



FCC RADIO TEST REPORT

Applicant : AOPEN Inc.
Address : 5F., No.15, Ln. 128, Sinhu 1st Rd., Neihu District,
 Taipei City 114, Taiwan(R.O.C.)
Equipment : AOPEN Chromebox Mini Commercial
Model No. : ME4100
Trade Name : AOPEN
FCC ID. : YEW-ME4100CM389

I HEREBY CERTIFY THAT :

The sample was received on Feb. 07, 2017 and the testing was carried out on Feb. 24, 2017 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass 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:

Cerpass Technology Corporation Test Laboratory





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History of this test report

Report No.	Issue Date	Description
TEFI1701084	Mar. 08, 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

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

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

WLAN Module	AzureWave / AW-CM389NF	
Frequency Range	2.4 GHz ISM radio band / 5 GHz Unlicensed National Information Infrastructure (U-NII) band	
Number of Channels	802.11ac: USA-4 802.11a: USA, Taiwan – 12/4 Most European Countries –19 Japan – 4 802.11b: USA, Canada and Taiwan – 11 Most European Countries – 13 France – 4 802.11g: USA, Canada and Taiwan – 11 Most European Countries – 13 Japan – 13 802.11n(HT20): Channel 1~13(2412~2472) 802.11n(HT40): Channel 1~7(2422~2452)	
Modulation	DSSS, OFDM, DBPSK, DQPSK, CCK, 16-QAM, 64-QAM and 256-QAM for WLAN GFSK (1Mbps), Π/4 DQPSK (2Mbps) and 8DPSK (3Mbps) for Bluetooth	
Data Rates	WLAN 802.11b: 1, 2, 5.5, 11Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: up to 150Mbps-single 802.11n: up to 300Mbps-2x2 MIMO 802.11ac:up to 192.6Mbps (20MHz channel) 802.11ac:up to 400Mbps (40MHz channel) 802.11ac:up to 866.7Mbps (80MHz channel) Bluetooth Bluetooth 2.1+EDR data rates of 1,2, and 3Mbps NFC NFC data rates up to 848Kbps	
Antenna Type/ gain	Dipole antenna / 1.92dBi	
Adapter	Model No.	ADP-40KD BB
	INPUT	100-240V~1.2A, 50-60Hz
	OUTPUT	19V, 2.1A

Note: for more details, please refer to the User's manual of the EUT.



2.2 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.

2.3 Test Mode and Test Software

- During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- An executive program, "Dut labtool V2.0.0.44" under Chrome was executed to transmit and receive data via WLAN.
- The following test modes were performed for the test:

Test Mode 1: 802.11b (1Mbps)

Test Mode 2: 802.11g (6Mbps)

Test Mode 3: 802.11n HT20 (6.5Mbps)

Test Mode 4: 802.11n HT40 (13.5Mbps)

For conduction test, caused "Test Mode 2" generated the worst case, it was reported as the final data.

For radiation test (below 1GHz), caused "Test Mode 2" generated the worst case, it was reported as the final data.

For radiation test (above 1GHz), caused "Test Mode 1~4" generated the worst case, they were reported as the final data.

2.4 Description of Test System

The EUT was tested alone. No support devices are needed for testing.



2.5 General Information of Test

Test Site	Cerpass 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-4218, R-4399 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	2016/03/28	2017/03/27
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	2016/03/22	2017/03/21
Active Loop Antenna	EMCO	6507	40855	2016/05/11	2017/05/10
Horn Antenna	EMCO	3115	31601	2016/09/05	2017/09/04
Horn Antenna	EMCO	3116	31970	2016/03/18	2017/03/17
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200207	2016/03/16	2017/03/15
Preamplifier	EM	EM330	660	2016/03/16	2017/03/15
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2016/09/13	2017/09/12
Preamplifier	Agilent	8449B	3008A01954	2017/02/09	2018/02/08
Preamplifier	MITEQ	AMF-7D-00101 00-30-10P	1860212	2016/03/16	2017/03/15
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2016/11/04	2017/11/03
MXG MW Analog Signal Generator	KEYSIGHT	N5183A	MY50142931	2016/03/18	2017/03/17
Spectrum Analyzer	R&S	FSP40	100219	2016/09/01	2017/08/31
Bluetooth Tester	R&S	CBT	101133	2016/03/18	2017/03/17
Attenuator	KEYSIGHT	8491B	MY39250703	2016/03/07	2017/03/06
Rotary Attenuator	Agilent	8494B	MY42154466	2016/03/08	2017/03/07
Rotary Attenuator	Agilent	8495B	MY42146680	2016/03/08	2017/03/07
Temp & Humi chamber	T-MACHINE	TMJ-9712	T-12-040111	2016/09/05	2017/09/04
Series Power Meter	Anritsu	ML2495A	1224005	2016/03/03	2017/03/02
Power Sensor	Anritsu	MA2411B	1207295	2016/03/03	2017/03/02
Cable	HUBER SUHNER	SUCOFLEX 102	28422/2	2016/03/15	2017/03/14
Cable	HUBER SUHNER	SUCOFLEX 102	28418/2	2016/03/16	2017/03/15
Cable	HUBER SUHNER	SUCOFLEX 102	28417/2	2016/03/04	2017/03/03
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	Antenna Gain
Dipole Antenna	Antenna A: 1.92 dBi
	Antenna B: 1.92 dBi

For Power directional gain= $G_{ant} = 1.92 \text{ dBi}$

$$\begin{aligned}\text{For PSD directional gain} &= 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] \\ &= 4.93 \text{ (dBi)}\end{aligned}$$



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

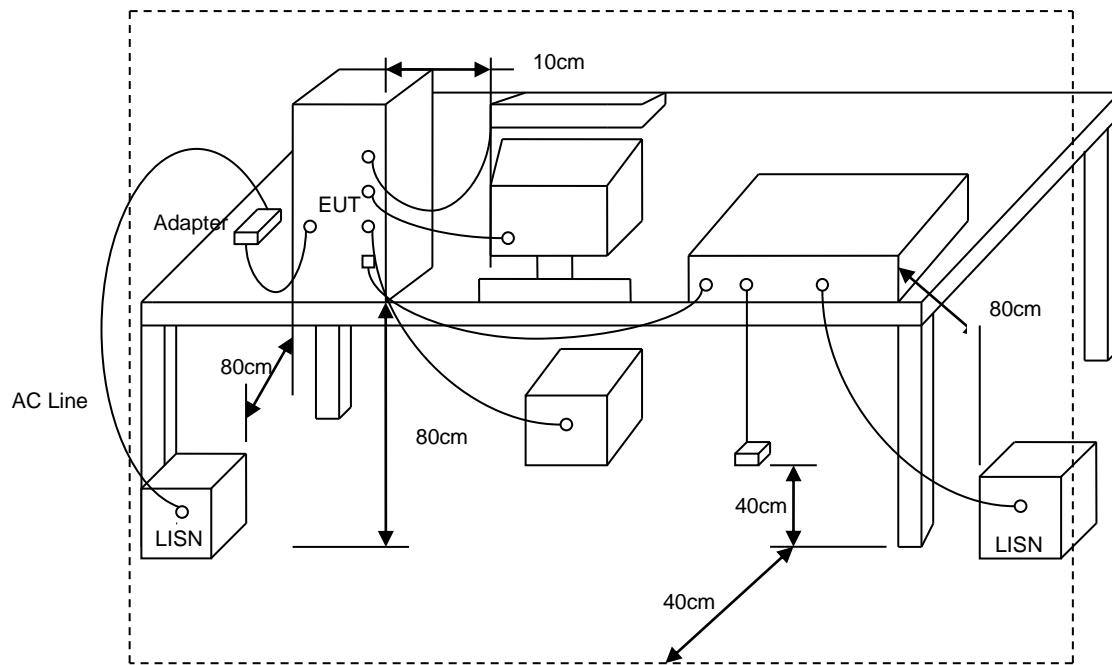
*Decreases with the logarithm of the frequency.

5.2 Test Procedures

- a. 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.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



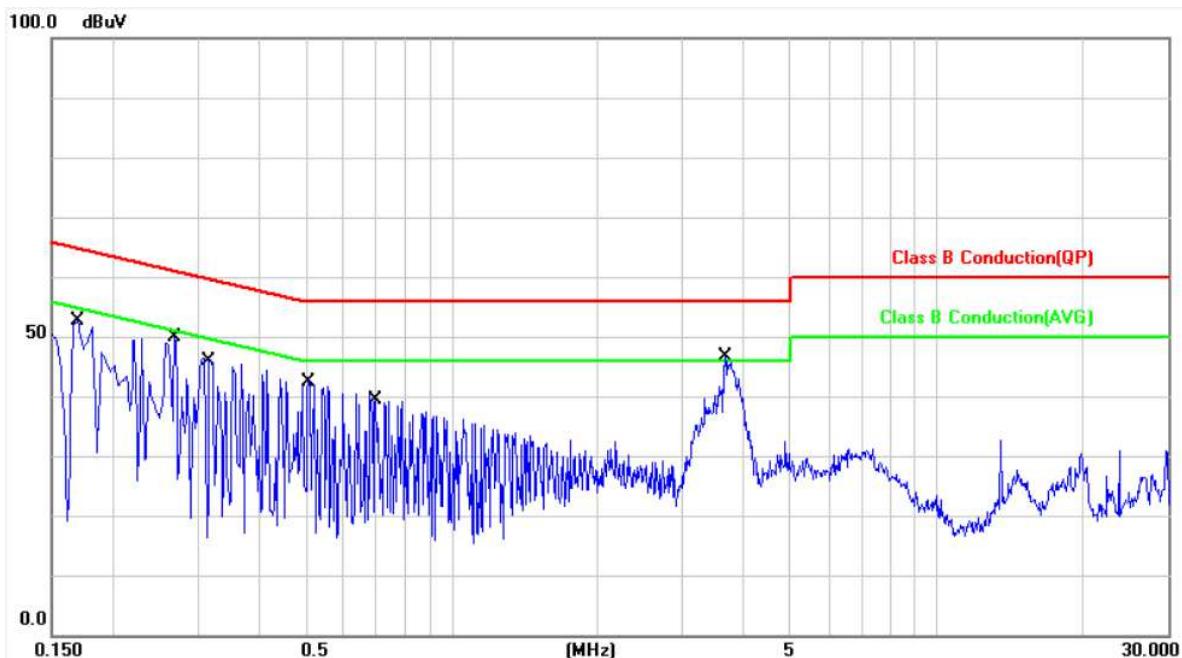
5.3 Typical Test Setup





5.4 Test Result and Data

Power :	AC 120V	Pol/Phase :	LINE
Test Mode :	Mode 2	Temperature :	22 °C
Test date :	Feb. 18, 2017	Humidity :	56 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1700	9.98	34.63	44.61	64.96	-20.35	QP	P
2	0.1700	9.98	13.28	23.26	54.96	-31.70	AVG	P
3	0.2700	9.97	30.34	40.31	61.12	-20.81	QP	P
4	0.2700	9.97	11.05	21.02	51.12	-30.10	AVG	P
5	0.3180	9.96	27.81	37.77	59.76	-21.99	QP	P
6	0.3180	9.96	6.25	16.21	49.76	-33.55	AVG	P
7	0.5100	9.98	22.76	32.74	56.00	-23.26	QP	P
8	0.5100	9.98	6.65	16.63	46.00	-29.37	AVG	P
9	0.6980	10.00	20.92	30.92	56.00	-25.08	QP	P
10	0.6980	10.00	4.64	14.64	46.00	-31.36	AVG	P
11	3.6780	10.13	31.30	41.43	56.00	-14.57	QP	P
12	3.6780	10.13	19.16	29.29	46.00	-16.71	AVG	P

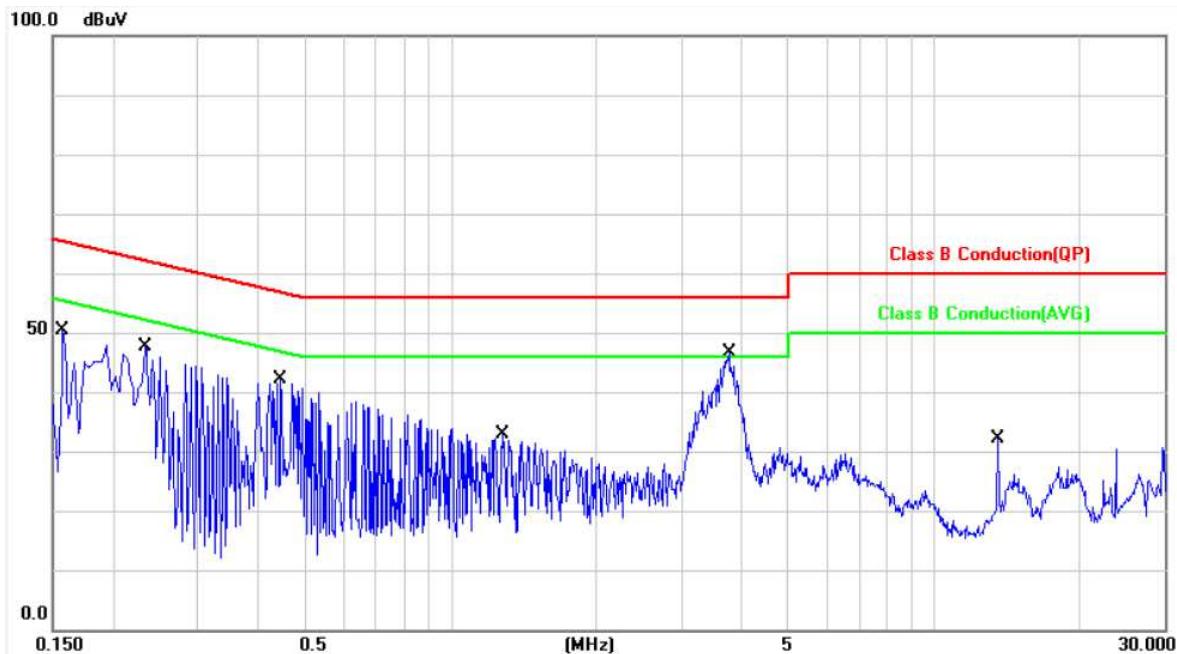
Note: Level = Reading + Factor

Margin = Level – Limit

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



Power :	AC 120V	Pol/Phase :	NEUTRAL
Test Mode :	Mode 2	Temperature :	22 °C
Test date :	Feb. 18, 2017	Humidity :	56 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1580	9.98	37.68	47.66	65.56	-17.90	QP	P
2	0.1580	9.98	18.75	28.73	55.56	-26.83	AVG	P
3	0.2340	9.97	30.76	40.73	62.30	-21.57	QP	P
4	0.2340	9.97	11.01	20.98	52.30	-31.32	AVG	P
5	0.4460	9.94	24.80	34.74	56.95	-22.21	QP	P
6	0.4460	9.94	9.34	19.28	46.95	-27.67	AVG	P
7	1.2860	10.00	15.09	25.09	56.00	-30.91	QP	P
8	1.2860	10.00	3.46	13.46	46.00	-32.54	AVG	P
9	3.7620	10.13	33.16	43.29	56.00	-12.71	QP	P
10	3.7620	10.13	18.83	28.96	46.00	-17.04	AVG	P
11	13.5620	10.42	18.93	29.35	60.00	-30.65	QP	P
12	13.5620	10.42	17.23	27.65	50.00	-22.35	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

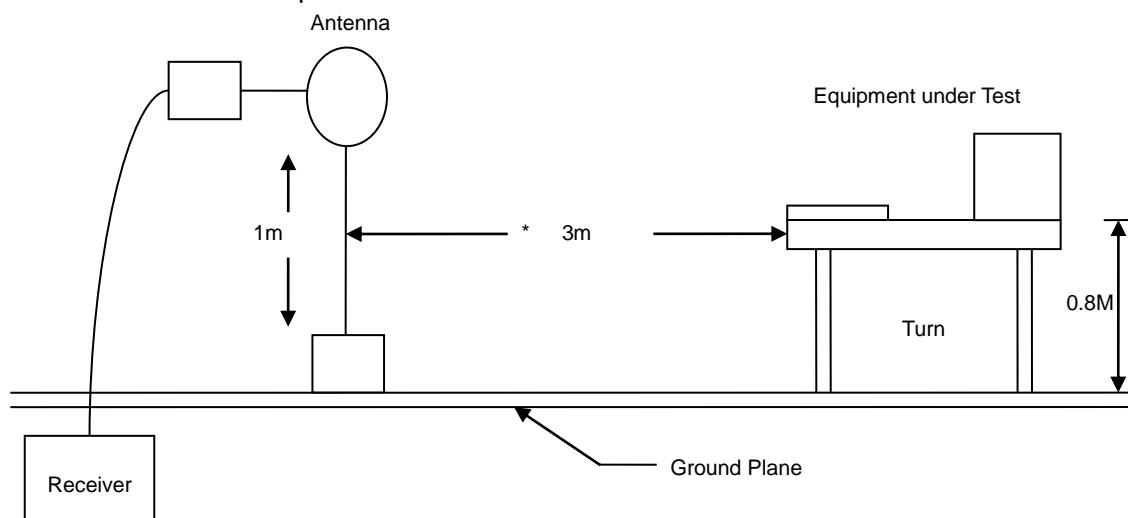
6.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. 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.
- e. 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.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. 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.
- h. 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.
- i. "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

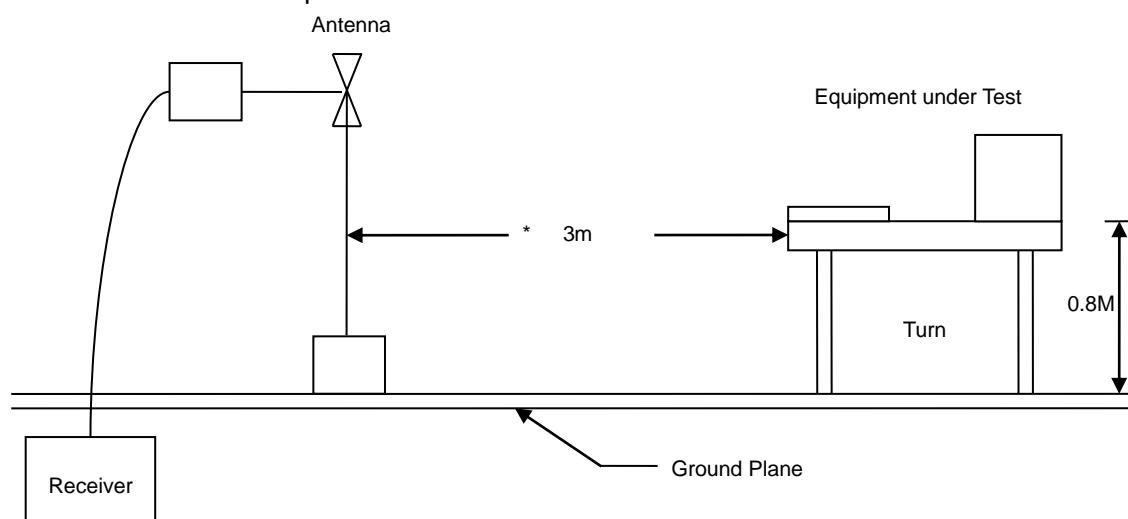


6.3 Typical Test Setup

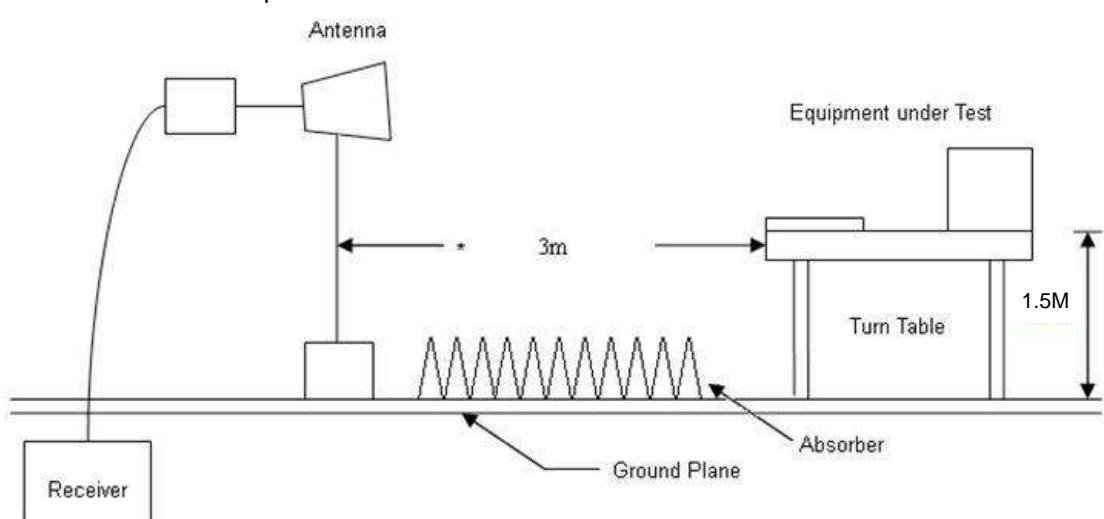
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



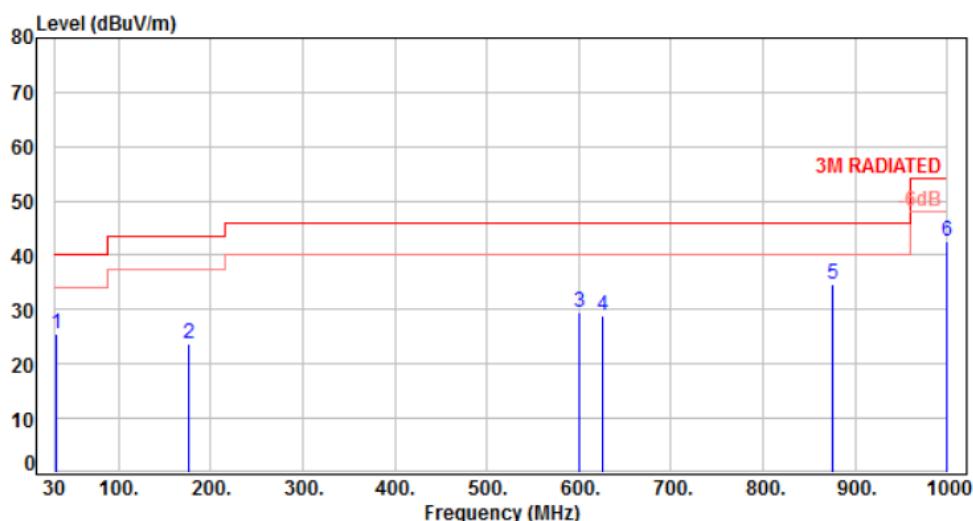


6.4 Test Result and Data (9KHz ~ 30MHz)

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 2	Temperature	: 24 °C
Test Date	: Feb. 15, 2017	Humidity	: 63 %

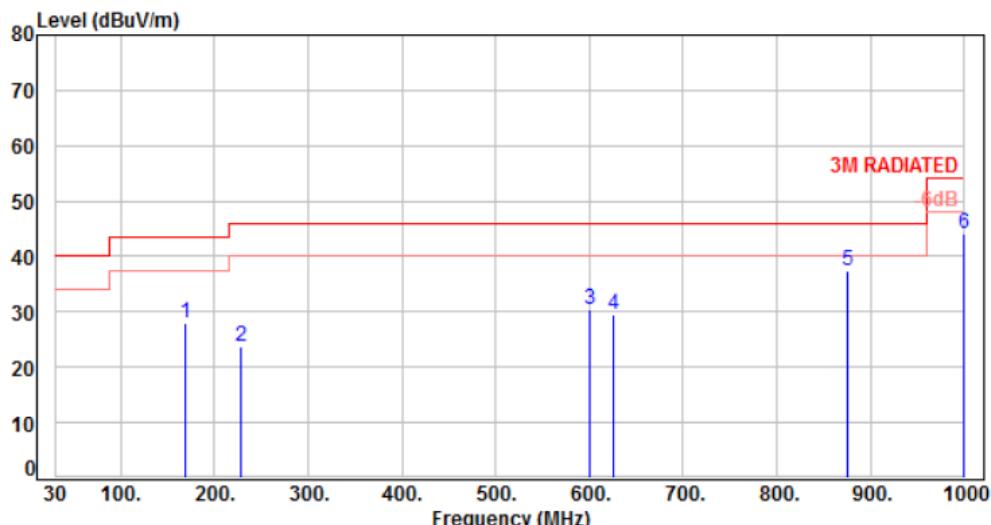


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	31.94	-10.66	36.29	25.63	40.00	-14.37	Peak	100	0	P
2	175.50	-10.86	34.70	23.84	43.50	-19.66	Peak	100	0	P
3	600.36	-1.98	31.56	29.58	46.00	-16.42	Peak	100	0	P
4	625.58	-1.70	30.52	28.82	46.00	-17.18	Peak	100	0	P
5	875.84	1.87	32.82	34.69	46.00	-11.31	Peak	100	0	P
6	1000.00	3.44	39.12	42.56	54.00	-11.44	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 2	Temperature :	24 °C
Test Date :	Feb. 15, 2017	Humidity :	63 %



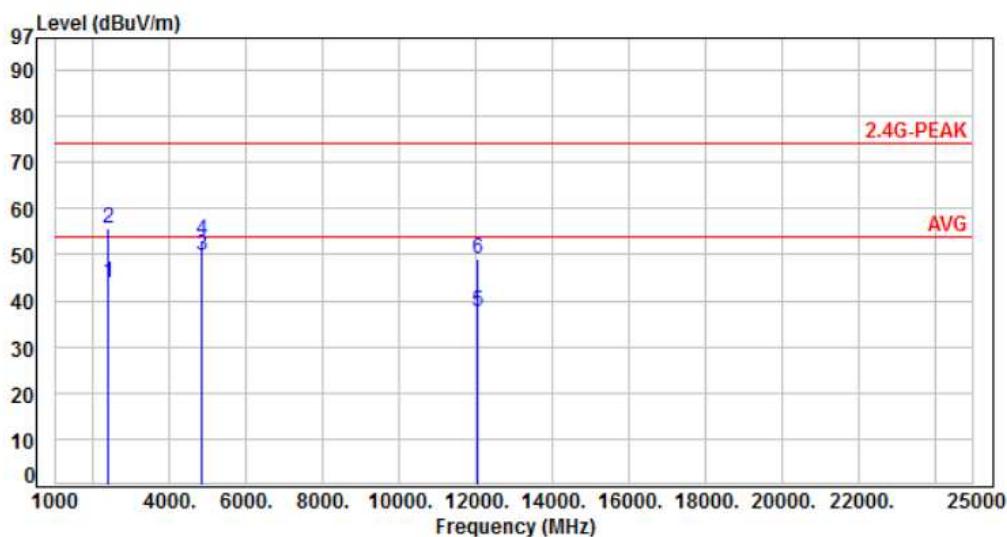
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	169.68	-10.22	38.12	27.90	43.50	-15.60	Peak	100	0	P
2	227.88	-12.18	35.93	23.75	46.00	-22.25	Peak	100	0	P
3	600.36	-1.98	32.33	30.35	46.00	-15.65	Peak	100	0	P
4	625.58	-1.70	31.16	29.46	46.00	-16.54	Peak	100	0	P
5	875.84	1.87	35.47	37.34	46.00	-8.66	Peak	100	0	P
6	1000.00	3.44	40.78	44.22	54.00	-9.78	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	: 24 °C
Test Date	: Feb. 07, 2017	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.75	59.55	43.80	54.00	-10.20	Average	380	193	P
2	2390.00	-15.75	71.58	55.83	74.00	-18.17	Peak	380	193	P
3	4824.00	-7.58	57.26	49.68	54.00	-4.32	Average	268	174	P
4	4824.00	-7.58	60.54	52.96	74.00	-21.04	Peak	268	174	P
5	12060.00	2.28	35.36	37.64	54.00	-16.36	Average	256	189	P
6	12060.00	2.28	46.70	48.98	74.00	-25.02	Peak	256	189	P

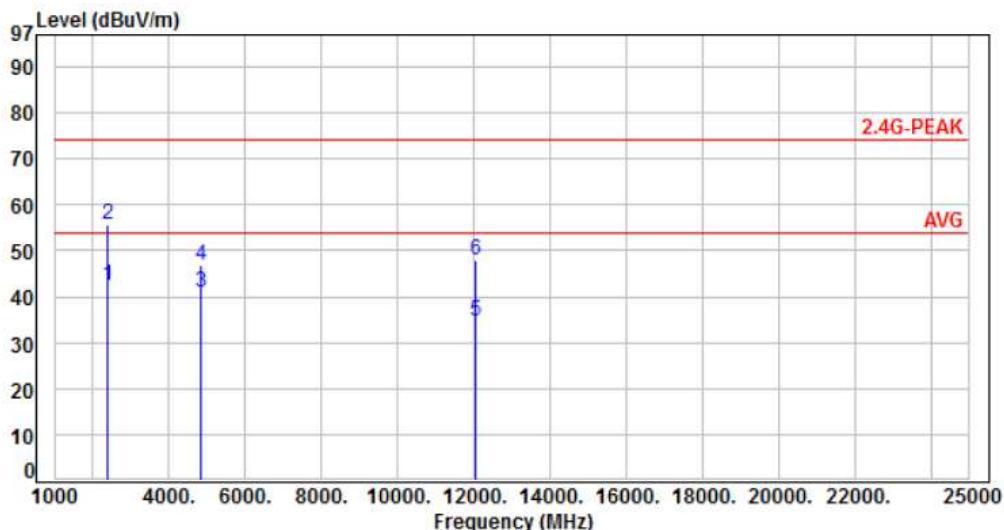
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	HORIZONTAL
Test Mode :	Mode 1, CH01	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.75	58.14	42.39	54.00	-11.61	Average	107	29	P
2	2390.00	-15.75	71.32	55.57	74.00	-18.43	Peak	107	29	P
3	4824.00	-7.58	48.56	40.98	54.00	-13.02	Average	194	111	P
4	4824.00	-7.58	54.60	47.02	74.00	-26.98	Peak	194	111	P
5	12060.00	2.28	32.45	34.73	54.00	-19.27	Average	172	146	P
6	12060.00	2.28	45.70	47.98	74.00	-26.02	Peak	172	146	P

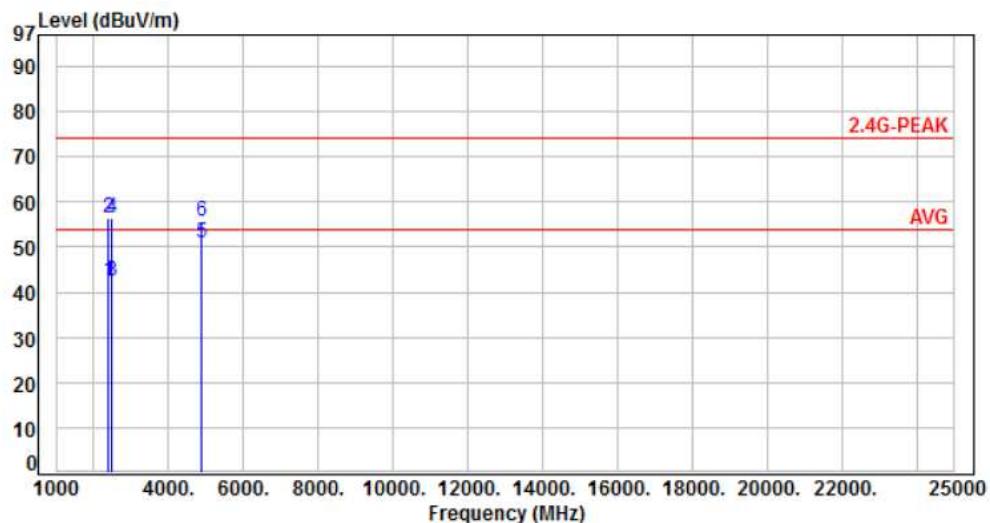
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH06	Temperature	: 24 °C
Test Date	: Feb. 07, 2017	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.75	58.21	42.46	54.00	-11.54	Average	350	276	P
2	2390.00	-15.75	72.33	56.58	74.00	-17.42	Peak	350	276	P
3	2483.50	-15.48	57.97	42.49	54.00	-11.51	Average	350	276	P
4	2483.50	-15.48	72.09	56.61	74.00	-17.39	Peak	350	276	P
5	4874.00	-7.39	58.45	51.06	54.00	-2.94	Average	310	151	P
6	4874.00	-7.39	63.14	55.75	74.00	-18.25	Peak	381	151	P

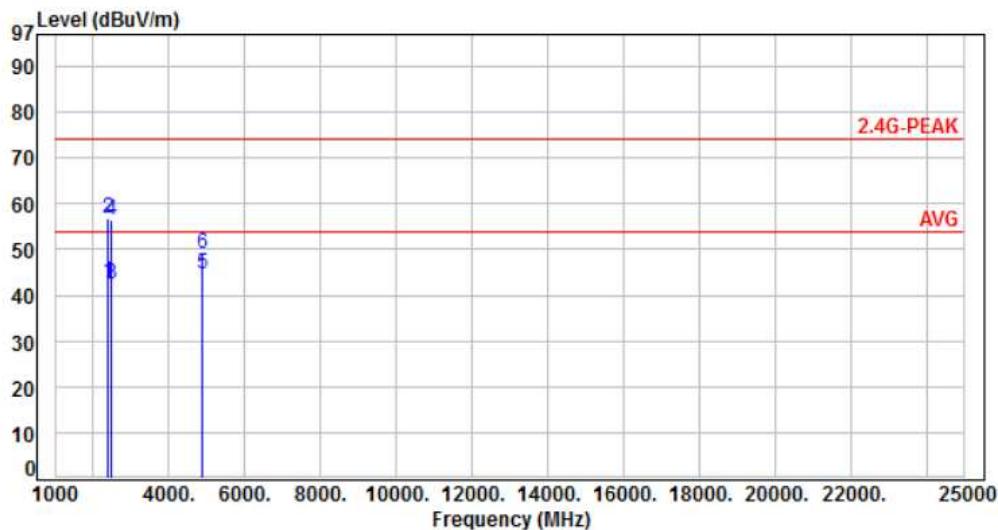
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	HORIZONTAL
Test Mode :	Mode 1, CH06	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.75	58.47	42.72	54.00	-11.28	Average	112	37	P
2	2390.00	-15.75	72.38	56.63	74.00	-17.37	Peak	112	37	P
3	2483.50	-15.48	57.73	42.25	54.00	-11.75	Average	112	37	P
4	2483.50	-15.48	71.87	56.39	74.00	-17.61	Peak	112	37	P
5	4874.00	-7.39	52.14	44.75	54.00	-9.25	Average	117	213	P
6	4874.00	-7.39	56.60	49.21	74.00	-24.79	Peak	183	134	P

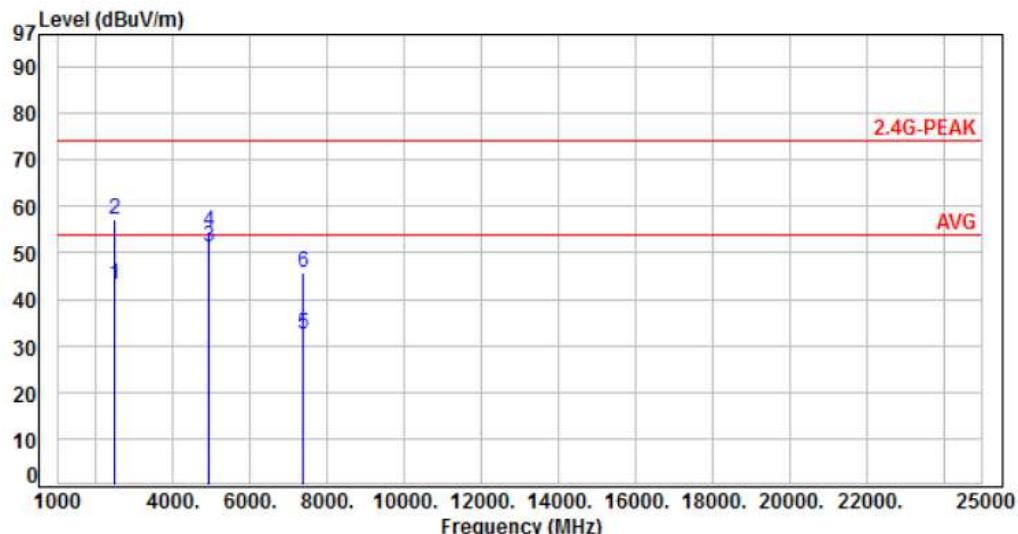
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH11	Temperature	: 24 °C
Test Date	: Feb. 07, 2017	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.48	58.53	43.05	54.00	-10.95	Average	273	331	P
2	2483.50	-15.48	72.49	57.01	74.00	-16.99	Peak	273	331	P
3	4924.00	-7.19	58.63	51.44	54.00	-2.56	Average	306	155	P
4	4924.00	-7.19	61.63	54.44	74.00	-19.56	Peak	279	181	P
5	7386.00	-3.39	35.81	32.42	54.00	-21.58	Average	244	192	P
6	7386.00	-3.39	49.12	45.73	74.00	-28.27	Peak	244	192	P

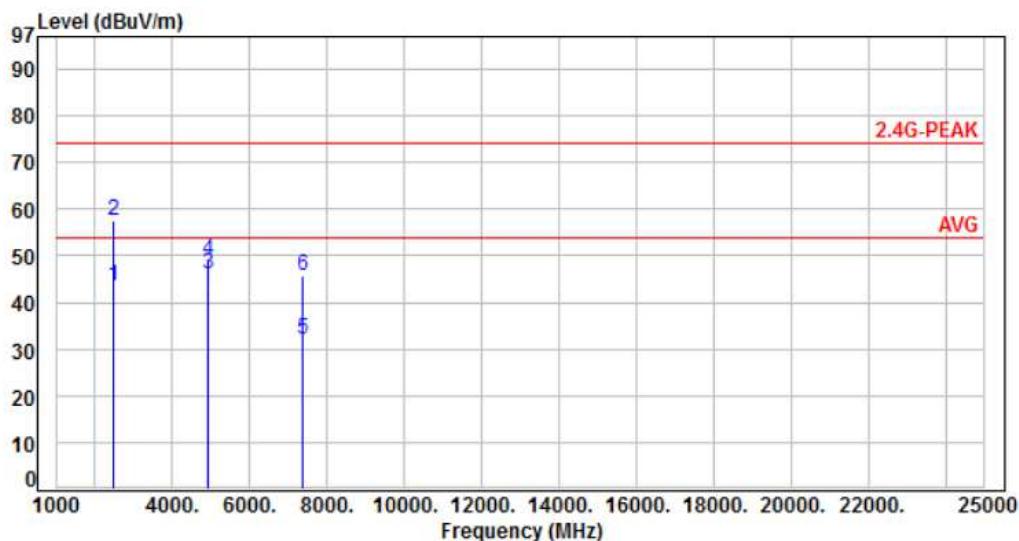
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	HORIZONTAL
Test Mode :	Mode 1, CH11	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.48	58.93	43.45	54.00	-10.55	Average	106	48	P
2	2483.50	-15.48	73.11	57.63	74.00	-16.37	Peak	106	48	P
3	4924.00	-7.19	53.44	46.25	54.00	-7.75	Average	152	217	P
4	4924.00	-7.19	56.41	49.22	74.00	-24.78	Peak	152	217	P
5	7386.00	-3.39	35.63	32.24	54.00	-21.76	Average	189	152	P
6	7386.00	-3.39	49.05	45.66	74.00	-28.34	Peak	189	152	P

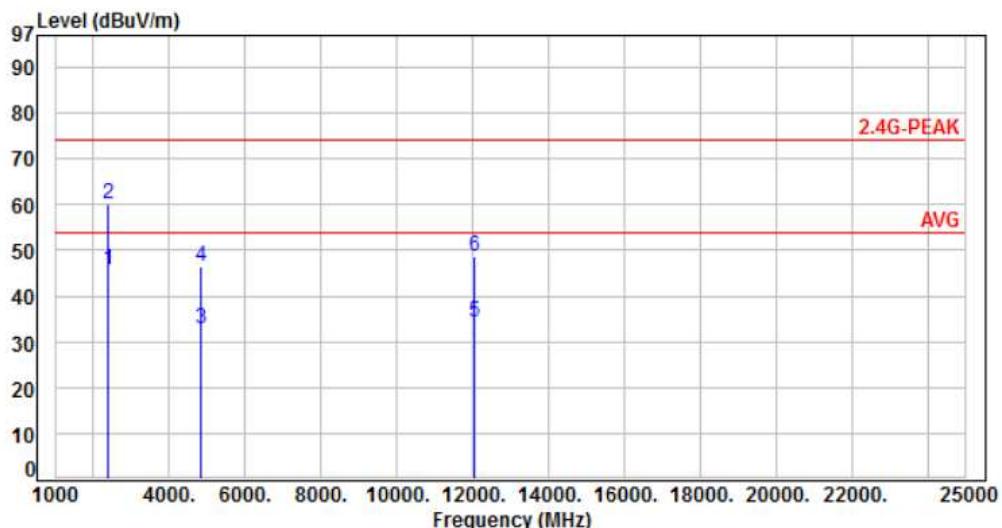
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH01	Temperature	: 24 °C
Test Date	: Feb. 07, 2017	Humidity	: 63 %

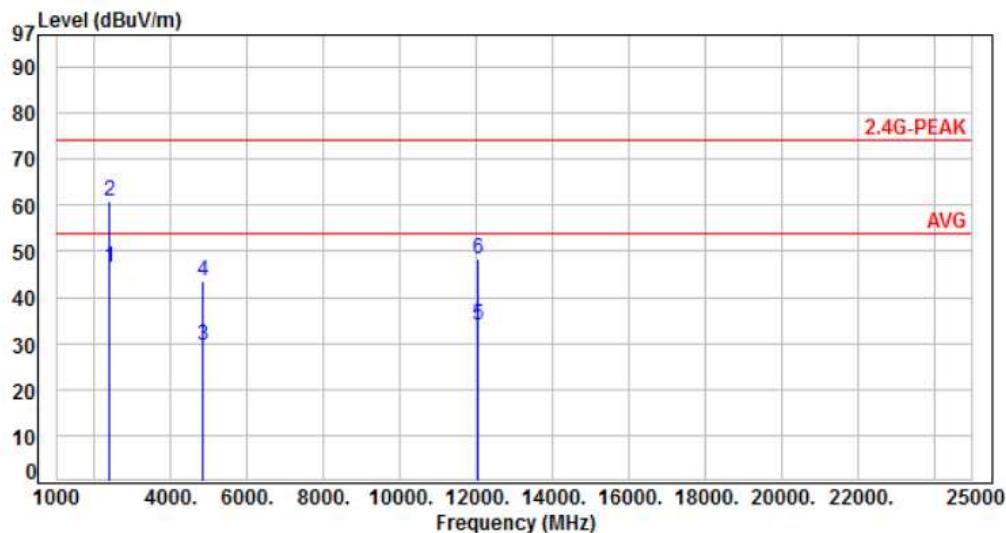


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.61	61.45	45.84	54.00	-8.16	Average	326	188	P
2	2390.00	-15.61	75.70	60.09	74.00	-13.91	Peak	326	188	P
3	4824.00	-7.51	40.19	32.68	54.00	-21.32	Average	286	174	P
4	4824.00	-7.51	54.12	46.61	74.00	-27.39	Peak	286	174	P
5	12060.00	2.66	31.75	34.41	54.00	-19.59	Average	298	177	P
6	12060.00	2.66	46.04	48.70	74.00	-25.30	Peak	298	177	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	: 24 °C
Test Date	: Feb. 07, 2017	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.61	62.17	46.56	54.00	-7.44	Average	110	33	P
2	2390.00	-15.61	76.55	60.94	74.00	-13.06	Peak	110	33	P
3	4824.00	-7.51	37.11	29.60	54.00	-24.40	Average	100	215	P
4	4824.00	-7.51	50.98	43.47	74.00	-30.53	Peak	100	215	P
5	12060.00	2.66	31.45	34.11	54.00	-19.89	Average	121	186	P
6	12060.00	2.66	45.67	48.33	74.00	-25.67	Peak	121	186	P

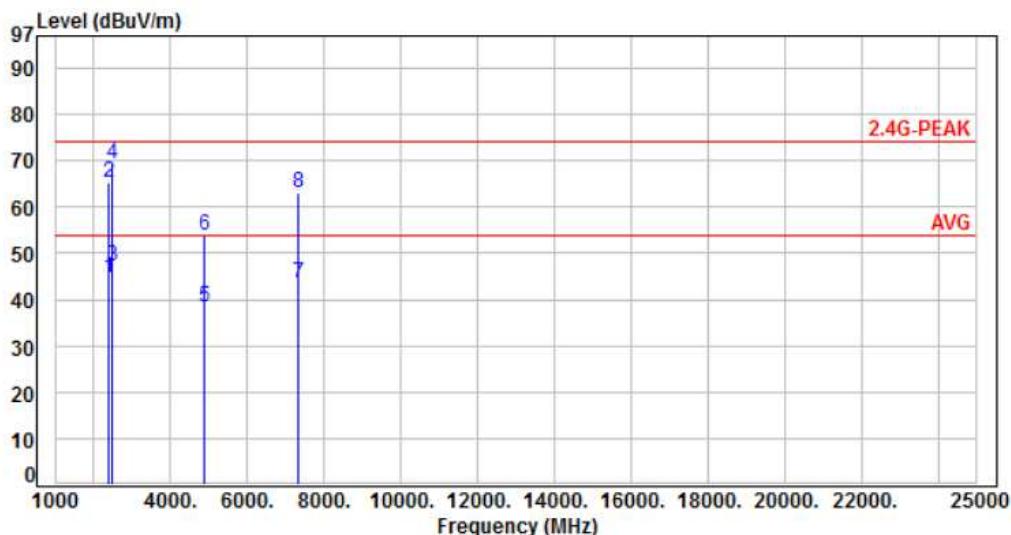
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH06	Temperature	: 24 °C
Test Date	: Feb. 07, 2017	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F	P/F
1	2390.00	-15.61	60.12	44.51	54.00	-9.49	Average	322	183	P
2	2390.00	-15.61	80.74	65.13	74.00	-8.87	Peak	322	183	P
3	2483.50	-15.29	62.61	47.32	54.00	-6.68	Average	315	197	P
4	2483.50	-15.29	84.60	69.31	74.00	-4.69	Peak	315	197	P
5	4874.00	-7.31	45.64	38.33	54.00	-15.67	Average	279	165	P
6	4874.00	-7.31	61.19	53.88	74.00	-20.12	Peak	279	165	P
7	7311.00	-3.18	46.53	43.35	54.00	-10.65	Average	280	219	P
8	7311.00	-3.18	66.17	62.99	74.00	-11.01	Peak	280	219	P

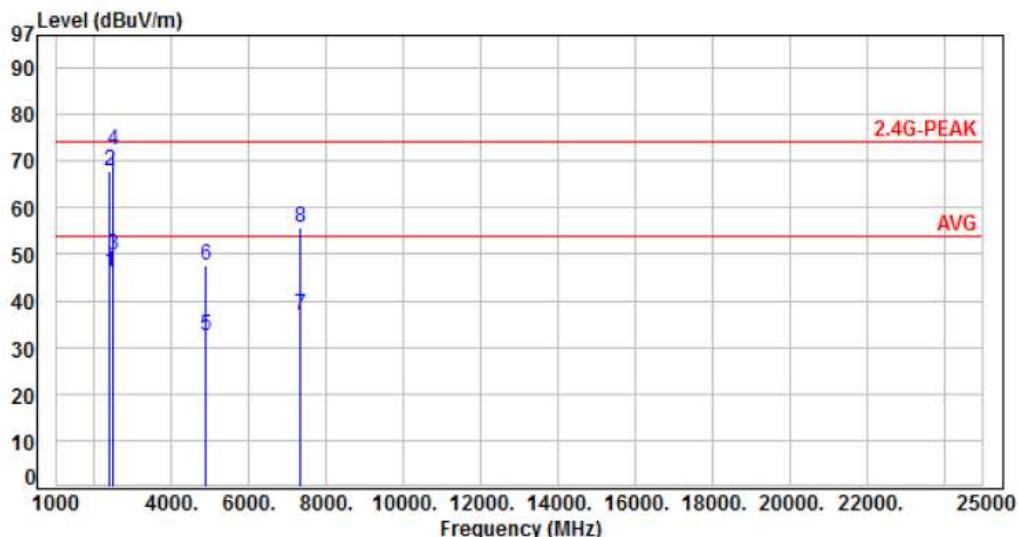
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	HORIZONTAL
Test Mode :	Mode 2, CH06	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.61	61.82	46.21	54.00	-7.79	Average	102	276	P
2	2390.00	-15.61	83.55	67.94	74.00	-6.06	Peak	102	276	P
3	2483.50	-15.29	65.06	49.77	54.00	-4.23	Average	124	281	P
4	2483.50	-15.29	87.73	72.44	74.00	-1.56	Peak	124	281	P
5	4874.00	-7.31	39.80	32.49	54.00	-21.51	Average	122	222	P
6	4874.00	-7.31	55.05	47.74	74.00	-26.26	Peak	122	222	P
7	7311.00	-3.18	40.20	37.02	54.00	-16.98	Average	135	71	P
8	7311.00	-3.18	58.75	55.57	74.00	-18.43	Peak	135	71	P

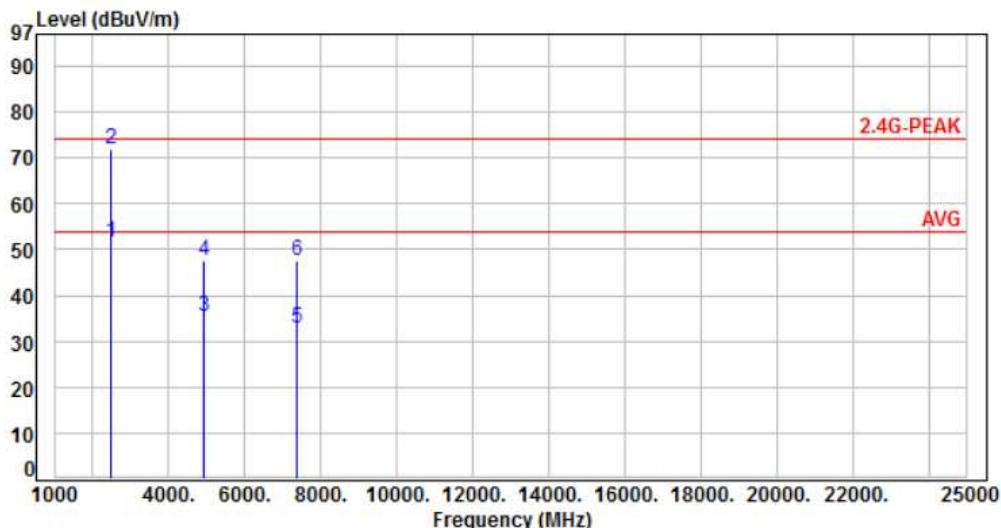
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	VERTICAL
Test Mode :	Mode 2, CH11	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %

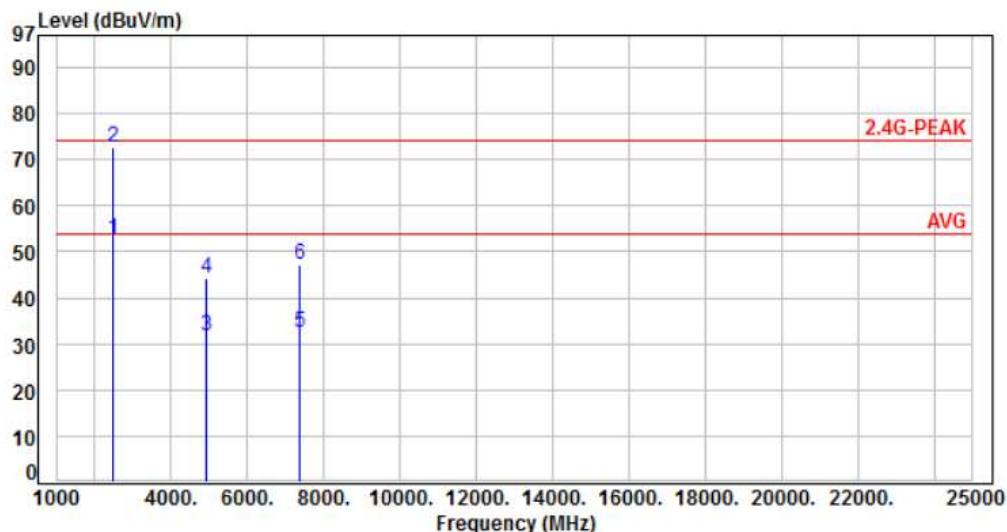


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.29	66.78	51.49	54.00	-2.51	Average	312	196	P
2	2483.50	-15.29	87.05	71.76	74.00	-2.24	Peak	312	196	P
3	4924.00	-7.10	42.63	35.53	54.00	-18.47	Average	262	217	P
4	4924.00	-7.10	54.81	47.71	74.00	-26.29	Peak	262	217	P
5	7386.00	-3.03	35.98	32.95	54.00	-21.05	Average	283	282	P
6	7386.00	-3.03	50.73	47.70	74.00	-26.30	Peak	283	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 2, CH11	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F (deg)
1	2483.50	-15.29	67.91	52.62	54.00	-1.38	Average	126	279 P
2	2483.50	-15.29	87.93	72.64	74.00	-1.36	Peak	126	279 P
3	4924.00	-7.10	38.80	31.70	54.00	-22.30	Average	360	121 P
4	4924.00	-7.10	51.40	44.30	74.00	-29.70	Peak	360	121 P
5	7386.00	-3.03	35.65	32.62	54.00	-21.38	Average	321	156 P
6	7386.00	-3.03	50.36	47.33	74.00	-26.67	Peak	321	156 P

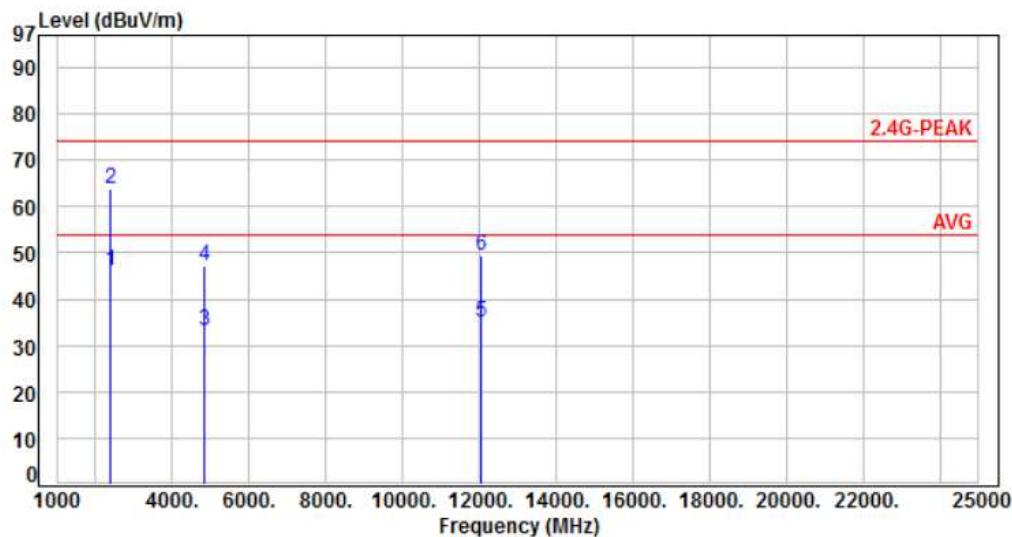
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	VERTICAL
Test Mode :	Mode 3, CH01	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F (deg)
1	2390.00	-15.61	61.57	45.96	54.00	-8.04	Average	331	194 P
2	2390.00	-15.61	79.26	63.65	74.00	-10.35	Peak	331	194 P
3	4824.00	-7.51	40.82	33.31	54.00	-20.69	Average	277	156 P
4	4824.00	-7.51	54.72	47.21	74.00	-26.79	Peak	277	156 P
5	12060.00	2.66	32.34	35.00	54.00	-19.00	Average	302	188 P
6	12060.00	2.66	46.58	49.24	74.00	-24.76	Peak	302	188 P

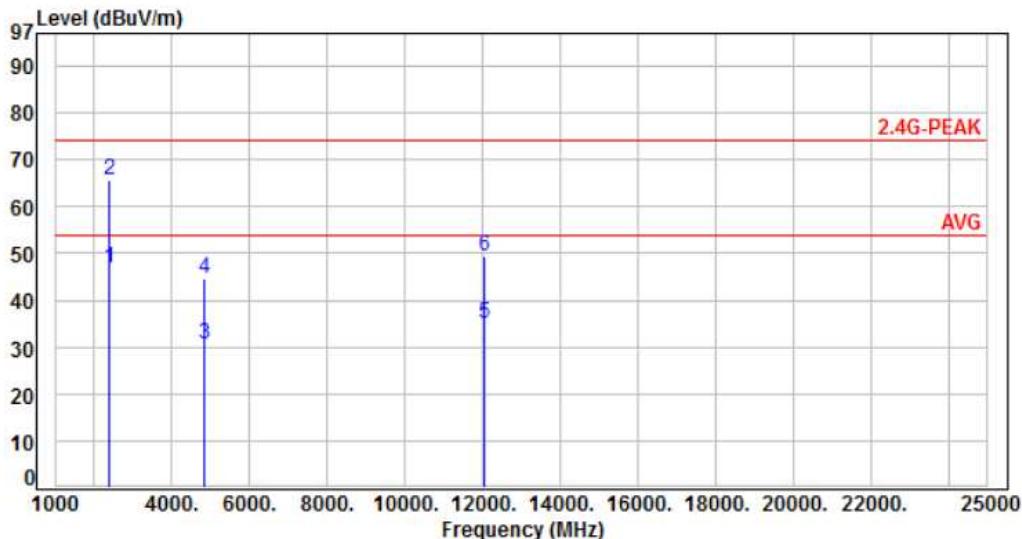
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	HORIZONTAL
Test Mode :	Mode 3, CH01	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.61	62.49	46.88	54.00	-7.12	Average	152	46	P
2	2390.00	-15.61	81.34	65.73	74.00	-8.27	Peak	152	46	P
3	4824.00	-7.51	38.21	30.70	54.00	-23.30	Average	113	228	P
4	4824.00	-7.51	52.12	44.61	74.00	-29.39	Peak	113	228	P
5	12060.00	2.66	32.56	35.22	54.00	-18.78	Average	127	193	P
6	12060.00	2.66	46.89	49.55	74.00	-24.45	Peak	127	193	P

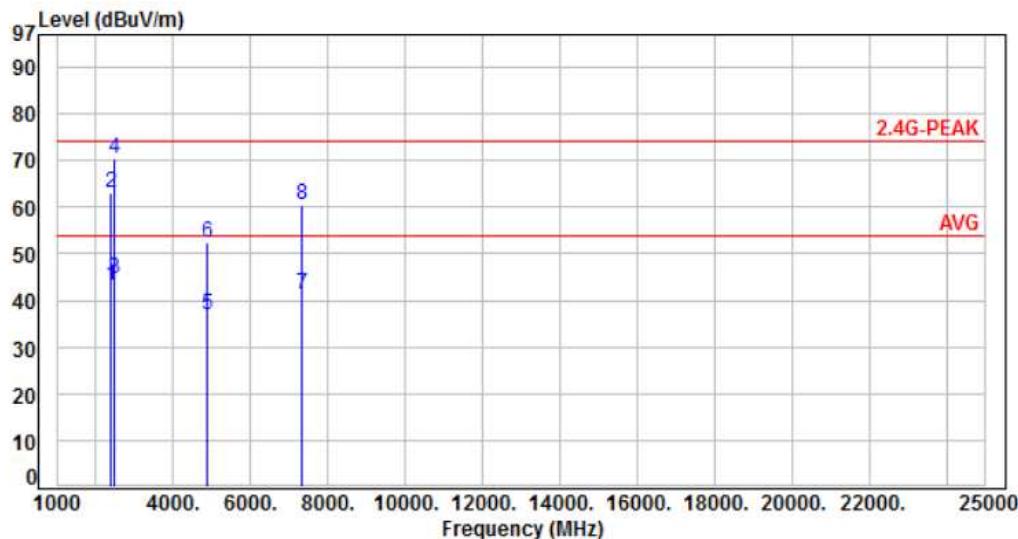
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	VERTICAL
Test Mode :	Mode 3, CH06	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F (deg)
1	2390.00	-15.61	58.58	42.97	54.00	-11.03	Average	318	179 P
2	2390.00	-15.61	78.74	63.13	74.00	-10.87	Peak	318	179 P
3	2483.50	-15.29	59.87	44.58	54.00	-9.42	Average	322	182 P
4	2483.50	-15.29	85.60	70.31	74.00	-3.69	Peak	322	182 P
5	4874.00	-7.31	44.12	36.81	54.00	-17.19	Average	283	161 P
6	4874.00	-7.31	59.67	52.36	74.00	-21.64	Peak	283	161 P
7	7311.00	-3.18	44.39	41.21	54.00	-12.79	Average	279	224 P
8	7311.00	-3.18	63.62	60.44	74.00	-13.56	Peak	279	224 P

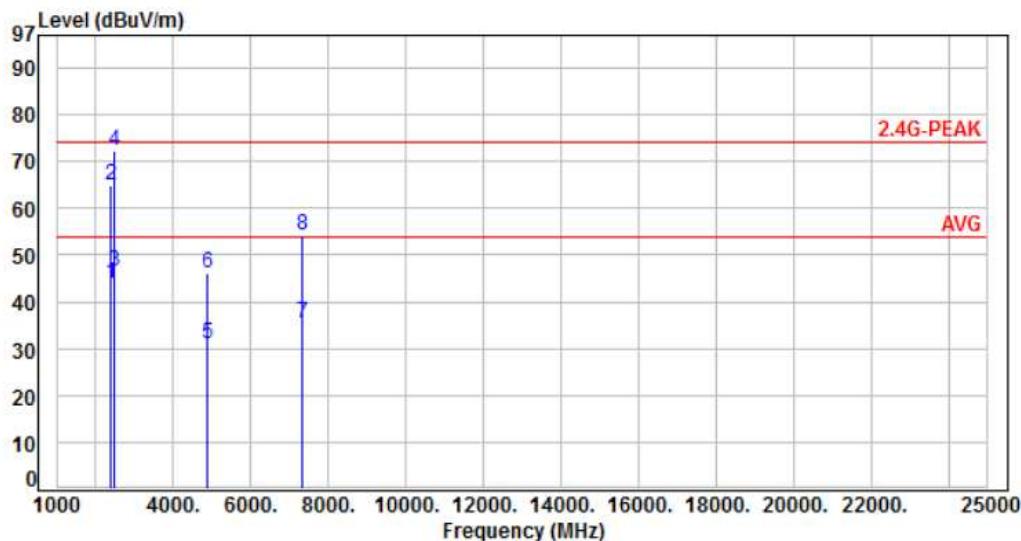
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	HORIZONTAL
Test Mode :	Mode 3, CH06	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F (deg)
1	2390.00	-15.61	59.46	43.85	54.00	-10.15	Average	118	284 P
2	2390.00	-15.61	80.63	65.02	74.00	-8.98	Peak	118	284 P
3	2483.50	-15.29	61.79	46.50	54.00	-7.50	Average	121	279 P
4	2483.50	-15.29	87.53	72.24	74.00	-1.76	Peak	121	279 P
5	4874.00	-7.31	38.21	30.90	54.00	-23.10	Average	118	234 P
6	4874.00	-7.31	53.45	46.14	74.00	-27.86	Peak	118	234 P
7	7311.00	-3.18	38.61	35.43	54.00	-18.57	Average	129	78 P
8	7311.00	-3.18	57.26	54.08	74.00	-19.92	Peak	129	78 P

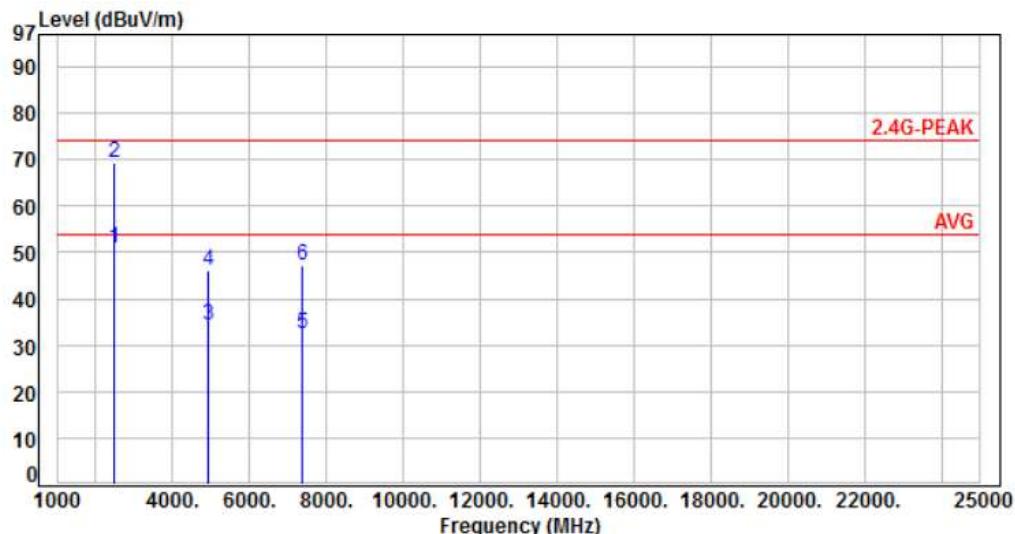
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	VERTICAL
Test Mode :	Mode 3, CH11	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %

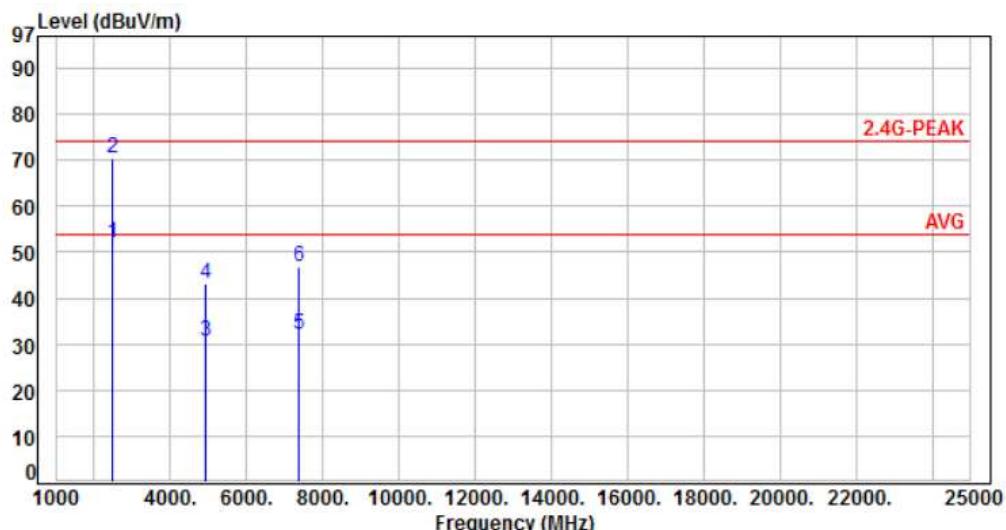


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F (deg)
1	2483.50	-15.29	66.20	50.91	54.00	-3.09	Average	318	201 P
2	2483.50	-15.29	84.65	69.36	74.00	-4.64	Peak	318	201 P
3	4924.00	-7.10	41.27	34.17	54.00	-19.83	Average	283	221 P
4	4924.00	-7.10	53.34	46.24	74.00	-27.76	Peak	283	221 P
5	7386.00	-3.03	35.62	32.59	54.00	-21.41	Average	279	198 P
6	7386.00	-3.03	50.36	47.33	74.00	-26.67	Peak	279	198 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 :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F (deg)
1	2483.50	-15.29	67.30	52.01	54.00	-1.99	Average	173	277 P
2	2483.50	-15.29	85.85	70.56	74.00	-3.44	Peak	173	277 P
3	4924.00	-7.10	37.54	30.44	54.00	-23.56	Average	354	137 P
4	4924.00	-7.10	50.21	43.11	74.00	-30.89	Peak	354	137 P
5	7386.00	-3.03	35.29	32.26	54.00	-21.74	Average	313	172 P
6	7386.00	-3.03	49.87	46.84	74.00	-27.16	Peak	313	172 P

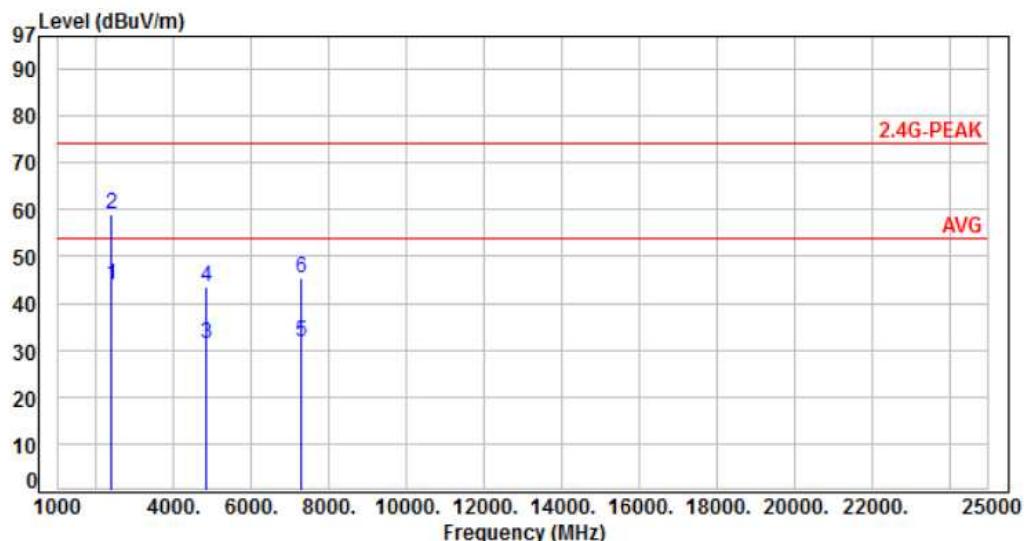
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	VERTICAL
Test Mode :	Mode 4, CH03	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.75	59.76	44.01	54.00	-9.99	Average	285	196	P
2	2390.00	-15.75	74.69	58.94	74.00	-15.06	Peak	285	196	P
3	4844.00	-7.50	39.03	31.53	54.00	-22.47	Average	284	176	P
4	4844.00	-7.50	51.11	43.61	74.00	-30.39	Peak	284	176	P
5	7266.00	-3.57	35.12	31.55	54.00	-22.45	Average	296	193	P
6	7266.00	-3.57	49.10	45.53	74.00	-28.47	Peak	296	193	P

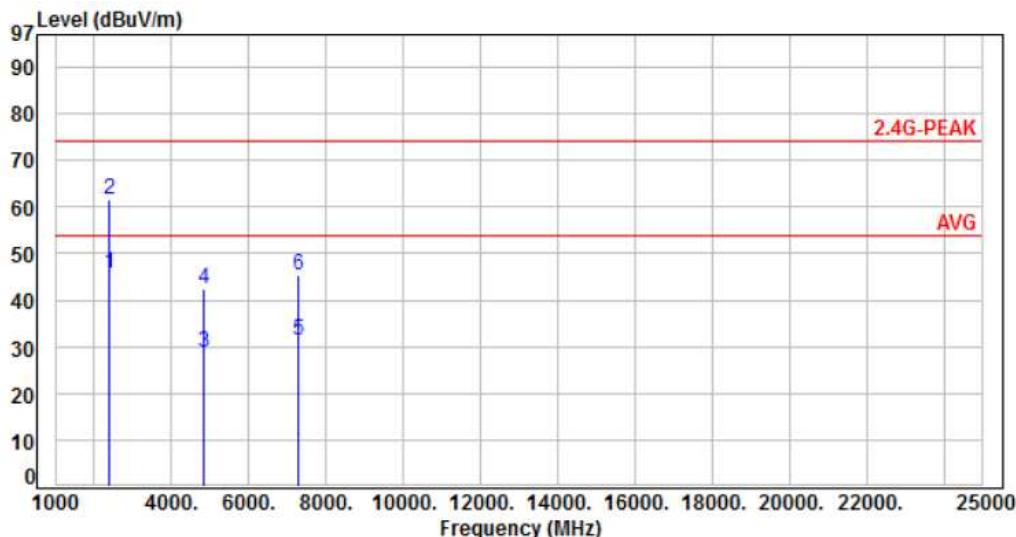
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	HORIZONTAL
Test Mode :	Mode 4, CH03	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F
1	2390.00	-15.75	61.63	45.88	54.00	-8.12	Average	193	281 P
2	2390.00	-15.75	77.34	61.59	74.00	-12.41	Peak	193	281 P
3	4844.00	-7.50	36.12	28.62	54.00	-25.38	Average	103	179 P
4	4844.00	-7.50	49.99	42.49	74.00	-31.51	Peak	103	179 P
5	7266.00	-3.57	34.85	31.28	54.00	-22.72	Average	100	185 P
6	7266.00	-3.57	48.90	45.33	74.00	-28.67	Peak	100	185 P

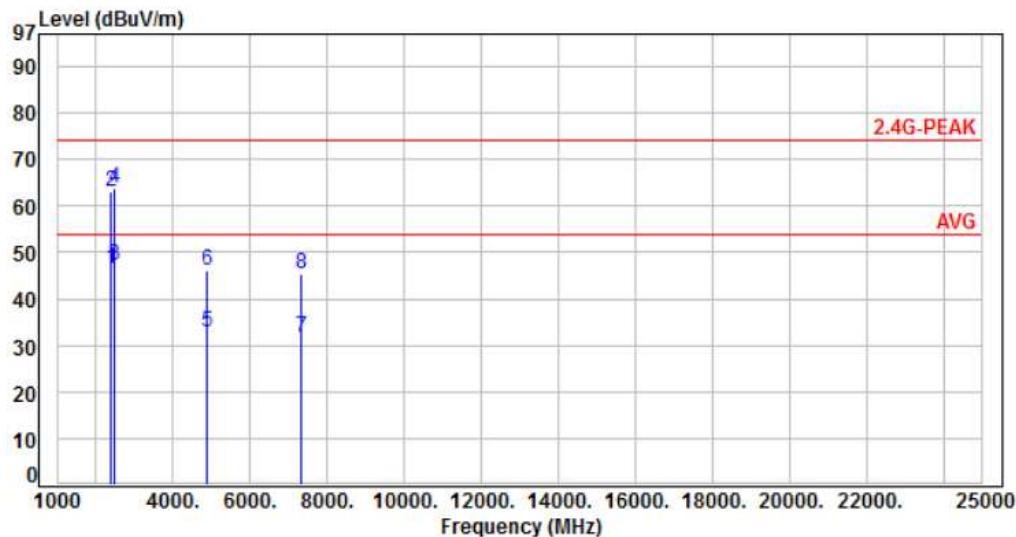
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	VERTICAL
Test Mode :	Mode 4, CH06	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F (deg)
1	2390.00	-15.75	62.19	46.44	54.00	-7.56	Average	361	275 P
2	2390.00	-15.75	78.90	63.15	74.00	-10.85	Peak	361	275 P
3	2483.50	-15.48	62.57	47.09	54.00	-6.91	Average	363	294 P
4	2483.50	-15.48	79.31	63.83	74.00	-10.17	Peak	363	294 P
5	4874.00	-7.39	40.12	32.73	54.00	-21.27	Average	343	179 P
6	4874.00	-7.39	53.60	46.21	74.00	-27.79	Peak	343	179 P
7	7311.00	-3.50	35.34	31.84	54.00	-22.16	Average	372	197 P
8	7311.00	-3.50	48.95	45.45	74.00	-28.55	Peak	372	197 P

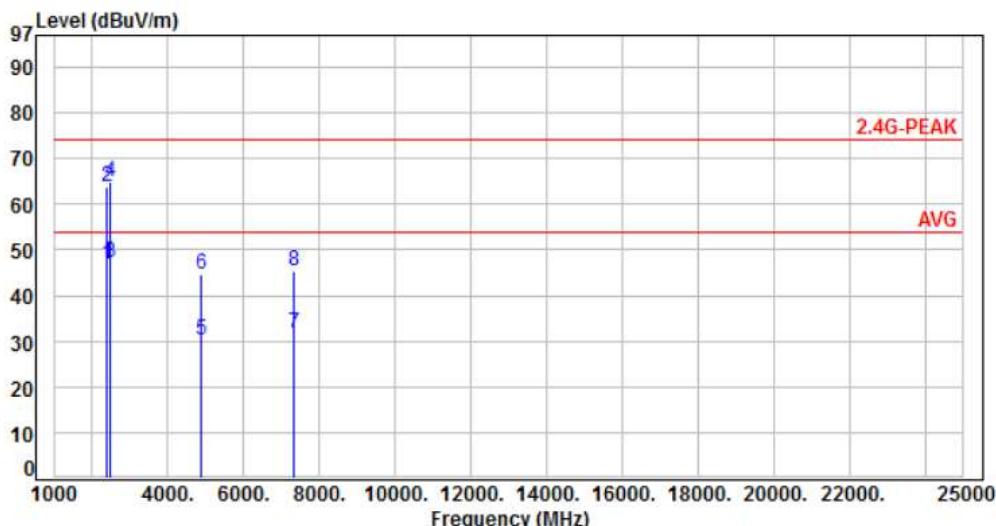
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120V	Pol/Phase :	HORIZONTAL
Test Mode :	Mode 4, CH06	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %

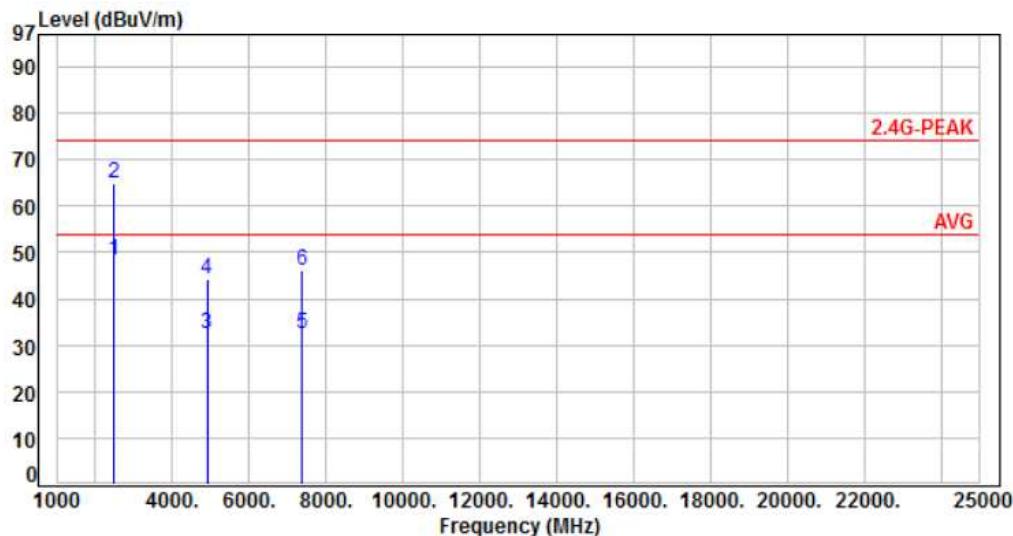


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth P/F (deg)
1	2390.00	-15.75	62.66	46.91	54.00	-7.09	Average	165	285 P
2	2390.00	-15.75	79.45	63.70	74.00	-10.30	Peak	165	285 P
3	2483.50	-15.48	62.78	47.30	54.00	-6.70	Average	100	279 P
4	2483.50	-15.48	80.36	64.88	74.00	-9.12	Peak	100	279 P
5	4874.00	-7.39	37.68	30.29	54.00	-23.71	Average	102	159 P
6	4874.00	-7.39	51.93	44.54	74.00	-29.46	Peak	102	159 P
7	7311.00	-3.50	35.12	31.62	54.00	-22.38	Average	100	173 P
8	7311.00	-3.50	48.77	45.27	74.00	-28.73	Peak	100	173 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	: 24 °C
Test Date	: Feb. 07, 2017	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.48	63.73	48.25	54.00	-5.75	Average	100	211	P
2	2483.50	-15.48	80.23	64.75	74.00	-9.25	Peak	100	211	P
3	4904.00	-7.26	39.57	32.31	54.00	-21.69	Average	289	188	P
4	4904.00	-7.26	51.68	44.42	74.00	-29.58	Peak	289	188	P
5	7356.00	-3.42	35.74	32.32	54.00	-21.68	Average	273	196	P
6	7356.00	-3.42	49.58	46.16	74.00	-27.84	Peak	273	196	P

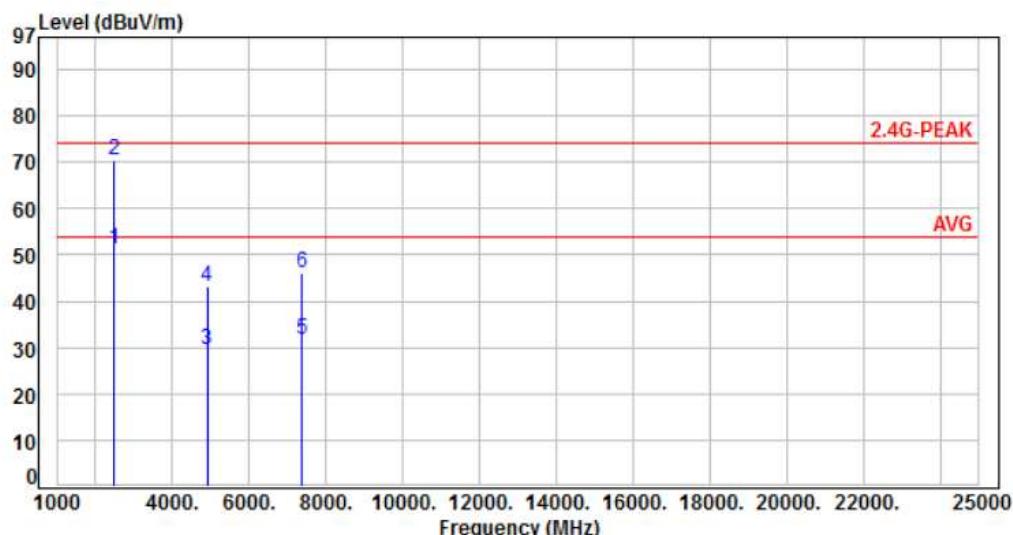
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power :	AC 120	Pol/Phase :	HORIZONTAL
Test Mode :	Mode 4, CH09	Temperature :	24 °C
Test Date :	Feb. 07, 2017	Humidity :	63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.48	66.56	51.08	54.00	-2.92	Average	100	279	P
2	2483.50	-15.48	86.09	70.61	74.00	-3.39	Peak	181	266	P
3	4904.00	-7.26	36.76	29.50	54.00	-24.50	Average	113	198	P
4	4904.00	-7.26	50.47	43.21	74.00	-30.79	Peak	113	198	P
5	7356.00	-3.42	35.32	31.90	54.00	-22.10	Average	126	177	P
6	7356.00	-3.42	49.36	45.94	74.00	-28.06	Peak	126	177	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

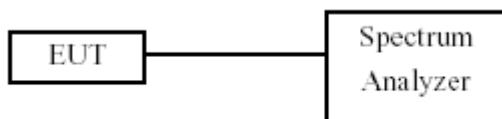
7.1 Test Limit

Below –20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

7.2 Test Procedure

- a. The transmitter output was connected to the spectrum analyzer via a low loss cable.
- b. 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.
- c. Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20dB relative to the maximum measured in-band peak PSD level.
- d. The band edges was measured and recorded.

7.3 Test Setup Layout



7.4 Test Result and Data

Test Result : PASS

Temperature : 22°C

Test Date : Feb. 24, 2017

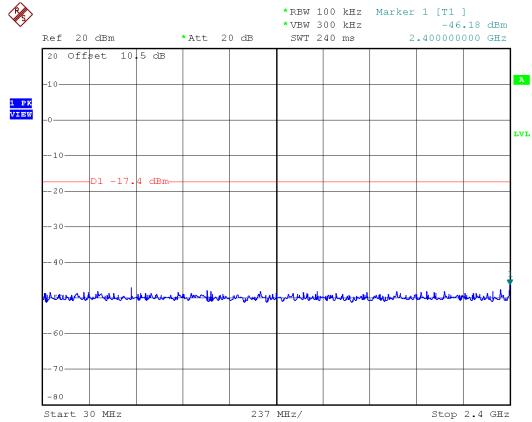
Humidity : 58%

Note: Test plots refers to the following pages.

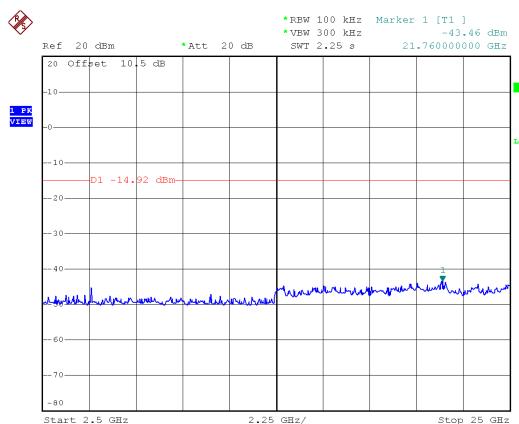
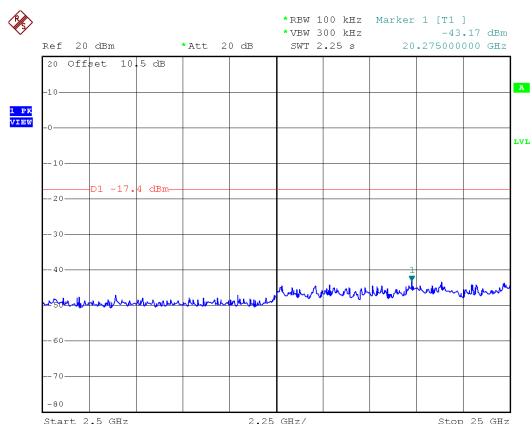
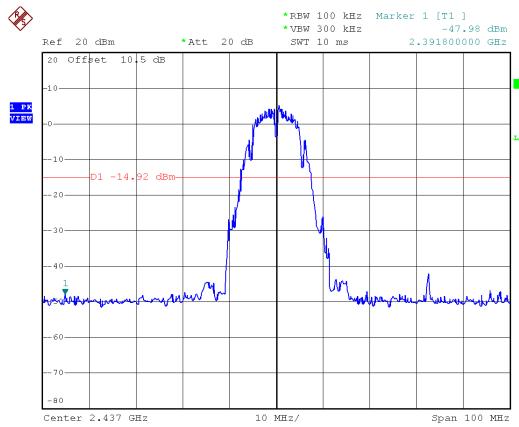
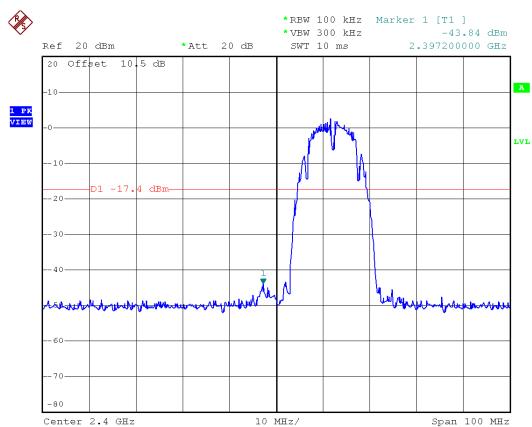
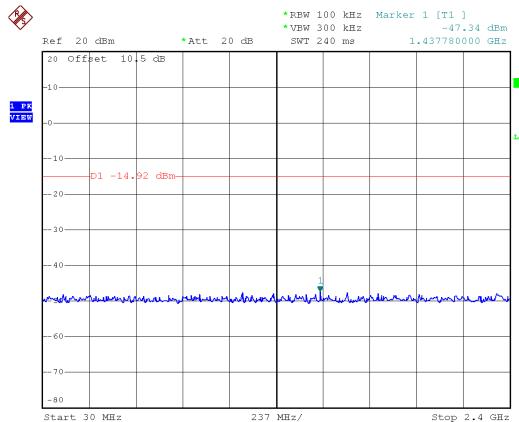


Antenna A

Modulation Type: 802.11b, CH 01



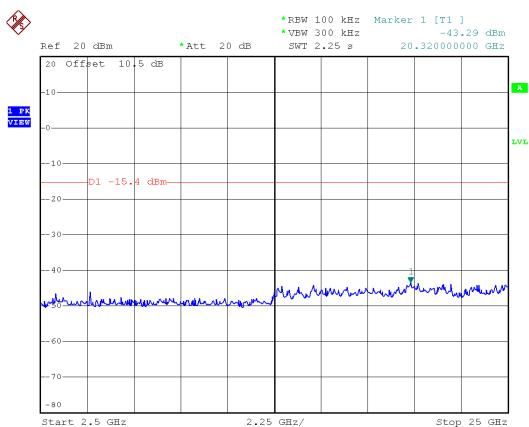
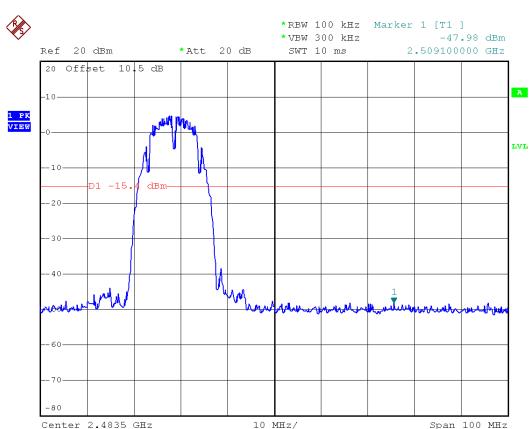
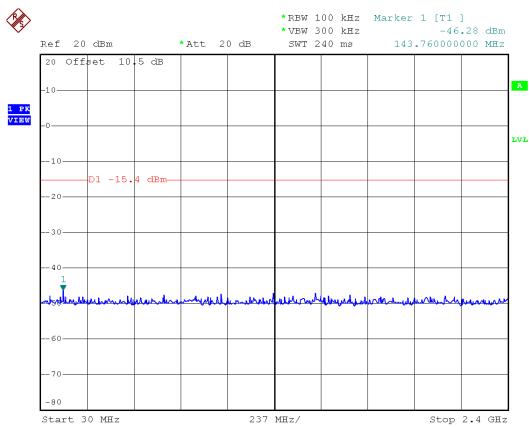
Modulation Type: 802.11b, CH 06





Antenna A

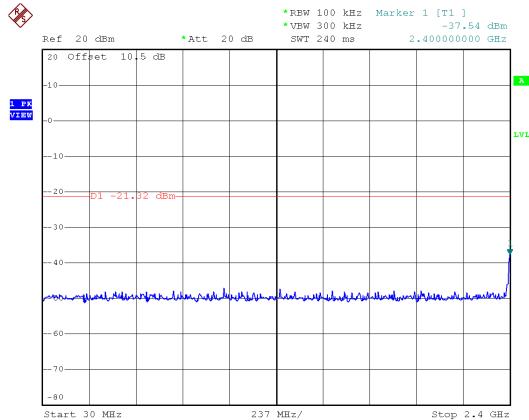
Modulation Type: 802.11b, CH 11



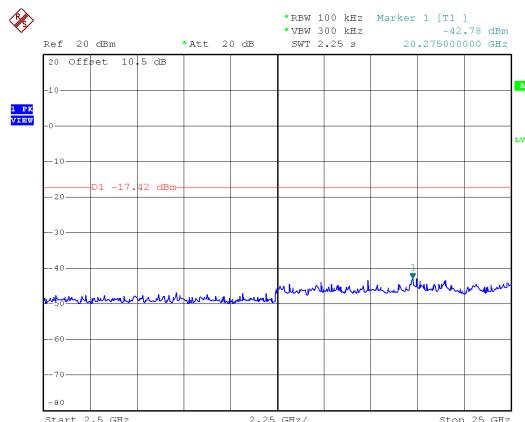
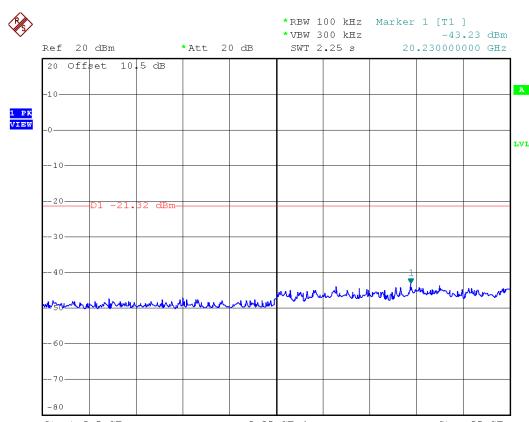
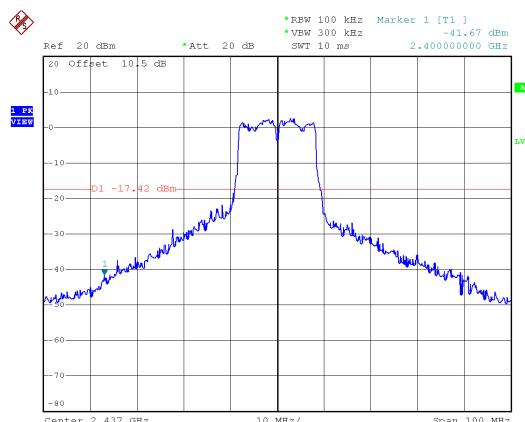
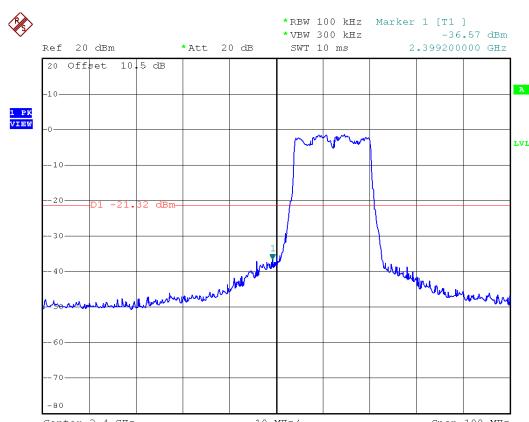
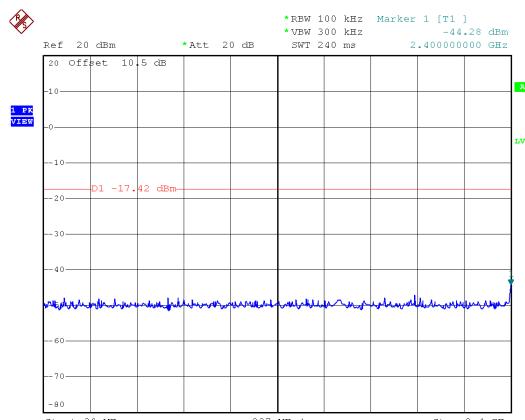


Antenna A

Modulation Type: 802.11g, CH 01



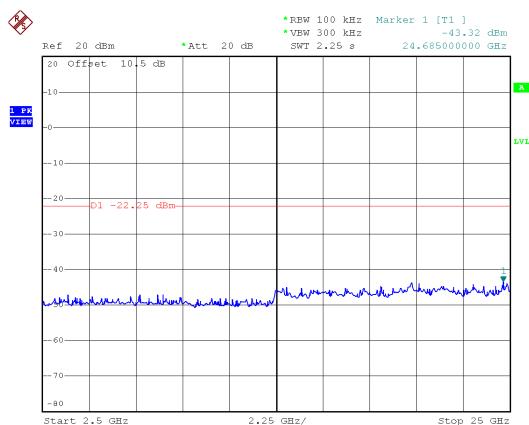
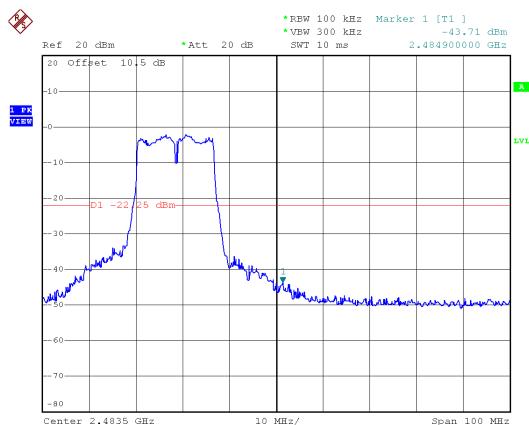
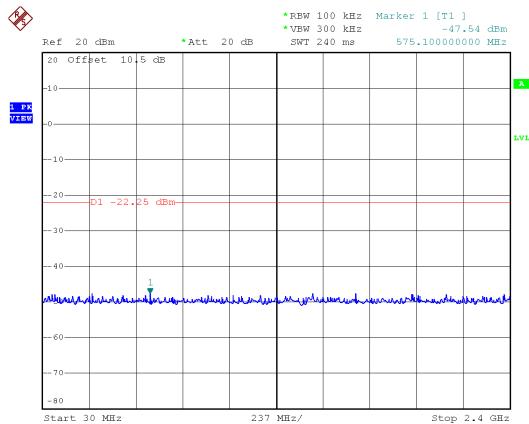
Modulation Type: 802.11g, CH 06





Antenna A

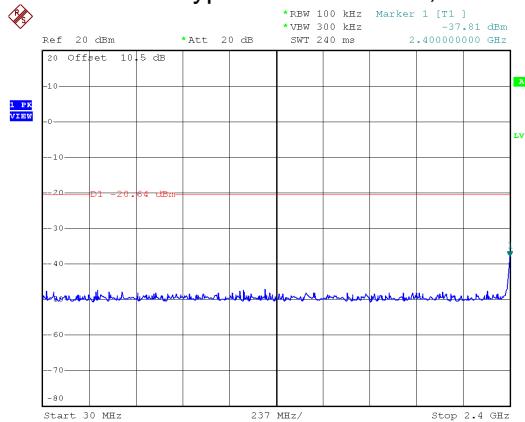
Modulation Type: 802.11g, CH 11



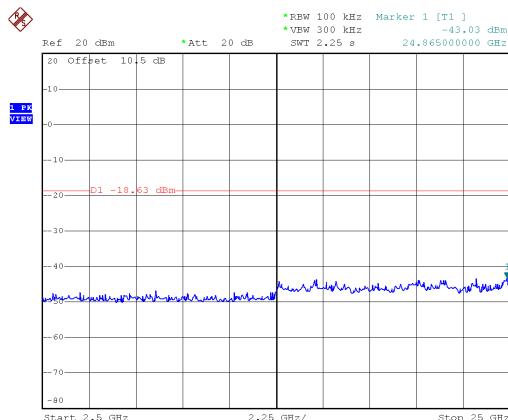
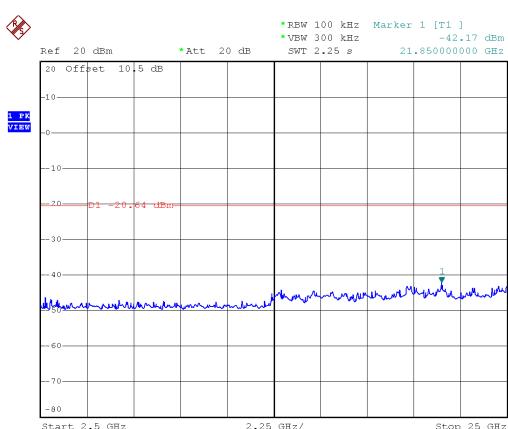
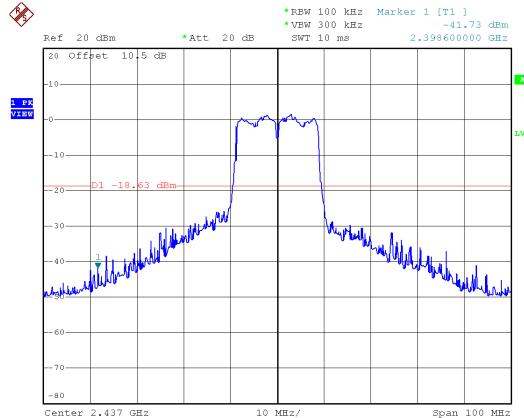
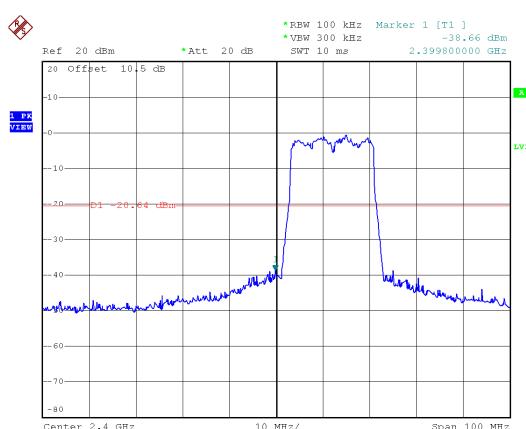
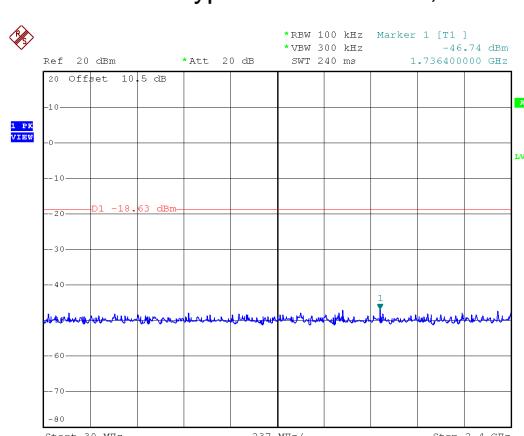


Antenna A

Modulation Type: 802.11n HT20, CH01



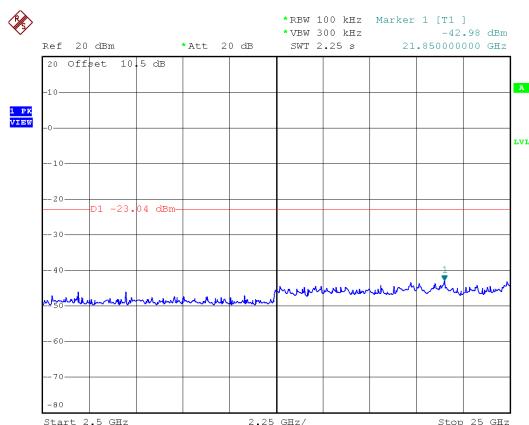
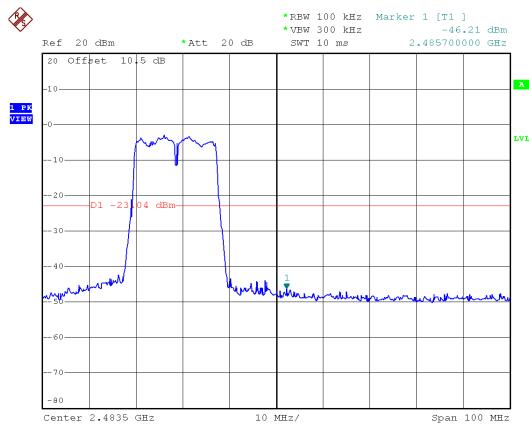
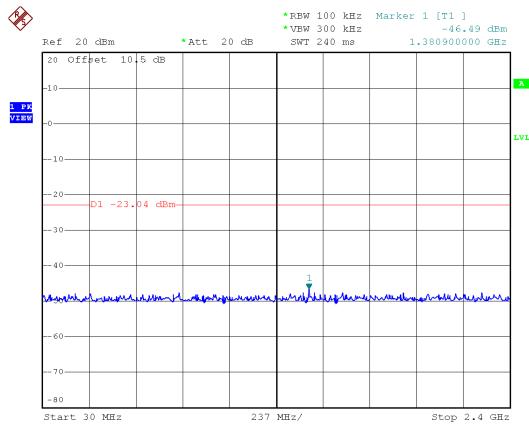
Modulation Type: 802.11n HT20, CH06





Antenna A

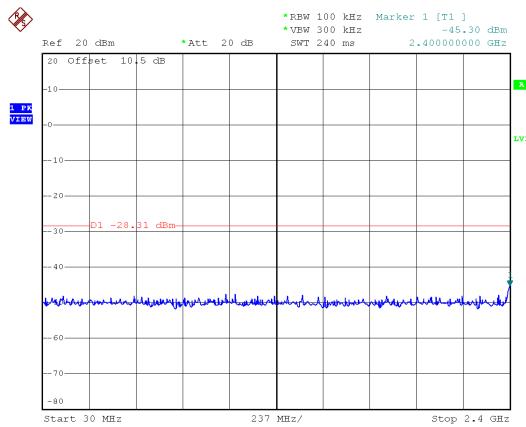
Modulation Type: 802.11n HT20, CH11



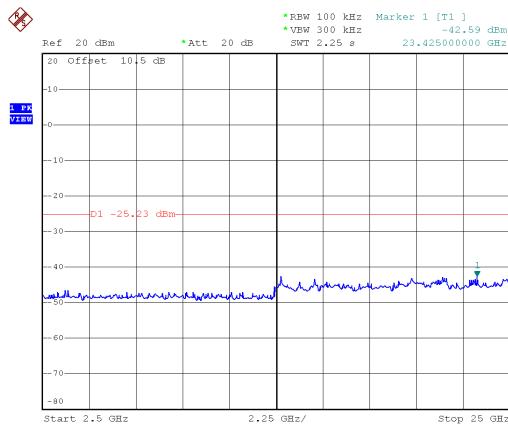
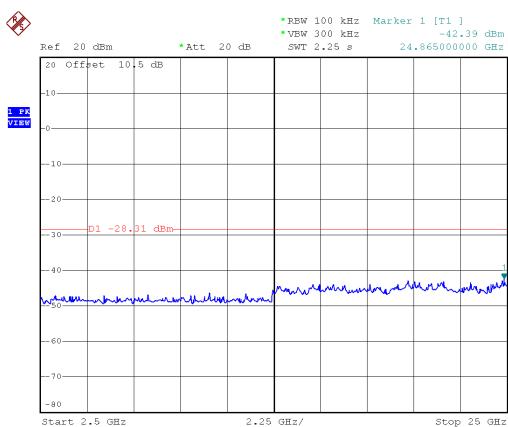
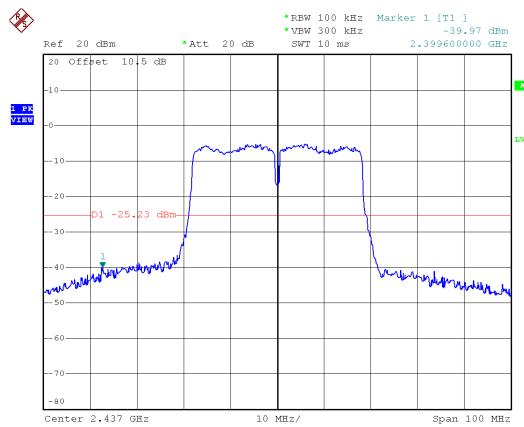
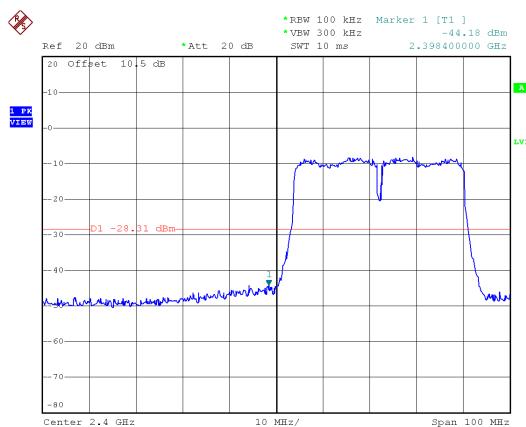
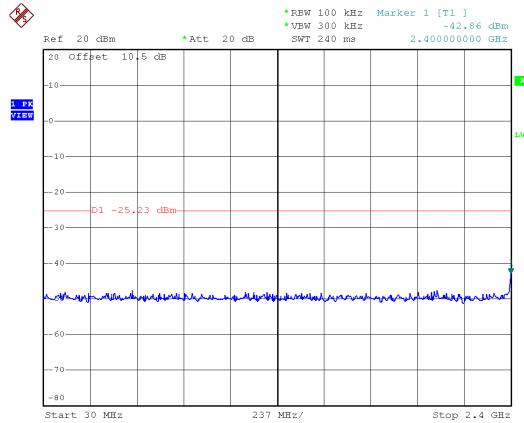


Antenna A

Modulation Type: 802.11n HT40, CH03



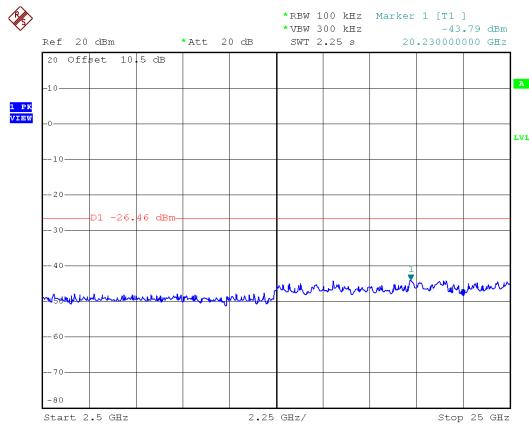
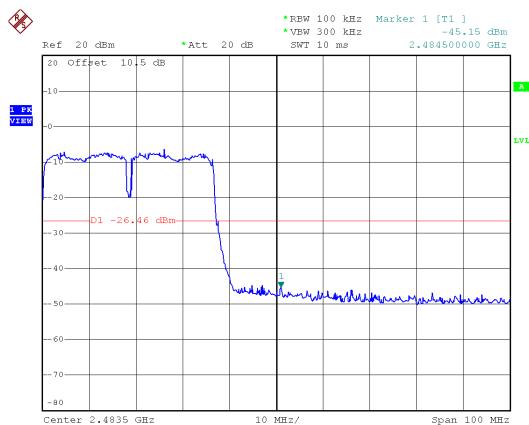
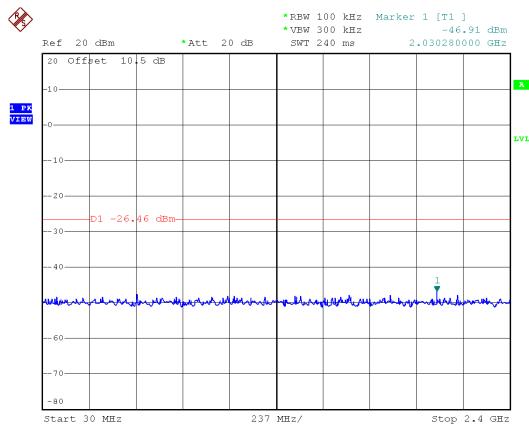
Modulation Type: 802.11n HT40, CH06





Antenna A

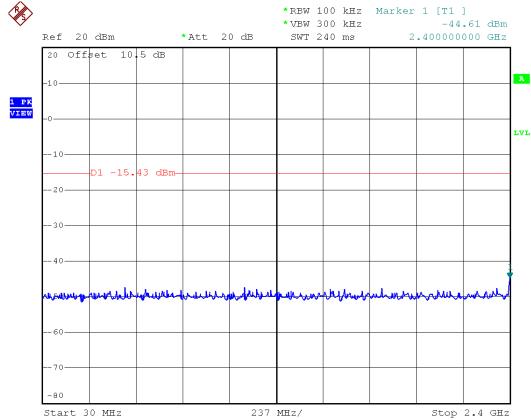
Modulation Type: 802.11n HT40, CH09



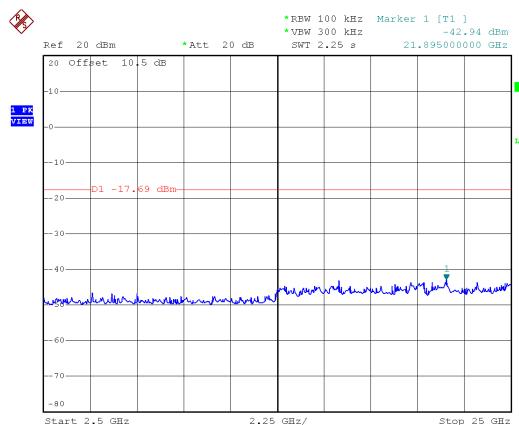
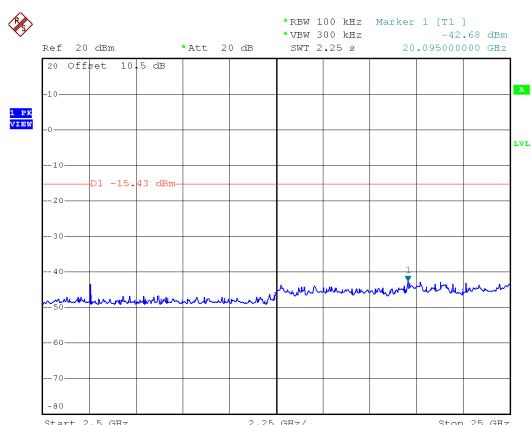
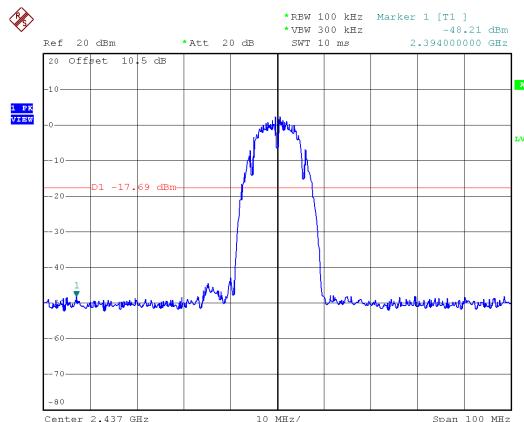
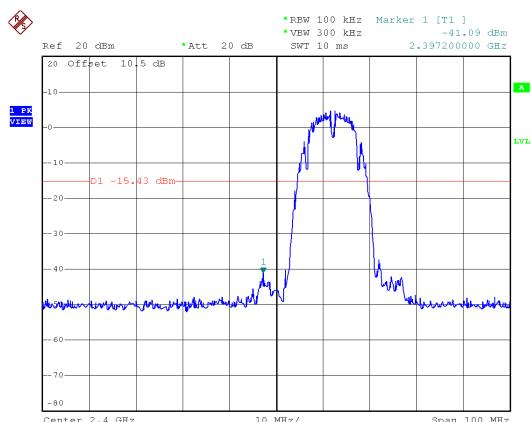
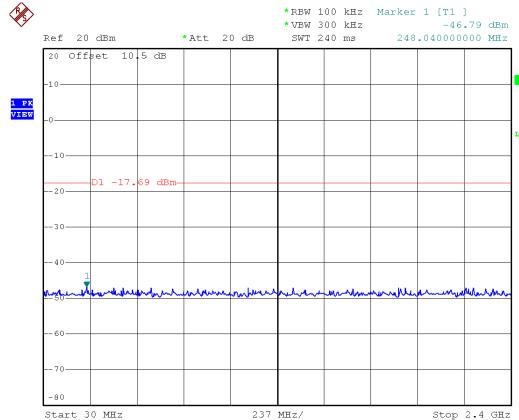


Antenna B

Modulation Type: 802.11b, CH 01



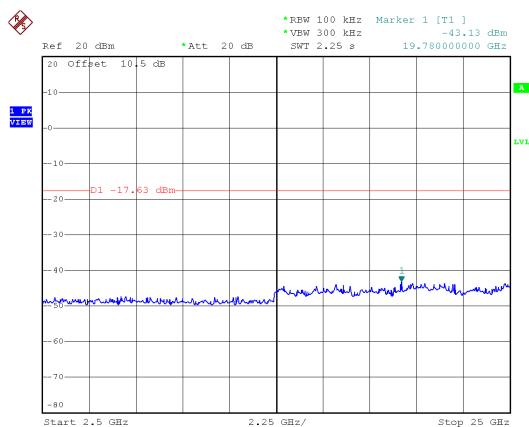
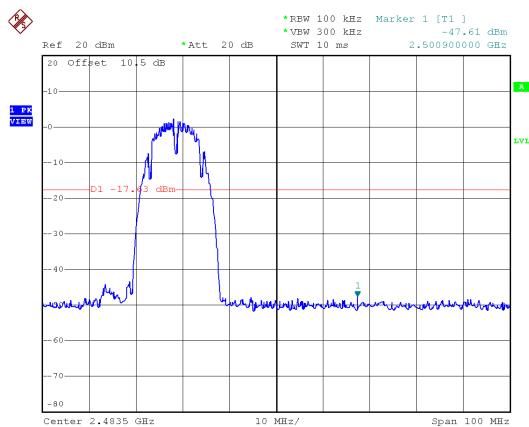
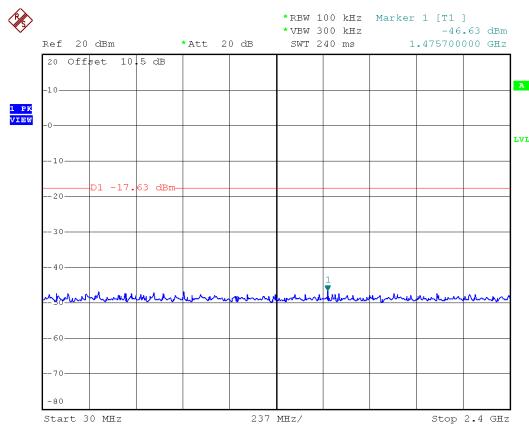
Modulation Type: 802.11b, CH 06





Antenna B

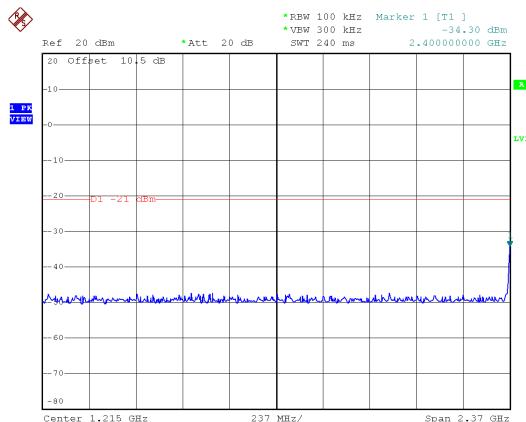
Modulation Type: 802.11b, CH 11



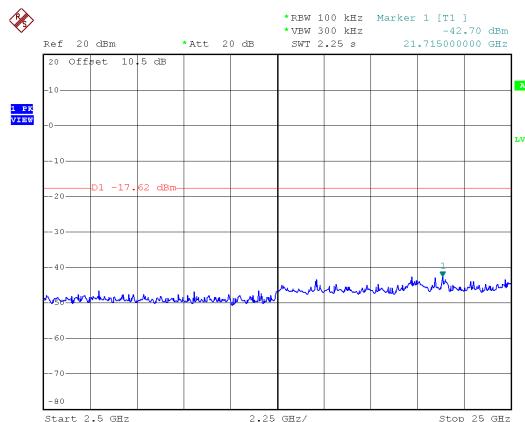
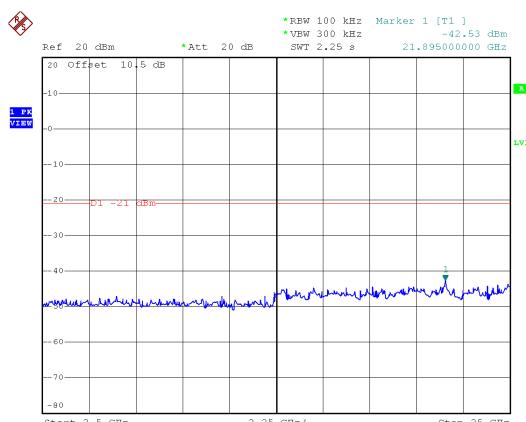
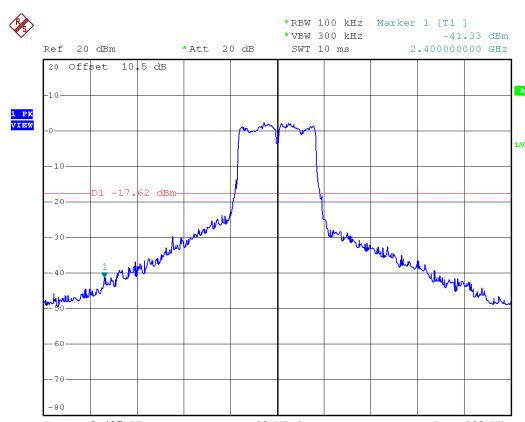
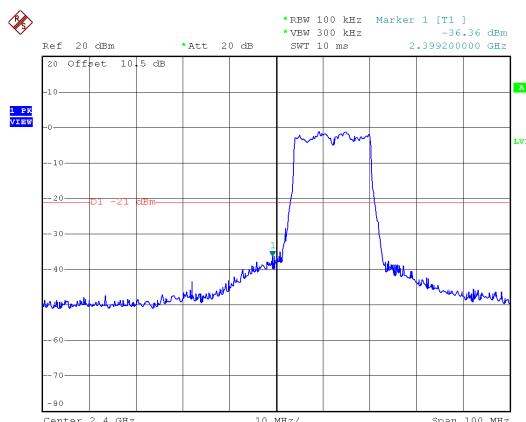
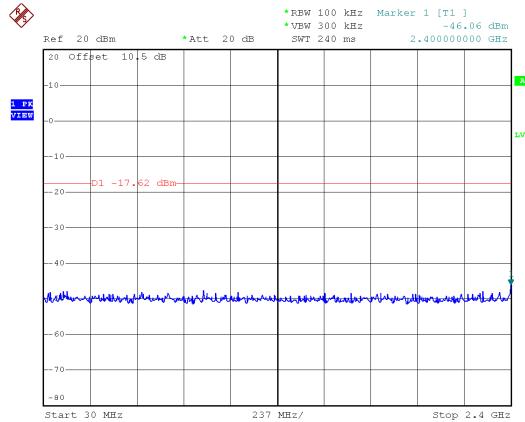


Antenna B

Modulation Type: 802.11g, CH 01



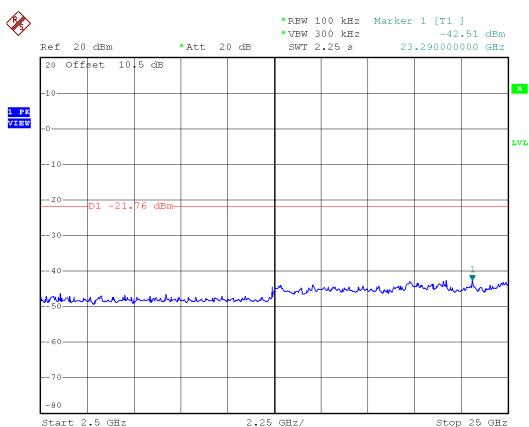
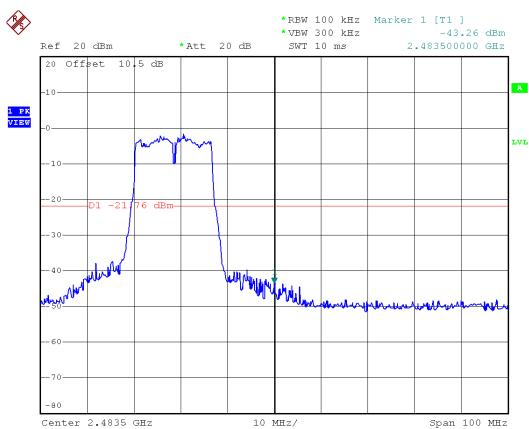
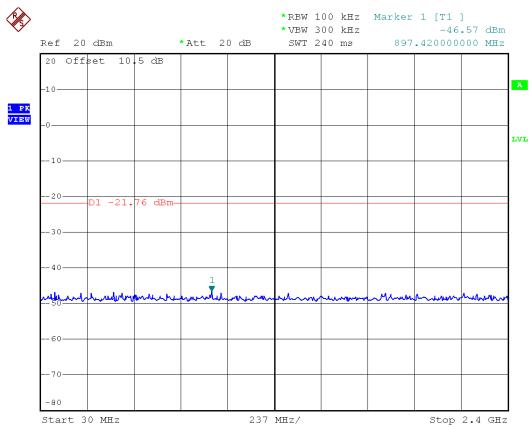
Modulation Type: 802.11g, CH 06





Antenna B

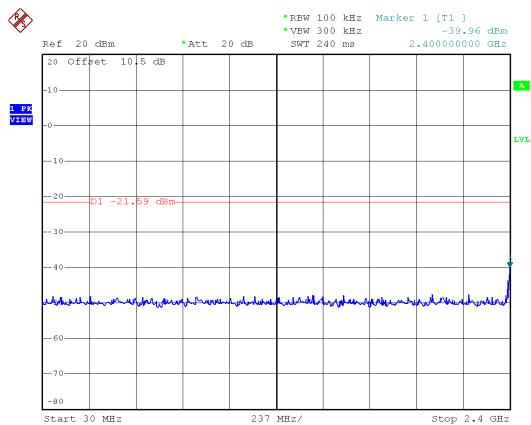
Modulation Type: 802.11g, CH 11



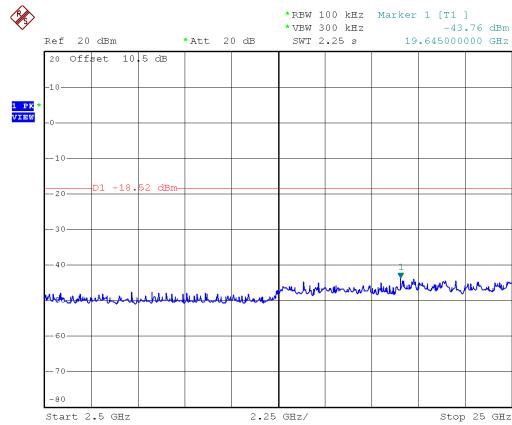
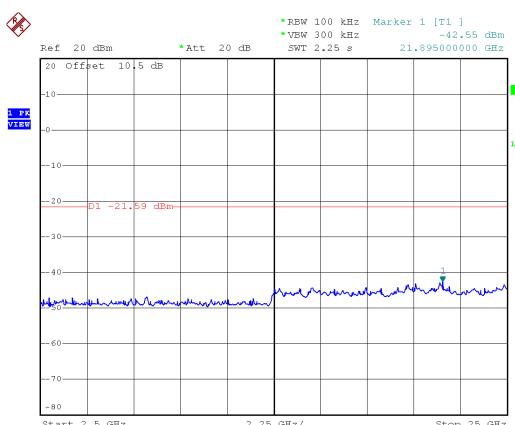
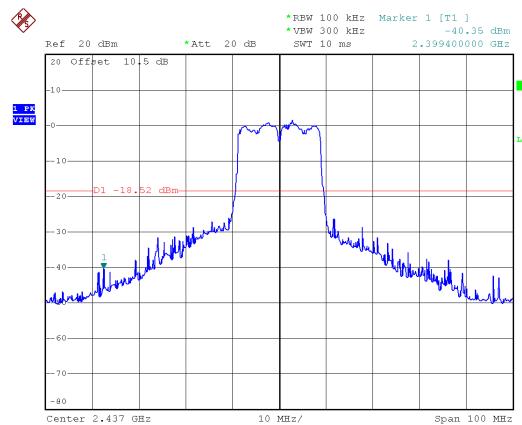
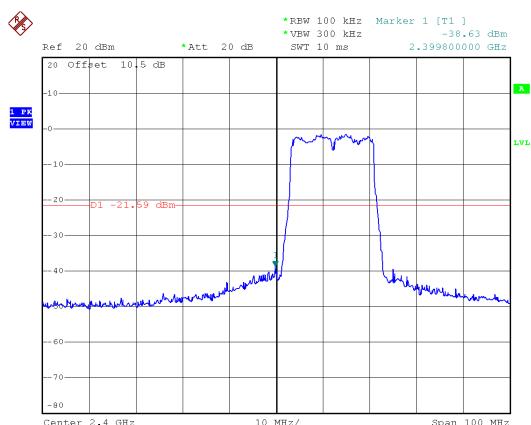
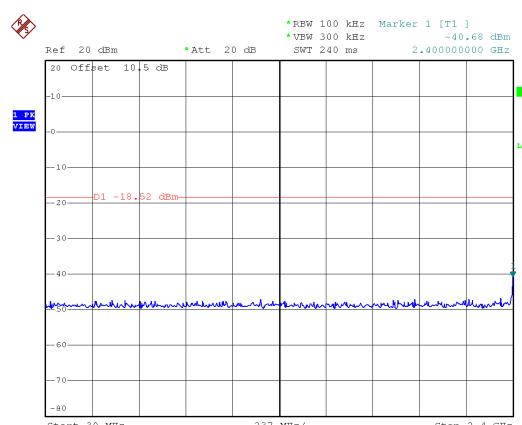


Antenna B

Modulation Type: 802.11n HT20, CH01



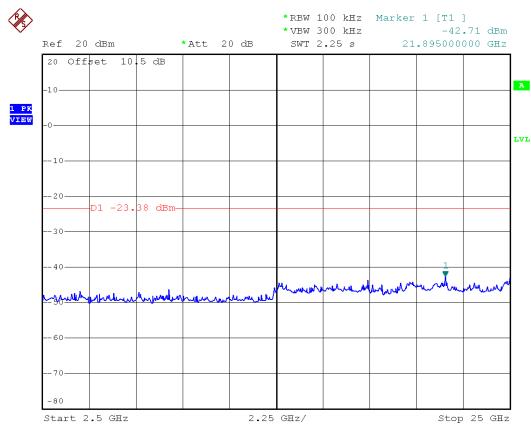
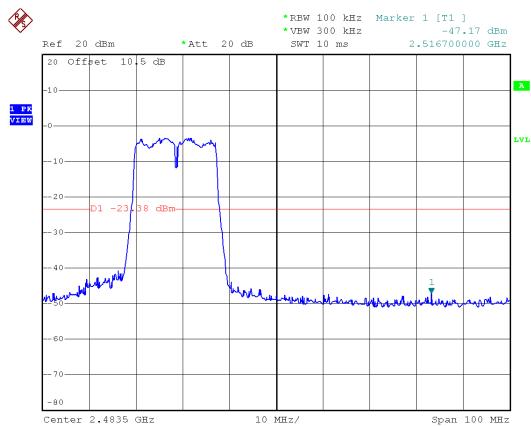
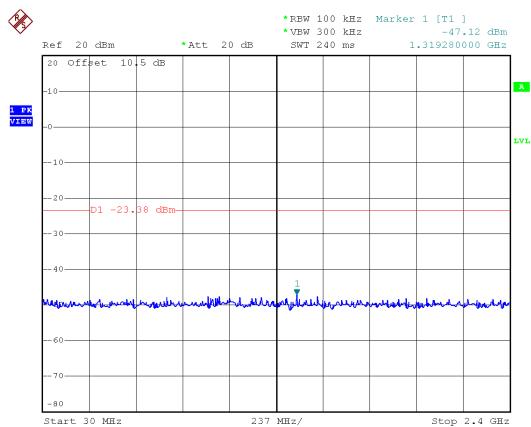
Modulation Type: 802.11n HT20, CH06





Antenna B

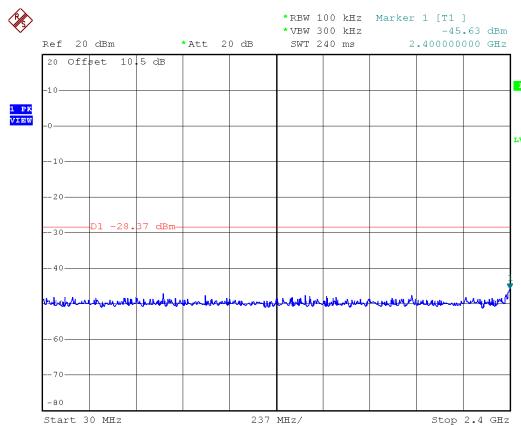
Modulation Type: 802.11n HT20, CH11



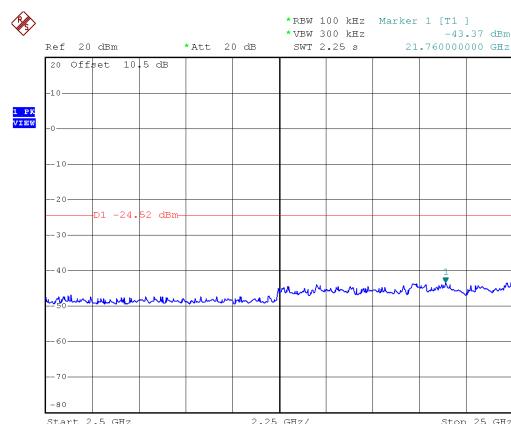
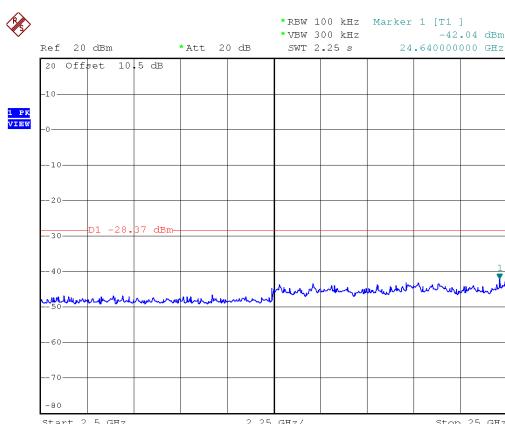
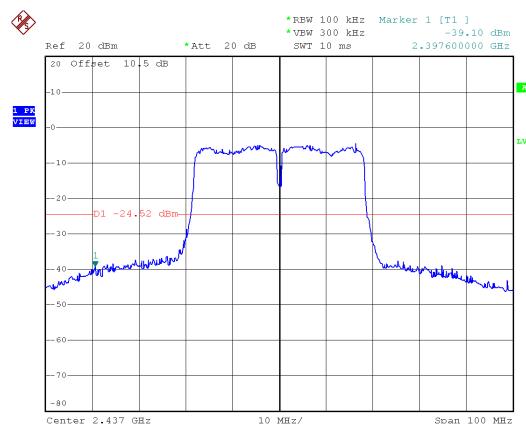
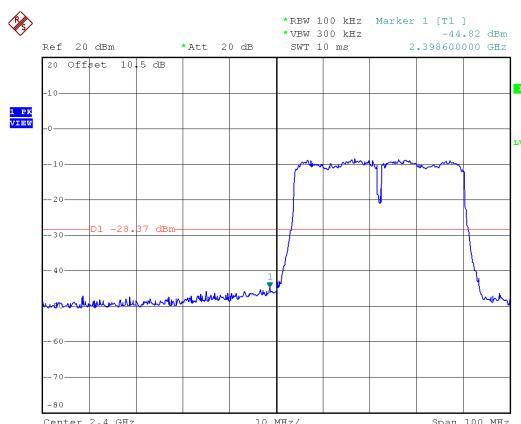
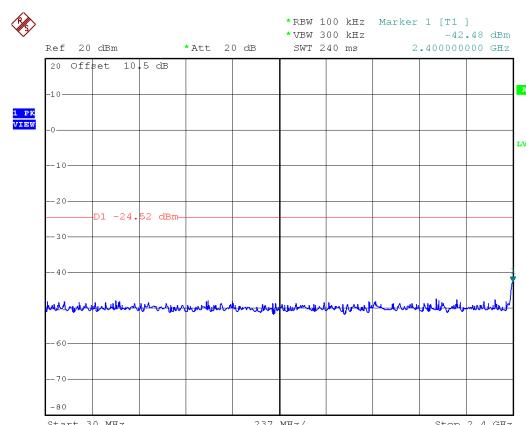


Antenna B

Modulation Type: 802.11n HT40, CH03



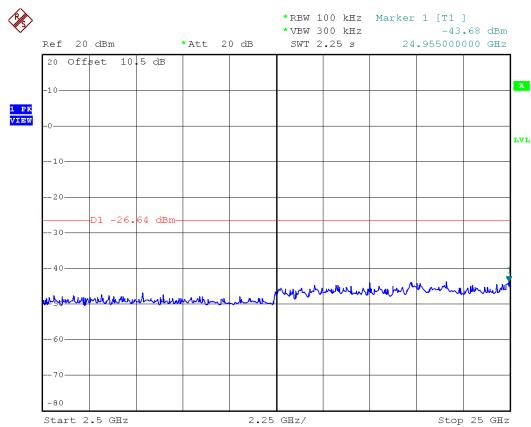
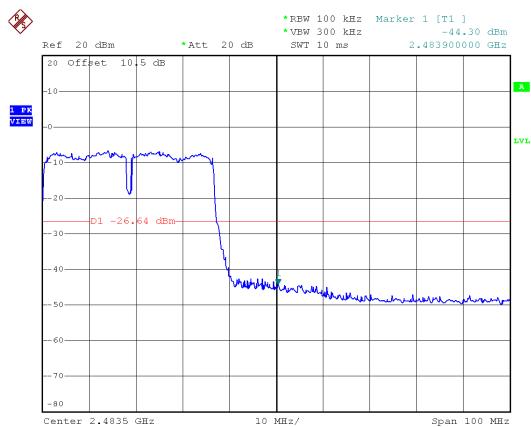
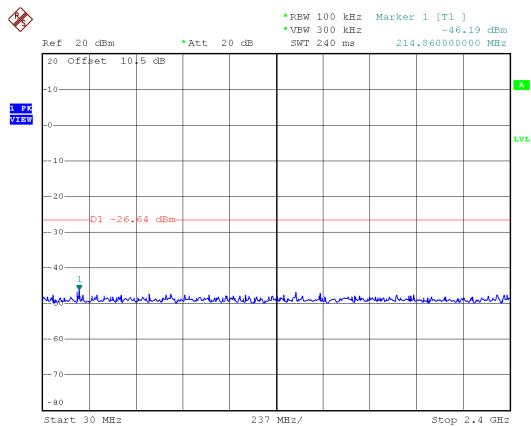
Modulation Type: 802.11n HT40, CH06





Antenna B

Modulation Type: 802.11n HT40, CH09





8. 6dB Bandwidth Measurement Data

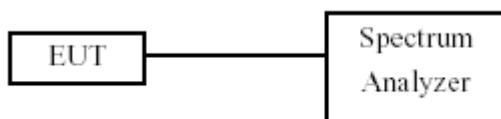
8.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

8.2 Test Procedures

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

8.3 Test Setup Layout



8.4 Test Result and Data

Temperature : 22°C

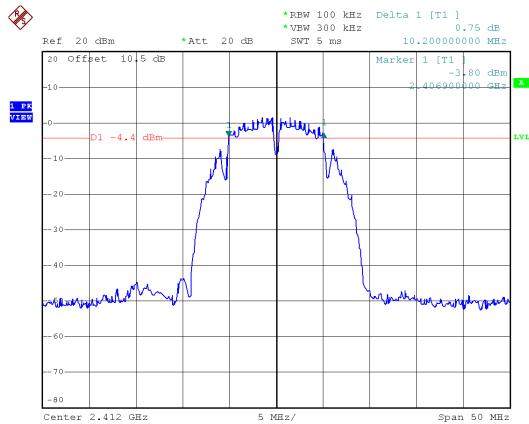
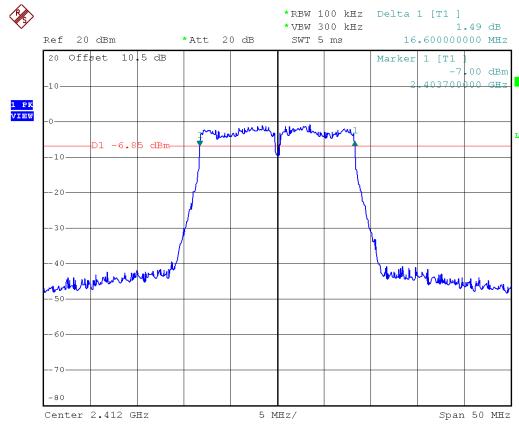
Humidity : 58%

Test Date : Feb. 24, 2017

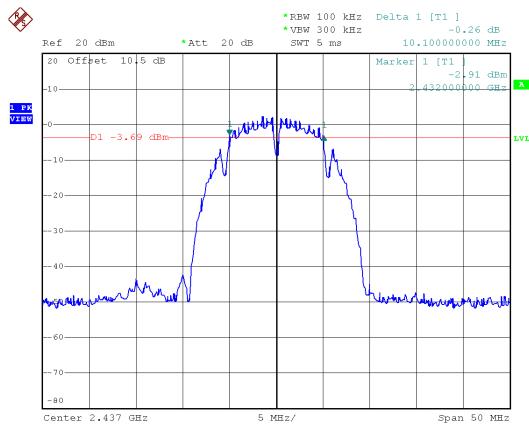
Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Limit (MHz)
			ANT A	ANT B	
IEEE 802.11b (1Mbps)	01	2412	10.20	10.10	0.5
	06	2437	10.10	10.00	0.5
	11	2462	9.40	9.40	0.5
IEEE 802.11g (6Mbps)	01	2412	16.60	17.80	0.5
	06	2437	16.50	16.50	0.5
	11	2462	16.60	16.50	0.5
IEEE 802.11n HT20 (6.5Mbps)	01	2412	17.80	17.80	0.5
	06	2437	17.80	17.70	0.5
	11	2462	17.70	17.70	0.5
IEEE 802.11n HT40 (13.5Mbps)	03	2422	36.40	36.40	0.5
	06	2437	36.40	36.20	0.5
	09	2452	36.40	36.40	0.5



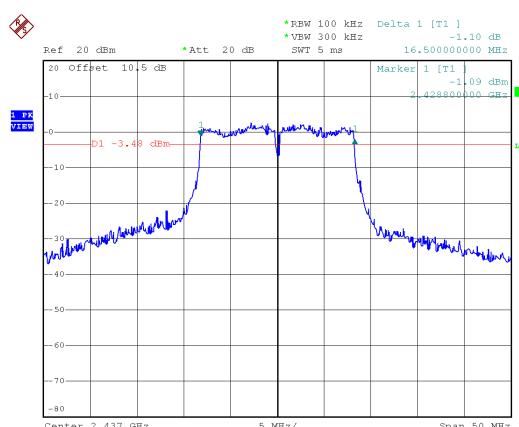
Antenna A

Modulation Type: 802.11b
CH01Modulation Type: 802.11g
CH01

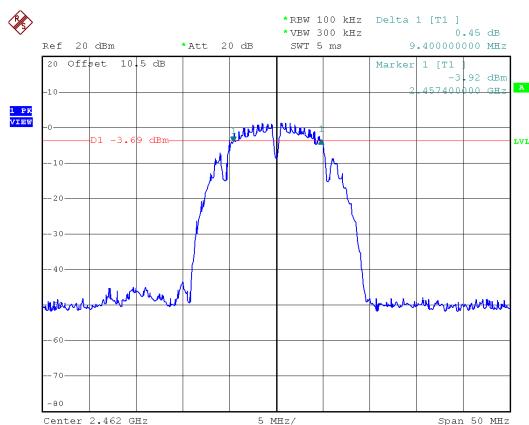
CH06



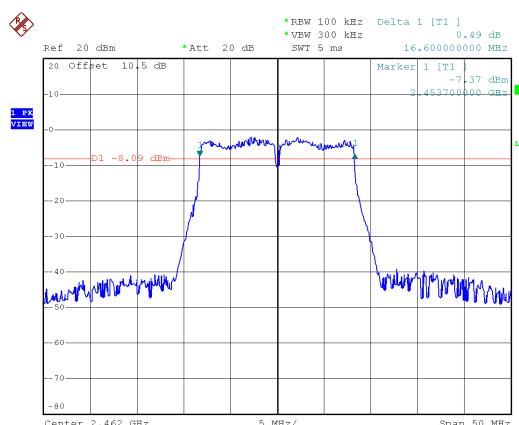
CH06



CH11

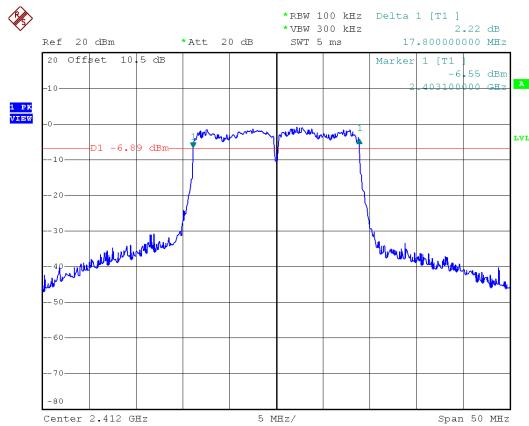
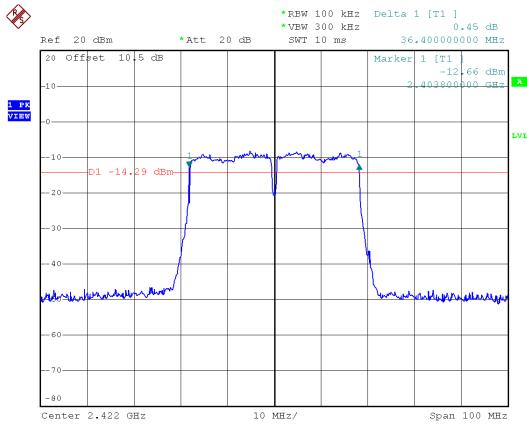


CH11

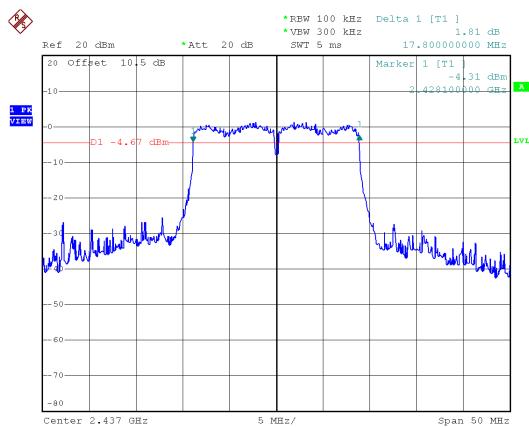




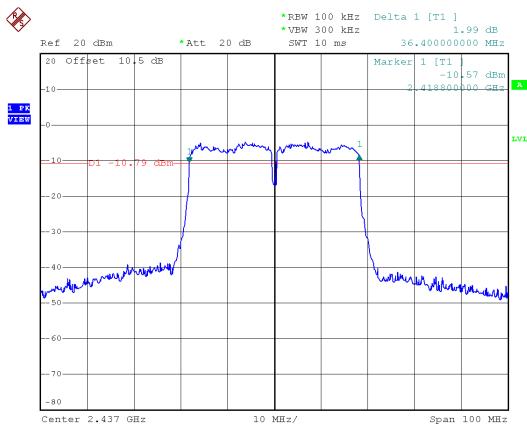
Antenna A

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

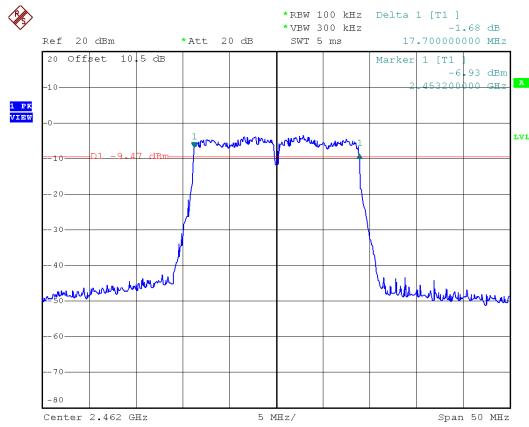
CH06



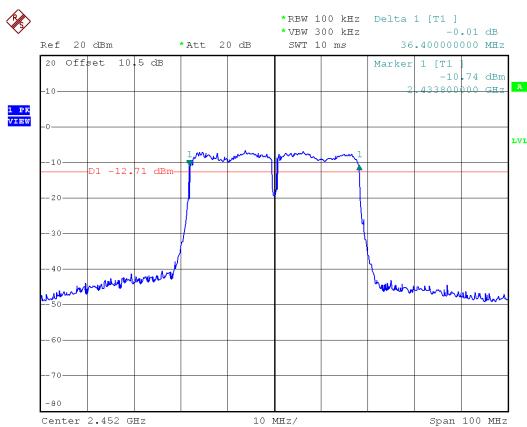
CH06



CH11

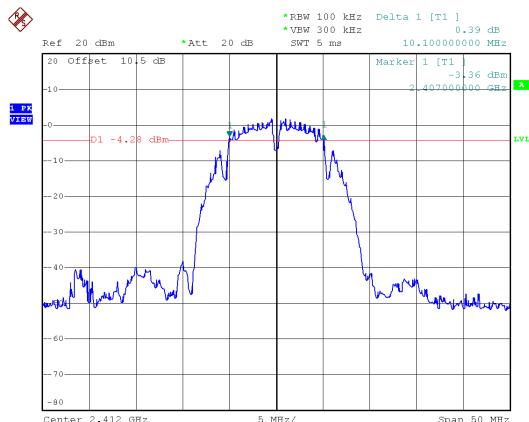
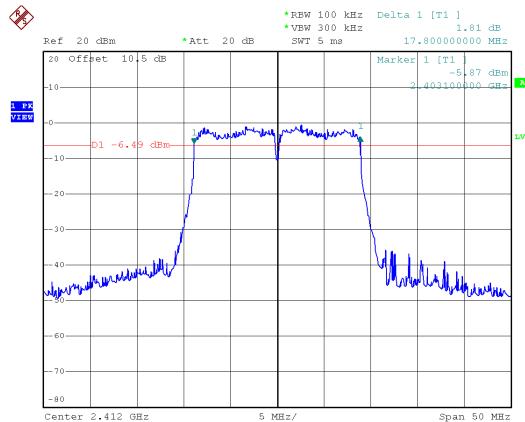


CH09

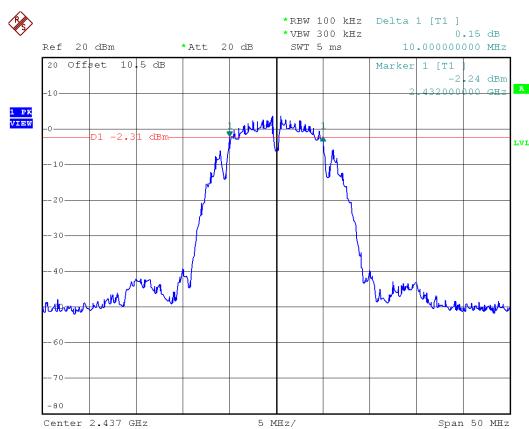




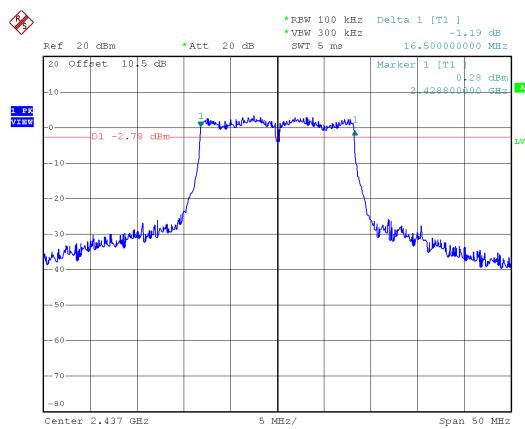
Antenna B

Modulation Type: 802.11b
CH01Modulation Type: 802.11g
CH01

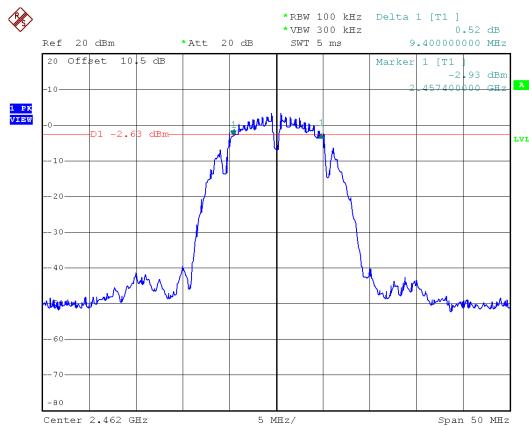
CH06



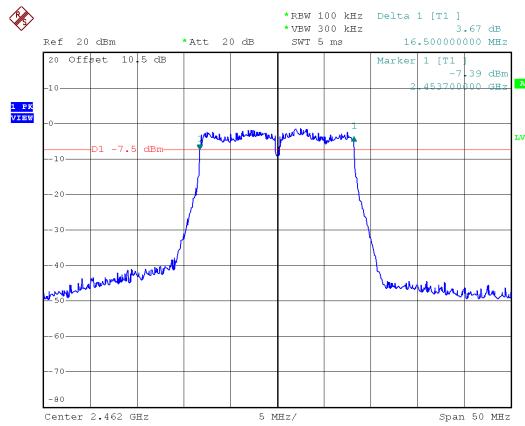
CH06



CH11



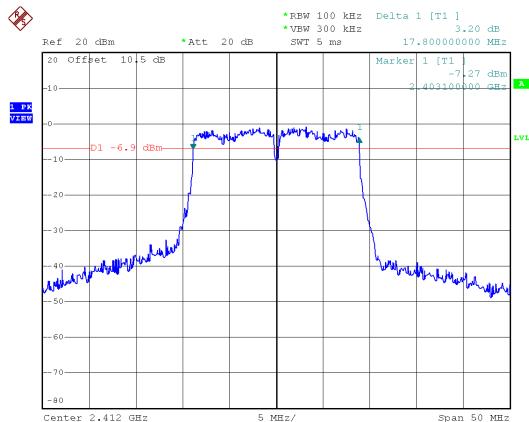
CH11



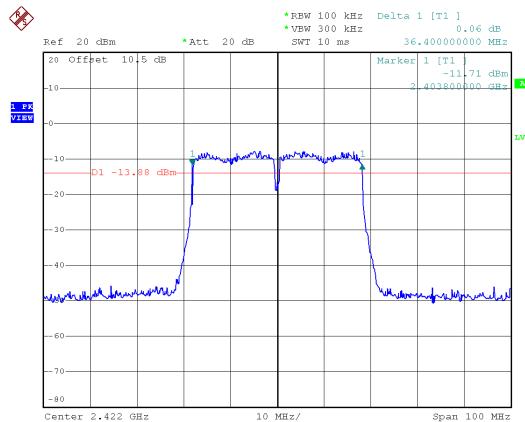


Antenna B

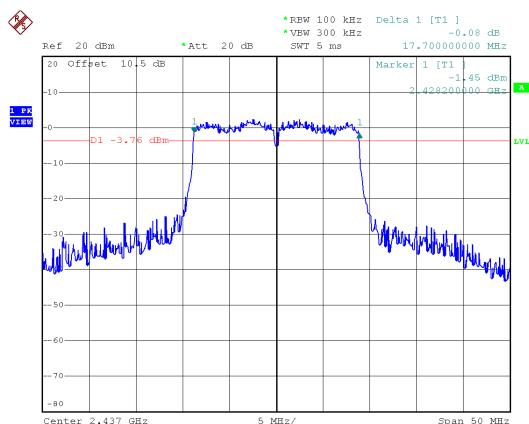
Modulation Type: 802.11n HT20
CH01



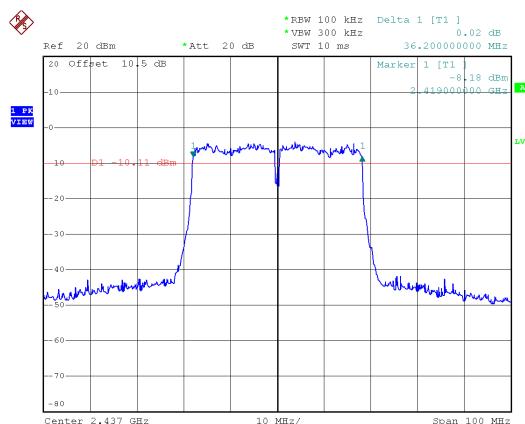
Modulation Type: 802.11n HT40
CH03



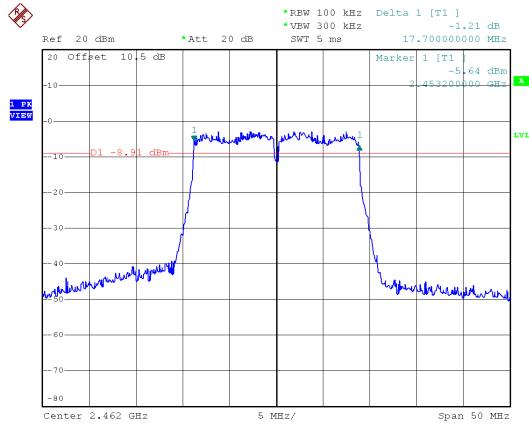
CH06



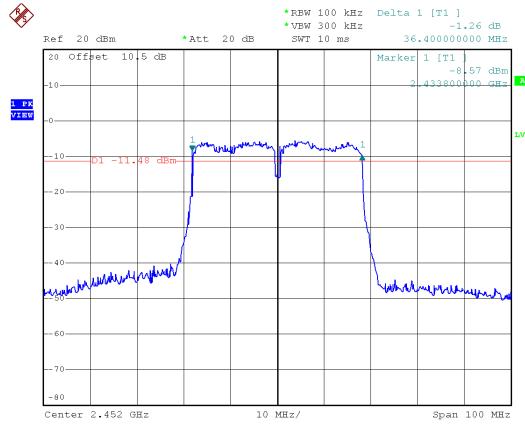
CH06



CH11



CH09





9. Maximum Peak and Average Output Power

9.1 Test Limit

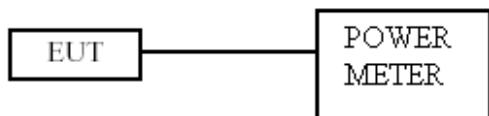
The Maximum Peak Output Power Measurement is 30dBm.

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

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 : 58 %

Test Date : Mar. 02. 2017

Modulation Type	Channel	Frequency (MHz)	Peak Power Output (dBm)			Peak Power Output (mW)	Power Limit (dBm)
			ANT A	ANT B	A+B		
IEEE 802.11b (1Mbps)	01	2412	15.26	15.06	18.17	65.64	30.00
	06	2437	14.9	16.02	18.51	70.90	30.00
	11	2462	14.71	15.69	18.24	66.65	30.00
IEEE 802.11g (6Mbps)	01	2412	21.9	21.85	24.89	307.99	30.00
	06	2437	24.81	25.07	27.95	624.06	30.00
	11	2462	21.29	20.72	24.02	252.62	30.00
IEEE 802.11n HT20 (6.5Mbps)	01	2412	22	22.70	25.37	344.70	30.00
	06	2437	24.33	23.97	27.16	520.48	30.00
	11	2462	20.92	19.76	23.39	218.22	30.00
IEEE 802.11n HT40 (13.5Mbps)	03	2422	19.96	19.90	22.94	196.81	30.00
	06	2437	21.40	21.50	24.46	279.29	30.00
	09	2452	19.25	20.50	22.93	196.34	30.00

Modulation Type	Channel	Frequency (MHz)	Avg. Power Output (dBm)			Avg. Power Output (mW)	Power Limit (dBm)
			ANT A	ANT B	A+B		
IEEE 802.11b (1Mbps)	01	2412	12.24	11.88	15.07	32.17	30.00
	06	2437	11.94	12.84	15.42	34.86	30.00
	11	2462	11.77	12.48	15.15	32.73	30.00
IEEE 802.11g (6Mbps)	01	2412	12.88	12.77	15.84	38.33	30.00
	06	2437	16.11	16.70	19.43	87.61	30.00
	11	2462	11.44	11.90	14.69	29.42	30.00
IEEE 802.11n HT20 (6.5Mbps)	01	2412	12.95	12.82	15.90	38.87	30.00
	06	2437	15.24	15.90	18.59	72.32	30.00
	11	2462	10.66	10.97	13.83	24.14	30.00
IEEE 802.11n HT40 (13.5Mbps)	03	2422	10.98	10.83	13.92	24.64	30.00
	06	2437	12.17	12.30	15.25	33.46	30.00
	09	2452	10.35	11.25	13.83	24.17	30.00

Note: Average power is for reference only.



10. Power Spectral Density

10.1 Test Limit

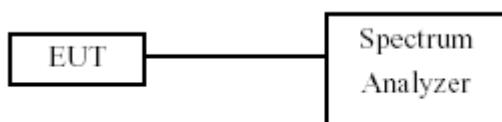
The Maximum of Power Spectral Density Measurement is 8dBm.

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

- a. The transmitter output was connected to spectrum analyzer.
- b. 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.
- c. The power spectral density was measured and recorded.

10.3 Test Setup Layout



10.4 Test Result and Data

Temperature : 22 °C

Humidity : 58 %

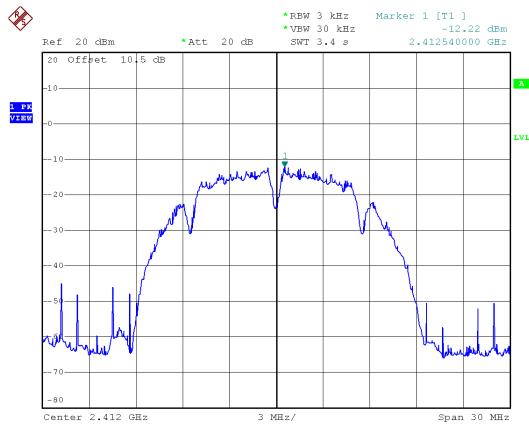
Test Date : Mar. 02. 2017

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				
IEEE 802.11b (1Mbps)	01	2412	-12.22	-12.55	-9.37	0.00	-9.37	8.00
	06	2437	-9.55	-11.33	-7.34	0.00	-7.34	8.00
	11	2462	-9.22	-12.04	-7.39	0.00	-7.39	8.00
IEEE 802.11g (6Mbps)	01	2412	-13.55	-13.41	-10.47	0.00	-10.47	8.00
	06	2437	-10.67	-9.3	-6.92	0.00	-6.92	8.00
	11	2462	-15.38	-14.29	-11.79	0.00	-11.79	8.00
IEEE 802.11n HT20 (6.5Mbps)	01	2412	-12.19	-11.09	-8.59	0.00	-8.59	8.00
	06	2437	-11.12	-9.98	-7.50	0.00	-7.50	8.00
	11	2462	-15.88	-15.06	-12.44	0.00	-12.44	8.00
IEEE 802.11n HT40 (13.5Mbps)	03	2422	-19.95	-19.16	-16.53	0.00	-16.53	8.00
	06	2437	-16.65	-16.23	-13.42	0.00	-13.42	8.00
	09	2452	-19.1	-17.72	-15.35	0.00	-15.35	8.00

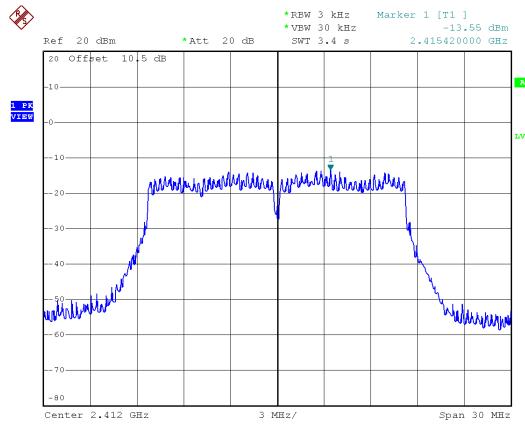


Antenna A

Modulation Type: 802.11b
CH01



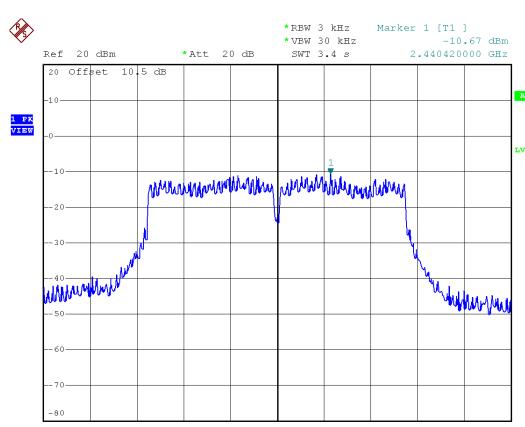
Modulation Type: 802.11g
CH01



CH06



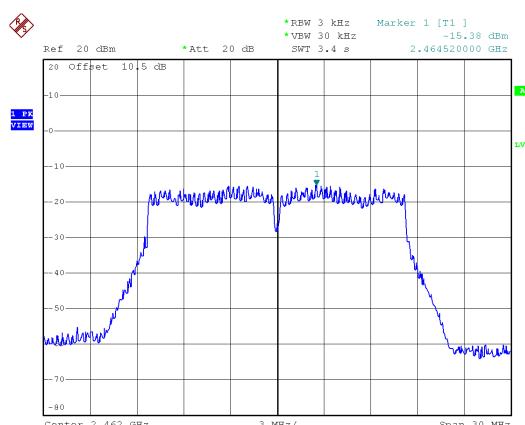
CH06



CH11



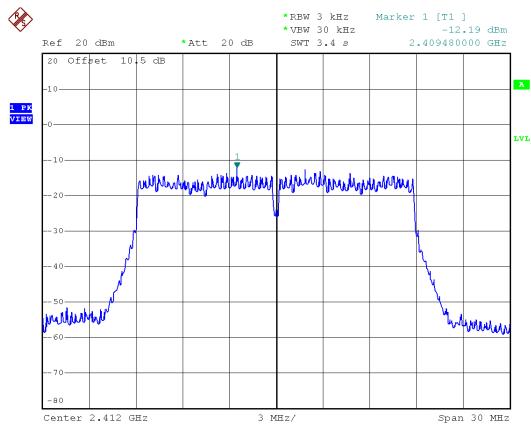
CH11



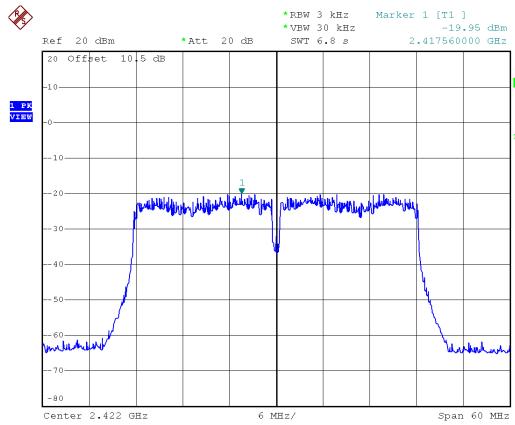


Antenna A

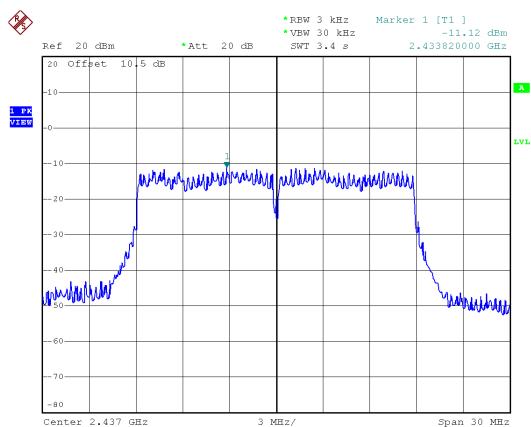
Modulation Type: 802.11n HT20
CH01



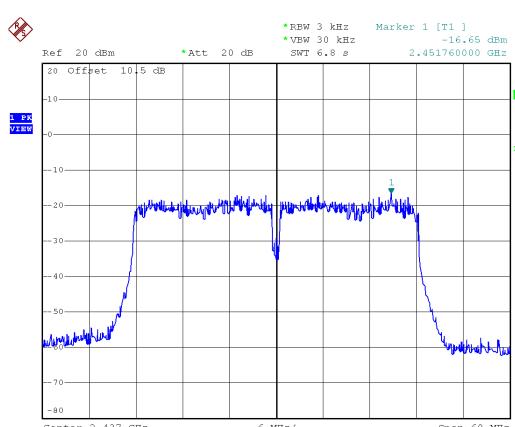
Modulation Type: 802.11n HT40
CH03



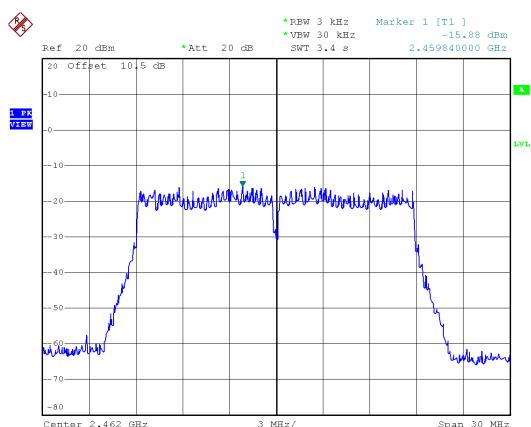
CH06



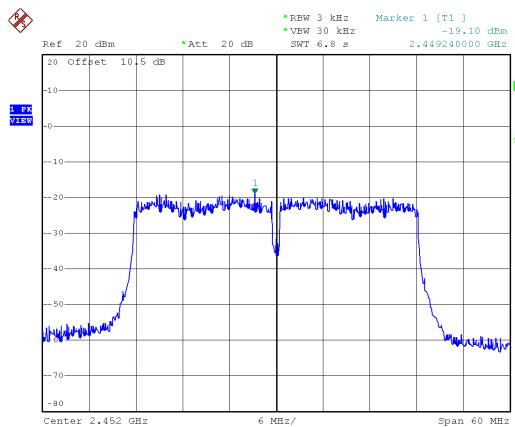
CH06



CH11

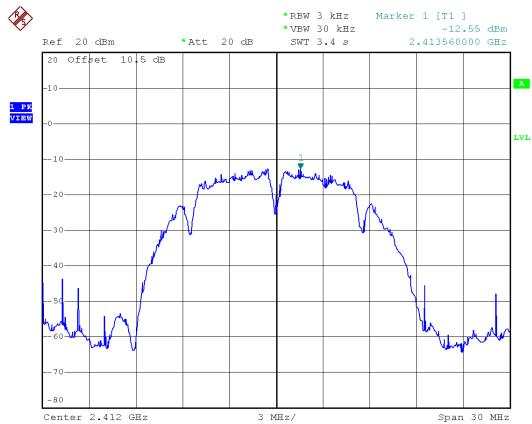
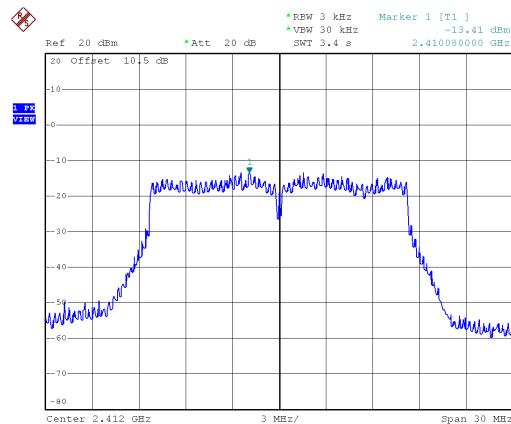


CH09

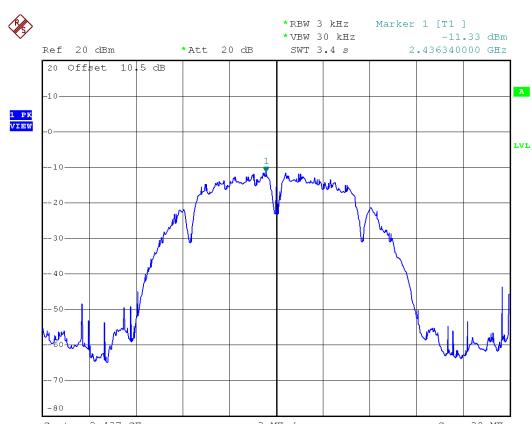




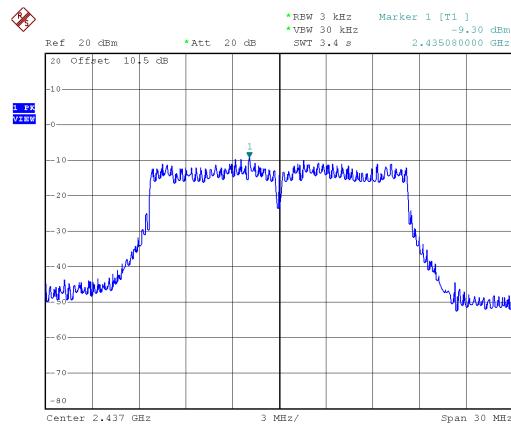
Antenna B

Modulation Type: 802.11b
CH01Modulation Type: 802.11g
CH01

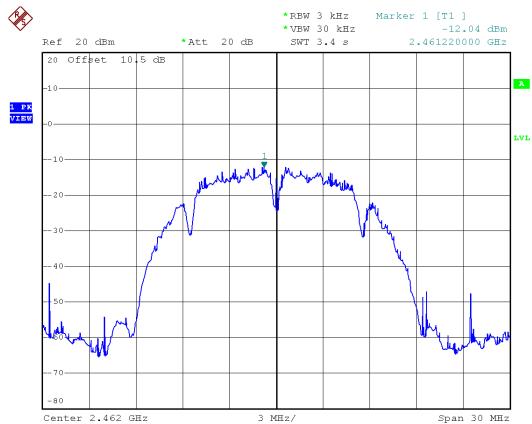
CH06



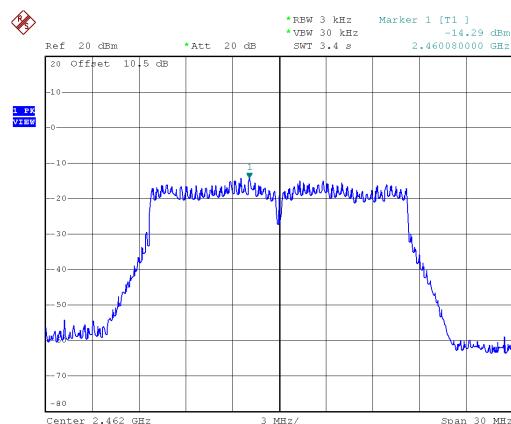
CH06



CH11

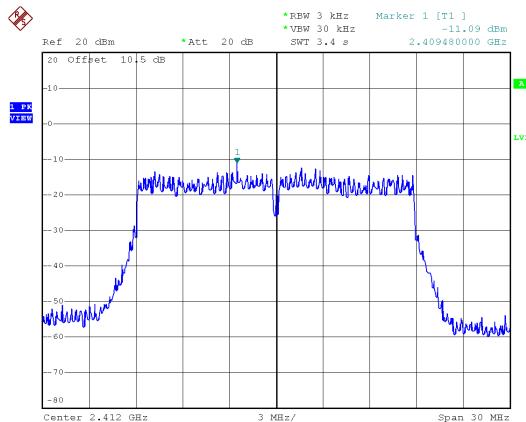
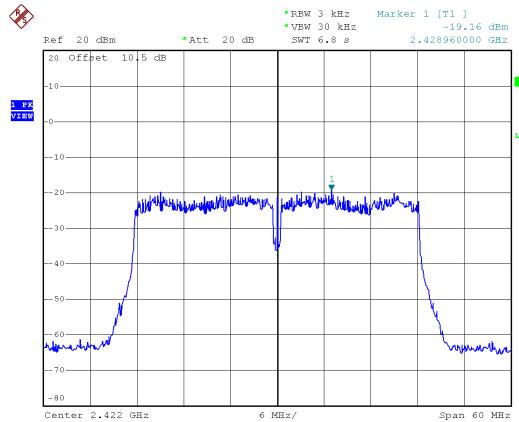


CH11

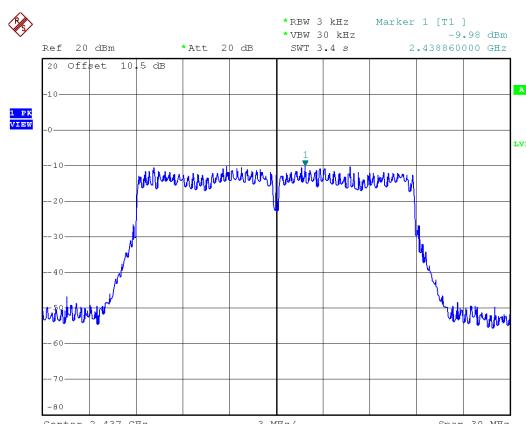




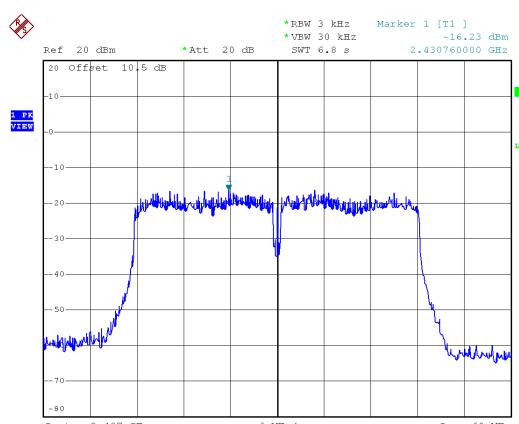
Antenna B

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

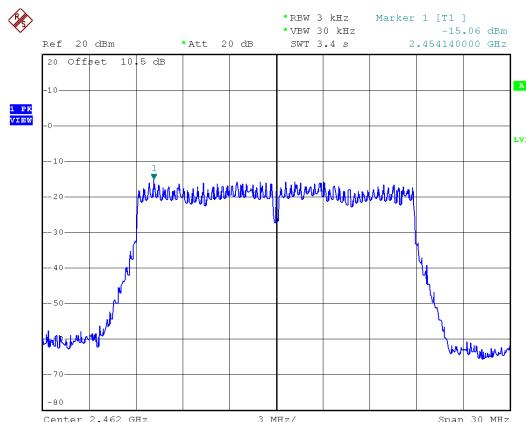
CH06



CH06



CH11



CH09

