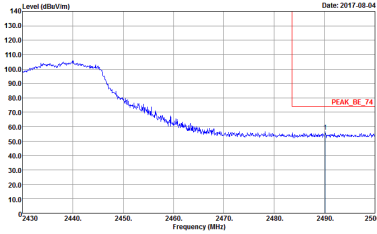
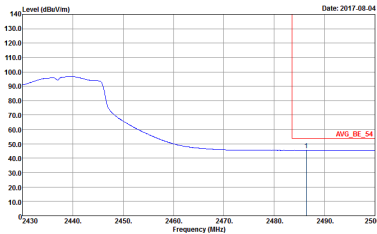


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 63CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 19	Left blank
Avg.	 Site : 63CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 19	Left blank

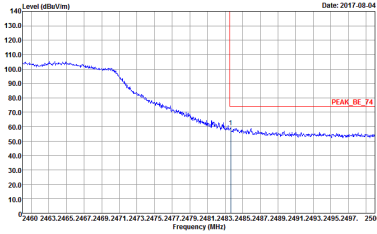
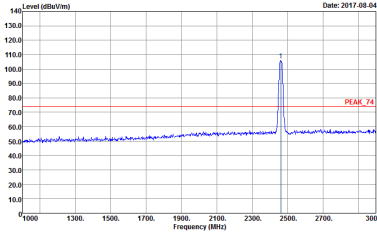
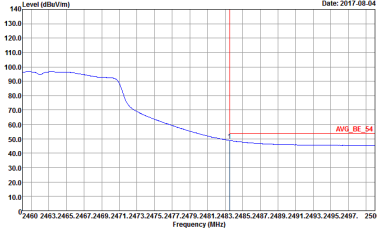
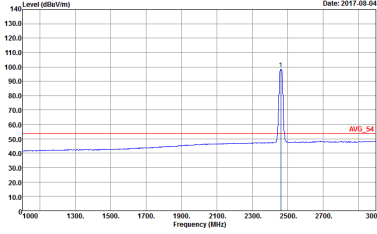


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 19	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 19
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 19	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 VERTICAL Detector : Peak Project : 771121 Mode : 19

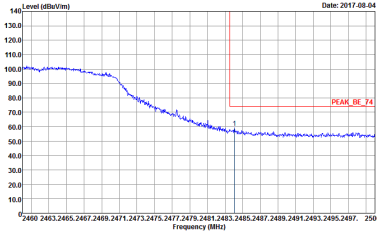
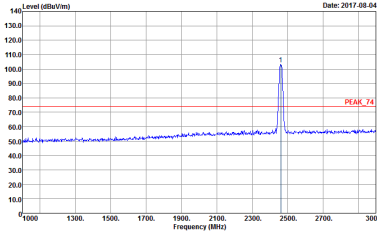
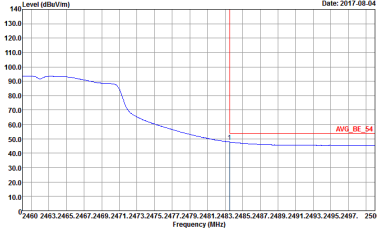
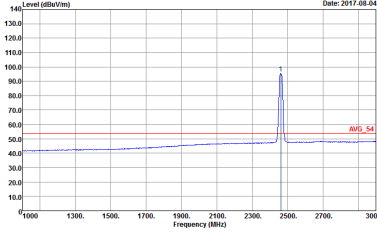


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 63CH07-4Y Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 19	Left Blank
Avg.	 Site : 63CH07-4Y Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 19	Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 20	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 20
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 20	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 20

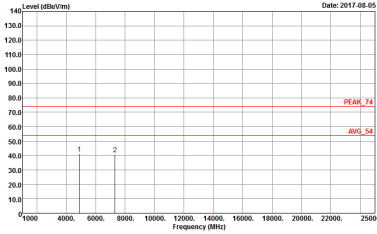
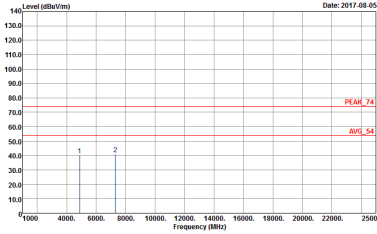


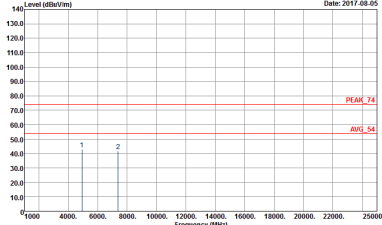
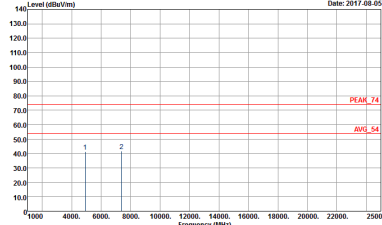
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 20	 Site : 03CH07-HY Condition : PEAK_74 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 771121 Mode : 20
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 20	 Site : 03CH07-HY Condition : AVG_54 3m HF-ANT_130829 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 771121 Mode : 20



2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)

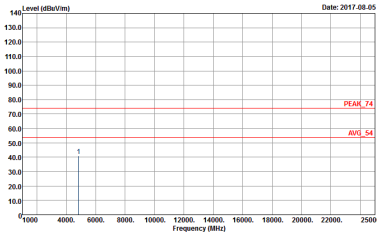
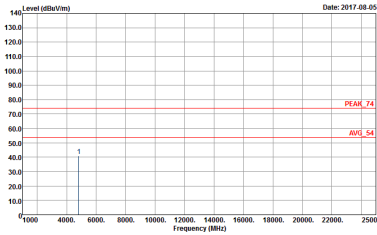
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	Site : 03CH07.HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 771121 Mode : 12	Site : 03CH07.HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 771121 Mode : 12

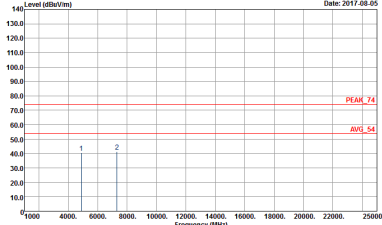
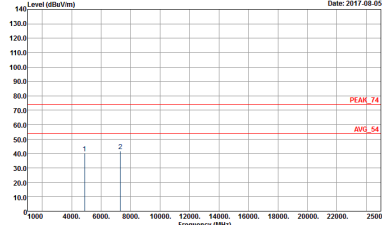
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 771121 Mode : 13	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 771121 Mode : 13

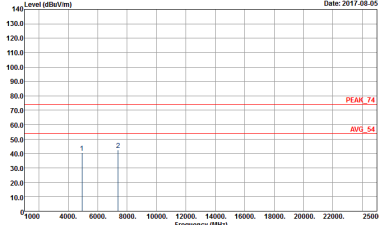
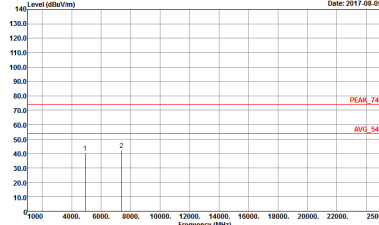
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 771121 Mode : 14	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 771121 Mode : 14



2.4GHz 2400~2483.5MHz
WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07.HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 771121 Mode : 15	 Site : 03CH07.HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 771121 Mode : 15

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 771121 Mode : 16	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 771121 Mode : 16

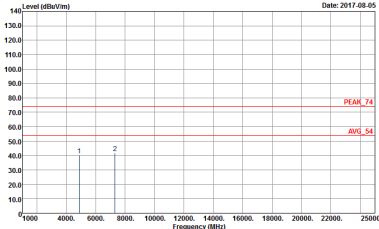
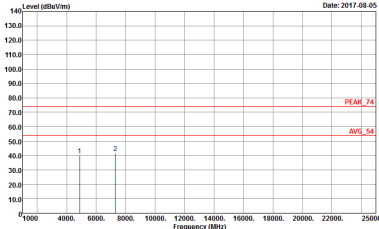
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 771121 Mode : 17	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 771121 Mode : 17

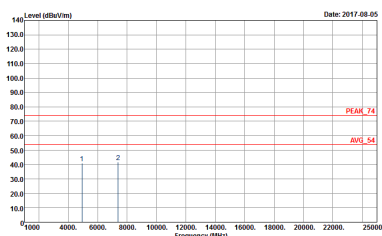
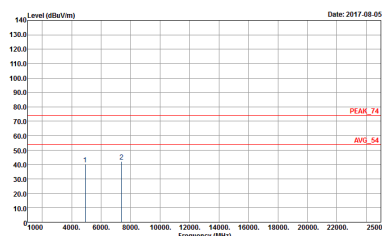


2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

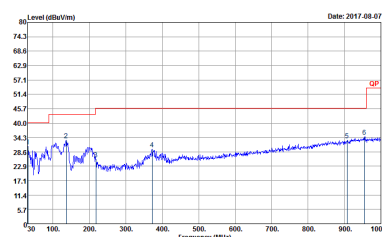
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	Site : 03CH07.HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 771121 Mode : 18	Site : 03CH07.HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 771121 Mode : 18



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 771121 Mode : 19	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 771121 Mode : 19

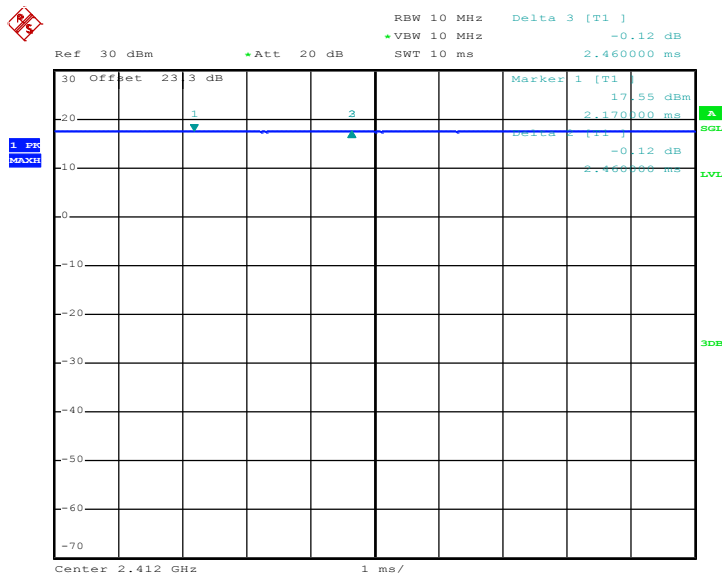
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 771121 Mode : 20	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 771121 Mode : 20

Emission below 1GHz
2.4GHz WIFI 802.11n HT20 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH07-4YY Condition : QP-3m LF-ANT-35419(E) HORIZONTAL Detector : Peak Project : 771121 Mode : 22	 Site : 03CH07-4YY Condition : QP-3m LF-ANT-35419(E) VERTICAL Detector : Peak Project : 771121 Mode : 22



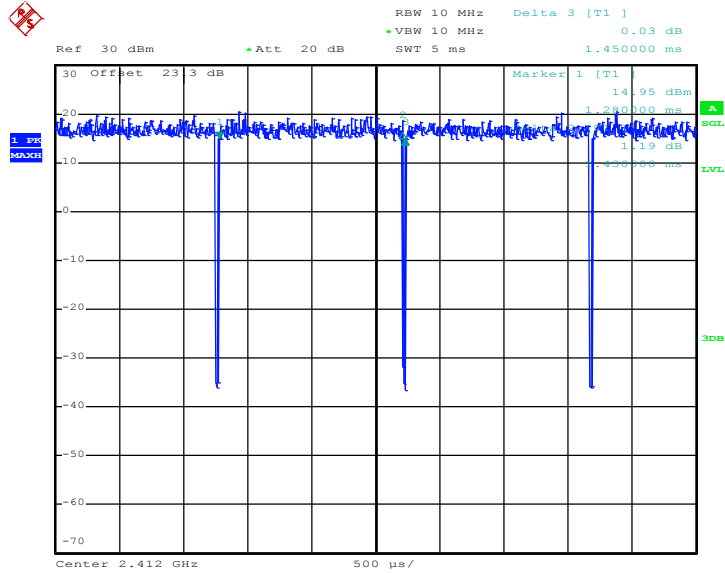
Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	98.62	-	-	10Hz
2.4GHz 802.11n HT20	98.05	-	-	10Hz



Date: 28.JUL.2017 15:29:38

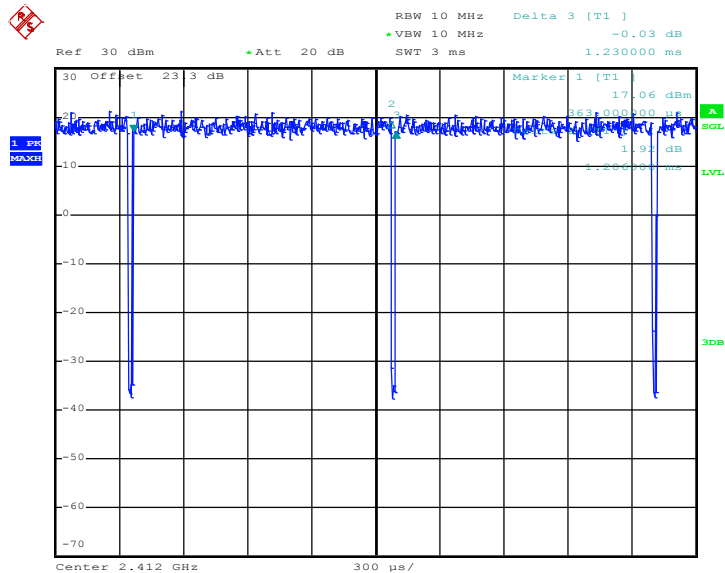


802.11g



Date: 28.JUL.2017 15:31:29

802.11n HT20



Date: 28.JUL.2017 15:32:55