FCC RADIO TEST REPORT

Applicant	:	Shenzhen ORVIBO Electronics Co., Ltd.
Address	:	7F, Block A7, Nanshan i Park, No.1001 Xueyuan Road, Nanshan District, Shenzhen
Equipment	:	WiFi Smart Socket
Model No.	:	S25US
Trade Name	:	ORVIBO
FCC ID	:	2ACLPS25US

I HEREBY CERTIFY THAT :

The sample was received on Mar. 09, 2016 and the testing was carried out on Mar. 21, 2016 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Sun Zhang
Technique principal

Laboratory Accreditation:

Cerpass Technology Corporation Test Laboratory

☐

NVLAP LAB Code:	**200954-0**
TAF LAB Code:	**1439**

Cerpass Technology(SuZhou) Co., Ltd.

☒

NVLAP LAB Code:	**200814-0**
CNAS LAB Code:	**L5515**

CONTENTSs

History of this test report

■ ORIGINAL

☐ Additional attachment as following record:

Attachment No.	Issue Date	Description

1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.4: 2014

ANSI C63.10: 2013

KDB 558074 D01 DTS Meas Guidance v03r05

FCC Rules and Regulations Part 15 Subpart C §15.247

FCC Rule	. Description of Test	Result
FCC CFR Title 47 Part 15 Subpart C: Section 15.203/15.247 (b)	. Antenna Requirement	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.207	. AC Power Line Conducted Emission	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.205/15.209; Part2 section 2.1051, 2.1053, 2.1057	. Spurious Emission(Radiated)	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(d); Part2 section 2.1051 and 2.1057	. Spurious Emission(Conducted)	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(a)(2); Part2 section 2.1049	. 6dB Bandwidth	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(b); Part2 section 2.1046	. Maximum Peak Output Power	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(e)	. Power Spectral Density	Pass

2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Equipment	WiFi Smart Socket
Model No.	S25US
Spreading	802.11b: CCK, DQPSK, DBPSK 802.11g: 64 QAM, 16 QAM, QPSK, BPSK 802.11n: BPSK, QPSK,16QAM, 64QAM
Frequency Range	802.11b/g/n(20MHz): 2412-2462MHz
Number of Channels	802.11b/g/n (20MHz):11
Data Rate	802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n(20MHz): 6.5, 13, 19.5, 26, 39, 52, 58.5, 65Mbps
Antenna	PCB Antenna 0dBi

2.2 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n HT 20 (2412MHz~2462MHz)

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

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, Mouse and EUT for the RF test.
c. An executive program, “FixFrequence FCC&CE.exe” which transmits and receives data through Wireless.
d. The EUT had been tested under operating condition

. After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.
EUT staying in continuous transmitting mode was programmed.
IEEE802.11b mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) were chosen for full testing.
IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) were chosen for full testing.
IEEE 802.11n Standard-20 MHz Channel mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) were chosen for full testing.

2.4 Description of Test System

N/A

2.5 General Information of Test

☐	Test Site	**Cerpass Technology Corporation Test Laboratory** Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582
	FCC	TW1079, TW1061,390316, 228391, 641184
	IC	4934B-1, 4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-3428, R-4218 for Radiated emission test G-812, G-813 for radiated disturbance above 1GHz
☒	Test Site	**Cerpass Technology (Suzhou) Co.,Ltd** Address: No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China Tel: +86-512-6917-5888 Fax: +86-512-6917-5666
	FCC	916572, 331395
	IC	7290A-1, 7290A-2
	VCCI	T-343 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test G-227 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.

3. Test Equipment and Ancillaries Used for Tests

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Test Receiver	R&S	ESCI	100564	2016.02.22	2017.02.21
LISN	SCHWARZBECK	NSLK 8127	8127748	2015.10.22	2016.10.21
LISN	SCHWARZBECK	NSLK 8127	8127749	2015.10.22	2016.10.21
Pulse Limiter with 10dB Attenuation	SCHWARZBECK	VTSD 9561-F	9561-F106	2016.02.22	2017.02.21
Temperature/ Humidity Meter	mingle	ETH529	N/A	2016.02.22	2017.02.21
AMPLIFIER	HP	8447F	3113A05915	2016.02.22	2017.02.21
BILOG Antenna	SCHAFFNER	CBL6112D	22241	2016.02.24	2017.02.23
Horn Antenna	Sunol	DRH-118	A072913	2015.09.30	2016.09.29
Temp&Humidity&barometer	mingle	ETH529	N/A	2016.02.19	2017.02.18
Preamplifier	FIeld	AFS44-00101800-25-10P-44	1579008	2015.09.30	2016.09.29
ESG VECTOR SIGNAL GENERATOR	Agilent	E4438C	MY45092582	2015.07.18	2016.07.17
MXG VECTOR SIGNAL GENERATOR	Agilent	N5182B	MY53050127	2015.07.18	2016.07.17
EXA Signal Analyzer	Agilent	N9020A	US46220290	2015.07.18	2016.07.17
Power sensor	e-channel	ERS-180T-24	TW5451026	2015.06.25	2016.06.24

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

No.	Antenna Type	Antenna Gain
1	PCB Antenna	0dBi

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 on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.10-2013. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 6.2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

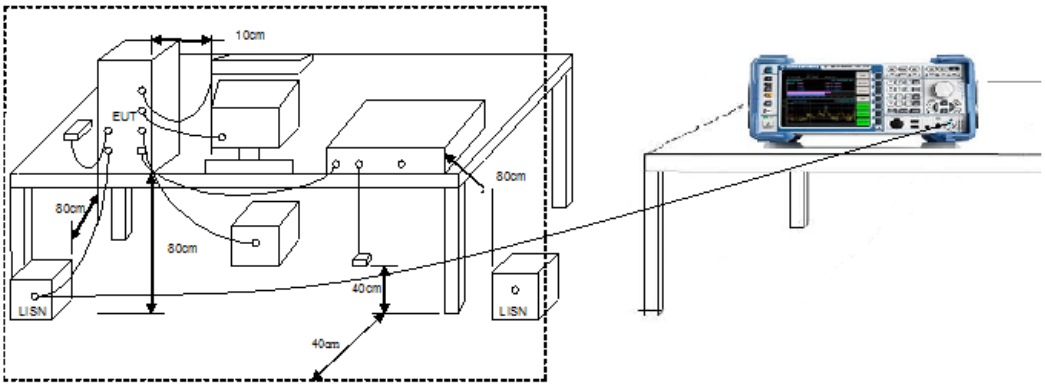
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

5.2 Test Procedures

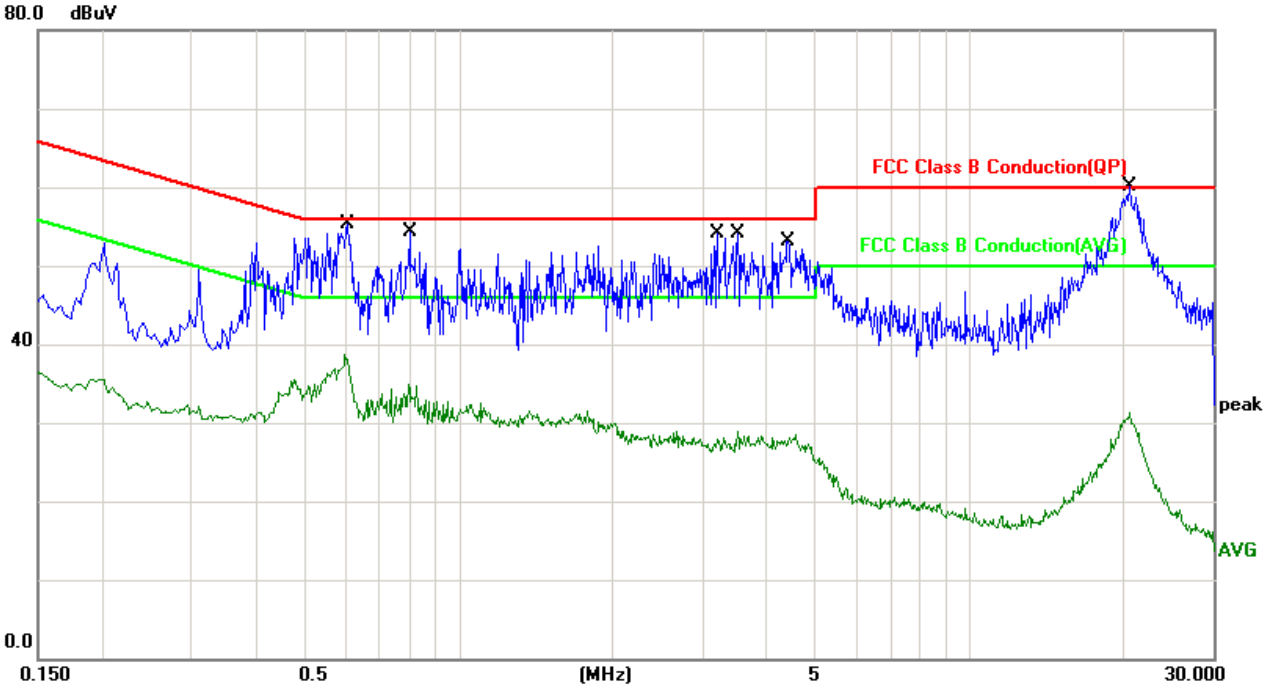
The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of Oct 2014 KDB558074 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

5.3 Typical Test Setup



5.4 Test Result and Data

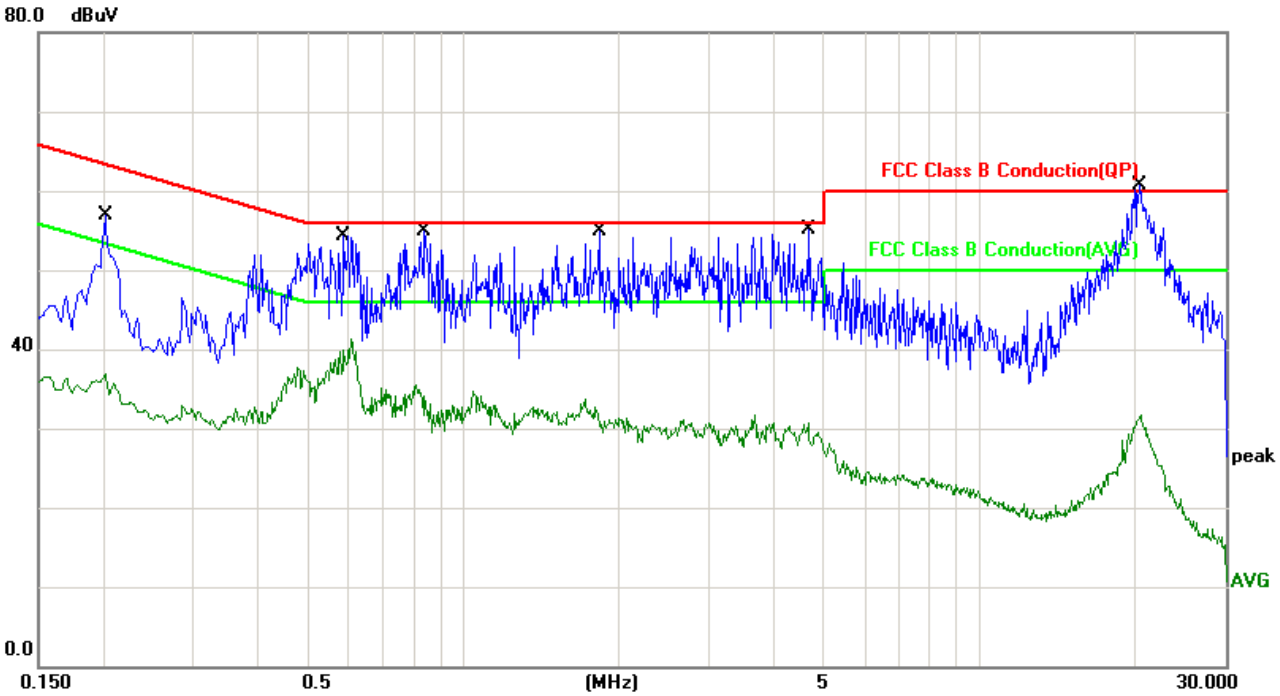
Test Mode :	Normal Link	Phase :	Line
Temperature :	20°C	Humidity:	51%
Pressur(mbar) :	1002	Date:	2016/03/21



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.6060	10.32	34.51	44.83	56.00	-11.17	QP
2	0.6060	10.32	26.01	36.33	46.00	-9.67	AVG
3	0.8020	10.29	32.49	42.78	56.00	-13.22	QP
4	0.8020	10.29	22.33	32.62	46.00	-13.38	AVG
5	3.2139	10.77	26.45	37.22	56.00	-18.78	QP
6	3.2139	10.77	14.70	25.47	46.00	-20.53	AVG
7	3.5140	10.70	27.93	38.63	56.00	-17.37	QP
8	3.5140	10.70	15.15	25.85	46.00	-20.15	AVG
9	4.4260	10.51	28.34	38.85	56.00	-17.15	QP
10	4.4260	10.51	15.00	25.51	46.00	-20.49	AVG
11	20.6820	10.52	35.11	45.63	60.00	-14.37	QP
12	20.6820	10.52	17.53	28.05	50.00	-21.95	AVG

Note: Measurement Level = Reading Level + Correct Factor+ Attenuator

Test Mode :	Normal Link	Phase :	Neutral
Temperature :	20°C	Humidity :	51%
Pressur(mbar) :	1002	Date :	2016/03/21



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2020	10.96	35.33	46.29	63.52	-17.23	QP
2	0.2020	10.96	25.39	36.35	53.52	-17.17	AVG
3	0.5860	10.34	35.92	46.26	56.00	-9.74	QP
4	0.5860	10.34	28.21	38.55	46.00	-7.45	AVG
5	0.8420	10.29	34.60	44.89	56.00	-11.11	QP
6	0.8420	10.29	22.94	33.23	46.00	-12.77	AVG
7	1.8380	10.28	31.39	41.67	56.00	-14.33	QP
8	1.8380	10.28	19.70	29.98	46.00	-16.02	AVG
9	4.6540	10.31	29.78	40.09	56.00	-15.91	QP
10	4.6540	10.31	17.42	27.73	46.00	-18.27	AVG
11	20.4140	10.52	35.39	45.91	60.00	-14.09	QP
12	20.4140	10.52	17.28	27.80	50.00	-22.20	AVG

Note: Measurement Level = Reading Level + Correct Factor+ 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).

FREQUENCIES(MHz)	FIELD STRENGTH (microvolts/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

KDB 558074 D01v03r02 - Section 12.2.3 (quasi-peak measurements)
KDB 558074 D01v03r02 - Section 12.2.4 (peak power measurements)
KDB 558074 D01v03r02 - Section 12.2.5 (average power measurements)

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

RBW as a function of frequency

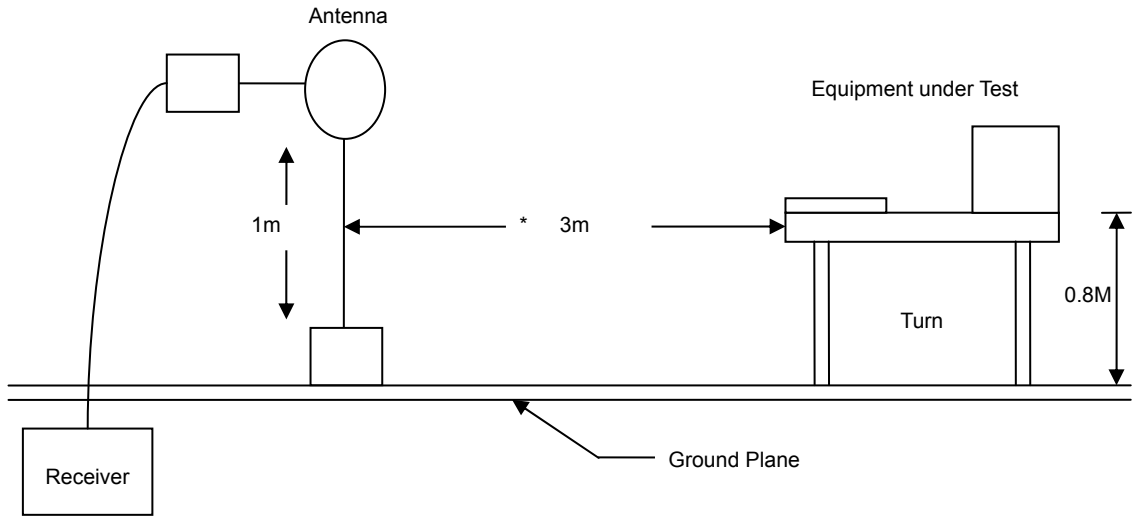
Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

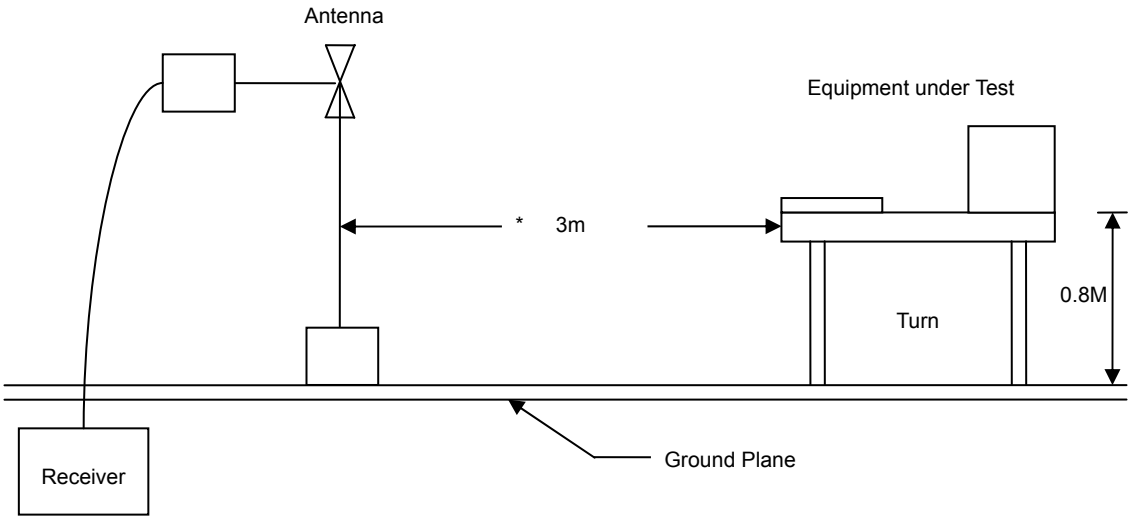
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to “Voltage” regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

6.3 Typical Test Setup

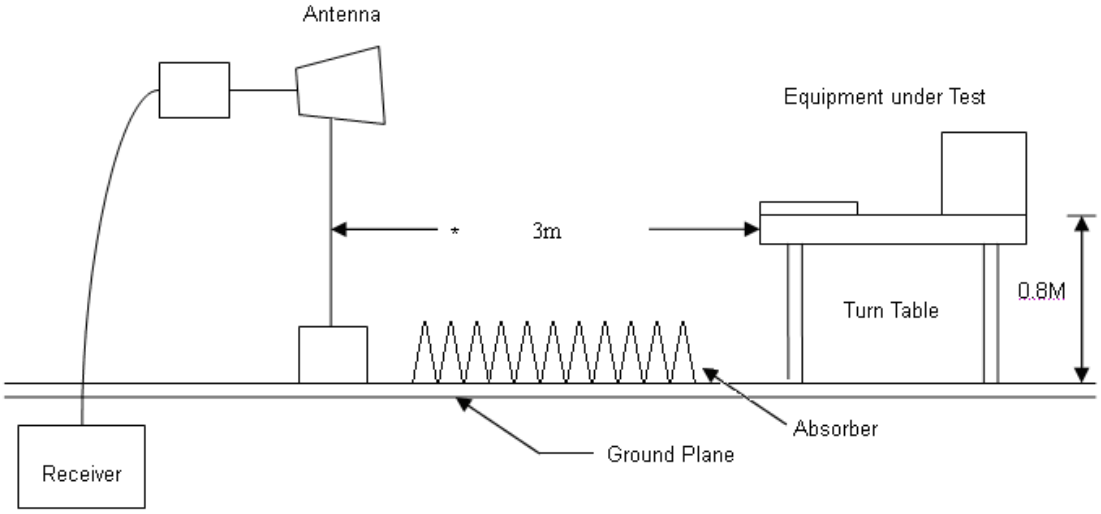
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



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

Power	:	AC 120V	Temperature	:	24 °C
Test Mode	:	Normal Link	Humidity	:	54 %
Test date	:	Mar. 17, 2016	Atmospheric Pressure	:	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
30.0000	H	-3.01	29.76	26.75	40.00	-13.25	QP
90.1400	H	-11.37	30.47	19.10	43.50	-24.40	QP
123.1200	H	-8.27	27.69	19.42	43.50	-24.08	QP
480.0800	H	-1.10	29.55	28.45	46.00	-17.55	QP
640.1300	H	-0.95	29.91	28.96	46.00	-17.04	QP
800.1799	H	0.37	30.22	30.59	46.00	-15.41	QP
33.8800	V	-5.41	34.23	28.82	40.00	-11.18	QP
43.5800	V	-11.77	38.56	26.79	40.00	-13.21	QP
71.7100	V	-14.83	36.27	21.44	40.00	-18.56	QP
480.0800	V	-1.10	29.03	27.93	46.00	-18.07	QP
640.1300	V	-0.95	30.48	29.53	46.00	-16.47	QP
800.1800	V	0.37	28.54	28.91	46.00	-17.09	QP

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

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

Power :	AC 120V	Temperature :	24 °C
Test Mode	802.11b (2412MHz)	Humidity :	54 %
Test date :	Mar. 21, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
1637.500	H	-6.82	46.74	39.92	74.00	-34.08	peak
2020.000	H	-4.64	46.55	41.91	74.00	-32.09	peak
2870.000	H	-0.10	42.43	42.33	74.00	-31.67	peak
4400.000	H	7.15	34.15	41.30	74.00	-32.70	peak
4825.000	H	8.27	42.96	51.23	74.00	-22.77	peak
6865.000	H	11.64	32.47	44.11	74.00	-29.89	peak
1637.500	V	-6.82	53.31	46.49	74.00	-27.51	peak
2020.000	V	-4.64	50.86	46.22	74.00	-27.78	peak
2955.000	V	0.47	40.94	41.41	74.00	-32.59	peak
4187.500	V	6.07	33.91	39.98	74.00	-34.02	peak
4825.000	V	8.27	43.21	51.48	74.00	-22.52	peak
6227.500	V	10.35	31.94	42.29	74.00	-31.71	peak

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

Power :	AC 120V	Temperature :	24 °C
Test Mode	802.11b (2437MHz)	Humidity :	54 %
Test date :	Mar. 21, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
1637.500	H	-6.82	46.87	40.05	74.00	-33.95	peak
2955.000	H	0.47	41.77	42.24	74.00	-31.76	peak
3890.000	H	4.73	34.66	39.39	74.00	-34.61	peak
4910.000	H	8.43	42.12	50.55	74.00	-23.45	peak
6057.500	H	10.28	32.56	42.84	74.00	-31.16	peak
7290.000	H	13.21	32.10	45.31	74.00	-28.69	peak
1595.000	V	-7.06	51.41	44.35	74.00	-29.65	peak
2020.000	V	-4.64	51.48	46.84	74.00	-27.16	peak
2955.000	V	0.47	41.73	42.20	74.00	-31.80	peak
4315.000	V	6.72	33.87	40.59	74.00	-33.41	peak
4910.000	V	8.43	41.27	49.70	74.00	-24.30	peak
6695.000	V	11.09	32.85	43.94	74.00	-30.06	peak

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

Power :	AC 120V	Temperature :	24 °C
Test Mode	802.11b (2462MHz)	Humidity :	54 %
Test date :	Mar. 21, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
1637.500	H	-6.82	48.18	41.36	74.00	-32.64	peak
2020.000	H	-4.64	44.90	40.26	74.00	-33.74	peak
2870.000	H	-0.10	42.68	42.58	74.00	-31.42	peak
4315.000	H	6.72	32.99	39.71	74.00	-34.29	peak
4952.500	H	8.51	43.20	51.71	74.00	-22.29	peak
6355.000	H	10.40	32.54	42.94	74.00	-31.06	peak
1637.500	V	-6.82	52.44	45.62	74.00	-28.38	peak
2020.000	V	-4.64	50.98	46.34	74.00	-27.66	peak
2870.000	V	-0.10	41.73	41.63	74.00	-32.37	peak
4400.000	V	7.15	33.34	40.49	74.00	-33.51	peak
4952.500	V	8.51	42.46	50.97	74.00	-23.03	peak
6270.000	V	10.37	32.60	42.97	74.00	-31.03	peak

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

Power :	AC 120V	Temperature :	24 °C
Test Mode	802.11g (2412MHz)	Humidity :	54 %
Test date :	Mar. 21, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
1637.500	H	-6.82	45.20	38.38	74.00	-35.62	peak
2020.000	H	-4.64	44.08	39.44	74.00	-34.56	peak
2955.000	H	0.47	41.12	41.59	74.00	-32.41	peak
4825.000	H	8.27	39.18	47.45	74.00	-26.55	peak
6057.500	H	10.28	32.54	42.82	74.00	-31.18	peak
6780.000	H	11.37	31.85	43.22	74.00	-30.78	peak
1637.500	V	-6.82	51.00	44.18	74.00	-29.82	peak
2020.000	V	-4.64	51.32	46.68	74.00	-27.32	peak
2445.000	V	-2.82	43.86	41.04	74.00	-32.96	peak
2955.000	V	0.47	41.64	42.11	74.00	-31.89	peak
4867.500	V	8.35	34.82	43.17	74.00	-30.83	peak
5802.500	V	9.77	32.15	41.92	74.00	-32.08	peak

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

Power :	AC 120V	Temperature :	24 °C
Test Mode	802.11g (2437MHz)	Humidity :	54 %
Test date :	Mar. 21, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
1467.500	H	-7.91	46.76	38.85	74.00	-35.15	peak
1595.000	H	-7.06	50.10	43.04	74.00	-30.96	peak
2020.000	H	-4.64	43.37	38.73	74.00	-35.27	peak
2955.000	H	0.47	41.83	42.30	74.00	-31.70	peak
4910.000	H	8.43	38.62	47.05	74.00	-26.95	peak
6057.500	H	10.28	32.60	42.88	74.00	-31.12	peak
1637.500	V	-6.82	51.56	44.74	74.00	-29.26	peak
2020.000	V	-4.64	47.93	43.29	74.00	-30.71	peak
2955.000	V	0.47	41.27	41.74	74.00	-32.26	peak
4612.500	V	7.87	34.34	42.21	74.00	-31.79	peak
4910.000	V	8.43	35.61	44.04	74.00	-29.96	peak
6355.000	V	10.40	32.33	42.73	74.00	-31.27	peak

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

Power :	AC 120V	Temperature :	24 °C
Test Mode	802.11g (2462MHz)	Humidity :	54 %
Test date :	Mar. 21, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
1467.500	H	-7.91	47.36	39.45	74.00	-34.55	peak
2020.000	H	-4.64	45.71	41.07	74.00	-32.93	peak
2870.000	H	-0.10	42.19	42.09	74.00	-31.91	peak
4527.500	H	7.71	33.45	41.16	74.00	-32.84	peak
4952.500	H	8.51	41.29	49.80	74.00	-24.20	peak
6270.000	H	10.37	31.85	42.22	74.00	-31.78	peak
1637.500	V	-6.82	54.76	47.94	74.00	-26.06	peak
2020.000	V	-4.64	53.16	48.52	74.00	-25.48	peak
2955.000	V	0.47	41.74	42.21	74.00	-31.79	peak
4357.500	V	6.93	33.24	40.17	74.00	-33.83	peak
4952.500	V	8.51	35.49	44.00	74.00	-30.00	peak
5887.500	V	9.98	32.23	42.21	74.00	-31.79	peak

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

Power :	AC 120V	Temperature :	24 °C
Test Mode	802.11n HT 20 (2412MHz)	Humidity :	54 %
Test date :	Mar. 21, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
1467.500	H	-7.91	47.06	39.15	74.00	-34.85	peak
1637.500	H	-6.82	48.37	41.55	74.00	-32.45	peak
2020.000	H	-4.64	47.30	42.66	74.00	-31.34	peak
2912.500	H	0.18	41.78	41.96	74.00	-32.04	peak
3677.500	H	4.01	35.94	39.95	74.00	-34.05	peak
4825.000	H	8.27	37.59	45.86	74.00	-28.14	peak
1637.500	V	-6.82	51.04	44.22	74.00	-29.78	peak
1850.000	V	-5.59	49.74	44.15	74.00	-29.85	peak
2020.000	V	-4.64	47.44	42.80	74.00	-31.20	peak
2955.000	V	0.47	41.14	41.61	74.00	-32.39	peak
4867.500	V	8.35	36.77	45.12	74.00	-28.88	peak
5972.500	V	10.19	32.01	42.20	74.00	-31.80	peak

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

Power :	AC 120V	Temperature :	24 °C
Test Mode	802.11n HT 20 (2437MHz)	Humidity :	54 %
Test date :	Mar. 21, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
1722.500	H	-6.33	50.88	44.55	74.00	-29.45	peak
1892.500	H	-5.35	49.54	44.19	74.00	-29.81	peak
4060.000	H	5.42	34.73	40.15	74.00	-33.85	peak
4910.000	H	8.43	37.90	46.33	74.00	-27.67	peak
6185.000	H	10.33	32.62	42.95	74.00	-31.05	peak
7077.500	H	12.38	32.91	45.29	74.00	-28.71	peak
1637.500	V	-6.82	56.93	50.11	74.00	-23.89	peak
2020.000	V	-4.64	50.80	46.16	74.00	-27.84	peak
2870.000	V	-0.10	42.79	42.69	74.00	-31.31	peak
3932.500	V	4.88	34.17	39.05	74.00	-34.95	peak
4910.000	V	8.43	35.07	43.50	74.00	-30.50	peak
6397.500	V	10.42	32.20	42.62	74.00	-31.38	peak

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

Power :	AC 120V	Temperature :	24 °C
Test Mode	802.11n HT 20 (2462MHz)	Humidity :	54 %
Test date :	Mar. 21, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
1637.500	H	-6.82	48.49	41.67	74.00	-32.33	peak
2870.000	H	-0.10	42.14	42.04	74.00	-31.96	peak
4357.500	H	6.93	34.32	41.25	74.00	-32.75	peak
4952.500	H	8.51	39.61	48.12	74.00	-25.88	peak
6227.500	H	10.35	31.78	42.13	74.00	-31.87	peak
6695.000	H	11.09	32.07	43.16	74.00	-30.84	peak
1637.500	V	-6.82	52.63	45.81	74.00	-28.19	peak
1977.500	V	-4.86	46.83	41.97	74.00	-32.03	peak
2955.000	V	0.47	40.97	41.44	74.00	-32.56	peak
4357.500	V	6.93	33.05	39.98	74.00	-34.02	peak
4952.500	V	8.51	35.01	43.52	74.00	-30.48	peak
5930.000	V	10.09	32.50	42.59	74.00	-31.41	peak

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

6.6 Restricted Bands of Operation

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

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

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

6.7 Restrict Band Emission Measurement Data

Test Date: Mar. 21, 2016 Temperature: 26℃

Atmospheric pressure: 1018 hPa Humidity: 47%

Modulation Standard: IEEE 802.11b

Channel 1				Fundamental Frequency: 2412 MHz			
Frequency (MHz)	**Factor (dB/m)**	**Reading (dBuV)**	**Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Det.**	**Ant-Pol H/V**
2390.000	-3.05	53.45	50.40	74.00	-23.60	peak	H
2390.000	-3.05	39.48	36.43	54.00	-17.57	AVG	H
2390.000	-3.05	52.59	49.54	74.00	-24.46	peak	V
2390.000	-3.05	38.22	35.17	54.00	-18.83	AVG	V
Channel 11				Fundamental Frequency: 2462 MHz			
2483.500	-2.65	52.12	49.47	74.00	-24.53	peak	H
2483.500	-2.65	38.26	35.61	54.00	-18.39	AVG	H
2483.500	-2.65	55.92	53.27	74.00	-20.73	peak	V
2483.500	-2.65	41.26	38.61	54.00	-15.39	AVG	V

Modulation Standard: IEEE 802.11g

Channel 1				Fundamental Frequency: 2412 MHz			
Frequency (MHz)	**Factor (dB/m)**	**Reading (dBuV)**	**Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Det.**	**Ant-Pol H/V**
2390.000	-3.05	52.49	49.44	74.00	-24.56	peak	H
2390.000	-3.05	38.03	34.98	54.00	-19.02	AVG	H
2390.000	-3.05	53.84	50.79	74.00	-23.21	peak	V
2390.000	-3.05	38.22	35.17	54.00	-18.83	AVG	V
Channel 11				Fundamental Frequency: 2462 MHz			
2483.500	-2.65	53.51	50.86	74.00	-23.14	peak	H
2483.500	-2.65	38.75	36.10	54.00	-17.90	AVG	H
2483.500	-2.65	56.31	53.66	74.00	-20.34	peak	V
2483.500	-2.65	41.78	39.13	54.00	-14.87	AVG	V

Modulation Standard: IEEE 802.11n HT20

Channel 1				Fundamental Frequency: 2412 MHz			
Frequency (MHz)	**Factor (dB/m)**	**Reading (dBuV)**	**Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Det.**	**Ant-Pol H/V**
2390.000	-3.05	53.04	49.99	74.00	-24.01	peak	H
2390.000	-3.05	38.67	35.62	54.00	-18.38	AVG	H
2390.000	-3.05	53.29	50.24	74.00	-23.76	peak	V
2390.000	-3.05	39.16	36.11	54.00	-17.89	AVG	V
Channel 11				Fundamental Frequency: 2462 MHz			
2483.500	-2.65	54.06	51.41	74.00	-22.59	peak	H
2483.500	-2.65	40.22	37.57	54.00	-16.43	AVG	H
2483.500	-2.65	57.42	54.77	74.00	-19.23	peak	V
2483.500	-2.65	43.67	41.02	54.00	-12.98	AVG	V

Notes:

1. Result = Meter Reading + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3 MHz (detector peak mode) for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3 MHz (detector sample mode) for Average detection at frequency above 1GHz.

7. Test of Spurious Emission (Conducted)

7.1 Test Limit

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

7.2 Test Procedure

KDB 558074 D01v03r02 - Section 11.2 & Section 11.3

1. Reference level measurement

(a) Set instrument center frequency to DTS channel center frequency

(b) Set the span to ≥ 1.5 times the DTS bandwidth

(c) Set the RBW = 100 kHz

(d) Set the VBW ≥ 3 x RBW

(e) Detector = peak

(f) Sweep time = auto couple

(g) Trace mode = max hold

(h) Allow trace to fully stabilize

2. Emission level measurement

(a) Set the center frequency and span to encompass frequency range to be measured

(b) RBW = 100kHz

(c) VBW = 300kHz

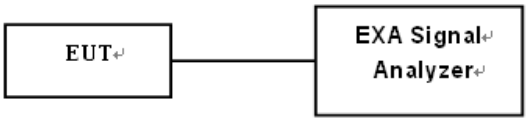
(d) Detector = Peak

(e) Trace mode = max hold

(f) Sweep time = auto couple

(g) The trace was allowed to stabilize

7.3 Test Setup Layout



7.4 Test Result and Data

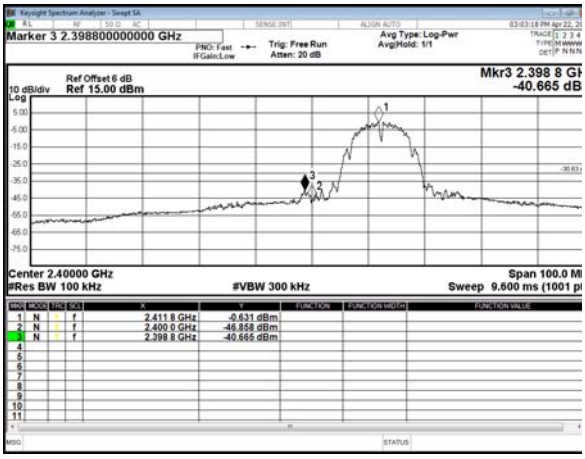
Test Date: Mar. 21, 2016 Temperature: 24℃

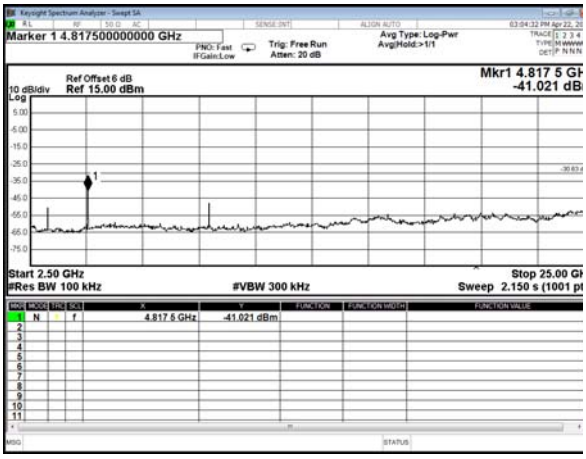
Atmospheric pressure: 1014 hPa Humidity: 47%

Modulation Standard	Channel	Frequency (MHz)	Test Result
802.11b	01	2412	Pass
	11	2462	Pass
802.11g	01	2412	Pass
	11	2462	Pass
802.11n HT20	01	2412	Pass
	11	2462	Pass

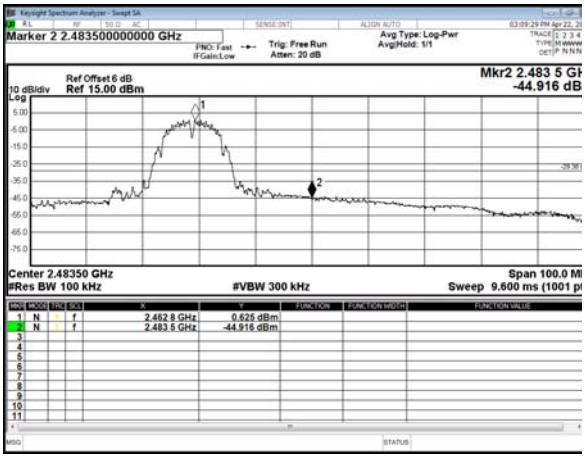
Note: Test plots refer to the following pages.

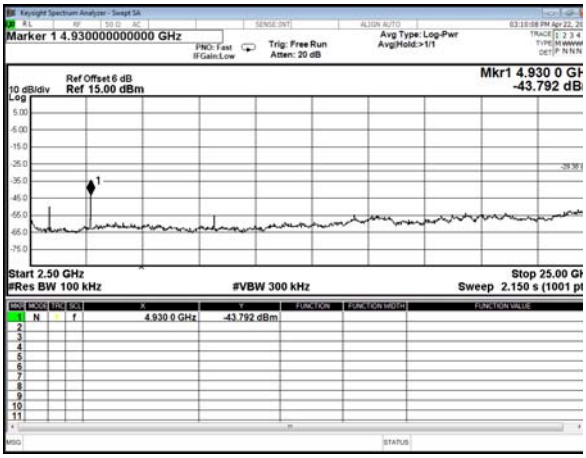
Modulation Type: 802.11b
CH01



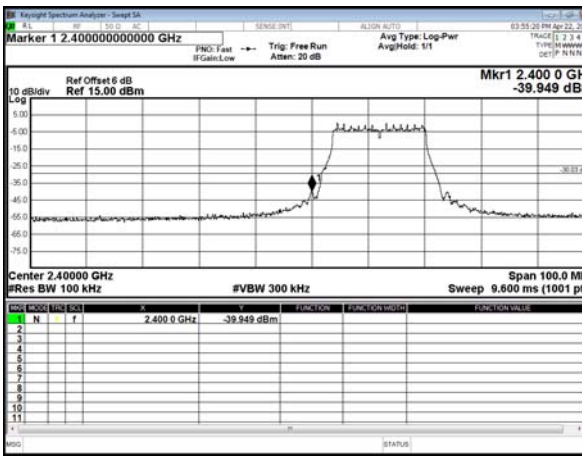


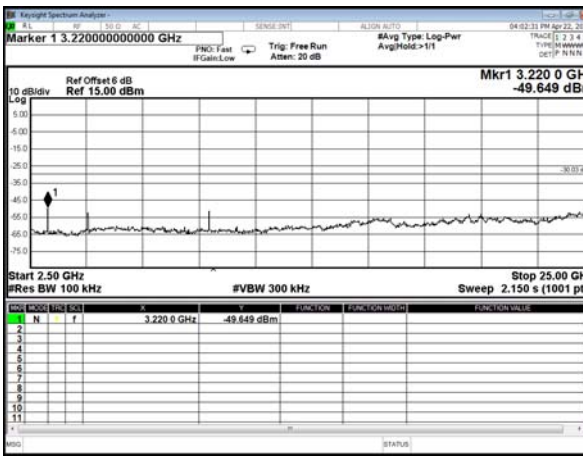
CH11



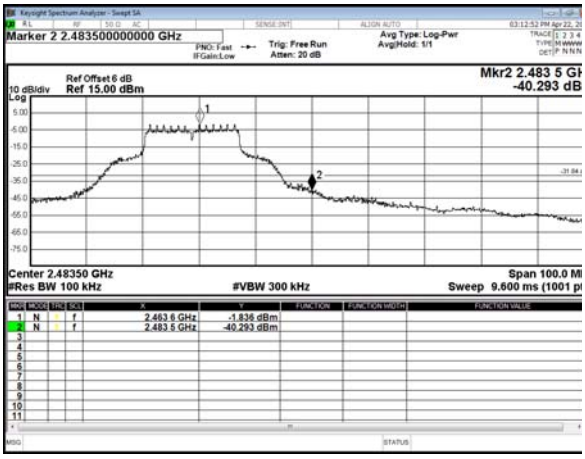


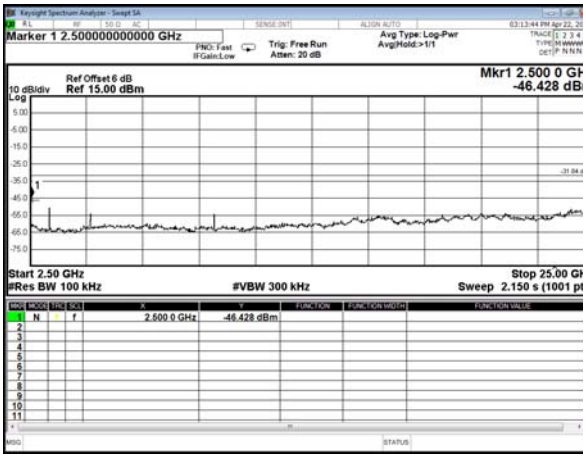
Modulation Type: 802.11g
CH01



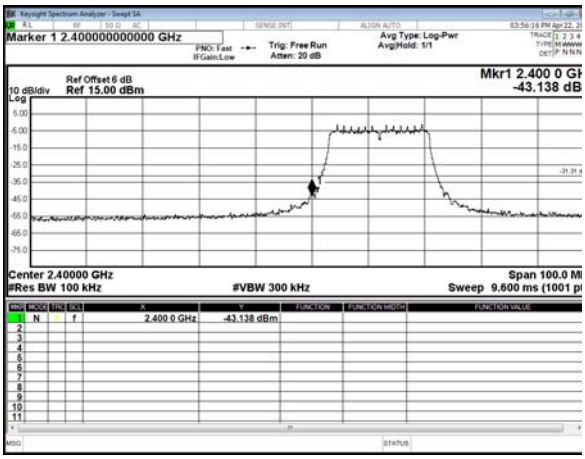


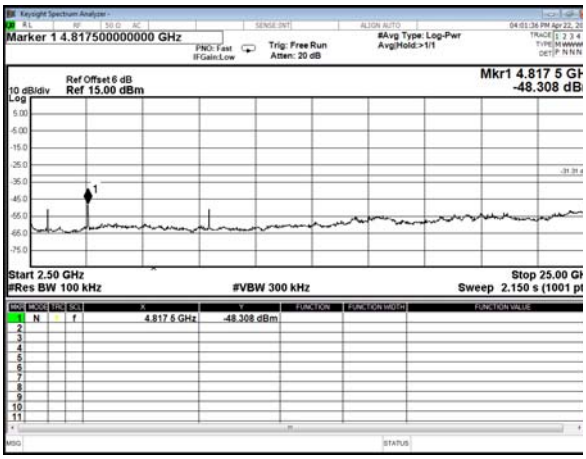
CH11



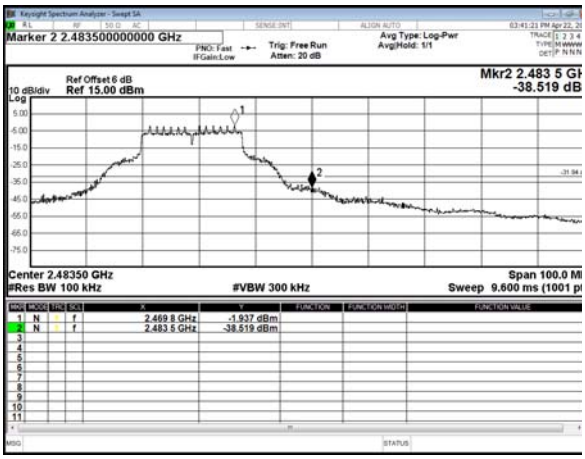


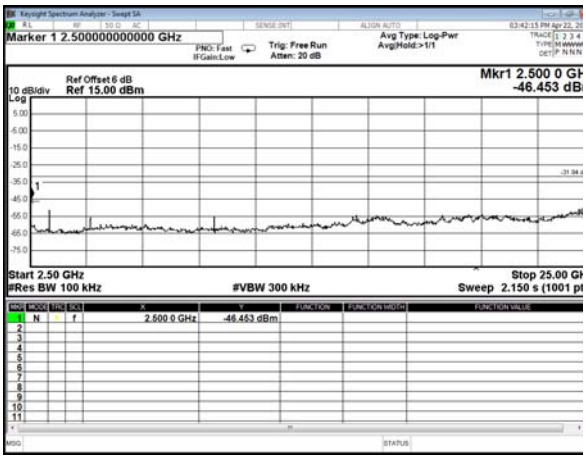
Modulation Type: 802.11n HT20
CH01





CH11





8. 6dB Bandwidth Measurement Data

8.1 Test Limit

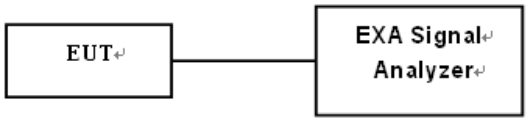
The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

8.2 Test Procedures

Per KDB558074 D01v03r05, section8.2 option2, test procedure

a. The transmitter output was connected to the spectrum analyzer.
b. Set RBW of spectrum analyzer to 100 KHz and VBW to 300 KHz.
c. Set spectrum analyzer X dB to 6 dB.
d. Set spectrum analyzer peak detector with maximum hold.

8.3 Test Setup Layout



8.4 Test Result and Data

Test Date: Mar. 21, 2016 Temperature: 24℃

Atmospheric pressure: 1016 hPa Humidity: 46%

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)
IEEE 802.11b (11Mbps)	01	2412	9.07
	06	2437	9.11
	11	2462	9.12
IEEE 802.11g (54Mbps)	01	2412	16.44
	06	2437	16.42
	11	2462	16.40
IEEE 802.11n HT20 (65Mbps)	01	2412	17.63
	06	2437	17.62
	11	2462	17.63

Modulation Type: IEEE 802.11b

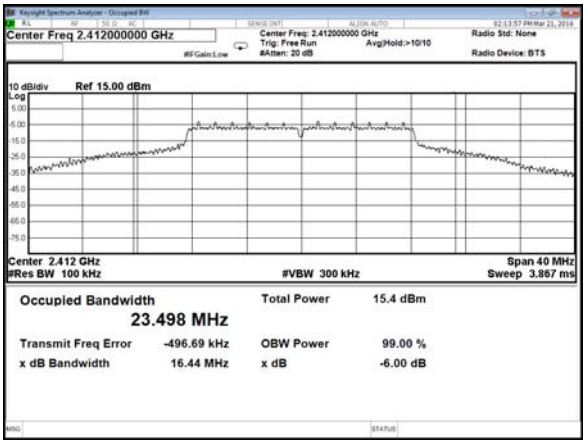
CH 01

CH 06

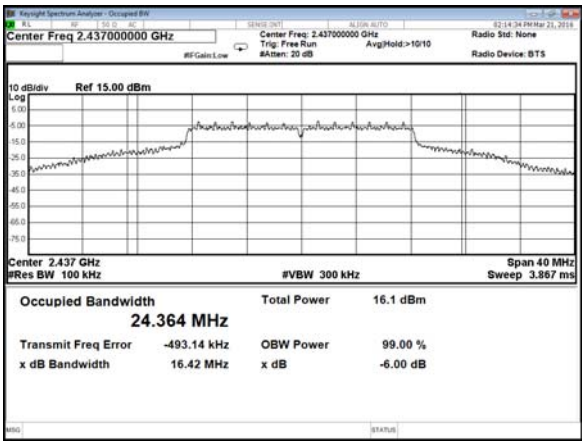
CH 11

Modulation Type: IEEE 802.11g

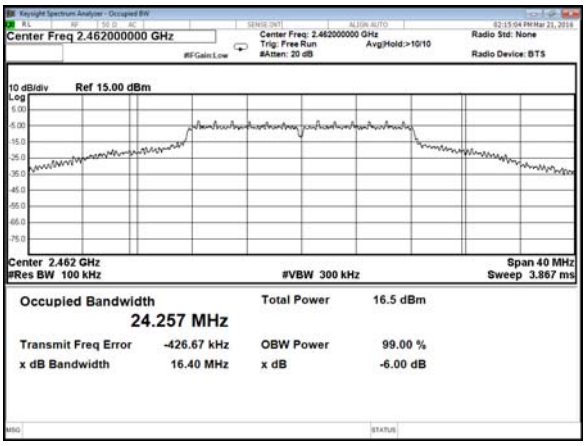
CH 01



CH 06

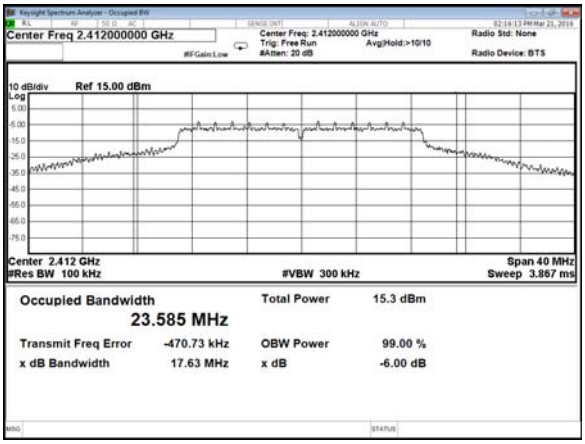


CH 11

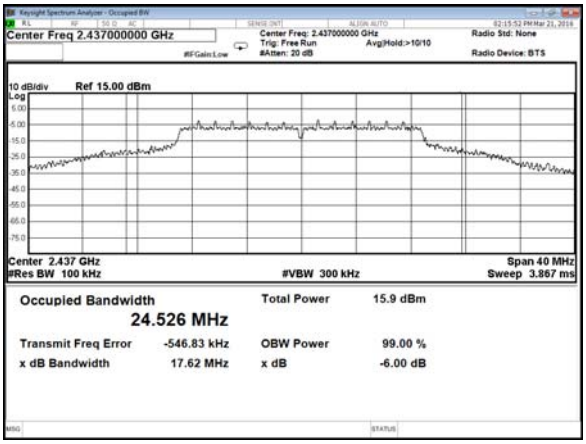


Modulation Type: IEEE 802.11n HT20

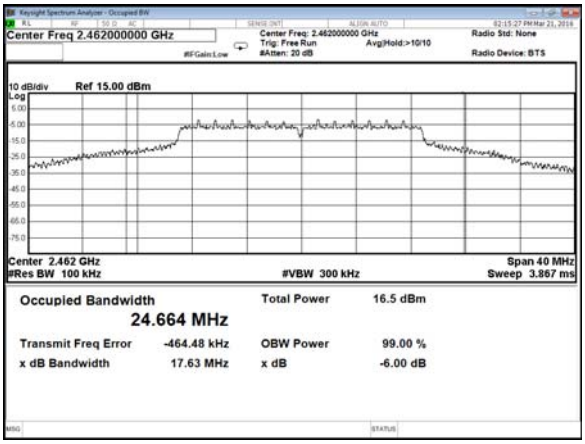
CH 01



CH 06



CH 11



9. Maximum Peak Output Power

9.1 Test Limit

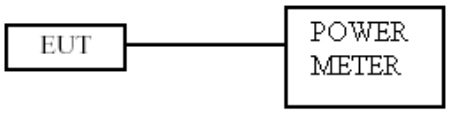
The Maximum Peak Output Power Measurement is 30dBm.

9.2 Test Procedures

Test procedure refers to KDB558074 D01v03r05, section9.1.2 PKPM1 Peak power meter method.

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: Mar. 21, 2016 Temperature: 24℃

Atmospheric pressure: 1016 hPa Humidity: 46%

Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
			Peak	Peak
IEEE 802.11b	01	2412	11.07	12.794
	06	2437	11.55	14.289
	11	2462	14.53	28.379
IEEE 802.11g	01	2412	16.40	43.652
	06	2437	**17.14**	**51.761**
	11	2462	14.53	28.379
IEEE 802.11n HT20	01	2412	16.36	43.251
	06	2437	16.96	49.659
	11	2462	10.75	11.885

10. Power Spectral Density

10.1 Test Limit

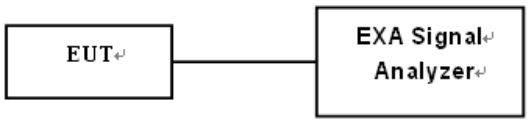
The Maximum of Power Spectral Density Measurement is 8dBm.

10.2 Test Procedures

Test procedure refers to section 10.3 Method AVGPSD-1.

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

10.3 Test Setup Layout



10.4 Test Result and Data

Test Date: Mar. 21, 2016 Temperature: 24℃

Atmospheric pressure: 1014 hPa Humidity: 47%

Modulation Standard	Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)
IEEE 802.11b	01	2412	-15.262
	06	2437	-15.342
	11	2462	-14.695
IEEE 802.11g	01	2412	-19.239
	06	2437	-17.134
	11	2462	-16.470
IEEE 802.11n HT20	01	2412	-19.121
	06	2437	-17.567
	11	2462	-16.496

Modulation Type: IEEE 802.11b

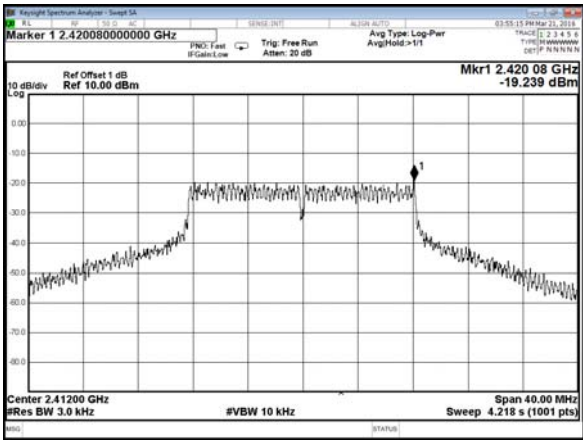
CH 01

CH 06

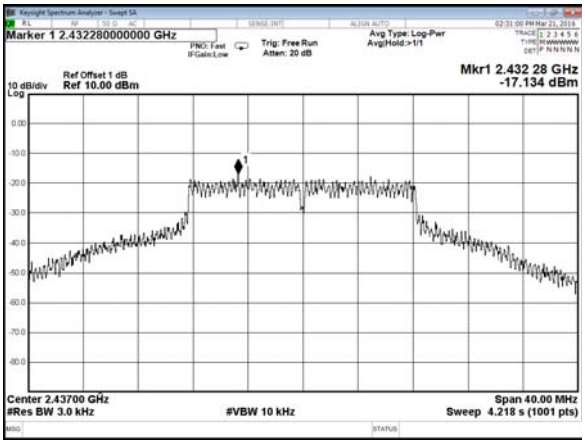
CH 11

Modulation Type: IEEE 802.11g

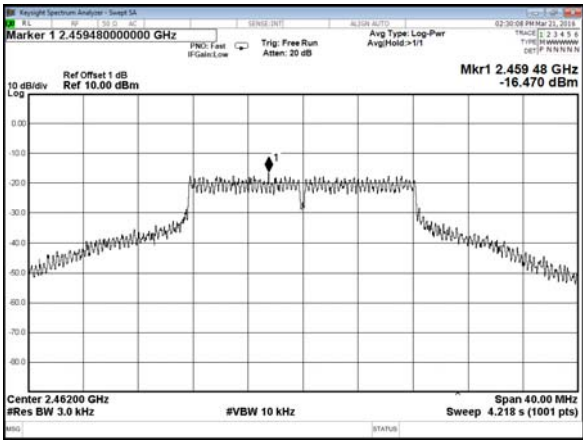
CH 01



CH 06

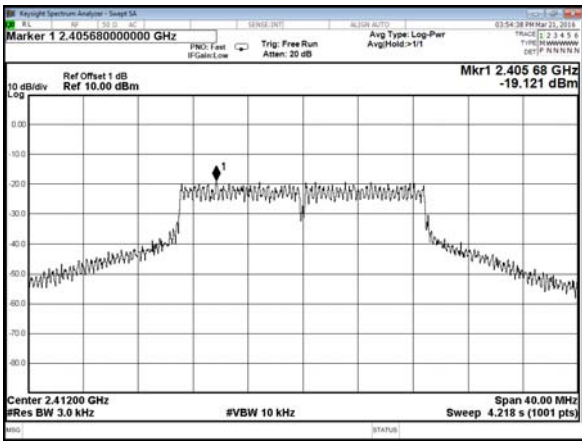


CH 11

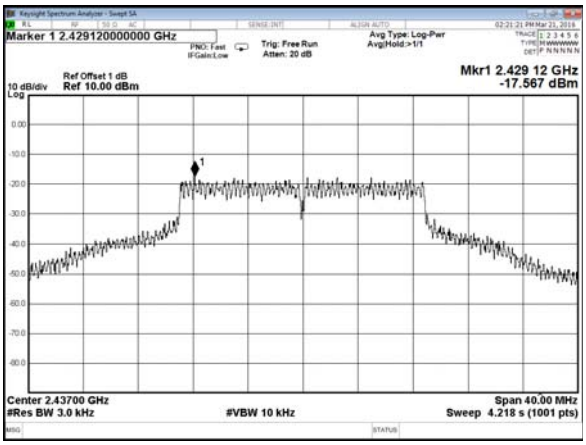


Modulation Type: IEEE 802.11n HT20

CH 01



CH 06



CH 11