



FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

Planet Computers Limited

Gemini

Gemini 4G

FCC ID: 2AO7Q-X600M1

Prepared for : Planet Computers Limited
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Date of Test : Jan.11~Jul.27, 2018
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TABLE OF CONTENTS

Description	Page
1. SUMMARY OF STANDARDS AND RESULTS	1-1
1.1. Description of Standards and Results	1-1
2. GENERAL INFORMATION	2-1
2.1. Description of Device (EUT)	2-1
2.2. Tested Supporting System Details	2-2
2.3. Block diagram of connection between the EUT and simulators	2-2
2.4. Test Information	2-2
2.5. Test Facility	2-3
2.6. Measurement Uncertainty (95% confidence levels, k=2)	2-3
3. POWER LINE CONDUCTED EMISSION TEST	3-1
3.1. Test Equipments	3-1
3.2. Block Diagram of Test Setup	3-1
3.3. Power Line Conducted Emission Test Limits	3-1
3.4. Configuration of EUT on Test	3-2
3.5. Operating Condition of EUT	3-2
3.6. Test Procedure	3-2
3.7. Power Line Conducted Emission Test Results	3-2
4. RADIATED EMISSION TEST	4-1
4.1. Test Equipment	4-1
4.2. Block Diagram of Test Setup	4-2
4.3. Radiated Emission Limit	4-3
4.4. EUT Configuration on Test	4-3
4.5. Operating Condition of EUT	4-4
4.6. Test Procedure	4-4
4.7. Radiated Emission Test Results	4-4
5. CONDUCTED SPURIOUS EMISSIONS	5-1
5.1. Test Equipment	5-1
5.2. Limit	5-1
5.3. Test Procedure	5-1
5.4. Test result	5-1
6. BAND EDGE COMPLIANCE TEST	6-1
6.1. Test Equipment	6-1
6.2. Limit	6-1
6.3. Test Procedure	6-1
6.4. Test Results	6-1
7. 6dB Bandwidth Test	7-1
7.1. Test Equipment	7-1
7.2. Limit	7-1
7.3. Test Procedure	7-1
7.4. Test Results	7-1
8. OUTPUT POWER TEST	8-1
8.1. Test Equipment	8-1
8.2. Limit (FCC Part 15C 15.247 b(3))	8-1
8.3. Test Procedure	8-1
8.4. Test Results	8-2
9. POWER SPECTRAL DENSITY TEST	9-1
9.1. Test Equipment	9-1



FCC ID:2AO7Q-X600M1

9.2.	Limit	9-1
9.3.	Test Procedure	9-1
9.4.	Test Results	9-2
10.	ANTENNA REQUIREMENT	10-1
10.1.	Standard Applicable	10-1
10.2.	Antenna Connected Construction	10-1
11.	DEVIATION TO TEST SPECIFICATIONS	11-1
12.	PHOTOGRAPH OF TEST	12-1
12.1.	Photos of Power Line Conducted Emission Test	12-1
12.2.	Photos of Radiated Emission Test	12-2
13.	PHOTOS OF EUT	13-1

TEST REPORT CERTIFICATION

Applicant : Planet Computers Limited
Manufacturer : Planet Computers Limited
Product : Gemini
FCC ID : 2A07Q-X600M1
(A) Model No. : Gemini 4G
(B) Serial No. : N/A
(C) Test Voltage : DC 5V From Adapter Input AC 120V/60Hz

Tested for comply with:
FCC CFR 47 Part 15 Subpart C

Test procedure used:
ANSI C63.10: 2013
KDB 558074 D01v04

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to confirm comply with all the FCC Part 15 Subpart C requirements. The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC and IC requirements. This report contains data that are not covered by the NVLAP accreditation.

This Report is made under FCC Part 2.1075. No modifications were required during testing to bring this product into compliance.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Jan.11~Jul.27, 2018 Report of date: Jul.27, 2018

Prepared by : Monica Liu Reviewed by : Sunny Lu
Monica Liu / Assistant Sunny Lu / Deputy Manager



Approved & Authorized Signer :

1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT has been tested according to the applicable standards as referenced below.

EMISSION		
Description of Test Item	Standard	Results
Power Line Conducted Emission	FCC Part 15: 15.207	PASS
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.205	PASS
Band Edge Compliance	FCC Part 15: 15.247(d)	PASS
Conducted spurious emissions	FCC Part 15: 15.247(d)	PASS
6dB Bandwidth	FCC Part 15: 15.247(a)(2)	PASS
Peak Output Power	FCC Part 15: 15.247(b)(3)	PASS
Power Spectral Density	FCC Part 15: 15.247(e)	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

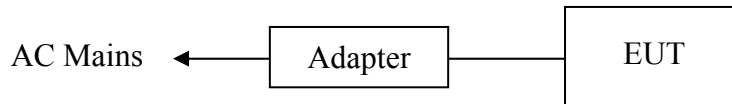
2.1. Description of Device (EUT)

Product	: Gemini
Model No.	: Gemini 4G
FCC ID	: 2AO7Q-X600M12AO7Q-X600M1
Radio	: IEEE802.11 a/b/g/n/ac 1T1R; Bluetooth V3.0+EDR; Bluetooth V4.0
Operation Frequency	: IEEE 802.11a: 5180MHz—5240MHz; 5745MHz—5825MHz IEEE 802.11ac VHT20: 5180MHz—5240MHz; 5745MHz—5825MHz IEEE 802.11ac VHT40: 5190MHz—5230MHz; 5755MHz—5795MHz IEEE 802.11ac VHT80: 5210MHz; 5775MHz IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE802.11n HT20: 2412MHz—2462MHz; 5180MHz—5240MHz; 5745MHz—5825MHz IEEE802.11n HT40: 2422MHz—2452MHz; 5190MHz—5230MHz; 5755MHz—5795MHz Bluetooth : 2402-2480MHz
Modulation Technology	: IEEE 802.11b: DSSS(CCK,DBPSK) IEEE 802.11a/g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT20, VHT40, VHT80: OFDM(16QAM, 64QAM, 256QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM,QPSK,BPSK) Bluetooth V3.0+EDR: GFSK, $\pi/4$ DQPSK,8-DPSK Bluetooth V4.0:GFSK
Antenna Assembly Gain	: Antenna Type: PIFA Bluetooth: 2.0dBi WIFI 2.4GHz: 2.0dBi WIFI 5GHz: 0.42dBi
Applicant	: Planet Computers Limited Suite #9, 56 Sloane Square, London, SW1W 8AX, United Kingdom
Manufacturer	: Planet Computers Limited Suite #9, 56 Sloane Square, London, SW1W 8AX, United Kingdom
Factory	: SHENZHEN YIXU ELECTRONICS CO., LTD. Building B, Area E, Yuwei, Qingxiang Rd, Longhua, Shenzhen
Power Adapter	: Manufacturer: Planet, M/N: TPA-10120125UUA-MTK; Cable: Unshielded, Detachable, 1.0m
USB Cable	: Shielded, Detachable, 0.8m
Date of Test	: Jan.11~Jul.27, 2018
Date of Receipt	: Dec.26, 2017
Sample Type	: Prototype production

2.2. Tested Supporting System Details

[None]

2.3. Block diagram of connection between the EUT and simulators



(EUT: Gemini)

2.4. Test Information

A special test software was used to control EUT work in Continuous TX mode(The duty cycle of the test signal is 100%), and select test channel, wireless mode and data rate.

Tested mode, channel, and data rate information			
Mode	data rate (Mbps)(see Note)	Channel	Frequency (MHz)
IEEE 802.11b	1	Low :CH1	2412
	1	Middle: CH6	2437
	1	High: CH11	2462
IEEE 802.11g	6	Low :CH1	2412
	6	Middle: CH6	2437
	6	High: CH11	2462
IEEE 802.11n HT20	MCS0	Low :CH1	2412
	MCS0	Middle: CH6	2437
	MCS0	High: CH11	2462
IEEE 802.11n HT40	MCS0	Low :CH3	2422
	MCS0	Middle: CH6	2437
	MCS0	High: CH9	2452

Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

2.5. Test Facility

Site Description

Name of Firm	:	Audix Technology (Shenzhen) Co., Ltd. No. 6, Kefeng Road, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China
EMC Lab.	:	Certificated by Industry Canada Registration Number: IC 5183A-1 Valid Date: May.07, 2020 Certificated by DAkkS, Germany Registration No: D-PL-12151-01-00 Valid Date: Dec.07, 2021 Accredited by NVLAP, USA NVLAP Code: 200372-0 Valid Date: Mar.31, 2018 Certificated by FCC, USA Designation Number: CN5022 Valid Date: Mar.31, 2018

2.6.Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 1 Conduction	3.6dB (150KHz to 30MHz)
Uncertainty for Radiation Emission test in 3m chamber	2.8dB (30~200MHz, Polarization: H)
	2.8dB (30~200MHz, Polarization: V)
	3.0dB (200M~1GHz, Polarization: H)
	3.0dB (200M~1GHz, Polarization: V)
Uncertainty for Radiation Emission test in 3m chamber	5.6dB (1~6GHz, Distance: 3m)
	5.8dB (6~18GHz, Distance: 3m)
	5.8dB (Above 18GHz, Distance: 3m)
Uncertainty for Radiated Spurious Emission test in RF chamber	3.7dB(30MHz~1000MHz)
	3.3dB(1GHz~26.5GHz)
Uncertainty for Conduction Spurious emission test	2.0dB
Uncertainty for Output power test	0.8dB
Uncertainty for Bandwidth test	83 kHz
Uncertainty for DC power test	0.1 %
Uncertainty for test site temperature and humidity	0.6℃
	3%

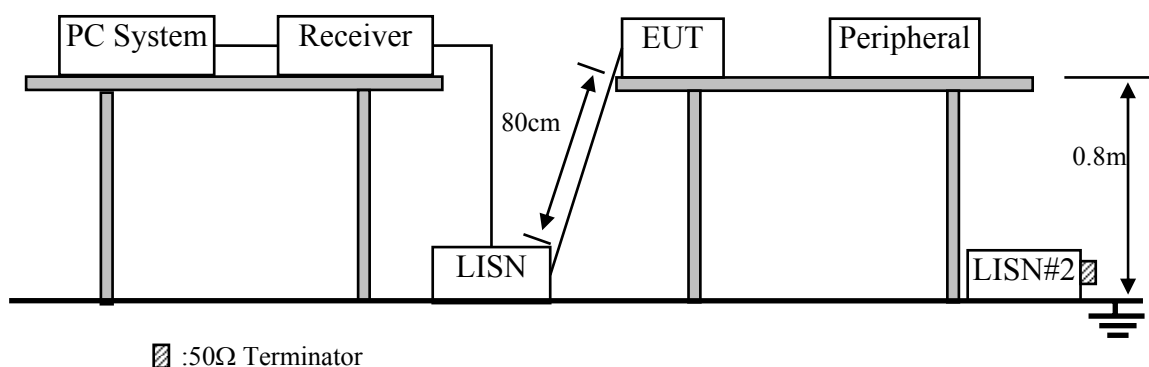
3. POWER LINE CONDUCTED EMISSION TEST

3.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	1# Shielding Room	AUDIX	N/A	N/A	Apr.17,17	1 Year
2.	Test Receiver	Rohde & Schwarz	ESCI	100842	Apr.22,17	1 Year
3.	L.I.S.N.	Rohde & Schwarz	ENV216	102160	Mar.06.17	1 Year
4.	L.I.S.N.#2	Kyoritsu	K NW-403D	8-1750-2	Apr.22,17	1 Year
5.	I.S.N.	TESEQ	S751	24559	Mar.06.17	1.year
6.	Terminator	Hubersuhner	50Ω	No.1	Apr.23,17	1 Year
7.	Terminator	Hubersuhner	50Ω	No.2	Apr.23,17	1 Year
8.	RF Cable	Fujikura	RG55/U	NO.2	Apr.22,17	1Year
9.	Coaxial Switch	Anritsu	MP59B	6201397223	Apr.22,17	1 Year
10.	Test Software	AUDIX	e3	6.100913a	N/A	N/A

Note: N/A means Not applicable.

3.2. Block Diagram of Test Setup



3.3. Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.4. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4.1. Gemini (EUT)

Model No. : Gemini 4G
Serial No. : N/A

3.4.2. Support Equipment: As Tested Supporting System Details, in Section 2.2.

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown as Section 3.2.

3.5.2. Turn on the power of all equipments.

3.5.3. PC run test software to control EUT work in Tx (WiFi 2.4GHz) mode.

3.6. Test Procedure

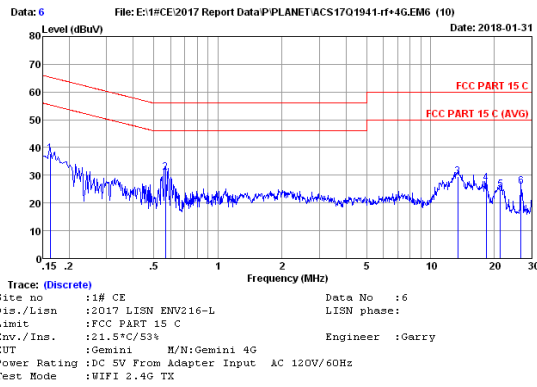
The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power Via PC connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

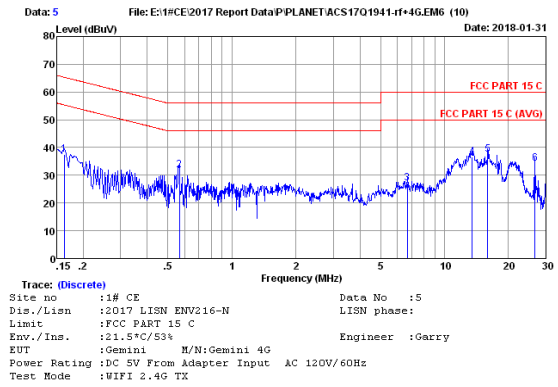
3.7. Power Line Conducted Emission Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)



No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.162	9.52	0.02	28.20	37.74	65.34	27.60	QP
2	0.567	9.50	0.03	21.55	31.08	56.00	24.92	QP
3	13.406	9.58	0.12	19.60	29.50	60.00	30.50	QP
4	18.232	9.69	0.12	17.44	27.25	60.00	32.75	QP
5	21.260	9.75	0.13	15.03	24.91	60.00	35.09	QP
6	26.699	9.80	0.13	15.92	25.85	60.00	34.15	QP

Remarks: 1. Emission Level=LISN Factor+Cable Loss+Reading.
2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.162	9.48	0.02	28.11	37.61	65.34	27.73	QP
2	0.567	9.31	0.03	22.51	31.85	56.00	24.15	QP
3	6.698	9.42	0.10	17.64	27.16	60.00	32.84	QP
4	13.479	9.49	0.12	27.11	36.72	60.00	23.28	QP
5	15.970	9.54	0.12	27.79	37.45	60.00	22.55	QP
6	26.699	9.79	0.13	24.37	34.29	60.00	25.71	QP

Remarks: 1. Emission Level=LISN Factor+Cable Loss+Reading.
2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

4. RADIATED EMISSION TEST

4.1. Test Equipment

4.1.1. For frequency range 30MHz~1000MHz (In 3m Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber	AUDIX	N/A	N/A	Mar.28,17	1 Year
2.	Signal Analyzer	R&S	FSV30	103669	Oct.15,17	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR7	101547	Apr.22,17	1 Year
4.	Amplifier	HP	8447D	2648A04738	Apr.22,17	1 Year
5.	Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	493	Jun.27.17	1 Year
6.	Loop Antenna	Chase	HLA6120	1062	Oct.15,17	1 Year
7.	RF Cable	MIYAZAKI	CFD400NL-LW	No.3	Sep.02.17	1 Year
8.	Coaxial Switch	Anritsu	MP59B	6201397222	Apr.22,17	1 Year
9.	Test Software	AUDIX	e3	6.2009-5-21a(n)	N/A	N/A

Note: N/A means Not applicable.

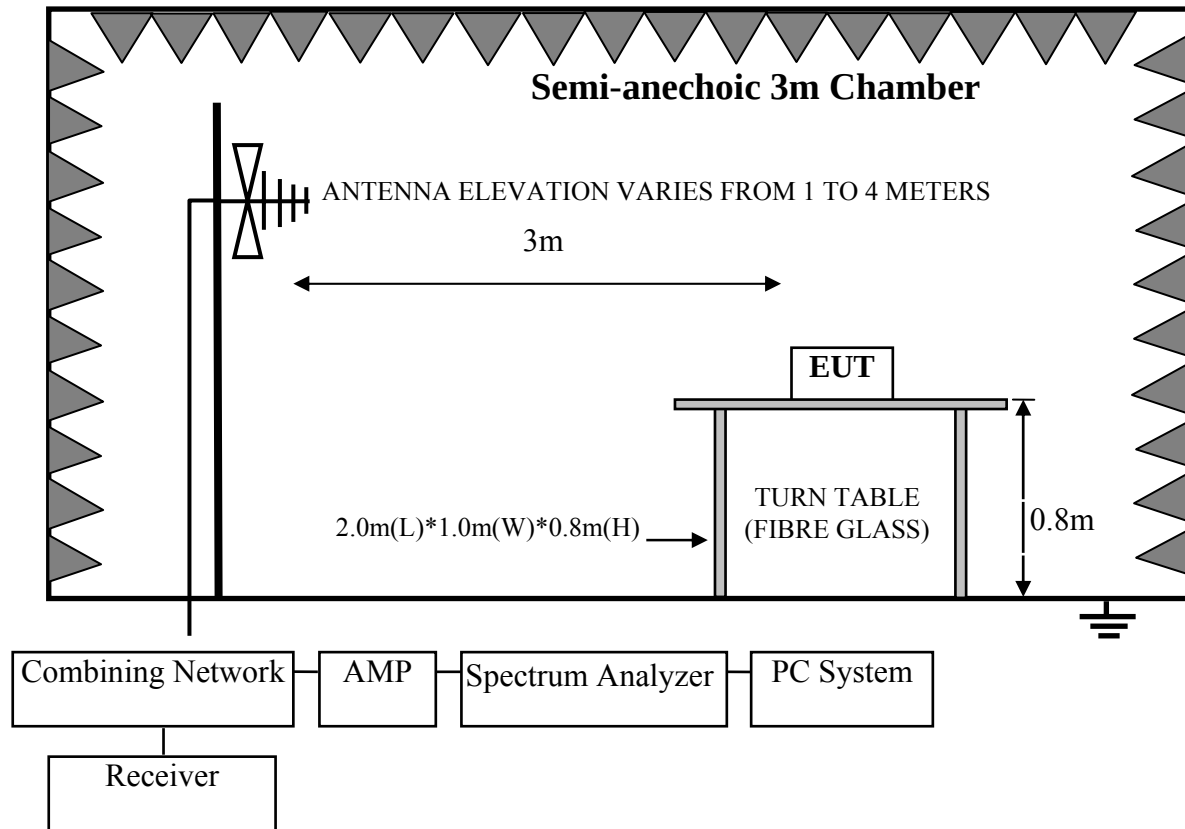
4.1.2. For frequency range 1GHz~40GHz (In 3m Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4446A	US44300459	Apr.22,17	1 Year
2.	Horn Antenna	ETC	MCTD 1209	DRH15F03006	May.15,17	1 Year
3.	Amplifier	Agilent	8449B	3008A02495	Apr.22,17	1 Year
4.	RF Cable	Hubersuhner	SUCOFLEX104	274094/4	Apr.22,17	1 Year
5.	Horn Antenna	EMCO	3116	0062643	Oct.10,17	1 Year
6.	Test Software	AUDIX	e3	6.2009-5-21a(n)	N/A	N/A

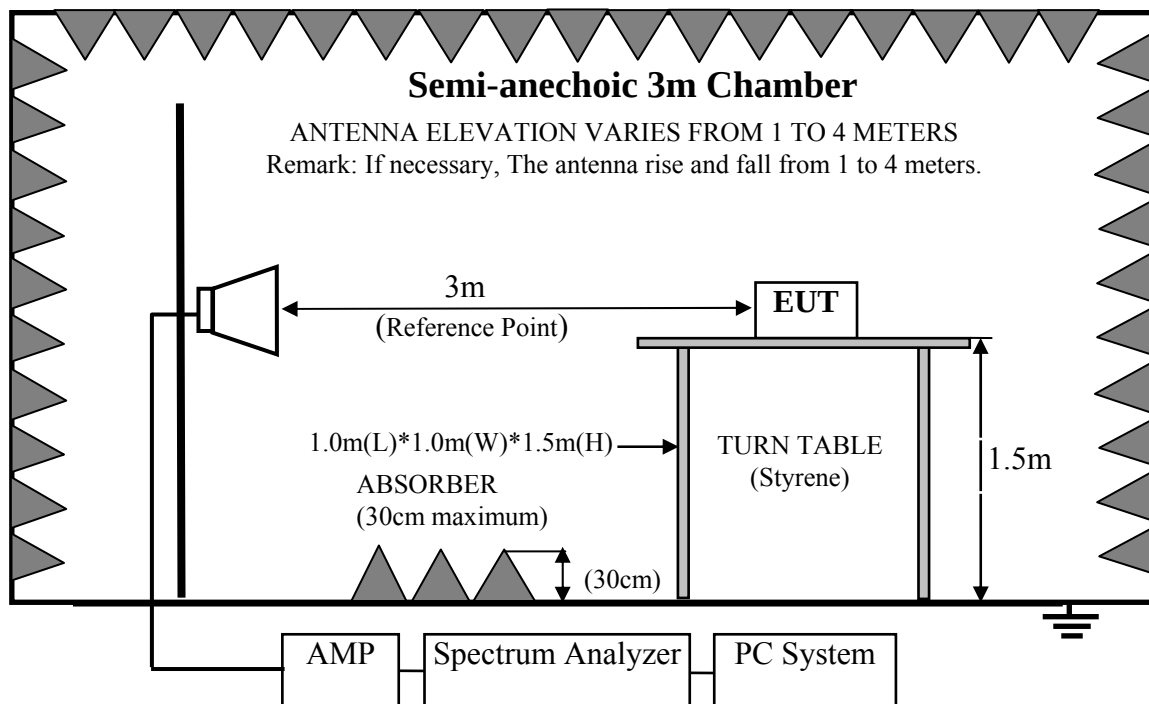
Note: N/A means Not applicable.

4.2. Block Diagram of Test Setup

For frequency range 30MHz-1000MHz



For frequency range 1GHz-25GHz



4.3. Radiated Emission Limit

4.3.1. 15.247&209 limits

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

Remark : (1) Emission level $\text{dB}\mu\text{V} = 20 \log$ Emission level $\mu\text{V/m}$

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

4.3.2. 15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions or comply with 15.209 limits.

4.4. EUT Configuration on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

4.4.1. Gemini (EUT)

Model No. : Gemini 4G

Serial No. : N/A

4.4.2. Support Equipment: As Tested Supporting System Details, in Section 2.2.

4.5. Operating Condition of EUT

- 4.5.1. Setup the EUT and simulator as shown as Section 4.2.
- 4.5.2. Turn on the power of all equipments.
- 4.5.3. Let EUT work in Tx(WiFi 2.4GHz) mode

4.6. Test Procedure

Frequency below 30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground for frequency 30MHz~1000MHz, 1.5 meter high above ground for frequency above 1GHz and put the absorbing with 2.4m(L)*2.4m(W)*0.3m(H) on the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna for frequency 30MHz~1000MHz, and the Horn antenna is used as receiving antenna for frequency above 1GHz. Both horizontal and vertical polarization of the antenna are set on test.

This test was performed with EUT in X, Y, Z position, and the worse case was found when EUT in X position as test photo indicated.

The bandwidth of the EMI test receiver (R&S ESR7) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25GHz, So the radiated emissions from 18GHz to 25GHz were not record.

4.7. Radiated Emission Test Results

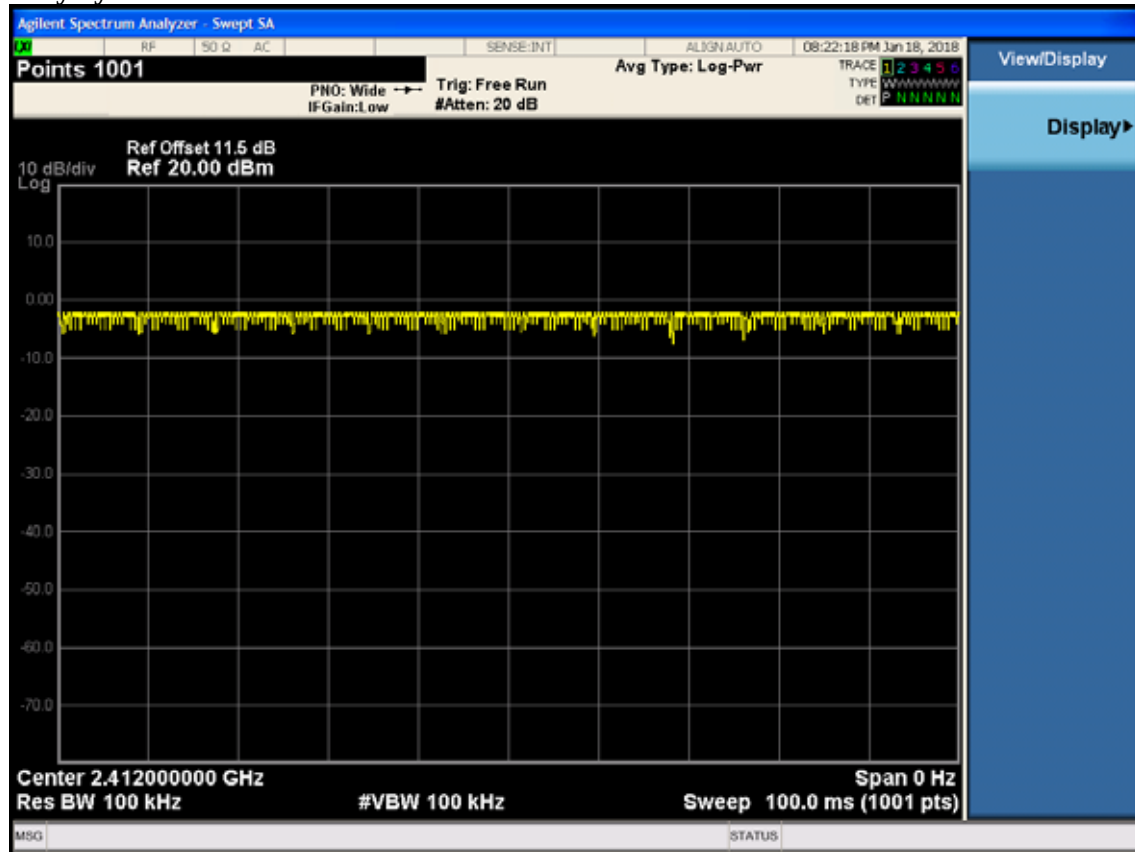
PASS.

All the emissions from 30MHz to 25 GHz were comply with 15.209 limits.

Note 1: For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

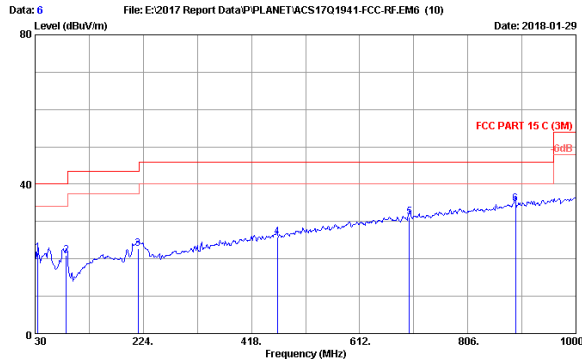
Note 2: The emissions (9kHz~30MHz) not reported for there is no emission be found.

Duty cycle



Note: The duty cycle of the test signal is 100%.

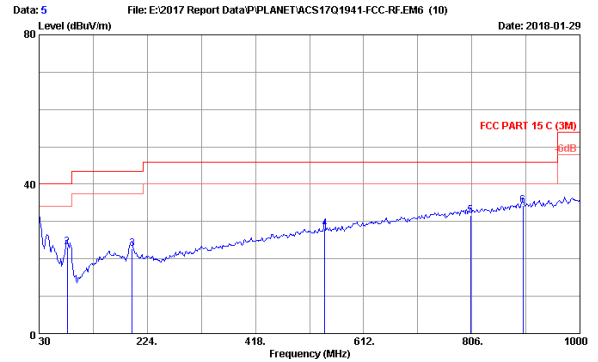
Frequency: 30MHz~1GHz



Site no. : 3m Chamber Data no. : 6
 Dis. / Ant. : 3m 2017 9168-493 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 C (3M)
 Env. / Ins. : 23.7°C/52% Engineer : Kayle
 EUT : Gemini M/N:Gemini 4G
 Power rating : DCSV From Adapter input AC 120V/60Hz
 Test Mode : WIFI2.4G TX

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	34.850	19.70	0.66	1.31	21.67	40.00	18.33	QP
2	86.260	14.36	1.02	5.46	20.84	40.00	19.16	QP
3	214.300	16.90	1.73	4.10	22.73	43.50	20.77	QP
4	464.560	23.42	3.08	-0.76	25.74	46.00	20.26	QP
5	701.240	27.21	4.13	-0.08	31.26	46.00	14.74	QP
6	891.360	29.40	5.04	0.23	34.67	46.00	11.33	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

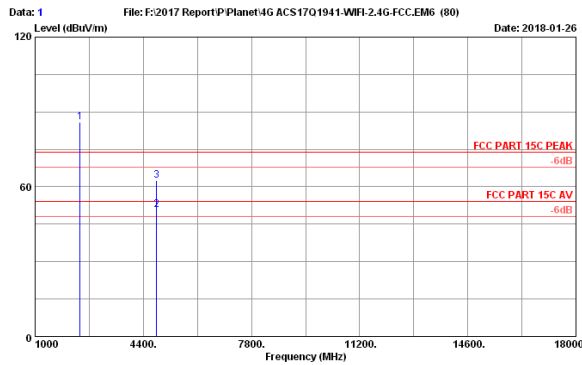


Site no. : 3m Chamber Data no. : 5
 Dis. / Ant. : 3m 2017 9168-493 Ant. pol. : VERTICAL
 Limit : FCC PART 15 C (3M)
 Env. / Ins. : 23.7°C/52% Engineer : Kayle
 EUT : Gemini M/N:Gemini 4G
 Power rating : DCSV From Adapter input AC 120V/60Hz
 Test Mode : WIFI2.4G TX

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	30.000	19.40	0.63	9.57	29.60	40.00	10.40	QP
2	80.440	15.20	0.98	6.94	23.12	40.00	16.88	QP
3	196.840	17.08	1.62	4.08	22.78	43.50	20.72	QP
4	542.160	24.85	3.39	-0.24	28.00	46.00	18.00	QP
5	804.060	28.44	4.53	-1.40	31.57	46.00	14.43	QP
6	898.150	29.48	5.08	-0.15	34.41	46.00	11.59	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

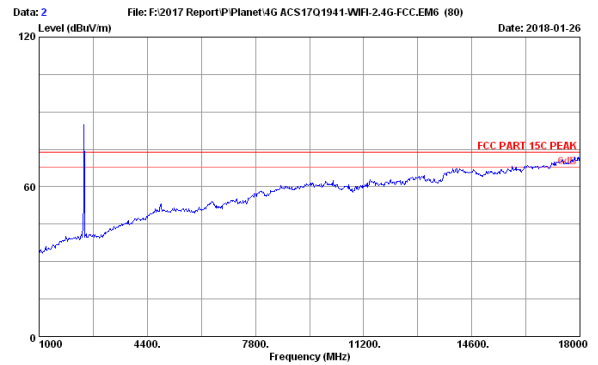
Frequency: 1GHz~18GHz



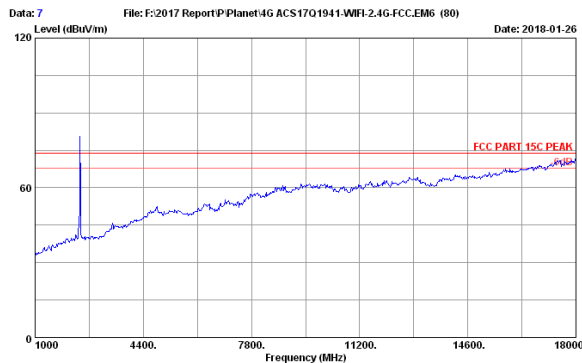
Site no. : 3m Chamber Data no. : 1
Dis. / Ant. : 3m 2017 ANT 3006 HF Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23.1°C/52.5% Engineer : Kayle
EUT : Gemini M/N:Gemini 4G
Power rating : DC 5V From Adapter Input AC 120V/60Hz
Test Mode : IEEE802.11b 2412 Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2412.00	27.98	10.34	83.14	35.61	85.85	74.00	-11.85	Peak
2	4824.00	33.46	14.55	36.43	33.80	50.64	54.00	3.36	Average
3	4824.00	33.46	14.55	48.21	33.80	62.42	74.00	11.58	Peak

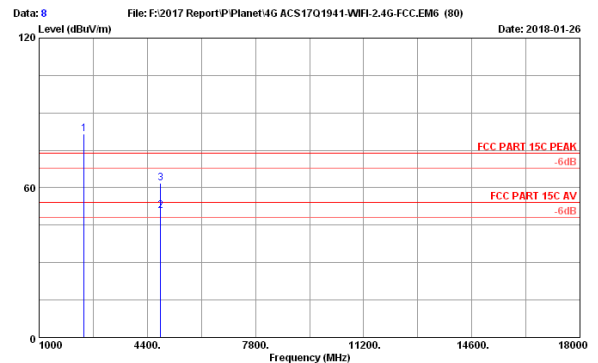
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2017 ANT 3006 HF Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23.1°C/52.5% Engineer : Kayle
EUT : Gemini M/N:Gemini 4G
Power rating : DC 5V From Adapter Input AC 120V/60Hz
Test Mode : IEEE802.11b 2412 Tx Mode



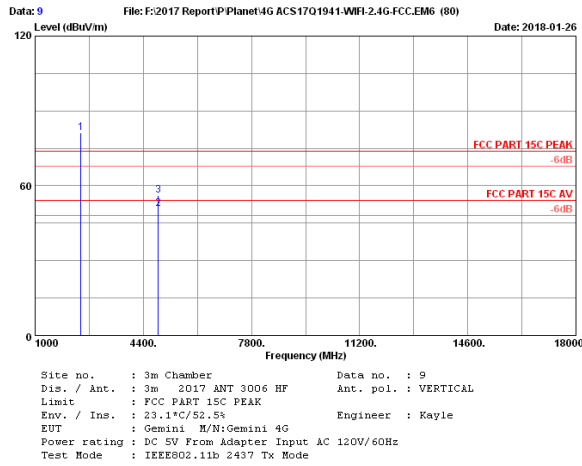
Site no. : 3m Chamber Data no. : 7
Dis. / Ant. : 3m 2017 ANT 3006 HF Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23.1°C/52.5% Engineer : Kayle
EUT : Gemini M/N:Gemini 4G
Power rating : DC 5V From Adapter Input AC 120V/60Hz
Test Mode : IEEE802.11b 2412 Tx Mode



Site no. : 3m Chamber Data no. : 8
Dis. / Ant. : 3m 2017 ANT 3006 HF Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23.1°C/52.5% Engineer : Kayle
EUT : Gemini M/N:Gemini 4G
Power rating : DC 5V From Adapter Input AC 120V/60Hz
Test Mode : IEEE802.11b 2412 Tx Mode

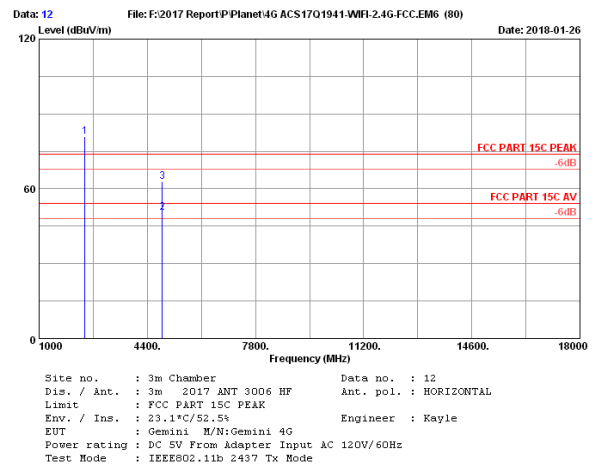
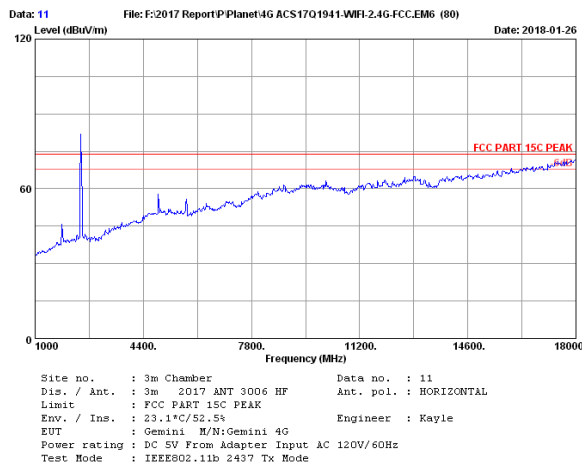
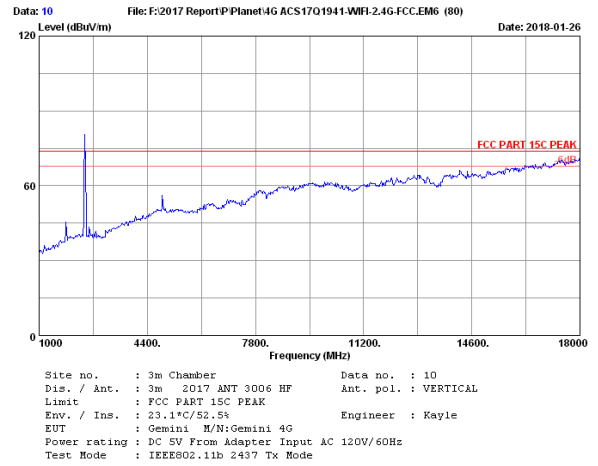
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2412.00	27.98	10.34	78.81	35.61	81.52	74.00	-7.52	Peak
2	4824.00	33.46	14.55	36.75	33.80	50.96	54.00	3.04	Average
3	4824.00	33.46	14.55	47.74	33.80	61.95	74.00	12.05	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



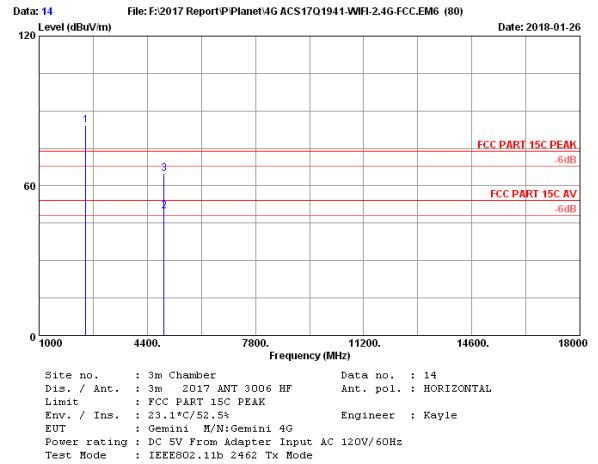
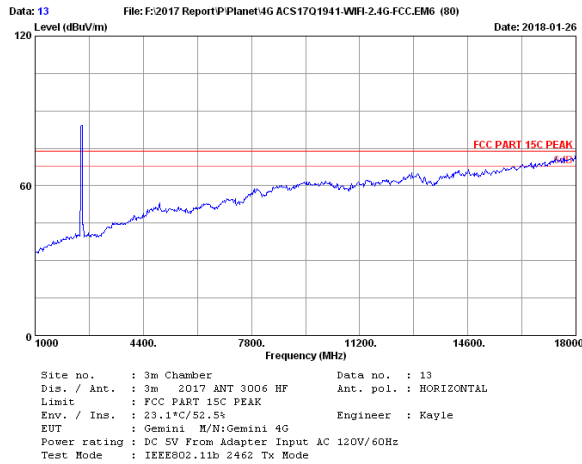
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	28.03	10.37	78.41	35.64	81.17	74.00	-7.17	Peak
2	4874.00	33.56	14.62	36.54	33.75	50.97	54.00	3.03	Average
3	4874.00	33.56	14.62	41.68	33.75	56.11	74.00	17.89	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



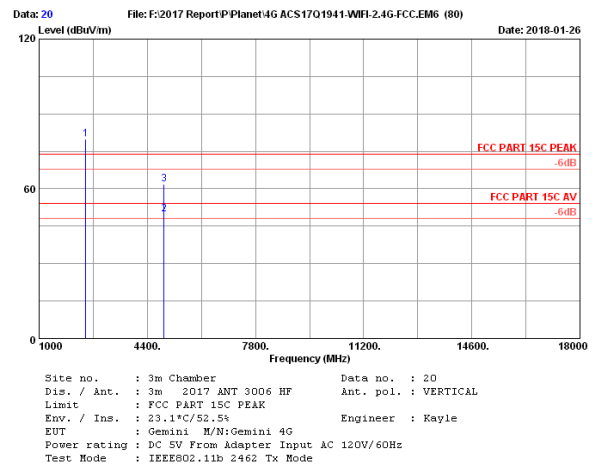
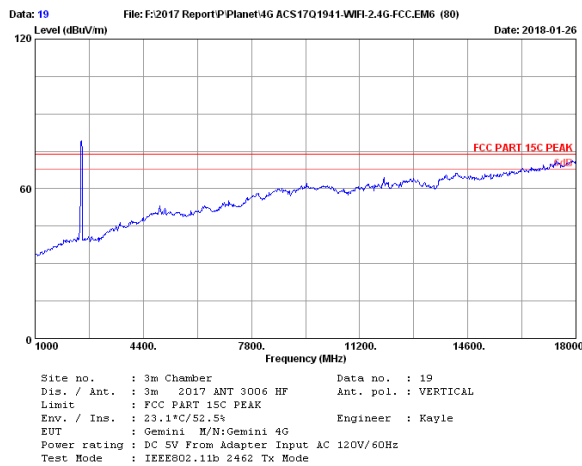
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	28.03	10.37	78.16	35.64	80.92	74.00	-6.92	Peak
2	4874.00	33.56	14.62	36.21	33.75	50.64	54.00	3.36	Average
3	4874.00	33.56	14.62	48.45	33.75	62.88	74.00	11.12	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



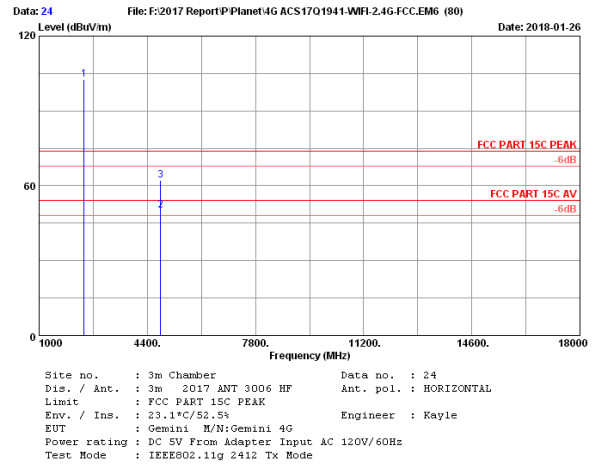
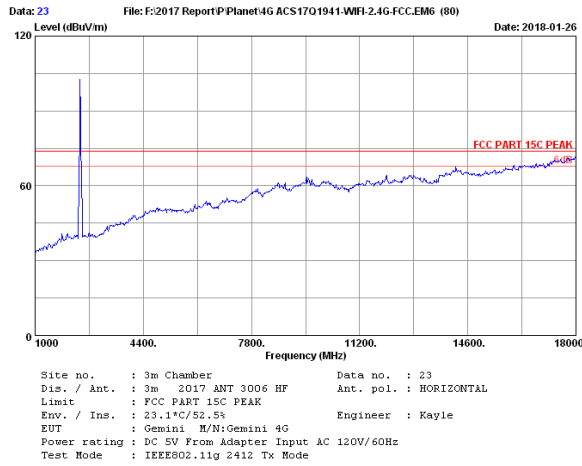
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2462.00	28.05	10.41	81.44	35.68	84.22	74.00	-10.22	Peak
2	4924.00	33.66	14.68	35.31	33.71	49.94	54.00	4.06	Average
3	4924.00	33.66	14.68	50.22	33.71	64.85	74.00	9.15	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official limit are not reported.



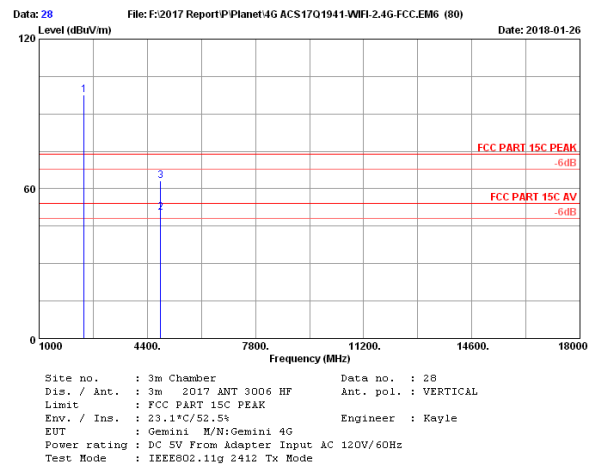
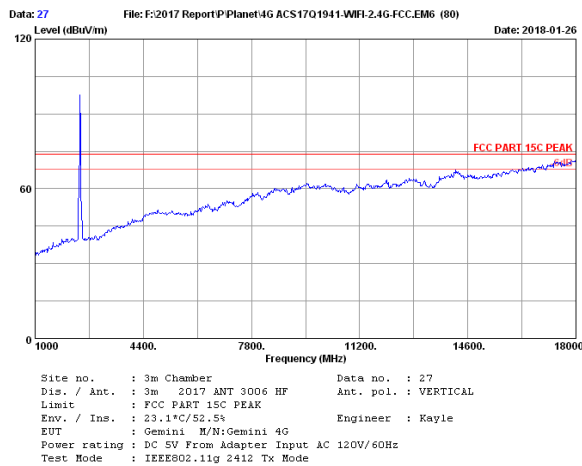
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2462.00	28.05	10.41	76.95	35.68	79.73	74.00	-5.73	Peak
2	4924.00	33.66	14.68	35.15	33.71	49.78	54.00	4.22	Average
3	4924.00	33.66	14.68	47.20	33.71	61.83	74.00	12.17	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official limit are not reported.



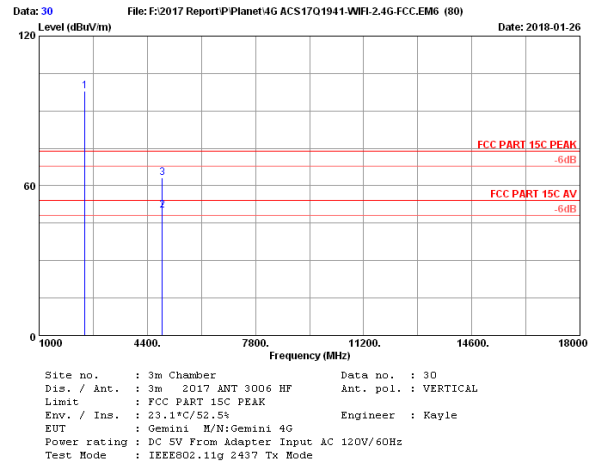
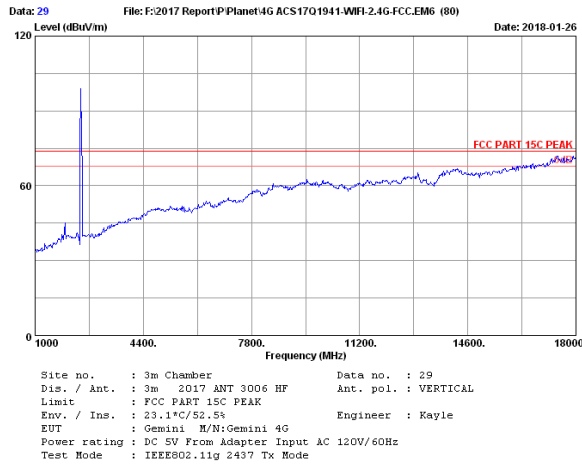
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2412.00	27.98	10.34	99.76	35.61	102.47	74.00	-28.47	Peak
2	4824.00	33.46	14.55	36.03	33.80	50.24	54.00	3.76	Average
3	4824.00	33.46	14.55	48.09	33.80	62.30	74.00	11.70	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official limit are not reported.



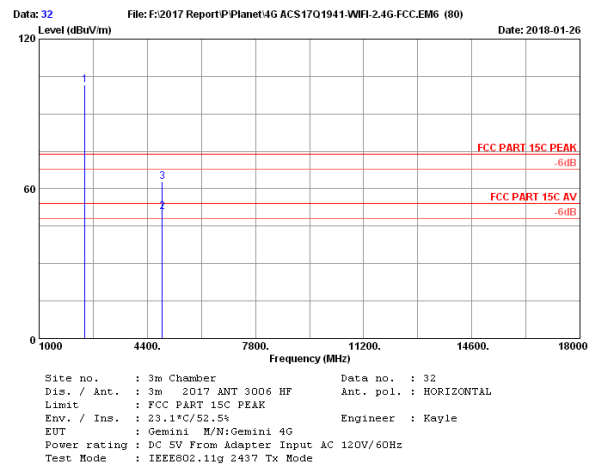
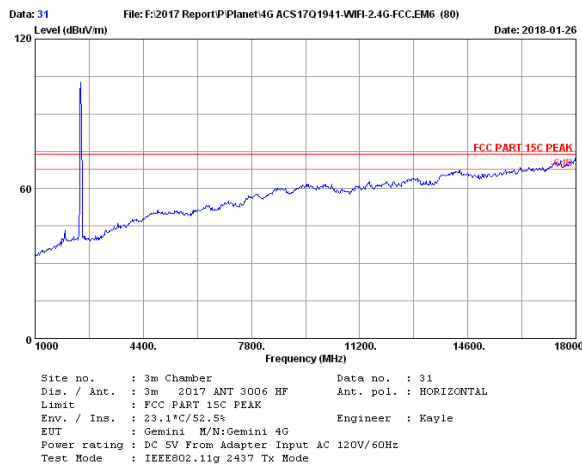
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2412.00	27.98	10.34	94.82	35.61	97.53	74.00	-23.53	Peak
2	4824.00	33.46	14.55	36.20	33.80	50.41	54.00	3.59	Average
3	4824.00	33.46	14.55	48.93	33.80	63.14	74.00	10.86	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official limit are not reported.



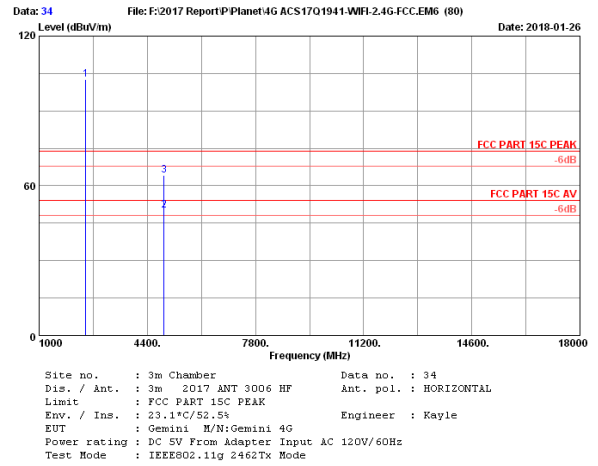
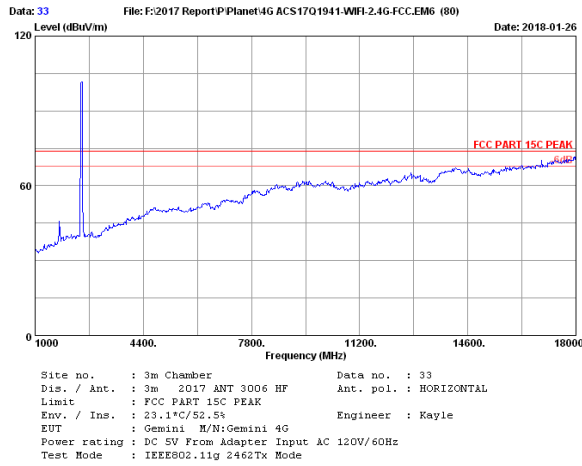
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	28.03	10.37	95.02	35.64	97.78	74.00	-23.78	Peak
2	4874.00	33.56	14.62	35.61	33.75	50.24	54.00	3.76	Average
3	4874.00	33.56	14.62	48.67	33.75	63.10	74.00	10.90	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



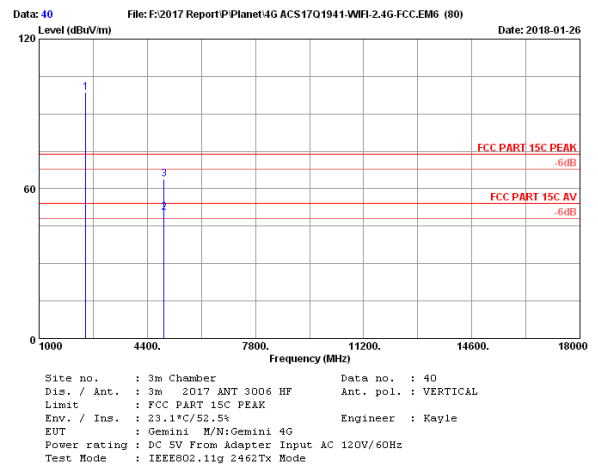
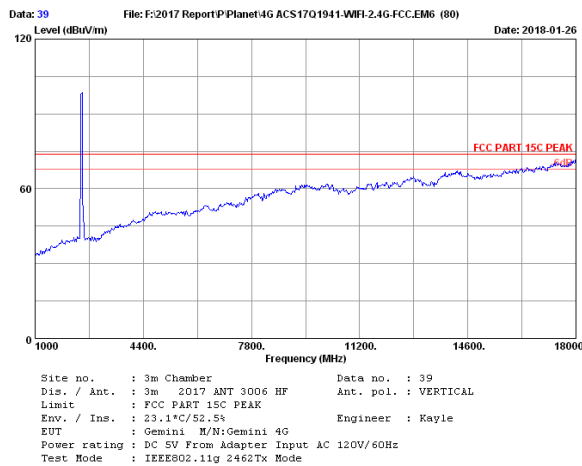
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	28.03	10.37	98.94	35.64	101.70	74.00	-27.70	Peak
2	4874.00	33.56	14.62	36.24	33.75	50.67	54.00	3.33	Average
3	4874.00	33.56	14.62	48.51	33.75	62.94	74.00	11.06	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



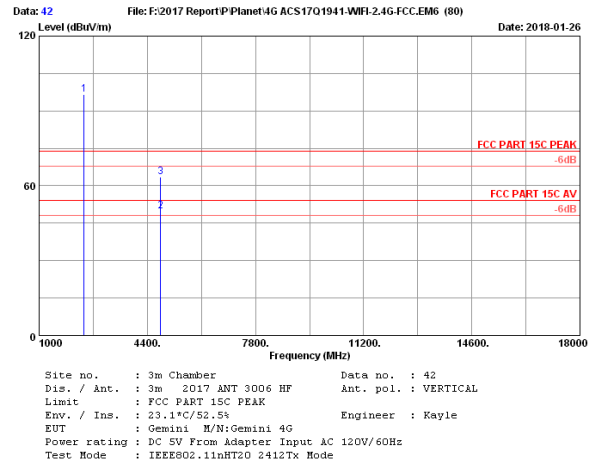
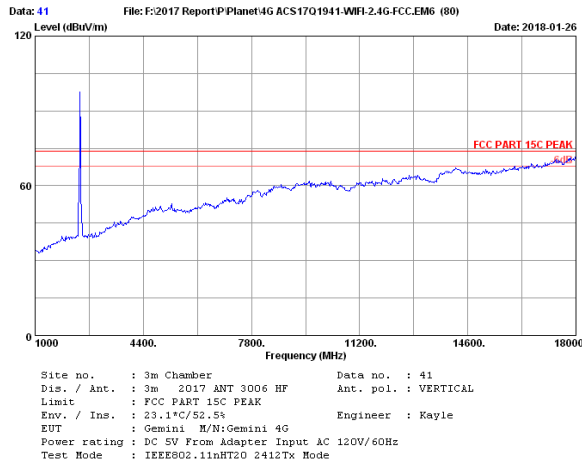
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2462.00	28.05	10.41	99.92	35.68	102.70	74.00	-28.70	Peak
2	4924.00	33.66	14.68	35.47	33.71	50.10	54.00	3.90	Average
3	4924.00	33.66	14.68	49.61	33.71	64.24	74.00	9.76	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official limit are not reported.



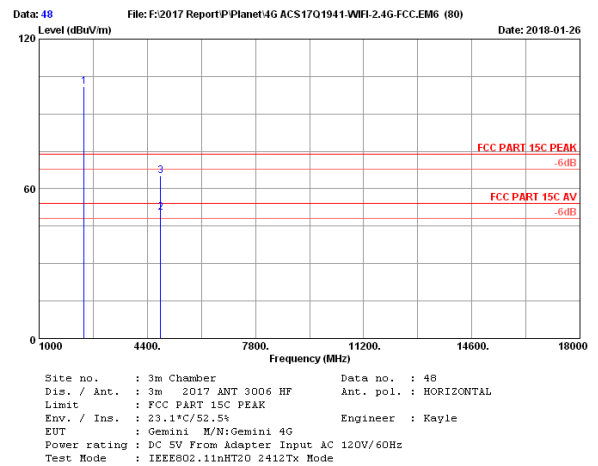
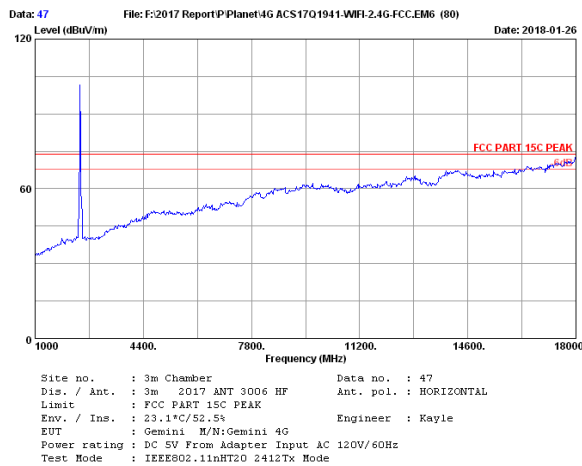
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2462.00	28.05	10.41	95.85	35.68	98.63	74.00	-24.63	Peak
2	4924.00	33.66	14.68	35.94	33.71	50.57	54.00	3.43	Average
3	4924.00	33.66	14.68	49.21	33.71	63.84	74.00	10.16	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official limit are not reported.



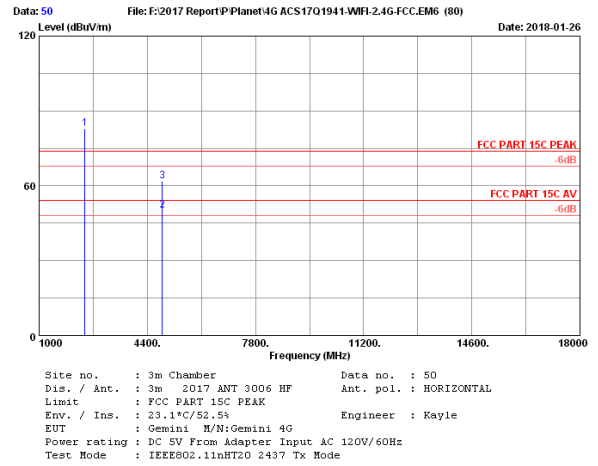
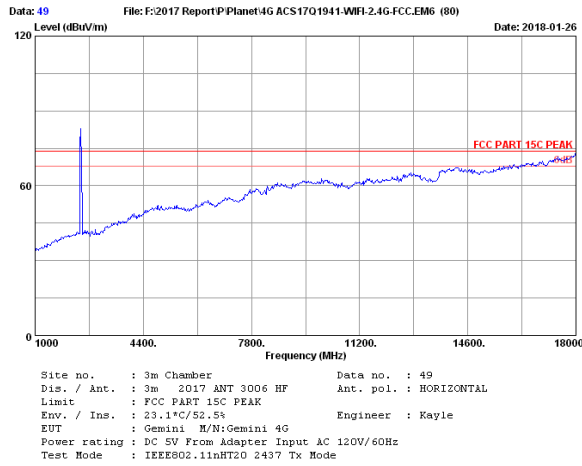
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2412.00	27.98	10.34	95.99	35.61	95.70	74.00	-22.70	Peak
2	4824.00	33.46	14.55	35.68	33.80	49.89	54.00	4.11	Average
3	4824.00	33.46	14.55	49.16	33.80	63.37	74.00	10.63	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



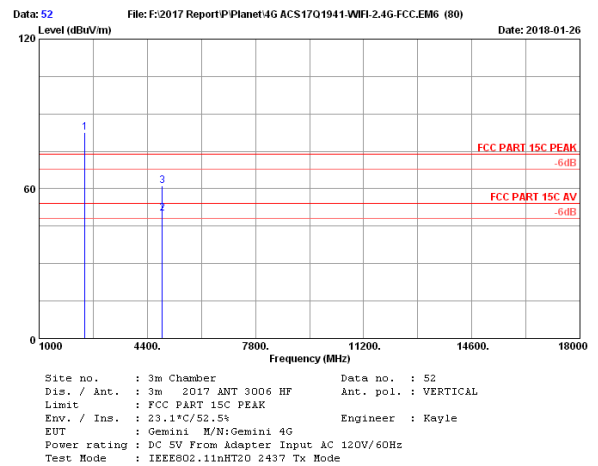
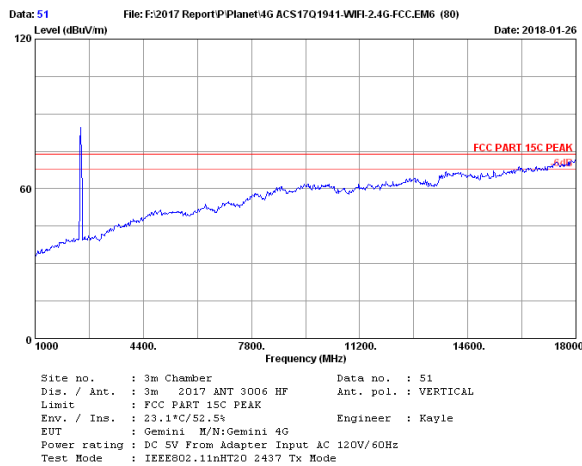
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2412.00	27.98	10.34	98.34	35.61	101.05	74.00	-27.05	Peak
2	4824.00	33.46	14.55	36.16	33.80	50.37	54.00	3.63	Average
3	4824.00	33.46	14.55	50.83	33.80	65.04	74.00	8.96	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



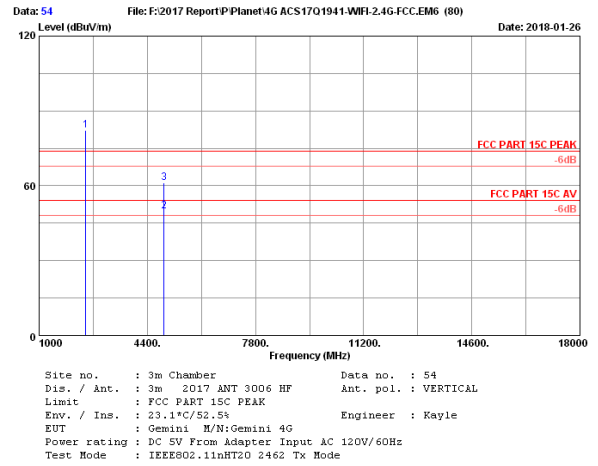
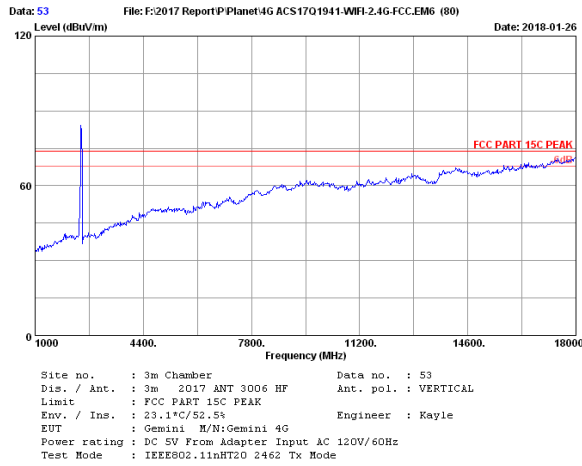
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	28.03	10.37	80.23	35.64	82.99	74.00	-8.99	Peak
2	4874.00	33.56	14.62	35.87	33.75	50.30	54.00	3.70	Average
3	4874.00	33.56	14.62	47.31	33.75	61.74	74.00	12.26	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



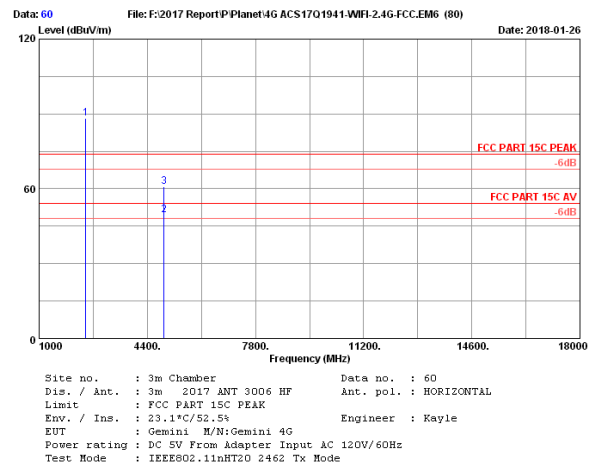
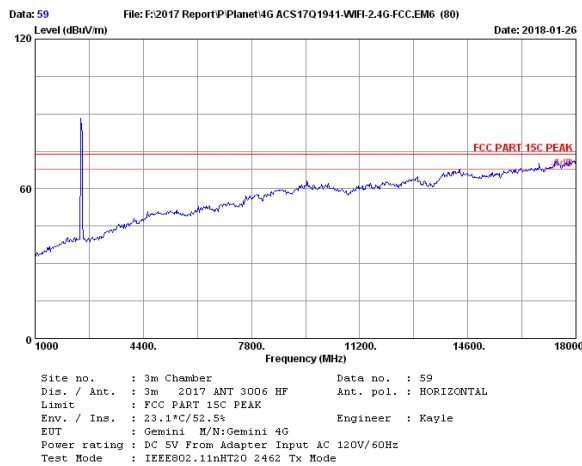
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	28.03	10.37	79.84	35.64	82.60	74.00	-8.60	Peak
2	4874.00	33.56	14.62	35.58	33.75	50.01	54.00	3.99	Average
3	4874.00	33.56	14.62	46.74	33.75	61.17	74.00	12.83	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



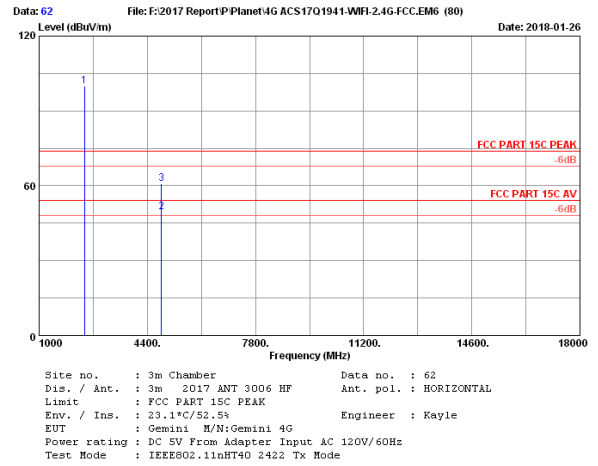
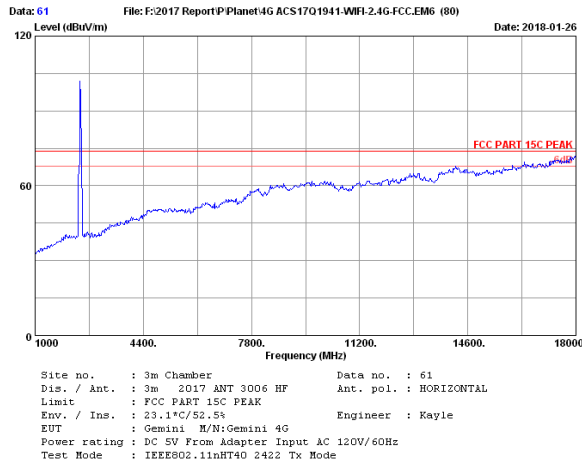
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2462.00	28.05	10.41	79.54	35.68	82.32	74.00	-8.32	Peak
2	4924.00	33.66	14.68	35.02	33.71	49.65	54.00	4.35	Average
3	4924.00	33.66	14.68	46.57	33.71	61.20	74.00	12.80	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official limit are not reported.



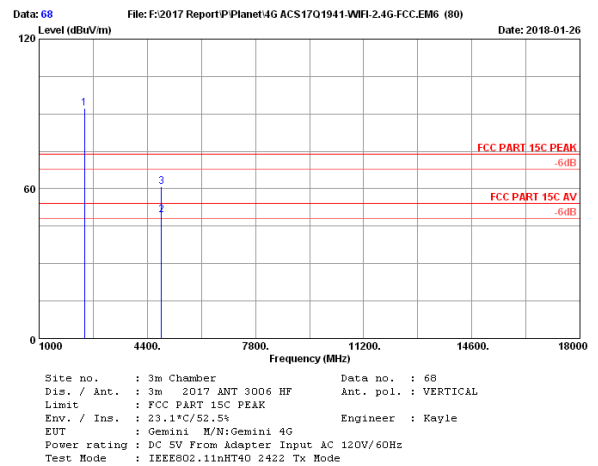
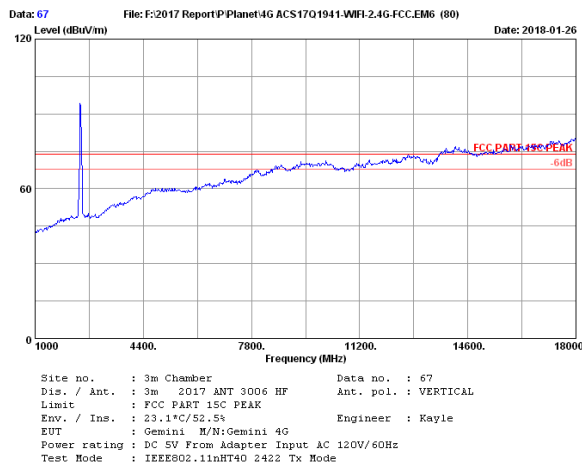
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2462.00	28.05	10.41	85.34	35.68	88.12	74.00	-14.12	Peak
2	4924.00	33.66	14.68	34.85	33.71	49.48	54.00	4.52	Average
3	4924.00	33.66	14.68	46.18	33.71	60.81	74.00	13.19	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official limit are not reported.



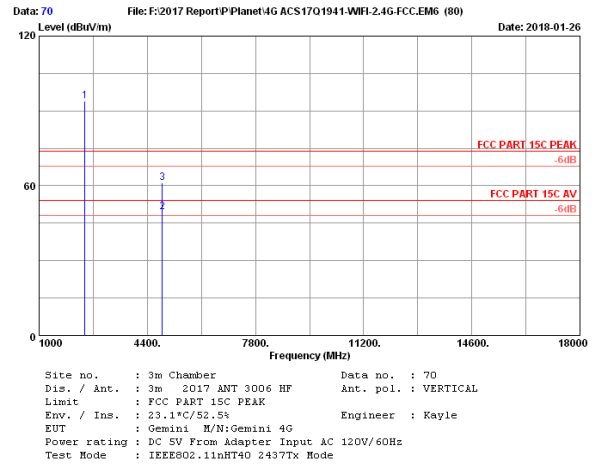
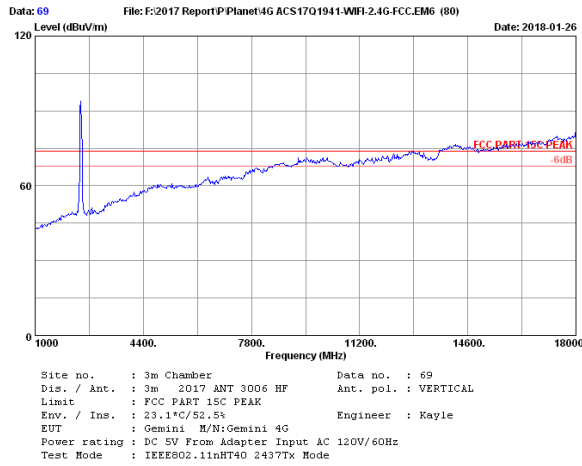
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2422.00	28.00	10.34	97.11	35.64	99.81	74.00	-25.81	Peak
2	4844.00	33.49	14.57	35.13	33.78	49.41	54.00	4.59	Average
3	4844.00	33.49	14.57	46.56	33.78	60.84	74.00	13.16	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official limit are not reported.



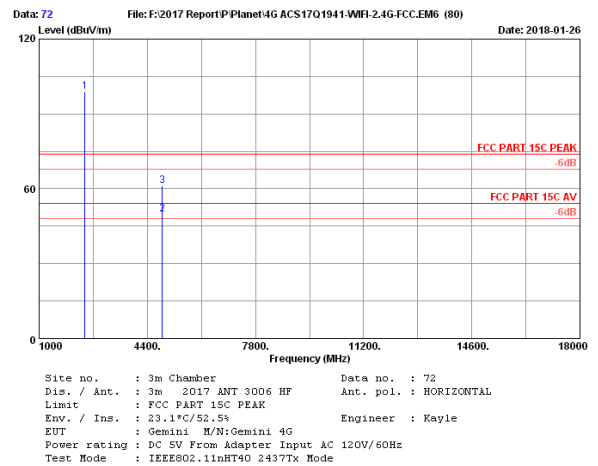
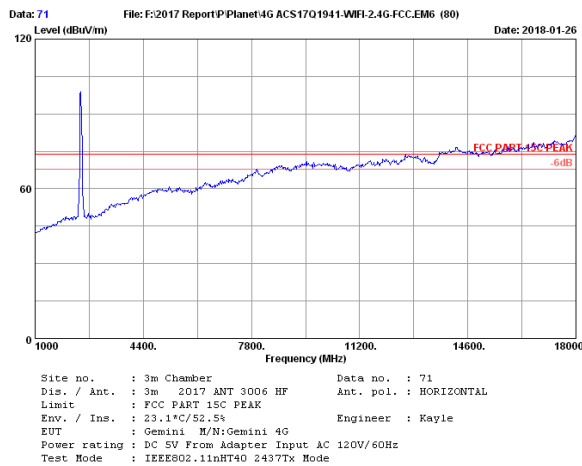
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2422.00	28.00	10.34	89.70	35.64	92.40	74.00	-18.40	Peak
2	4844.00	33.49	14.57	35.05	33.78	49.33	54.00	4.67	Average
3	4844.00	33.49	14.57	46.63	33.78	60.91	74.00	13.09	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official limit are not reported.



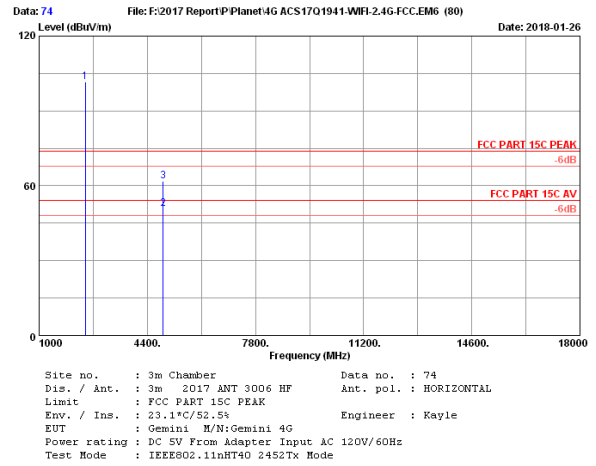
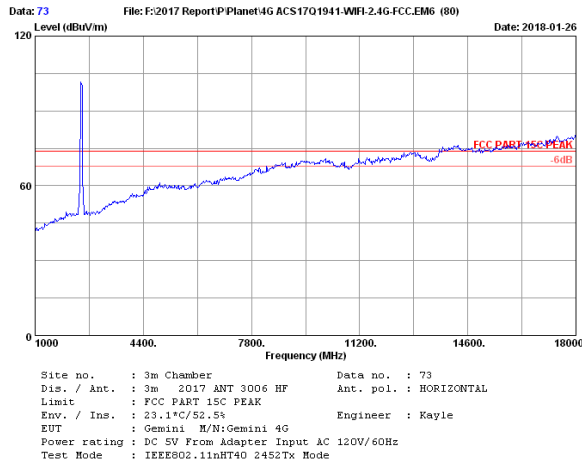
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	28.03	10.37	91.25	35.64	94.01	74.00	-20.01	Peak
2	4874.00	33.56	14.62	35.02	33.75	49.45	54.00	4.55	Average
3	4874.00	33.56	14.62	46.60	33.75	61.03	74.00	12.97	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



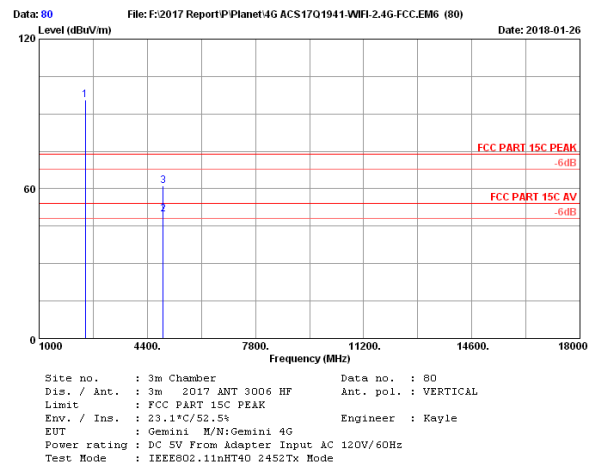
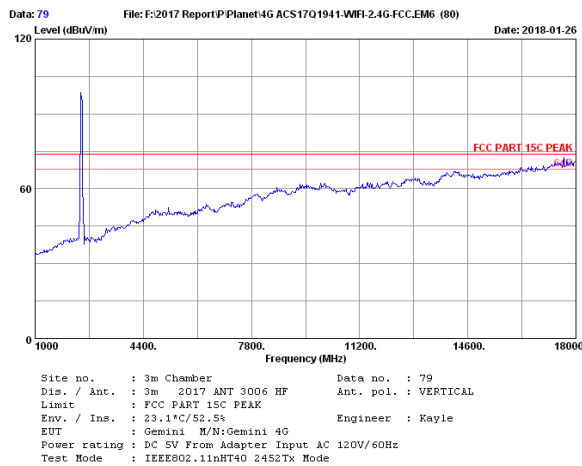
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	28.03	10.37	96.11	35.64	98.87	74.00	-24.87	Peak
2	4874.00	33.56	14.62	35.41	33.75	49.84	54.00	4.16	Average
3	4874.00	33.56	14.62	46.58	33.75	61.01	74.00	12.99	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2452.00	28.03	10.41	98.79	35.68	101.55	74.00	-27.55	Peak
2	4904.00	33.63	14.65	36.21	33.73	50.76	54.00	3.24	Average
3	4904.00	33.63	14.65	47.13	33.73	61.68	74.00	12.32	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official limit are not reported.



No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2452.00	28.03	10.41	92.81	35.68	95.57	74.00	-21.57	Peak
2	4904.00	33.63	14.65	35.14	33.73	49.69	54.00	4.31	Average
3	4904.00	33.63	14.65	46.75	33.73	61.30	74.00	12.70	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official limit are not reported.

5. CONDUCTED SPURIOUS EMISSIONS

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY53311015	Oct.15,17	1 Year
2.	Attenuator	Agilent	8491B	MY39262165	Apr.27,17	1 Year
3.	RF Cable	Marvelous Microwave Inc	SFL402105FLEX	NO.1	Oct.15,17	1 Year

5.2. Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

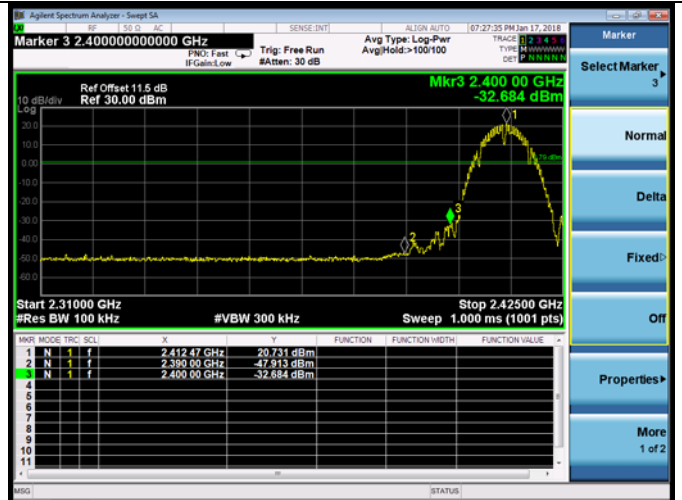
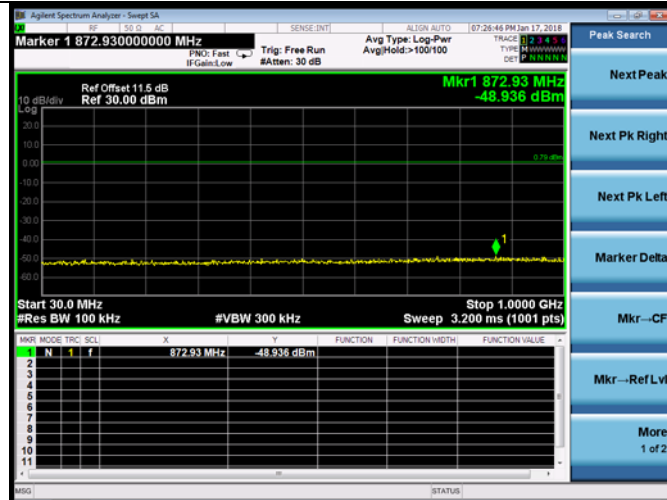
5.3. Test Procedure

The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions with peak detector.

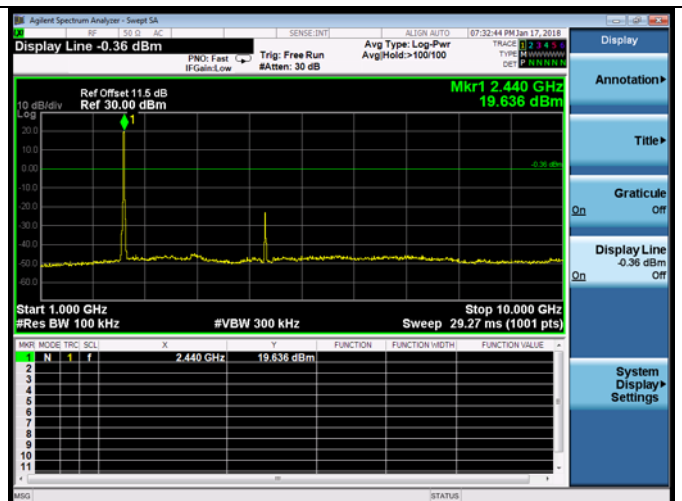
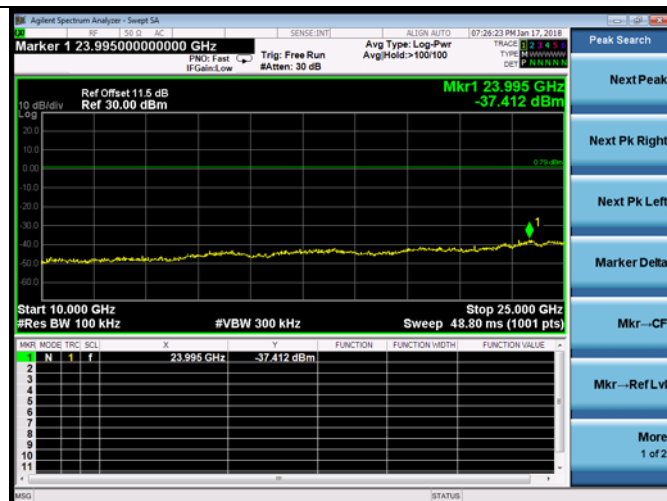
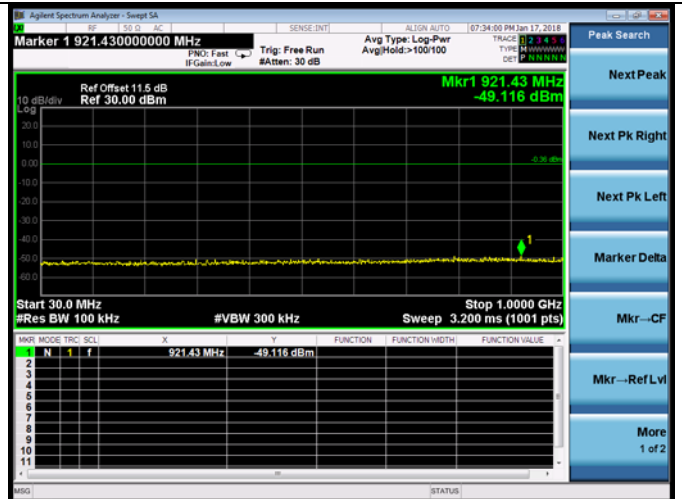
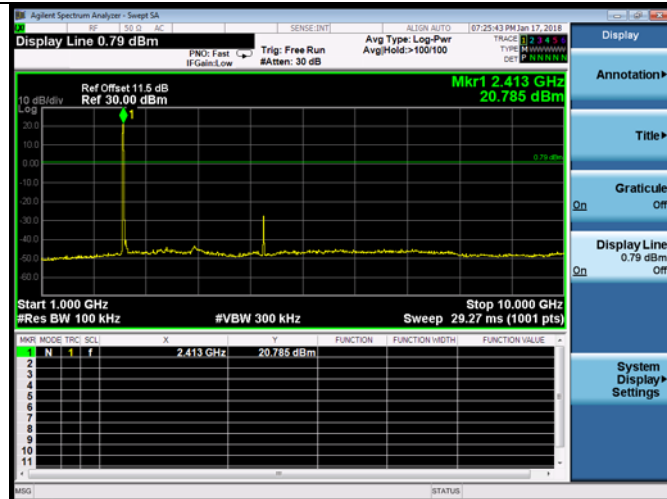
5.4. Test result

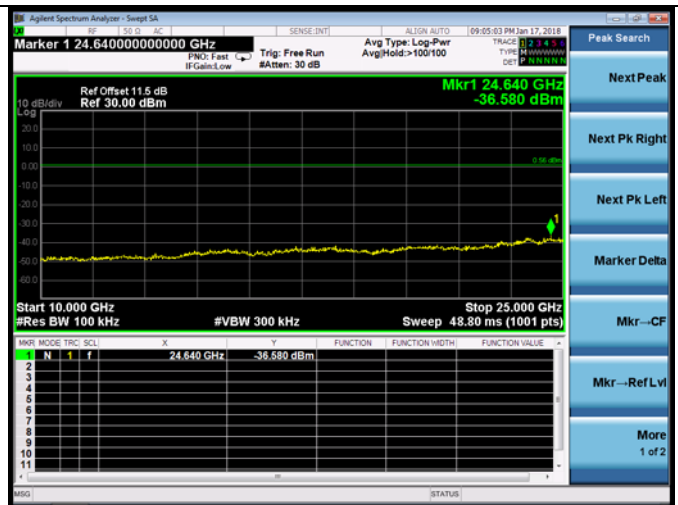
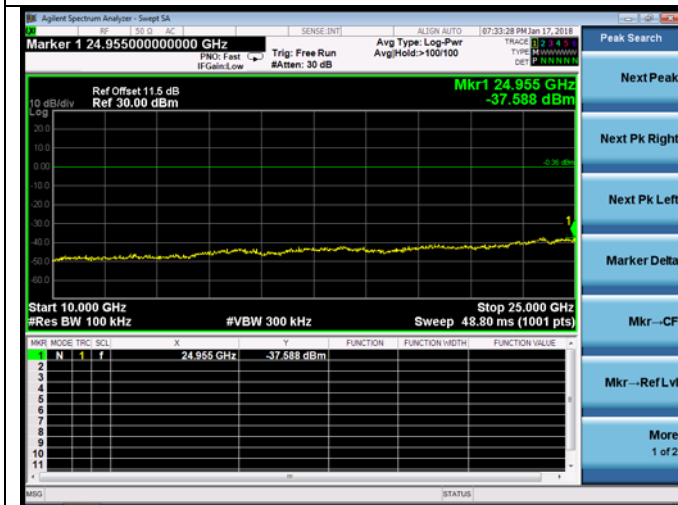
PASS (The testing data was attached in the next pages.)

Test Mode: IEEE 802.11b
Test CH1: 2412MHz

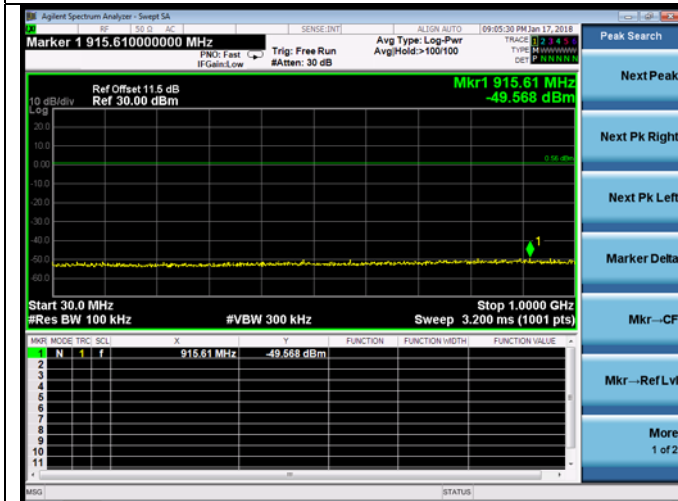


Test CH6: 2437MHz

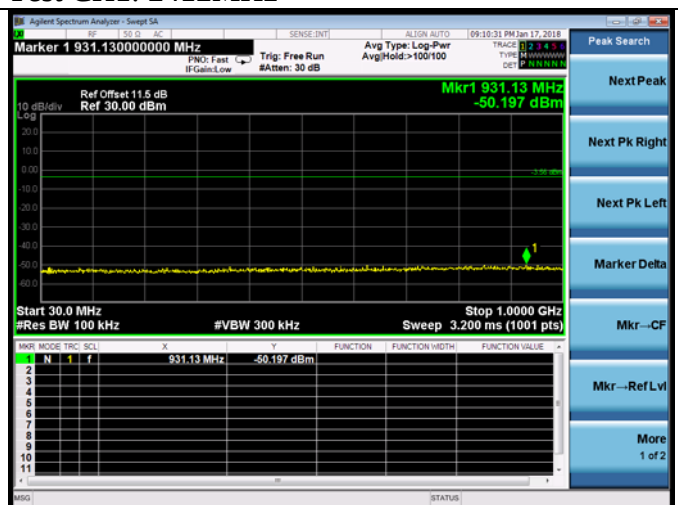
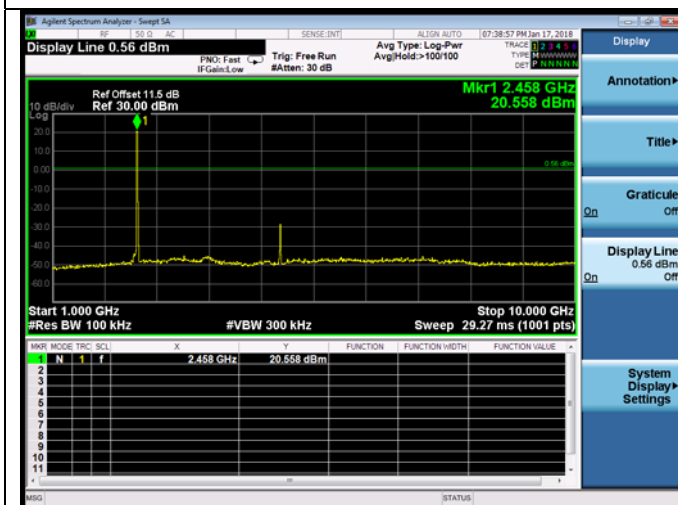




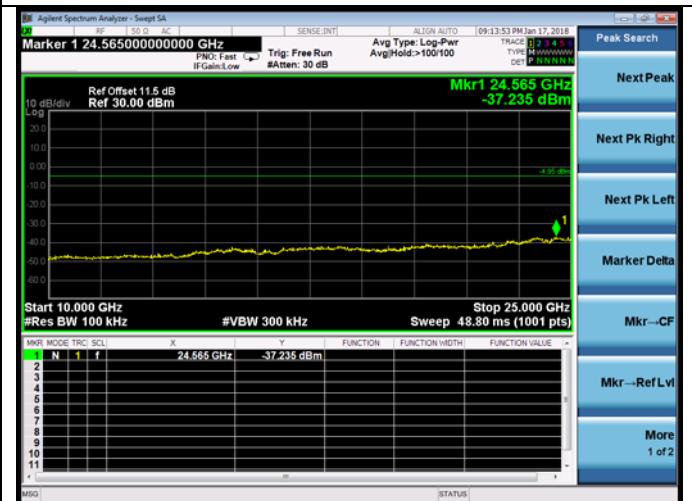
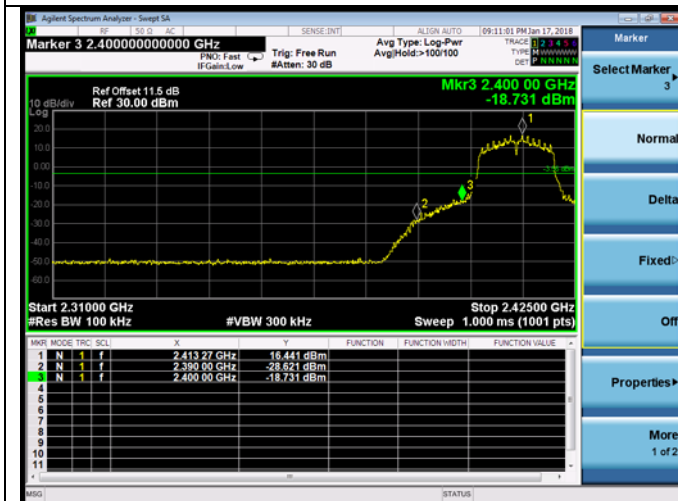
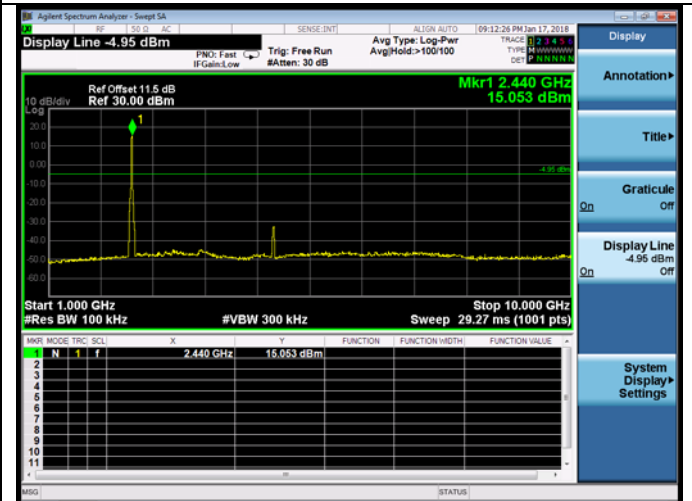
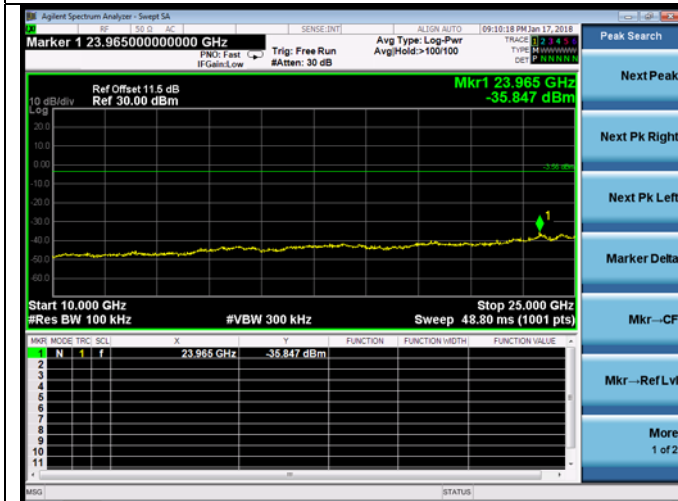
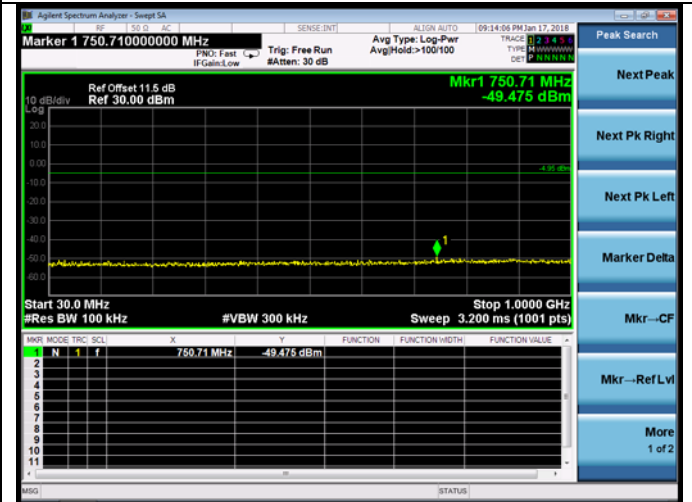
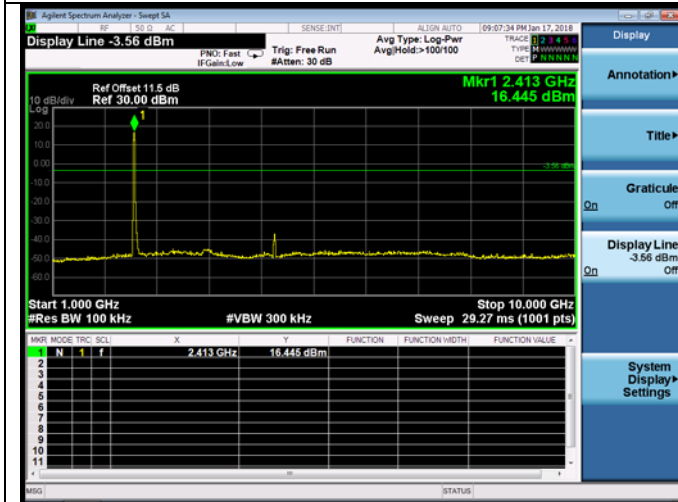
Test CH11: 2462MHz



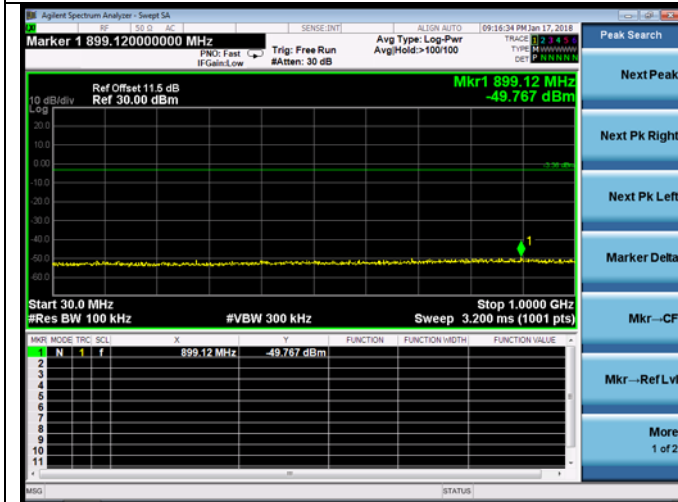
Test Mode: IEEE 802.11g Test CH1: 2412MHz



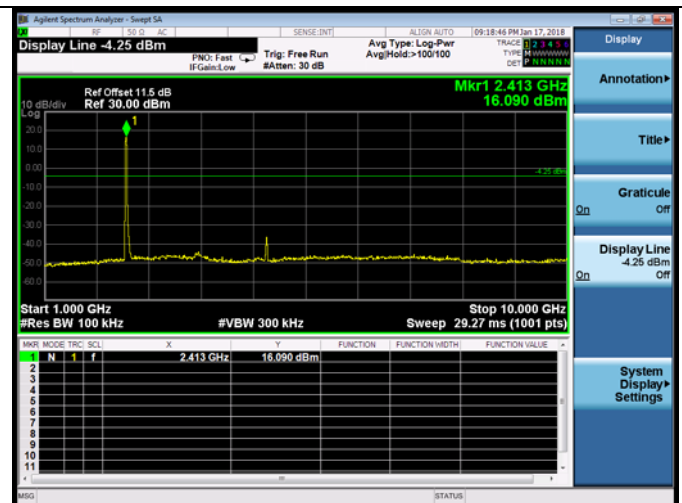
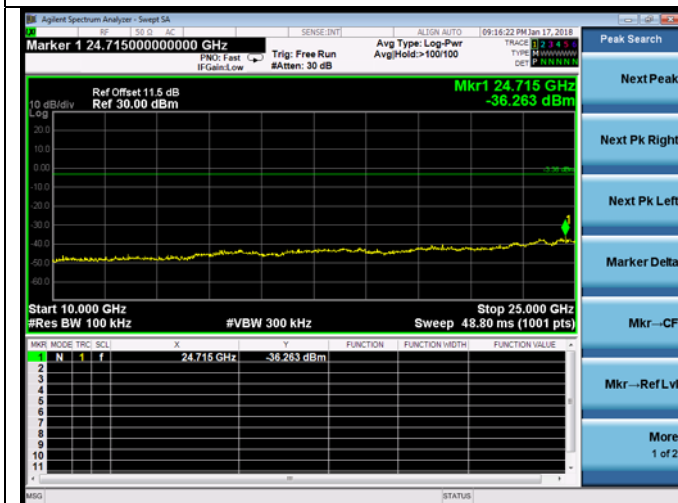
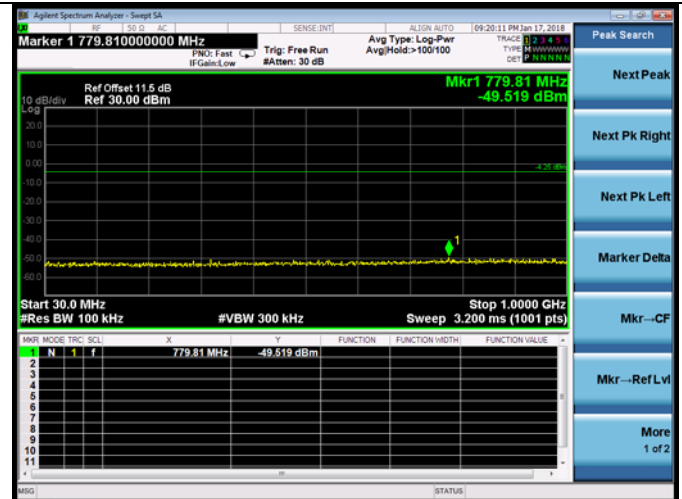
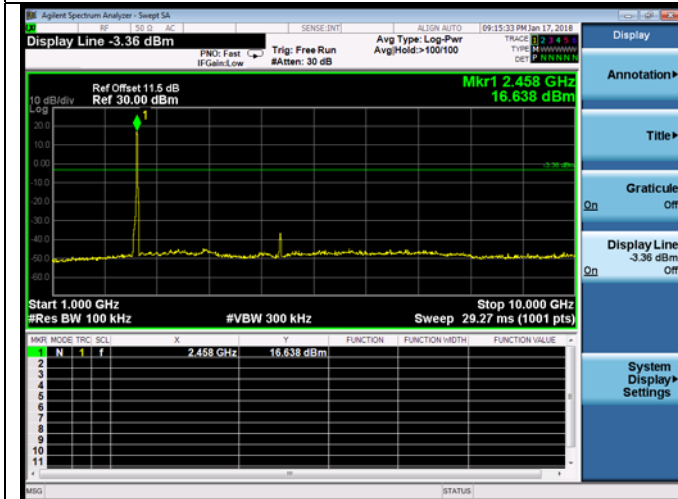
Test CH6: 2437MHz

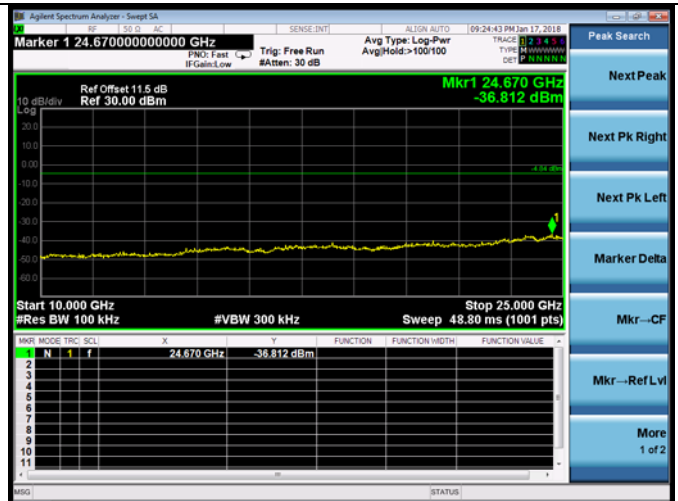
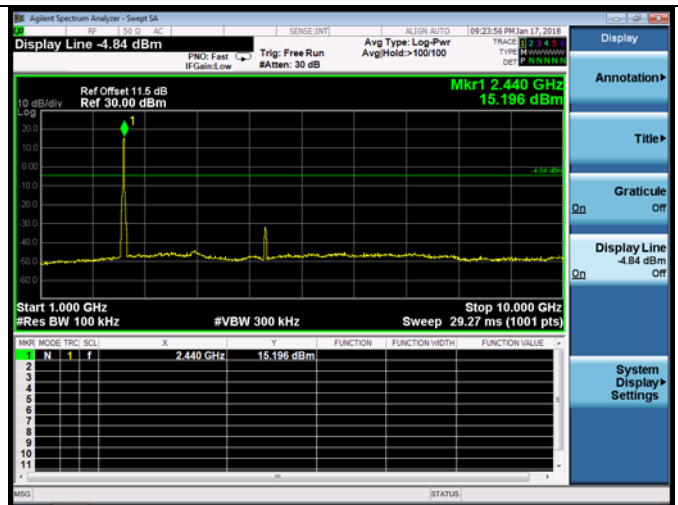
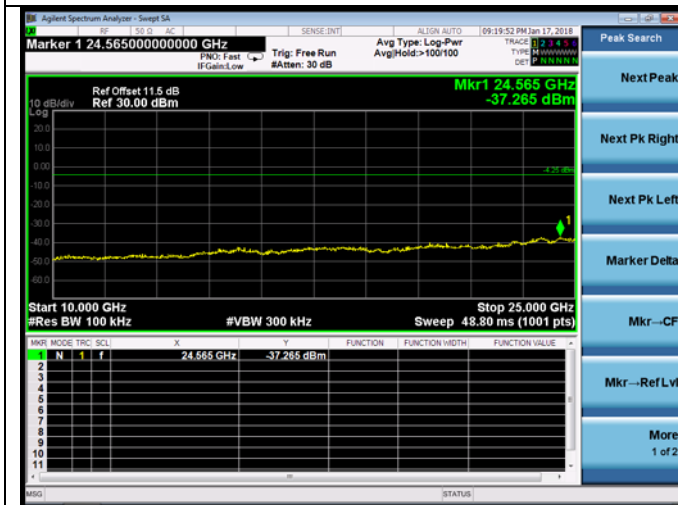


Test CH11: 2462MHz

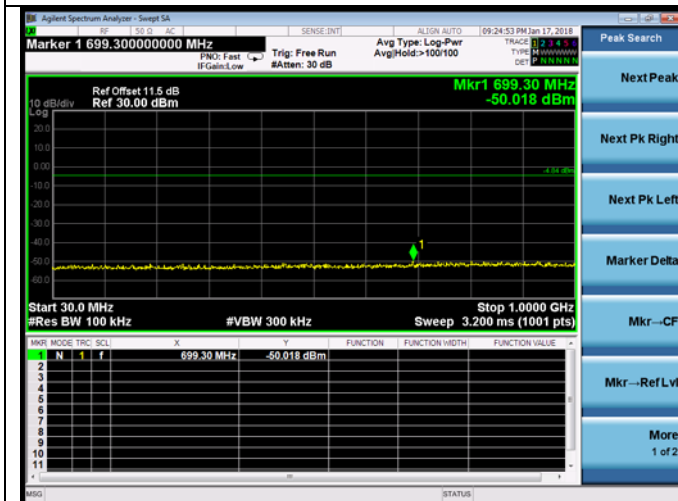


Test Mode: IEEE 802.11n HT20 Test CH1: 2412MHz

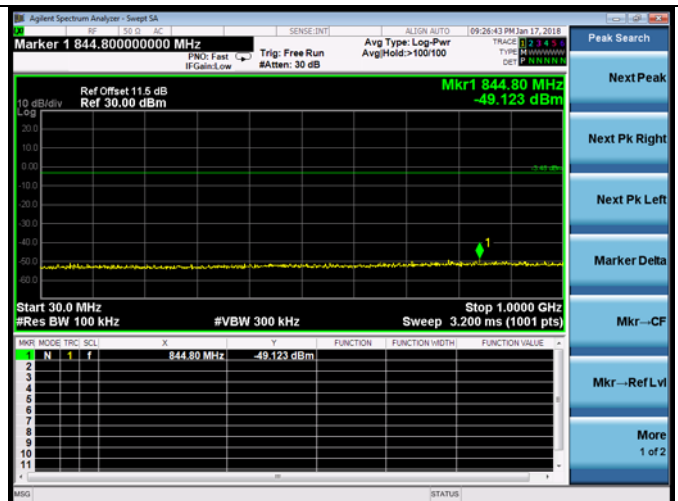




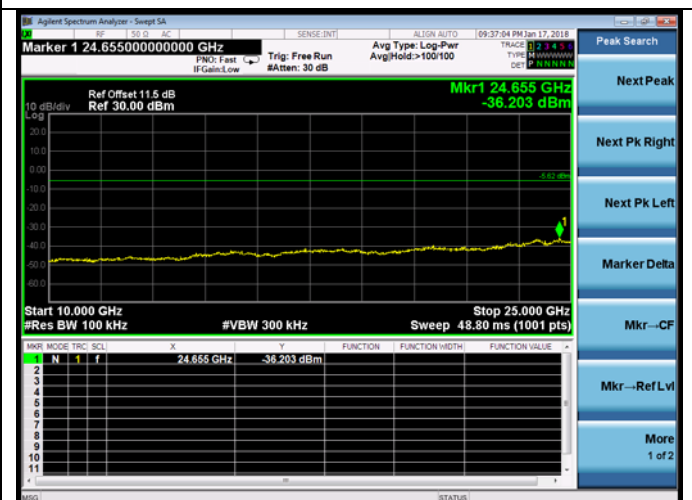
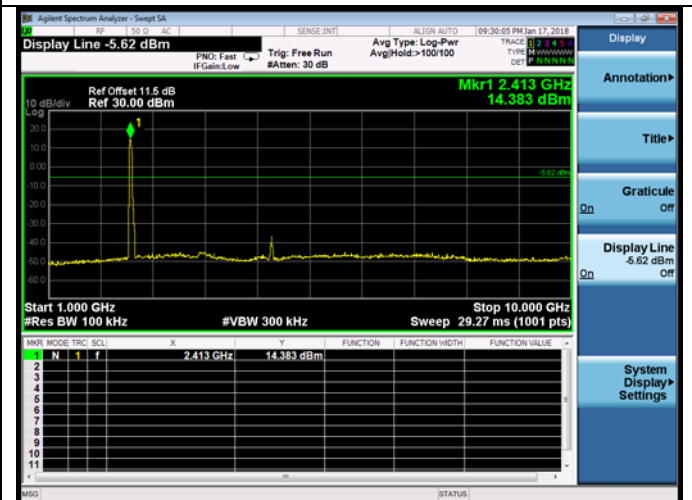
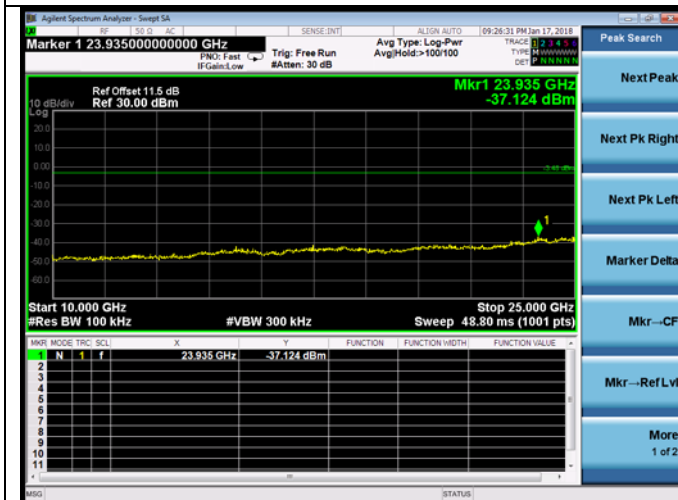
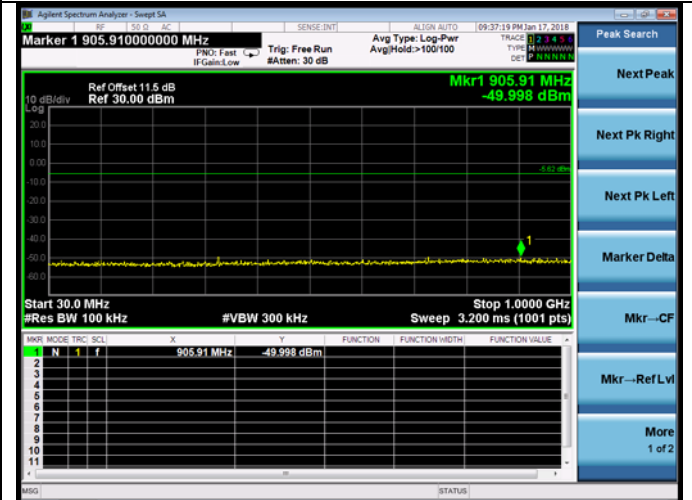
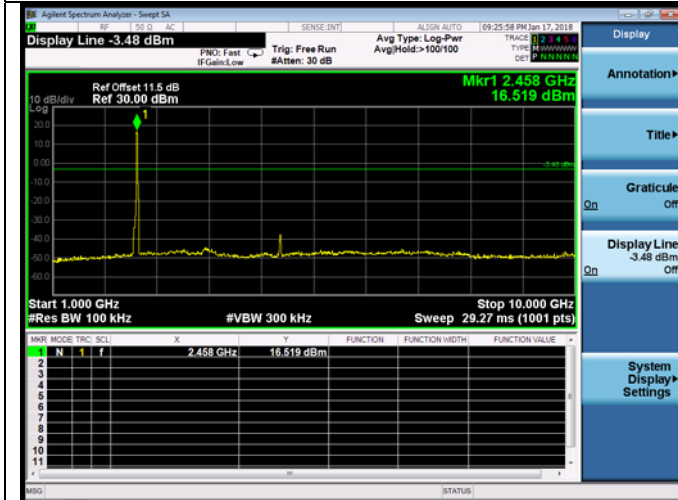
Test CH6: 2437MHz

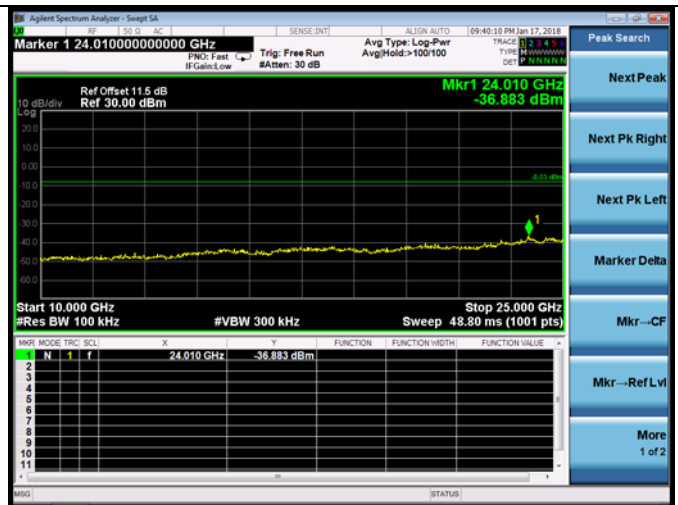
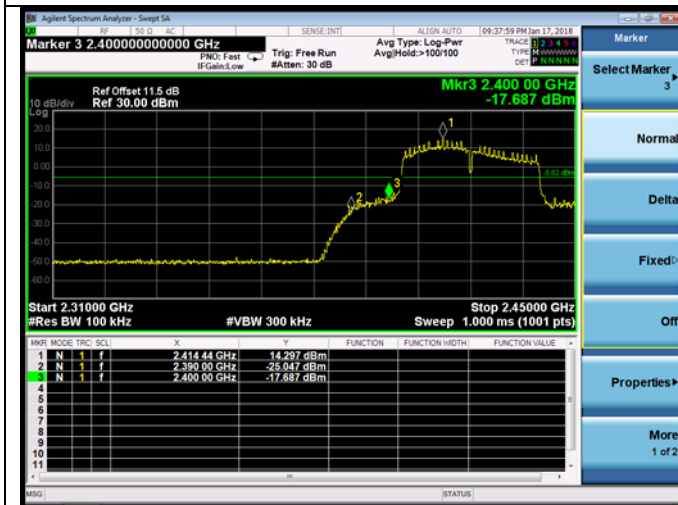


Test CH11: 2462MHz

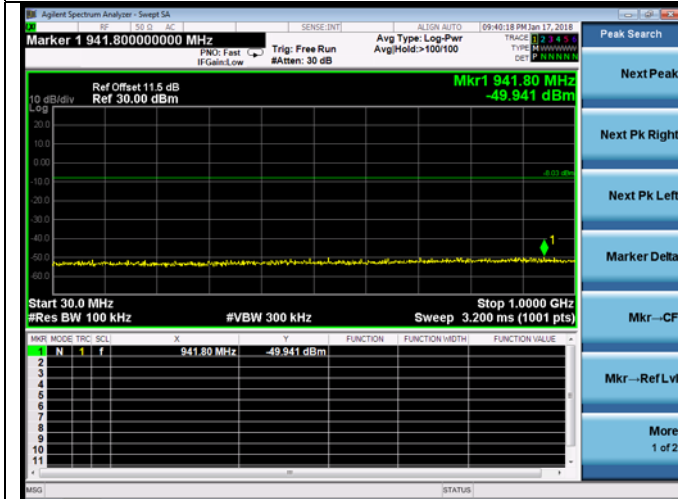


Test Mode: IEEE 802.11n HT40 Test CH3: 2422MHz





Test CH6: 2437MHz



Test CH9: 2452MHz

