



FCC RADIO TEST REPORT

Applicant : Ubiquiti Networks, Inc.
Address : 685 Third Avenue, 27th Floor New York,
New York 10017 USA
Equipment : NanoBeam AC
Model No. : NBE-2AC-13
Trade Name : UBIQUITI
FCC ID. : SWX-NBE2ACN

I HEREBY CERTIFY THAT :

The sample was received on Aug. 17, 2017 and the testing was carried out on Aug. 18, 2017 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Mark Liao / Assistant Manager

Tested by:

Spree Yei / Engineer

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





Contents

1. Summary of Test Procedure and Test Results.....	5
1.1 Applicable Standards	5
2. Test Configuration of Equipment under Test.....	6
2.1 Feature of Equipment.....	6
2.2 Carrier Frequency of Channels.....	6
2.3 Test Mode and Test Software	7
2.4 Description of Test System.....	7
2.5 General Information of Test.....	8
2.6 Measurement Uncertainty	8
3. Test Equipment and Ancillaries Used for Tests.....	9
4. Antenna Requirements.....	10
4.1 Antenna Construction and Directional Gain.....	10
5. Test of AC Power Line Conducted Emission	11
5.1 Test Limit	11
5.2 Test Procedures	11
5.3 Typical Test Setup	12
5.4 Test Result and Data.....	13
5.5 Test Photographs	15
6. Test of Radiated Spurious Emission.....	16
6.1 Test Limit	16
6.2 Test Procedures	16
6.3 Typical Test Setup	17
6.4 Test Result and Data (9KHz ~ 30MHz)	18
6.5 Test Result and Data (30MHz ~ 1GHz).....	18
6.6 Test Result and Data (1GHz ~ 25GHz).....	20
6.7 Restricted Bands of Operation	56
6.8 Test Photographs (30MHz ~ 1GHz)	57
6.9 Test Photographs (1GHz ~ 25GHz)	58
7. Test of Conducted Spurious Emission	59
7.1 Test Limit	59
7.2 Test Procedure	59
7.3 Test Setup Layout	59
7.4 Test Result and Data.....	59
8. 6dB Bandwidth Measurement Data.....	84
8.1 Test Limit	84
8.2 Test Procedures	84
8.3 Test Setup Layout	84
8.4 Test Result and Data.....	84
9. Maximum Average Output Power.....	94
9.1 Test Limit	94
9.2 Test Procedures	94
9.3 Test Setup Layout	94



9.4	Test Result and Data.....	95
10.	Power Spectral Density	96
10.1	Test Limit	96
10.2	Test Procedures	96
10.3	Test Setup Layout	96
10.4	Test Result and Data.....	97
11.	Radio Frequency Exposure	106
11.1	Applicable Standards	106
11.2	EUT Specification	106
11.3	Test Results.....	107
11.4	Calculation.....	107
11.5	Maximum Permissible Exposure.....	108



History of this test report

Report No.	Issue Date	Description
TEF11707241	Aug. 23, 2017	Original



1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.4:2014

ANSI C63.10:2013

FCC Rules and Regulations Part 15 Subpart C §15.247

KDB558074

KDB662911

KDB447498

FCC Rule	Description of Test	Result
15.203	. Antenna Requirement	Pass
15.207	. AC Power Line Conducted Emission	Pass
15.209 15.205	. Radiated Spurious Emission	Pass
15.247(d)	. Conducted Spurious Emission	Pass
15.247(a)(2)	. 6dB Bandwidth	Pass
15.247(b)	. Maximum Peak and Average Output Power	Pass
15.247(e)	. Power Spectral Density	Pass
2.1091	. Radio Frequency Exposure	Pass

This EUT has been also tested and compiled with the requirement of FCC Part 15, Subpart B, recorded in a separate test report.



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment

Frequency Range	802.11n/ac: 2412-2462 MHz 802.11n: 5725MHz -5850MHz
Modulation Type	OFDM
Data Rate	2.4GHz 802.11n: MCS0 – MCS15, HT10/20/40 802.11ac: MCS0 – MCS9, VHT10/20/40 5GHz 802.11n: MCS0 – MCS7, HT20
Antenna Type/ gain	Internal antenna 2.4G: ANT 0/1: 13dBi, 5G: ANT 0: 2dBi

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2 Carrier Frequency of Channels

802.11n HT10, 802.11n HT20, 802.11ac VHT10, 802.11ac VHT20 (2412MHz~2462MHz)

Frequency(MHz)	Frequency(MHz)	Frequency(MHz)	Frequency(MHz)
*2412	2427	2442	2457
2414	2429	2444	2459
2417	2432	2447	*2462
2419	2434	2449	
2422	*2437	2452	
2424	2439	2454	

802.11n HT40, 802.11ac VHT40 (2422MHz~2452MHz)

Frequency(MHz)	Frequency(MHz)	Frequency(MHz)
*2422	*2437	*2452
2424	2439	
2427	2442	
2429	2444	
2432	2447	
2434	2449	

Note: Channels remarked * are selected to perform test.



2.3 Test Mode and Test Software

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
 - b. The complete test system included EUT for RF test.
 - c. An executive program, "RF Tool" under WIN 8 was executed to transmit and receive data via WLAN.
 - d. The following test modes were performed for the test:
 - Test Mode 1: 802.11n HT10 (MCS0)
 - Test Mode 2: 802.11n HT20 (MCS0)
 - Test Mode 3: 802.11n HT40 (MCS0)
 - Test Mode 4: 802.11ac VHT10 (MCS0)
 - Test Mode 5: 802.11ac VHT20 (MCS0)
 - Test Mode 6: 802.11ac VHT40 (MCS0)
- For conduction test, caused "Test Mode 4" generated the worst case, it was reported as the final data.
- For radiation test (below 1GHz), caused "Test Mode 4" generated the worst case, it was reported as the final data.
- For radiation test (above 1GHz), caused "Test Mode 4~6" generated the worst case, they were reported as the final data.

2.4 Description of Test System

No support unit was used during testing.



2.5 General Information of Test

Test Site	CerpPASS Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582	
	FCC	TW1079, TW1061, 390316, 228391, 641184
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-4399, R-4218 for Radiated emission test G-812, G-813 for radiated disturbance above 1GHz
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 25,000MHz	
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.	

2.6 Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	Line / Neutral	±2.9076 dB
Radiated Emission	9 kHz ~ 25,000 MHz	Vertical / Horizontal	±0.948 dB
Spurious Emission (Conducted)	-	-	±4.011 dB
Maximum Peak and Average Output Power	-	-	±0.322 dB
Power Spectral Density	-	-	±0.322 dB
Bandwidth	-	-	74.224Hz



3. Test Equipment and Ancillaries Used for Tests

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Receiver	R&S	ESCI3	100443	2017/03/07	2018/03/06
LISN	Schwarzbeck	NSLK 8127	8127-740	2016/08/30	2017/08/29
LISN	Schwarzbeck	NSLK 8127	8127-516	2016/09/06	2017/09/05
Pulse Limiter	R&S	ESH3-Z2	101934	2017/02/14	2018/02/13
Bilog Antenna	Schwarzbeck	VULB9168	369	2017/03/15	2018/03/14
Active Loop Antenna	EMCO	6507	40855	2017/05/15	2018/05/14
Horn Antenna	EMCO	3115	31601	2016/09/05	2017/09/04
Horn Antenna	EMCO	3116	31970	2017/03/29	2018/03/28
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200207	2017/03/17	2018/03/16
Preamplifier	EM	EM330	60660	2017/02/25	2018/02/24
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2016/09/13	2017/09/12
Preamplifier	Agilent	8449B	3008A01954	2017/02/09	2018/02/08
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2016/11/04	2017/11/03
MXG MW Analog Signal Generator	KEYSIGHT	N5183A	MY50142931	2017/03/17	2018/03/16
Spectrum Analyzer	R&S	FSP40	100219	2016/09/01	2017/08/31
Bluetooth Tester	R&S	CBT	101133	2017/03/10	2018/03/09
Attenuator	KEYSIGHT	8491B	MY39250703	2017/03/07	2018/03/06
Rotary Attenuator	Agilent	8495B	MY42146680	2017/03/13	2018/03/12
Temp & Humi chamber	T-MACHINE	TMJ-9712	T-12-040111	2016/09/05	2017/09/04
Series Power Meter	Anritsu	ML2495A	1224005	2017/03/01	2018/02/28
Power Sensor	Anritsu	MA2411B	1207295	2017/03/01	2018/02/28
Cable	HUBER SUHNER	SUCOFLEX 102	28422/2	2017/02/25	2018/02/24
Cable	HUBER SUHNER	SUCOFLEX 102	28418/2	2017/02/25	2018/02/24
Software	Farad	Ez-EMC	ver.ct3a1	N/A	N/A
Software	AUDIX	E3	V8.2014-8-6	N/A	N/A
Software	Keysight	N7607B Signal Studio	v2.0.0.1	N/A	N/A
Software	Keysight	Inservice MonitorUtility	N/A	N/A	N/A



4. Antenna Requirements

4.1 Antenna Construction and Directional Gain

Antenna Type	Internal Antenna
Antenna Gain	2.4G: ANT 0/1: 13dBi, 5G: ANT 0: 2dBi

2412-2462MHz

For Power directional gain= G_{ant} = 13 dBi

For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / NANT]$
= 16.01 (dBi)

5725MHz -5850MHz

For Power directional gain= G_{ant} = 2 dBi

For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / NANT]$
= 2 (dBi)



5. Test of AC Power Line Conducted Emission

5.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz, according to the methods defined in ANSI C63.4-2014. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

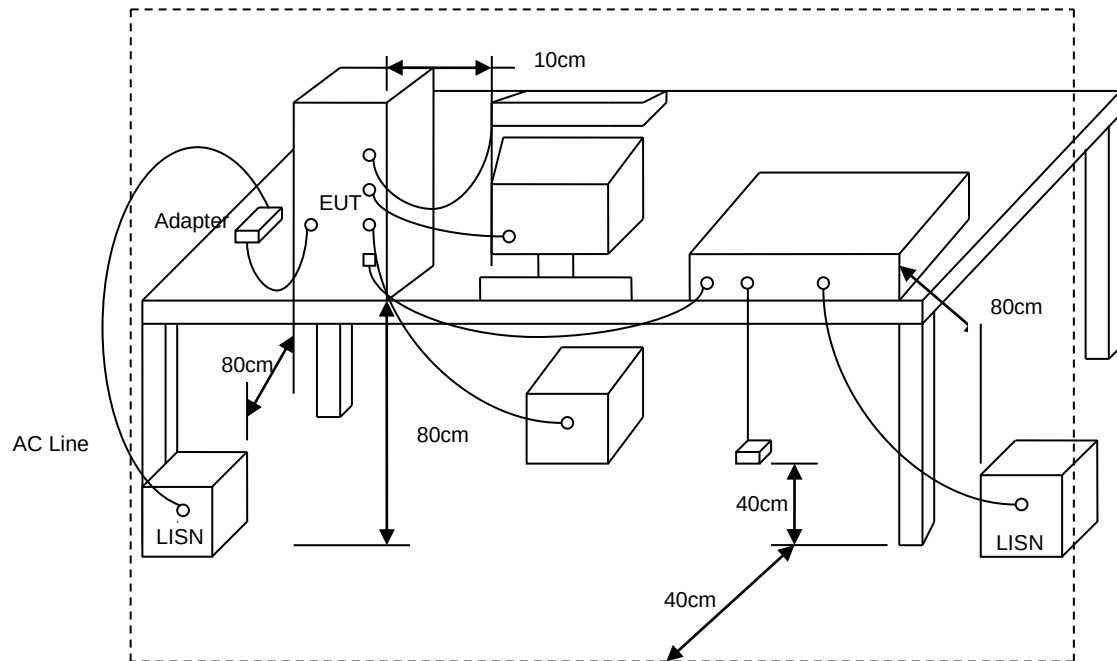
*Decreases with the logarithm of the frequency.

5.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



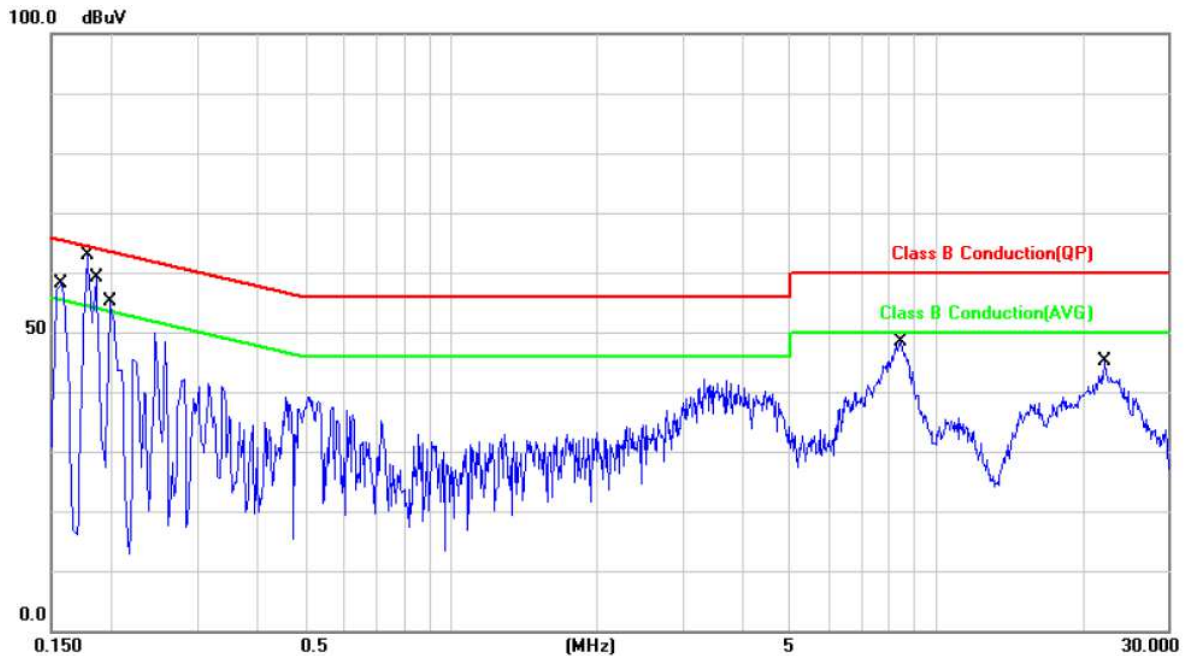
5.3 Typical Test Setup





5.4 Test Result and Data

Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: Mode 4	Temperature	: 24 °C
Test date	: Aug. 18, 2017	Humidity	: 64 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1580	9.91	41.82	51.73	65.56	-13.83	QP	P
2	0.1580	9.91	16.86	26.77	55.56	-28.79	AVG	P
3	0.1780	9.91	44.75	54.66	64.57	-9.91	QP	P
4	0.1780	9.91	21.47	31.38	54.57	-23.19	AVG	P
5	0.1860	9.91	50.68	60.59	64.21	-3.62	QP	P
6	0.1860	9.91	32.16	42.07	54.21	-12.14	AVG	P
7	0.1980	9.91	49.15	59.06	63.69	-4.63	QP	P
8	0.1980	9.91	31.57	41.48	53.69	-12.21	AVG	P
9	8.4260	10.29	34.25	44.54	60.00	-15.46	QP	P
10	8.4260	10.29	25.55	35.84	50.00	-14.16	AVG	P
11	22.2020	10.66	27.30	37.96	60.00	-22.04	QP	P
12	22.2020	10.66	21.75	32.41	50.00	-17.59	AVG	P

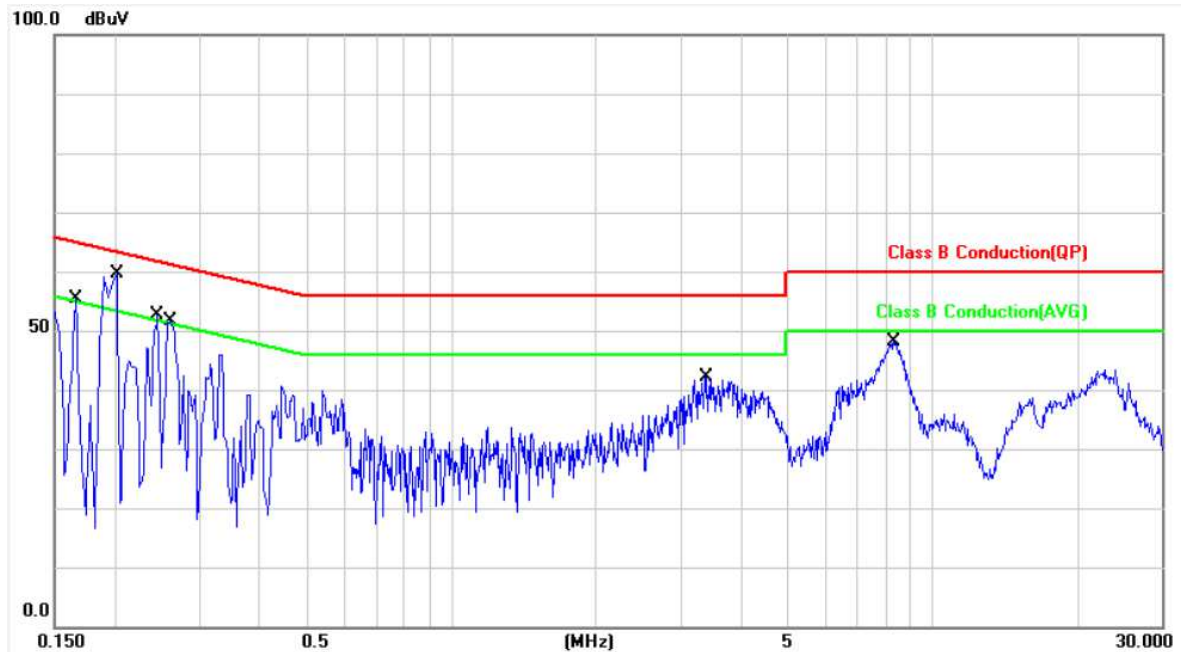
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss+ Attenuator



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode	: Mode 4	Temperature	: 24 °C
Test date	: Aug. 18, 2017	Humidity	: 64 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1660	9.88	39.24	49.12	65.15	-16.03	QP	P
2	0.1660	9.88	14.26	24.14	55.15	-31.01	AVG	P
3	0.2020	9.88	47.73	57.61	63.52	-5.91	QP	P
4	0.2020	9.88	27.95	37.83	53.52	-15.69	AVG	P
5	0.2460	9.88	40.23	50.11	61.89	-11.78	QP	P
6	0.2460	9.88	20.22	30.10	51.89	-21.79	AVG	P
7	0.2620	9.88	38.80	48.68	61.36	-12.68	QP	P
8	0.2620	9.88	21.01	30.89	51.36	-20.47	AVG	P
9	3.4060	10.06	28.12	38.18	56.00	-17.82	QP	P
10	3.4060	10.06	14.21	24.27	46.00	-21.73	AVG	P
11	8.3300	10.26	34.37	44.63	60.00	-15.37	QP	P
12	8.3300	10.26	25.47	35.73	50.00	-14.27	AVG	P

Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss+ Attenuator



6. Test of Radiated Spurious Emission

6.1 Test Limit

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/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

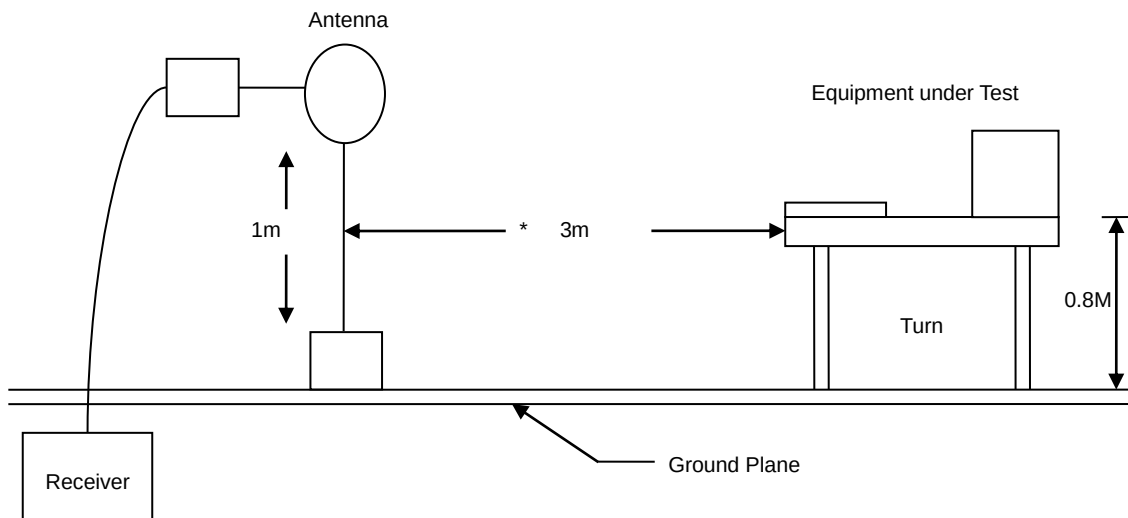
6.2 Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

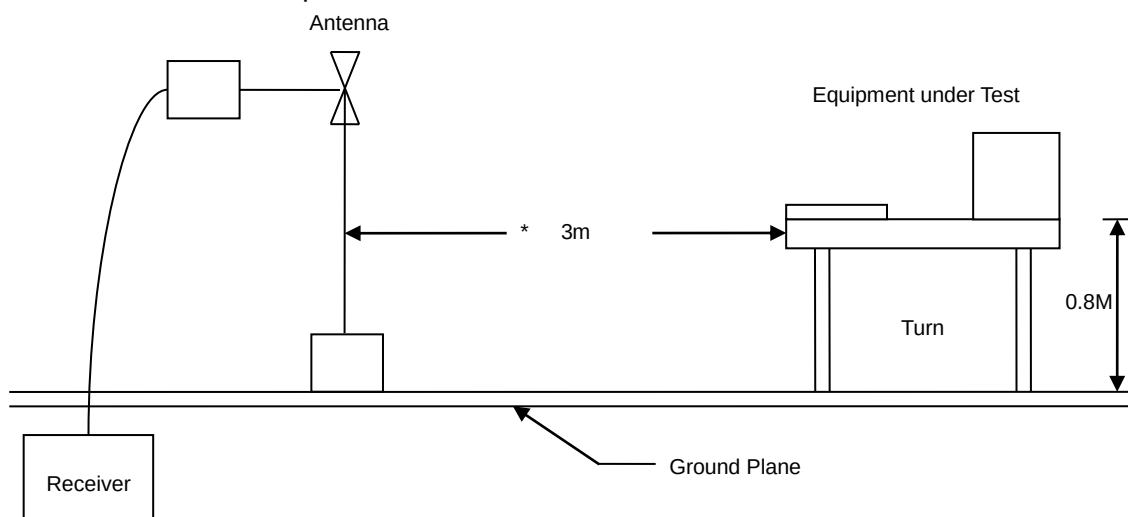


6.3 Typical Test Setup

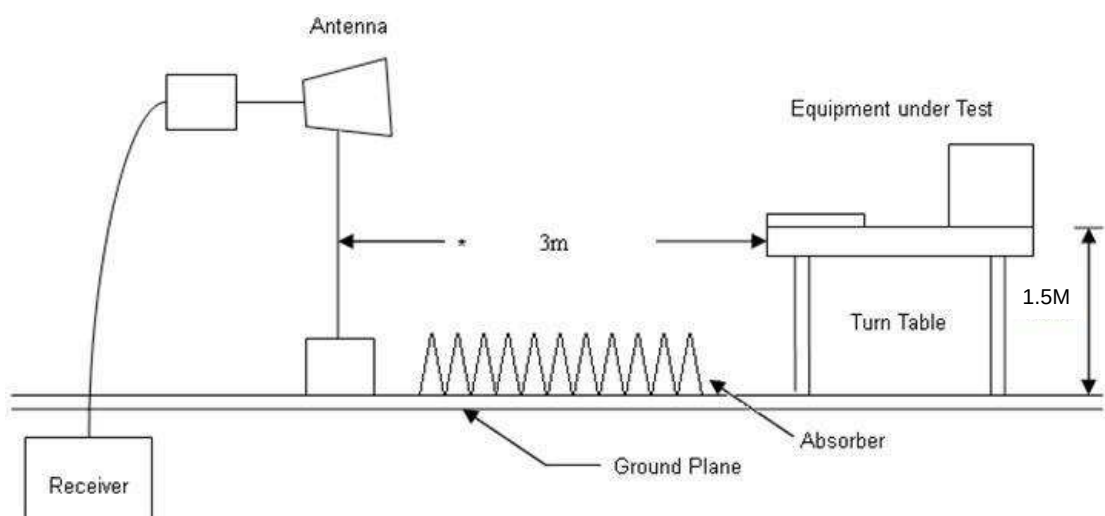
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



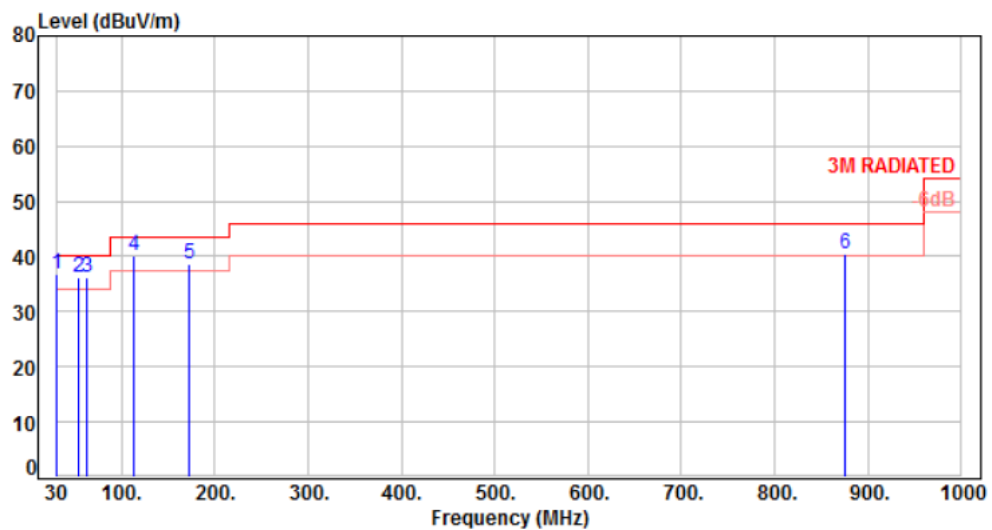


6.4 Test Result and Data (9KHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

6.5 Test Result and Data (30MHz ~ 1GHz)

Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	30.00	-11.20	48.05	36.85	40.00	-3.15	Peak	100	0	P
2	53.28	-10.73	47.02	36.29	40.00	-3.71	QP	100	161	P
3	62.98	-11.84	48.12	36.28	40.00	-3.72	QP	100	182	P
4	113.42	-13.48	53.62	40.14	43.50	-3.36	QP	100	159	P
5	171.62	-11.19	49.96	38.77	43.50	-4.73	Peak	100	0	P
6	875.84	1.45	39.11	40.56	46.00	-5.44	Peak	100	0	P

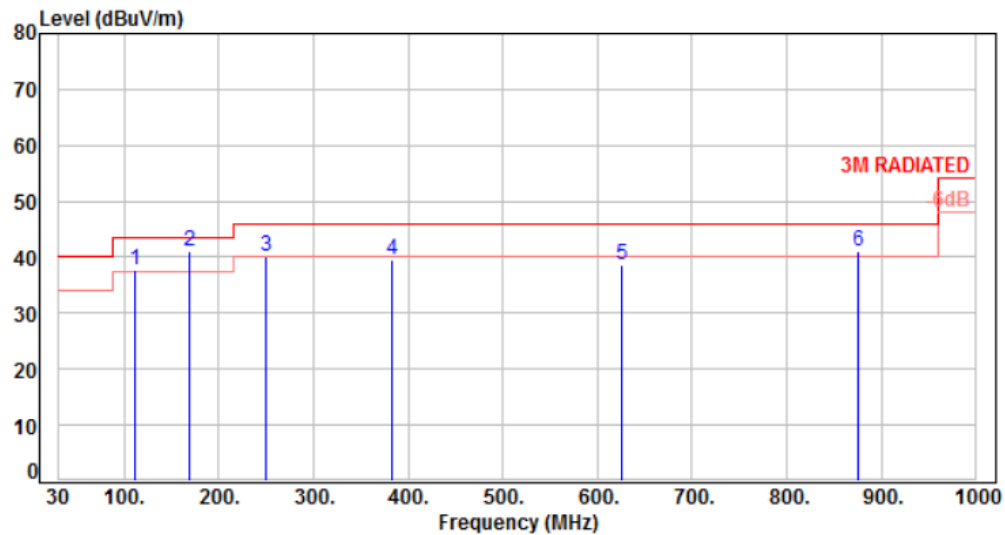
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	111.48	-13.66	51.31	37.65	43.50	-5.85	QP	100	167	P
2	169.68	-11.00	52.12	41.12	43.50	-2.38	QP	100	158	P
3	249.22	-11.47	51.64	40.17	46.00	-5.83	Peak	100	0	P
4	383.08	-7.51	47.10	39.59	46.00	-6.41	Peak	100	0	P
5	625.58	-2.37	41.12	38.75	46.00	-7.25	Peak	100	0	P
6	875.84	1.45	39.73	41.18	46.00	-4.82	QP	100	172	P

Note: Level=Reading+Factor

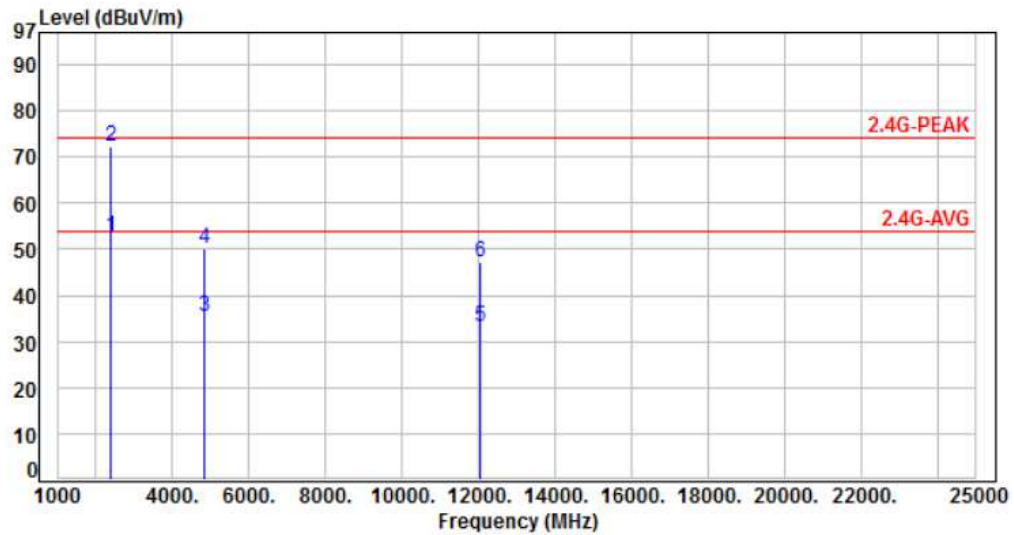
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



6.6 Test Result and Data (1GHz ~ 25GHz)

Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, 2412MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	71.85	52.82	54.00	-1.18	Average	218	341	P
2	2390.00	-19.03	91.46	72.43	74.00	-1.57	Peak	218	341	P
3	4824.00	-13.33	48.88	35.55	54.00	-18.45	Average	318	194	P
4	4824.00	-13.33	63.45	50.12	74.00	-23.88	Peak	318	194	P
5	12060.00	-6.06	39.33	33.27	54.00	-20.73	Average	373	225	P
6	12060.00	-6.06	53.39	47.33	74.00	-26.67	Peak	373	225	P

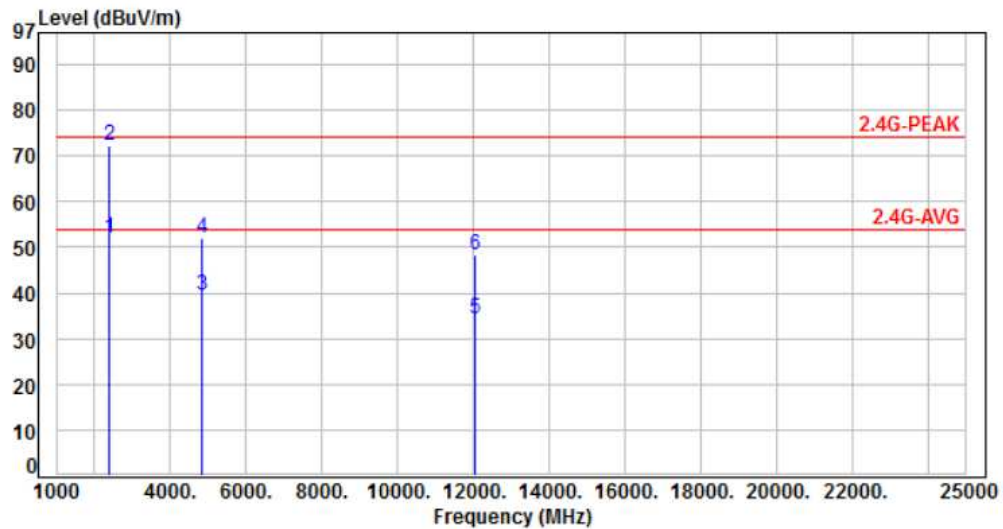
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, 2412MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	71.20	52.17	54.00	-1.83	Average	207	345	P
2	2390.00	-19.03	91.29	72.26	74.00	-1.74	Peak	207	345	P
3	4824.00	-13.33	52.64	39.31	54.00	-14.69	Average	111	223	P
4	4824.00	-13.33	65.50	52.17	74.00	-21.83	Peak	111	223	P
5	12060.00	-6.06	40.23	34.17	54.00	-19.83	Average	100	198	P
6	12060.00	-6.06	54.31	48.25	74.00	-25.75	Peak	100	198	P

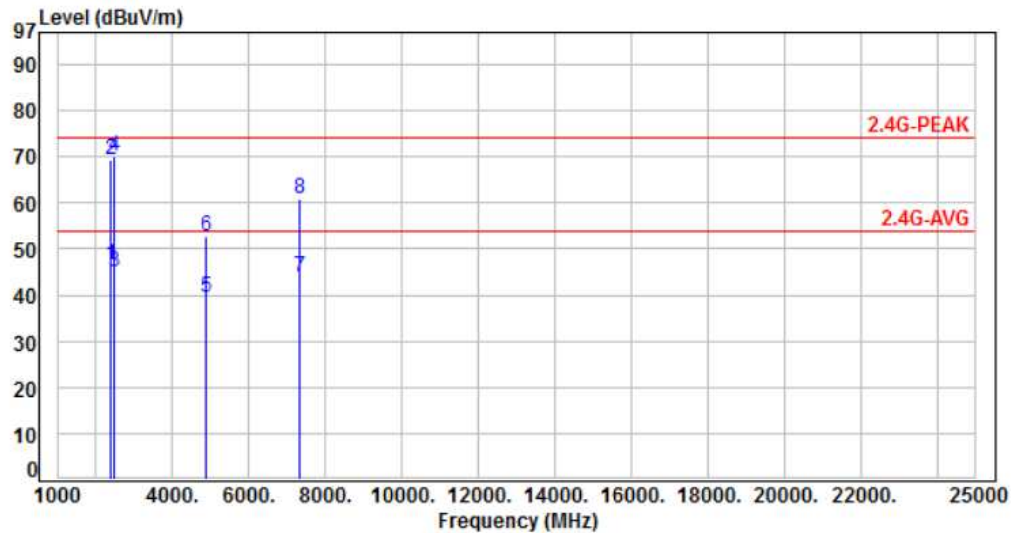
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, 2437MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	65.39	46.36	54.00	-7.64	Average	225	340	P
2	2390.00	-19.03	88.20	69.17	74.00	-4.83	Peak	225	340	P
3	2483.50	-18.81	63.91	45.10	54.00	-8.90	Average	249	339	P
4	2483.50	-18.81	88.99	70.18	74.00	-3.82	Peak	249	339	P
5	4874.00	-13.24	52.67	39.43	54.00	-14.57	Average	124	173	P
6	4874.00	-13.24	66.05	52.81	74.00	-21.19	Peak	124	173	P
7	7311.00	-10.19	54.22	44.03	54.00	-9.97	Average	142	160	P
8	7311.00	-10.19	71.17	60.98	74.00	-13.02	Peak	142	160	P

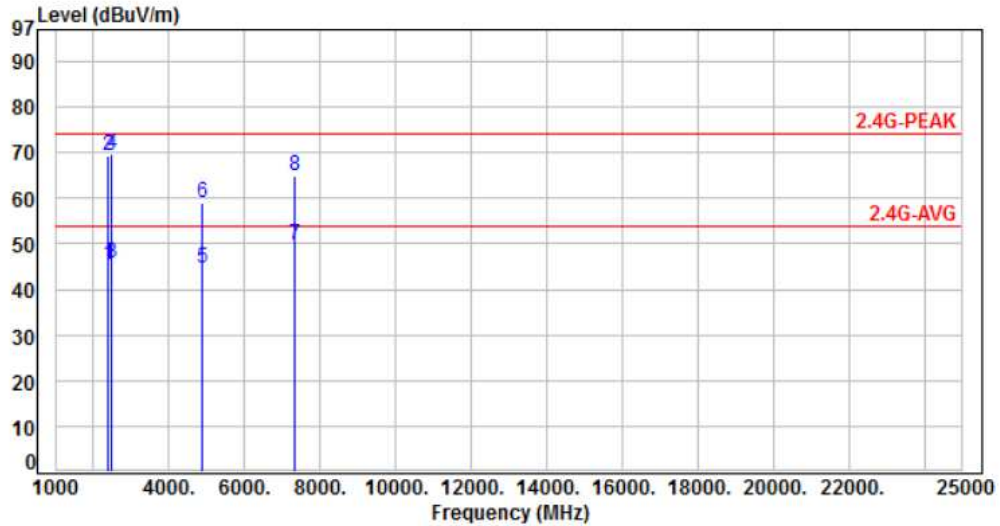
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, 2437MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	64.45	45.42	54.00	-8.58	Average	258	343	P
2	2390.00	-19.03	88.19	69.16	74.00	-4.84	Peak	258	343	P
3	2483.50	-18.81	64.38	45.57	54.00	-8.43	Average	254	349	P
4	2483.50	-18.81	88.70	69.89	74.00	-4.11	Peak	254	349	P
5	4874.00	-13.24	57.84	44.60	54.00	-9.40	Average	168	124	P
6	4874.00	-13.24	72.33	59.09	74.00	-14.91	Peak	168	124	P
7	7311.00	-10.19	59.84	49.65	54.00	-4.35	Average	155	146	P
8	7311.00	-10.19	75.04	64.85	74.00	-9.15	Peak	155	146	P

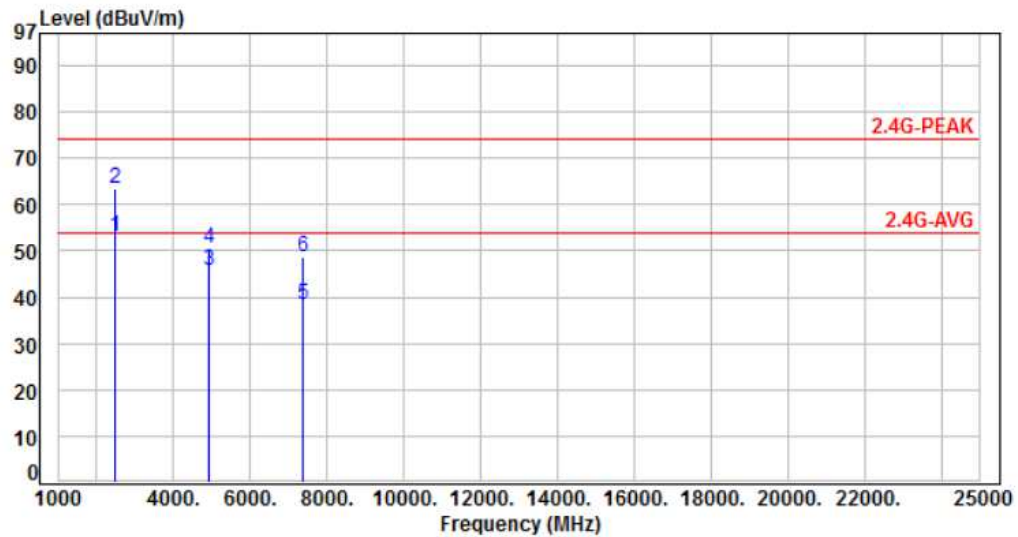
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, 2462MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	71.83	53.02	54.00	-0.98	Average	235	330	P
2	2483.50	-18.81	82.34	63.53	74.00	-10.47	Peak	235	330	P
3	4924.00	-13.14	58.75	45.61	54.00	-8.39	Average	393	116	P
4	4924.00	-13.14	63.55	50.41	74.00	-23.59	Peak	393	116	P
5	7386.00	-10.01	48.43	38.42	54.00	-15.58	Average	100	58	P
6	7386.00	-10.01	58.51	48.50	74.00	-25.50	Peak	100	58	P

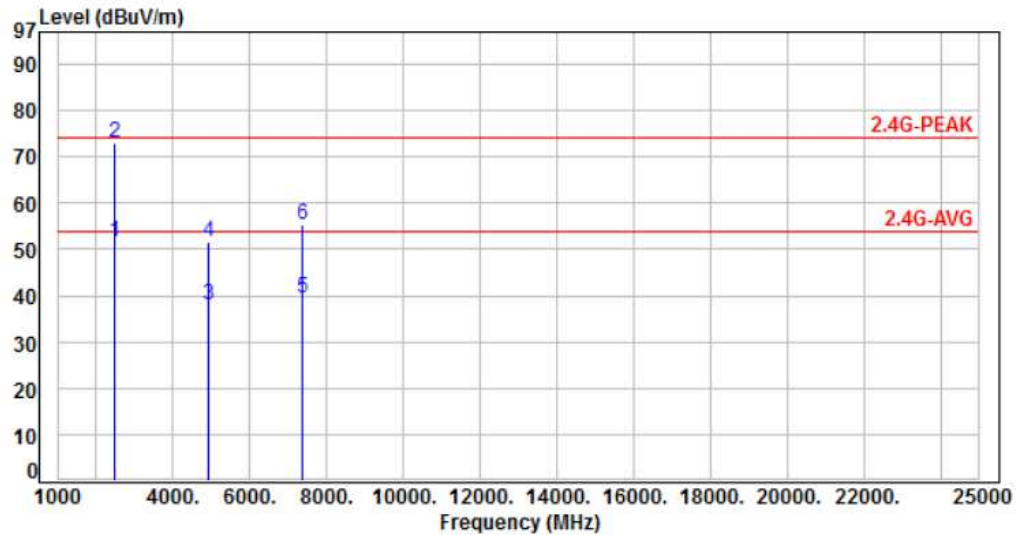
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, 2462MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	70.34	51.53	54.00	-2.47	Average	200	342	P
2	2483.50	-18.81	91.66	72.85	74.00	-1.15	Peak	200	342	P
3	4924.00	-13.14	51.13	37.99	54.00	-16.01	Average	100	215	P
4	4924.00	-13.14	64.63	51.49	74.00	-22.51	Peak	100	215	P
5	7386.00	-10.01	49.63	39.62	54.00	-14.38	Average	109	203	P
6	7386.00	-10.01	65.47	55.46	74.00	-18.54	Peak	109	203	P

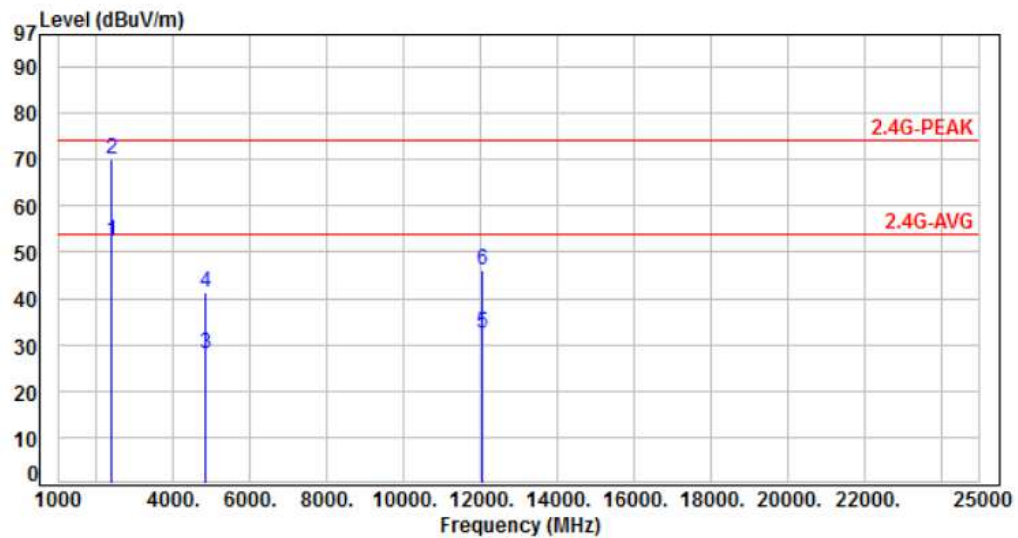
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, 2412MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	71.58	52.55	54.00	-1.45	Average	200	341	P
2	2390.00	-19.03	89.10	70.07	74.00	-3.93	Peak	200	341	P
3	4824.00	-13.33	41.37	28.04	54.00	-25.96	Average	178	169	P
4	4824.00	-13.33	54.48	41.15	74.00	-32.85	Peak	178	169	P
5	12060.00	-6.06	38.52	32.46	54.00	-21.54	Average	389	216	P
6	12060.00	-6.06	52.29	46.23	74.00	-27.77	Peak	389	216	P

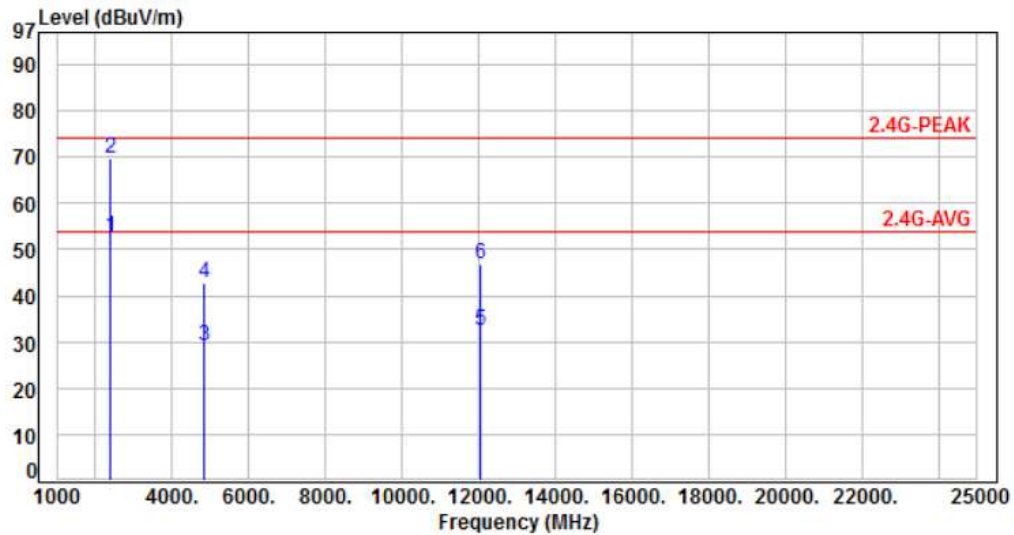
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, 2412MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	71.89	52.86	54.00	-1.14	Average	204	347	P
2	2390.00	-19.03	88.56	69.53	74.00	-4.47	Peak	204	347	P
3	4824.00	-13.33	42.57	29.24	54.00	-24.76	Average	221	115	P
4	4824.00	-13.33	56.18	42.85	74.00	-31.15	Peak	221	115	P
5	12060.00	-6.06	38.42	32.36	54.00	-21.64	Average	177	153	P
6	12060.00	-6.06	52.98	46.92	74.00	-27.08	Peak	177	153	P

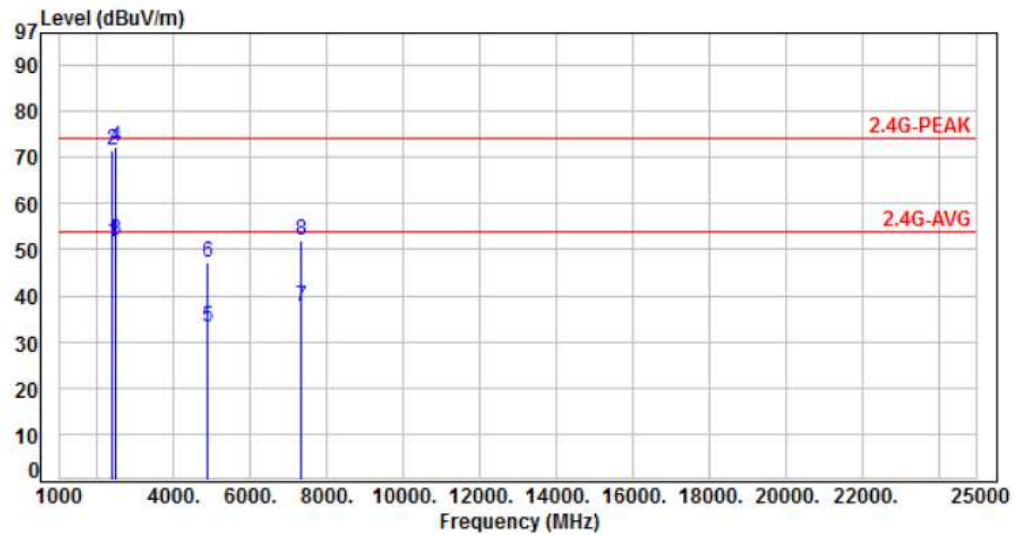
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, 2437MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	70.64	51.61	54.00	-2.39	Average	249	342	P
2	2390.00	-19.03	90.44	71.41	74.00	-2.59	Peak	249	342	P
3	2483.50	-18.81	70.67	51.86	54.00	-2.14	Average	249	344	P
4	2483.50	-18.81	91.09	72.28	74.00	-1.72	Peak	249	344	P
5	4874.00	-13.24	46.49	33.25	54.00	-20.75	Average	180	174	P
6	4874.00	-13.24	60.47	47.23	74.00	-26.77	Peak	180	174	P
7	7311.00	-10.19	47.81	37.62	54.00	-16.38	Average	392	202	P
8	7311.00	-10.19	62.24	52.05	74.00	-21.95	Peak	392	202	P

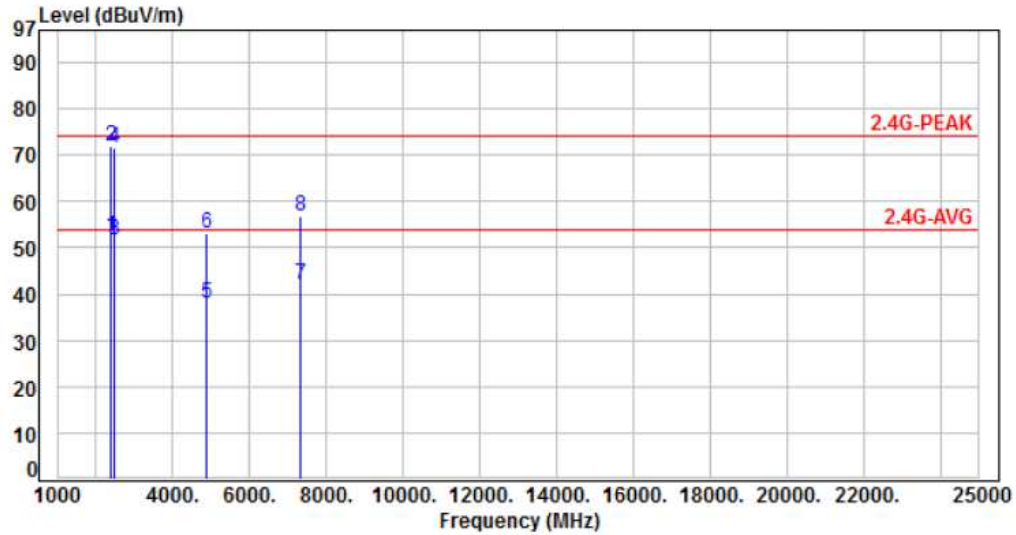
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, 2437MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	71.55	52.52	54.00	-1.48	Average	228	345	P
2	2390.00	-19.03	90.89	71.86	74.00	-2.14	Peak	228	345	P
3	2483.50	-18.81	70.48	51.67	54.00	-2.33	Average	227	349	P
4	2483.50	-18.81	90.50	71.69	74.00	-2.31	Peak	227	349	P
5	4874.00	-13.24	51.41	38.17	54.00	-15.83	Average	176	113	P
6	4874.00	-13.24	66.41	53.17	74.00	-20.83	Peak	176	113	P
7	7311.00	-10.19	52.18	41.99	54.00	-12.01	Average	170	151	P
8	7311.00	-10.19	66.81	56.62	74.00	-17.38	Peak	170	151	P

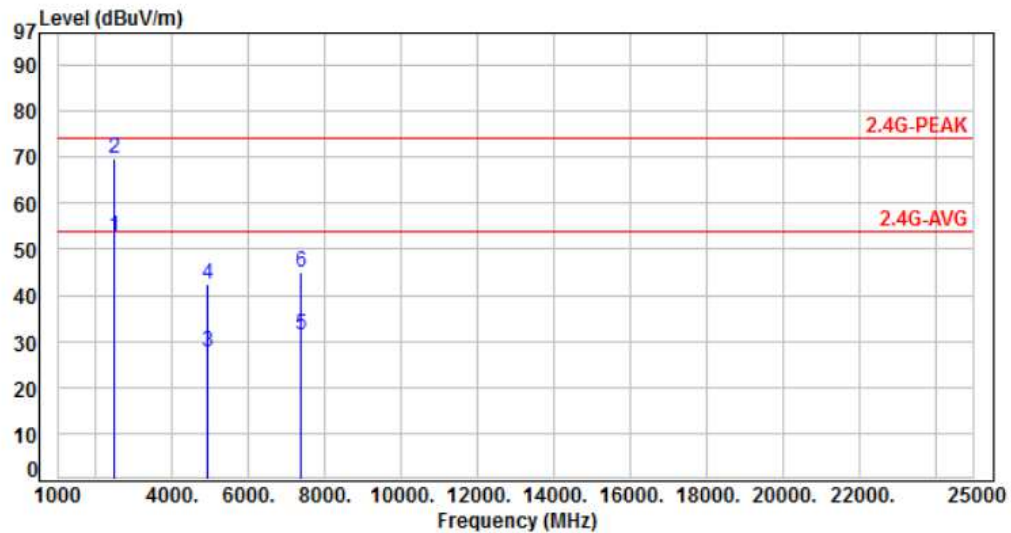
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, 2462MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	71.45	52.64	54.00	-1.36	Average	239	343	P
2	2483.50	-18.81	88.65	69.84	74.00	-4.16	Peak	239	343	P
3	4924.00	-13.14	40.80	27.66	54.00	-26.34	Average	192	155	P
4	4924.00	-13.14	55.48	42.34	74.00	-31.66	Peak	192	155	P
5	7386.00	-10.01	41.26	31.25	54.00	-22.75	Average	384	223	P
6	7386.00	-10.01	54.88	44.87	74.00	-29.13	Peak	384	223	P

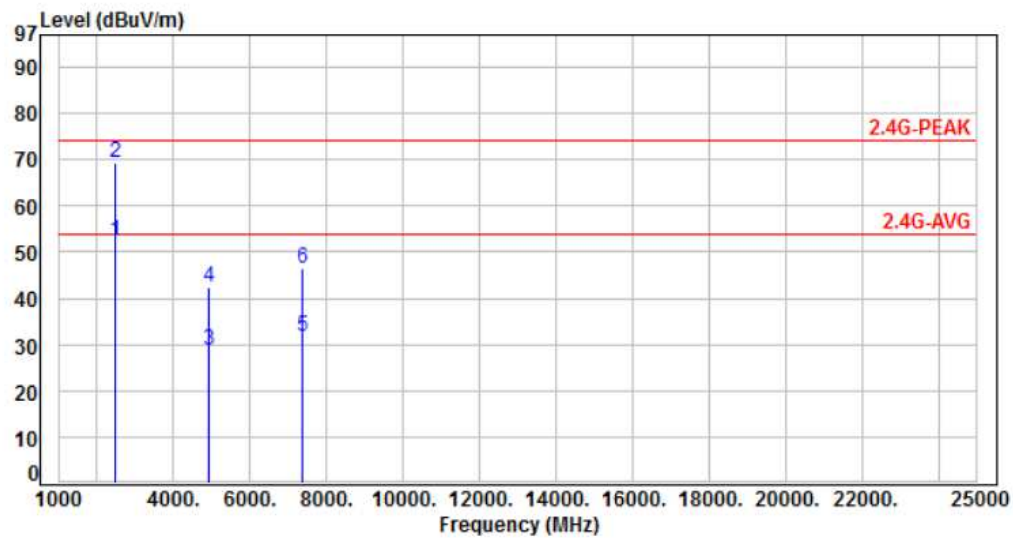
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, 2462MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	71.32	52.51	54.00	-1.49	Average	174	346	P
2	2483.50	-18.81	88.07	69.26	74.00	-4.74	Peak	174	346	P
3	4924.00	-13.14	41.80	28.66	54.00	-25.34	Average	159	117	P
4	4924.00	-13.14	55.64	42.50	74.00	-31.50	Peak	159	117	P
5	7386.00	-10.01	41.83	31.82	54.00	-22.18	Average	182	166	P
6	7386.00	-10.01	56.31	46.30	74.00	-27.70	Peak	182	166	P

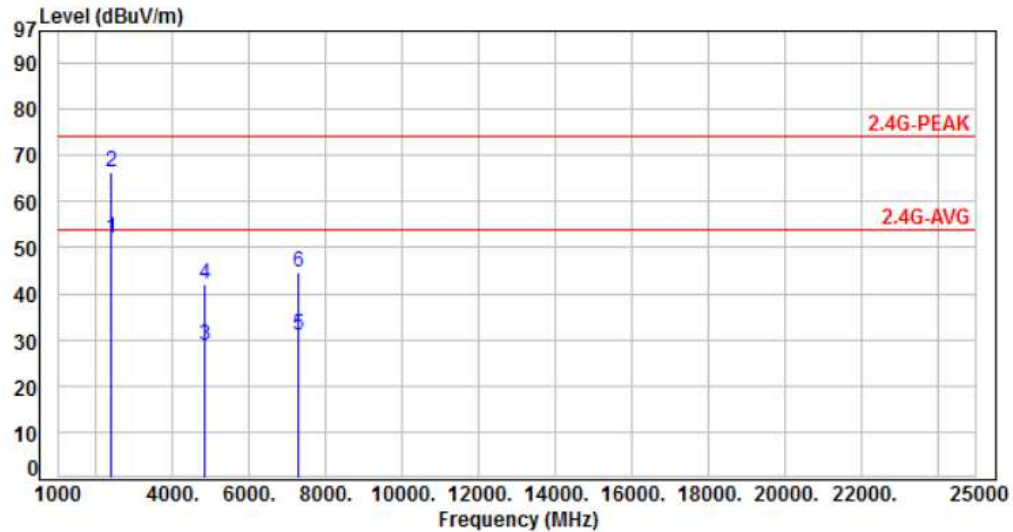
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, 2422MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	70.88	51.85	54.00	-2.15	Average	195	339	P
2	2390.00	-19.03	85.46	66.43	74.00	-7.57	Peak	195	339	P
3	4844.00	-13.29	41.95	28.66	54.00	-25.34	Average	188	143	P
4	4844.00	-13.29	55.16	41.87	74.00	-32.13	Peak	188	143	P
5	7266.00	-10.30	41.46	31.16	54.00	-22.84	Average	227	182	P
6	7266.00	-10.30	54.77	44.47	74.00	-29.53	Peak	227	182	P

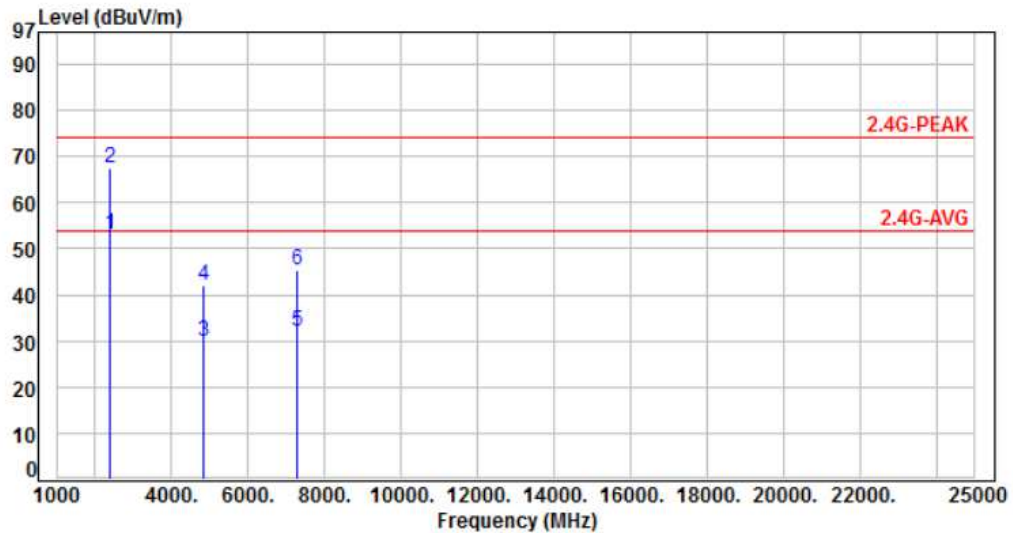
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, 2422MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	72.15	53.12	54.00	-0.88	Average	185	343	P
2	2390.00	-19.03	86.63	67.60	74.00	-6.40	Peak	185	343	P
3	4844.00	-13.29	43.13	29.84	54.00	-24.16	Average	142	337	P
4	4844.00	-13.29	55.34	42.05	74.00	-31.95	Peak	142	337	P
5	7266.00	-10.30	42.33	32.03	54.00	-21.97	Average	113	194	P
6	7266.00	-10.30	55.81	45.51	74.00	-28.49	Peak	113	194	P

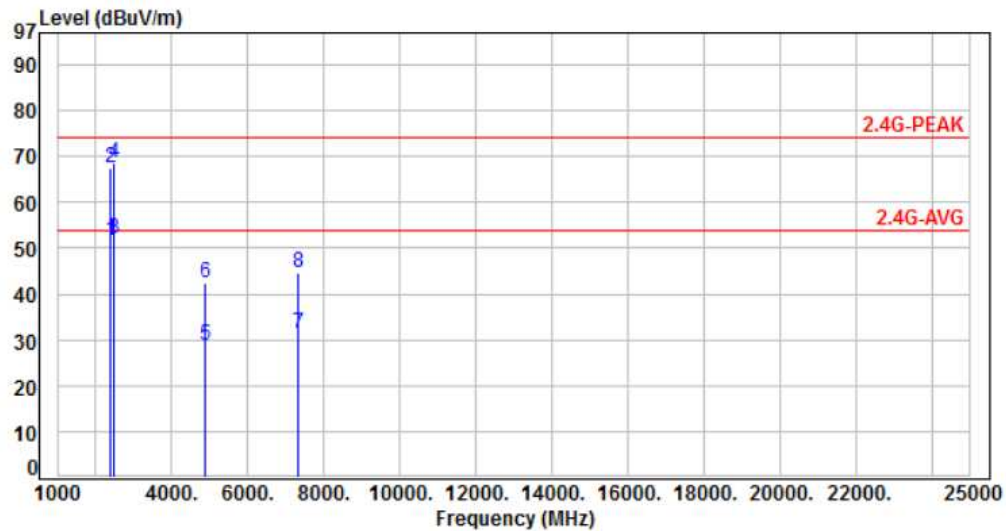
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, 2437MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	70.69	51.66	54.00	-2.34	Average	245	344	P
2	2390.00	-19.03	86.50	67.47	74.00	-6.53	Peak	245	344	P
3	2483.50	-18.81	70.79	51.98	54.00	-2.02	Average	245	345	P
4	2483.50	-18.81	87.30	68.49	74.00	-5.51	Peak	245	345	P
5	4874.00	-13.24	42.14	28.90	54.00	-25.10	Average	186	58	P
6	4874.00	-13.24	55.80	42.56	74.00	-31.44	Peak	186	58	P
7	7311.00	-10.19	41.55	31.36	54.00	-22.64	Average	231	169	P
8	7311.00	-10.19	54.84	44.65	74.00	-29.35	Peak	231	169	P

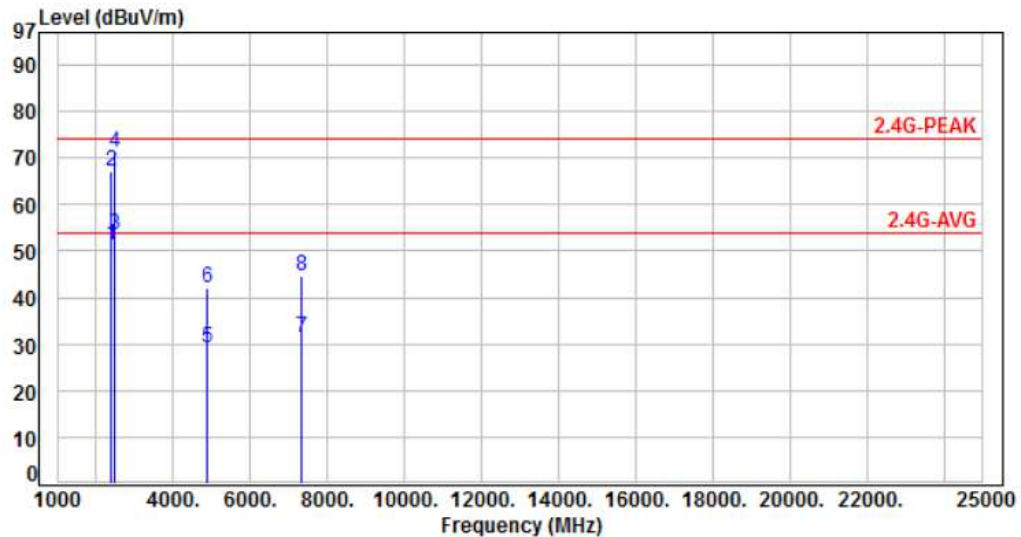
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, 2437MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	70.39	51.36	54.00	-2.64	Average	243	349	P
2	2390.00	-19.03	86.23	67.20	74.00	-6.80	Peak	243	349	P
3	2483.50	-18.81	72.19	53.38	54.00	-0.62	Average	247	349	P
4	2483.50	-18.81	90.01	71.20	74.00	-2.80	Peak	247	349	P
5	4874.00	-13.24	42.46	29.22	54.00	-24.78	Average	142	314	P
6	4874.00	-13.24	55.38	42.14	74.00	-31.86	Peak	142	314	P
7	7311.00	-10.19	41.69	31.50	54.00	-22.50	Average	102	178	P
8	7311.00	-10.19	54.87	44.68	74.00	-29.32	Peak	102	178	P

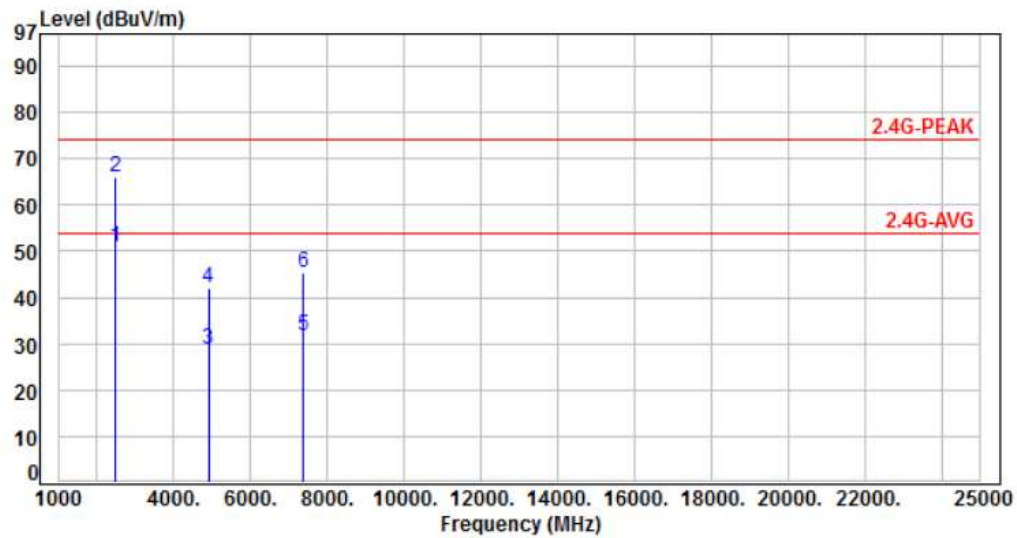
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, 2452MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	69.59	50.78	54.00	-3.22	Average	204	342	P
2	2483.50	-18.81	84.83	66.02	74.00	-7.98	Peak	204	342	P
3	4904.00	-13.17	41.94	28.77	54.00	-25.23	Average	192	169	P
4	4904.00	-13.17	55.04	41.87	74.00	-32.13	Peak	192	169	P
5	7356.00	-10.07	41.97	31.90	54.00	-22.10	Average	244	173	P
6	7356.00	-10.07	55.41	45.34	74.00	-28.66	Peak	244	173	P

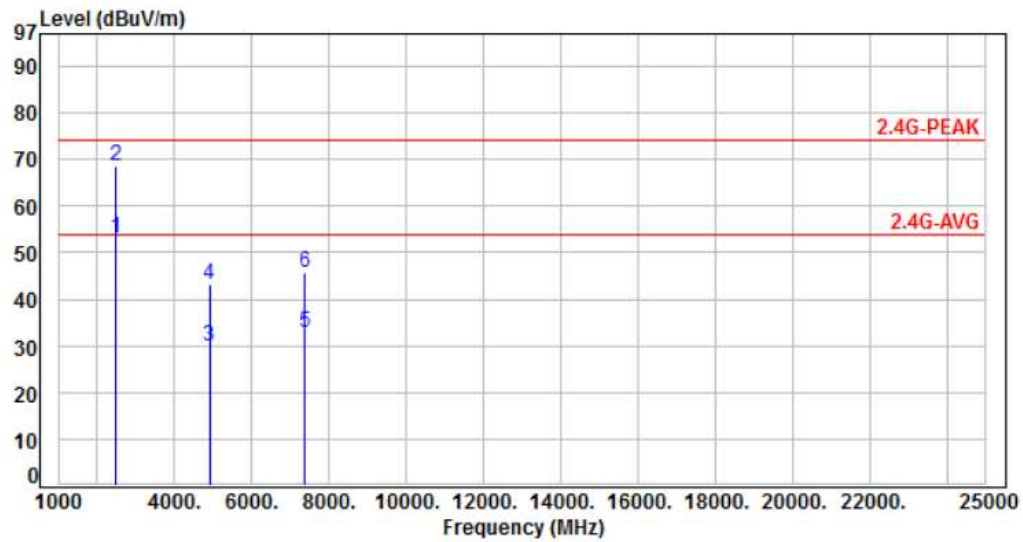
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, 2452MHz, P to P	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	72.10	53.29	54.00	-0.71	Average	171	344	P
2	2483.50	-18.81	87.55	68.74	74.00	-5.26	Peak	171	344	P
3	4904.00	-13.17	42.88	29.71	54.00	-24.29	Average	146	328	P
4	4904.00	-13.17	56.39	43.22	74.00	-30.78	Peak	146	328	P
5	7356.00	-10.07	42.77	32.70	54.00	-21.30	Average	100	186	P
6	7356.00	-10.07	55.79	45.72	74.00	-28.28	Peak	100	186	P

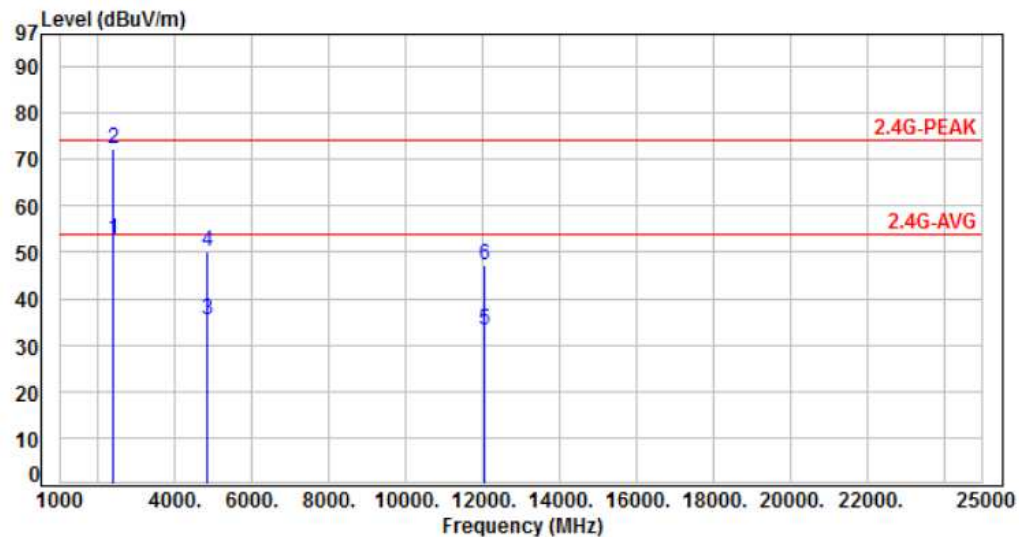
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, 2412MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	71.85	52.82	54.00	-1.18	Average	218	341	P
2	2390.00	-19.03	91.46	72.43	74.00	-1.57	Peak	218	341	P
3	4824.00	-13.33	48.88	35.55	54.00	-18.45	Average	318	194	P
4	4824.00	-13.33	63.45	50.12	74.00	-23.88	Peak	318	194	P
5	12060.00	-6.06	39.33	33.27	54.00	-20.73	Average	373	225	P
6	12060.00	-6.06	53.39	47.33	74.00	-26.67	Peak	373	225	P

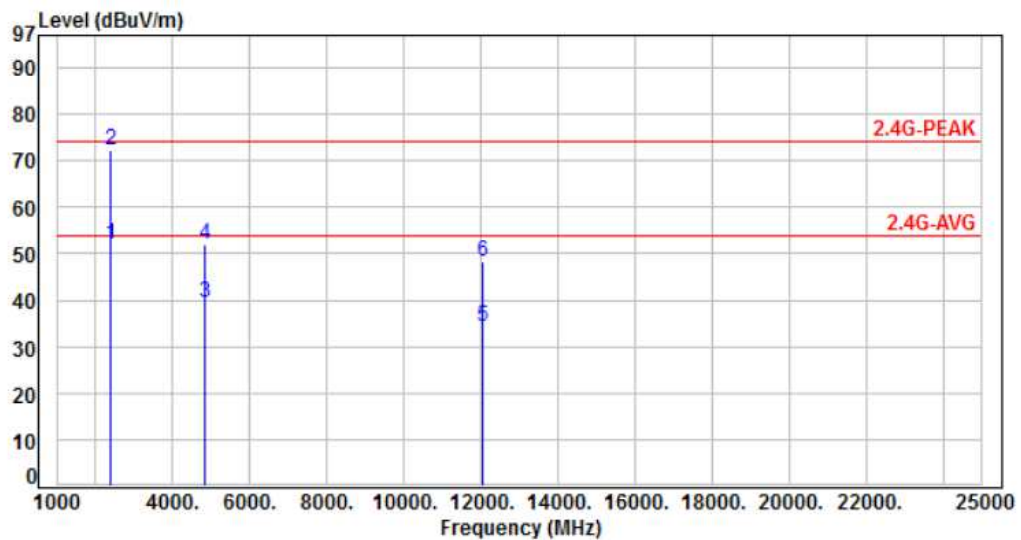
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, 2412MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	71.20	52.17	54.00	-1.83	Average	207	345	P
2	2390.00	-19.03	91.29	72.26	74.00	-1.74	Peak	207	345	P
3	4824.00	-13.33	52.64	39.31	54.00	-14.69	Average	111	223	P
4	4824.00	-13.33	65.50	52.17	74.00	-21.83	Peak	111	223	P
5	12060.00	-6.06	40.23	34.17	54.00	-19.83	Average	100	198	P
6	12060.00	-6.06	54.31	48.25	74.00	-25.75	Peak	100	198	P

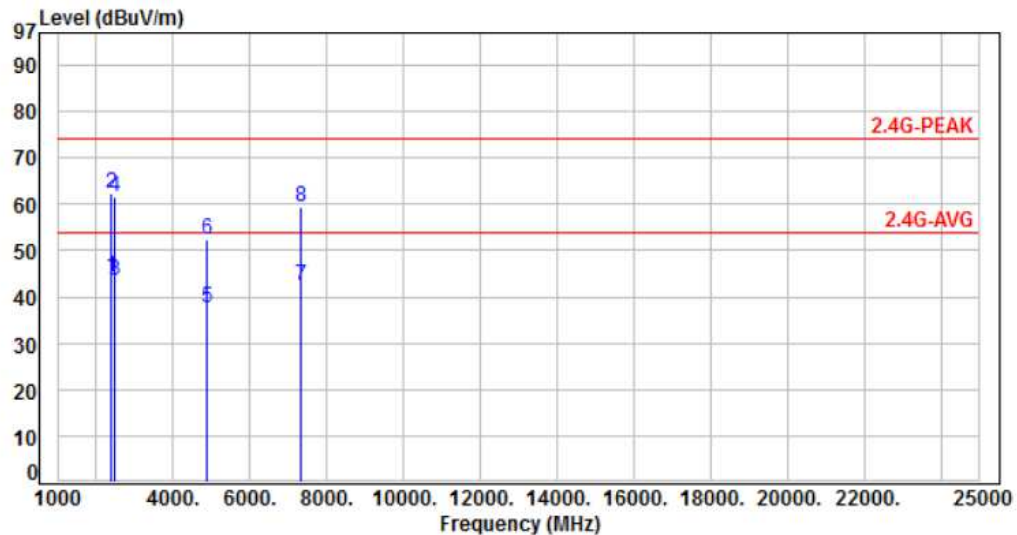
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, 2437MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	63.25	44.22	54.00	-9.78	Average	225	340	P
2	2390.00	-19.03	81.20	62.17	74.00	-11.83	Peak	225	340	P
3	2483.50	-18.81	62.24	43.43	54.00	-10.57	Average	249	339	P
4	2483.50	-18.81	80.50	61.69	74.00	-12.31	Peak	249	339	P
5	4874.00	-13.24	50.90	37.66	54.00	-16.34	Average	124	173	P
6	4874.00	-13.24	65.66	52.42	74.00	-21.58	Peak	124	173	P
7	7311.00	-10.19	52.74	42.55	54.00	-11.45	Average	142	160	P
8	7311.00	-10.19	69.67	59.48	74.00	-14.52	Peak	142	160	P

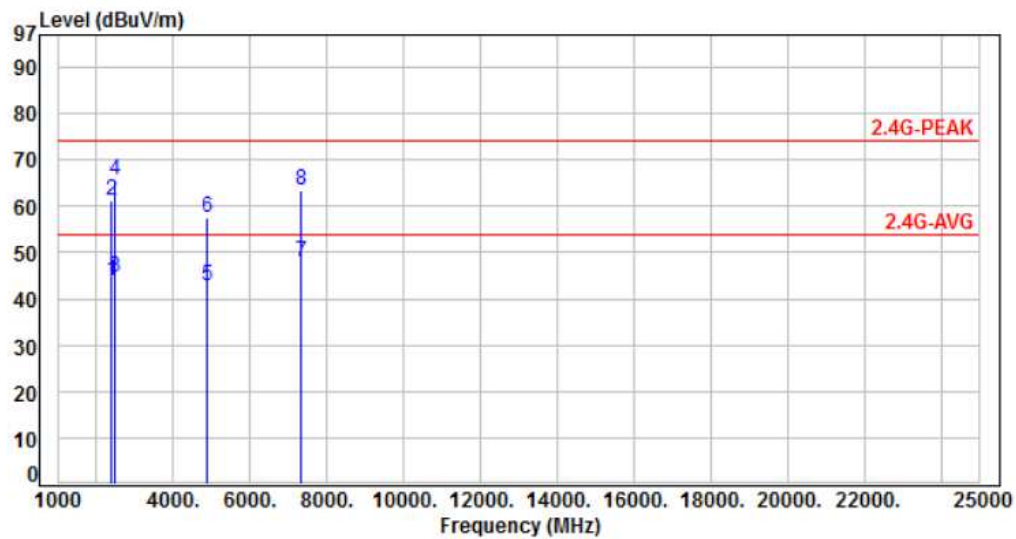
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, 2437MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.76	43.73	54.00	-10.27	Average	258	343	P
2	2390.00	-19.03	80.35	61.32	74.00	-12.68	Peak	258	343	P
3	2483.50	-18.81	63.49	44.68	54.00	-9.32	Average	254	349	P
4	2483.50	-18.81	84.55	65.74	74.00	-8.26	Peak	254	349	P
5	4874.00	-13.24	55.96	42.72	54.00	-11.28	Average	168	124	P
6	4874.00	-13.24	70.70	57.46	74.00	-16.54	Peak	168	124	P
7	7311.00	-10.19	57.97	47.78	54.00	-6.22	Average	155	146	P
8	7311.00	-10.19	73.54	63.35	74.00	-10.65	Peak	155	146	P

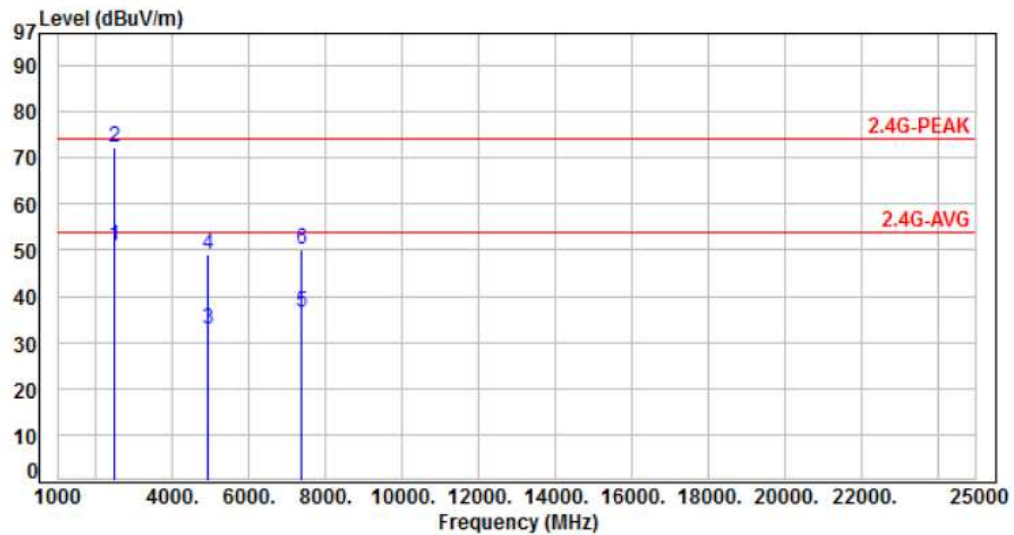
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, 2462MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	69.72	50.91	54.00	-3.09	Average	181	340	P
2	2483.50	-18.81	91.15	72.34	74.00	-1.66	Peak	181	340	P
3	4924.00	-13.14	45.86	32.72	54.00	-21.28	Average	161	170	P
4	4924.00	-13.14	62.24	49.10	74.00	-24.90	Peak	161	170	P
5	7386.00	-10.01	46.61	36.60	54.00	-17.40	Average	336	226	P
6	7386.00	-10.01	60.30	50.29	74.00	-23.71	Peak	336	226	P

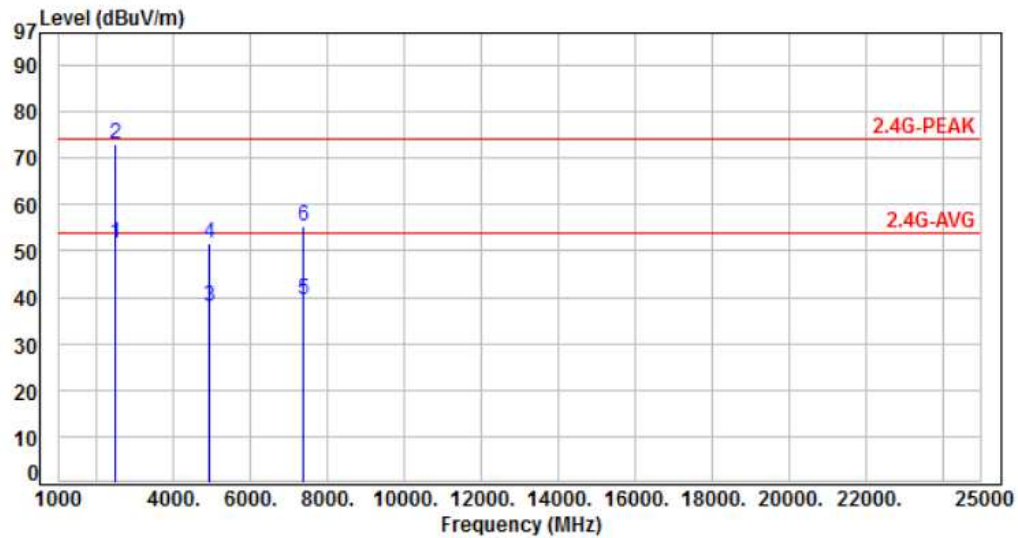
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, 2462MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	70.34	51.53	54.00	-2.47	Average	200	342	P
2	2483.50	-18.81	91.66	72.85	74.00	-1.15	Peak	200	342	P
3	4924.00	-13.14	51.13	37.99	54.00	-16.01	Average	100	215	P
4	4924.00	-13.14	64.63	51.49	74.00	-22.51	Peak	100	215	P
5	7386.00	-10.01	49.63	39.62	54.00	-14.38	Average	109	203	P
6	7386.00	-10.01	65.47	55.46	74.00	-18.54	Peak	109	203	P

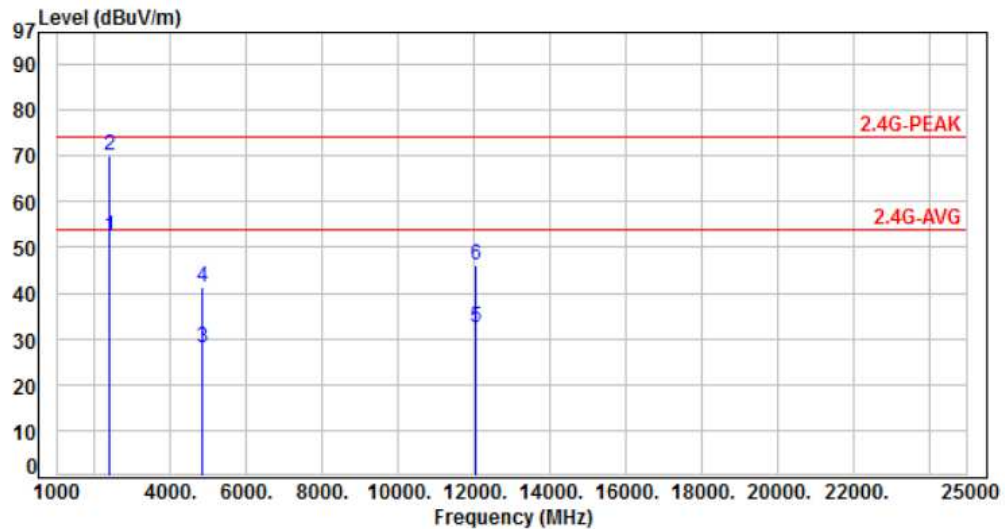
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, 2412MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	71.58	52.55	54.00	-1.45	Average	200	341	P
2	2390.00	-19.03	89.10	70.07	74.00	-3.93	Peak	200	341	P
3	4824.00	-13.33	41.37	28.04	54.00	-25.96	Average	178	169	P
4	4824.00	-13.33	54.48	41.15	74.00	-32.85	Peak	178	169	P
5	12060.00	-6.06	38.52	32.46	54.00	-21.54	Average	389	216	P
6	12060.00	-6.06	52.29	46.23	74.00	-27.77	Peak	389	216	P

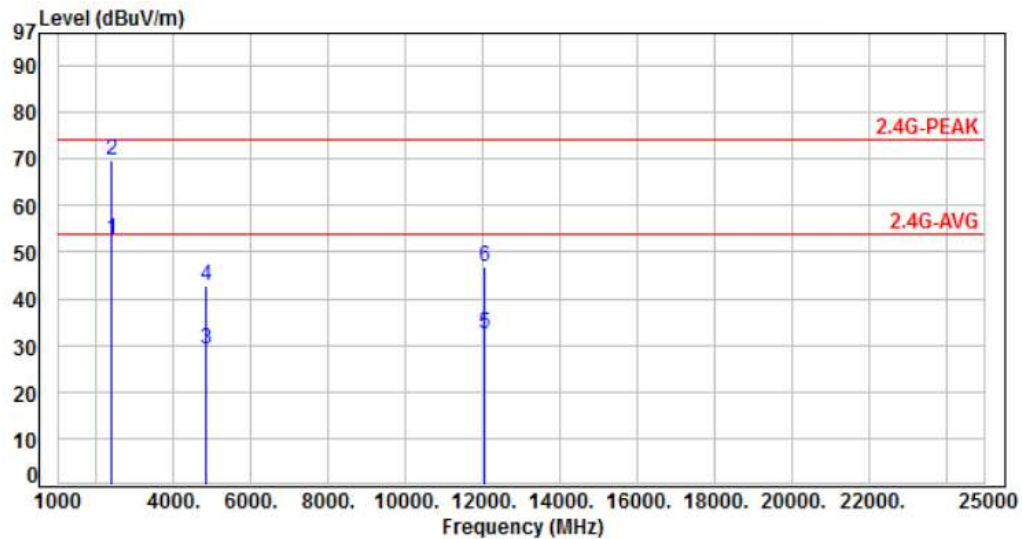
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, 2412MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	71.89	52.86	54.00	-1.14	Average	204	347	P
2	2390.00	-19.03	88.56	69.53	74.00	-4.47	Peak	204	347	P
3	4824.00	-13.33	42.57	29.24	54.00	-24.76	Average	221	115	P
4	4824.00	-13.33	56.18	42.85	74.00	-31.15	Peak	221	115	P
5	12060.00	-6.06	38.42	32.36	54.00	-21.64	Average	177	153	P
6	12060.00	-6.06	52.98	46.92	74.00	-27.08	Peak	177	153	P

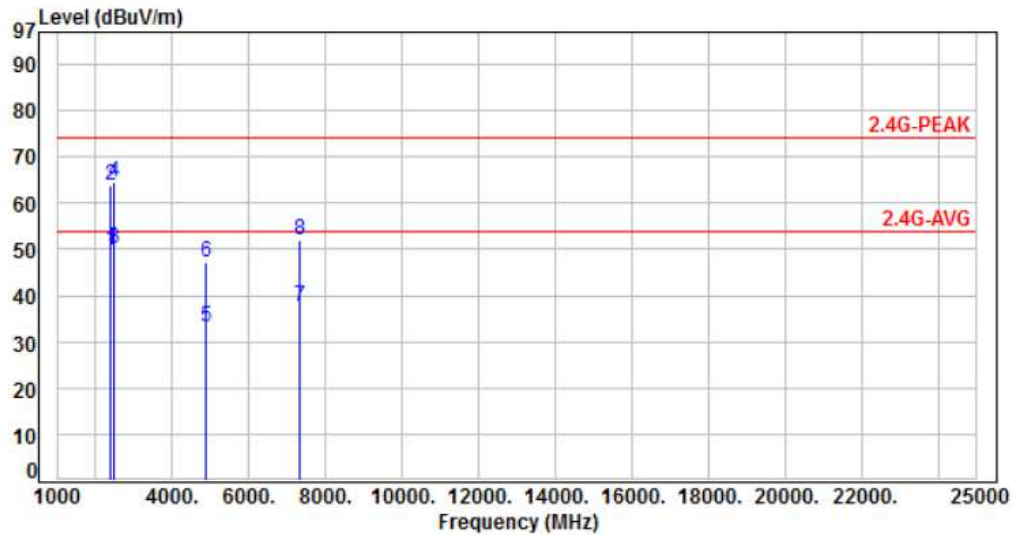
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, 2437MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	68.90	49.87	54.00	-4.13	Average	249	342	P
2	2390.00	-19.03	82.69	63.66	74.00	-10.34	Peak	249	342	P
3	2483.50	-18.81	68.86	50.05	54.00	-3.95	Average	249	344	P
4	2483.50	-18.81	83.18	64.37	74.00	-9.63	Peak	249	344	P
5	4874.00	-13.24	46.49	33.25	54.00	-20.75	Average	180	174	P
6	4874.00	-13.24	60.47	47.23	74.00	-26.77	Peak	180	174	P
7	7311.00	-10.19	47.81	37.62	54.00	-16.38	Average	392	202	P
8	7311.00	-10.19	62.24	52.05	74.00	-21.95	Peak	392	202	P

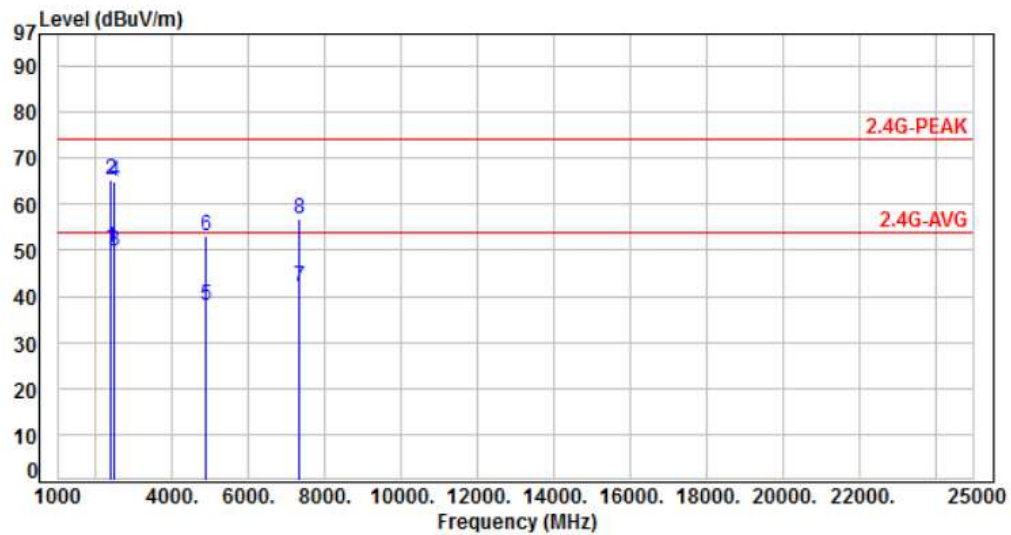
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, 2437MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	69.63	50.60	54.00	-3.40	Average	228	345	P
2	2390.00	-19.03	84.40	65.37	74.00	-8.63	Peak	228	345	P
3	2483.50	-18.81	68.65	49.84	54.00	-4.16	Average	227	349	P
4	2483.50	-18.81	83.67	64.86	74.00	-9.14	Peak	227	349	P
5	4874.00	-13.24	51.41	38.17	54.00	-15.83	Average	176	113	P
6	4874.00	-13.24	66.41	53.17	74.00	-20.83	Peak	176	113	P
7	7311.00	-10.19	52.18	41.99	54.00	-12.01	Average	170	151	P
8	7311.00	-10.19	66.81	56.62	74.00	-17.38	Peak	170	151	P

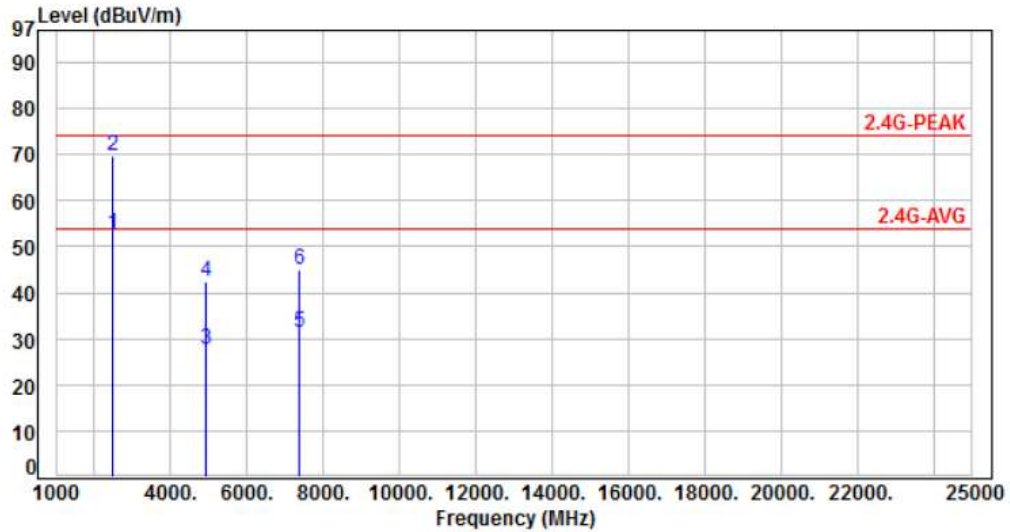
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, 2462MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	71.45	52.64	54.00	-1.36	Average	239	343	P
2	2483.50	-18.81	88.65	69.84	74.00	-4.16	Peak	239	343	P
3	4924.00	-13.14	40.80	27.66	54.00	-26.34	Average	192	155	P
4	4924.00	-13.14	55.48	42.34	74.00	-31.66	Peak	192	155	P
5	7386.00	-10.01	41.26	31.25	54.00	-22.75	Average	384	223	P
6	7386.00	-10.01	54.88	44.87	74.00	-29.13	Peak	384	223	P

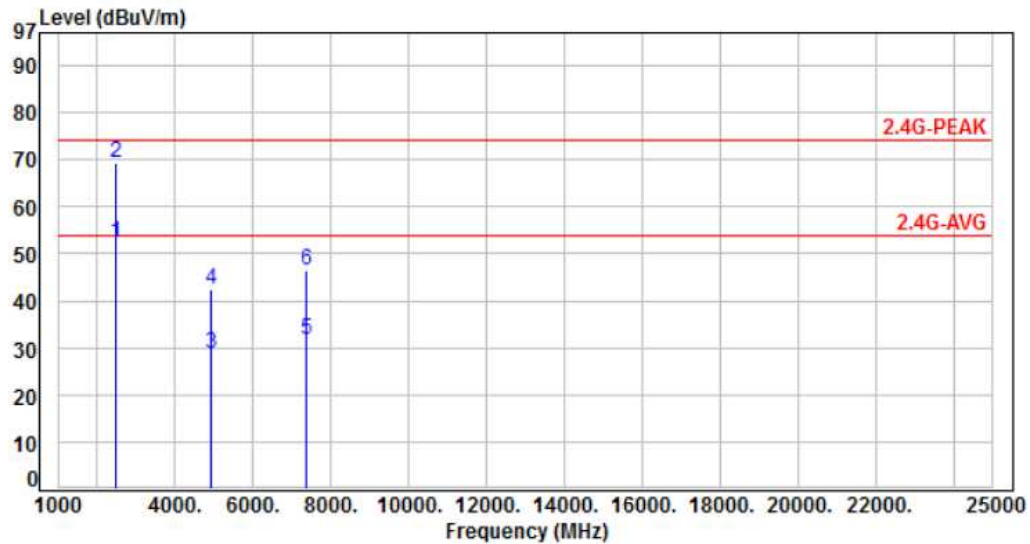
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, 2462MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	71.32	52.51	54.00	-1.49	Average	174	346	P
2	2483.50	-18.81	88.07	69.26	74.00	-4.74	Peak	174	346	P
3	4924.00	-13.14	41.80	28.66	54.00	-25.34	Average	159	117	P
4	4924.00	-13.14	55.64	42.50	74.00	-31.50	Peak	159	117	P
5	7386.00	-10.01	41.83	31.82	54.00	-22.18	Average	182	166	P
6	7386.00	-10.01	56.31	46.30	74.00	-27.70	Peak	182	166	P

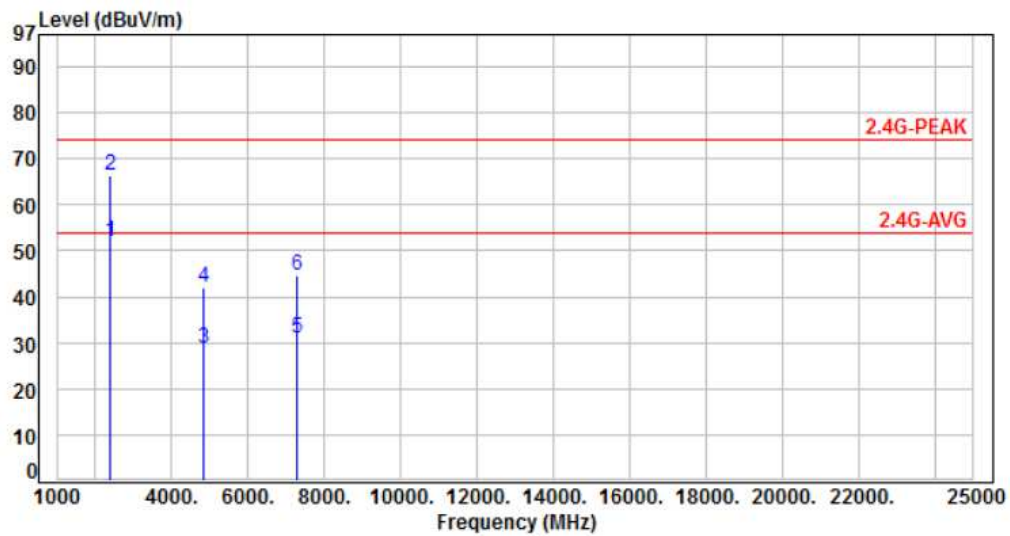
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, 2422MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	70.88	51.85	54.00	-2.15	Average	195	339	P
2	2390.00	-19.03	85.46	66.43	74.00	-7.57	Peak	195	339	P
3	4844.00	-13.29	41.95	28.66	54.00	-25.34	Average	188	143	P
4	4844.00	-13.29	55.16	41.87	74.00	-32.13	Peak	188	143	P
5	7266.00	-10.30	41.46	31.16	54.00	-22.84	Average	227	182	P
6	7266.00	-10.30	54.77	44.47	74.00	-29.53	Peak	227	182	P

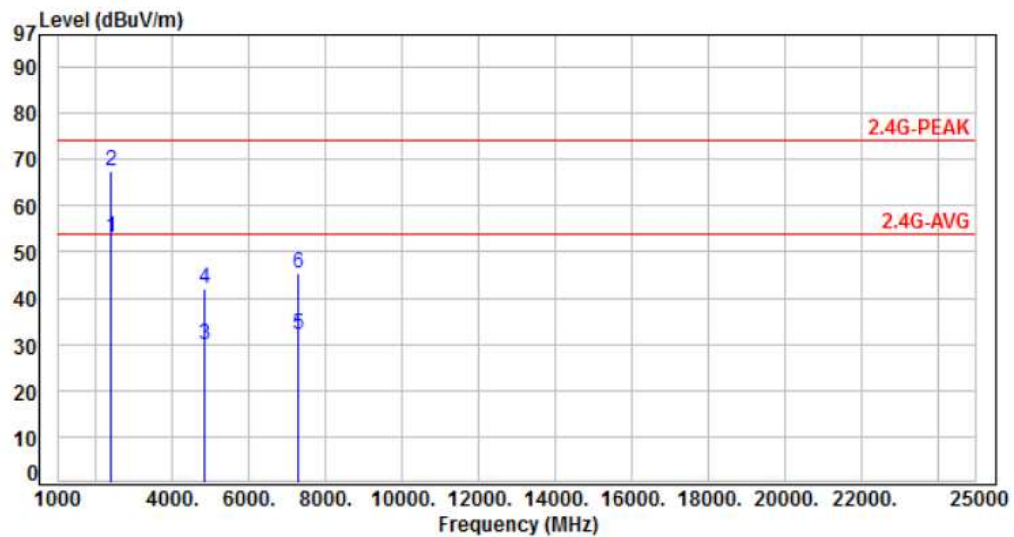
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, 2422MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	72.15	53.12	54.00	-0.88	Average	185	343	P
2	2390.00	-19.03	86.63	67.60	74.00	-6.40	Peak	185	343	P
3	4844.00	-13.29	43.13	29.84	54.00	-24.16	Average	142	337	P
4	4844.00	-13.29	55.34	42.05	74.00	-31.95	Peak	142	337	P
5	7266.00	-10.30	42.33	32.03	54.00	-21.97	Average	113	194	P
6	7266.00	-10.30	55.81	45.51	74.00	-28.49	Peak	113	194	P

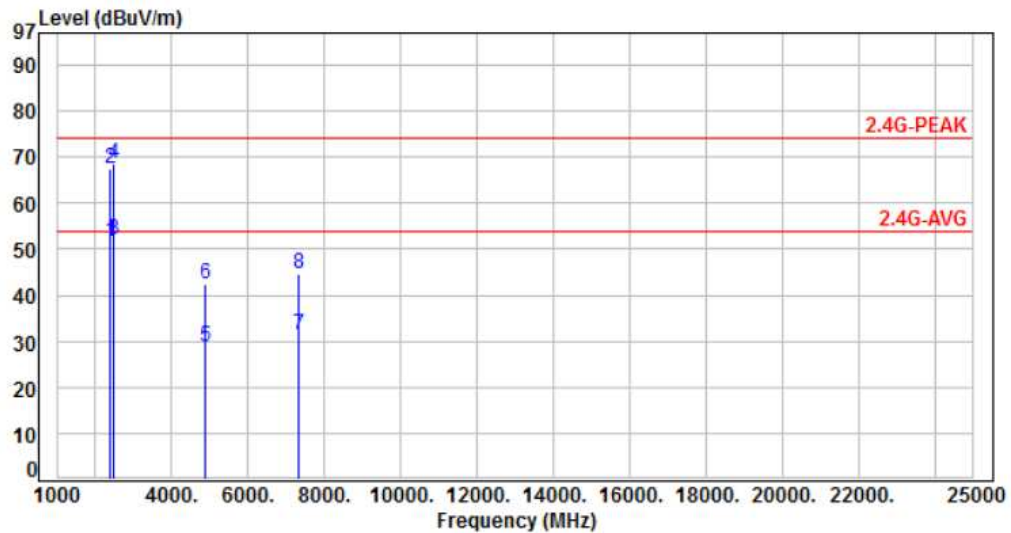
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, 2437MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	70.69	51.66	54.00	-2.34	Average	245	344	P
2	2390.00	-19.03	86.50	67.47	74.00	-6.53	Peak	245	344	P
3	2483.50	-18.81	70.79	51.98	54.00	-2.02	Average	245	345	P
4	2483.50	-18.81	87.30	68.49	74.00	-5.51	Peak	245	345	P
5	4874.00	-13.24	42.14	28.90	54.00	-25.10	Average	186	58	P
6	4874.00	-13.24	55.80	42.56	74.00	-31.44	Peak	186	58	P
7	7311.00	-10.19	41.55	31.36	54.00	-22.64	Average	231	169	P
8	7311.00	-10.19	54.84	44.65	74.00	-29.35	Peak	231	169	P

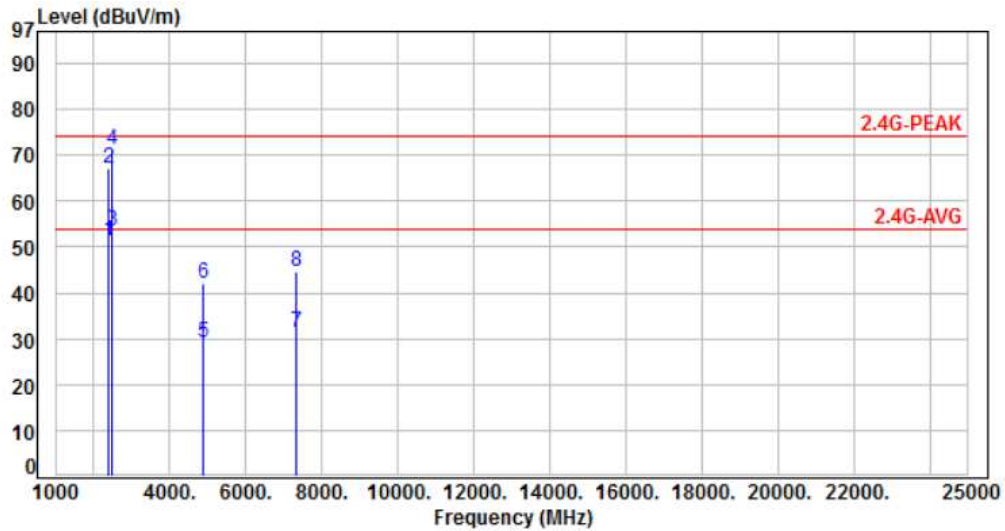
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, 2437MHz P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	70.39	51.36	54.00	-2.64	Average	243	349	P
2	2390.00	-19.03	86.23	67.20	74.00	-6.80	Peak	243	349	P
3	2483.50	-18.81	72.19	53.38	54.00	-0.62	Average	247	349	P
4	2483.50	-18.81	90.01	71.20	74.00	-2.80	Peak	247	349	P
5	4874.00	-13.24	42.46	29.22	54.00	-24.78	Average	142	314	P
6	4874.00	-13.24	55.38	42.14	74.00	-31.86	Peak	142	314	P
7	7311.00	-10.19	41.69	31.50	54.00	-22.50	Average	102	178	P
8	7311.00	-10.19	54.87	44.68	74.00	-29.32	Peak	102	178	P

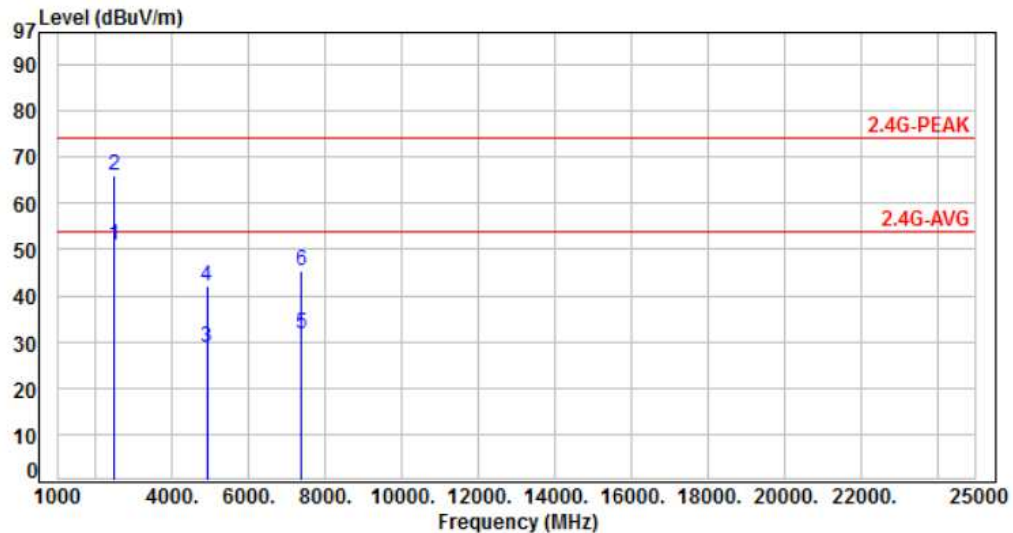
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, 2452MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	69.59	50.78	54.00	-3.22	Average	204	342	P
2	2483.50	-18.81	84.83	66.02	74.00	-7.98	Peak	204	342	P
3	4904.00	-13.17	41.94	28.77	54.00	-25.23	Average	192	169	P
4	4904.00	-13.17	55.04	41.87	74.00	-32.13	Peak	192	169	P
5	7356.00	-10.07	41.97	31.90	54.00	-22.10	Average	244	173	P
6	7356.00	-10.07	55.41	45.34	74.00	-28.66	Peak	244	173	P

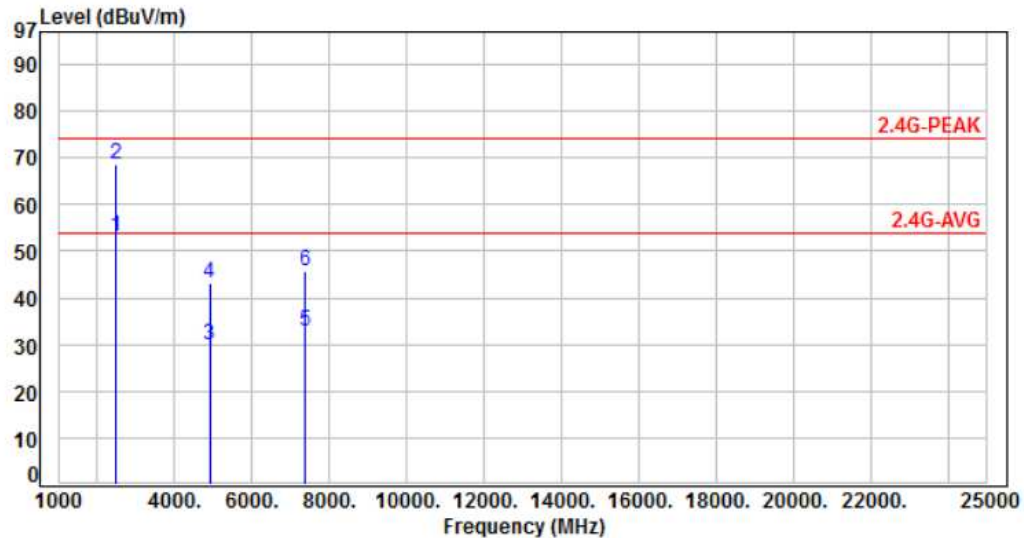
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, 2452MHz, P to MP	Temperature	: 24 °C
Test Date	: Aug. 17, 2017	Humidity	: 68 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	72.10	53.29	54.00	-0.71	Average	171	344	P
2	2483.50	-18.81	87.55	68.74	74.00	-5.26	Peak	171	344	P
3	4904.00	-13.17	42.88	29.71	54.00	-24.29	Average	146	328	P
4	4904.00	-13.17	56.39	43.22	74.00	-30.78	Peak	146	328	P
5	7356.00	-10.07	42.77	32.70	54.00	-21.30	Average	100	186	P
6	7356.00	-10.07	55.79	45.72	74.00	-28.28	Peak	100	186	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



6.7 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.250
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz



7. Test of Conducted Spurious Emission

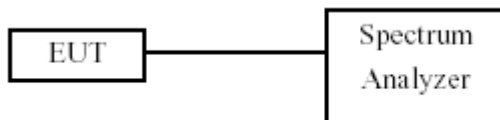
7.1 Test Limit

Below -30dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

7.2 Test Procedure

- The transmitter output was connected to the spectrum analyzer via a low lose cable.
- Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- Average conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 30dB relative to the maximum measured in-band peak PSD level.
- The band edges was measured and recorded.

7.3 Test Setup Layout



7.4 Test Result and Data

Test Result : PASS

Test Date : Aug. 18, 2017

Temperature : 21°C

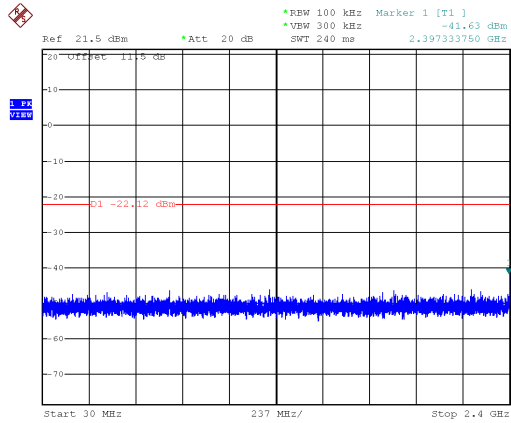
Humidity : 64%

Note: Test plots refers to the following pages.

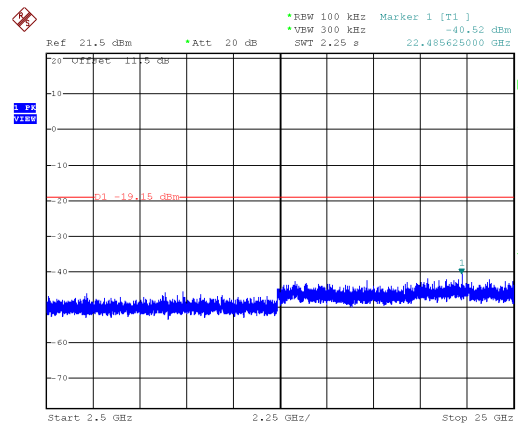
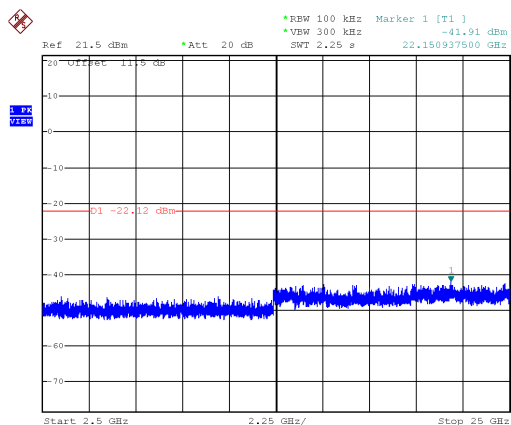
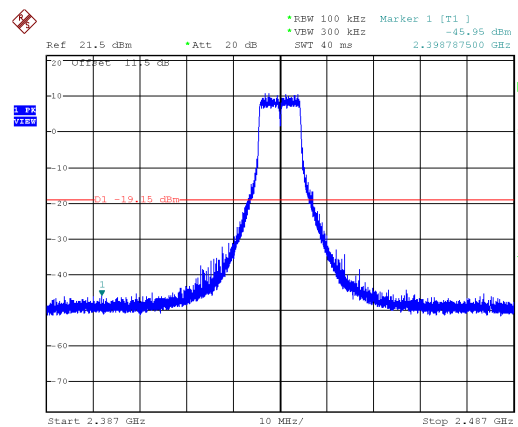
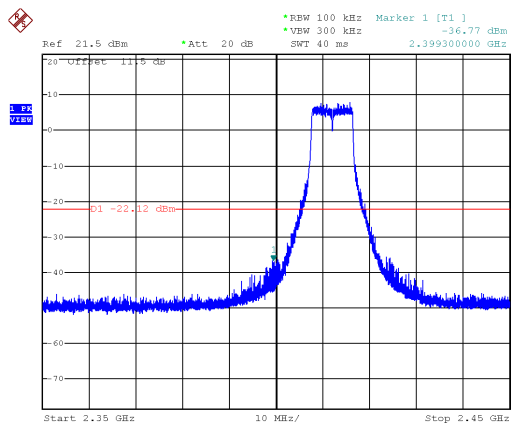
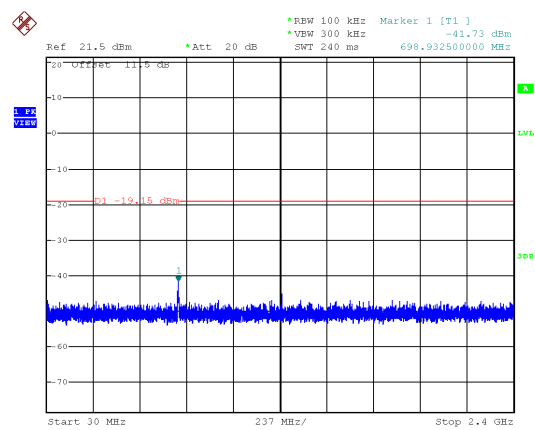


P to P
ANT 0

Modulation Type: 802.11ac VHT10, 2412MHz



Modulation Type: 802.11ac VHT10, 2437MHz

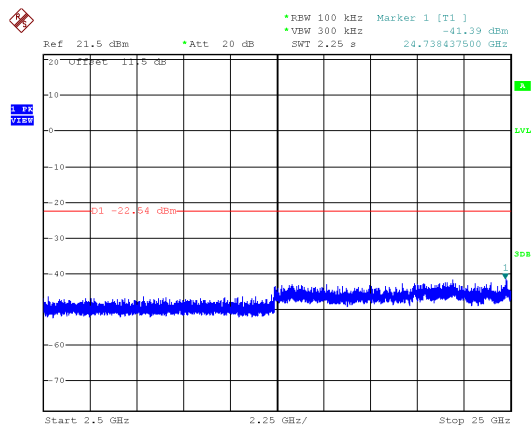
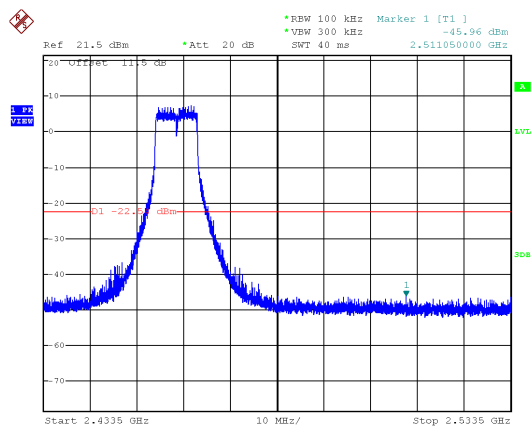
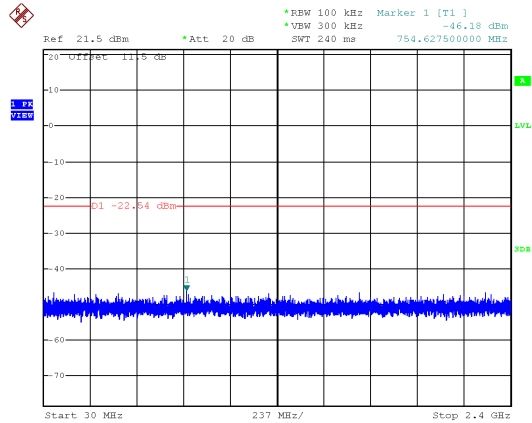




P to P

ANT 0

Modulation Type: 802.11ac VHT10, 2462MHz

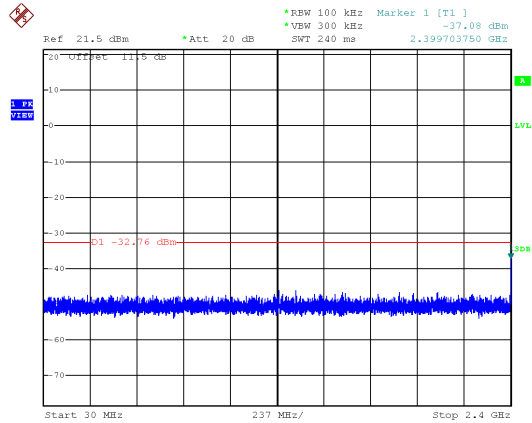




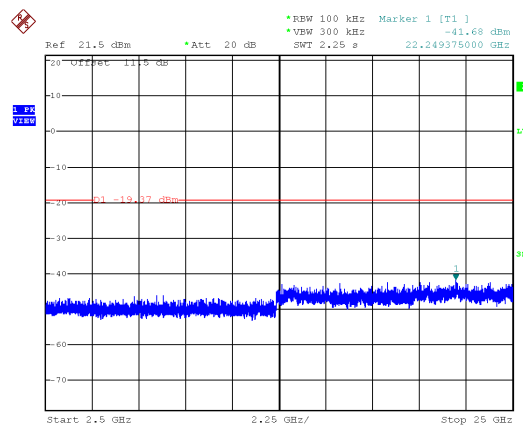
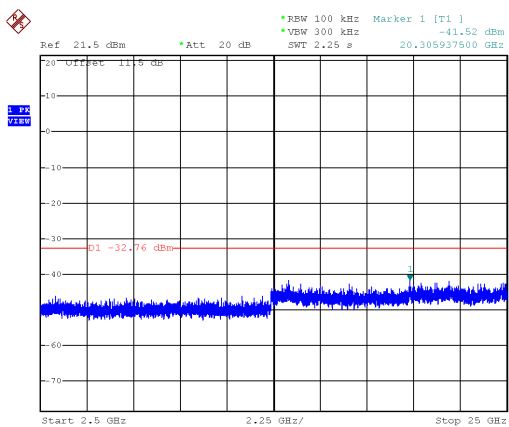
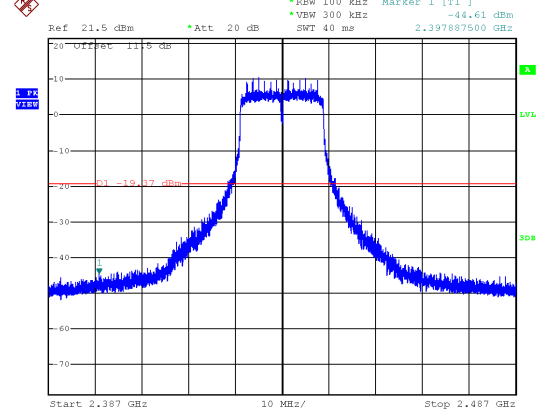
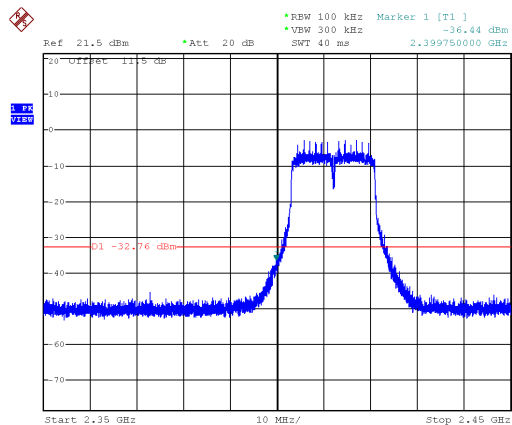
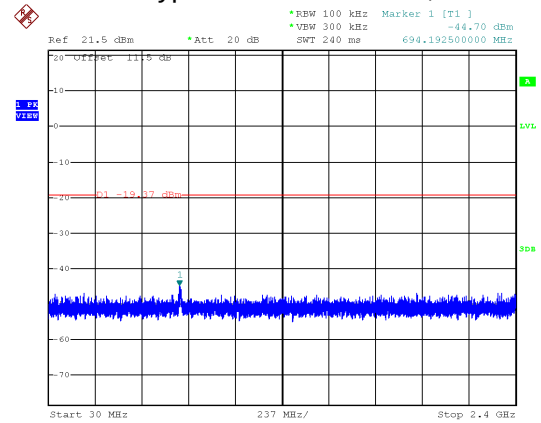
P to P

ANT 0

Modulation Type: 802.11ac VHT20, 2412MHz



Modulation Type: 802.11ac VHT20, 2437MHz

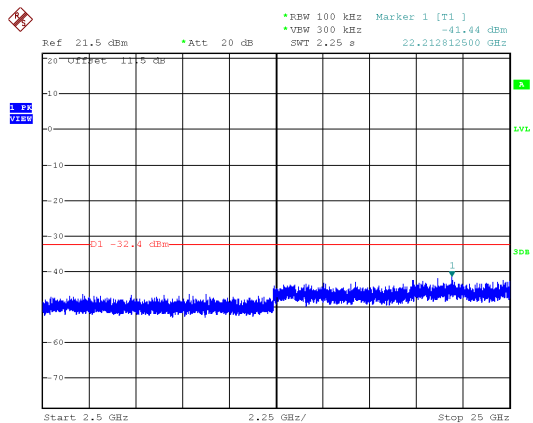
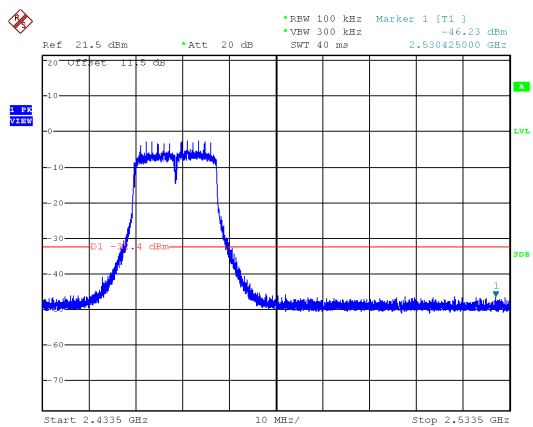
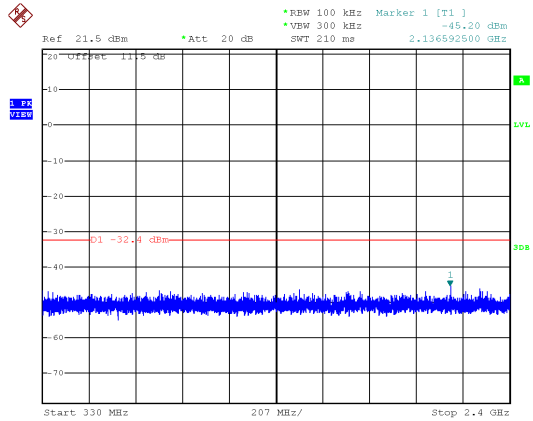




P to P

ANT 0

Modulation Type: 802.11ac VHT20, 2462MHz

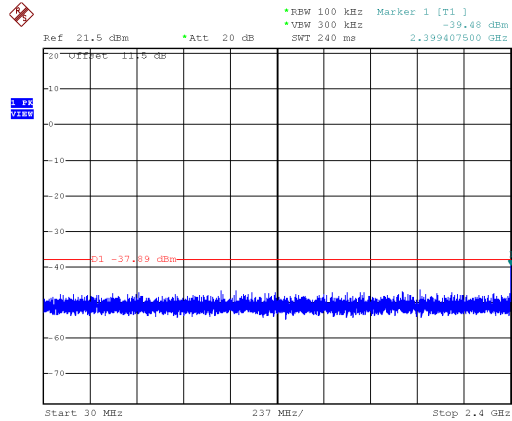




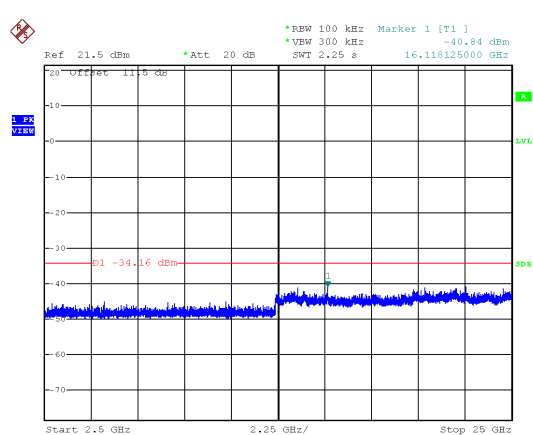
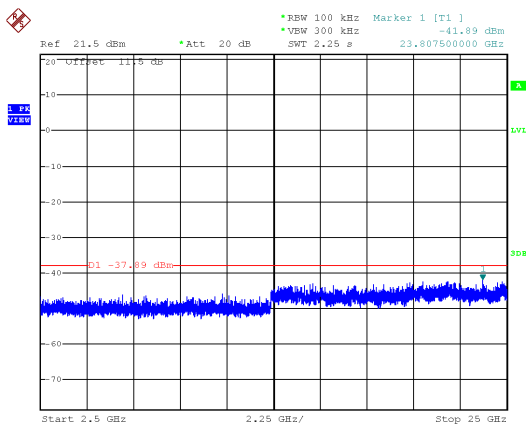
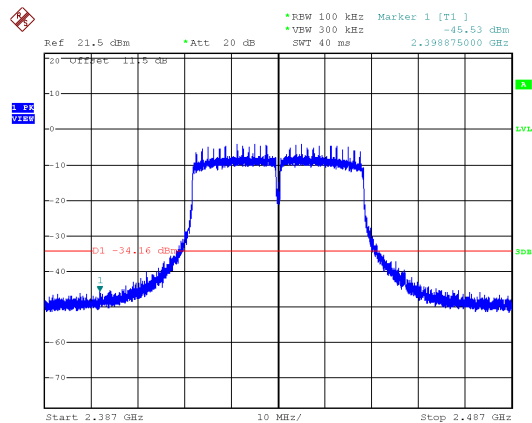
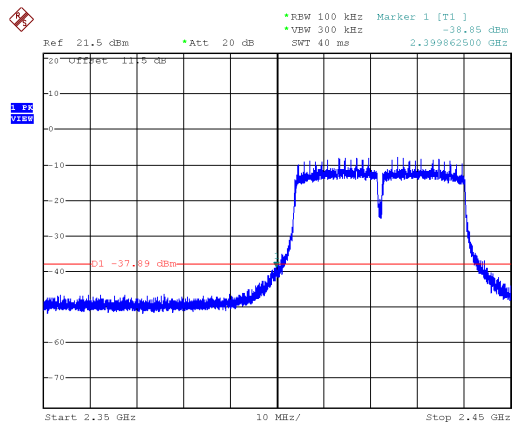
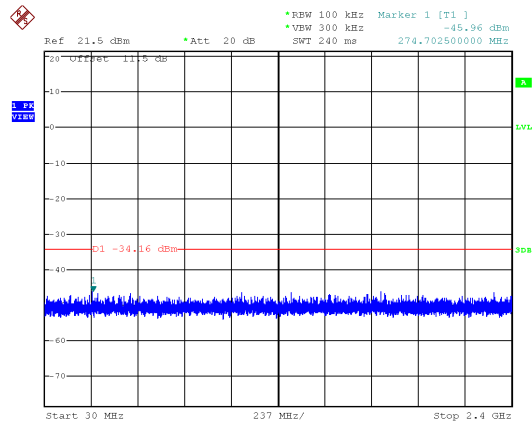
P to P

ANT 0

Modulation Type: 802.11ac VHT40, 2422MHz



Modulation Type: 802.11ac VHT40, 2437MHz

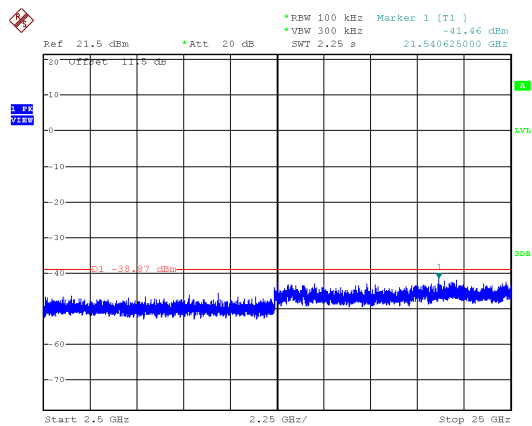
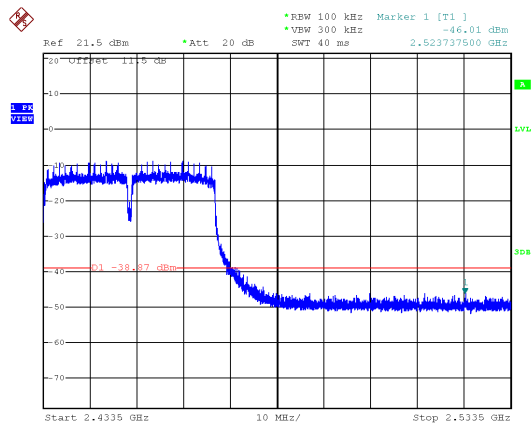
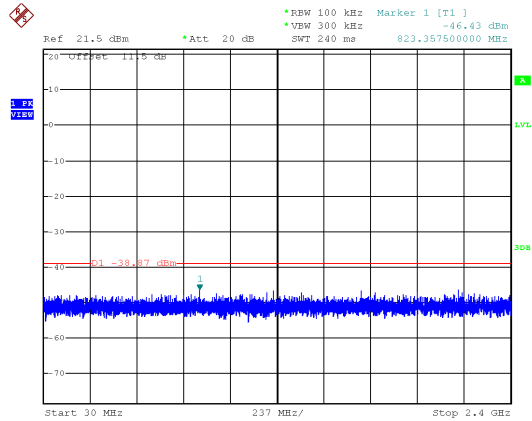




P to P

ANT 0

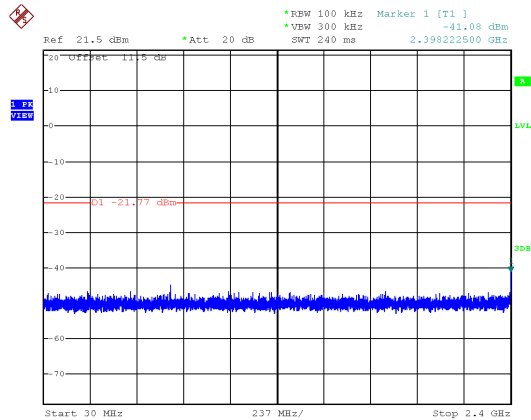
Modulation Type: 802.11ac VHT40, 2452MHz



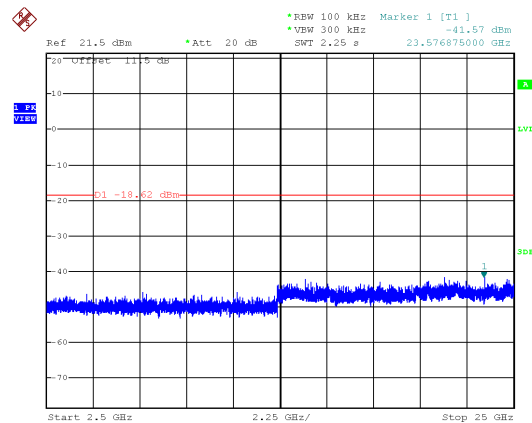
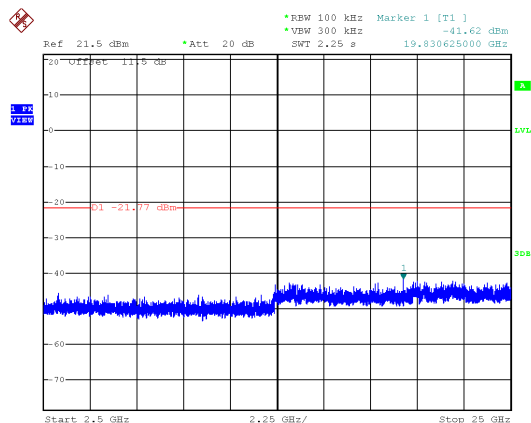
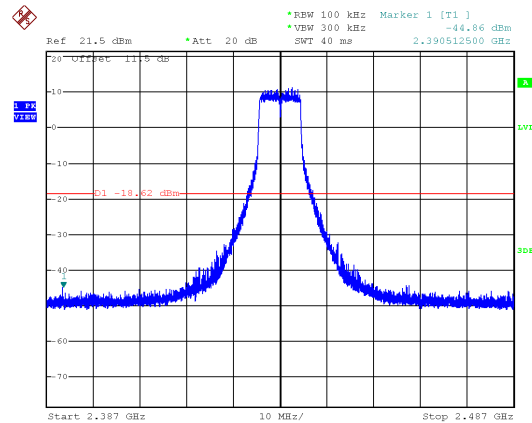
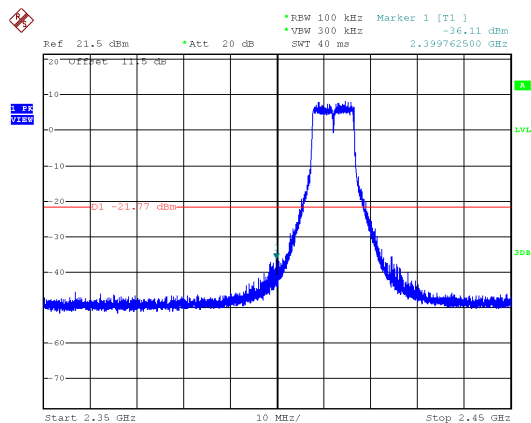
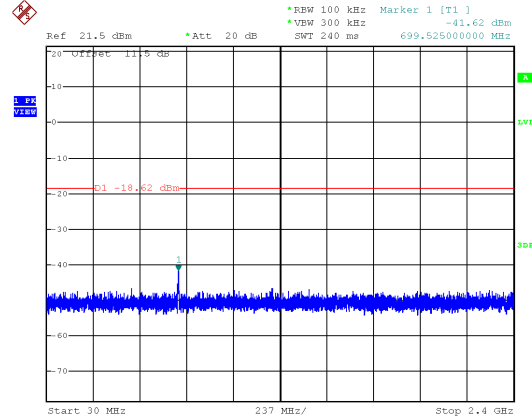


P to P
ANT 1

Modulation Type: 802.11ac VHT10, 2412MHz



Modulation Type: 802.11ac VHT10, 2437MHz

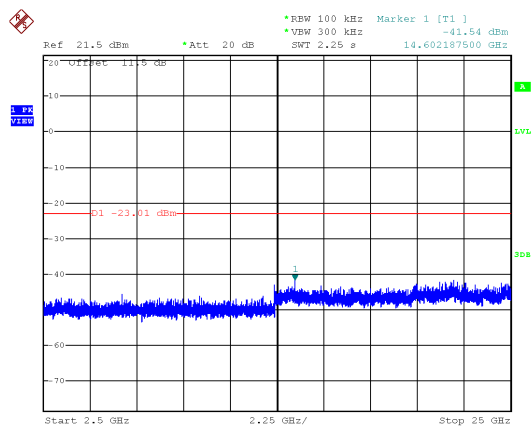
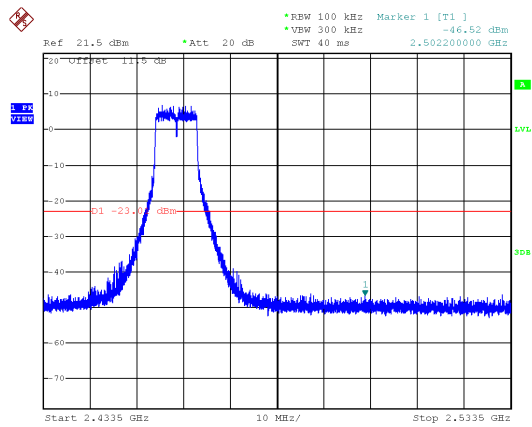
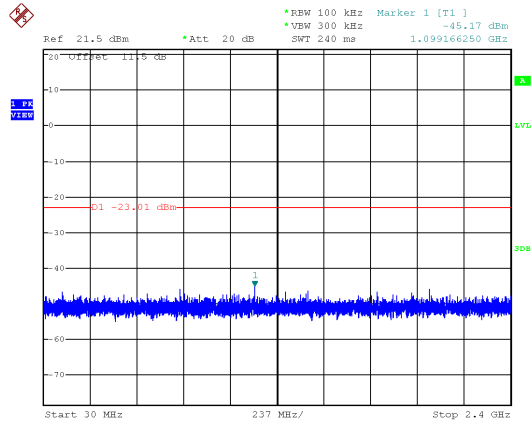




P to P

ANT 1

Modulation Type: 802.11ac VHT10, 2462MHz

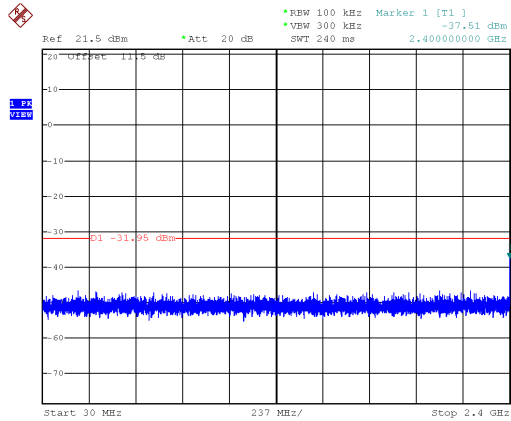




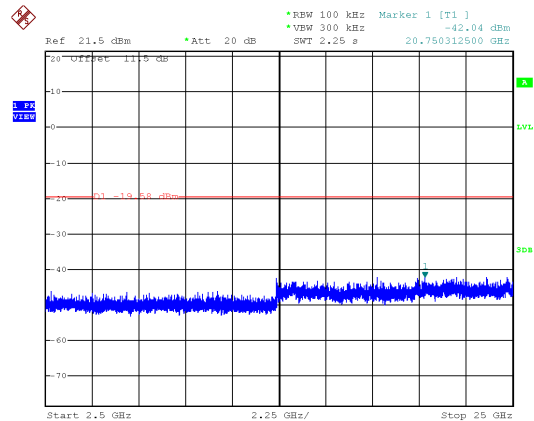
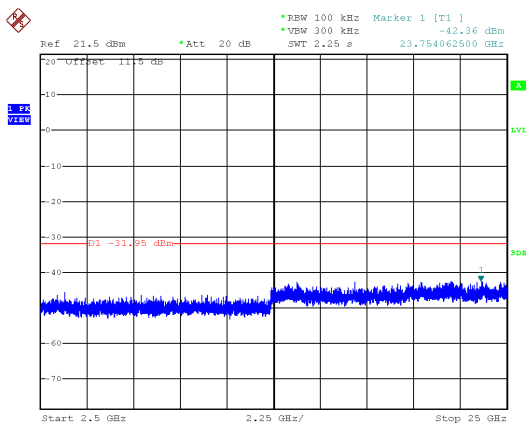
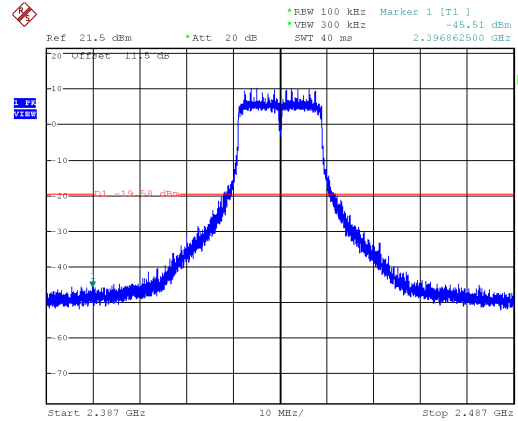
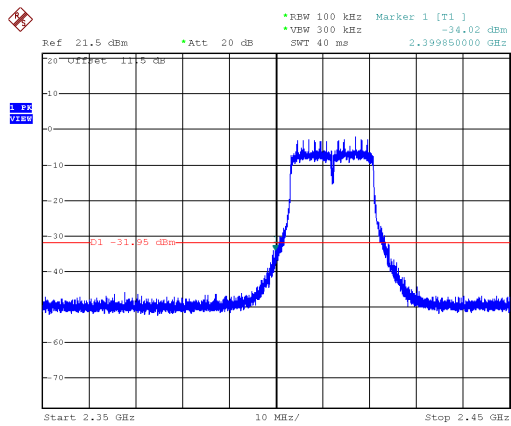
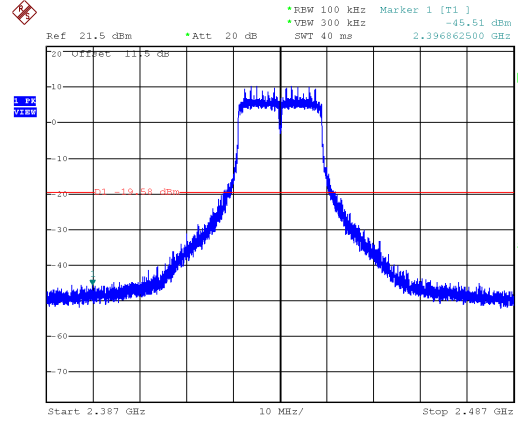
P to P

ANT 1

Modulation Type: 802.11ac VHT20, 2412MHz



Modulation Type: 802.11ac VHT20, 2437MHz

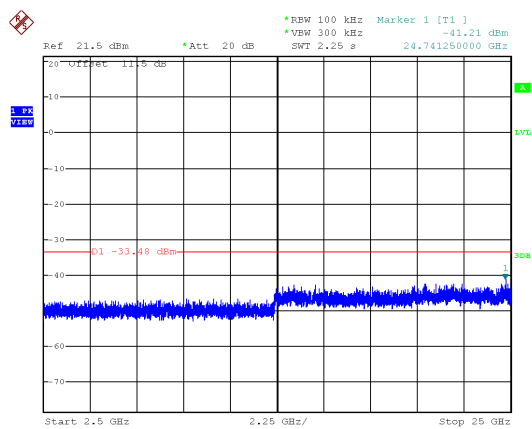
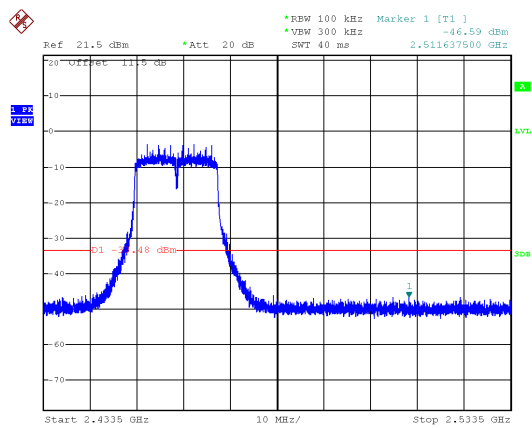
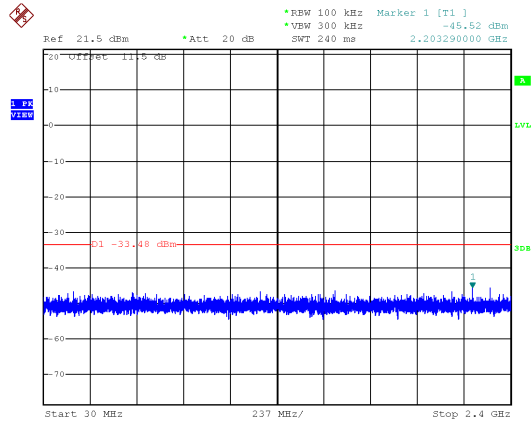




P to P

ANT 1

Modulation Type: 802.11ac VHT20, 2462MHz

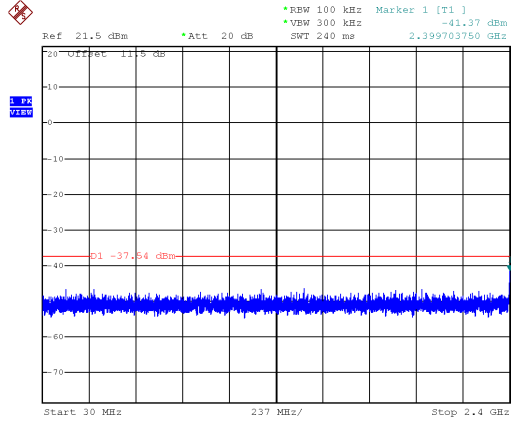




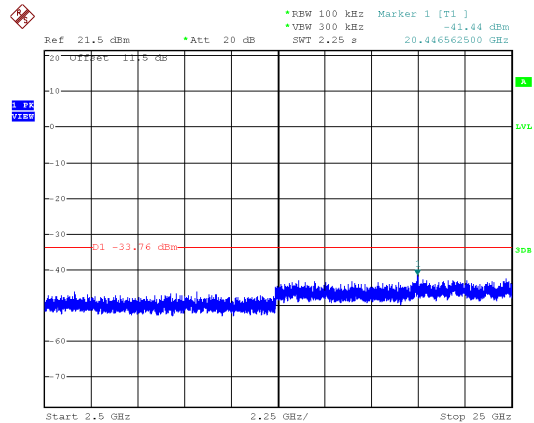
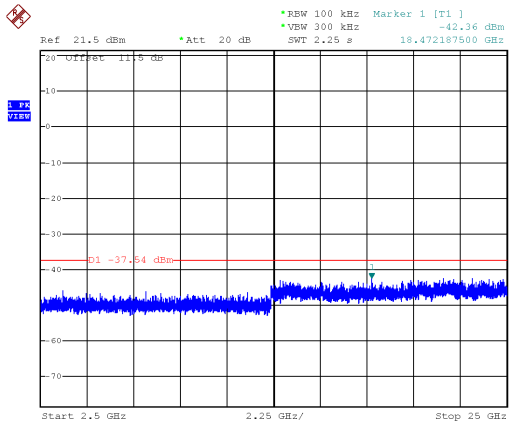
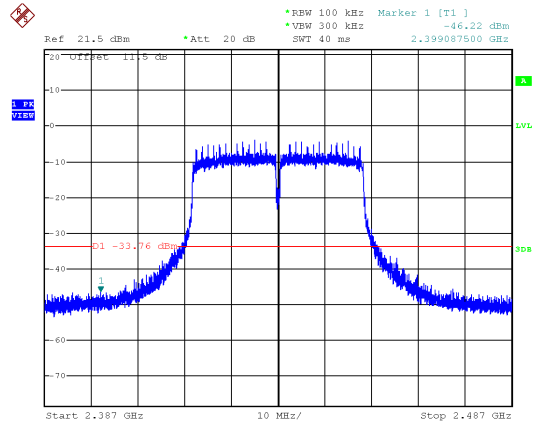
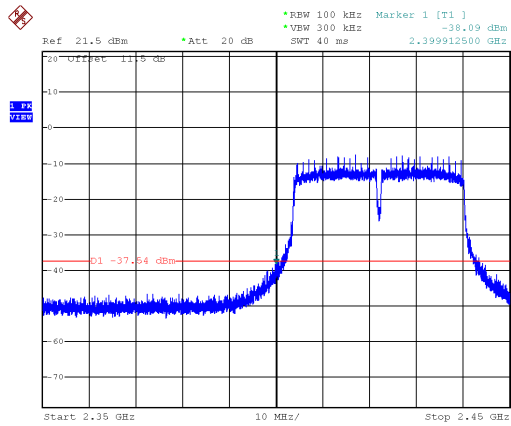
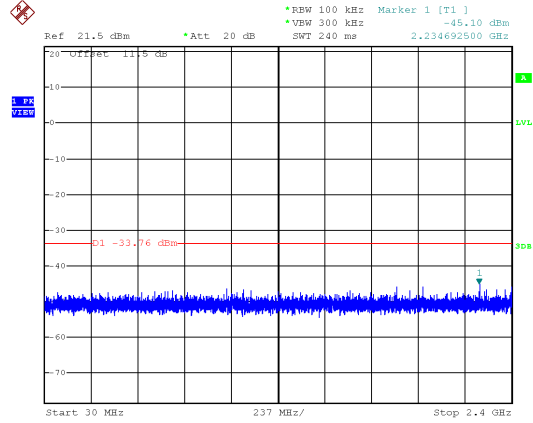
P to P

ANT 1

Modulation Type: 802.11ac VHT40, 2422MHz



Modulation Type: 802.11ac VHT40, 2437MHz

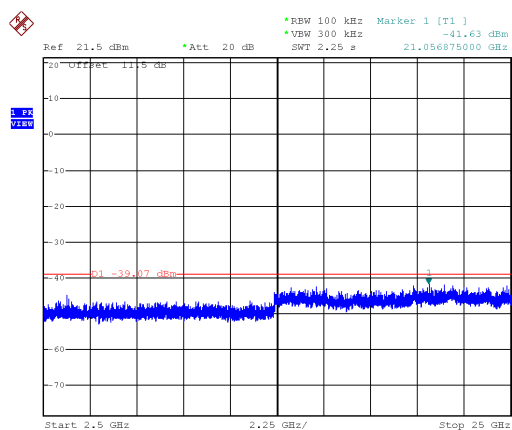
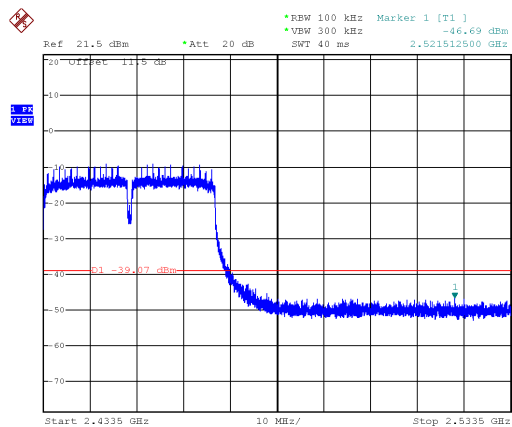
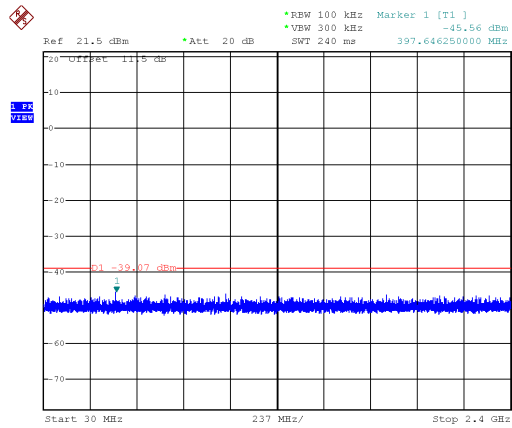




P to P

ANT 1

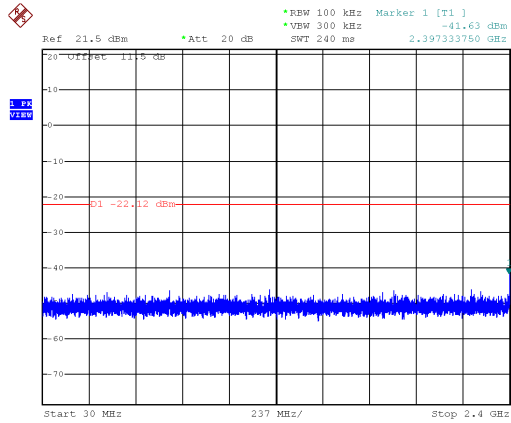
Modulation Type: 802.11ac VHT40, 2452MHz



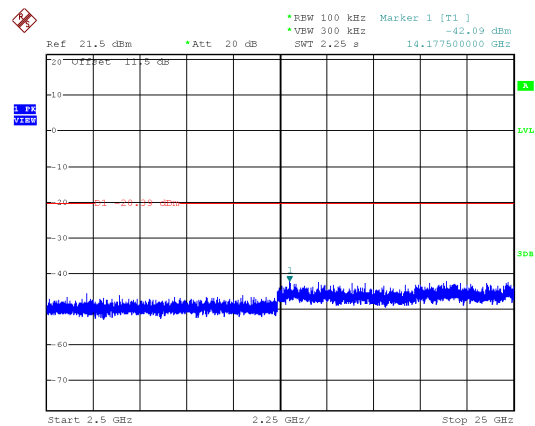
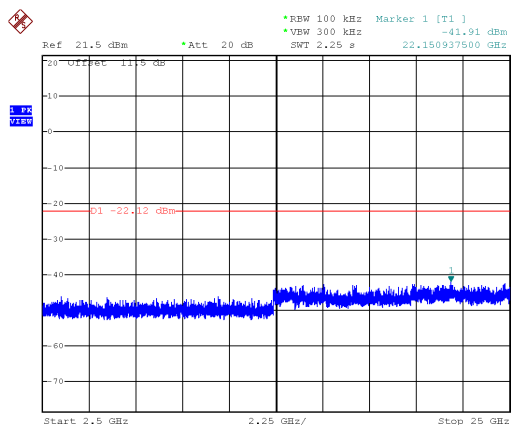
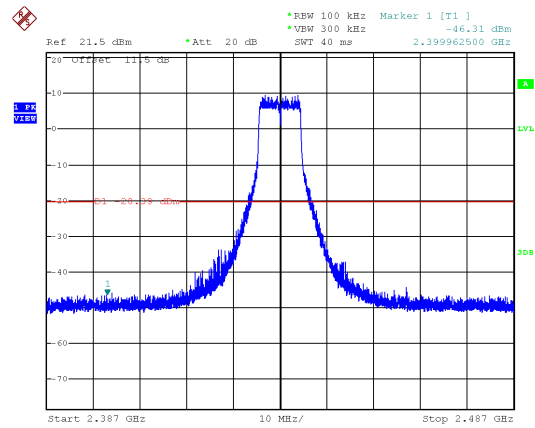
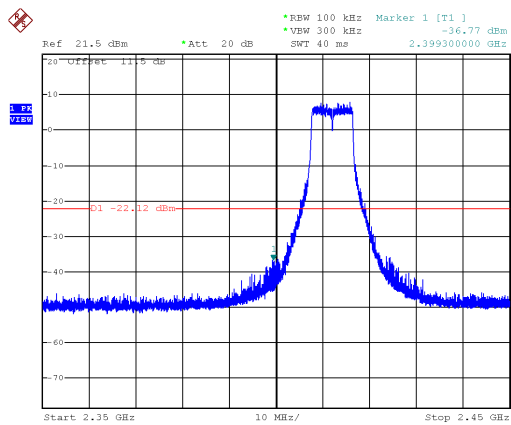
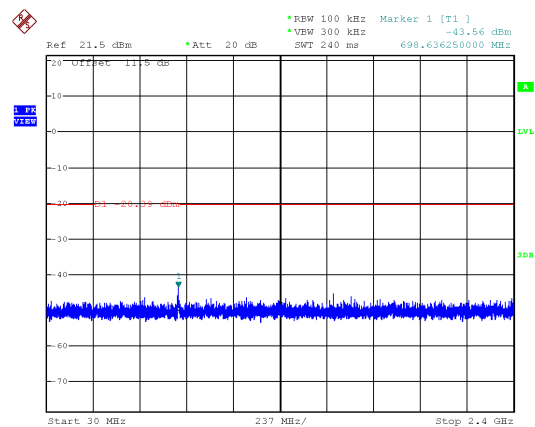


P to MP
ANT 0

Modulation Type: 802.11ac VHT10, 2412MHz



Modulation Type: 802.11ac VHT10, 2437MHz

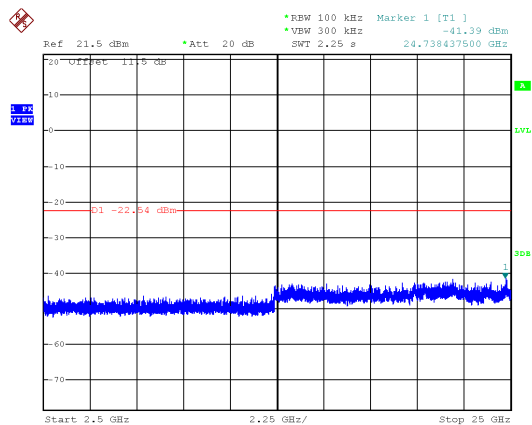
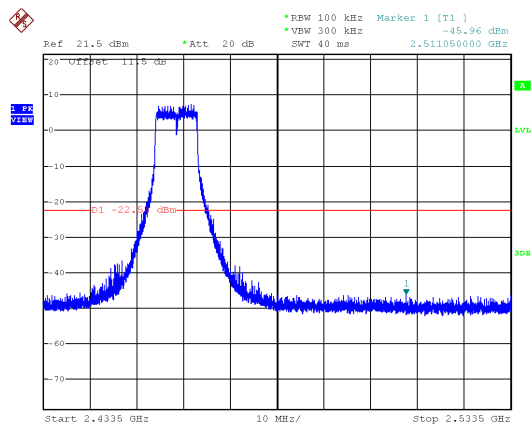
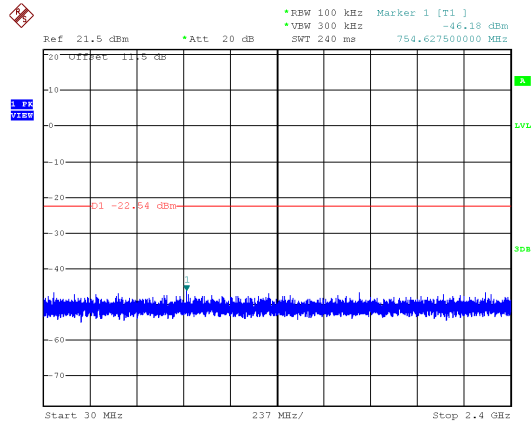




P to MP

ANT 0

Modulation Type: 802.11ac VHT10, 2462MHz

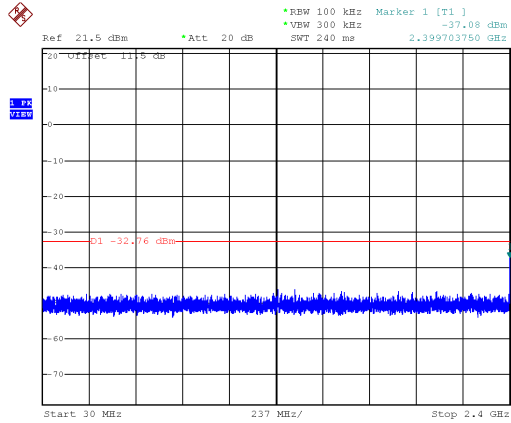




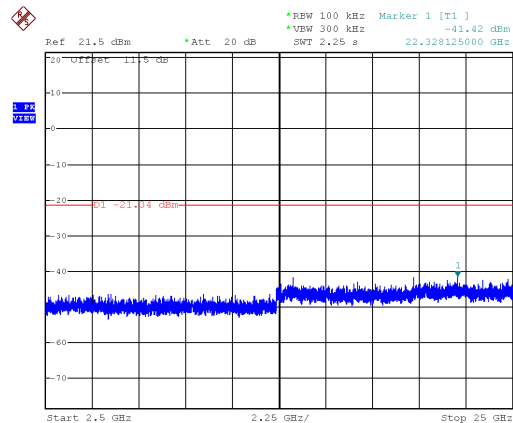
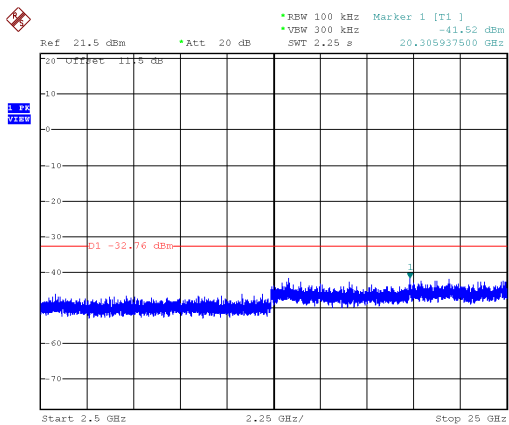
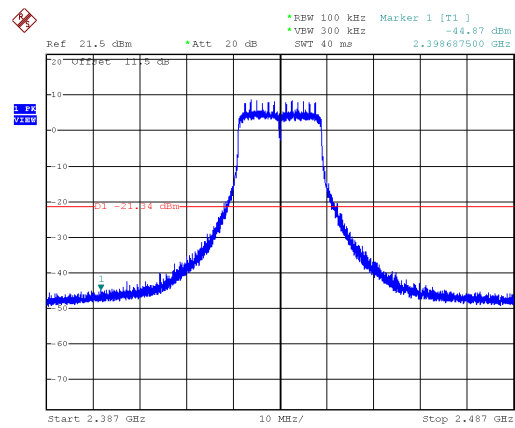
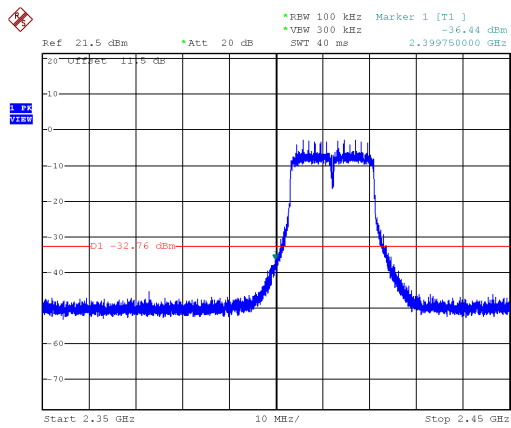
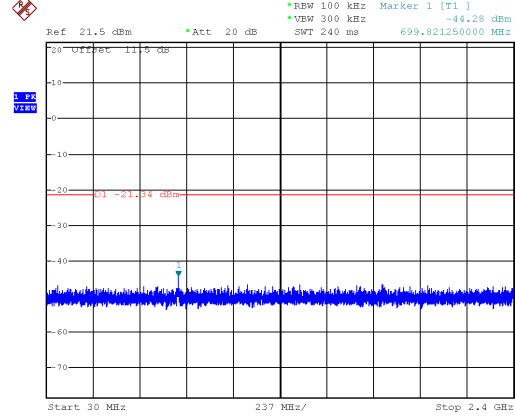
P to MP

ANT 0

Modulation Type: 802.11ac VHT20, 2412MHz



Modulation Type: 802.11ac VHT20, 2437MHz

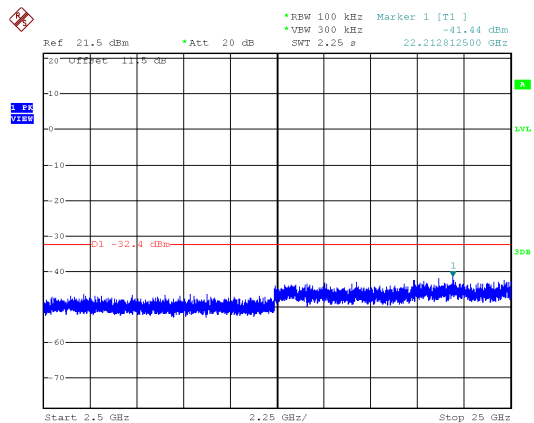
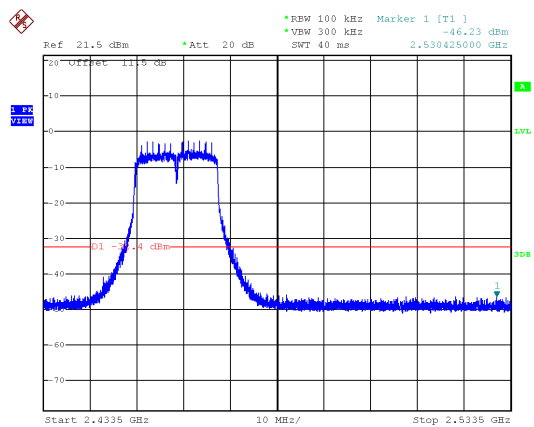
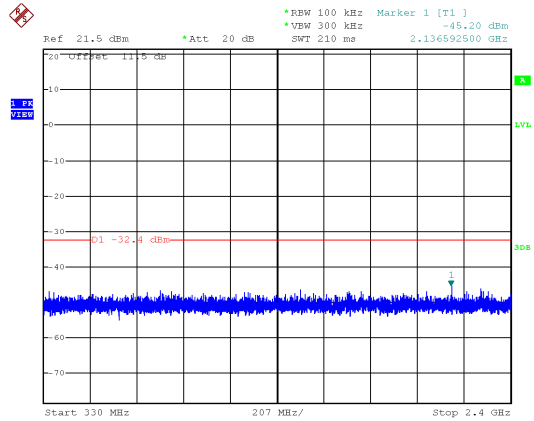




P to MP

ANT 0

Modulation Type: 802.11ac VHT20, 2462MHz

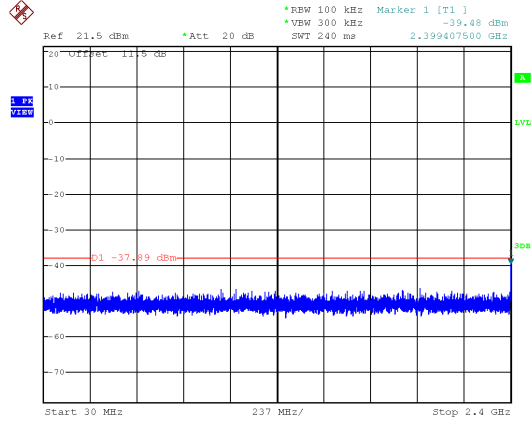




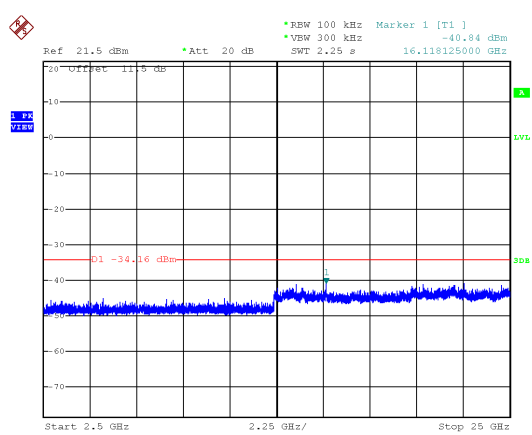
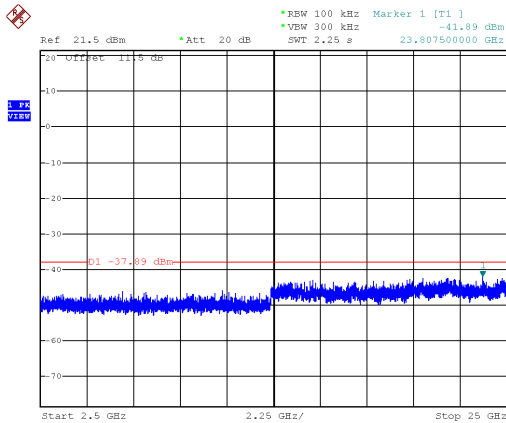
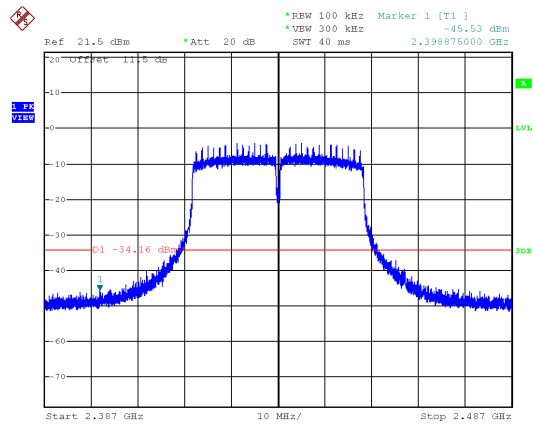
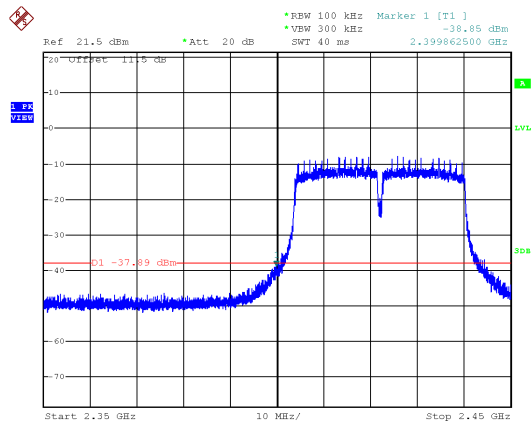
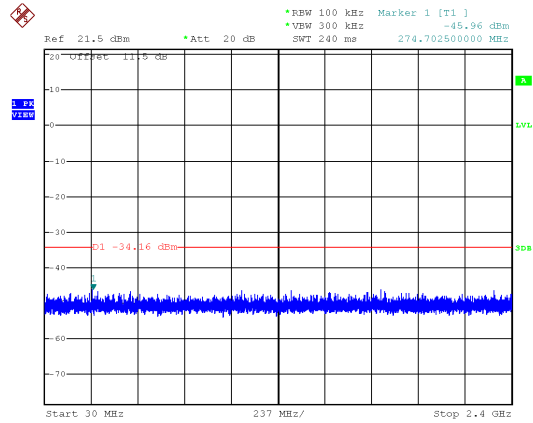
P to MP

ANT 0

Modulation Type: 802.11ac VHT40, 2422MHz



Modulation Type: 802.11ac VHT40, 2437MHz

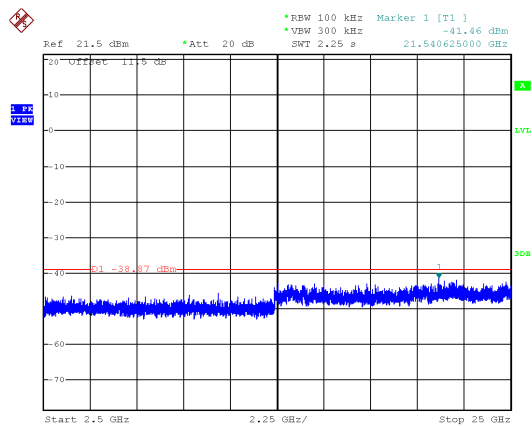
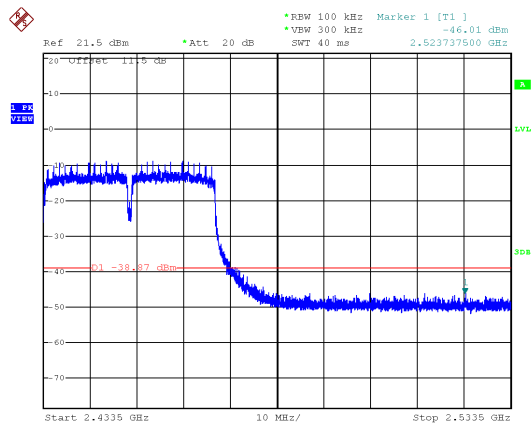
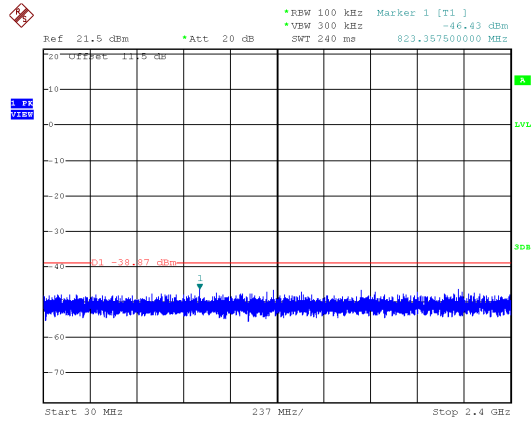




P to MP

ANT 0

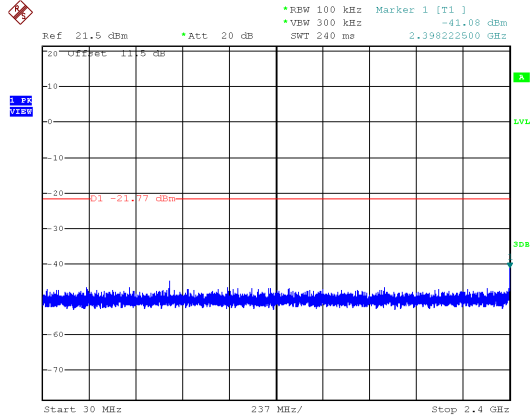
Modulation Type: 802.11ac VHT40, 2452MHz



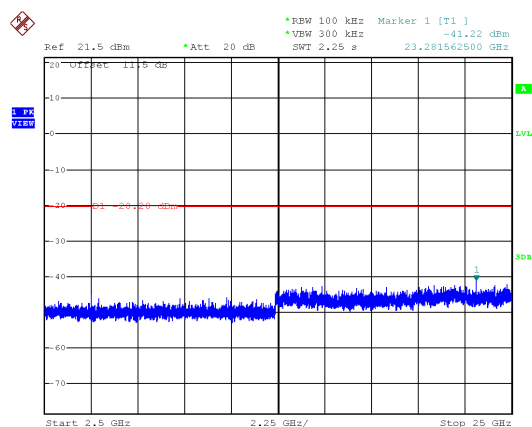
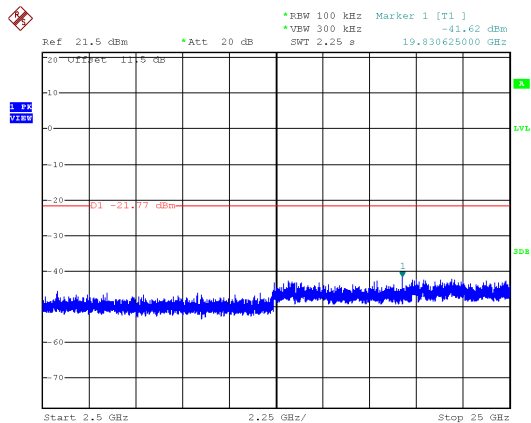
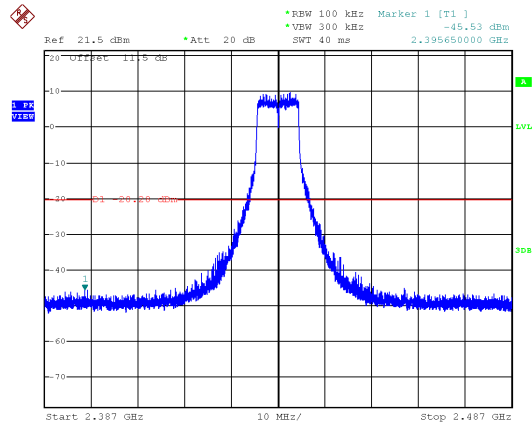
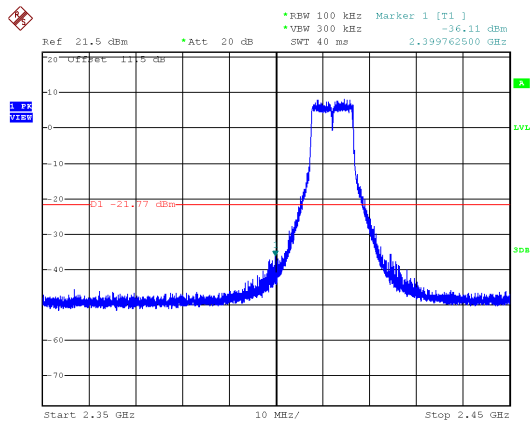
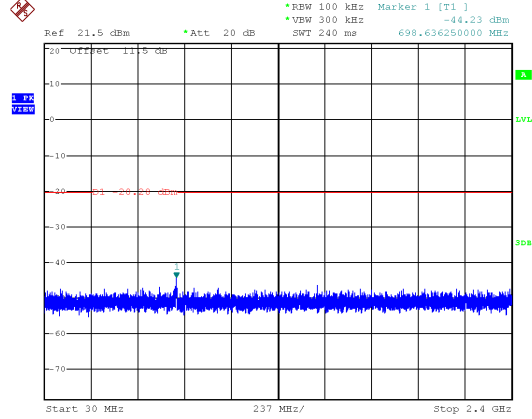


P to MP
ANT 1

Modulation Type: 802.11ac VHT10, 2412MHz



Modulation Type: 802.11ac VHT10, 2437MHz

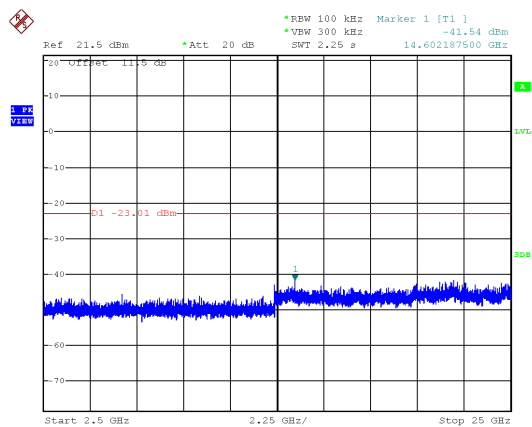
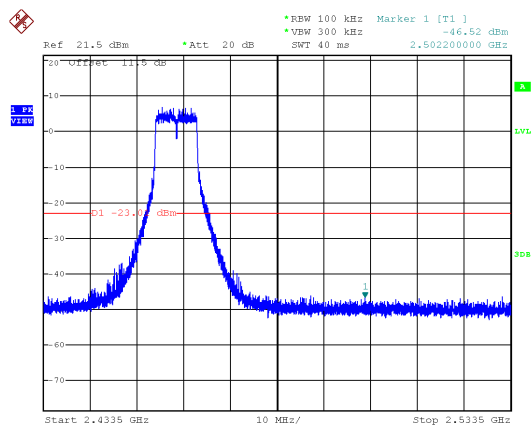
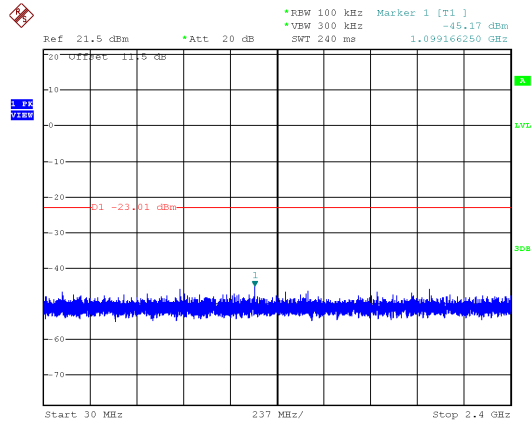




P to MP

ANT 1

Modulation Type: 802.11ac VHT10, 2462MHz

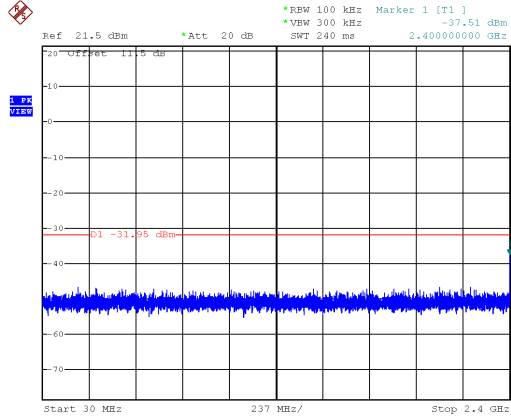




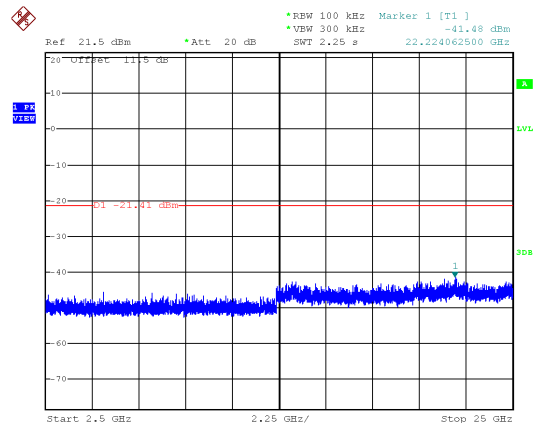
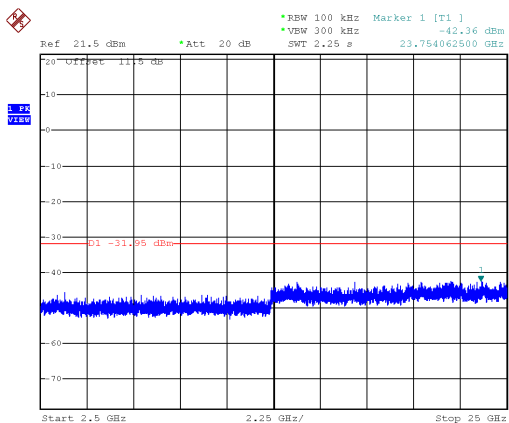
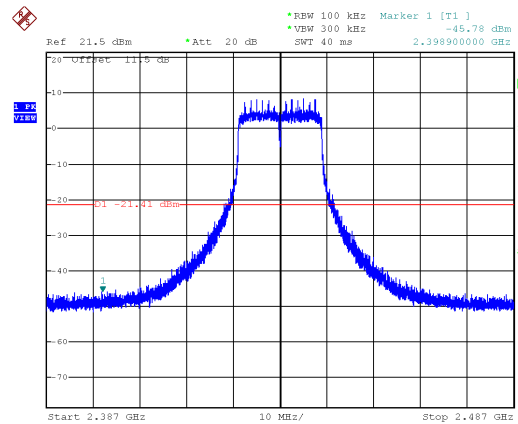
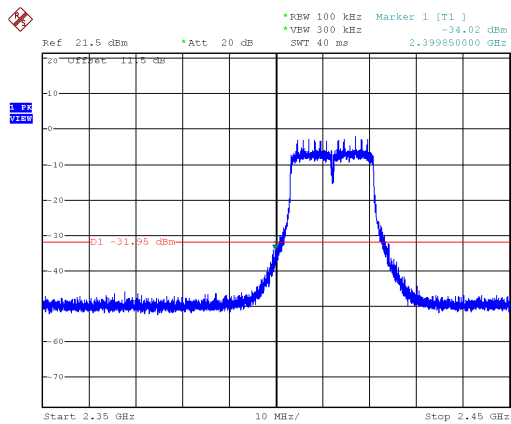
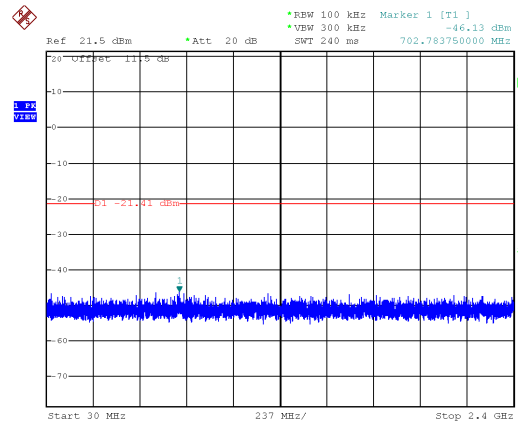
P to MP

ANT 1

Modulation Type: 802.11ac VHT20, 2412MHz



Modulation Type: 802.11ac VHT20, 2437MHz

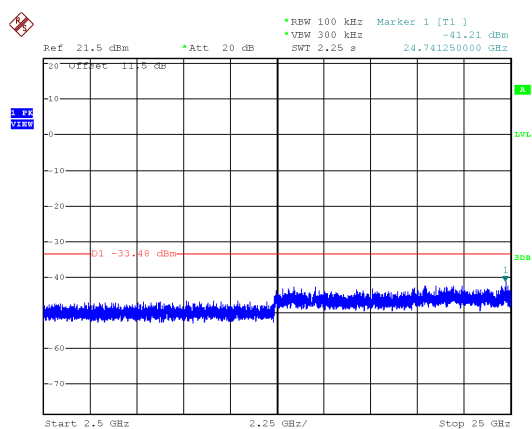
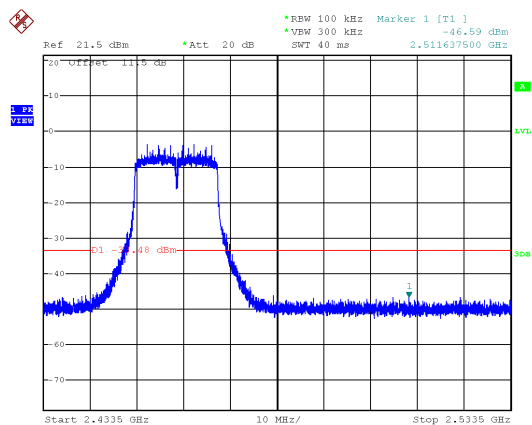
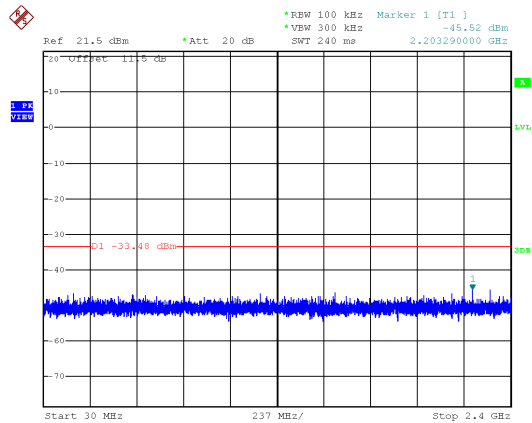




P to MP

ANT 1

Modulation Type: 802.11ac VHT20, 2462MHz

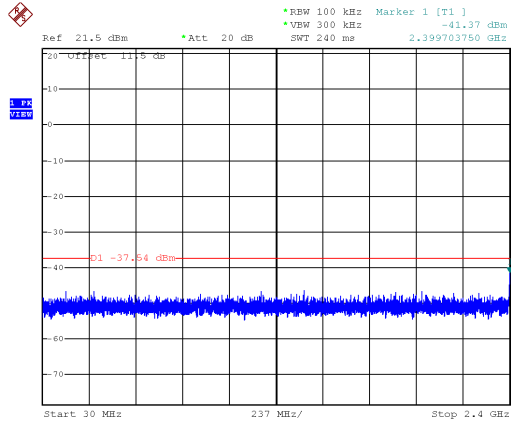




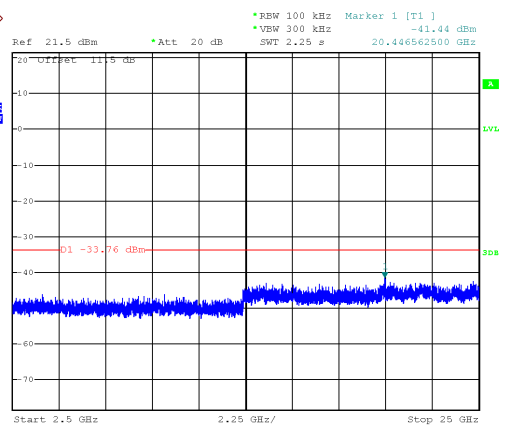
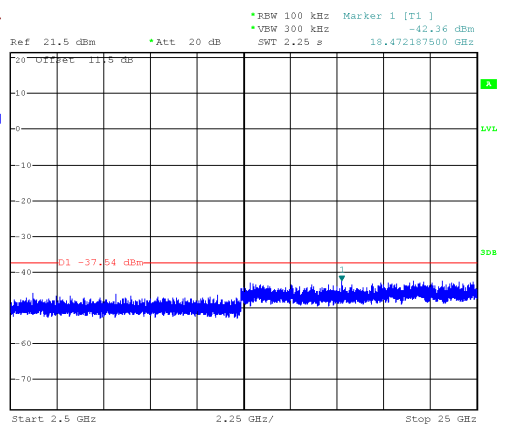
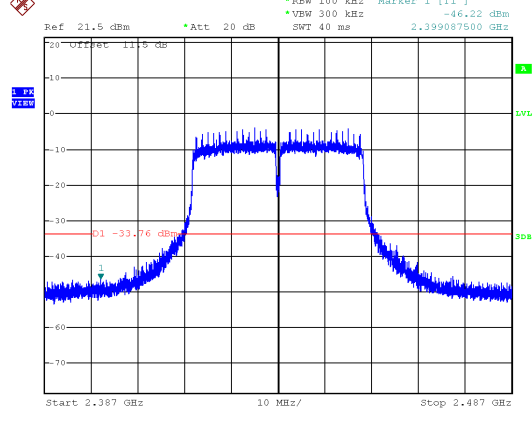
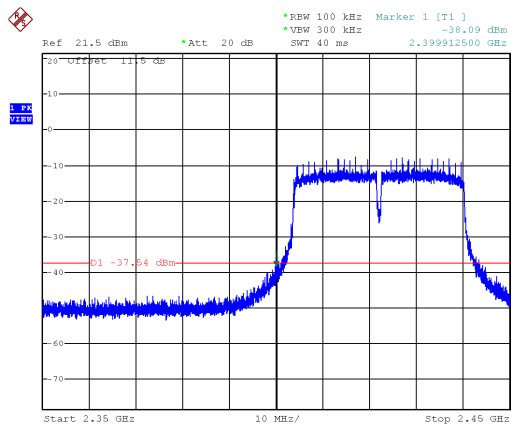
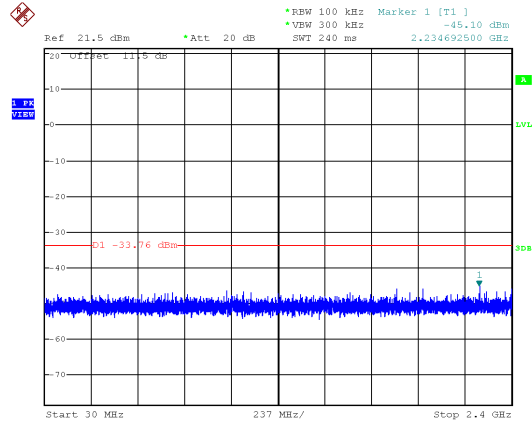
P to MP

ANT 1

Modulation Type: 802.11ac VHT40, 2422MHz



Modulation Type: 802.11ac VHT40, 2437MHz

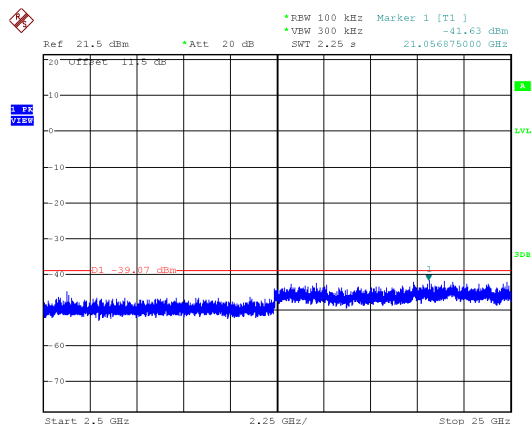
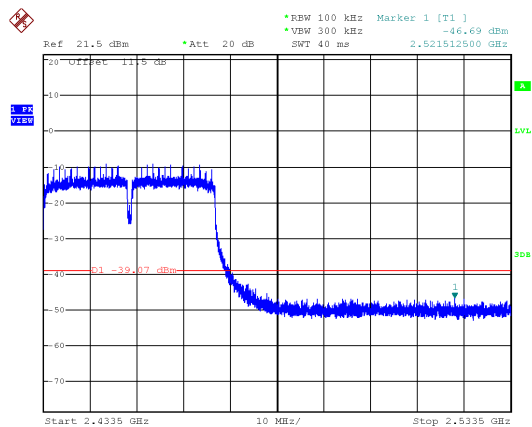
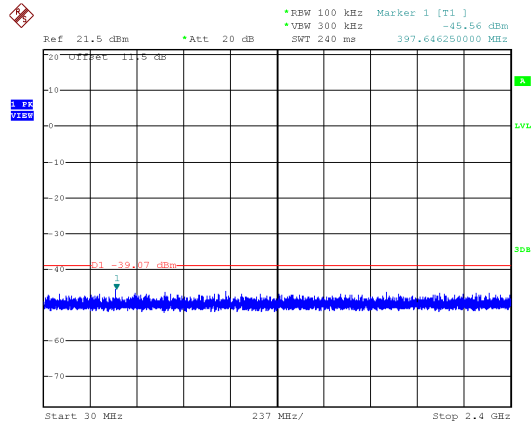




P to MP

ANT 1

Modulation Type: 802.11ac VHT40, 2452MHz





8. 6dB Bandwidth Measurement Data

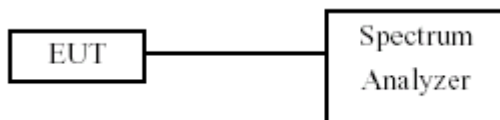
8.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

8.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 1~5% of the emission bandwidth and VBW $\geq 3 \times$ RBW.
- The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.
- The 6dB Bandwidth was measured and recorded.

8.3 Test Setup Layout



8.4 Test Result and Data

Temperature : 21°C

Humidity : 64%

Test Date : Aug. 18, 2017

P to P

Modulation Type	Frequency (MHz)	6dB Bandwidth (MHz)		Limit (KHz)
		ANT 0	ANT 1	
IEEE 802.11ac VHT10 (MCS0)	2412	8.94	8.88	500
	2437	8.88	8.82	500
	2462	8.88	8.88	500
IEEE 802.11ac VHT20 (MCS0)	2412	17.60	17.60	500
	2437	17.60	17.60	500
	2462	17.60	17.60	500
IEEE 802.11ac VHT40 (MCS0)	2422	36.20	36.40	500
	2437	36.40	36.40	500
	2452	36.40	36.40	500



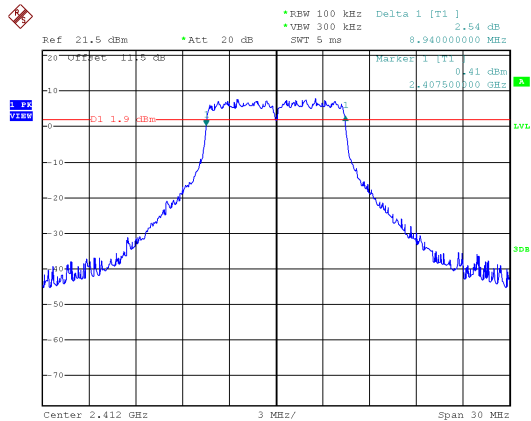
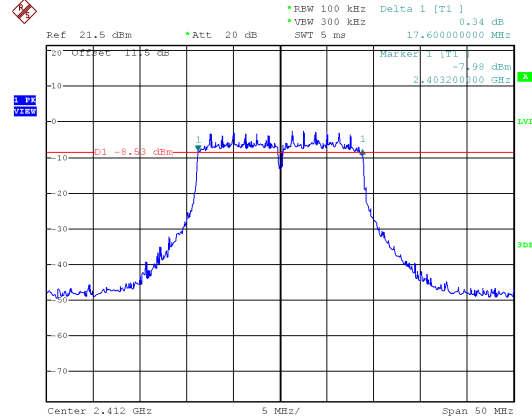
P to MP

Modulation Type	Frequency (MHz)	6dB Bandwidth (MHz)		Limit (KHz)
		ANT 0	ANT 1	
IEEE 802.11ac VHT10 (MCS0)	2412	8.94	8.88	500
	2437	8.94	8.88	500
	2462	8.88	8.88	500
IEEE 802.11ac VHT20 (MCS0)	2412	17.60	17.60	500
	2437	17.60	17.60	500
	2462	17.60	17.60	500
IEEE 802.11ac VHT40 (MCS0)	2422	36.20	36.40	500
	2437	36.40	36.40	500
	2452	36.40	36.40	500

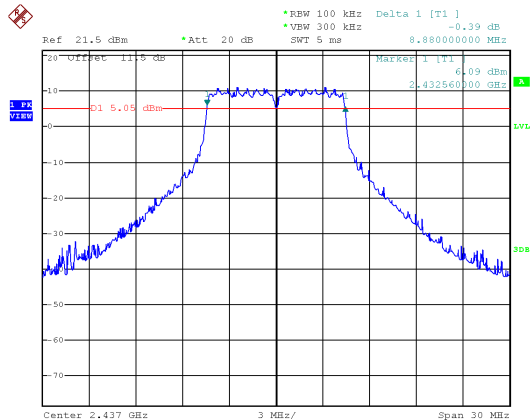


P to P

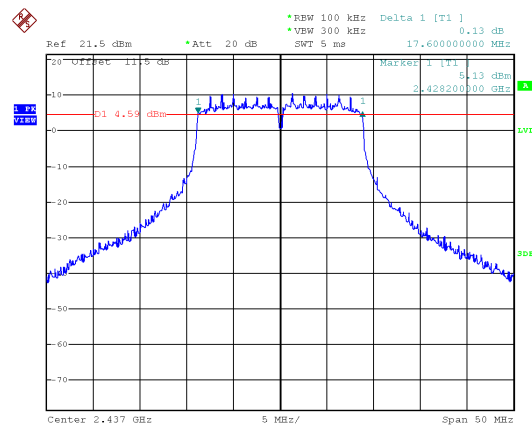
ANT 0

Modulation Type: 802.11ac VHT10
2412MHzModulation Type: 802.11ac VHT20
2412MHz

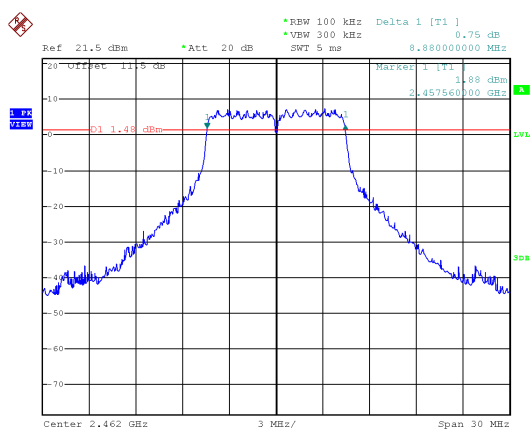
2437MHz



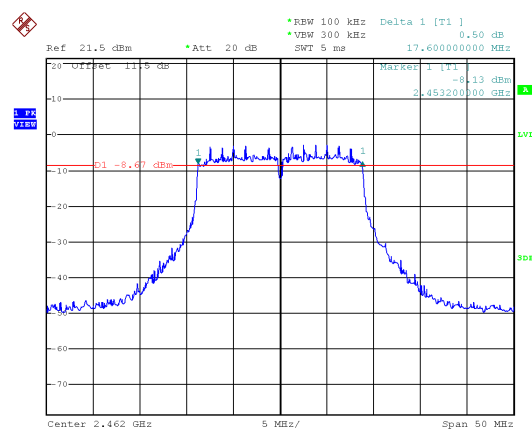
2437MHz



2462MHz



2462MHz



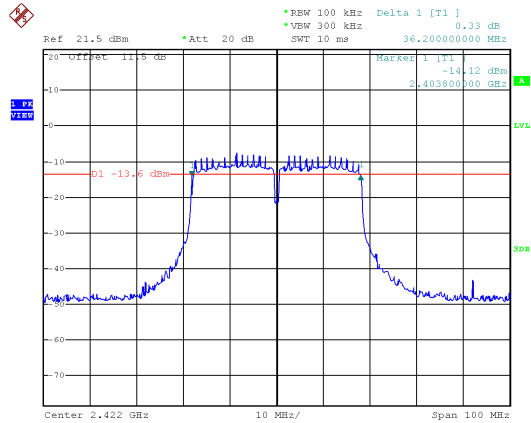


P to P

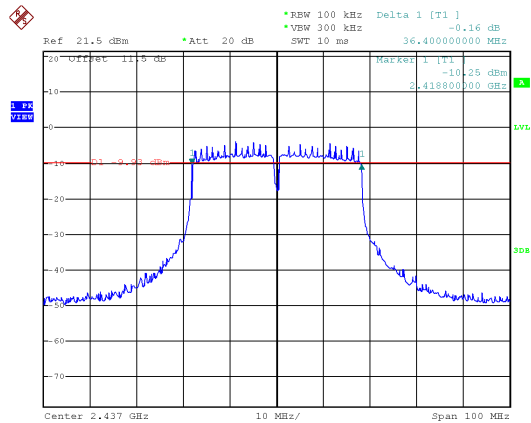
ANT 0

Modulation Type: 802.11ac VHT40

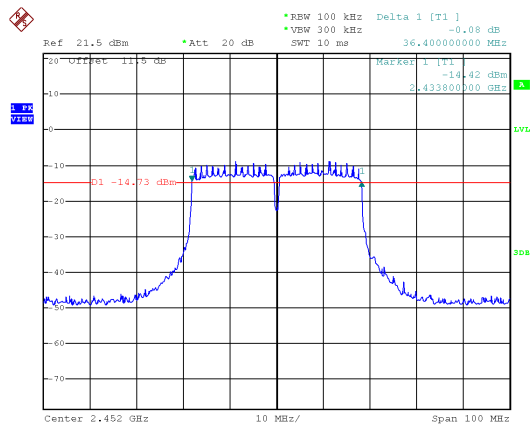
2422MHz



2437MHz



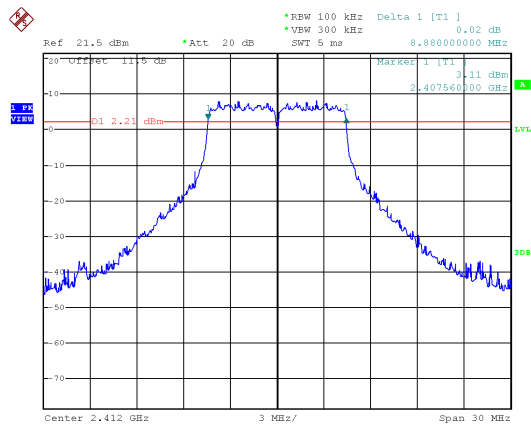
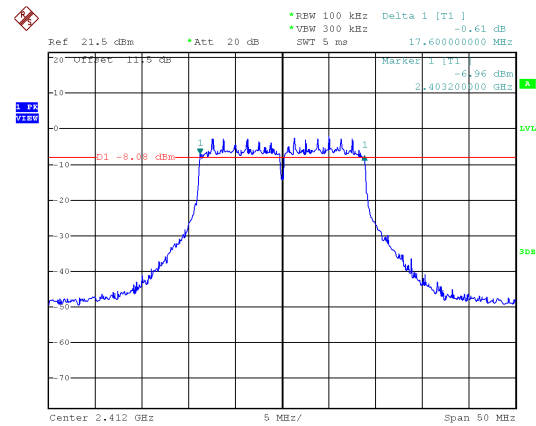
2452MHz



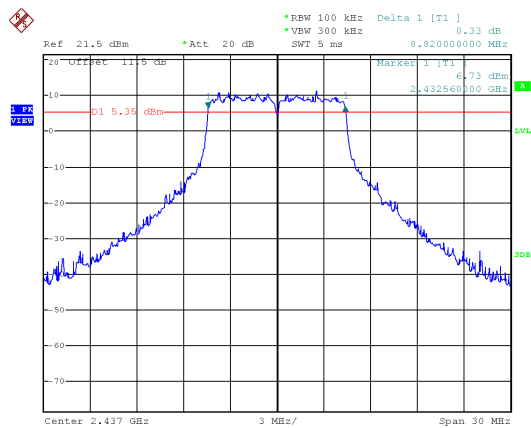


P to P

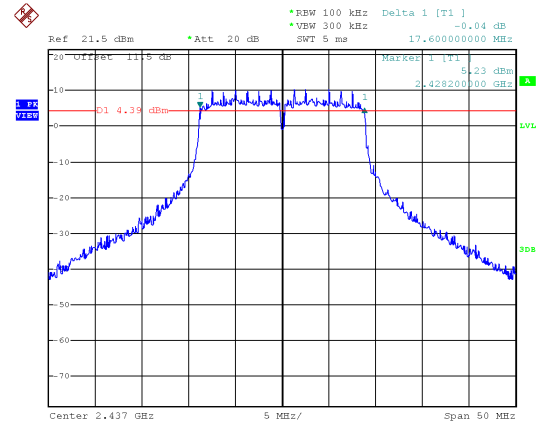
ANT 1

Modulation Type: 802.11ac VHT10
2412MHzModulation Type: 802.11ac VHT20
2412MHz

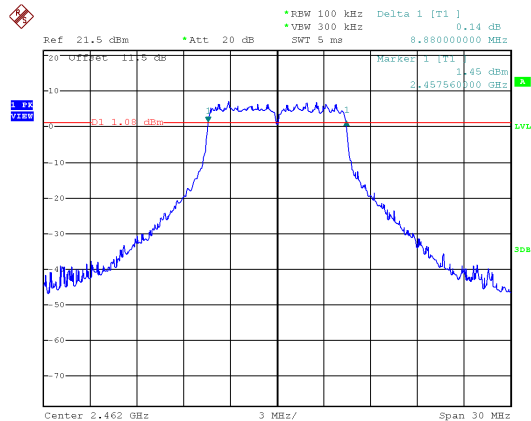
2437MHz



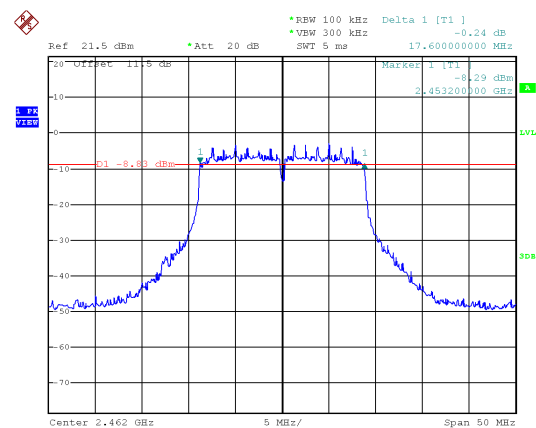
2437MHz



2462MHz



2462MHz



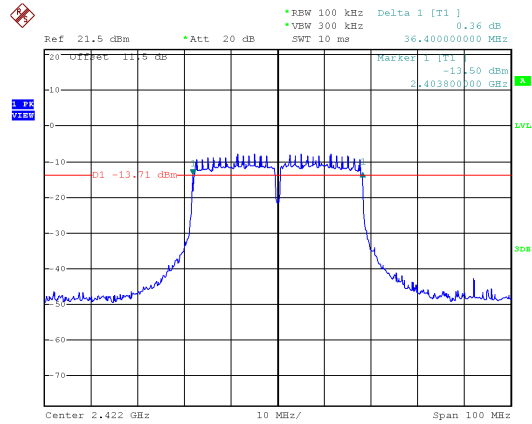


P to P

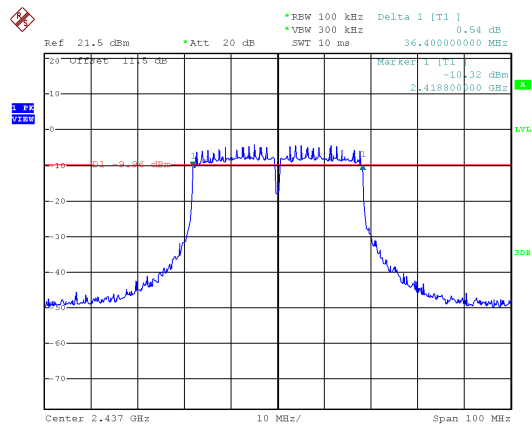
ANT 1

Modulation Type: 802.11ac VHT40

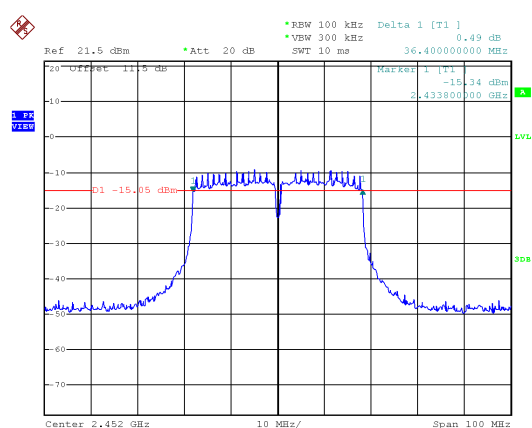
2422MHz



2437MHz



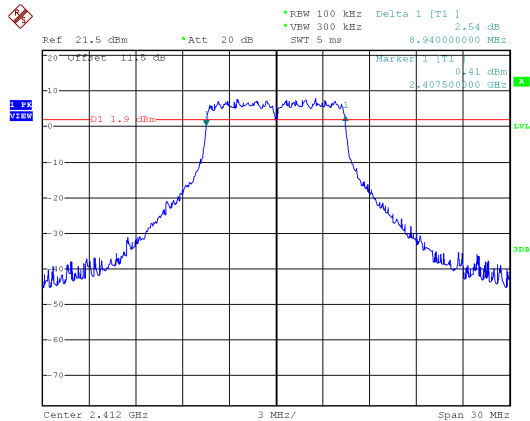
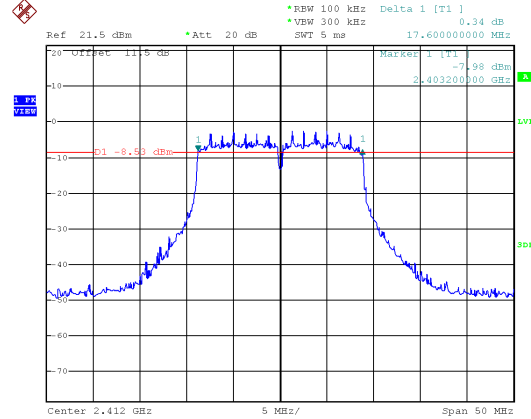
2452MHz



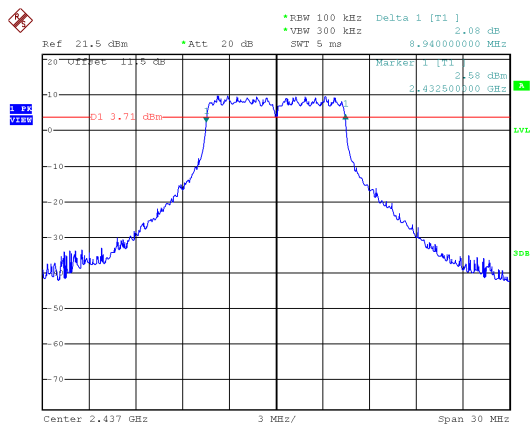


P to MP

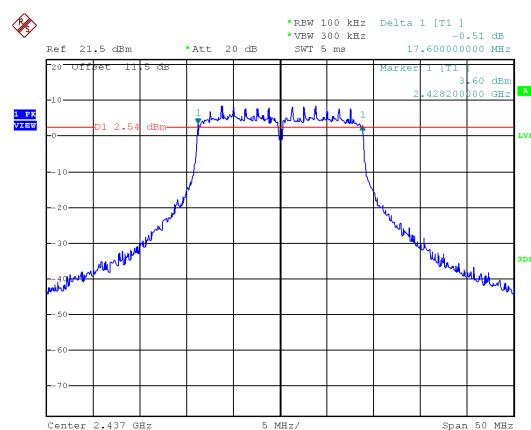
ANT 0

Modulation Type: 802.11ac VHT10
2412MHzModulation Type: 802.11ac VHT20
2412MHz

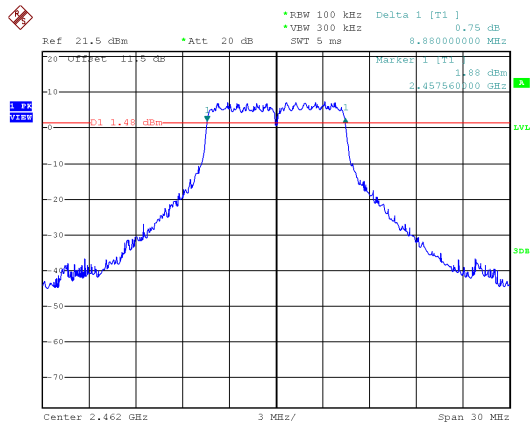
2437MHz



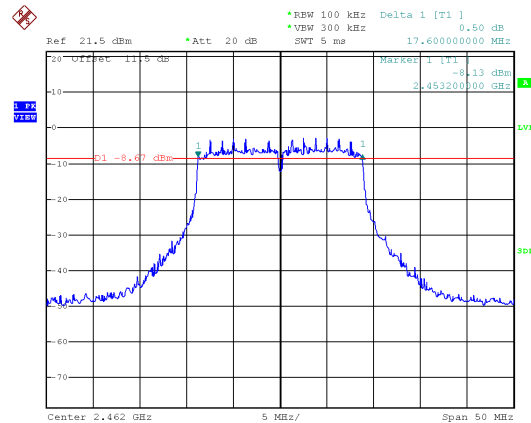
2437MHz



2462MHz



2462MHz



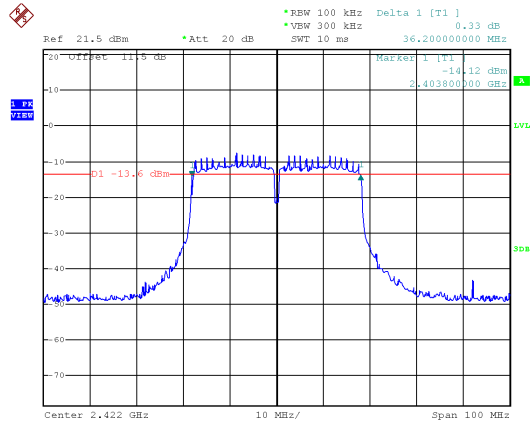


P to MP

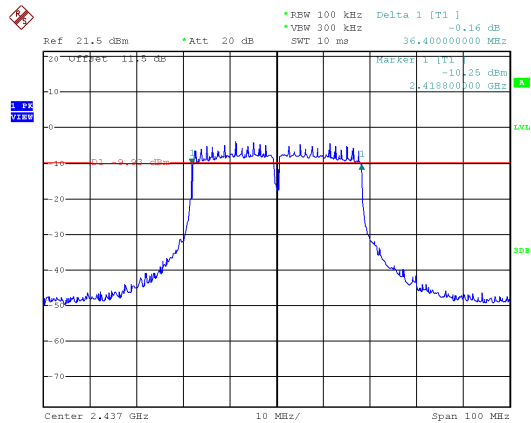
ANT 0

Modulation Type: 802.11ac VHT40

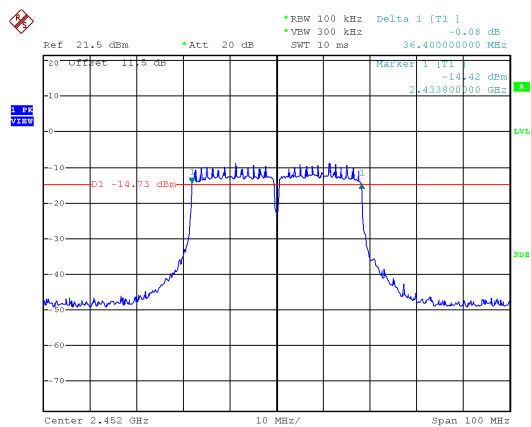
2422MHz



2437MHz



2452MHz

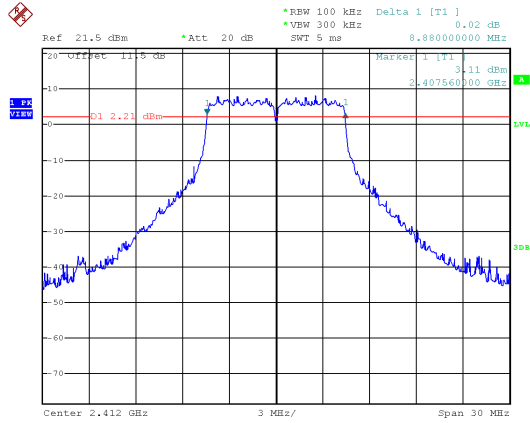




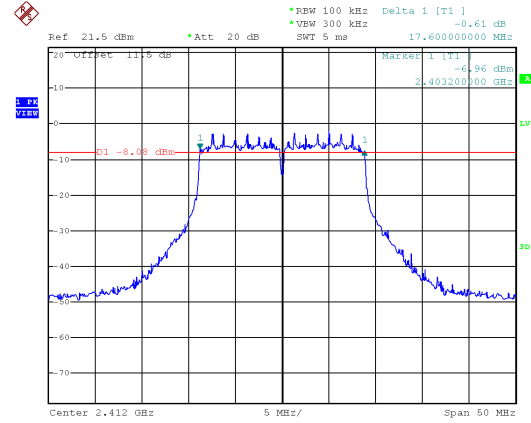
P to MP

ANT 1

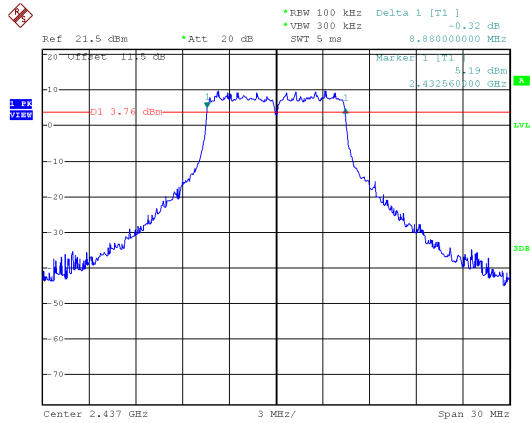
Modulation Type: 802.11ac VHT10
2412MHz



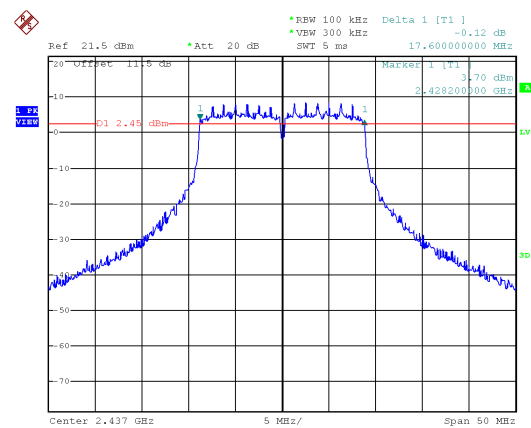
Modulation Type: 802.11ac VHT20
2412MHz



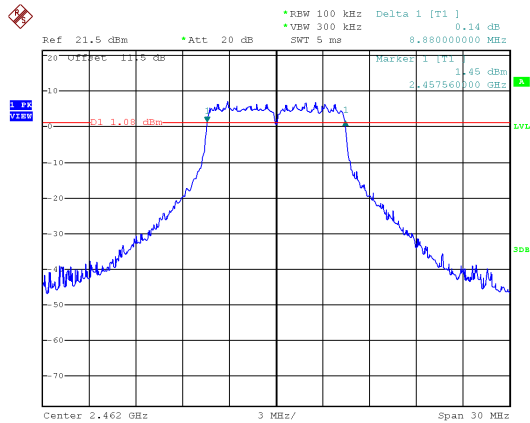
2437MHz



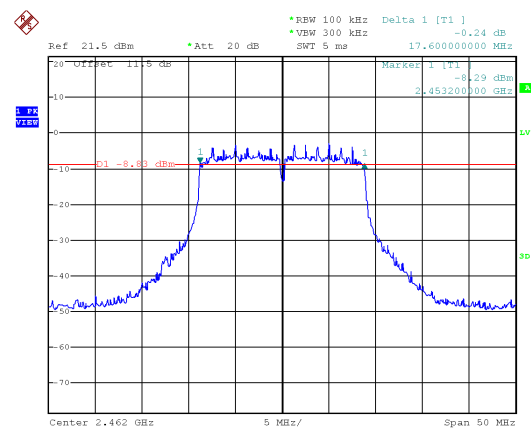
2437MHz



2462MHz



2462MHz



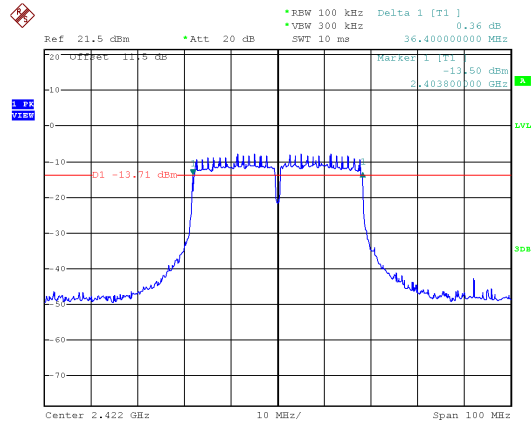


P to MP

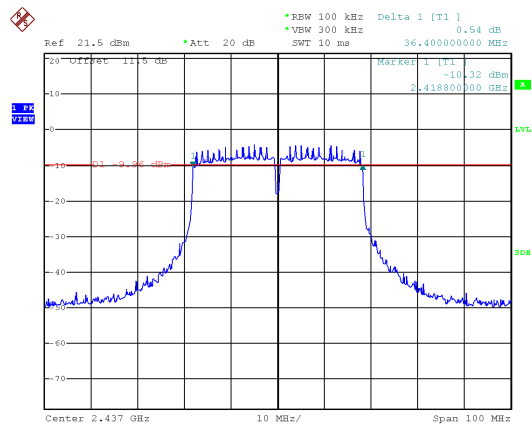
ANT 1

Modulation Type: 802.11ac VHT40

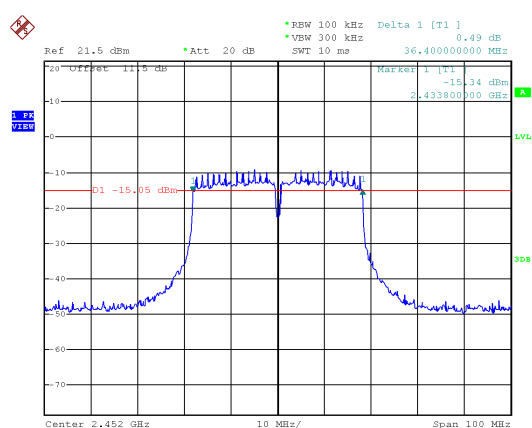
2422MHz



2437MHz



2452MHz





9. Maximum Average Output Power

9.1 Test Limit

The Maximum Average Output Power Measurement is 30dBm.

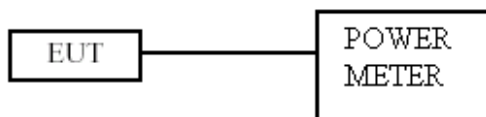
If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

9.2 Test Procedures

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

9.3 Test Setup Layout





9.4 Test Result and Data

Temperature : 21°C
Test Date : Aug. 18, 2017

Humidity : 64%

P to P

Modulation Type	Frequency (MHz)	Avg. Power Output (dBm)		Total Avg. Power (dBm)	Total Avg. Power (mW)	Limit (dBm)
		ANT 0	ANT 1			
IEEE 802.11ac VHT10 (MCS0)	2412	18.46	18.6	21.54	142.59	27.67
	2437	24.6	24.43	27.53	565.74	27.67
	2462	17.83	17.4	20.63	115.63	27.67
IEEE 802.11ac VHT20 (MCS0)	2412	8.93	9.04	12.00	15.83	27.67
	2437	21.55	21.69	24.63	290.46	27.67
	2462	8.92	8.39	11.67	14.70	27.67
IEEE 802.11ac VHT40 (MCS0)	2422	6.57	6.56	9.58	9.07	27.67
	2437	10.21	10.28	13.26	21.16	27.67
	2452	5.47	5.09	8.29	6.75	27.67

P to MP

Modulation Type	Frequency (MHz)	Avg. Power Output (dBm)		Total Avg. Power (dBm)	Total Avg. Power (mW)	Limit (dBm)
		ANT 0	ANT 1			
IEEE 802.11ac VHT10 (MCS0)	2412	18.46	18.6	21.54	142.59	23.00
	2437	19.78	19.93	22.87	193.46	23.00
	2462	17.83	17.4	20.63	115.63	23.00
IEEE 802.11ac VHT20 (MCS0)	2412	8.93	9.04	12.00	15.83	23.00
	2437	19.66	19.72	22.70	186.23	23.00
	2462	8.92	8.39	11.67	14.70	23.00
IEEE 802.11ac VHT40 (MCS0)	2422	5.57	6.56	9.10	8.13	23.00
	2437	10.21	10.28	13.26	21.16	23.00
	2452	5.47	5.09	8.29	6.75	23.00



10. Power Spectral Density

10.1 Test Limit

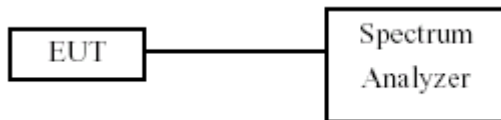
The Maximum of Power Spectral Density Measurement is 8dBm.

If transmitting antennas of directional gain greater than 6 dBi are used, the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

10.2 Test Procedures

- The transmitter output was connected to spectrum analyzer.
- The spectrum analyzer's resolution bandwidth were set at 3kHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
- The power spectral density was measured and recorded.

10.3 Test Setup Layout





10.4 Test Result and Data

Temperature : 21°C

Humidity : 64%

Test Date : Aug. 18, 2017

P to P

Modulation Type	Freq. (MHz)	Maximum Power Density (dBm)		Sum chain (dBm)	Duty Cycle CF(dB)	Total PSD (dBm)	Limit (dBm)
		ANT 0	ANT 1				
IEEE 802.11ac VHT10 (MCS0)	2412	-8.3	-7.85	-5.06	0.10	-4.96	4.66
	2437	-1.88	-1.42	1.37	0.10	1.47	4.66
	2462	-8.68	-9.31	-5.97	0.10	-5.87	4.66
IEEE 802.11ac VHT20 (MCS0)	2412	-20.55	-20.73	-17.63	0.20	-17.43	4.66
	2437	-7.45	-7.75	-4.59	0.20	-4.39	4.66
	2462	-20.1	-21.29	-17.64	0.20	-17.44	4.66
IEEE 802.11ac VHT40 (MCS0)	2422	-21.06	-20.95	-17.99	0.43	-17.56	4.66
	2437	-17.53	-17.11	-14.30	0.43	-13.87	4.66
	2452	-22.31	-22.15	-19.22	0.43	-18.79	4.66

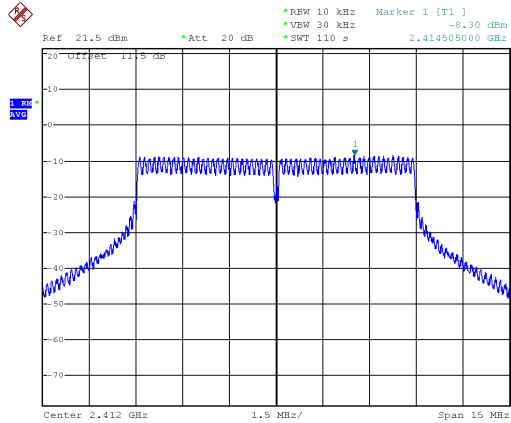
P to MP

Modulation Type	Freq. (MHz)	Maximum Power Density (dBm)		Sum chain (dBm)	Duty Cycle CF(dB)	Total PSD (dBm)	Limit (dBm)
		ANT 0	ANT 1				
IEEE 802.11ac VHT10 (MCS0)	2412	-8.3	-7.85	-5.06	0.10	-4.96	-2.01
	2437	-6.36	-6.39	-3.36	0.10	-3.26	-2.01
	2462	-8.68	-9.31	-5.97	0.10	-5.87	-2.01
IEEE 802.11ac VHT20 (MCS0)	2412	-20.55	-20.73	-17.63	0.20	-17.43	-2.01
	2437	-9.52	-9.54	-6.52	0.20	-6.32	-2.01
	2462	-20.1	-21.29	-17.64	0.20	-17.44	-2.01
IEEE 802.11ac VHT40 (MCS0)	2422	-21.06	-20.95	-17.99	0.43	-17.56	-2.01
	2437	-17.53	-17.11	-14.30	0.43	-13.87	-2.01
	2452	-22.31	-22.15	-19.22	0.43	-18.79	-2.01

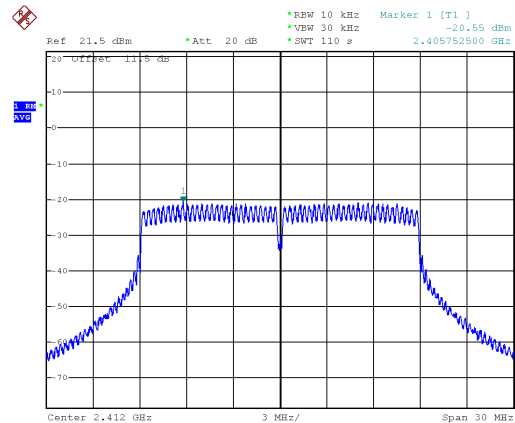


P to P
ANT 0

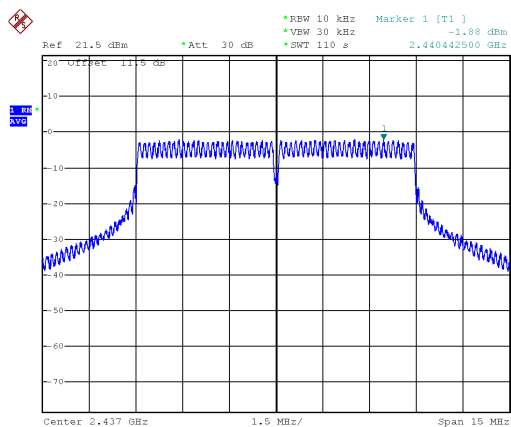
Modulation Type: 802.11ac VHT10
2412MHz



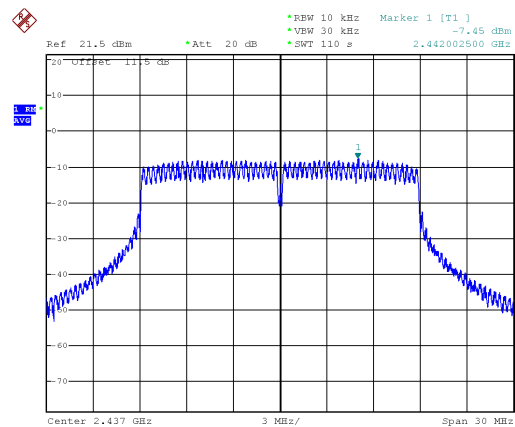
Modulation Type: 802.11ac VHT20
2412MHz



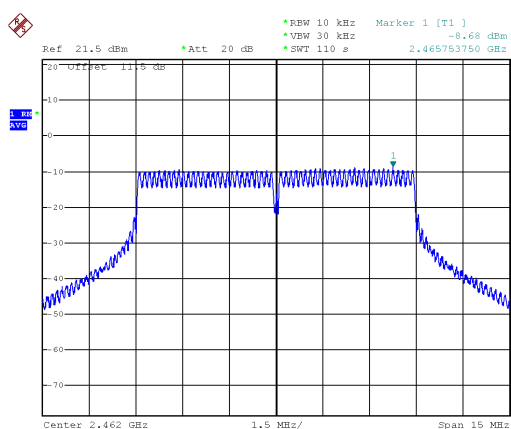
2437MHz



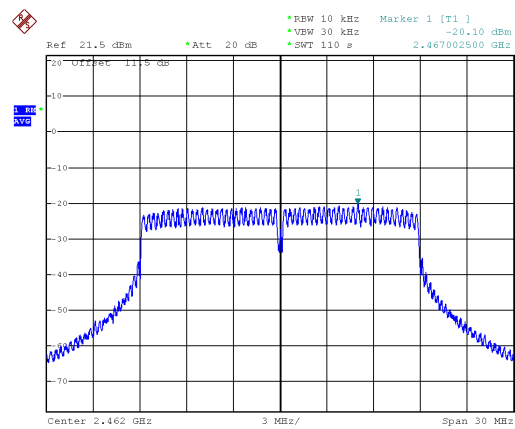
2437MHz



2462MHz



2462MHz

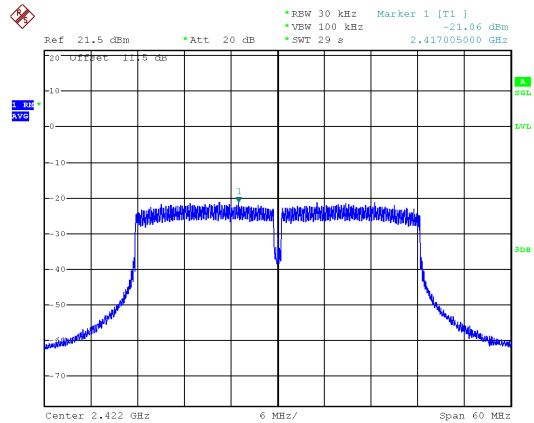




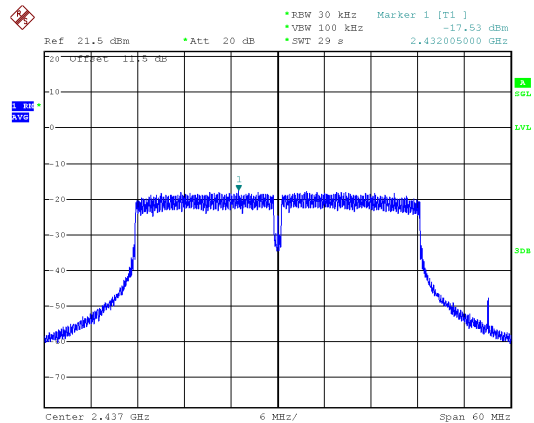
P to P

ANT 0

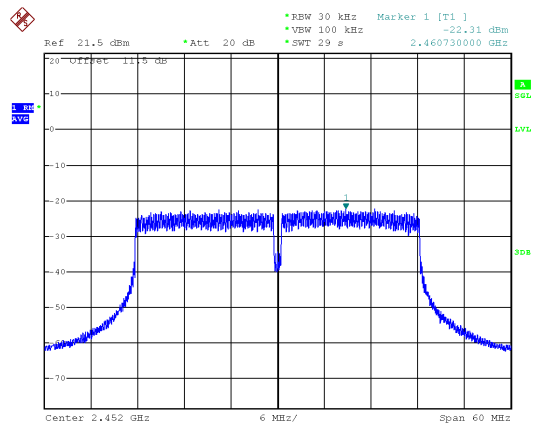
Modulation Type: 802.11ac VHT40
2422MHz



2437MHz



2452MHz

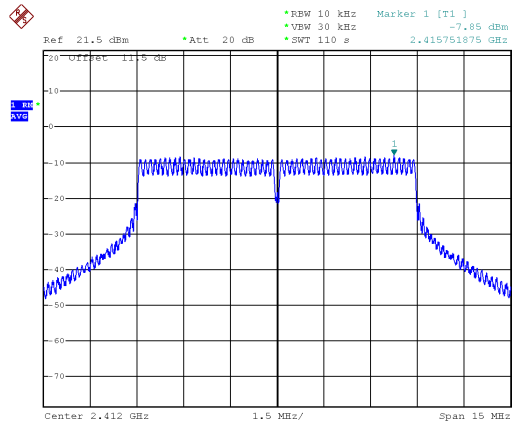




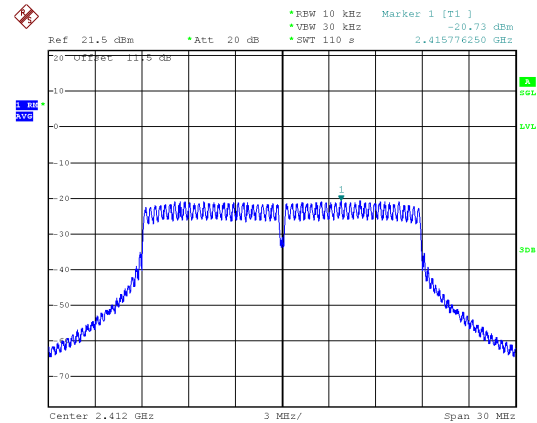
P to P

ANT 1

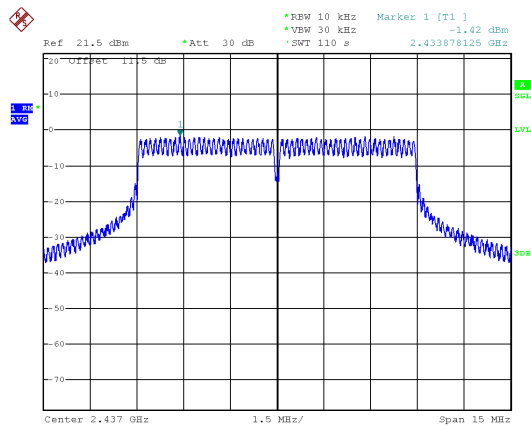
Modulation Type: 802.11ac VHT10
2412MHz



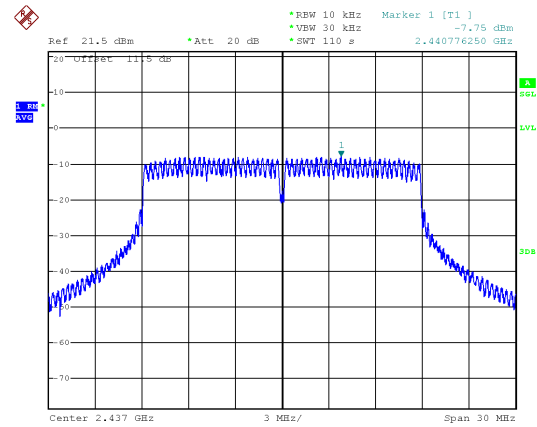
Modulation Type: 802.11ac VHT20
2412MHz



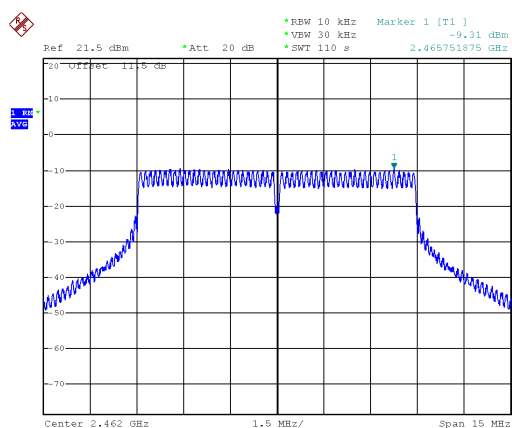
2437MHz



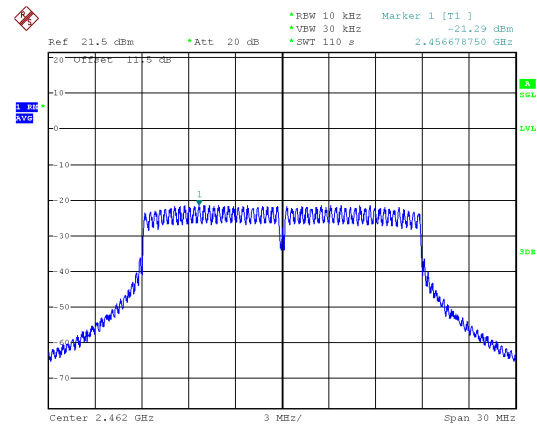
2437MHz



2462MHz



2462MHz



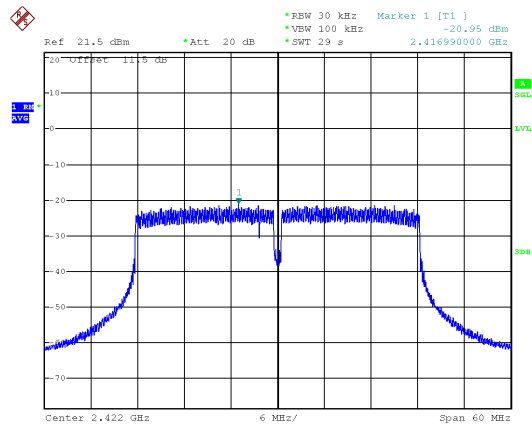


P to P

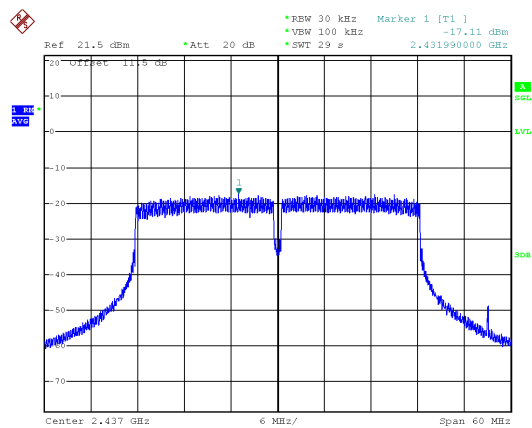
ANT 1

Modulation Type: 802.11ac VHT40

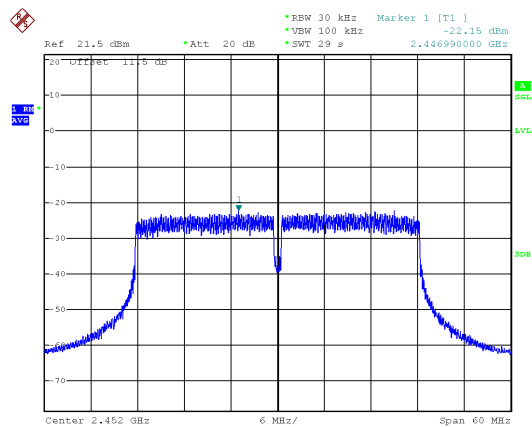
2422MHz



2437MHz



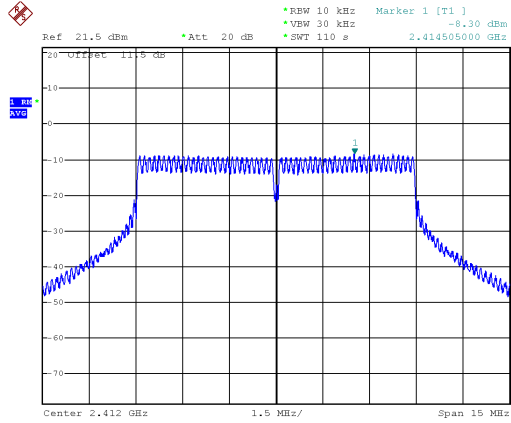
2452MHz



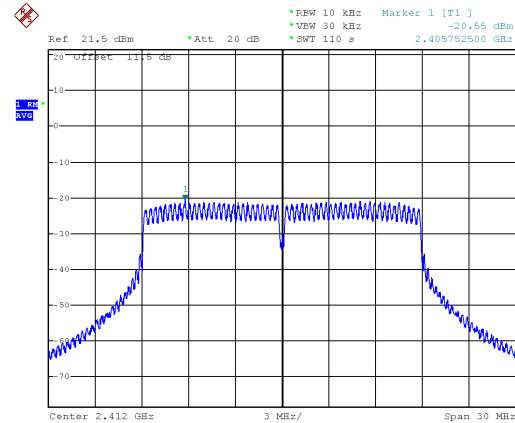


P to MP
ANT 0

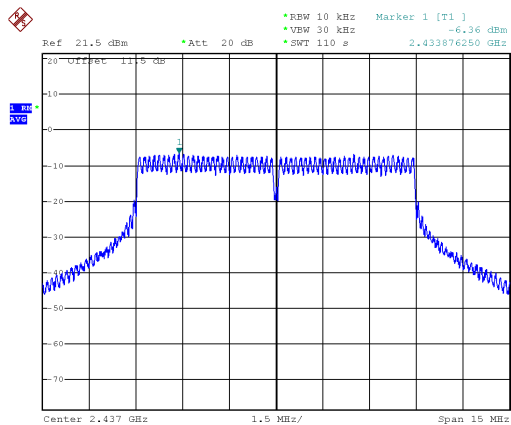
Modulation Type: 802.11ac VHT10
2412MHz



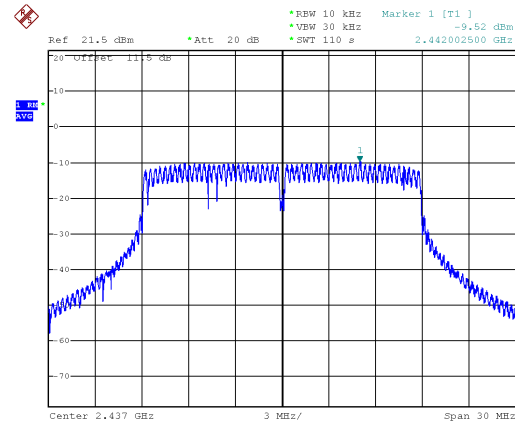
Modulation Type: 802.11ac VHT20
2461MHz



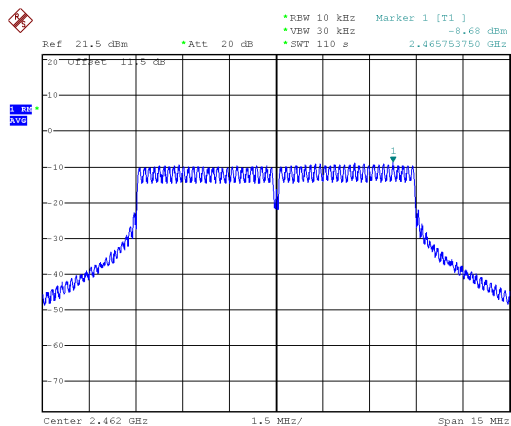
2437MHz



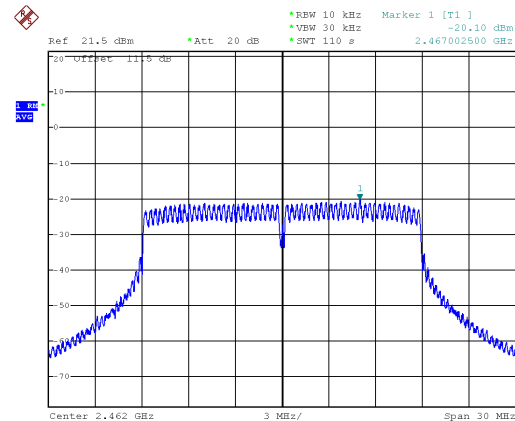
2437MHz



2462MHz



2462MHz

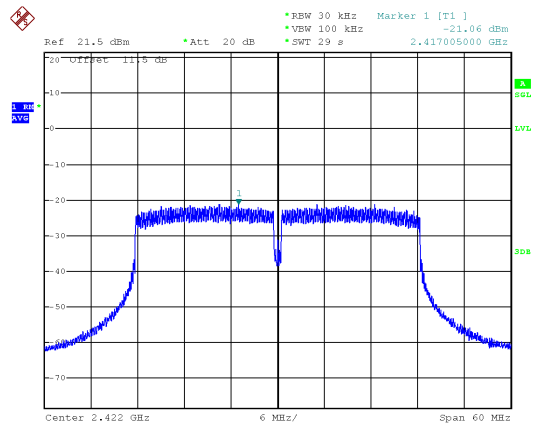




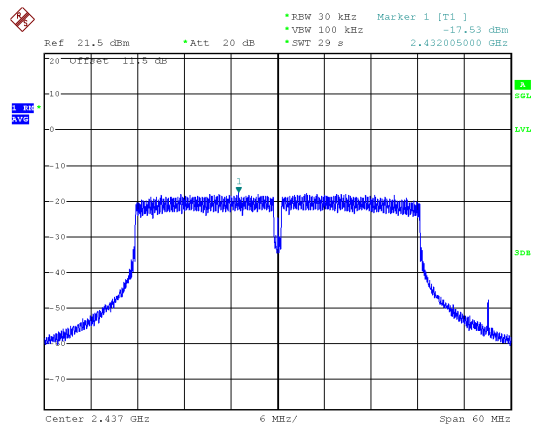
P to MP

ANT 0

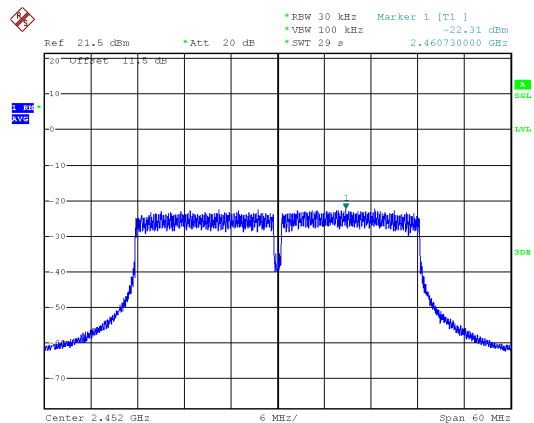
Modulation Type: 802.11ac VHT40
2422MHz



2437MHz



2452MHz

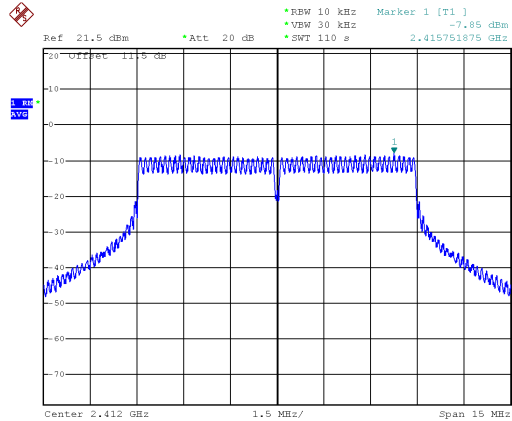




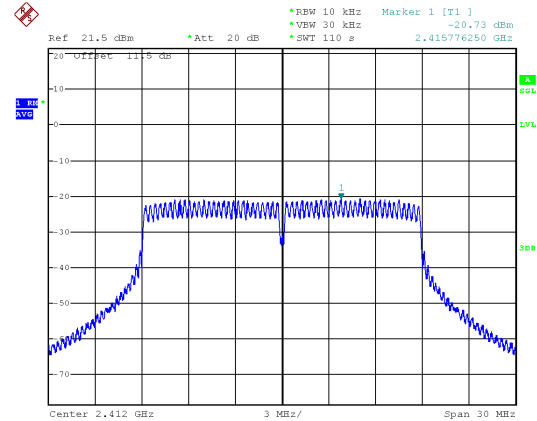
P to MP

ANT 1

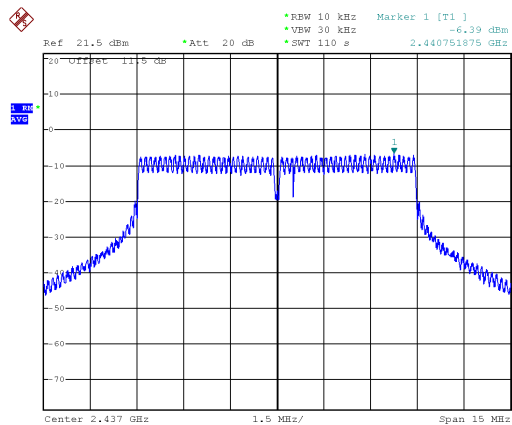
Modulation Type: 802.11ac VHT10
2412MHz



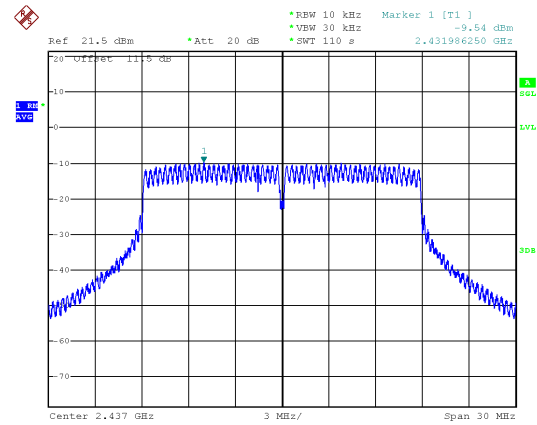
Modulation Type: 802.11ac VHT20
2412MHz



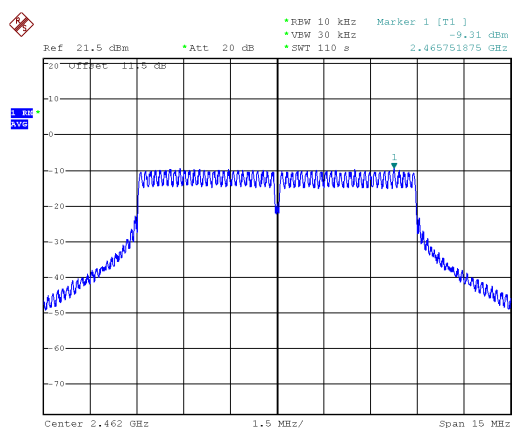
2437MHz



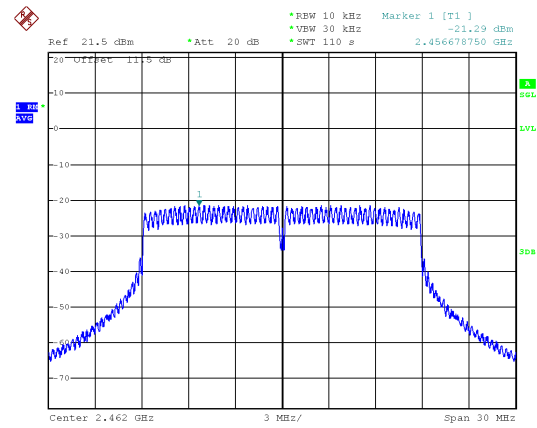
2437MHz



2462MHz



2462MHz



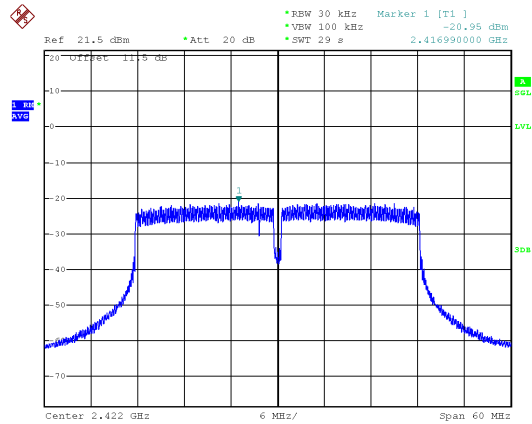


P to MP

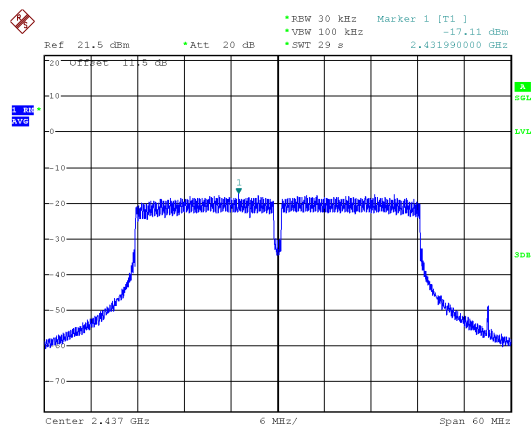
ANT 1

Modulation Type: 802.11ac VHT40

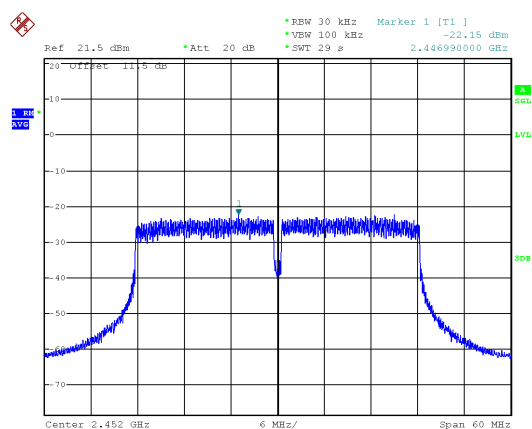
2422MHz



2437MHz



2452MHz





11. Radio Frequency Exposure

11.1 Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in FCC Part 2 (Section 2.1091)
KDB 447498

11.2 EUT Specification

Frequency band (Operating)	☒ WLAN: 2412MHz ~ 2462MHz ☐ WLAN: 5150MHz ~ 5250MHz ☐ WLAN: 5250MHz ~ 5350MHz ☐ WLAN: 5470MHz ~ 5725MHz ☒ WLAN: 5725MHz ~ 5850MHz ☐ Bluetooth: 2402MHz ~ 2480MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure ($S = 5\text{mW}/\text{cm}^2$) ☒ General Population/Uncontrolled exposure ($S=1\text{mW}/\text{cm}^2$)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A
Remark: 1. The maximum output power is <u>27.53dBm (565.74mW)</u> at <u>2437MHz</u> (with <u>numeric 13 antenna gain.</u>) 2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance. 3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is $1.0\text{ mW}/\text{cm}^2$ even if the calculation indicates that the power density would be larger.	



11.3 Test Results

No non-compliance noted.

11.4 Calculation

$$\text{Given } E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$P \text{ (mW)} = P \text{ (W)} / 1000$ and

$d \text{ (cm)} = d \text{ (m)} / 100$

Yields

$$S = \frac{30 \times (P / 1000) \times G}{3770 \times (d / 100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²



11.5 Maximum Permissible Exposure

P to P

Modulation Type	Frequency band (MHz)	Max. Conducted output power(dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
11n HT10	2412-2462	27.45	13	41	0.5252	1
11n HT20	2412-2462	24.57	13	41	0.2706	1
11n HT40	2422-2452	13.19	13	41	0.0197	1
11ac VHT10	2412-2462	27.53	13	41	0.5344	1
11ac VHT20	2412-2462	24.63	13	41	0.2744	1
11ac VHT40	2422-2452	13.26	13	41	0.0200	1

P to MP

Modulation Type	Frequency band (MHz)	Max. Conducted output power(dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
11n HT10	2412-2462	22.79	13	41	0.1796	1
11n HT20	2412-2462	22.65	13	41	0.1737	1
11n HT40	2422-2452	13.19	13	41	0.0197	1
11ac VHT10	2412-2462	22.87	13	41	0.1827	1
11ac VHT20	2412-2462	22.70	13	41	0.1759	1
11ac VHT40	2422-2452	13.26	13	41	0.0200	1