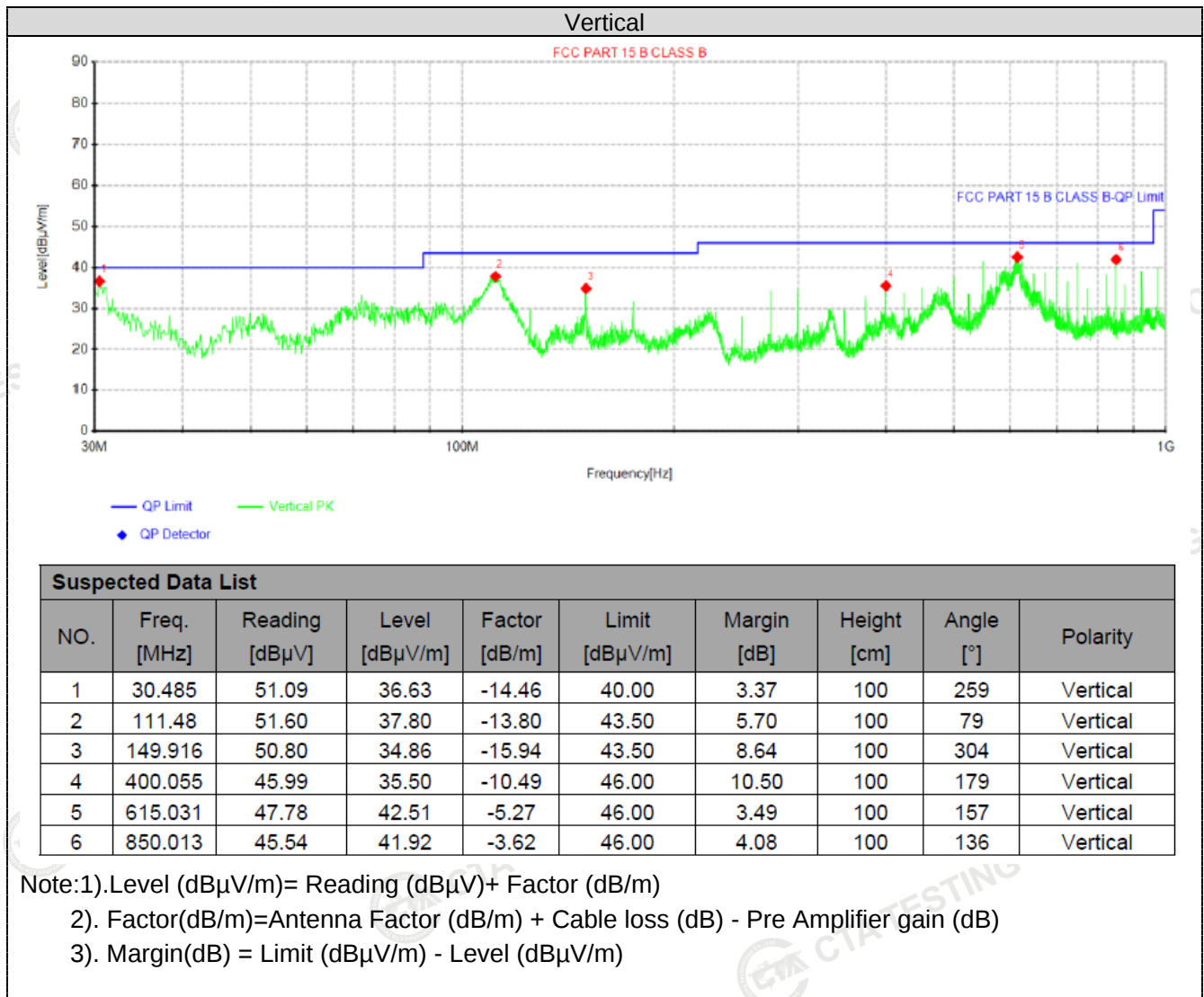




For 1GHz to 25GHz

Note: 802.11b Mode all have been tested, only worse case 802.11b mode is reported
(above 1GHz)

Frequency(MHz):			2412		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	62.36	PK	74	11.64	66.72	32.4	5.11	41.87	-4.36
4824.00	44.21	AV	54	9.79	48.57	32.4	5.11	41.87	-4.36
7236.00	54.57	PK	74	19.43	55.20	36.58	6.43	43.64	-0.63
7236.00	42.12	AV	54	11.88	42.75	36.58	6.43	43.64	-0.63

Frequency(MHz):			2412		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	60.02	PK	74	13.98	64.38	32.4	5.11	41.87	-4.36
4824.00	43.54	AV	54	10.46	47.90	32.4	5.11	41.87	-4.36
7236.00	52.81	PK	74	21.19	53.44	36.58	6.43	43.64	-0.63
7236.00	42.06	AV	54	11.94	42.69	36.58	6.43	43.64	-0.63

Frequency(MHz):			2437		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	61.87	PK	74	12.13	65.82	32.56	5.34	41.85	-3.95
4874.00	45.31	AV	54	8.69	49.26	32.56	5.34	41.85	-3.95
7311.00	54.35	PK	74	19.65	54.71	36.54	6.81	43.71	-0.36
7311.00	41.99	AV	54	12.01	42.35	36.54	6.81	43.71	-0.36

Frequency(MHz):			2437		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	59.36	PK	74	14.64	63.31	32.56	5.34	41.85	-3.95
4874.00	43.95	AV	54	10.05	47.90	32.56	5.34	41.85	-3.95
7311.00	52.14	PK	74	21.86	52.50	36.54	6.81	43.71	-0.36
7311.00	41.45	AV	54	12.55	41.81	36.54	6.81	43.71	-0.36

Frequency(MHz):			2462		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	61.48	PK	74	12.52	64.94	32.73	5.64	41.83	-3.46
4924.00	45.92	AV	54	8.08	49.38	32.73	5.64	41.83	-3.46
7386.00	54.40	PK	74	19.60	54.46	36.5	7.23	43.79	-0.06
7386.00	42.86	PK	54	11.14	42.92	36.5	7.23	43.79	-0.06

Frequency(MHz):			2462		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	59.07	PK	74	14.93	62.53	32.73	5.64	41.83	-3.46
4924.00	44.03	AV	54	9.97	47.49	32.73	5.64	41.83	-3.46
7386.00	52.25	PK	74	21.75	52.31	36.5	7.23	43.79	-0.06
7386.00	40.89	PK	54	13.11	40.95	36.5	7.23	43.79	-0.06

- 1) Emission level (dBuV/m) = Meter Reading+ antenna Factor+ cable loss- preamp factor.
- 2) Margin value = Limits-Emission level.
- 3) -- Mean the PK detector measured value is below average limit.
- 4) The other emission levels were very low against the limit.
- 5) RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

Results of Band Edges Test (Radiated)

Note: 802.11b Mode all have been tested, only worse case 802.11b mode is reported

Frequency(MHz):			2412		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	61.73	PK	74	12.27	72.15	27.42	4.31	42.15	-10.42
2390.00	41.58	AV	54	12.42	52.00	27.42	4.31	42.15	-10.42
Frequency(MHz):			2412		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	59.34	PK	74	14.66	69.76	27.42	4.31	42.15	-10.42
2390.00	40.25	AV	54	13.75	50.67	27.42	4.31	42.15	-10.42
Frequency(MHz):			2462		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	61.42	PK	74	12.58	71.53	27.7	4.47	42.28	-10.11
2483.50	42.22	AV	54	11.78	52.33	27.7	4.47	42.28	-10.11
Frequency(MHz):			2462		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	58.57	PK	74	15.43	68.68	27.7	4.47	42.28	-10.11
2483.50	41.02	AV	54	12.98	51.13	27.7	4.47	42.28	-10.11

Note:

- 1) Emission level (dBuV/m) = Meter Reading+ antenna Factor+ cable loss- preamp factor.
- 2) Margin value = Limits-Emission level.
- 3) -- Mean the PK detector measured value is below average limit.
- 4) The other emission levels were very low against the limit.
- 5) RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

4.3 Maximum Peak Conducted Output Power

Limit

The Maximum Peak Output Power Measurement is 30dBm.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



Test Results

ANT 1:

Type	Channel	Output power PK (dBm)	Limit (dBm)	Result
802.11b	01	16.45	30.00	Pass
	06	15.84		
	11	16.00		

ANT 2:

Type	Channel	Output power PK (dBm)	Limit (dBm)	Result
802.11b	01	16.38	30.00	Pass
	06	16.08		
	11	15.79		

Note:

- 1) Measured output power at difference data rate for each mode and recorded worst case for each mode.
- 2) Test results including cable loss.
- 3) Worst case data at 1Mbps at IEEE 802.11b

4.4 Power Spectral Density

Limit

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.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW ≥ 3 kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Set the span to 1.5 times the DTS channel bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be 8dBm.

Test Configuration



Test Results

ANT 1:

Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-8.96	8.00	Pass
	06	-9.24		
	11	-8.85		

ANT 2:

Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-8.37	8.00	Pass
	06	-9.24		
	11	-9.46		

Note:

- 1) Measured peak power spectrum density at difference data rate for each mode and recorded worst case for each mode.
- 2) Test results including cable loss;
- 3) Worst case data at 1Mbps at IEEE 802.11b

Power Spectral Density

ANT 1:

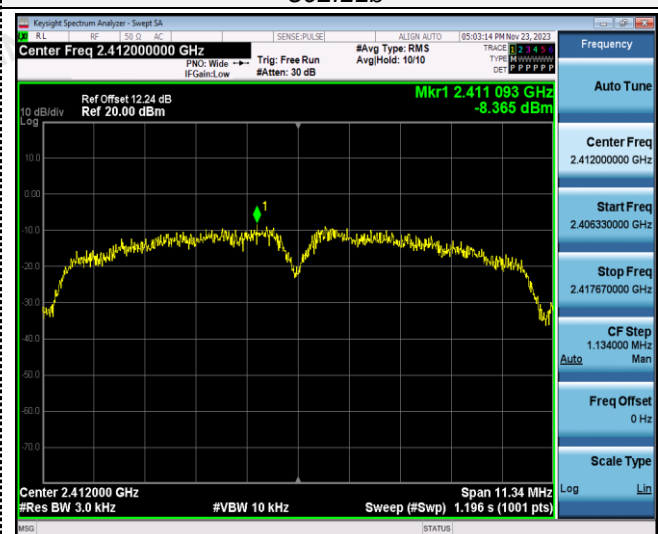
802.11b



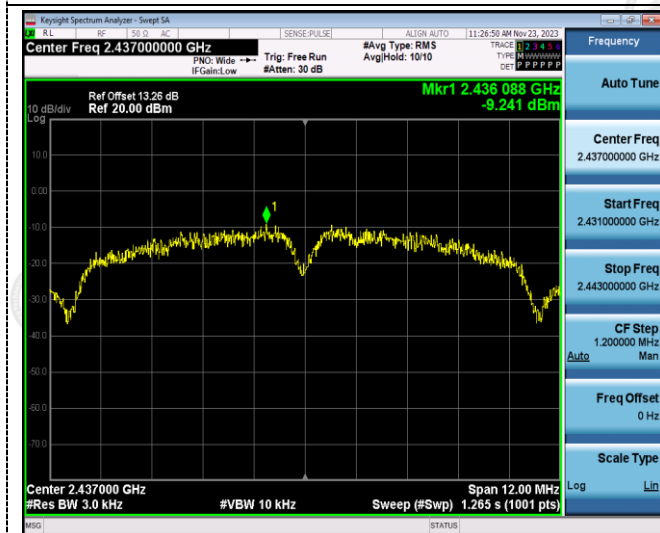
CH01

ANT 2:

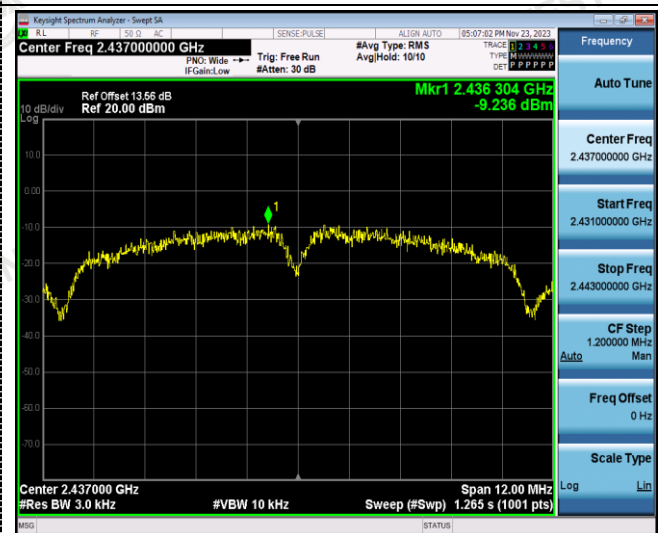
802.11b



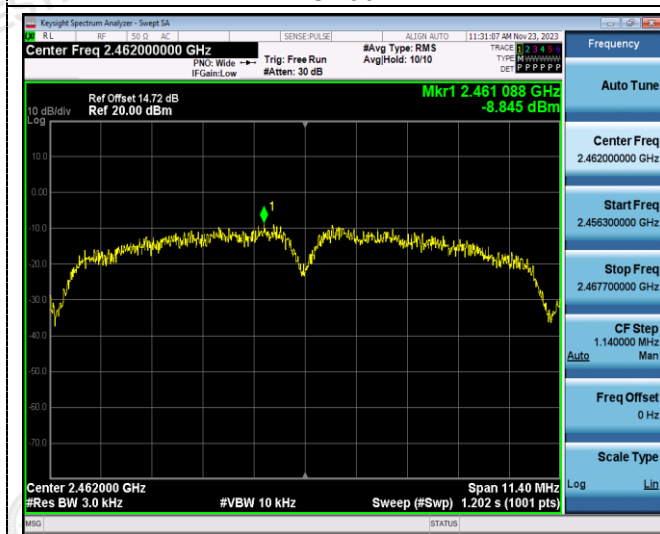
CH01



CH06



CH06



CH11



CH11

4.5 6dB Bandwidth

Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

Test Configuration



Test Results

ANT 1:

Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11b	01	8.080	≥500	Pass
	06	8.000		
	11	7.600		

ANT 2:

Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11b	01	7.560	≥500	Pass
	06	8.000		
	11	7.600		

Note:

- 1) Measured peak power spectrum density at difference data rate for each mode and recorded worst case for each mode.
- 2) Test results including cable loss;
- 3) Worst case data at 1Mbps at IEEE 802.11b

Please refer to following plots;

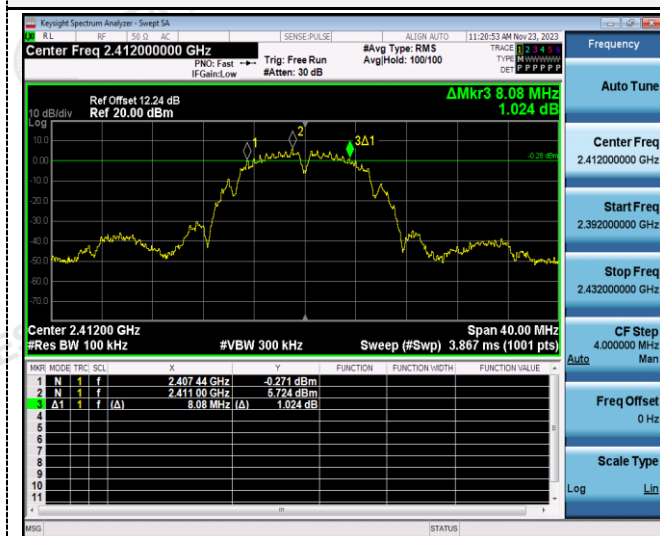
6dB Bandwidth

ANT 1:

802.11b

ANT 2:

802.11b



CH01



CH01



CH06



CH06



CH11



CH11

4.6 Out-of-band Emissions

Limit

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. Attenuation below the general limits specified in §15.209(a) is not required.

Test Procedure

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, band edge and out-of-band emissions.

Test Configuration

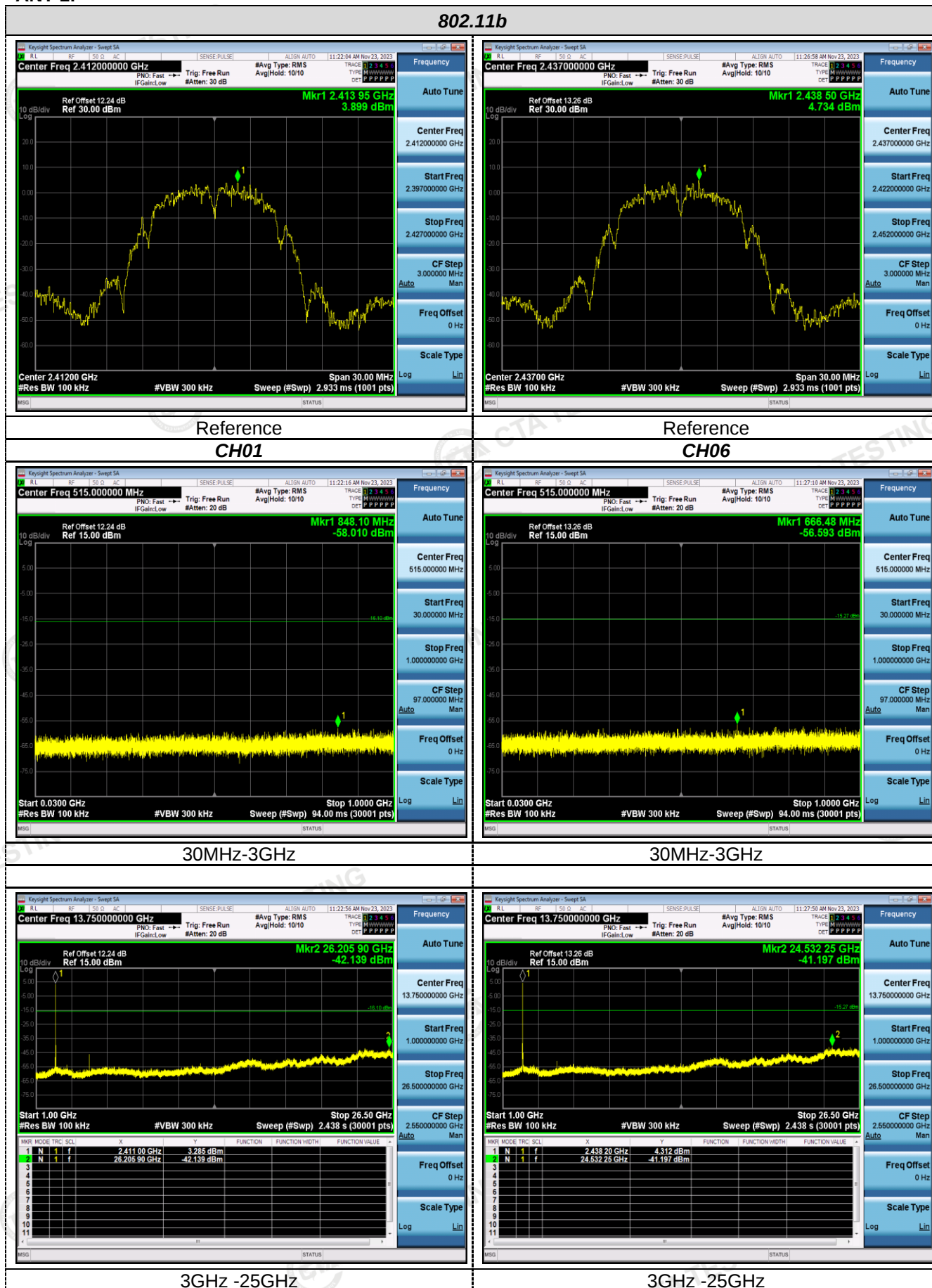


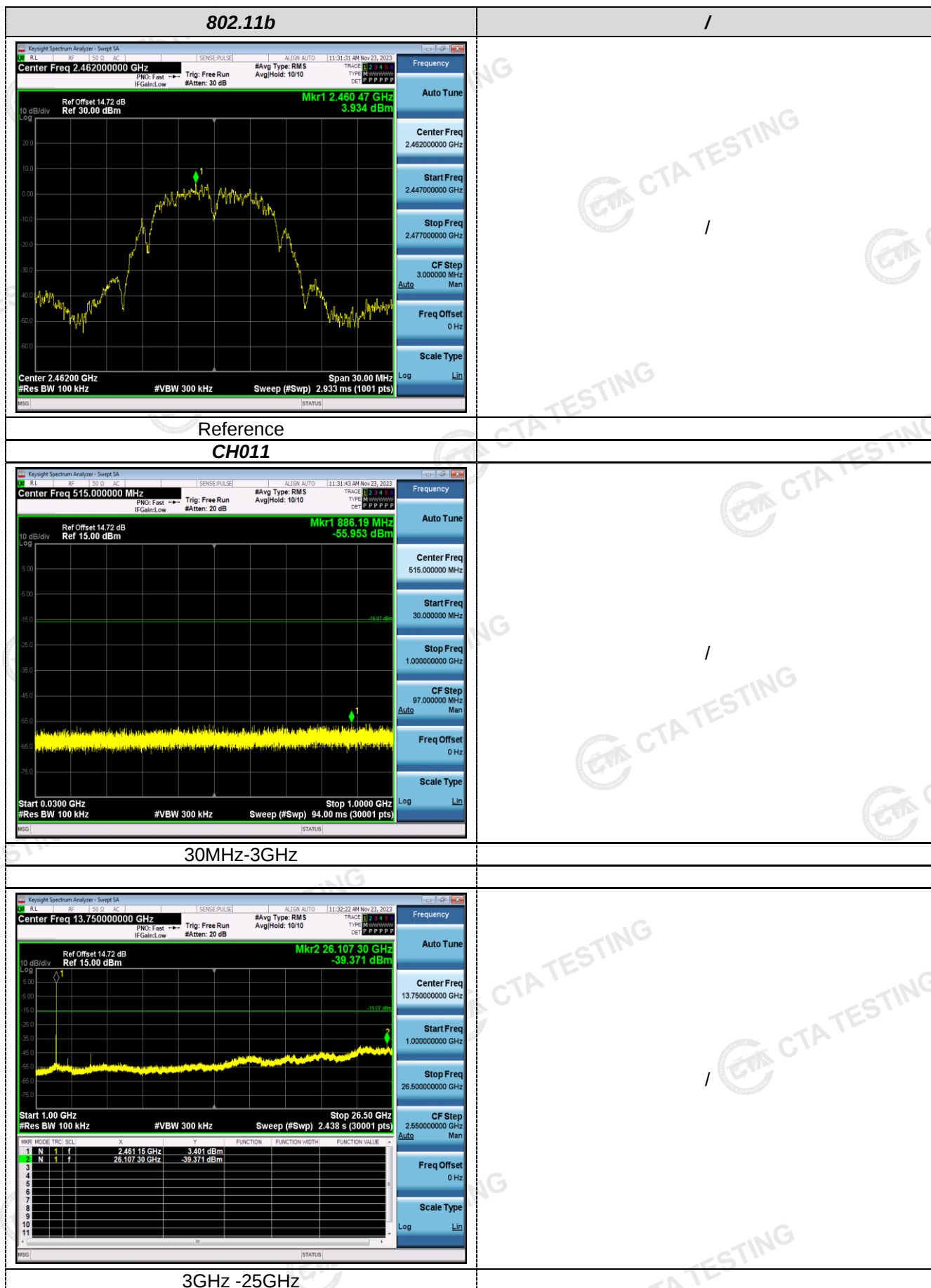
Test Results

Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data. And record the worst data in the report.

Test plot as follows:

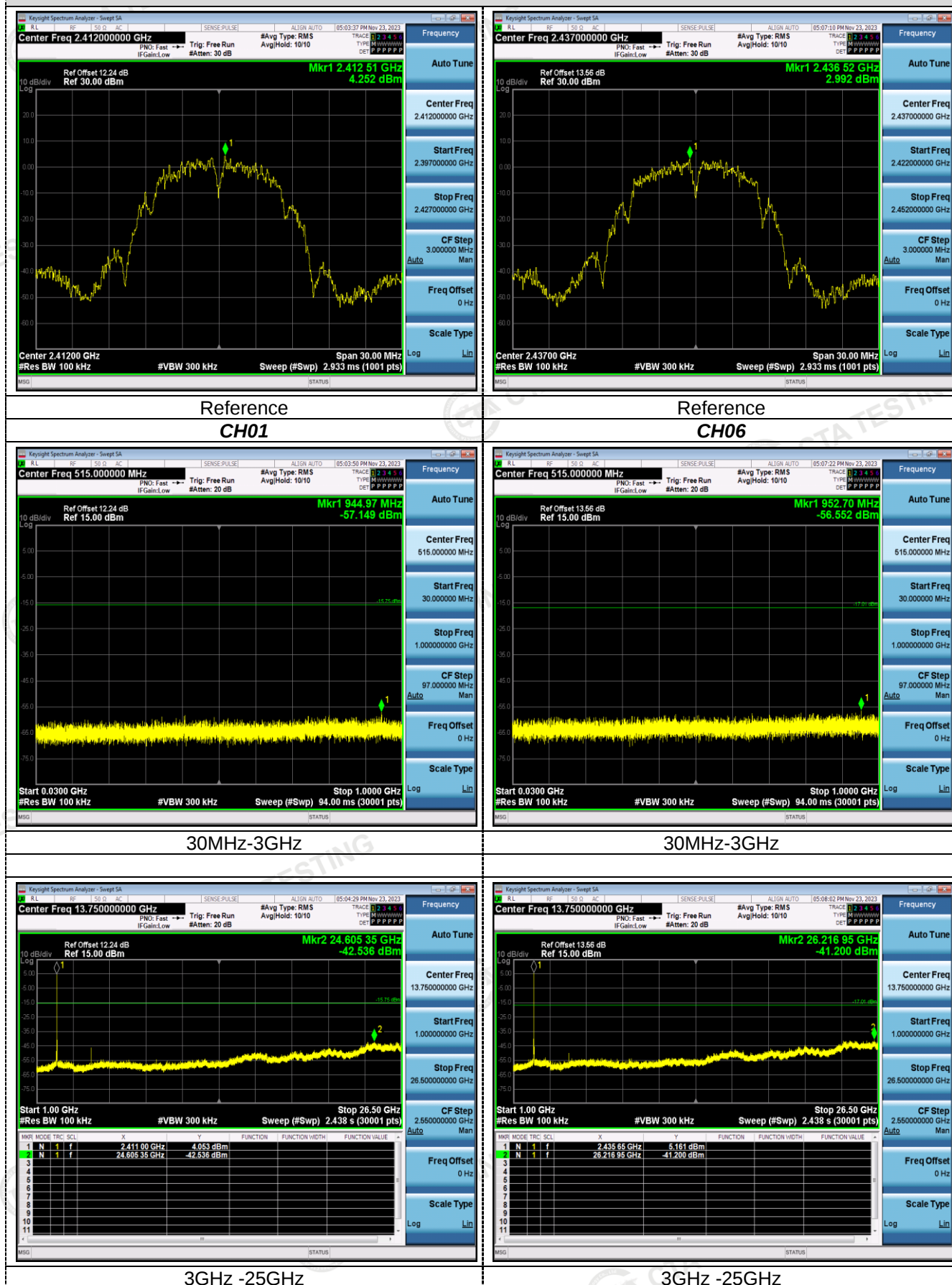
ANT 1:

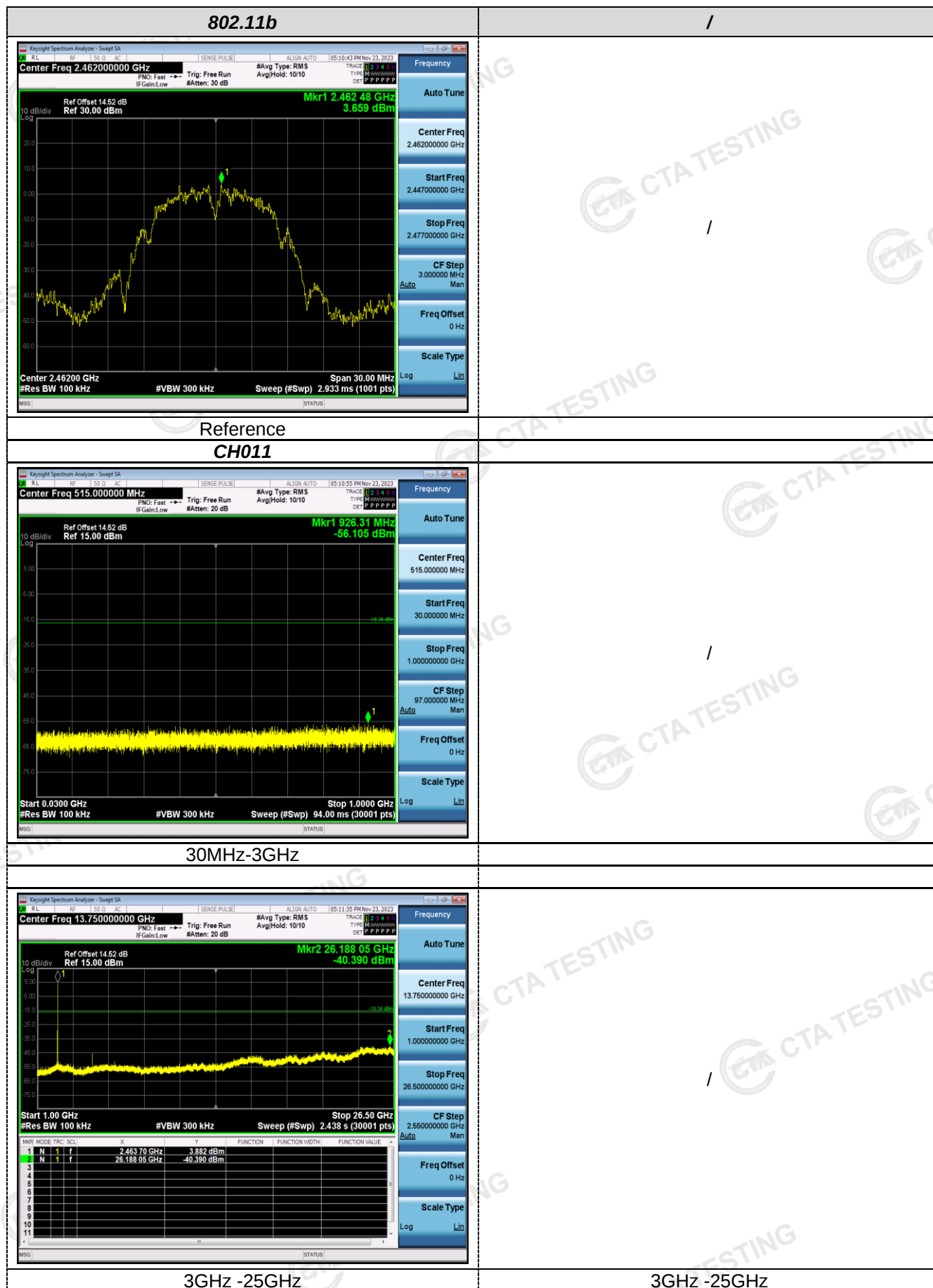


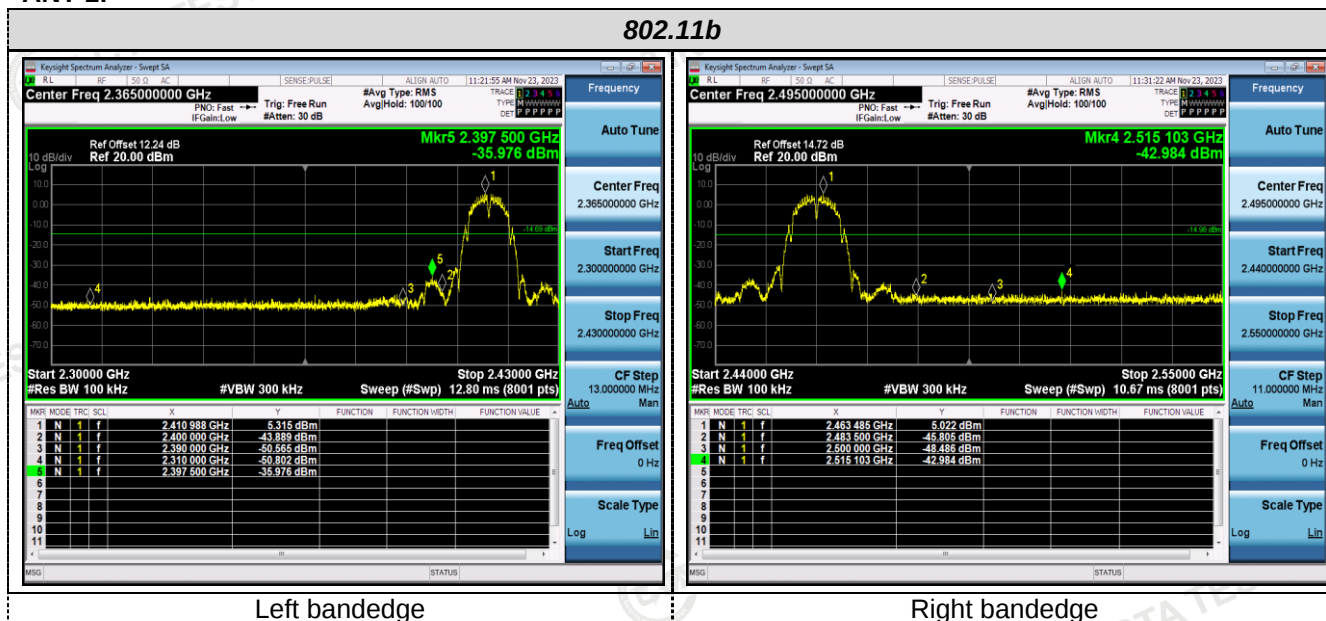
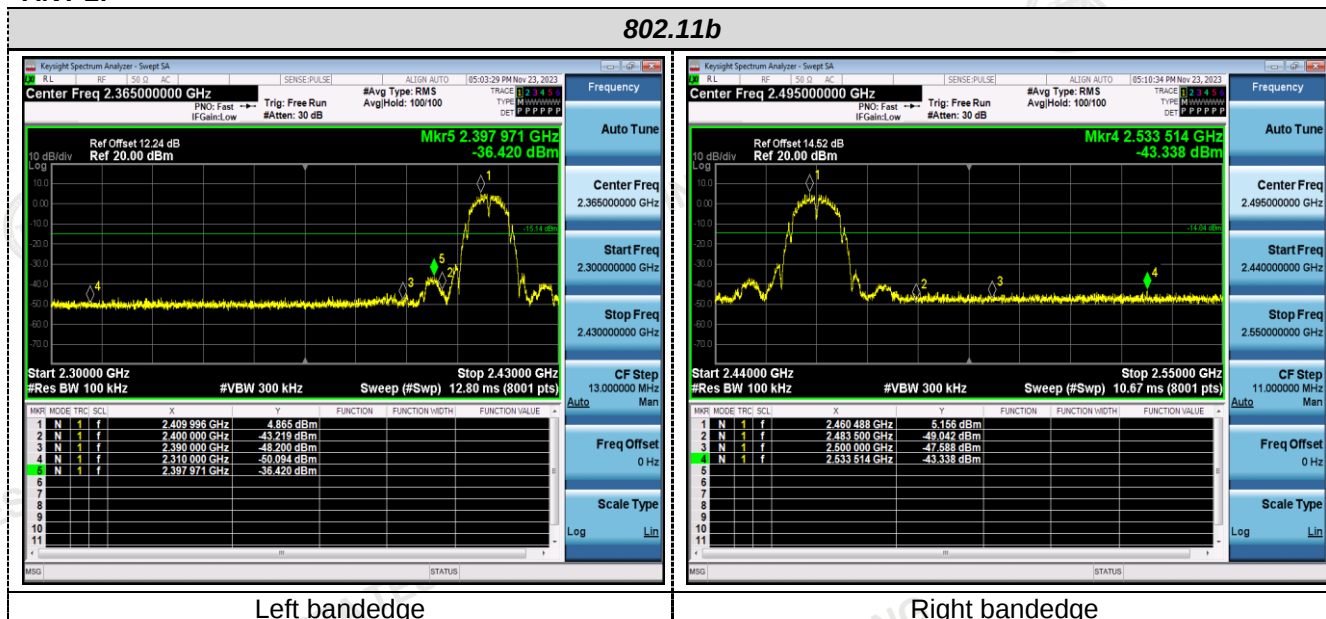


ANT 2:

802.11b





Band-edge Measurements for RF Conducted Emissions:**ANT 1:****ANT 2:**

4.7 Antenna Requirement

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1) (I):

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result:

The maximum gain of antenna 1 and antenna 2 were 4.50 dBi for 2.4GHz WIFI.

Remark: The antenna gain is provided by the customer, if the data provided by the customer is not accurate, Shenzhen CTA Testing Technology Co., Ltd. does not assume any responsibility.

5 Test Setup Photos of the EUT



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