



RF TEST REPORT

Applicant Smawave Technology Co. ,Ltd
FCC ID 2AU8HSRP620
Product 5G IP67 Ruggedized Router
Brand smawave
Model SRP620
Report No. R2201A0113-R1
Issue Date March 9, 2022

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2021)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Summary of measurement results

Number	Test Case	Clause in FCC rules	Verdict
1	Maximum output power	15.247(b)(3)	PASS
2	6 dB bandwidth	15.247(a)(2)	PASS
3	Power spectral density	15.247(e)	PASS
4	Band Edge	15.247(d)	PASS
5	Spurious RF Conducted Emissions	15.247(d)	PASS
6	Unwanted Emissions	15.247(d),15.205,15.209	PASS
7	Conducted Emissions	15.207	PASS
Date of Testing: February 8, 2022 ~ March 8, 2022			
Date of Sample Received: January 28, 2022			
Note: All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			



1. Test Laboratory

1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
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E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Smawave Technology Co. ,Ltd
Applicant address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China
Manufacturer	Smawave Technology Co. ,Ltd
Manufacturer address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China

2.2. General information

EUT Description		
Model	SRP620	
IMEI	862165041380377	
Hardware Version	V1.0	
Software Version	SQXR60_V1.0	
Power Supply	External power supply	
Antenna Type	External Antenna	
Antenna Connector	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)	
Antenna Gain	Antenna 1(dBi)	Antenna 2(dBi)
	4.4	3.0
additional beamforming gain	NA	
Operating Frequency Range(s)	802.11b/g/n(HT20): 2412 ~ 2462 MHz 802.11n(HT40): 2422 ~ 2452 MHz	
Modulation Type	802.11b: DSSS 802.11g/n(HT20/HT40): OFDM	
Max. Conducted Power	Wi-Fi 2.4G: 24.25dBm	
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.		

3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR47 Part 15C (2021) Radio Frequency Devices

ANSI C63.10 (2013)

Reference standard:

KDB 558074 D01 15.247 Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

4. Test Configuration

Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the loop antenna is vertical, the others are vertical and horizontal. and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Preliminary tests have been done on all the configuration for confirming worst case. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

Test Mode	Data Rate		
	Antenna 1	Antenna 2	CDD
802.11b	1 Mbps	1 Mbps	1 Mbps
802.11g	6 Mbps	6 Mbps	6 Mbps
802.11n HT20	MCS0	MCS0	MCS8
802.11n HT40	MCS0	MCS0	MCS8

The worst case Antenna mode for each of the following tests for Wi-Fi:

Test Cases	Antenna 1	Antenna 2	CDD
Maximum conducted output power	O	O	O
6dB Bandwidth	O	--	--
Band Edge	O	--	--
Power Spectral Density	O	O	O
Spurious RF Conducted Emissions	O	--	--
Unwanted Emissions	--	--	O
Conducted Emission	--	--	802.11g
Note: "O": test all bands			

After the pre-test, CDD was selected as the worst antenna. SISO Antenna 1 was selected as the worst SISO antenna.

5. Test Case Results

5.1. Maximum output power

Ambient condition

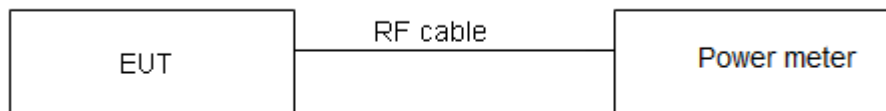
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to Power meter with a known loss. The EUT is max power transmission with proper modulation.

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Test Setup



Limits

Rule Part 15.247 (b) (3) specifies that " For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz: 1 Watt."

Average Output Power	$\leq 1\text{W}$ (30dBm)
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.44$ dB.

Test Results

SISO Antenna Power Index						
Antenna	Channel	802.11b	802.11g	802.11n HT20	Channel	802.11n HT40
Antenna 1&2	CH1	19	21	21	CH3	19
	CH6	24	23	23	CH6	23
	CH11	19	19	17	CH9	15
CDD Antenna Power Index						
Antenna	Channel	802.11b	802.11g	802.11n HT20	Channel	802.11n HT40
Antenna 1&2	CH1	19	21	21	CH3	19
	CH6	24	23	23	CH6	23
	CH11	19	19	17	CH9	15

Test Mode	T _{on} (ms)	T _(on+off) (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11b	1.54	2.12	0.73	1.39
802.11g	1.98	2.08	0.95	0.21
802.11n HT20	5.40	5.65	0.96	0.20
802.11n HT40	11.28	12.36	0.91	0.40
Note: when Duty cycle ≥ 0.98 , Duty cycle correction Factor not required.				

SISO Antenna 1

Test Mode	Carrier frequency (MHz))/ Channel	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11b	2412/CH1	15.36	16.75	30	PASS
	2437/CH6	20.29	21.68	30	PASS
	2462/CH11	16.75	18.14	30	PASS
802.11g	2412/CH1	19.26	19.47	30	PASS
	2437/CH6	20.85	21.06	30	PASS
	2462/CH11	18.36	18.57	30	PASS
802.11n HT20	2412/CH1	18.87	19.07	30	PASS
	2437/CH 6	20.73	20.93	30	PASS
	2462/CH11	16.08	16.28	30	PASS
802.11n HT40	2422/CH3	17.50	17.90	30	PASS
	2437/CH6	21.08	21.48	30	PASS
	2452/CH9	13.68	14.08	30	PASS

Note: Average Power with duty factor = Average Power Measured + Duty cycle correction factor

SISO Antenna 2

Test Mode	Carrier frequency (MHz))/ Channel	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11b	2412/CH1	15.99	17.38	30	PASS
	2437/CH6	20.16	21.55	30	PASS
	2462/CH11	15.19	16.58	30	PASS
802.11g	2412/CH1	19.89	20.10	30	PASS
	2437/CH6	20.63	20.84	30	PASS
	2462/CH11	17.21	17.42	30	PASS
802.11n HT20	2412/CH1	19.54	19.74	30	PASS
	2437/CH6	20.31	20.51	30	PASS
	2462/CH11	14.89	15.09	30	PASS
802.11n HT40	2422/CH3	15.16	15.56	30	PASS
	2437/CH6	20.78	21.18	30	PASS
	2452/CH9	12.55	12.95	30	PASS

Note: Average Power with duty factor = Average Power Measured + Duty cycle correction factor

CDD Antenna

Test Mode	Carrier frequency (MHz) / Channel	CDD Antenna 1		CDD Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11b	2412/CH 1	15.14	16.53	16.04	17.43	20.01	30	PASS
	2437/CH 6	19.95	21.34	19.74	21.13	24.25	30	PASS
	2462/CH11	16.46	17.85	15.52	16.90	20.41	30	PASS
802.11g	2412/CH 1	19.43	19.64	19.84	20.05	22.86	30	PASS
	2437/CH 6	20.87	21.08	20.48	20.69	23.90	30	PASS
	2462/CH11	18.46	18.68	17.13	17.34	21.07	30	PASS
802.11n HT20	2412/CH 1	19.23	19.42	19.32	19.52	22.48	30	PASS
	2437/CH 6	20.60	20.80	20.18	20.38	23.60	30	PASS
	2462/CH11	15.93	16.13	14.85	15.05	18.63	30	PASS
802.11n HT40	2422/CH3	17.61	18.01	17.75	18.15	21.09	30	PASS
	2437/CH6	21.11	21.51	20.54	20.94	24.24	30	PASS
	2452/CH9	13.69	14.09	12.65	13.04	16.61	30	PASS

Note: 1.Average Power with duty factor = Average Power Measured +Duty cycle correction factor

2. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$.

3. The manufacturer declared the transmitter output signals is CDD mode And $N_{ss}=1$. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT \text{ MAX}} + \text{Array Gain}$,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{ss})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So directional gain = $G_{ANT} + \text{Array Gain} = 4.4+0=4.4\text{dBi}<6\text{dBi}$. So the power limit is 30dBm

5.2. 99% Bandwidth and 6dB Bandwidth

Ambient condition

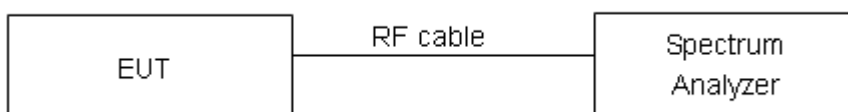
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 100 kHz; VBW is set to 300 kHz on spectrum analyzer.
Dector=Peak, Trace mode=max hold.

The EUT was connected to the spectrum analyzer through a known loss cable. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value.

Test Setup



Limits

Rule Part 15.247 (a) (2) specifies that “Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.”

minimum 6 dB bandwidth	≥ 500 kHz
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 936$ Hz.

**Test Results:**

Test Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11b	2412	12.95	7.59	500	PASS
	2437	12.98	7.57	500	PASS
	2462	12.87	8.04	500	PASS
802.11g	2412	16.37	16.28	500	PASS
	2437	16.37	16.06	500	PASS
	2462	16.38	16.24	500	PASS
802.11n HT20	2412	17.60	16.91	500	PASS
	2437	17.60	17.55	500	PASS
	2462	17.60	16.65	500	PASS
802.11n HT40	2422	36.07	35.29	500	PASS
	2437	36.08	36.40	500	PASS
	2452	36.09	36.31	500	PASS



99%bandwidth

802.11b, Carrier frequency (MHz): 2412



802.11g, Carrier frequency (MHz): 2412



802.11b, Carrier frequency (MHz): 2437



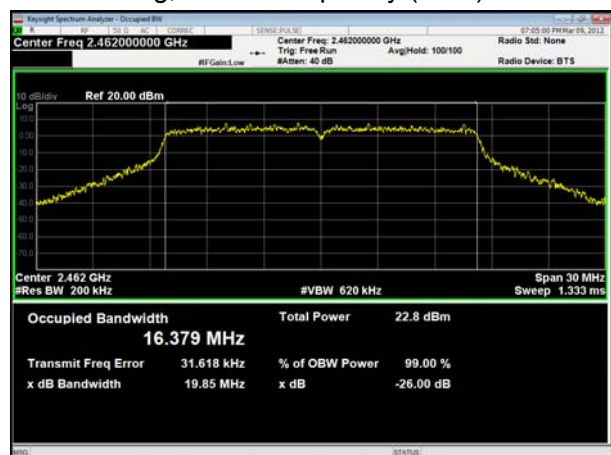
802.11g, Carrier frequency (MHz): 2437



802.11b, Carrier frequency (MHz): 2462



802.11g, Carrier frequency (MHz): 2462



802.11n(HT20), Carrier frequency (MHz): 2412



802.11n(HT40), Carrier frequency (MHz): 2422



802.11n(HT20), Carrier frequency (MHz): 2437



802.11n(HT40), Carrier frequency (MHz): 2437



802.11n(HT20), Carrier frequency (MHz): 2462



802.11n(HT40), Carrier frequency (MHz): 2452





6 dB bandwidth

802.11b, Carrier frequency (MHz): 2412



802.11g, Carrier frequency (MHz): 2412



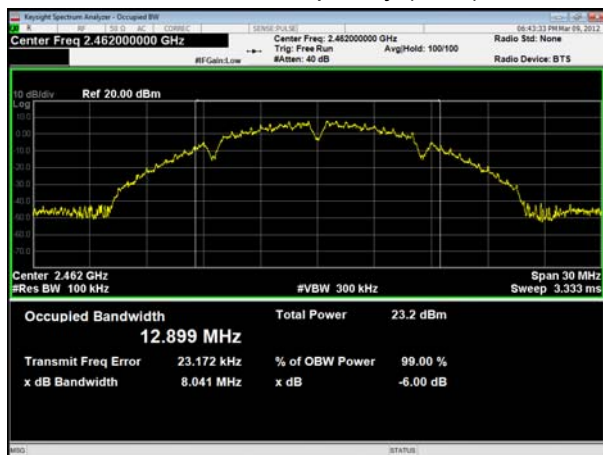
802.11b, Carrier frequency (MHz): 2437



802.11g, Carrier frequency (MHz): 2437



802.11b, Carrier frequency (MHz): 2462



802.11g, Carrier frequency (MHz): 2462



802.11n(HT20), Carrier frequency (MHz): 2412



802.11n(HT40), Carrier frequency (MHz): 2422



802.11n(HT20), Carrier frequency (MHz): 2437



802.11n(HT40), Carrier frequency (MHz): 2437



802.11n(HT20), Carrier frequency (MHz): 2462



802.11n(HT40), Carrier frequency (MHz): 2452



5.3. Band Edge

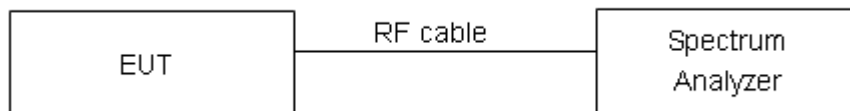
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable the band edge of the lowest and highest channels were measured. The peak detector is used and RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 15.247(d) specifies that “In any 100 kHz 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.” If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.”

Measurement Uncertainty

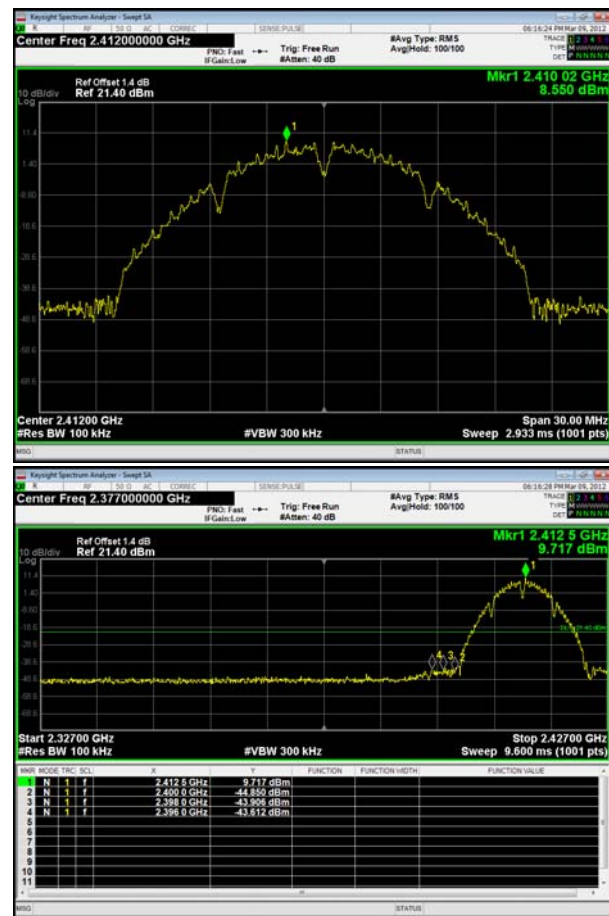
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
2GHz-3GHz	1.407 dB



Test Results: PASS

802.11b, Channel No.: 1

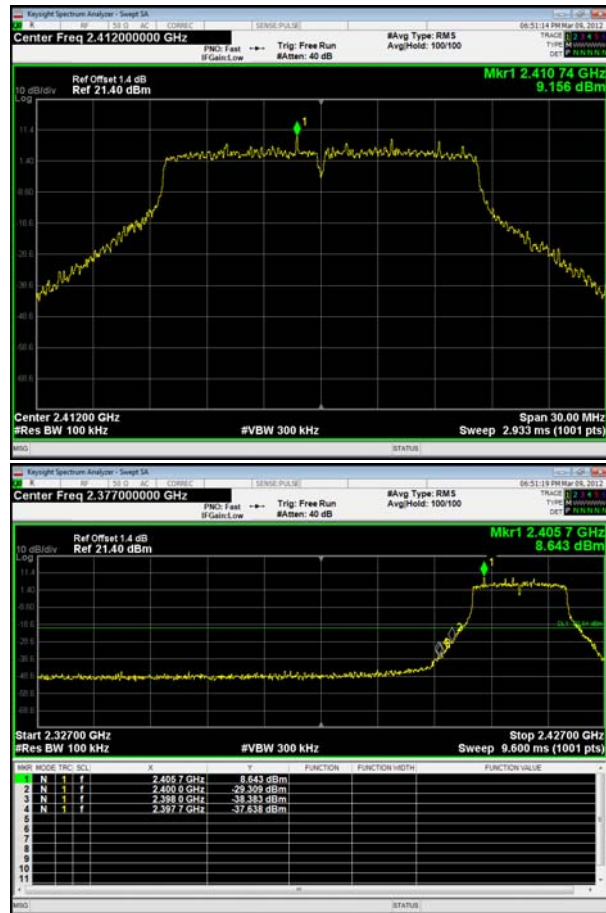


802.11b, Channel No.: 11





802.11g, Channel No.: 1



802.11g, Channel No.: 11





802.11n(HT20), Channel No. 1

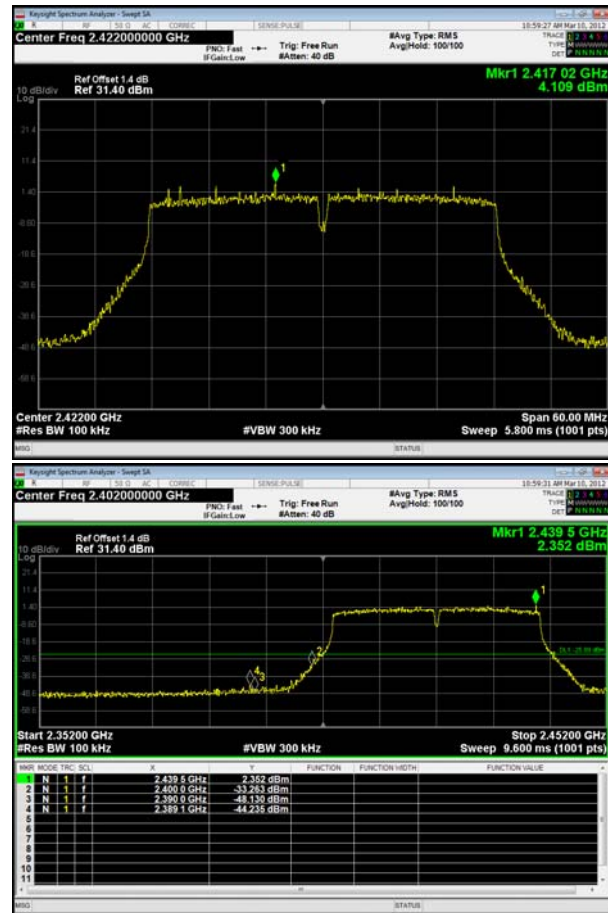


802.11n(HT20), Channel No. 11





802.11n(HT40), Channel No. 3



802.11n(HT40), Channel No. 9



5.4. Power Spectral Density

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

During the process of the testing, The EUT was connected to Spectrum Analyzer with a known loss.

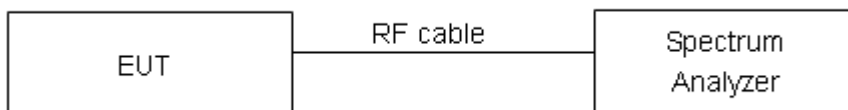
The EUT is max power transmission with proper modulation.

Method AVGPS-2 was used for this test.

- Measure the duty cycle (D) of the transmitter output signal as described in 11.6
- Set instrument center frequency to DTS channel center frequency
- Set span to at least 1.5 times the OBW
- Set RBW to: $3\text{kHz} \leq \text{RBW} \leq 100\text{Kh}$
- Set VBW $\geq [3 \times \text{RBW}]$
- Detector= power averaging (rms) or sample detector (when rms not available)
- Ensure that the number of measurement points in the sweep $2[2 \times \text{span}/\text{RBW}]$
- Sweep time =auto couple
- Do not use sweep triggering; allow sweep to "free run"
- Employ trace averaging (rms) mode over a minimum of 100 traces
- Use the peak marker function to determine the maximum amplitude level
- Add $[10 \log(1/ D)]$, where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time
- If measured value exceeds requirement specified by regulatory agency then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced)

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Test setup



Limits

Rule Part 15.247(e) specifies that" For digitally modulated systems, the power spectral density



conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. ”

Limits	$\leq 8 \text{ dBm} / 3\text{kHz}$
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.75\text{dB}$.

**Test Results:****SISO Antenna 1**

Test Mode	Channel Number	Read Value (dBm / 30kHz)	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
802.11b	1	-4.43	-13.04	8	PASS
	6	-0.65	-9.26	8	PASS
	11	-3.93	-12.54	8	PASS
802.11g	1	-4.60	-14.39	8	PASS
	6	-3.38	-13.16	8	PASS
	11	-6.14	-15.93	8	PASS
802.11n HT20	1	-5.44	-15.25	8	PASS
	6	-3.59	-13.39	8	PASS
	11	-8.71	-18.51	8	PASS
802.11n HT40	3	-9.89	-19.49	8	PASS
	6	-6.53	-16.13	8	PASS
	9	-14.29	-23.90	8	PASS

Note: Power Spectral Density = Read Value+Duty cycle correction factor+10*LOG10(3/30)

SISO Antenna 2

Test Mode	Channel Number	Read Value (dBm / 30kHz)	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
802.11b	1	-4.47	-13.08	8	PASS
	6	-1.25	-9.86	8	PASS
	11	-5.15	-13.76	8	PASS
802.11g	1	-4.60	-14.38	8	PASS
	6	-4.00	-13.79	8	PASS
	11	-7.51	-17.30	8	PASS
802.11n HT20	1	-5.38	-15.18	8	PASS
	6	-4.72	-14.52	8	PASS
	11	-10.10	-19.90	8	PASS
802.11n HT40	3	-13.12	-22.73	8	PASS
	6	-7.23	-16.84	8	PASS
	9	-15.46	-25.06	8	PASS

Note: Power Spectral Density =Read Value+Duty cycle correction factor+10*LOG10(3/30)

CDD Antenna

Test Mode	Channel Number	Power Spectral Density				Total PSD	Limit (dBm / 3kHz)	Conclusion
		Antenna 1		Antenna 2				
		Read Value (dBm / 30kHz)	Power Spectral Density (dBm / 3kHz)	Read Value (dBm / 30kHz)	Power Spectral Density (dBm / 3kHz)	(dBm / 3kHz)		
802.11b	1	-4.96	-13.57	-3.88	-12.49	-9.99	6.59	PASS
	6	-0.67	-9.28	-1.16	-9.77	-6.51	6.59	PASS
	11	-4.12	-12.73	-4.96	-13.57	-10.12	6.59	PASS
802.11g	1	-4.88	-14.67	-4.47	-14.26	-11.45	6.59	PASS
	6	-3.27	-13.06	-3.84	-13.63	-10.32	6.59	PASS
	11	-5.96	-15.75	-7.07	-16.86	-13.26	6.59	PASS
802.11n HT20	1	-5.28	-15.08	-4.77	-14.57	-11.81	6.59	PASS
	6	-3.79	-13.59	-4.51	-14.31	-10.93	6.59	PASS
	11	-8.34	-18.14	-9.61	-19.41	-15.72	6.59	PASS
802.11n HT40	3	-9.79	-19.39	-12.48	-22.08	-17.52	6.59	PASS
	6	-6.32	-15.92	-6.70	-16.30	-13.10	6.59	PASS
	9	-13.84	-23.44	-14.82	-24.42	-20.90	6.59	PASS

Note: 1.Power Spectral Density = Read Value+Duty cycle correction factor+10*LOG10(3/30)

2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),the power spectral density= $10\log(10^{(\text{PSD antenna1 in dBm}/10)} + 10^{(\text{PSD antenna2 in dBm}/10)})$

3. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = G_{ANT} + Array Gain. For PSD measurements on all devices, Array

Gain= $10\log(N_{\text{ant}}/N_{\text{ss}})$ dB, so directional gain= G_{ANT} +Array Gain= $4.4+10\log(2/1)=7.41>6\text{dBi}$.

So the PSD limit is $8+6-\text{MAX}(6, B7)$ dBm=6.59dBm



SISO Antenna 1

802.11b, Channel No.: 1



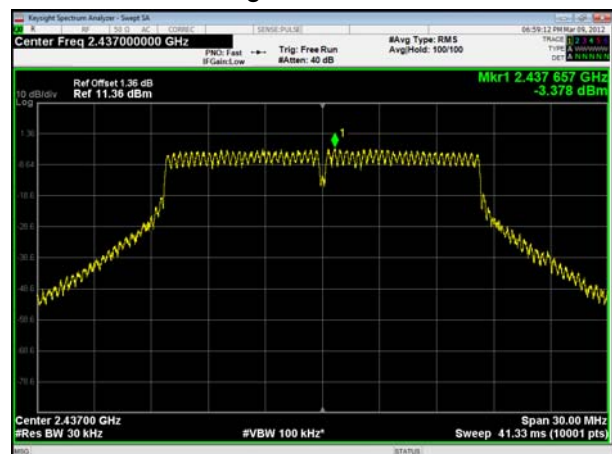
802.11g, Channel No.: 1



802.11b, Channel No.: 6



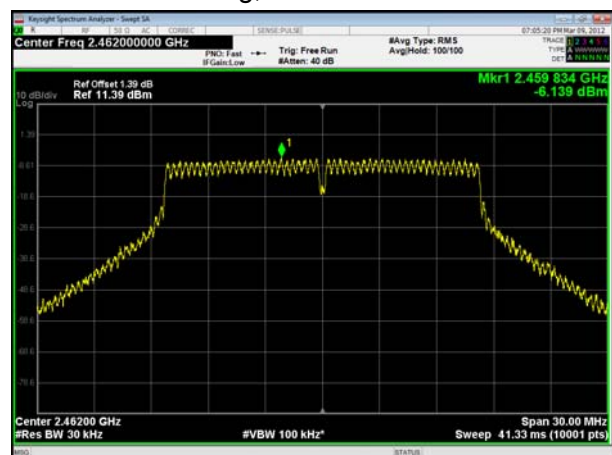
802.11g, Channel No.: 6



802.11b, Channel No.: 11



802.11g, Channel No.: 11





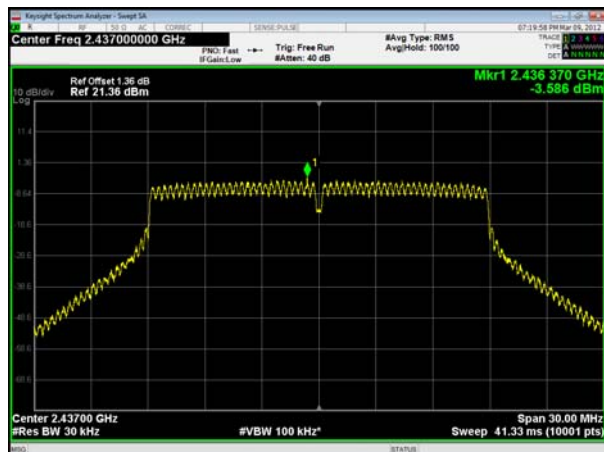
802.11n(HT20), Channel No. 1



802.11n(HT40), Channel No. 3



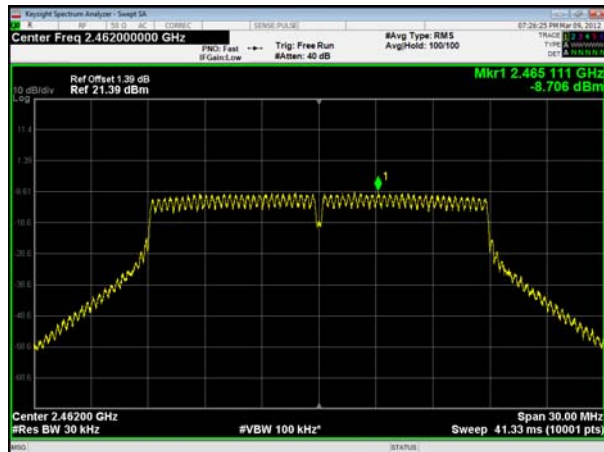
802.11n(HT20), Channel No. 6



802.11n(HT40), Channel No. 6



802.11n(HT20), Channel No. 11



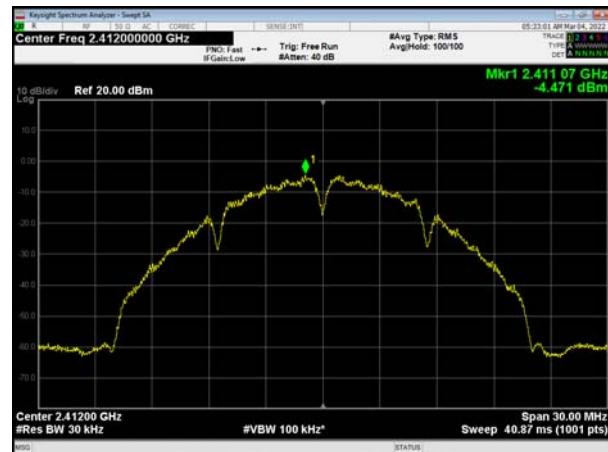
802.11n(HT40), Channel No. 9



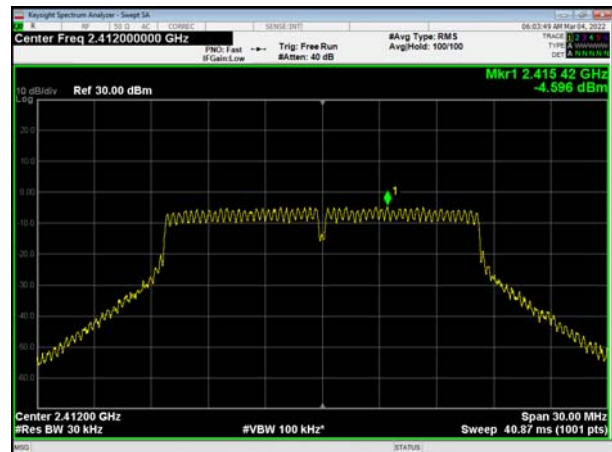


SISO Antenna 2

802.11b, Channel No.: 1



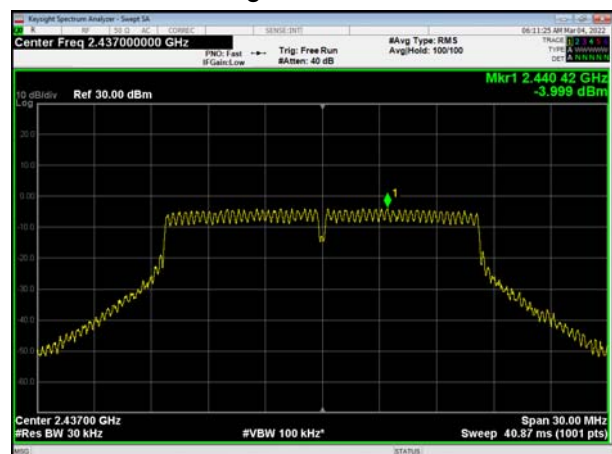
802.11g, Channel No.: 1



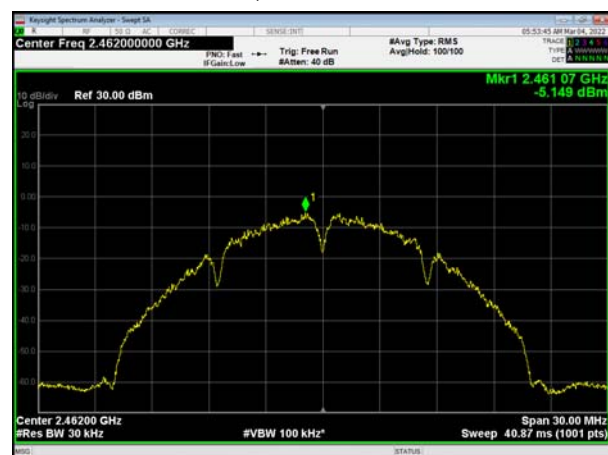
802.11b, Channel No.: 6



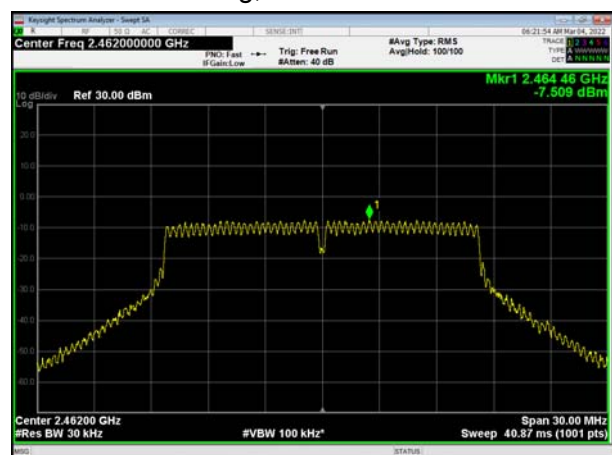
802.11g, Channel No.: 6



802.11b, Channel No.: 11



802.11g, Channel No.: 11





802.11n(HT20), Channel No. 1



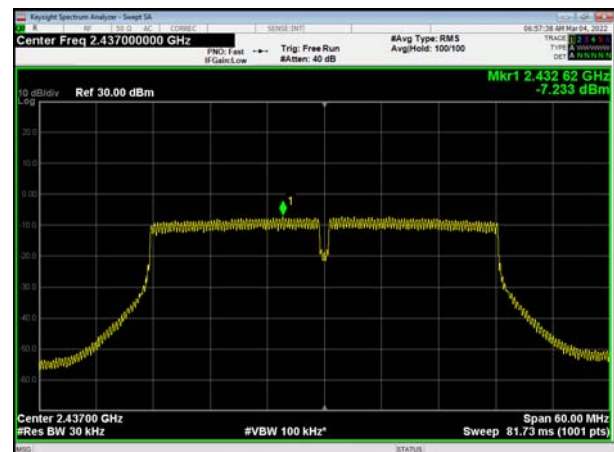
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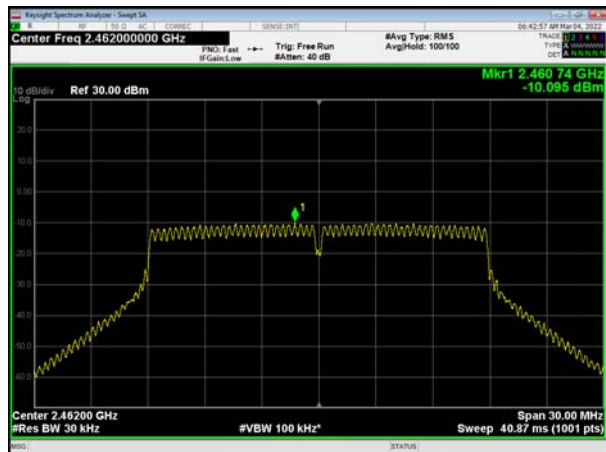
802.11n(HT20), Channel No. 6



802.11n(HT40), Channel No. 6



802.11n(HT20), Channel No. 11



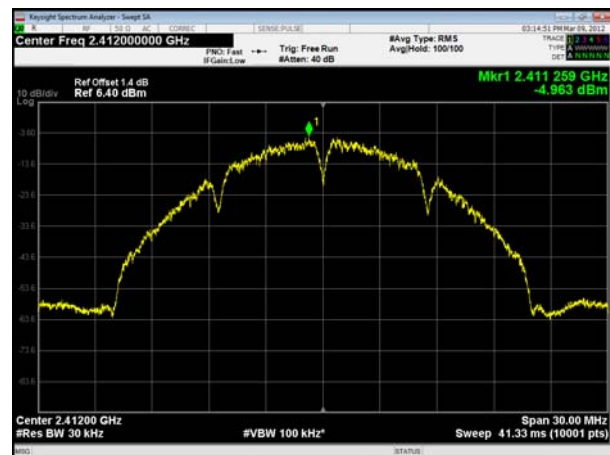
802.11n(HT40), Channel No. 9





CDD Antenna 1

802.11b, Channel No.: 1



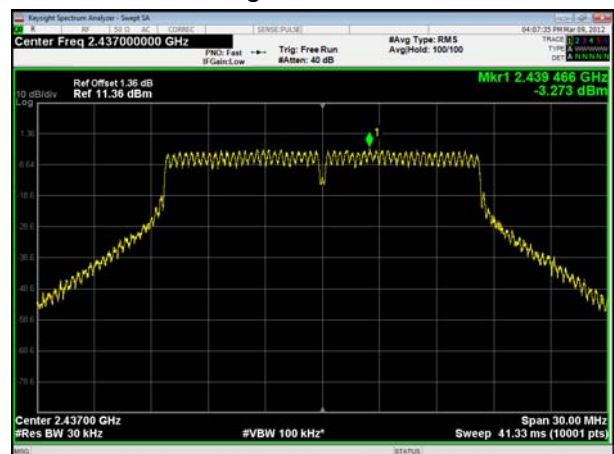
802.11g, Channel No.: 1



802.11b, Channel No.: 6



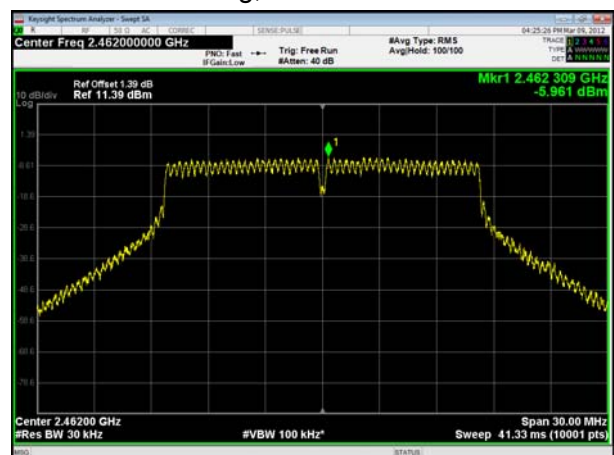
802.11g, Channel No.: 6



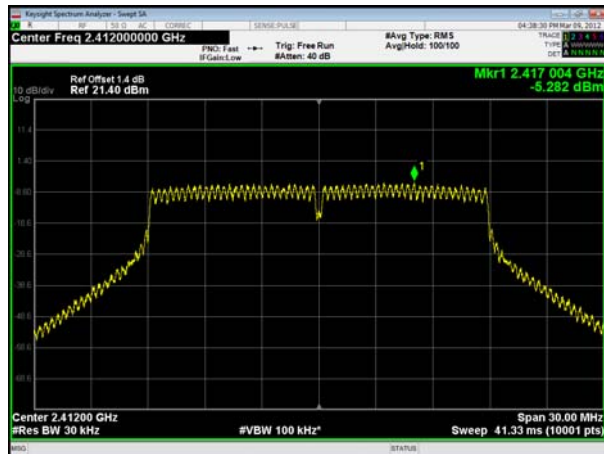
802.11b, Channel No.: 11



802.11g, Channel No.: 11



802.11n(HT20), Channel No. 1



802.11n(HT40), Channel No. 3



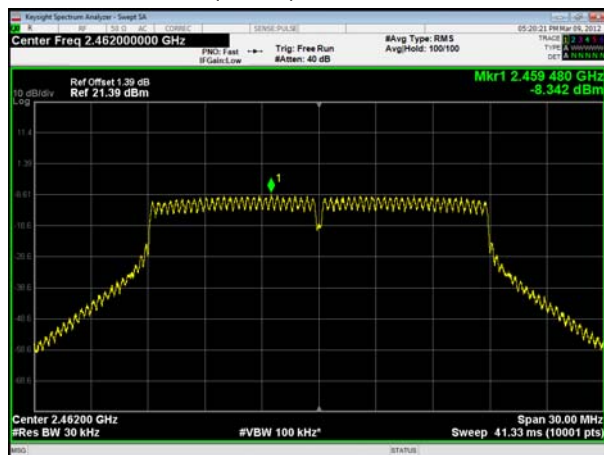
802.11n(HT20), Channel No. 6



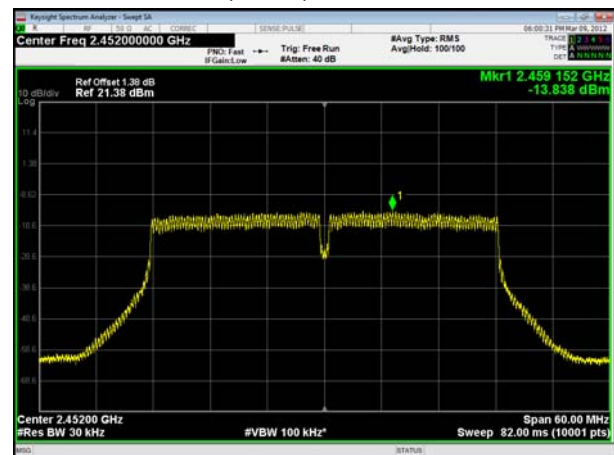
802.11n(HT40), Channel No. 6



802.11n(HT20), Channel No. 11



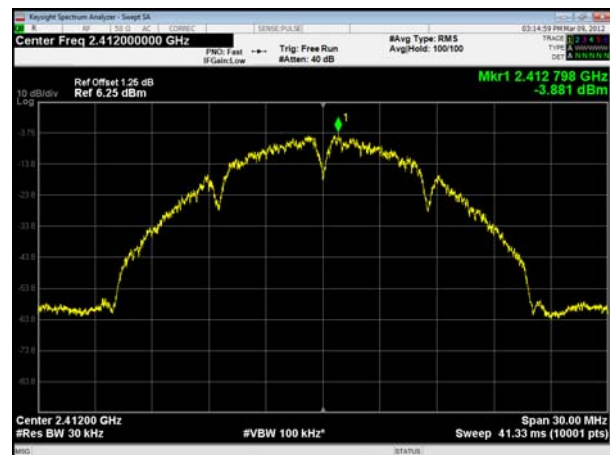
802.11n(HT40), Channel No. 9





CDD Antenna 2

802.11b, Channel No.: 1



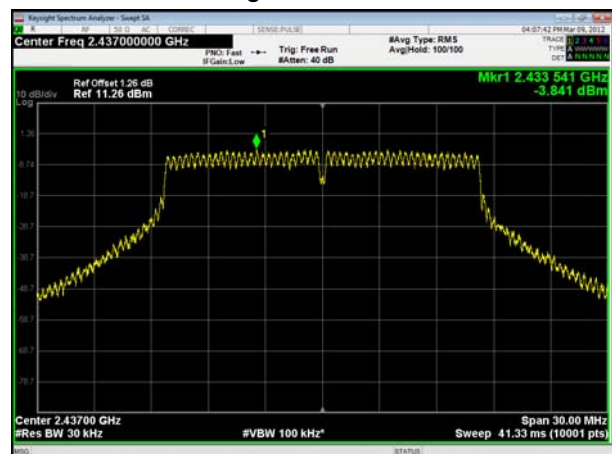
802.11g, Channel No.: 1



802.11b, Channel No.: 6



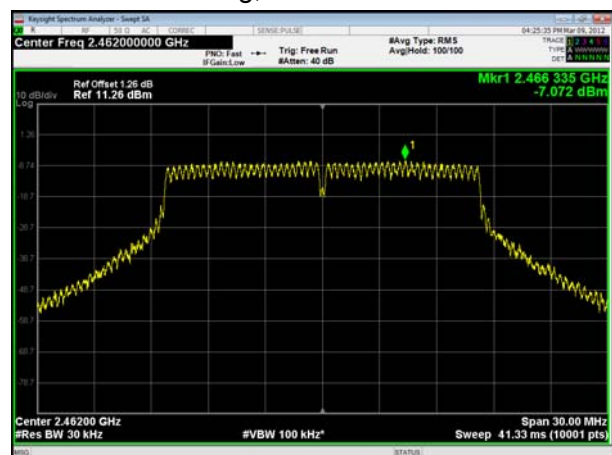
802.11g, Channel No.: 6



802.11b, Channel No.: 11



802.11g, Channel No.: 11





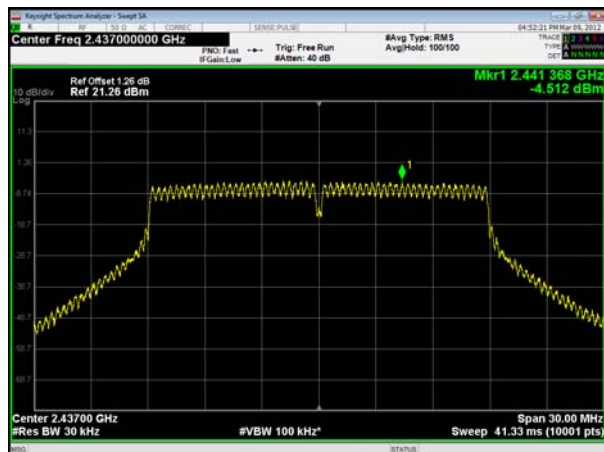
802.11n(HT20), Channel No. 1



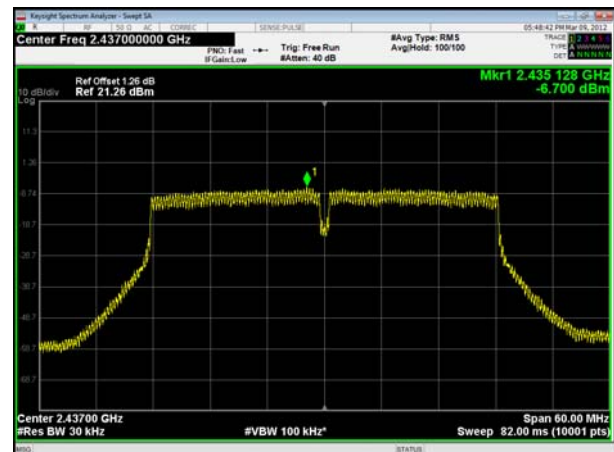
802.11n(HT40), Channel No. 3



802.11n(HT20), Channel No. 6



802.11n(HT40), Channel No. 6



802.11n(HT20), Channel No. 11



802.11n(HT40), Channel No. 9



5.5. Spurious RF Conducted Emissions

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer with a known loss. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. Set RBW to 100 kHz and VBW to 300 kHz, Sweep is set to ATUO.

The test is in transmitting mode.

Test setup



Limits

Rule Part 15.247(d) pacifies that “In any 100 kHz 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. ”

Test Mode	Carrier frequency (MHz)	Reference value (dBm)	Limit
802.11b	2412	9.15	-20.85
	2437	12.96	-17.04
	2462	9.71	-20.29
802.11g	2412	9.79	-20.21
	2437	11.61	-18.39
	2462	7.73	-22.27
802.11n HT20	2412	8.67	-21.33
	2437	10.42	-19.58
	2462	5.97	-24.03
802.11n HT40	2422	3.57	-26.43
	2437	7.63	-22.37
	2452	0.60	-29.40

**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-26GHz	1.407 dB

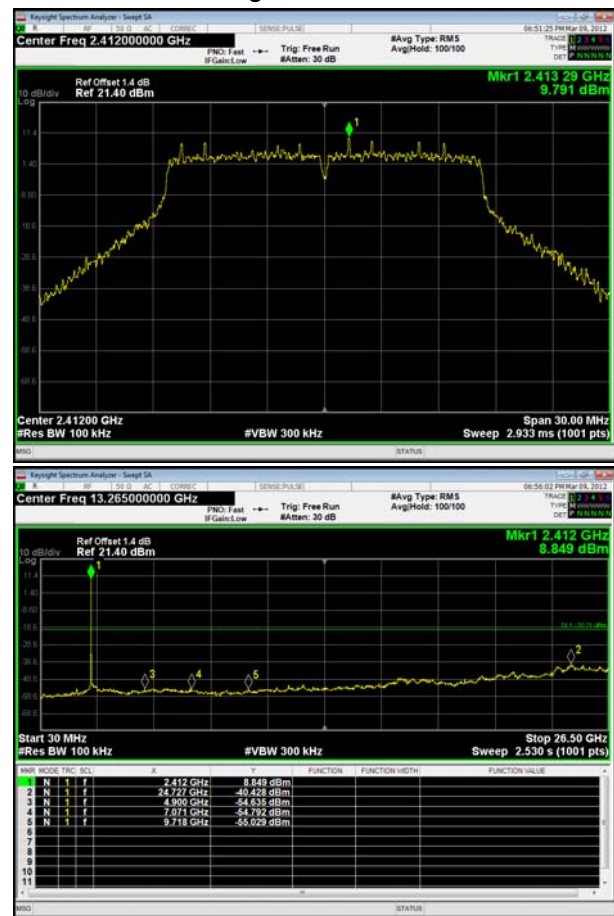


Test Results:

802.11b, Channel No.: 1

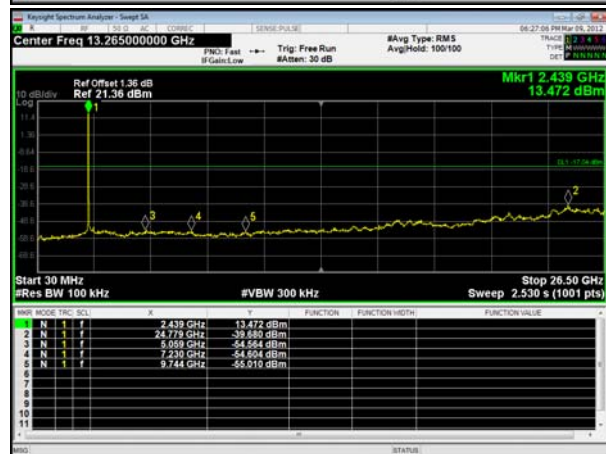
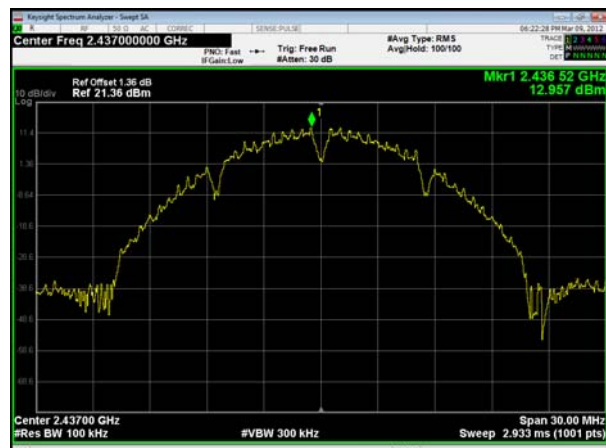


802.11g, Channel No.: 1

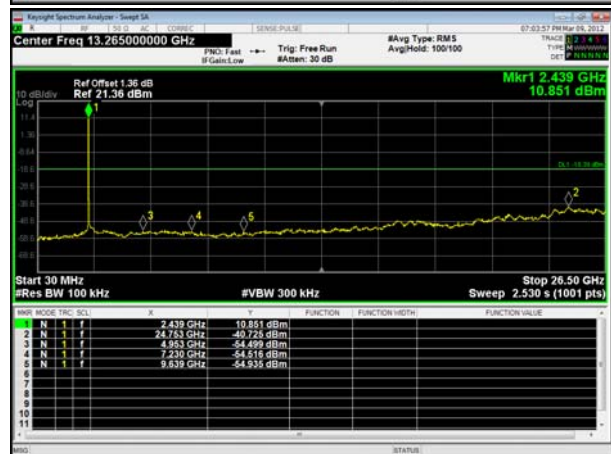
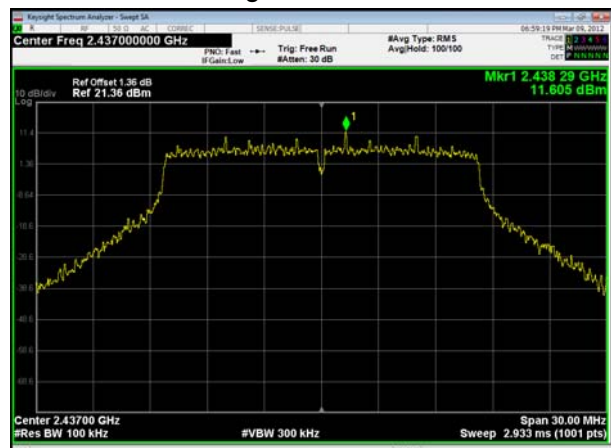




802.11b, Channel No.: 6

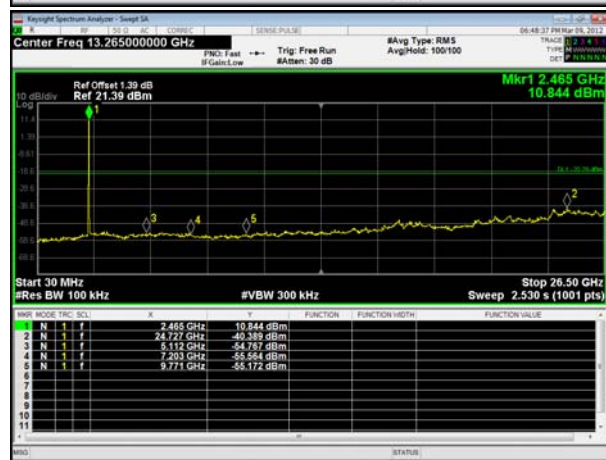


802.11g, Channel No.: 6

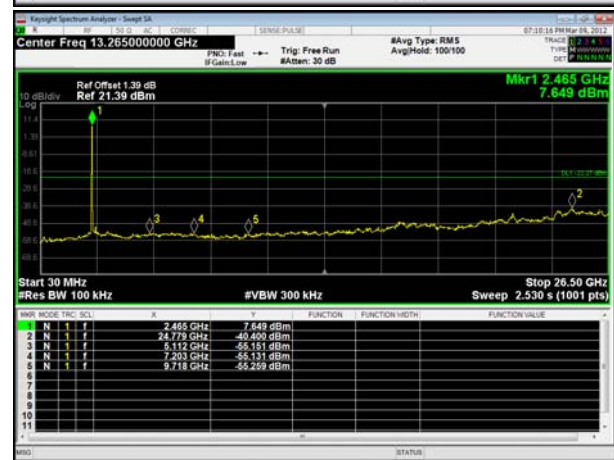




802.11b, Channel No.: 11

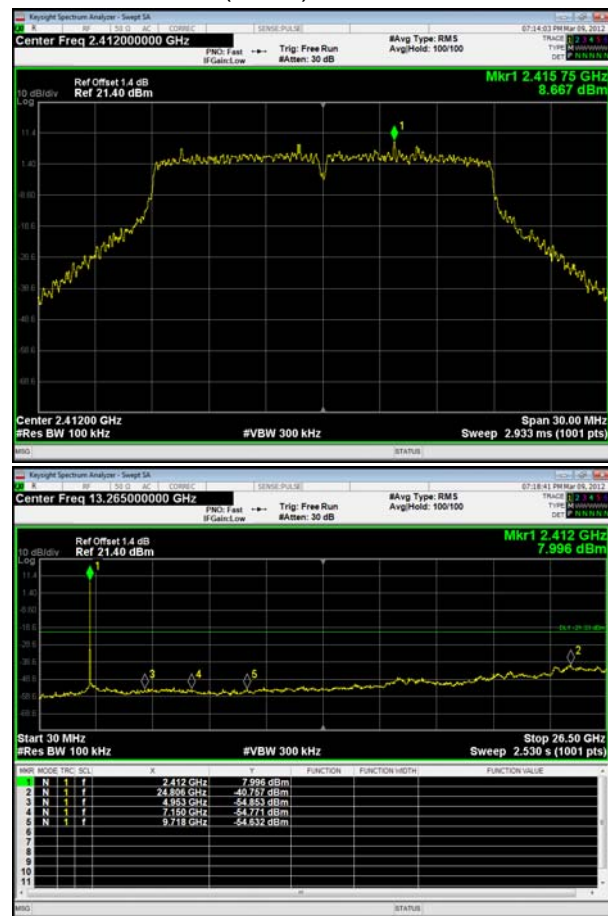


802.11g, Channel No.: 11





802.11n(HT20), Channel No. 1



802.11n(HT40), Channel No. 3

