



# FCC RADIO TEST REPORT

Applicant : Acer Cloud Technology (Taiwan) Inc.  
Address : 9F, 88, Sec.1, Xintai 5th Rd. Xizhi,  
New Taipei City 221, Taiwan, R.O.C  
Equipment : Acer Smart Plug  
Model No. : SP100  
Trade Name : acer  
FCC ID. : 2ALY8-SP100

**I HEREBY CERTIFY THAT :**

The sample was received on Jun. 30, 2017 and the testing was carried out on Jun. 30, 2017 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Mark Liao / Assistant Manager

Tested by:

Spree Yei / Engineer

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





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### History of this test report

Report No.	Issue Date	Description
TEF11704335	Jul. 04, 2017	Original



# 1. Summary of Test Procedure and Test Results

## 1.1 Applicable Standards

**ANSI C63.4:2014**

**ANSI C63.10:2013**

**FCC Rules and Regulations Part 15 Subpart C §15.247**

**KDB558074**

**KDB662911**

**KDB447498**

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

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



## 2. Test Configuration of Equipment under Test

### 2.1 Feature of Equipment

Frequency Range	2412-2462 MHz
Modulation Type	OFDM, DSSS
Data Rate	802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS7, HT20
Antenna Type/ gain	Printed antenna / 1.5dBi

Note: For a more detailed please refer to user’s manual.

### 2.2 Carrier Frequency of Channels

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

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

Note: Channels remarked \* are selected to perform test.



### 2.3 Test Mode and Test Software

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- b. An executive program, "Ameba mptool 1v11" under WIN 7 was executed to transmit and receive data via WLAN.
- c. 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)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), "Test Mode 1,2,3" 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	<b>CerpPASS Technology Corporation Test Laboratory</b> Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582	
	FCC	TW1079, TW1061, 390316, 228391, 641184
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-4399, R-4218 for Radiated emission test G-812, G-813 for radiated disturbance above 1GHz
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 25,000MHz	
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.	

## 2.6 Measurement Uncertainty

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





### 3. Test Equipment and Ancillaries Used for Tests

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



## 4. Antenna Requirements

### 4.1 Antenna Construction and Directional Gain

Printed antenna, 1.5dBi

For Power directional gain=  $G_{ant}= 1.5 \text{ dBi}$

For PSD directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / NANT]$   
= 1.5 (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 $\mu$ V)	Average (dB $\mu$ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

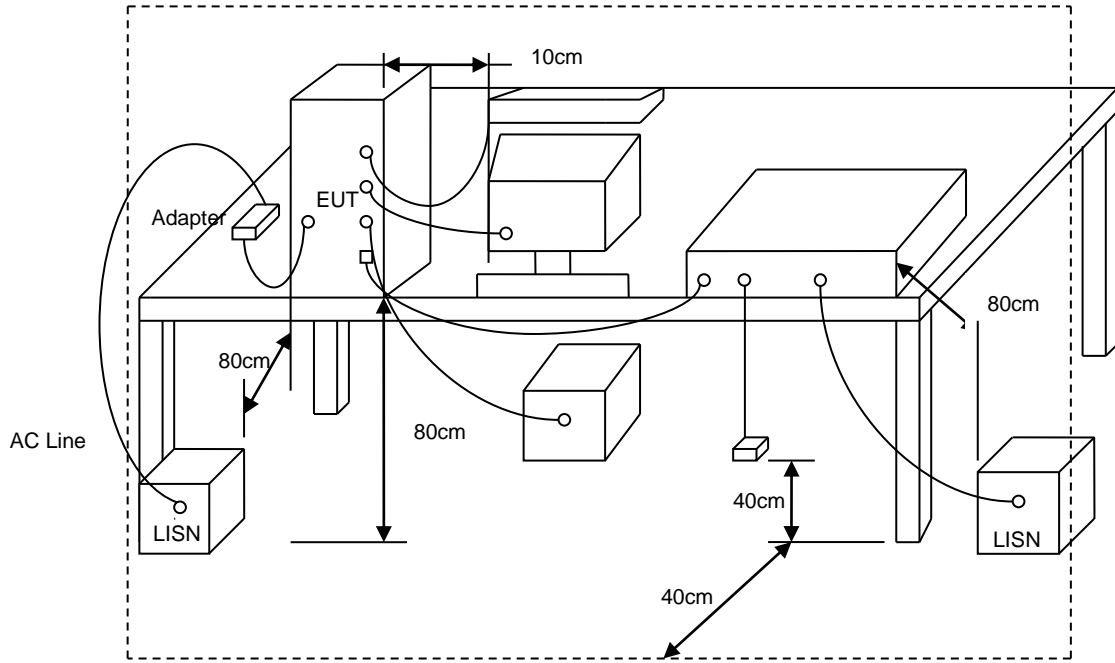
\*Decreases with the logarithm of the frequency.

### 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.



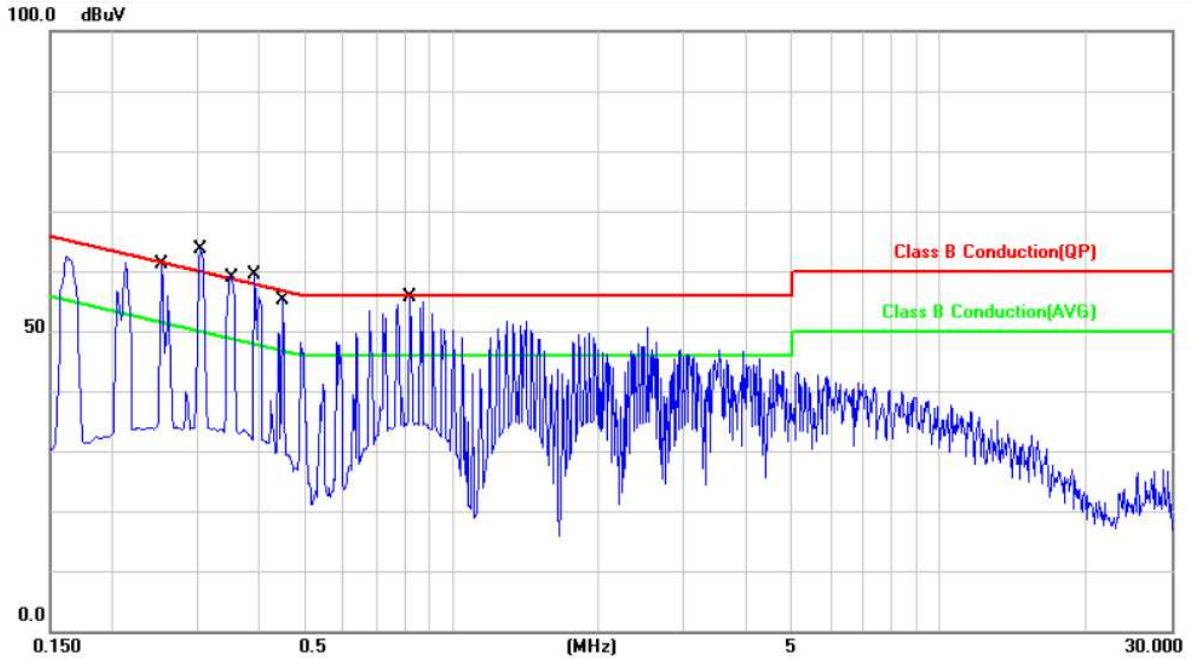
### 5.3 Typical Test Setup





### 5.4 Test Result and Data

Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: Mode 2	Temperature	: 24 °C
Test date	: Jun. 30, 2017	Humidity	: 62 %

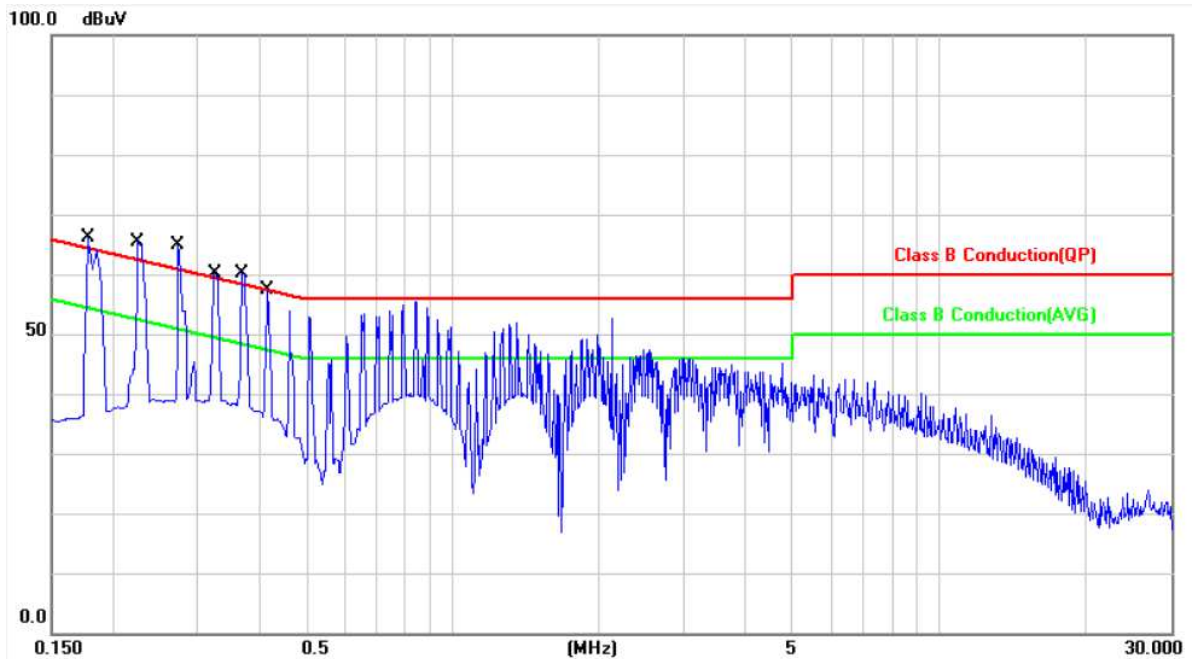


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2540	9.91	44.83	54.74	61.62	-6.88	QP	P
2	0.2540	9.91	25.36	35.27	51.62	-16.35	AVG	P
3	0.3060	9.92	43.13	53.05	60.08	-7.03	QP	P
4	0.3060	9.92	24.52	34.44	50.08	-15.64	AVG	P
5	0.3540	9.93	41.35	51.28	58.87	-7.59	QP	P
6	0.3540	9.93	23.62	33.55	48.87	-15.32	AVG	P
7	0.3940	9.93	39.90	49.83	57.98	-8.15	QP	P
8	0.3940	9.93	22.24	32.17	47.98	-15.81	AVG	P
9	0.4500	9.93	36.01	45.94	56.87	-10.93	QP	P
10	0.4500	9.93	18.76	28.69	46.87	-18.18	AVG	P
11	0.8180	9.95	36.36	46.31	56.00	-9.69	QP	P
12	0.8180	9.95	22.86	32.81	46.00	-13.19	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	: 24 °C
Test date	: Jun. 30, 2017	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1780	9.88	45.42	55.30	64.57	-9.27	QP	P
2	0.1780	9.88	27.46	37.34	54.57	-17.23	AVG	P
3	0.2260	9.88	44.08	53.96	62.59	-8.63	QP	P
4	0.2260	9.88	28.09	37.97	52.59	-14.62	AVG	P
5	0.2740	9.88	43.94	53.82	60.99	-7.17	QP	P
6	0.2740	9.88	28.47	38.35	50.99	-12.64	AVG	P
7	0.3260	9.88	41.78	51.66	59.55	-7.89	QP	P
8	0.3260	9.88	27.59	37.47	49.55	-12.08	AVG	P
9	0.3700	9.89	40.46	50.35	58.50	-8.15	QP	P
10	0.3700	9.89	26.57	36.46	48.50	-12.04	AVG	P
11	0.4180	9.89	38.33	48.22	57.49	-9.27	QP	P
12	0.4180	9.89	24.94	34.83	47.49	-12.66	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

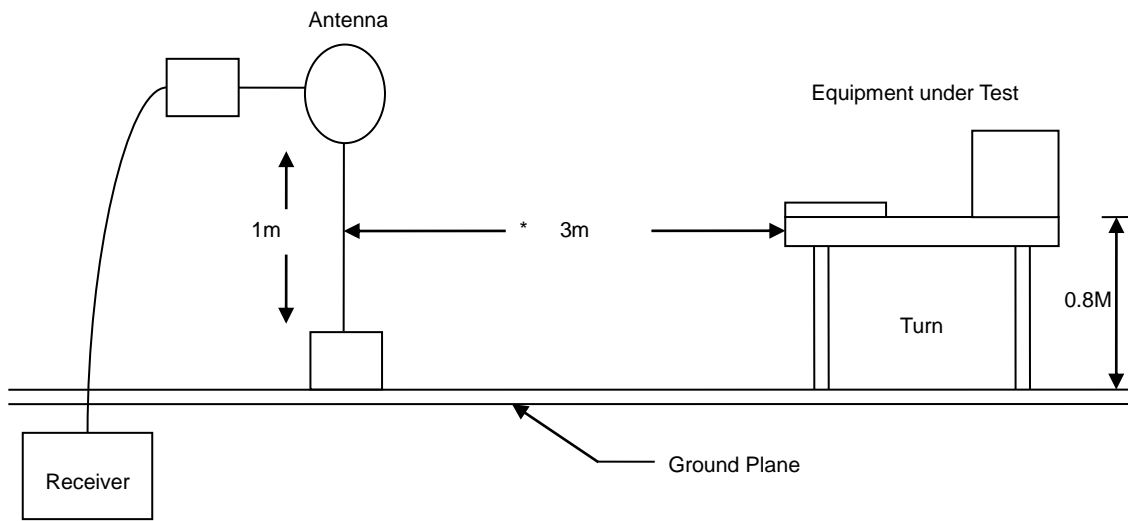
### 6.2 Test Procedures

- 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.

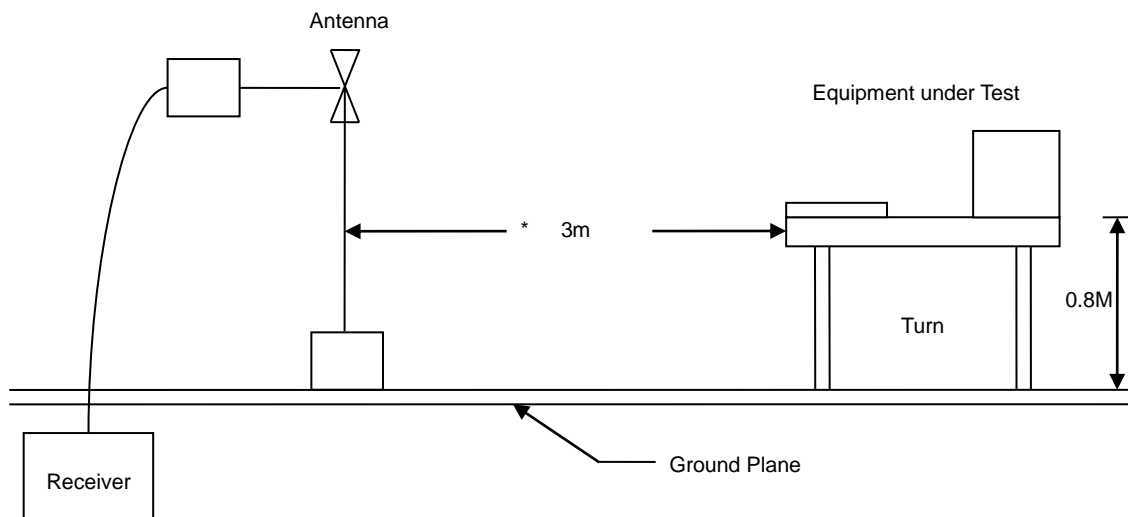


### 6.3 Typical Test Setup

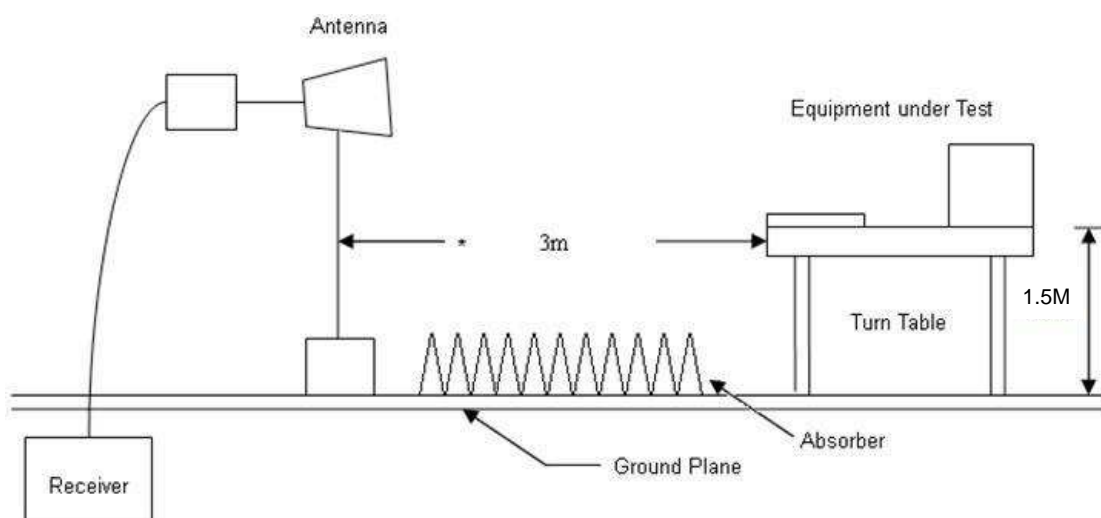
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup





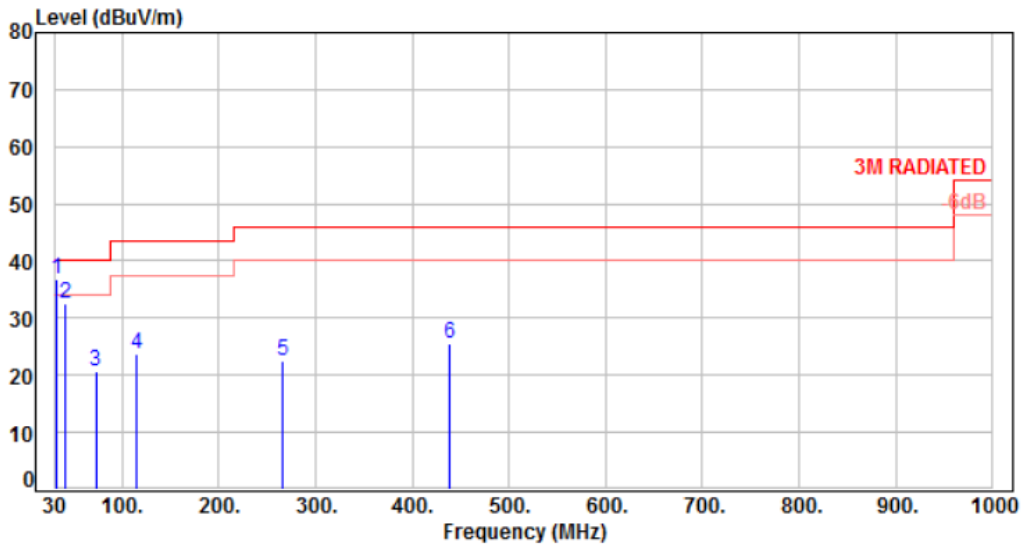


### 6.4 Test Result and Data (9KHz ~ 30MHz)

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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

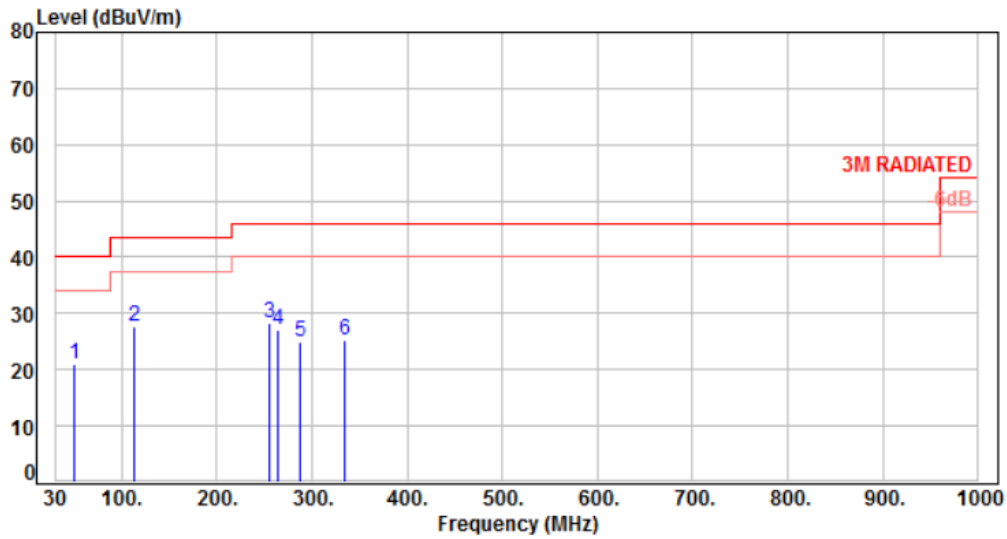


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	31.94	-10.76	47.66	36.90	40.00	-3.10	Peak	100	0	P
2	41.64	-9.80	42.39	32.59	40.00	-7.41	Peak	100	0	P
3	72.68	-12.54	33.28	20.74	40.00	-19.26	Peak	100	0	P
4	115.36	-12.39	36.23	23.84	43.50	-19.66	Peak	100	0	P
5	266.68	-9.88	32.36	22.48	46.00	-23.52	Peak	100	0	P
6	439.34	-5.18	30.81	25.63	46.00	-20.37	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %



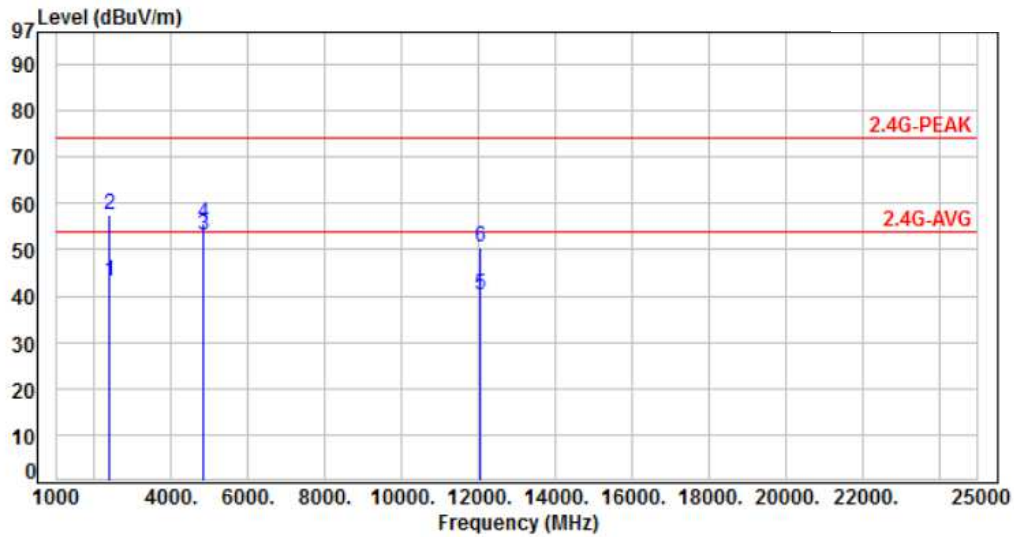
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	49.40	-9.53	30.63	21.10	40.00	-18.90	Peak	100	0	P
2	113.42	-12.57	40.36	27.79	43.50	-15.71	Peak	100	0	P
3	255.04	-10.41	38.64	28.23	46.00	-17.77	Peak	100	0	P
4	264.74	-9.98	37.14	27.16	46.00	-18.84	Peak	100	0	P
5	288.02	-9.04	34.04	25.00	46.00	-21.00	Peak	100	0	P
6	334.58	-7.97	33.36	25.39	46.00	-20.61	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

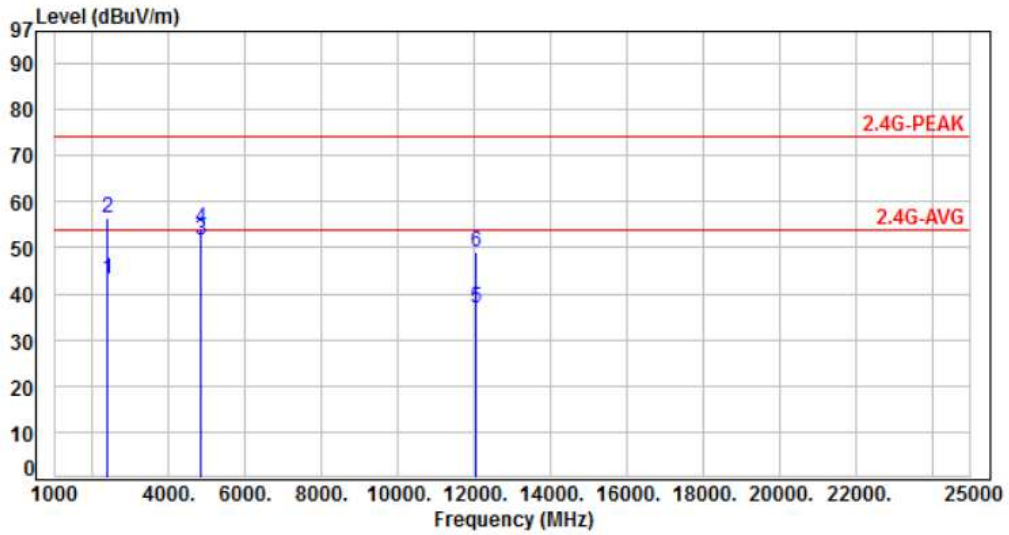


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.33	43.30	54.00	-10.70	Average	119	219	P
2	2390.00	-19.03	76.63	57.60	74.00	-16.40	Peak	119	219	P
3	4824.00	-13.33	66.30	52.97	54.00	-1.03	Average	343	96	P
4	4824.00	-13.33	68.90	55.57	74.00	-18.43	Peak	343	96	P
5	12060.00	-6.06	46.18	40.12	54.00	-13.88	Average	111	131	P
6	12060.00	-6.06	56.48	50.42	74.00	-23.58	Peak	111	131	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

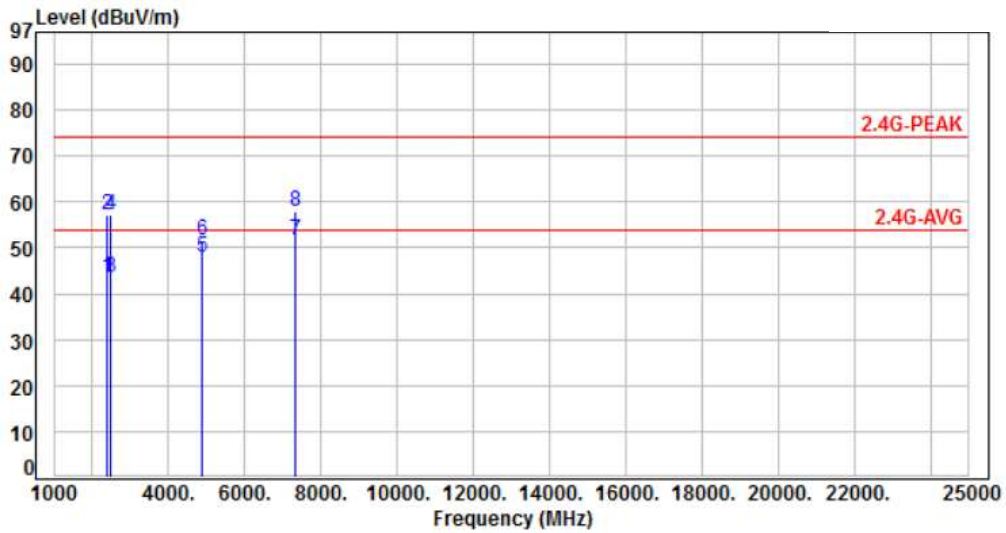


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.21	43.18	54.00	-10.82	Average	100	118	P
2	2390.00	-19.03	75.34	56.31	74.00	-17.69	Peak	100	118	P
3	4824.00	-13.33	65.06	51.73	54.00	-2.27	Average	123	332	P
4	4824.00	-13.33	67.49	54.16	74.00	-19.84	Peak	123	332	P
5	12060.00	-6.06	42.84	36.78	54.00	-17.22	Average	218	178	P
6	12060.00	-6.06	55.01	48.95	74.00	-25.05	Peak	218	178	P

Note: Level=Reading+Factor  
 Margin=Level-Limit  
 Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH06	Temperature	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

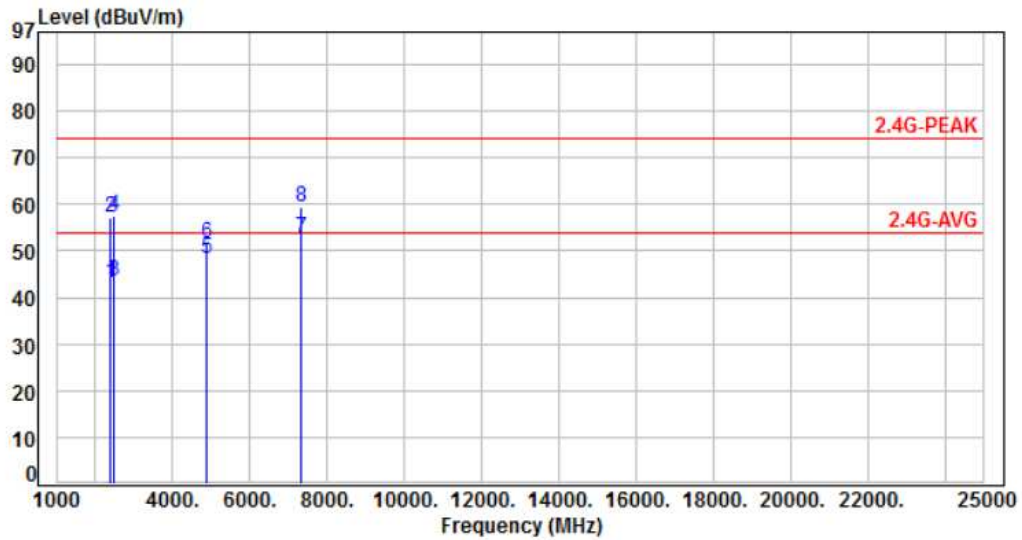


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.41	43.38	54.00	-10.62	Average	118	225	P
2	2390.00	-19.03	76.35	57.32	74.00	-16.68	Peak	118	225	P
3	2483.50	-18.81	62.39	43.58	54.00	-10.42	Average	118	225	P
4	2483.50	-18.81	76.16	57.35	74.00	-16.65	Peak	118	225	P
5	4874.00	-13.24	61.30	48.06	54.00	-5.94	Average	300	98	P
6	4874.00	-13.24	65.06	51.82	74.00	-22.18	Peak	300	98	P
7	7311.00	-10.19	61.75	51.56	54.00	-2.44	Average	135	85	P
8	7311.00	-10.19	68.19	58.00	74.00	-16.00	Peak	135	85	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

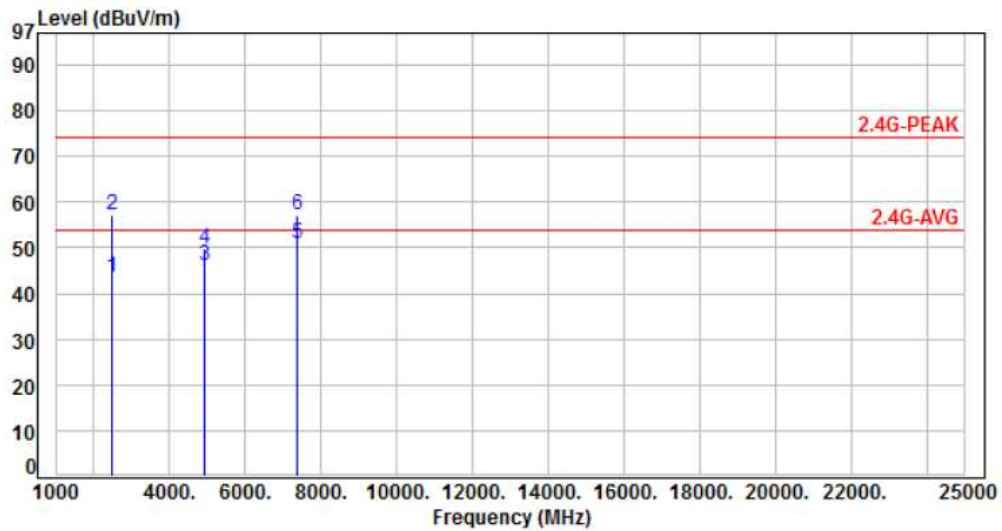


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.35	43.32	54.00	-10.68	Average	100	121	P
2	2390.00	-19.03	76.33	57.30	74.00	-16.70	Peak	100	121	P
3	2483.50	-18.81	62.15	43.34	54.00	-10.66	Average	100	121	P
4	2483.50	-18.81	76.51	57.70	74.00	-16.30	Peak	100	121	P
5	4874.00	-13.24	61.56	48.32	54.00	-5.68	Average	100	330	P
6	4874.00	-13.24	65.06	51.82	74.00	-22.18	Peak	100	330	P
7	7311.00	-10.19	63.01	52.82	54.00	-1.18	Average	217	161	P
8	7311.00	-10.19	69.42	59.23	74.00	-14.77	Peak	217	161	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

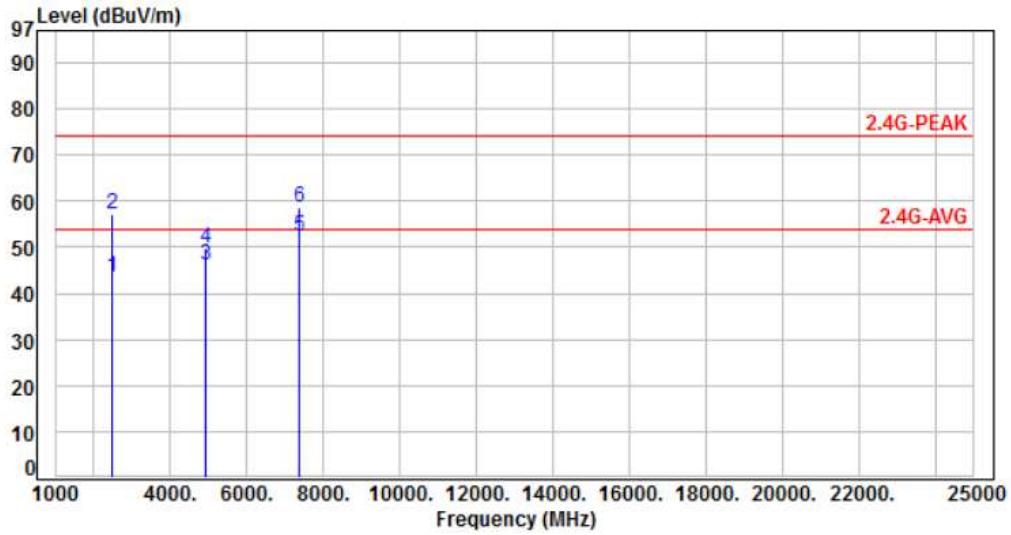


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	62.17	43.36	54.00	-10.64	Average	121	223	P
2	2483.50	-18.81	76.16	57.35	74.00	-16.65	Peak	121	223	P
3	4924.00	-13.14	59.16	46.02	54.00	-7.98	Average	296	93	P
4	4924.00	-13.14	63.11	49.97	74.00	-24.03	Peak	296	93	P
5	7386.00	-10.01	60.74	50.73	54.00	-3.27	Average	148	85	P
6	7386.00	-10.01	67.16	57.15	74.00	-16.85	Peak	148	85	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %



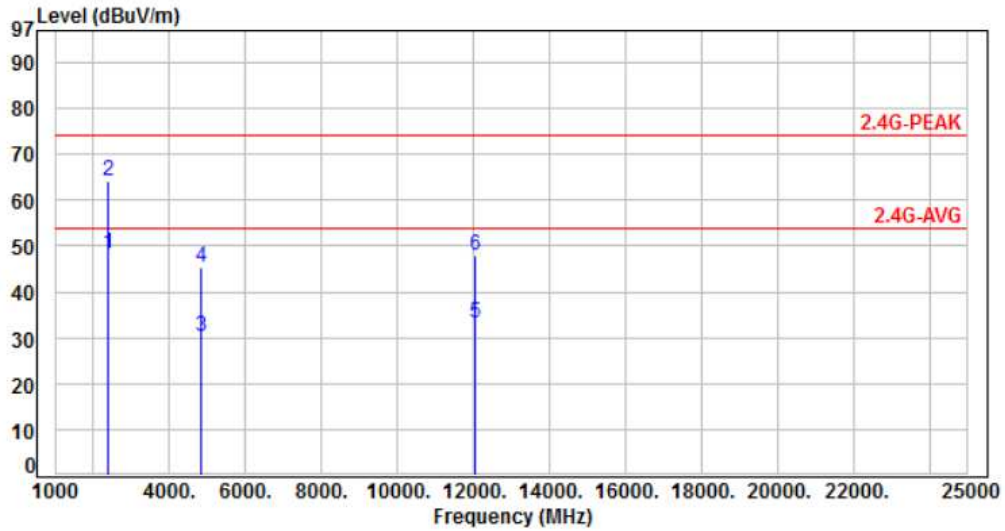
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	62.18	43.37	54.00	-10.63	Average	100	113	P
2	2483.50	-18.81	75.94	57.13	74.00	-16.87	Peak	100	113	P
3	4924.00	-13.14	59.31	46.17	54.00	-7.83	Average	117	331	P
4	4924.00	-13.14	63.07	49.93	74.00	-24.07	Peak	117	331	P
5	7386.00	-10.01	62.37	52.36	54.00	-1.64	Average	191	155	P
6	7386.00	-10.01	68.82	58.81	74.00	-15.19	Peak	191	155	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

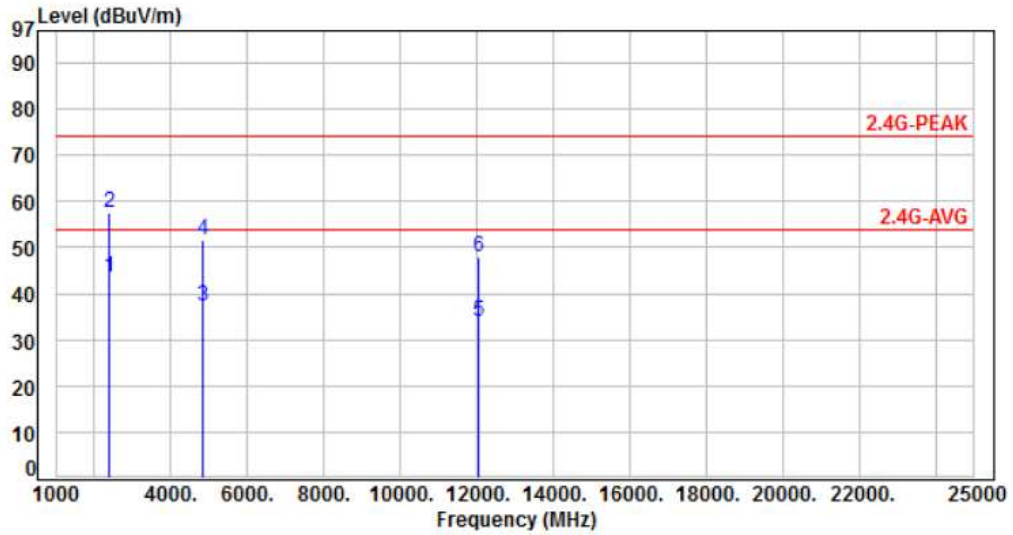


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.02	67.41	48.39	54.00	-5.61	Average	158	325	P
2	2390.00	-19.02	83.11	64.09	74.00	-9.91	Peak	158	325	P
3	4824.00	-13.30	43.51	30.21	54.00	-23.79	Average	302	241	P
4	4824.00	-13.30	58.55	45.25	74.00	-28.75	Peak	302	241	P
5	12060.00	-6.02	39.12	33.10	54.00	-20.90	Average	258	202	P
6	12060.00	-6.02	53.82	47.80	74.00	-26.20	Peak	258	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, CH01	Temperature	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

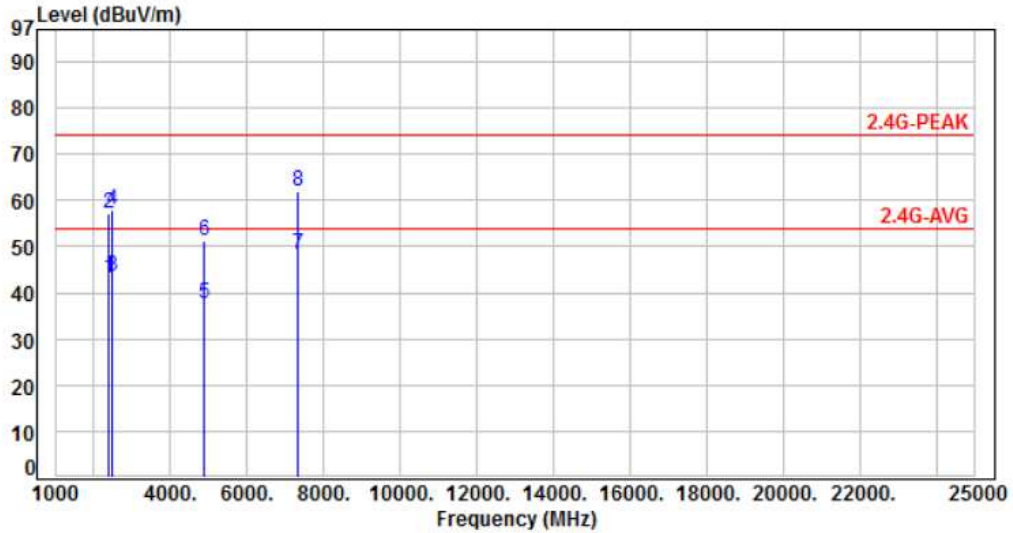


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.61	43.58	54.00	-10.42	Average	156	133	P
2	2390.00	-19.03	76.44	57.41	74.00	-16.59	Peak	156	133	P
3	4824.00	-13.33	50.65	37.32	54.00	-16.68	Average	115	331	P
4	4824.00	-13.33	64.95	51.62	74.00	-22.38	Peak	115	331	P
5	12060.00	-6.06	39.81	33.75	54.00	-20.25	Average	221	176	P
6	12060.00	-6.06	54.14	48.08	74.00	-25.92	Peak	221	176	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

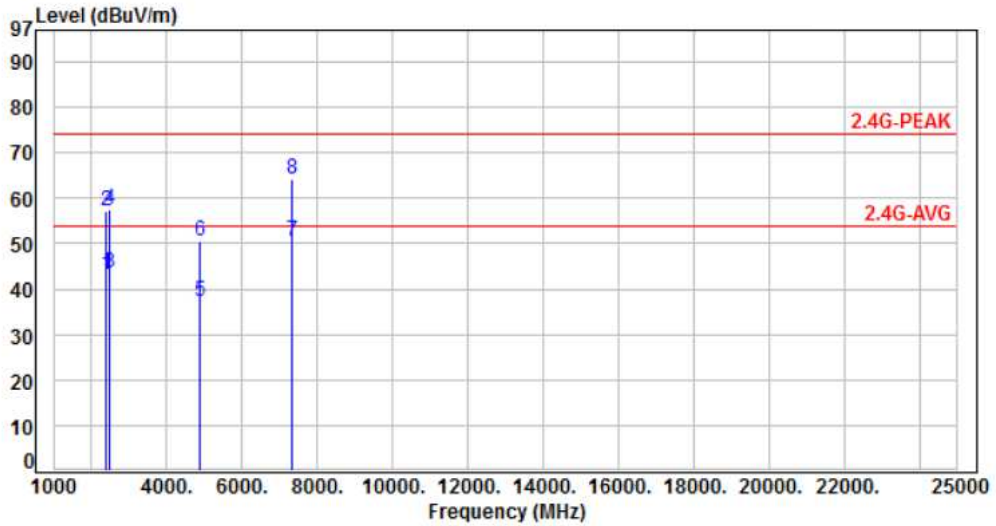


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.29	43.26	54.00	-10.74	Average	116	218	P
2	2390.00	-19.03	76.30	57.27	74.00	-16.73	Peak	116	218	P
3	2483.50	-18.81	62.16	43.35	54.00	-10.65	Average	116	218	P
4	2483.50	-18.81	76.59	57.78	74.00	-16.22	Peak	116	218	P
5	4874.00	-13.24	50.69	37.45	54.00	-16.55	Average	299	98	P
6	4874.00	-13.24	64.64	51.40	74.00	-22.60	Peak	299	98	P
7	7311.00	-10.19	58.68	48.49	54.00	-5.51	Average	135	86	P
8	7311.00	-10.19	72.33	62.14	74.00	-11.86	Peak	135	86	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

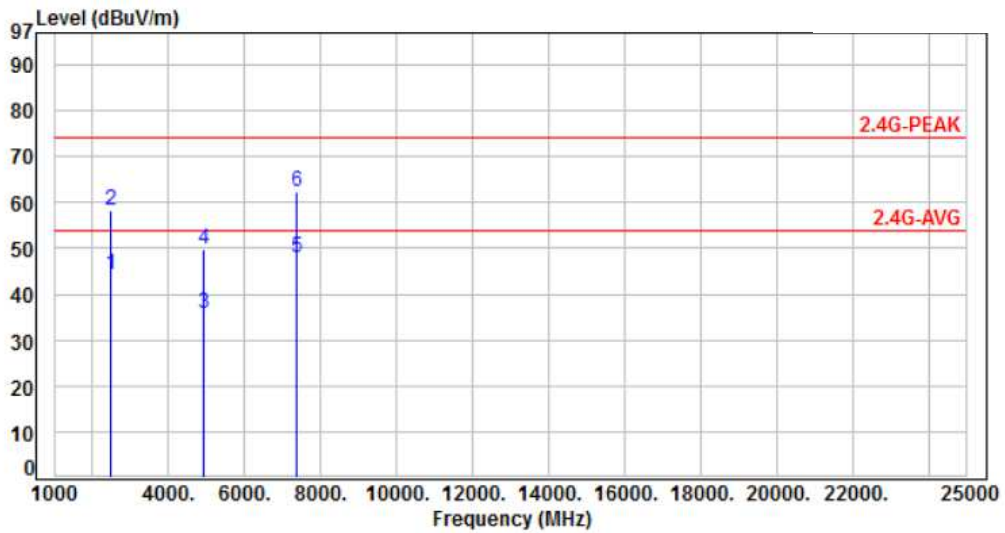


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.23	43.20	54.00	-10.80	Average	100	131	P
2	2390.00	-19.03	76.18	57.15	74.00	-16.85	Peak	100	131	P
3	2483.50	-18.81	62.25	43.44	54.00	-10.56	Average	100	131	P
4	2483.50	-18.81	76.33	57.52	74.00	-16.48	Peak	100	131	P
5	4874.00	-13.24	50.40	37.16	54.00	-16.84	Average	100	329	P
6	4874.00	-13.24	63.83	50.59	74.00	-23.41	Peak	100	329	P
7	7311.00	-10.19	60.64	50.45	54.00	-3.55	Average	193	161	P
8	7311.00	-10.19	74.19	64.00	74.00	-10.00	Peak	193	161	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

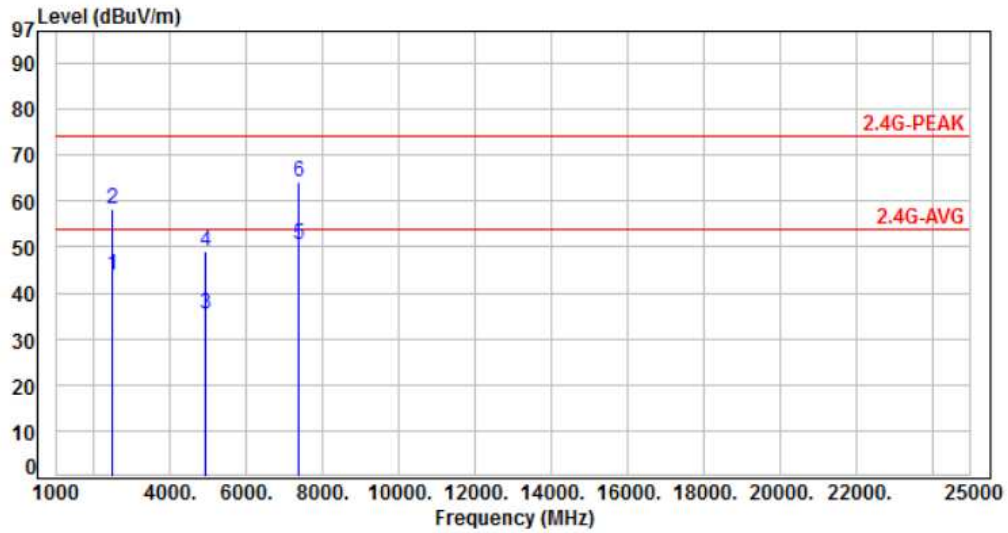


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	63.22	44.41	54.00	-9.59	Average	114	216	P
2	2483.50	-18.81	77.14	58.33	74.00	-15.67	Peak	114	216	P
3	4924.00	-13.14	48.91	35.77	54.00	-18.23	Average	297	93	P
4	4924.00	-13.14	62.90	49.76	74.00	-24.24	Peak	297	93	P
5	7386.00	-10.01	58.10	48.09	54.00	-5.91	Average	148	85	P
6	7386.00	-10.01	72.35	62.34	74.00	-11.66	Peak	148	85	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	62.66	43.85	54.00	-10.15	Average	355	236	P
2	2483.50	-18.81	77.18	58.37	74.00	-15.63	Peak	355	236	P
3	4924.00	-13.14	48.66	35.52	54.00	-18.48	Average	110	334	P
4	4924.00	-13.14	62.25	49.11	74.00	-24.89	Peak	110	334	P
5	7386.00	-10.01	60.39	50.38	54.00	-3.62	Average	193	159	P
6	7386.00	-10.01	74.09	64.08	74.00	-9.92	Peak	193	159	P

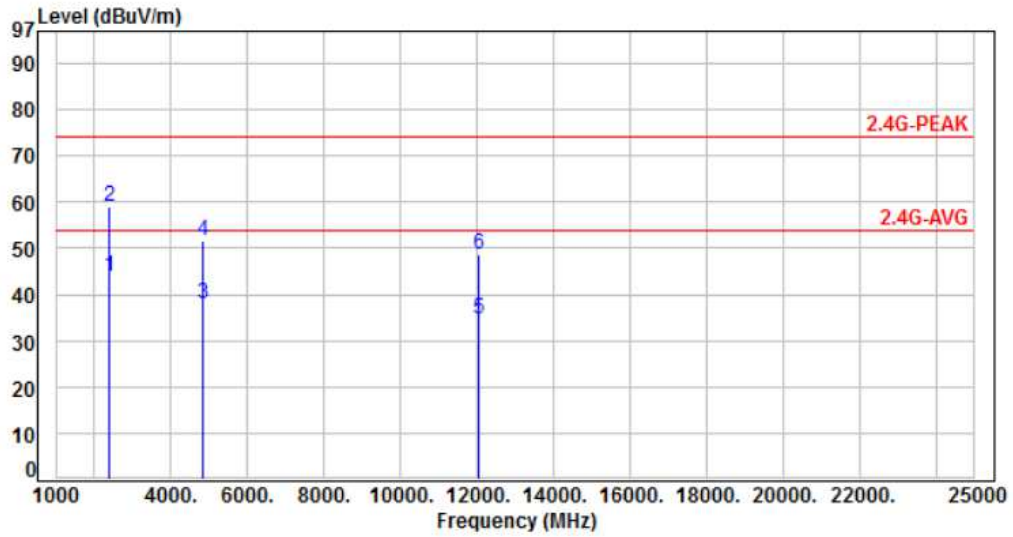
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH01	Temperature	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

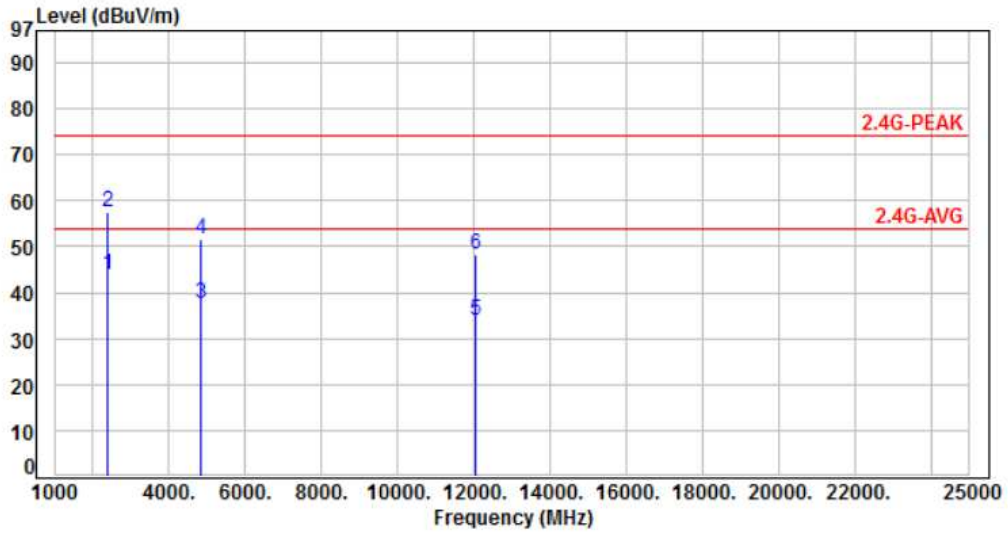


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.94	43.91	54.00	-10.09	Average	100	238	P
2	2390.00	-19.03	78.08	59.05	74.00	-14.95	Peak	100	238	P
3	4824.00	-13.33	51.22	37.89	54.00	-16.11	Average	328	101	P
4	4824.00	-13.33	64.89	51.56	74.00	-22.44	Peak	328	101	P
5	12060.00	-6.06	40.64	34.58	54.00	-19.42	Average	100	144	P
6	12060.00	-6.06	54.56	48.50	74.00	-25.50	Peak	100	144	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %



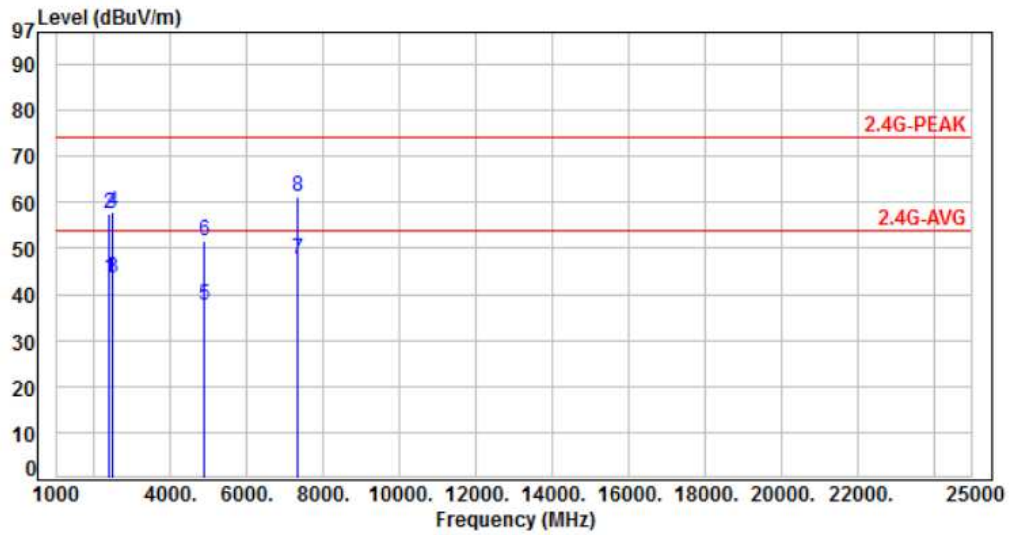
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.78	43.75	54.00	-10.25	Average	151	138	P
2	2390.00	-19.03	76.61	57.58	74.00	-16.42	Peak	151	138	P
3	4824.00	-13.33	50.79	37.46	54.00	-16.54	Average	118	326	P
4	4824.00	-13.33	65.11	51.78	74.00	-22.22	Peak	118	326	P
5	12060.00	-6.06	39.97	33.91	54.00	-20.09	Average	225	181	P
6	12060.00	-6.06	54.37	48.31	74.00	-25.69	Peak	225	181	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

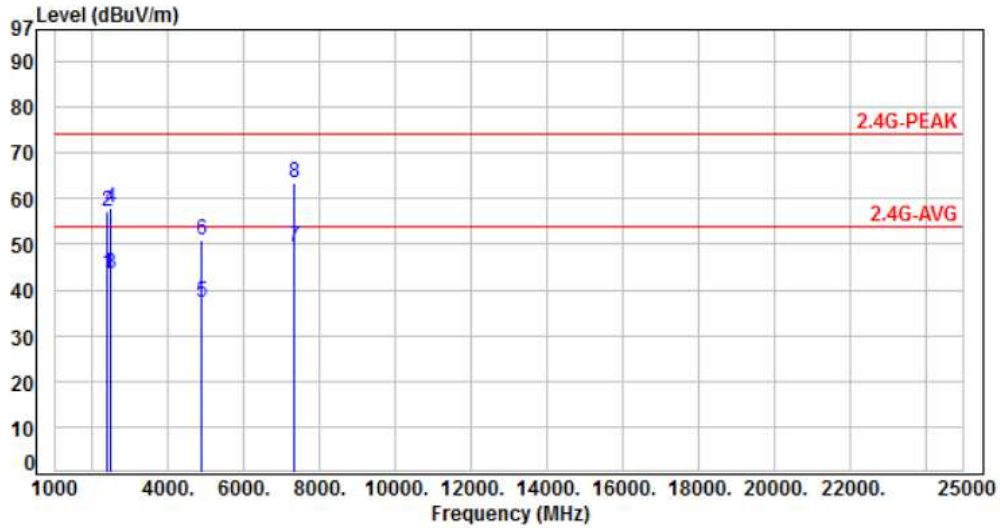


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.51	43.48	54.00	-10.52	Average	100	224	P
2	2390.00	-19.03	76.60	57.57	74.00	-16.43	Peak	100	224	P
3	2483.50	-18.81	62.37	43.56	54.00	-10.44	Average	100	224	P
4	2483.50	-18.81	76.73	57.92	74.00	-16.08	Peak	100	224	P
5	4874.00	-13.24	50.86	37.62	54.00	-16.38	Average	301	112	P
6	4874.00	-13.24	64.79	51.55	74.00	-22.45	Peak	301	112	P
7	7311.00	-10.19	57.92	47.73	54.00	-6.27	Average	142	89	P
8	7311.00	-10.19	71.56	61.37	74.00	-12.63	Peak	142	89	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

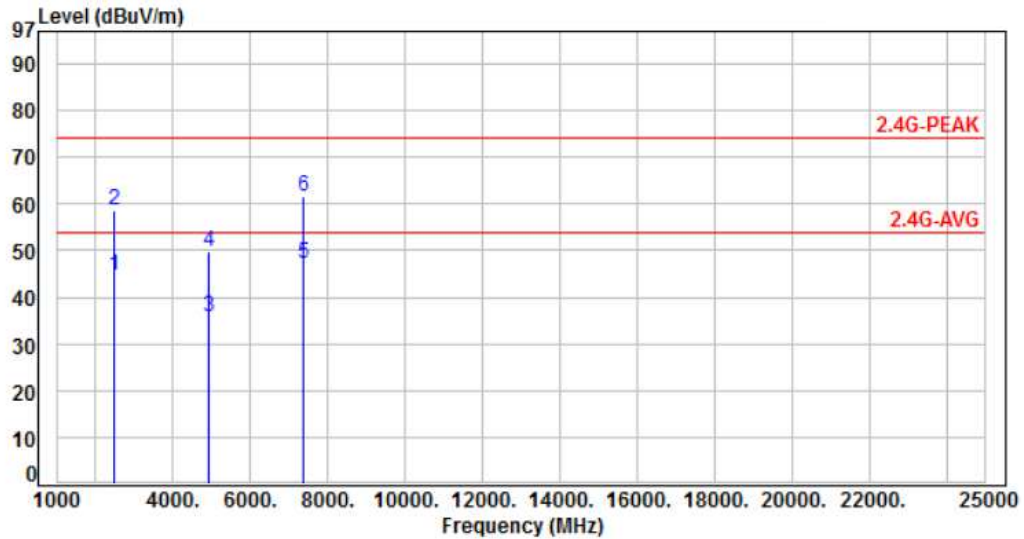


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-19.03	62.44	43.41	54.00	-10.59	Average	100	122	P
2	2390.00	-19.03	76.36	57.33	74.00	-16.67	Peak	100	122	P
3	2483.50	-18.81	62.41	43.60	54.00	-10.40	Average	100	122	P
4	2483.50	-18.81	76.62	57.81	74.00	-16.19	Peak	100	122	P
5	4874.00	-13.24	50.56	37.32	54.00	-16.68	Average	100	314	P
6	4874.00	-13.24	63.97	50.73	74.00	-23.27	Peak	100	314	P
7	7311.00	-10.19	59.79	49.60	54.00	-4.40	Average	176	158	P
8	7311.00	-10.19	73.55	63.36	74.00	-10.64	Peak	176	158	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %

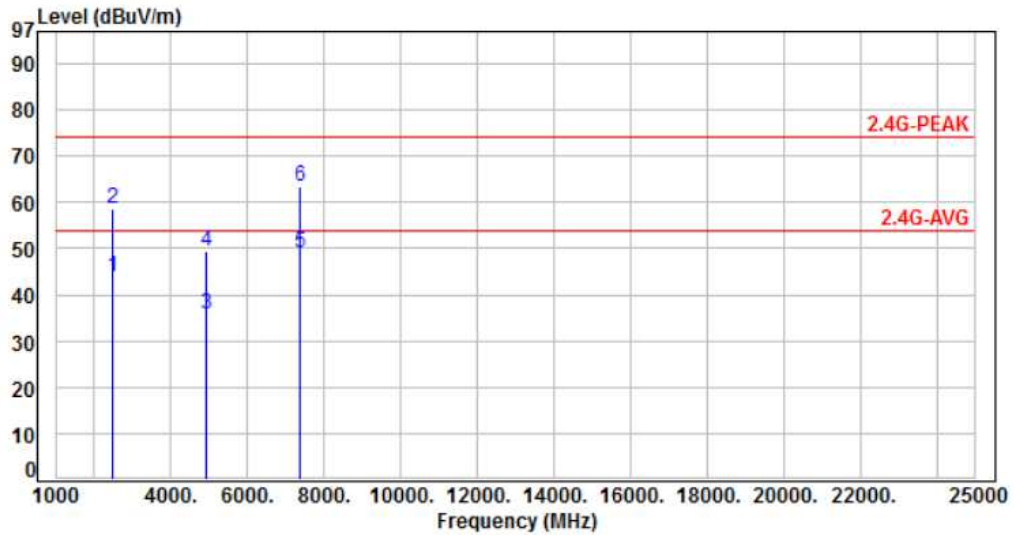


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	63.56	44.75	54.00	-9.25	Average	112	218	P
2	2483.50	-18.81	77.61	58.80	74.00	-15.20	Peak	112	218	P
3	4924.00	-13.14	49.02	35.88	54.00	-18.12	Average	298	95	P
4	4924.00	-13.14	63.10	49.96	74.00	-24.04	Peak	298	95	P
5	7386.00	-10.01	57.25	47.24	54.00	-6.76	Average	155	87	P
6	7386.00	-10.01	71.61	61.60	74.00	-12.40	Peak	155	87	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	: 25 °C
Test Date	: Jun. 30, 2017	Humidity	: 60 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-18.81	62.79	43.98	54.00	-10.02	Average	348	241	P
2	2483.50	-18.81	77.50	58.69	74.00	-15.31	Peak	348	241	P
3	4924.00	-13.14	48.87	35.73	54.00	-18.27	Average	112	336	P
4	4924.00	-13.14	62.51	49.37	74.00	-24.63	Peak	112	336	P
5	7386.00	-10.01	59.10	49.09	54.00	-4.91	Average	172	150	P
6	7386.00	-10.01	73.36	63.35	74.00	-10.65	Peak	172	150	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

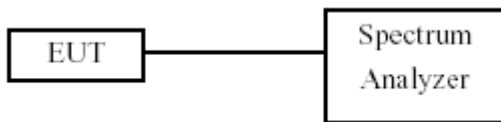
### 7.1 Test Limit

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 lose 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



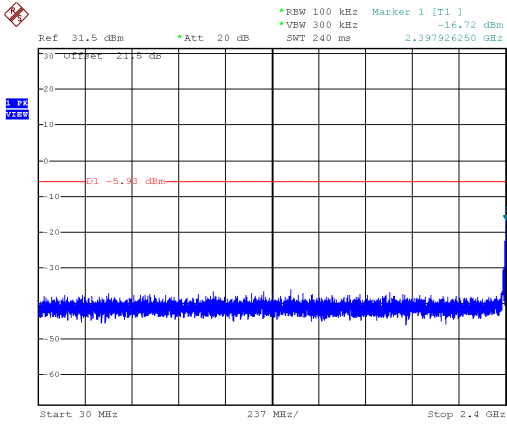
### 7.4 Test Result and Data

Test Result	: PASS	Temperature	: 25°C
Test Date	: Jun. 30, 2017	Humidity	: 42%

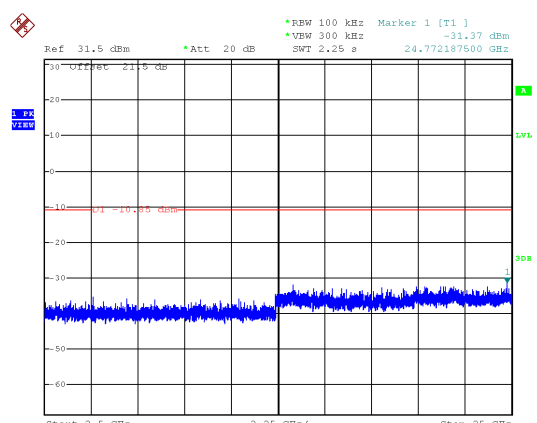
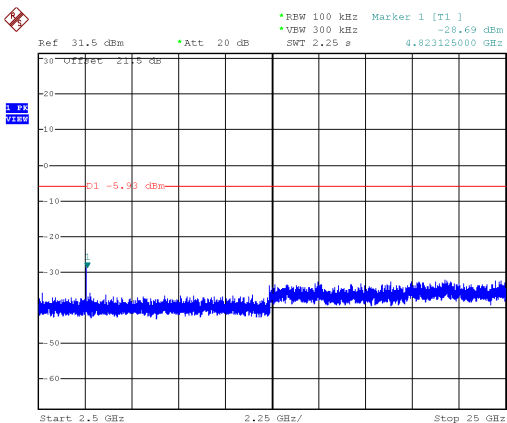
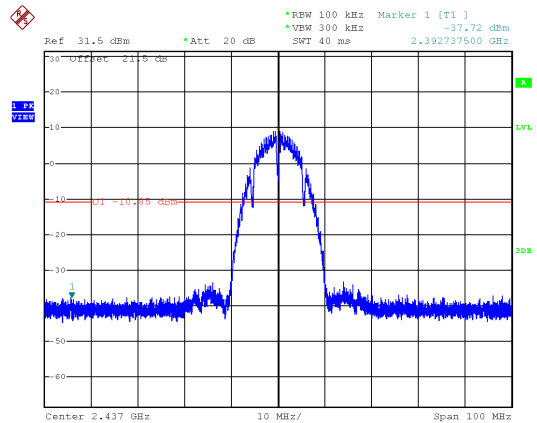
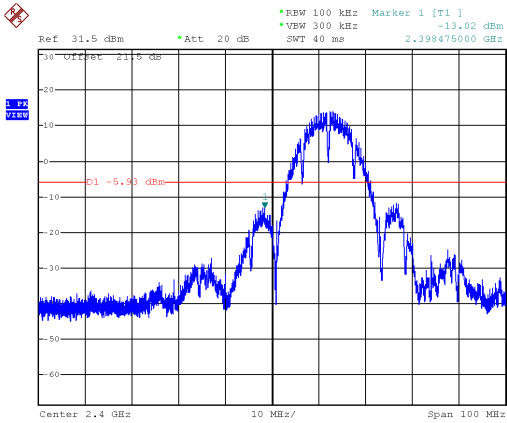
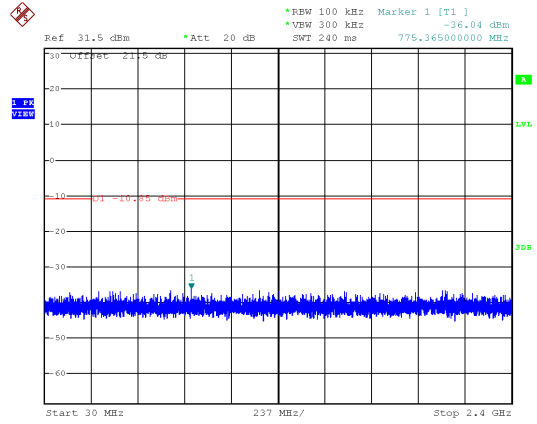
Note: Test plots refers to the following pages.



Modulation Type: 802.11b, CH 01

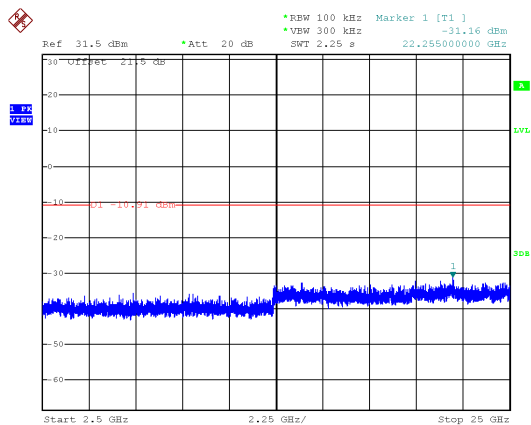
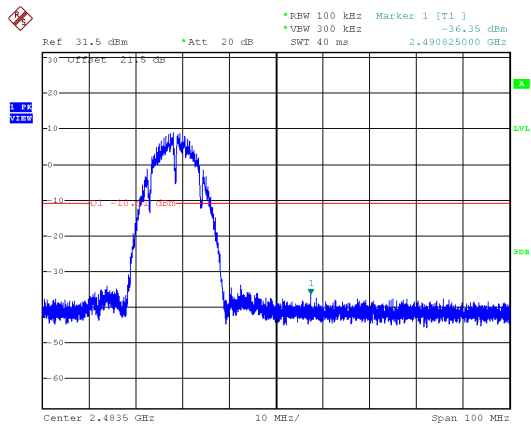
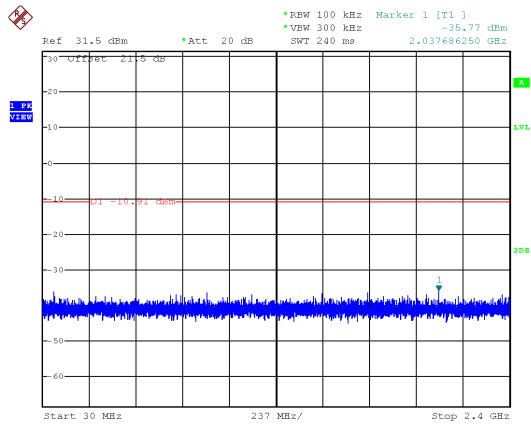


Modulation Type: 802.11b, CH 06





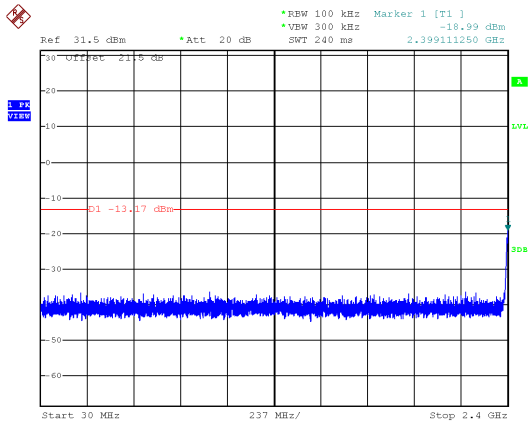
Modulation Type: 802.11b, CH 11



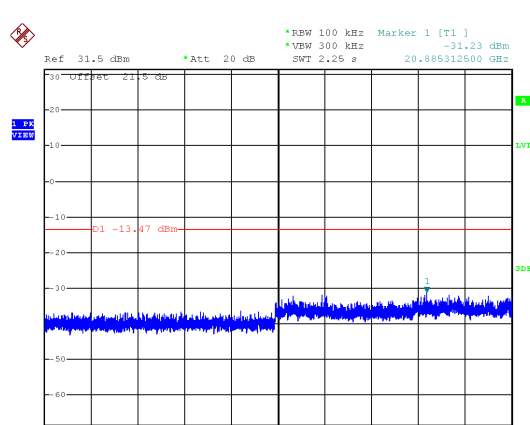
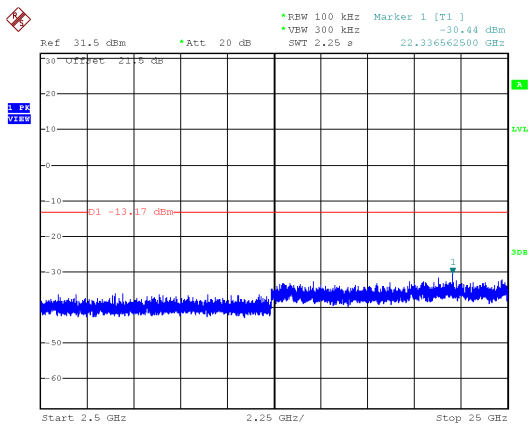
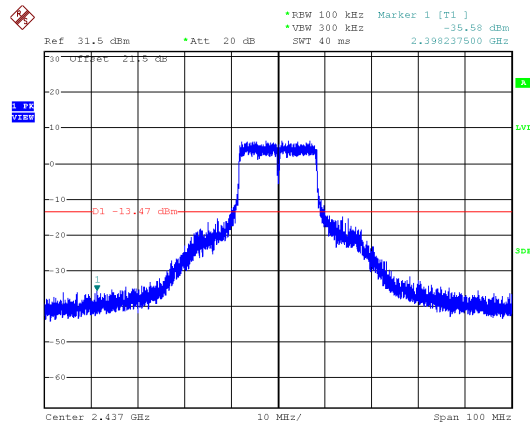
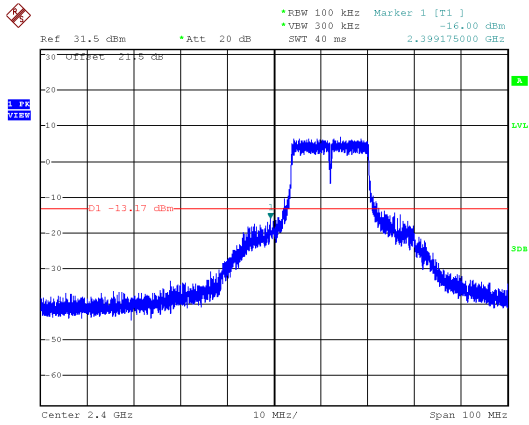
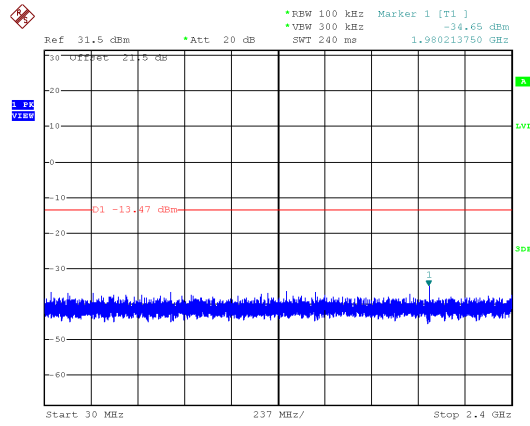




Modulation Type: 802.11g, CH 01

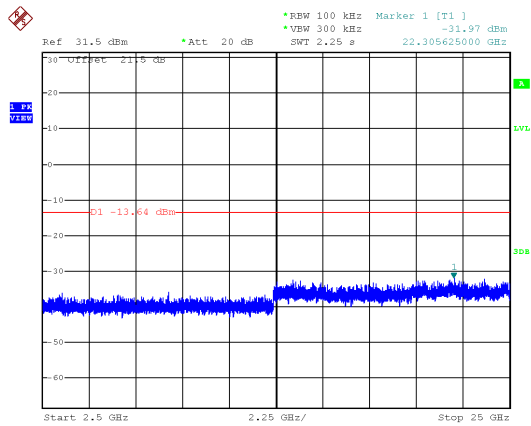
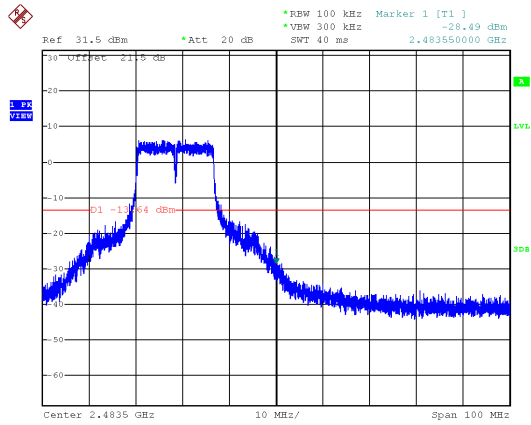
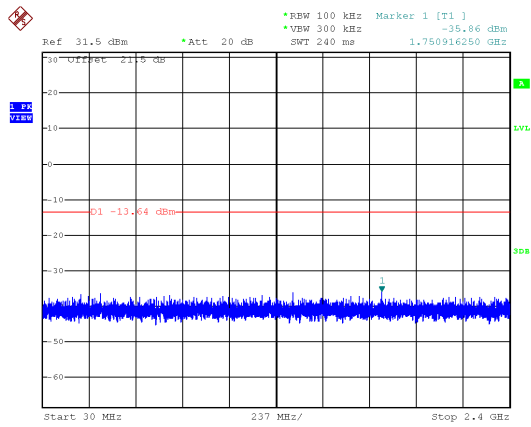


Modulation Type: 802.11g, CH 06



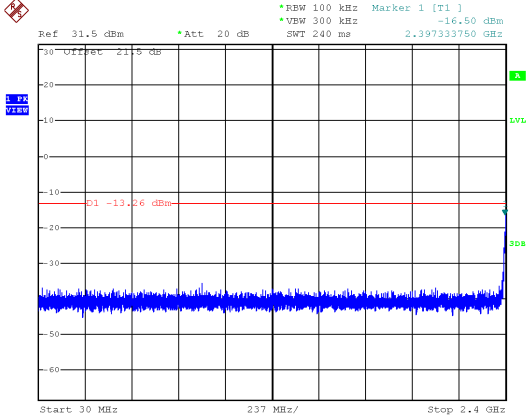


Modulation Type: 802.11g, CH 11

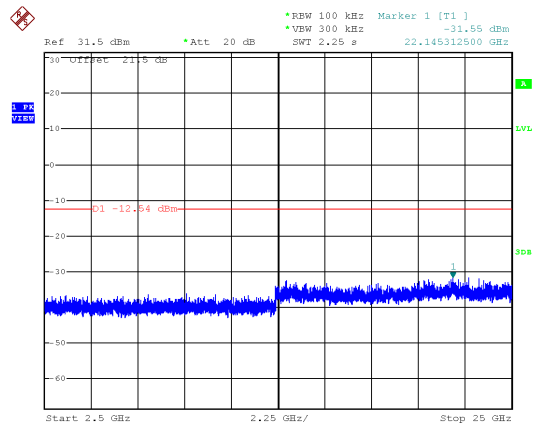
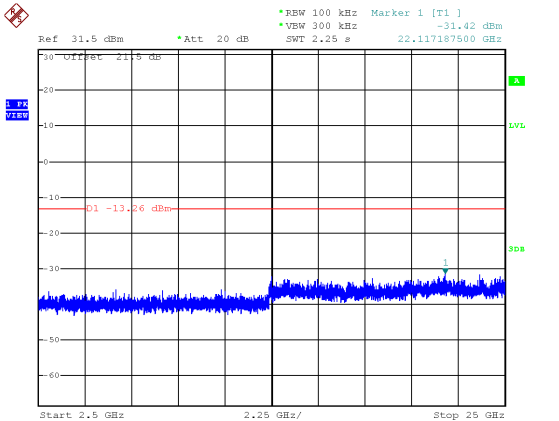
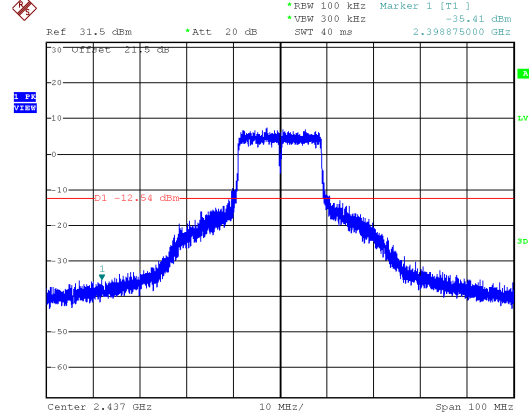
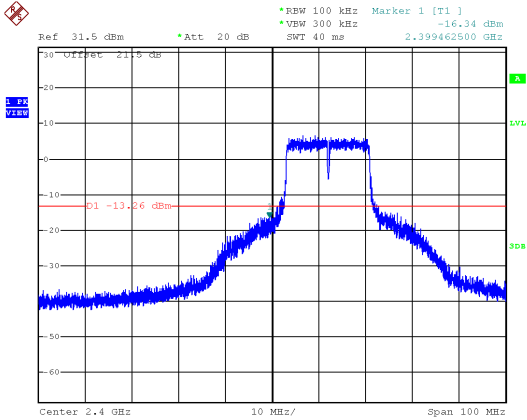
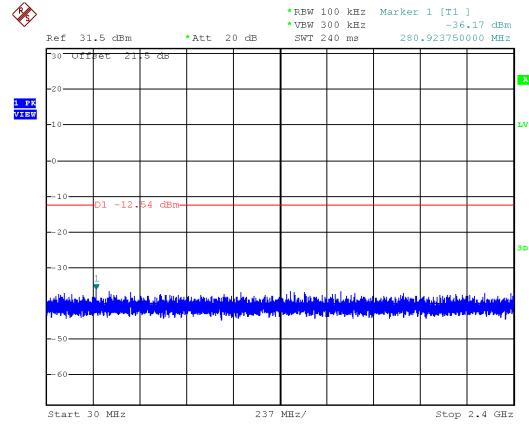




Modulation Type: 802.11n HT20, CH01

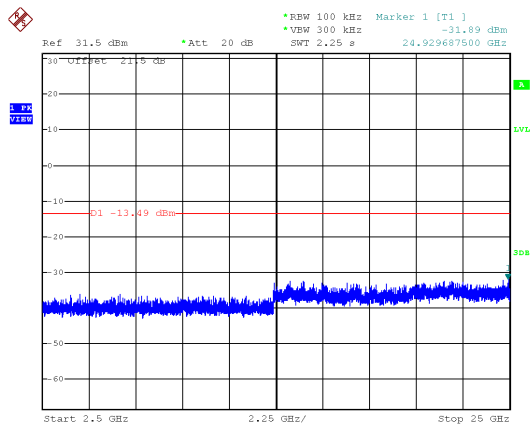
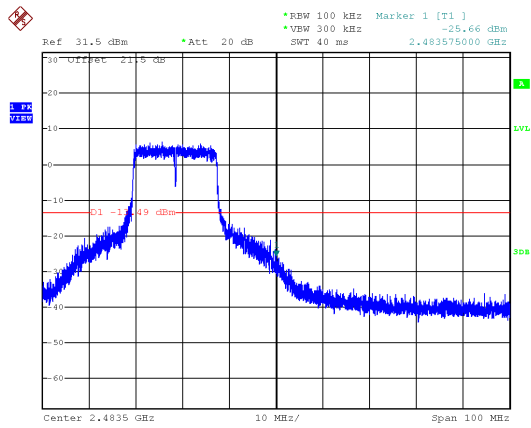
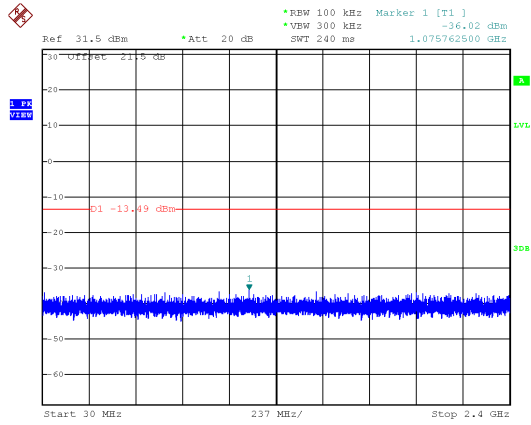


Modulation Type: 802.11n HT20, CH06





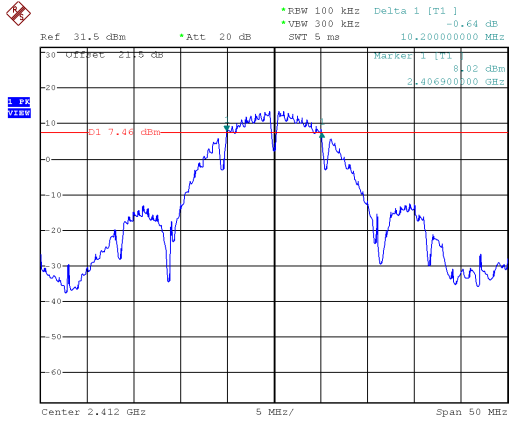
Modulation Type: 802.11n HT20, CH11



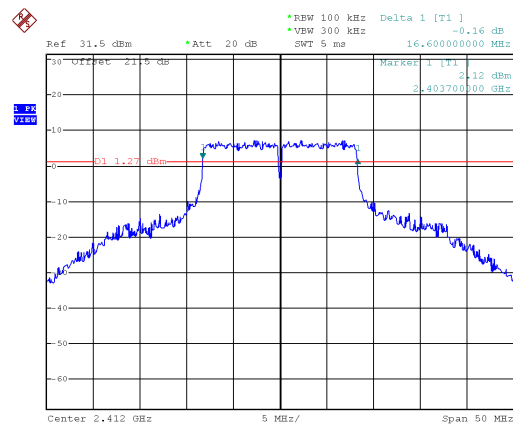




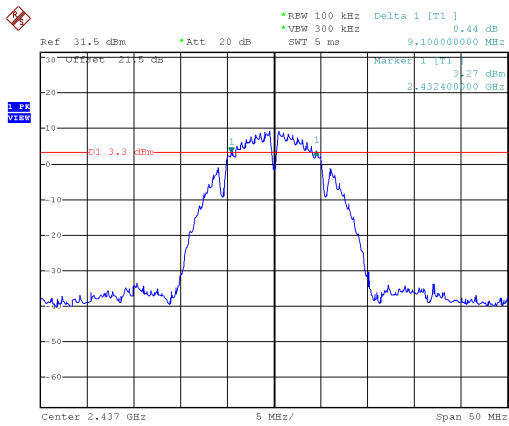
Modulation Type: 802.11b  
CH01



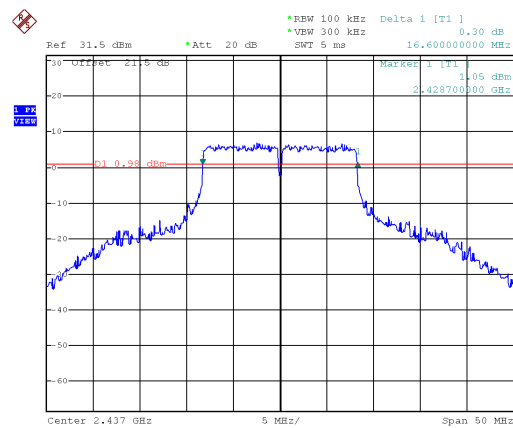
Modulation Type: 802.11g  
CH01



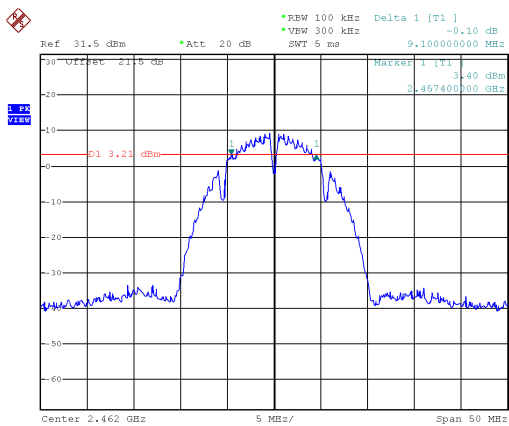
CH06



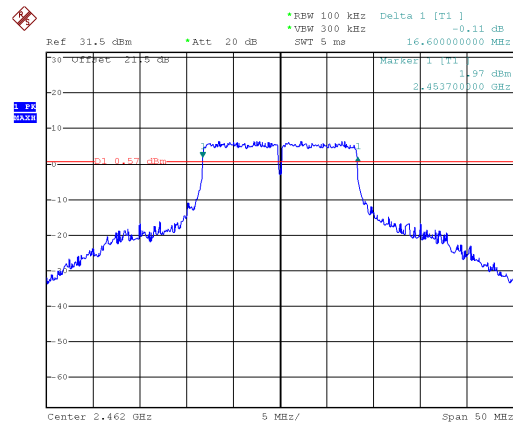
CH06



CH11

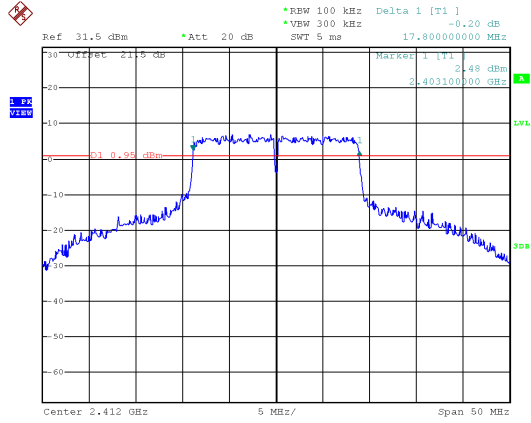


CH11

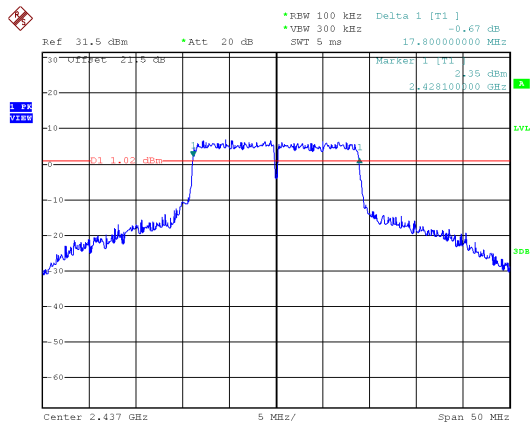




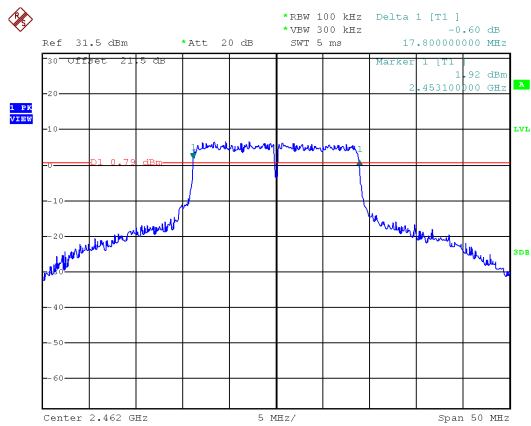
Modulation Type: 802.11n HT20  
CH01



CH06



CH11





### 9. Maximum Peak and Average Output Power

#### 9.1 Test Limit

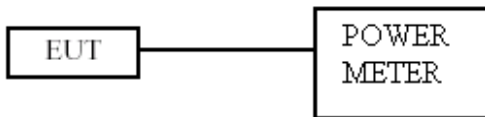
The Maximum Peak Output Power Measurement is 30dBm.

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 : 25°C

Humidity : 42%

Test Date : Jun. 30, 2017

Modulation Type	Channel	Freq. (MHz)	Peak Power Output (dBm)	Total Power (mW)	Total Power (dBm)	Power Limit (dBm)
IEEE 802.11b (1Mbps)	01	2412	25.06	320.627	25.06	30.00
	06	2437	22.29	169.434	22.29	30.00
	11	2462	21.82	152.055	21.82	30.00
IEEE 802.11g (6Mbps)	01	2412	25.34	341.979	25.34	30.00
	06	2437	24.88	307.610	24.88	30.00
	11	2462	25.12	325.087	25.12	30.00
IEEE 802.11n HT20 (6.5Mbps)	01	2412	25.23	333.426	25.23	30.00
	06	2437	25.23	333.426	25.23	30.00
	11	2462	24.98	314.775	24.98	30.00





Modulation Type	Channel	Freq. (MHz)	Avg. Power Output (dBm)	Total Power (mW)	Total Power (dBm)	Power Limit (dBm)
IEEE 802.11b (1Mbps)	01	2412	23.66	232.274	23.66	NA
	06	2437	19.69	93.111	19.69	NA
	11	2462	19.19	82.985	19.19	NA
IEEE 802.11g (6Mbps)	01	2412	21.12	129.420	21.12	NA
	06	2437	20.45	110.917	20.45	NA
	11	2462	19.87	97.051	19.87	NA
IEEE 802.11n HT20 (6.5Mbps)	01	2412	21.11	129.122	21.11	NA
	06	2437	20.51	112.460	20.51	NA
	11	2462	19.85	96.605	19.85	NA

Note: Average power is for reference only.



### 10. Power Spectral Density

#### 10.1 Test Limit

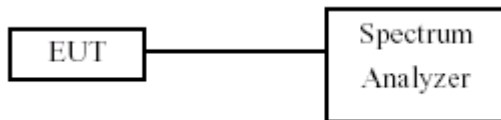
The Maximum of Power Spectral Density Measurement is 8dBm.

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 : 25°C

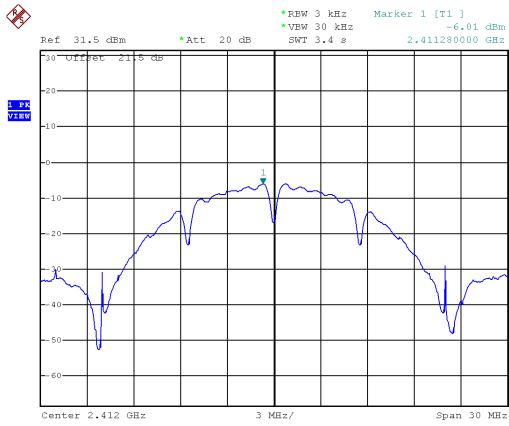
Humidity : 42%

Test Date : Jun. 30, 2017

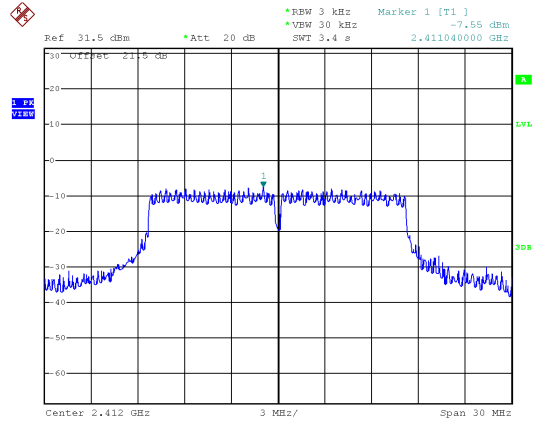
Modulation Type	Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)	Sum chain (dBm)	Duty Cycle CF(dB)	Total PSD (dBm)	Limit (dBm)
IEEE 802.11b (1Mbps)	01	2412	-6.01	-6.01	0.00	-6.01	8.00
	06	2437	-10.57	-10.57	0.00	-10.57	8.00
	11	2462	-10.95	-10.95	0.00	-10.95	8.00
IEEE 802.11g (6Mbps)	01	2412	-7.55	-7.55	0.00	-7.55	8.00
	06	2437	-7.49	-7.49	0.00	-7.49	8.00
	11	2462	-7.97	-7.97	0.00	-7.97	8.00
IEEE 802.11n HT20 (6.5Mbps)	01	2412	-7.11	-7.11	0.00	-7.11	8.00
	06	2437	-6.68	-6.68	0.00	-6.68	8.00
	11	2462	-7.6	-7.60	0.00	-7.60	8.00



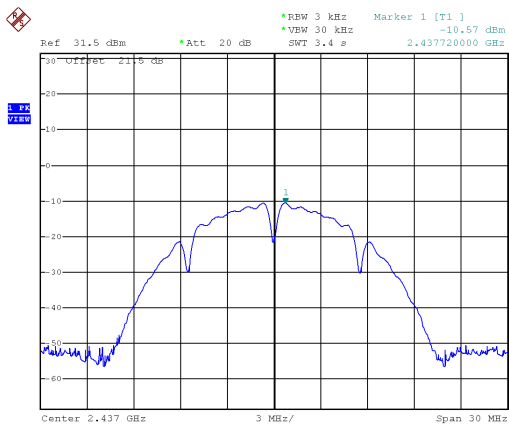
Modulation Type: 802.11b  
CH01



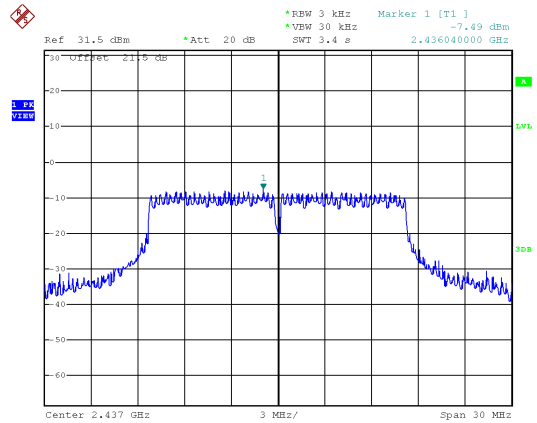
Modulation Type: 802.11g  
CH01



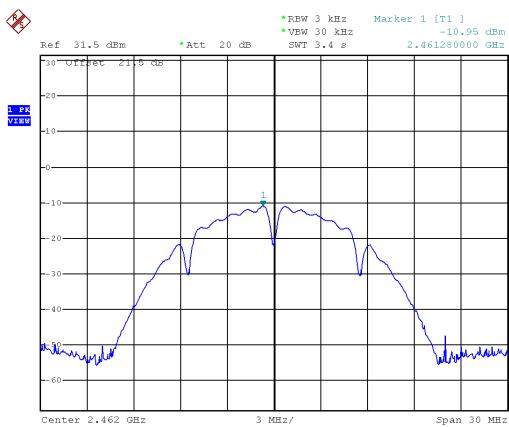
CH06



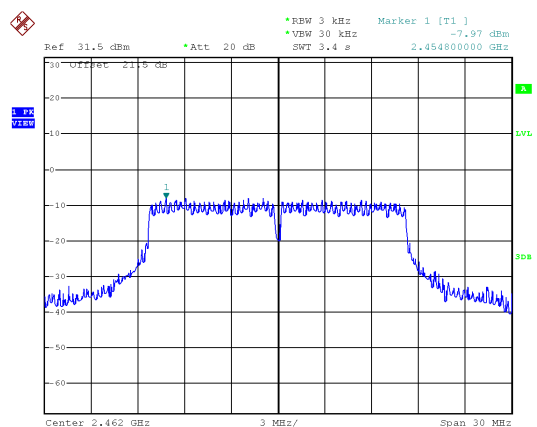
CH06



CH11

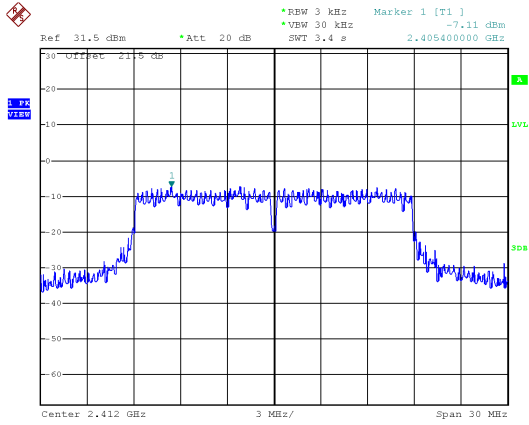


CH11

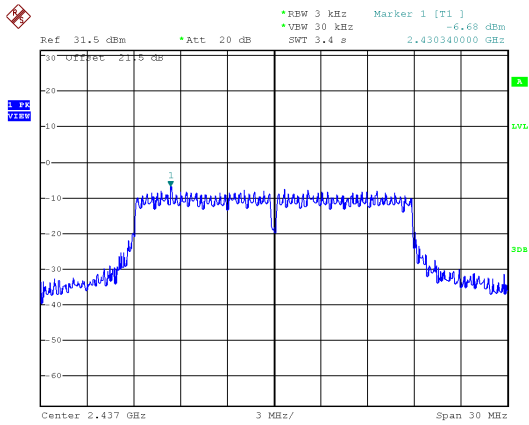




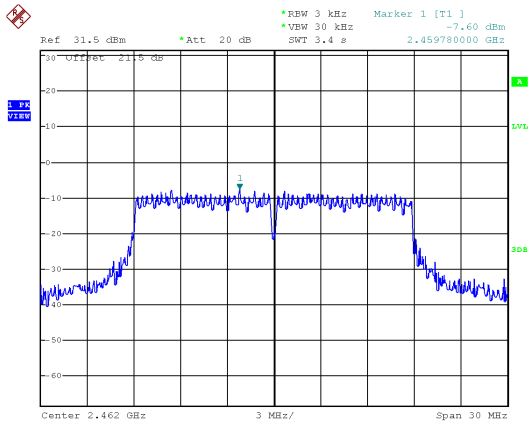
Modulation Type: 802.11n HT20  
CH01



CH06



CH11





## 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

<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 2412MHz ~ 2462MHz <input type="checkbox"/> WLAN: 5150MHz ~ 5250MHz <input type="checkbox"/> WLAN: 5250MHz ~ 5350MHz <input type="checkbox"/> WLAN: 5470MHz ~ 5725MHz <input type="checkbox"/> WLAN: 5725MHz ~ 5850MHz <input type="checkbox"/> Bluetooth: 2402MHz ~ 2480MHz
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation)
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
<b>Antenna diversity</b>	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
<b>Max. output power</b>	Band: 2412MHz ~ 2462MHz 802.11b: 25.06dBm (320.627mW) 802.11g: 25.34dBm (341.979mW) 802.11n HT20: 25.23dBm (333.426mW)
<b>Antenna gain (Max)</b>	1.5dBi
<b>Evaluation applied</b>	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A
<b>Remark:</b>	
<ol style="list-style-type: none"> <li>The maximum output power is <u>25.34dBm (341.979mW)</u> at <u>2412MHz</u> (with <u>numeric 1.5 antenna gain.</u>)</li> <li>DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.</li> <li>For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm<sup>2</sup> even if the calculation indicates that the power density would be larger.</li> </ol>	



### 11.3 Test Results

No non-compliance noted.

#### 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 (mW) = P (W) / 1000 and
- d (cm) = d(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 / cm<sup>2</sup>

### 11.4 Maximum Permissible Exposure

Modulation Mode	Frequency band (MHz)	Max. Conducted output power(dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm2)	Limit (mW/cm2)
802.11b	2412-2462	25.06	1.5	20	0.0901	1
802.11g	2412-2462	25.34	1.5	20	0.0961	1
802.11n HT20	2412-2462	25.23	1.5	20	0.0937	1