FCC RF Test Report

APPLICANT	:	Circuit Board Design LLC
EQUIPMENT	:	Tablet
MODEL NAME	:	L5S83A
FCC ID	:	2ANXB-5276
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product testing was completed on Mar. 13, 2018. We, Sporton International (Shenzhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Shenzhen) Inc., the test report shall not be reproduced except in full.

Eric Shih

TESTING
NVLAP LAB CODE 600156-0

Approved by: Eric Shih / Manager

Sporton International (Shenzhen) Inc.
1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City Guangdong Province 518055 China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR7O2504-01C	Rev. 01	Initial issue of report	Apr. 03, 2018

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result
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	≤ 20dBc	Pass
		Conducted Spurious Emission		Pass
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass
3.6	15.207	AC Conducted Emission	15.207(a)	Pass
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass

1 General Description

1.1 Applicant

Circuit Board Design LLC
4320 Winfield Road Cornerstone @ Cantera Suite 200 Warrenville, Illinois, 60555

1.2 Product Feature of Equipment Under Test

Product Feature	
Equipment	Tablet
Model Name	L5S83A
FCC ID	2ANXB-5276
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 Bluetooth v3.0+EDR/Bluetooth v4.0 LE Bluetooth v4.1 LE/ Bluetooth v4.2 LE
SW Version	userdebug 6.0 NMAIN1 530

			SN
Radiated Emission	Sample	B#4	G0W0U0027516F07V
	Adapter	AP16#2	AH17320956836
Conducted Emission	Sample	B#1	G0W0U0027516F057
	Adapter	AP16#1	AH17320956997
Conducted	Sample	B#4	G0W0U0027516F07V

1.3 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2472 MHz
Maximum (Peak) Output Power to antenna	802.11b : 17.18 dBm (0.0522 W) 802.11g : 22.84 dBm (0.1923 W) 802.11n HT20 : 22.84 dBm (0.1923 W)
99% Occupied Bandwidth	802.11b : 12.39MHz 802.11g : 18.23MHz 802.11n HT20 : 18.33MHz
Antenna Type / Gain	fixed internal Antenna with gain -0.1 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.4 Modification of EUT

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

1.5 Testing Location

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0) and the FCC designation No. are CN5018 and CN5019.

Test Site	Sporton International (Shenzhen) Inc.		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City Guangdong Province 518055 China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595		
Test Site No.	**Sporton Site No.**		**FCC Test Firm Registration No.**
	TH01-SZ	CO01-SZ	251365

Test Site	Sporton International (Shenzhen) Inc.	
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan District Shenzhen City Guangdong Province 518055 China TEL: +86-755-3320-2398	
Test Site No.	**Sporton Site No.**	**FCC Test Firm Registration No.**
	03CH04-SZ	577730

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

1.6 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

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

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	8	2447
	2	2417	9	2452
	3	2422	10	2457
	4	2427	11	2462
	5	2432	12	2467
	6	2437	13	2472
	7	2442		

2.2 Test Mode

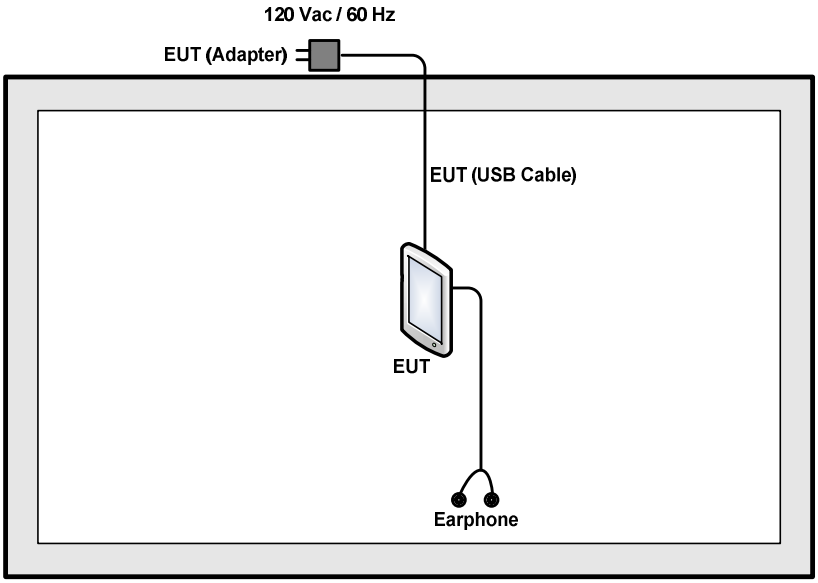
Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

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

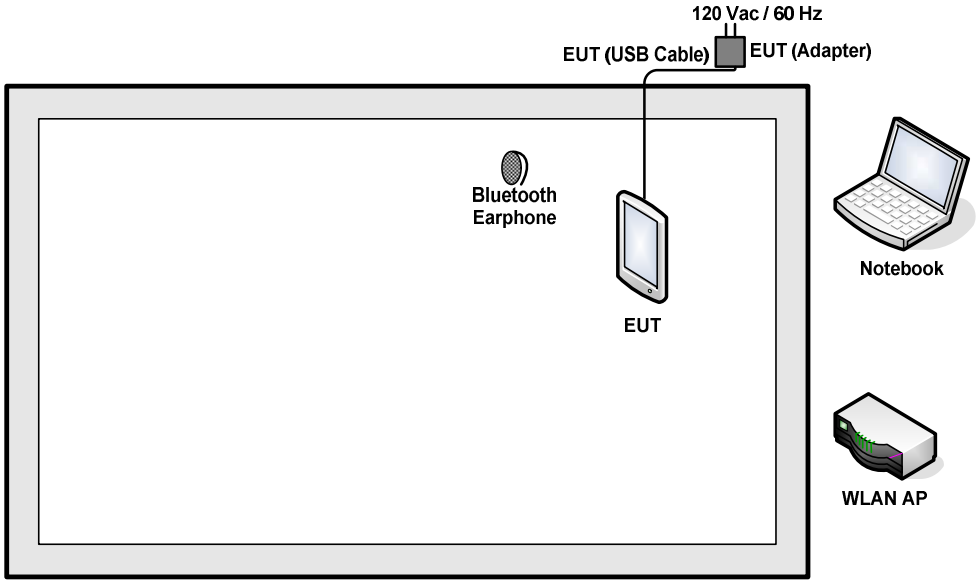
Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN (2.4G) Link + Play MPEG4 from MicroSD card + USB Cable (Charging from Adapter AP-16) + MicroSD card
Remark: For Radiated Test Cases, The tests were performed with Earphone, Adapter and USB Cable.	

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
2.	Notebook	E540	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Bluetooth Earphone	EO-MG900	N/A	N/A	N/A
4.	SD Card	MicroSD HC	FCC DoC	N/A	N/A
5.	Earphone	N/A	N/A	Unshielded, 1.2 m	N/A

2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor..

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

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

= 5.0 + 10 = 15.0 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

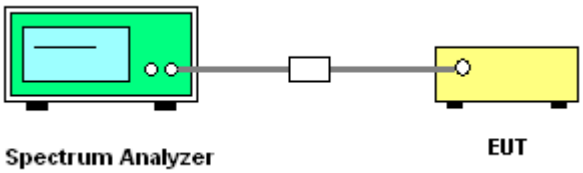
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

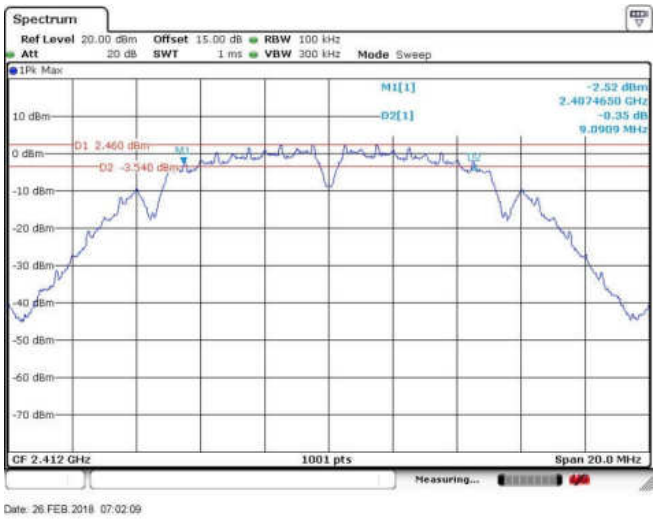
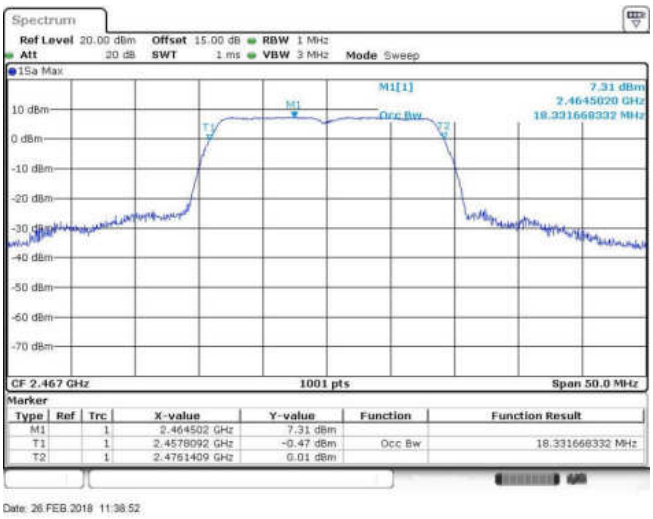
1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	

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

3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

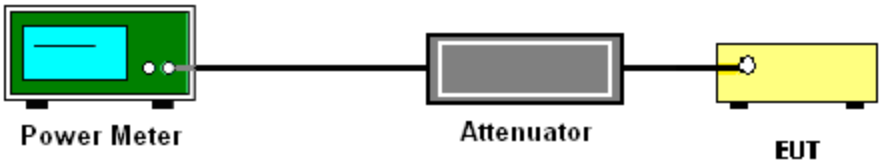
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.2 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

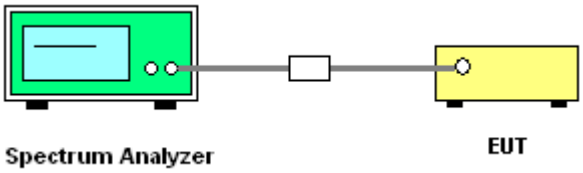
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

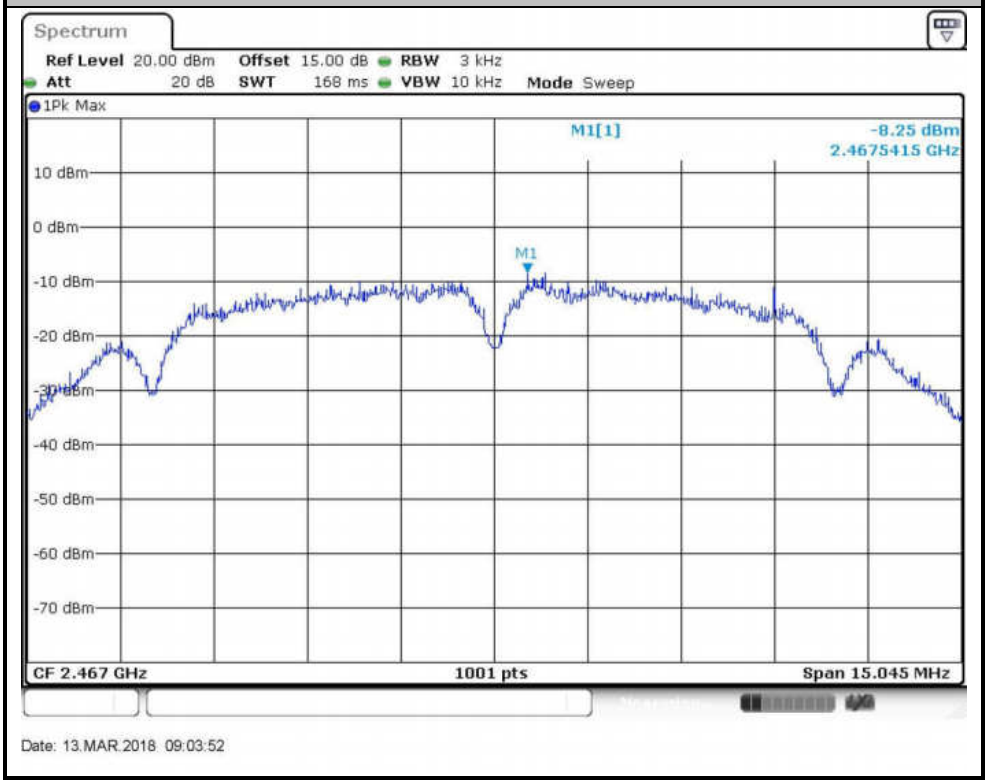
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/3kHz)



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

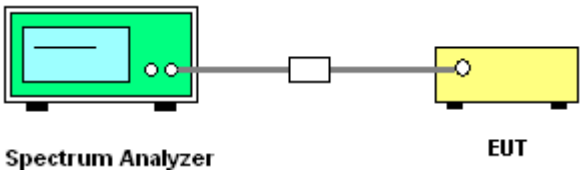
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup

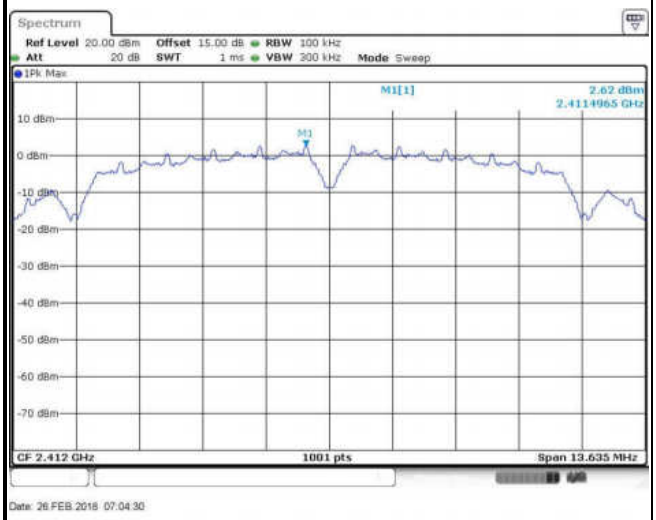


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

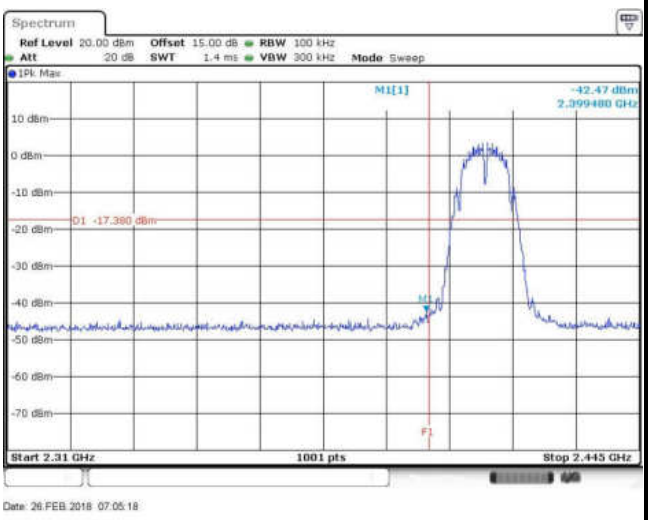
Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	50~53%
Test Channel :	01	**Test Engineer :**	Rain Wang

WLAN 802.11b Channel 01

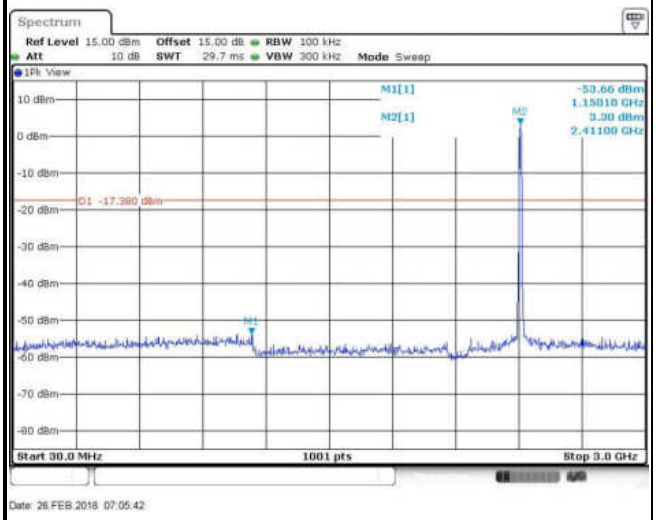
100kHz PSD reference Level



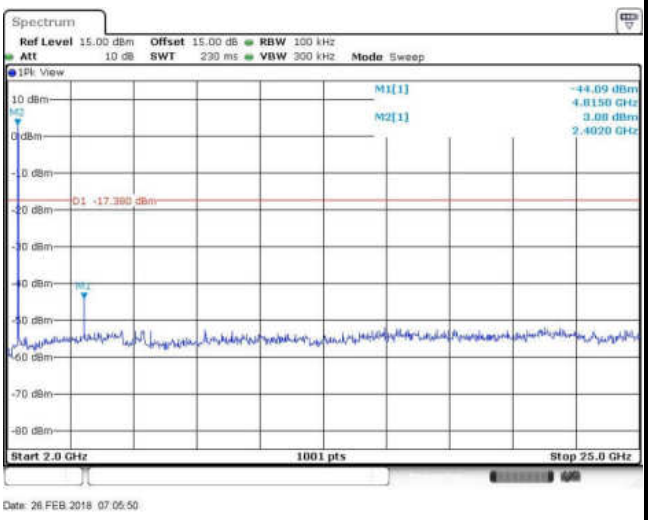
Low Channel Plot



Spurious Emission 30MHz~3GHz



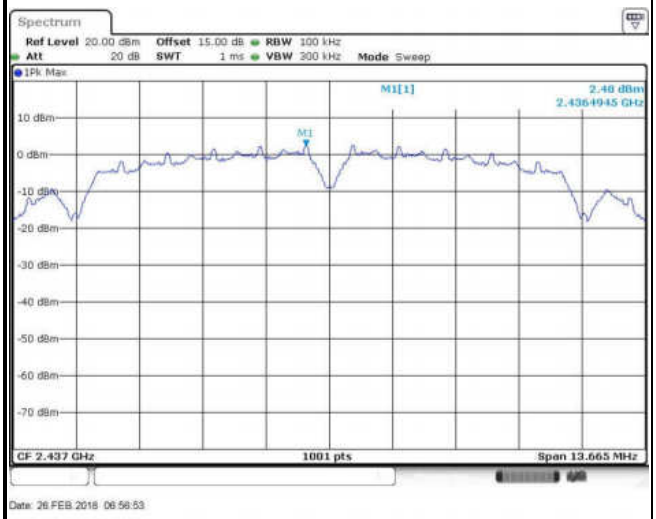
Spurious Emission 2GHz~25GHz



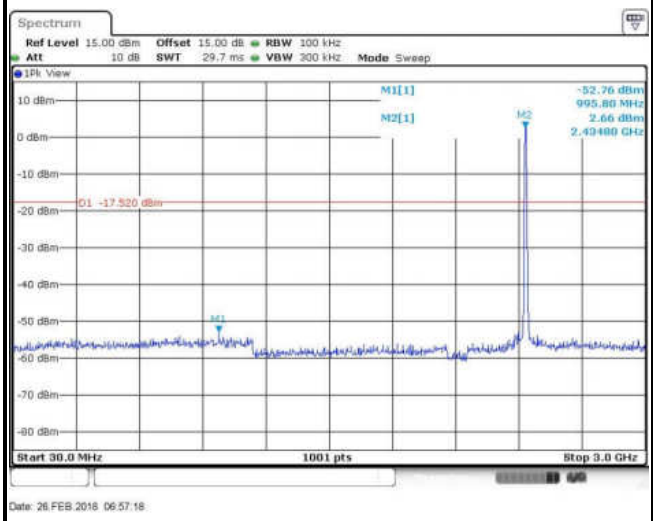
Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	50~53%
Test Channel :	06	**Test Engineer :**	Rain Wang

WLAN 802.11b Channel 06

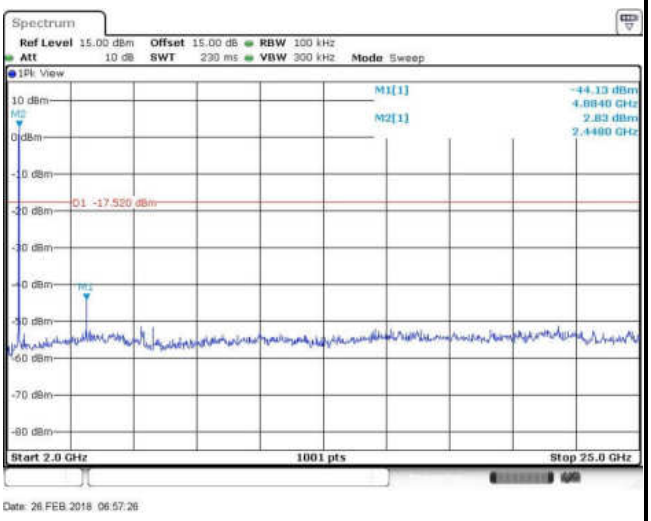
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



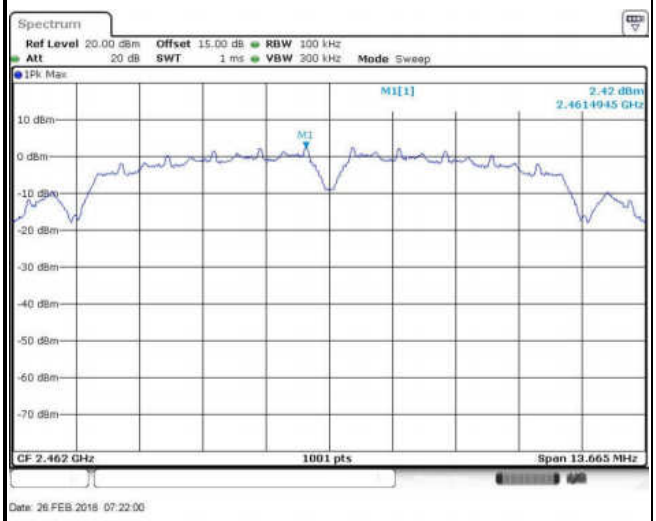
Spurious Emission 2GHz~25GHz



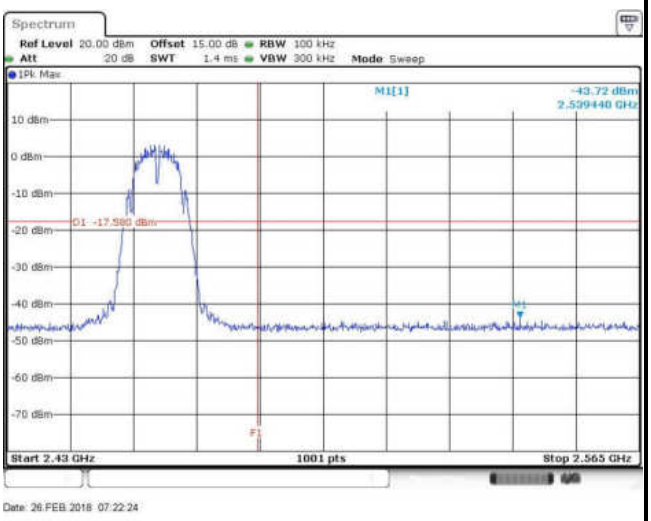
Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	11	**Test Engineer :**	Rain Wang

WLAN 802.11b Channel 11

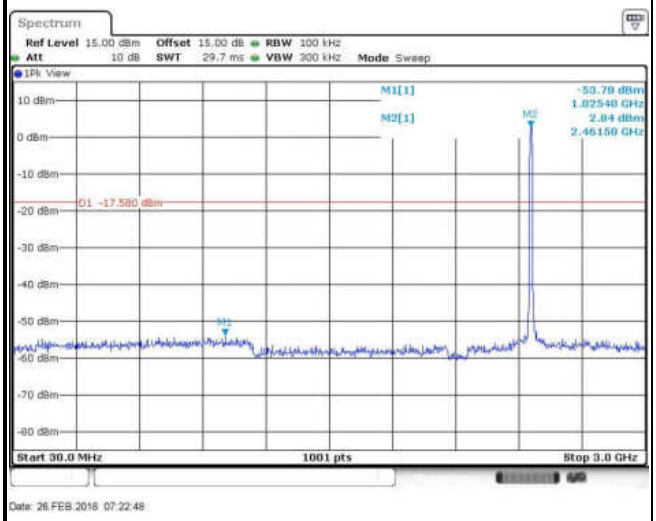
100kHz PSD reference Level



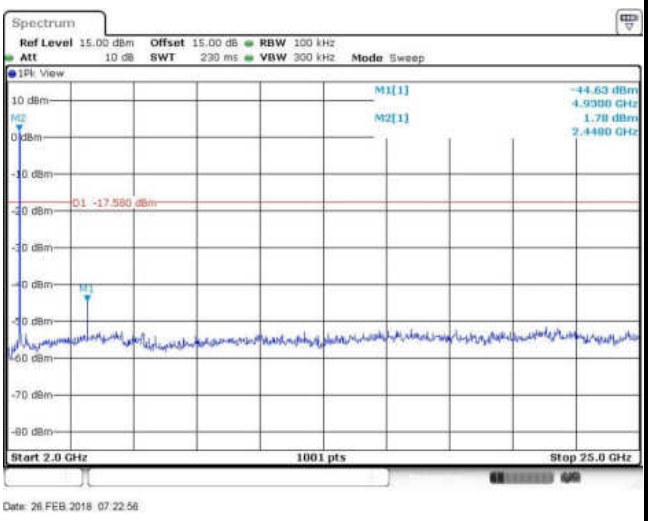
High Channel Plot



Spurious Emission 30MHz~3GHz



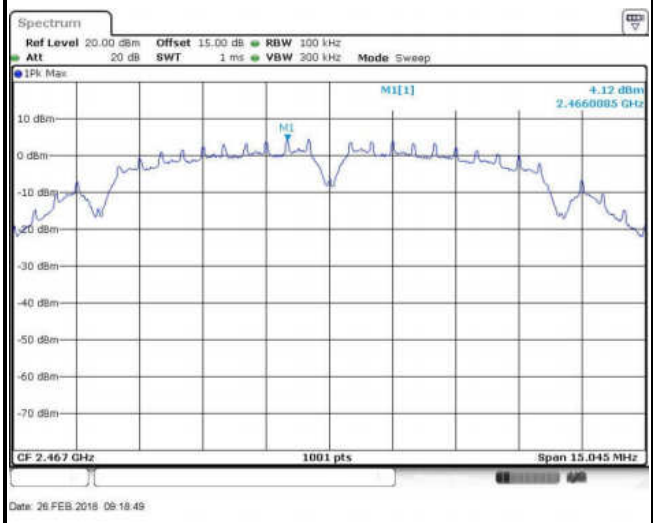
Spurious Emission 2GHz~25GHz



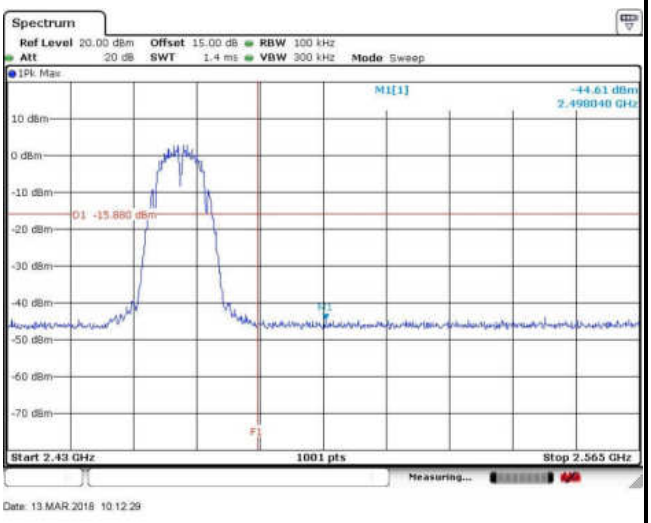
Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	12	**Test Engineer :**	Rain Wang

WLAN 802.11b Channel 12

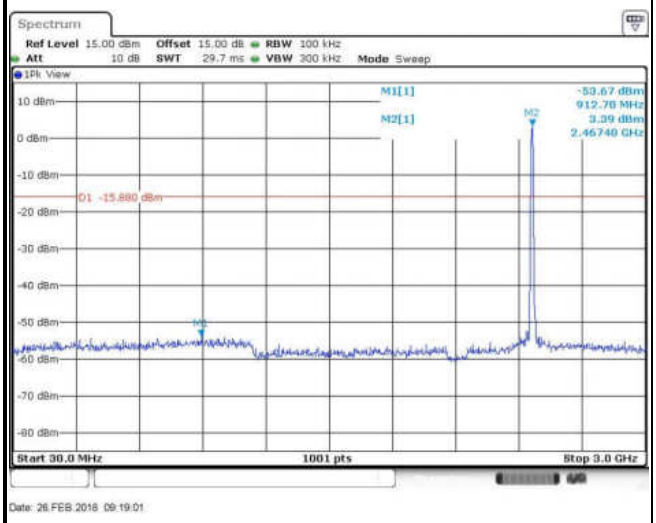
100kHz PSD reference Level



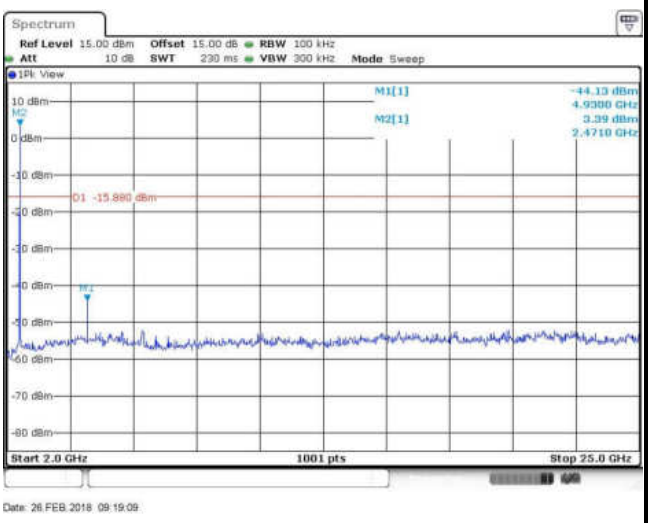
High Channel Plot



Spurious Emission 30MHz~3GHz



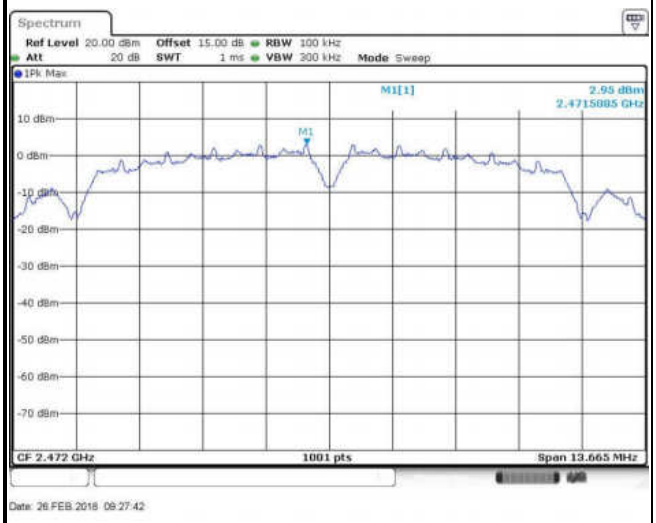
Spurious Emission 2GHz~25GHz



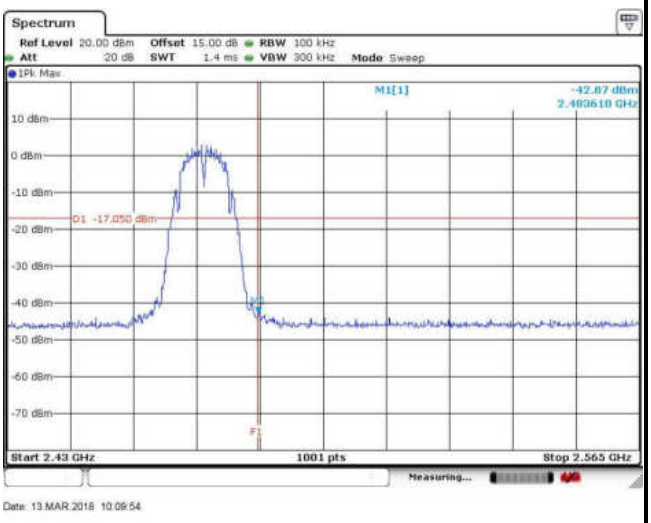
Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	13	**Test Engineer :**	Rain Wang

WLAN 802.11b Channel 13

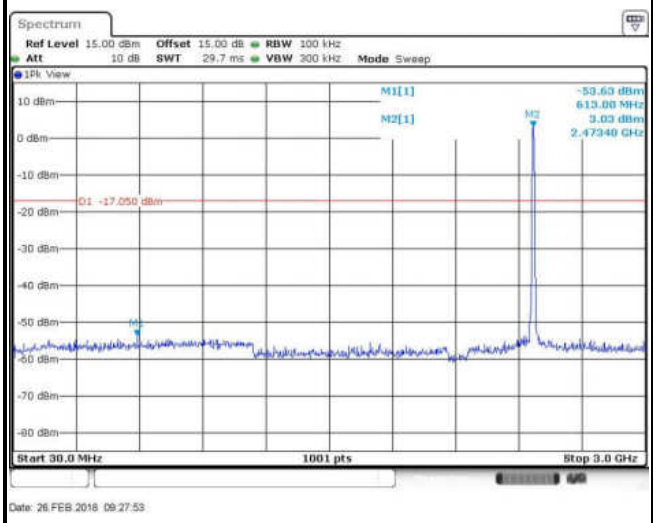
100kHz PSD reference Level



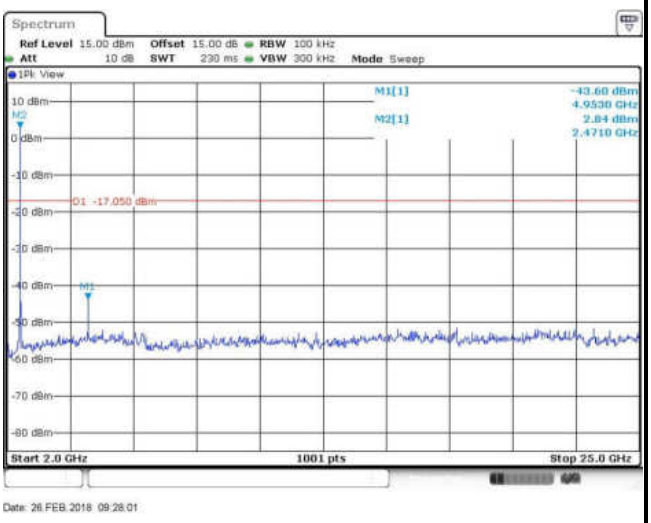
High Channel Plot



Spurious Emission 30MHz~3GHz



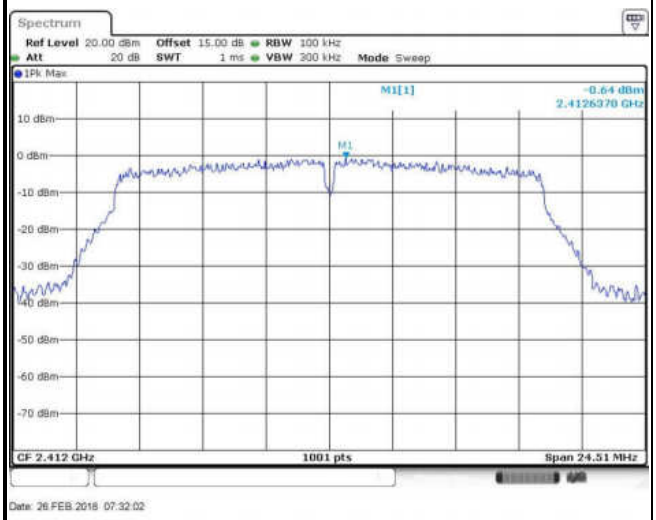
Spurious Emission 2GHz~25GHz



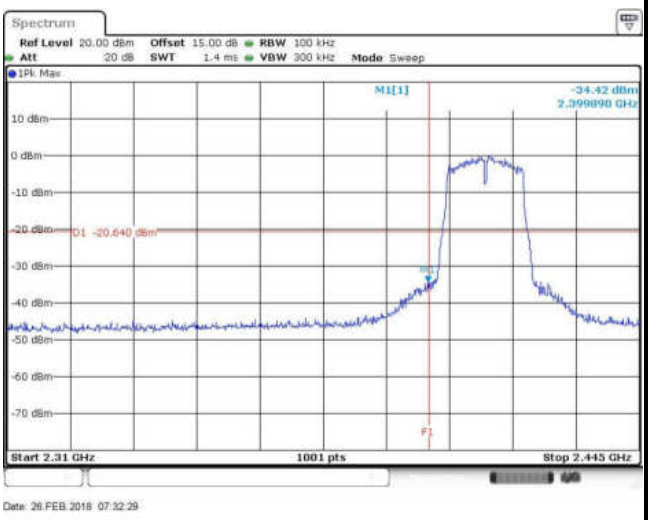
Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	50~53%
Test Channel :	01	**Test Engineer :**	Rain Wang

WLAN 802.11g Channel 01

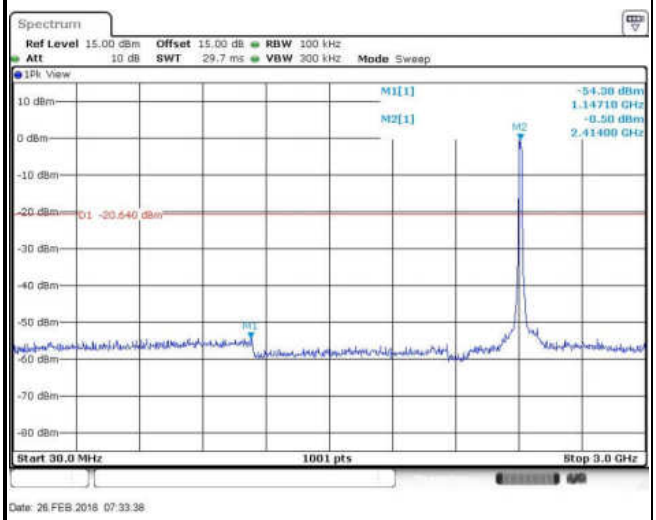
100kHz PSD reference Level



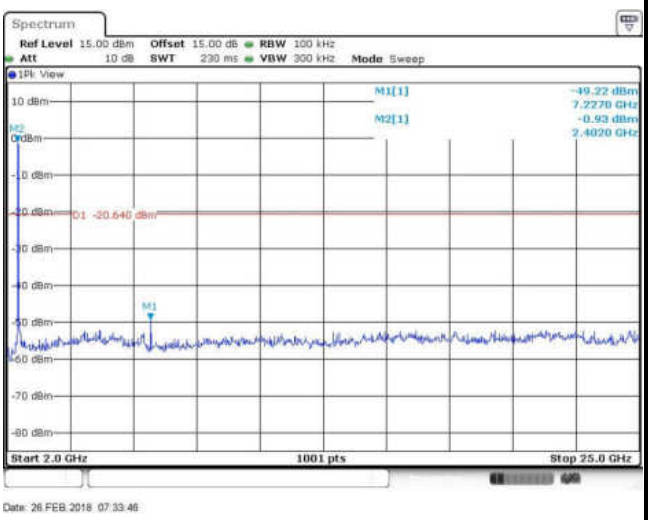
Low Channel Plot



Spurious Emission 30MHz~3GHz



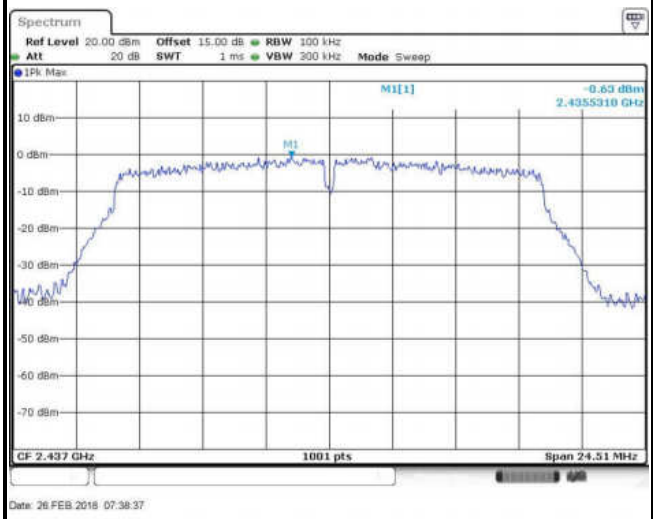
Spurious Emission 2GHz~25GHz



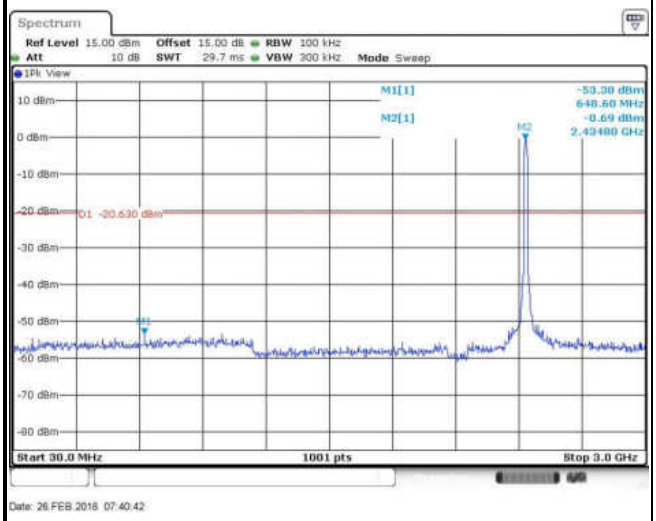
Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	50~53%
Test Channel :	06	**Test Engineer :**	Rain Wang

WLAN 802.11g Channel 06

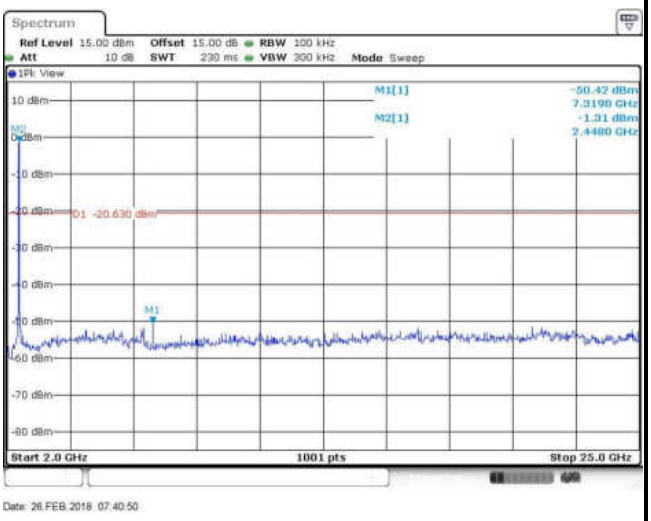
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



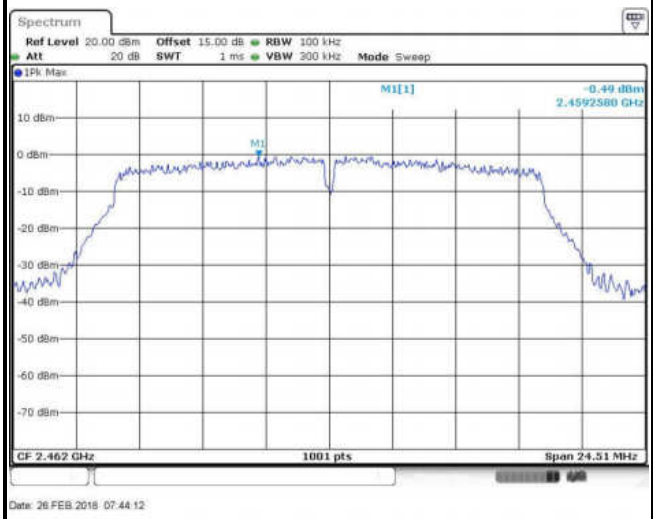
Spurious Emission 2GHz~25GHz



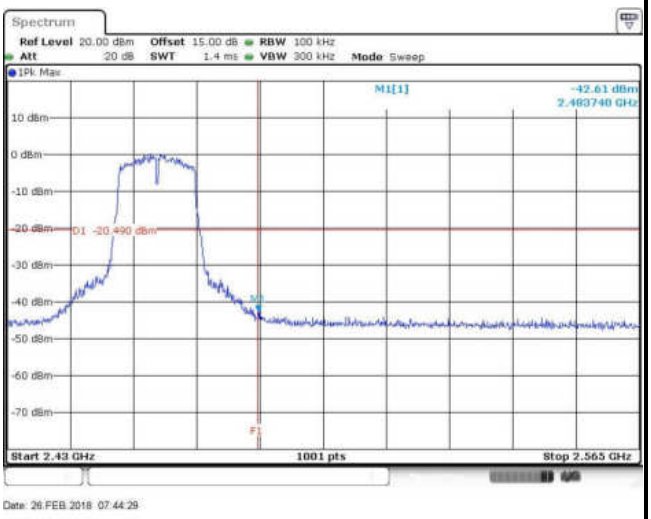
Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	11	**Test Engineer :**	Rain Wang

WLAN 802.11g Channel 11

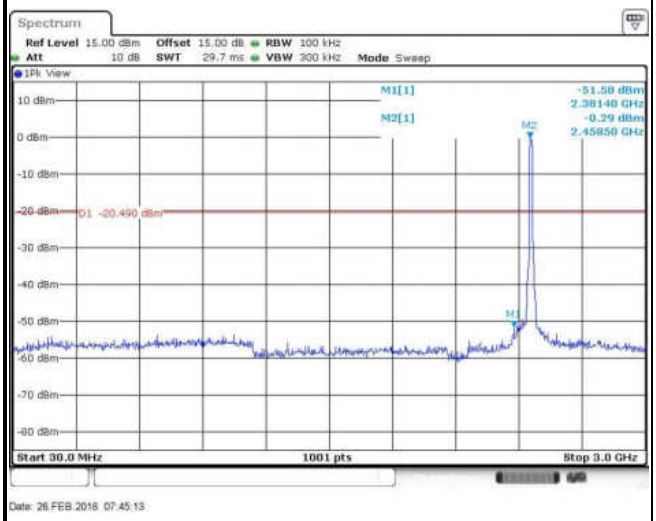
100kHz PSD reference Level



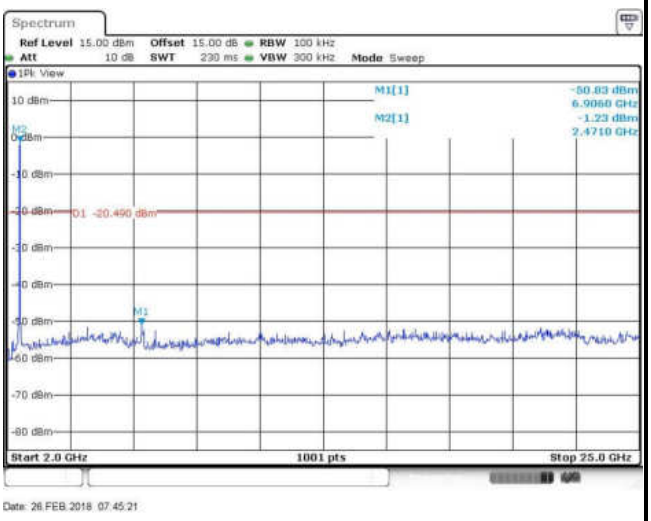
High Channel Plot



Spurious Emission 30MHz~3GHz



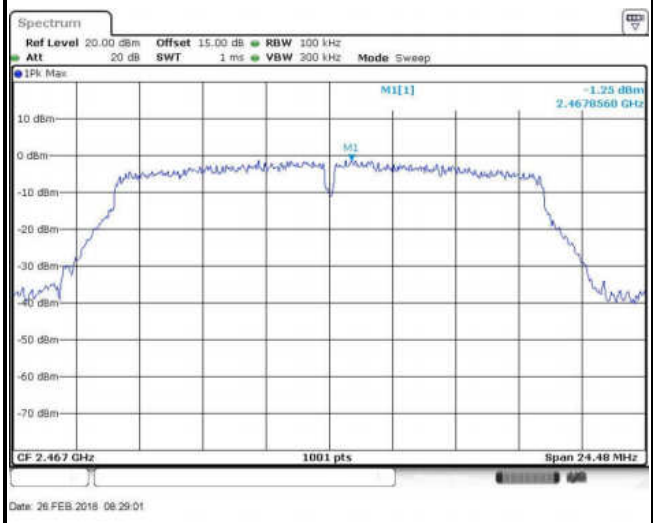
Spurious Emission 2GHz~25GHz



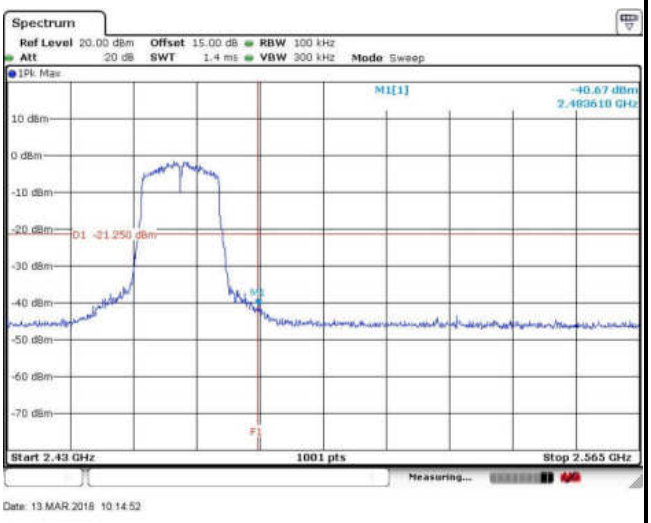
Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	12	**Test Engineer :**	Rain Wang

WLAN 802.11g Channel 12

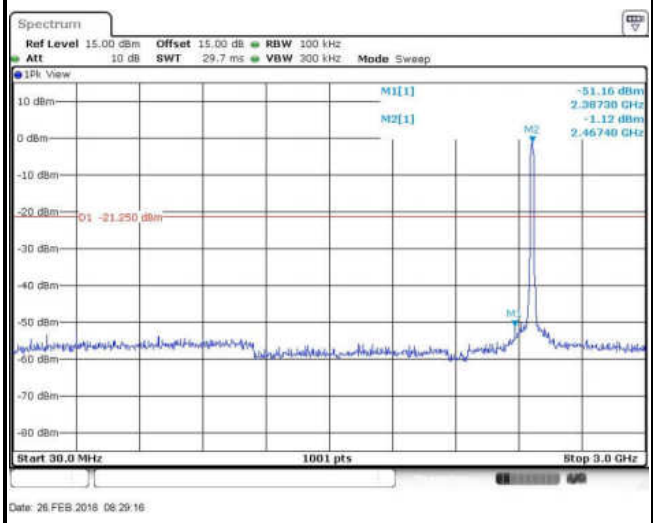
100kHz PSD reference Level



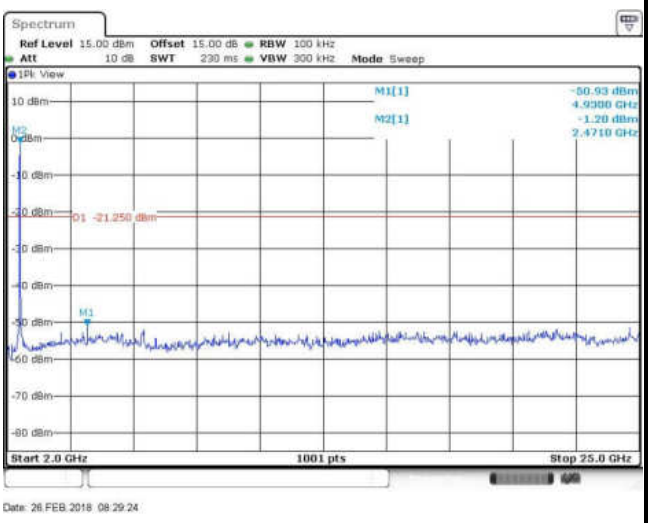
High Channel Plot



Spurious Emission 30MHz~3GHz



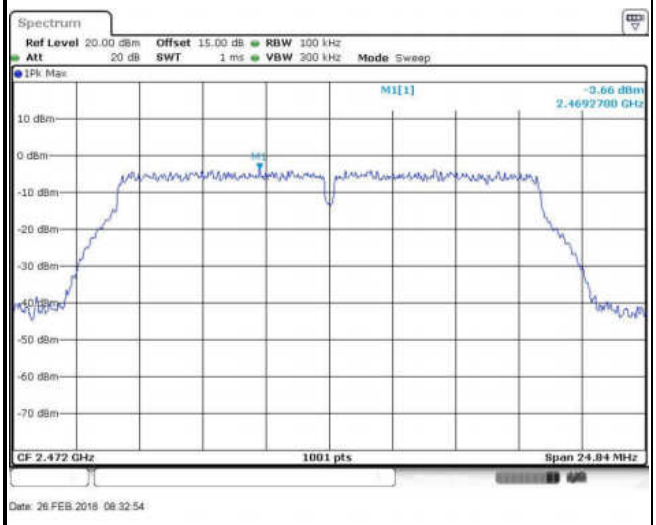
Spurious Emission 2GHz~25GHz



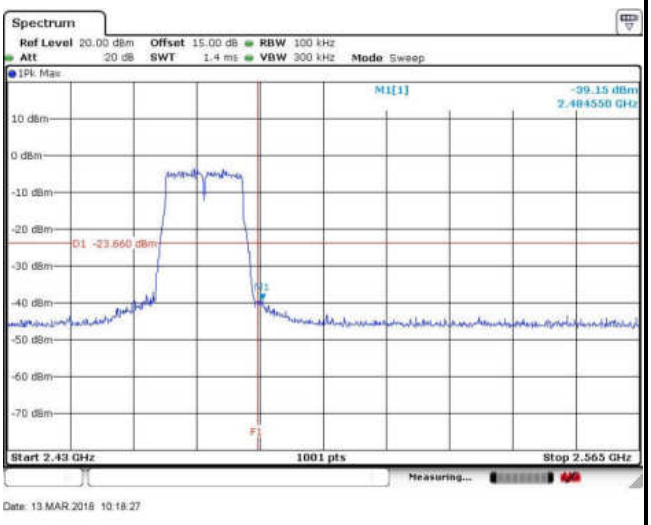
Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	13	**Test Engineer :**	Rain Wang

WLAN 802.11g Channel 13

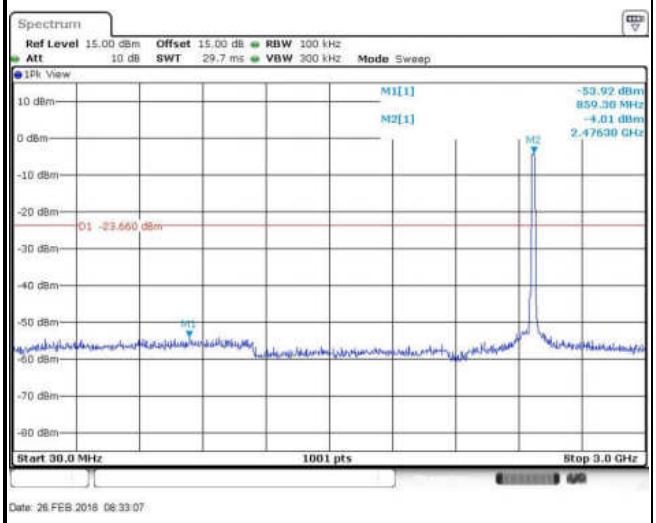
100kHz PSD reference Level



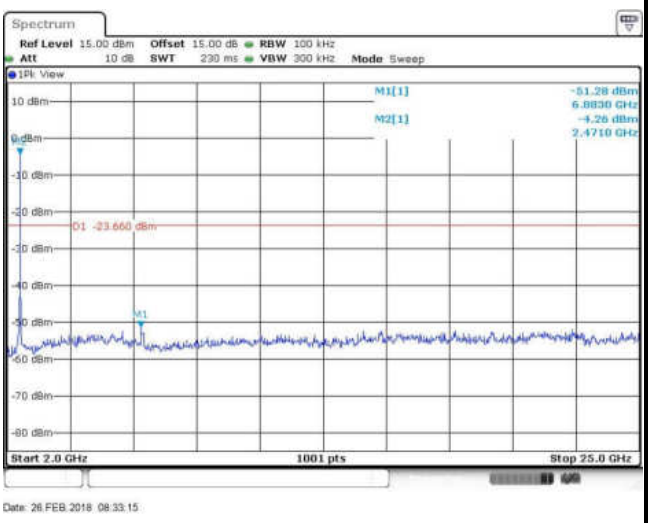
High Channel Plot



Spurious Emission 30MHz~3GHz



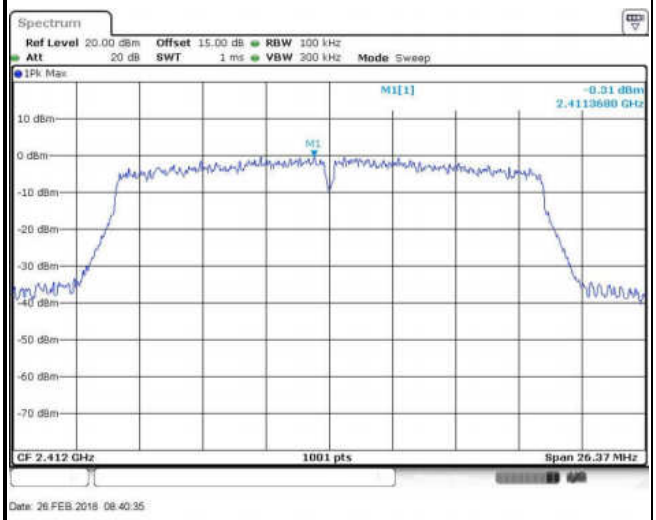
Spurious Emission 2GHz~25GHz



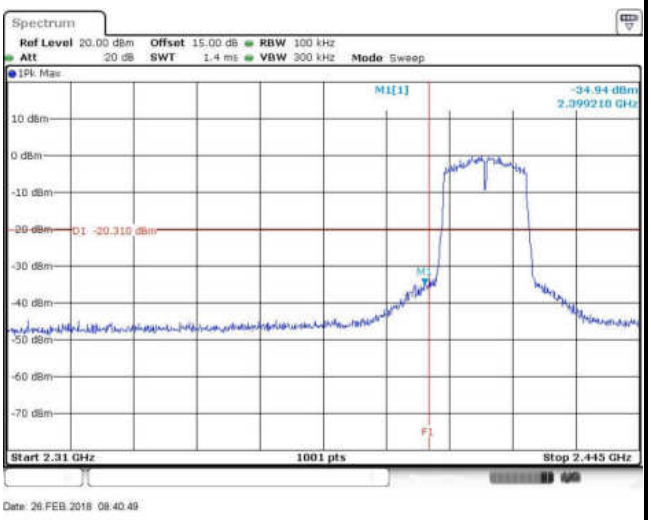
Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	50~53%
Test Channel :	01	**Test Engineer :**	Rain Wang

WLAN 802.11n HT20 Channel 01

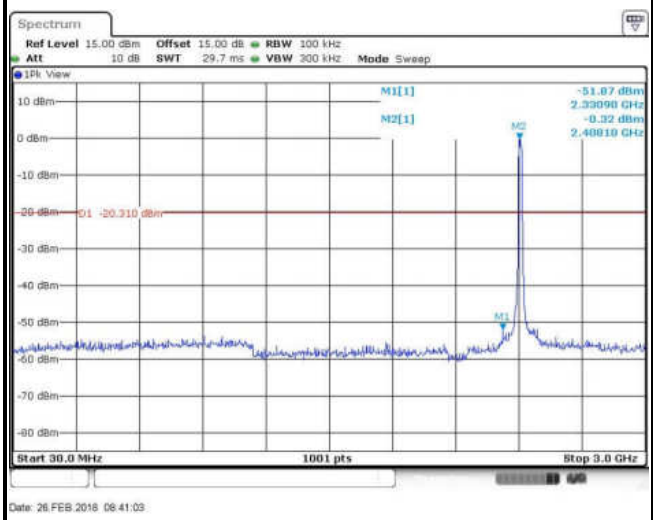
100kHz PSD reference Level



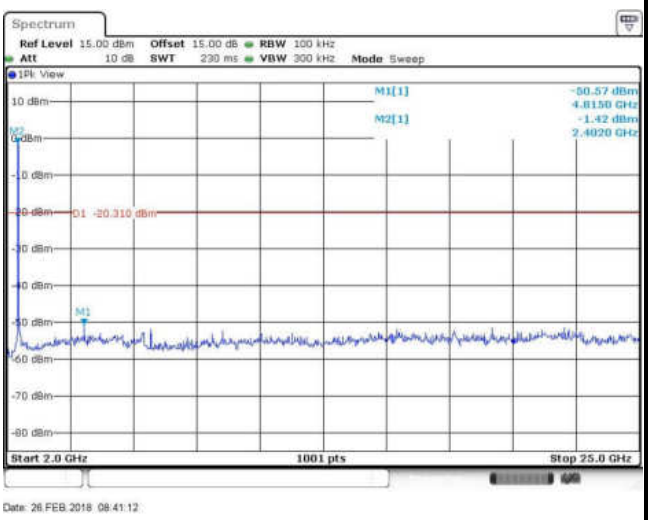
Low Channel Plot



Spurious Emission 30MHz~3GHz



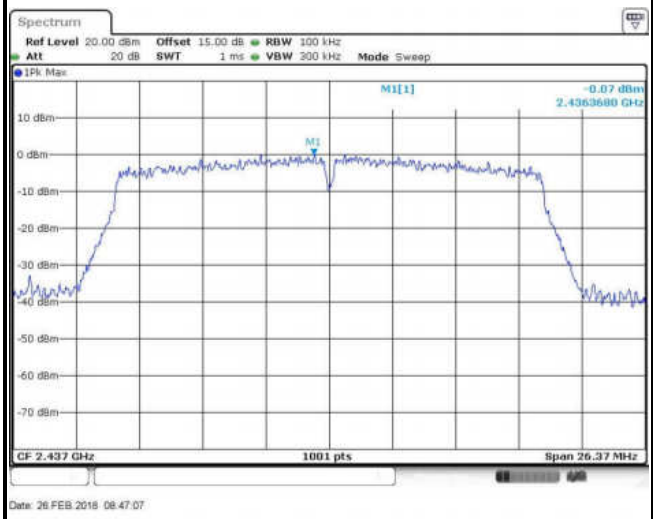
Spurious Emission 2GHz~25GHz



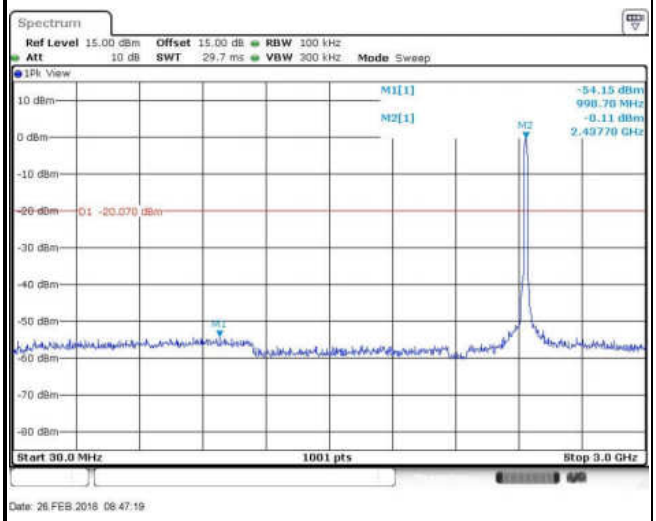
Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	50~53%
Test Channel :	06	**Test Engineer :**	Rain Wang

WLAN 802.11n HT20 Channel 06

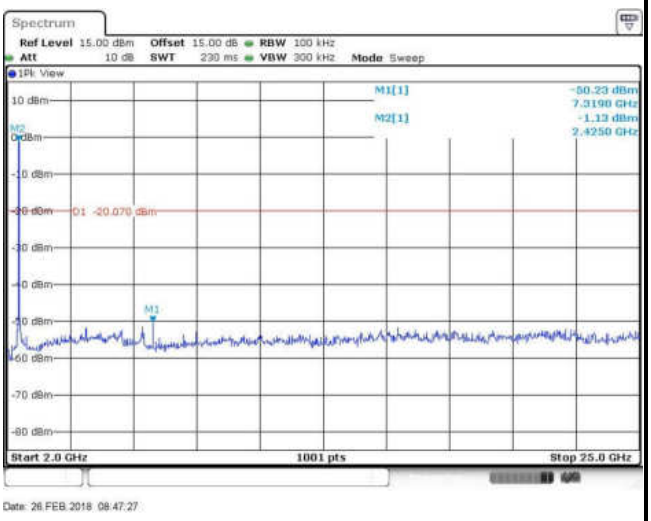
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



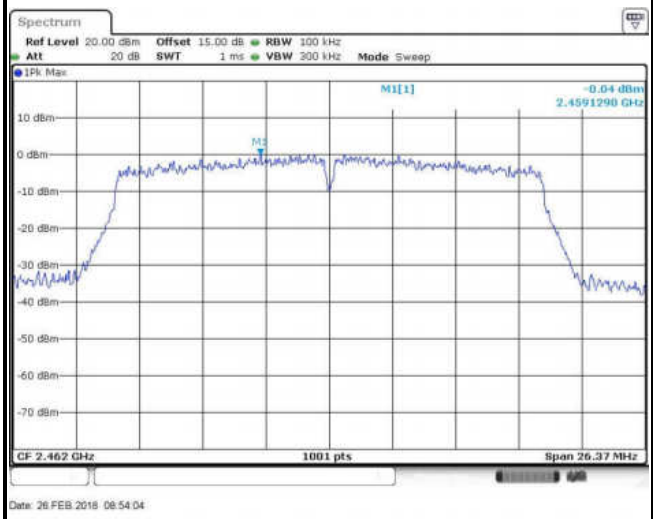
Spurious Emission 2GHz~25GHz



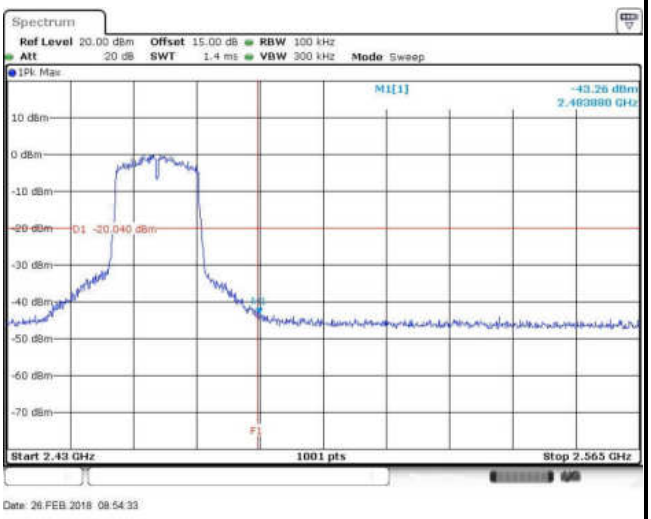
Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	11	**Test Engineer :**	Rain Wang

WLAN 802.11n HT20 Channel 11

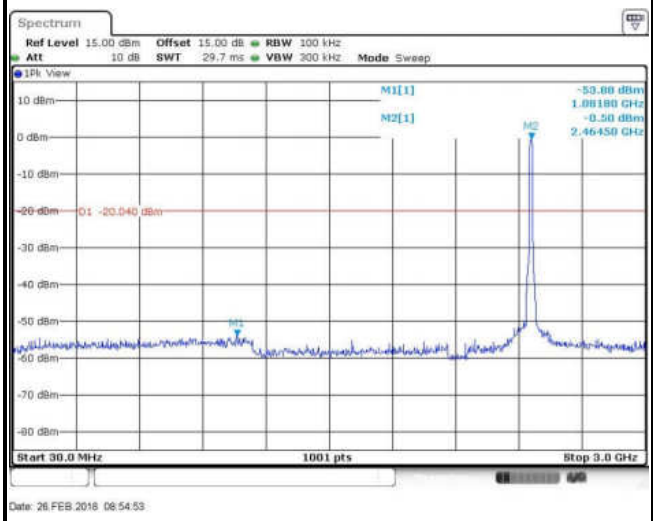
100kHz PSD reference Level



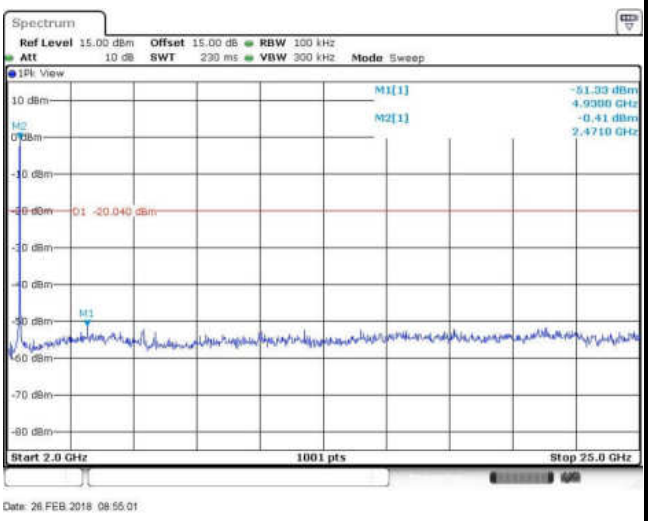
High Channel Plot



Spurious Emission 30MHz~3GHz



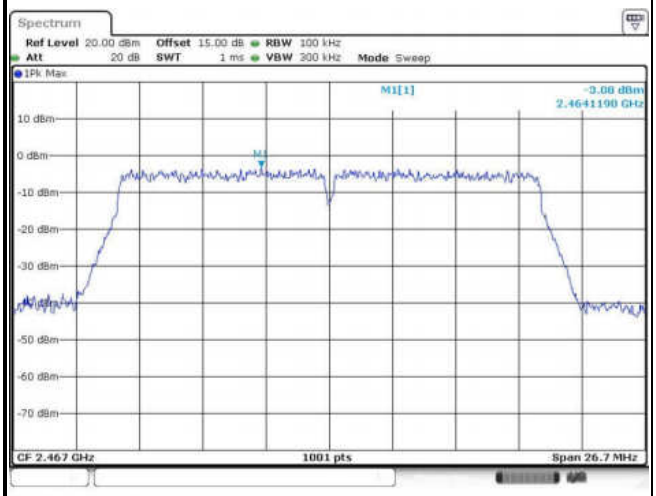
Spurious Emission 2GHz~25GHz



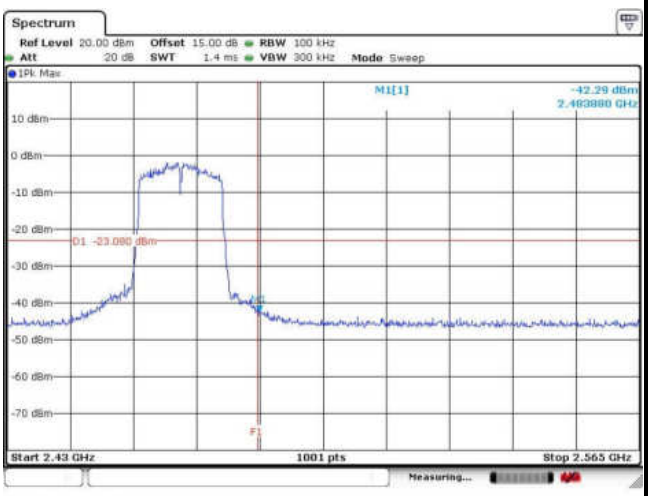
Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	12	**Test Engineer :**	Rain Wang

WLAN 802.11n HT20 Channel 12

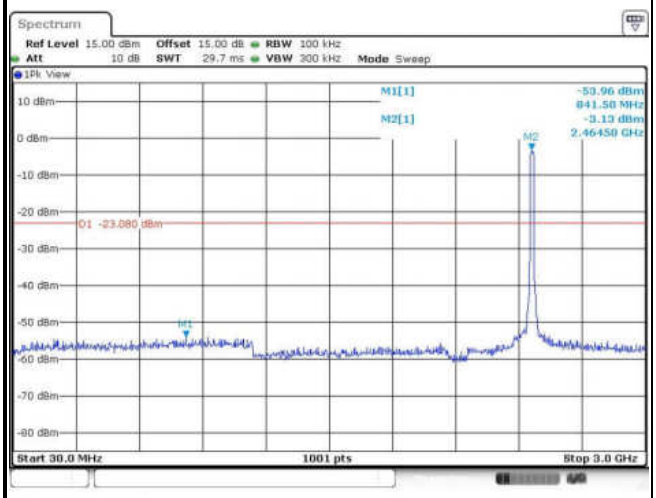
100kHz PSD reference Level



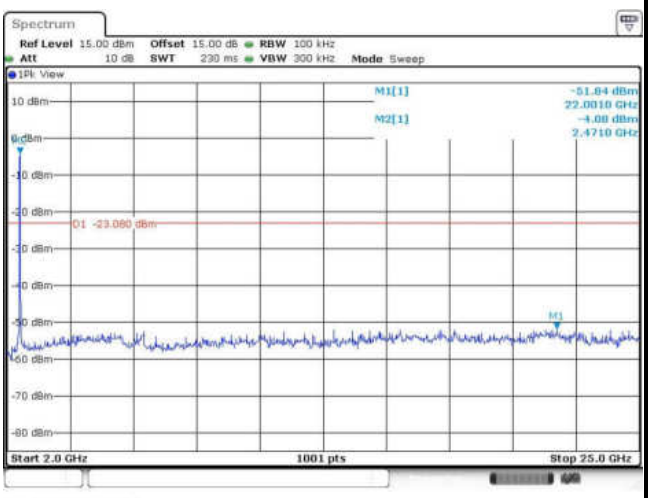
High Channel Plot



Spurious Emission 30MHz~3GHz



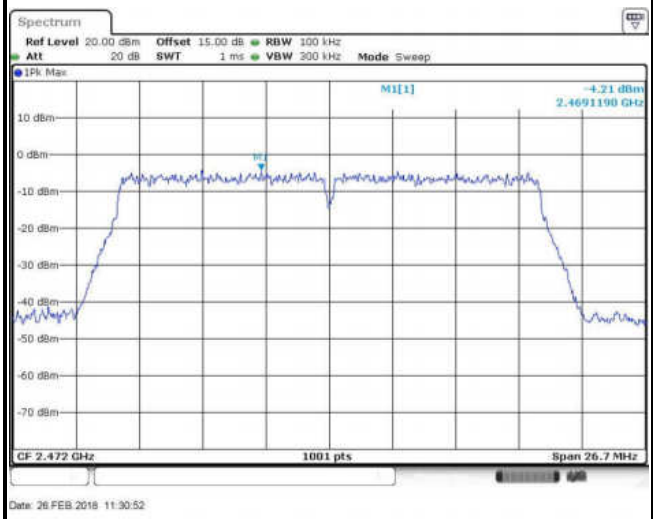
Spurious Emission 2GHz~25GHz



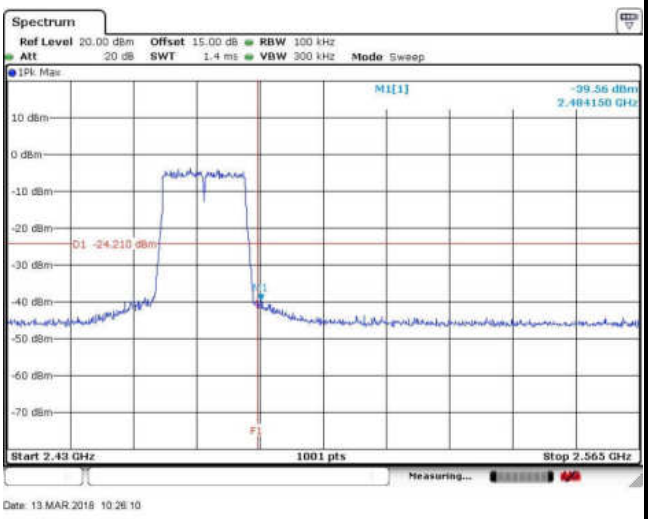
Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	13	**Test Engineer :**	Rain Wang

WLAN 802.11n HT20 Channel 13

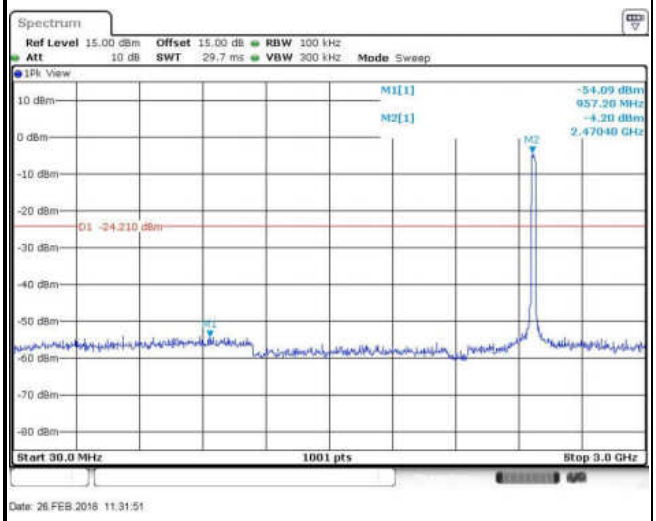
100kHz PSD reference Level



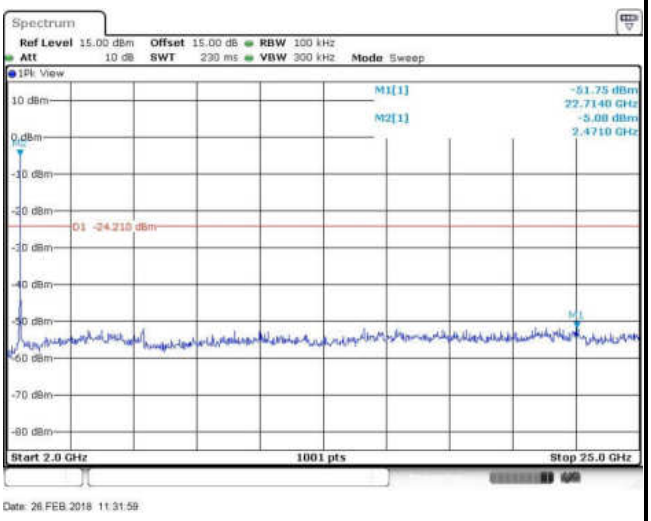
High Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz



3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

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

3.5.2 Measuring Instruments

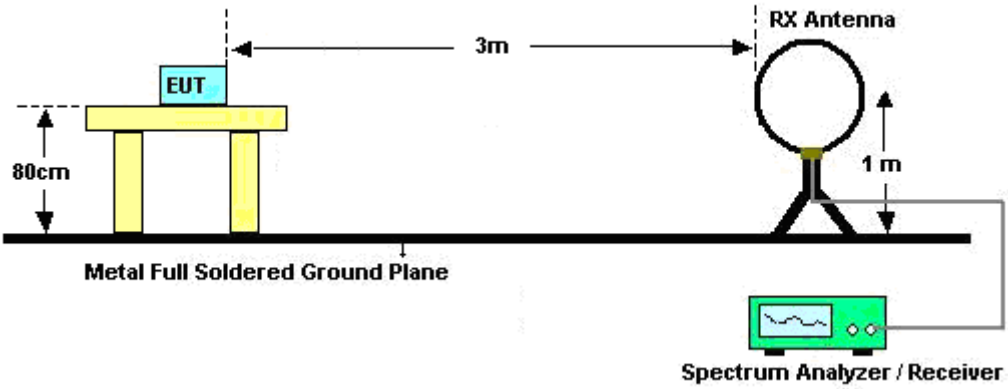
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

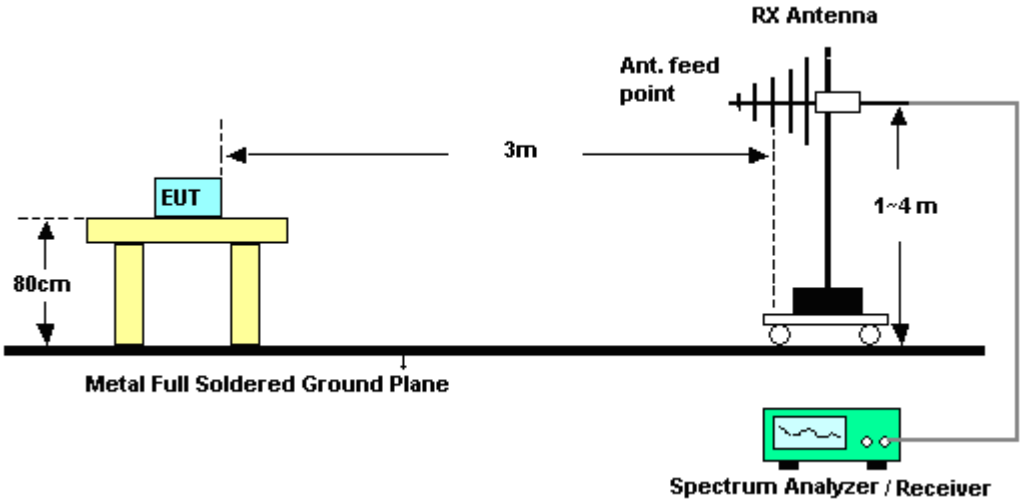
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test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

3.5.4 Test Setup

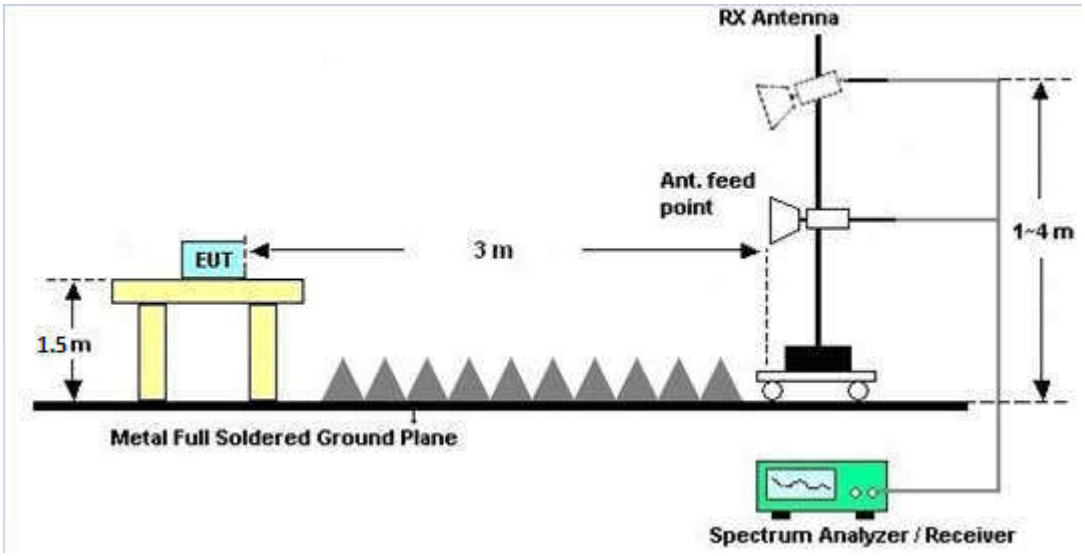
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line 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.

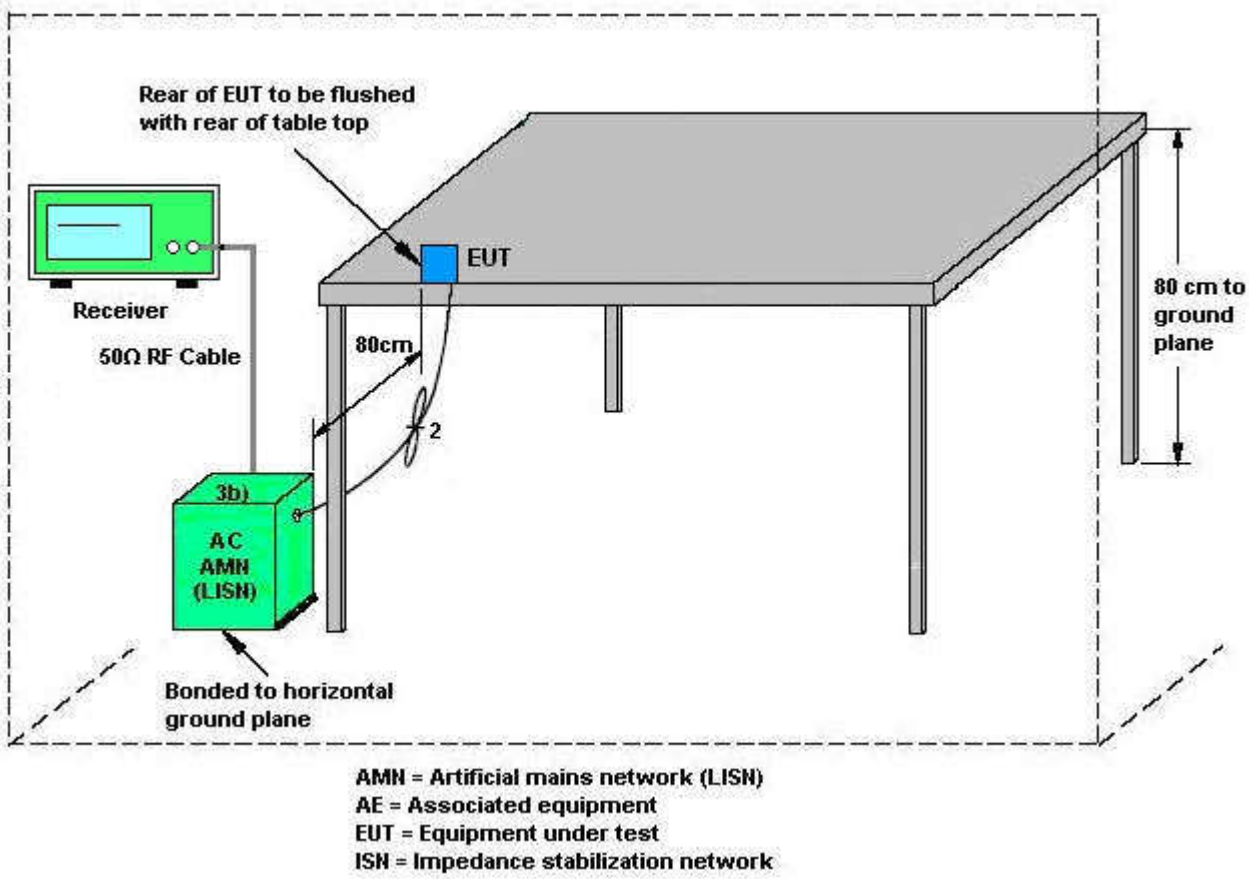
3.6.2 Measuring Instruments

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.

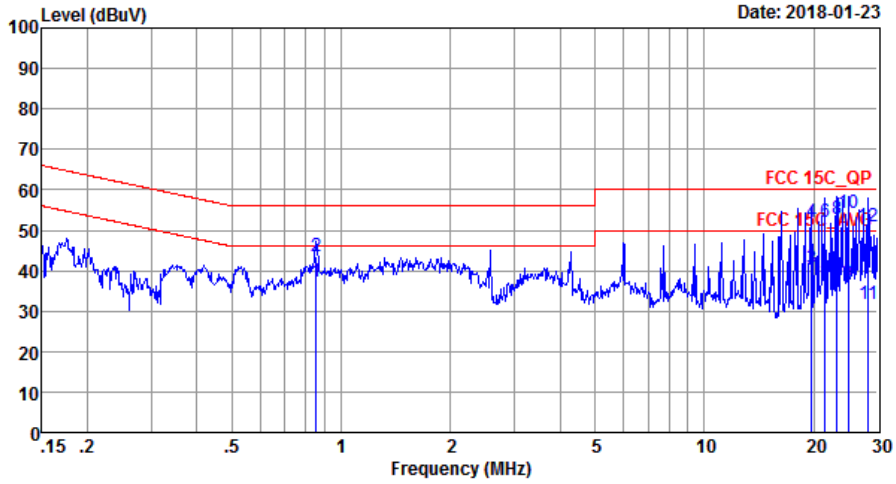
3.6.4 Test Setup



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

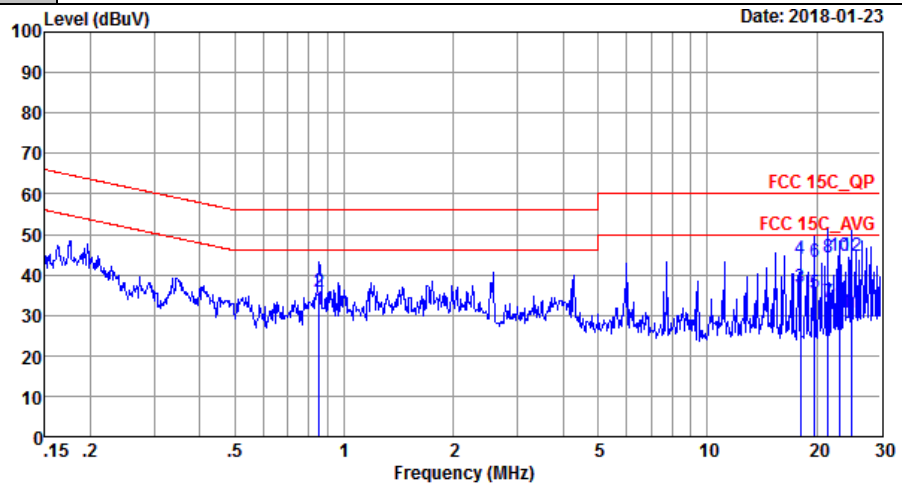
Test Mode :	Mode 1	**Temperature :**	22~25℃
Test Engineer :	Peng wang	**Relative Humidity :**	50~55%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	Bluetooth Link + WLAN (2.4G) Link + Play MPEG4 from MicroSD card + USB Cable (Charging from Adapter AP-16) + MicroSD card		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_20170907_L LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.85	37.13	-8.87	46.00	26.99	0.05	10.09	Average
2		0.85	43.63	-12.37	56.00	33.49	0.05	10.09	QP
3		19.74	40.42	-9.58	50.00	28.81	1.26	10.35	Average
4		19.74	52.12	-7.88	60.00	40.51	1.26	10.35	QP
5		21.49	37.90	-12.10	50.00	26.20	1.33	10.37	Average
6		21.49	52.00	-8.00	60.00	40.30	1.33	10.37	QP
7		23.14	37.54	-12.46	50.00	25.80	1.35	10.39	Average
8		23.14	52.94	-7.06	60.00	41.20	1.35	10.39	QP
9		24.92	36.98	-13.02	50.00	25.21	1.36	10.41	Average
10	*	24.92	54.18	-5.82	60.00	42.41	1.36	10.41	QP
11		28.30	31.85	-18.15	50.00	19.99	1.40	10.46	Average
12		28.30	50.75	-9.25	60.00	38.89	1.40	10.46	QP

Test Mode :	Mode 1	**Temperature :**	22~25℃
Test Engineer :	Peng wang	**Relative Humidity :**	50~55%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	Bluetooth Link + WLAN (2.4G) Link + Play MPEG4 from MicroSD card + USB Cable (Charging from Adapter AP-16) + MicroSD card		



Site : CO01-SZ
Condition: FCC 15C QP LISN_20170907_N NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
				dB	dBuV	dBuV	dB	dB	
1		0.85	31.42	-14.58	46.00	21.29	0.04	10.09	Average
2		0.85	35.92	-20.08	56.00	25.79	0.04	10.09	QP
3	*	18.04	36.86	-13.14	50.00	26.00	0.49	10.37	Average
4		18.04	43.76	-16.24	60.00	32.90	0.49	10.37	QP
5		19.74	35.42	-14.58	50.00	24.50	0.57	10.35	Average
6		19.74	43.22	-16.78	60.00	32.30	0.57	10.35	QP
7		21.49	33.28	-16.72	50.00	22.19	0.72	10.37	Average
8		21.49	44.18	-15.82	60.00	33.09	0.72	10.37	QP
9		23.14	32.84	-17.16	50.00	21.60	0.85	10.39	Average
10		23.14	44.64	-15.36	60.00	33.40	0.85	10.39	QP
11		24.92	30.70	-19.30	50.00	19.30	0.99	10.41	Average
12		24.92	44.70	-15.30	60.00	33.30	0.99	10.41	QP

3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	9kHz~40GHz	Apr. 20, 2017	Feb. 26, 2018~ Mar. 13, 2018	Apr. 19, 2018	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 26, 2017	Feb. 26, 2018~ Mar. 13, 2018	Dec. 25, 2018	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 26, 2017	Feb. 26, 2018~ Mar. 13, 2018	Dec. 25, 2018	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Apr. 20, 2017	Mar. 08, 2018	Apr. 19, 2018	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Apr. 20, 2017	Mar. 08, 2018	Apr. 19, 2018	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 14, 2017	Mar. 08, 2018	May 13, 2018	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	May 16, 2017	Mar. 08, 2018	May 15, 2018	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1285	1GHz~18GHz	Dec. 13, 2017	Mar. 08, 2018	Dec. 12, 2018	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	May 17, 2017	Mar. 08, 2018	May 16, 2018	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct.19, 2017	Mar. 08, 2018	Oct 18, 2018	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1989346	1GHz~18GHz	Jul. 27, 2017	Mar. 08, 2018	Jul. 26, 2018	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1988315	18GHz~40GHz	Jul.27, 2017	Mar. 08, 2018	Jul.26, 2018	Radiation (03CH04-SZ
Amplifier	Agilent Technologies	83017A	MY53270156	500MHz~26.5GHz	Apr. 20, 2017	Mar. 08, 2018	Apr. 19, 2018	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	Mar. 08, 2018	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Mar. 08, 2018	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Mar. 08, 2018	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 26, 2017	Jan. 23, 2018	Dec. 25, 2018	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Dec. 26, 2017	Jan. 23, 2018	Dec. 25, 2018	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	MessTec	3816/2SH	00103892	9kHz~30MHz	Nov. 01, 2017	Jan. 23, 2018	Oct. 31, 2018	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 19, 2017	Jan. 23, 2018	Jul. 18, 2018	Conduction (CO01-SZ)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.6dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.8dB

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1dB

Appendix A. Conducted Test Results

Report Number : FR7O2501-01C

A1 - DTS Part

Test Engineer:	Rain Wang	Temperature:	24~26	°C
Test Date:	2018/2/26 ~ 2018/3/13	Relative Humidity:	50~53	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band								
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	12.39	9.09	0.50	Pass
11b	1Mbps	1	6	2437	12.39	9.11	0.50	Pass
11b	1Mbps	1	11	2462	12.39	9.11	0.50	Pass
11b	1Mbps	1	12	2467	12.39	10.03	0.50	Pass
11b	1Mbps	1	13	2472	12.39	9.11	0.50	Pass
11g	6Mbps	1	1	2412	17.93	16.34	0.50	Pass
11g	6Mbps	1	6	2437	17.88	16.34	0.50	Pass
11g	6Mbps	1	11	2462	17.88	16.34	0.50	Pass
11g	6Mbps	1	12	2467	17.83	16.32	0.50	Pass
11g	6Mbps	1	13	2472	18.23	16.56	0.50	Pass
HT20	MCS0	1	1	2412	18.03	17.58	0.50	Pass
HT20	MCS0	1	6	2437	18.03	17.58	0.50	Pass
HT20	MCS0	1	11	2462	18.08	17.58	0.50	Pass
HT20	MCS0	1	12	2467	18.33	17.80	0.50	Pass
HT20	MCS0	1	13	2472	18.28	17.80	0.50	Pass

TEST RESULTS DATA
Peak Power Table

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
11b	1Mbps	1	1	2412	17.01	30.00	-0.10	16.91	36.00	Pass
11b	1Mbps	1	6	2437	17.11	30.00	-0.10	17.01	36.00	Pass
11b	1Mbps	1	11	2462	17.18	30.00	-0.10	17.08	36.00	Pass
11b	1Mbps	1	12	2467	17.05	30.00	-0.10	16.95	36.00	Pass
11b	1Mbps	1	13	2472	17.16	30.00	-0.10	17.06	36.00	Pass
11g	6Mbps	1	1	2412	22.71	30.00	-0.10	22.61	36.00	Pass
11g	6Mbps	1	6	2437	22.74	30.00	-0.10	22.64	36.00	Pass
11g	6Mbps	1	11	2462	22.84	30.00	-0.10	22.74	36.00	Pass
11g	6Mbps	1	12	2467	21.73	30.00	-0.10	21.63	36.00	Pass
11g	6Mbps	1	13	2472	19.86	30.00	-0.10	19.76	36.00	Pass
HT20	MCS0	1	1	2412	22.74	30.00	-0.10	22.64	36.00	Pass
HT20	MCS0	1	6	2437	22.75	30.00	-0.10	22.65	36.00	Pass
HT20	MCS0	1	11	2462	22.84	30.00	-0.10	22.74	36.00	Pass
HT20	MCS0	1	12	2467	21.23	30.00	-0.10	21.13	36.00	Pass
HT20	MCS0	1	13	2472	19.77	30.00	-0.10	19.67	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

2.4GHz Band						
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.09	13.94
11b	1Mbps	1	6	2437	0.09	14.02
11b	1Mbps	1	11	2462	0.09	14.06
11b	1Mbps	1	12	2467	0.09	13.92
11b	1Mbps	1	13	2472	0.09	14.03
11g	6Mbps	1	1	2412	0.51	13.93
11g	6Mbps	1	6	2437	0.51	13.97
11g	6Mbps	1	11	2462	0.51	14.04
11g	6Mbps	1	12	2467	0.51	12.95
11g	6Mbps	1	13	2472	0.51	11.04
HT20	MCS0	1	1	2412	0.53	13.93
HT20	MCS0	1	6	2437	0.53	13.95
HT20	MCS0	1	11	2462	0.53	13.99
HT20	MCS0	1	12	2467	0.53	12.49
HT20	MCS0	1	13	2472	0.53	11.03

TEST RESULTS DATA
Peak Power Density

2.4GHz Band								
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	-9.10	-0.10	8.00	Pass
11b	1Mbps	1	6	2437	-9.66	-0.10	8.00	Pass
11b	1Mbps	1	11	2462	-10.34	-0.10	8.00	Pass
11b	1Mbps	1	12	2467	-8.25	-0.10	8.00	Pass
11b	1Mbps	1	13	2472	-9.78	-0.10	8.00	Pass
11g	6Mbps	1	1	2412	-10.52	-0.10	8.00	Pass
11g	6Mbps	1	6	2437	-10.09	-0.10	8.00	Pass
11g	6Mbps	1	11	2462	-11.09	-0.10	8.00	Pass
11g	6Mbps	1	12	2467	-10.53	-0.10	8.00	Pass
11g	6Mbps	1	13	2472	-13.44	-0.10	8.00	Pass
HT20	MCS0	1	1	2412	-11.20	-0.10	8.00	Pass
HT20	MCS0	1	6	2437	-10.82	-0.10	8.00	Pass
HT20	MCS0	1	11	2462	-9.75	-0.10	8.00	Pass
HT20	MCS0	1	12	2467	-11.93	-0.10	8.00	Pass
HT20	MCS0	1	13	2472	-14.17	-0.10	8.00	Pass

Appendix B. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		2389.275	45.96	-28.04	74	42.23	27.43	4.78	28.48	120	128	P	H
		2384.97	36.07	-17.93	54	32.4	27.37	4.78	28.48	120	128	A	H
	*	2412	105.13	-	-	101.22	27.49	4.78	28.36	120	128	P	H
	*	2412	101.64	-	-	97.73	27.49	4.78	28.36	120	128	A	H
		2383.29	45.16	-28.84	74	41.55	27.37	4.72	28.48	120	70	P	V
		2384.97	34.9	-19.1	54	31.23	27.37	4.78	28.48	120	70	A	V
	*	2412	99.21	-	-	95.3	27.49	4.78	28.36	120	70	P	V
	*	2412	96.2	-	-	92.29	27.49	4.78	28.36	120	70	A	V
802.11b CH 06 2437MHz		2384.06	44.86	-29.14	74	41.25	27.37	4.72	28.48	130	60	P	H
		2386.72	34.95	-19.05	54	31.22	27.43	4.78	28.48	130	60	A	H
	*	2437	105.26	-	-	101.07	27.61	4.82	28.24	130	60	P	H
	*	2437	102.04	-	-	97.85	27.61	4.82	28.24	130	60	A	H
		2486.77	46.25	-27.75	74	41.67	27.74	4.85	28.01	130	60	P	H
		2487.12	35.27	-18.73	54	30.69	27.74	4.85	28.01	130	60	A	H
		2372.72	44.65	-29.35	74	41.04	27.37	4.72	28.48	206	96	P	V
		2386.86	34.63	-19.37	54	30.9	27.43	4.78	28.48	206	96	A	V
	*	2437	101.98	-	-	97.79	27.61	4.82	28.24	206	96	P	V
	*	2437	98.92	-	-	94.73	27.61	4.82	28.24	206	96	A	V
		2488.38	45.91	-28.09	74	41.27	27.8	4.85	28.01	206	96	P	V
		2487.19	35.11	-18.89	54	30.53	27.74	4.85	28.01	206	96	A	V

802.11b CH 11 2462MHz	*	2462	105.48	-	-	101.11	27.68	4.82	28.13	132	57	P	H
	*	2462	102.35	-	-	97.98	27.68	4.82	28.13	132	57	A	H
		2485.08	46.78	-27.22	74	42.2	27.74	4.85	28.01	132	57	P	H
		2484.48	36.64	-17.36	54	32.06	27.74	4.85	28.01	132	57	A	H
	*	2462	102.78	-	-	98.41	27.68	4.82	28.13	137	92	P	V
	*	2462	98.7	-	-	94.33	27.68	4.82	28.13	137	92	A	V
		2493.28	46.31	-27.69	74	41.56	27.8	4.85	27.9	137	92	P	V
		2484.52	35.71	-18.29	54	31.13	27.74	4.85	28.01	137	92	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 12 2467MHz	*	2467	105.12	-	-	100.6	27.68	4.85	28.01	106	132	P	H
	*	2467	102.03	-	-	97.51	27.68	4.85	28.01	106	132	A	H
		2483.8	47.59	-26.41	74	43.01	27.74	4.85	28.01	106	132	P	H
		2485.16	38.64	-15.36	54	34.06	27.74	4.85	28.01	106	132	A	H
	*	2467	102.2	-	-	97.68	27.68	4.85	28.01	127	92	P	V
	*	2467	98.16	-	-	93.64	27.68	4.85	28.01	127	92	A	V
		2492.08	46.94	-27.06	74	42.19	27.8	4.85	27.9	127	92	P	V
		2485.28	37.55	-16.45	54	32.97	27.74	4.85	28.01	127	92	A	V
802.11b CH 13 2472MHz	*	2472	105.2	-	-	100.62	27.74	4.85	28.01	107	131	P	H
	*	2472	102.04	-	-	97.46	27.74	4.85	28.01	107	131	A	H
		2483.76	53.77	-20.23	74	49.19	27.74	4.85	28.01	107	131	P	H
		2483.52	47.96	-6.04	54	43.38	27.74	4.85	28.01	107	131	A	H
	*	2472	102.06	-	-	97.48	27.74	4.85	28.01	132	93	P	V
	*	2472	98.93	-	-	94.35	27.74	4.85	28.01	132	93	A	V
		2483.56	51.93	-22.07	74	47.35	27.74	4.85	28.01	132	93	P	V
		2483.52	45.83	-8.17	54	41.25	27.74	4.85	28.01	132	93	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	46.08	-27.92	74	67.23	31.49	5.55	58.19	150	0	P	H
		4824	44.74	-29.26	74	65.89	31.49	5.55	58.19	150	0	P	V
802.11b CH 06 2437MHz		4874	41.98	-32.02	74	62.82	31.61	5.65	58.1	150	0	P	H
		7311	44.69	-29.31	74	59.18	36.17	7.26	57.92	150	0	P	H
		4874	40.89	-33.11	74	61.73	31.61	5.65	58.1	150	0	P	V
		7311	45.78	-28.22	74	60.27	36.17	7.26	57.92	150	0	P	V
802.11b CH 11 2462MHz		4924	42.73	-31.27	74	63.16	31.73	5.86	58.02	150	0	P	H
		7386	43.77	-30.23	74	57.94	36.28	7.2	57.65	150	0	P	H
		4924	42.65	-31.35	74	63.08	31.73	5.86	58.02	150	0	P	V
		7386	44.94	-29.06	74	59.11	36.28	7.2	57.65	150	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 12 2467MHz		4934	41.66	-32.34	74	62.09	31.73	5.86	58.02	151	360	P	H
		7401	43.69	-30.31	74	57.79	36.3	7.2	57.6	151	360	P	H
		4934	41.67	-32.33	74	62.1	31.73	5.86	58.02	151	360	P	V
		7401	45.02	-28.98	74	59.12	36.3	7.2	57.6	151	360	P	V
802.11b CH 13 2472MHz		4944	42.49	-31.51	74	62.84	31.78	5.86	57.99	152	360	P	H
		7416	43.19	-30.81	74	57.32	36.3	7.17	57.6	152	360	P	H
		4944	41.18	-32.82	74	61.53	31.78	5.86	57.99	152	360	P	V
		7416	43.28	-30.72	74	57.41	36.3	7.17	57.6	152	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.275	56.92	-17.08	74	53.19	27.43	4.78	28.48	135	61	P	H
		2389.8	43.83	-10.17	54	39.98	27.43	4.78	28.36	135	61	A	H
	*	2412	105.52	-	-	101.61	27.49	4.78	28.36	135	61	P	H
	*	2412	97.88	-	-	93.97	27.49	4.78	28.36	135	61	P	H
		2389.695	54.17	-19.83	74	50.44	27.43	4.78	28.48	176	92	P	V
		2389.8	42.16	-11.84	54	38.31	27.43	4.78	28.36	176	92	A	V
	*	2412	104.73	-	-	100.82	27.49	4.78	28.36	176	92	P	V
	*	2412	96.26	-	-	92.35	27.49	4.78	28.36	176	92	A	V
802.11g CH 06 2437MHz		2383.5	48.21	-25.79	74	44.6	27.37	4.72	28.48	106	62	P	H
		2389.38	39.03	-14.97	54	35.3	27.43	4.78	28.48	106	62	A	H
	*	2437	105.67	-	-	101.48	27.61	4.82	28.24	106	62	P	H
	*	2437	98.02	-	-	93.83	27.61	4.82	28.24	106	62	A	H
		2484.67	48.61	-25.39	74	44.03	27.74	4.85	28.01	106	62	P	H
		2484.88	39.69	-14.31	54	35.11	27.74	4.85	28.01	106	62	A	H
		2389.94	47.05	-26.95	74	43.2	27.43	4.78	28.36	171	91	P	V
		2389.94	37.68	-16.32	54	33.83	27.43	4.78	28.36	171	91	A	V
	*	2437	104.19	-	-	100	27.61	4.82	28.24	171	91	P	V
	*	2437	96.59	-	-	92.4	27.61	4.82	28.24	171	91	A	V
		2485.16	49.33	-24.67	74	44.75	27.74	4.85	28.01	171	91	P	V
		2483.69	39.48	-14.52	54	34.9	27.74	4.85	28.01	171	91	A	V

802.11g CH 11 2462MHz	*	2462	106.75	-	-	102.38	27.68	4.82	28.13	157	58	P	H
	*	2462	98.86	-	-	94.49	27.68	4.82	28.13	157	58	A	H
		2483.76	61.78	-12.22	74	57.2	27.74	4.85	28.01	157	58	P	H
		2483.52	45.93	-8.07	54	41.35	27.74	4.85	28.01	157	58	A	H
	*	2462	106.04	-	-	101.67	27.68	4.82	28.13	195	95	P	V
	*	2462	98.16	-	-	93.79	27.68	4.82	28.13	195	95	A	V
		2484.04	57.65	-16.35	74	53.07	27.74	4.85	28.01	195	95	P	V
		2483.52	45.3	-8.7	54	40.72	27.74	4.85	28.01	195	95	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 12 2467MHz	*	2467	104.78	-	-	100.26	27.68	4.85	28.01	105	131	P	H
	*	2467	97.51	-	-	92.99	27.68	4.85	28.01	105	131	A	H
		2484.44	67.45	-6.55	74	62.87	27.74	4.85	28.01	105	131	P	H
		2483.52	53.13	-0.87	54	48.55	27.74	4.85	28.01	105	131	A	H
	*	2467	103.39	-	-	98.87	27.68	4.85	28.01	131	93	P	V
	*	2467	95.75	-	-	91.23	27.68	4.85	28.01	131	93	A	V
		2485.16	65.74	-8.26	74	61.16	27.74	4.85	28.01	131	93	P	V
		2483.52	50.47	-3.53	54	45.89	27.74	4.85	28.01	131	93	A	V
802.11g CH 13 2472MHz	*	2472	102.6	-	-	98.02	27.74	4.85	28.01	105	131	P	H
	*	2472	94.88	-	-	90.3	27.74	4.85	28.01	105	131	A	H
		2484	69.39	-4.61	74	64.81	27.74	4.85	28.01	105	131	P	H
		2484.04	53.24	-0.76	54	48.66	27.74	4.85	28.01	105	131	A	H
	*	2472	100.63	-	-	96.05	27.74	4.85	28.01	103	91	P	V
	*	2472	93.01	-	-	88.43	27.74	4.85	28.01	103	91	A	V
		2484.04	67.95	-6.05	74	63.37	27.74	4.85	28.01	103	91	P	V
		2483.64	50.8	-3.2	54	46.22	27.74	4.85	28.01	103	91	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	42.61	-31.39	74	63.76	31.49	5.55	58.19	150	0	P	H
		4824	42.93	-31.07	74	64.08	31.49	5.55	58.19	150	0	P	V
802.11g CH 06 2437MHz		4874	40.31	-33.69	74	61.15	31.61	5.65	58.1	150	0	P	H
		7311	48.31	-25.69	74	62.8	36.17	7.26	57.92	150	0	P	H
		4874	38.99	-35.01	74	59.83	31.61	5.65	58.1	150	0	P	V
		7311	50.69	-23.31	74	65.18	36.17	7.26	57.92	150	0	P	V
802.11g CH 11 2462MHz		4924	41.64	-32.36	74	62.07	31.73	5.86	58.02	150	0	P	H
		7386	46.52	-27.48	74	60.69	36.28	7.2	57.65	150	0	P	H
		4924	41.43	-32.57	74	61.86	31.73	5.86	58.02	150	0	P	V
		7386	50.27	-23.73	74	64.44	36.28	7.2	57.65	150	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 12 2467MHz		4934	38.25	-35.75	74	58.68	31.73	5.86	58.02	150	360	P	H
		7401	43.84	-30.16	74	57.94	36.3	7.2	57.6	150	360	P	H
		4934	36.7	-37.3	74	57.13	31.73	5.86	58.02	150	360	P	V
		7401	44.67	-29.33	74	58.77	36.3	7.2	57.6	150	360	P	V
802.11g CH 13 2472MHz		4944	38.96	-35.04	74	59.31	31.78	5.86	57.99	160	360	P	H
		7416	44.98	-29.02	74	59.11	36.3	7.17	57.6	160	360	P	H
		4944	37.87	-36.13	74	58.22	31.78	5.86	57.99	160	360	P	V
		7416	46.5	-27.5	74	60.63	36.3	7.17	57.6	160	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2389.8	63	-11	74	59.15	27.43	4.78	28.36	111	130	P	H
		2389.695	49.04	-4.96	54	45.31	27.43	4.78	28.48	111	130	A	H
	*	2412	106.13	-	-	102.22	27.49	4.78	28.36	111	130	P	H
	*	2412	98.32	-	-	94.41	27.49	4.78	28.36	111	130	A	H
		2389.695	62.72	-11.28	74	58.99	27.43	4.78	28.48	126	89	P	V
		2389.8	47.89	-6.11	54	44.04	27.43	4.78	28.36	126	89	A	V
	*	2412	103.61	-	-	99.7	27.49	4.78	28.36	126	89	P	V
	*	2412	95.93	-	-	92.02	27.49	4.78	28.36	126	89	A	V
802.11n HT20 CH 06 2437MHz		2383.78	49.63	-24.37	74	46.02	27.37	4.72	28.48	107	130	P	H
		2389.8	39.99	-14.01	54	36.14	27.43	4.78	28.36	107	130	A	H
	*	2437	106.42	-	-	102.23	27.61	4.82	28.24	107	130	P	H
	*	2437	98.59	-	-	94.4	27.61	4.82	28.24	107	130	A	H
		2484.6	50.79	-23.21	74	46.21	27.74	4.85	28.01	107	130	P	H
		2483.55	40.29	-13.71	54	35.71	27.74	4.85	28.01	107	130	A	H
		2381.26	47.97	-26.03	74	44.36	27.37	4.72	28.48	111	90	P	V
		2389.8	38.61	-15.39	54	34.76	27.43	4.78	28.36	111	90	A	V
	*	2437	104.13	-	-	99.94	27.61	4.82	28.24	111	90	P	V
	*	2437	96.96	-	-	92.77	27.61	4.82	28.24	111	90	A	V
		2487.89	48.37	-25.63	74	43.73	27.8	4.85	28.01	111	90	P	V
		2483.5	38.75	-15.25	54	34.17	27.74	4.85	28.01	111	90	A	V

802.11n HT20 CH 11 2462MHz	*	2462	106.55	-	-	102.18	27.68	4.82	28.13	126	130	P	H
	*	2462	97.89	-	-	93.52	27.68	4.82	28.13	126	130	A	H
		2483.64	64.21	-9.79	74	59.63	27.74	4.85	28.01	126	130	P	H
		2483.72	48.65	-5.35	54	44.07	27.74	4.85	28.01	126	130	A	H
	*	2462	104.24	-	-	99.84	27.68	4.85	28.13	347	91	P	V
	*	2462	96.67	-	-	92.3	27.68	4.82	28.13	347	91	A	V
		2483.76	63.49	-10.51	74	58.91	27.74	4.85	28.01	347	91	P	V
		2483.56	47.43	-6.57	54	42.85	27.74	4.85	28.01	347	91	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 12 2467MHz	*	2467	104.06	-	-	99.54	27.68	4.85	28.01	207	59	P	H
	*	2467	96.55	-	-	92.03	27.68	4.85	28.01	207	59	A	H
		2484.48	69.29	-4.71	74	64.71	27.74	4.85	28.01	207	59	P	H
		2483.64	52.26	-1.74	54	47.68	27.74	4.85	28.01	207	59	A	H
	*	2467	103.8	-	-	99.4	27.68	4.85	28.13	198	83	P	V
	*	2467	96.2	-	-	91.8	27.68	4.85	28.13	198	83	A	V
		2484.72	66.28	-7.72	74	61.7	27.74	4.85	28.01	198	83	P	V
		2483.68	51.87	-2.13	54	47.29	27.74	4.85	28.01	198	83	A	V
802.11n HT20 CH 13 2472MHz	*	2472	102.6	-	-	98.02	27.74	4.85	28.01	135	60	P	H
	*	2472	94.49	-	-	89.91	27.74	4.85	28.01	135	60	A	H
		2483.6	70.03	-3.97	74	65.45	27.74	4.85	28.01	135	60	P	H
		2484.48	53.1	-0.9	54	48.52	27.74	4.85	28.01	135	60	A	H
	*	2472	100.01	-	-	95.43	27.74	4.85	28.01	116	104	P	V
	*	2472	93.12	-	-	88.54	27.74	4.85	28.01	116	104	A	V
		2483.72	67.83	-6.17	74	63.25	27.74	4.85	28.01	116	104	P	V
		2483.68	51.5	-2.5	54	46.92	27.74	4.85	28.01	116	104	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4824	42.5	-31.5	74	63.65	31.49	5.55	58.19	150	0	P	H
		4824	41.9	-32.1	74	63.05	31.49	5.55	58.19	150	0	P	V
802.11n HT20 CH 06 2437MHz		4874	41.05	-32.95	74	61.89	31.61	5.65	58.1	150	0	P	H
		7311	50.41	-23.59	74	64.9	36.17	7.26	57.92	150	0	P	H
		4874	41.42	-32.58	74	62.26	31.61	5.65	58.1	150	0	P	V
		7311	51.39	-22.61	74	65.88	36.17	7.26	57.92	150	230	P	V
		7311	43.29	-10.71	54	57.78	36.17	7.26	57.92	150	230	A	V
802.11n HT20 CH 11 2462MHz		4924	42.3	-31.7	74	62.73	31.73	5.86	58.02	150	0	P	H
		7386	47.51	-26.49	74	61.68	36.28	7.2	57.65	150	0	P	H
		4924	39.43	-34.57	74	59.86	31.73	5.86	58.02	150	0	P	V
		7386	47.96	-26.04	74	62.13	36.28	7.2	57.65	150	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		4934	37.78	-36.22	74	58.21	31.73	5.86	58.02	150	355	P	H
HT20		7401	43.11	-30.89	74	57.21	36.3	7.2	57.6	150	355	P	H
CH 12		4934	37.37	-36.63	74	57.8	31.73	5.86	58.02	151	350	P	V
2467MHz		7401	44.74	-29.26	74	58.84	36.3	7.2	57.6	151	350	P	V
802.11n		4944	38.52	-35.48	74	58.87	31.78	5.86	57.99	160	360	P	H
HT20		7416	44.21	-29.79	74	58.34	36.3	7.17	57.6	160	360	P	H
CH 13		4944	37.99	-36.01	74	58.34	31.78	5.86	57.99	155	360	P	V
2472MHz		7416	43.61	-30.39	74	57.74	36.3	7.17	57.6	155	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2.4GHz 802.11g LF		30.97	25.74	-14.26	40	33.01	24.43	0.27	31.97	-	-	P	H
		124.09	21.51	-21.99	43.5	34.46	17.52	1.16	31.63	-	-	P	H
		260.86	23.19	-22.81	46	32.36	20.33	1.74	31.24	-	-	P	H
		701.24	29.57	-16.43	46	31.18	26.72	2.93	31.26	-	-	P	H
		791.45	31.38	-14.62	46	31.07	28.34	3.14	31.17	-	-	P	H
		919.49	33.4	-12.6	46	31.67	29.53	3.42	31.22	100	257	P	H
		33.88	27.84	-12.16	40	36.45	23.02	0.34	31.97	100	21	P	V
		49.4	26.83	-13.17	40	43.15	15.02	0.61	31.95	-	-	P	V
		96.93	22.71	-20.79	43.5	37.5	15.91	1.04	31.74	-	-	P	V
		204.6	21.55	-21.95	43.5	35.95	15.3	1.62	31.32	-	-	P	V
		547.01	26.81	-19.19	46	30.67	24.84	2.55	31.25	-	-	P	V
		862.26	32.13	-13.87	46	31.02	29	3.29	31.18	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

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

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

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

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

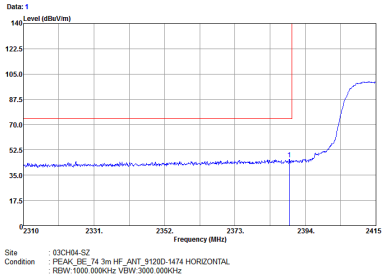
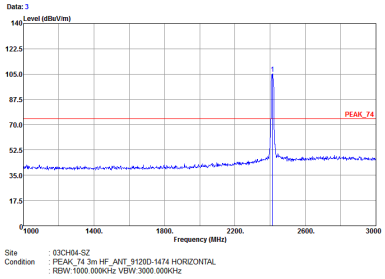
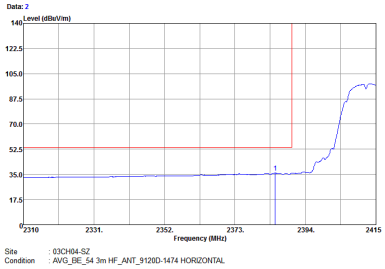
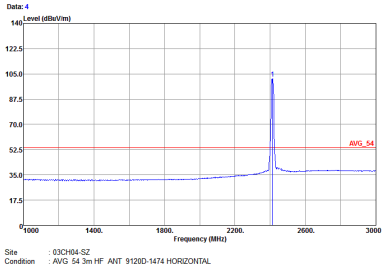
Appendix C. Radiated Spurious Emission Plots

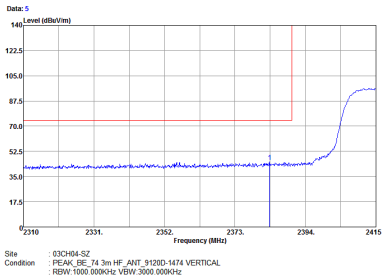
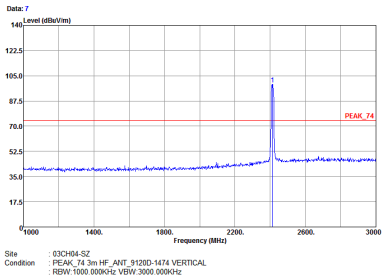
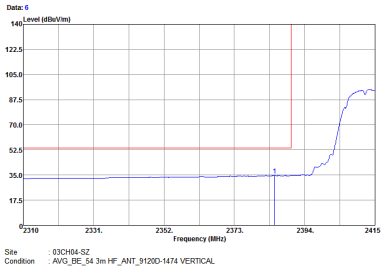
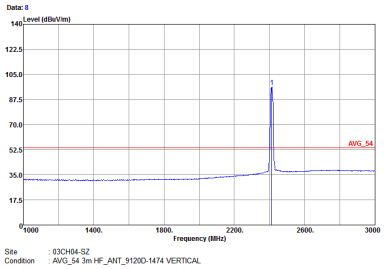
Note symbol

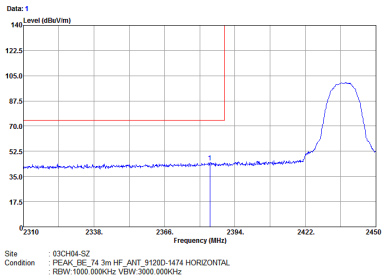
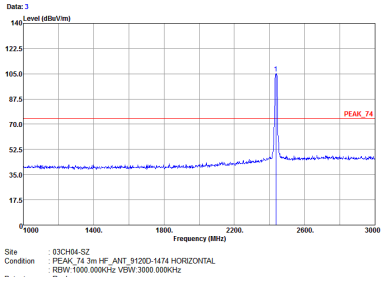
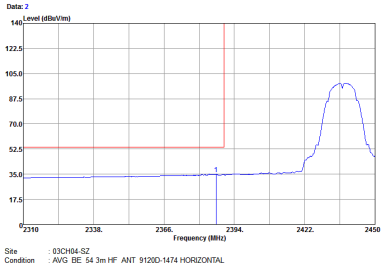
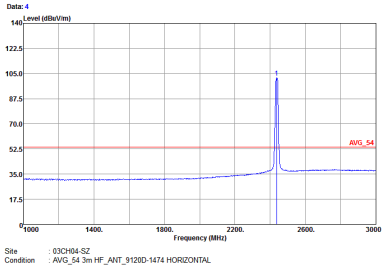
-L	**Low channel location**
-R	**High channel location**

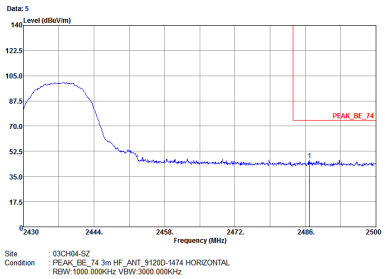
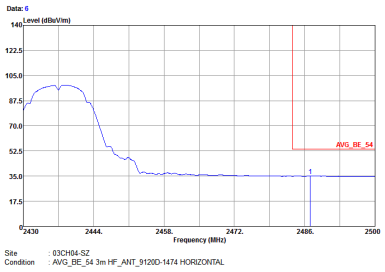
2.4GHz 2400~2483.5MHz

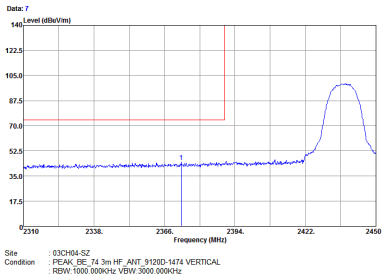
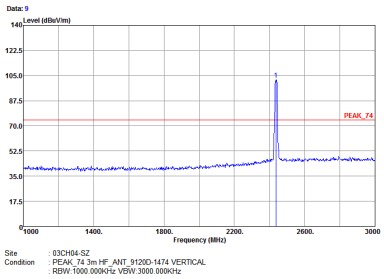
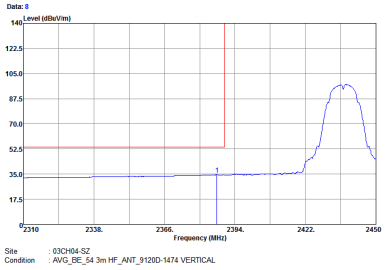
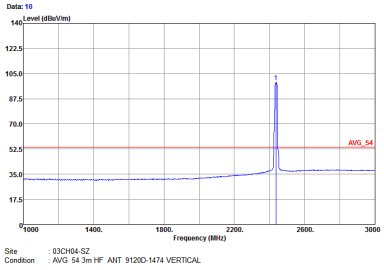
WIFI 802.11b (Band Edge @ 3m)

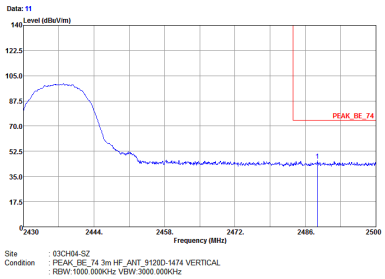
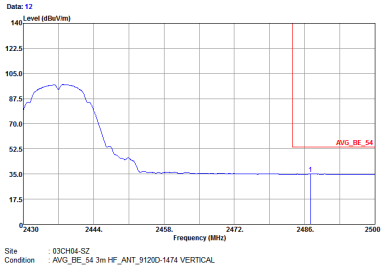
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

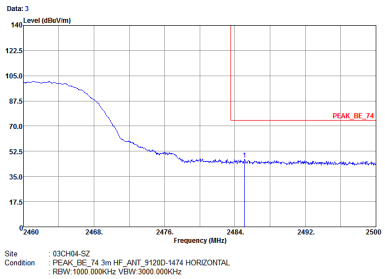
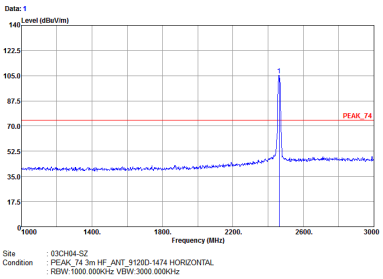
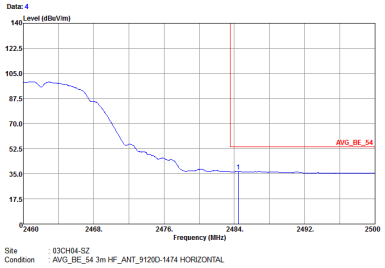
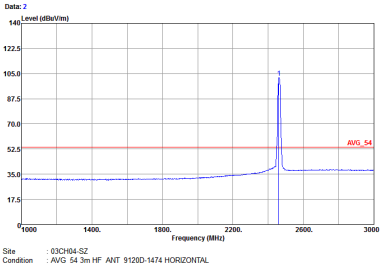
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

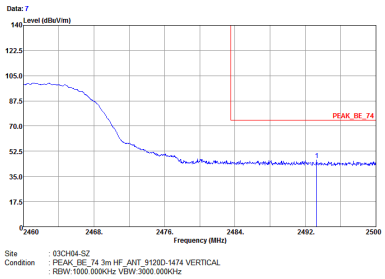
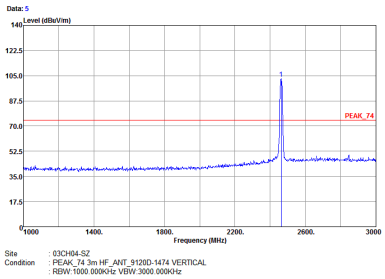
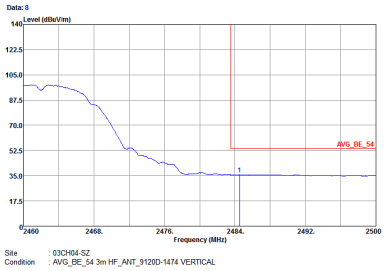
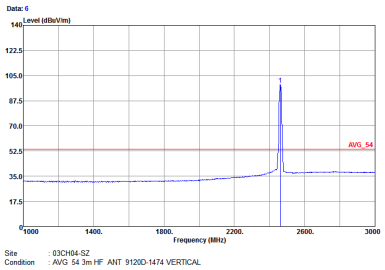
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

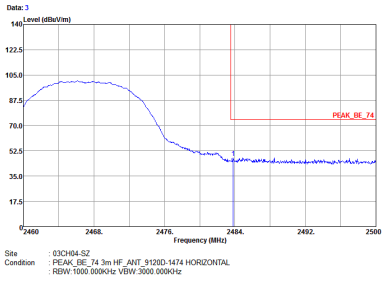
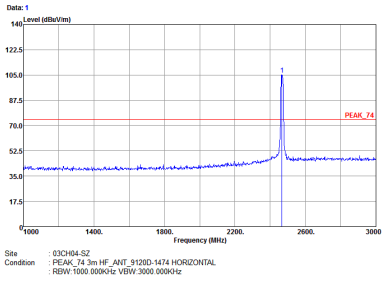
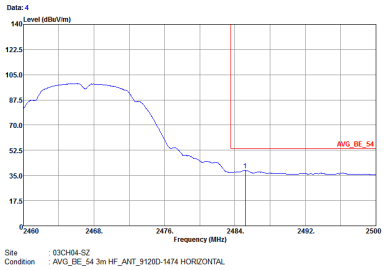
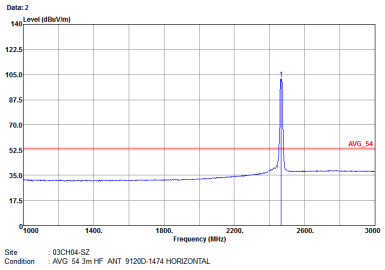
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	
Peak		
Avg.		

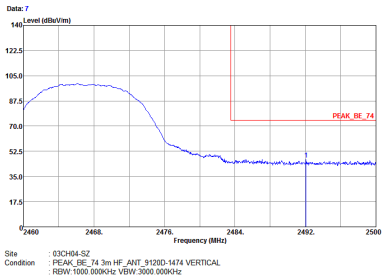
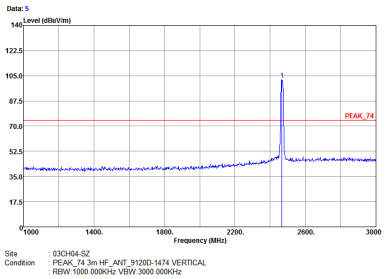
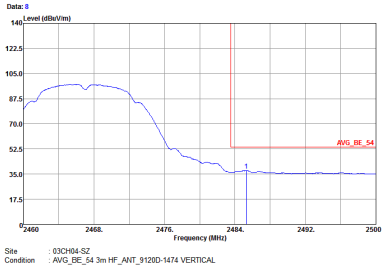
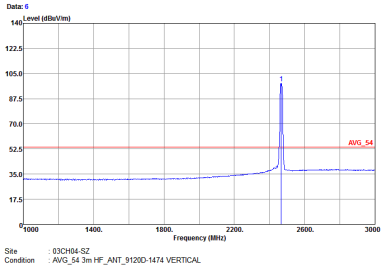
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

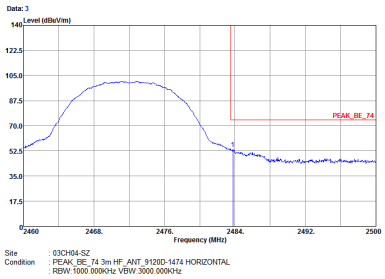
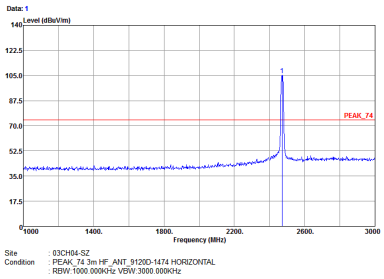
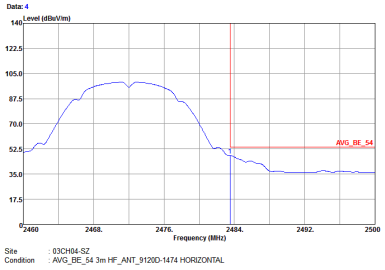
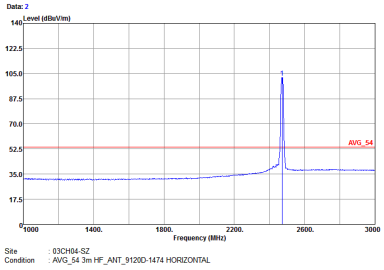
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	
Peak		
Avg.		

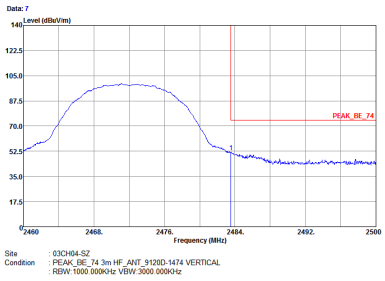
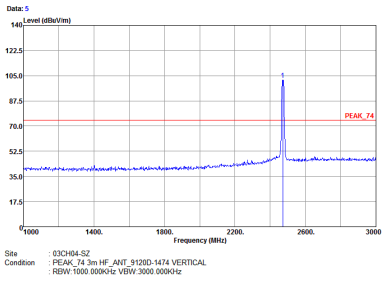
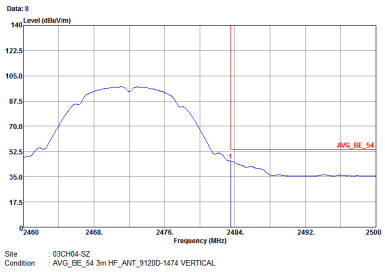
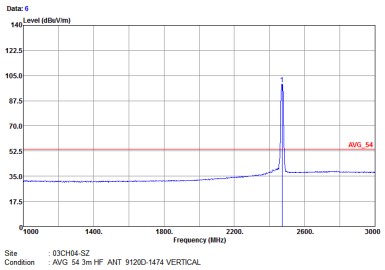
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH12 2467MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

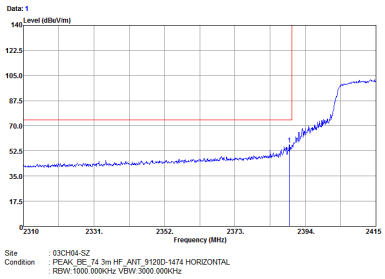
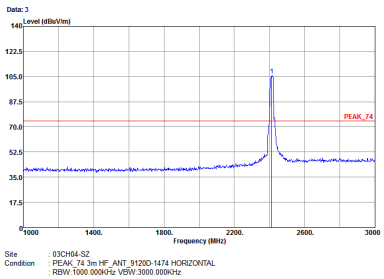
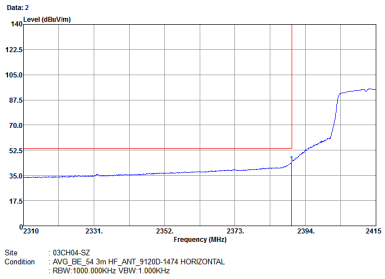
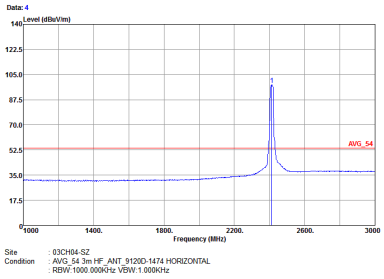
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH12 2467MHz	
1	Vertical	Fundamental
Peak		
Avg.		

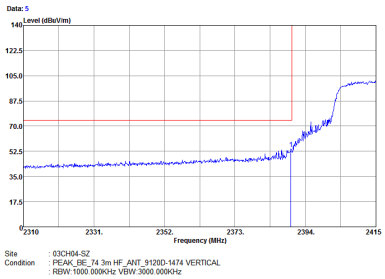
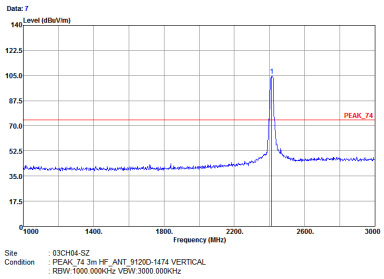
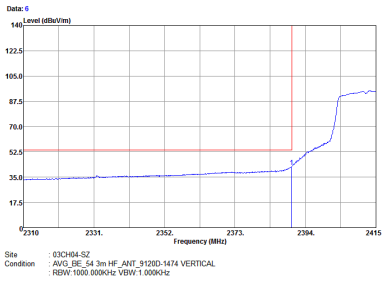
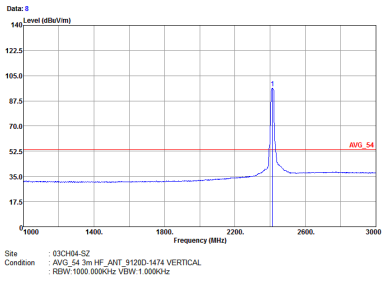
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH13 2472MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

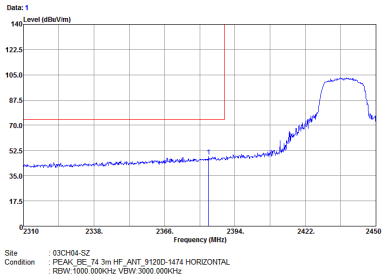
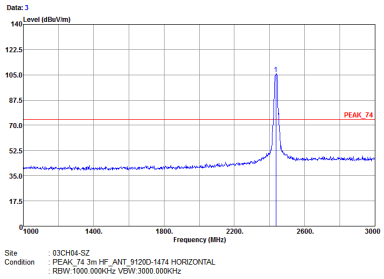
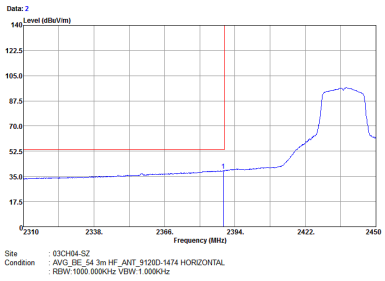
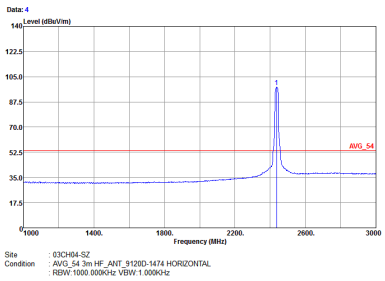
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH13 2472MHz	
1	Vertical	Fundamental
Peak		
Avg.		

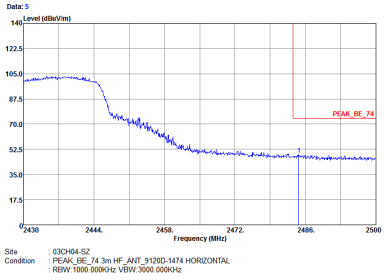
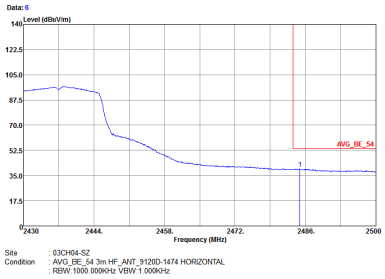
2.4GHz 2400~2483.5MHz

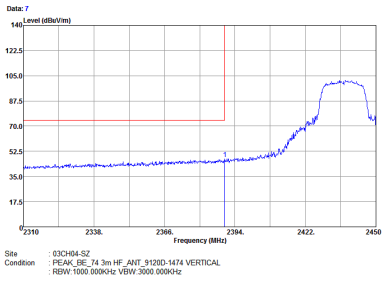
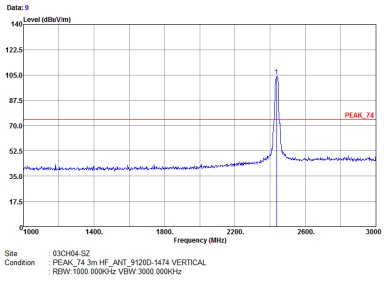
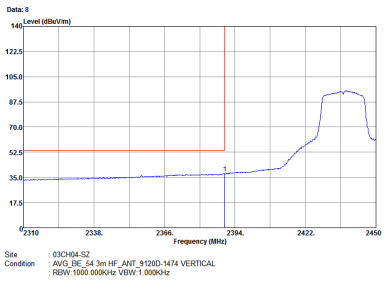
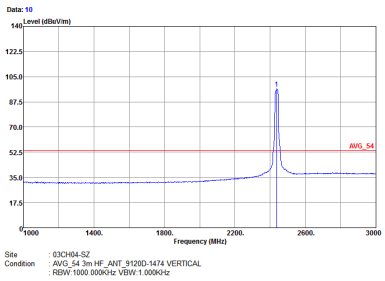
WIFI 802.11g (Band Edge @ 3m)

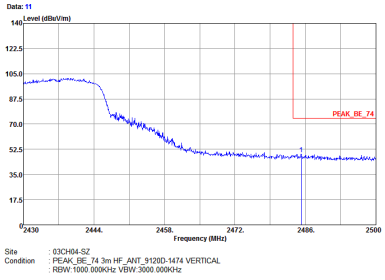
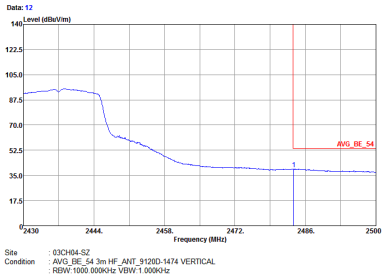
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

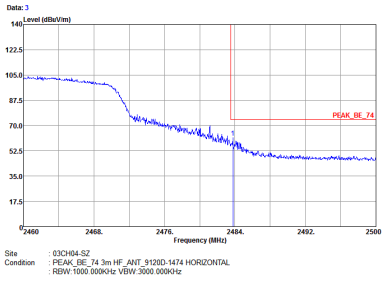
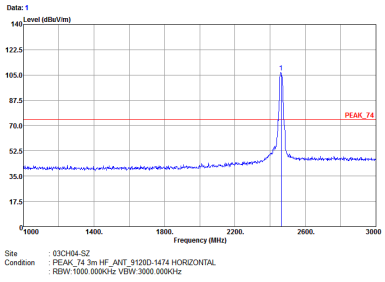
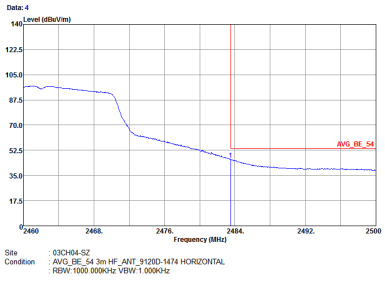
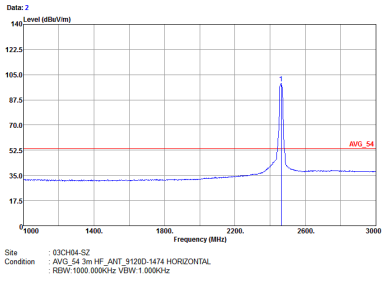
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

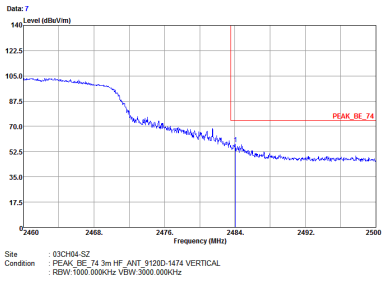
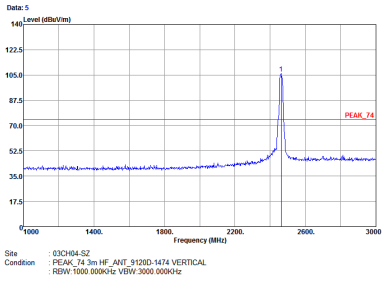
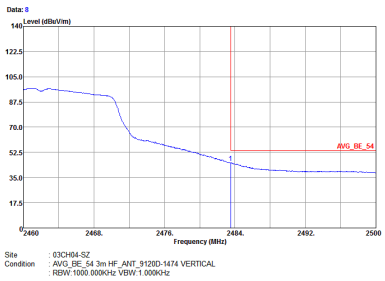
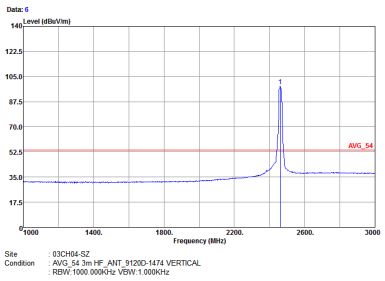
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

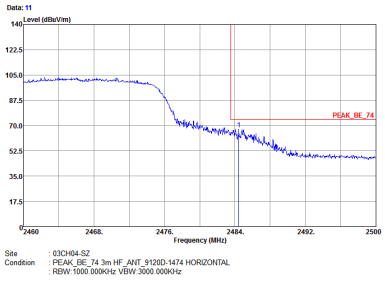
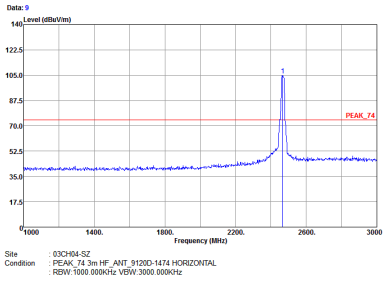
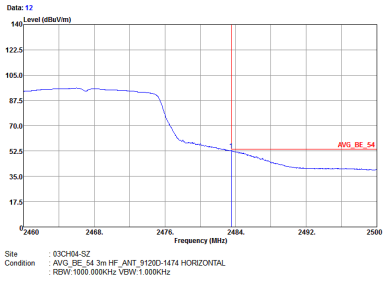
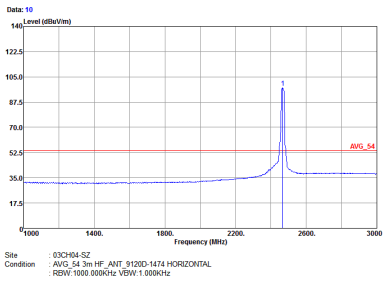
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	
Peak		
Avg.		

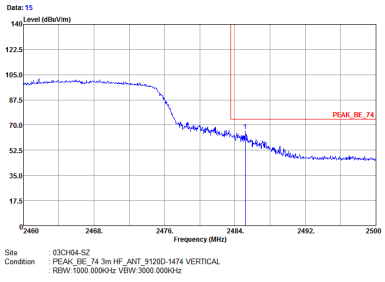
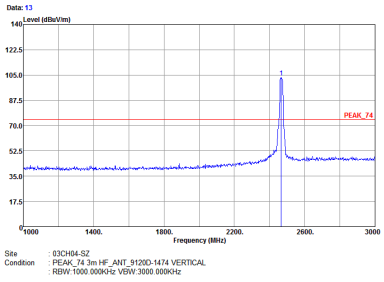
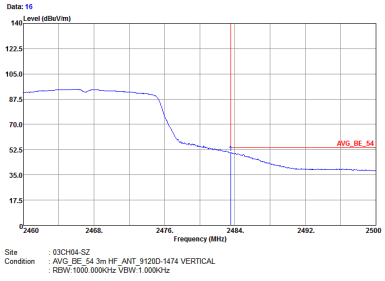
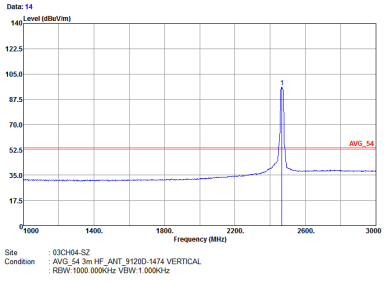
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

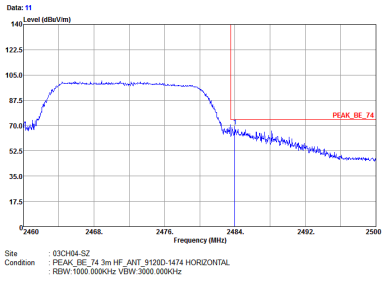
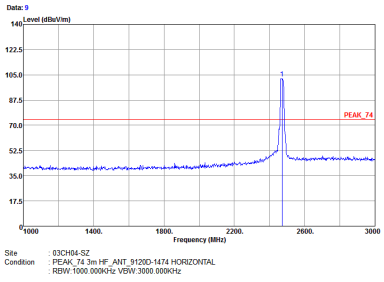
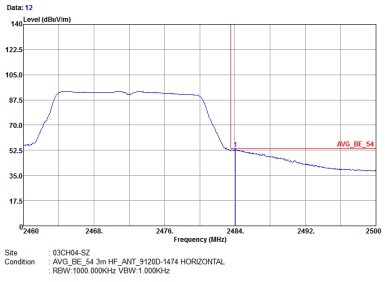
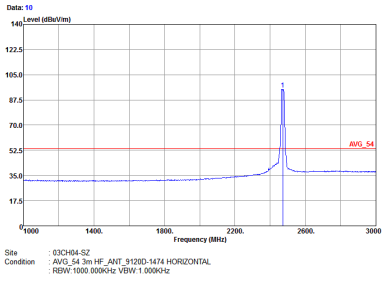
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	
Peak		
Avg.		

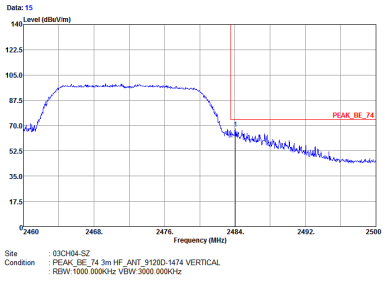
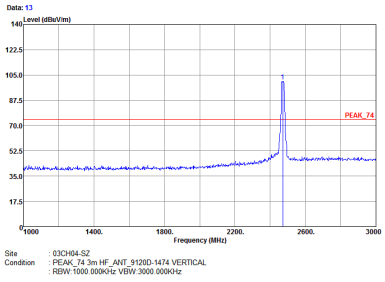
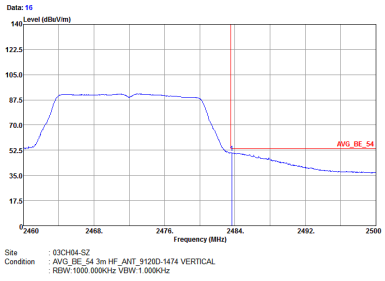
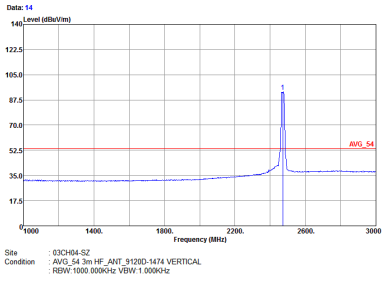
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH12 2467MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

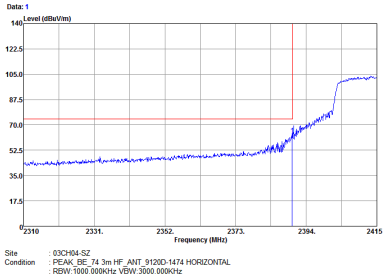
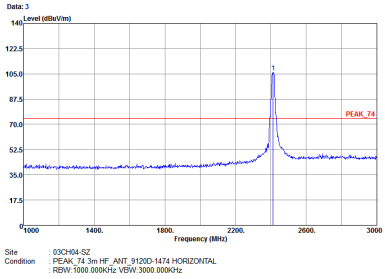
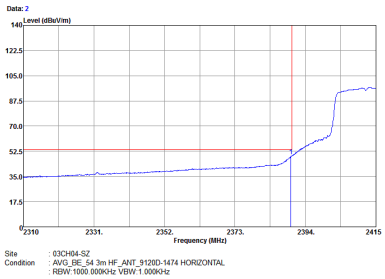
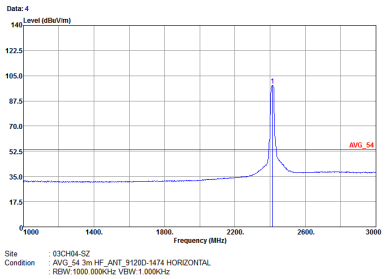
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH12 2467MHz	
1	Vertical	Fundamental
Peak		
Avg.		

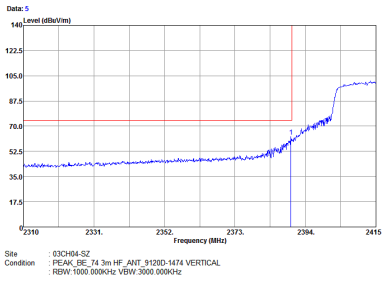
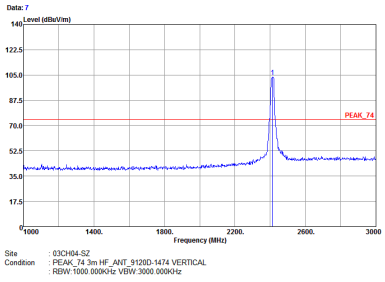
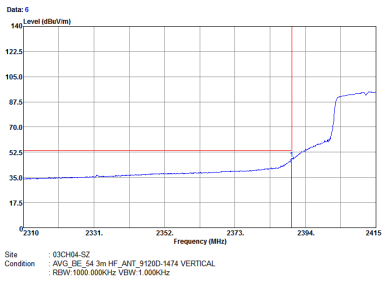
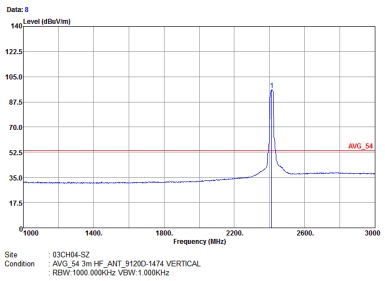
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH13 2472MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

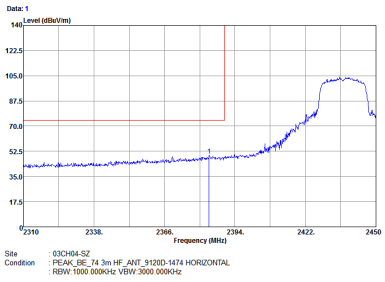
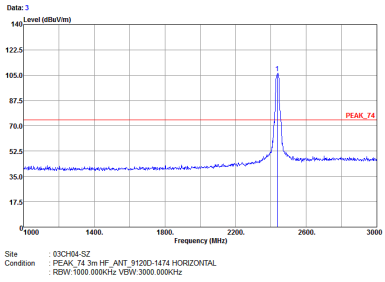
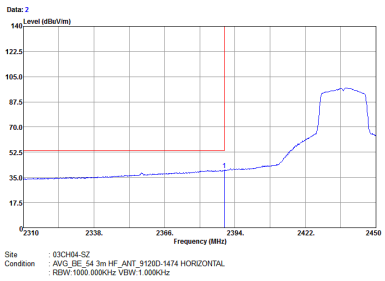
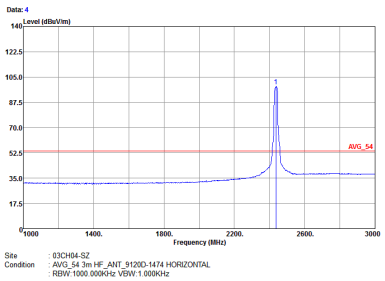
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH13 2472MHz	
1	Vertical	Fundamental
Peak		
Avg.		

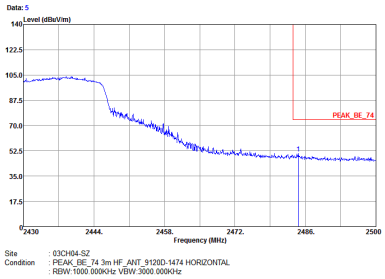
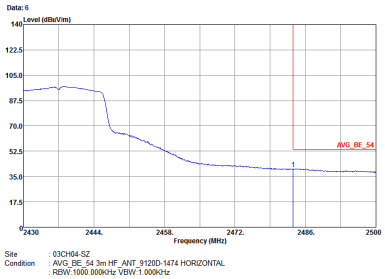
2.4GHz 2400~2483.5MHz

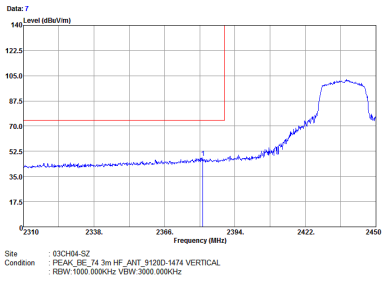
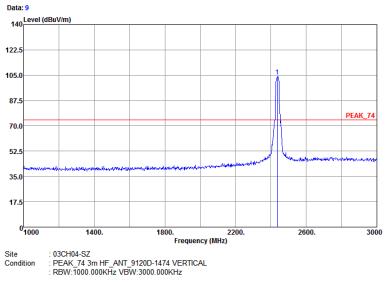
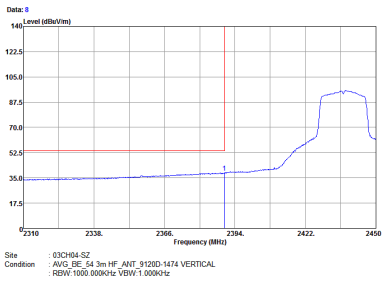
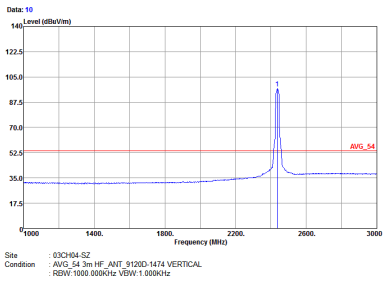
WIFI 802.11n HT20 (Band Edge @ 3m)

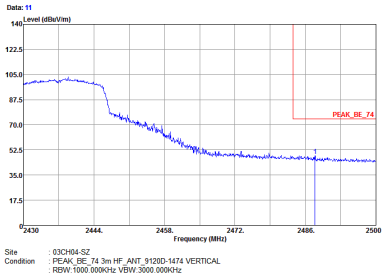
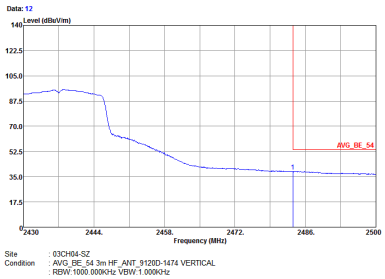
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

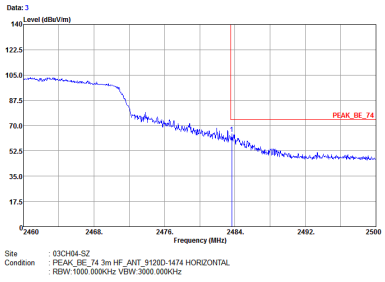
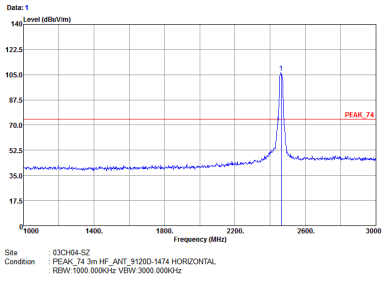
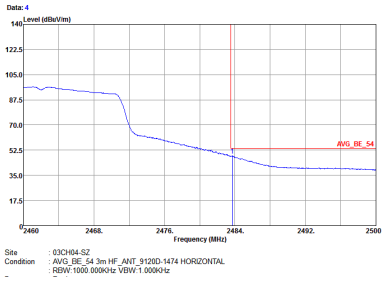
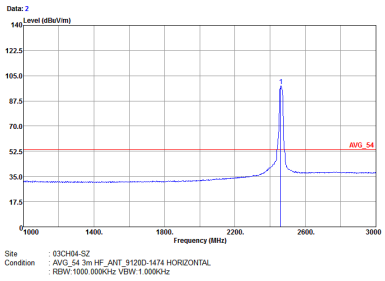
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

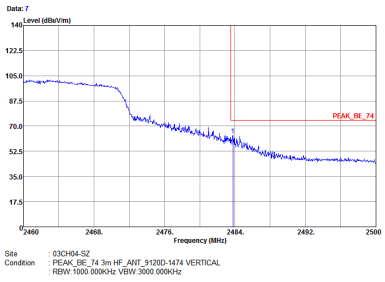
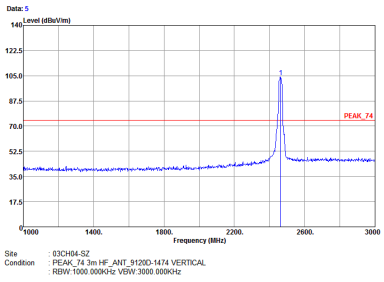
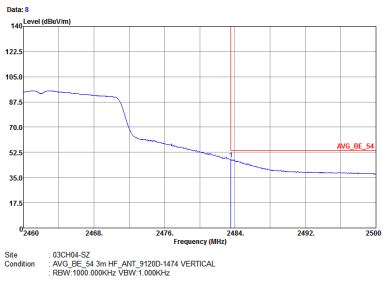
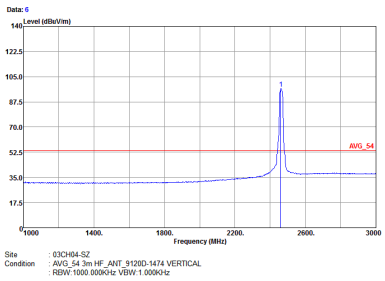
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

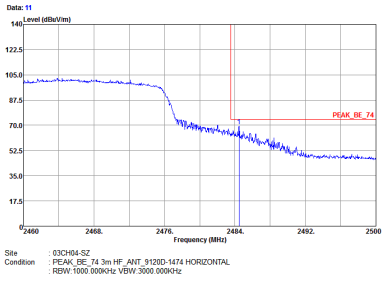
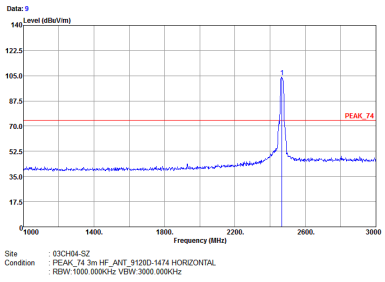
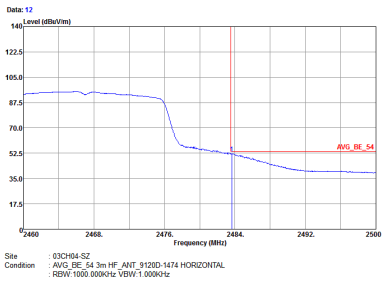
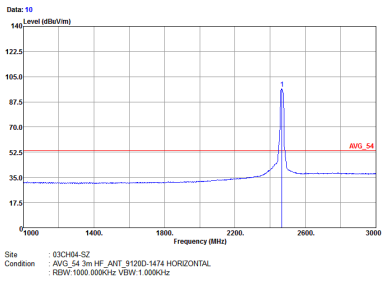
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	
Peak		
Avg.		

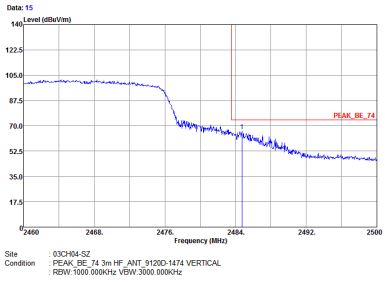
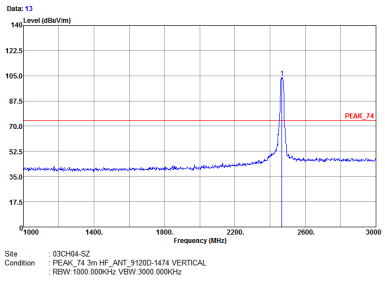
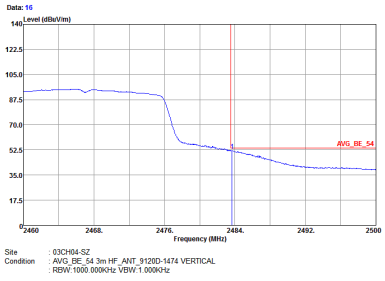
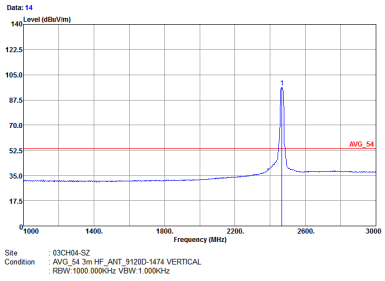
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

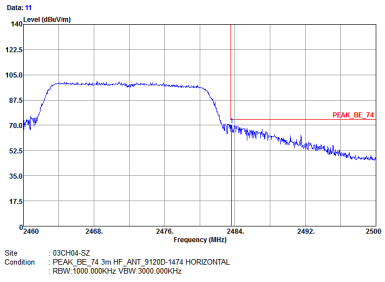
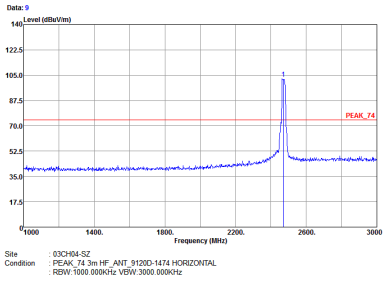
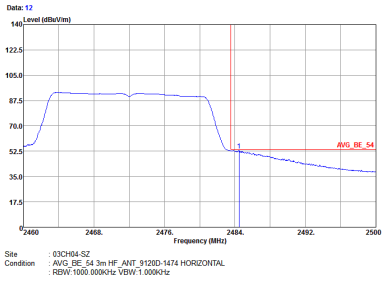
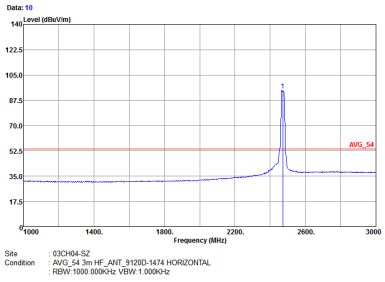
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	
Peak		
Avg.		

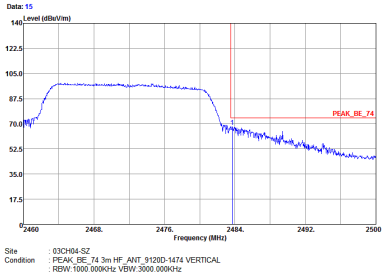
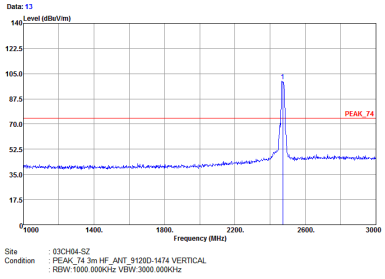
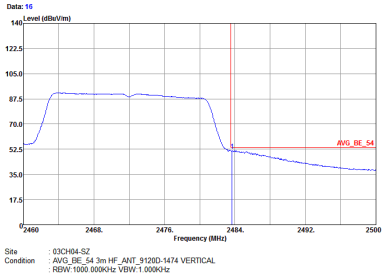
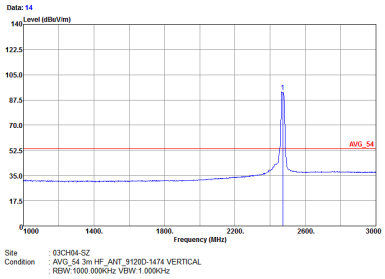
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH12 2467MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

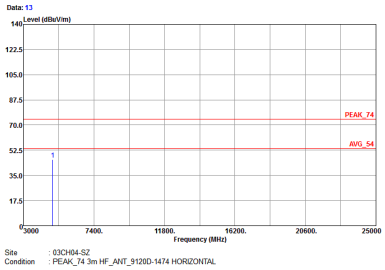
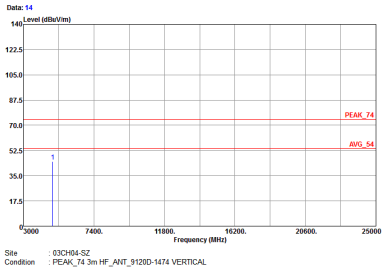
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH12 2467MHz	
1	Vertical	Fundamental
Peak		
Avg.		

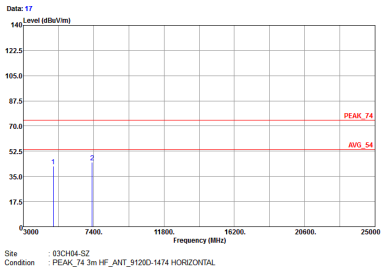
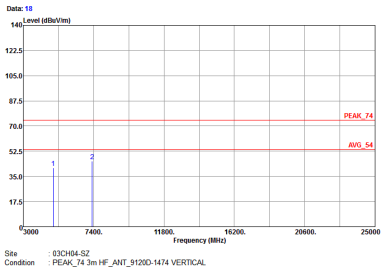
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH13 2472MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

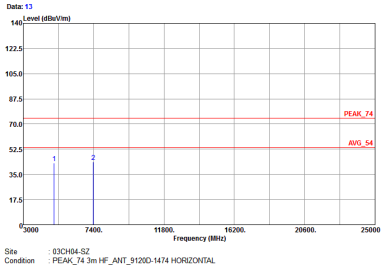
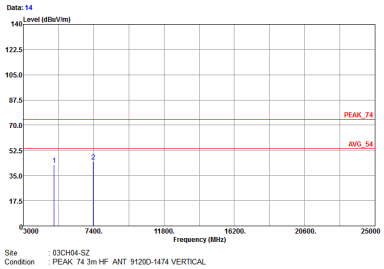
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH13 2472MHz	
1	Vertical	Fundamental
Peak		
Avg.		

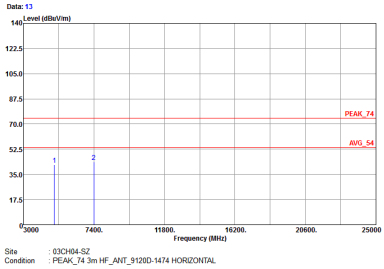
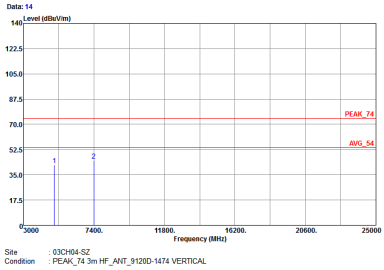
2.4GHz 2400~2483.5MHz

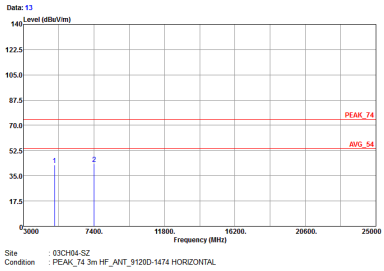
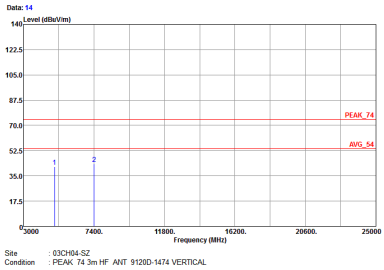
WIFI 802.11b (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

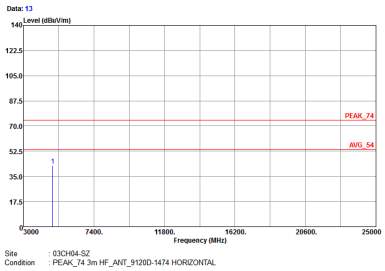
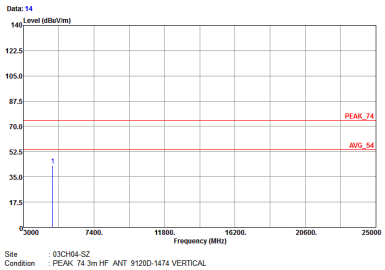
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

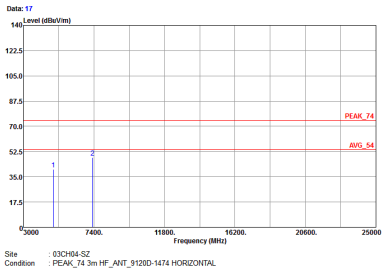
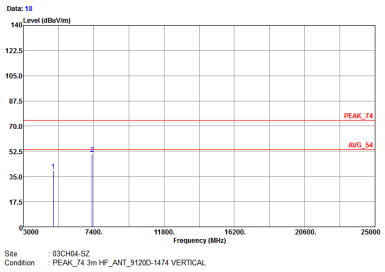
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH12 2467MHz	
1	Horizontal	Vertical
Peak Avg.		

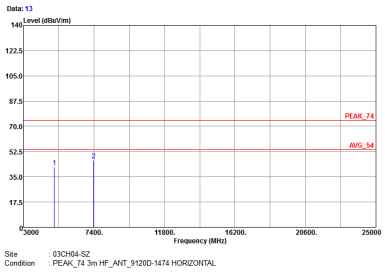
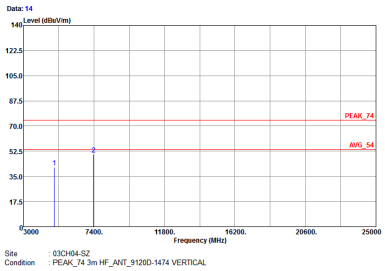
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH13 2472MHz	
1	Horizontal	Vertical
Peak Avg.		

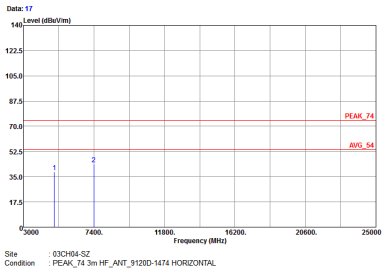
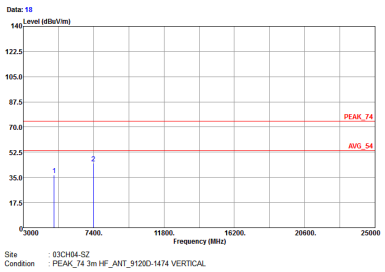
2.4GHz 2400~2483.5MHz

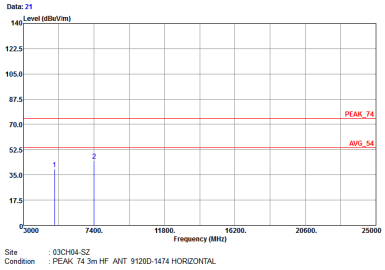
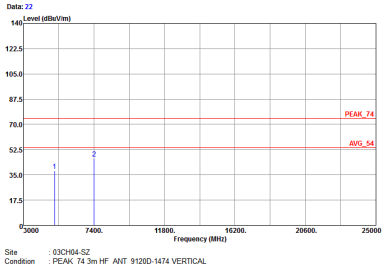
WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

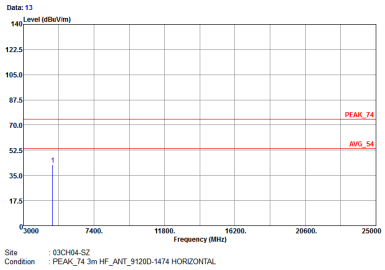
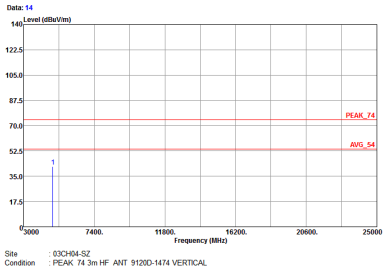
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

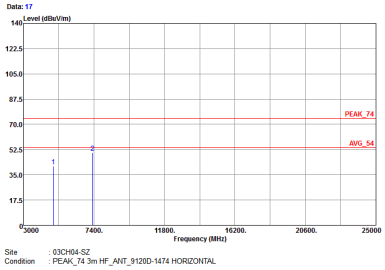
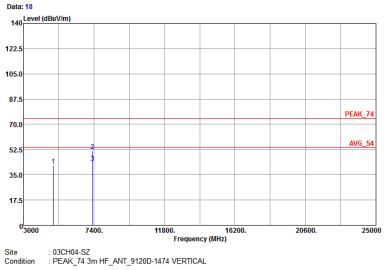
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH12 2467MHz	
1	Horizontal	Vertical
Peak Avg.		

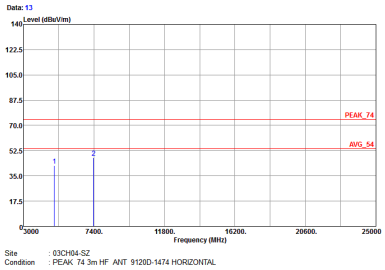
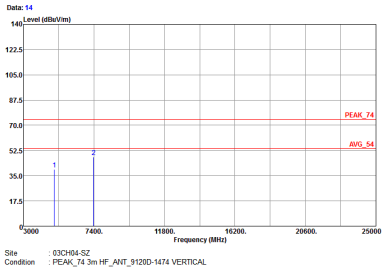
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH13 2472MHz	
1	Horizontal	Vertical
Peak Avg.		

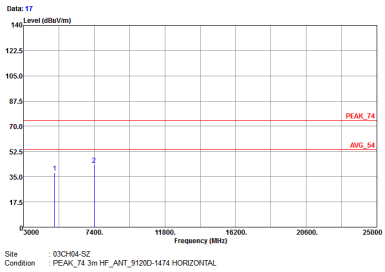
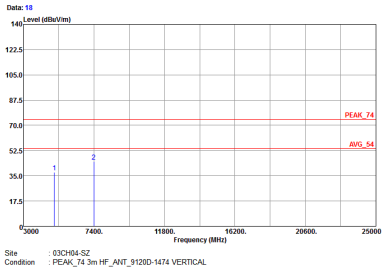
2.4GHz 2400~2483.5MHz

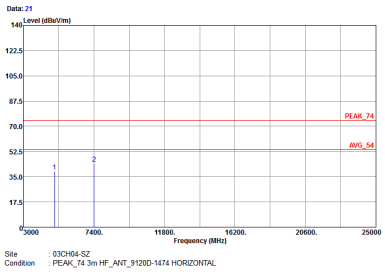
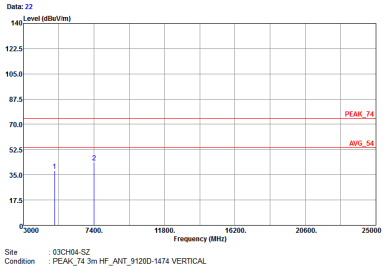
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

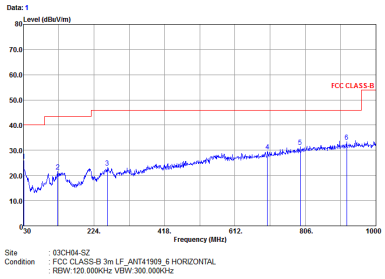
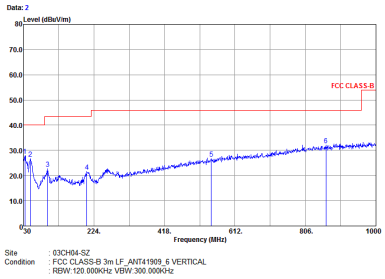
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH12 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH13 2472MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

Emission below 1GHz

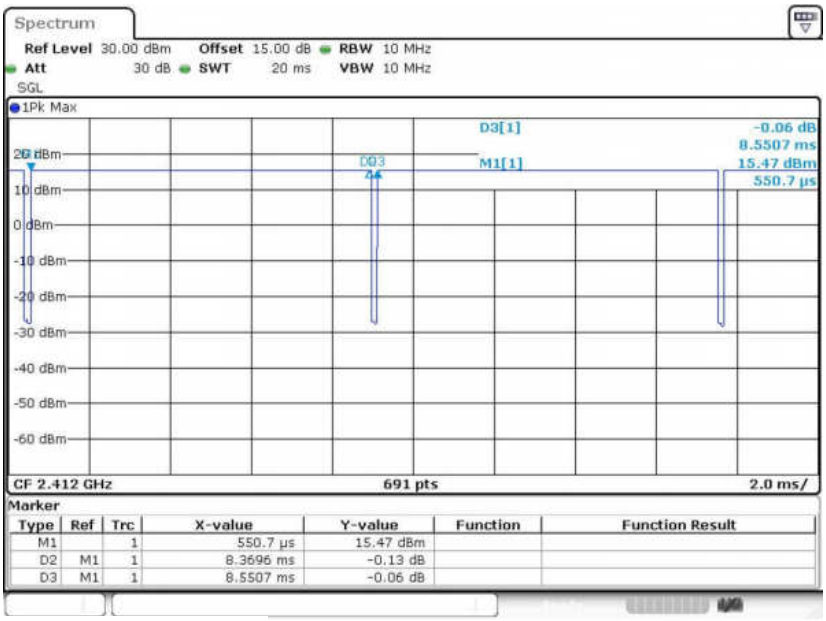
2.4GHz WIFI 802.11g (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11g LF	
1	Horizontal	Vertical
QP / Peak		

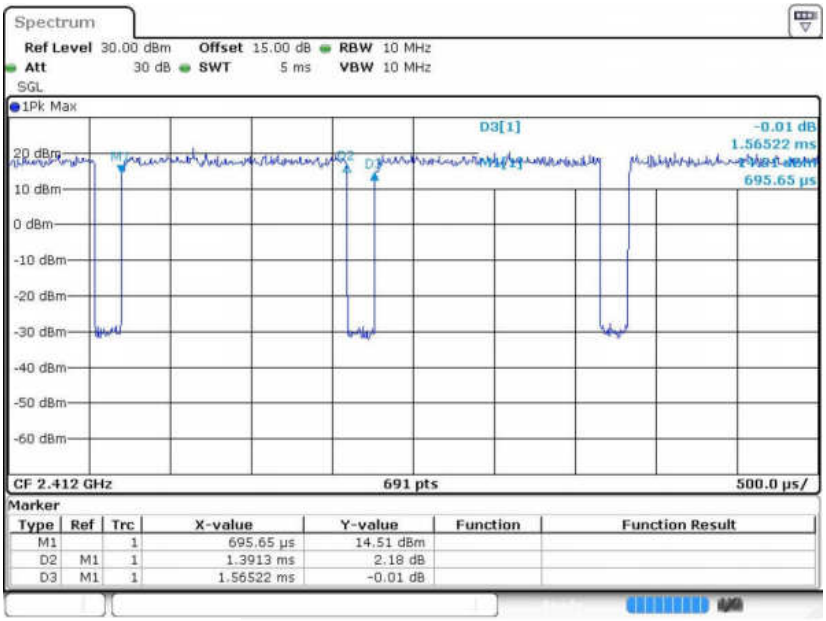
Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	97.88	8.370	0.119	300Hz
802.11g	88.89	1.391	0.719	1KHz
802.11n HT20	88.56	1.290	0.775	1KHz

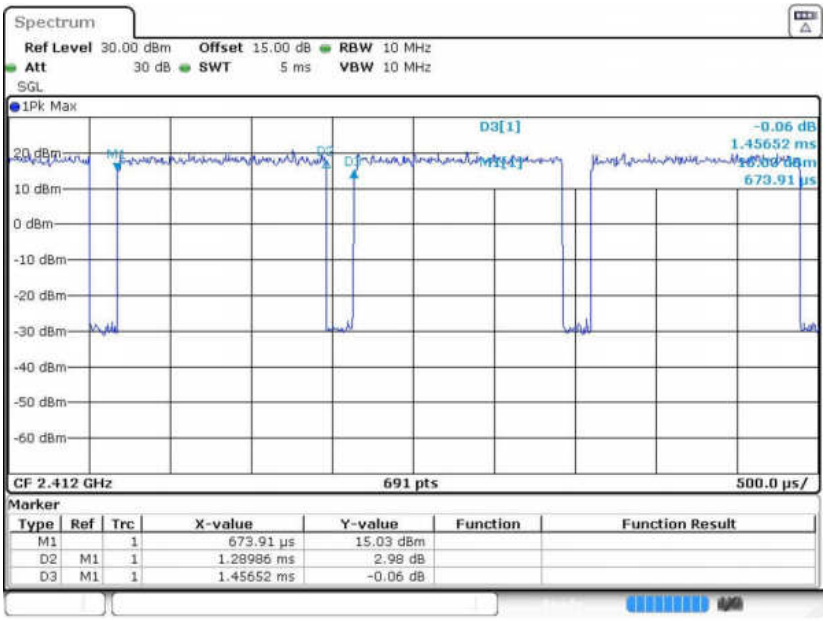
802.11b



802.11g



802.11n20


Spectrum
Ref Level 30.00 dBm Offset 15.00 dB RBW 10 MHz
Att 30 dB SWT 5 ms VBW 10 MHz
SGL
1Pk Max
D3[1] -0.06 dB
1.45652 ms
673.91 µs
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.412 GHz
691 pts
500.0 µs/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 673.91 µs 15.03 dBm
D2 M1 1 1.28986 ms 2.98 dB
D3 M1 1 1.45652 ms -0.06 dB