FCC RF Test Report

APPLICANT	**:**	**Zebra Technologies Corporation**
EQUIPMENT	**:**	**Touch computer**
BRAND NAME	**:**	**Zebra**
MODEL NAME	**:**	**TC700K**
FCC ID	**:**	**UZ7TC700K**
STANDARD	**:**	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	**:**	**(DTS) Digital Transmission System**

The product was received on Aug. 12, 2016 and testing was completed on Dec. 19, 2016. 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

Testing Laboratory 1190

SPORTON INTERNATIONAL INC.

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

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR672834-04C	Rev. 01	Initial issue of report	Jan. 05, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.2	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.3	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

Wistron Corporation

21F, No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih Dist, New Taipei City 221,Taiwan R.O.C.

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Touch computer
Brand Name	Zebra
Model Name	TC700K
FCC ID	UZ7TC700K
EUT supports Radios application	NFC WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	DV
SW Version	Android version 6.0.1
FW Version	91-12.04.4-MG-00
MFD	08NOV16
EUT Stage	Engineering sample

Specification of Accessories				
AC Adapter	**Brand Name**	Zebra	**Part Number**	PWR-BUA5V16W0WW
Snap-On USB/Charge Cable	**Brand Name**	Symbol	**Part Number**	CBL-TC7X-USB1-01
Snap-On Charging Cable Cup	**Brand Name**	Symbol	**Part Number**	CHG-TC7X-CBL1-01
Battery	**Brand Name**	Zebra	**Part Number**	BT-000318-01
Earphone 1	**Brand Name**	Zebra	**Part Number**	HDST-35MM-PTVP-01
Earphone 2	**Brand Name**	Zebra	**Part Number**	HS2100-OTH
Earphone 3	**Brand Name**	Zebra	**Part Number**	HS3100-OTH
Snap-on 3.5MM Audio Jack Adapter	**Brand Name**	Symbol	**Part Number**	ADP-TC7X-AUD35-01
3.5mm Jack 43"(1.1m) Standard Cable	**Brand Name**	Zebra	**Part Number**	CBL-HS2100-3MS1-01
Soft Holster	**Brand Name**	Zebra	**Part Number**	SG-TC7X-HLSTR1-01
Rigid Holster	**Brand Name**	Zebra	**Part Number**	SG-TC7X-RHLSTR1-01
Power Cord	**Brand Name**	LOROM	**Part Number**	50-16000-182R
Cable line	**Brand Name**	Zebra	**Part Number**	CBL-DC-383A1-01

1.4 Re-use of Measured Data

1.4.1 Introduction Section

The part 15C test data for 2.4G WLAN (equipment class: DTS) of UZ7TC700K (model: TC700K) is referenced from UZ7TC75EK (model: TC75EK).

The applicant takes full responsibility that the test data as referenced in section 1.4.4 below represent compliance for UZ7TC700K (model: TC700K).

1.4.2 Difference Section

UZ7TC700K is a variant version of UZ7TC75EK by changing hardware in UZ7TC75GK.

Detailed information is available in the appendix B - Product Equality Declaration.

1.4.3 Spot Check Verification Data Section

In order to confirm hardware similarity of the subject device with the reference device, WLAN conducted power and PSD spot check has been performed on FCC ID: UZ7TC700K (model: TC700K) for certain parameters. The test results are significantly consistent with its parent model FCC ID: UZ7TC75EK (model: TC75EK).

1.4.4 Reference detail Section:

Equipment Class	Reference FCC ID	Folder Test/RF Exposure	Report Title/Section
DTS	UZ7TC75EK	Part15C (FR672834C)	All sections applicable

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. TW1022 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 1st 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

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

1.7 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- FCC KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01
- 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

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 is considering the modulation and worse data rates as below table.

Single Antenna

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps

MIMO Antenna

Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0

2.3 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.

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

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 Output Power Measurement

3.1.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the 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.

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

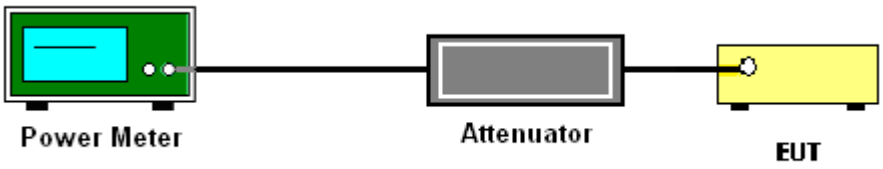
CDD Modes

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r05 section 9.2.3.2 Method AVGPM-G.
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.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

TXBF Modes

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r05 section 9.2.3.2 Method AVGPM-G.
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.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.1.4 Test Setup



3.1.5 Test Result of Peak Output Power (Reporting Only)

Please refer to Appendix A.

3.1.6 Test Result of Average output Power

Please refer to Appendix A.

3.2 Power Spectral Density Measurement

3.2.1 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.

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

CDD Modes

Method AVGPSD-2

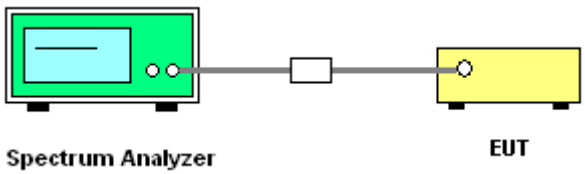
1. The testing follows Measurement Procedure 10.5 Method AVGPSD-2 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 10 kHz. Video bandwidth VBW = 30 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW).
5. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins).
6. Detector = RMS, Sweep time = auto couple.
7. Trace average at least 100 traces in power averaging mode.
8. Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.
9. Measure and record the results in the test report.For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
   Method (c): Measure and add 10 log(N_{ANT}) dB.
   With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit. The addition of 10 log(N_{ANT}) dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}$ th of the PSD limit .

TXBF Modes

Method AVGPSD-3

1. The testing follows Measurement Procedure 10.7 Method AVGPSD-3 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 10 kHz. Video bandwidth VBW = 30 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW).
5. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins).
6. Detector = RMS, Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
9. Measure and record the results in the test report.For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
   Method (c): Measure and add 10 log(N_{ANT}) dB.
   With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit. The addition of 10 log(N_{ANT}) dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}$ th of the PSD limit .

3.2.4 Test Setup

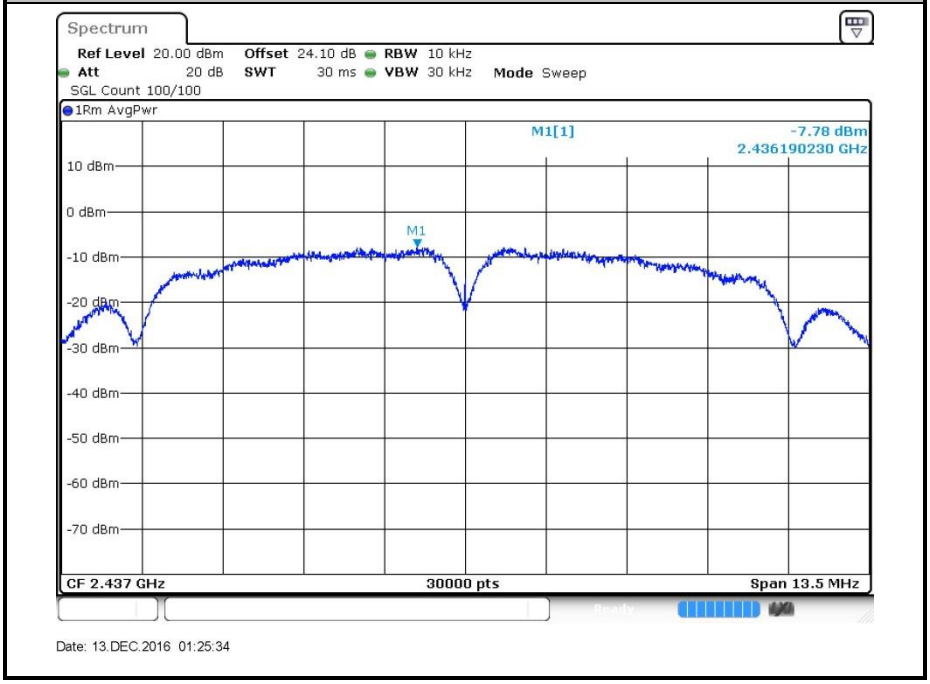


3.2.5 Test Result of Power Spectral Density

Please refer to Appendix A.

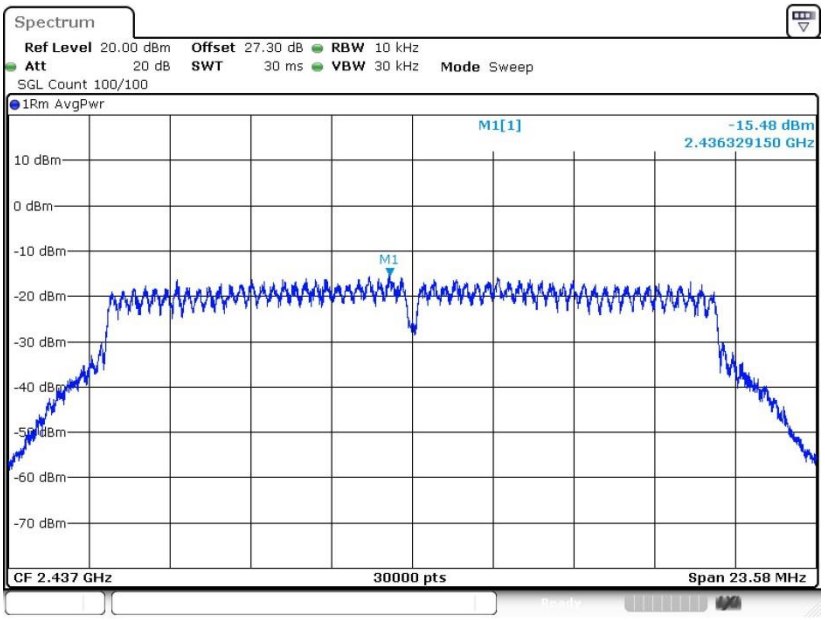
<CDD Modes>

Worst Case Power Density (dBm/3kHz)

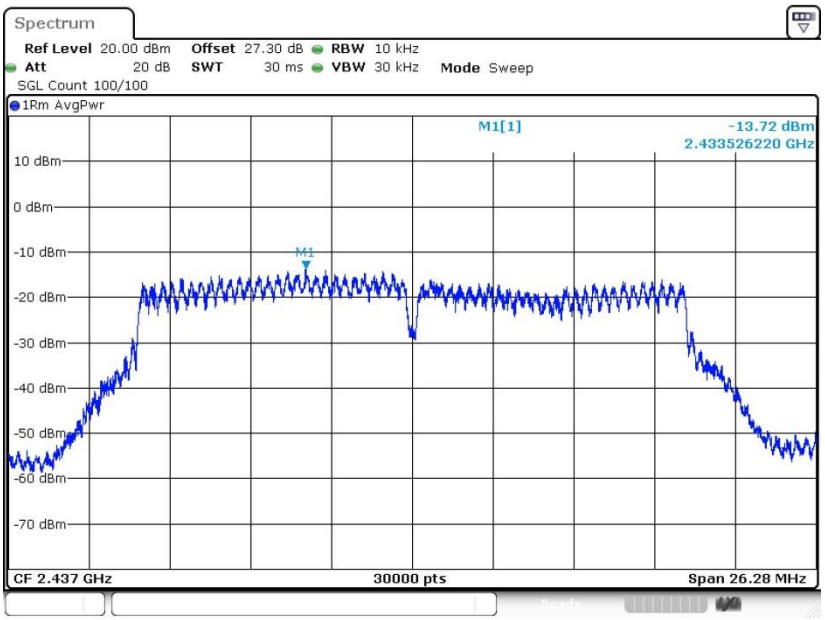


<TXBF Modes>

Worst Case Power Density (dBm/3kHz) for MIMO Ant. 1



Worst Case Power Density (dBm/3kHz) for MIMO Ant. 2



3.3 Antenna Requirements

3.3.1 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.

3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.3.3 Antenna Gain

CDD modes

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

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

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

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

For power measurements on IEEE 802.11 devices,

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

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain G_{ANT} is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

	Ant 1 (dBi)	Ant 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4GHz	2.50	1.70	2.50	5.12	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)

TXBF modes

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

$$Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k / 20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

The EUT supports beamforming for 802.11ac modes.

The directional gain calculation is following F)2)e)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

	Ant 1 (dBi)	Ant 2 (dBi)	for Power (dBi)	for PSD (dBi)	Limit Reduction (dB)	Limit Reduction (dB)
2.4GHz	2.50	1.70	5.12	5.12	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1132003	300MHz~40GHz	Aug. 04, 2016	Dec. 12, 2016 ~ Dec. 19, 2016	Aug. 03, 2017	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	13I00030SNO31	9kHz~6GHz	Sep. 21, 2016	Dec. 12, 2016 ~ Dec. 19, 2016	Sep. 20, 2017	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	13I00030SNO32	9kHz~6GHz	Sep. 21, 2016	Dec. 12, 2016 ~ Dec. 19, 2016	Sep. 20, 2017	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1126017	300MHz~40GHz	Aug. 04, 2016	Dec. 12, 2016 ~ Dec. 19, 2016	Aug. 03, 2017	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 25, 2016	Dec. 12, 2016 ~ Dec. 19, 2016	Nov. 24, 2017	Conducted (TH05-HY)

Appendix A. Conducted Test Results

<CDD Modes>

Report Number : FR672834-04C

Test Engineer:	Kia Liao	Temperature:	21~25	°C
Test Date:	2016/12/12 ~ 2016/12/19	Relative Humidity:	51~54	%

TEST RESULTS DATA
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
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	20.78	21.27		30.00	30.00	2.50	1.70	23.28	22.97	36.00	36.00	Pass
11b	1Mbps	1	6	2437	21.15	21.95		30.00	30.00	2.50	1.70	23.65	23.65	36.00	36.00	Pass
11b	1Mbps	1	11	2462	20.98	21.55		30.00	30.00	2.50	1.70	23.48	23.25	36.00	36.00	Pass
11g	6Mbps	1	1	2412	22.04	22.24		30.00	30.00	2.50	1.70	24.54	23.94	36.00	36.00	Pass
11g	6Mbps	1	6	2437	23.06	23.44		30.00	30.00	2.50	1.70	25.56	25.14	36.00	36.00	Pass
11g	6Mbps	1	11	2462	22.04	22.22		30.00	30.00	2.50	1.70	24.54	23.92	36.00	36.00	Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Average Output Power

2.4GHz Band									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)		
					Ant 1	Ant 2	Ant 1	Ant 2	SUM
11b	1Mbps	1	1	2412	0.06	0.04	17.58	17.92	
11b	1Mbps	1	6	2437	0.06	0.04	18.03	18.77	
11b	1Mbps	1	11	2462	0.06	0.04	17.80	18.39	
11g	6Mbps	1	1	2412	0.32	0.32	15.69	16.22	
11g	6Mbps	1	6	2437	0.32	0.32	16.64	17.42	
11g	6Mbps	1	11	2462	0.32	0.32	15.54	16.01	

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Average Power Spectral Density

2.4GHz Band												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average PSD (dBm/3kHz)			DG (dBi)		Average PSD Limit (dBm/3kHz)		Pass/Fail
					Ant 1	Ant 2	Worse + 3.01	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	-8.62	-8.58	-	2.50	1.70	8.00	8.00	Pass
11b	1Mbps	1	6	2437	-8.41	-7.78		2.50	1.70	8.00	8.00	Pass
11b	1Mbps	1	11	2462	-7.88	-8.19		2.50	1.70	8.00	8.00	Pass
11g	6Mbps	1	1	2412	-11.63	-11.63		2.50	1.70	8.00	8.00	Pass
11g	6Mbps	1	6	2437	-10.82	-9.83		2.50	1.70	8.00	8.00	Pass
11g	6Mbps	1	11	2462	-12.53	-11.09		2.50	1.70	8.00	8.00	Pass

Measured power density (dBm) has offset with cable loss.

<TXBF Modes>

Report Number : FR672834-04C

Test Engineer:	Kai Liao	Temperature:	21~25	°C
Test Date:	2016/12/12~ 2016/12/19	Relative Humidity:	51~54	%

TEST RESULTS DATA
Average Output Power

2.4GHz Band																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
HT20	MCS0	2	1	2412	14.00	14.60	17.32	30.00		5.12		22.44		36.00		Pass
HT20	MCS0	2	2	2417	17.10	17.50	20.31	30.00		5.12		25.43		36.00		Pass
HT20	MCS0	2	6	2437	17.20	17.90	20.57	30.00		5.12		25.69		36.00		Pass
HT20	MCS0	2	10	2457	16.70	17.40	20.07	30.00		5.12		25.19		36.00		Pass
HT20	MCS0	2	11	2462	14.30	14.80	17.57	30.00		5.12		22.69		36.00		Pass
HT40	MCS0	2	3	2422	12.20	12.80	15.52	30.00		5.12		20.64		36.00		Pass
HT40	MCS0	2	4	2427	12.60	13.10	15.87	30.00		5.12		20.99		36.00		Pass
HT40	MCS0	2	6	2437	13.80	14.90	17.40	30.00		5.12		22.51		36.00		Pass
HT40	MCS0	2	8	2447	13.60	14.00	16.81	30.00		5.12		21.93		36.00		Pass
HT40	MCS0	2	9	2452	12.80	13.50	16.17	30.00		5.12		21.29		36.00		Pass
VHT20	MCS0	2	1	2412	13.90	14.60	17.27	30.00		5.12		22.39		36.00		Pass
VHT20	MCS0	2	2	2417	16.90	17.60	20.27	30.00		5.12		25.39		36.00		Pass
VHT20	MCS0	2	6	2437	16.90	18.00	20.50	30.00		5.12		25.61		36.00		Pass
VHT20	MCS0	2	10	2457	16.70	17.10	19.91	30.00		5.12		25.03		36.00		Pass
VHT20	MCS0	2	11	2462	14.40	15.00	17.72	30.00		5.12		22.84		36.00		Pass
VHT40	MCS0	2	3	2422	12.30	12.40	15.36	30.00		5.12		20.48		36.00		Pass
VHT40	MCS0	2	4	2427	12.60	13.30	15.97	30.00		5.12		21.09		36.00		Pass
VHT40	MCS0	2	6	2437	13.80	15.00	17.45	30.00		5.12		22.57		36.00		Pass
VHT40	MCS0	2	8	2447	13.50	14.00	16.77	30.00		5.12		21.89		36.00		Pass
VHT40	MCS0	2	9	2452	12.80	13.30	16.07	30.00		5.12		21.19		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Average Power Spectral Density

2.4GHz Band												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average PSD (dBm/3kHz)			DG (dBi)		Average PSD Limit (dBm/3kHz)		Pass/Fail
					Ant 1	Ant 2	Worse + 3.01	Ant 1	Ant 2	Ant 1	Ant 2	
HT20	MCS0	2	1	2412	-18.55	-17.91	-14.90	5.12		8.00		Pass
HT20	MCS0	2	6	2437	-15.48	-13.72	-10.71	5.12		8.00		Pass
HT20	MCS0	2	11	2462	-17.79	-17.50	-14.49	5.12		8.00		Pass
HT40	MCS0	2	3	2422	-25.02	-25.34	-22.01	5.12		8.00		Pass
HT40	MCS0	2	6	2437	-21.43	-22.78	-18.42	5.12		8.00		Pass
HT40	MCS0	2	9	2452	-22.09	-25.01	-19.08	5.12		8.00		Pass
VHT20	MCS0	2	1	2412	-18.37	-18.64	-15.36	5.12		8.00		Pass
VHT20	MCS0	2	6	2437	-14.50	-14.33	-11.32	5.12		8.00		Pass
VHT20	MCS0	2	11	2462	-18.19	-17.21	-14.20	5.12		8.00		Pass
VHT40	MCS0	2	3	2422	-24.63	-24.81	-21.62	5.12		8.00		Pass
VHT40	MCS0	2	6	2437	-22.15	-22.15	-19.14	5.12		8.00		Pass
VHT40	MCS0	2	9	2452	-23.68	-23.28	-20.27	5.12		8.00		Pass

Measured power density (dBm) has offset with cable loss.

Appendix B. Product Equality Declaration

1. CPU change, pin to pin capability see attached power point
2. Remove below components
   (1) WWAN Multi-band PA
   (2) LTE B2/4/5/12/13/17/25/26 TRX components
   (3) WCDMA B1/2/4/5/8 TRX components
   (4) GSM 850/900/1800/1900 TRX components
   (5) CDMA BC0/1/10 TRX components
   (6) WWAN Primary Antenna switch
   (7) Antenna tuner
   (8) DC/DC converter for WWAN PA
   (9) GPS RX components
   (10) WWAN Diversity Antenna switch
   (11) LTE B2/4/5/12/13/17/25/26 DRX components
   (12) WCDMA B1/2/4/5/8 DRX components
   (13) CDMA BC0/1/10 DRX components
   (14) RF Transceiver components
3. Remove WAN/GPS components (bottom of device).
4. Keep DIV/GPS/ Main antenna (top of device).
5. No layout change.

Appendix C. Original Report

Please refer to Sporton report number FR672834C as below.

FCC RF Test Report

APPLICANT	:	Zebra Technologies Corporation
EQUIPMENT	:	Touch computer
BRAND NAME	:	Zebra
MODEL NAME	:	TC75EK
FCC ID	:	UZ7TC75EK
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Jul. 28, 2016 and testing was completed on Sep. 22, 2016. 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.

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR672834C	Rev. 01	Initial issue of report	Sep. 30, 2016
FR672834C	Rev. 02	Revising the specification of accessories.	Oct. 04, 2016
FR672834C	Rev. 03	Revising the Adapter information in specification of accessories.	Oct. 07, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	99% Bandwidth	-	Pass	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	≤ 30dBc	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 1.03 dB at 2483.520 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 3.10 dB at 0.758 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

Wistron Corporation
21F, No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih Dist, New Taipei City 221, Taiwan R.O.C.

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Touch computer
Brand Name	Zebra
Model Name	TC75EK
FCC ID	UZ7TC75EK
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/NFC WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	DV
SW Version	Android version 6.0.1
FW Version	91-10-01-MG-00
MFD	14JUL16
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				
AC Adapter	**Brand Name**	Zebra	**Part Number**	PWR-BUA5V16W0WW
Snap-On USB/Charge Cable	**Brand Name**	Symbol	**Part Number**	CBL-TC7X-USB1-01
Snap-On Charging Cable Cup	**Brand Name**	Symbol	**Part Number**	CHG-TC7X-CBL1-01
Battery	**Brand Name**	Zebra	**Part Number**	BT-000318-01
Earphone 1	**Brand Name**	Zebra	**Part Number**	HDST-35MM-PTVP-01
Earphone 2	**Brand Name**	Zebra	**Part Number**	HS2100-OTH
Earphone 3	**Brand Name**	Zebra	**Part Number**	HS3100-OTH
Snap-on 3.5MM Audio Nugget	**Brand Name**	Symbol	**Part Number**	ADP-TC7X-AUD35-01
3.5mm Jack 43"(1.1m) Standard Cable	**Brand Name**	Zebra	**Part Number**	CBL-HS2100-3MS1-01
Soft Holster	**Brand Name**	Zebra	**Part Number**	SG-TC7X-HLSTR1-01
Rigid Holster	**Brand Name**	Zebra	**Part Number**	SG-TC7X-RHLSTR1-01
Power Cord	**Brand Name**	LOROM	**Part Number**	50-16000-182R
Cable line	**Brand Name**	Zebra	**Part Number**	CBL-DC-383A1-01

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Average) Output Power to antenna <CDD Modes>	**<Ant. 1>** 802.11b : 18.13 dBm (0.0650 W) 802.11g : 17.10 dBm (0.0513 W) 802.11n HT20 : 16.99 dBm (0.0500 W) 802.11n HT40 : 14.52 dBm (0.0283 W) 802.11ac VHT20 : 17.19 dBm (0.0524 W) 802.11ac VHT40 : 14.57 dBm (0.0286 W) **<Ant. 2>** 802.11b : 18.72 dBm (0.0745 W) 802.11g : 17.90 dBm (0.0617 W) 802.11n HT20 : 17.66 dBm (0.0583 W) 802.11n HT40 : 14.86 dBm (0.0306 W) 802.11ac VHT20 : 17.67 dBm (0.0585 W) 802.11ac VHT40 : 14.88 dBm (0.0308 W) **MIMO <Ant. 1 + 2>** 802.11b : 21.46 dBm (0.1400 W) 802.11g : 20.64 dBm (0.1159 W) 802.11n HT20 : 20.63 dBm (0.1156 W) 802.11n HT40 : 17.90 dBm (0.0617 W) 802.11ac VHT20 : 20.68 dBm (0.1169 W) 802.11ac VHT40 : 17.93 dBm (0.0621 W)
Maximum (Average) Output Power to antenna <TXBF Modes>	**MIMO <Ant. 1 + 2>** 802.11n HT20 : 20.61 dBm (0.1151 W) 802.11n HT40 : 17.80 dBm (0.0603 W) 802.11ac VHT20 : 20.66 dBm (0.1164 W) 802.11ac VHT40 : 17.90 dBm (0.0617 W)

<table>
<tr><th colspan="2">Standards-related Product Specification</th></tr>
<tr><td>99% Occupied Bandwidth
<CDD Modes></td><td>802.11b : 11.95MHz
802.11g : 18.60MHz
802.11ac VHT20 : 18.45MHz
802.11ac VHT40 : 36.70MHz</td></tr>
<tr><td>99% Occupied Bandwidth
<TXBF Modes></td><td>802.11ac VHT20 : 19.55MHz
802.11ac VHT40 : 36.70MHz</td></tr>
<tr><td>Antenna Type / Gain</td><td><Ant 1>
IFA Antenna type with gain 2.60 dBi
<Ant 2>
IFA Antenna type with gain 1.80 dBi</td></tr>
<tr><td>Type of Modulation</td><td>802.11b : DSSS (DBPSK / DQPSK / CCK)
802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)</td></tr>
<tr><td>Antenna Function for Transmitter</td><td>
<table>
<tr><th></th><th>Ant. 1</th><th>Ant. 2</th></tr>
<tr><td>802.11 b/g/n/ac</td><td>V</td><td>V</td></tr>
<tr><td>802.11 b/g/n/ac MIMO</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

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. TW1022 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 1st 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.**		
	TH02-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 v03r05
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- FCC KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01
- 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 position for each mode was recorded in the appendix of this test report.

2.1 Carrier Frequency and Channel

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

2.2 Pre-Scanned RF Power

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

<CDD Modes>

<Ant. 1>

802.11b RF Average Output Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
Duty Cycle (%)		98.62		97.73	94.44	89.58
CH 01	2412	17.60	CH 06	18.06	18.05	18.10
CH 02	2417	17.65				
CH 06	2437	**18.04**				
CH 10	2457	18.09				
CH 11	2462	18.13				

802.11g RF Average Output Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)					
		6M		9M	12M	18M	24M	36M	48M	54M
Duty Cycle (%)		92.21		89.72	86.75	82.83	77.97	71.11	64.65	63.12
CH 01	2412	16.17	CH 06	17.09	17.07	17.05	17.04	17.06	17.09	17.08
CH 02	2417	16.90								
CH 06	2437	**17.10**								
CH 10	2457	16.89								
CH 11	2462	15.83								

802.11n HT20 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Duty Cycle (%)		93.06		91.67	82.58	77.66	70.79	65.01	64.56	62.22
CH 01	2412	14.10	CH 06	16.65	16.79	16.87	16.94	16.98	16.91	16.98
CH 02	2417	17.01								
CH 06	2437	**16.99**								
CH 10	2457	16.47								
CH 11	2462	14.65								

802.11n HT40 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Duty Cycle (%)		97.52		95.31	93.41	92.96	89.86	87.21	86.25	85.14
CH 03	2422	12.59	CH 06	14.41	14.34	14.43	14.46	14.49	14.45	14.50
CH 04	2427	12.55								
CH 06	2437	**14.52**								
CH 08	2447	13.01								
CH 09	2452	12.86								

802.11ac VHT20 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
Duty Cycle (%)		92.21		86.25	82.29	77.97	70.33	66.23	64.71	61.77	59.52
CH 01	2412	14.15	CH 06	17.04	16.96	17.04	17.14	17.15	17.11	17.15	17.16
CH 02	2417	17.22									
CH 06	2437	**17.19**									
CH 10	2457	17.15									
CH 11	2462	14.72									

802.11ac VHT40 RF Average Output Power (dBm)												
Power vs. Channel			Power vs. Data Rate									
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index								
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Duty Cycle (%)		96.69		95.35	93.41	97.71	90.00	87.64	86.75	85.53	83.82	82.09
CH 03	2422	12.68										
CH 04	2427	12.66										
CH 06	2437	**14.57**	CH 06	14.40	14.36	14.22	14.50	14.52	14.54	14.55	14.49	14.54
CH 08	2447	13.25										
CH 09	2452	12.99										

<Ant. 2>

802.11b RF Average Output Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
Duty Cycle (%)		98.62		97.73	94.22	89.58
CH 01	2412	17.94				
CH 02	2417	18.33				
CH 06	2437	**18.72**	CH 06	18.65	18.64	18.60
CH 10	2457	18.44				
CH 11	2462	18.23				

802.11g RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9M	12M	18M	24M	36M	48M	54M
Duty Cycle (%)		92.21		89.72	86.75	81.82	77.22	71.91	65.66	63.83
CH 01	2412	16.71	CH 06	17.80	17.79	17.76	17.89	17.89	17.80	17.79
CH 02	2417	17.89								
CH 06	2437	**17.90**								
CH 10	2457	17.88								
CH 11	2462	16.50								

802.11n HT20 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Duty Cycle (%)		93.06		91.78	82.29	77.78	71.43	66.00	64.56	62.22
CH 01	2412	14.61	CH 06	17.35	17.52	17.64	17.56	17.61	17.54	17.60
CH 02	2417	17.89								
CH 06	2437	**17.66**								
CH 10	2457	17.84								
CH 11	2462	14.93								

802.11n HT40 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Duty Cycle (%)		97.52		96.09	92.98	91.58	89.42	88.37	86.42	85.14
CH 03	2422	12.89	CH 06	14.67	14.81	14.79	14.78	14.72	14.77	14.84
CH 04	2427	14.79								
CH 06	2437	**14.86**								
CH 08	2447	14.98								
CH 09	2452	13.11								

802.11ac VHT20 RF Average Output Power (dBm)											
Power vs. Channel			Power vs. Data Rate								
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index							
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
Duty Cycle (%)		93.42		86.25	82.29	78.63	71.07	66.34	64.58	62.50	59.06
CH 01	2412	14.65	CH 06	17.66	17.57	17.65	17.66	17.65	17.65	17.65	17.62
CH 02	2417	17.88									
CH 06	2437	**17.67**									
CH 10	2457	17.95									
CH 11	2462	14.94									

802.11ac VHT40 RF Average Output Power (dBm)											
Power vs. Channel			Power vs. Data Rate								
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index							
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Duty Cycle (%)		97.52		95.35	93.41	91.75	89.62	87.50	86.59	85.62	82.61	82.09
CH 03	2422	12.96	CH 06	14.75	14.82	14.78	14.80	14.80	14.82	14.84	14.84	14.86
CH 04	2427	14.79										
CH 06	2437	**14.88**										
CH 08	2447	14.83										
CH 09	2452	13.13										

MIMO <Ant. 1+2>

802.11b RF Average Output Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	20.88	CH 06	21.39	21.43	21.42
CH 02	2417	20.89				
CH 06	2437	**21.46**				
CH 10	2457	21.27				
CH 11	2462	21.26				

802.11g RF Average Output Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)					
		6M		9M	12M	18M	24M	36M	48M	54M
CH 01	2412	18.97	CH 06	20.55	20.54	20.50	20.55	20.63	20.63	20.55
CH 02	2417	20.60								
CH 06	2437	**20.64**								
CH 10	2457	20.68								
CH 11	2462	18.46								

802.11n HT20 RF Average Output Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index					
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	17.54	CH 06	20.40	20.23	19.98	19.90	19.87	19.98	19.93
CH 02	2417	20.63								
CH 06	2437	**20.63**								
CH 10	2457	20.17								
CH 11	2462	17.90								

802.11n HT40 RF Average Output Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index					
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	15.97	CH 06	17.69	17.64	17.63	17.65	17.70	17.69	17.80
CH 04	2427	15.96								
CH 06	2437	**17.90**								
CH 08	2447	16.38								
CH 09	2452	16.15								

802.11ac VHT20 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
CH 01	2412	17.71	CH 06	20.46	20.23	20.02	20.00	19.90	19.98	19.98	19.89
CH 02	2417	20.54									
CH 06	2437	**20.68**									
CH 10	2457	20.20									
CH 11	2462	17.97									

802.11ac VHT40 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 03	2422	16.00	CH 06	17.70	17.55	17.62	17.59	17.66	17.64	17.71	17.61	17.59
CH 04	2427	16.01										
CH 06	2437	**17.93**										
CH 08	2447	16.46										
CH 09	2452	16.17										

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

<TXBF Modes>

MIMO <Ant. 1+2>

802.11n HT20 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	17.57	CH 06	20.56	20.56	20.46	20.56	20.46	20.51	20.51
CH 02	2417	20.63								
CH 06	2437	**20.61**								
CH 10	2457	20.17								
CH 11	2462	17.91								

802.11n HT40 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	15.97	CH 06	17.74	17.78	17.74	17.68	17.74	17.70	17.74
CH 04	2427	15.96								
CH 06	2437	**17.80**								
CH 08	2447	16.38								
CH 09	2452	16.11								

802.11ac VHT20 RF Average Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
CH 01	2412	17.67	CH 06	20.61	20.61	20.56	20.61	20.51	20.56	20.56	20.51
CH 02	2417	20.54									
CH 06	2437	**20.66**									
CH 10	2457	20.20									
CH 11	2462	17.96									

802.11ac VHT40 RF Average Output Power (dBm)											
Power vs. Channel			Power vs. Data Rate								
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 03	2422	16.03	CH 06	17.84	17.85	17.85	17.84	17.78	17.78	17.80	17.84	17.80
CH 04	2427	16.01										
CH 06	2437	**17.90**										
CH 08	2447	16.46										
CH 09	2452	16.16										

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

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.

Single Antenna

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

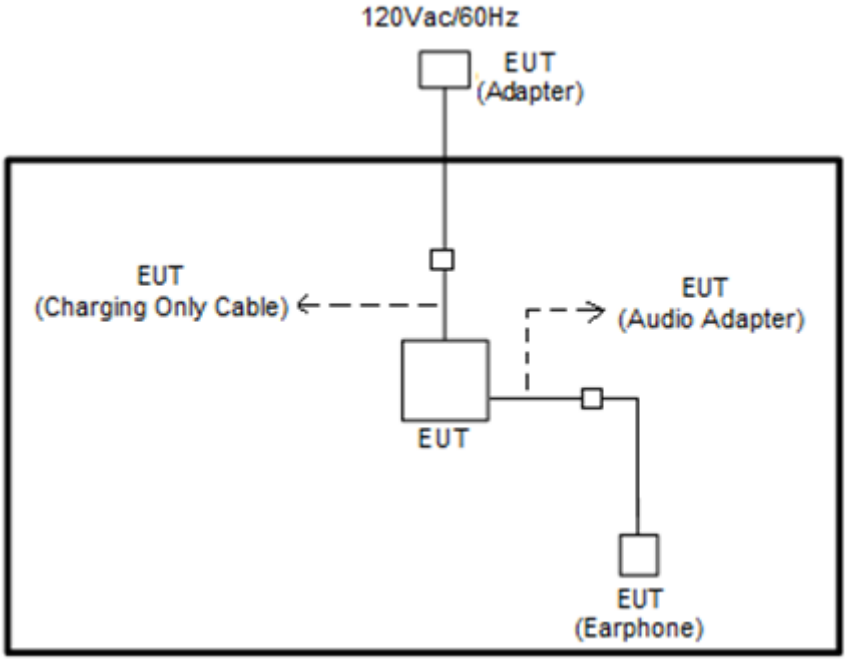
MIMO Antenna

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

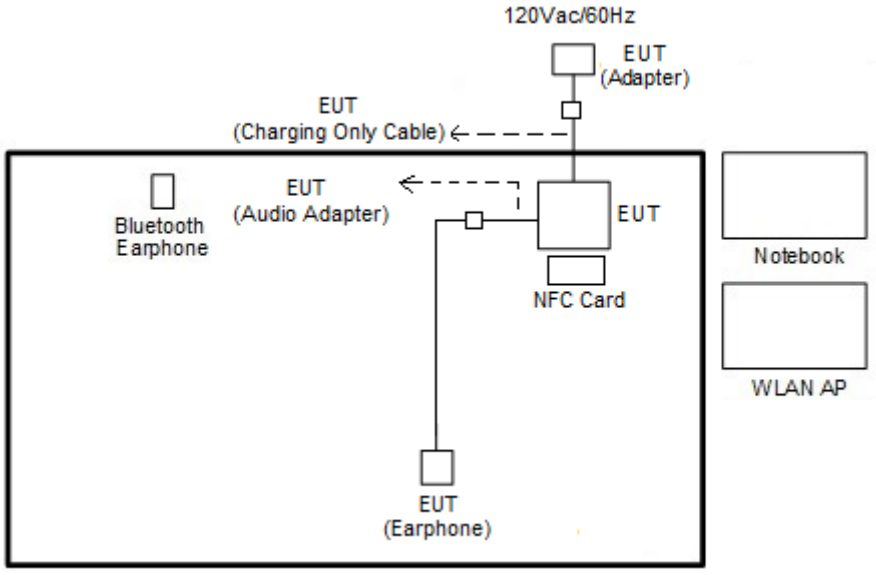
Test Cases	
AC Conducted Emission	Mode 1 :NFC Link + WLAN (2.4GHz) Link + Bluetooth Link + Earphone 1 with Audio Adapter connect to EUT + Charging Only Cable + AC Adapter Mode 2 :NFC Link + WLAN (5GHz) Link + Bluetooth Link with Earphone 3 + Snap on USB Cable Data Link with Notebook + Copy Data from Notebook to EDA (SD Card) + AC Adapter Mode 3 :NFC Link + WLAN (2.4GHz) Link + Bluetooth Link + Earphone 2 with Audio Adapter connect to EUT + Charging Only Cable + AC Adapter

2.4 Connection Diagram of Test System

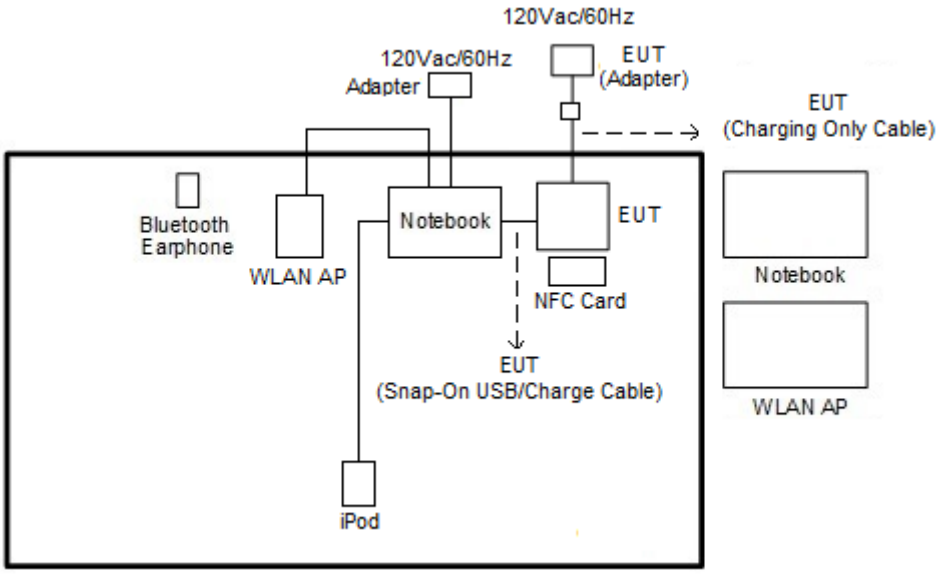
<WLAN Tx Mode>



<AC Conducted Emission for charging mode>



<AC Conducted Emission for data link mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
3.	Notebook	DELL	P20G	FCC DoC/ Contains FCC ID: QDS-BRCM1051	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Notebook	Lenovo	M490S(E330)	QDS-BRCM1063	N/A	Unshielded, 1.8 m
6.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
7.	NFC Card	Metro Taipei	Easy Card	N/A	N/A	N/A
8.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A

2.6 EUT Operation Test Setup

For WLAN function, programmed RF utility, “AT Command” installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

For WLAN MIMO TXBF modes, the EUT was tested under normal operation and link to another device with power, modulation modes and data rates controlled by engineer mode command lines. The “CMD” software tool was used to make EUT continuous transmitting signals.

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 4.2 dB and 10dB attenuator.

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

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

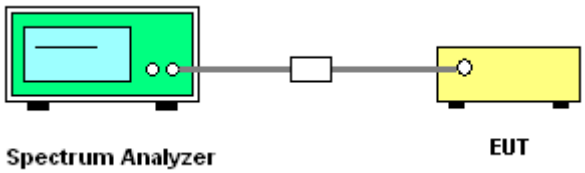
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

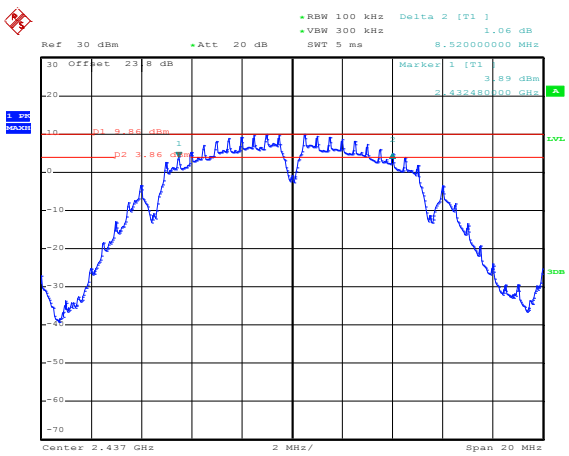
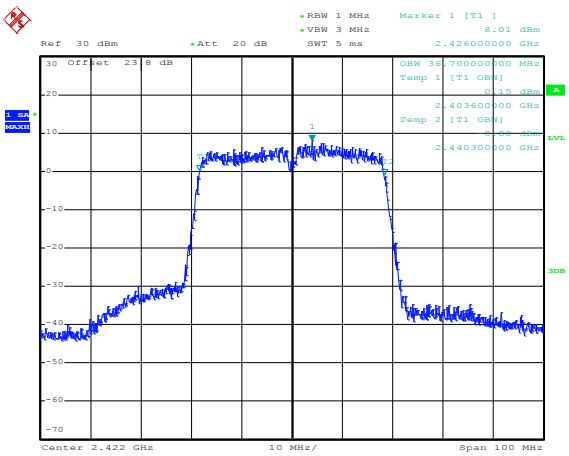
3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

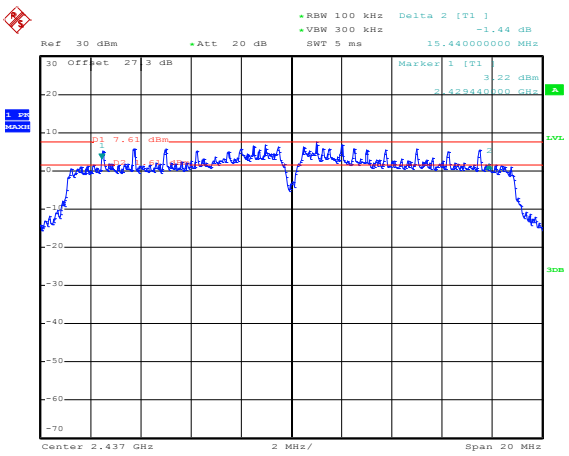
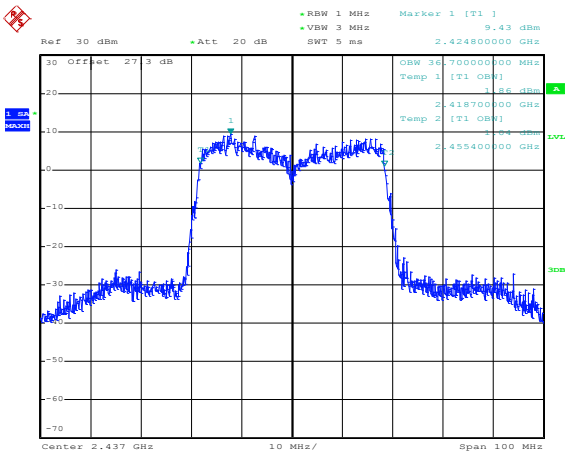
Please refer to Appendix A.

<CDD Modes>

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	
Date: 3.SEP.2016 10:11:57	Date: 3.SEP.2016 13:57:38

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

<TXBF Modes>

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	
Date: 11.SEP.2016 11:08:19	Date: 11.SEP.2016 13:33:54

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 output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the 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

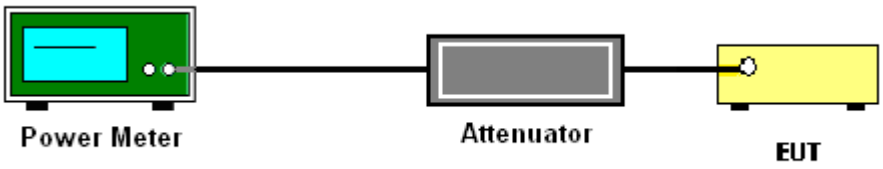
CDD Modes

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r05 section 9.2.3.1 Method AVGPM.
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.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

TXBF Modes

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r05 section 9.2.3.2 Method AVGPM-G.
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.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power (Reporting Only)

Please refer to Appendix A.

3.2.6 Test Result of Average output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

CDD Modes

Method AVGPSD-2

1. The testing follows Measurement Procedure 10.5 Method AVGPSD-2 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 10 kHz. Video bandwidth VBW = 30 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW).
5. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins).
6. Detector = RMS, Sweep time = auto couple.
7. Trace average at least 100 traces in power averaging mode.
8. Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.
9. Measure and record the results in the test report.For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
   Method (c): Measure and add 10 log(N_{ANT}) dB.
   With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit. The addition of 10 log(N_{ANT}) dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}$ th of the PSD limit .

TXBF Modes

Method AVGPSD-3

1. The testing follows Measurement Procedure 10.7 Method AVGPSD-3 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 10 kHz. Video bandwidth VBW = 30 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW).
5. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins).
6. Detector = RMS, Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
9. Measure and record the results in the test report.For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
   Method (c): Measure and add 10 log(N_{ANT}) dB.
   With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit. The addition of 10 log(N_{ANT}) dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}$ th of the PSD limit .

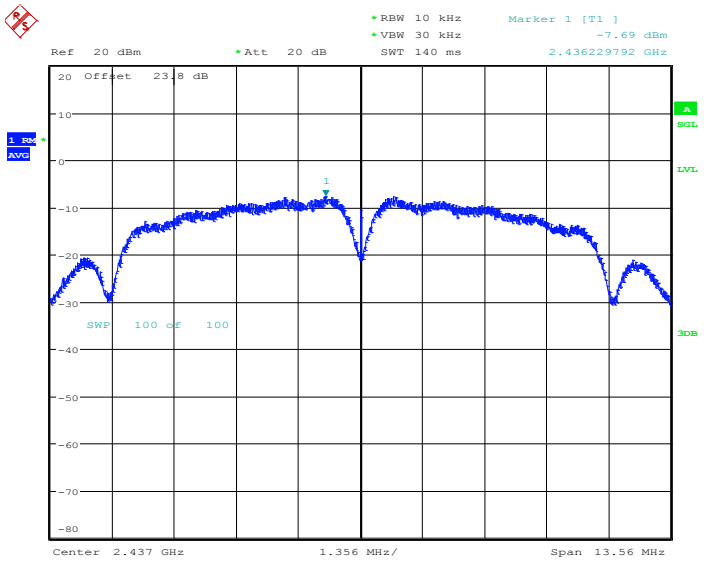
3.3.4 Test Setup

3.3.5 Test Result of Power Spectral Density

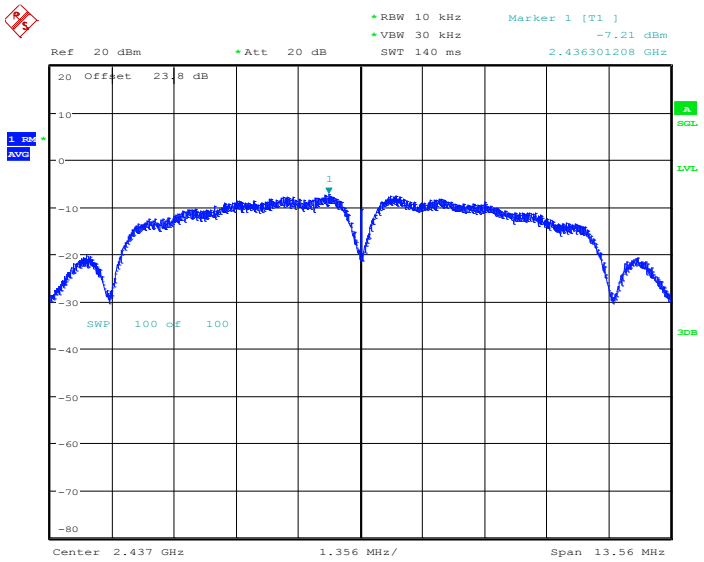
Please refer to Appendix A.

<CDD Modes>

Worst Case Power Density (dBm/3kHz) for MIMO Ant. 1

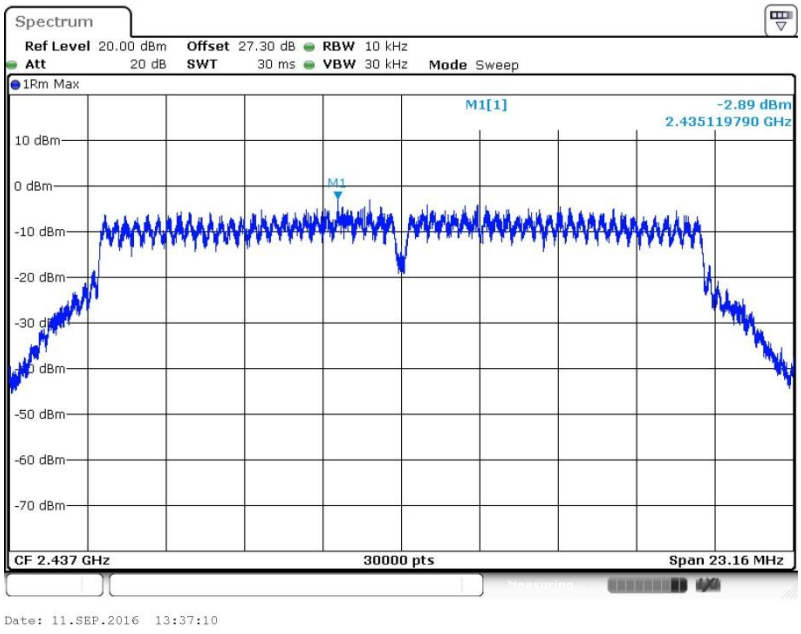


Worst Case Power Density (dBm/3kHz) for MIMO Ant. 2

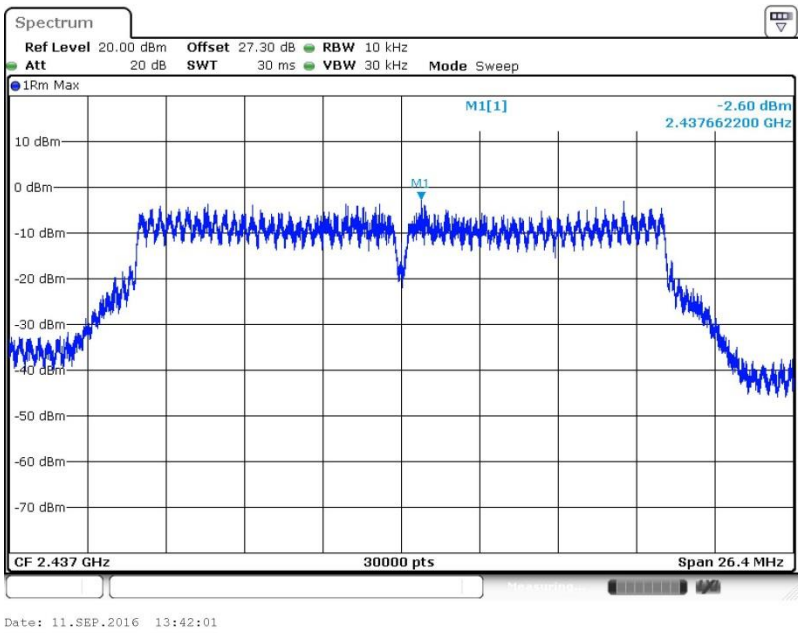


<TXBF Modes>

Worst Case Power Density (dBm/3kHz) for MIMO Ant. 1



Worst Case Power Density (dBm/3kHz) for MIMO Ant. 2



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

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

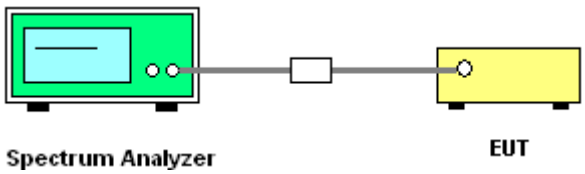
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

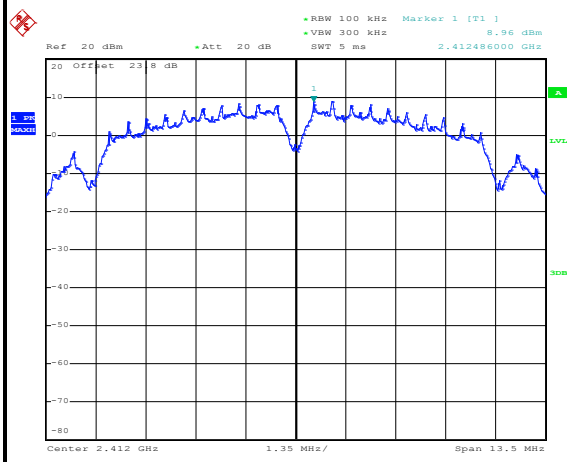
<CDD Modes>

Number of TX = 1, Ant. 1 (Measured)

Number of TX	1	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

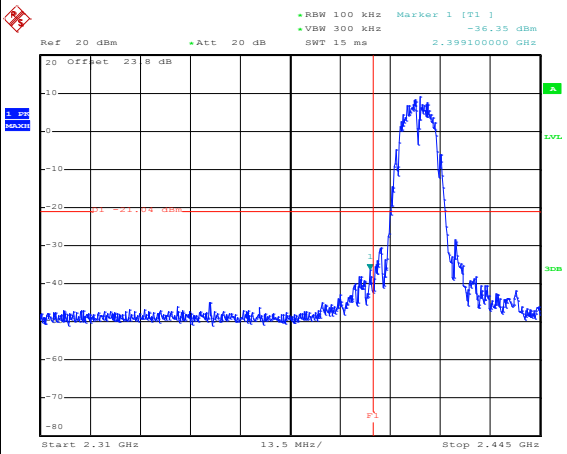
WLAN 802.11b Channel 01

100kHz PSD reference Level



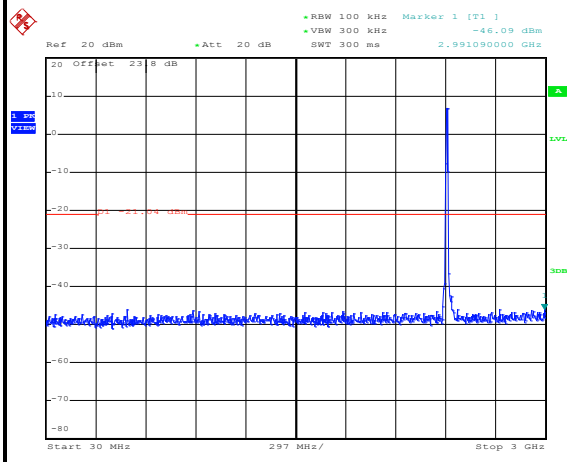
Date: 3.SEP.2016 10:21:26

Low Channel Plot



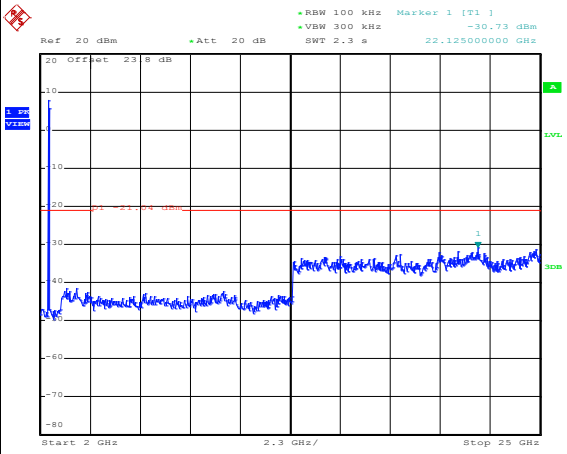
Date: 3.SEP.2016 10:22:28

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 10:22:40

Spurious Emission 2GHz~25GHz

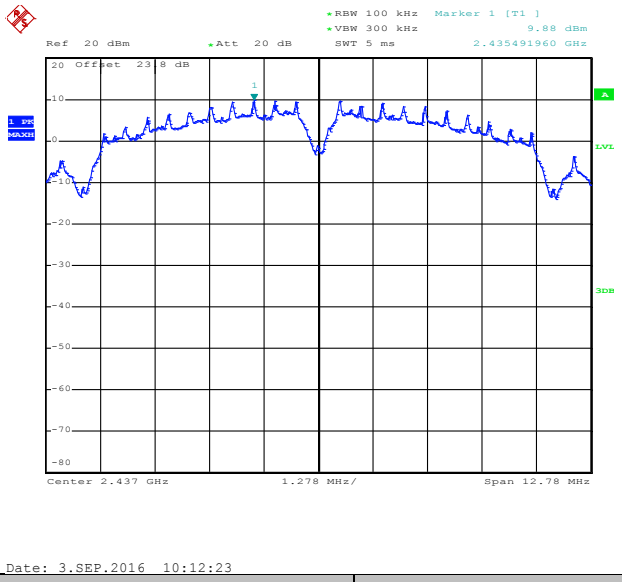


Date: 3.SEP.2016 10:22:49

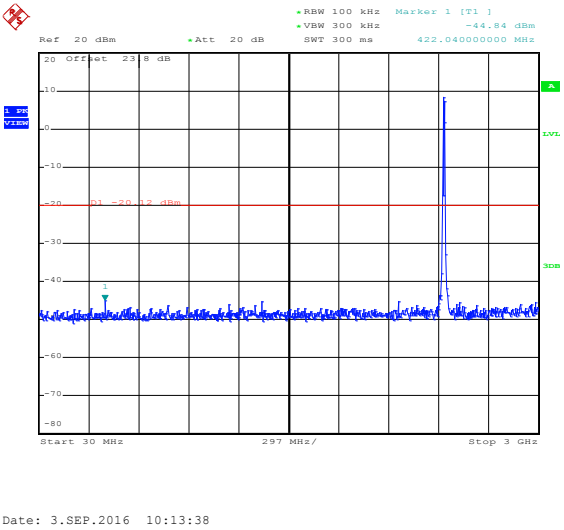
Number of TX :	1	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11b Channel 06

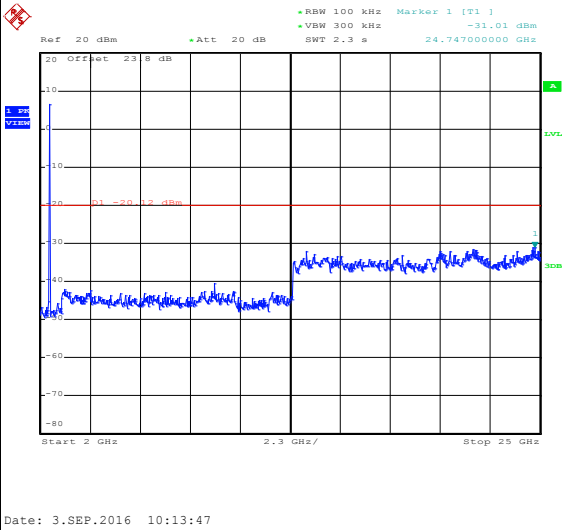
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



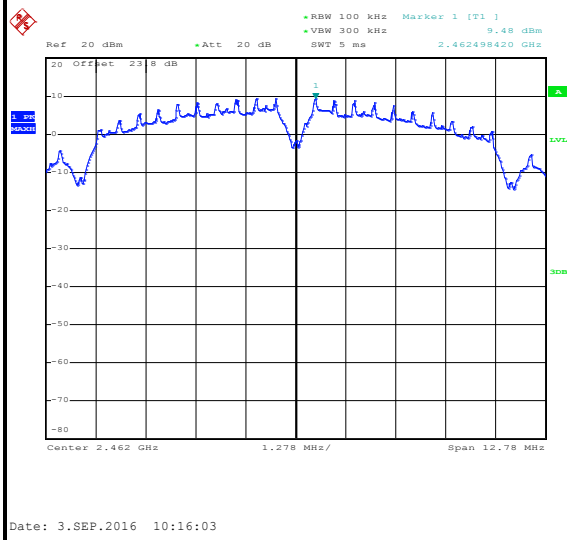
Spurious Emission 2GHz~25GHz



Number of TX :	1	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

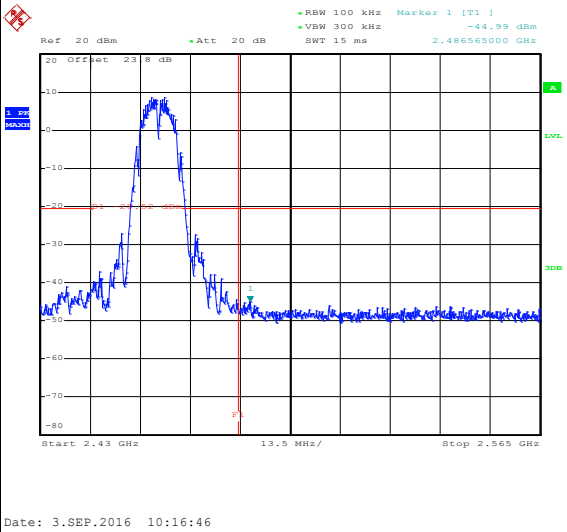
WLAN 802.11b Channel 11

100kHz PSD reference Level



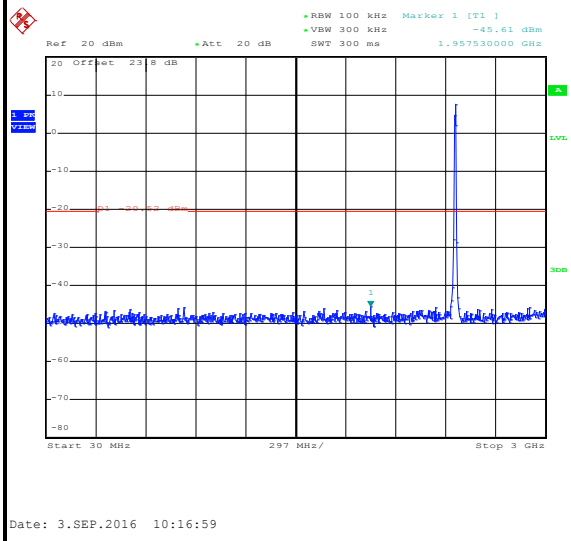
Date: 3.SEP.2016 10:16:03

High Channel Plot



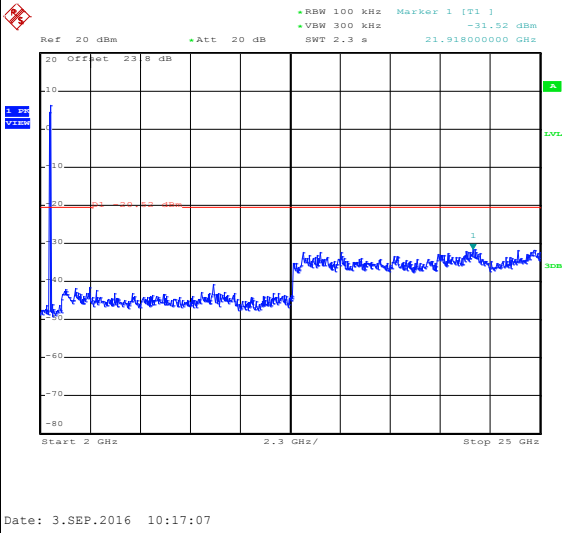
Date: 3.SEP.2016 10:16:46

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 10:16:59

Spurious Emission 2GHz~25GHz

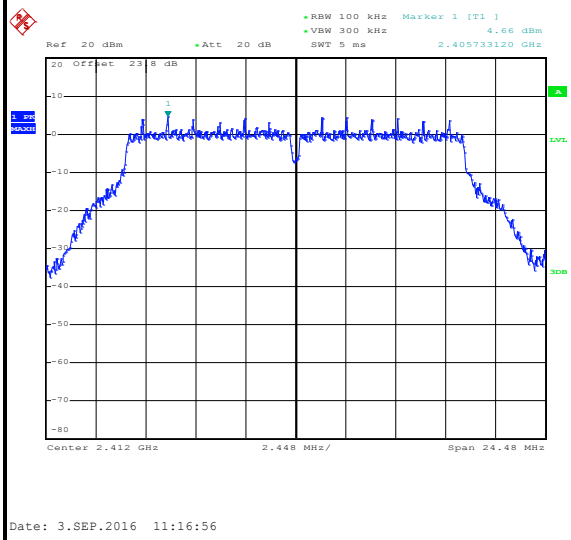


Date: 3.SEP.2016 10:17:07

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

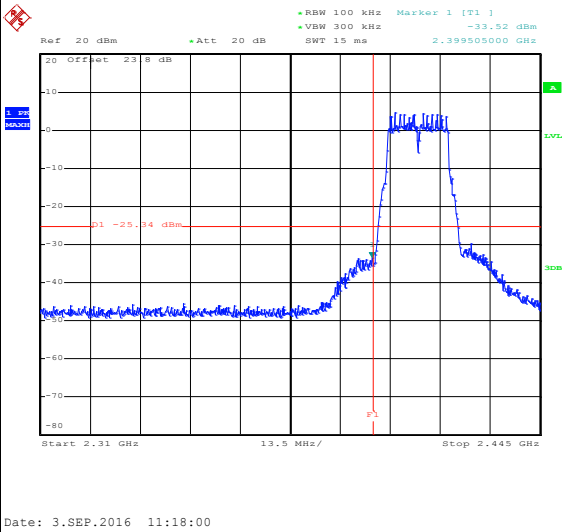
WLAN 802.11g Channel 01

100kHz PSD reference Level



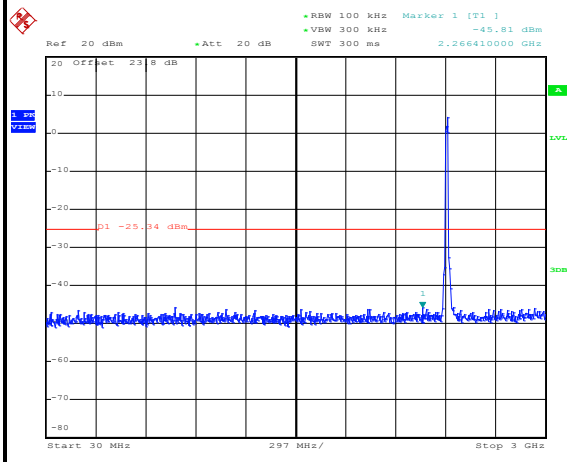
Date: 3.SEP.2016 11:16:56

Low Channel Plot



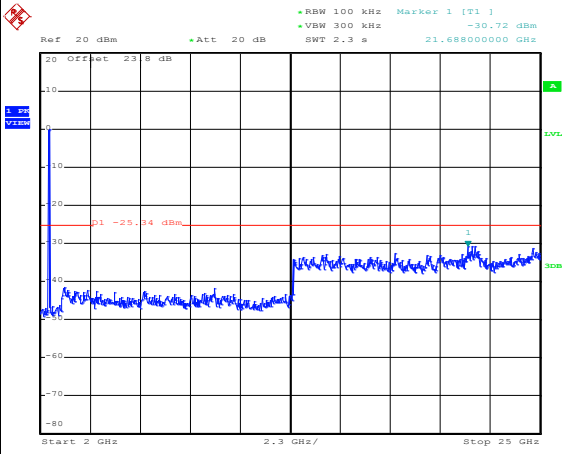
Date: 3.SEP.2016 11:18:00

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 11:18:13

Spurious Emission 2GHz~25GHz

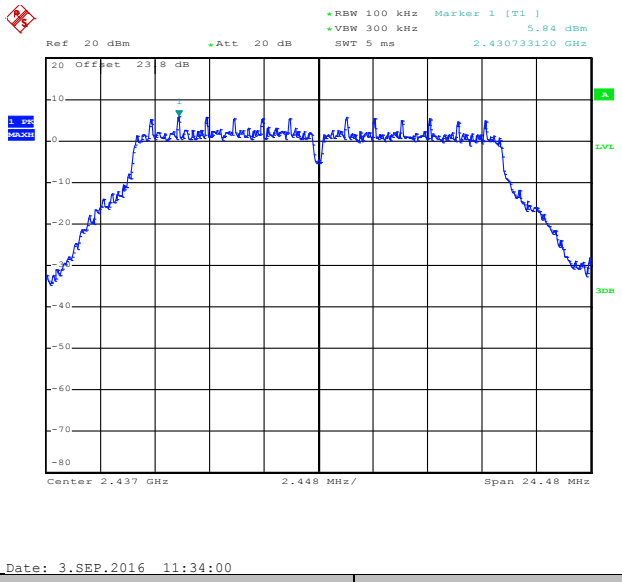


Date: 3.SEP.2016 11:18:21

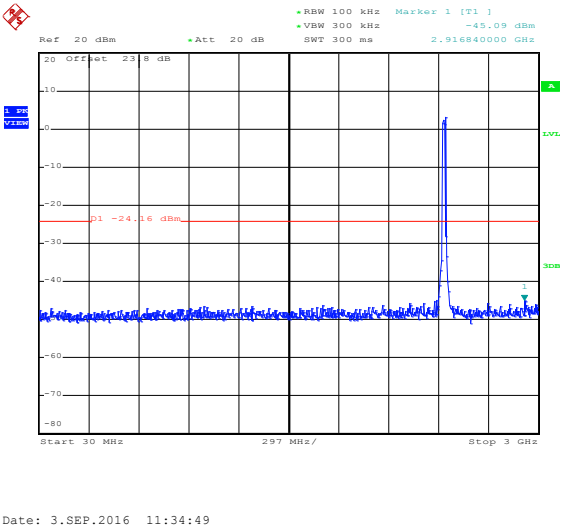
Number of TX :	1	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11g Channel 06

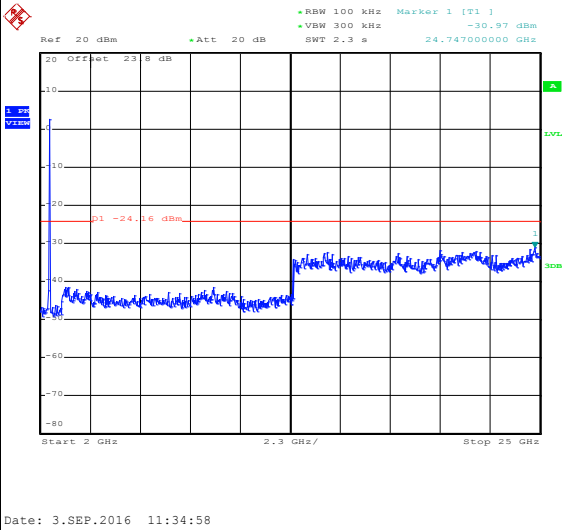
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



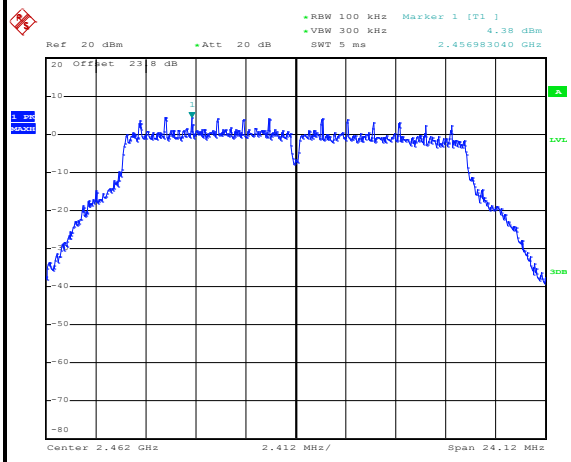
Spurious Emission 2GHz~25GHz



Number of TX :	1	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

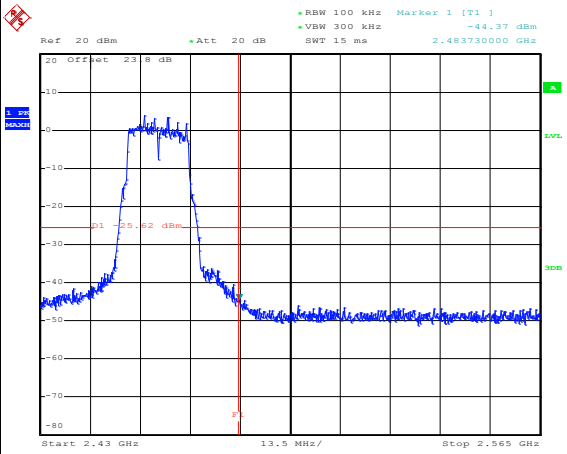
WLAN 802.11g Channel 11

100kHz PSD reference Level



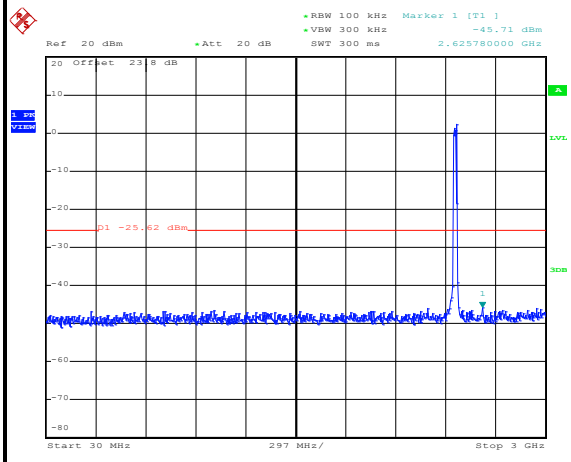
Date: 3.SEP.2016 11:38:24

High Channel Plot



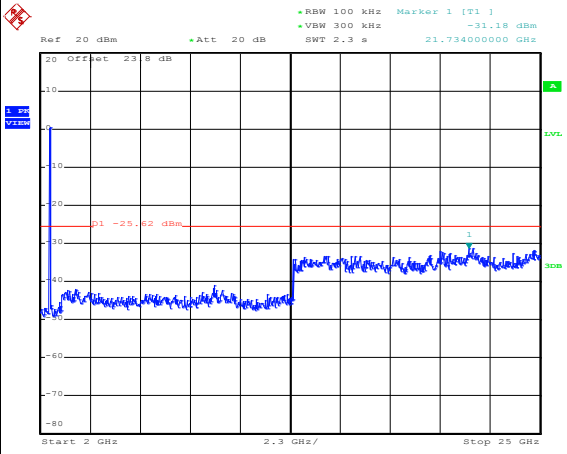
Date: 3.SEP.2016 11:39:00

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 11:39:17

Spurious Emission 2GHz~25GHz



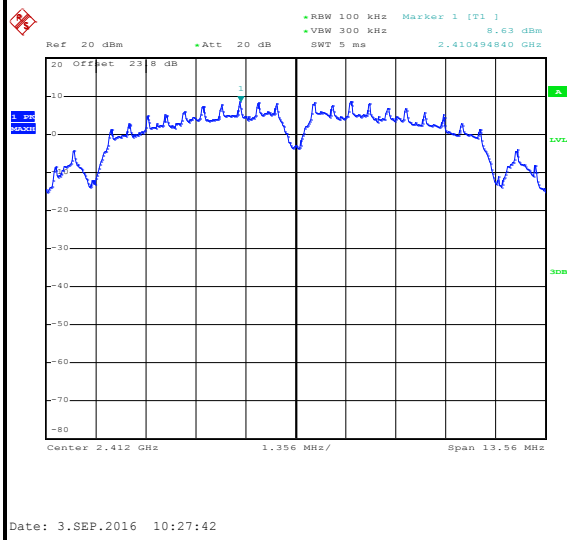
Date: 3.SEP.2016 11:39:26

Number of TX = 1, Ant. 2 (Measured)

Number of TX	1	**Ant. :**	2
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

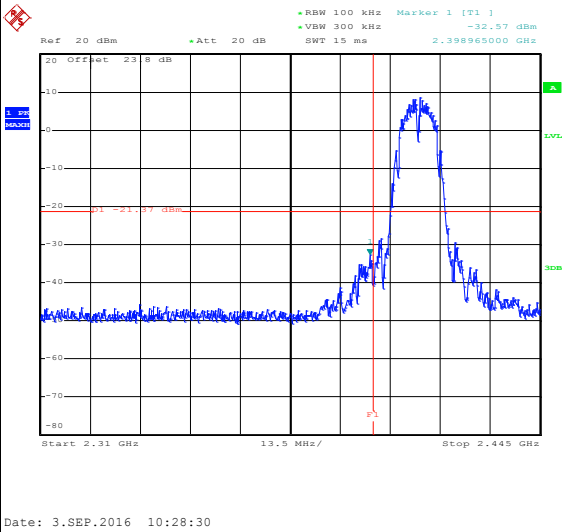
WLAN 802.11b Channel 01

100kHz PSD reference Level



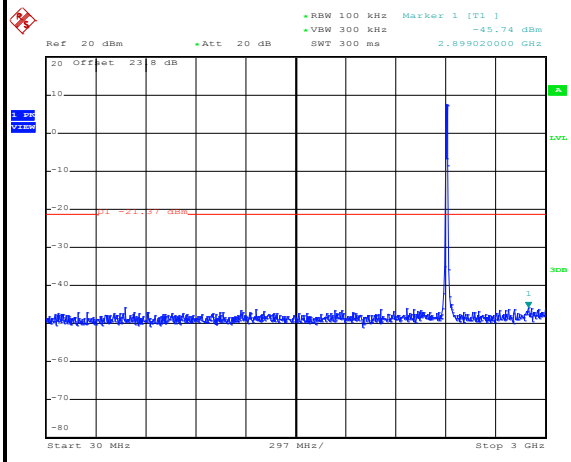
Date: 3.SEP.2016 10:27:42

Low Channel Plot



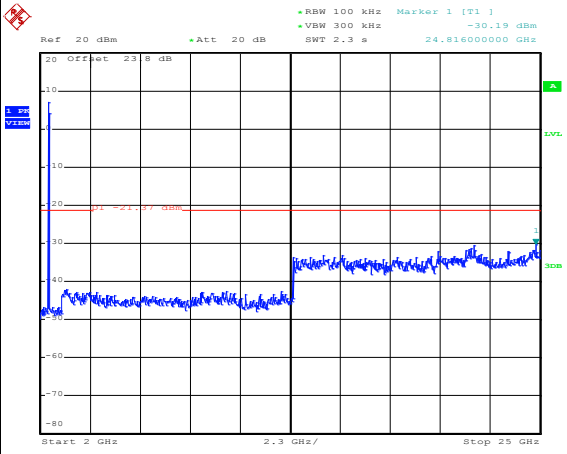
Date: 3.SEP.2016 10:28:30

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 10:28:42

Spurious Emission 2GHz~25GHz

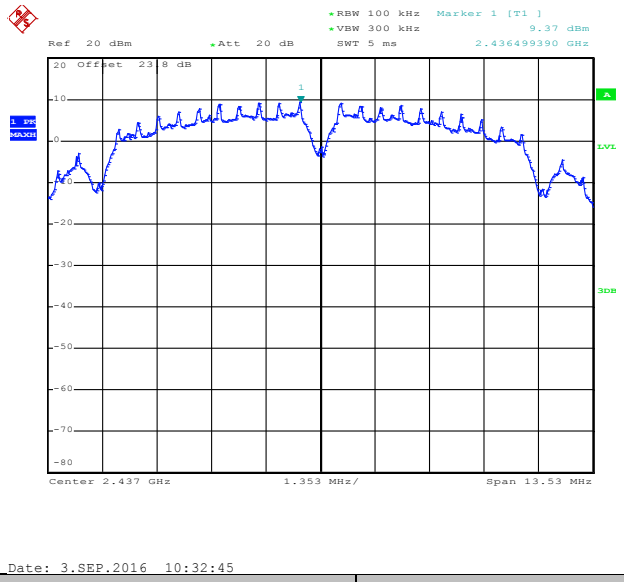


Date: 3.SEP.2016 10:28:50

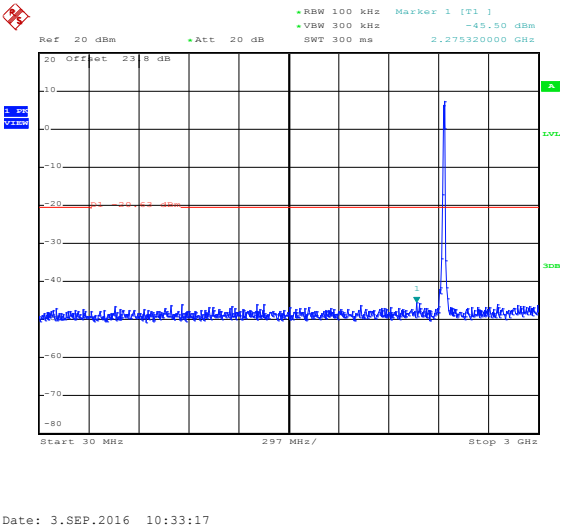
Number of TX :	1	**Ant. :**	2
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11b Channel 06

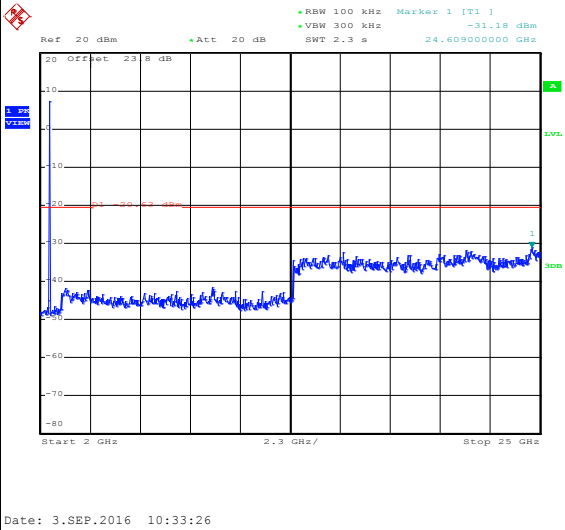
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



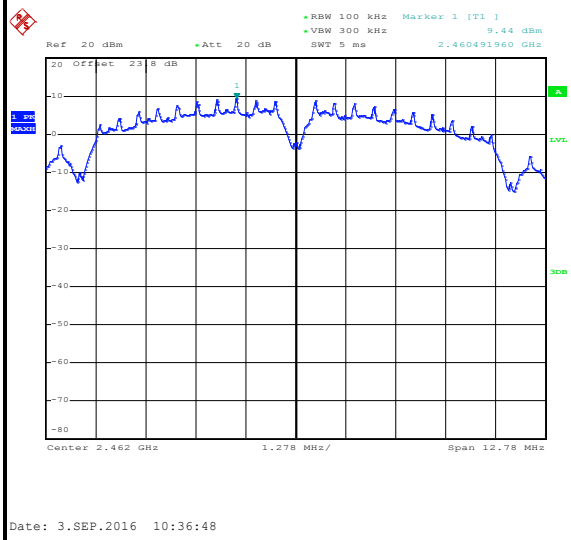
Spurious Emission 2GHz~25GHz



Number of TX :	1	**Ant. :**	2
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

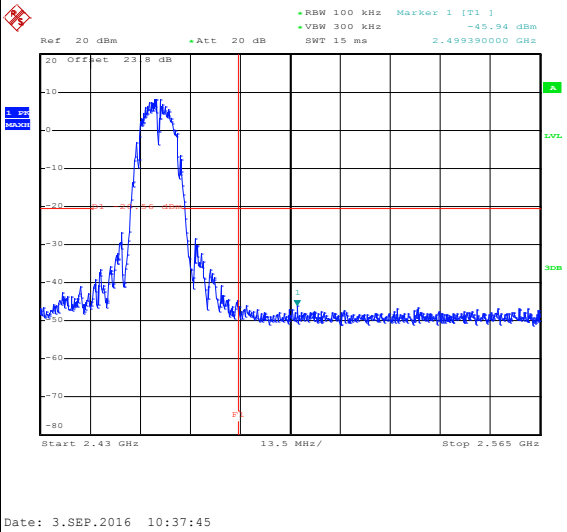
WLAN 802.11b Channel 11

100kHz PSD reference Level



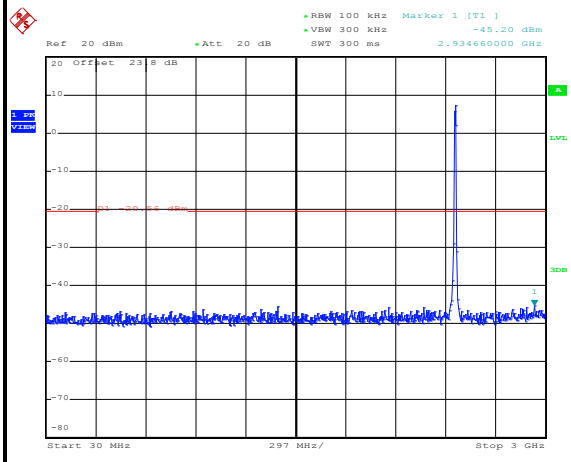
Date: 3.SEP.2016 10:36:48

High Channel Plot



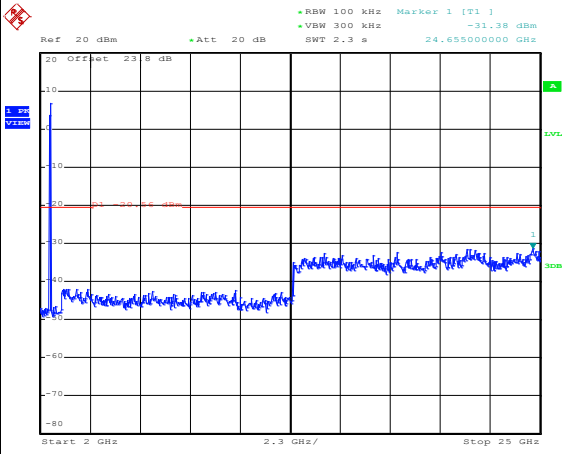
Date: 3.SEP.2016 10:37:45

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 10:37:58

Spurious Emission 2GHz~25GHz

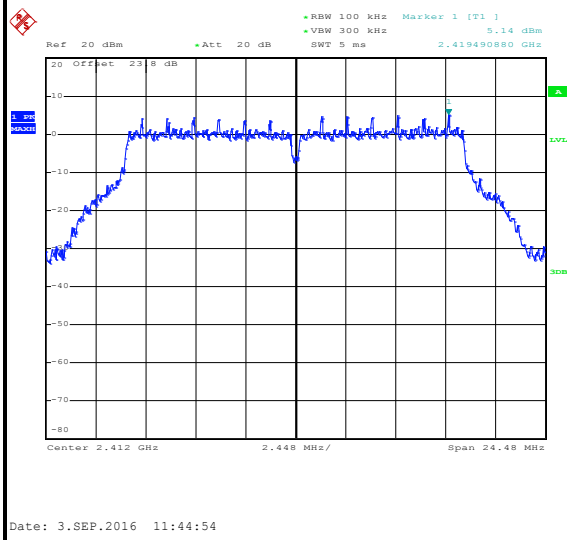


Date: 3.SEP.2016 10:38:07

Number of TX :	1	**Ant. :**	2
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

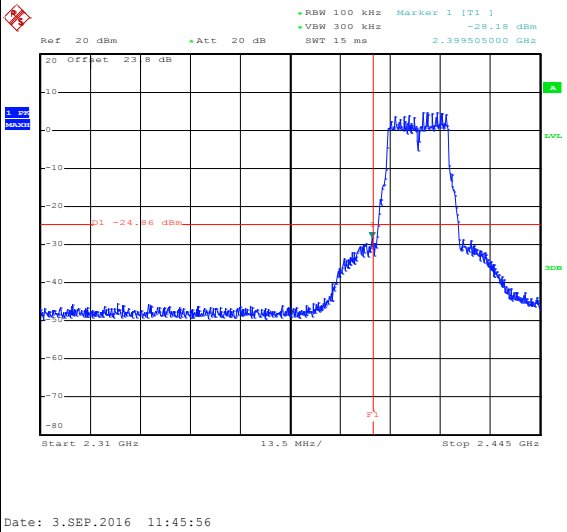
WLAN 802.11g Channel 01

100kHz PSD reference Level



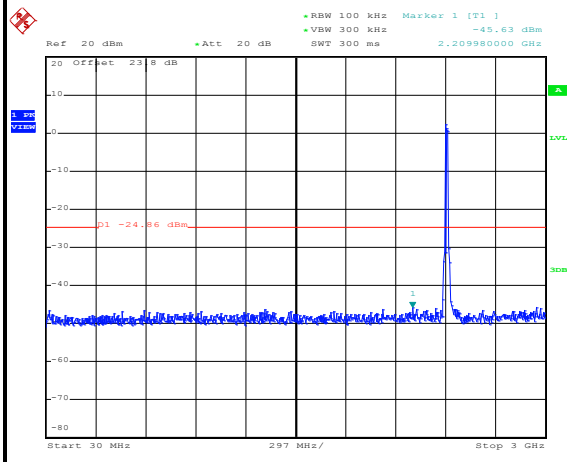
Date: 3.SEP.2016 11:44:54

Low Channel Plot



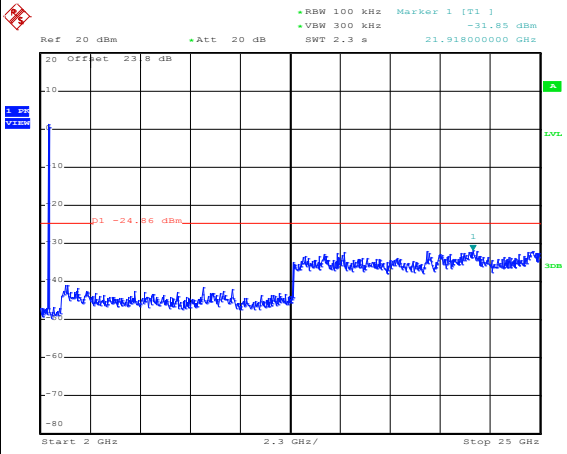
Date: 3.SEP.2016 11:45:56

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 11:46:09

Spurious Emission 2GHz~25GHz

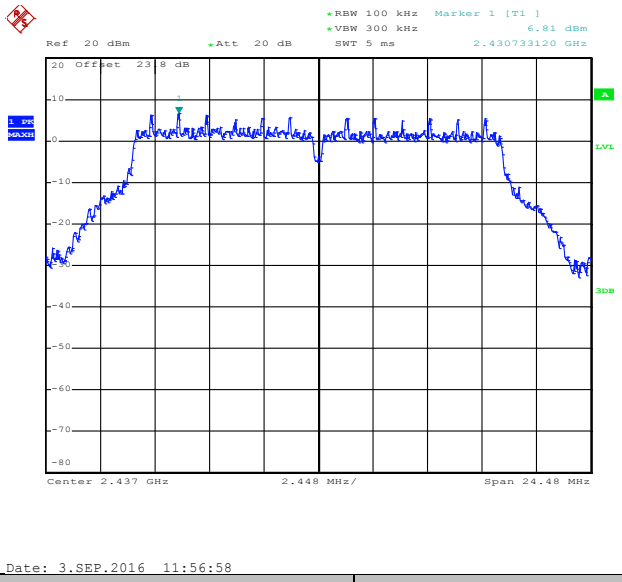


Date: 3.SEP.2016 11:46:18

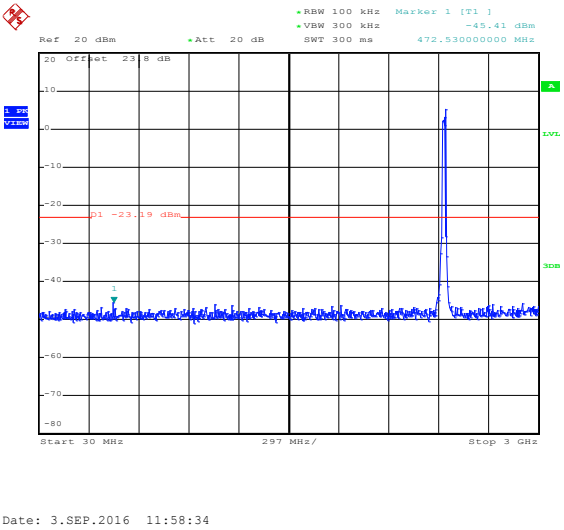
Number of TX :	1	**Ant. :**	2
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11g Channel 06

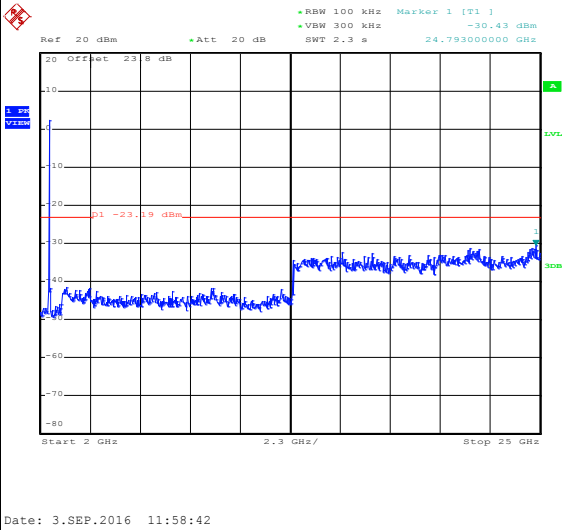
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



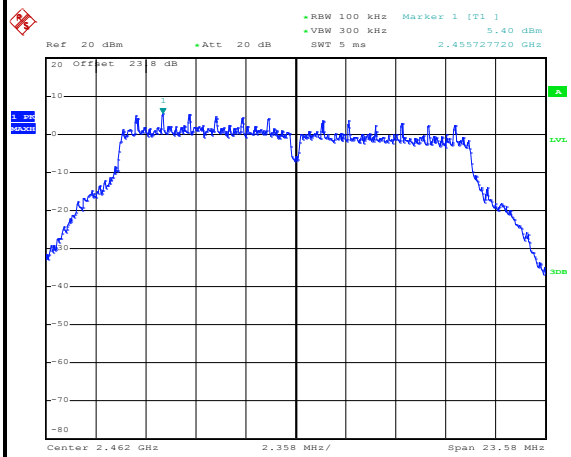
Spurious Emission 2GHz~25GHz



Number of TX :	1	**Ant. :**	2
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

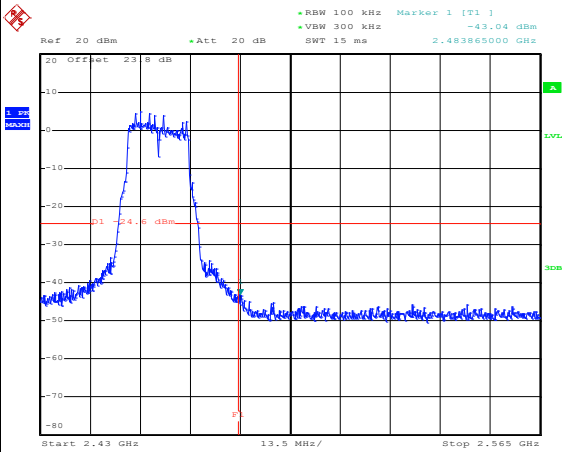
WLAN 802.11g Channel 11

100kHz PSD reference Level



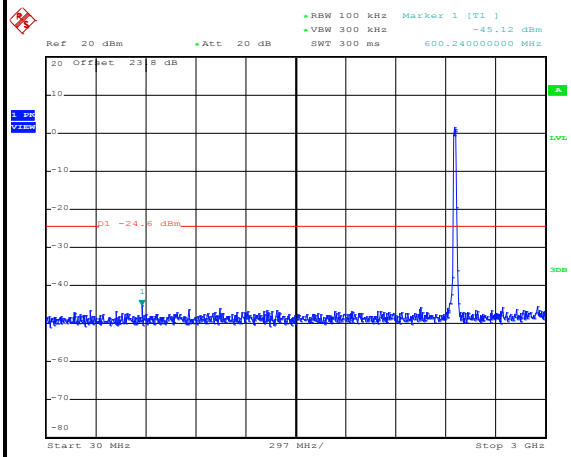
Date: 3.SEP.2016 12:02:46

High Channel Plot



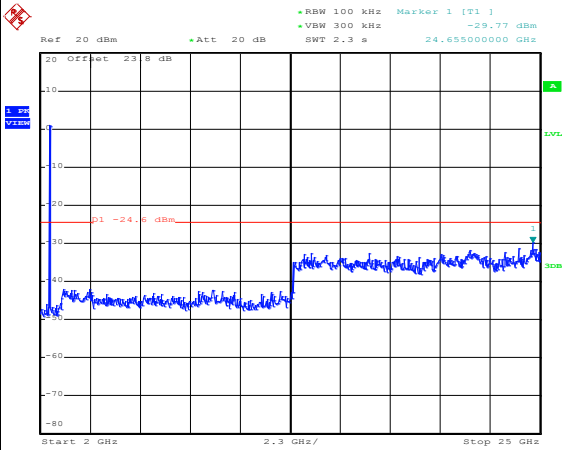
Date: 3.SEP.2016 12:05:05

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 12:05:21

Spurious Emission 2GHz~25GHz



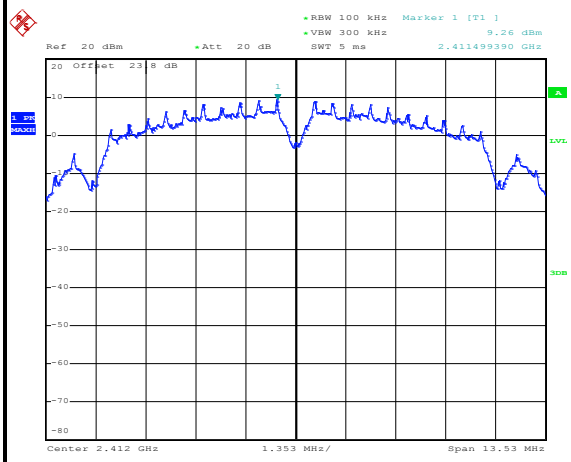
Date: 3.SEP.2016 12:05:29

Number of TX = 2, Ant. 1 (Measured)

Number of TX	2	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

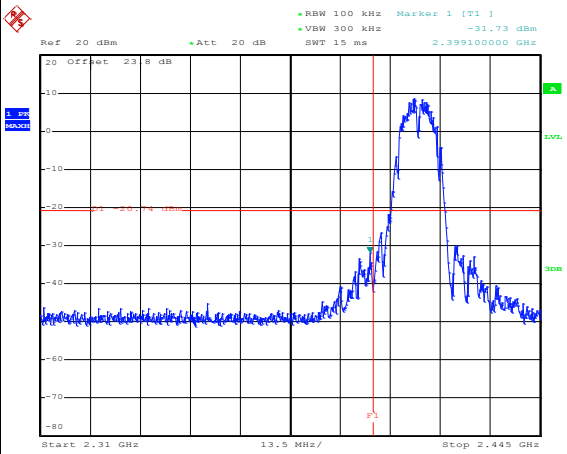
WLAN 802.11b Channel 01

100kHz PSD reference Level



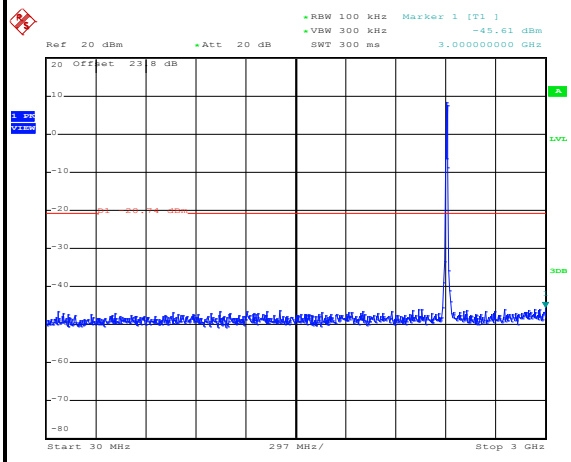
Date: 3.SEP.2016 10:42:30

Low Channel Plot



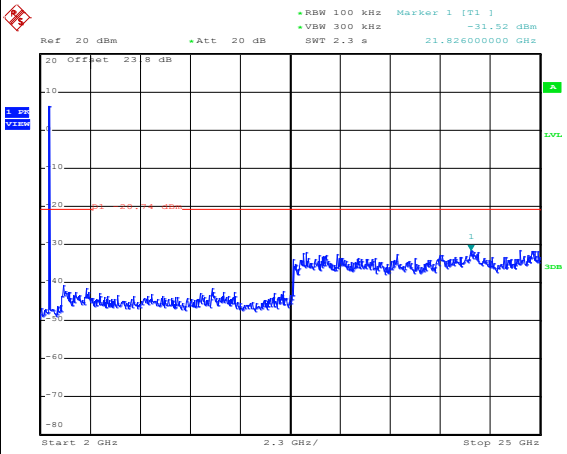
Date: 3.SEP.2016 10:43:10

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 10:43:21

Spurious Emission 2GHz~25GHz

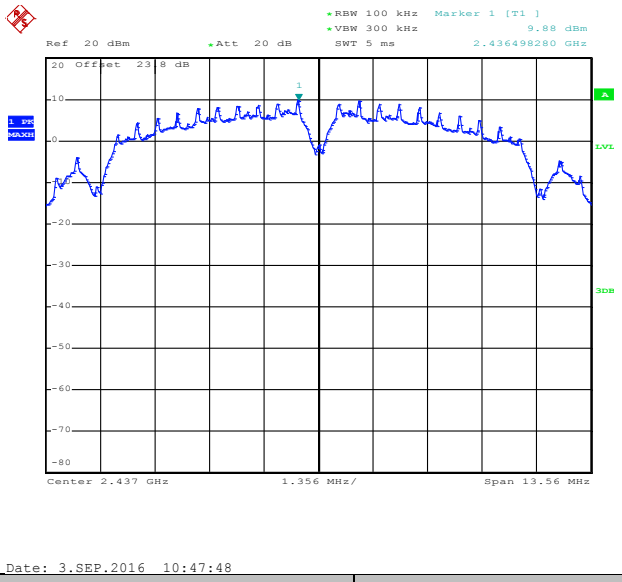


Date: 3.SEP.2016 10:43:30

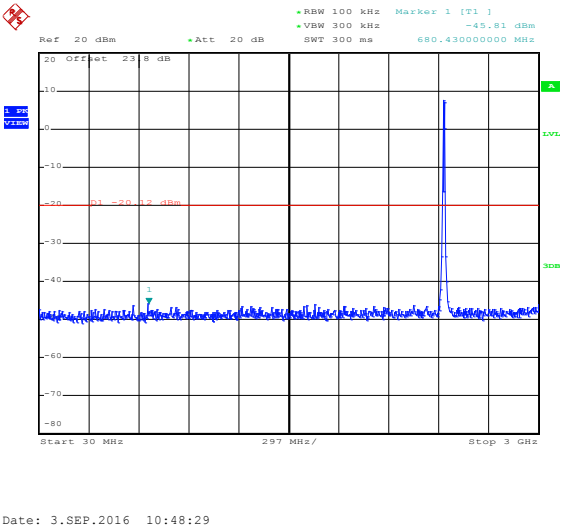
Number of TX :	2	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11b Channel 06

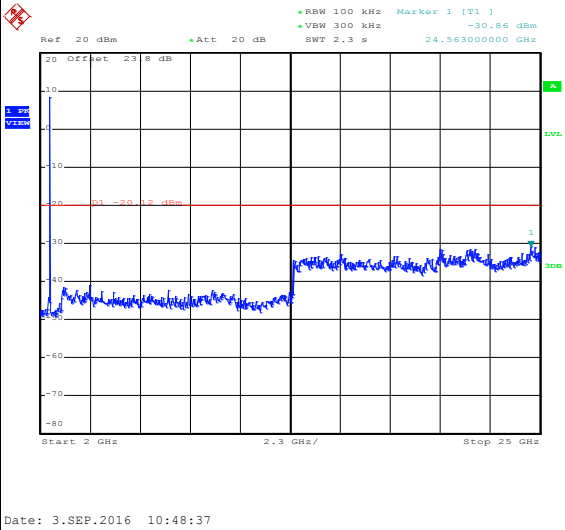
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



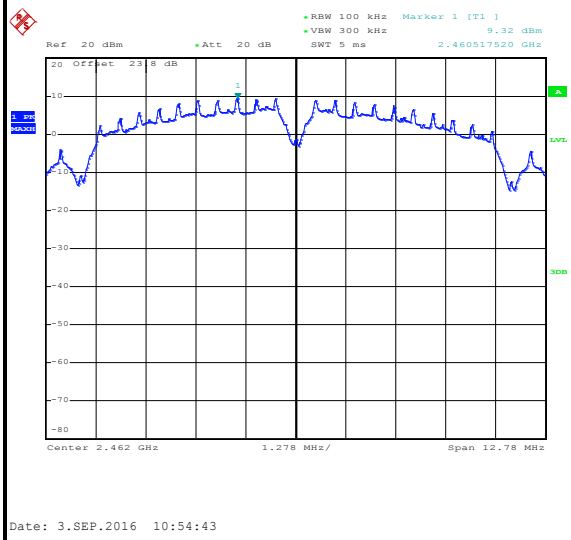
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

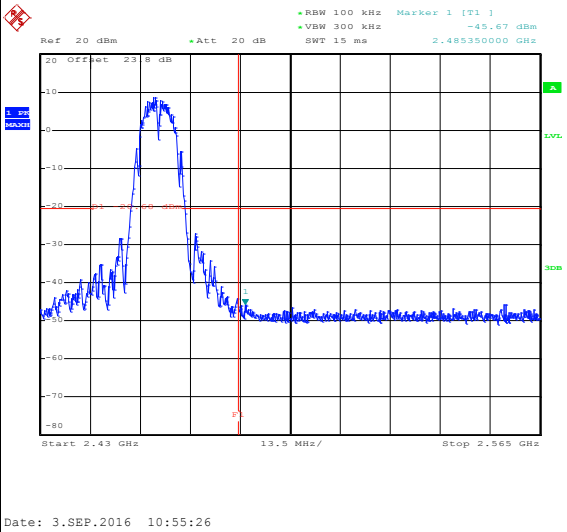
WLAN 802.11b Channel 11

100kHz PSD reference Level



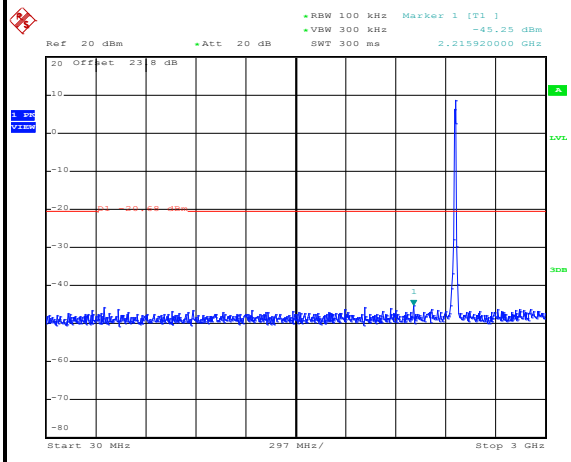
Date: 3.SEP.2016 10:54:43

High Channel Plot



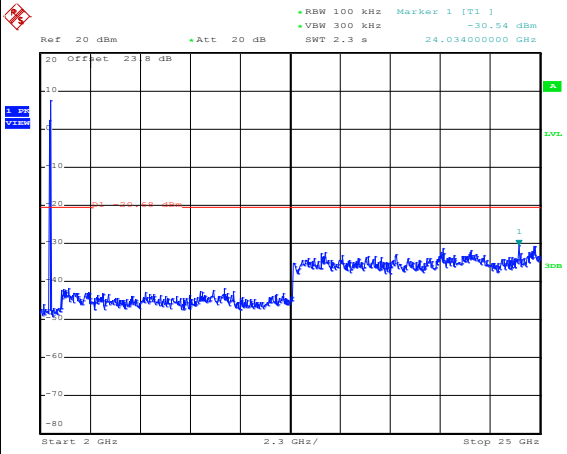
Date: 3.SEP.2016 10:55:26

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 10:55:41

Spurious Emission 2GHz~25GHz

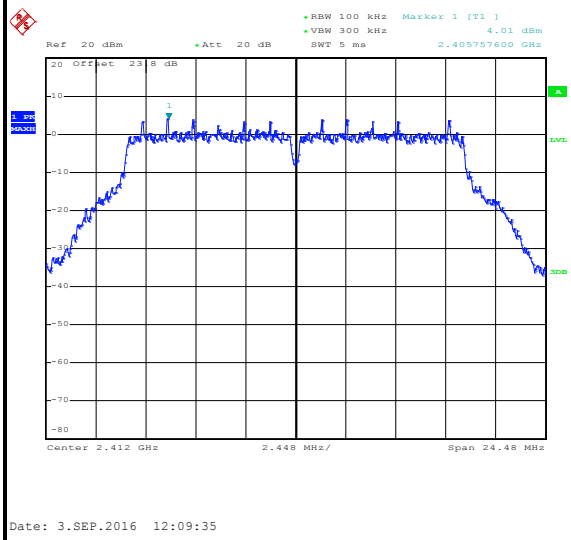


Date: 3.SEP.2016 10:55:50

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

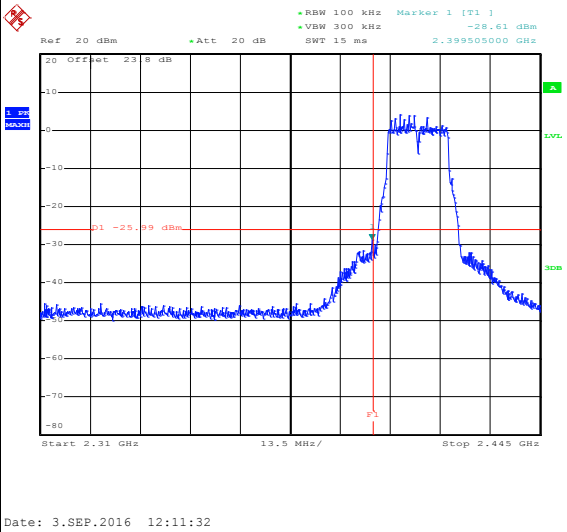
WLAN 802.11g Channel 01

100kHz PSD reference Level



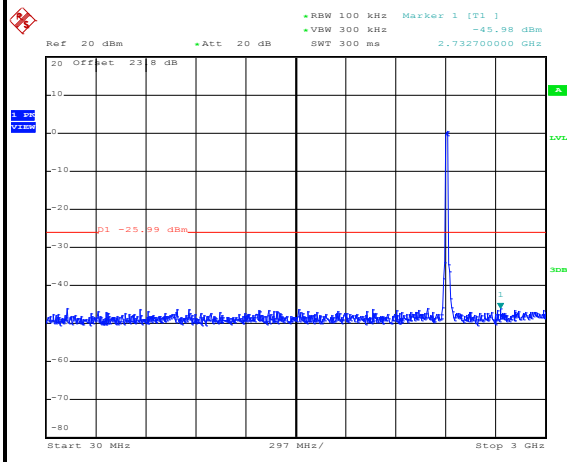
Date: 3.SEP.2016 12:09:35

Low Channel Plot



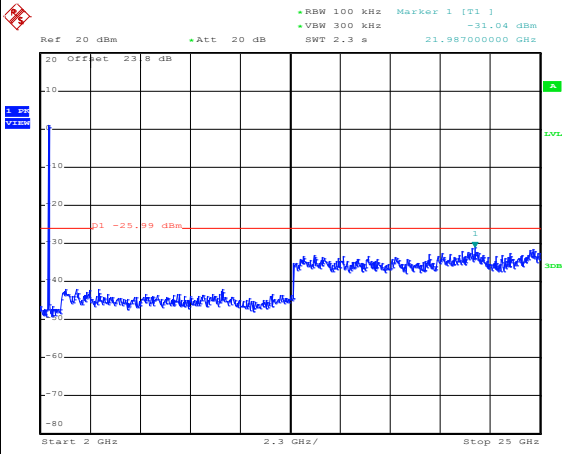
Date: 3.SEP.2016 12:11:32

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 12:12:26

Spurious Emission 2GHz~25GHz

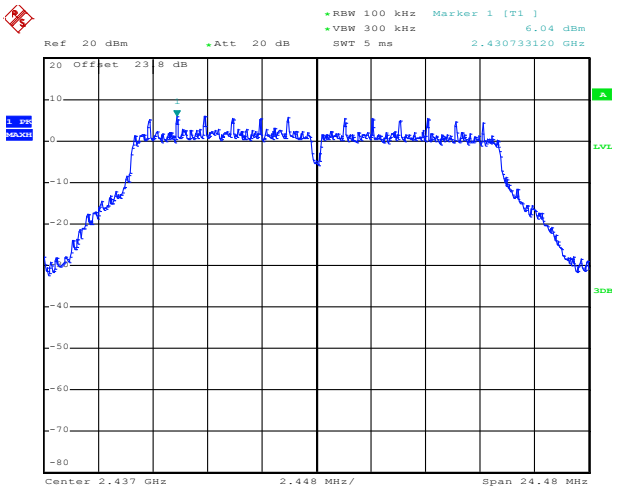


Date: 3.SEP.2016 12:12:34

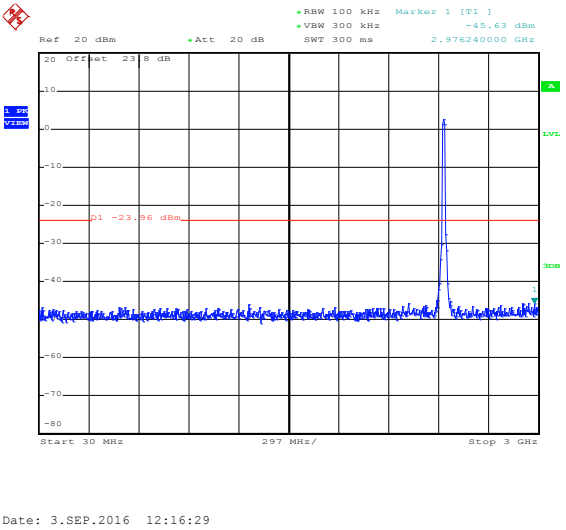
Number of TX :	2	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11g Channel 06

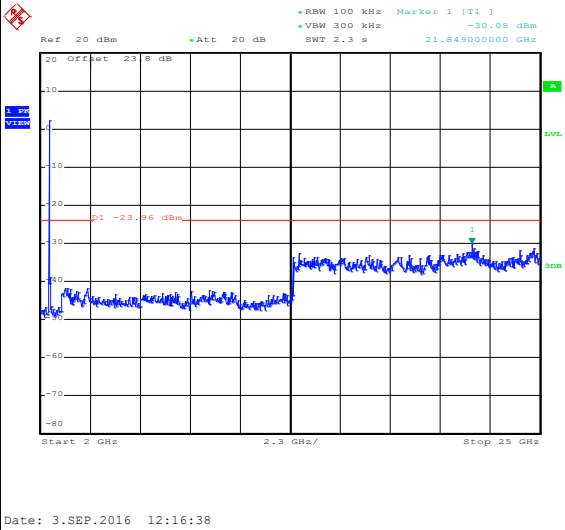
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



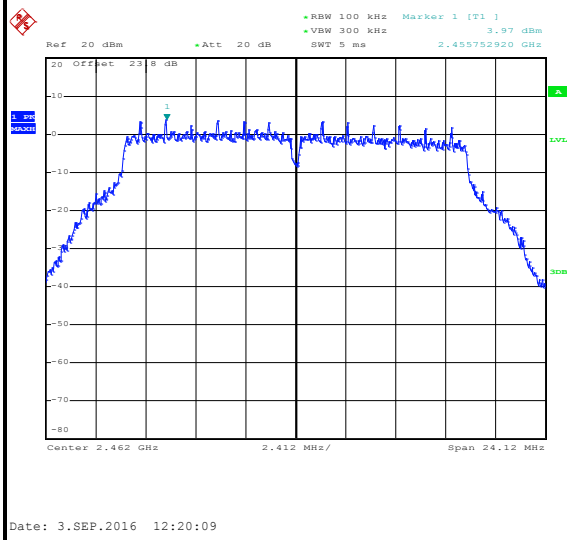
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

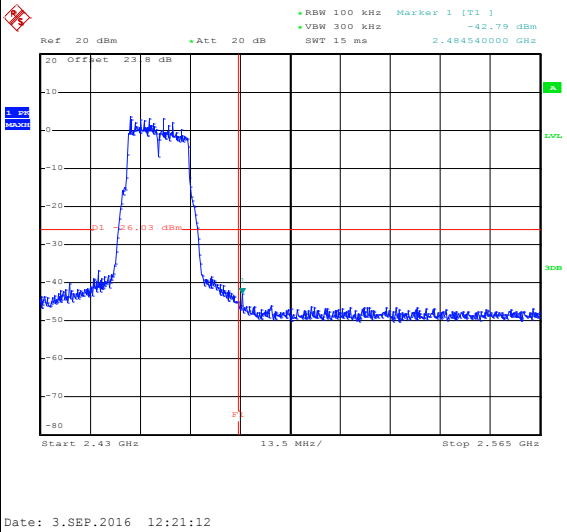
WLAN 802.11g Channel 11

100kHz PSD reference Level



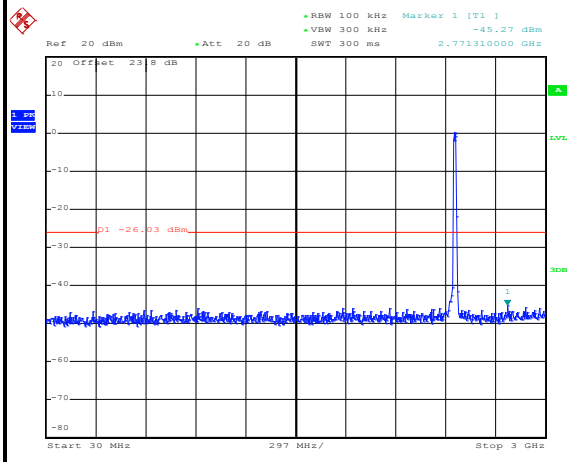
Date: 3.SEP.2016 12:20:09

High Channel Plot



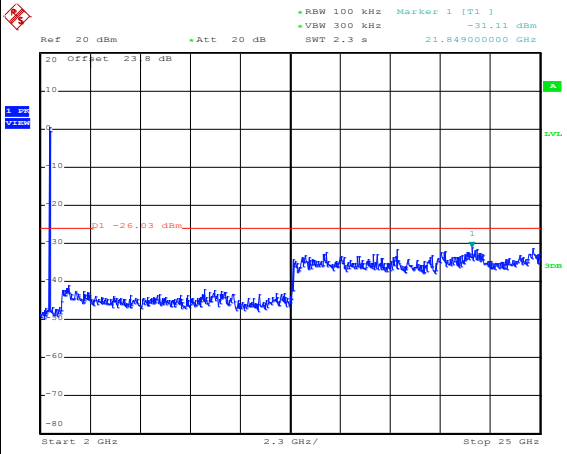
Date: 3.SEP.2016 12:21:12

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 12:21:25

Spurious Emission 2GHz~25GHz

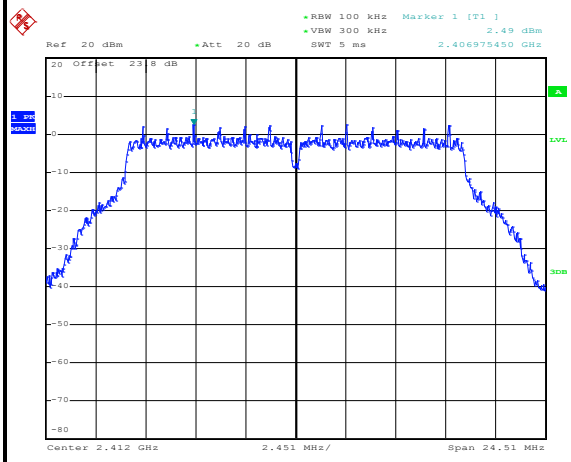


Date: 3.SEP.2016 12:21:33

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

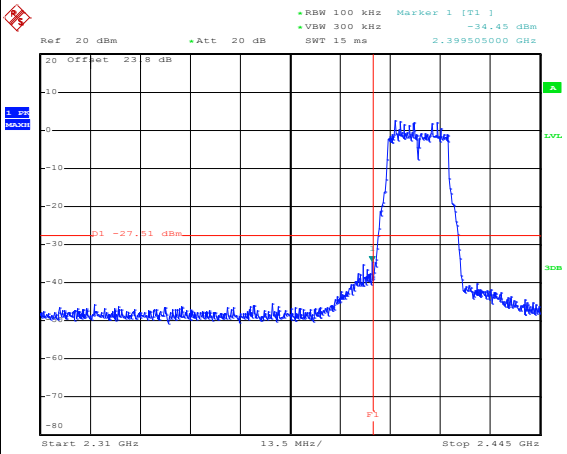
WLAN 802.11ac VHT20 Channel 01

100kHz PSD reference Level



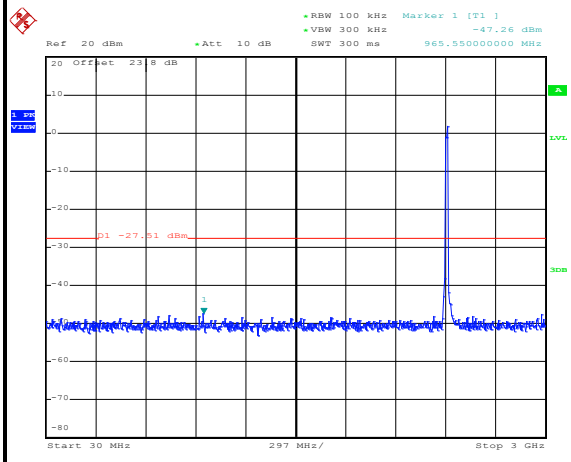
Date: 3.SEP.2016 12:44:52

Low Channel Plot



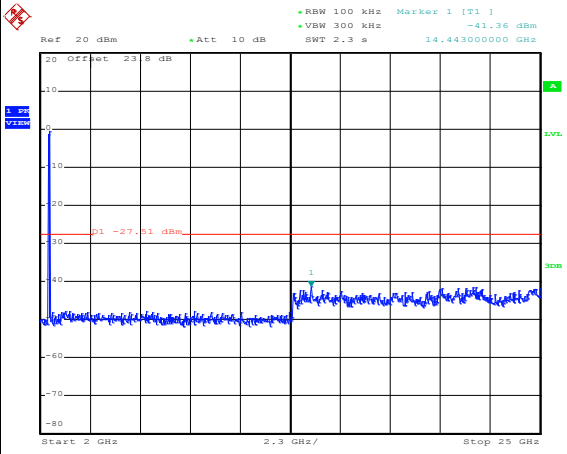
Date: 3.SEP.2016 12:46:14

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 12:48:14

Spurious Emission 2GHz~25GHz

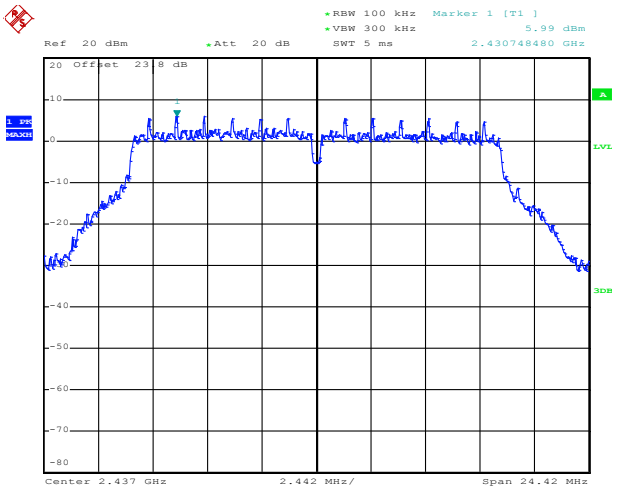


Date: 3.SEP.2016 12:48:22

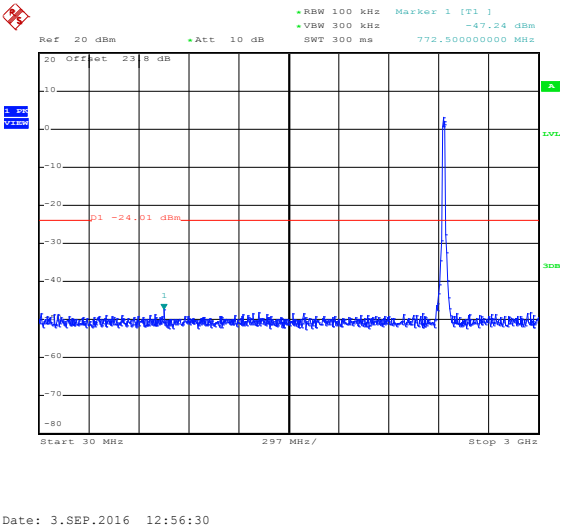
Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11ac VHT20 Channel 06

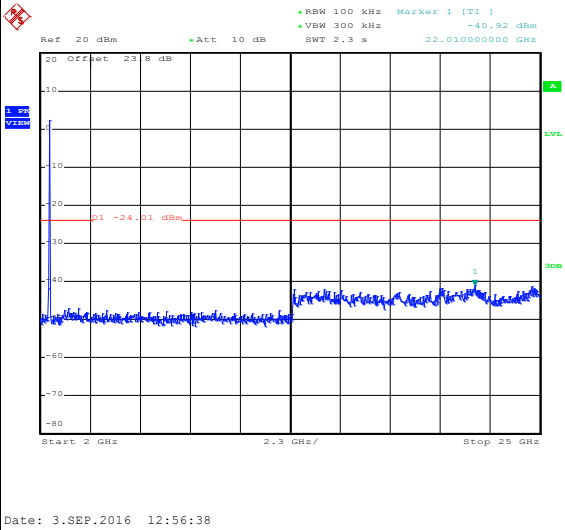
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



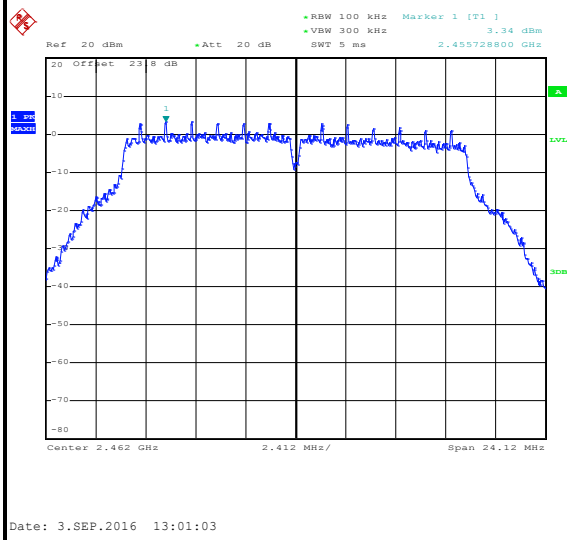
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

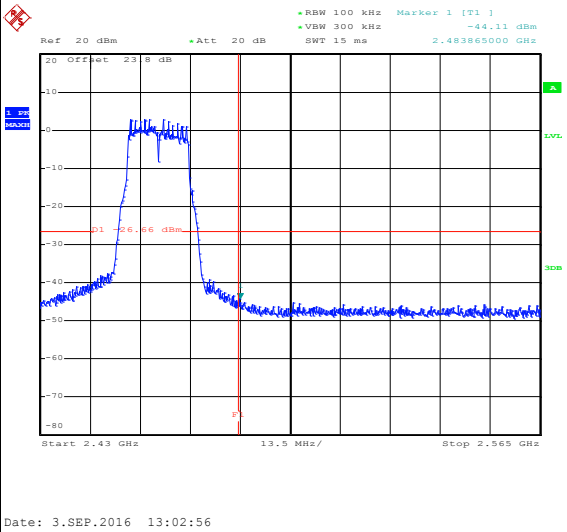
WLAN 802.11ac VHT20 Channel 11

100kHz PSD reference Level



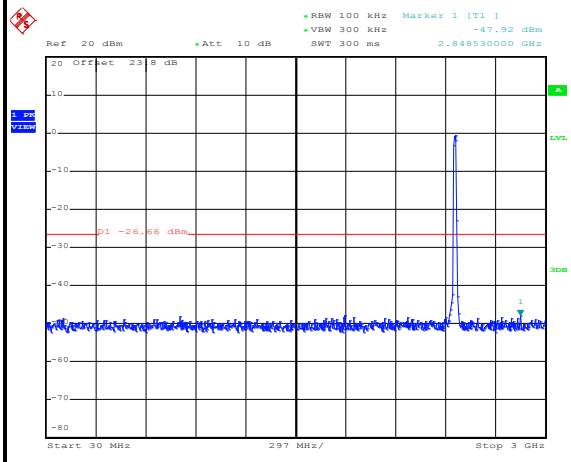
Date: 3.SEP.2016 13:01:03

High Channel Plot



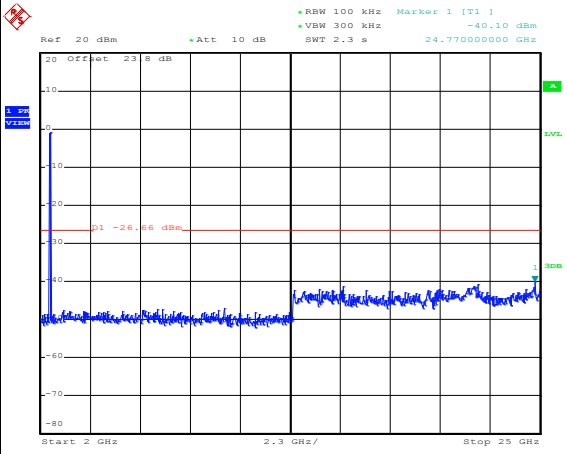
Date: 3.SEP.2016 13:02:56

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 13:04:50

Spurious Emission 2GHz~25GHz

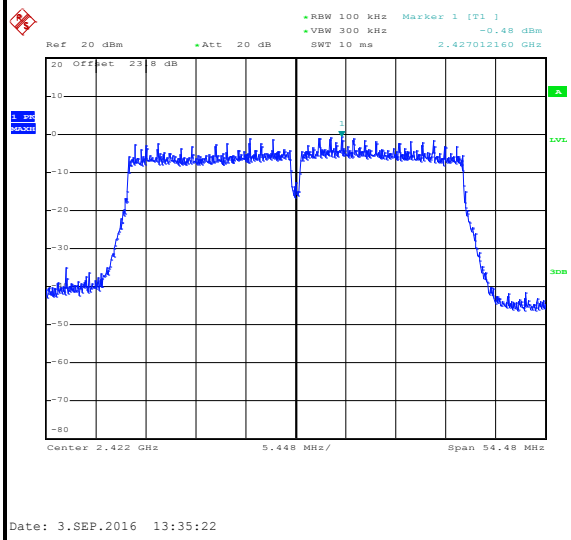


Date: 3.SEP.2016 13:04:59

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	03	**Test Engineer :**	AnAn Wu

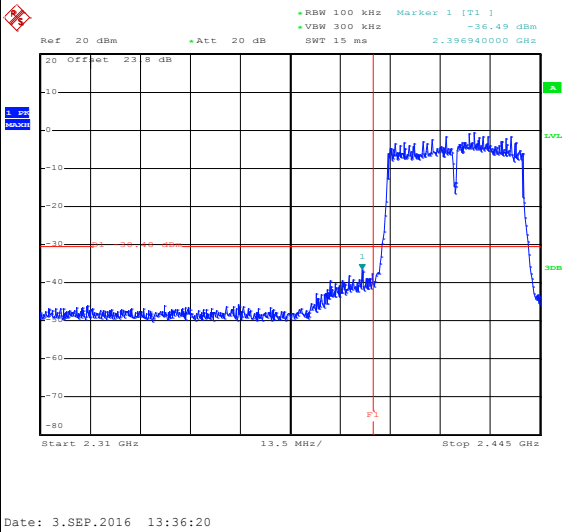
WLAN 802.11ac VHT40 Channel 03

100kHz PSD reference Level



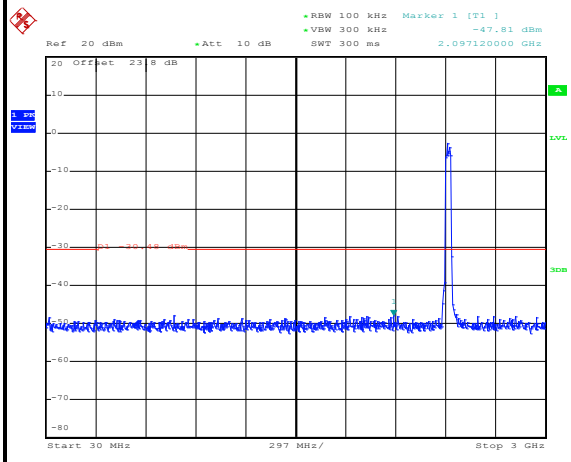
Date: 3.SEP.2016 13:35:22

Low Channel Plot



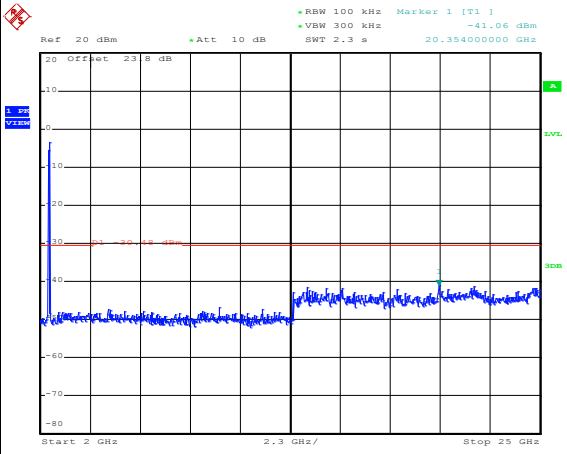
Date: 3.SEP.2016 13:36:20

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 13:36:58

Spurious Emission 2GHz~25GHz

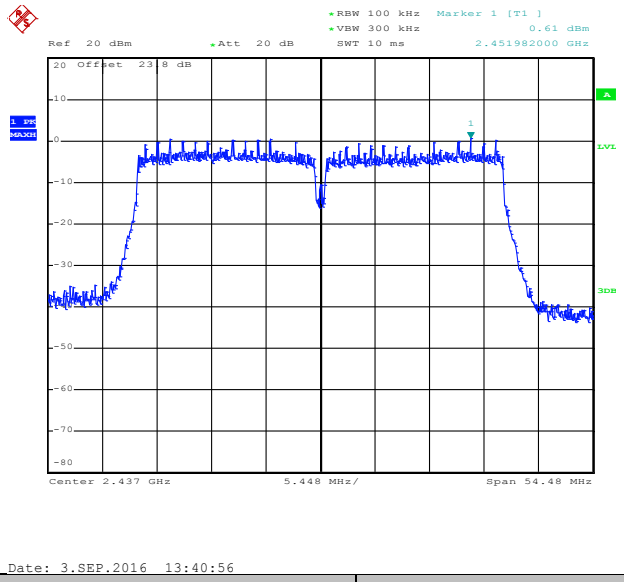


Date: 3.SEP.2016 13:37:06

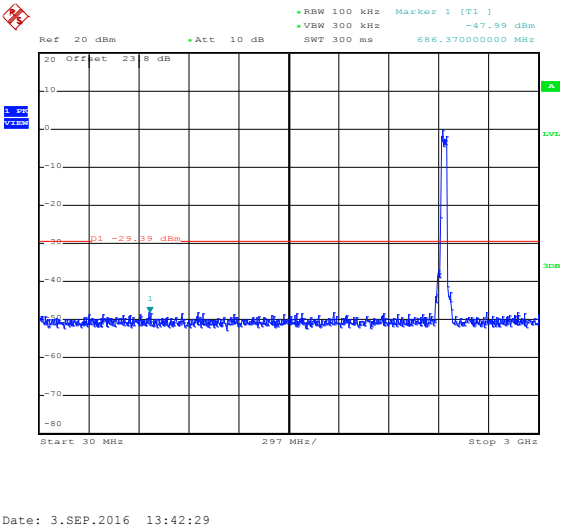
Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11ac VHT40 Channel 06

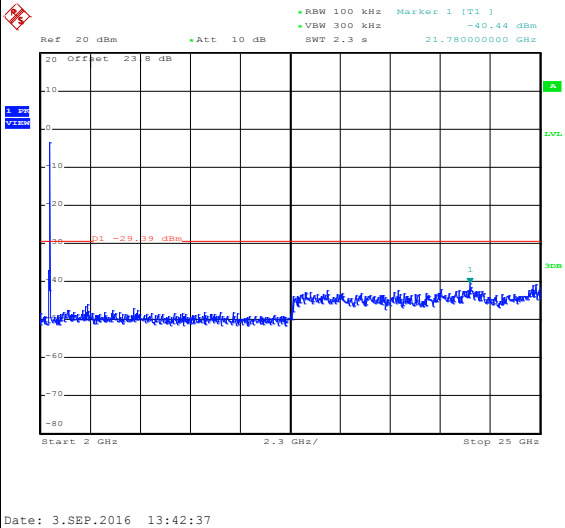
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



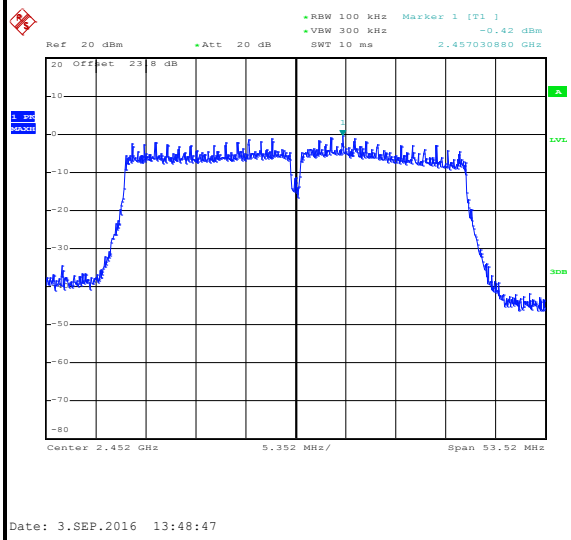
Spurious Emission 2GHz~25GHz



Number of TX :	2	Ant. :	1
Test Mode :	802.11ac VHT40	Temperature :	21~25℃
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	09	Test Engineer :	AnAn Wu

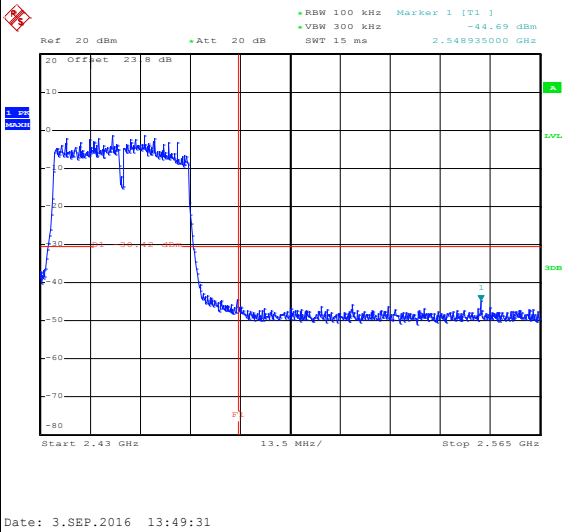
WLAN 802.11ac VHT40 Channel 09

100kHz PSD reference Level



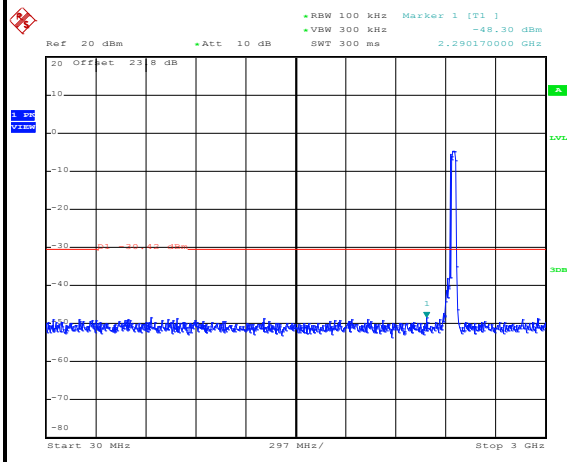
Date: 3.SEP.2016 13:48:47

High Channel Plot



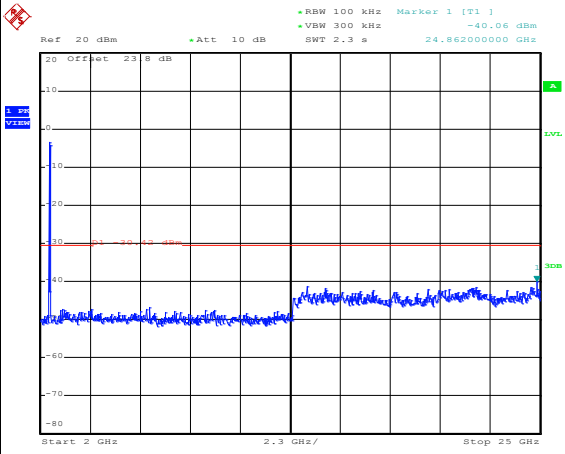
Date: 3.SEP.2016 13:49:31

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 13:52:50

Spurious Emission 2GHz~25GHz



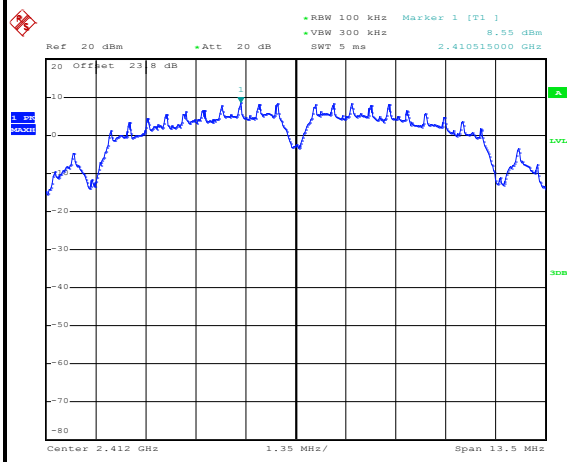
Date: 3.SEP.2016 13:52:58

Number of TX = 2, Ant. 2 (Measured)

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

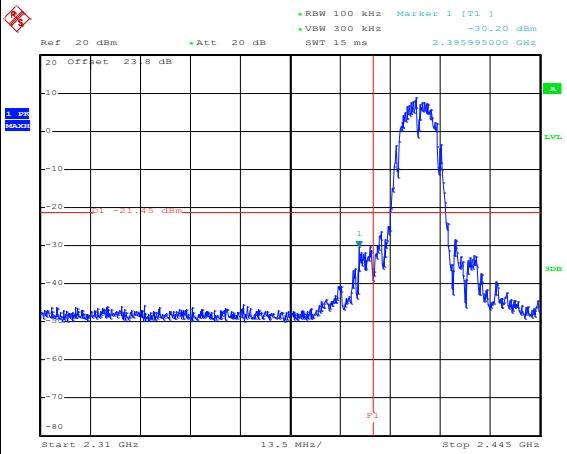
WLAN 802.11b Channel 01

100kHz PSD reference Level



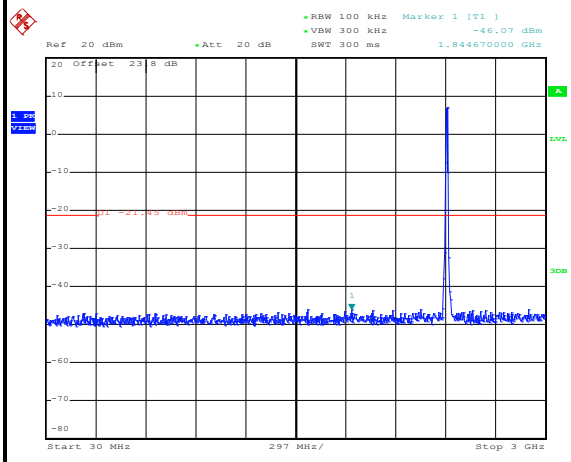
Date: 3.SEP.2016 11:00:08

Low Channel Plot



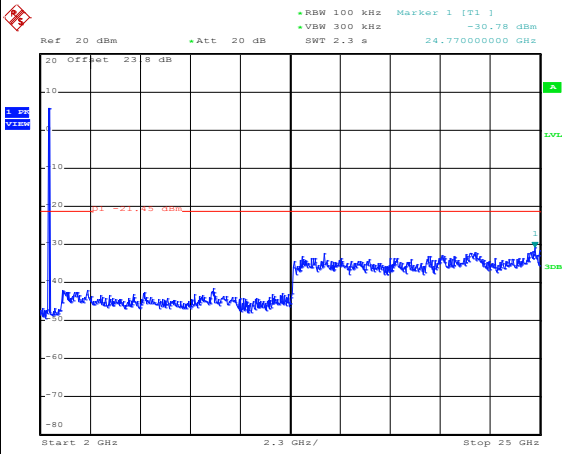
Date: 3.SEP.2016 11:00:47

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 11:00:58

Spurious Emission 2GHz~25GHz

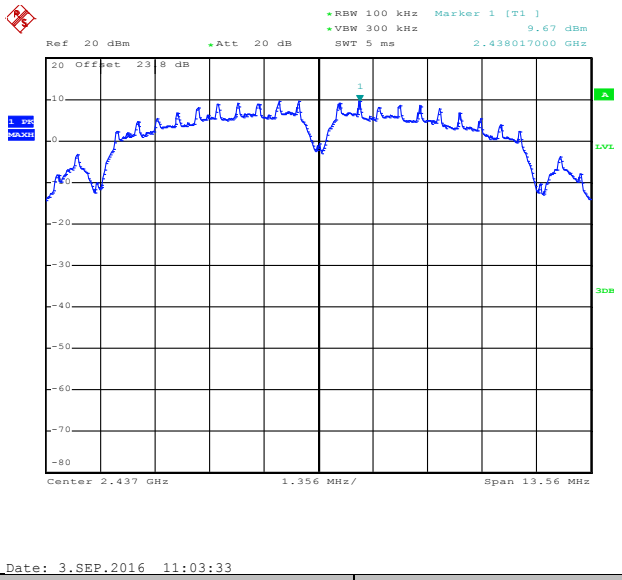


Date: 3.SEP.2016 11:01:07

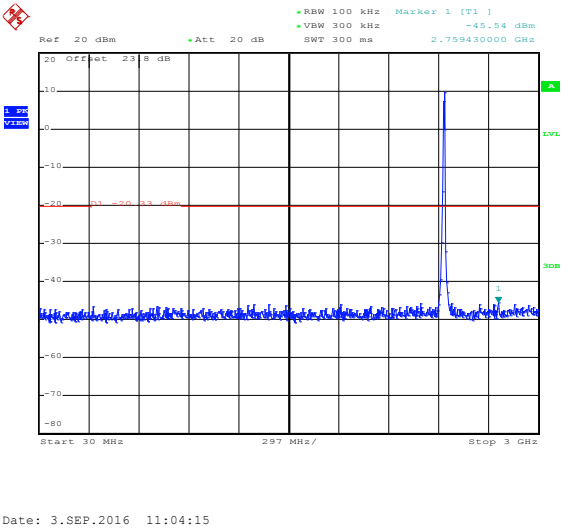
Number of TX :	2	**Ant. :**	2
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11b Channel 06

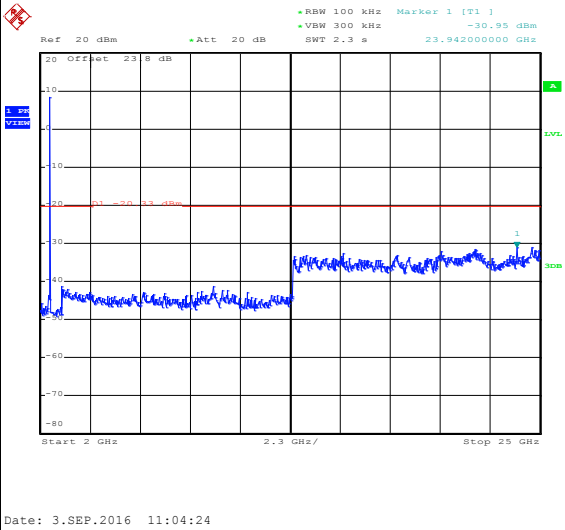
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



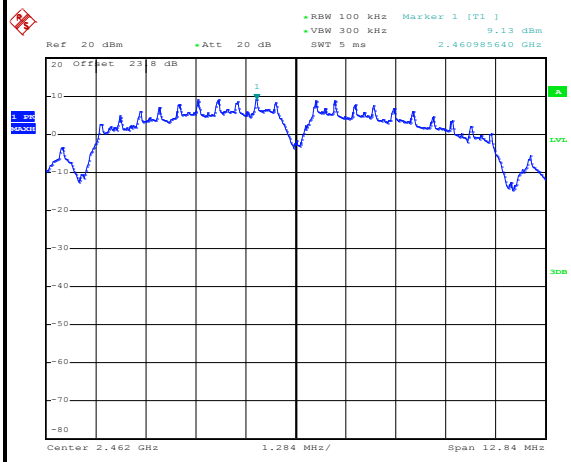
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	2
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

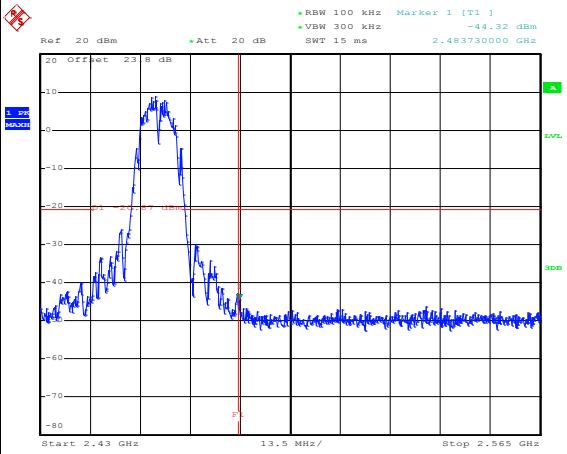
WLAN 802.11b Channel 11

100kHz PSD reference Level



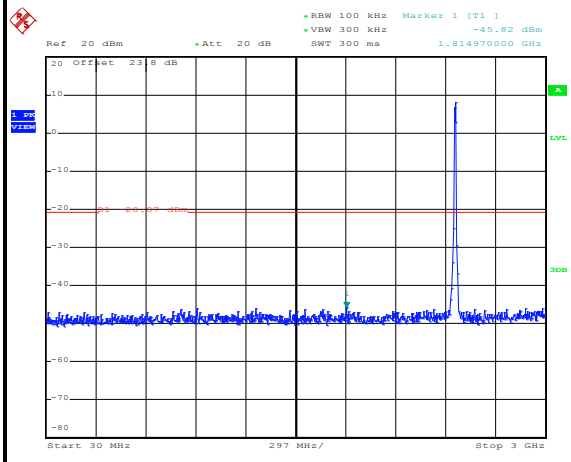
Date: 3.SEP.2016 11:06:38

High Channel Plot



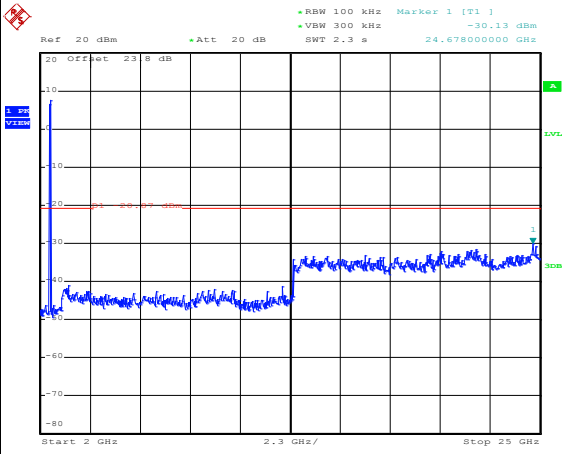
Date: 3.SEP.2016 11:07:33

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 11:07:55

Spurious Emission 2GHz~25GHz

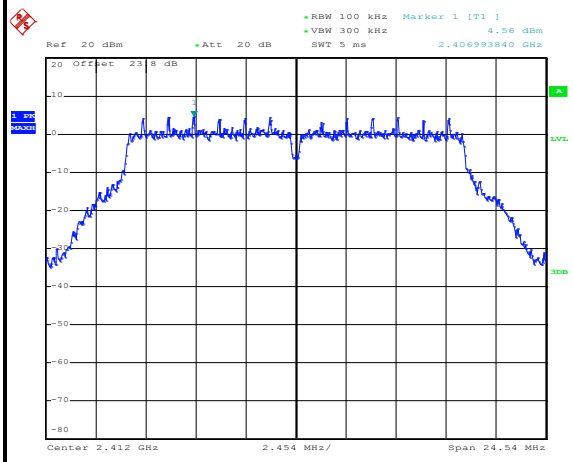


Date: 3.SEP.2016 11:08:03

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

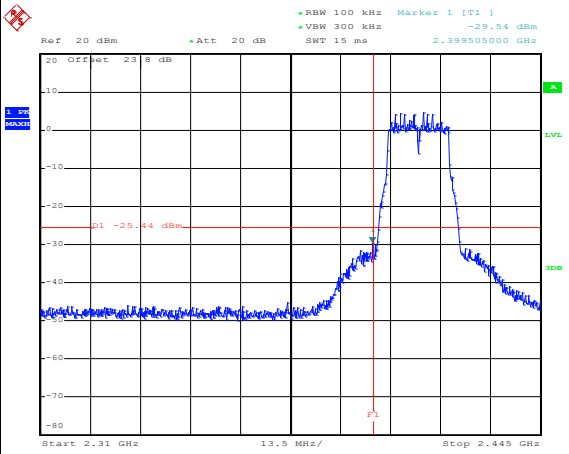
WLAN 802.11g Channel 01

100kHz PSD reference Level



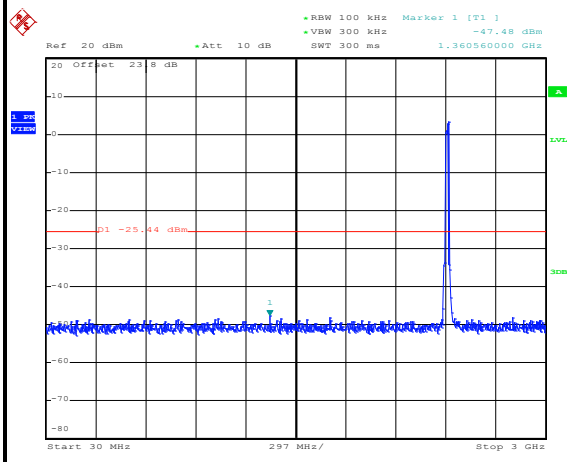
Date: 22.SEP.2016 23:44:03

Low Channel Plot



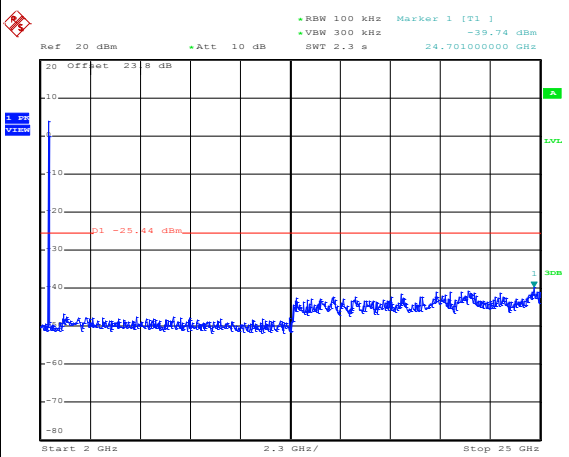
Date: 22.SEP.2016 23:44:54

Spurious Emission 30MHz~3GHz



Date: 22.SEP.2016 23:45:23

Spurious Emission 2GHz~25GHz

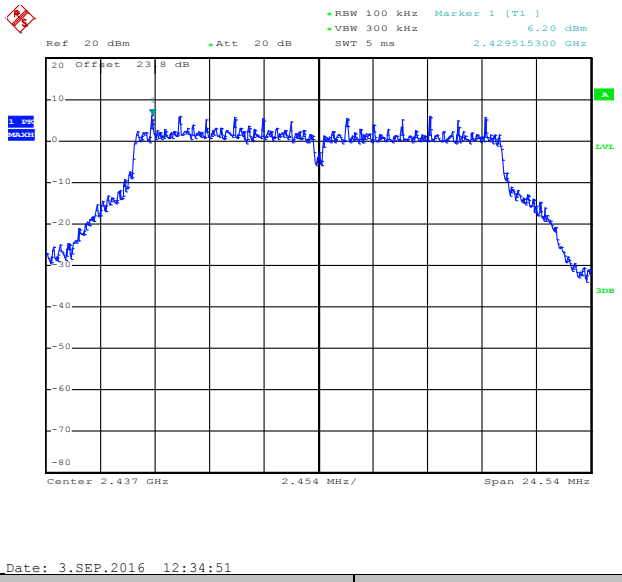


Date: 22.SEP.2016 23:45:32

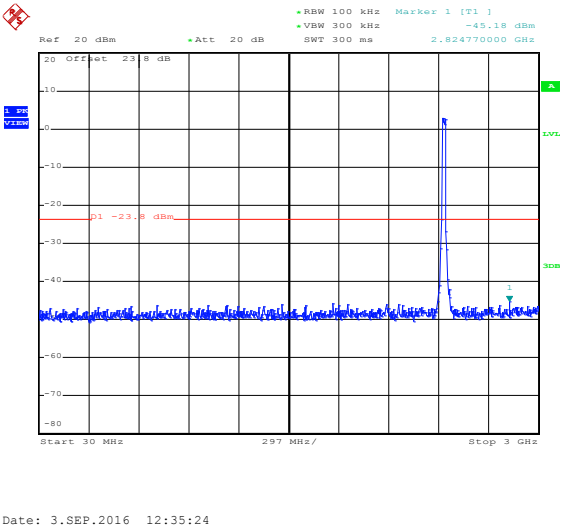
Number of TX :	2	**Ant. :**	2
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11g Channel 06

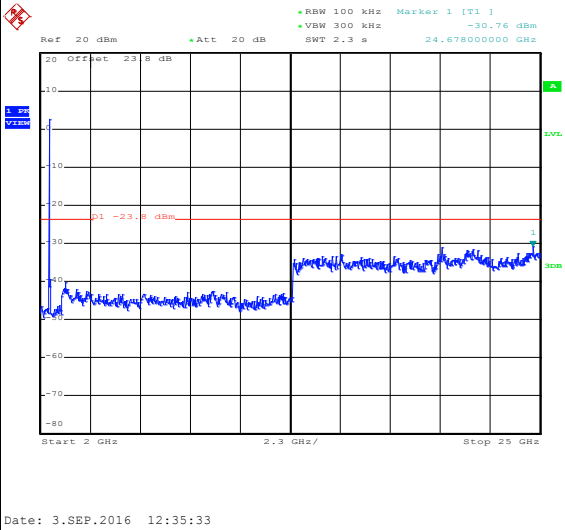
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



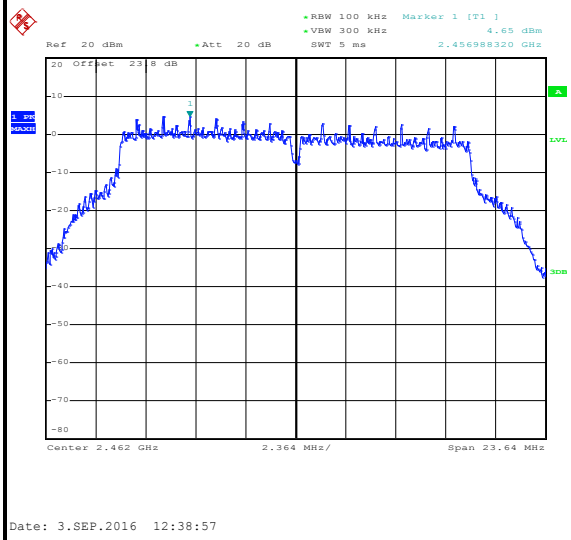
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	2
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

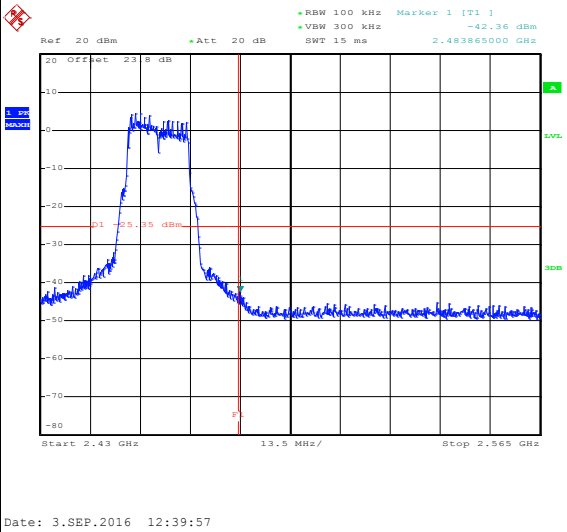
WLAN 802.11g Channel 11

100kHz PSD reference Level



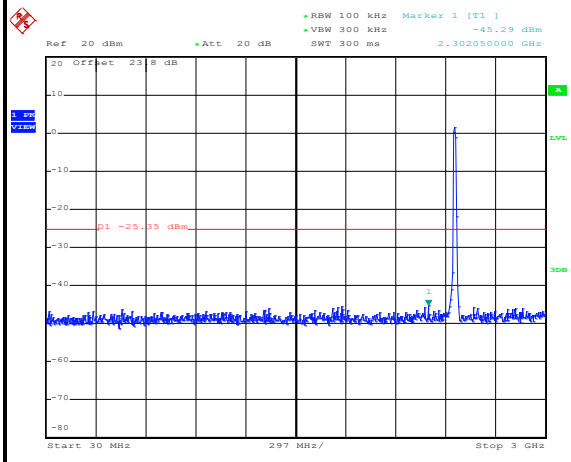
Date: 3.SEP.2016 12:38:57

High Channel Plot



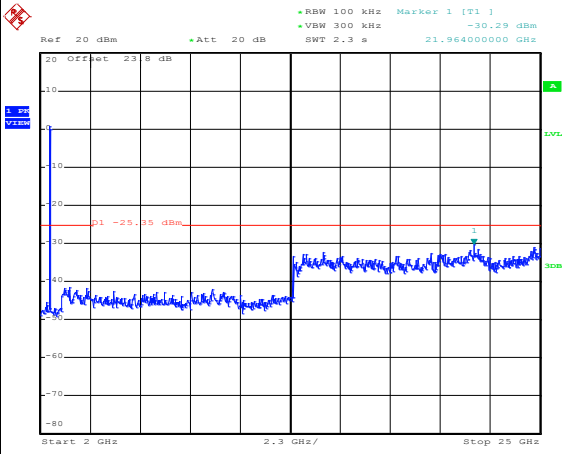
Date: 3.SEP.2016 12:39:57

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 12:40:14

Spurious Emission 2GHz~25GHz

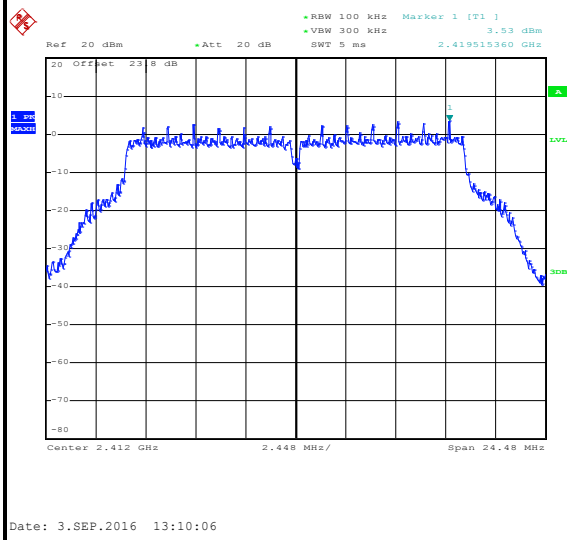


Date: 3.SEP.2016 12:40:23

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

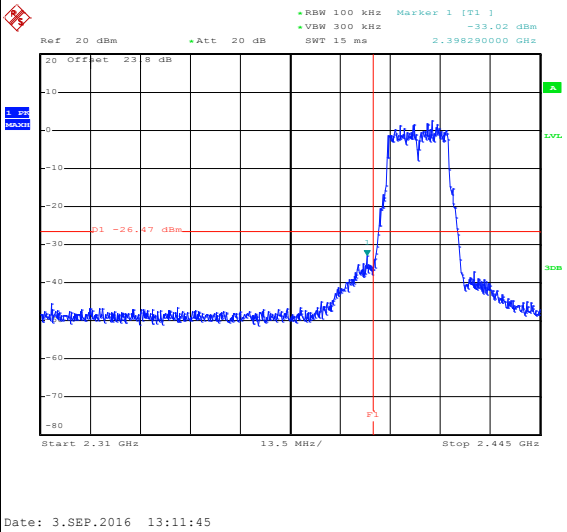
WLAN 802.11ac VHT20 Channel 01

100kHz PSD reference Level



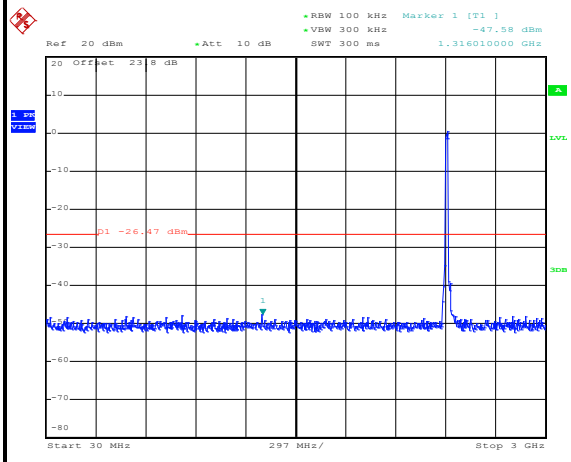
Date: 3.SEP.2016 13:10:06

Low Channel Plot



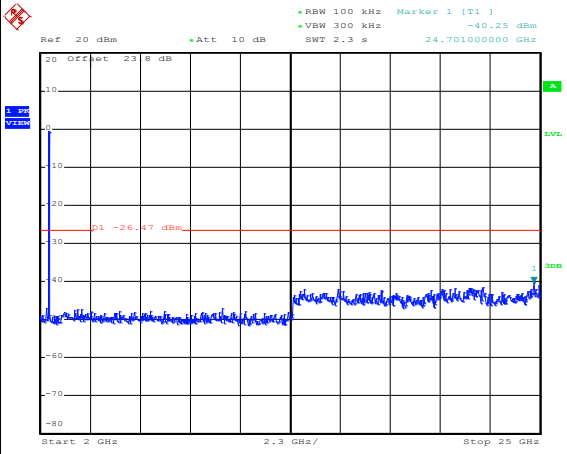
Date: 3.SEP.2016 13:11:45

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 13:12:24

Spurious Emission 2GHz~25GHz

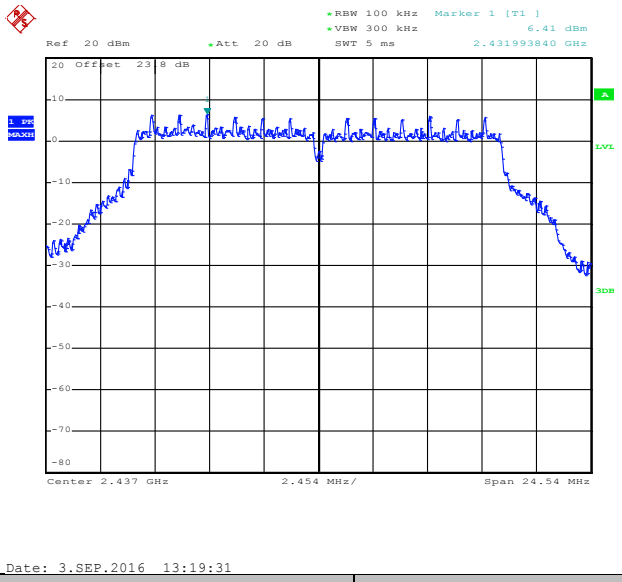


Date: 3.SEP.2016 13:12:33

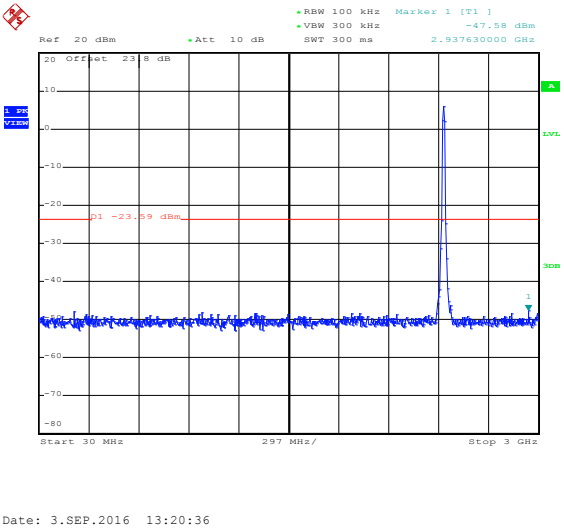
Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11ac VHT20 Channel 06

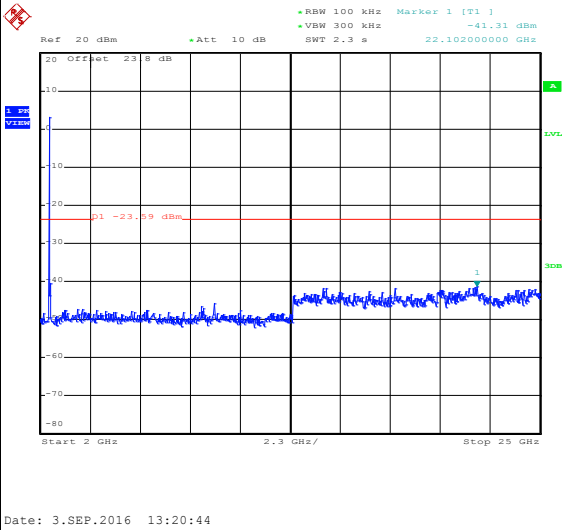
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



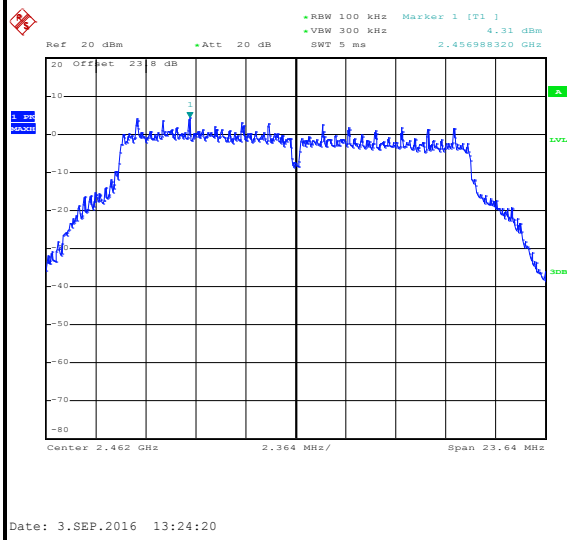
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

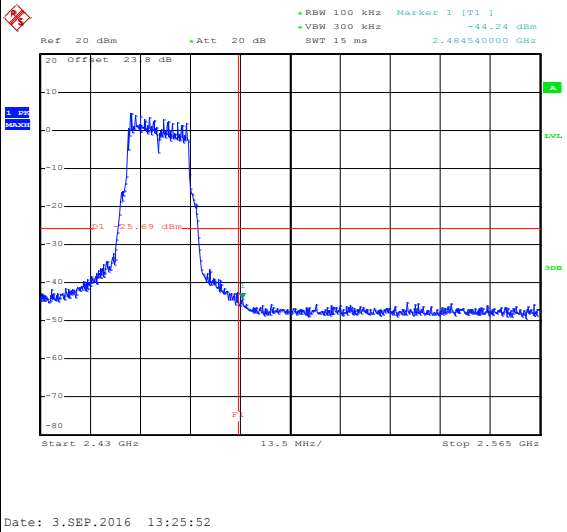
WLAN 802.11ac VHT20 Channel 11

100kHz PSD reference Level



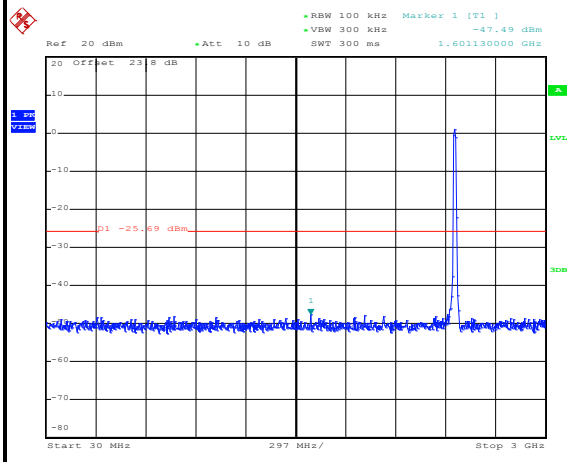
Date: 3.SEP.2016 13:24:20

High Channel Plot



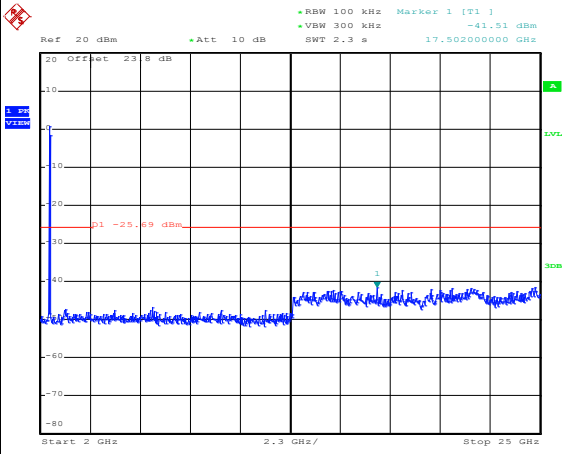
Date: 3.SEP.2016 13:25:52

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 13:26:16

Spurious Emission 2GHz~25GHz

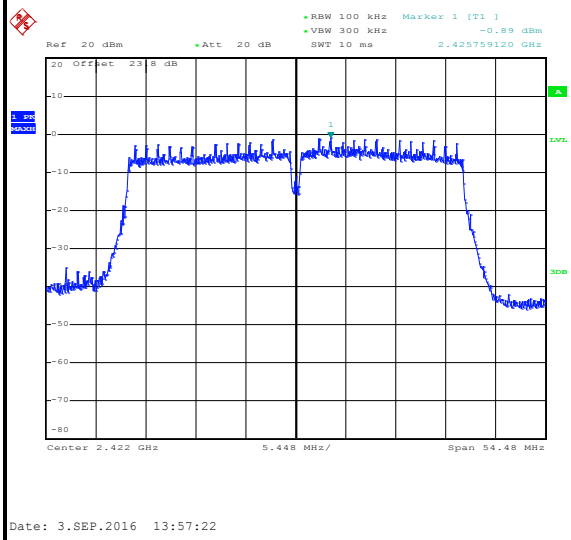


Date: 3.SEP.2016 13:26:24

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	03	**Test Engineer :**	AnAn Wu

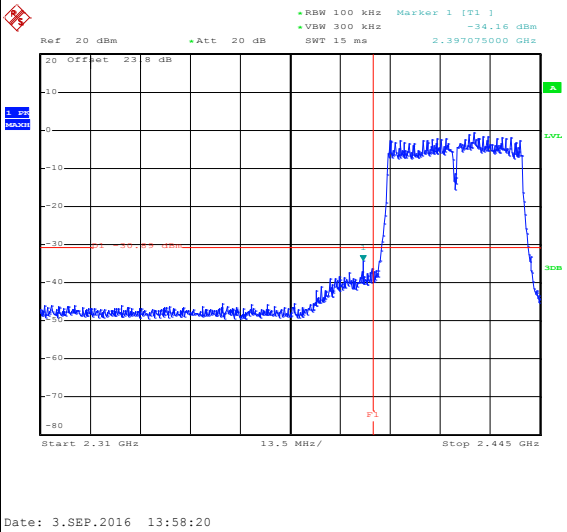
WLAN 802.11ac VHT40 Channel 03

100kHz PSD reference Level



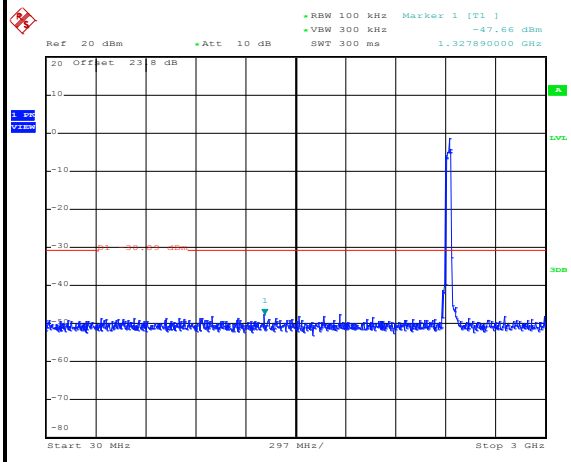
Date: 3.SEP.2016 13:57:22

Low Channel Plot



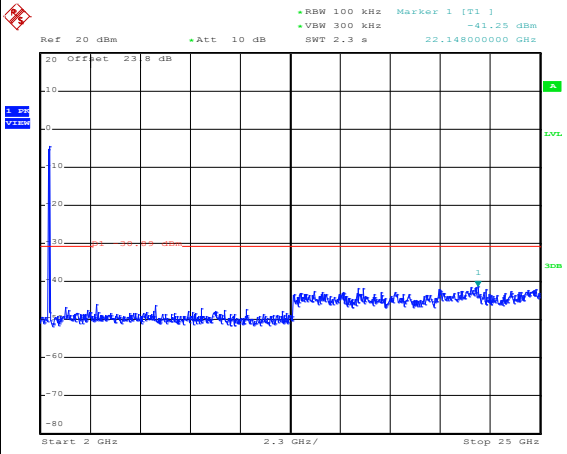
Date: 3.SEP.2016 13:58:20

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 13:58:33

Spurious Emission 2GHz~25GHz

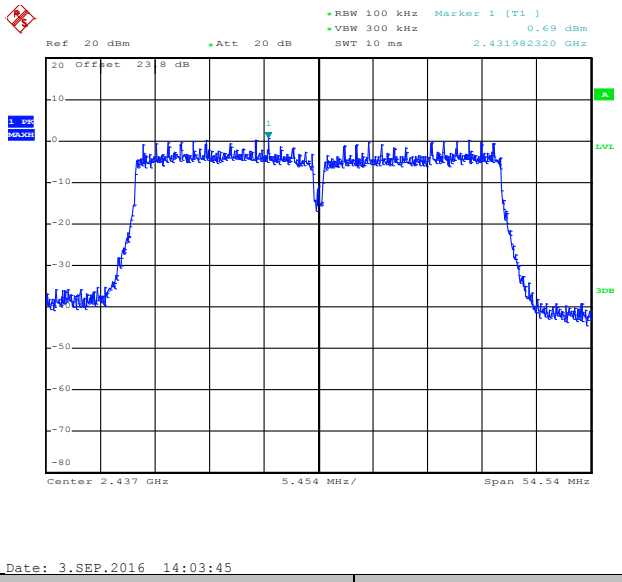


Date: 3.SEP.2016 13:58:41

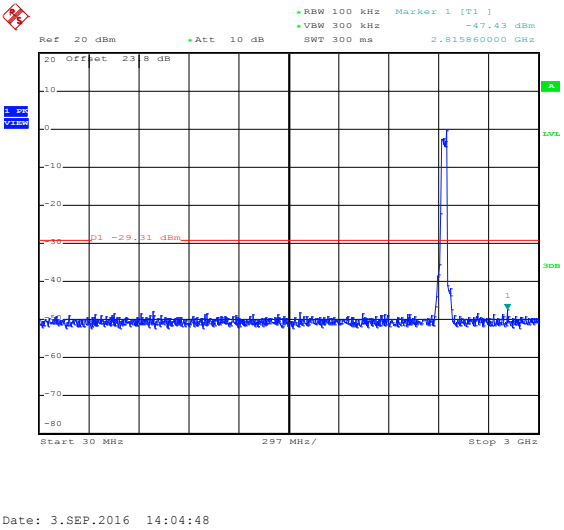
Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11ac VHT40 Channel 06

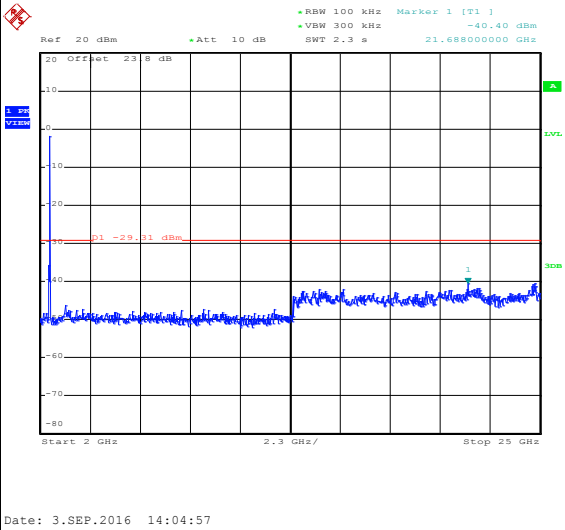
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



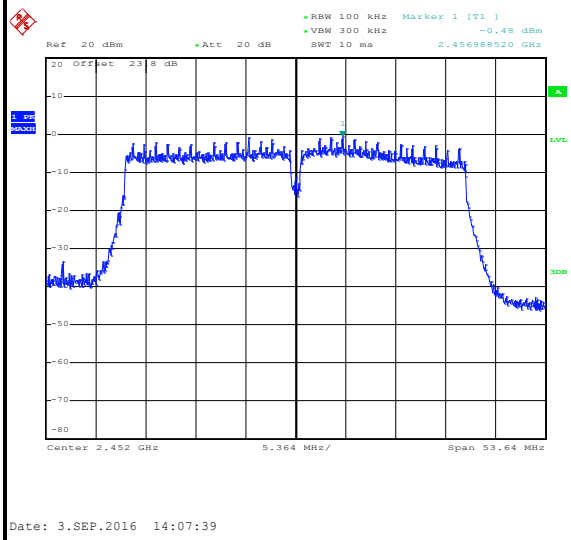
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	09	**Test Engineer :**	AnAn Wu

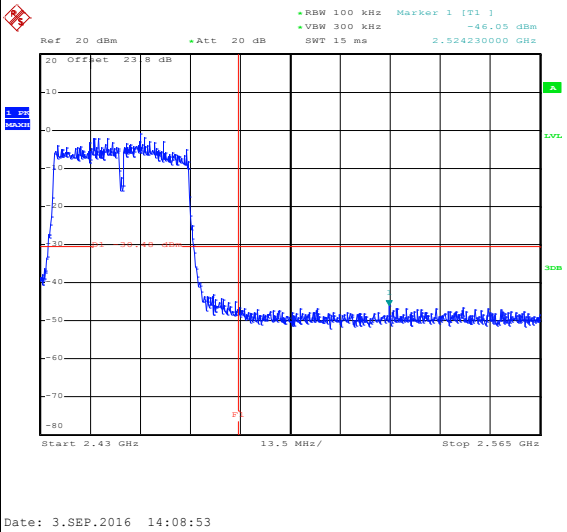
WLAN 802.11ac VHT40 Channel 09

100kHz PSD reference Level



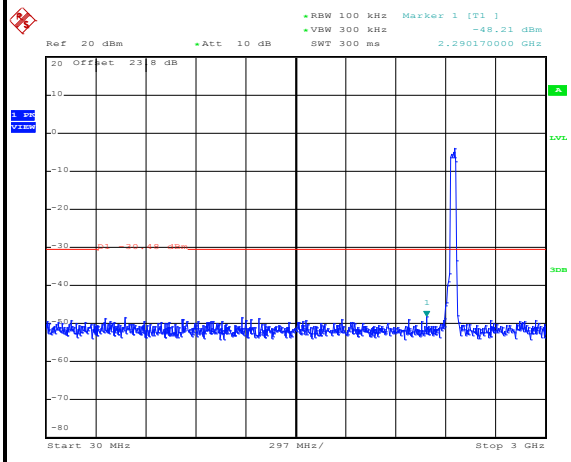
Date: 3.SEP.2016 14:07:39

High Channel Plot



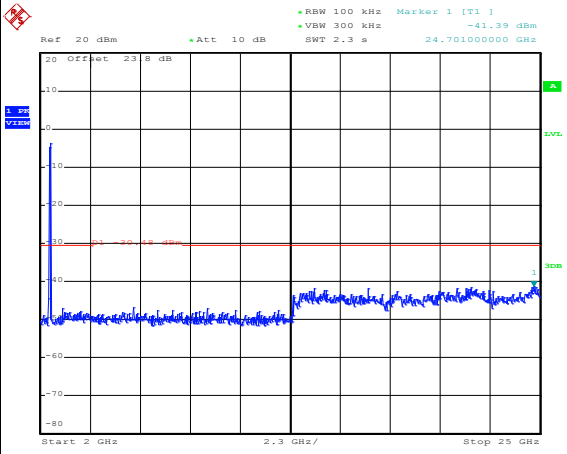
Date: 3.SEP.2016 14:08:53

Spurious Emission 30MHz~3GHz



Date: 3.SEP.2016 14:09:28

Spurious Emission 2GHz~25GHz



Date: 3.SEP.2016 14:09:36

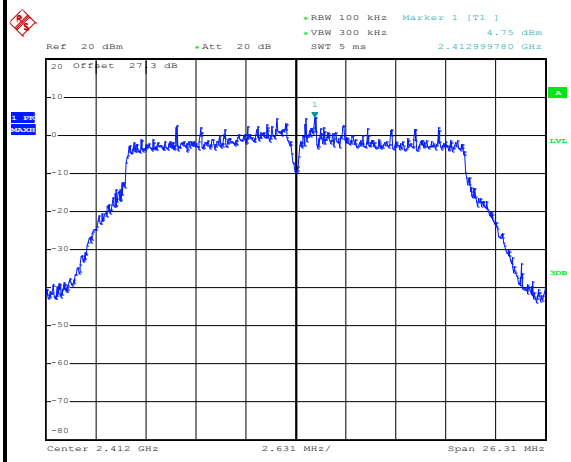
<TXBF Modes>

Number of TX = 2, Ant. 1 (Measured)

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

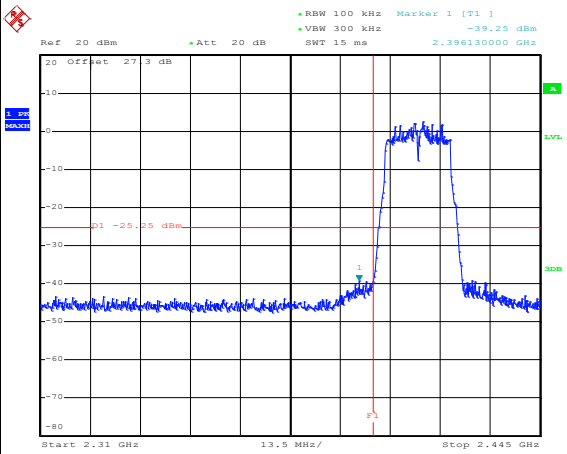
WLAN 802.11ac VHT20 Channel 01

100kHz PSD reference Level



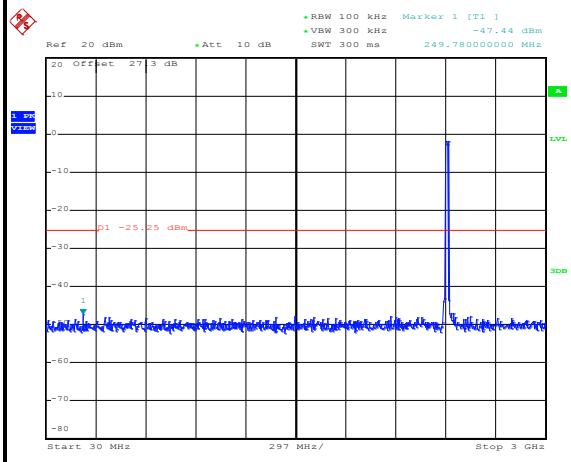
Date: 15.SEP.2016 15:10:23

Low Channel Plot



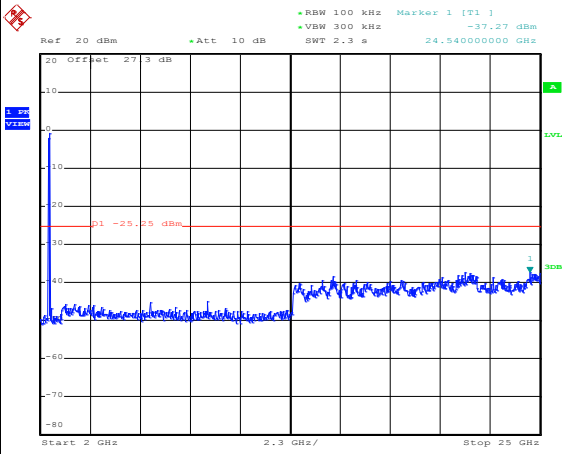
Date: 15.SEP.2016 15:12:33

Spurious Emission 30MHz~3GHz



Date: 15.SEP.2016 15:12:50

Spurious Emission 2GHz~25GHz

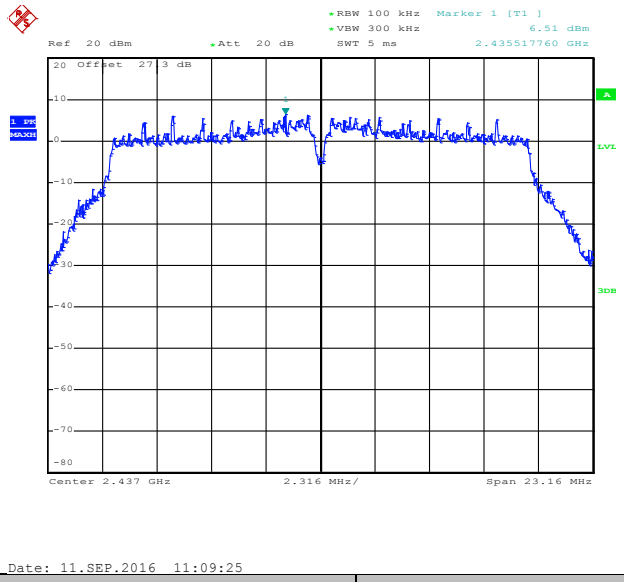


Date: 15.SEP.2016 15:12:59

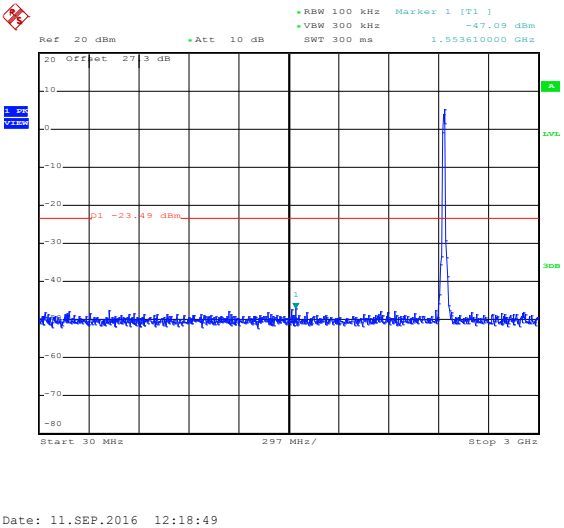
Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11ac VHT20 Channel 06

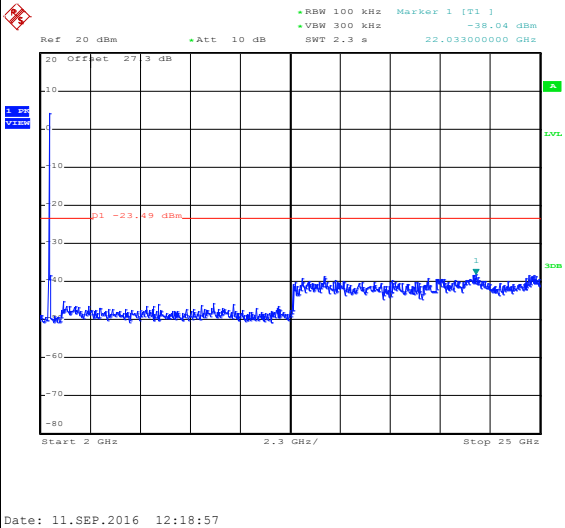
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



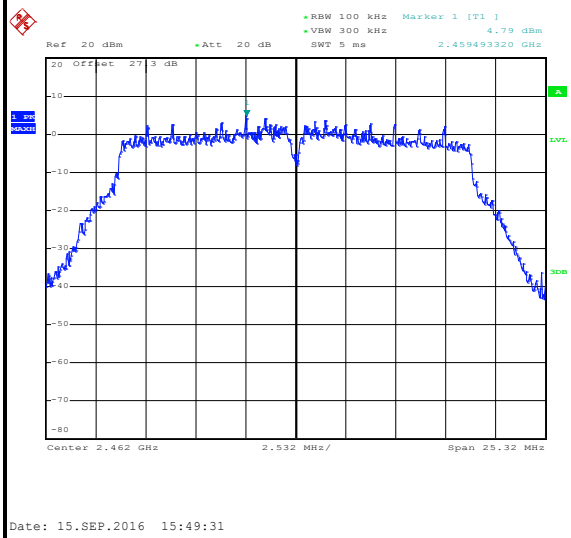
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

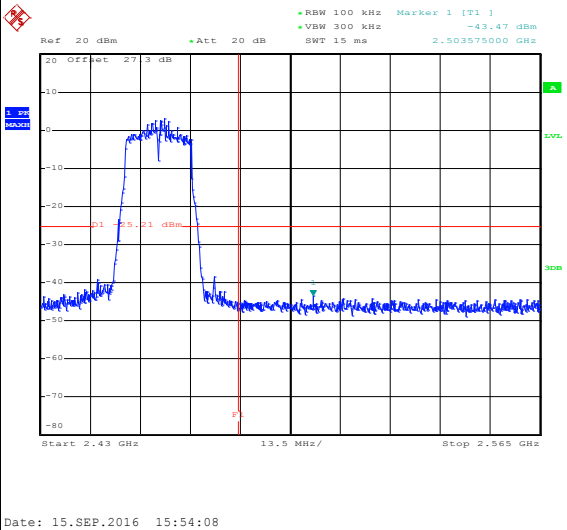
WLAN 802.11ac VHT20 Channel 11

100kHz PSD reference Level



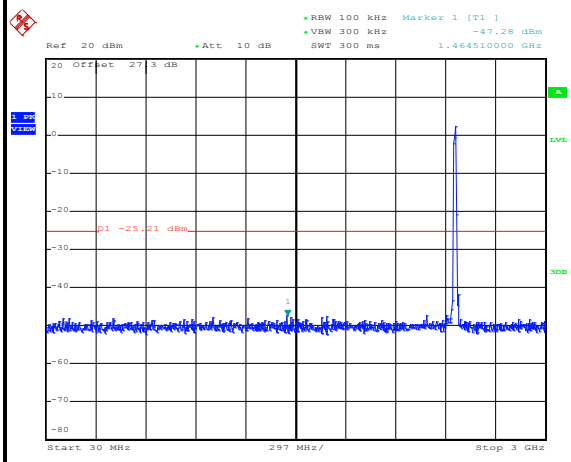
Date: 15.SEP.2016 15:49:31

High Channel Plot



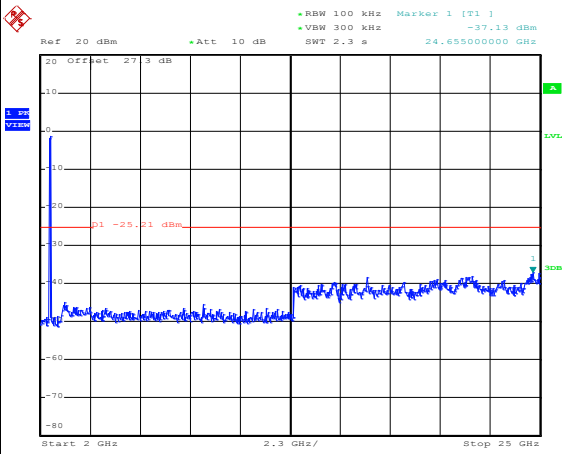
Date: 15.SEP.2016 15:54:08

Spurious Emission 30MHz~3GHz



Date: 15.SEP.2016 15:55:31

Spurious Emission 2GHz~25GHz

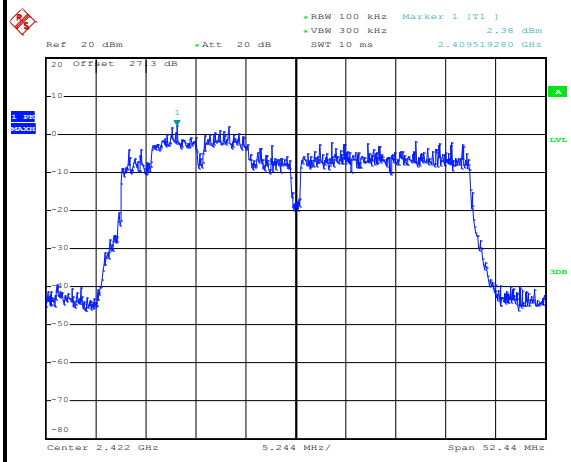


Date: 15.SEP.2016 15:55:39

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	03	**Test Engineer :**	AnAn Wu

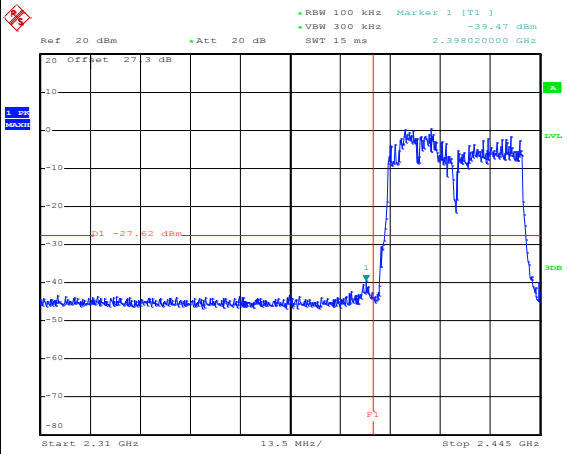
WLAN 802.11ac VHT40 Channel 03

100kHz PSD reference Level



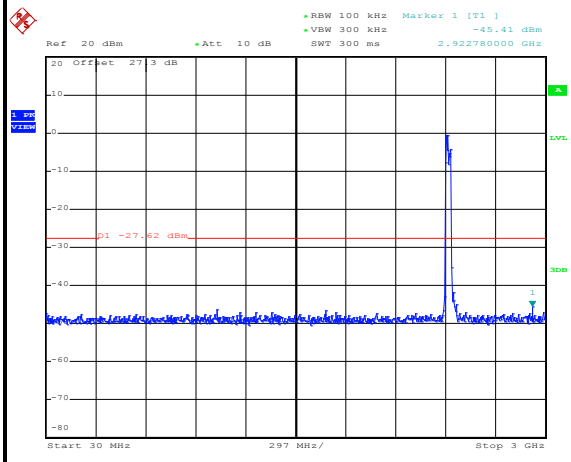
Date: 15.SEP.2016 13:28:36

Low Channel Plot



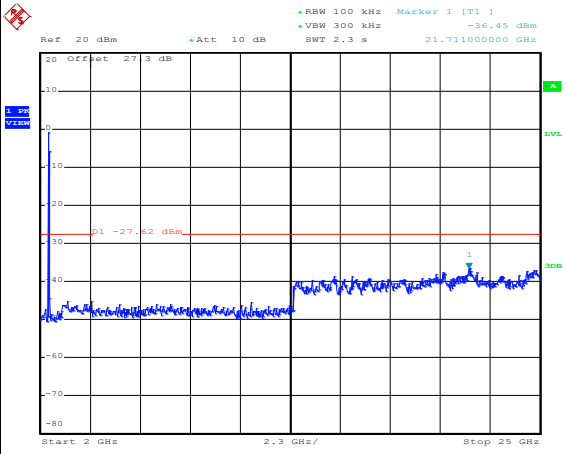
Date: 15.SEP.2016 13:29:23

Spurious Emission 30MHz~3GHz



Date: 15.SEP.2016 13:35:41

Spurious Emission 2GHz~25GHz

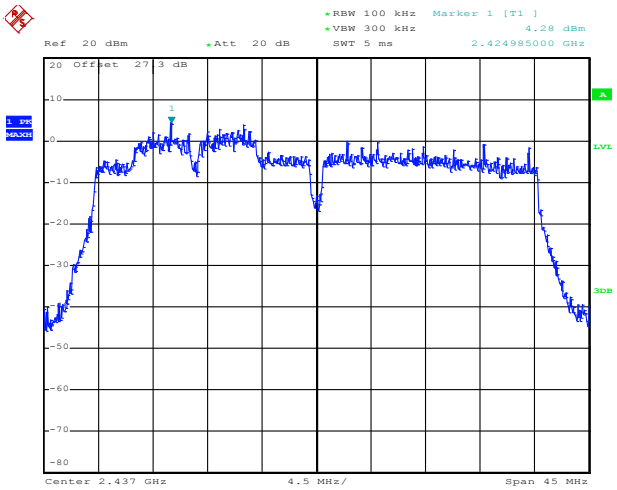


Date: 15.SEP.2016 13:36:51

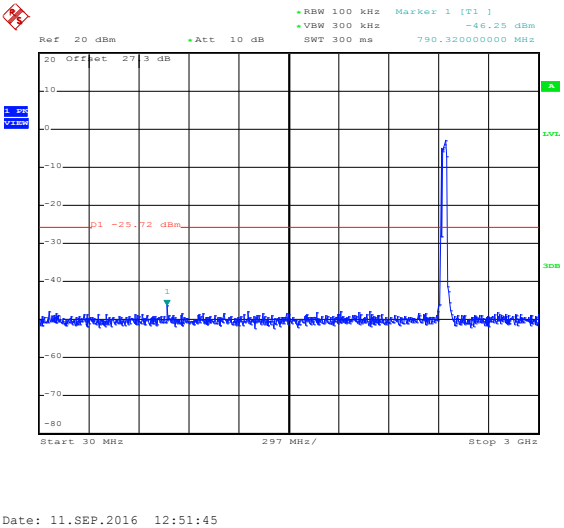
Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11ac VHT40 Channel 06

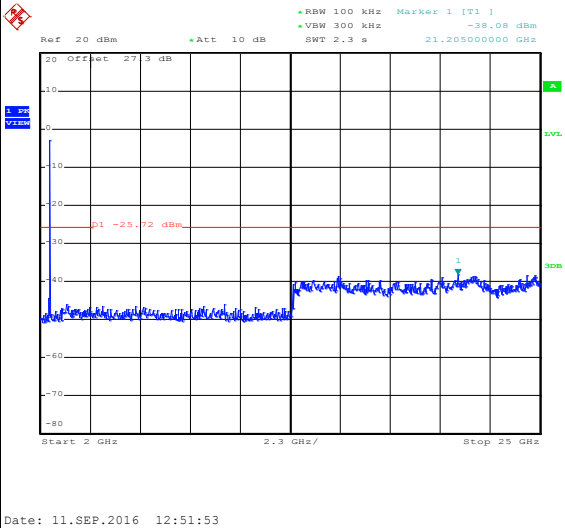
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



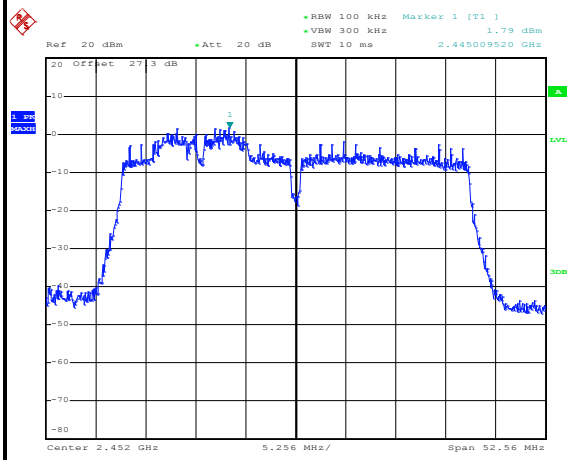
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	09	**Test Engineer :**	AnAn Wu

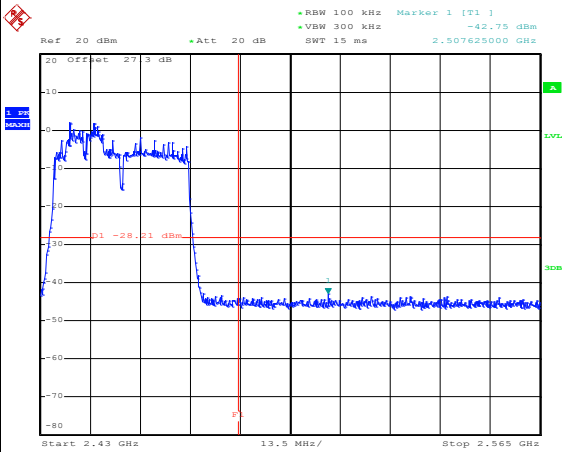
WLAN 802.11ac VHT40 Channel 09

100kHz PSD reference Level



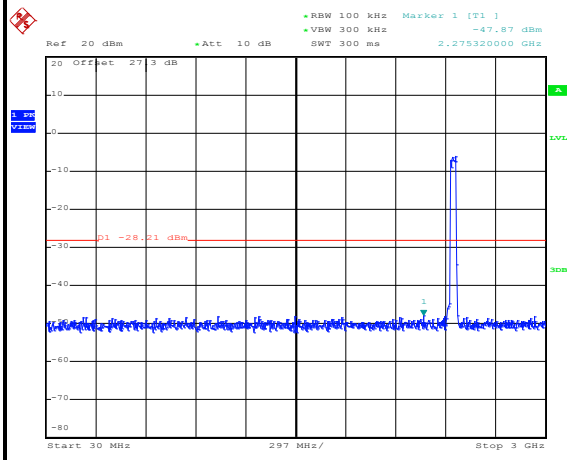
Date: 15.SEP.2016 14:29:30

High Channel Plot



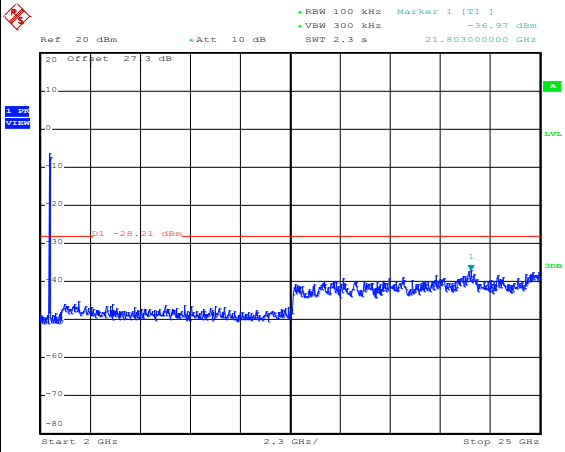
Date: 15.SEP.2016 14:30:21

Spurious Emission 30MHz~3GHz



Date: 15.SEP.2016 14:30:57

Spurious Emission 2GHz~25GHz



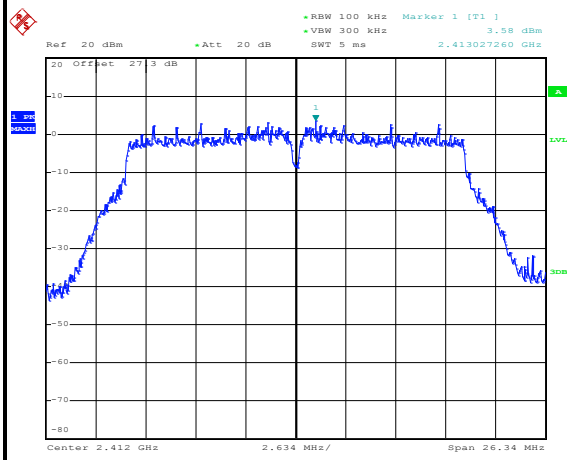
Date: 15.SEP.2016 14:31:05

Number of TX = 2, Ant. 2 (Measured)

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	AnAn Wu

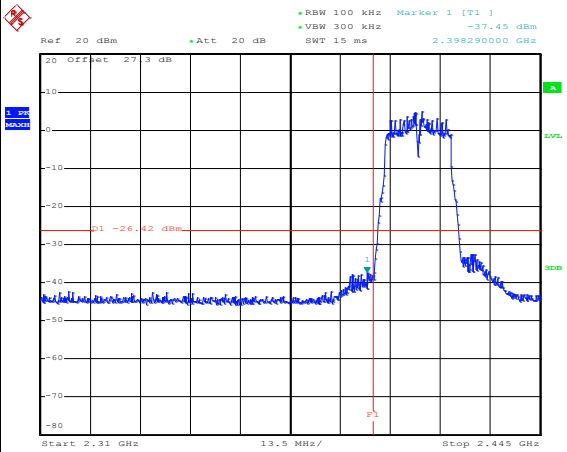
WLAN 802.11ac VHT20 Channel 01

100kHz PSD reference Level



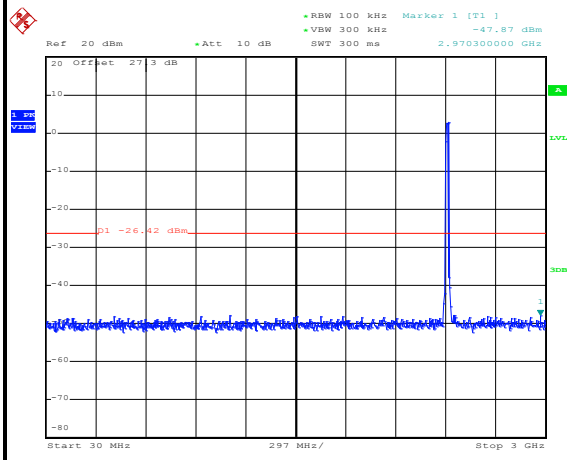
Date: 15.SEP.2016 15:17:54

Low Channel Plot



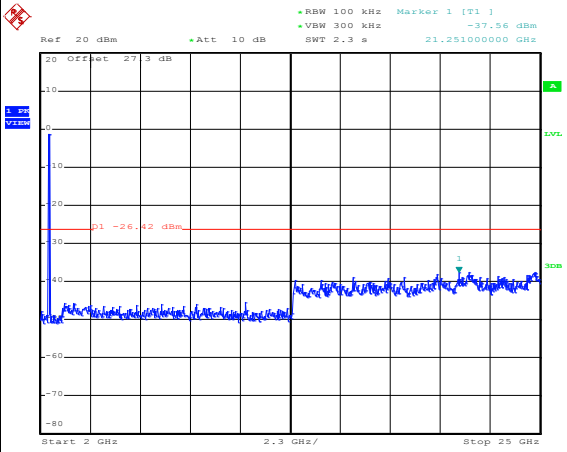
Date: 15.SEP.2016 15:20:34

Spurious Emission 30MHz~3GHz



Date: 15.SEP.2016 15:20:48

Spurious Emission 2GHz~25GHz

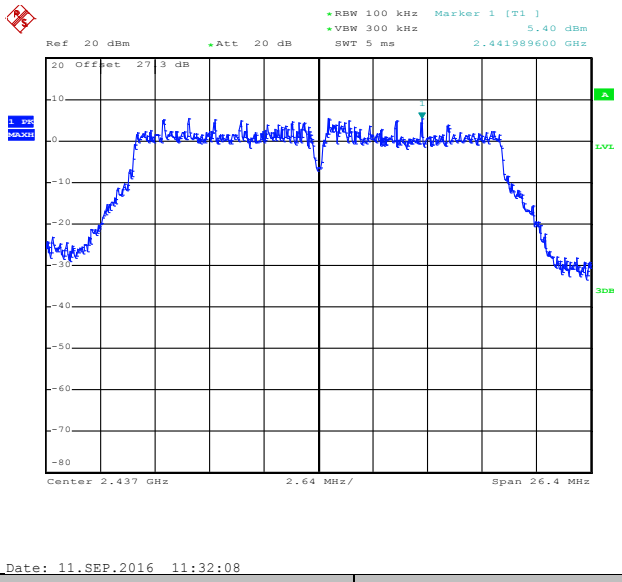


Date: 15.SEP.2016 15:20:56

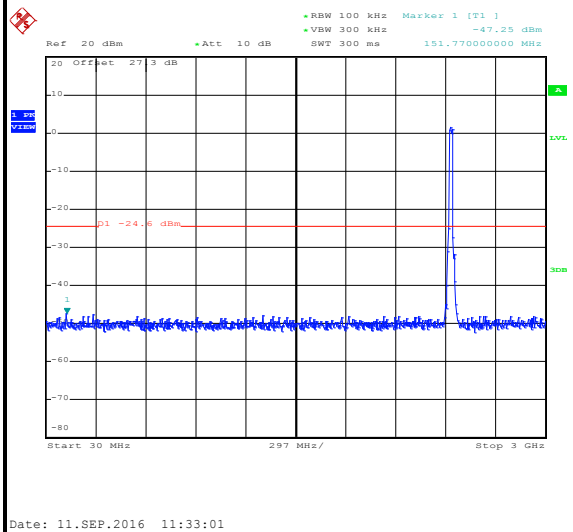
Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	AnAn Wu

WLAN 802.11ac VHT20 Channel 06

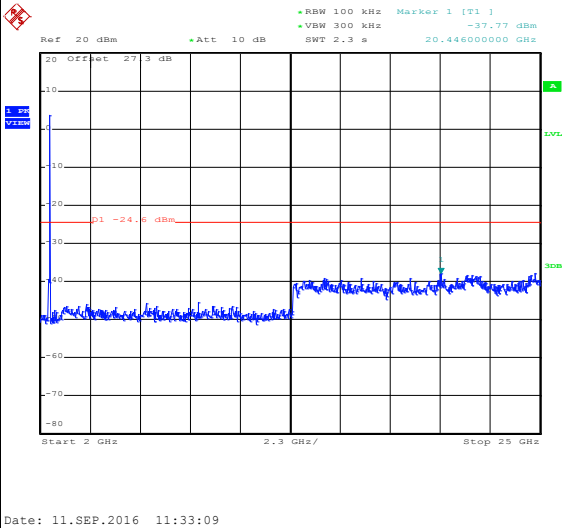
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



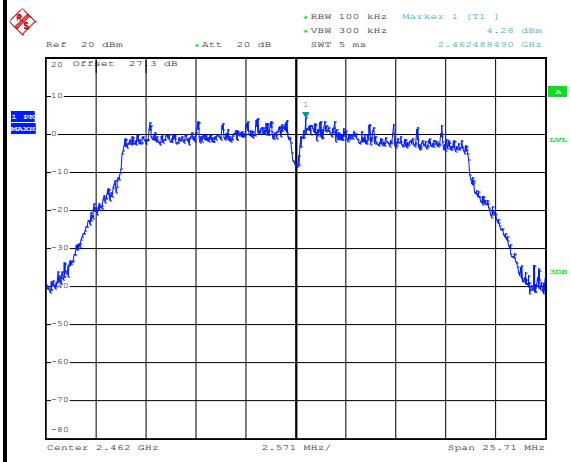
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	AnAn Wu

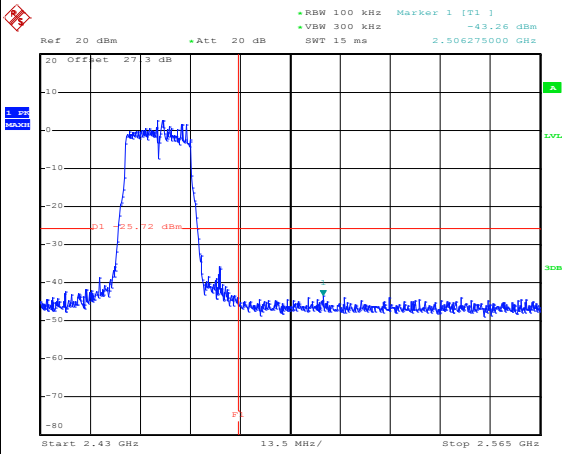
WLAN 802.11ac VHT20 Channel 11

100kHz PSD reference Level



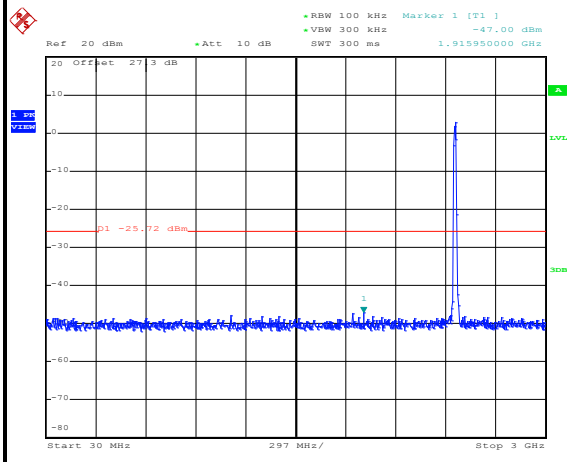
Date: 15.SEP.2016 15:58:07

High Channel Plot



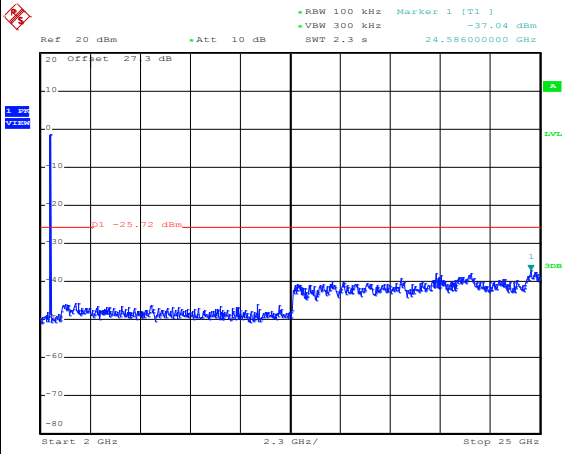
Date: 15.SEP.2016 15:58:23

Spurious Emission 30MHz~3GHz



Date: 15.SEP.2016 15:58:35

Spurious Emission 2GHz~25GHz

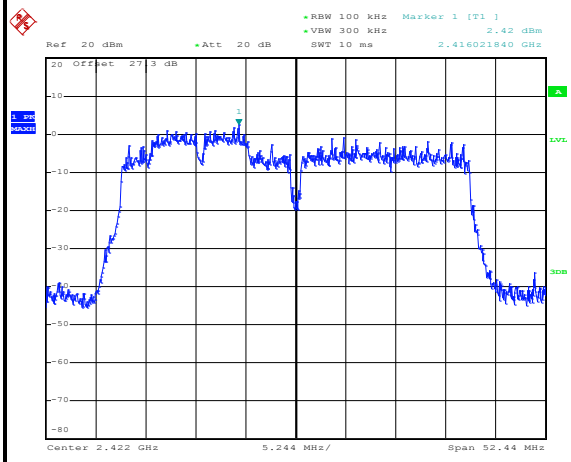


Date: 15.SEP.2016 15:58:44

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	03	**Test Engineer :**	AnAn Wu

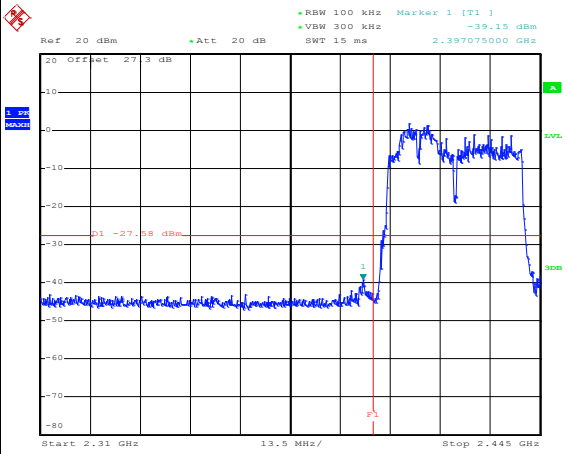
WLAN 802.11ac VHT40 Channel 03

100kHz PSD reference Level



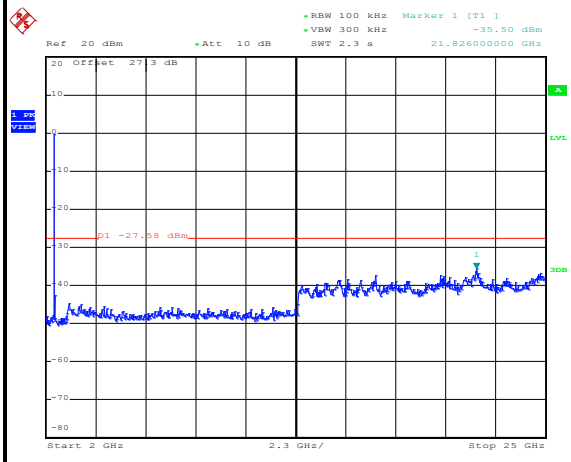
Date: 15.SEP.2016 13:48:18

Low Channel Plot



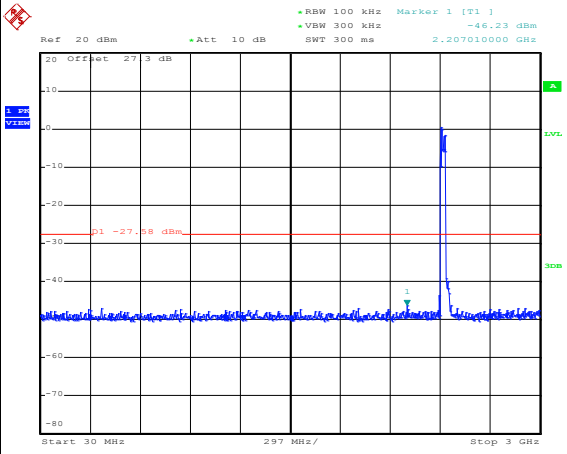
Date: 15.SEP.2016 13:48:56

Spurious Emission 30MHz~3GHz



Date: 15.SEP.2016 13:51:41

Spurious Emission 2GHz~25GHz

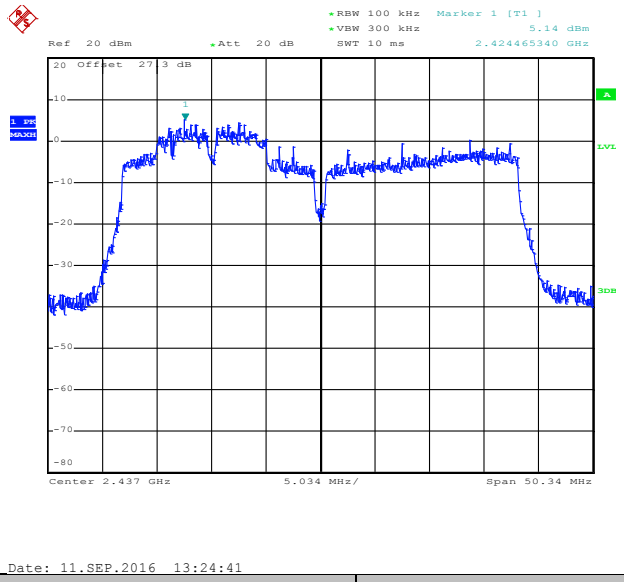


Date: 15.SEP.2016 13:53:58

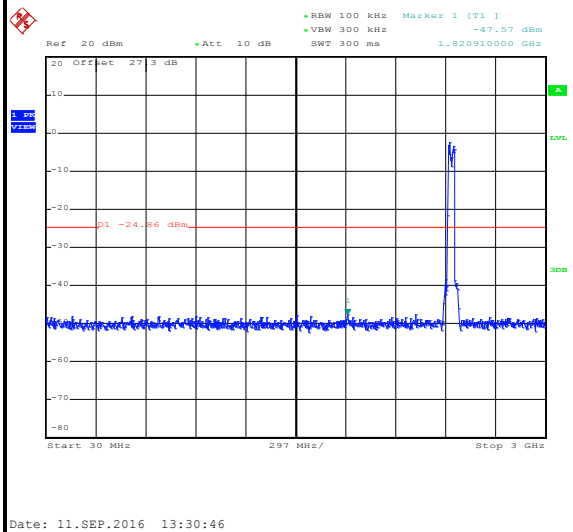
Number of TX :	2	Ant. :	2
Test Mode :	802.11ac VHT40	Temperature :	21~25℃
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	AnAn Wu

WLAN 802.11ac VHT40 Channel 06

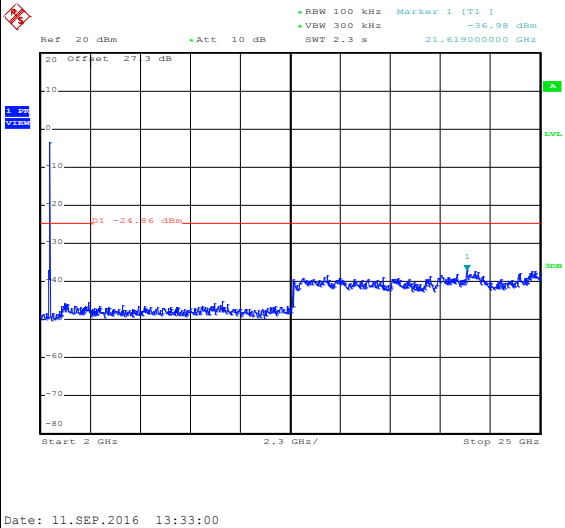
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



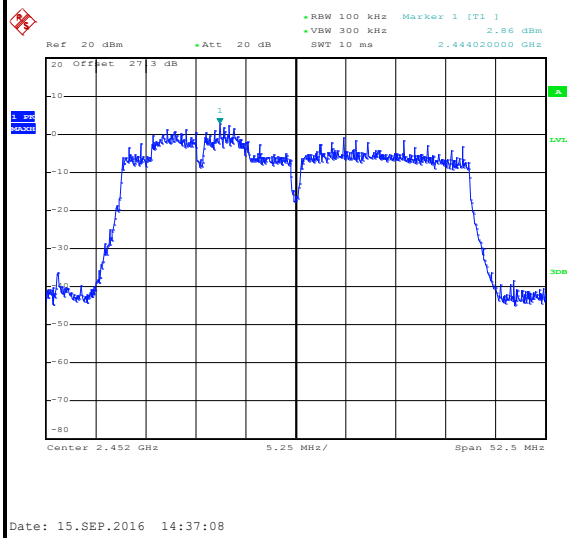
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	09	**Test Engineer :**	AnAn Wu

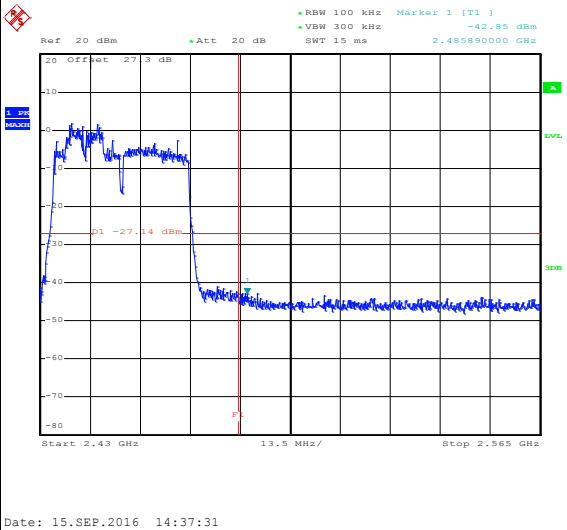
WLAN 802.11ac VHT40 Channel 09

100kHz PSD reference Level



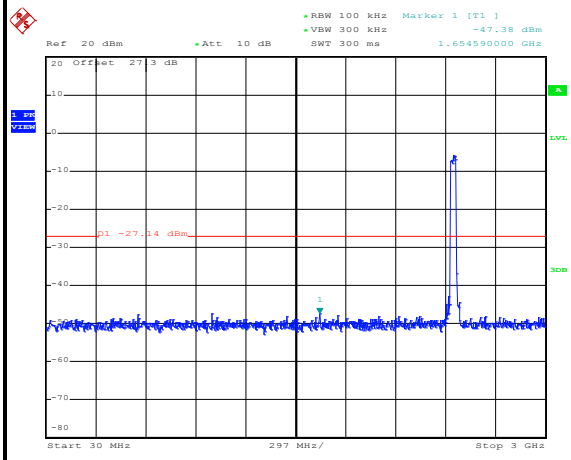
Date: 15.SEP.2016 14:37:08

High Channel Plot



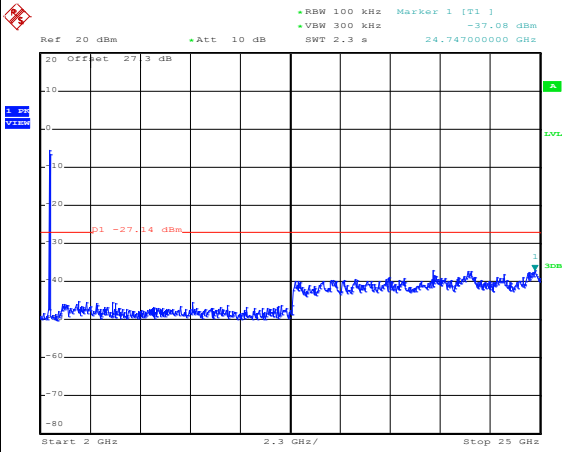
Date: 15.SEP.2016 14:37:31

Spurious Emission 30MHz~3GHz



Date: 15.SEP.2016 14:38:07

Spurious Emission 2GHz~25GHz



Date: 15.SEP.2016 14:39:37

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 FCC section 15.209 limits as below.

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

3.5.2 Measuring Instruments

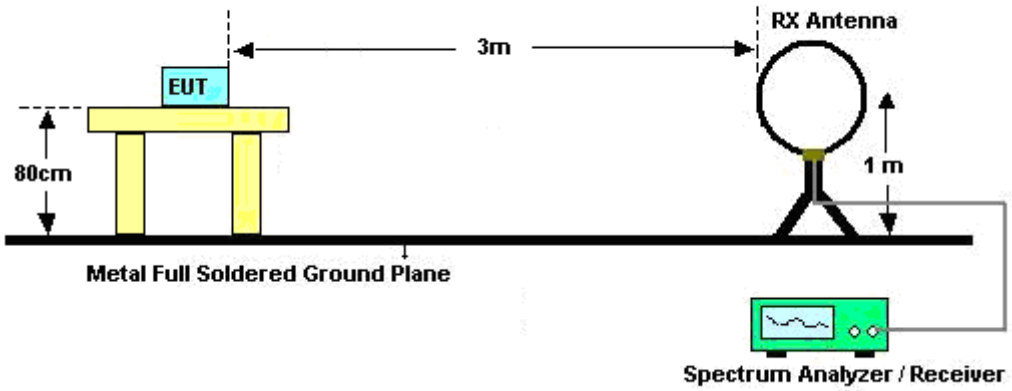
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

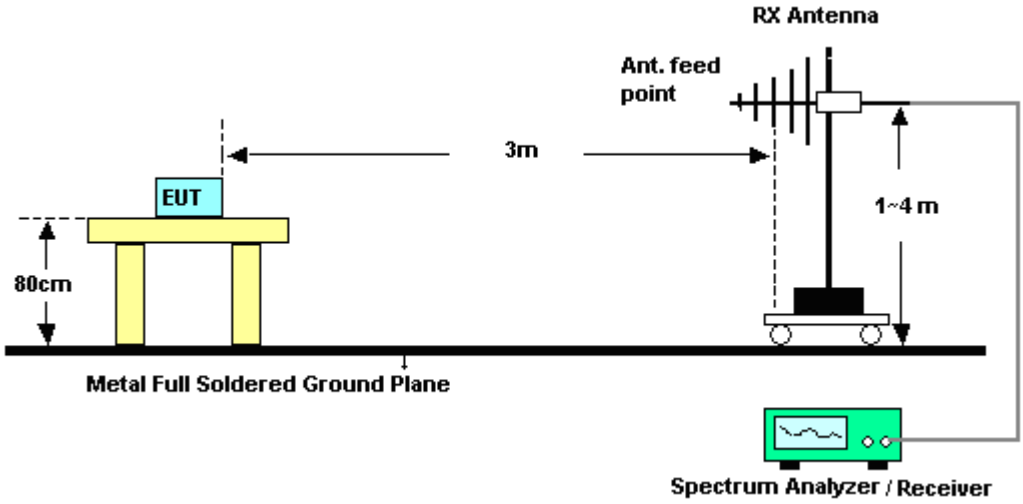
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the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

3.5.4 Test Setup

For radiated emissions below 30MHz

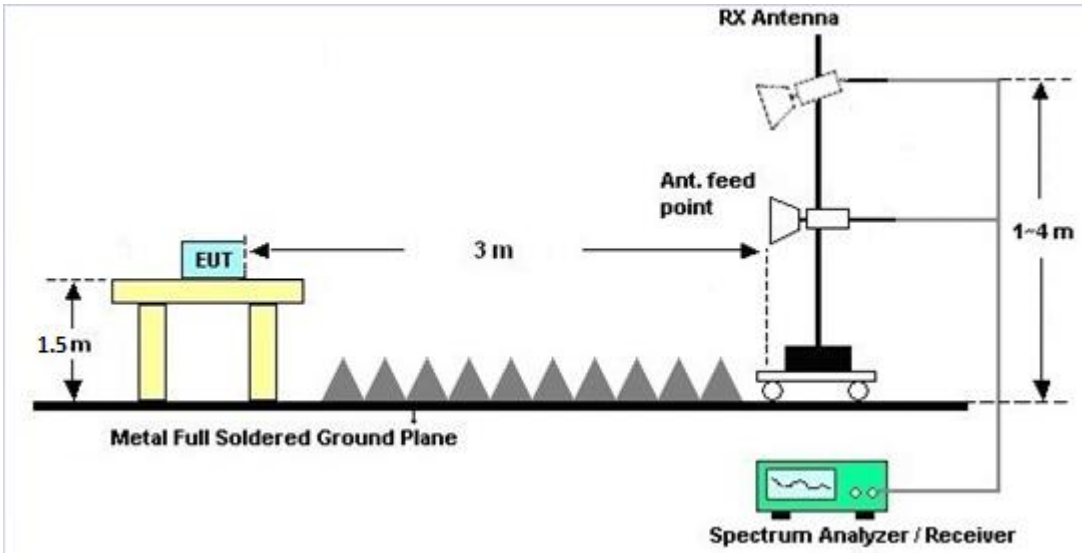


For radiated emissions from 30MHz to 1GHz

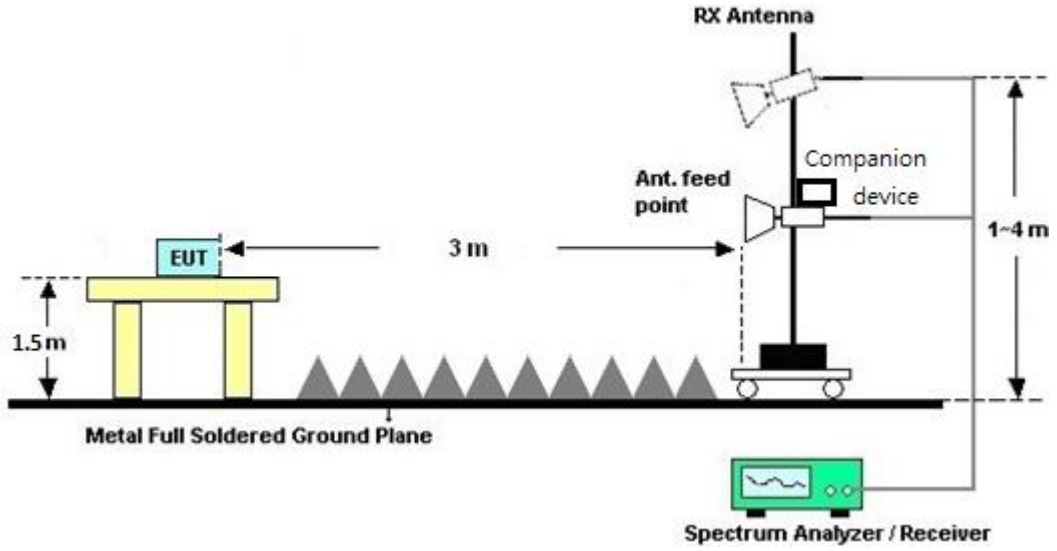


For radiated emissions above 1GHz

<CDD Modes>



<TXBF Modes>



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 and C.

3.5.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix B and C.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

For terminal test result, the testing follows FCC KDB 174176.

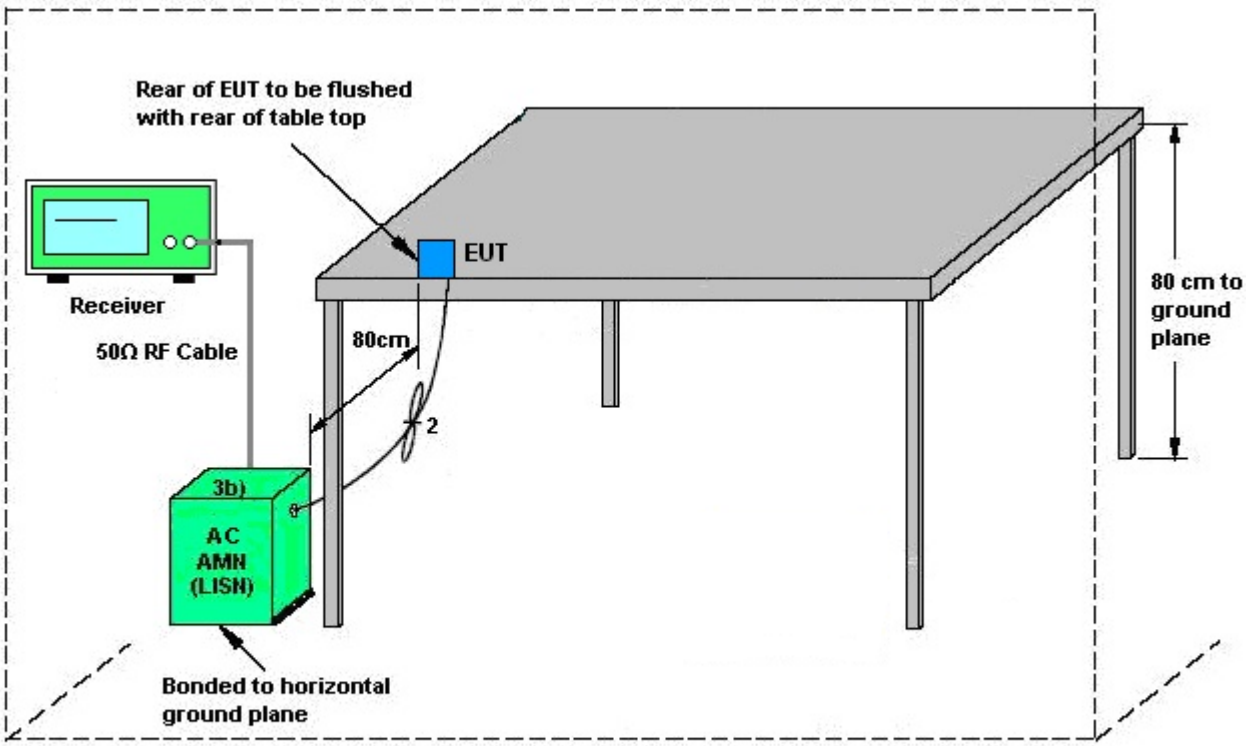
3.6.2 Measuring Instruments

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

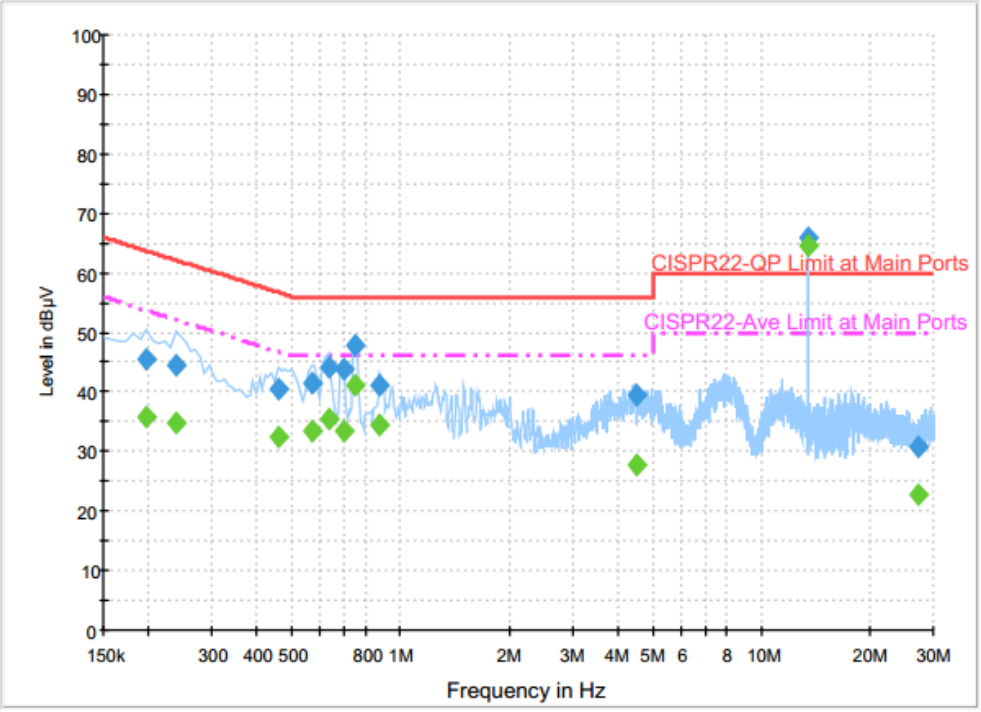


AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

<Original test result with NFC antenna>

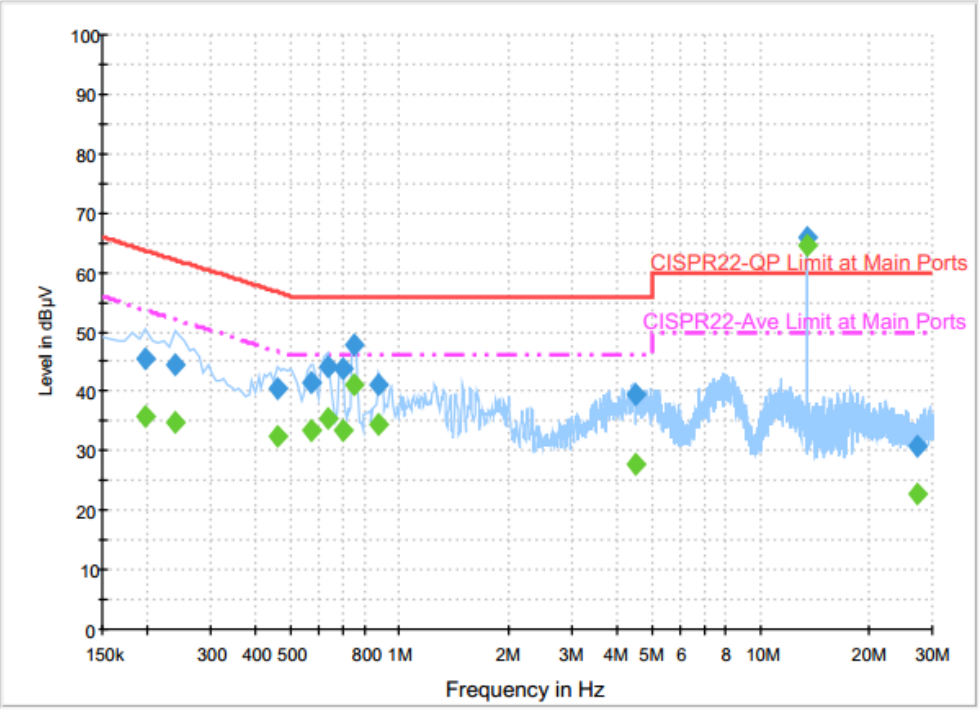
Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Arthur Hsieh	**Relative Humidity :**	51~53%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	NFC Link + WLAN (2.4GHz) Link + Bluetooth Link + Earphone 1 with Audio Adapter connect to EUT + Charging Only Cable + AC Adapter		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	45.5	Off	L1	19.6	18.2	63.7
0.238000	44.4	Off	L1	19.6	17.8	62.2
0.462000	40.5	Off	L1	19.6	16.2	56.7
0.566000	41.4	Off	L1	19.6	14.6	56.0
0.630000	44.1	Off	L1	19.6	11.9	56.0
0.694000	43.8	Off	L1	19.6	12.2	56.0
0.750000	48.0	Off	L1	19.6	8.0	56.0
0.878000	41.2	Off	L1	19.6	14.8	56.0
4.534000	39.3	Off	L1	19.7	16.7	56.0
13.558000	65.9	Off	L1	19.8	-5.9	60.0
27.118000	30.9	Off	L1	19.9	29.1	60.0

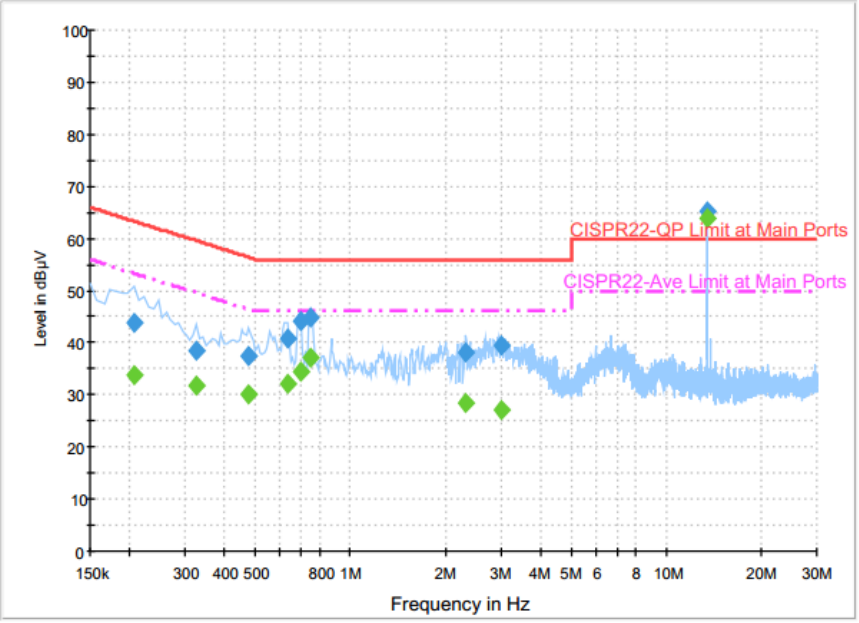
Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Arthur Hsieh	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	NFC Link + WLAN (2.4GHz) Link + Bluetooth Link + Earphone 1 with Audio Adapter connect to EUT + Charging Only Cable + AC Adapter		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	35.7	Off	L1	19.6	18.0	53.7
0.238000	34.7	Off	L1	19.6	17.5	52.2
0.462000	32.3	Off	L1	19.6	14.4	46.7
0.566000	33.4	Off	L1	19.6	12.6	46.0
0.630000	35.3	Off	L1	19.6	10.7	46.0
0.694000	33.6	Off	L1	19.6	12.4	46.0
0.750000	41.1	Off	L1	19.6	4.9	46.0
0.878000	34.4	Off	L1	19.6	11.6	46.0
4.534000	27.8	Off	L1	19.7	18.2	46.0
13.558000	64.6	Off	L1	19.8	-14.6	50.0
27.118000	22.6	Off	L1	19.9	27.4	50.0

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Arthur Hsieh	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	NFC Link + WLAN (2.4GHz) Link + Bluetooth Link + Earphone 1 with Audio Adapter connect to EUT + Charging Only Cable + AC Adapter		



Final Result : Quasi-Peak

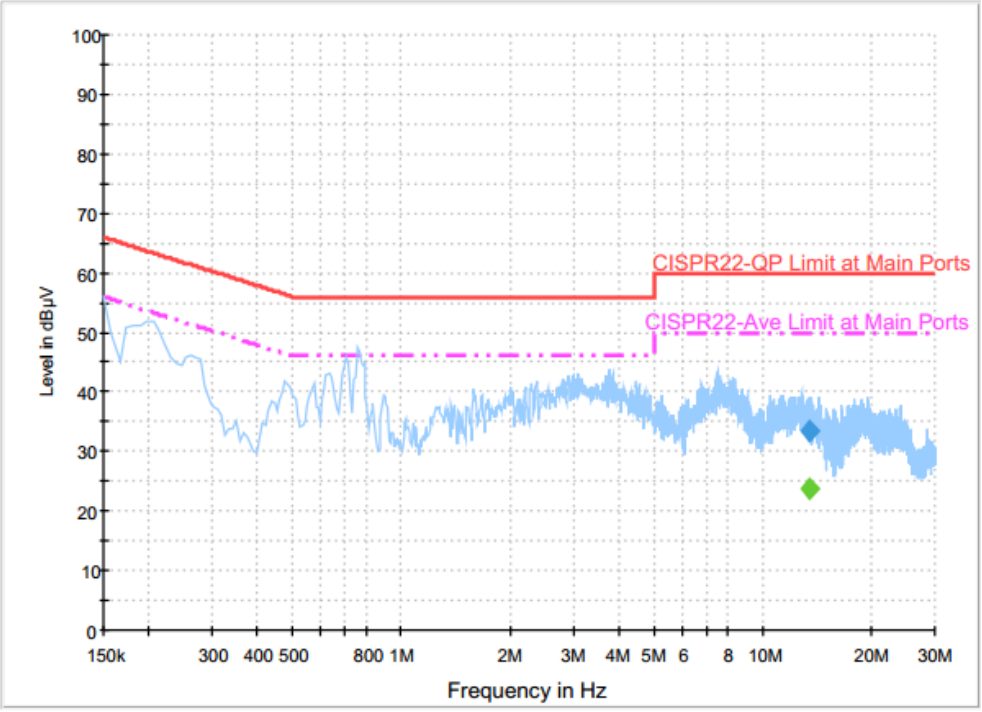
Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.206000	44.0	Off	N	19.6	19.4	63.4
0.326000	38.6	Off	N	19.6	21.0	59.6
0.478000	37.6	Off	N	19.6	18.8	56.4
0.630000	40.9	Off	N	19.6	15.1	56.0
0.694000	44.2	Off	N	19.6	11.8	56.0
0.750000	44.7	Off	N	19.6	11.3	56.0
2.326000	38.1	Off	N	18.6	17.9	56.0
3.022000	39.3	Off	N	19.5	16.7	56.0
13.558000	65.3	Off	N	19.8	-5.3	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.206000	33.9	Off	N	19.6	19.5	53.4
0.326000	31.8	Off	N	19.6	17.8	49.6
0.478000	30.1	Off	N	19.6	16.3	46.4
0.630000	31.9	Off	N	19.6	14.1	46.0
0.694000	34.5	Off	N	19.6	11.5	46.0
0.750000	37.1	Off	N	19.6	8.9	46.0
2.326000	28.4	Off	N	18.6	17.6	46.0
3.022000	27.2	Off	N	19.5	18.8	46.0
13.558000	63.8	Off	N	19.8	-13.8	50.0

<Terminal test result with dummy load>

Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Arthur Hsieh	**Relative Humidity :**	51~53%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	NFC Link + WLAN (2.4GHz) Link + Bluetooth Link + Earphone 1 with Audio Adapter connect to EUT + Charging Only Cable + AC Adapter		



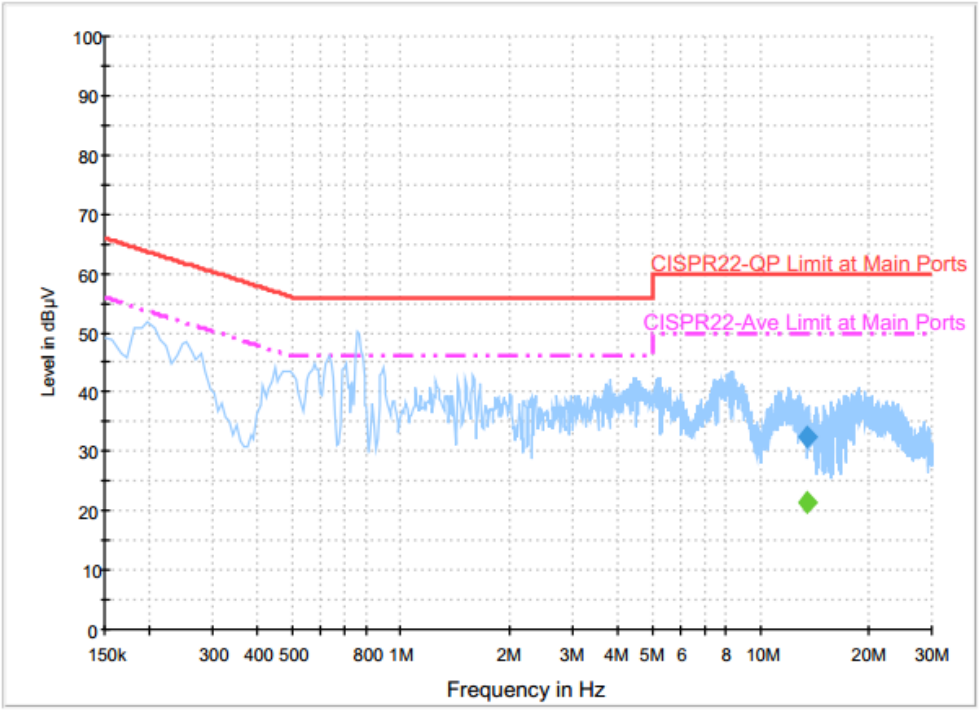
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
13.558000	33.5	Off	L1	19.8	26.5	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
13.558000	23.6	Off	L1	19.8	26.4	50.0

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Arthur Hsieh	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	NFC Link + WLAN (2.4GHz) Link + Bluetooth Link + Earphone 1 with Audio Adapter connect to EUT + Charging Only Cable + AC Adapter		



Final Result : Quasi-Peak

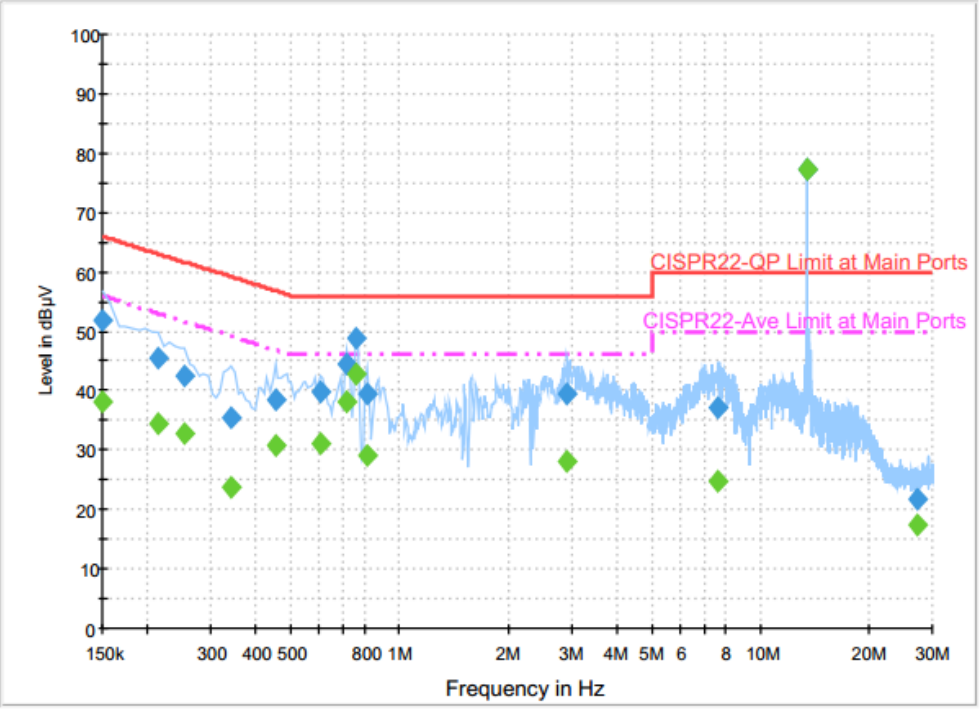
Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
13.558000	32.3	Off	N	19.8	27.7	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
13.558000	21.5	Off	N	19.8	28.5	50.0

<Original test result with NFC antenna>

Test Mode :	Mode 2	**Temperature :**	22~24℃
Test Engineer :	Arthur Hsieh	**Relative Humidity :**	51~53%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	NFC Link + WLAN (5GHz) Link + Bluetooth Link with Earphone 3 + Snap on USB Cable Data Link with Notebook + Copy Data from Notebook to EDA (SD Card) + AC Adapter		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	51.9	Off	L1	19.6	14.1	66.0
0.214000	45.6	Off	L1	19.6	17.4	63.0
0.254000	42.6	Off	L1	19.6	19.0	61.6
0.342000	35.4	Off	L1	19.6	23.8	59.2
0.454000	38.5	Off	L1	19.6	18.3	56.8
0.606000	39.8	Off	L1	19.6	16.2	56.0
0.710000	44.4	Off	L1	19.6	11.6	56.0
0.758000	48.8	Off	L1	19.6	7.2	56.0
0.814000	39.6	Off	L1	19.6	16.4	56.0
2.918000	39.6	Off	L1	19.5	16.4	56.0
7.654000	37.2	Off	L1	19.7	22.8	60.0
13.558000	77.4	Off	L1	19.8	-17.4	60.0
27.118000	21.9	Off	L1	19.9	38.1	60.0