




# FCC RADIO TEST REPORT

Applicant : TP-Link Technologies Co., Ltd.  
Address : Building 24 (floors 1, 3, 4, 5) and 28 (floors 1-4)  
Address : Central Science and Technology Park, Shennan Rd,  
Nanshan, Shenzhen, P.R. China  
Equipment : Wireless LAN print server, USB 2.0  
Model No. : TL-WPS510U  
Trade Name :  **TP-LINK**<sup>®</sup>  
FCC ID. : TE7WPS510UV7

### I HEREBY CERTIFY THAT :

The sample was received on Dec. 22, 2016 and the testing was carried out on Dec. 28, 2016 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:

Dian Chen / Engineer

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





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# 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

#### Interfaces

USB: 1-USB2.0 high speed compliant port
Wireless LAN: Complies with IEEE 802.11b/g/n standards, supporting Ad-Hoc and Infrastructure modes

\* This product does not support use of USB hubs for daisy-chained connection, USB-to-Parallel connectors, or USB cable extenders.

#### Wireless

Wireless Chipset	MediaTek MT7688AN - 802.11b/g/n
Security	WEP(64/128bit), WPA/WPA2-PSK(TKIP, AES)
Standards	IEEE 802.11b/802.11g/802.11n
LED Indicator	Status, Wireless
Frequency Range	2412MHz~2462MHz
Channel Number	11 channels
Data Rate	up to 135Mbps/150Mbps
Type of Antenna	Dipole Antenna
Antenna Gain	2 dBi

#### Hardware Specification

CPU	MediaTek MT7688
Flash	2MByte
System Memory	16 MByte DDR2 SDRAM
USB Port	B type USB2.0
WLAN Port	802.11b/g/n with external 2dBi antenna (SMA)
Self-test page	Yes(by reset button)
Reset Button	Yes
LED Indicator	Red(Status), Green(Wireless Status)
Power Adapter	5V/0.6A, switching, mini-sized
Dimension	65 (Length) x 40 (Width) x 18 (Height) mm
Weight	50g
Temperature	Operating : 0 ~ 45 °C; Storage : -5 ~ 65 °C
Humidity	Operating : 0 ~ 70%; Storage : 0 ~ 80%

#### Power Adapter:

Power Supply Type	AC Power Cord	DC Power Cable
From Adapter	Wall-Mount, 2 pin	Non-Shielded, 1.55 m
Manufacturer / trademark	TP-Link Technologies Co., Ltd.	
Type / model	T050060-2B1	
Technical data	I/P: AC100-240V, 50/60Hz, 0.3A O/P: 5V/0.6A	



### 2.2 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n HT 20 (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>	---	---

802.11an HT40 (2422-2452MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
<b>*03</b>	<b>2422</b>	<b>*09</b>	<b>2452</b>
04	2427	---	---
05	2432	---	---
<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. The complete test system included Notebook and EUT for RF test.
- c. An executive program, "IE" under WIN 7 was executed to transmit and receive data via WLAN.
- d. 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 conducted test, "Test Mode 2" generated the worst case, it was reported as the final data.

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

For radiated test (above 1GHz), "Test Mode 1~4" were reported as the final data.

### 2.4 Description of Test System

Device	Manufacturer	Model No.	Description
Notebook	DELL	LatitudeE5450	Power Cable, Unshielding, 1.8m
Test Fixture	N/A	N/A	N/A

Use Cable:

Cable	Quantity	Description
Network	1	Unshielding, 5m





## 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-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 25000MHz
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	2016/03/09	2017/03/08
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	60660	2016/03/16	2017/03/15
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2016/09/13	2017/09/12
Preamplifier	Agilent	8449B	3008A01954	2016/03/04	2017/03/03
Preamplifier	MITEQ	AMF-7D-0010100-30-10P	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 Standard Applicable

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

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

### 4.2 Antenna Construction and Directional Gain

Antenna Type: Dipole

Antenna Gain: 2.0dBi

For Power directional gain=  $G_{ant}$ = 2.0 dBi

For PSD directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / NANT]$   
= 2.0 (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.

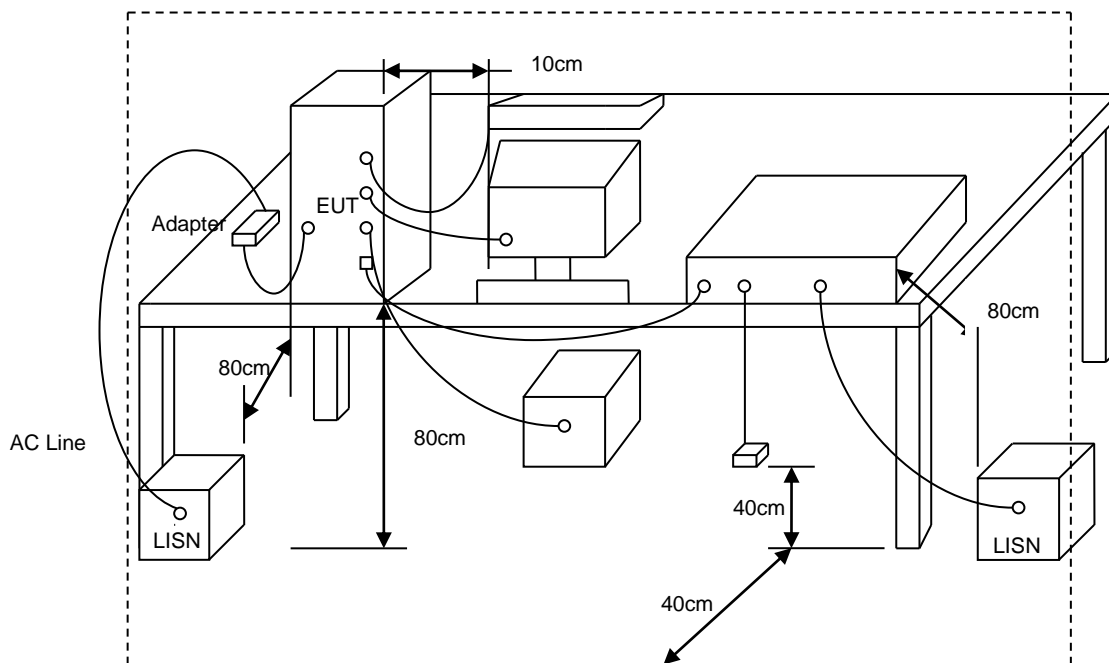
Frequency (MHz)	Quasi Peak (dB $\mu$ V)	Average (dB $\mu$ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

\*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.

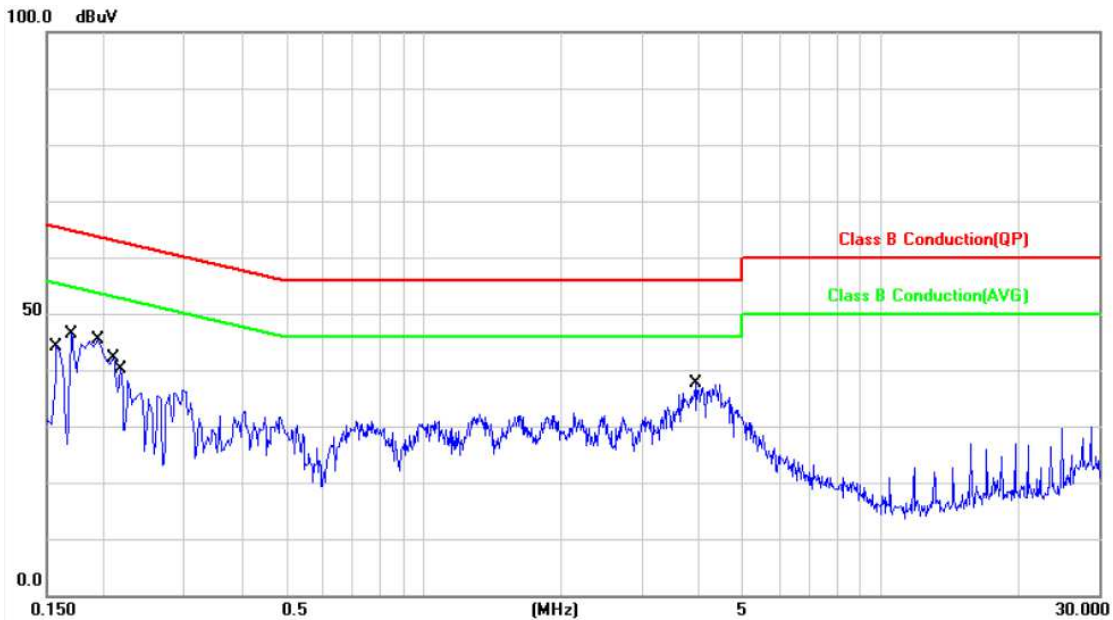
### 5.3 Typical Test Setup





### 5.4 Test Result and Data

Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: Mode 2	Temperature	: 22 °C
Test date	: Dec. 26, 2016	Humidity	: 65 %

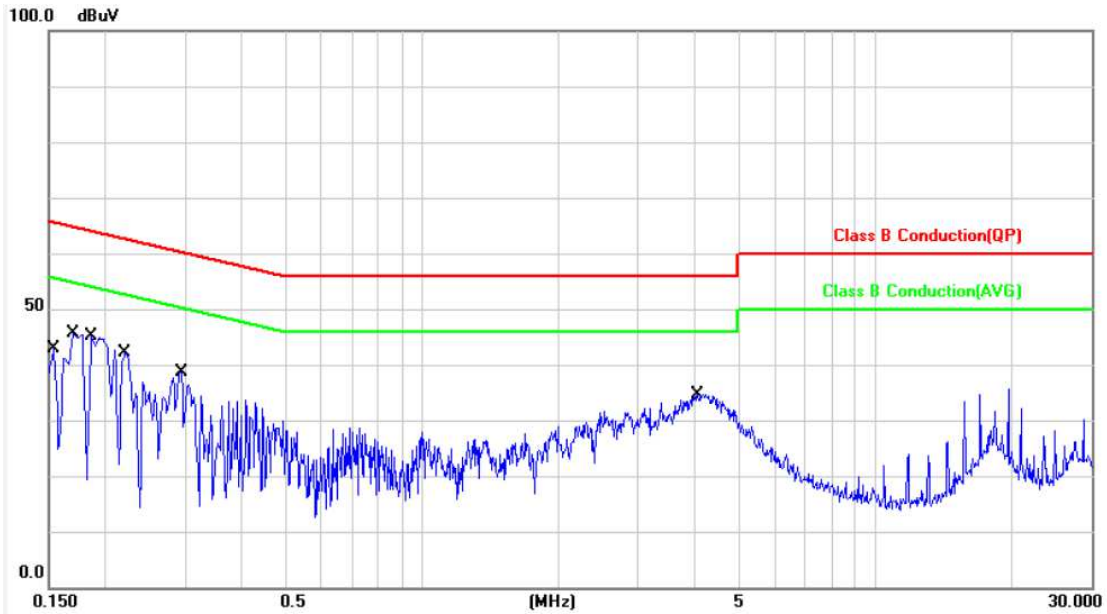


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1580	9.91	29.74	39.65	65.56	-25.91	QP	P
2	0.1580	9.91	13.02	22.93	55.56	-32.63	AVG	P
3	0.1700	9.91	32.99	42.90	64.96	-22.06	QP	P
4	0.1700	9.91	15.56	25.47	54.96	-29.49	AVG	P
5	0.1940	9.91	33.08	42.99	63.86	-20.87	QP	P
6	0.1940	9.91	18.09	28.00	53.86	-25.86	AVG	P
7	0.2100	9.91	29.99	39.90	63.20	-23.30	QP	P
8	0.2100	9.91	16.73	26.64	53.20	-26.56	AVG	P
9	0.2180	9.91	27.52	37.43	62.89	-25.46	QP	P
10	0.2180	9.91	14.12	24.03	52.89	-28.86	AVG	P
11	3.9420	10.04	22.47	32.51	56.00	-23.49	QP	P
12	3.9420	10.04	13.31	23.35	46.00	-22.65	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	: Dec. 26, 2016	Humidity	: 65 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1539	9.91	30.48	40.39	65.78	-25.39	QP	P
2	0.1539	9.91	11.86	21.77	55.78	-34.01	AVG	P
3	0.1700	9.91	33.14	43.05	64.96	-21.91	QP	P
4	0.1700	9.91	13.82	23.73	54.96	-31.23	AVG	P
5	0.1860	9.91	33.02	42.93	64.21	-21.28	QP	P
6	0.1860	9.91	14.83	24.74	54.21	-29.47	AVG	P
7	0.2220	9.91	28.70	38.61	62.74	-24.13	QP	P
8	0.2220	9.91	9.62	19.53	52.74	-33.21	AVG	P
9	0.2940	9.91	27.37	37.28	60.41	-23.13	QP	P
10	0.2940	9.91	11.90	21.81	50.41	-28.60	AVG	P
11	4.0700	10.04	20.31	30.35	56.00	-25.65	QP	P
12	4.0700	10.04	8.72	18.76	46.00	-27.24	AVG	P

Note: Level = Reading + Factor  
 Margin = Level – Limit  
 Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss+ Attenuator



## 6. Test of Spurious Emission (Radiated)

### 6.1 Test Limit

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

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

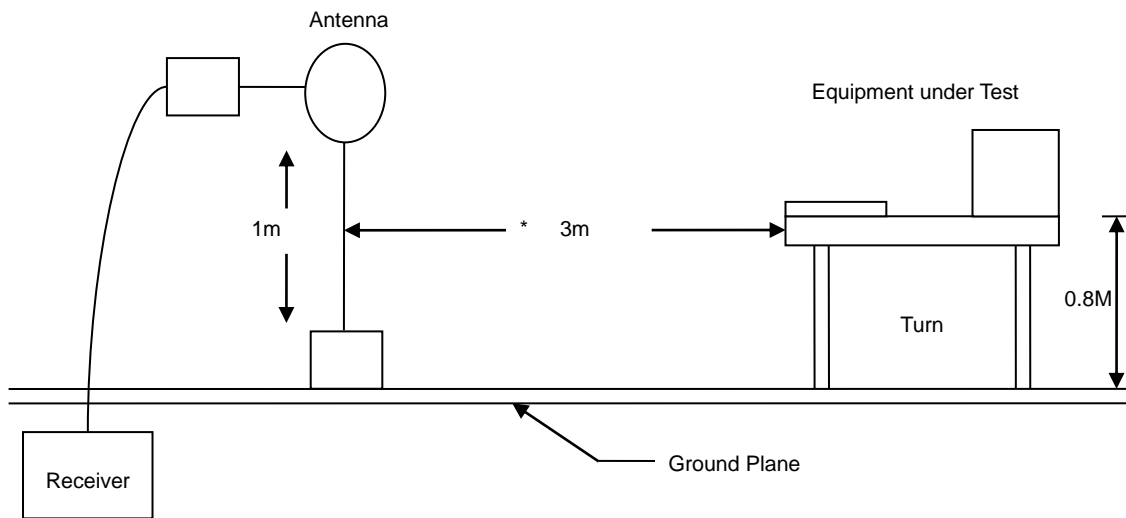
### 6.2 Test Procedures

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

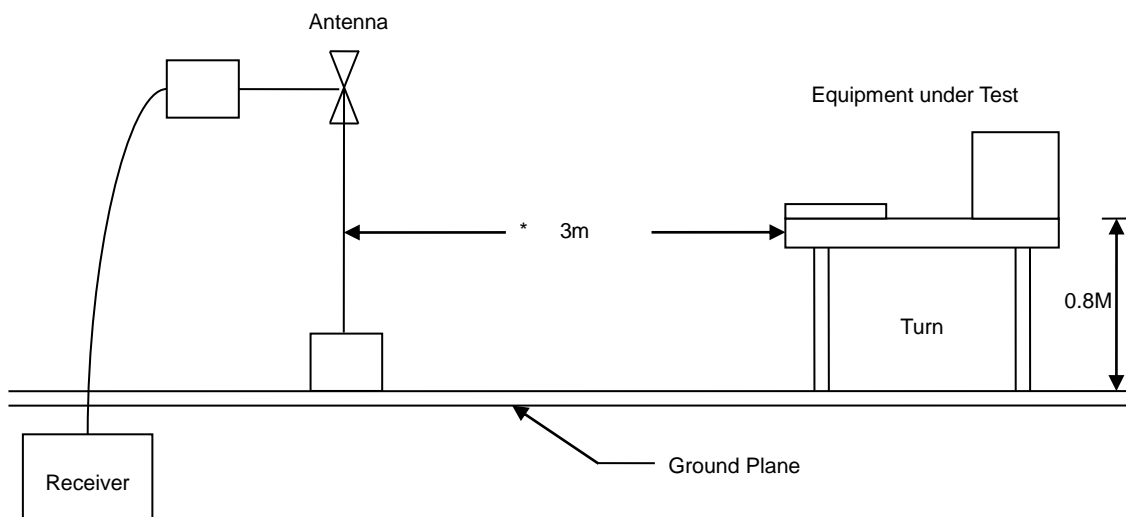


### 6.3 Typical Test Setup

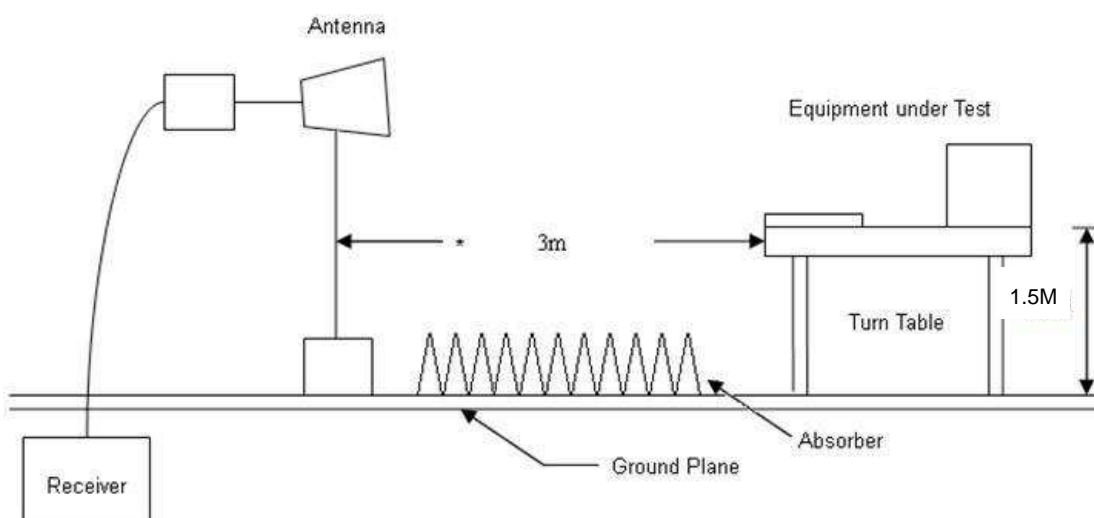
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup





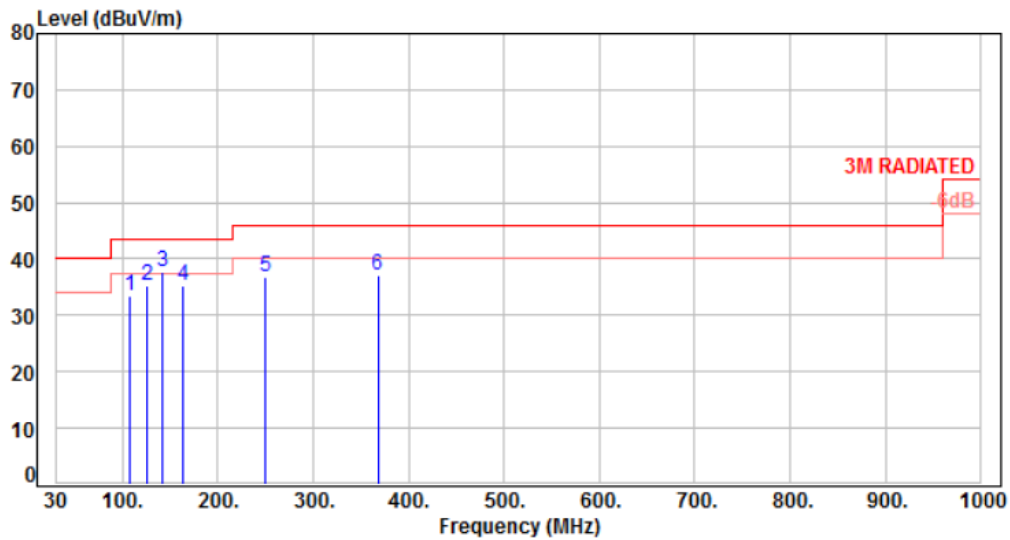


### 6.4 Test Result and Data (9KHz ~ 30MHz)

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

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

Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 68 %

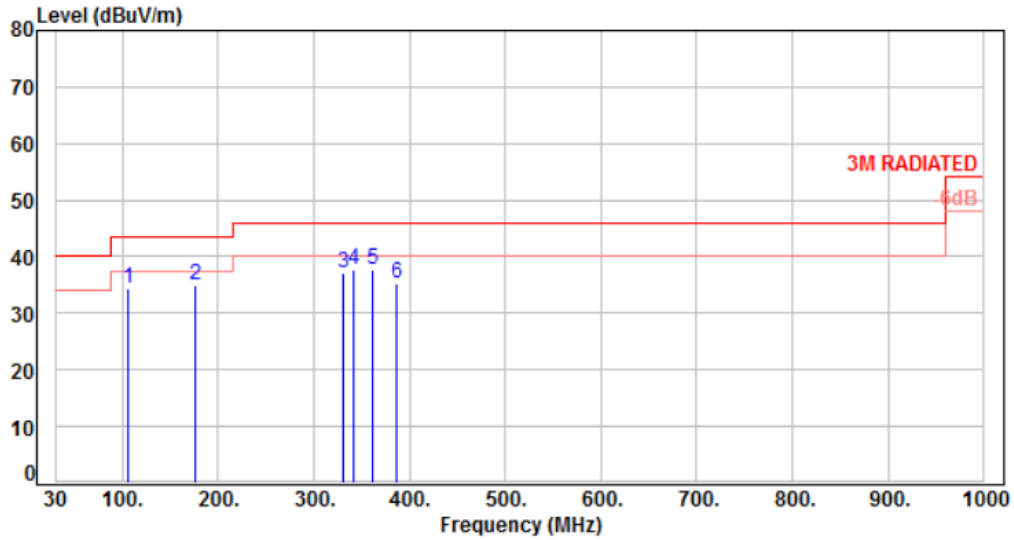


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	107.60	-13.42	46.95	33.53	43.50	-9.97	Peak	100	0	P
2	125.06	-12.00	47.36	35.36	43.50	-8.14	Peak	100	0	P
3	142.52	-10.27	48.10	37.83	43.50	-5.67	Peak	100	0	P
4	163.86	-10.03	45.33	35.30	43.50	-8.20	Peak	100	0	P
5	249.22	-11.00	47.77	36.77	46.00	-9.23	Peak	100	0	P
6	367.56	-7.28	44.28	37.00	46.00	-9.00	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	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 68 %



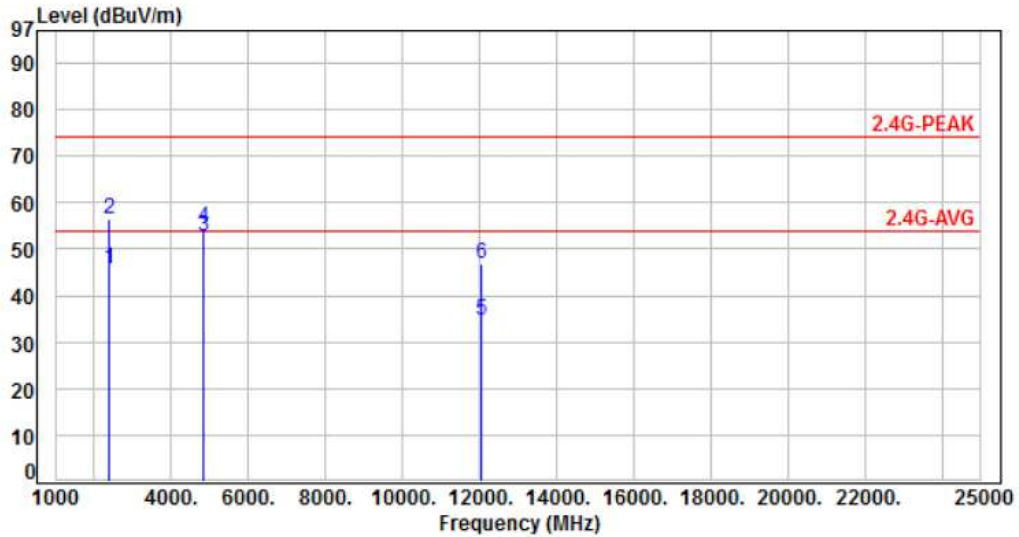
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	105.66	-13.78	48.07	34.29	43.50	-9.21	Peak	100	0	P
2	175.50	-10.86	45.88	35.02	43.50	-8.48	Peak	100	0	P
3	330.70	-8.26	45.41	37.15	46.00	-8.85	Peak	100	0	P
4	342.34	-7.96	45.77	37.81	46.00	-8.19	Peak	100	0	P
5	361.74	-7.44	45.09	37.65	46.00	-8.35	Peak	100	0	P
6	386.96	-6.74	41.96	35.22	46.00	-10.78	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, CH 01	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

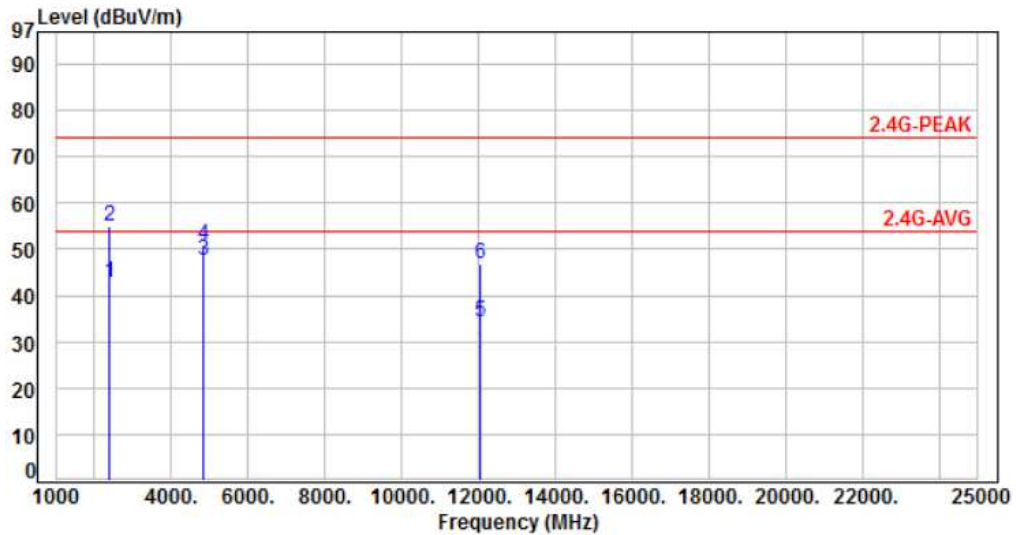


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	61.57	45.77	54.00	-8.23	Average	100	198	P
2	2390.00	-15.80	72.31	56.51	74.00	-17.49	Peak	100	198	P
3	4824.00	-8.26	60.85	52.59	54.00	-1.41	Average	364	336	P
4	4824.00	-8.26	62.82	54.56	74.00	-19.44	Peak	364	336	P
5	12060.00	2.29	32.20	34.49	54.00	-19.51	Average	100	120	P
6	12060.00	2.29	44.66	46.95	74.00	-27.05	Peak	100	120	P

Note: Level = Reading + Factor  
Margin = Level – Limit  
Factor = Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH 01	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

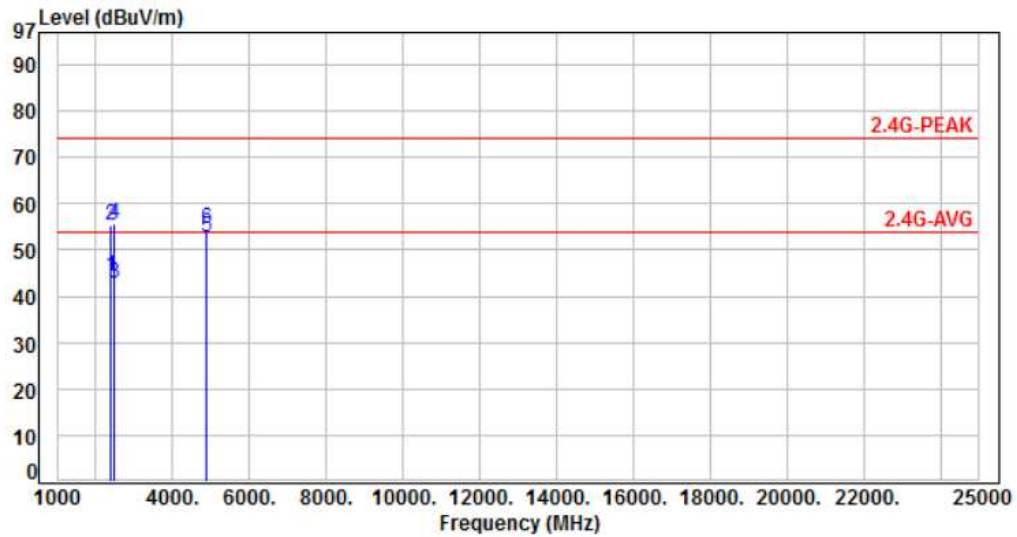


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	58.66	42.86	54.00	-11.14	Average	163	184	P
2	2390.00	-15.80	70.90	55.10	74.00	-18.90	Peak	163	184	P
3	4824.00	-8.26	55.78	47.52	54.00	-6.48	Average	293	73	P
4	4824.00	-8.26	59.11	50.85	74.00	-23.15	Peak	293	73	P
5	12060.00	2.29	32.15	34.44	54.00	-19.56	Average	100	250	P
6	12060.00	2.29	44.48	46.77	74.00	-27.23	Peak	100	250	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, CH 06	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

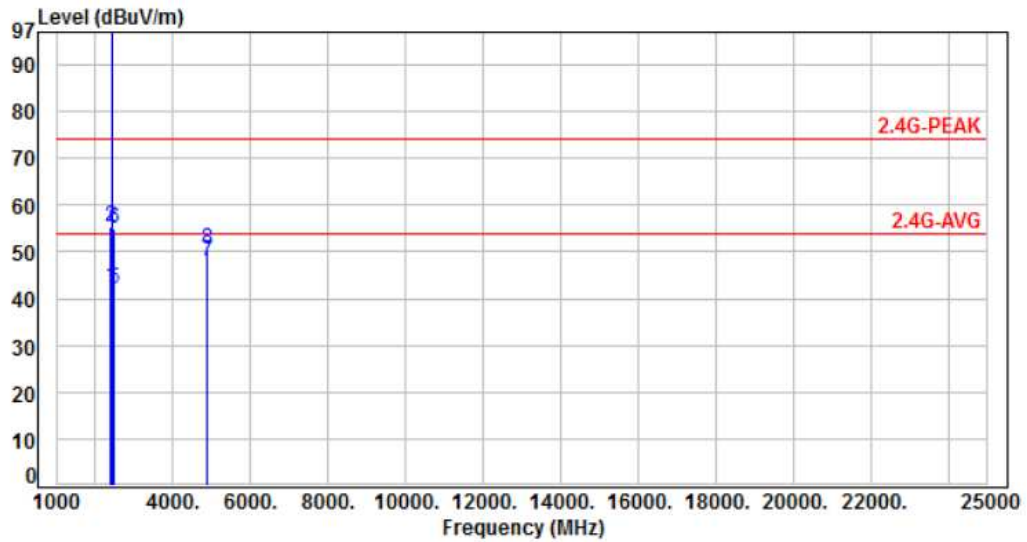


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	59.89	44.09	54.00	-9.91	Average	138	210	P
2	2390.00	-15.80	71.00	55.20	74.00	-18.80	Peak	138	210	P
3	2483.50	-15.49	58.16	42.67	54.00	-11.33	Average	138	210	P
4	2483.50	-15.49	71.14	55.65	74.00	-18.35	Peak	138	210	P
5	4874.00	-8.08	60.73	52.65	54.00	-1.35	Average	364	2	P
6	4874.00	-8.08	62.61	54.53	74.00	-19.47	Peak	364	2	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, CH 06	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

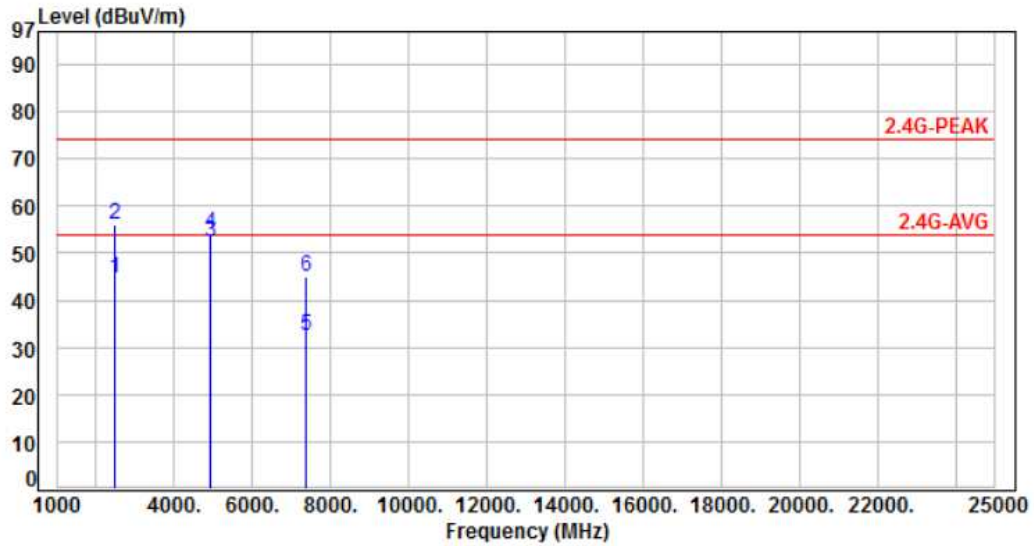


No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	58.36	42.56	54.00	-11.44	Average	164	179	P
2	2390.00	-15.80	70.95	55.15	74.00	-18.85	Peak	164	179	P
3	2437.00	-15.65	112.06	96.41	54.00	42.41	Average	164	179	F
4	2437.00	-15.65	116.66	101.01	74.00	27.01	Peak	164	179	F
5	2483.50	-15.49	57.70	42.21	54.00	-11.79	Average	164	179	P
6	2483.50	-15.49	70.62	55.13	74.00	-18.87	Peak	164	179	P
7	4874.00	-8.08	56.12	48.04	54.00	-5.96	Average	385	73	P
8	4874.00	-8.08	58.64	50.56	74.00	-23.44	Peak	385	73	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, CH 11	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

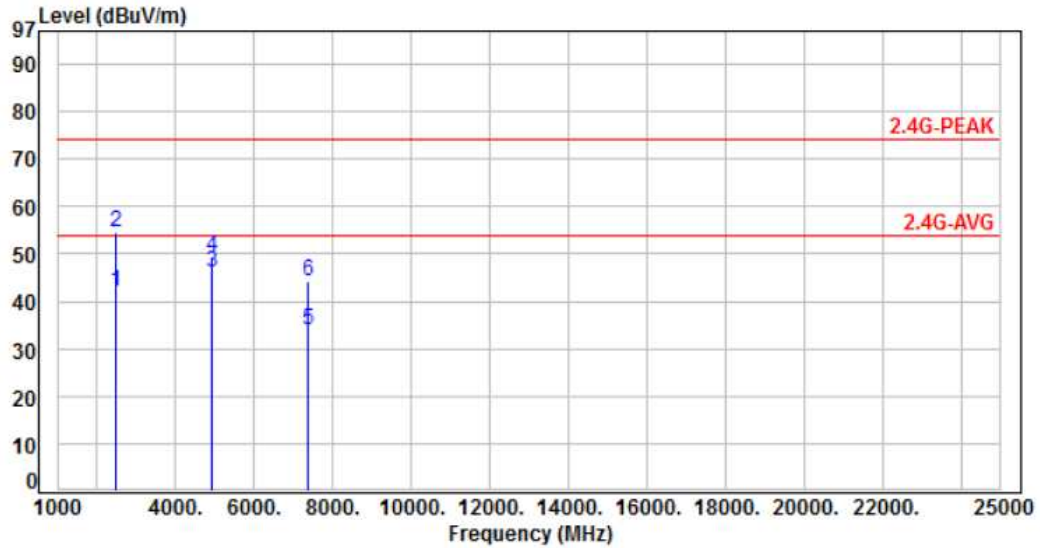


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.49	60.03	44.54	54.00	-9.46	Average	100	198	P
2	2483.50	-15.49	71.62	56.13	74.00	-17.87	Peak	100	198	P
3	4924.00	-7.89	60.43	52.54	54.00	-1.46	Average	394	346	P
4	4924.00	-7.89	62.25	54.36	74.00	-19.64	Peak	394	346	P
5	7386.00	-4.71	37.34	32.63	54.00	-21.37	Average	100	109	P
6	7386.00	-4.71	49.68	44.97	74.00	-29.03	Peak	100	109	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, CH 11	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %



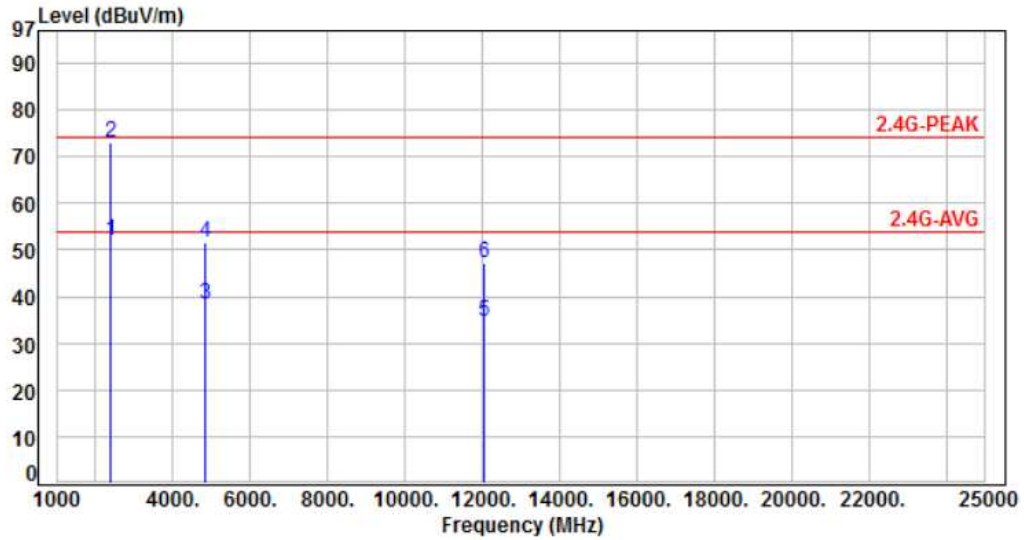
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.49	57.66	42.17	54.00	-11.83	Average	100	186	P
2	2483.50	-15.49	70.24	54.75	74.00	-19.25	Peak	100	186	P
3	4924.00	-7.89	54.07	46.18	54.00	-7.82	Average	258	74	P
4	4924.00	-7.89	57.30	49.41	74.00	-24.59	Peak	258	74	P
5	7386.00	-4.71	38.55	33.84	54.00	-20.16	Average	100	311	P
6	7386.00	-4.71	48.98	44.27	74.00	-29.73	Peak	100	311	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, CH 01	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

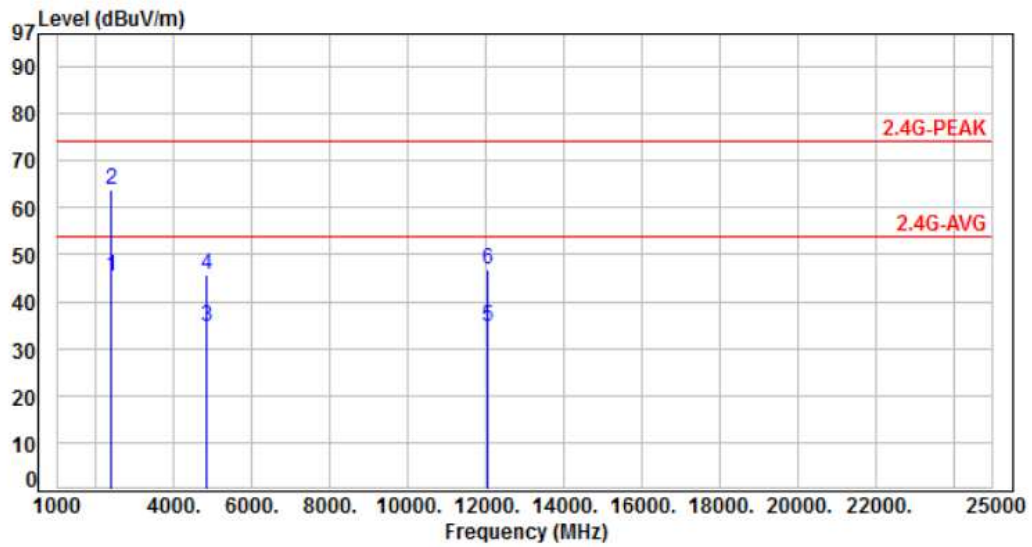


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	67.89	52.09	54.00	-1.91	Average	100	199	P
2	2390.00	-15.80	88.78	72.98	74.00	-1.02	Peak	100	199	P
3	4824.00	-8.26	46.71	38.45	54.00	-15.55	Average	326	346	P
4	4824.00	-8.26	59.92	51.66	74.00	-22.34	Peak	326	346	P
5	12060.00	2.29	32.34	34.63	54.00	-19.37	Average	100	122	P
6	12060.00	2.29	45.05	47.34	74.00	-26.66	Peak	100	122	P

Note: Level = Reading + Factor  
 Margin = Level - Limit  
 Factor = Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH 01	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

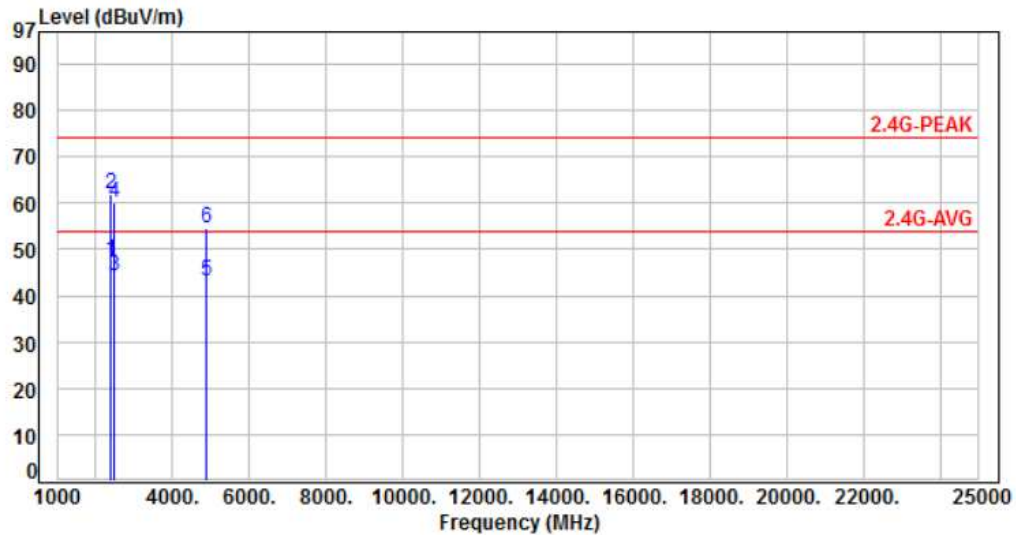


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	61.28	45.48	54.00	-8.52	Average	167	186	P
2	2390.00	-15.80	79.73	63.93	74.00	-10.07	Peak	167	186	P
3	4824.00	-8.26	42.80	34.54	54.00	-19.46	Average	293	70	P
4	4824.00	-8.26	54.07	45.81	74.00	-28.19	Peak	293	70	P
5	12060.00	2.29	32.46	34.75	54.00	-19.25	Average	100	255	P
6	12060.00	2.29	44.59	46.88	74.00	-27.12	Peak	100	255	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, CH 06	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

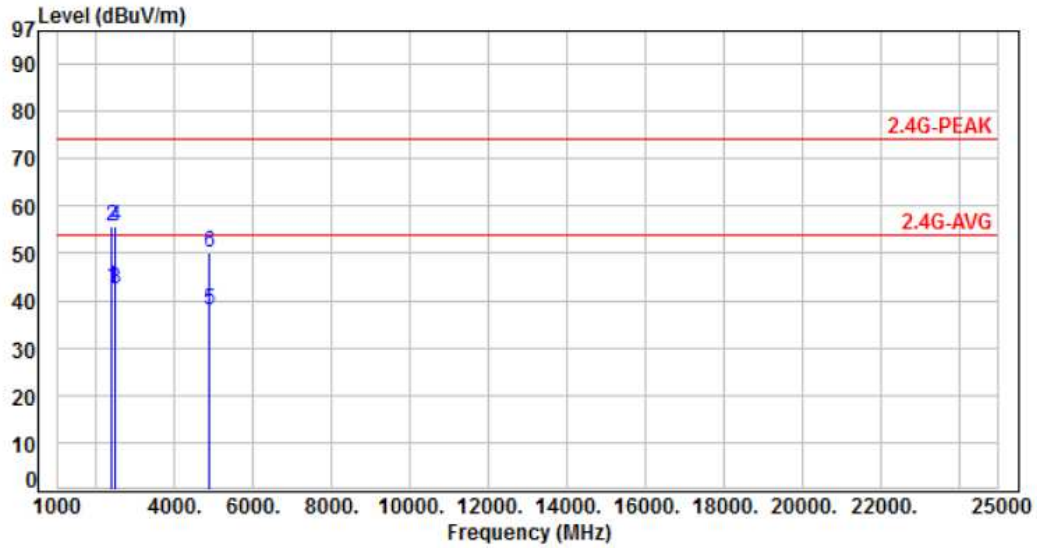


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	63.46	47.66	54.00	-6.34	Average	153	201	P
2	2390.00	-15.80	77.70	61.90	74.00	-12.10	Peak	153	201	P
3	2483.50	-15.49	59.60	44.11	54.00	-9.89	Average	153	201	P
4	2483.50	-15.49	75.68	60.19	74.00	-13.81	Peak	153	201	P
5	4874.00	-8.08	51.15	43.07	54.00	-10.93	Average	364	0	P
6	4874.00	-8.08	62.59	54.51	74.00	-19.49	Peak	364	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, CH 06	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

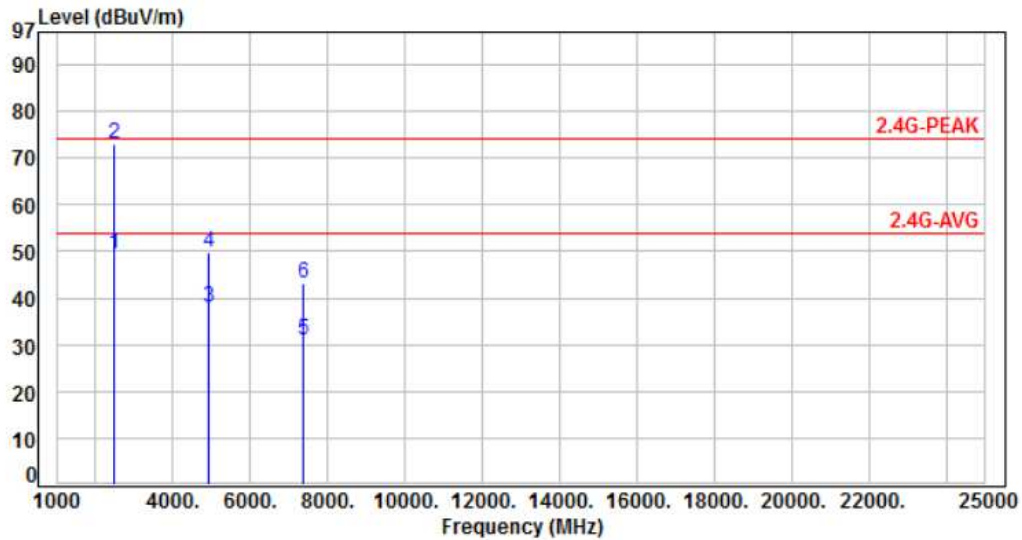


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	58.75	42.95	54.00	-11.05	Average	100	185	P
2	2390.00	-15.80	71.60	55.80	74.00	-18.20	Peak	100	185	P
3	2483.50	-15.49	57.89	42.40	54.00	-11.60	Average	100	185	P
4	2483.50	-15.49	71.21	55.72	74.00	-18.28	Peak	100	185	P
5	4874.00	-8.08	46.22	38.14	54.00	-15.86	Average	385	72	P
6	4874.00	-8.08	58.09	50.01	74.00	-23.99	Peak	385	72	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, CH 11	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

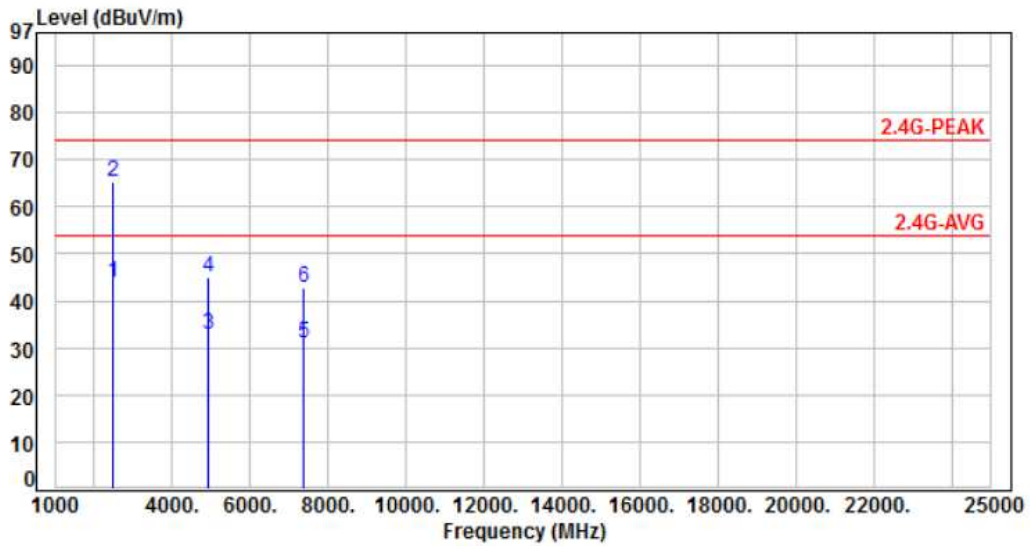


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.49	65.01	49.52	54.00	-4.48	Average	100	201	P
2	2483.50	-15.49	88.48	72.99	74.00	-1.01	Peak	100	201	P
3	4924.00	-7.89	45.94	38.05	54.00	-15.95	Average	394	347	P
4	4924.00	-7.89	57.86	49.97	74.00	-24.03	Peak	394	347	P
5	7386.00	-4.71	35.66	30.95	54.00	-23.05	Average	100	111	P
6	7386.00	-4.71	48.00	43.29	74.00	-30.71	Peak	100	111	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, CH 11	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

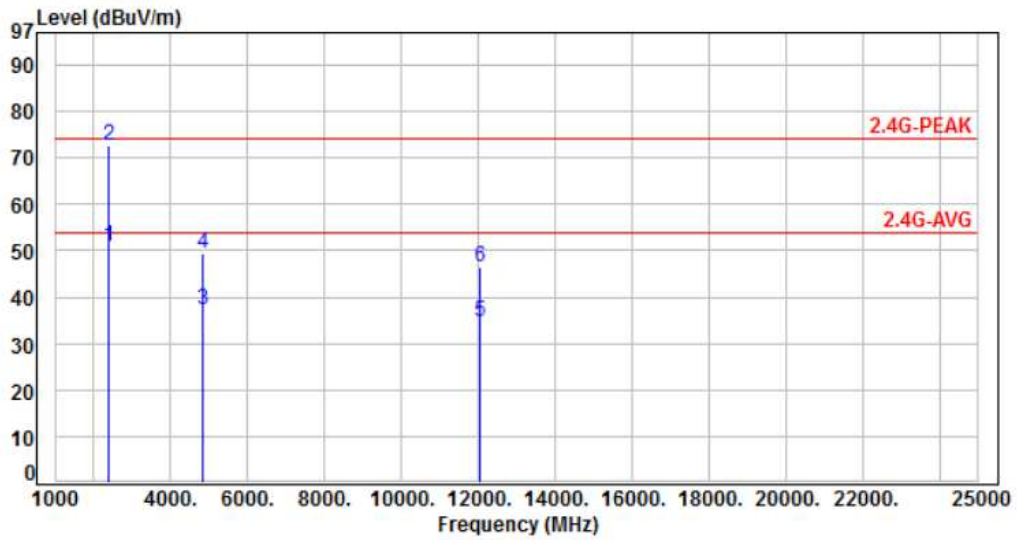


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.49	59.55	44.06	54.00	-9.94	Average	100	188	P
2	2483.50	-15.49	80.74	65.25	74.00	-8.75	Peak	100	188	P
3	4924.00	-7.89	40.58	32.69	54.00	-21.31	Average	308	75	P
4	4924.00	-7.89	53.01	45.12	74.00	-28.88	Peak	308	75	P
5	7386.00	-4.71	35.53	30.82	54.00	-23.18	Average	100	320	P
6	7386.00	-4.71	47.48	42.77	74.00	-31.23	Peak	100	320	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, CH 01	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

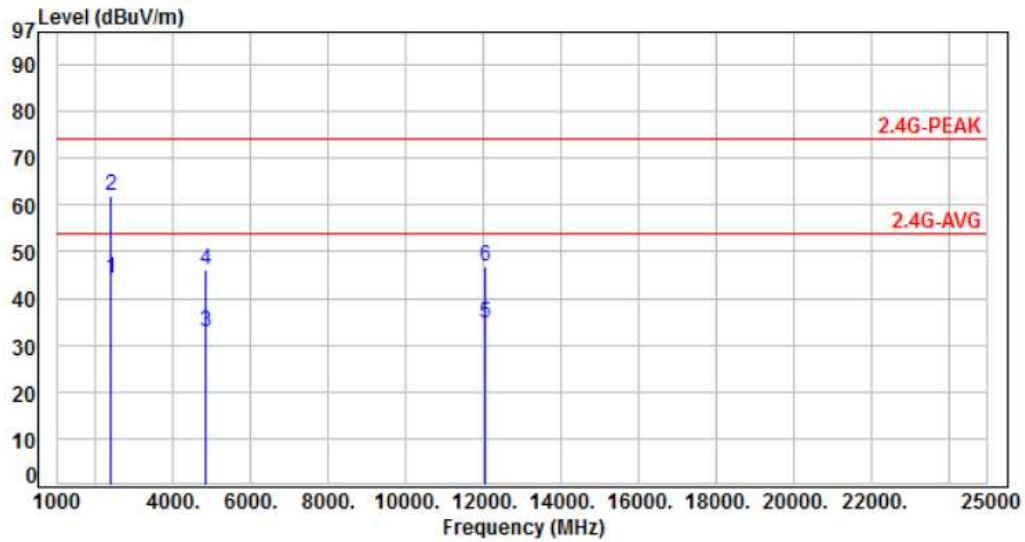


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	66.74	50.94	54.00	-3.06	Average	202	154	P
2	2390.00	-15.80	88.41	72.61	74.00	-1.39	Peak	202	154	P
3	4824.00	-8.26	45.37	37.11	54.00	-16.89	Average	345	327	P
4	4824.00	-8.26	57.68	49.42	74.00	-24.58	Peak	345	327	P
5	12060.00	2.29	32.49	34.78	54.00	-19.22	Average	100	130	P
6	12060.00	2.29	44.29	46.58	74.00	-27.42	Peak	100	130	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, CH 01	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %



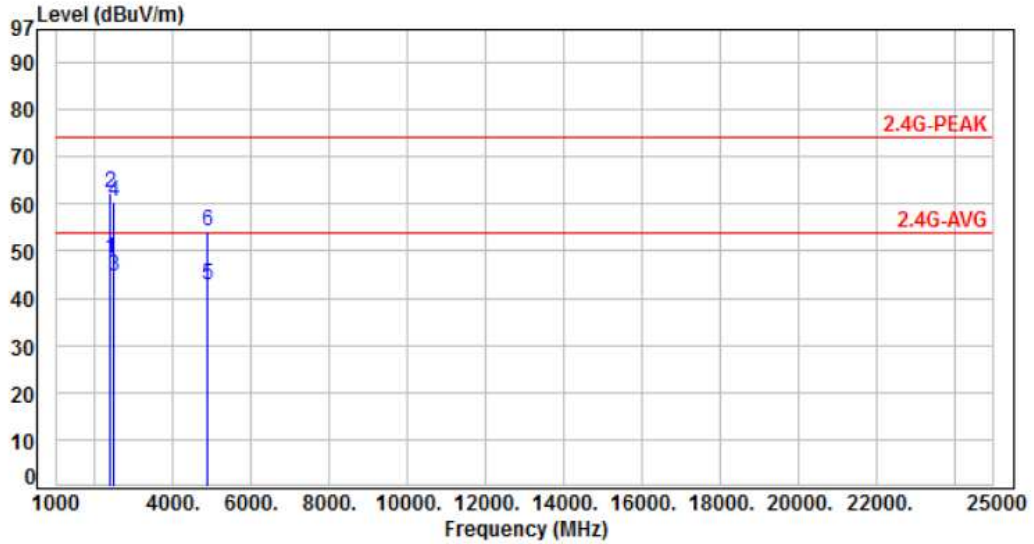
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	60.04	44.24	54.00	-9.76	Average	168	185	P
2	2390.00	-15.80	77.74	61.94	74.00	-12.06	Peak	168	185	P
3	4824.00	-8.26	41.02	32.76	54.00	-21.24	Average	297	72	P
4	4824.00	-8.26	54.37	46.11	74.00	-27.89	Peak	297	72	P
5	12060.00	2.29	32.49	34.78	54.00	-19.22	Average	100	258	P
6	12060.00	2.29	44.51	46.80	74.00	-27.20	Peak	100	258	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, CH 06	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

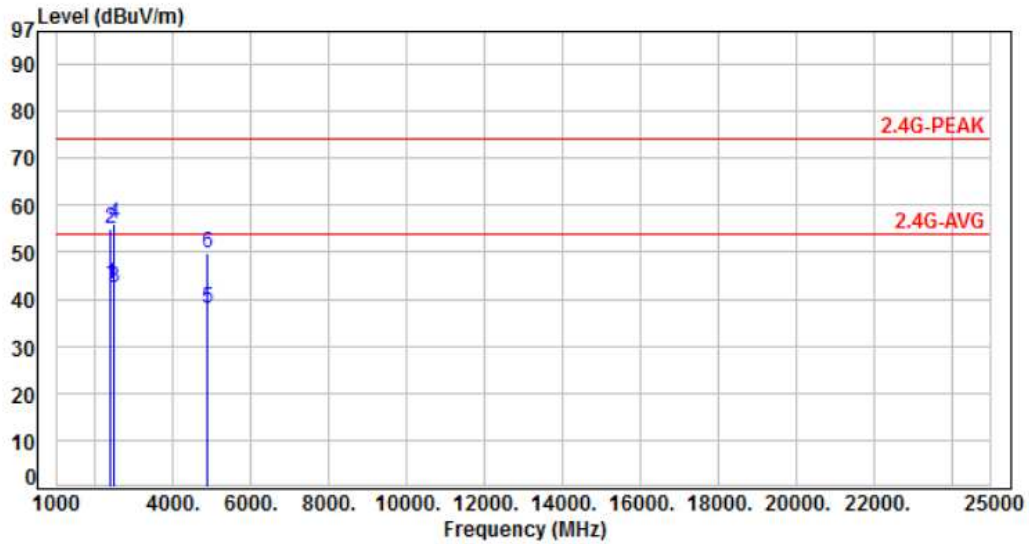


No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	63.99	48.19	54.00	-5.81	Average	146	199	P
2	2390.00	-15.80	78.24	62.44	74.00	-11.56	Peak	146	199	P
3	2483.50	-15.49	60.22	44.73	54.00	-9.27	Average	146	199	P
4	2483.50	-15.49	76.10	60.61	74.00	-13.39	Peak	146	199	P
5	4874.00	-8.08	50.71	42.63	54.00	-11.37	Average	364	3	P
6	4874.00	-8.08	62.36	54.28	74.00	-19.72	Peak	364	3	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, CH 06	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

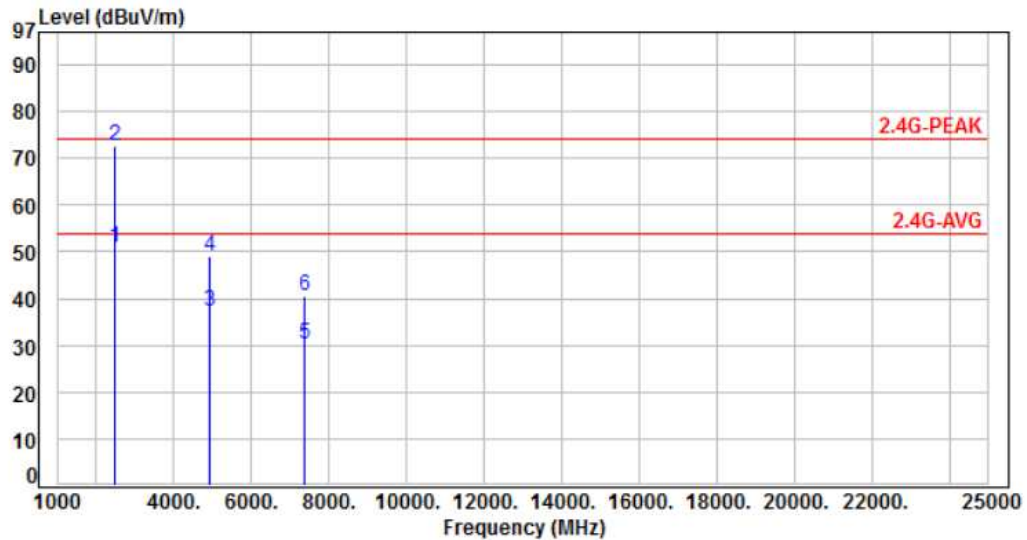


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	58.81	43.01	54.00	-10.99	Average	167	184	P
2	2390.00	-15.80	70.92	55.12	74.00	-18.88	Peak	167	184	P
3	2483.50	-15.49	57.90	42.41	54.00	-11.59	Average	167	184	P
4	2483.50	-15.49	71.55	56.06	74.00	-17.94	Peak	167	184	P
5	4874.00	-8.08	45.93	37.85	54.00	-16.15	Average	389	74	P
6	4874.00	-8.08	57.78	49.70	74.00	-24.30	Peak	389	74	P

Note: Level = Reading + Factor  
Margin = Level – Limit  
Factor = Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH 11	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

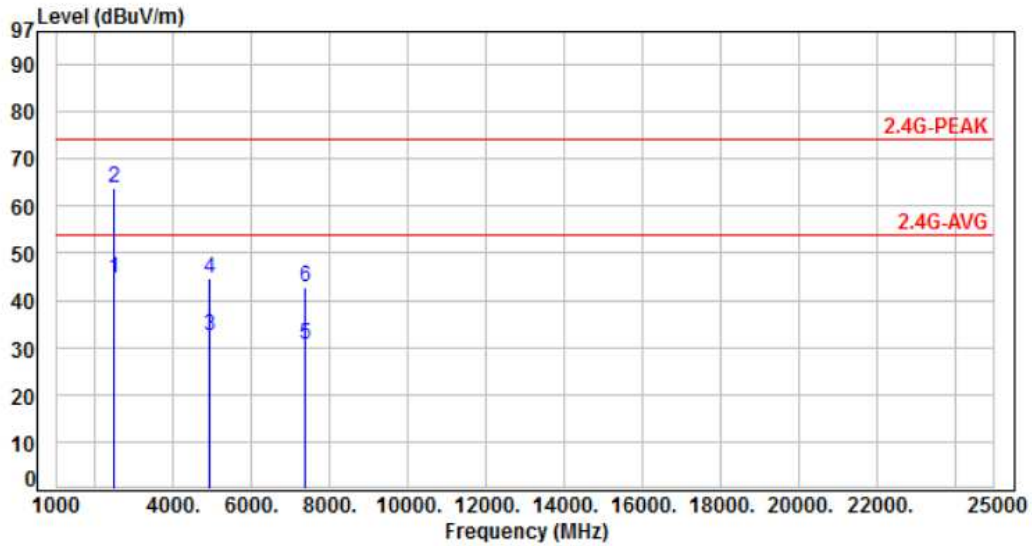


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.49	66.21	50.72	54.00	-3.28	Average	100	200	P
2	2483.50	-15.49	88.09	72.60	74.00	-1.40	Peak	100	200	P
3	4924.00	-7.89	45.23	37.34	54.00	-16.66	Average	394	350	P
4	4924.00	-7.89	56.89	49.00	74.00	-25.00	Peak	394	350	P
5	7386.00	-4.71	34.90	30.19	54.00	-23.81	Average	100	115	P
6	7386.00	-4.71	45.36	40.65	74.00	-33.35	Peak	100	115	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, CH 11	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

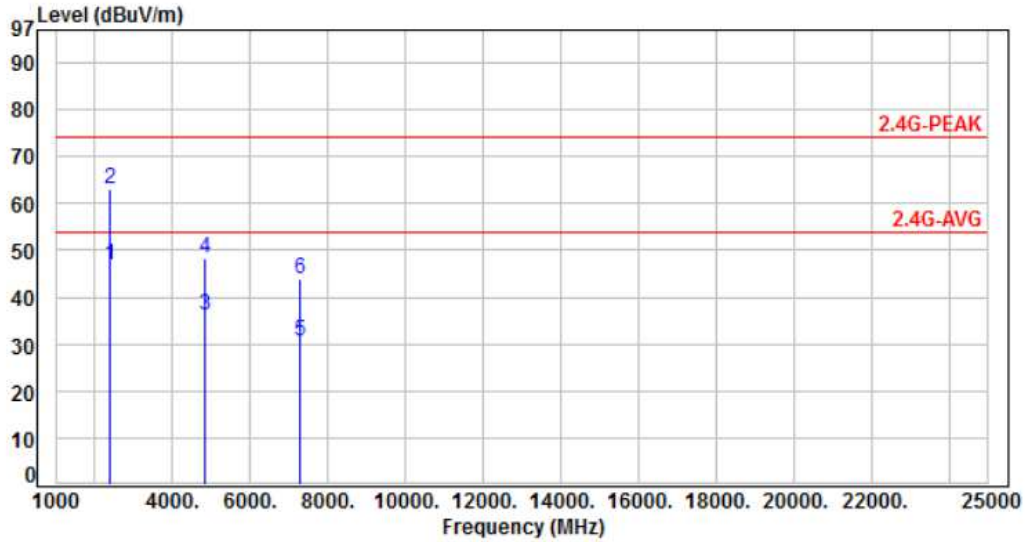


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.49	60.21	44.72	54.00	-9.28	Average	100	189	P
2	2483.50	-15.49	79.47	63.98	74.00	-10.02	Peak	100	189	P
3	4924.00	-7.89	40.23	32.34	54.00	-21.66	Average	309	74	P
4	4924.00	-7.89	52.68	44.79	74.00	-29.21	Peak	309	74	P
5	7386.00	-4.71	35.30	30.59	54.00	-23.41	Average	100	330	P
6	7386.00	-4.71	47.52	42.81	74.00	-31.19	Peak	100	330	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, CH 03	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

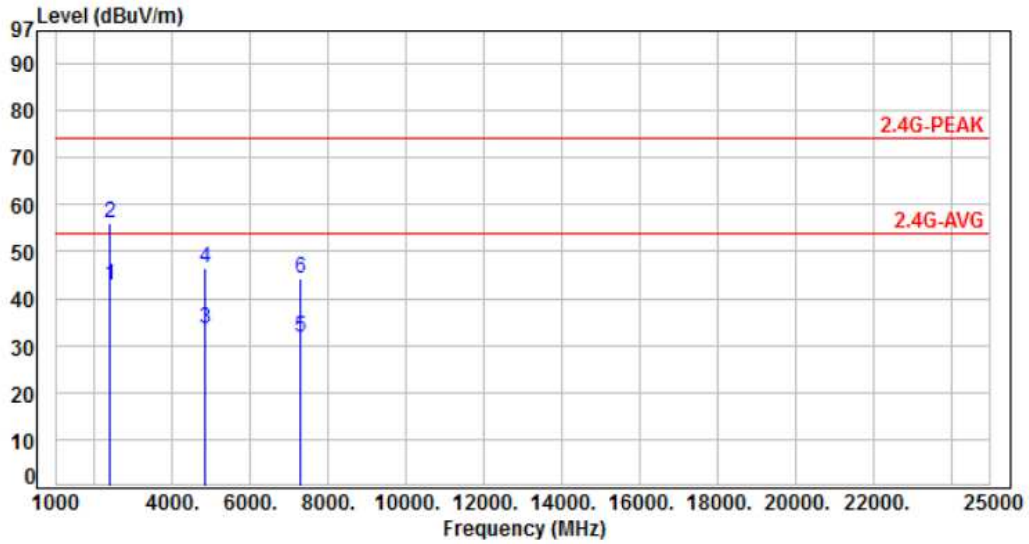


No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	62.76	46.96	54.00	-7.04	Average	193	153	P
2	2390.00	-15.80	78.96	63.16	74.00	-10.84	Peak	193	153	P
3	4844.00	-8.19	44.29	36.10	54.00	-17.90	Average	248	312	P
4	4844.00	-8.19	56.48	48.29	74.00	-25.71	Peak	248	312	P
5	7266.00	-5.01	35.46	30.45	54.00	-23.55	Average	126	139	P
6	7266.00	-5.01	48.89	43.88	74.00	-30.12	Peak	126	139	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, CH 03	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

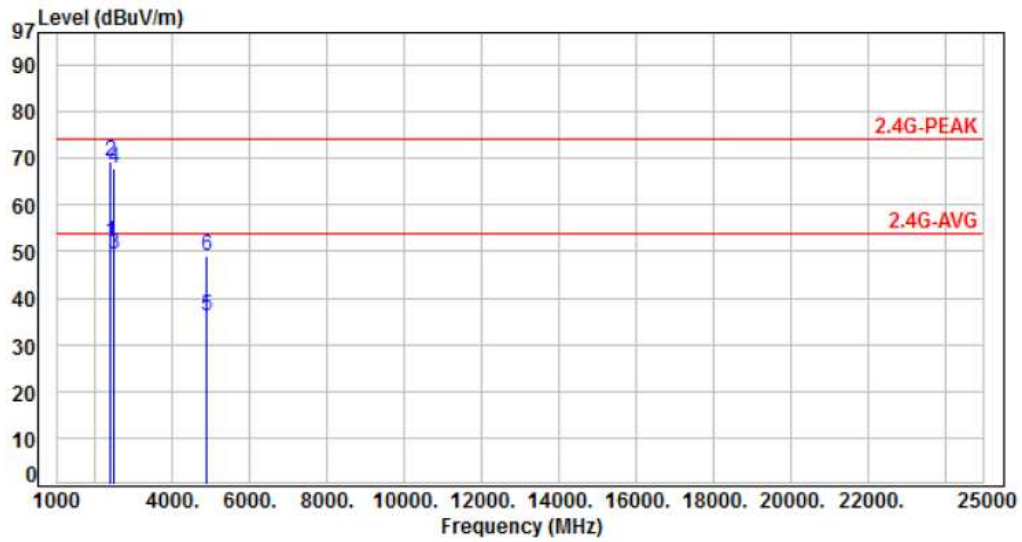


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	58.76	42.96	54.00	-11.04	Average	100	153	P
2	2390.00	-15.80	71.96	56.16	74.00	-17.84	Peak	100	153	P
3	4844.00	-8.19	41.58	33.39	54.00	-20.61	Average	136	249	P
4	4844.00	-8.19	54.79	46.60	74.00	-27.40	Peak	136	249	P
5	7266.00	-5.01	36.75	31.74	54.00	-22.26	Average	100	127	P
6	7266.00	-5.01	49.12	44.11	74.00	-29.89	Peak	100	127	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, CH 06	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

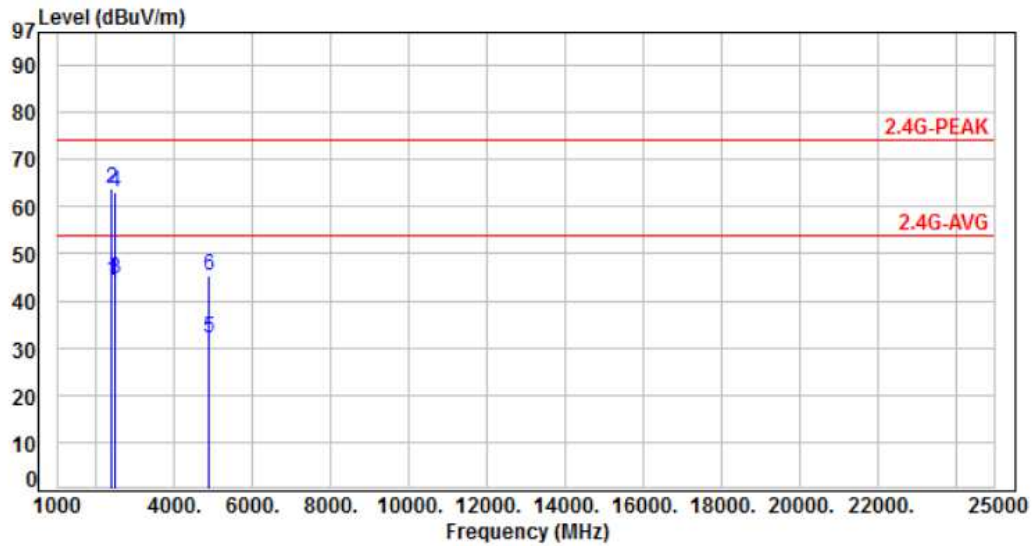


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	67.91	52.11	54.00	-1.89	Average	229	145	P
2	2390.00	-15.80	85.24	69.44	74.00	-4.56	Peak	229	145	P
3	2483.50	-15.49	64.80	49.31	54.00	-4.69	Average	242	145	P
4	2483.50	-15.49	83.44	67.95	74.00	-6.05	Peak	242	145	P
5	4874.00	-8.08	44.10	36.02	54.00	-17.98	Average	212	197	P
6	4874.00	-8.08	57.17	49.09	74.00	-24.91	Peak	212	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, CH 06	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %



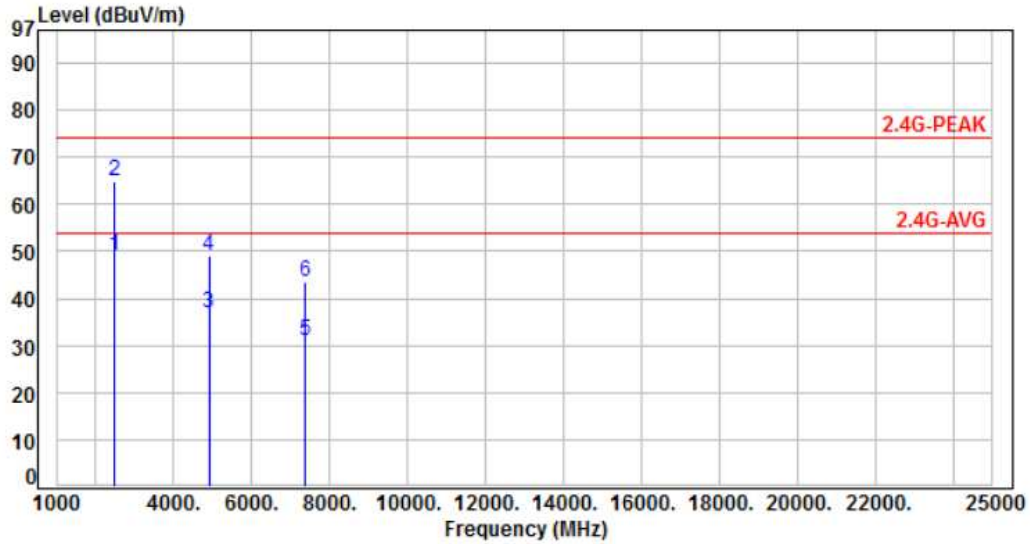
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.80	60.12	44.32	54.00	-9.68	Average	134	242	P
2	2390.00	-15.80	79.57	63.77	74.00	-10.23	Peak	134	242	P
3	2483.50	-15.49	60.12	44.63	54.00	-9.37	Average	145	241	P
4	2483.50	-15.49	78.69	63.20	74.00	-10.80	Peak	145	241	P
5	4874.00	-8.08	40.21	32.13	54.00	-21.87	Average	100	137	P
6	4874.00	-8.08	53.26	45.18	74.00	-28.82	Peak	100	137	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, CH 09	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %

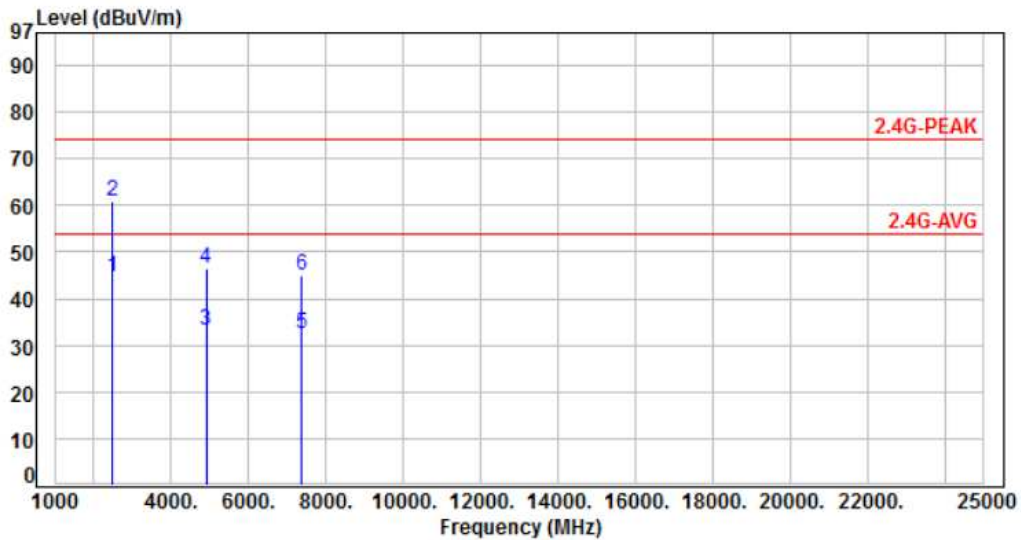


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.49	64.57	49.08	54.00	-4.92	Average	119	108	P
2	2483.50	-15.49	80.37	64.88	74.00	-9.12	Peak	119	108	P
3	4904.00	-7.96	44.77	36.81	54.00	-17.19	Average	243	252	P
4	4904.00	-7.96	56.97	49.01	74.00	-24.99	Peak	243	252	P
5	7356.00	-4.78	35.77	30.99	54.00	-23.01	Average	198	237	P
6	7356.00	-4.78	48.36	43.58	74.00	-30.42	Peak	198	237	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, CH 09	Temperature	: 23 °C
Test Date	: Dec. 22, 2016	Humidity	: 57 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.49	60.25	44.76	54.00	-9.24	Average	100	246	P
2	2483.50	-15.49	76.49	61.00	74.00	-13.00	Peak	100	246	P
3	4904.00	-7.96	41.14	33.18	54.00	-20.82	Average	279	301	P
4	4904.00	-7.96	54.54	46.58	74.00	-27.42	Peak	279	301	P
5	7356.00	-4.78	37.11	32.33	54.00	-21.67	Average	100	162	P
6	7356.00	-4.78	49.77	44.99	74.00	-29.01	Peak	100	162	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

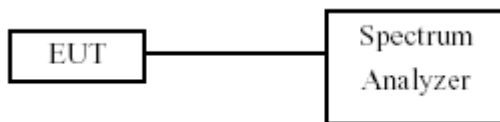
### 7.1 Test Limit

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

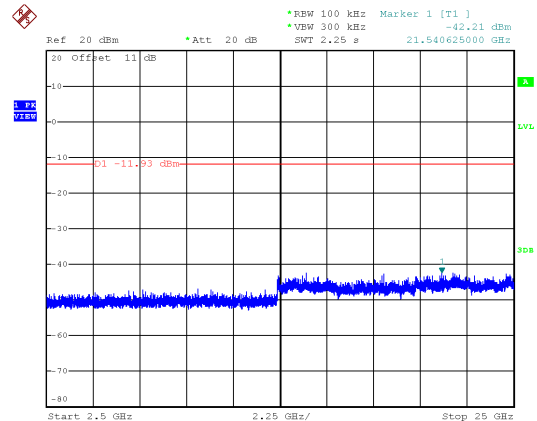
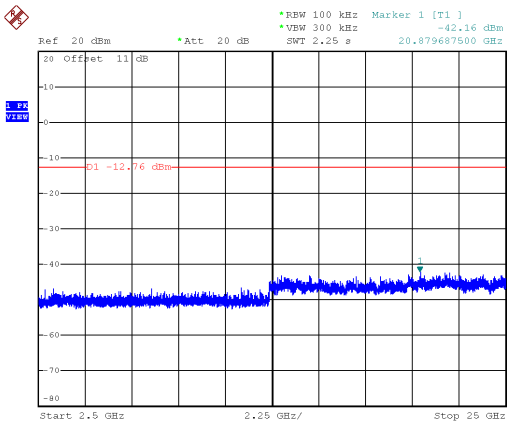
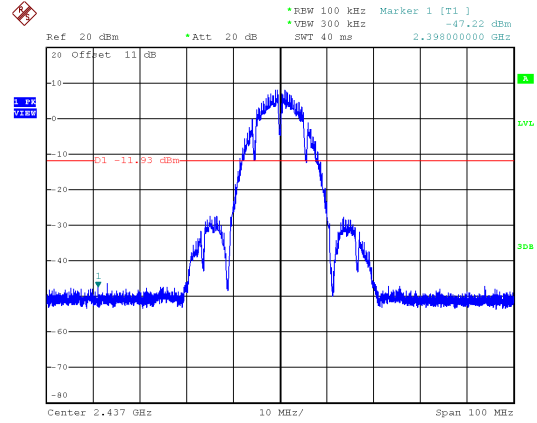
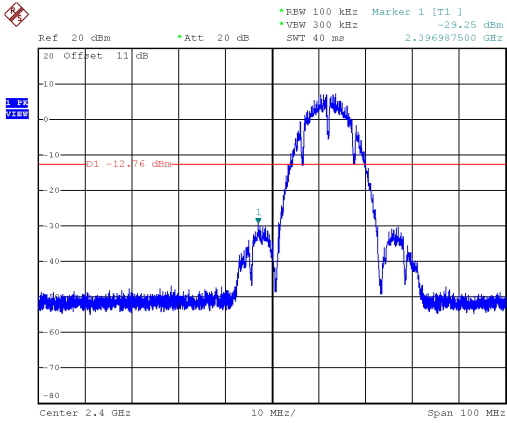
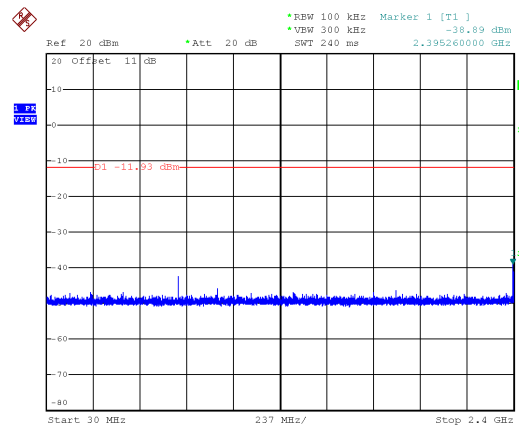
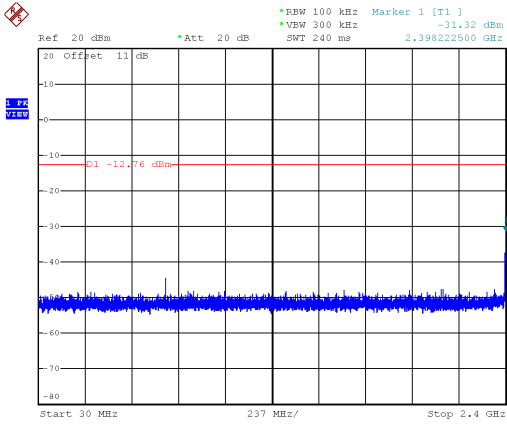
Test Result	: PASS	Temperature	: 22°C
Test Date	: Dec. 28, 2016	Humidity	: 58%

Note: Test plots refers to the following pages.



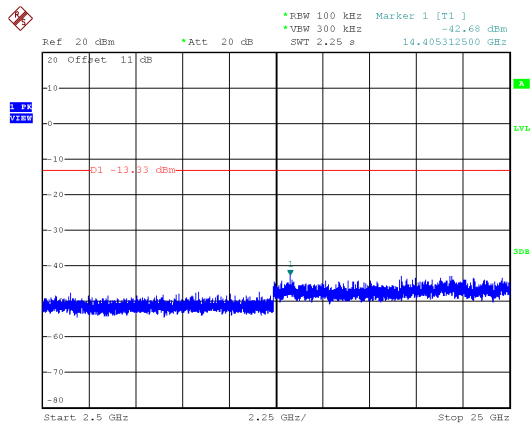
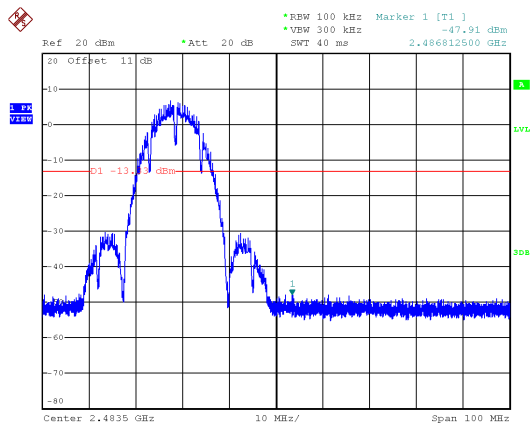
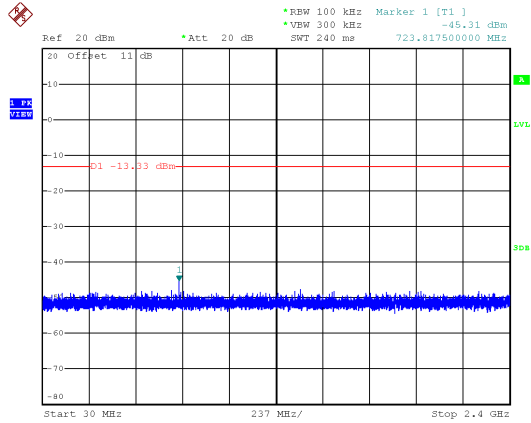
Modulation Type: 802.11b, CH 01

Modulation Type: 802.11b, CH 06



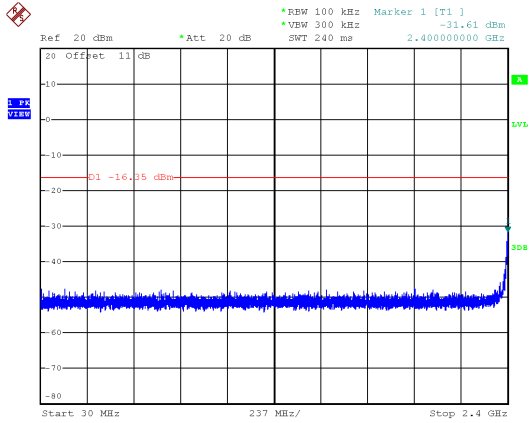


Modulation Type: 802.11b, CH 11

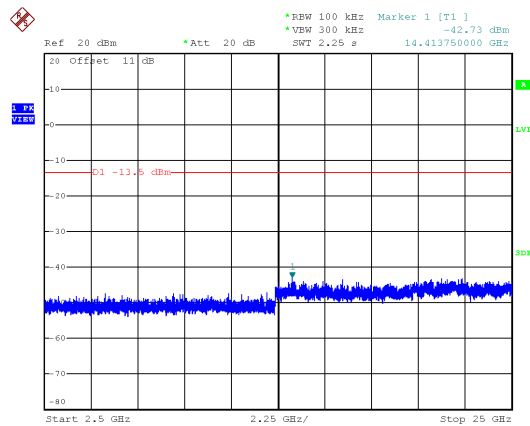
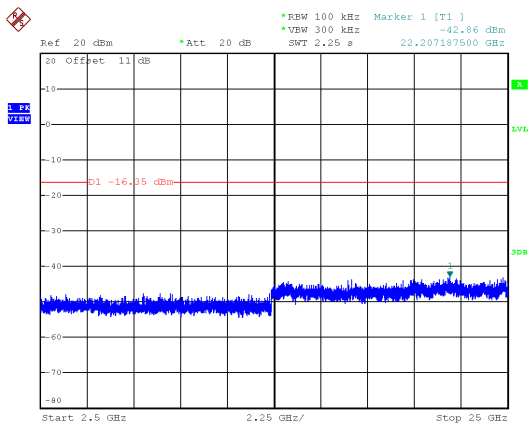
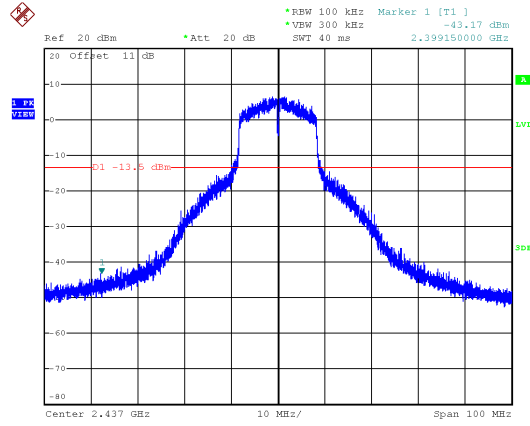
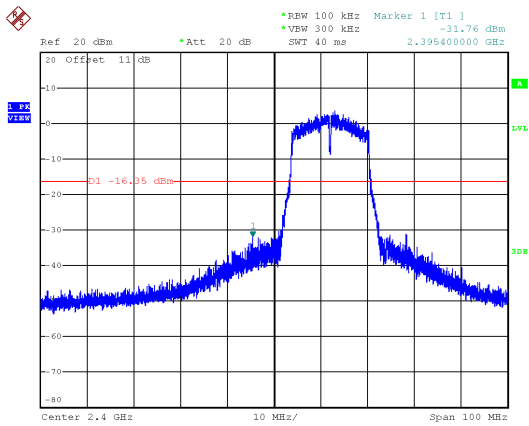
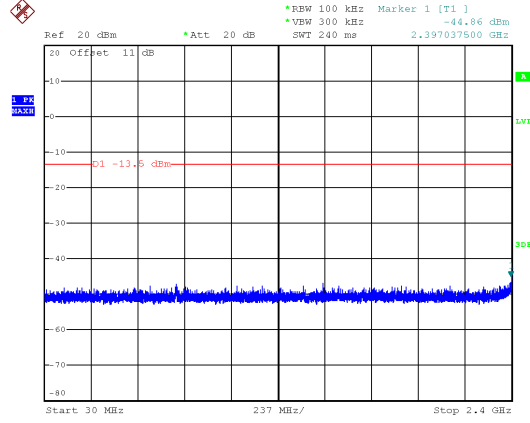




Modulation Type: 802.11g, CH 01

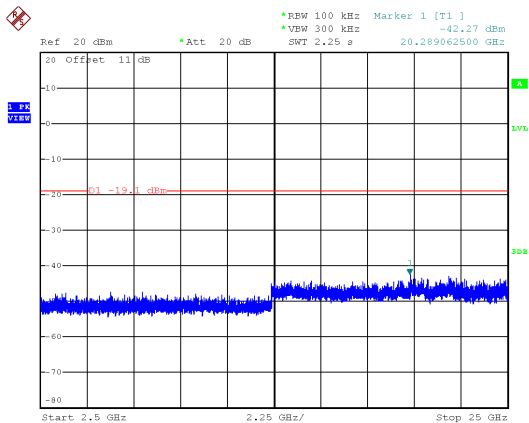
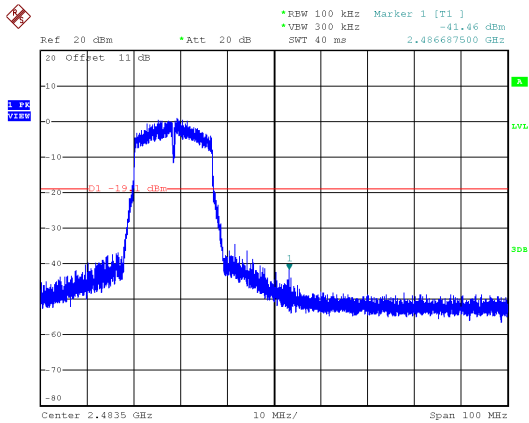
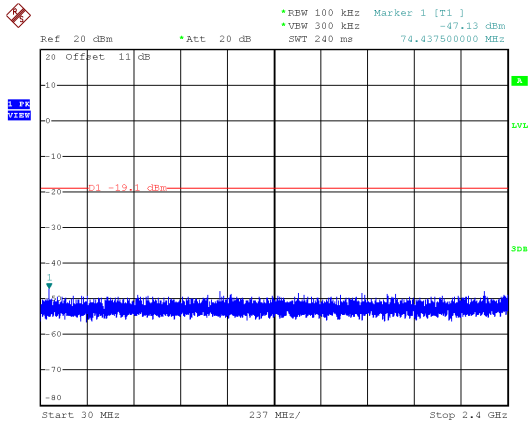


Modulation Type: 802.11g, CH 06





Modulation Type: 802.11g, CH 11

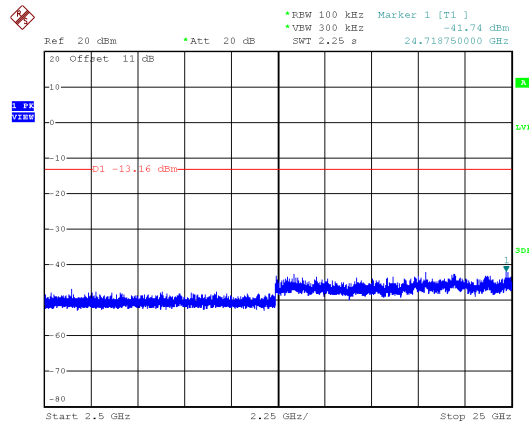
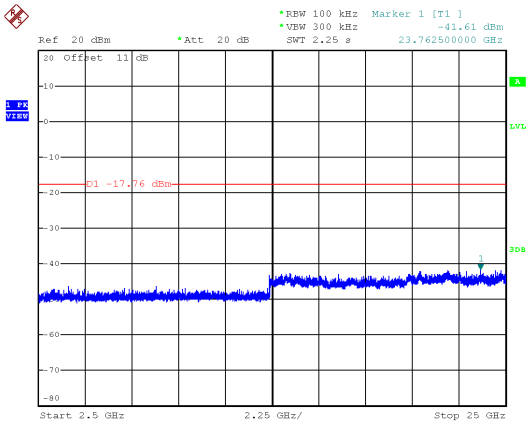
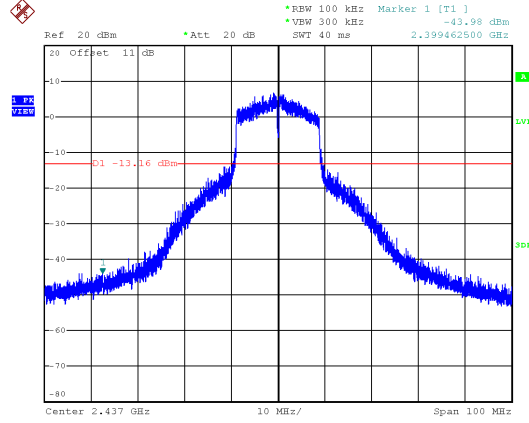
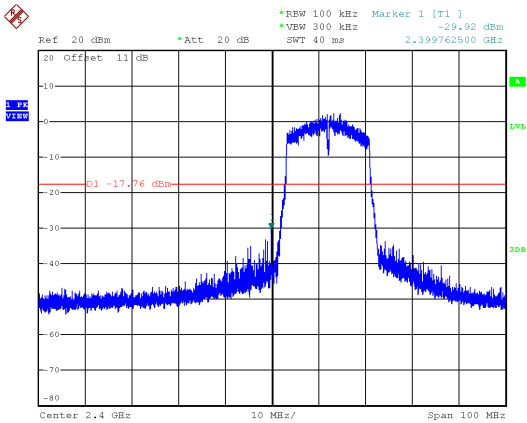
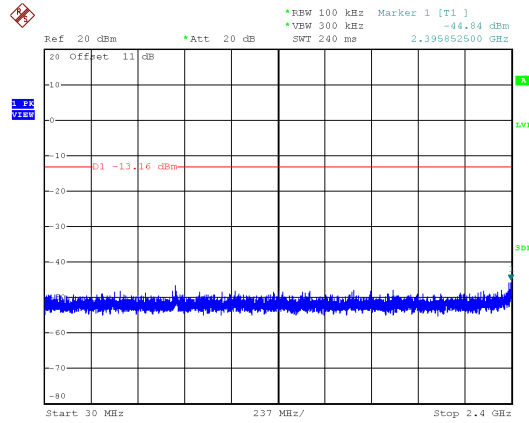
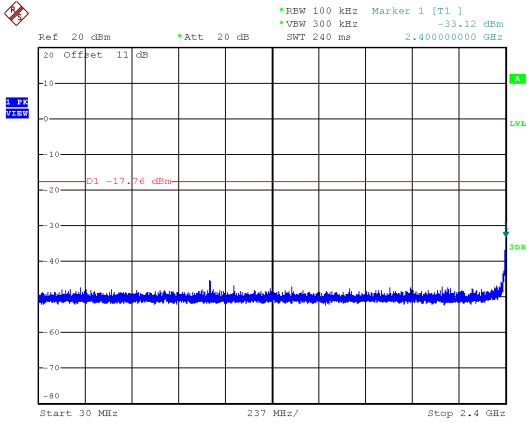






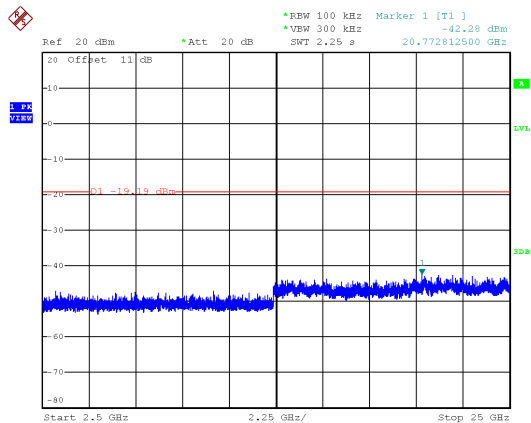
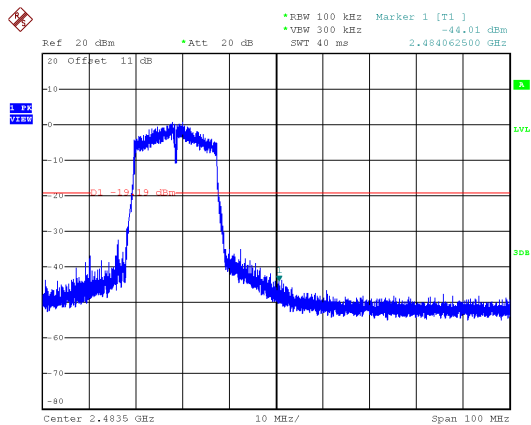
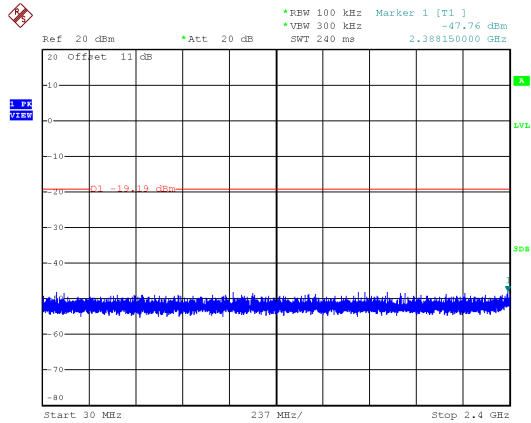
Modulation Type: 802.11n HT20, CH 01

Modulation Type: 802.11n HT20, CH 06





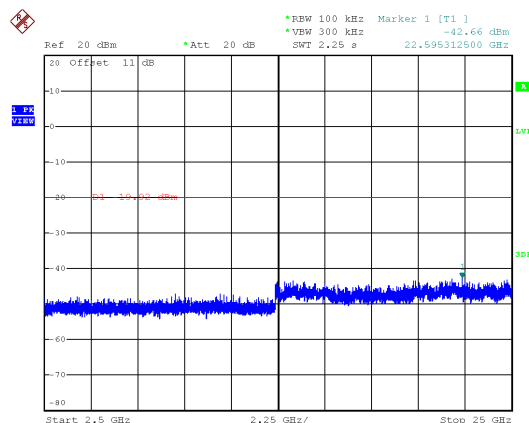
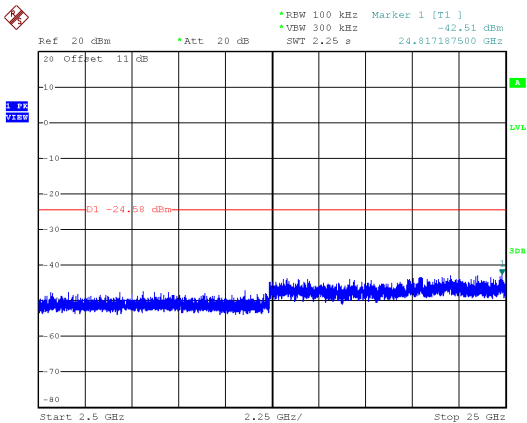
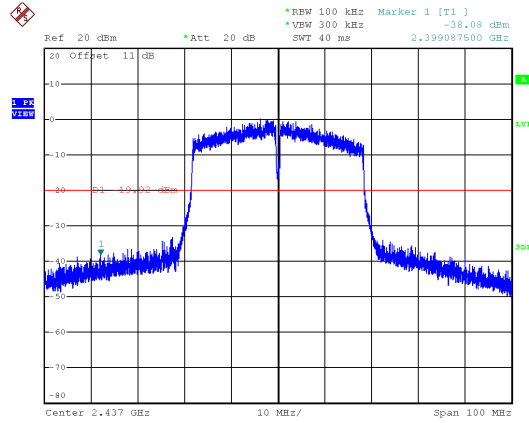
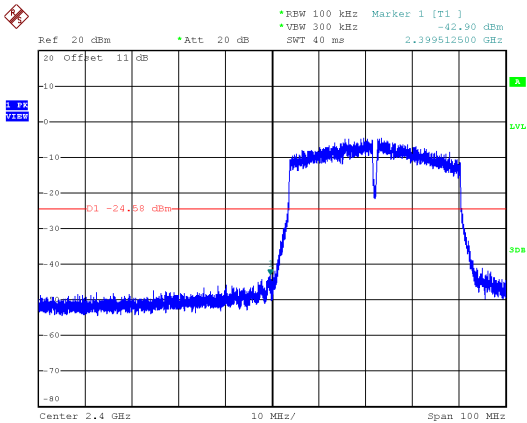
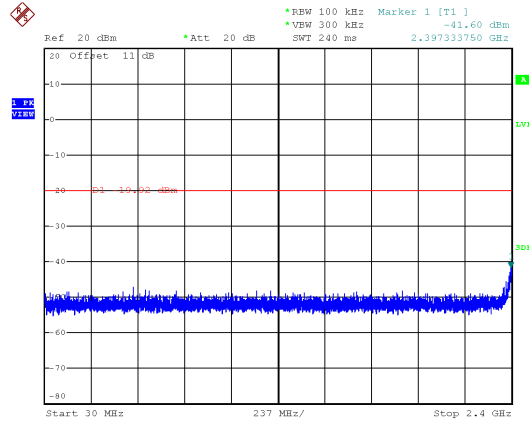
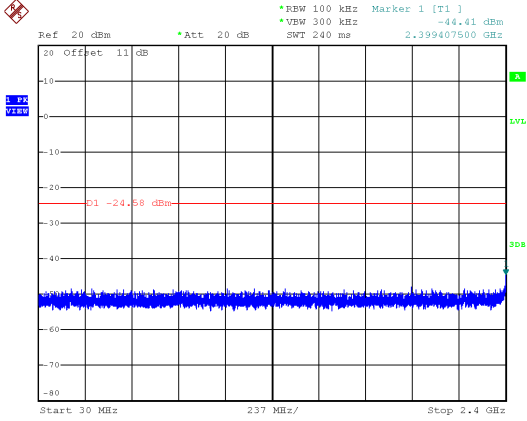
Modulation Type: 802.11n HT20, CH 11





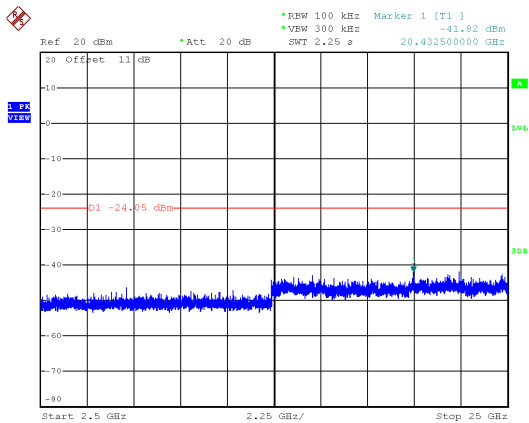
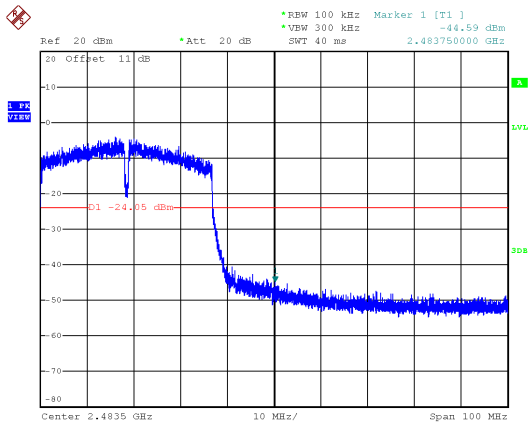
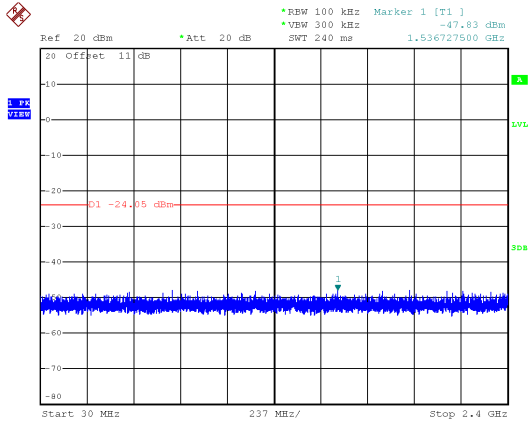
Modulation Type: 802.11n HT40, CH 03

Modulation Type: 802.11n HT40, CH 06





Modulation Type: 802.11n HT40, CH 09





### 8. 6dB Bandwidth Measurement Data

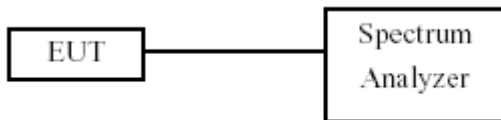
#### 8.1 Test Limit

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 ≥ 3x 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



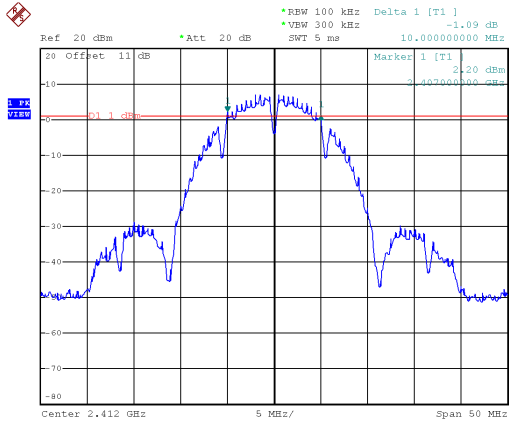
#### 8.4 Test Result and Data

Test Date : Dec. 28, 2016  
 Temperature : 22°C  
 Humidity : 58%

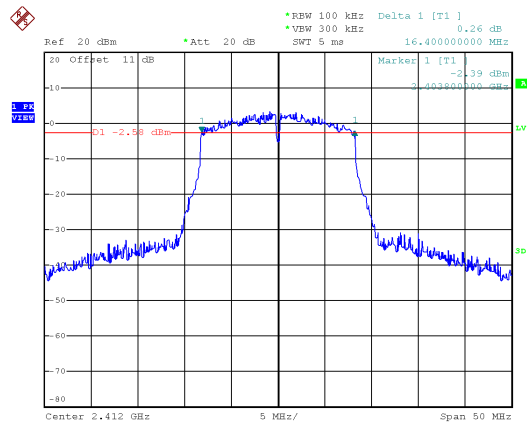
Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limits (MHz)
IEEE 802.11b (1Mbps)	01	2412	10.00	0.5
	06	2437	9.10	0.5
	11	2462	9.10	0.5
IEEE 802.11g (6Mbps)	01	2412	16.40	0.5
	06	2437	16.40	0.5
	11	2462	16.40	0.5
IEEE 802.11n HT20 (6.5Mbps)	01	2412	16.60	0.5
	06	2437	17.60	0.5
	11	2462	17.20	0.5
IEEE 802.11n HT40 (13.5Mbps)	03	2422	34.20	0.5
	06	2437	34.20	0.5
	09	2452	33.80	0.5



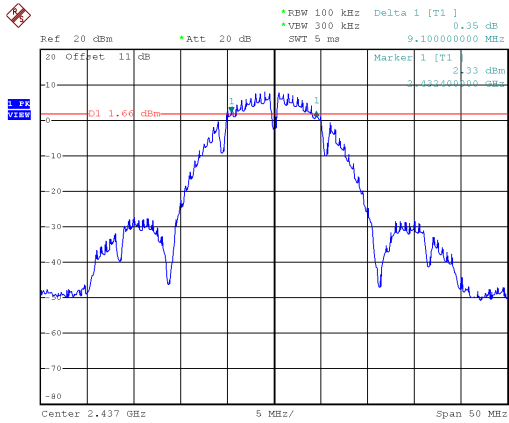
Modulation Type: 802.11b  
CH01



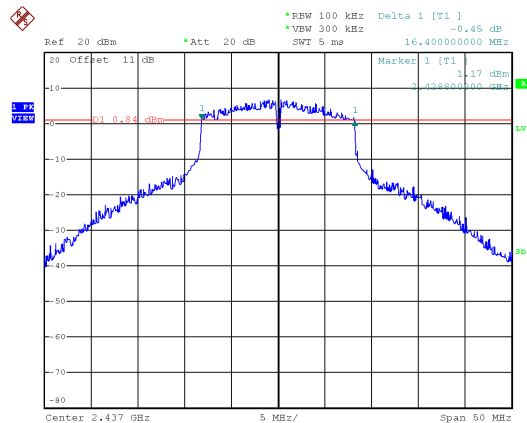
Modulation Type: 802.11g  
CH01



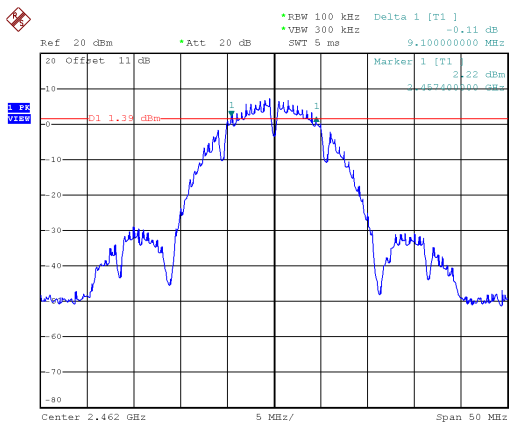
CH06



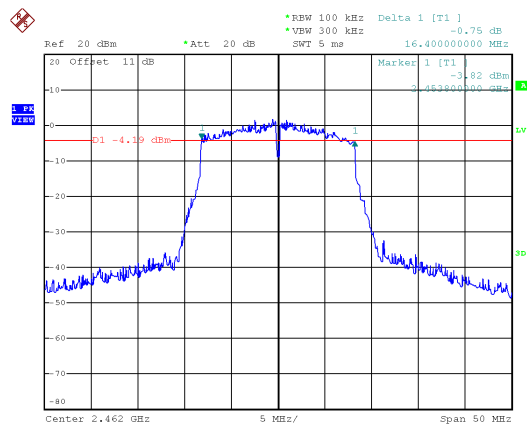
CH06



CH11

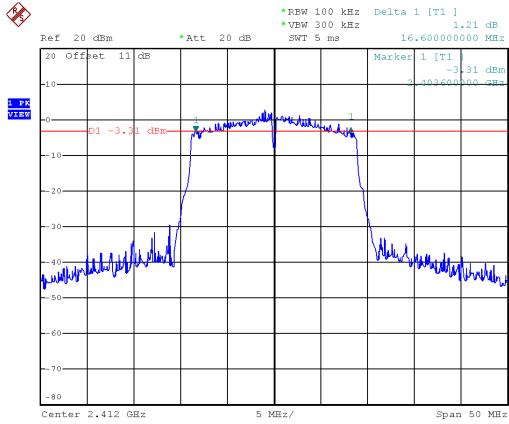


CH11

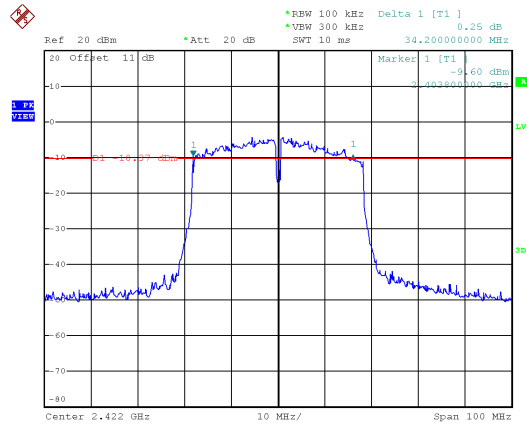




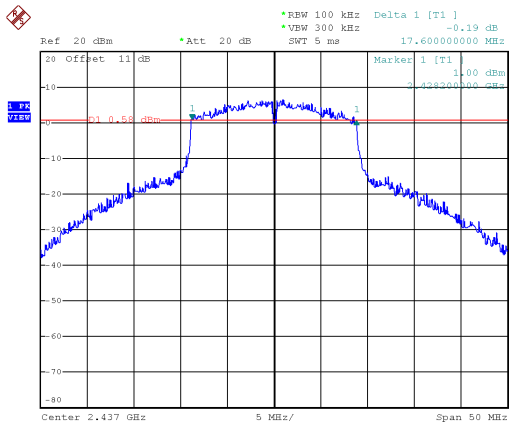
Modulation Type: 802.11n HT20  
CH01



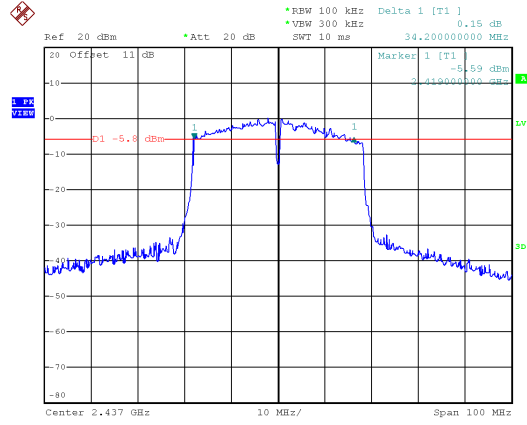
Modulation Type: 802.11n HT40  
CH03



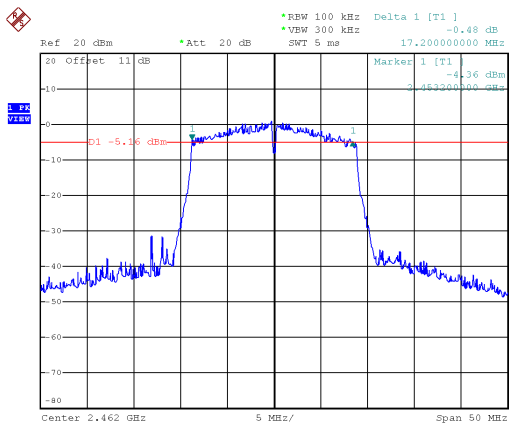
CH06



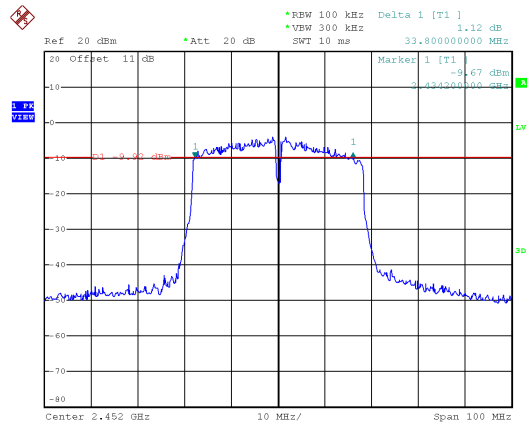
CH06



CH11



CH09





## 9. Maximum Peak and Average Output Power

### 9.1 Test Limit

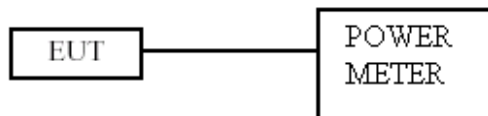
The Maximum Peak Output Power Measurement is 30dBm.

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**

Test Date : Dec. 28, 2016  
 Temperature : 22°C  
 Humidity : 58%

Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)	Power Limit (dBm)
802.11b (1Mbps)	01	2412	14.64	29.107	30.00
	06	2437	17.41	55.081	30.00
	11	2462	16.77	47.534	30.00
802.11g (6Mbps)	01	2412	22.21	166.341	30.00
	06	2437	22.74	187.932	30.00
	11	2462	21.38	137.404	30.00
802.11n HT20 (6.5Mbps)	01	2412	22.04	159.956	30.00
	06	2437	22.91	195.434	30.00
	11	2462	21.24	133.045	30.00
802.11n HT40 (13.5Mbps)	03	2422	18.16	65.464	30.00
	06	2437	22.09	161.808	30.00
	09	2452	18.34	68.234	30.00

Modulation Standard	Channel	Frequency (MHz)	Avg. Power Output (dBm)	Avg. Power Output (mW)	Power Limit (dBm)
802.11b (1Mbps)	01	2412	12.83	19.187	N/A
	06	2437	15.73	37.411	N/A
	11	2462	14.72	29.648	N/A
802.11g (6Mbps)	01	2412	14.01	25.177	N/A
	06	2437	18.35	68.391	N/A
	11	2462	12.29	16.943	N/A
802.11n HT20 (6.5Mbps)	01	2412	12.88	19.409	N/A
	06	2437	18.5	70.795	N/A
	11	2462	11.9	15.488	N/A
802.11n HT40 (13.5Mbps)	03	2422	9.53	8.974	N/A
	06	2437	13.53	22.542	N/A
	09	2452	9.16	8.241	N/A

Note: Average power is for reference only.



## 10. Power Spectral Density

### 10.1 Test Limit

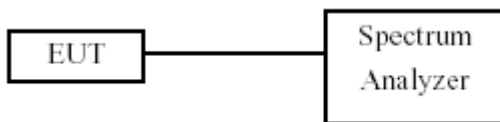
The Maximum of Power Spectral Density Measurement is 8dBm.

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

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

### 10.3 Test Setup Layout



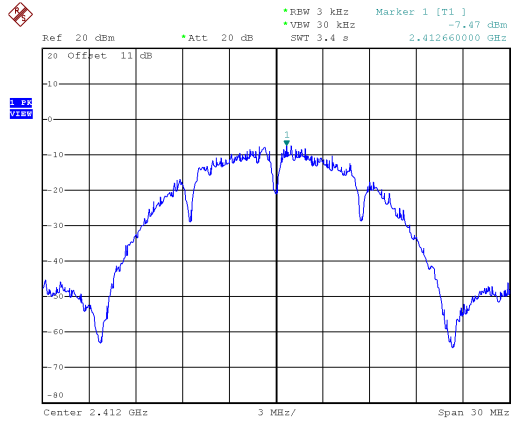
### 10.4 Test Result and Data

Test Date : Dec. 07, 2016  
 Temperature : 23°C  
 Humidity : 64%

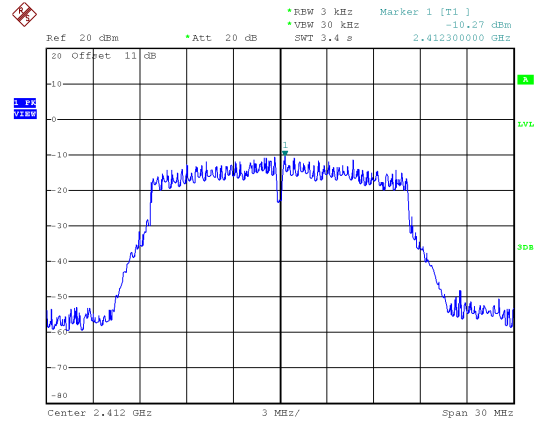
Modulation Type	Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)	Sum chain (dBm)	Duty Cycle CF(dB)	Total PSD (dBm)	Limit (dBm)
IEEE 802.11b (1Mbps)	01	2412	-7.47	-7.47	0.00	-7.47	8.00
	06	2437	-6.93	-6.93	0.00	-6.93	8.00
	11	2462	-7.46	-7.46	0.00	-7.46	8.00
IEEE 802.11g (6Mbps)	01	2412	-10.27	-10.27	0.00	-10.27	8.00
	06	2437	-6.67	-6.67	0.00	-6.67	8.00
	11	2462	-13.53	-13.53	0.00	-13.53	8.00
IEEE 802.11n HT20 (6.5Mbps)	01	2412	-11.99	-11.99	0.00	-11.99	8.00
	06	2437	-7.15	-7.15	0.00	-7.15	8.00
	11	2462	-13.16	-13.16	0.00	-13.16	8.00
IEEE 802.11n HT40 (13.5Mbps)	03	2422	-18.22	-18.22	0.00	-18.22	8.00
	06	2437	-13.7	-13.70	0.00	-13.70	8.00
	09	2452	-17.63	-17.63	0.00	-17.63	8.00



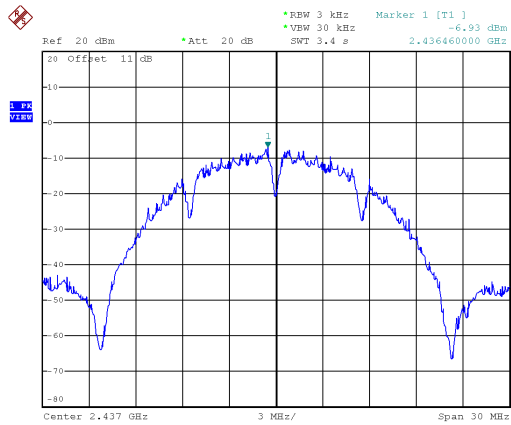
Modulation Type: 802.11b  
CH01



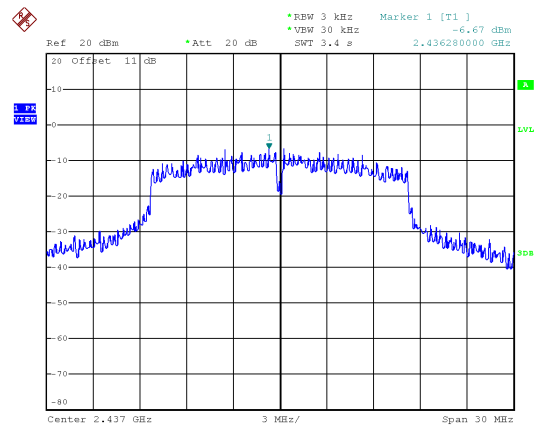
Modulation Type: 802.11g  
CH01



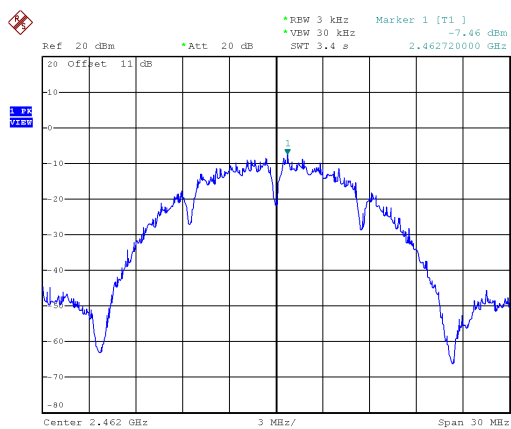
CH06



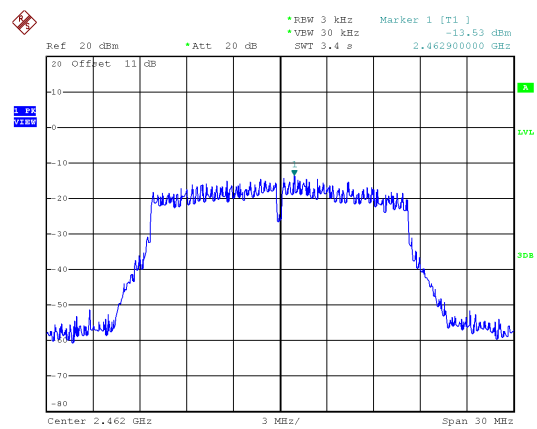
CH06



CH11

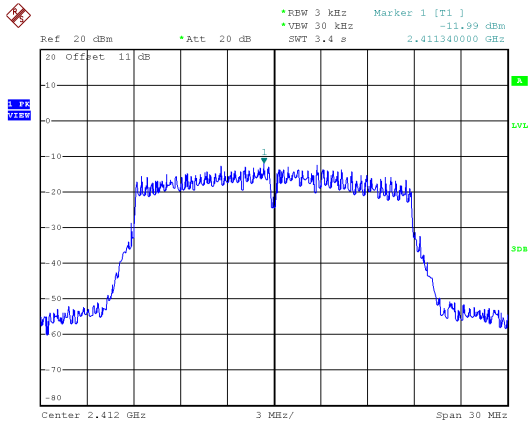


CH11

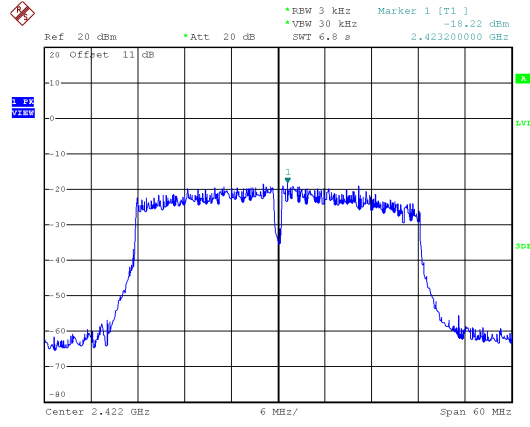




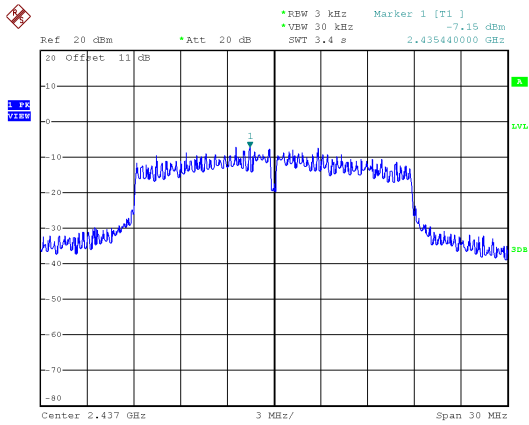
Modulation Type: 802.11n HT20  
CH01



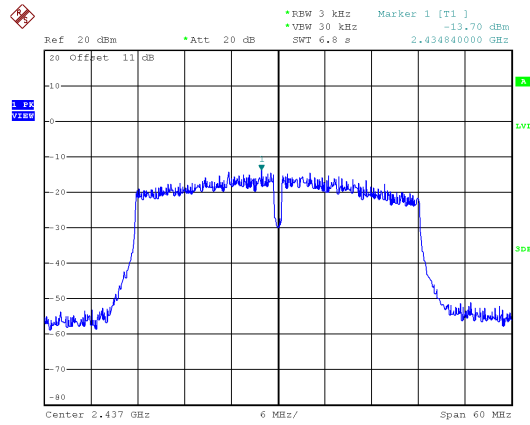
Modulation Type: 802.11n HT40  
CH03



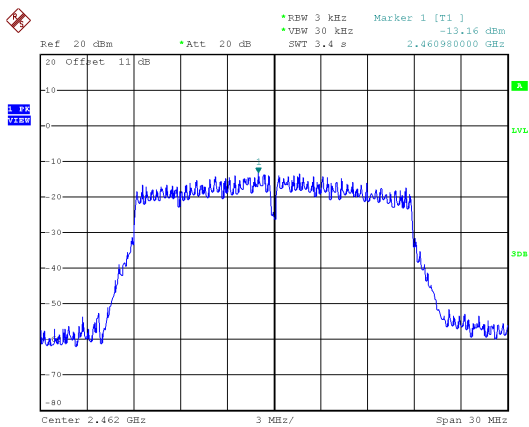
CH06



CH06



CH11



CH09

