



FCC RADIO TEST REPORT

Applicant : COMTREND CORPORATION

Address : 3F-1, No. 10, Lane 609, Chung Hsin Road, Section 5,
San Chung Dist., New Taipei City, Taiwan

Equipment : Home Gateway

Model No. : VR-3063

Series : VR-3063u
Model No.

Trade Name : COMTREND

FCC ID : L9VVR3063U

I HEREBY CERTIFY THAT :

The sample was received on Apr. 13, 2018 and the testing was carried out on Aug. 22, 2018 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 under Test.....	6
2.2 The Difference of Model No.	6
2.3 Carrier Frequency of Channels.....	7
2.4 Test Mode and Test Software.....	8
2.5 Description of Test System.....	8
2.6 General Information of Test.....	9
2.7 Measurement Uncertainty	9
3. Test Equipment and Ancillaries Used for Tests	10
4. Antenna Requirements.....	11
4.1 Standard Applicable	11
4.2 Antenna Construction and Directional Gain.....	11
5. Test of AC Power Line Conducted Emission	12
5.1 Test Limit	12
5.2 Test Procedures	12
5.3 Typical Test Setup	13
5.4 Test Result and Data.....	14
5.5 Test Photographs	16
6. Test of Radiated Spurious Emission.....	17
6.1 Test Limit	17
6.2 Test Procedures	17
6.3 Typical Test Setup	18
6.4 Test Result and Data (9KHz ~ 30MHz)	19
6.5 Test Result and Data (30MHz ~ 1GHz).....	19
6.6 Test Result and Data (1GHz ~ 25GHz).....	21
6.7 Restricted Bands of Operation	45
6.8 Test Photographs (30MHz ~ 1GHz)	46
6.9 Test Photographs (1GHz ~ 25GHz)	47
7. Test of Conducted Spurious Emission	48
7.1 Test Limit	48
7.2 Test Procedure	48
7.3 Test Setup Layout	48
7.4 Test Result and Data.....	48
8. 6dB Bandwidth & 99% Bandwidth Measurement Data.....	69
8.1 Test Limit	69
8.2 Test Procedures	69
8.3 Test Setup Layout	69
8.4 Test Result and Data (6dB Bandwidth)	69
8.5 Test Result and Data (99% Bandwidth)	70
9. Maximum Peak and Average Output Power.....	83



9.1	Test Limit	83
9.2	Test Procedures	83
9.3	Test Setup Layout	83
9.4	Test Result and Data	84
10.	Power Spectral Density	85
10.1	Test Limit	85
10.2	Test Procedures	85
10.3	Test Setup Layout	85
10.4	Test Result and Data	85
11.	Radio Frequency Exposure	92
11.1	Applicable Standards	92
11.2	EUT Specification	92
11.3	Test Results	93
11.4	Calculation	93
11.5	Maximum Permissible Exposure	94

History of this test report

[illegible]



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

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 under Test

Frequency Range	802.11b/g/n: 2412MHz-2462MHz 802.11a/n/ac: 5150MHz-5250MHz, 5725MHz-5850MHz
Modulation Technology	2.4GHz: 802.11b: DSSS 802.11g: OFDM 802.11n: OFDM
	5GHz: 802.11a: OFDM 802.11n: OFDM 802.11ac: OFDM
Modulation Type	2.4GHz: 802.11b: CCK, DQPSK, DBPSK 802.11g: 64QAM, 16QAM, QPSK, BPSK 802.11n: 64QAM, 16QAM, QPSK, BPSK
	5GHz: 802.11a: 64QAM, 16QAM, QPSK, BPSK 802.11n: 64QAM, 16QAM, QPSK, BPSK 802.11ac: 256QAM, 64QAM, 16QAM, QPSK, BPSK
Data Rate	2.4GHz: 802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS31, HT20/40
	5GHz: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS31, HT20/40 802.11ac: MCS0 – MCS9, 802.11n HT20/40/80
Antenna Type	Dipole Antenna
Antenna Gain	2.4GHz: ANT A: 4.2 dBi ; ANT B: 4.5 dBi ; ANT C: 3.3 dBi
	5GHz: 5150MHz-5250MHz: ANT A: 3.5 dBi ; ANT B: 3.8 dBi ; ANT C: 3.5 dBi ; ANT D: 5.7 dBi 5725MHz-5850MHz: ANT A: 3.5 dBi ; ANT B: 3.8 dBi ; ANT C: 3.5 dBi ; ANT D: 5.7 dBi

2.2 The Difference of Model No.

The differences between all model numbers as below:

Model No.	Remark
VR-3063	The differences between these two model numbers are for marketing purpose, the circuit design and layout are the same.
VR-3063u	



2.3 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n HT20 (2412MHz~2462MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
*01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	*11	2462
*06	2437	---	---

802.11n HT40 (2422MHz~2452MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
*03	2422	*09	2452
04	2427	---	---
05	2432	---	---
*06	2437	---	---

Note: Channels remarked * are selected to perform test.



2.4 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 remote workstation and EUT for RF test. The remote workstation included Notebook.
- c. An executive program, "ATE Command" under WIN 8 was executed to transmit and receive data via WLAN.
- d. The following test modes were performed for the test:

Conducted Emissions from the AC mains power ports	
Test Mode	Operating Description
1	802.11b (1Mbps)
2	802.11g (6Mbps)
3	802.11n HT20 (6.5Mbps)
4	802.11n HT40 (13.5Mbps)
caused "Test Mode 2" generated the worst case, it was reported as the final data.	
Radiation Emissions (30MHz ~ 1GHz)	
Test Mode	Operating Description
1	802.11b (1Mbps)
2	802.11g (6Mbps)
3	802.11n HT20 (6.5Mbps)
4	802.11n HT40 (13.5Mbps)
caused "Test Mode 2" generated the worst case, it was reported as the final data.	
Radiation Emissions (1GHz ~ 25GHz)	
Test Mode	Operating Description
1	802.11b (1Mbps)
2	802.11g (6Mbps)
3	802.11n HT20 (6.5Mbps)
4	802.11n HT40 (13.5Mbps)
caused "Test Mode 1~4" generated the worst case, they were reported as the final data.	

2.5 Description of Test System

Device	Manufacturer	Model No.	Description
Remote workstation			
Notebook	ASUS	P2430U	Power Cable, Unshielding, 1.8m



2.6 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, TW1439
	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-10812, G-10813 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.	

2.7 Measurement Uncertainty

Measurement Item	Uncertainty
Radiated Spurious Emission(9KHz~30MHz)	±5.007dB
Radiated Spurious Emission(30MHz~1GHz)	±5.157dB
Radiated Spurious Emission(1GHz~18GHz)	±6.383dB
Radiated Spurious Emission(18GHz~40GHz)	±6.648dB
Conducted Spurious Emission	±1.253dB
6dB Bandwidth	±6.89%
Power Spectral Density	±0.630dB
26 dB Occupied Bandwidth	±6.10%
Frequency Stability	±375KHz
Channel Frequencies Separation	±6.10%
20dB Bandwidth	±6.12%
Dwell Time	±1.34%
Peak Output Power(Conducted Power Meter)	±0.86dB
Temperature	±1.2℃
Humidity	±2.7%
Channel Move Time	±4.53%
Channel Closing Transmission Time	±6.61%
Threshold	±0.631dB
Non occupancy period	±1.17%



3. Test Equipment and Ancillaries Used for Tests

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Receiver	R&S	ESCI3	100821	2017/09/08	2018/09/07
LISN	Schwarzbeck	NSLK 8127	8127-568	2018/02/26	2019/02/25
Pulse Limiter	R&S	ESH3-Z2	101934	2018/02/22	2019/02/21
Bilog Antenna	Schwarzbeck	VULB9168	275	2017/08/31	2018/08/30
Horn Antenna	EMCO	3115	31601	2017/09/11	2018/09/10
Horn Antenna	EMCO	3116	31970	2018/03/23	2019/03/22
Preamplifier	EM	EM330	60658	2017/09/08	2018/09/07
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2017/09/20	2018/09/19
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2017/11/10	2018/11/09
MXG MW Analog Signal Generator	KEYSIGHT	N5183A	MY50142931	2018/04/10	2019/04/09
Spectrum Analyzer	R&S	FSP40	100219	2018/07/03	2019/07/02
BLUETOOTH TESTER	R&S	CBT	101133	2018/04/02	2019/04/01
Attenuator	KEYSIGHT	8491B	MY39250705	2017/09/04	2018/09/03
Rotary Attenuator	Agilent	8495B	MY42146680	2018/03/29	2019/03/28
Temp & Humi chamber	T-MACHINE	TMJ-9712	T-12-040111	2017/09/04	2018/09/03
Series Power Meter	Anritsu	ML2495A	1224005	2018/03/23	2019/03/22
Power Sensor	Anritsu	MA2411B	1207295	2018/03/23	2019/03/22
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	V3.0.0.0	N/A	N/A
Software	Keysight	Inservice MonitorUtility	N/A	N/A	N/A



4. Antenna Requirements

4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2 Antenna Construction and Directional Gain

Antenna Type	Dipole Antenna
Antenna Gain	2.4GHz: ANT A: 4.2 dBi ; ANT B: 4.5 dBi ; ANT C: 3.3 dBi
	5GHz: 5150MHz-5250MHz: ANT A: 3.5 dBi ; ANT B: 3.8 dBi ; ANT C: 3.5 dBi ; ANT D: 5.7 dBi
	5725MHz-5850MHz: ANT A: 3.5 dBi ; ANT B: 3.8 dBi ; ANT C: 3.5 dBi ; ANT D: 5.7 dBi

2412MHz-2462MHz, 802.11b
For Power directional gain= $G_{ant} = 4.20$ dBi For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 4.20 dBi
2412MHz-2462MHz, 802.11g, 802.11n HT20, HT40
For Power directional gain= $G_{ant} = 4.50$ dBi For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 8.79 dBi
5150MHz-5250MHz
For Power directional gain= $G_{ant} = 5.70$ dBi For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 10.20 dBi
5725MHz-5850MHz
For Power directional gain= $G_{ant} = 5.70$ dBi For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 10.20 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

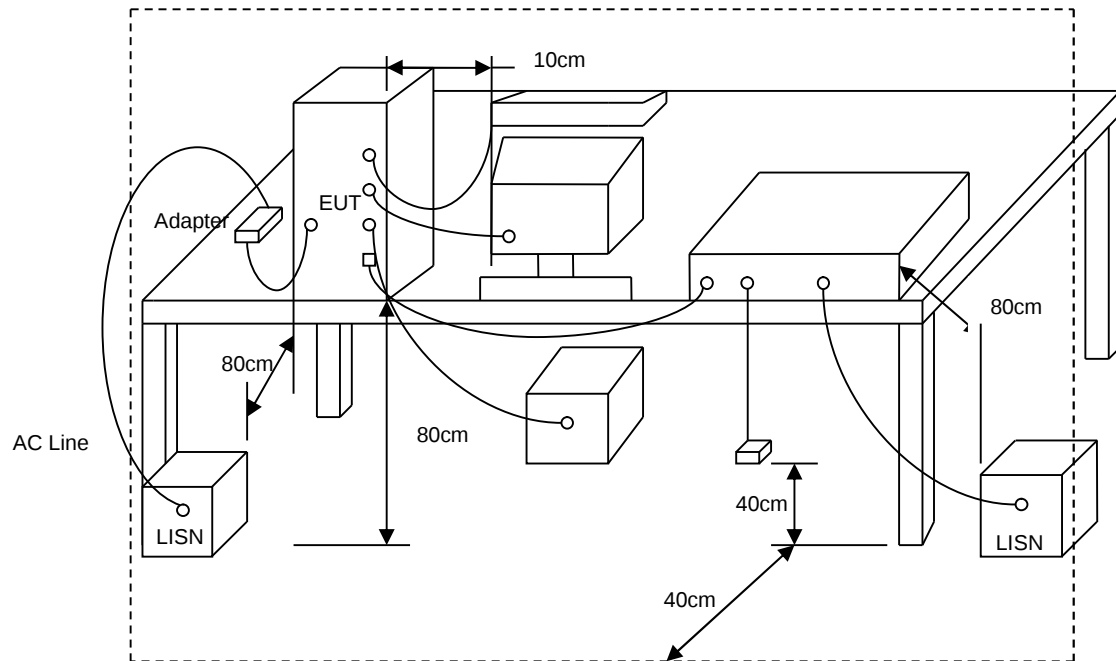
*Decreases with the logarithm of the frequency.

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.



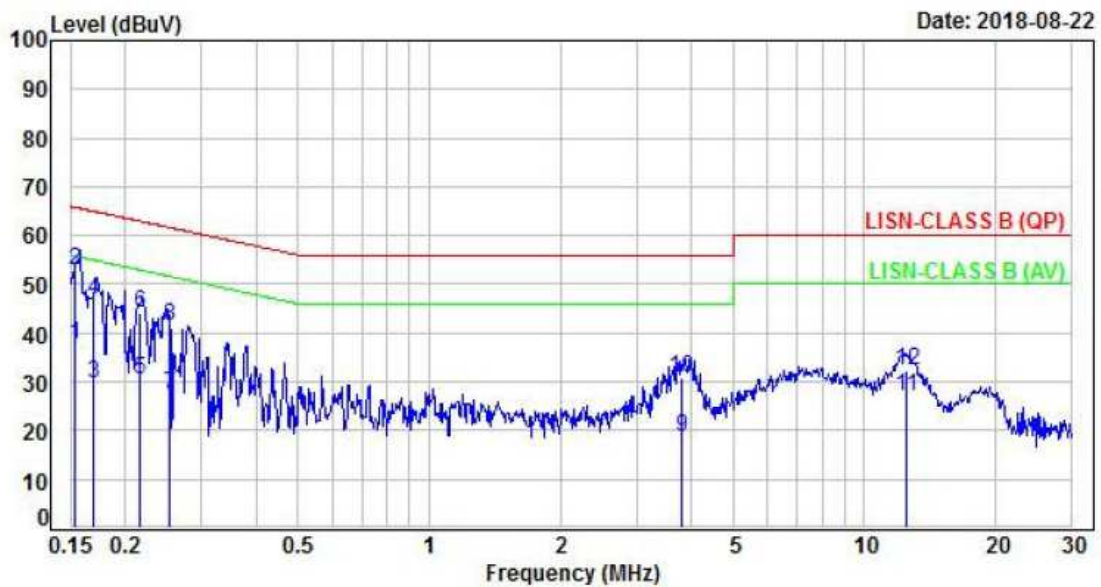
5.3 Typical Test Setup





5.4 Test Result and Data

Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: Mode 2	Temperature	: 22 °C
Test Date	: Aug. 22, 2018	Humidity	: 43 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.15	9.70	27.84	37.54	55.79	-18.25	Average	P
2	0.15	9.70	43.05	52.75	65.79	-13.04	QP	P
3	0.17	9.70	19.89	29.59	54.99	-25.40	Average	P
4	0.17	9.70	36.92	46.62	64.99	-18.37	QP	P
5	0.22	9.69	20.69	30.38	52.96	-22.58	Average	P
6	0.22	9.69	34.34	44.03	62.96	-18.93	QP	P
7	0.25	9.69	17.81	27.50	51.67	-24.17	Average	P
8	0.25	9.69	31.79	41.48	61.67	-20.19	QP	P
9	3.79	9.83	8.82	18.65	46.00	-27.35	Average	P
10	3.79	9.83	20.87	30.70	56.00	-25.30	QP	P
11	12.49	9.96	16.95	26.91	50.00	-23.09	Average	P
12	12.49	9.96	22.47	32.43	60.00	-27.57	QP	P

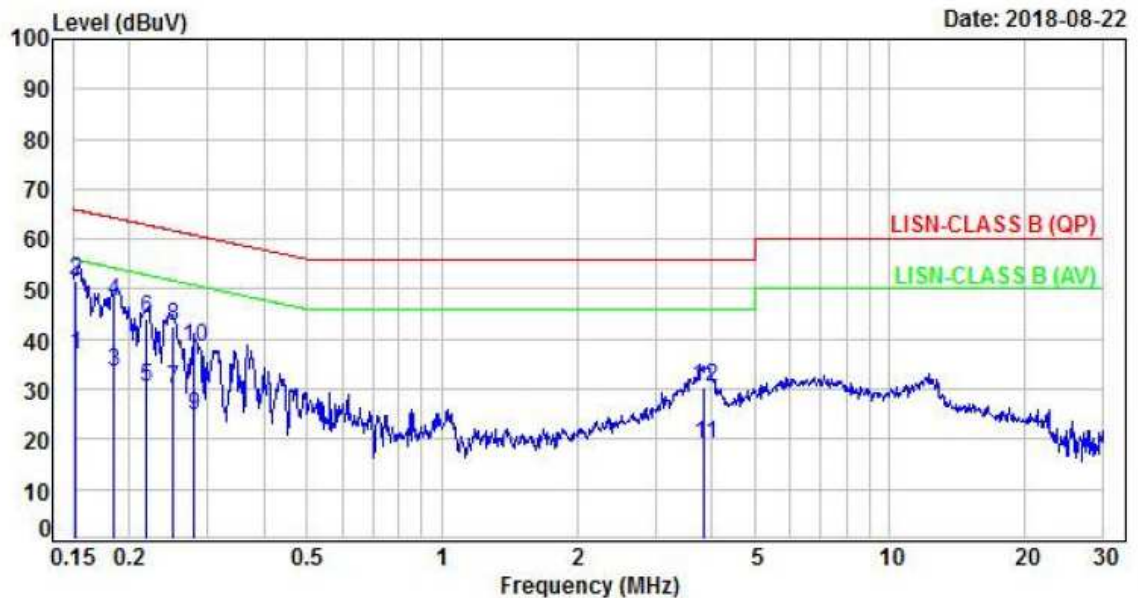
Note: Level = Reading + Factor

Margin = Level – Limit

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



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode	: Mode 2	Temperature	: 22 °C
Test Date	: Aug. 22, 2018	Humidity	: 43 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.15	9.70	27.36	37.06	55.89	-18.83	Average	P
2	0.15	9.70	41.97	51.67	65.89	-14.22	QP	P
3	0.19	9.70	23.73	33.43	54.25	-20.82	Average	P
4	0.19	9.70	37.75	47.45	64.25	-16.80	QP	P
5	0.22	9.70	20.55	30.25	52.91	-22.66	Average	P
6	0.22	9.70	34.41	44.11	62.91	-18.80	QP	P
7	0.25	9.70	20.40	30.10	51.76	-21.66	Average	P
8	0.25	9.70	33.07	42.77	61.76	-18.99	QP	P
9	0.28	9.70	14.88	24.58	50.82	-26.24	Average	P
10	0.28	9.70	28.79	38.49	60.82	-22.33	QP	P
11	3.85	9.85	9.29	19.14	46.00	-26.86	Average	P
12	3.85	9.85	20.53	30.38	56.00	-25.62	QP	P

Note: Level = Reading + Factor

Margin = Level – Limit

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



5.5 Test Photographs

Front View



Rear View





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

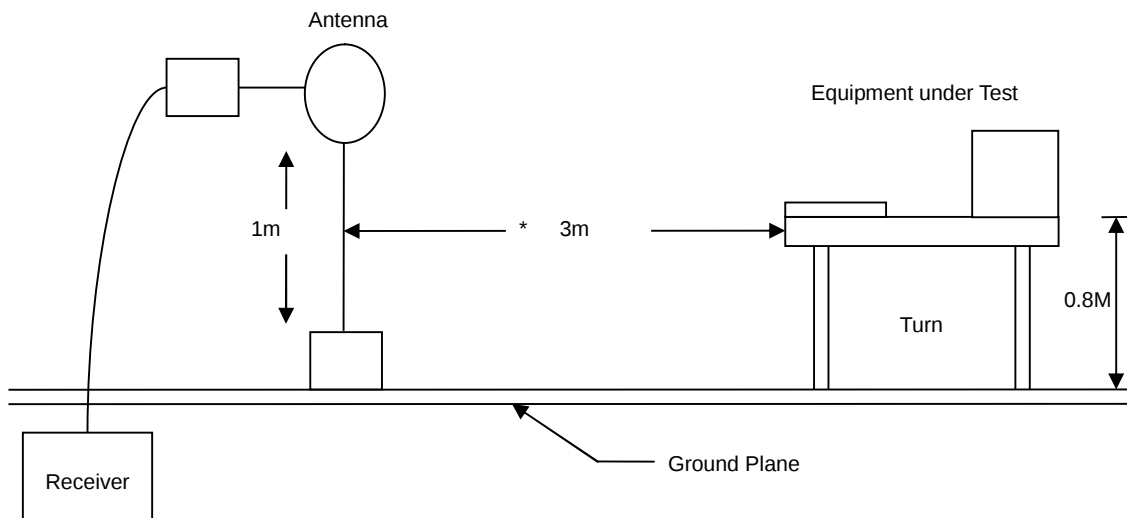
6.2 Test Procedures

- 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.

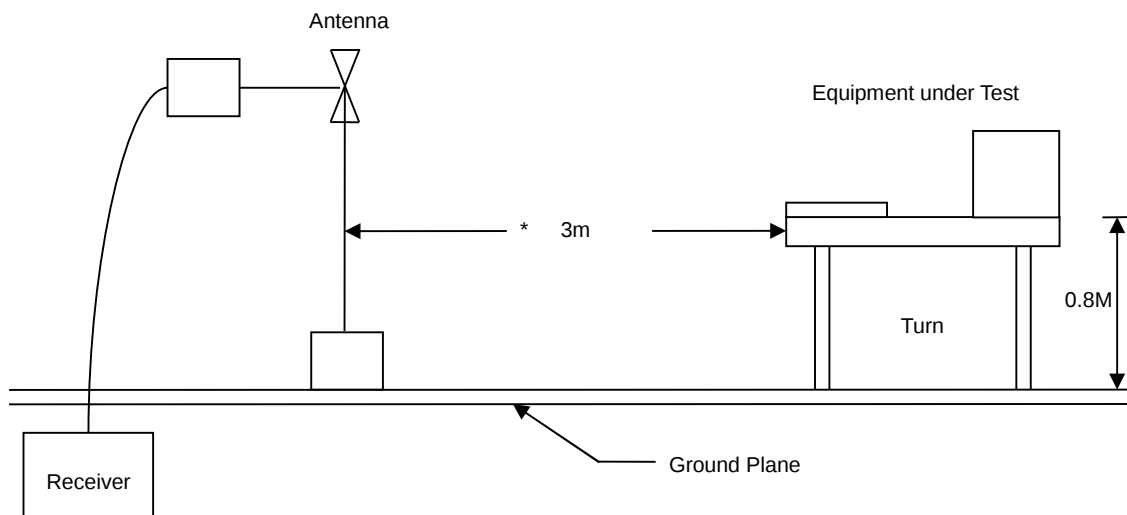


6.3 Typical Test Setup

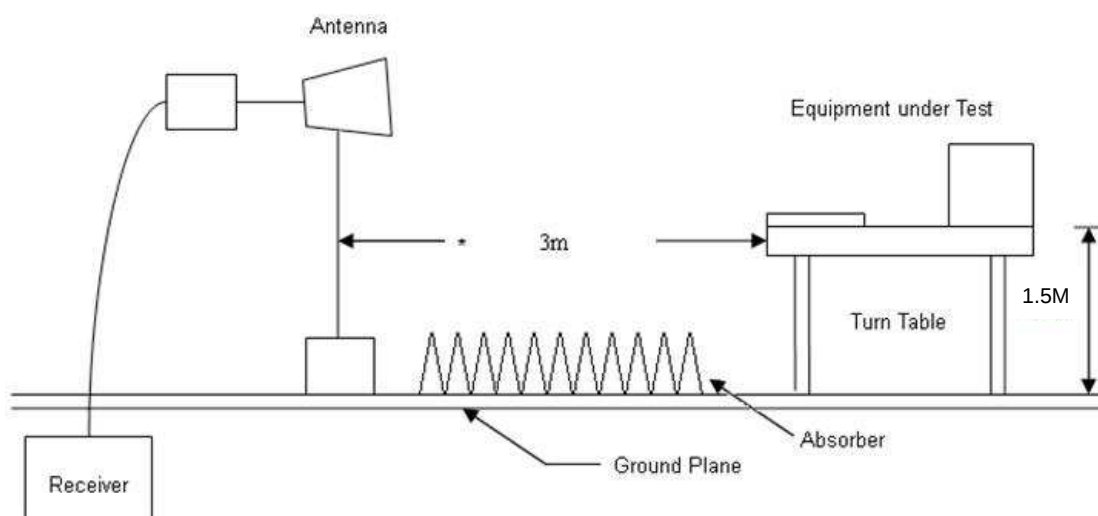
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



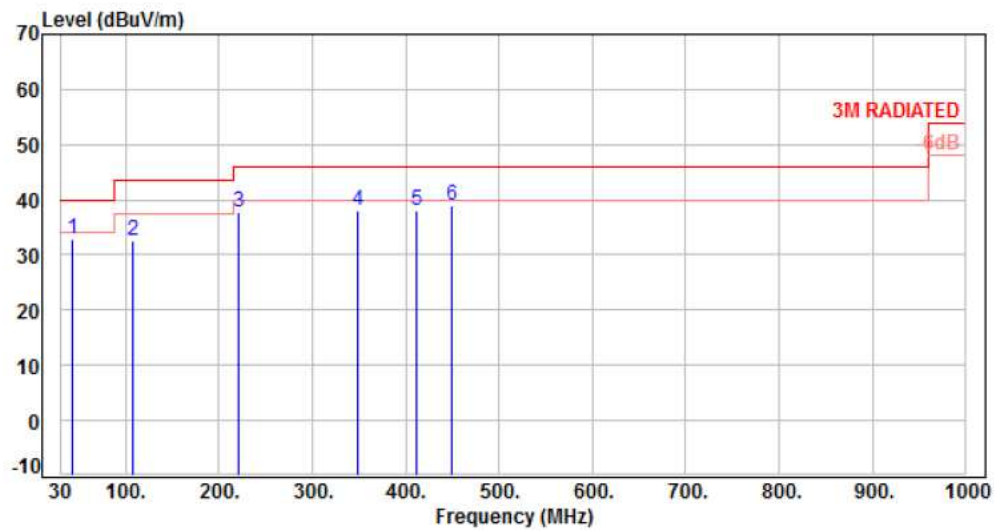


6.4 Test Result and Data (9KHz ~ 30MHz)

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 1	Temperature	: 21 °C
Test Date	: Jul. 17, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	43.58	-10.86	43.80	32.94	40.00	-7.06	QP	100	233	P
2	108.57	-14.45	47.02	32.57	43.50	-10.93	Peak	400	0	P
3	221.09	-12.88	50.65	37.77	46.00	-8.23	Peak	400	0	P
4	349.13	-8.60	46.69	38.09	46.00	-7.91	Peak	400	0	P
5	412.18	-6.78	44.84	38.06	46.00	-7.94	Peak	400	0	P
6	449.04	-5.84	44.90	39.06	46.00	-6.94	Peak	400	0	P

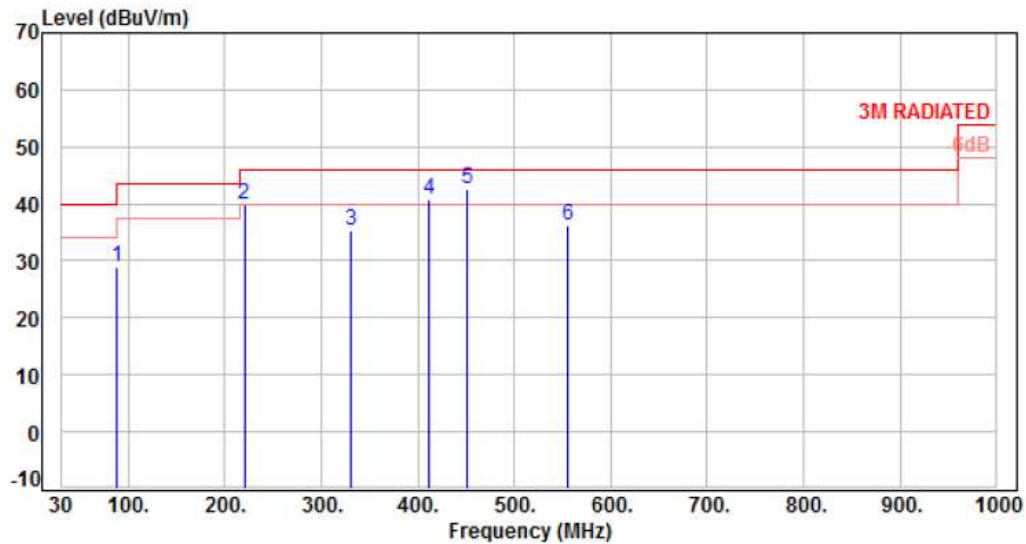
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1	Temperature	: 21 °C
Test Date	: Jul. 17, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	87.23	-16.29	45.30	29.01	40.00	-10.99	Peak	100	0	P
2	220.12	-12.88	52.87	39.99	46.00	-6.01	Peak	100	0	P
3	330.70	-9.06	44.36	35.30	46.00	-10.70	Peak	100	0	P
4	412.18	-6.78	47.51	40.73	46.00	-5.27	Peak	100	0	P
5	451.95	-5.79	48.56	42.77	46.00	-3.23	Peak	100	0	P
6	555.74	-3.93	40.14	36.21	46.00	-9.79	Peak	100	0	P

Note: Level=Reading+Factor

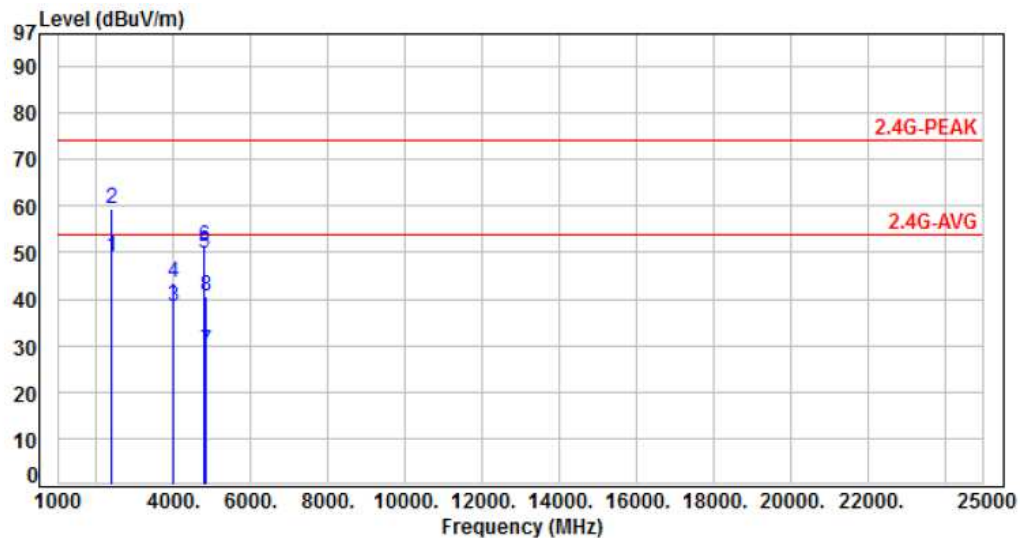
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



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

Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH01	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	64.86	48.90	54.00	-5.10	Average	127	197	P
2	2390.00	-15.96	75.21	59.25	74.00	-14.75	Peak	127	197	P
3	3996.00	-10.19	48.40	38.21	54.00	-15.79	Average	100	304	P
4	3996.00	-10.19	53.60	43.41	74.00	-30.59	Peak	100	304	P
5	4800.00	-8.88	58.50	49.62	54.00	-4.38	Average	100	74	P
6	4800.00	-8.88	60.00	51.12	74.00	-22.88	Peak	100	74	P
7	4824.00	-8.80	37.69	28.89	54.00	-25.11	Average	100	280	P
8	4824.00	-8.80	49.29	40.49	74.00	-33.51	Peak	100	280	P

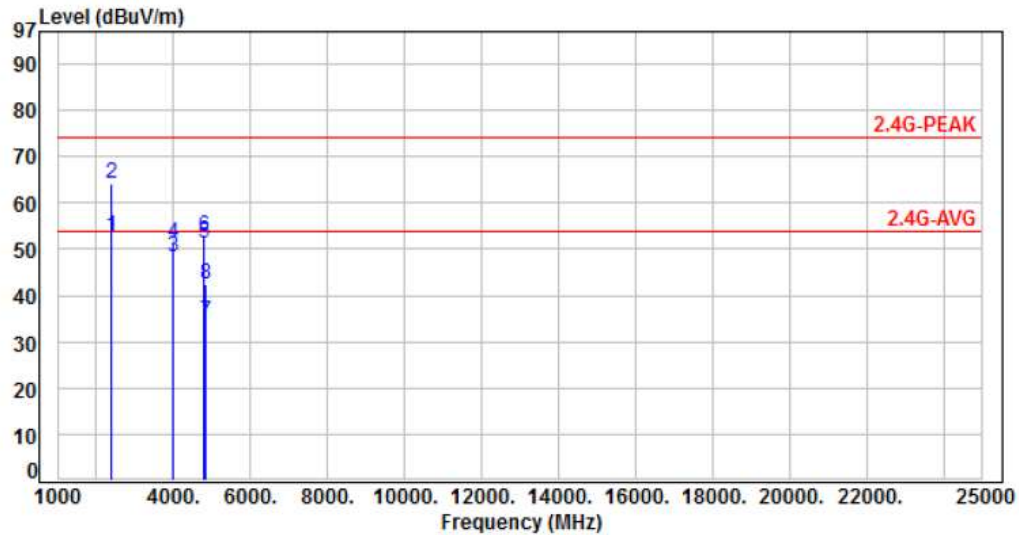
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH01	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	68.71	52.75	54.00	-1.25	Average	198	75	P
2	2390.00	-15.96	80.21	64.25	74.00	-9.75	Peak	198	75	P
3	3996.00	-10.19	58.50	48.31	54.00	-5.69	Average	169	34	P
4	3996.00	-10.19	61.60	51.41	74.00	-22.59	Peak	169	34	P
5	4800.00	-8.88	60.10	51.22	54.00	-2.78	Average	100	111	P
6	4800.00	-8.88	61.80	52.92	74.00	-21.08	Peak	100	111	P
7	4824.00	-8.80	43.21	34.41	54.00	-19.59	Average	100	83	P
8	4824.00	-8.80	51.19	42.39	74.00	-31.61	Peak	100	83	P

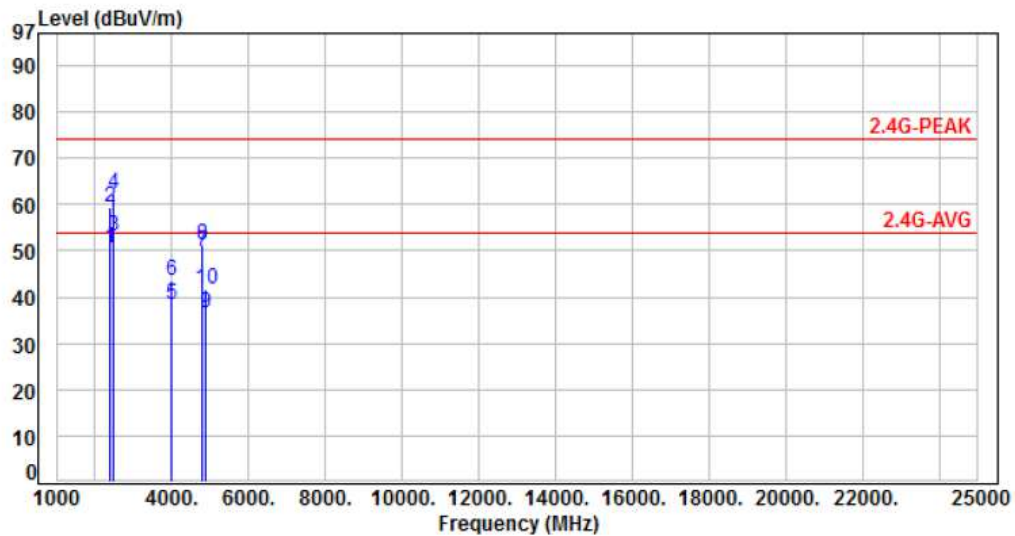
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH06	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	66.61	50.65	54.00	-3.35	Average	400	75	P
2	2390.00	-15.96	75.51	59.55	74.00	-14.45	Peak	400	75	P
3	2487.25	-15.65	68.61	52.96	54.00	-1.04	Average	353	357	P
4	2487.25	-15.65	77.81	62.16	74.00	-11.84	Peak	353	357	P
5	3996.00	-10.19	48.52	38.33	54.00	-15.67	Average	100	332	P
6	3996.00	-10.19	53.65	43.46	74.00	-30.54	Peak	100	332	P
7	4800.00	-8.88	58.60	49.72	54.00	-4.28	Average	105	88	P
8	4800.00	-8.88	60.20	51.32	74.00	-22.68	Peak	105	88	P
9	4874.00	-8.65	45.20	36.55	54.00	-17.45	Average	100	122	P
10	4874.00	-8.65	50.50	41.85	74.00	-32.15	Peak	100	122	P

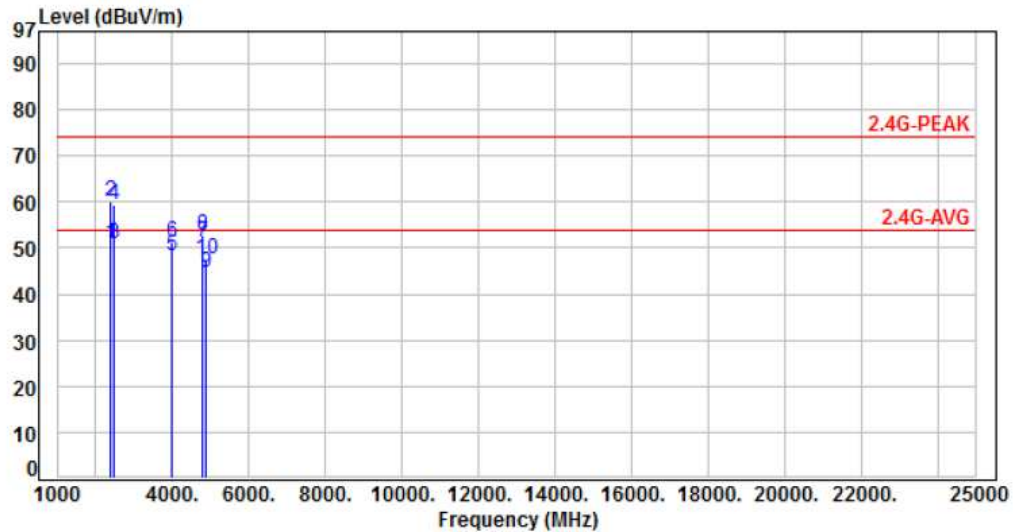
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH06	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	66.91	50.95	54.00	-3.05	Average	219	23	P
2	2390.00	-15.96	76.11	60.15	74.00	-13.85	Peak	219	23	P
3	2487.25	-15.65	66.51	50.86	54.00	-3.14	Average	340	120	P
4	2487.25	-15.65	75.21	59.56	74.00	-14.44	Peak	340	120	P
5	3996.00	-10.19	58.63	48.44	54.00	-5.56	Average	162	55	P
6	3996.00	-10.19	61.55	51.36	74.00	-22.64	Peak	162	55	P
7	4800.00	-8.88	60.25	51.37	54.00	-2.63	Average	100	123	P
8	4800.00	-8.88	61.52	52.64	74.00	-21.36	Peak	100	123	P
9	4874.00	-8.65	53.30	44.65	54.00	-9.35	Average	154	98	P
10	4874.00	-8.65	56.20	47.55	74.00	-26.45	Peak	154	98	P

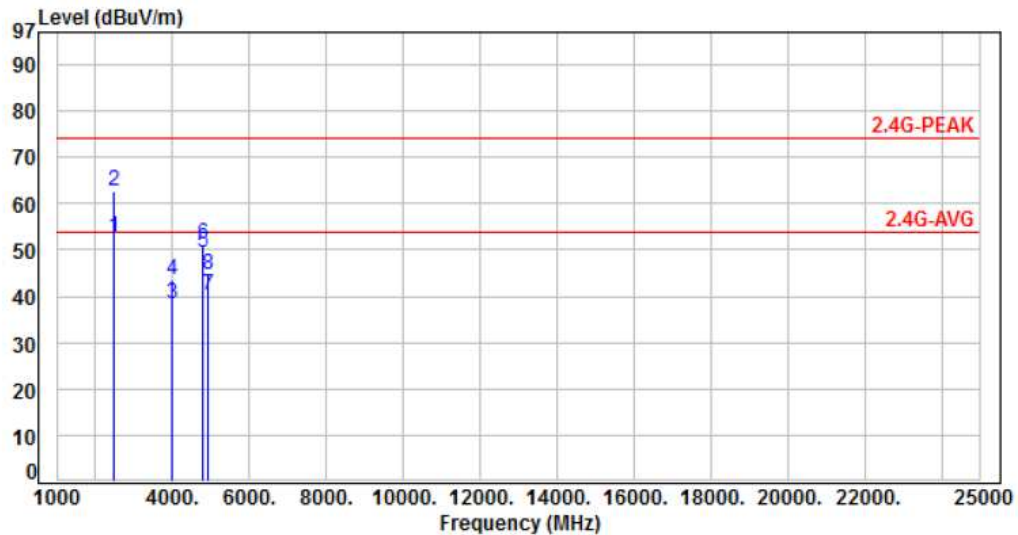
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH11	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2484.50	-15.65	68.50	52.85	54.00	-1.15	Average	360	0	P
2	2484.50	-15.65	78.40	62.75	74.00	-11.25	Peak	360	0	P
3	3996.00	-10.19	48.52	38.33	54.00	-15.67	Average	100	300	P
4	3996.00	-10.19	53.67	43.48	74.00	-30.52	Peak	100	300	P
5	4800.00	-8.88	58.43	49.55	54.00	-4.45	Average	108	55	P
6	4800.00	-8.88	60.10	51.22	74.00	-22.78	Peak	108	55	P
7	4924.00	-8.49	48.59	40.10	54.00	-13.90	Average	100	120	P
8	4924.00	-8.49	53.19	44.70	74.00	-29.30	Peak	100	120	P

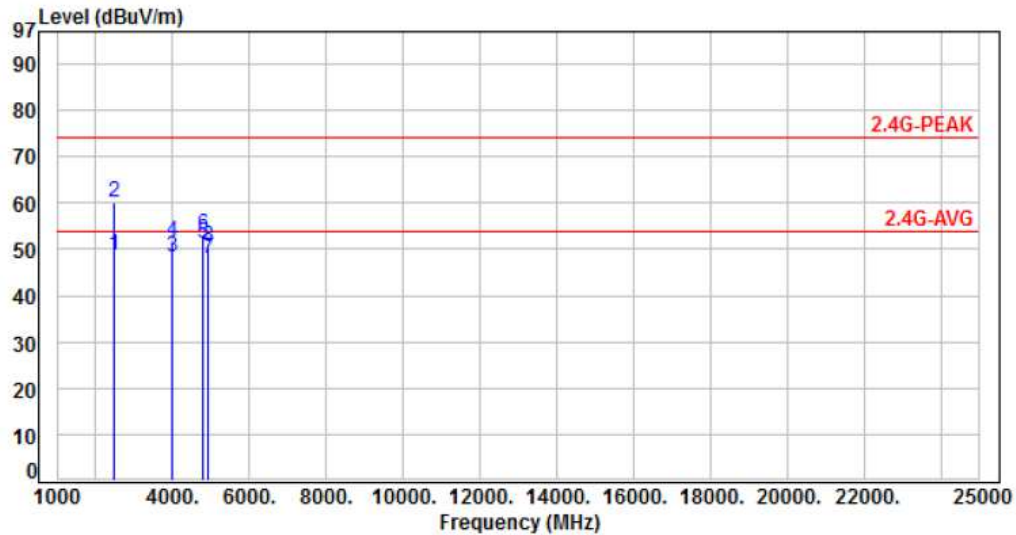
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH11	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2484.50	-15.65	64.50	48.85	54.00	-5.15	Average	182	42	P
2	2484.50	-15.65	75.80	60.15	74.00	-13.85	Peak	182	42	P
3	3996.00	-10.19	58.45	48.26	54.00	-5.74	Average	172	46	P
4	3996.00	-10.19	61.77	51.58	74.00	-22.42	Peak	172	46	P
5	4800.00	-8.88	60.22	51.34	54.00	-2.66	Average	112	90	P
6	4800.00	-8.88	61.85	52.97	74.00	-21.03	Peak	112	90	P
7	4924.00	-8.49	56.49	48.00	54.00	-6.00	Average	100	76	P
8	4924.00	-8.49	58.89	50.40	74.00	-23.60	Peak	100	76	P

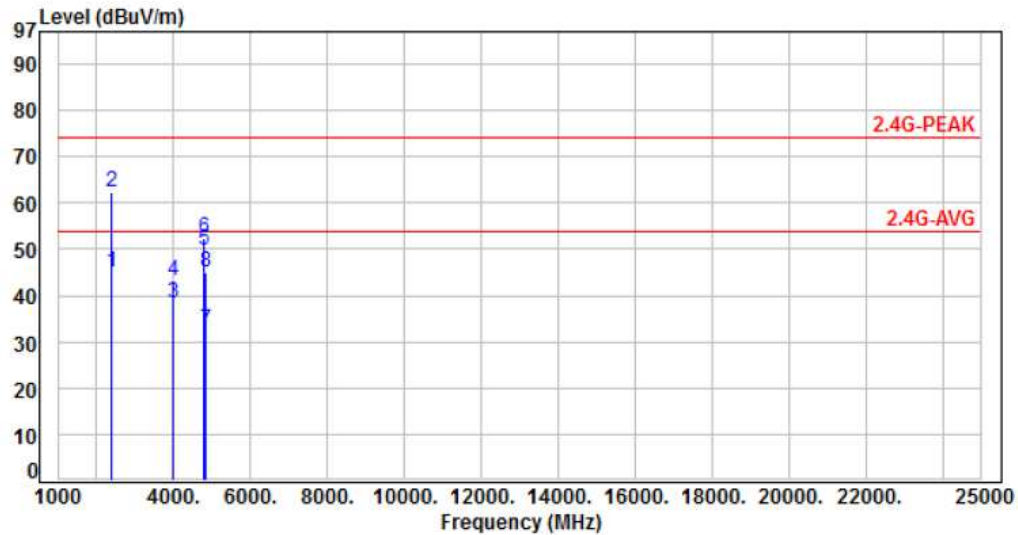
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH01	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	61.01	45.05	54.00	-8.95	Average	100	199	P
2	2390.00	-15.96	78.21	62.25	74.00	-11.75	Peak	100	199	P
3	3996.00	-10.19	48.59	38.40	54.00	-15.60	Average	100	322	P
4	3996.00	-10.19	53.49	43.30	74.00	-30.70	Peak	100	322	P
5	4800.00	-8.88	58.64	49.76	54.00	-4.24	Average	106	82	P
6	4800.00	-8.88	61.22	52.34	74.00	-21.66	Peak	106	82	P
7	4824.00	-8.80	41.19	32.39	54.00	-21.61	Average	100	98	P
8	4824.00	-8.80	53.79	44.99	74.00	-29.01	Peak	100	98	P

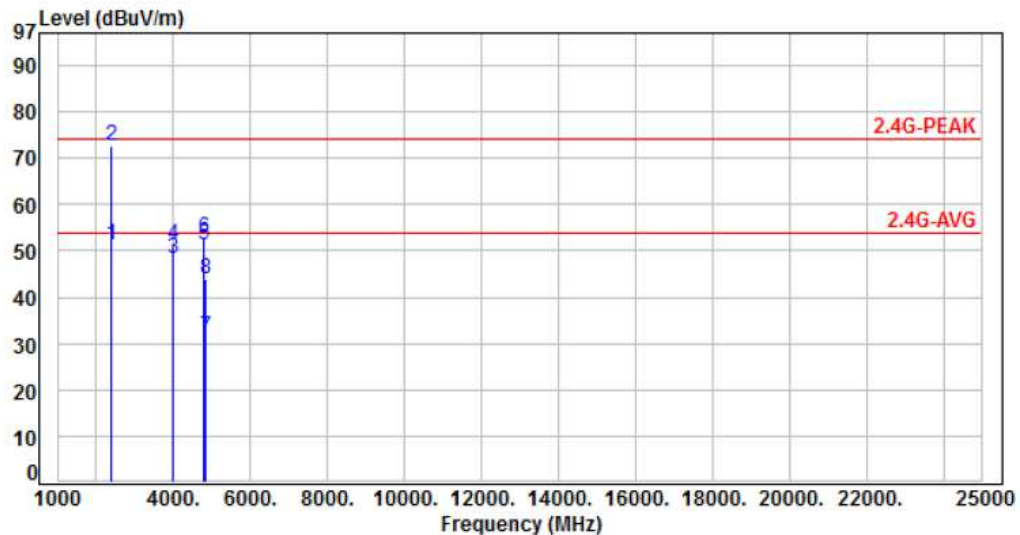
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH01	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	67.31	51.35	54.00	-2.65	Average	199	85	P
2	2390.00	-15.96	88.71	72.75	74.00	-1.25	Peak	199	85	P
3	3996.00	-10.19	58.49	48.30	54.00	-5.70	Average	172	48	P
4	3996.00	-10.19	61.33	51.14	74.00	-22.86	Peak	172	48	P
5	4800.00	-8.88	60.23	51.35	54.00	-2.65	Average	100	152	P
6	4800.00	-8.88	61.65	52.77	74.00	-21.23	Peak	100	152	P
7	4824.00	-8.80	40.19	31.39	54.00	-22.61	Average	195	351	P
8	4824.00	-8.80	52.59	43.79	74.00	-30.21	Peak	195	351	P

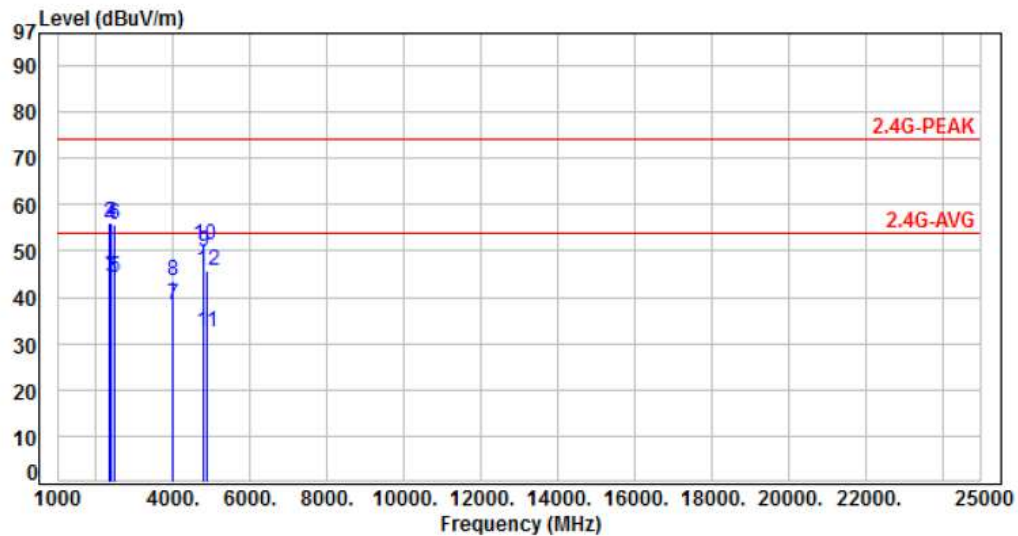
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH06	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2364.23	-16.03	60.89	44.86	54.00	-9.14	Average	332	94	P
2	2364.23	-16.03	72.19	56.16	74.00	-17.84	Peak	332	94	P
3	2390.00	-15.96	60.21	44.25	54.00	-9.75	Average	400	360	P
4	2390.00	-15.96	72.11	56.15	74.00	-17.85	Peak	400	360	P
5	2483.50	-15.65	59.80	44.15	54.00	-9.85	Average	400	360	P
6	2483.50	-15.65	71.30	55.65	74.00	-18.35	Peak	400	360	P
7	3996.00	-10.19	48.52	38.33	54.00	-15.67	Average	100	314	P
8	3996.00	-10.19	53.73	43.54	74.00	-30.46	Peak	100	314	P
9	4800.00	-8.88	58.66	49.78	54.00	-4.22	Average	105	87	P
10	4800.00	-8.88	60.23	51.35	74.00	-22.65	Peak	105	87	P
11	4874.00	-8.65	41.20	32.55	54.00	-21.45	Average	105	281	P
12	4874.00	-8.65	54.30	45.65	74.00	-28.35	Peak	105	281	P

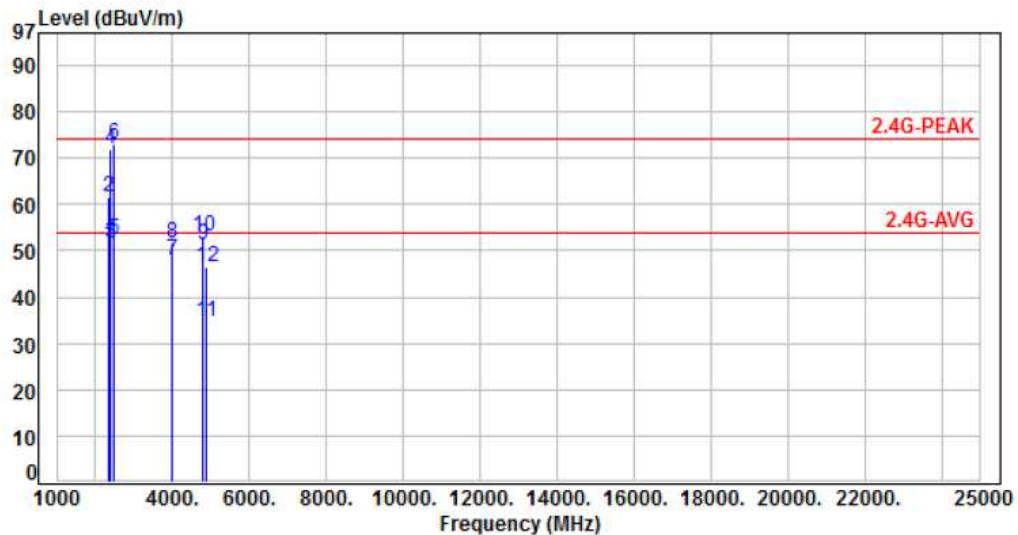
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH06	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2364.23	-16.03	67.39	51.36	54.00	-2.64	Average	250	65	P
2	2364.23	-16.03	77.79	61.76	74.00	-12.24	Peak	250	65	P
3	2390.00	-15.96	67.51	51.55	54.00	-2.45	Average	170	86	P
4	2390.00	-15.96	87.91	71.95	74.00	-2.05	Peak	170	86	P
5	2483.50	-15.65	68.20	52.55	54.00	-1.45	Average	170	86	P
6	2483.50	-15.65	88.60	72.95	74.00	-1.05	Peak	170	86	P
7	3996.00	-10.19	58.22	48.03	54.00	-5.97	Average	163	57	P
8	3996.00	-10.19	61.70	51.51	74.00	-22.49	Peak	163	57	P
9	4800.00	-8.88	60.20	51.32	54.00	-2.68	Average	100	122	P
10	4800.00	-8.88	61.90	53.02	74.00	-20.98	Peak	100	120	P
11	4874.00	-8.65	43.20	34.55	54.00	-19.45	Average	100	70	P
12	4874.00	-8.65	55.30	46.65	74.00	-27.35	Peak	100	70	P

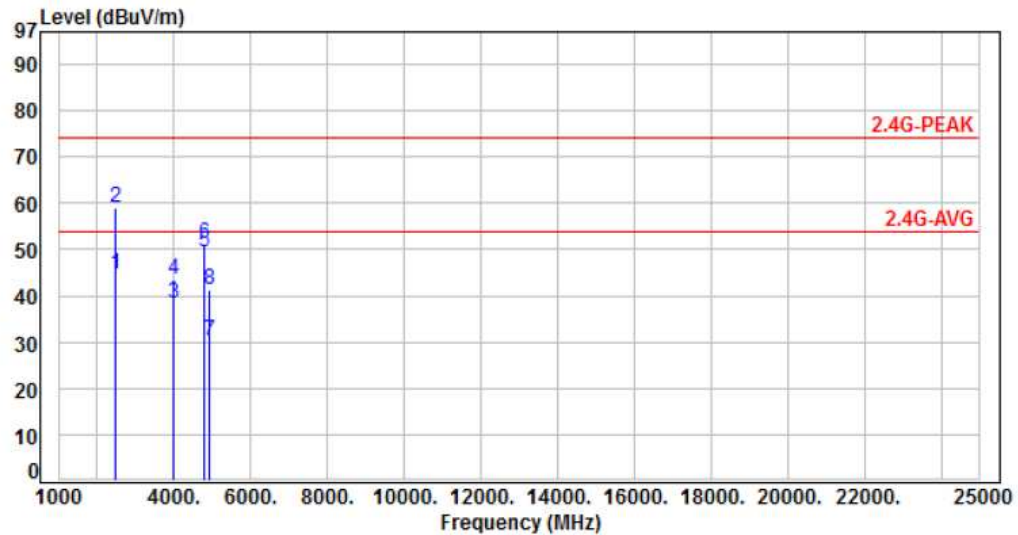
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH11	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.65	60.40	44.75	54.00	-9.25	Average	168	0	P
2	2483.50	-15.65	74.60	58.95	74.00	-15.05	Peak	168	0	P
3	3996.00	-10.19	48.41	38.22	54.00	-15.78	Average	100	293	P
4	3996.00	-10.19	53.54	43.35	74.00	-30.65	Peak	100	293	P
5	4800.00	-8.88	58.36	49.48	54.00	-4.52	Average	100	85	P
6	4800.00	-8.88	60.23	51.35	74.00	-22.65	Peak	100	85	P
7	4924.00	-8.49	38.79	30.30	54.00	-23.70	Average	140	281	P
8	4924.00	-8.49	49.89	41.40	74.00	-32.60	Peak	140	281	P

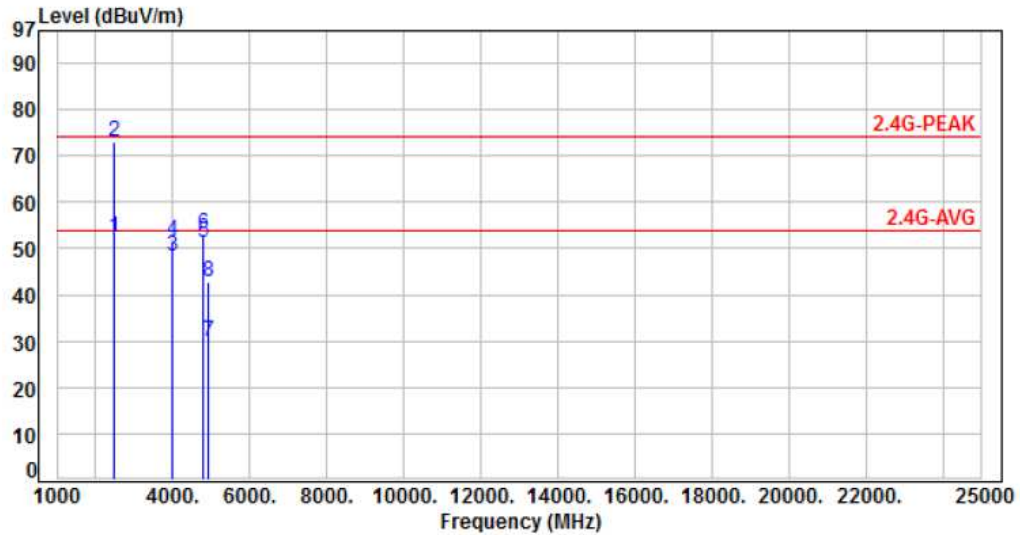
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH11	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.65	68.00	52.35	54.00	-1.65	Average	144	83	P
2	2483.50	-15.65	88.60	72.95	74.00	-1.05	Peak	144	83	P
3	3996.00	-10.19	58.53	48.34	54.00	-5.66	Average	158	54	P
4	3996.00	-10.19	61.73	51.54	74.00	-22.46	Peak	158	54	P
5	4800.00	-8.88	60.20	51.32	54.00	-2.68	Average	105	122	P
6	4800.00	-8.88	61.93	53.05	74.00	-20.95	Peak	105	122	P
7	4924.00	-8.49	38.49	30.00	54.00	-24.00	Average	150	77	P
8	4924.00	-8.49	51.19	42.70	74.00	-31.30	Peak	150	77	P

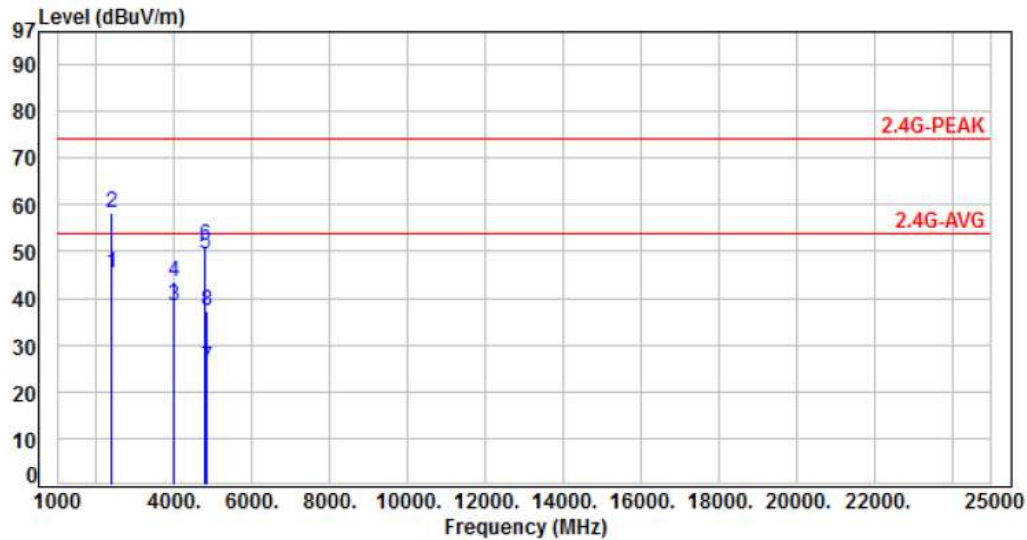
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH01	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	61.51	45.55	54.00	-8.45	Average	241	0	P
2	2390.00	-15.96	74.21	58.25	74.00	-15.75	Peak	241	0	P
3	3996.00	-10.19	48.52	38.33	54.00	-15.67	Average	100	311	P
4	3996.00	-10.19	53.73	43.54	74.00	-30.46	Peak	100	311	P
5	4800.00	-8.88	58.43	49.55	54.00	-4.45	Average	100	52	P
6	4800.00	-8.88	60.20	51.32	74.00	-22.68	Peak	100	52	P
7	4824.00	-8.80	33.89	25.09	54.00	-28.91	Average	104	182	P
8	4824.00	-8.80	46.19	37.39	74.00	-36.61	Peak	104	182	P

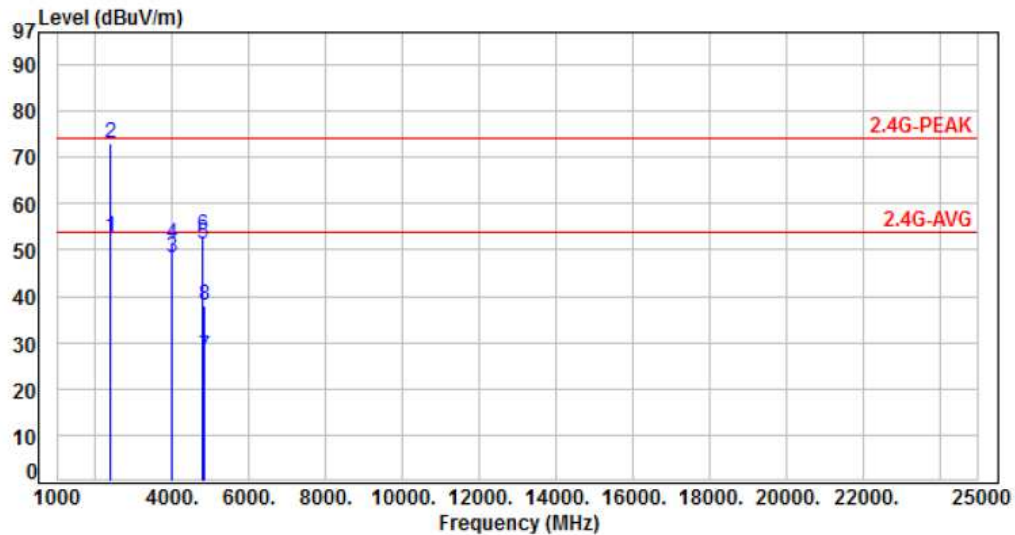
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH01	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	68.61	52.65	54.00	-1.35	Average	166	78	P
2	2390.00	-15.96	88.93	72.97	74.00	-1.03	Peak	166	78	P
3	3996.00	-10.19	58.44	48.25	54.00	-5.75	Average	155	82	P
4	3996.00	-10.19	61.37	51.18	74.00	-22.82	Peak	155	82	P
5	4800.00	-8.88	60.23	51.35	54.00	-2.65	Average	100	147	P
6	4800.00	-8.88	61.93	53.05	74.00	-20.95	Peak	100	147	P
7	4824.00	-8.80	35.59	26.79	54.00	-27.21	Average	251	355	P
8	4824.00	-8.80	46.79	37.99	74.00	-36.01	Peak	251	355	P

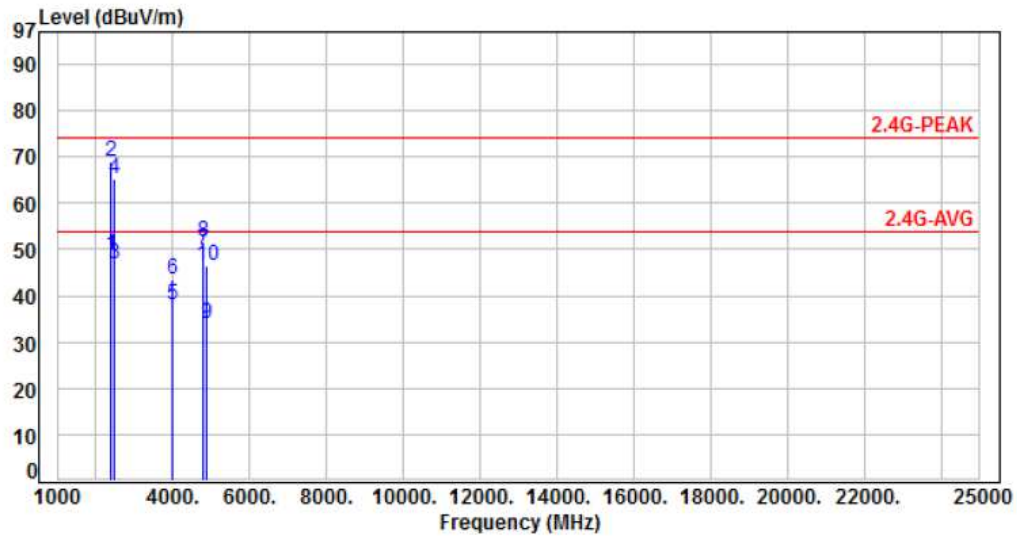
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH06	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	64.71	48.75	54.00	-5.25	Average	300	0	P
2	2390.00	-15.96	84.81	68.85	74.00	-5.15	Peak	300	0	P
3	2483.50	-15.65	62.50	46.85	54.00	-7.15	Average	300	0	P
4	2483.50	-15.65	80.90	65.25	74.00	-8.75	Peak	300	0	P
5	3996.00	-10.19	48.23	38.04	54.00	-15.96	Average	105	311	P
6	3996.00	-10.19	53.80	43.61	74.00	-30.39	Peak	105	311	P
7	4800.00	-8.88	58.60	49.72	54.00	-4.28	Average	122	88	P
8	4800.00	-8.88	60.50	51.62	74.00	-22.38	Peak	122	88	P
9	4874.00	-8.65	42.60	33.95	54.00	-20.05	Average	100	100	P
10	4874.00	-8.65	55.20	46.55	74.00	-27.45	Peak	100	100	P

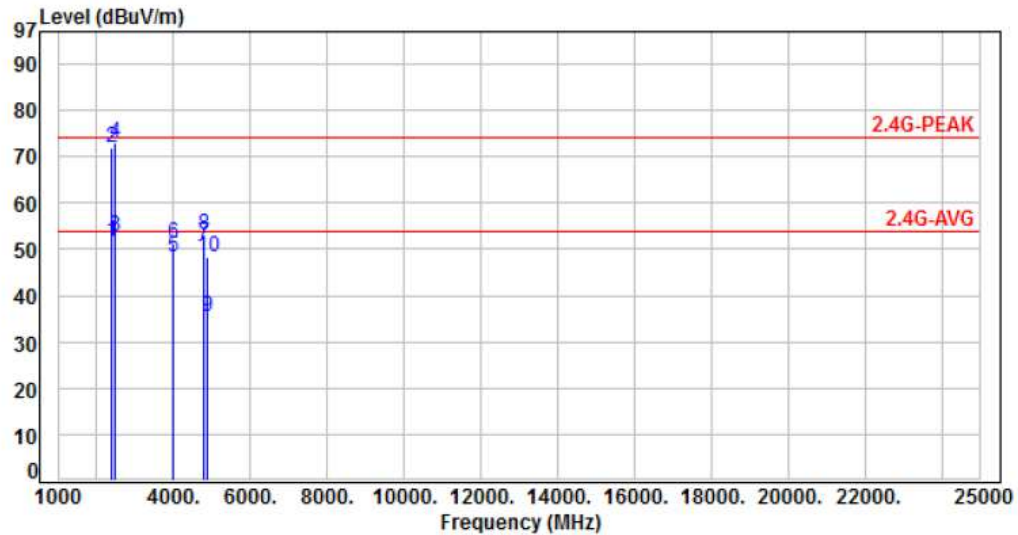
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH06	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	67.71	51.75	54.00	-2.25	Average	167	81	P
2	2390.00	-15.96	87.91	71.95	74.00	-2.05	Peak	167	81	P
3	2483.50	-15.65	68.43	52.78	54.00	-1.22	Average	167	81	P
4	2483.50	-15.65	88.50	72.85	74.00	-1.15	Peak	167	81	P
5	3996.00	-10.19	58.33	48.14	54.00	-5.86	Average	153	100	P
6	3996.00	-10.19	61.57	51.38	74.00	-22.62	Peak	153	100	P
7	4800.00	-8.88	60.23	51.35	54.00	-2.65	Average	100	99	P
8	4800.00	-8.88	61.82	52.94	74.00	-21.06	Peak	100	99	P
9	4874.00	-8.65	44.11	35.46	54.00	-18.54	Average	159	74	P
10	4874.00	-8.65	56.80	48.15	74.00	-25.85	Peak	159	74	P

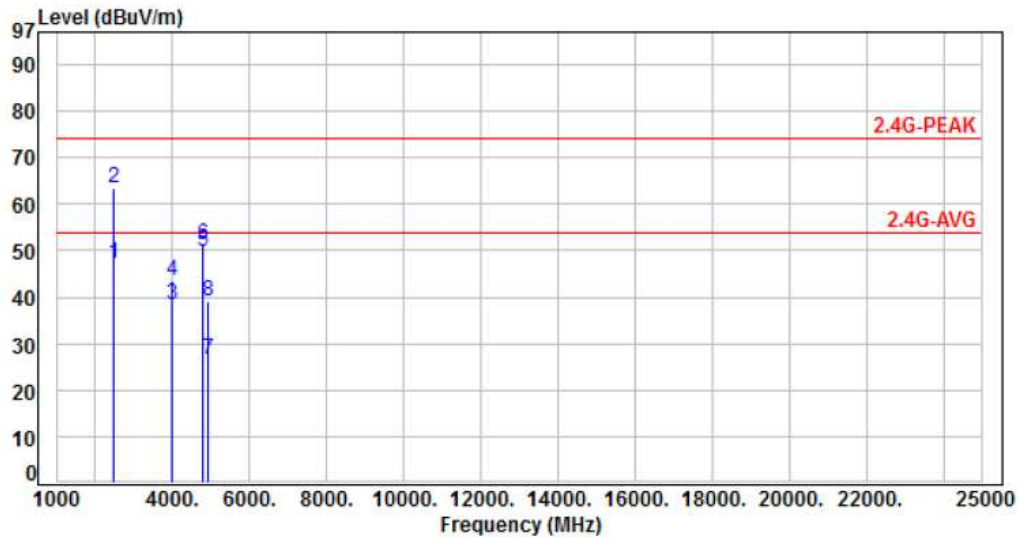
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH11	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.65	62.80	47.15	54.00	-6.85	Average	400	360	P
2	2483.50	-15.65	79.20	63.55	74.00	-10.45	Peak	400	360	P
3	3996.00	-10.19	48.58	38.39	54.00	-15.61	Average	112	336	P
4	3996.00	-10.19	53.64	43.45	74.00	-30.55	Peak	112	336	P
5	4800.00	-8.88	58.63	49.75	54.00	-4.25	Average	100	71	P
6	4800.00	-8.88	60.20	51.32	74.00	-22.68	Peak	100	71	P
7	4924.00	-8.49	35.19	26.70	54.00	-27.30	Average	148	110	P
8	4924.00	-8.49	47.49	39.00	74.00	-35.00	Peak	148	110	P

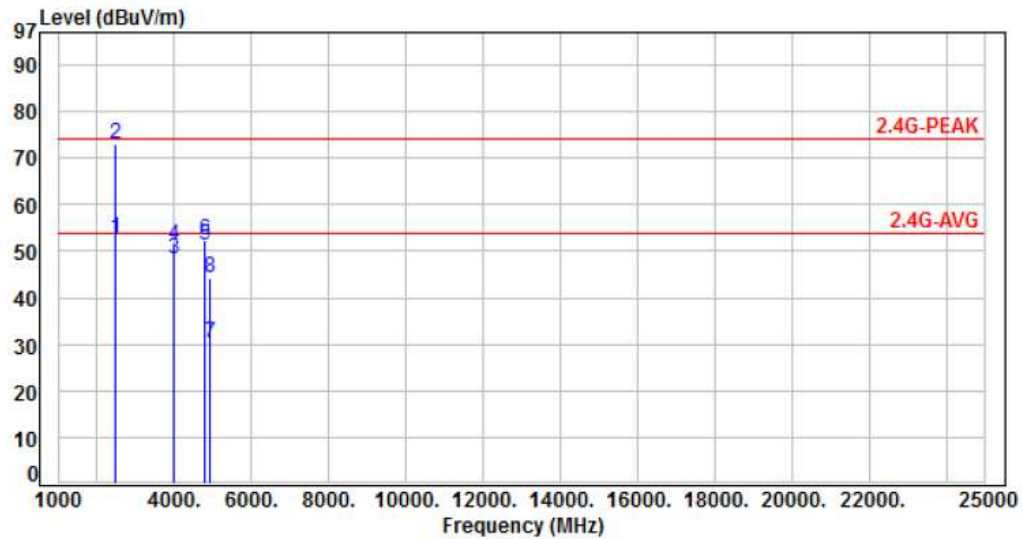
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH11	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.65	68.50	52.85	54.00	-1.15	Average	190	85	P
2	2483.50	-15.65	88.60	72.95	74.00	-1.05	Peak	190	85	P
3	3996.00	-10.19	58.33	48.14	54.00	-5.86	Average	152	73	P
4	3996.00	-10.19	61.63	51.44	74.00	-22.56	Peak	152	73	P
5	4800.00	-8.88	60.20	51.32	54.00	-2.68	Average	100	124	P
6	4800.00	-8.88	61.35	52.47	74.00	-21.53	Peak	100	124	P
7	4924.00	-8.49	38.59	30.10	54.00	-23.90	Average	100	99	P
8	4924.00	-8.49	52.79	44.30	74.00	-29.70	Peak	100	99	P

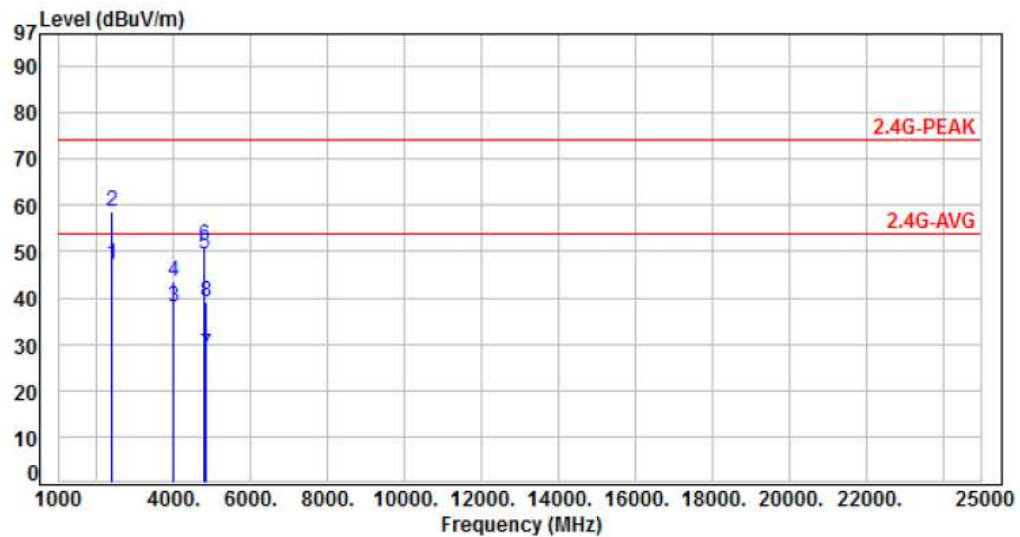
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH03	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	63.21	47.25	54.00	-6.75	Average	399	360	P
2	2390.00	-15.96	74.51	58.55	74.00	-15.45	Peak	399	360	P
3	3996.00	-10.19	48.36	38.17	54.00	-15.83	Average	100	324	P
4	3996.00	-10.19	53.67	43.48	74.00	-30.52	Peak	100	324	P
5	4800.00	-8.88	58.33	49.45	54.00	-4.55	Average	122	85	P
6	4800.00	-8.88	60.11	51.23	74.00	-22.77	Peak	122	85	P
7	4844.00	-8.74	36.50	27.76	54.00	-26.24	Average	100	271	P
8	4844.00	-8.74	47.80	39.06	74.00	-34.94	Peak	100	271	P

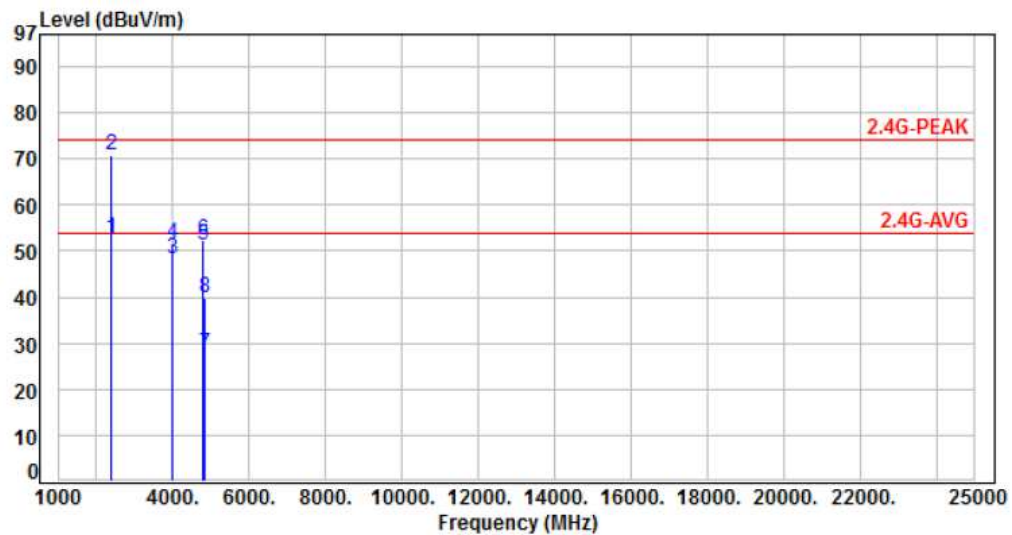
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH03	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	68.81	52.85	54.00	-1.15	Average	223	78	P
2	2390.00	-15.96	86.81	70.85	74.00	-3.15	Peak	223	78	P
3	3996.00	-10.19	58.43	48.24	54.00	-5.76	Average	156	52	P
4	3996.00	-10.19	61.72	51.53	74.00	-22.47	Peak	156	52	P
5	4800.00	-8.88	60.13	51.25	54.00	-2.75	Average	100	124	P
6	4800.00	-8.88	61.43	52.55	74.00	-21.45	Peak	100	124	P
7	4844.00	-8.74	36.50	27.76	54.00	-26.24	Average	100	70	P
8	4844.00	-8.74	48.60	39.86	74.00	-34.14	Peak	100	70	P

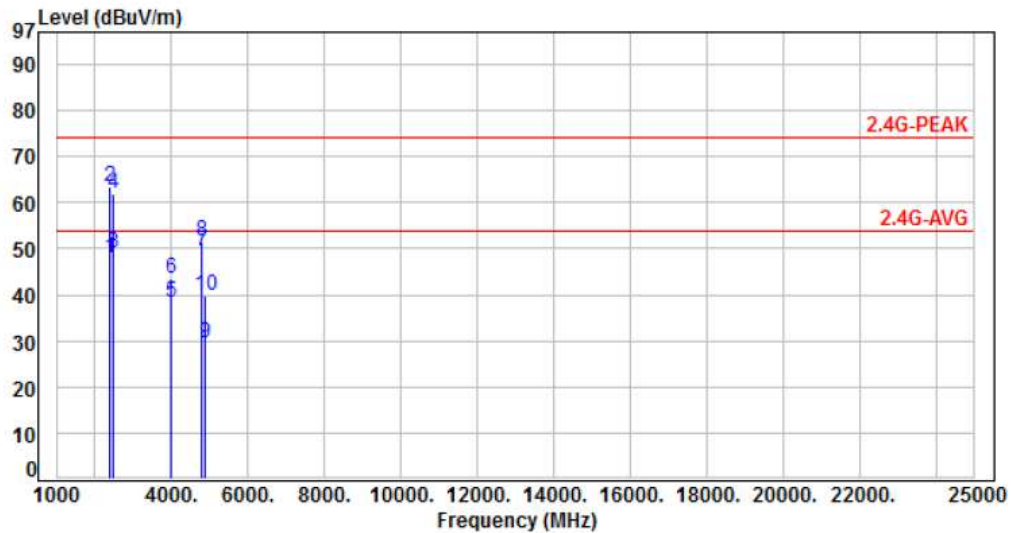
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH06	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	63.81	47.85	54.00	-6.15	Average	378	360	P
2	2390.00	-15.96	79.51	63.55	74.00	-10.45	Peak	378	360	P
3	2483.50	-15.65	64.70	49.05	54.00	-4.95	Average	378	360	P
4	2483.50	-15.65	77.60	61.95	74.00	-12.05	Peak	378	360	P
5	3996.00	-10.19	48.37	38.18	54.00	-15.82	Average	112	325	P
6	3996.00	-10.19	53.66	43.47	74.00	-30.53	Peak	112	325	P
7	4800.00	-8.88	58.16	49.28	54.00	-4.72	Average	100	57	P
8	4800.00	-8.88	60.58	51.70	74.00	-22.30	Peak	100	57	P
9	4874.00	-8.65	38.20	29.55	54.00	-24.45	Average	112	103	P
10	4874.00	-8.65	48.60	39.95	74.00	-34.05	Peak	112	103	P

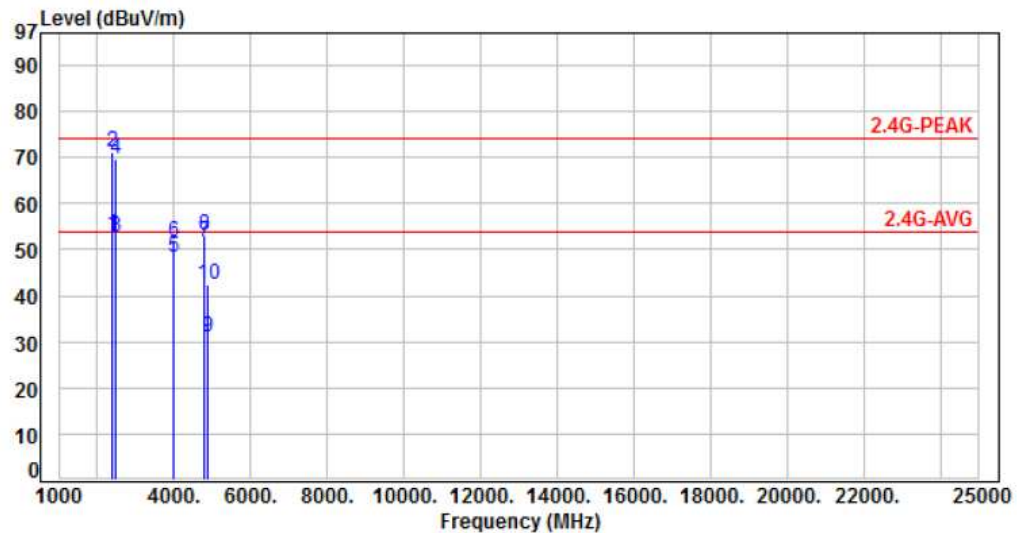
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH06	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.96	68.91	52.95	54.00	-1.05	Average	162	80	P
2	2390.00	-15.96	87.31	71.35	74.00	-2.65	Peak	162	80	P
3	2483.50	-15.65	68.30	52.65	54.00	-1.35	Average	162	80	P
4	2483.50	-15.65	85.20	69.55	74.00	-4.45	Peak	162	80	P
5	3996.00	-10.19	58.43	48.24	54.00	-5.76	Average	143	62	P
6	3996.00	-10.19	61.77	51.58	74.00	-22.42	Peak	143	62	P
7	4800.00	-8.88	60.36	51.48	54.00	-2.52	Average	100	123	P
8	4800.00	-8.88	61.84	52.96	74.00	-21.04	Peak	100	123	P
9	4874.00	-8.65	39.80	31.15	54.00	-22.85	Average	231	315	P
10	4874.00	-8.65	51.00	42.35	74.00	-31.65	Peak	231	315	P

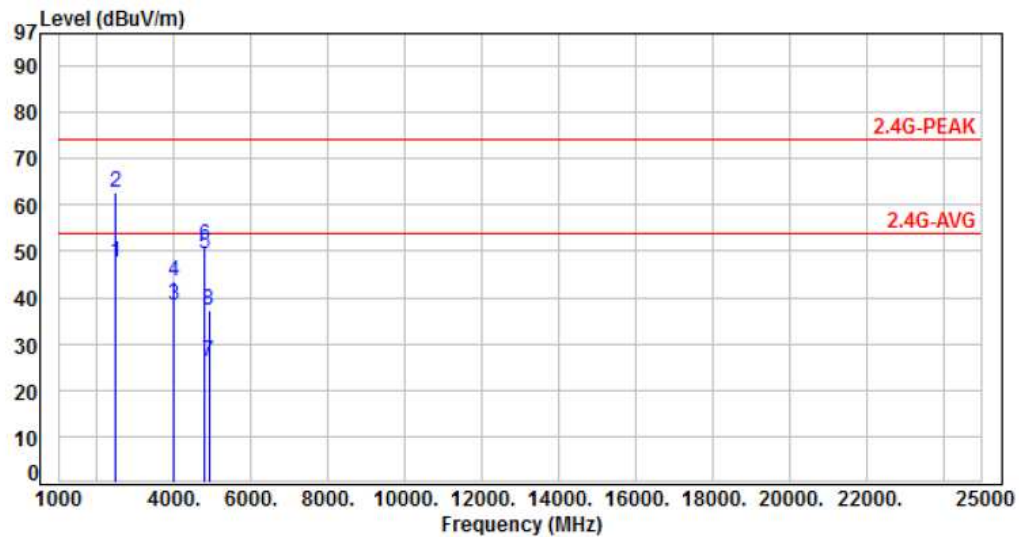
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH09	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.65	63.20	47.55	54.00	-6.45	Average	391	355	P
2	2483.50	-15.65	78.30	62.65	74.00	-11.35	Peak	391	355	P
3	3996.00	-10.19	48.43	38.24	54.00	-15.76	Average	100	325	P
4	3996.00	-10.19	53.64	43.45	74.00	-30.55	Peak	100	325	P
5	4800.00	-8.88	58.36	49.48	54.00	-4.52	Average	112	82	P
6	4800.00	-8.88	60.11	51.23	74.00	-22.77	Peak	112	82	P
7	4904.00	-8.56	34.60	26.04	54.00	-27.96	Average	122	147	P
8	4904.00	-8.56	45.70	37.14	74.00	-36.86	Peak	122	147	P

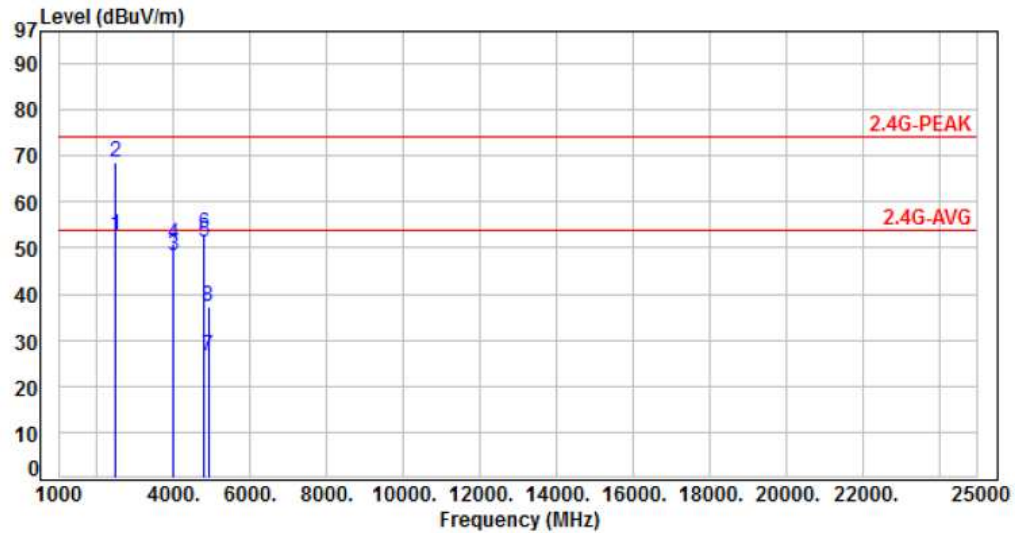
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH09	Temperature	: 21 °C
Test Date	: Apr. 13, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.65	68.50	52.85	54.00	-1.15	Average	168	77	P
2	2483.50	-15.65	84.10	68.45	74.00	-5.55	Peak	168	77	P
3	3996.00	-10.19	58.55	48.36	54.00	-5.64	Average	147	71	P
4	3996.00	-10.19	61.25	51.06	74.00	-22.94	Peak	147	71	P
5	4800.00	-8.88	60.02	51.14	54.00	-2.86	Average	100	123	P
6	4800.00	-8.88	61.93	53.05	74.00	-20.95	Peak	100	123	P
7	4904.00	-8.56	35.22	26.66	54.00	-27.34	Average	100	142	P
8	4904.00	-8.56	45.80	37.24	74.00	-36.76	Peak	100	142	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

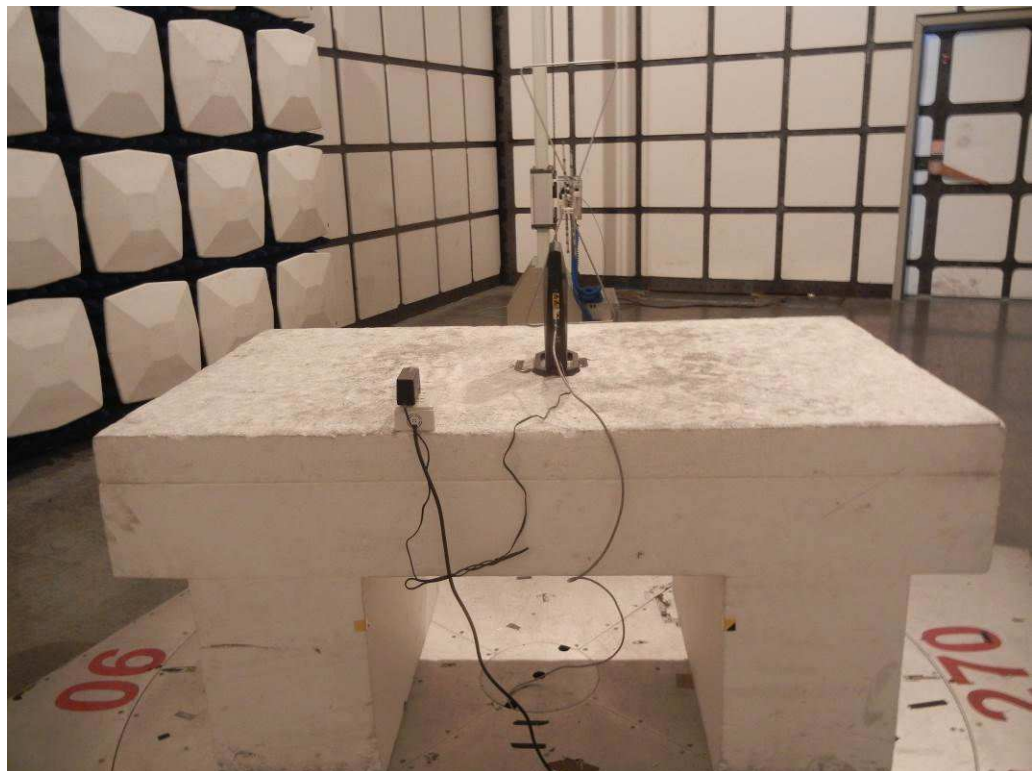


6.8 Test Photographs (30MHz ~ 1GHz)

Front View



Rear View





6.9 Test Photographs (1GHz ~ 25GHz)

Front View



Rear View





7. Test of Conducted Spurious Emission

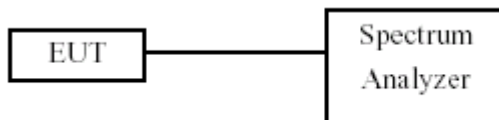
7.1 Test Limit

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.
- Peak 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. 22, 2018

Temperature : 22°C

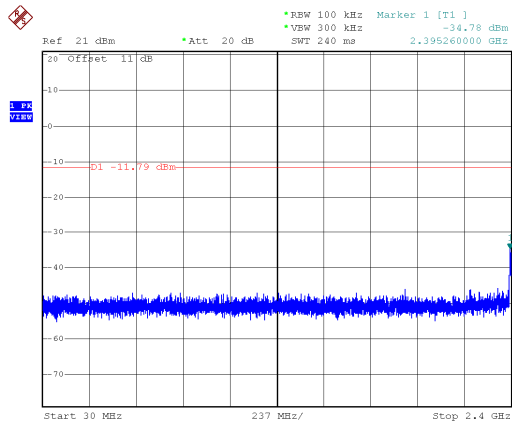
Humidity : 62%

Note: Test plots refers to the following pages.

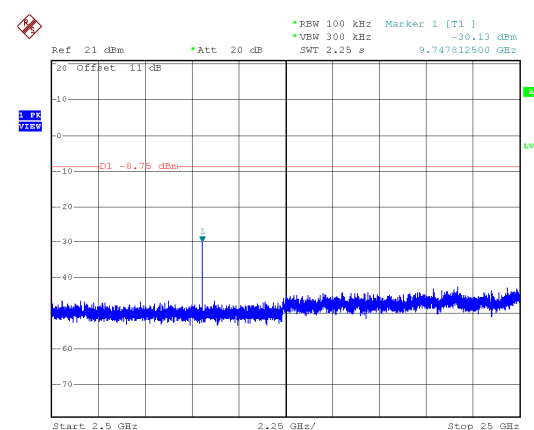
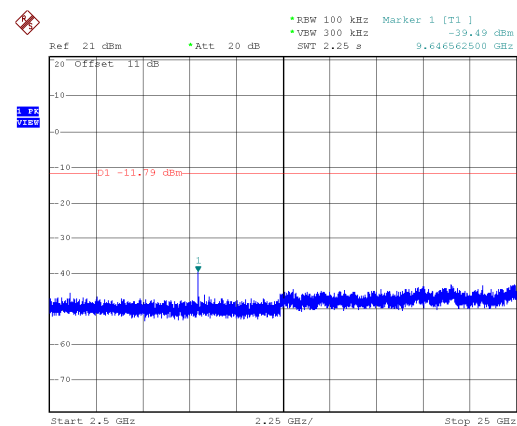
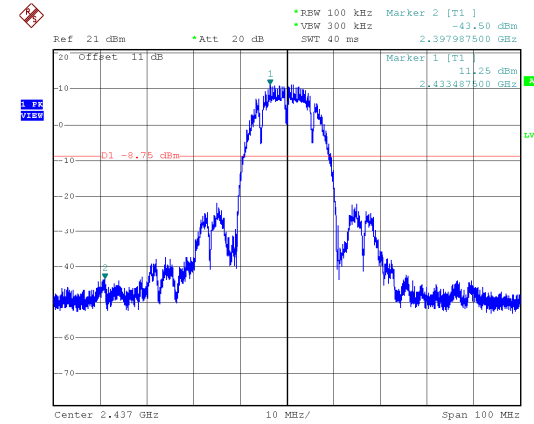
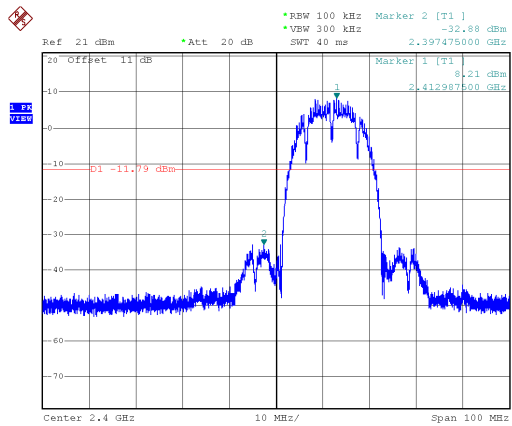
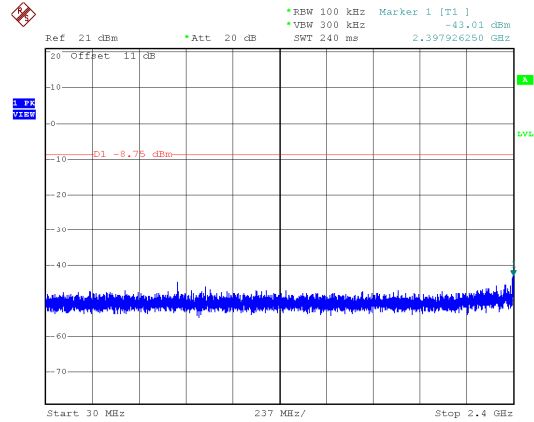


ANT A

Modulation Type: 802.11b, CH 01

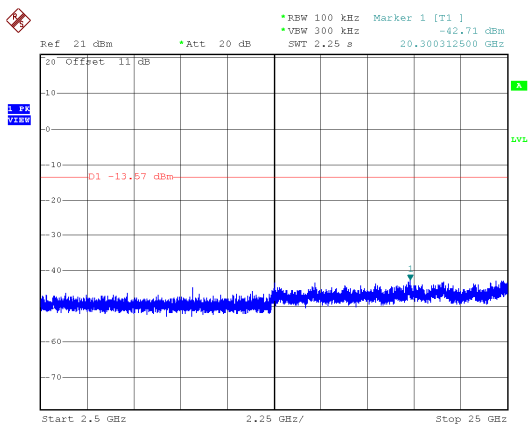
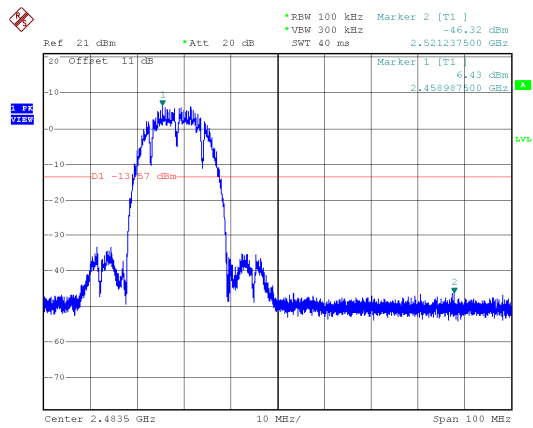
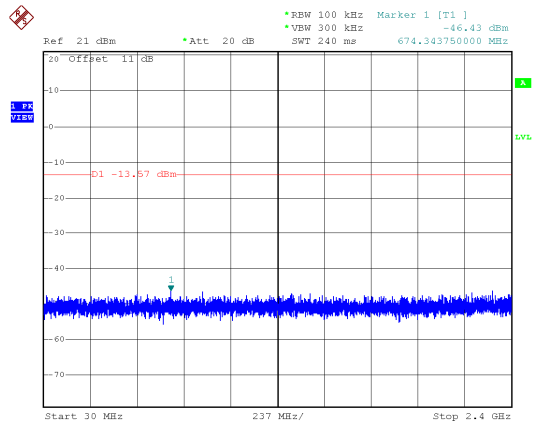


Modulation Type: 802.11b, CH 06





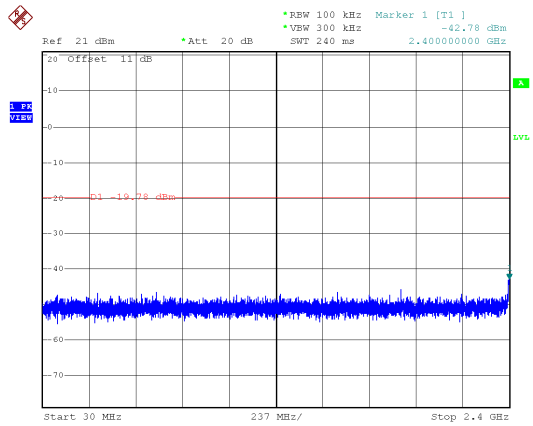
Modulation Type: 802.11b, CH 11



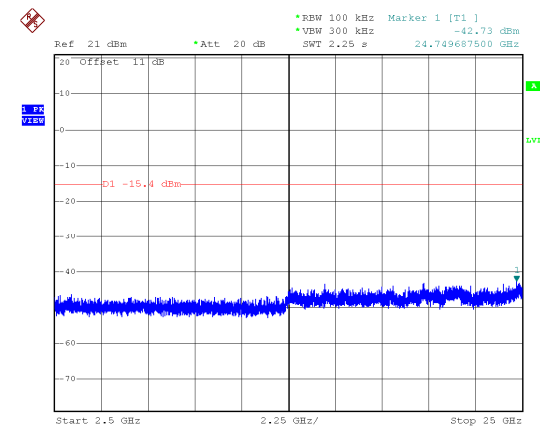
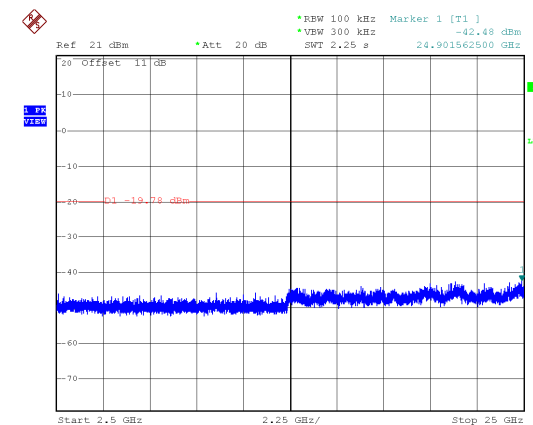
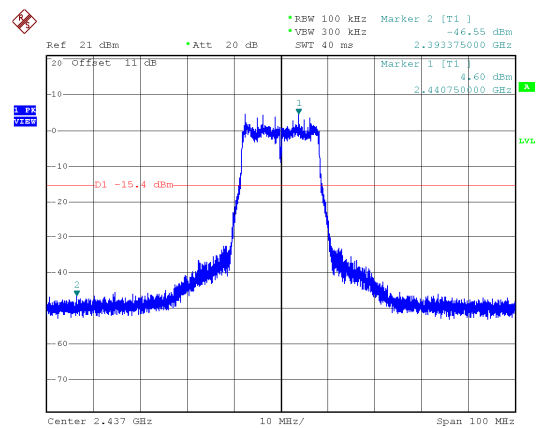
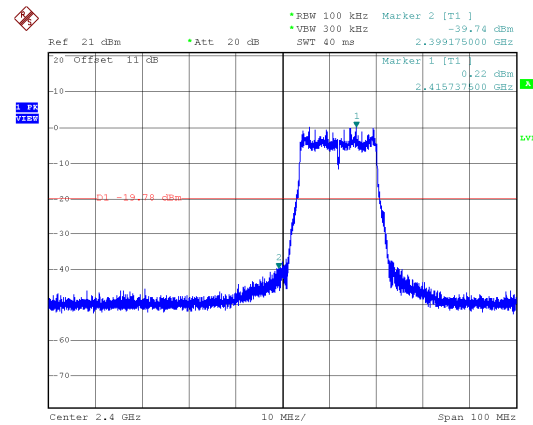
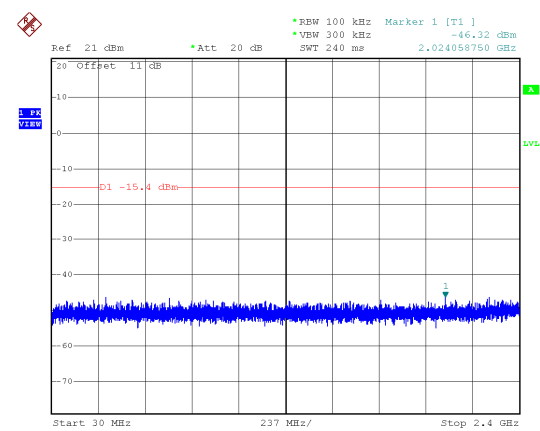


ANT A

Modulation Type: 802.11g, CH 01

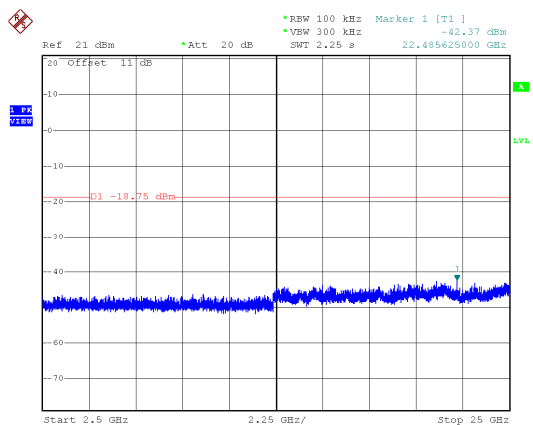
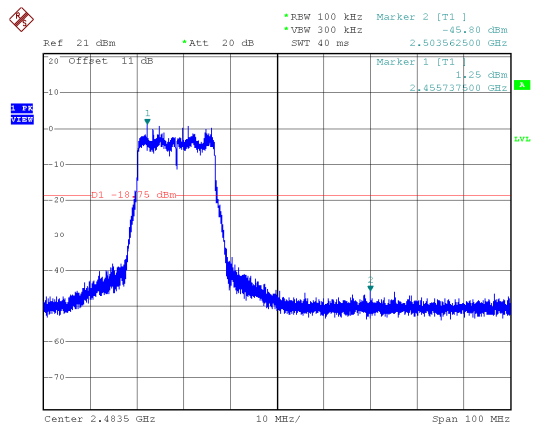
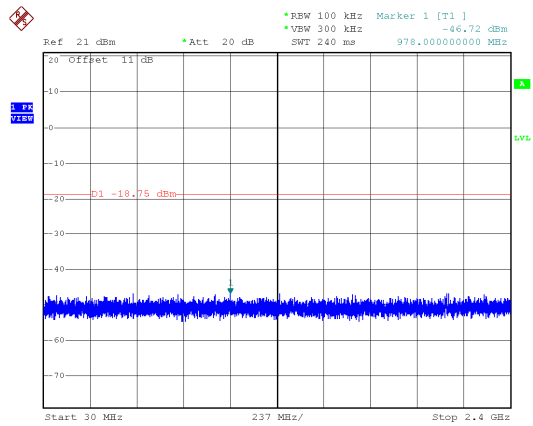


Modulation Type: 802.11g, CH 06





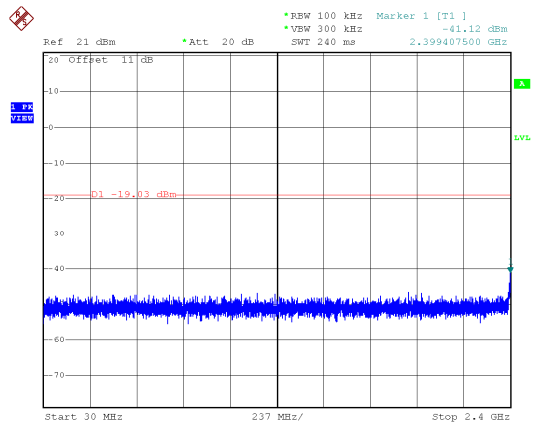
Modulation Type: 802.11g, CH 11



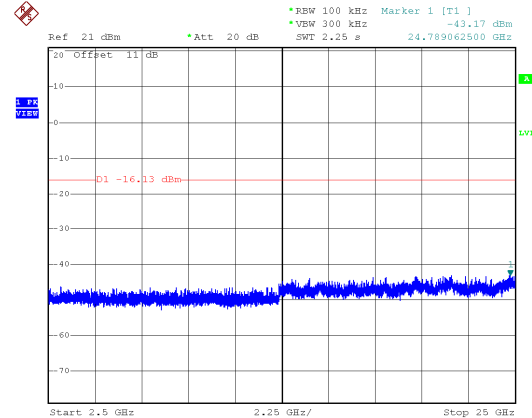
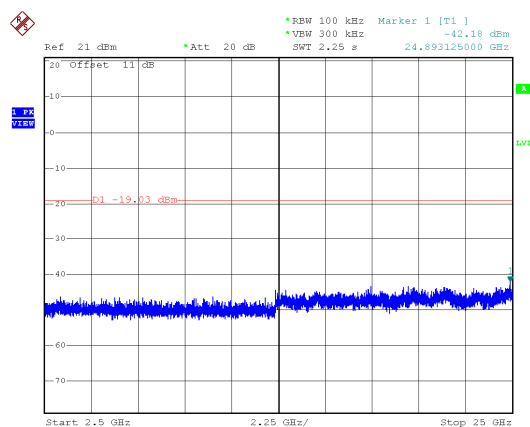
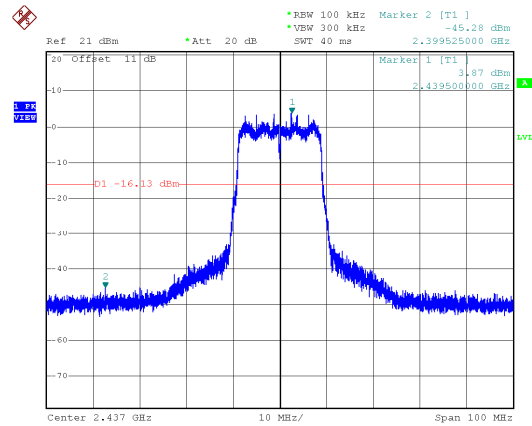
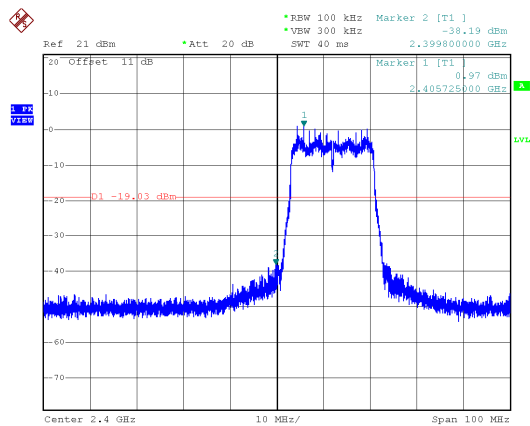
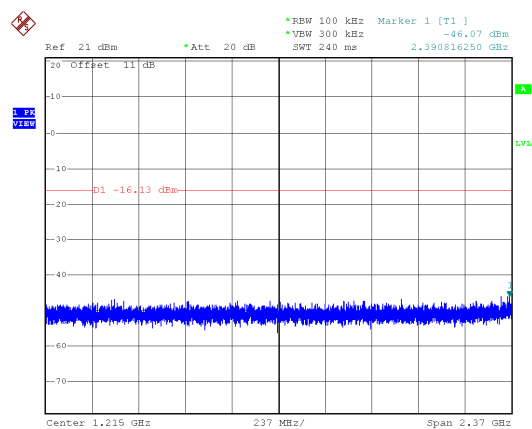


ANT A

Modulation Type: 802.11n HT20, CH01

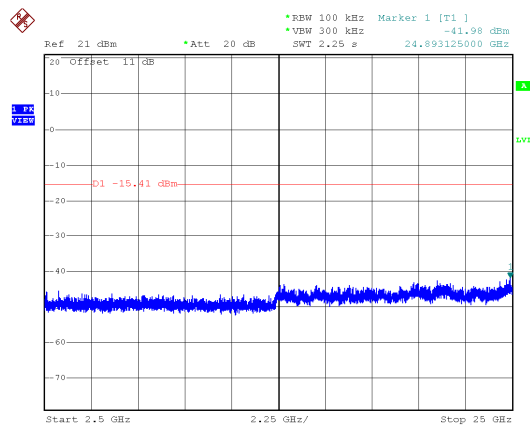
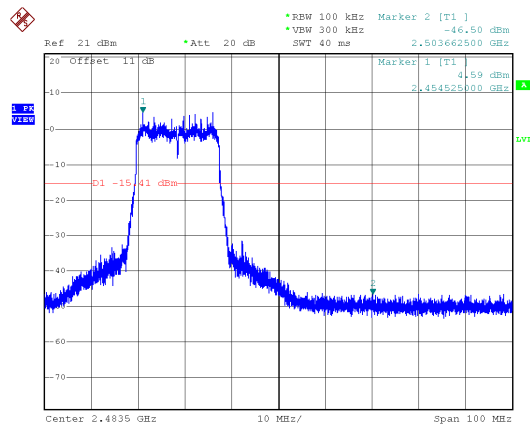
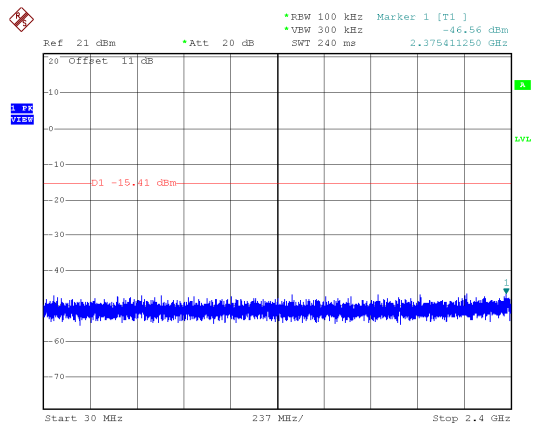


Modulation Type: 802.11n HT20, CH06





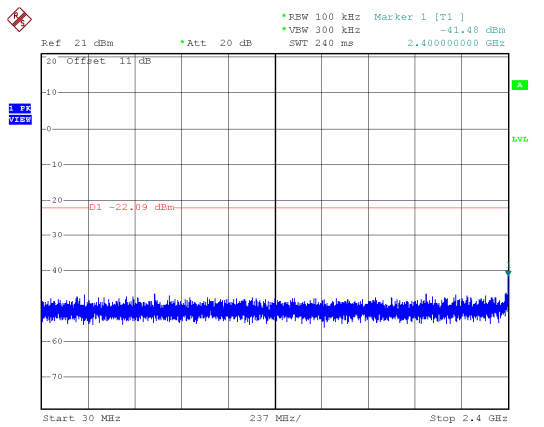
Modulation Type: 802.11n HT20, CH11



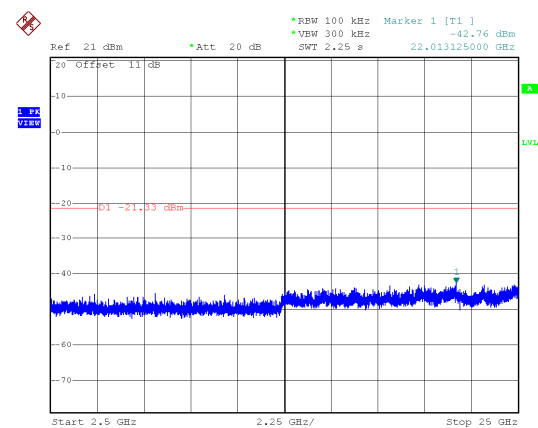
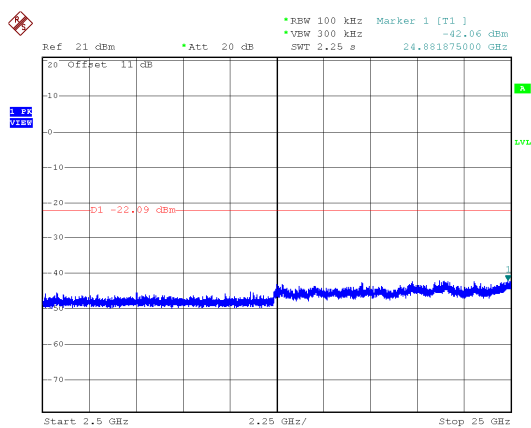
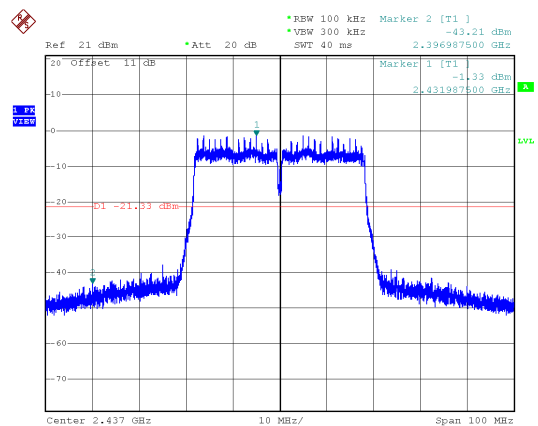
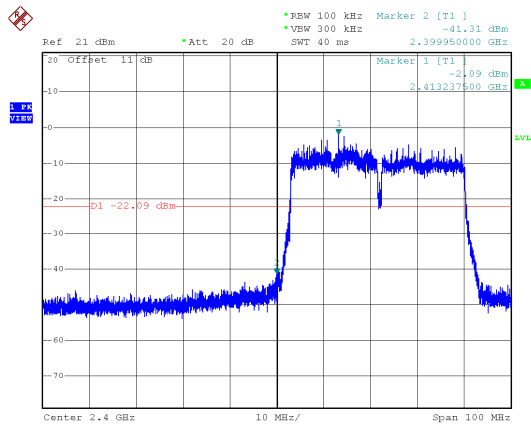
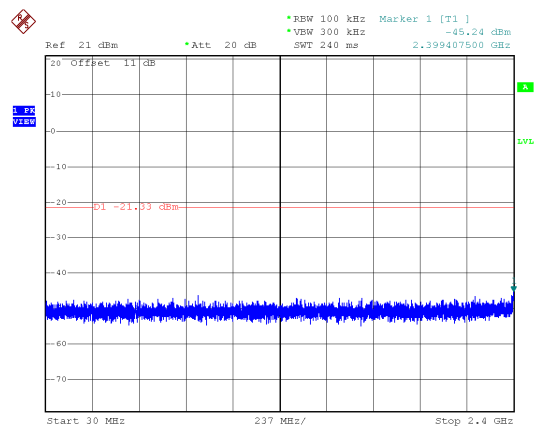


ANT A

Modulation Type: 802.11n HT40, CH03

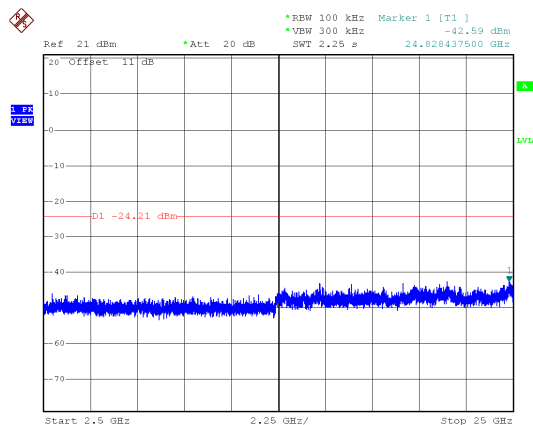
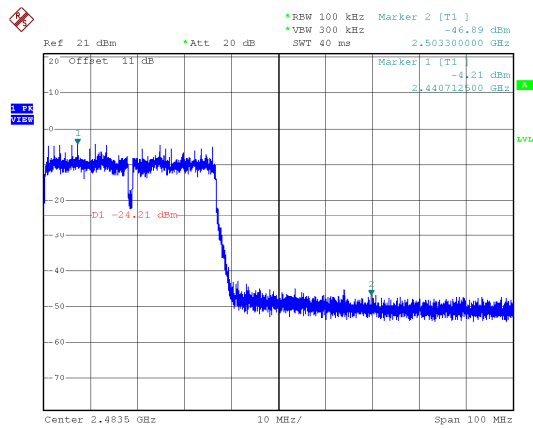
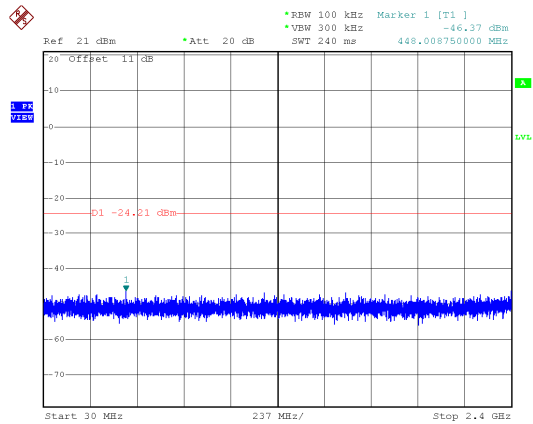


Modulation Type: 802.11n HT40, CH06





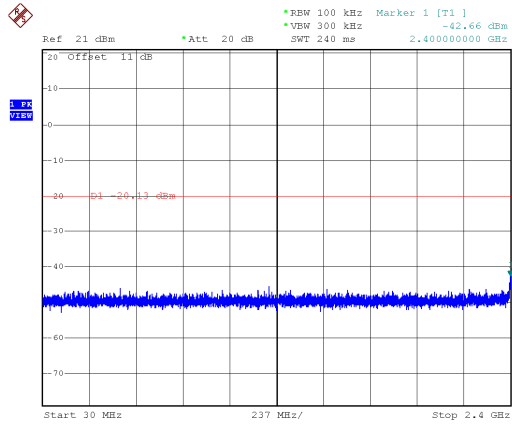
Modulation Type: 802.11n HT40, CH09



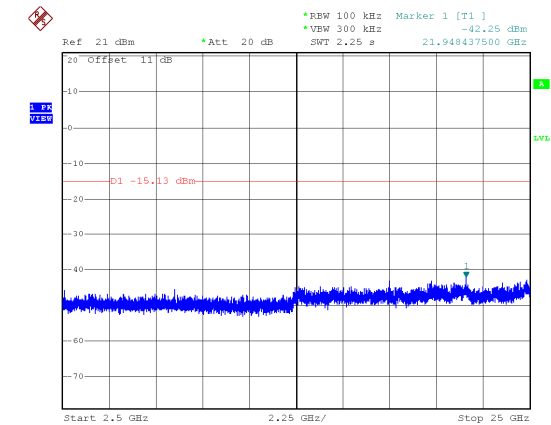
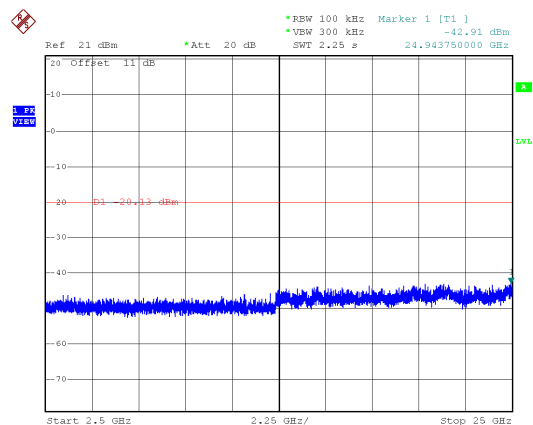
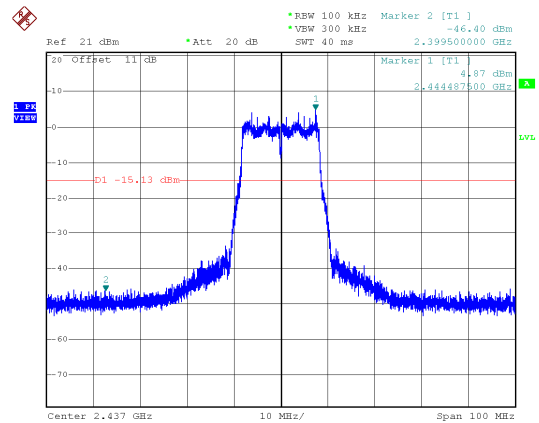
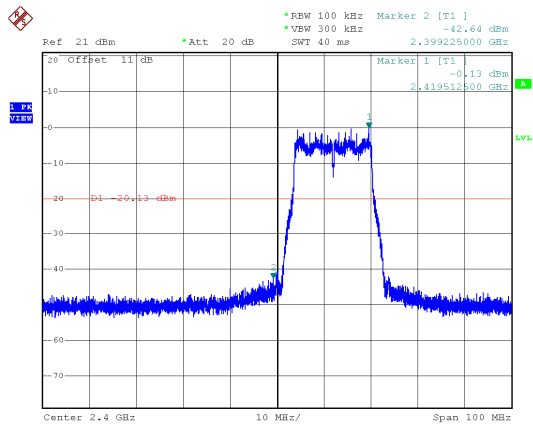
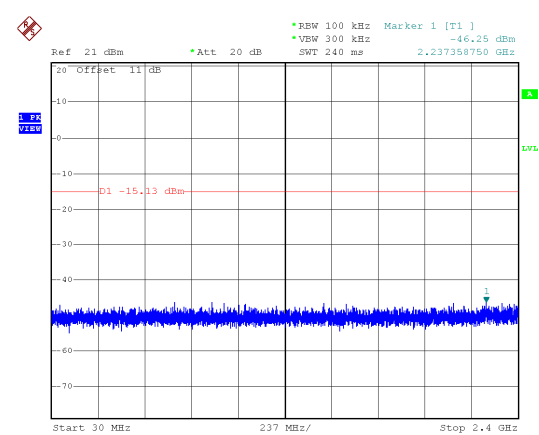


ANT B

Modulation Type: 802.11g, CH01

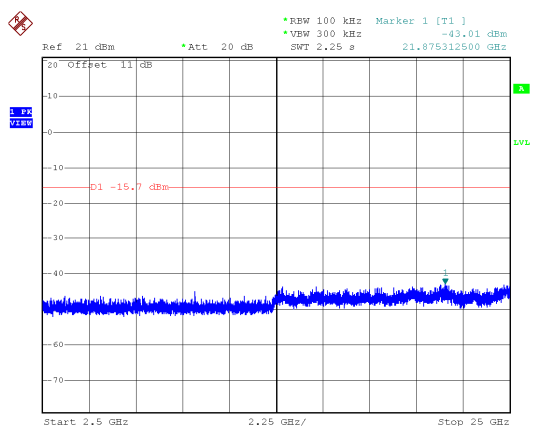
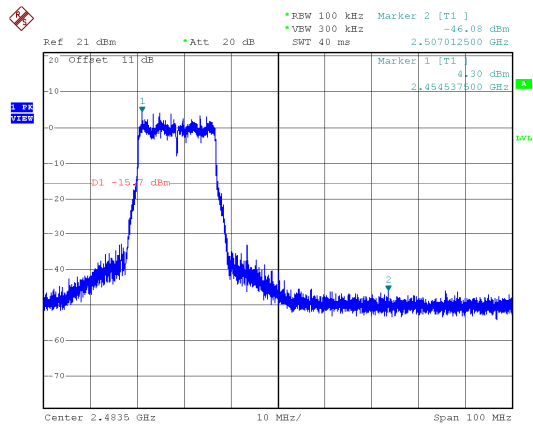
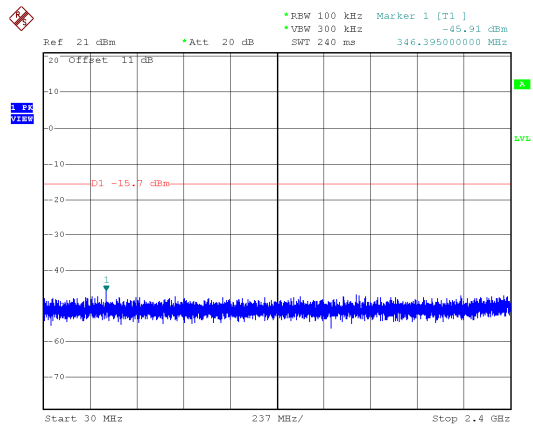


Modulation Type: 802.11g, CH06





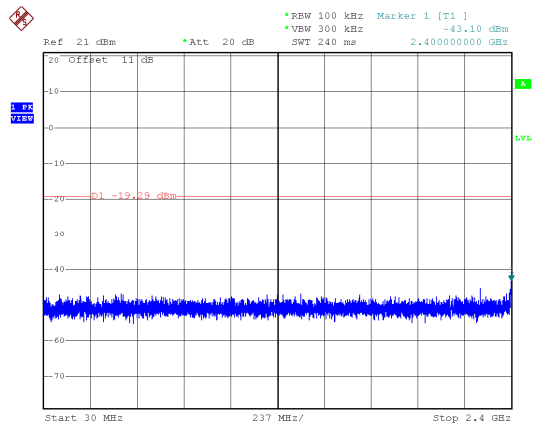
Modulation Type: 802.11g, CH11



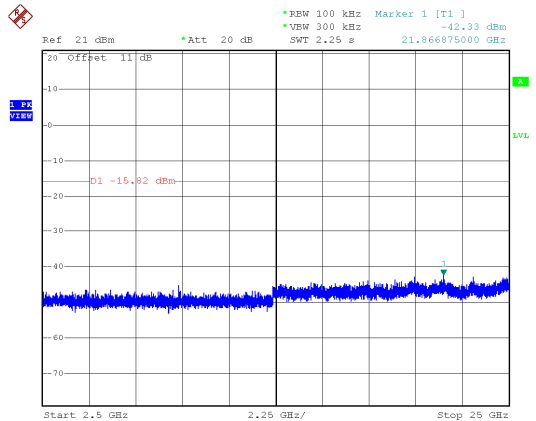
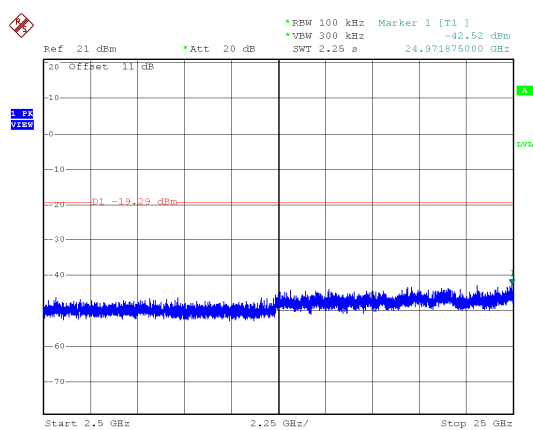
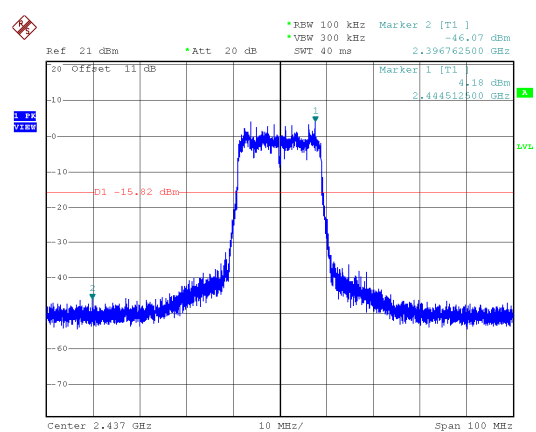
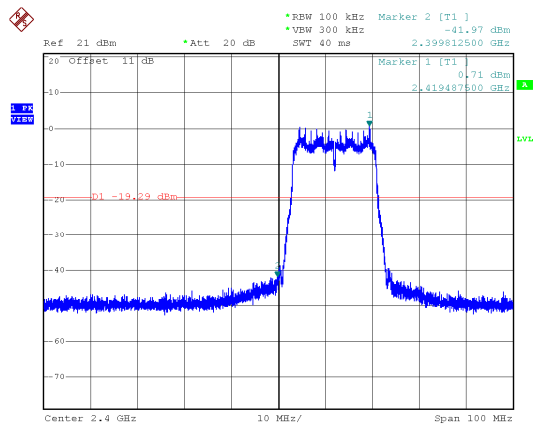
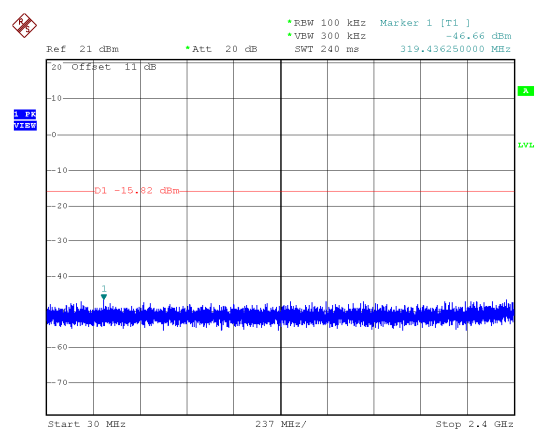


ANT B

Modulation Type: 802.11n HT20, CH01

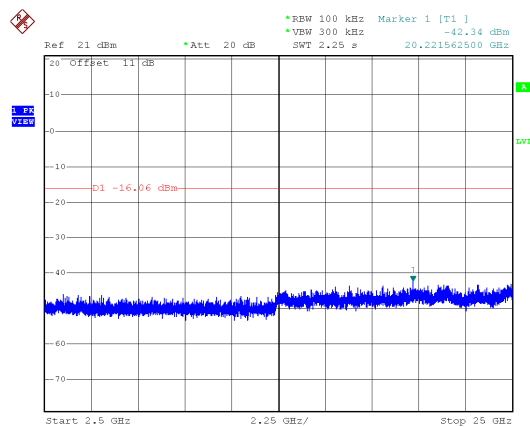
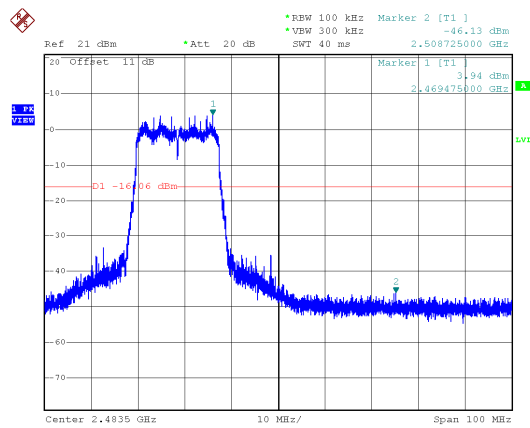
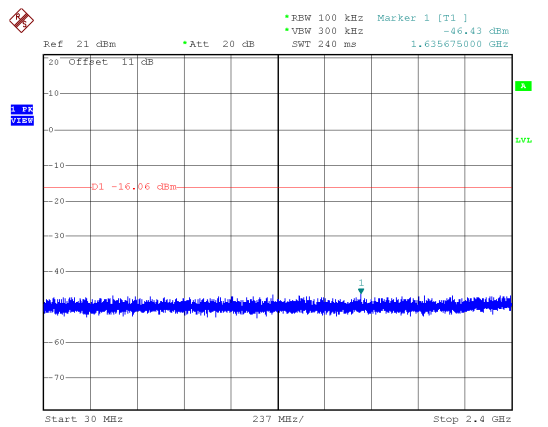


Modulation Type: 802.11n HT20, CH06





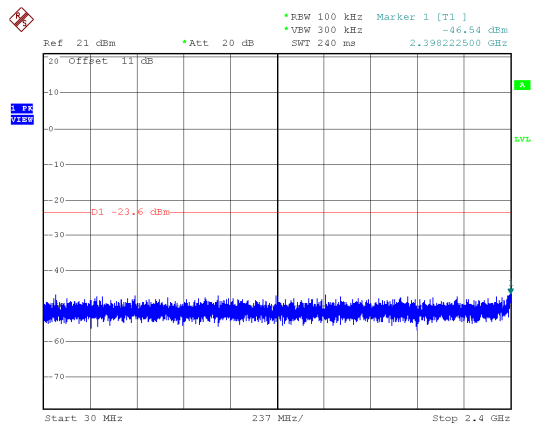
Modulation Type: 802.11n HT20, CH11



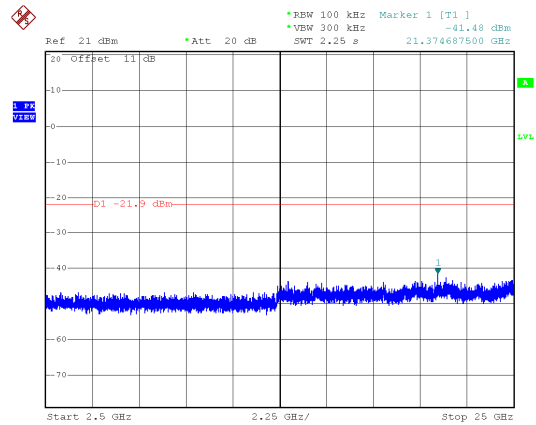
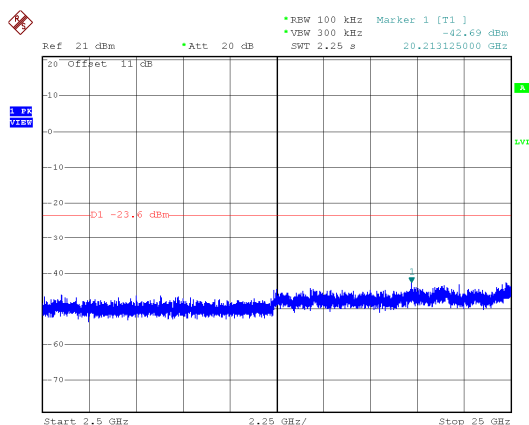
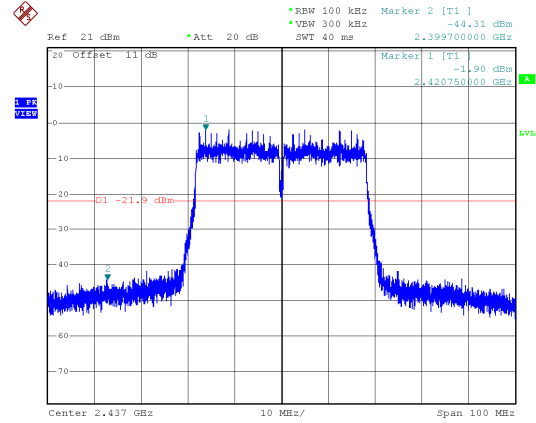
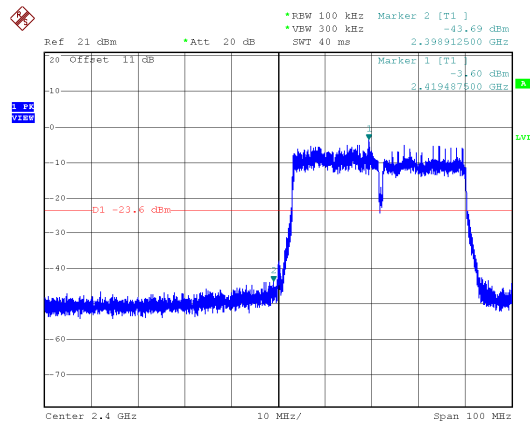
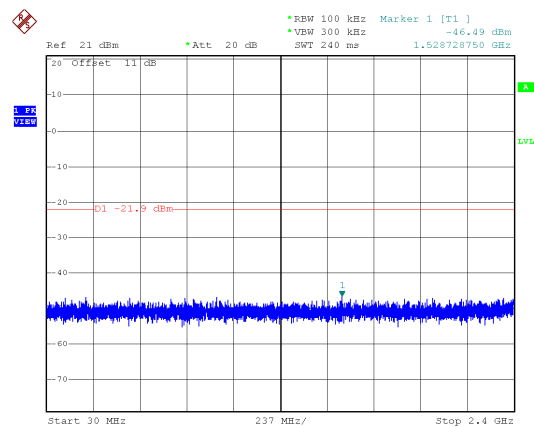


ANT B

Modulation Type: 802.11n HT40, CH03

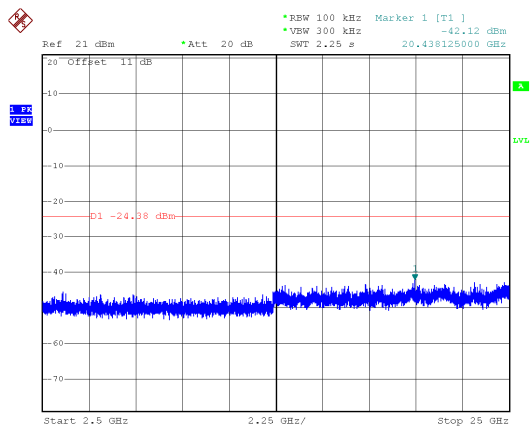
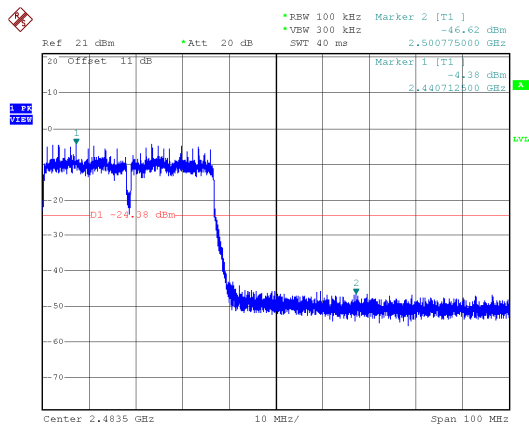
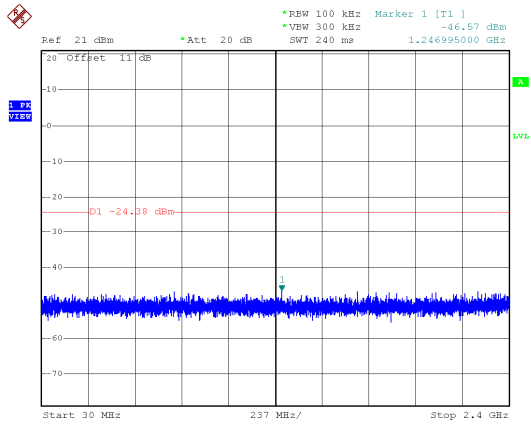


Modulation Type: 802.11n HT40, CH06





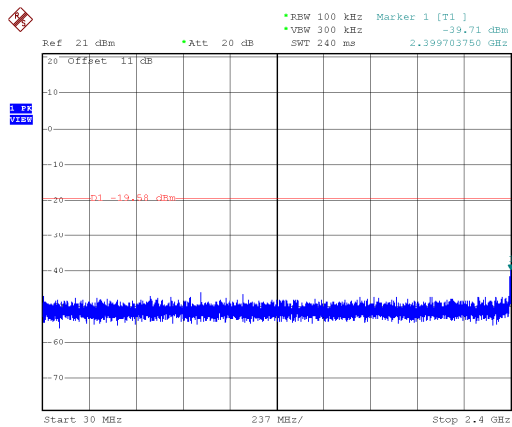
Modulation Type: 802.11n HT40, CH09



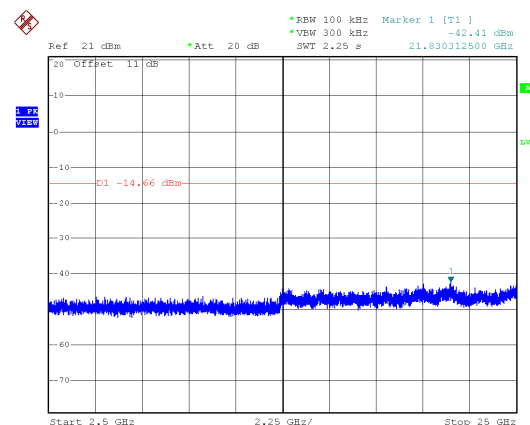
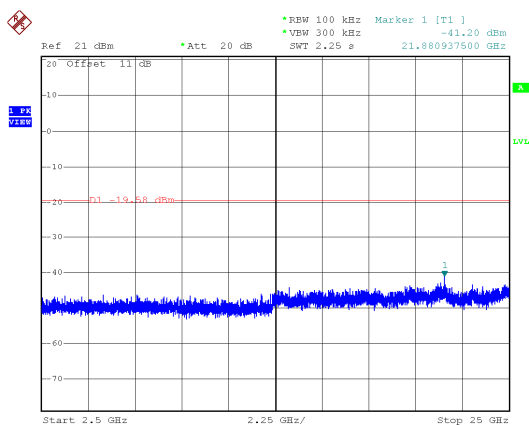
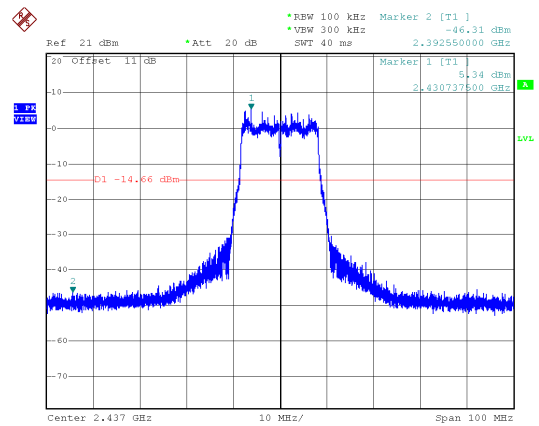
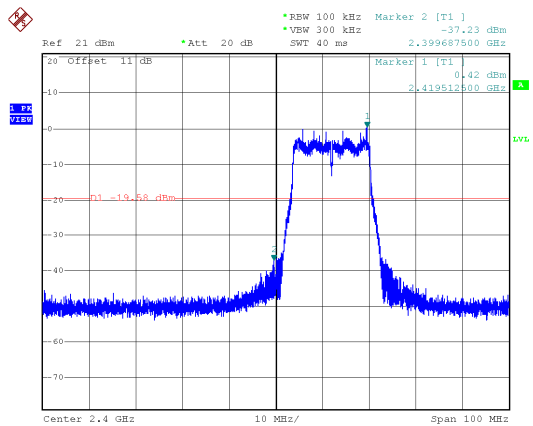
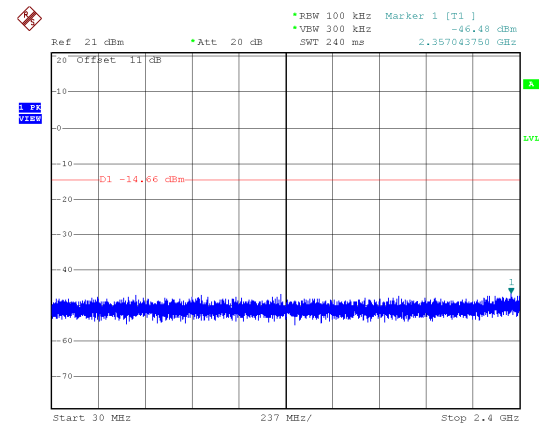


ANT C

Modulation Type: 802.11g, CH01

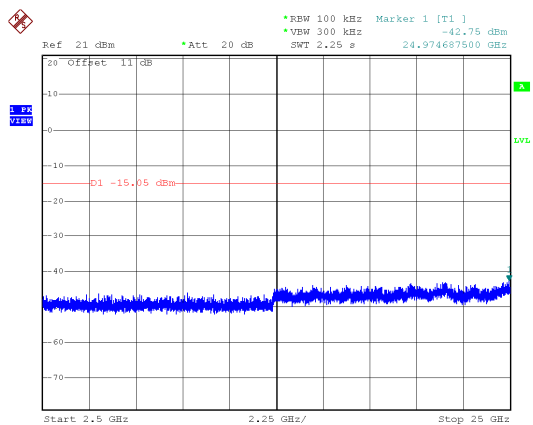
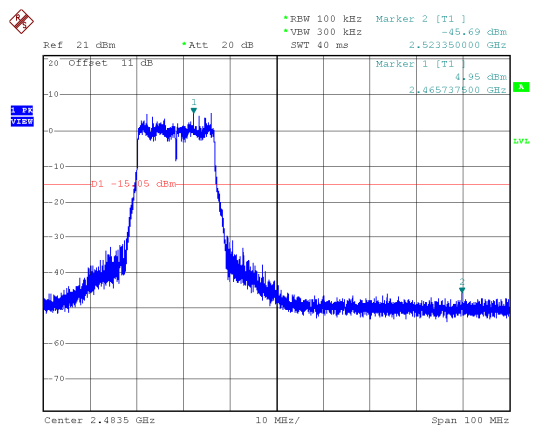
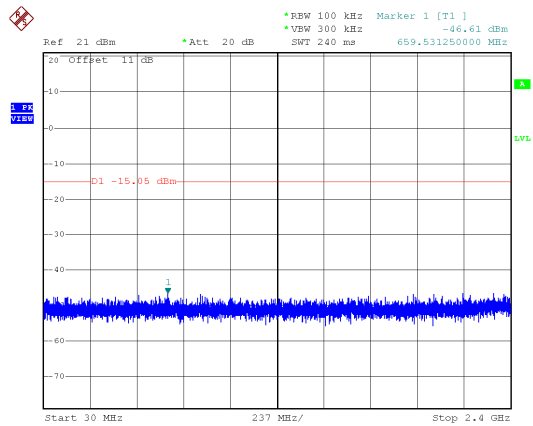


Modulation Type: 802.11g, CH06





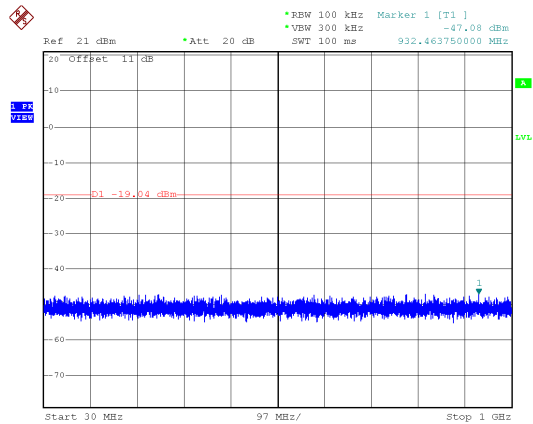
Modulation Type: 802.11g, CH11



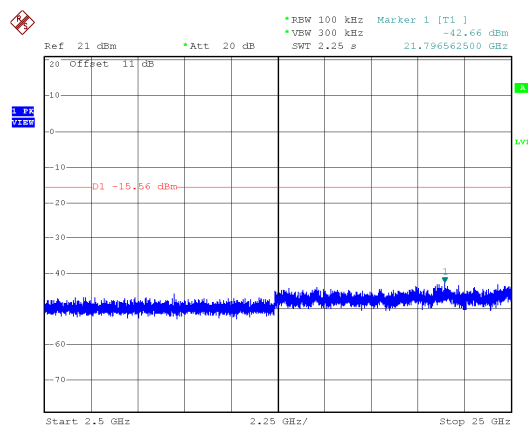
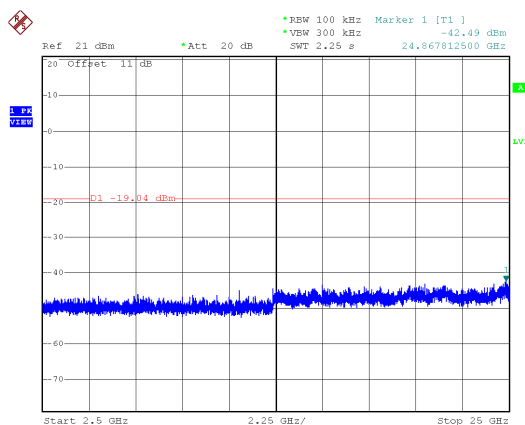
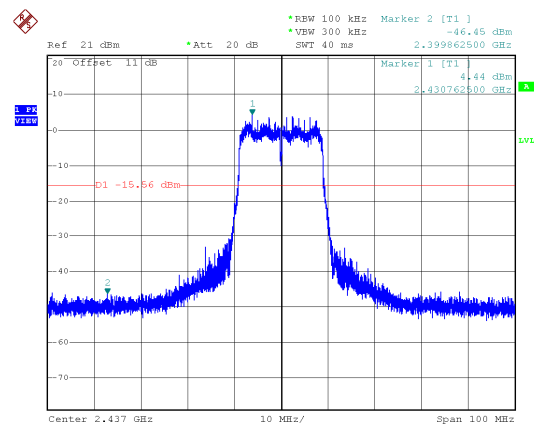
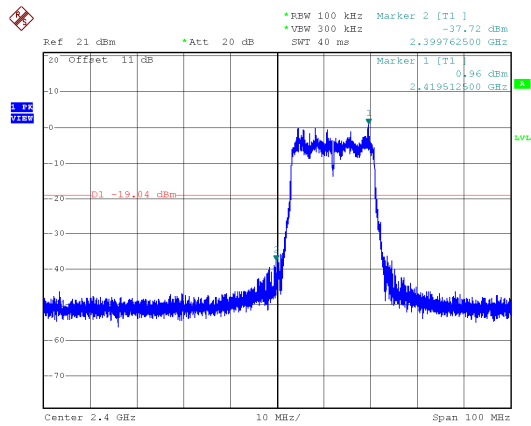
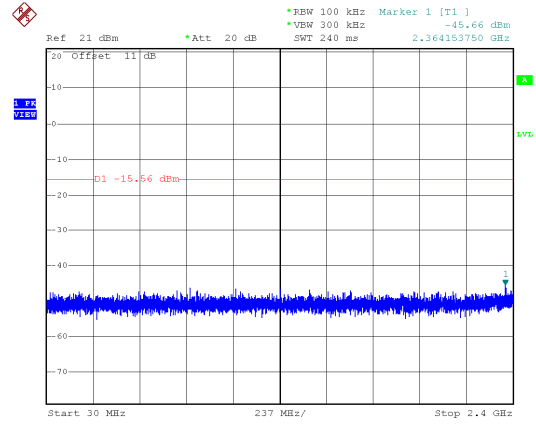


ANT C

Modulation Type: 802.11n HT20, CH01

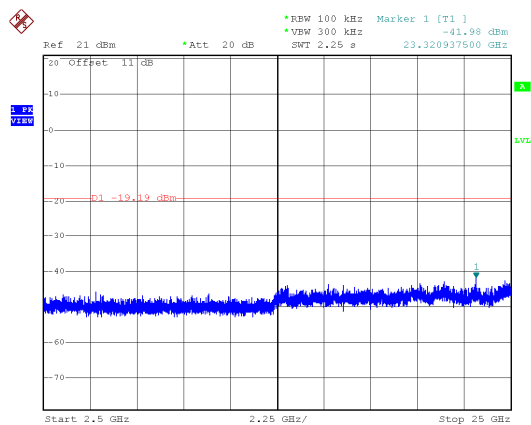
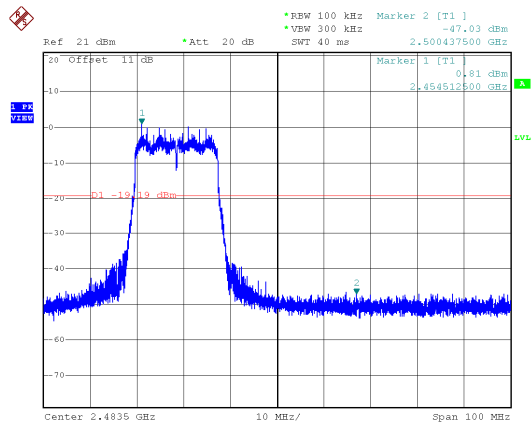
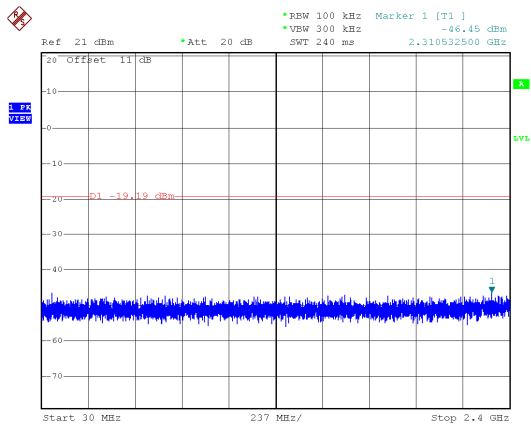


Modulation Type: 802.11n HT20, CH06





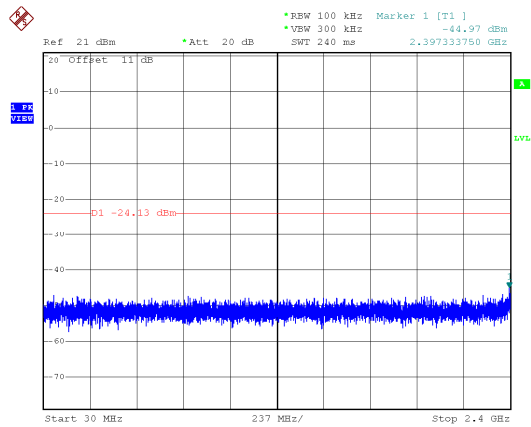
Modulation Type: 802.11n HT20, CH11



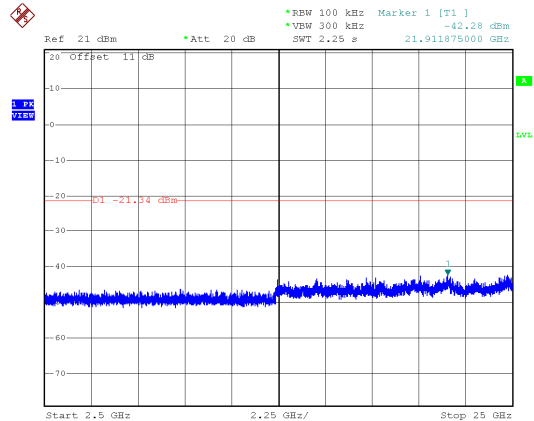
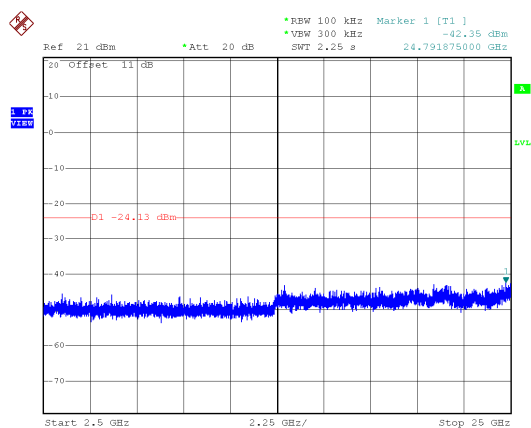
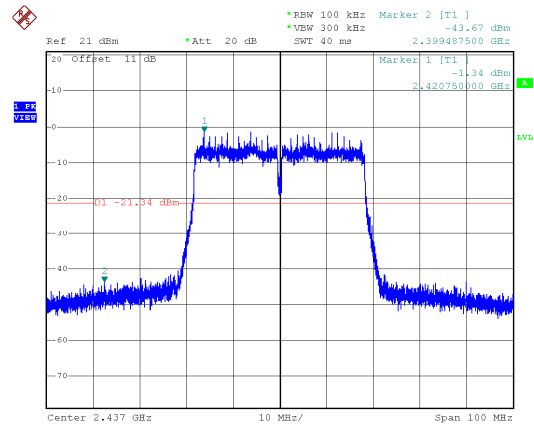
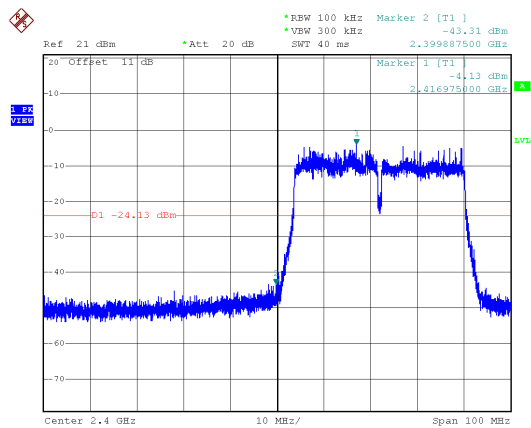
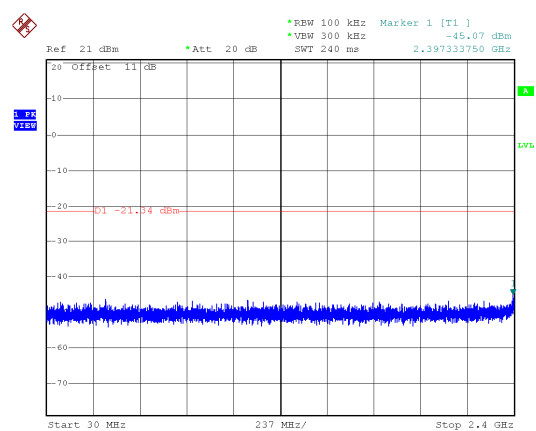


ANT C

Modulation Type: 802.11n HT40, CH03

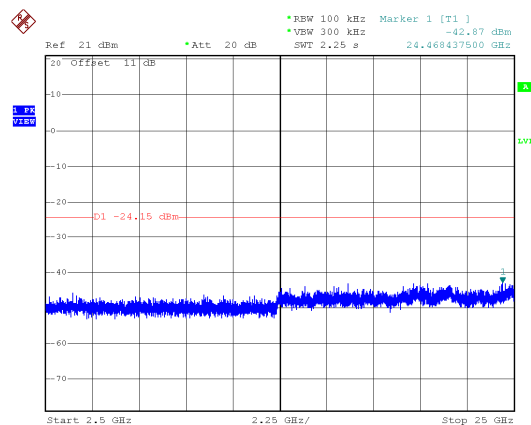
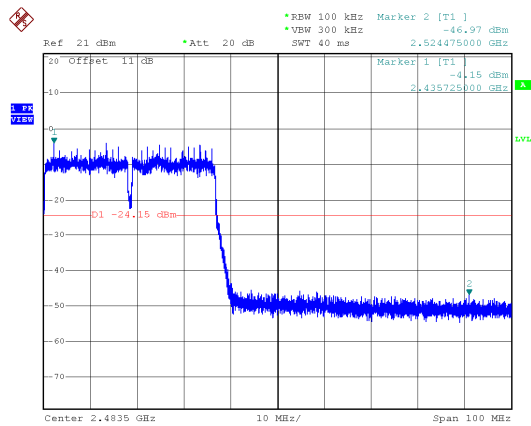
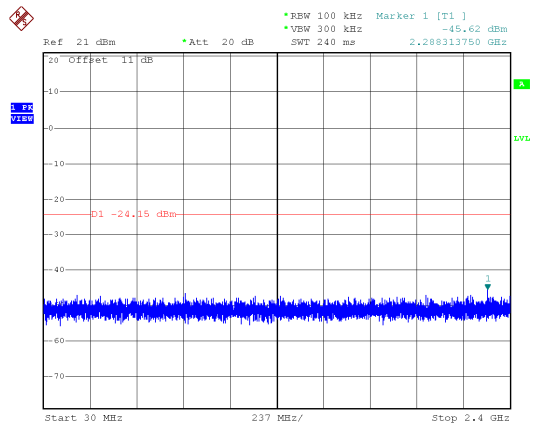


Modulation Type: 802.11n HT40, CH06





Modulation Type: 802.11n HT40, CH09





8. 6dB Bandwidth & 99% Bandwidth Measurement Data

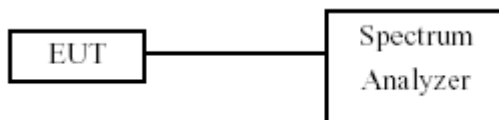
8.1 Test Limit

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 (6dB Bandwidth)

Temperature : 22°C

Humidity : 62%

Test Date : Aug. 22, 2018

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Limit (MHz)
			ANT A	ANT B	ANT C	
IEEE 802.11b (1Mbps)	01	2412	13.50	---	---	0.5
	06	2437	13.10	---	---	0.5
	11	2462	13.20	---	---	0.5
IEEE 802.11g (6Mbps)	01	2412	16.40	16.40	16.40	0.5
	06	2437	16.40	16.40	16.40	0.5
	11	2462	16.30	16.30	16.30	0.5
802.11n HT20 (6.5Mbps)	01	2412	17.20	17.10	17.10	0.5
	06	2437	17.00	17.00	17.40	0.5
	11	2462	17.30	17.00	17.10	0.5
802.11n HT40 (13.5Mbps)	03	2422	36.40	36.80	36.00	0.5
	06	2437	36.00	36.00	36.20	0.5
	09	2452	36.40	36.40	36.20	0.5



8.5 Test Result and Data (99% Bandwidth)

Temperature : 22°C

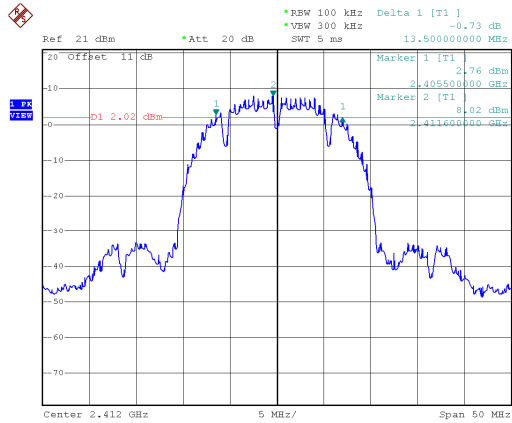
Humidity : 62%

Test Date : Aug. 22, 2018

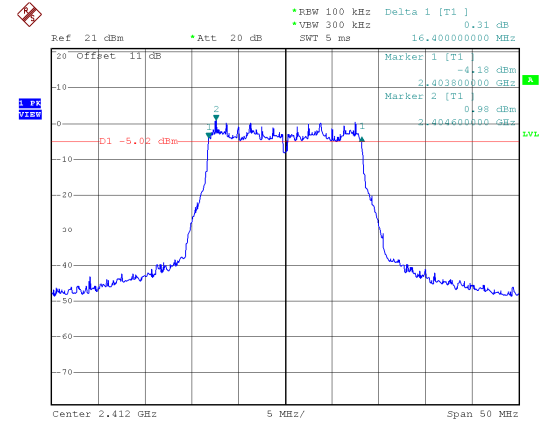
Modulation Type	Channel	Frequency (MHz)	99% Bandwidth (MHz)		
			ANT A	ANT B	ANT C
IEEE 802.11b (1Mbps)	01	2412	16.50	---	---
	06	2437	16.50	---	---
	11	2462	16.50	---	---
IEEE 802.11g (6Mbps)	01	2412	16.80	16.70	16.70
	06	2437	16.90	16.90	16.70
	11	2462	16.90	16.70	16.70
802.11n HT20 (6.5Mbps)	01	2412	17.70	17.80	17.70
	06	2437	17.70	17.70	17.60
	11	2462	17.70	17.80	17.70
802.11n HT40 (13.5Mbps)	03	2422	36.80	36.60	36.60
	06	2437	36.80	36.60	36.40
	09	2452	36.60	36.60	36.60



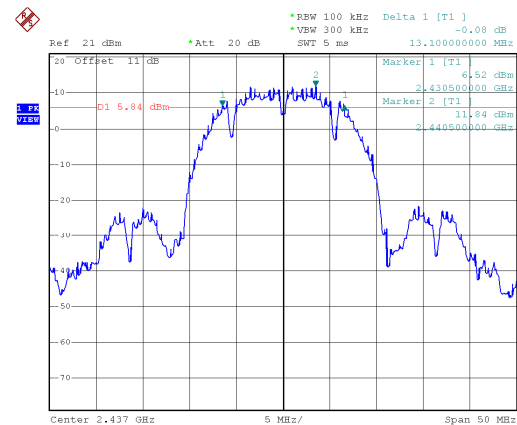
6dB Bandwidth
ANT A
Modulation Type: 802.11b
CH01



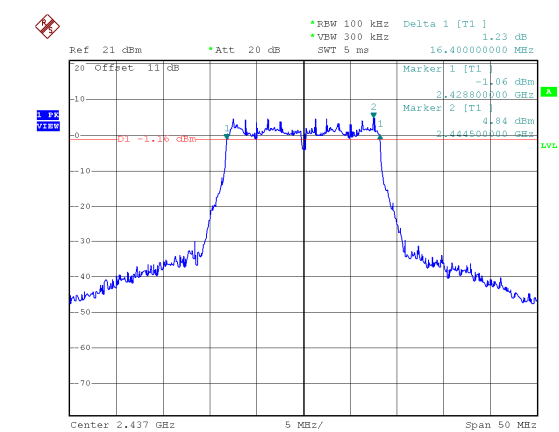
Modulation Type: 802.11g
CH01



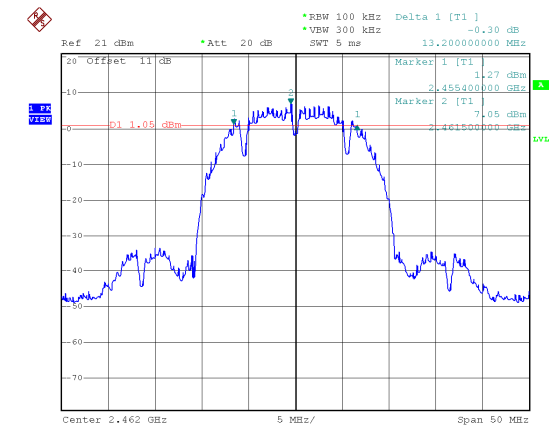
CH06



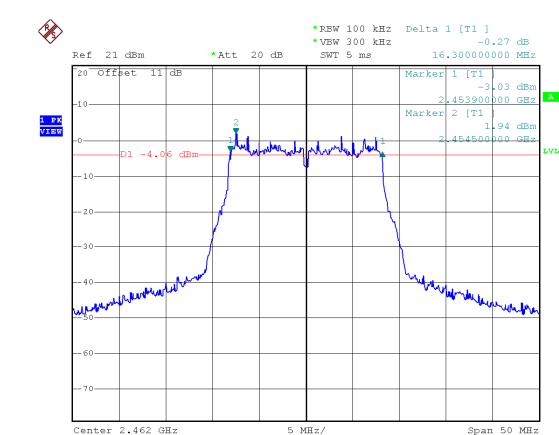
CH06

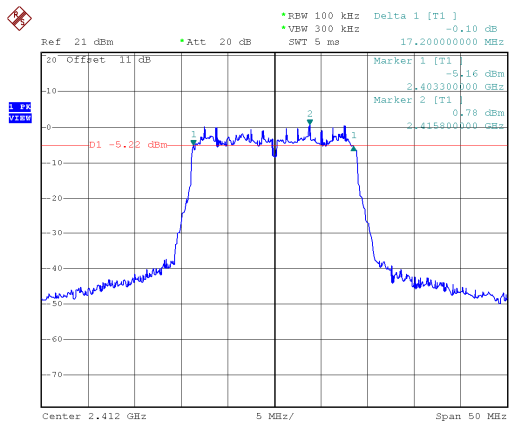
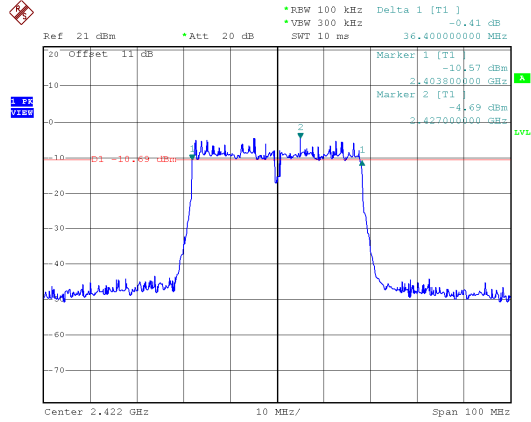


CH11

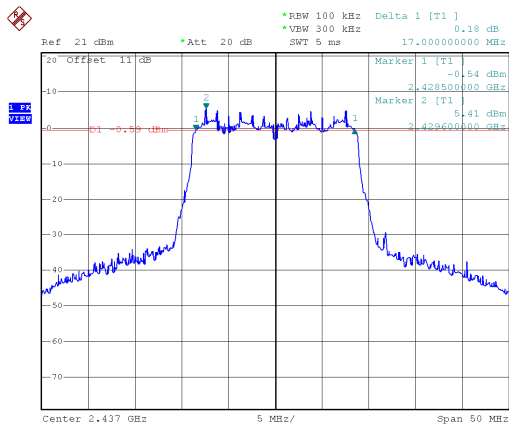


CH11

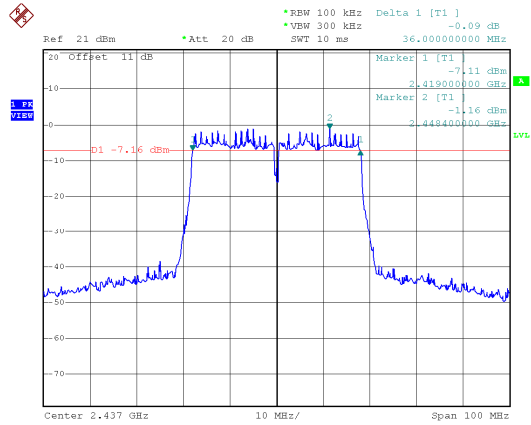


Modulation Type: 802.11n HT20
CH01Modulation Type: 802.11n HT40
CH03

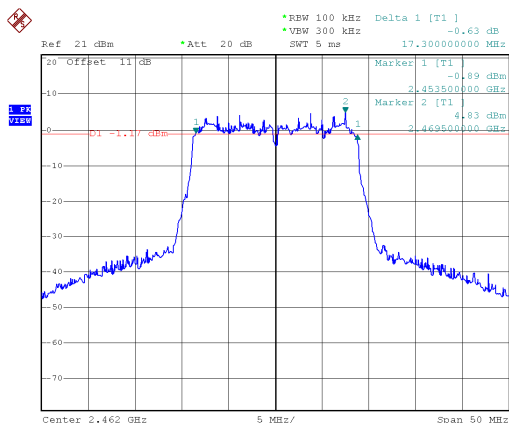
CH06



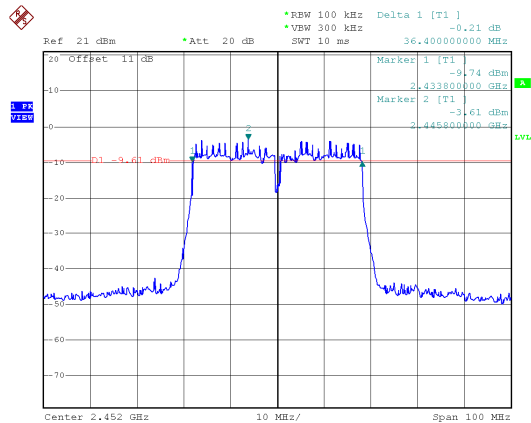
CH06



CH11

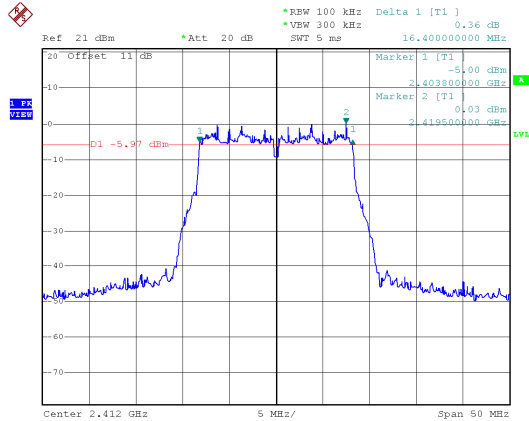


CH09

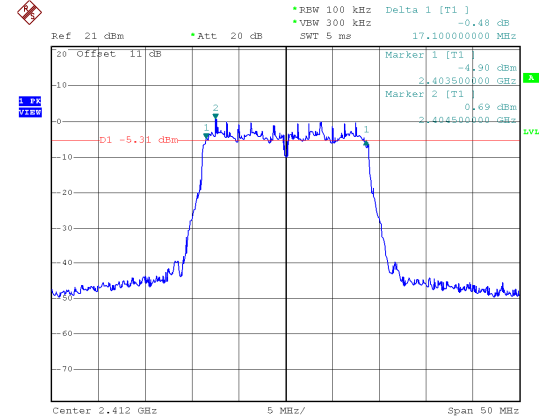




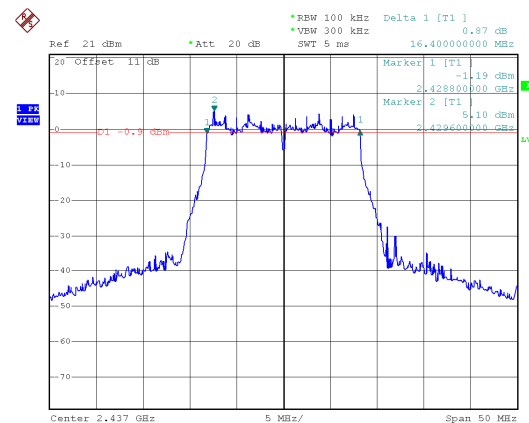
ANT B
Modulation Type: 802.11g
CH01



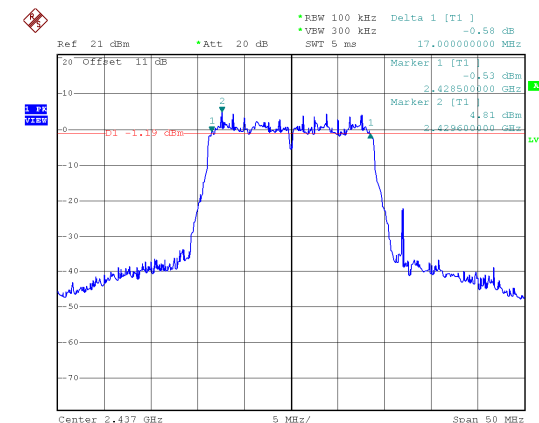
Modulation Type: 802.11n HT20
CH01



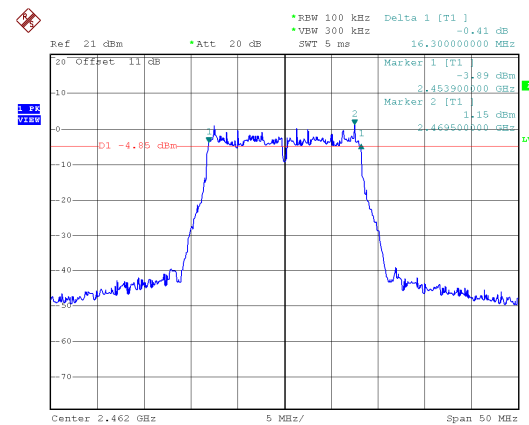
CH06



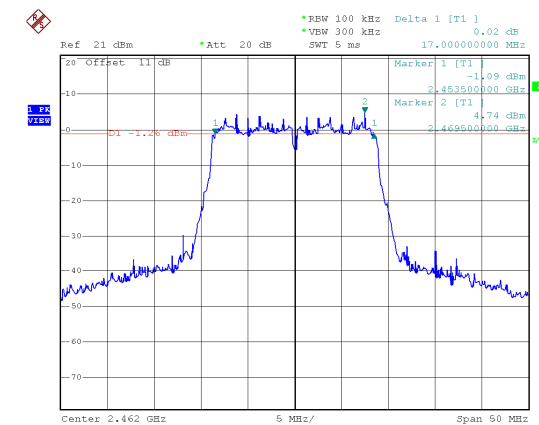
CH06

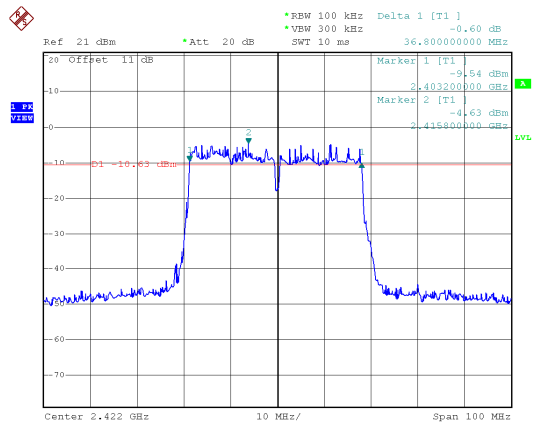


CH11

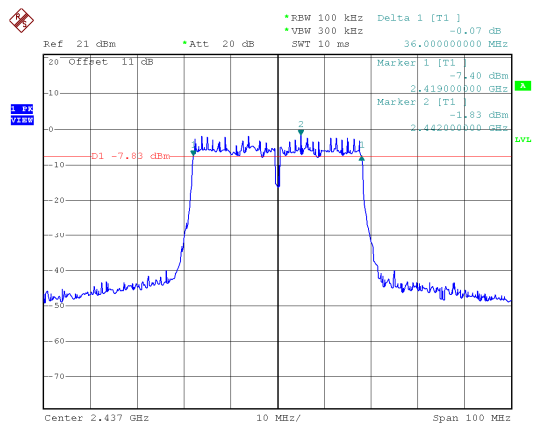


CH11

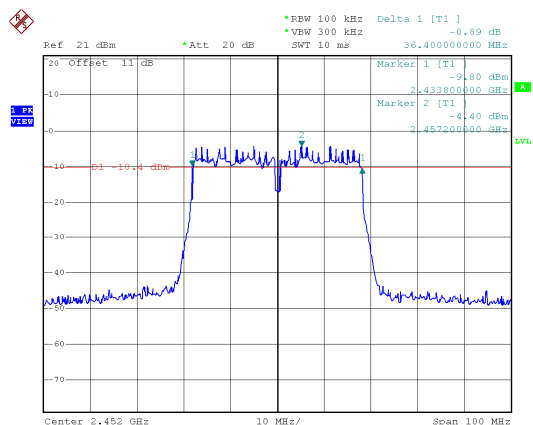


Modulation Type: 802.11n HT40
CH03

CH06

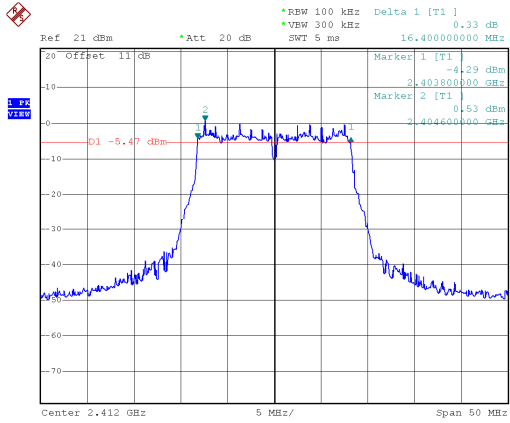
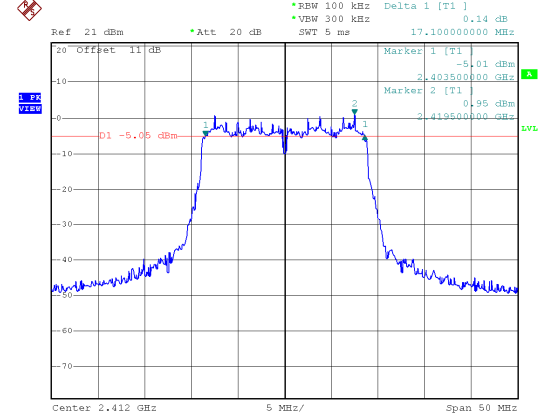


CH09

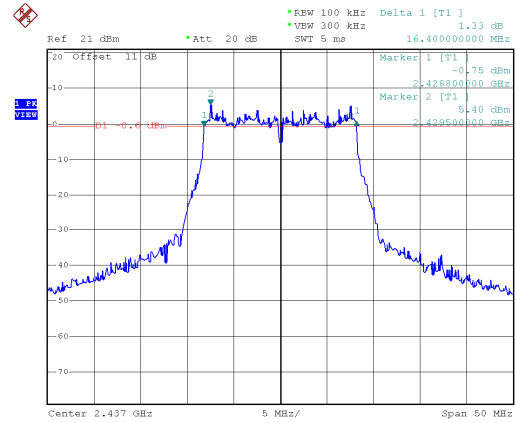




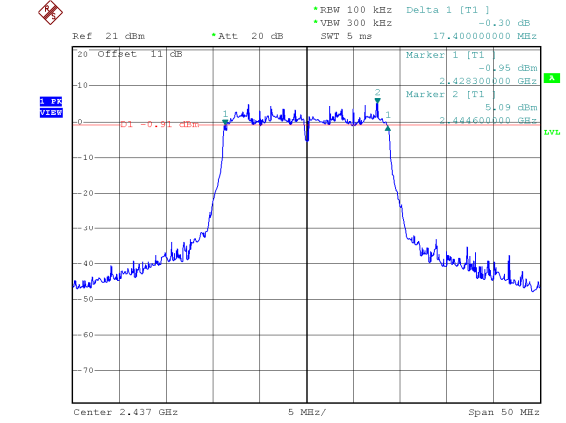
ANT C

Modulation Type: 802.11g
CH01Modulation Type: 802.11n HT20
CH01

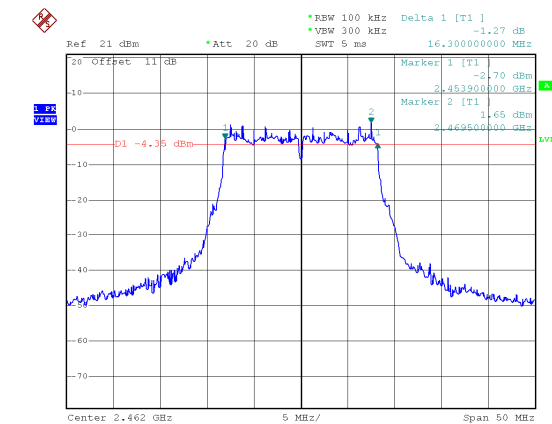
CH06



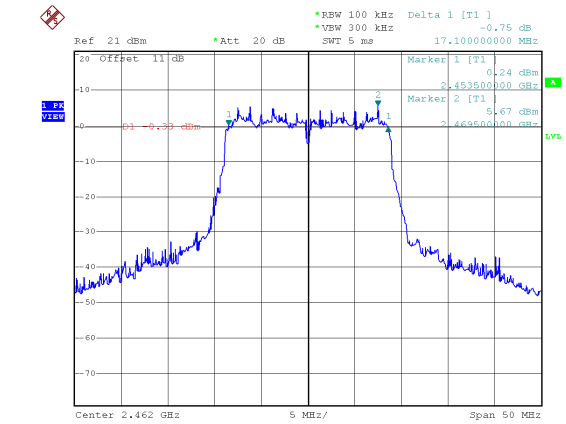
CH06

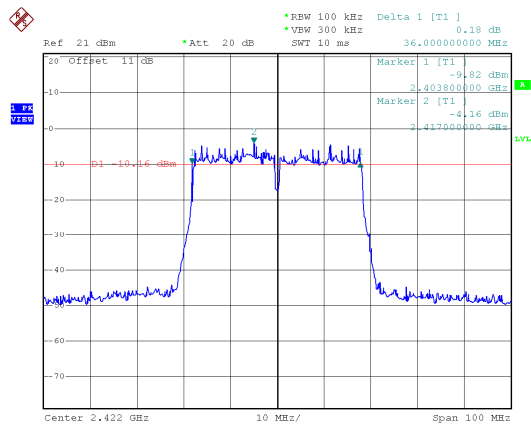


CH11

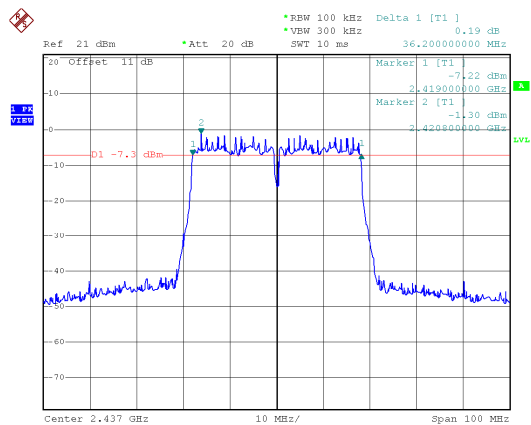


CH11

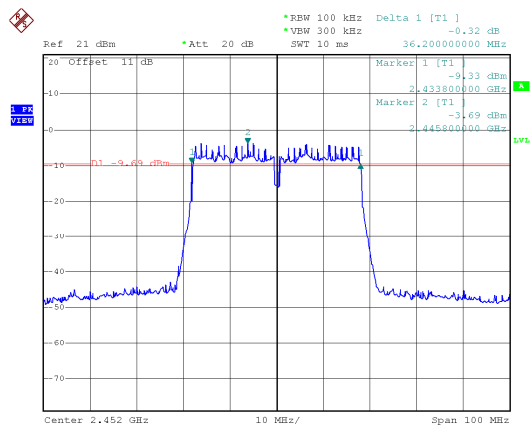


Modulation Type: 802.11n HT40
CH03

CH06

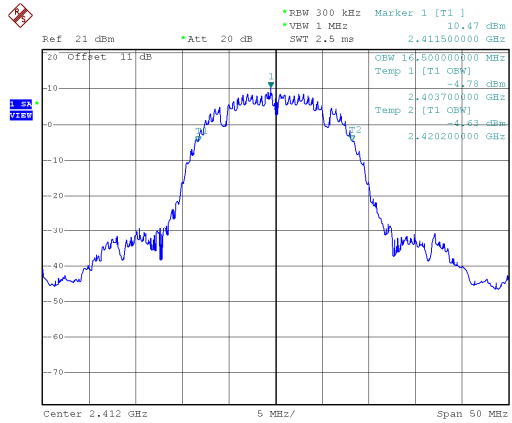


CH09

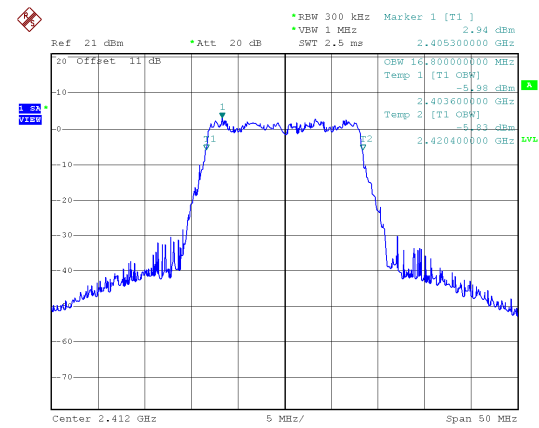




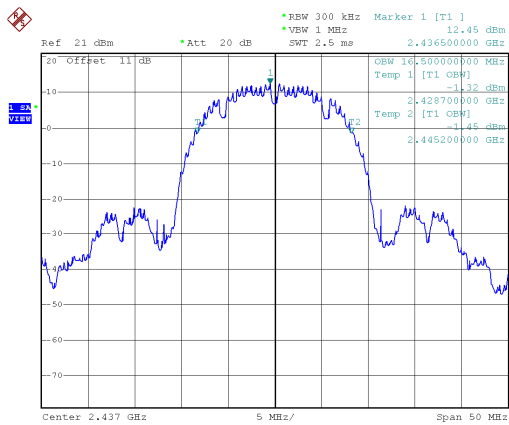
99% Bandwidth
ANT A
Modulation Type: 802.11b
CH01



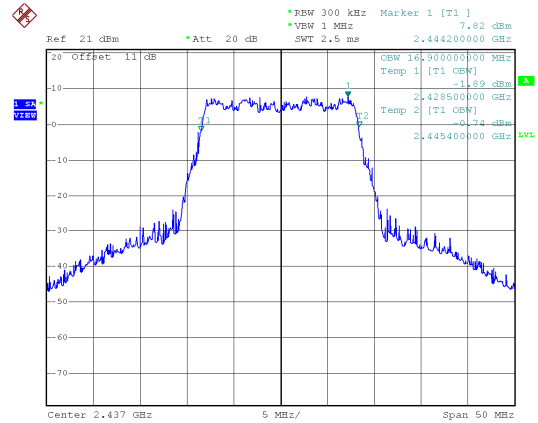
Modulation Type: 802.11g
CH01



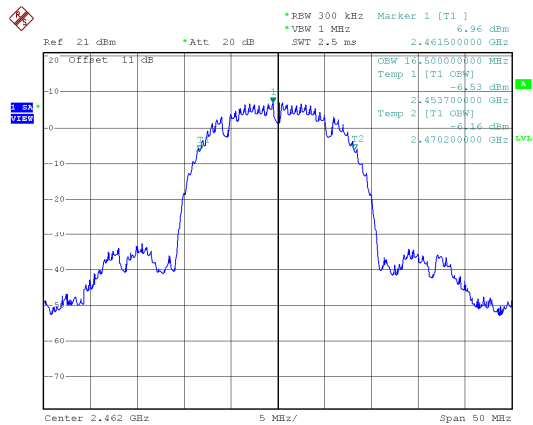
CH06



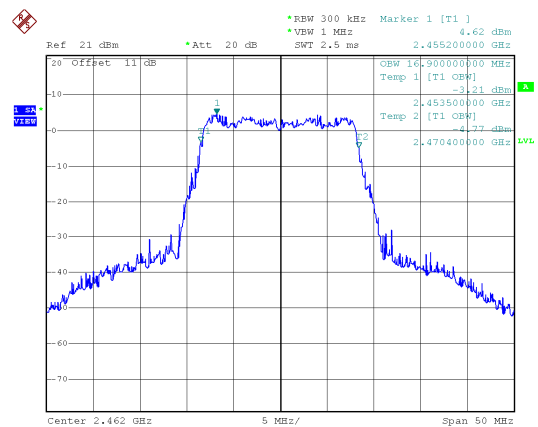
CH06

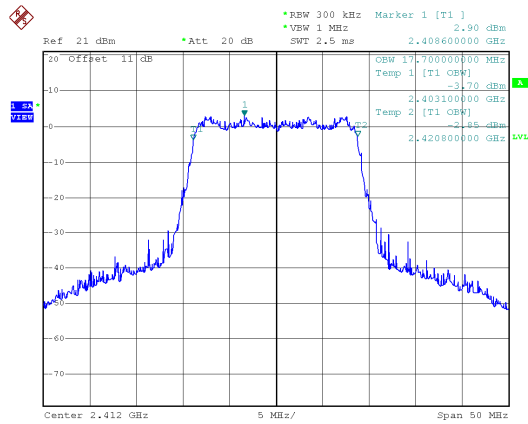
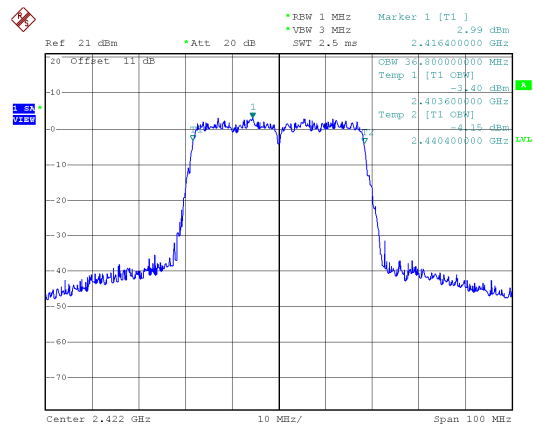


CH11

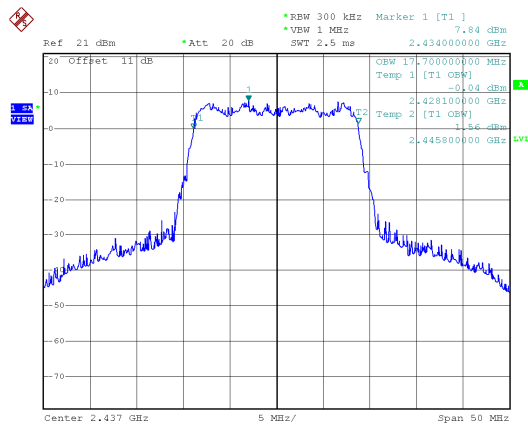


CH11

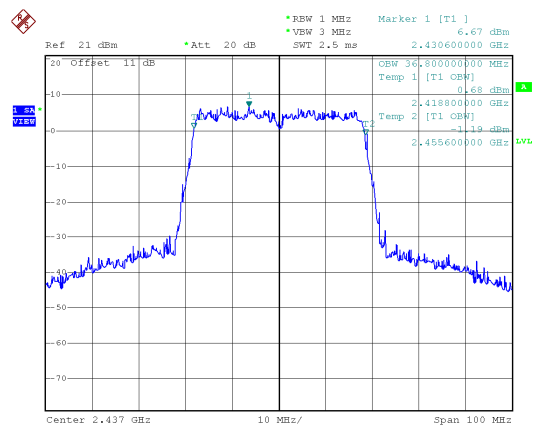


Modulation Type: 802.11n HT20
CH01Modulation Type: 802.11n HT40
CH03

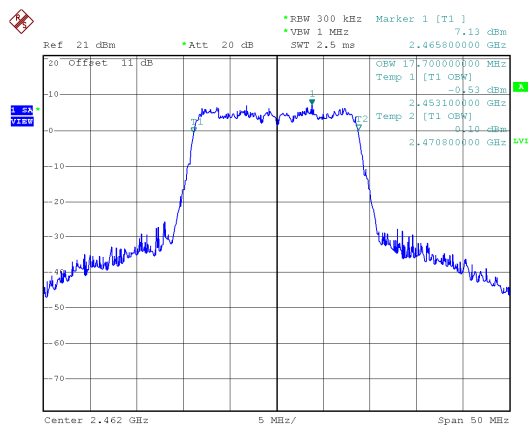
CH06



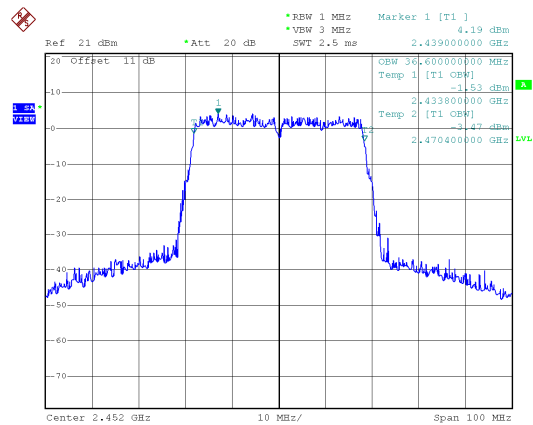
CH06



CH11

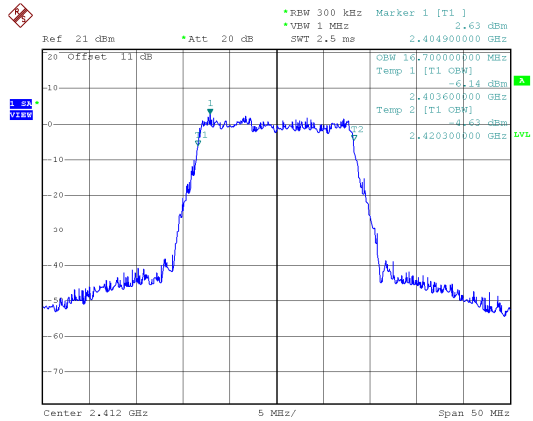


CH09

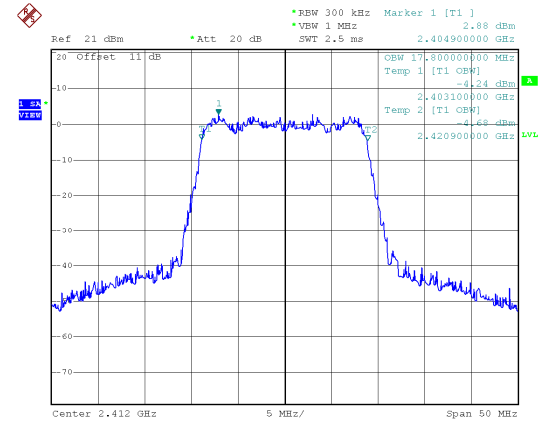




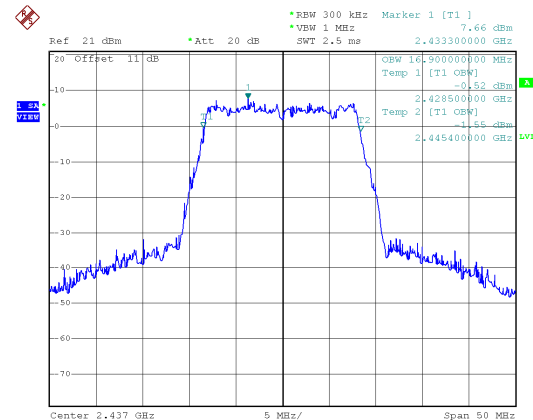
ANT B
Modulation Type: 802.11g
CH01



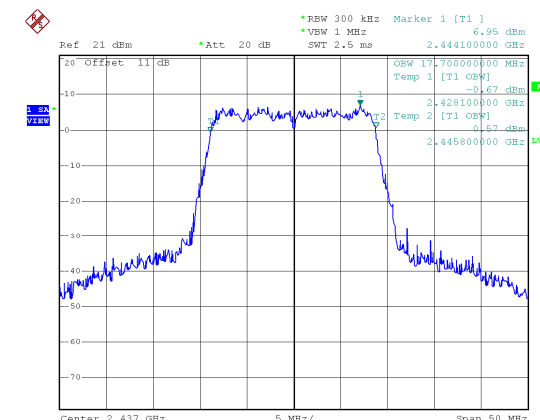
Modulation Type: 802.11n HT20
CH01



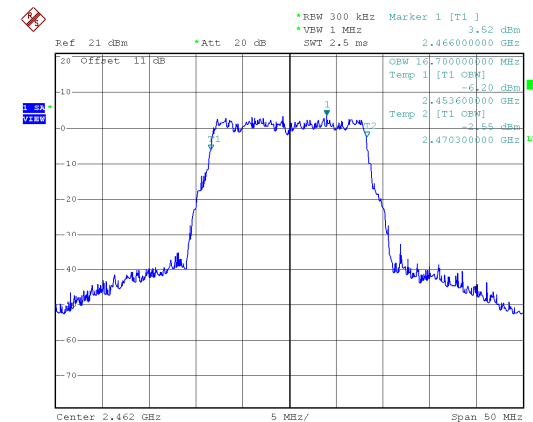
CH06



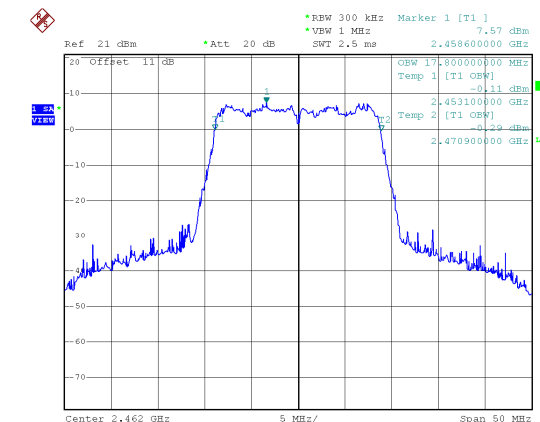
CH06



CH11

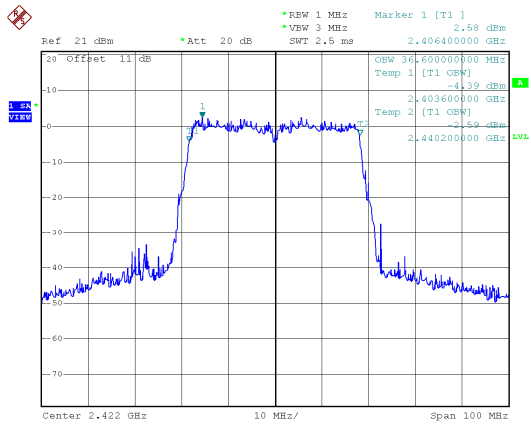


CH11

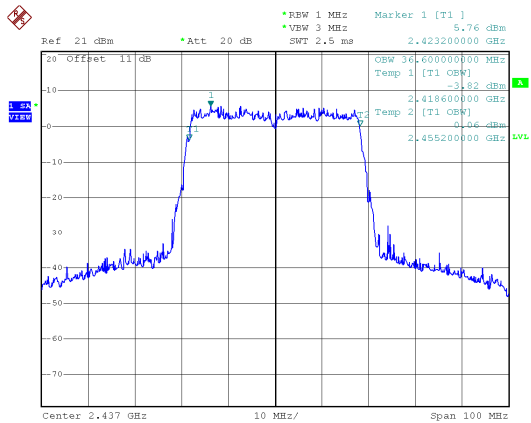




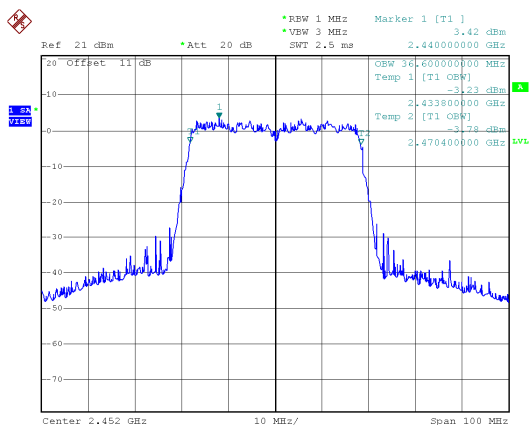
Modulation Type: 802.11n HT40
CH03



CH06

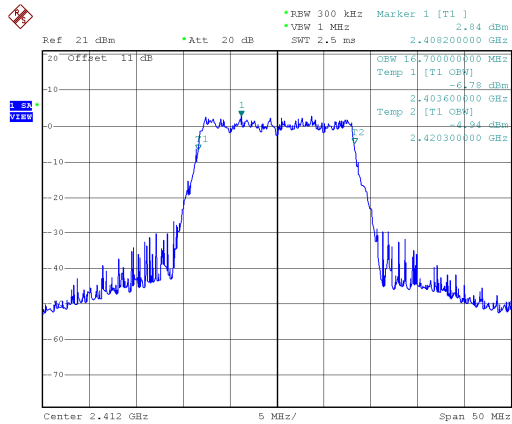
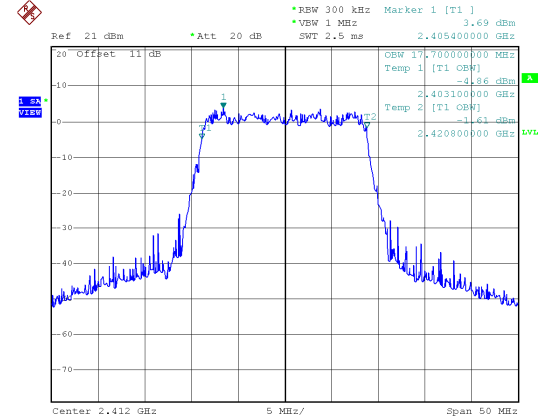


CH09

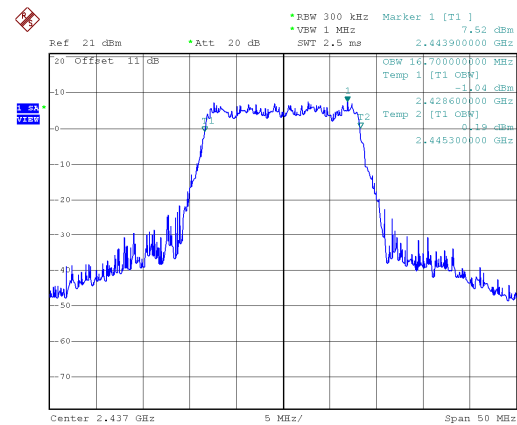




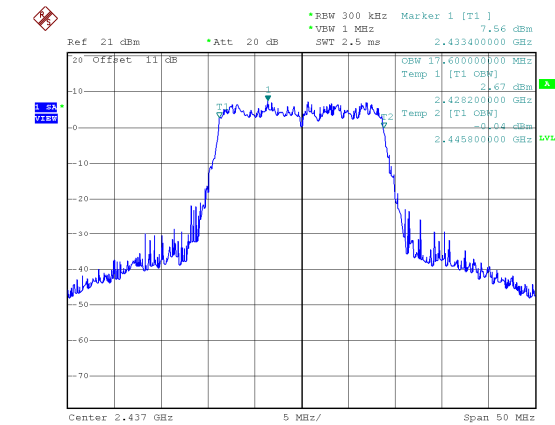
ANT C

Modulation Type: 802.11g
CH01Modulation Type: 802.11n HT20
CH01

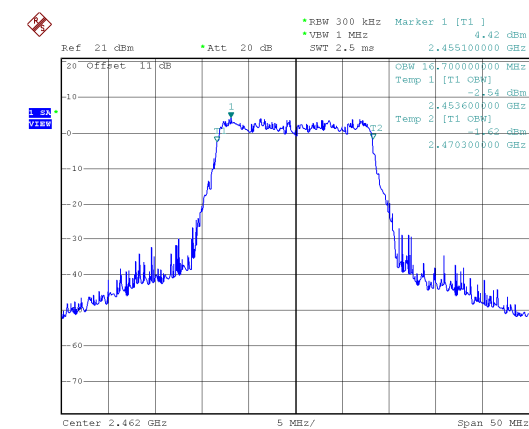
CH06



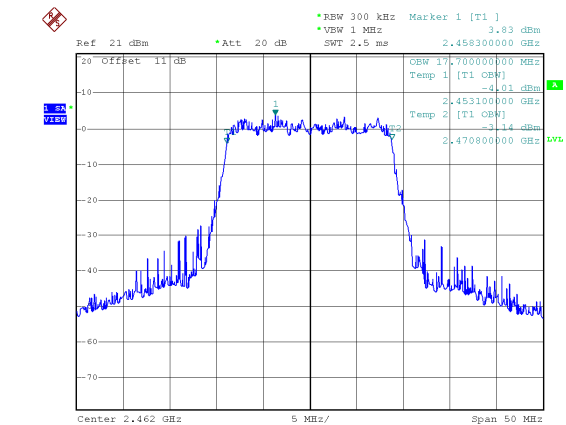
CH06



CH11

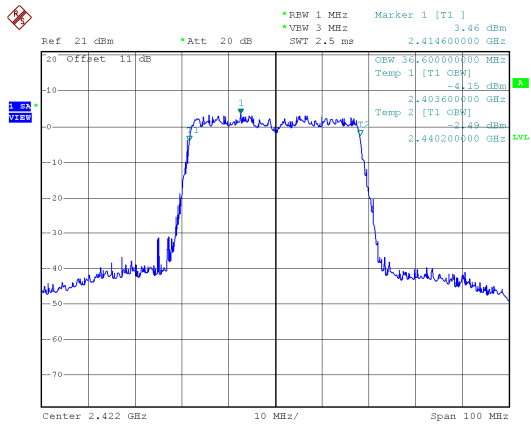


CH11

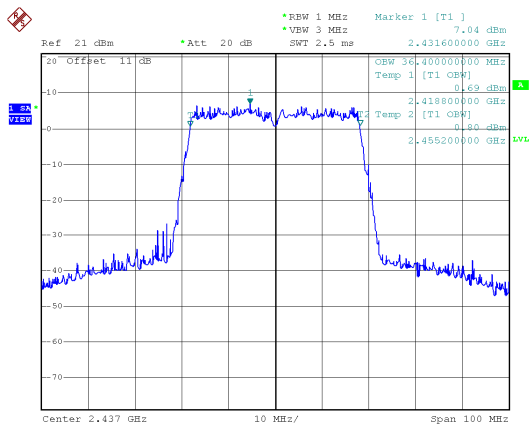




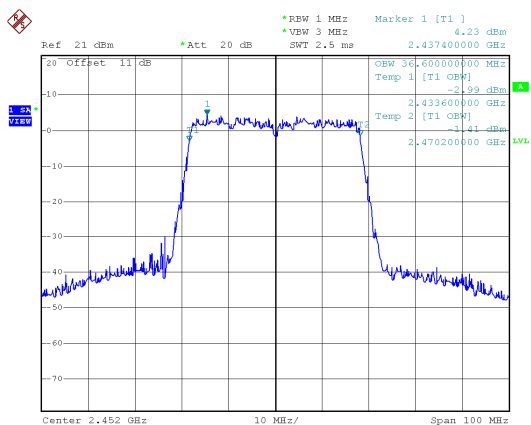
Modulation Type: 802.11n HT40
CH03



CH06



CH09





9. Maximum Peak and Average Output Power

9.1 Test Limit

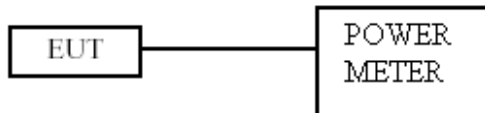
The Maximum Average Output Power Measurement is 30dBm.

If transmitting antennas of directional gain greater than 6 dBi are used, the average output power shall be reduced by the amount in 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 : 22°C

Humidity : 62%

Test Date : Aug. 22, 2018

Modulation Type	Channel	Frequency (MHz)	Peak Power Output (dBm)			Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B	ANT C			
IEEE 802.11b (1Mbps)	01	2412	25.1	---	---	25.10	323.59	30.00
	06	2437	25.71	---	---	25.71	372.39	30.00
	11	2462	23.59	---	---	23.59	228.56	30.00
IEEE 802.11g (6Mbps)	01	2412	20.76	20.19	20.47	25.25	335.03	30.00
	06	2437	24.85	24.61	25.02	29.60	912.25	30.00
	11	2462	20.97	20.67	21.15	25.71	372.02	30.00
IEEE 802.11n HT20 (6.5Mbps)	01	2412	20.88	20.48	20.89	25.53	356.89	30.00
	06	2437	24.97	24.68	24.85	29.61	913.31	30.00
	11	2462	20.39	20.11	20.55	25.13	325.46	30.00
IEEE 802.11n HT40 (13.5Mbps)	03	2422	18.34	17.66	18.21	22.85	192.80	30.00
	06	2437	21.48	21.02	21.46	26.10	407.04	30.00
	09	2452	18.91	18.27	19.07	23.53	225.67	30.00

Modulation Type	Channel	Frequency (MHz)	Avg. Power Output (dBm)V			Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B	ANT C			
IEEE 802.11b (1Mbps)	01	2412	22.15	---	---	22.15	164.06	30.00
	06	2437	24.26	---	---	24.26	266.69	30.00
	11	2462	20.45	---	---	20.45	110.92	30.00
IEEE 802.11g (6Mbps)	01	2412	12.15	11.51	11.77	16.59	45.60	30.00
	06	2437	16.49	16.11	16.54	21.16	130.48	30.00
	11	2462	12.46	11.98	12.52	17.10	51.26	30.00
IEEE 802.11n HT20 (6.5Mbps)	01	2412	12.26	11.77	12.19	16.85	48.42	30.00
	06	2437	16.56	16.02	16.43	21.11	129.24	30.00
	11	2462	11.78	11.45	11.94	16.50	44.66	30.00
IEEE 802.11n HT40 (13.5Mbps)	03	2422	9.76	9.27	9.59	14.32	27.01	30.00
	06	2437	12.87	12.42	12.78	17.47	55.79	30.00
	09	2452	10.25	9.75	10.19	14.84	30.48	30.00

Note: Average power is for reference only.



10. Power Spectral Density

10.1 Test Limit

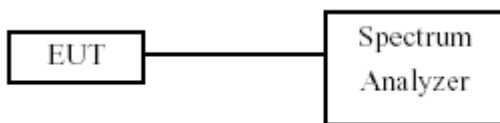
The Maximum of Power Spectral Density Measurement is 8dBm.

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

Reference to KDB558074 DTS Meas Guidance v04 D01

10.3 Test Setup Layout



10.4 Test Result and Data

Temperature : 22°C

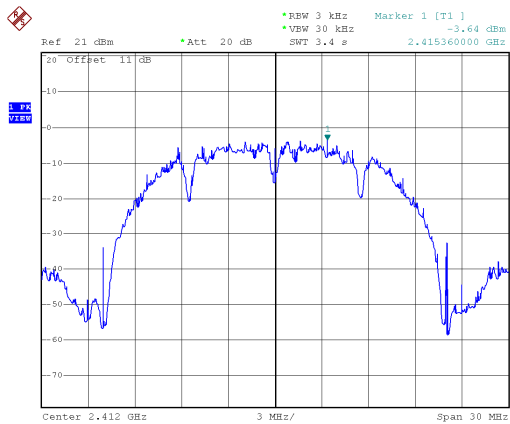
Humidity : 62%

Test Date : Aug. 22, 2018

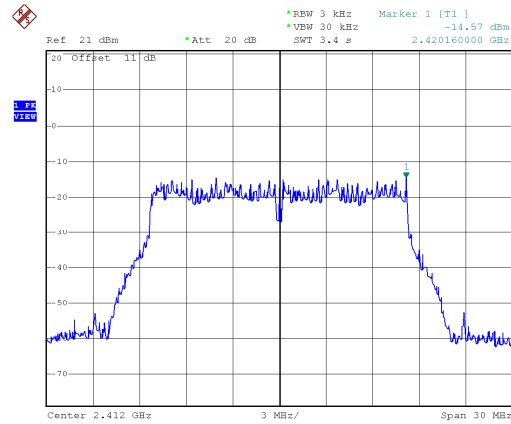
Modulation Type	Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)			Sum chain (dBm)	Duty Cycle CF(dB)	Total PSD (dBm)	Limit (dBm)
			ANT A	ANT B	ANT C				
IEEE 802.11b (1Mbps)	01	2412	-3.64	---	---	-3.64	0.00	-3.64	8.00
	06	2437	-0.90	---	---	-0.90	0.00	-0.90	8.00
	11	2462	-4.79	---	---	-4.79	0.00	-4.79	8.00
IEEE 802.11g (6Mbps)	01	2412	-14.57	-13.24	-13.72	-9.04	0.00	-9.04	5.21
	06	2437	-8.14	-9.23	-7.68	-3.53	0.00	-3.53	5.21
	11	2462	-11.71	-11.62	-12.24	-7.08	0.00	-7.08	5.21
802.11n HT20 (6.5Mbps)	01	2412	-14.47	-15.38	-13.90	-9.77	0.00	-9.77	5.21
	06	2437	-9.66	-9.56	-9.17	-4.69	0.00	-4.69	5.21
	11	2462	-14.06	-13.09	-13.28	-8.69	0.00	-8.69	5.21
802.11n HT40 (6.5Mbps)	03	2422	-17.18	-15.61	-17.03	-11.78	0.00	-11.78	5.21
	06	2437	-16.34	-16.88	-15.59	-11.47	0.00	-11.47	5.21
	09	2452	-17.63	-18.27	-18.71	-13.41	0.00	-13.41	5.21



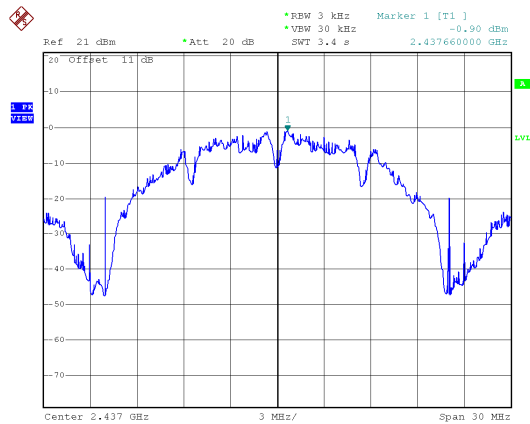
ANT A
Modulation Type: 802.11b
CH01



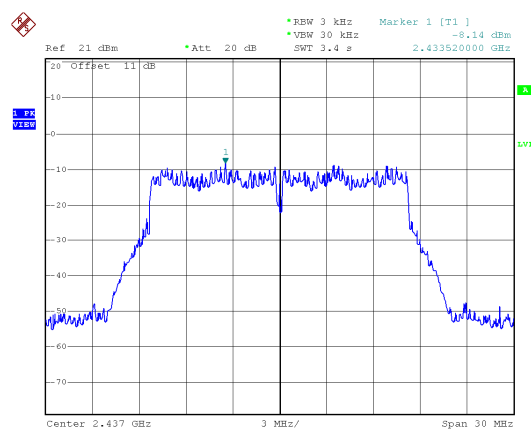
Modulation Type: 802.11g
CH01



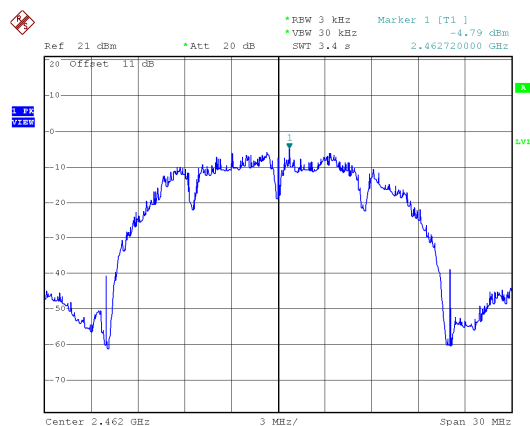
CH06



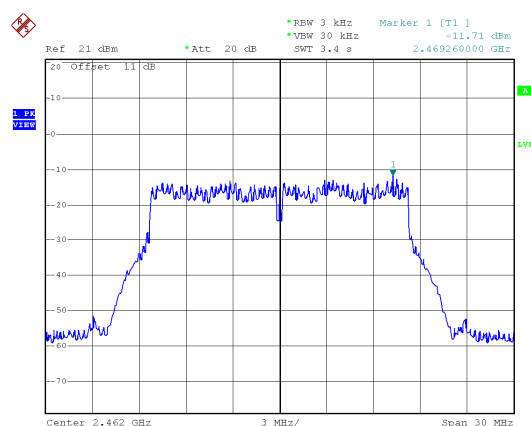
CH06

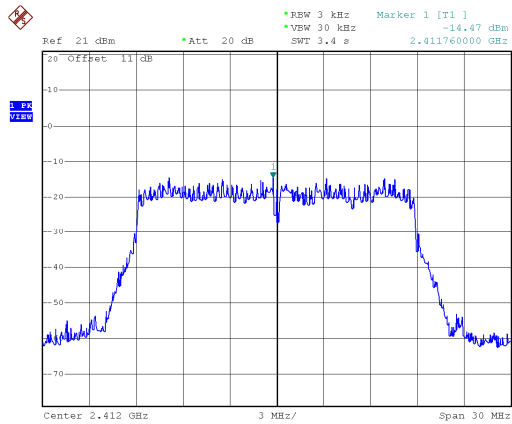
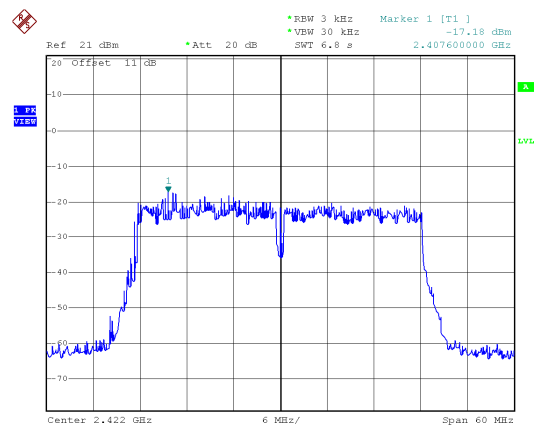


CH11

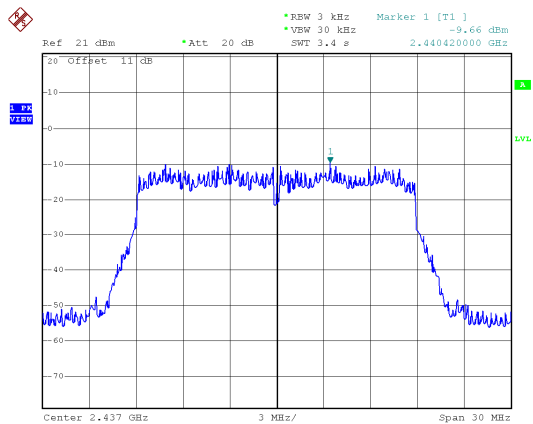


CH11

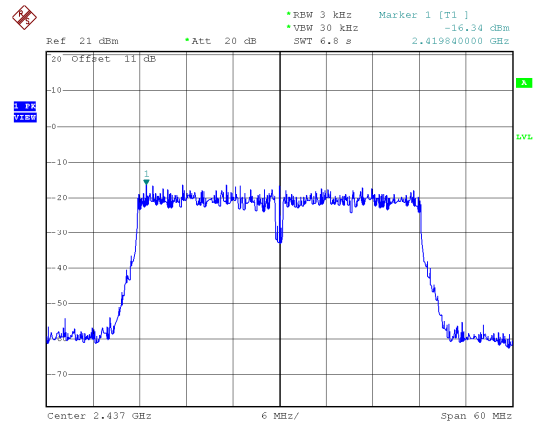


Modulation Type: 802.11n HT20
CH01Modulation Type: 802.11n HT40
CH03

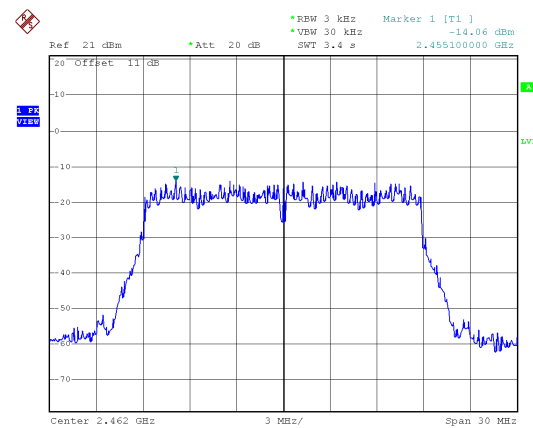
CH06



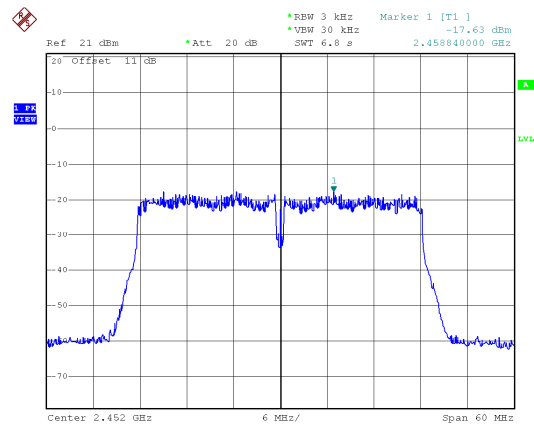
CH06



CH11

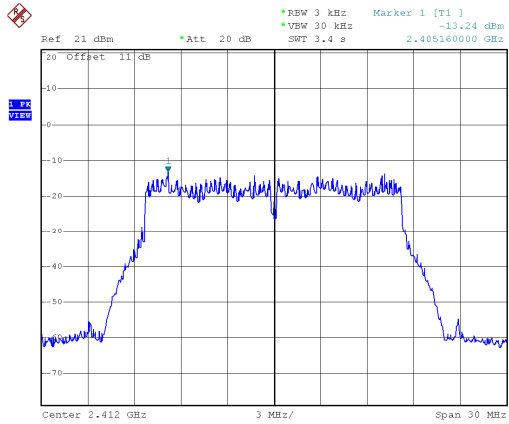


CH09

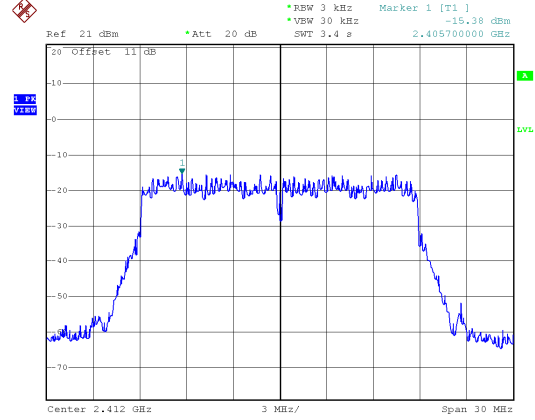




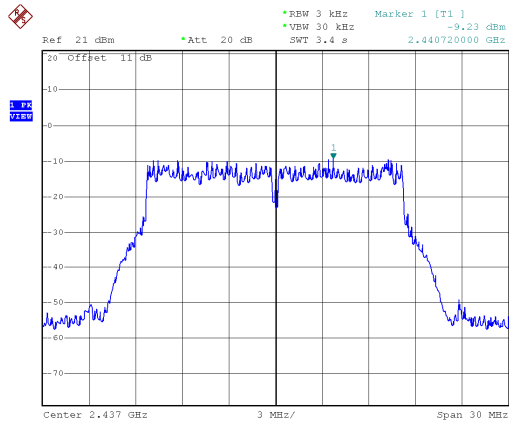
ANT B
Modulation Type: 802.11g
CH01



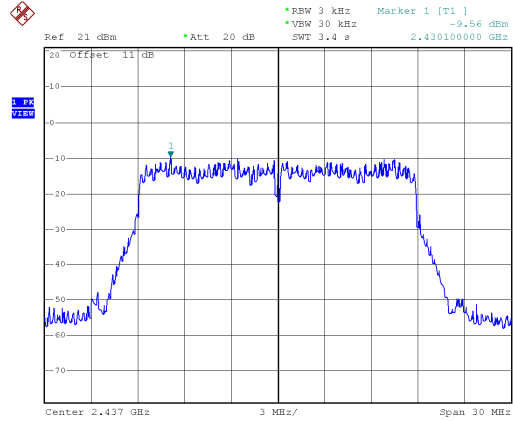
Modulation Type: 802.11n HT20
CH01



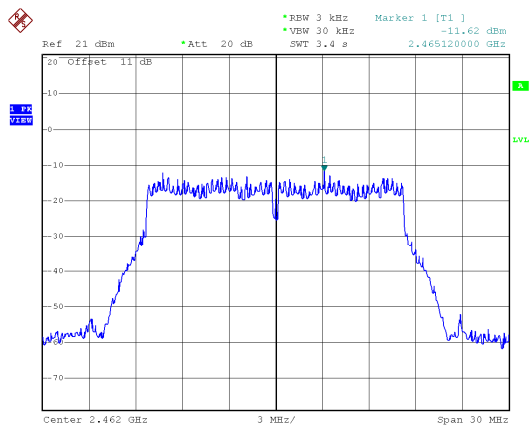
CH06



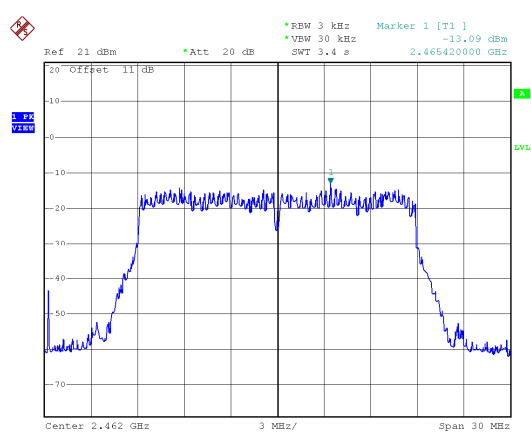
CH06



CH11

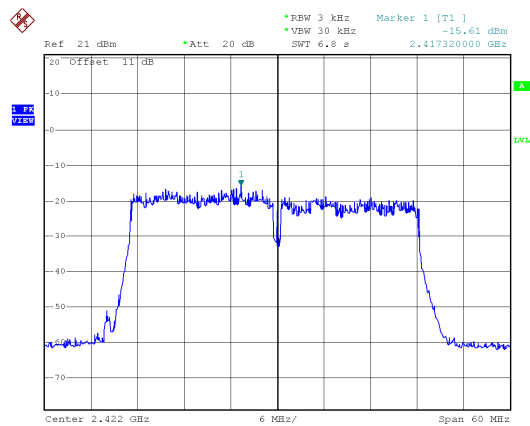


CH11

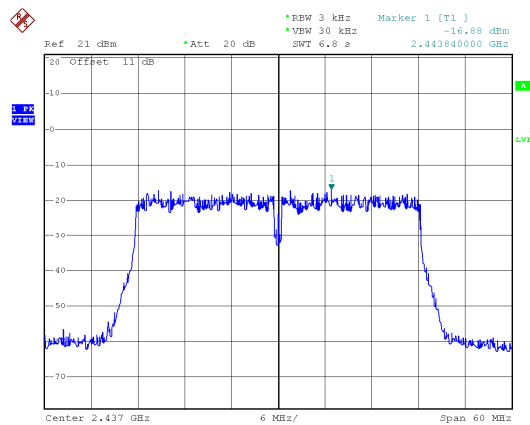




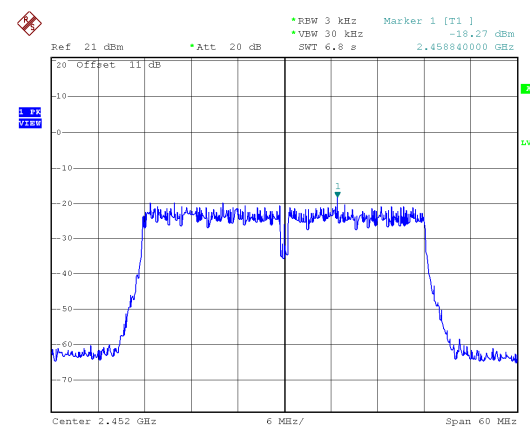
Modulation Type: 802.11n HT40
CH03



CH06



CH09

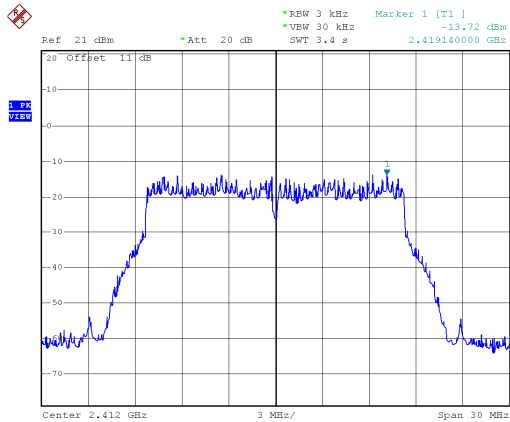




ANT C

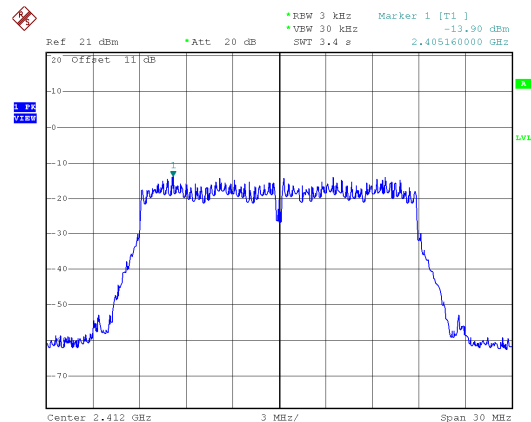
Modulation Type: 802.11g

CH01

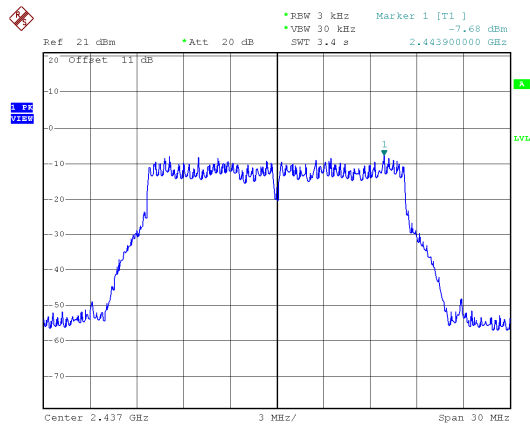


Modulation Type: 802.11n HT20

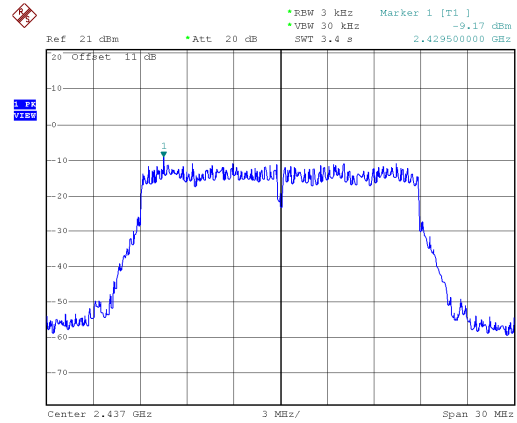
CH01



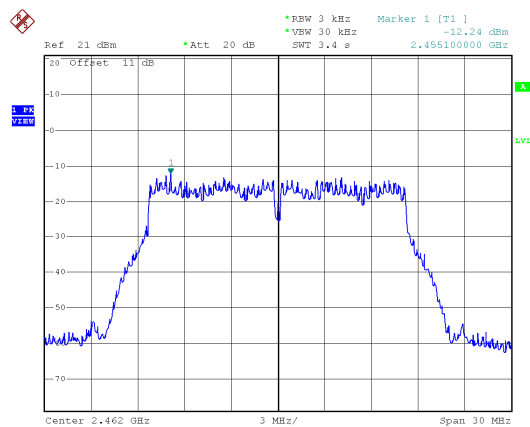
CH06



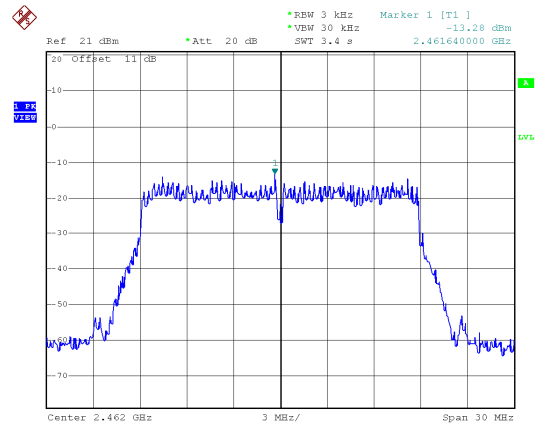
CH06



CH11

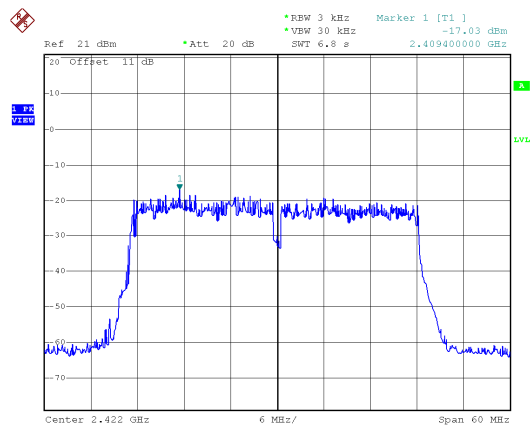


CH11

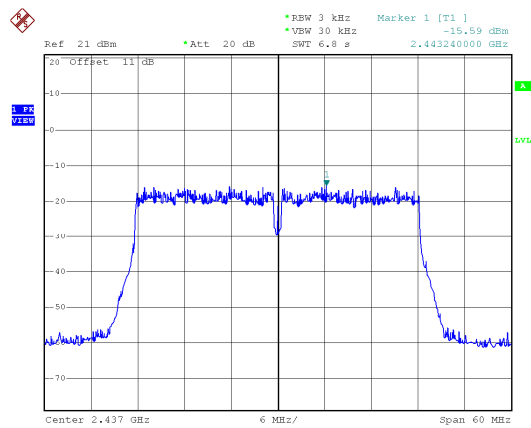




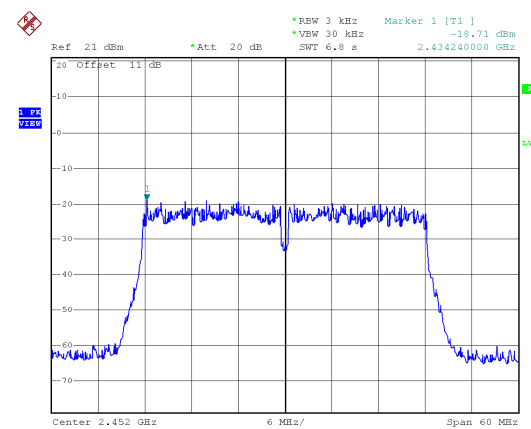
Modulation Type: 802.11n HT40
CH03



CH06



CH09





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. 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:

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

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

Maximum Permissible Exposure

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
802.11b	2412-2462	25.71	4.2	20	0.1949	1
802.11g	2412-2462	29.60	4.5	20	0.5115	1
802.11n HT20	2412-2462	29.61	4.5	20	0.5121	1
802.11n HT40	2422-2452	26.10	4.5	20	0.2282	1

Maximum Permissible Exposure (Co-location)

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)
802.11n HT20	2412-2462	29.61	4.5	20	0.5121
802.11ac VHT40	5150-5250	25.83	5.7	20	0.2827
Co-location Total					0.7948
Maximum Permissible Exposure Limit					1