

RF TEST REPORT

Report No.: SET2022-01169

Product Name: Tyke-L3 Thermal Imager

Model No.: Tyke L325

Serial model No.: Tyke Labcd
(a = 0~9, A~Z; b = 0~9, A~Z; c = 0~9, A~Z; d = 0~9, A~Z)

FCC ID: 2AYGT-TYKEL3

Applicant: IRay Techonlogy Co.,Ltd

Address: 11GUIYANG STREET,YANTAI ECONOMY AND TECHNOLOGY
DEVELOPMENT DISTRICT, YANTAI SHANDONG, P.R.CHINA

Dates of Testing: 2021.07.27-2022.05.23

Issued by: CCIC Southern Testing Co., Ltd.

Lab Location: Electronic Testing Building, No. 43 Shahe Road, Xili Street,
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Test Report

Product Name.....: Tyke-L3 Thermal Imager

Brand Name.....: InfiRay

Trade Name.....: InfiRay

Applicant.....: IRay Technology Co.,Ltd.

Applicant Address.....: 11GUIYANG STREET, YANTAI ECONOMY AND
TECHNOLOGY DEVELOPMENT DISTRICT, YANTAI
SHANDONG P.R.CHINA.

Manufacturer.....: IRay Technology Co.,Ltd.

Manufacturer Address.....: 11GUIYANG STREET, YANTAI ECONOMY AND
TECHNOLOGY DEVELOPMENT DISTRICT, YANTAI
SHANDONG P.R.CHINA.

Test Standards.....: 47 CFR Part 15 Subpart C
ANSI C63.10-2013

Test Result.....: PASS

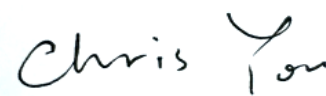
Tested by



2022.05.24

Sun, Test Engineer

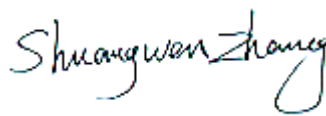
Reviewed by



2022.05.24

Chris You, Senior Engineer

Approved by



2022.05.24

ShuangwenZhang, Manager

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Change History		
Issue	Date	Reason for change
1.0	2022.06.07	First edition

1. General Information

1.1. EUT Description

EUT Type	Tyke-L3 Thermal Imager
EUT supports Radios application	WLAN2.4GHz 802.11b/g/n (HT20)
Frequency Range	802.11b/g/n-20MHz: 2.412GHz - 2.462GHz
Channel Number	802.11b/g/n-20MHz: 11
Bit Rate of Transmitter	802.11b: 11/5.5/2/1 Mbps 802.11g: 54/48/36/24/18/12/9/6 Mbps 802.11n : up to 72.2Mbps
Modulation Type	DSSS (802.11b), OFDM (802.11g/n)
MIMO	Not support
Antenna Type	Internal
Antenna Gain	2.84dBi

Note 1: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Note 2: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

Note 3: The antenna gain and RF adapter/cable insert loss provided by manufacture.

1.2. Test Standards and Results

The objective of the report is to perform testing according to below standards for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C	Radio Frequency Devices
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section in CFR 47	Description	Result
1	15.203 15.247(c)	Antenna Requirement	PASS
2	15.247(b)(3)	Peak Conducted Output Power	PASS
3	15.247(a)(2)	6dB Bandwidth	PASS
4	15.247(d)	Conducted Band Edges and Spurious Emission	PASS
5	15.247(e)	Power spectral density (PSD)	PASS
6	15.207	AC Power Line Conducted Emission	N/A
7	15.209 15.205 15.247(d)	Radiated Band Edges and Spurious Emission	PASS

Note: N/A means that EUT is not suitable for this test item.

Note 1: The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10-2013.

Note 2: These RF tests were performed according to the method of measurements prescribed in KDB 558074 D01 15.247 Meas Guidance v05r02.

For 20MHz bandwidth systems, use Channel 1~ Channel 11.

Channel No.	Frequency	Channel No.	Frequency	Channel No.	Frequency
1	2412MHz	5	2432MHz	9	2452MHz
2	2417MHz	6	2437MHz	10	2457MHz
3	2422MHz	7	2442MHz	11	2462MHz
4	2427MHz	8	2447MHz		

Note: Channel 1, 6 & 11 selected for 802.11b/g/n-HT20 as Lowest, Middle and Highest channel.

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Conducted and Spurious Emission	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	MCS 0	1/6/11
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	MCS 0	1/11

1.3. Table for Supporting Units

No.	Equipment	Brand Name	Model Name	Manufacturer	Serial No.	Note
1	Notebook	DELL	PP11L	DELL	H5914A03	FCC DOC

1.4. EUT Operation Test Setup

For RF test items, an engineering test program was provided and enable to make EUT transmitting.

1.5. Facilities and Accreditations

1.5.1. Facilities

CNAS-Lab Code: L1659

CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

FCC-Registration No.: 406086

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until April 19th, 2023.

ISED Registration: 11185A-1

CAB identifier: CN0064

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Jun. 30th, 2023.

A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

1.5.2. Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15°C - 35°C
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. Test Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

According to FCC 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 shall be considered sufficient to comply with the provisions of this section.

And according to FCC 47 CFR Section 15.247(c), 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.

2.1.2. Antenna Information

Antenna Category: Internal Antenna

A internal Antenna was soldered to the antenna port of EUT via an adaptor cable, can't be removed.

Antenna General Information:

No.	EUT	Operating frequency range	Ant. Type	Ant. Gain
1	Tyke-L3 Thermal Imager	2412-2462MHz	Internal	2.84dBi

2.1.3. Result: comply

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

2.2. Maximum Conducted Output Power

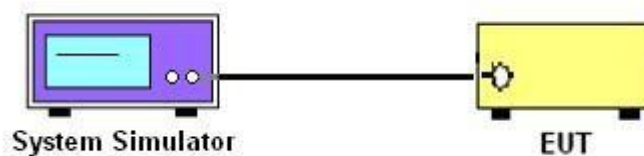
2.2.1. Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.2.3. Test Setup



2.2.4. Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.9.1.3.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Record the measurement results in the test report.

2.2.5. Test Result of Peak Output Power

Please refer to Appendix A for detail.

2.3. 6dB Bandwidth

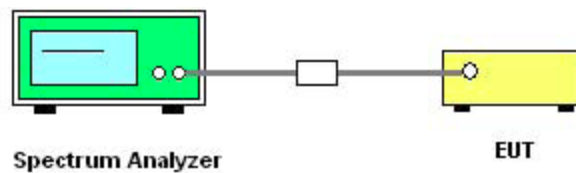
2.3.1. Limit of 6dB Bandwidth

The minimum 6 dB Occupied bandwidth shall be at least 500 kHz.

2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3. Test Setup



2.3.4. Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.8.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Using the X dB bandwidth mode of the instrument's automatic bandwidth measurement function, X is set to 6 dB. the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
5. Use the following spectrum analyzer settings:
RBW: 100kHz / VBW: 300kHz / Detector: Peak / Trace mode: Max hold / Sweep time: Auto couple / Allow trace to fully stabilize.
6. Record the measurement results in the test report.

2.3.5. Test Results of 6dB Bandwidth

Please refer to Appendix A for detail.

2.4. Power spectral density (PSD)

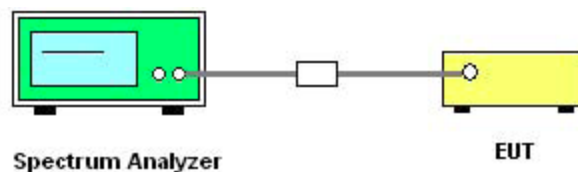
2.4.1. Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3. Test Setup



2.4.4. Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.10.2.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings:
Set instrument center frequency to DTS channel center frequency / Set the span to 1.5 times the DTS bandwidth / RBW:3kHz / VBW:10kHz / Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize / Use the peak marker function to determine the maximum power level.
5. Record the measurement results in the test report.

2.4.5. Test Results of Power spectral density

Please refer to Appendix A for detail.

2.5. Conducted Band Edges and Spurious Emissions

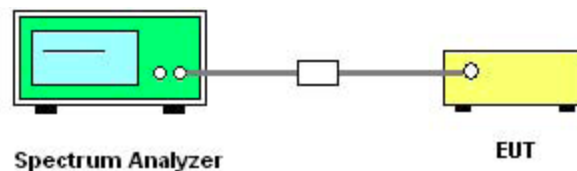
2.5.1. Limit of Conducted Band Edges and Spurious Emissions

In any 100 kHz bandwidth outside the frequency band in which the 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.

2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.5.3. Test Setup



2.5.4. Test Procedure

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.11 and 11.13.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings:

Reference level measurement: Set spectrum analyzer center frequency to DTS channel center frequency / Set the span to ≥ 1.5 times the DTS bandwidth / RBW: 100kHz / VBW: 300kHz / Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize / Use the peak marker function to determine the maximum PSD level and attenuate it by 20dB.

Emission level measurement: Set the center frequency and span to encompass frequency range to be measured / RBW: 100kHz / VBW: 300kHz / Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize / Use the peak marker function to determine the maximum amplitude level.

6. Record the measurement results in the test report.

2.5.5. Test Results of Conducted Band Edges and Spurious Emissions

Please refer to Appendix A for detail.

2.6. Radiated Band Edge and Spurious Emission

2.6.1. Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Note: Wireless charger configuration was evaluated.

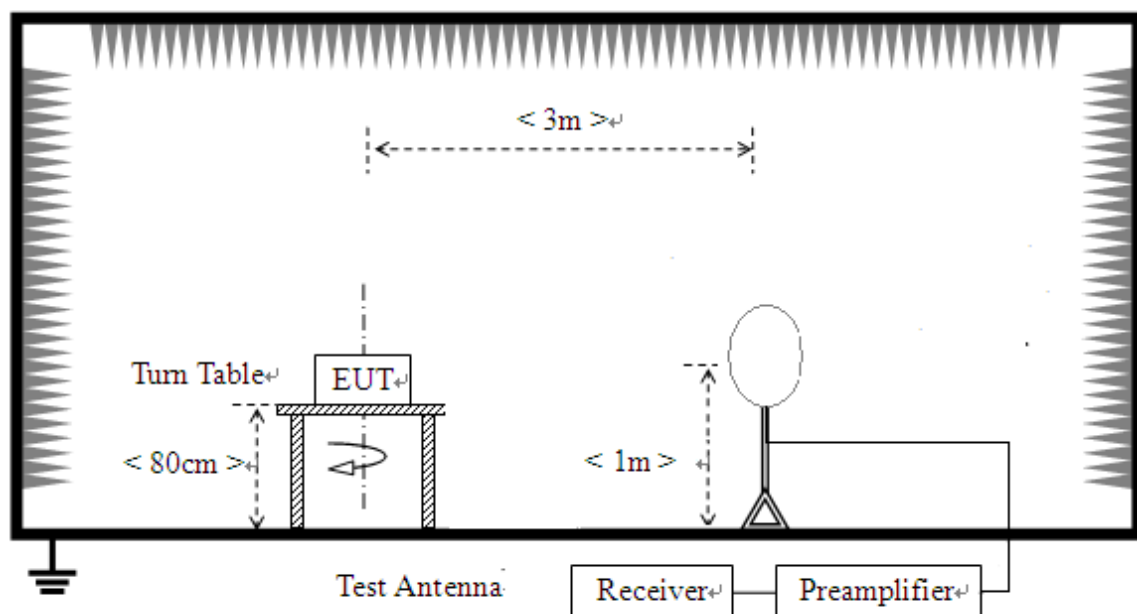
Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
0.009 - 0.490	$2400/F(\text{kHz})$	300
0.490 - 1.705	$24000/F(\text{kHz})$	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

2.6.2. Measuring Instruments

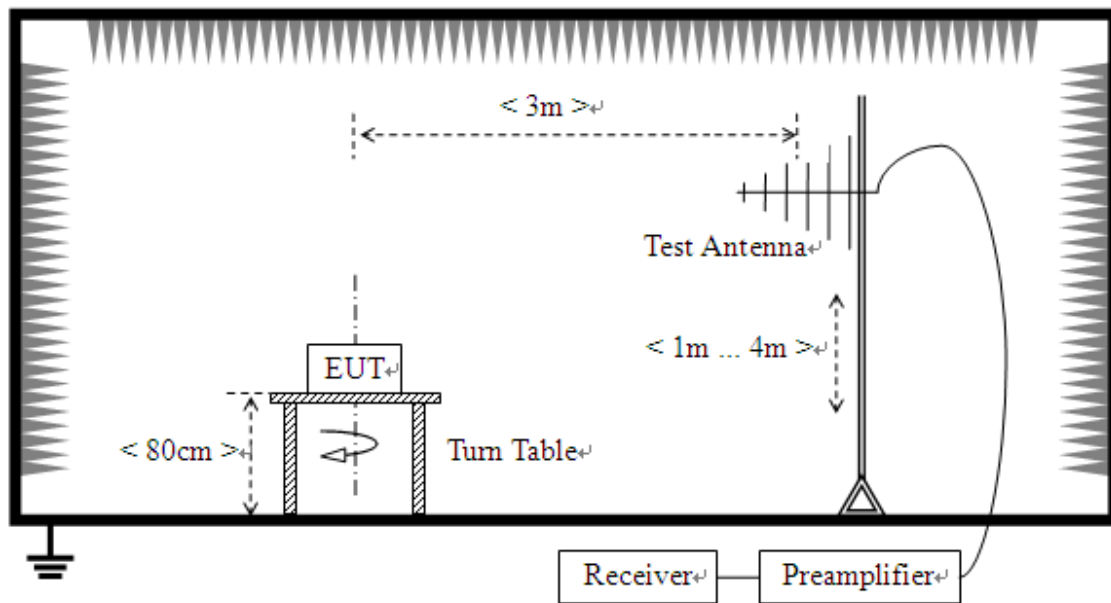
The measuring equipment is listed in the section 3 of this test report.

2.6.3. Test Setup

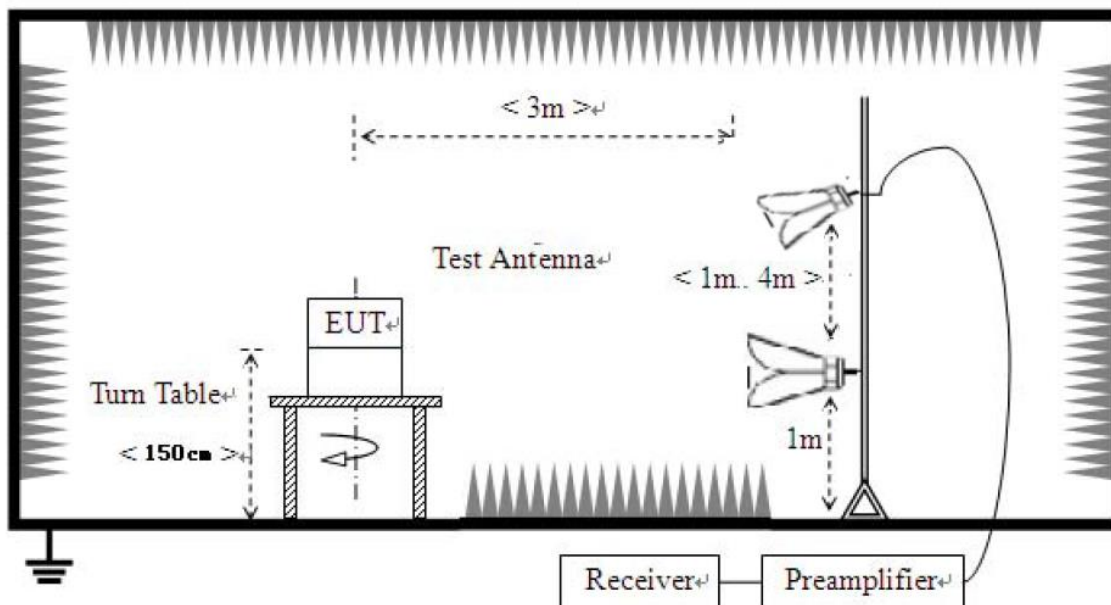
For radiated emissions from 9 kHz to 30 MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.6.4. Test Procedures

1. The EUT was placed on the top of a rotating table 0.8m for below 1GHz and 1.5m for above 1GHz above the ground at a 3 meters semi-anechoic chamber.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. Height of receiving antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
7. For the radiated emission test above 1GHz:

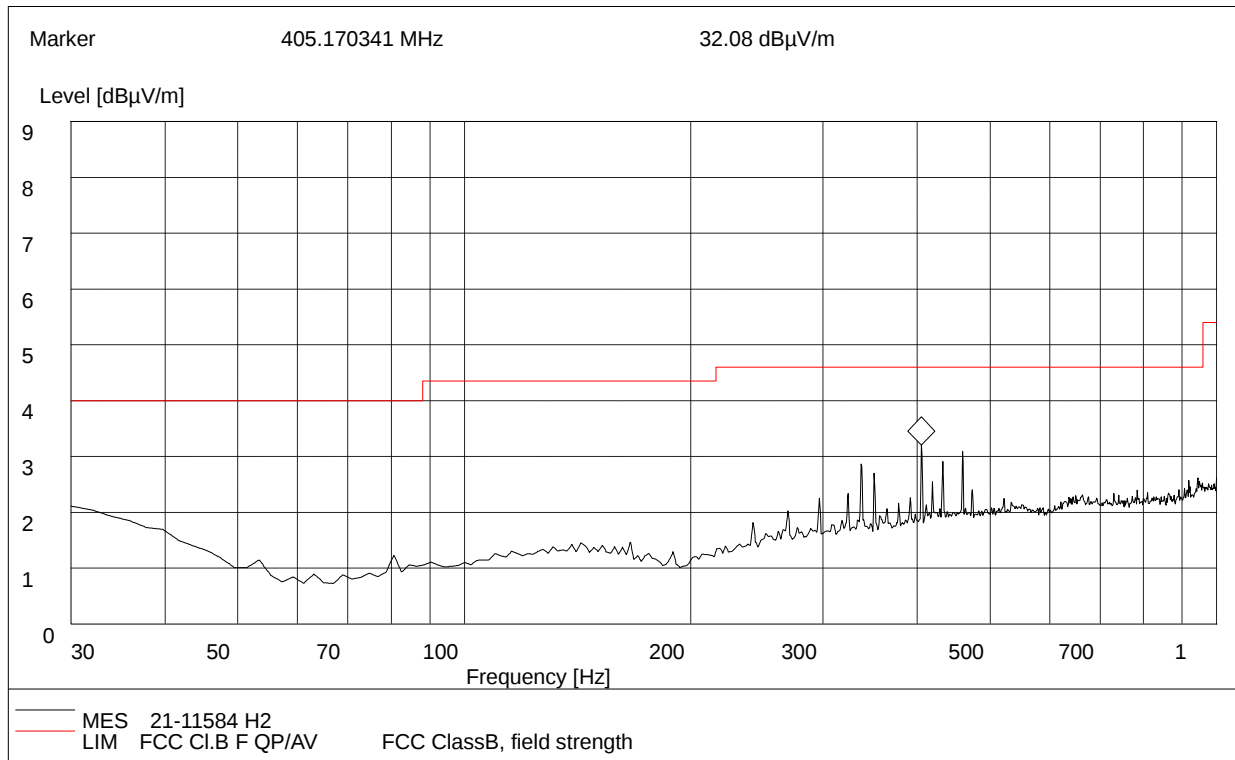
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

2.6.5. Test Results of Radiated Band Edge and Spurious Emission**For 9 kHz to 30MHz**

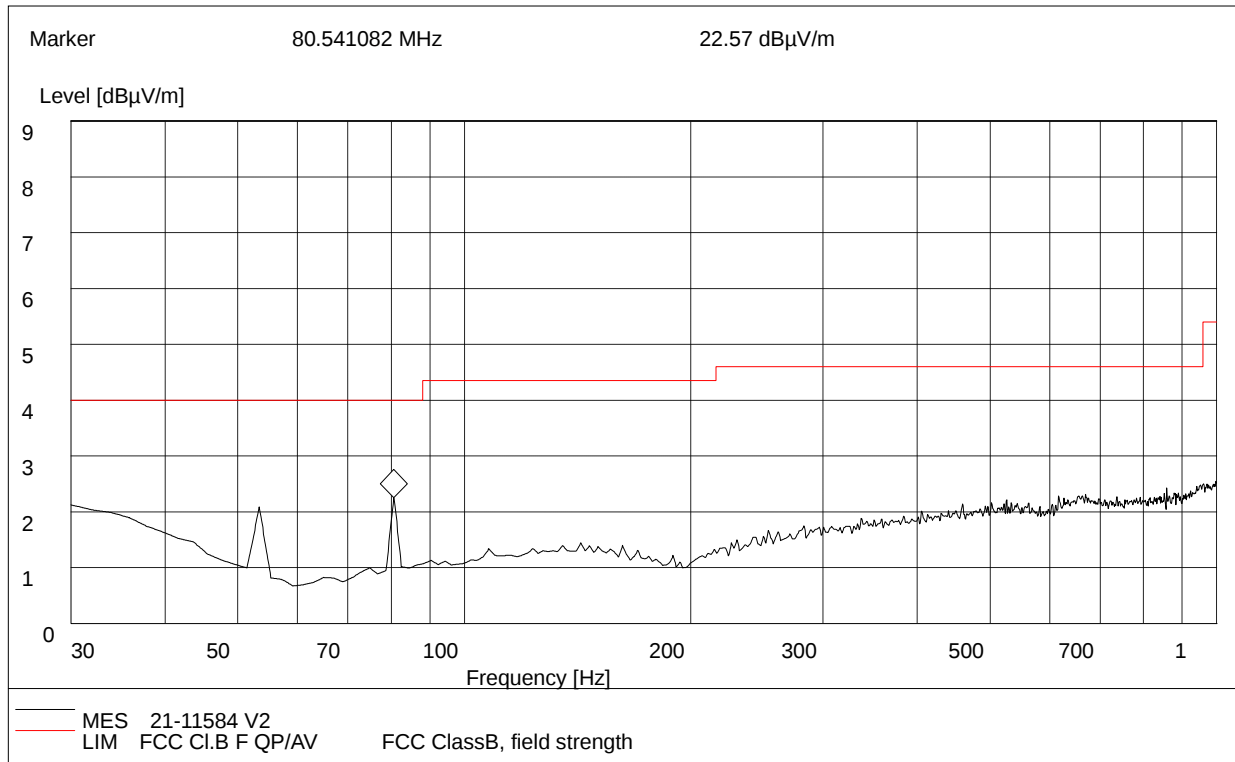
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1000MHz

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Corr.Factor (dB/m)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Polarity
30.000000	20.20	120.000	19.3	100.0	40.0	19.80	Horizontal
53.210000	11.53	120.000	8.6	100.0	40.0	28.47	Horizontal
142.650000	14.30	120.000	12.6	100.0	43.5	29.20	Horizontal
337.560000	27.64	120.000	16.9	100.0	46.0	18.36	Horizontal
405.530000	31.20	120.000	17.9	100.0	46.0	14.80	Horizontal
459.590000	29.53	120.000	18.9	100.0	46.0	19.80	Horizontal

Test Result : Pass**Remark:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB).
3. Margin value = Limit value - Emission Level.
4. The other emission levels were very low against the limit.



Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Corr.Factor (dB/m)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Polarity
30.000000	21.29	120.000	19.3	100.0	40.0	18.71	Vertical
53.210000	20.84	120.000	8.6	100.0	40.0	19.16	Vertical
80.410000	22.50	120.000	8.5	100.0	40.0	17.50	Vertical
134.560000	13.50	120.000	12.6	100.0	43.5	30.00	Vertical
663.700000	22.83	120.000	21.8	100.0	46.0	23.17	Vertical
858.080000	23.43	120.000	23.9	100.0	46.0	22.57	Vertical

Test Result : Pass

Remark:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB).
3. Margin value = Limit value - Emission Level.
4. The other emission levels were very low against the limit.

For 1GHz to 25GHz

2.4G Wi-Fi 802.11b_2412MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
2390.00	62.52	74.00	-11.48	1.60	220	61.22	1.30	Horizontal	Peak
2390.00	44.63	54.00	-9.37	1.60	220	43.33	1.30	Horizontal	Average
4824.00	48.14	74.00	-25.86	1.60	220	41.74	6.40	Horizontal	Peak
4824.00	38.07	54.00	-15.93	1.60	220	31.67	6.40	Horizontal	Average
7236.00	52.36	74.00	-21.64	1.60	220	41.86	10.50	Horizontal	Peak
7236.00	41.01	54.00	-12.99	1.60	220	30.51	10.50	Horizontal	Average
2390.00	62.47	74.00	-11.53	1.90	90	61.17	1.30	Vertical	Peak
2390.00	43.56	54.00	-10.44	1.90	90	42.26	1.30	Vertical	Average
4824.00	48.46	74.00	-25.54	1.90	90	42.06	6.40	Vertical	Peak
4824.00	37.61	54.00	-16.39	1.90	90	31.21	6.40	Vertical	Average
7236.00	52.03	74.00	-21.97	1.90	90	41.53	10.50	Vertical	Peak
7236.00	41.35	54.00	-12.65	1.90	90	30.85	10.50	Vertical	Average
2.4G Wi-Fi 802.11b_2437MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
4874.00	47.71	74.00	-26.29	1.60	220	41.91	5.80	Horizontal	Peak
4874.00	37.77	54.00	-16.23	1.60	220	31.97	5.80	Horizontal	Average
7311.00	52.79	74.00	-21.21	1.60	220	41.99	10.80	Horizontal	Peak
7311.00	40.52	54.00	-13.48	1.60	220	29.72	10.80	Horizontal	Average
4874.00	48.92	74.00	-25.08	1.90	90	43.12	5.80	Vertical	Peak
4874.00	37.87	54.00	-16.13	1.90	90	32.07	5.80	Vertical	Average
7311.00	52.24	74.00	-21.76	1.90	90	41.44	10.80	Vertical	Peak
7311.00	40.94	54.00	-13.06	1.90	90	30.14	10.80	Vertical	Average
Remark: 1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m) 2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB) 3. Margin value = Emission Level – Limit value 4. The emission levels of other frequencies are very lower than the limit and not show in test report.									

2.4G Wi-Fi 802.11b_2462MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
2483.50	62.15	74.00	-11.85	1.60	220	60.55	1.60	Horizontal	Peak
2483.50	44.36	54.00	-9.64	1.60	220	42.76	1.60	Horizontal	Average
4924.00	48.36	74.00	-25.64	1.60	220	42.66	5.70	Horizontal	Peak
4924.00	38.37	54.00	-15.63	1.60	220	32.67	5.70	Horizontal	Average
7386.00	51.90	74.00	-22.10	1.60	220	41.10	10.80	Horizontal	Peak
7386.00	40.55	54.00	-13.45	1.60	220	29.75	10.80	Horizontal	Average
2483.50	62.96	74.00	-11.04	1.90	90	61.36	1.60	Vertical	Peak
2483.50	43.07	54.00	-10.93	1.90	90	41.47	1.60	Vertical	Average
4924.00	48.53	74.00	-25.47	1.90	90	42.83	5.70	Vertical	Peak
4924.00	37.86	54.00	-16.14	1.90	90	32.16	5.70	Vertical	Average
7386.00	51.72	74.00	-22.28	1.90	90	40.92	10.80	Vertical	Peak
7386.00	41.46	54.00	-12.54	1.90	90	30.66	10.80	Vertical	Average
<i>Remark:</i> 1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m) 2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB) 3. Margin value = Emission Level – Limit value 4. The emission levels of other frequencies are very lower than the limit and not show in test report.									

2.4G Wi-Fi 802.11g_2412MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
2390.00	67.31	74.00	-6.69	1.60	220	66.01	1.30	Horizontal	Peak
2390.00	49.07	54.00	-4.93	1.60	220	47.77	1.30	Horizontal	Average
4824.00	48.18	74.00	-25.82	1.60	220	41.78	6.40	Horizontal	Peak
4824.00	38.73	54.00	-15.27	1.60	220	32.33	6.40	Horizontal	Average
7236.00	51.59	74.00	-22.41	1.60	220	41.09	10.50	Horizontal	Peak
7236.00	40.53	54.00	-13.47	1.60	220	30.03	10.50	Horizontal	Average
2390.00	67.43	74.00	-6.57	1.90	90	66.13	1.30	Vertical	Peak
2390.00	48.69	54.00	-5.31	1.90	90	47.39	1.30	Vertical	Average
4824.00	48.43	74.00	-25.57	1.90	90	42.03	6.40	Vertical	Peak
4824.00	37.63	54.00	-16.37	1.90	90	31.23	6.40	Vertical	Average
7236.00	51.58	74.00	-22.42	1.90	90	41.08	10.50	Vertical	Peak
7236.00	41.81	54.00	-12.19	1.90	90	31.31	10.50	Vertical	Average
2.4G Wi-Fi 802.11g_2437MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
4874.00	47.94	74.00	-26.06	1.60	220	42.14	5.80	Horizontal	Peak
4874.00	37.60	54.00	-16.40	1.60	220	31.80	5.80	Horizontal	Average
7311.00	52.82	74.00	-21.18	1.60	220	42.02	10.80	Horizontal	Peak
7311.00	40.63	54.00	-13.37	1.60	220	29.83	10.80	Horizontal	Average
4874.00	49.32	74.00	-24.68	1.90	90	43.52	5.80	Vertical	Peak
4874.00	38.25	54.00	-15.75	1.90	90	32.45	5.80	Vertical	Average
7311.00	52.57	74.00	-21.43	1.90	90	41.77	10.80	Vertical	Peak
7311.00	40.89	54.00	-13.11	1.90	90	30.09	10.80	Vertical	Average
Remark: 1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m) 2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB) 3. Margin value = Emission Level – Limit value 4. The emission levels of other frequencies are very lower than the limit and not show in test report.									

2.4G Wi-Fi 802.11g_2462MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
2483.50	64.70	74.00	-9.30	1.60	220	63.10	1.60	Horizontal	Peak
2483.50	50.98	54.00	-3.02	1.60	220	49.38	1.60	Horizontal	Average
4924.00	48.46	74.00	-25.54	1.60	220	42.76	5.70	Horizontal	Peak
4924.00	38.55	54.00	-15.45	1.60	220	32.85	5.70	Horizontal	Average
7386.00	52.08	74.00	-21.92	1.60	220	41.28	10.80	Horizontal	Peak
7386.00	40.26	54.00	-13.74	1.60	220	29.46	10.80	Horizontal	Average
2483.50	65.63	74.00	-8.37	1.90	90	64.03	1.60	Vertical	Peak
2483.50	52.06	54.00	-1.94	1.90	90	50.46	1.60	Vertical	Average
4924.00	48.20	74.00	-25.80	1.90	90	42.50	5.70	Vertical	Peak
4924.00	37.94	54.00	-16.06	1.90	90	32.24	5.70	Vertical	Average
7386.00	51.26	74.00	-22.74	1.90	90	40.46	10.80	Vertical	Peak
7386.00	41.42	54.00	-12.58	1.90	90	30.62	10.80	Vertical	Average
<i>Remark:</i> 1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m) 2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB) 3. Margin value = Emission Level – Limit value 4. The emission levels of other frequencies are very lower than the limit and not show in test report.									

2.4G Wi-Fi 802.11n-HT20_2412MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
2390.00	62.40	74.00	-11.60	1.60	220	61.10	1.30	Horizontal	Peak
2390.00	48.23	54.00	-5.77	1.60	220	46.93	1.30	Horizontal	Average
4824.00	48.11	74.00	-25.89	1.60	220	41.71	6.40	Horizontal	Peak
4824.00	38.94	54.00	-15.06	1.60	220	32.54	6.40	Horizontal	Average
7236.00	51.78	74.00	-22.22	1.60	220	41.28	10.50	Horizontal	Peak
7236.00	41.00	54.00	-13.00	1.60	220	30.50	10.50	Horizontal	Average
2390.00	61.47	74.00	-12.53	1.90	90	60.17	1.30	Vertical	Peak
2390.00	47.09	54.00	-6.91	1.90	90	45.79	1.30	Vertical	Average
4824.00	48.63	74.00	-25.37	1.90	90	42.23	6.40	Vertical	Peak
4824.00	37.81	54.00	-16.19	1.90	90	31.41	6.40	Vertical	Average
7236.00	52.05	74.00	-21.95	1.90	90	41.55	10.50	Vertical	Peak
7236.00	41.41	54.00	-12.59	1.90	90	30.91	10.50	Vertical	Average
2.4G Wi-Fi 802.11n-HT20_2437MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
4874.00	48.17	74.00	-25.83	1.60	220	42.37	5.80	Horizontal	Peak
4874.00	37.77	54.00	-16.23	1.60	220	31.97	5.80	Horizontal	Average
7311.00	52.61	74.00	-21.39	1.60	220	41.81	10.80	Horizontal	Peak
7311.00	40.46	54.00	-13.54	1.60	220	29.66	10.80	Horizontal	Average
4874.00	49.54	74.00	-24.46	1.90	90	43.74	5.80	Vertical	Peak
4874.00	38.54	54.00	-15.46	1.90	90	32.74	5.80	Vertical	Average
7311.00	52.69	74.00	-21.31	1.90	90	41.89	10.80	Vertical	Peak
7311.00	41.30	54.00	-12.70	1.90	90	30.50	10.80	Vertical	Average
Remark: 1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m) 2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB) 3. Margin value = Emission Level – Limit value 4. The emission levels of other frequencies are very lower than the limit and not show in test report.									

2.4G Wi-Fi 802.11n-HT20_2462MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
2483.50	63.37	74.00	-10.63	1.60	220	61.77	1.60	Horizontal	Peak
2483.50	49.75	54.00	-4.25	1.60	220	48.15	1.60	Horizontal	Average
4924.00	48.58	74.00	-25.42	1.60	220	42.88	5.70	Horizontal	Peak
4924.00	38.80	54.00	-15.20	1.60	220	33.10	5.70	Horizontal	Average
7386.00	51.70	74.00	-22.30	1.60	220	40.90	10.80	Horizontal	Peak
7386.00	40.48	54.00	-13.52	1.60	220	29.68	10.80	Horizontal	Average
2483.50	62.05	74.00	-11.95	1.90	90	60.45	1.60	Vertical	Peak
2483.50	46.71	54.00	-7.29	1.90	90	45.11	1.60	Vertical	Average
4924.00	49.13	74.00	-24.87	1.90	90	43.43	5.70	Vertical	Peak
4924.00	37.89	54.00	-16.11	1.90	90	32.19	5.70	Vertical	Average
7386.00	52.18	74.00	-21.82	1.90	90	41.38	10.80	Vertical	Peak
7386.00	41.97	54.00	-12.03	1.90	90	31.17	10.80	Vertical	Average
<i>Remark:</i> 1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m) 2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB) 3. Margin value = Emission Level – Limit value 4. The emission levels of other frequencies are very lower than the limit and not show in test report.									

3. List of measuring equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2020.08.13	2021.08.12
					2021.08.03	2022.08.02
2	Power Meter	R&S	NRP-Z31	A141001975	2021.05.08	2022.05.07
3	5M Anechoic Chamber	Albatross	SAC-5MAC 12.8x6.8x6.4m	A0304210	2019.03.25	2023.03.24
4	Loop Antenna	Schwarz beck	HFH2-Z2	A0304220	2019.04.26	2022.04.25
5	Broadband antenna (30MHz~1GHz)	R&S	HL562	A0304224	2020.06.19	2023.06.18
6	EMI Horn Ant. (1-18G)	ETC	1209	A150402241	2021.01.02	2024.01.01
7	Horn antenna (18GHz~26.5GHz)	AR	AT4510	A0804450	2020.06.19	2023.06.18
8	Amplifier 30M~1GHz	MILMEGA	80RF1000-10004	A140101634	2020.09.22	2023.09.21
9	Amplifier 1G~18GHz	MILMEGA	AS0104R-800/400	A160302517	2020.03.23	2021.03.22
					2021.12.23	2022.12.22
10	Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2021.04.26	2022.04.25
					2022.03.25	2023.03.24
11	Test Receiver	R&S	ESIB7	A0501375	2021.05.24	2022.05.23
12	Broadband Ant.	2786	ETC	A150402240	2018.09.17	2021.09.16
					2021.09.16	2024.03.03
13	3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2019.03.26	2023.03.25
14	Temperature chamber	TABAI	PS-232	A8708054	2020.10.30	2021.10.29
					2021.09.24	2022.09.23
15	Test Receiver	KEYSIGHT	N9038A	A141202036	2020.09.21	2021.09.20
					2021.09.20	2022.08.04
16	LISN	ROHDE&SCHWARZ	ENV216	A140701847	2020.09.21	2021.09.20
					2021.09.21	2022.08.02

4. Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All the measurement uncertainty value were shown with a coverage $K=2$ to indicate 95% level of confidence . The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of AC Power Line Conducted Emission Measurement (150KHz~30MHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	2.8dB
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Uncertainty of Radiated Emission Measurement (9KHz~30MHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	3.5dB
---	-------

Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	3.91dB
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Uncertainty of Radiated Emission Measurement (1GHz~18GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	4.5dB
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Uncertainty of Radiated Emission Measurement (18GHz~40GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	4.9dB
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Uncertainty of RF Conducted Measurement (9KHz~40GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	1.3dB
---	-------

Appendix A

RF Output Power

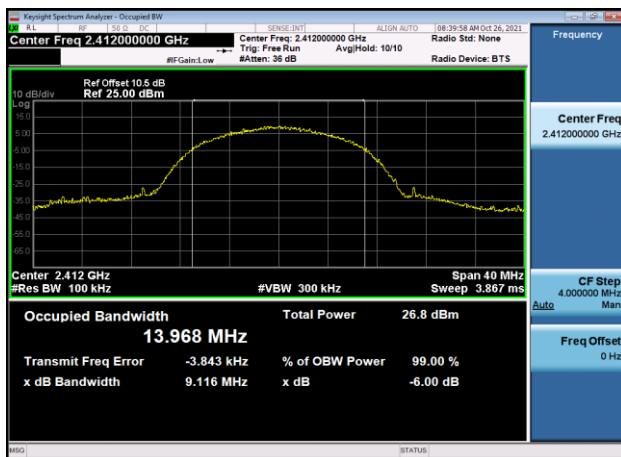
Test Result and Data

Conducted Output Power (Peak)				
Mode	Test Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)	Result
802.11b	2412	17.34	30	Pass
802.11b	2437	17.58	30	Pass
802.11b	2462	17.99	30	Pass
802.11g	2412	15.73	30	Pass
802.11g	2437	16.11	30	Pass
802.11g	2462	16.34	30	Pass
802.11n (HT20)	2412	13.67	30	Pass
802.11n (HT20)	2437	14.19	30	Pass
802.11n (HT20)	2462	14.45	30	Pass

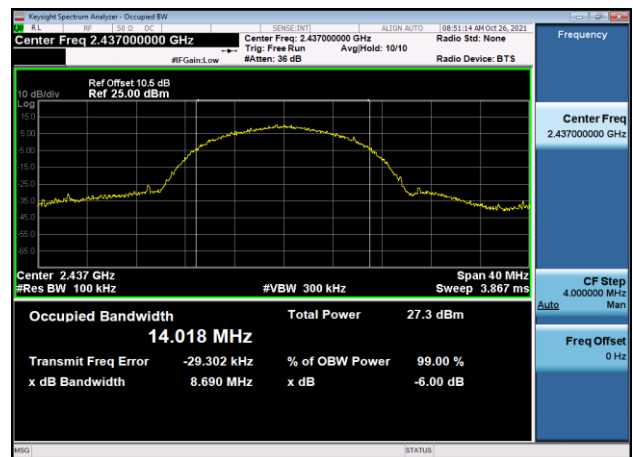
6dB Bandwidth Test Result and Data

WLAN 6dB Bandwidth				
Mode	Test Frequency (MHz)	Occupied Bandwidth (MHz)	Limit (KHz)	Result
802.11b	2412	9.12	500	Pass
802.11b	2437	8.69	500	Pass
802.11b	2462	8.64	500	Pass
802.11g	2412	16.38	500	Pass
802.11g	2437	16.39	500	Pass
802.11g	2462	16.40	500	Pass
802.11n (HT20)	2412	16.37	500	Pass
802.11n (HT20)	2437	16.68	500	Pass
802.11n (HT20)	2462	16.65	500	Pass

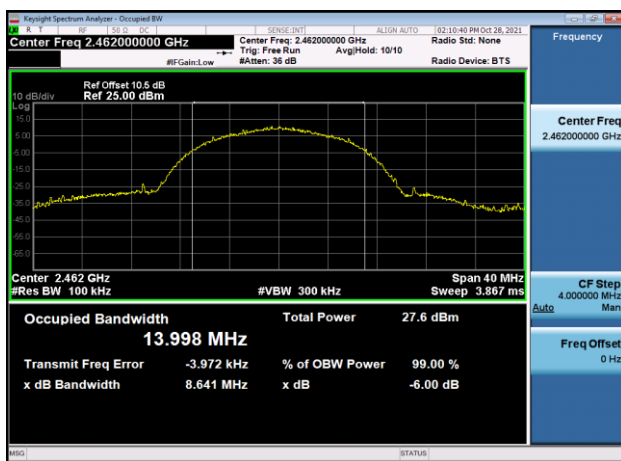
6dB Bandwidth-802.11b,2412MHz,Ant0



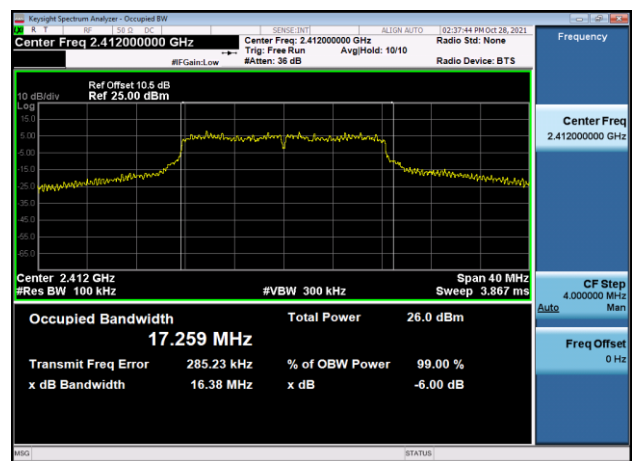
6dB Bandwidth-802.11b,2437MHz,Ant0



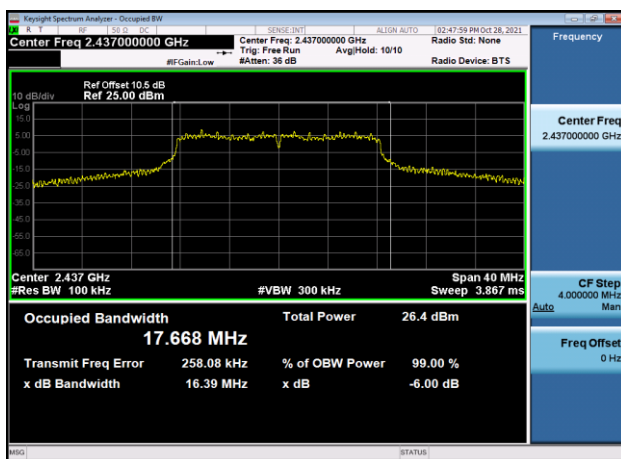
6dB Bandwidth-802.11b,2462MHz,Ant0



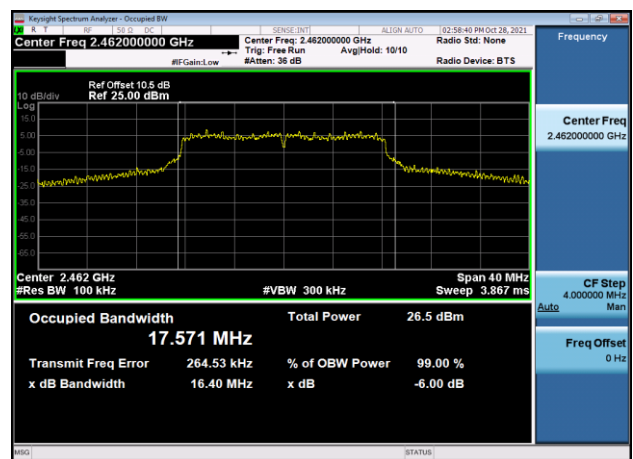
6dB Bandwidth-802.11g,2412MHz,Ant0



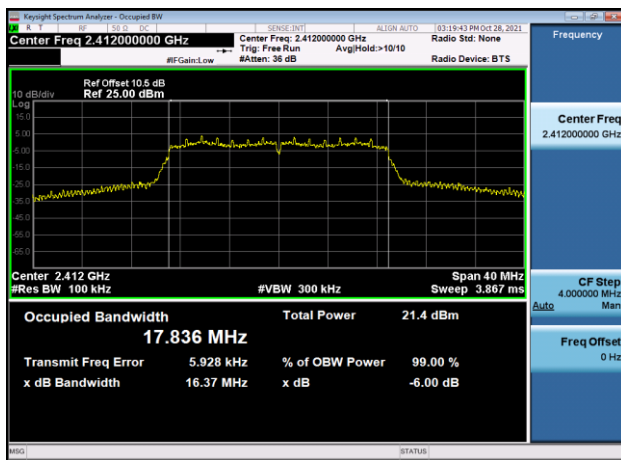
6dB Bandwidth-802.11g,2437MHz,Ant0



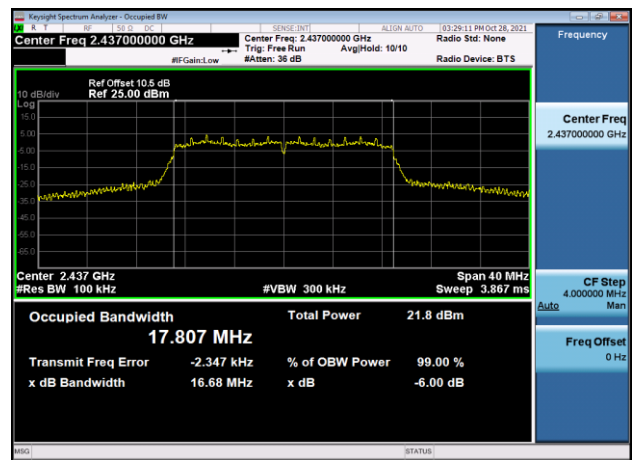
6dB Bandwidth-802.11g,2462MHz,Ant0



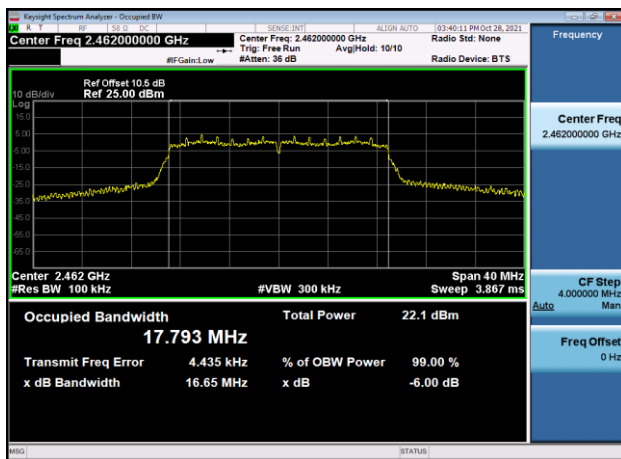
6dB Bandwidth-802.11n(HT20),2412MHz
,Ant0



6dB Bandwidth-802.11n(HT20),2437MHz
,Ant0

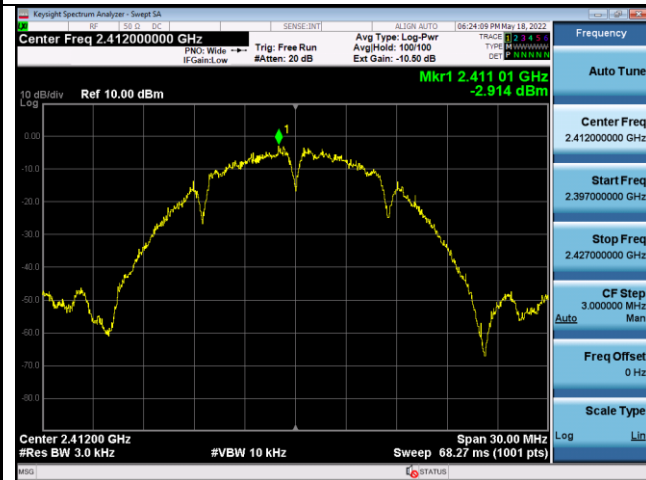
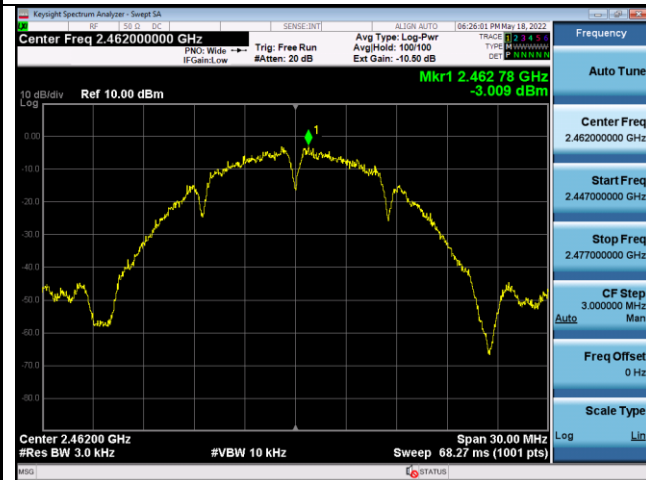
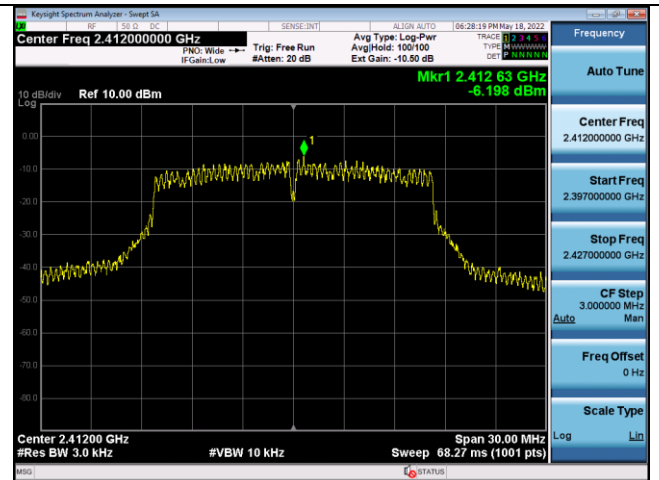
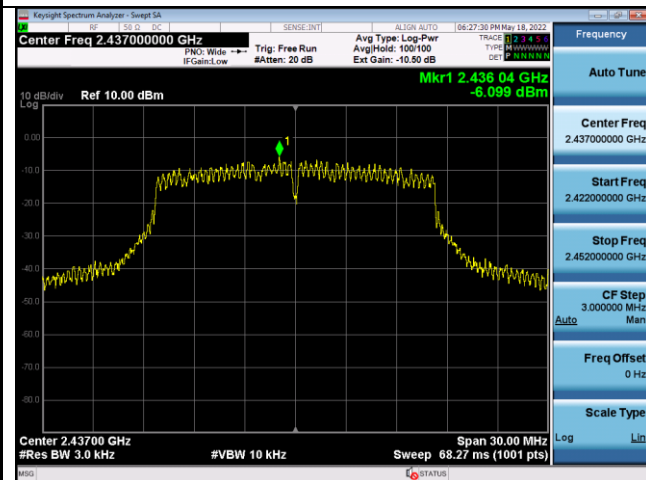
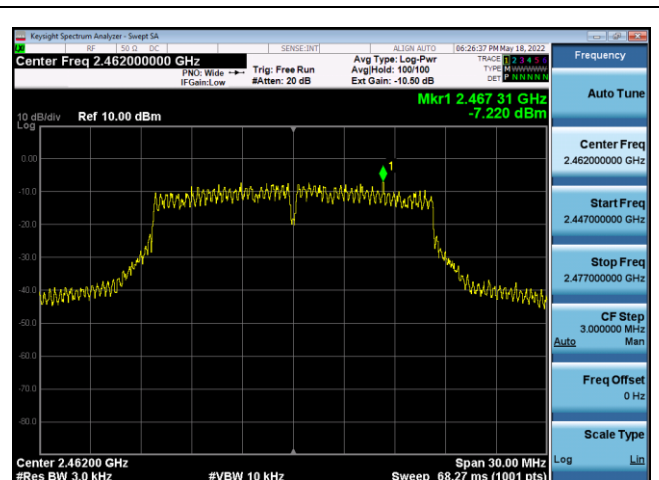


6dB Bandwidth-802.11n(HT20),2462MHz
,Ant0

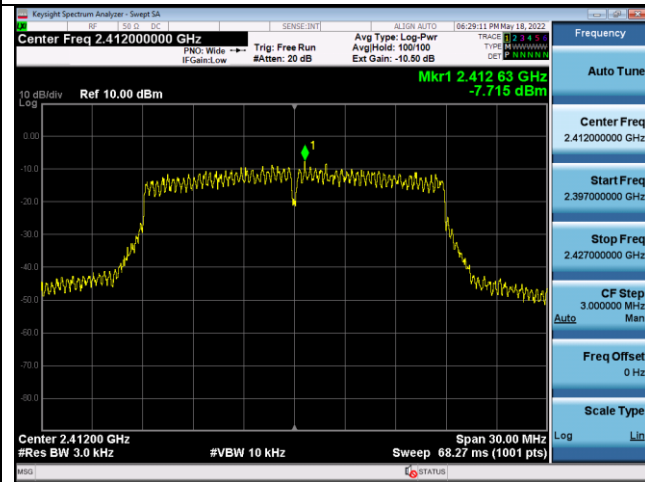


Power Spectral Density**Test Result and Data**

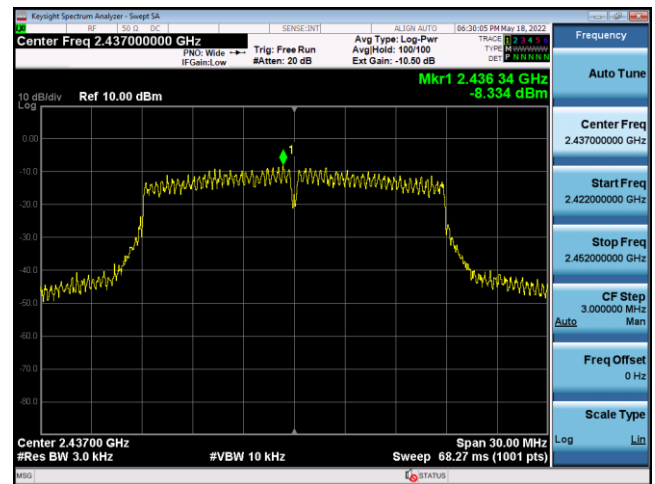
Power Spectral Density				
Mode	Test Frequency (MHz)	PSD (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	2412	-2.914	8	Pass
802.11b	2437	-2.903	8	Pass
802.11b	2462	-3.009	8	Pass
802.11g	2412	-6.198	8	Pass
802.11g	2437	-6.099	8	Pass
802.11g	2462	-7.220	8	Pass
802.11n (HT20)	2412	-7.715	8	Pass
802.11n (HT20)	2437	-8.334	8	Pass
802.11n (HT20)	2462	-8.087	8	Pass

Power spectral density-802.11b
,2412MHz,Ant0Power spectral density-802.11b
,2437MHz,Ant0Power spectral density-802.11b
,2462MHz,Ant0Power spectral density-802.11g
,2412MHz,Ant0Power spectral density-802.11g
,2437MHz,Ant0Power spectral density-802.11g
,2462MHz,Ant0

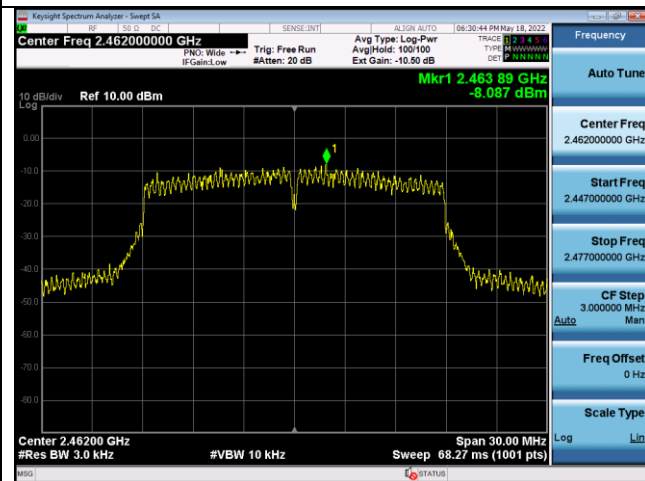
Power spectral density-802.11n(HT20)
,2412MHz,Ant0



Power spectral density-802.11n(HT20)
,2437MHz,Ant0

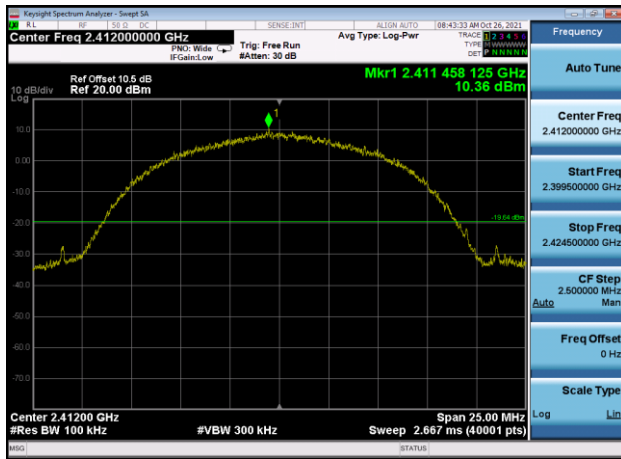


Power spectral density-802.11n(HT20)
,2462MHz,Ant0



Conducted Band Edges and Spurious Emissions Test Result and Data

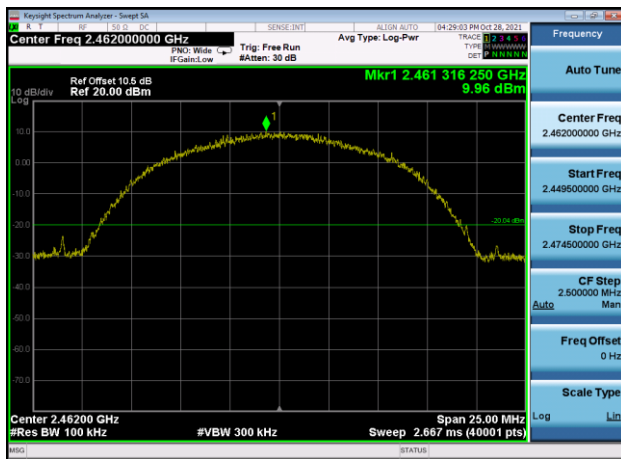
,Plot 1,Reference Level-802.11b
,2412MHz,Ant0



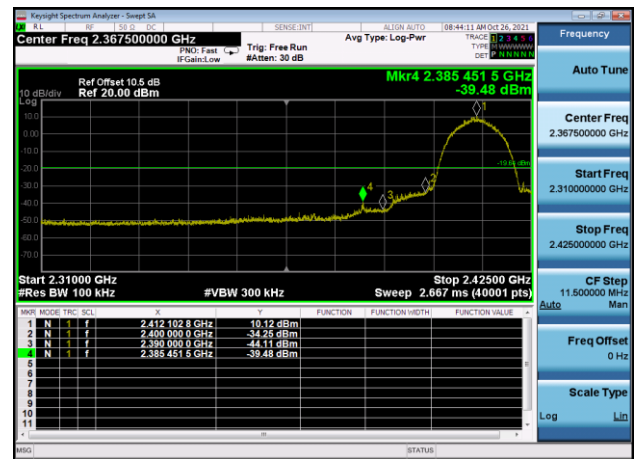
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,2437MHz,Ant0



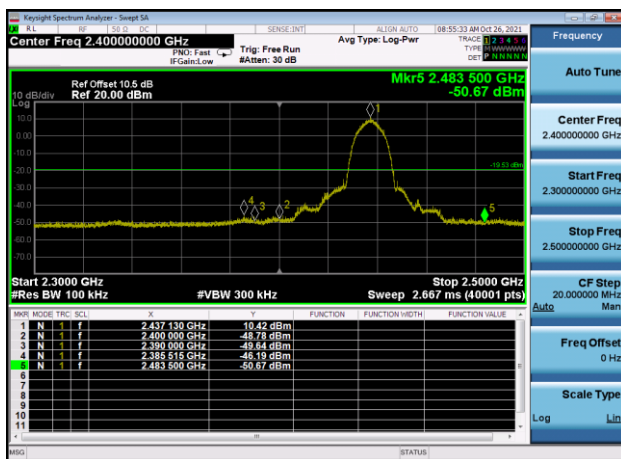
,Plot 1,Reference Level-802.11b
,2462MHz,Ant0



,Plot 2,Band Edge-802.11b,2412MHz
,Ant0



,Plot 2,Band Edge-802.11b,2437MHz
,Ant0

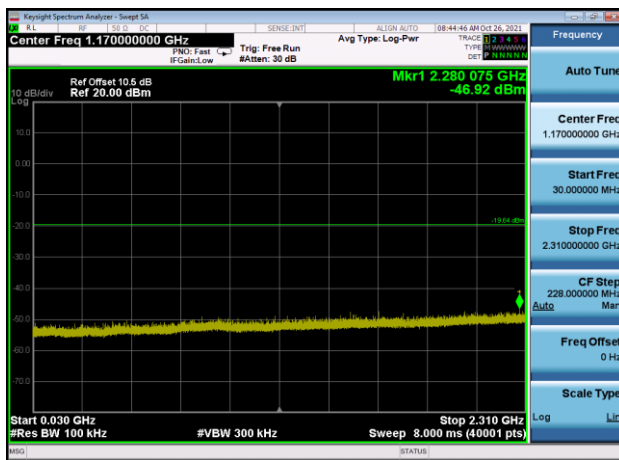


,Plot 2,Band Edge-802.11b,2462MHz
,Ant0



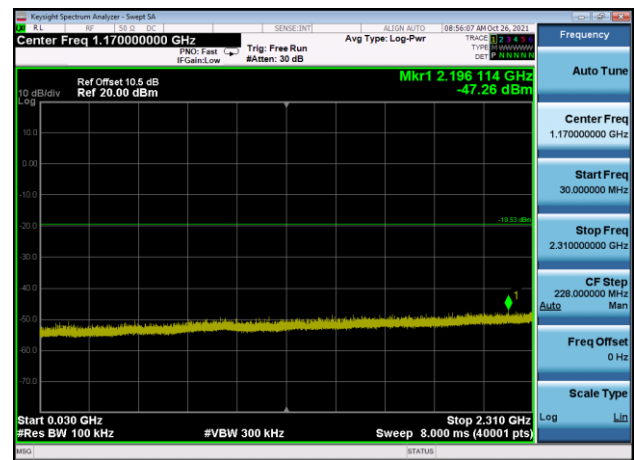
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,Ant0



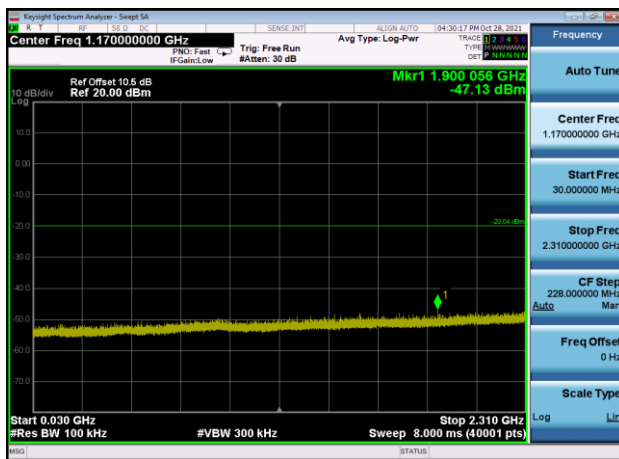
,Plot 3,30MHz~2310MHz-802.11b,2437MHz

,Ant0



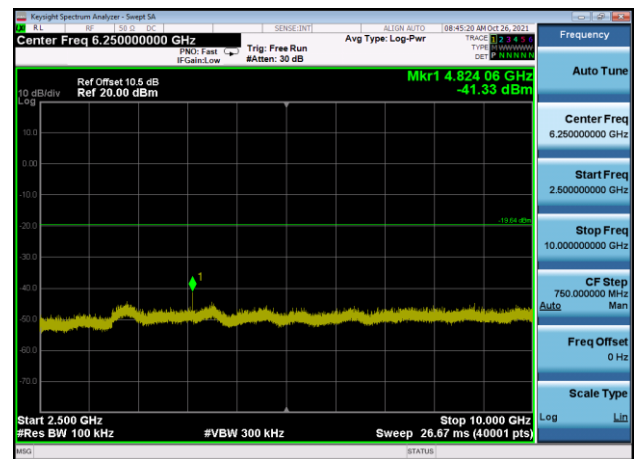
,Plot 3,30MHz~2310MHz-802.11b,2462MHz

,Ant0



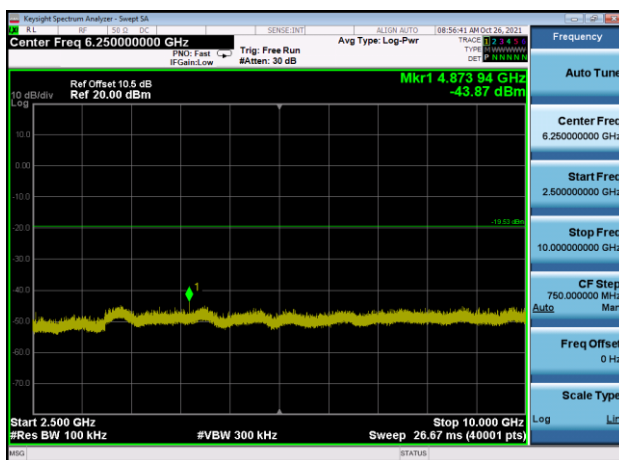
,Plot 4,2500MHz~10000MHz-802.11b

,2412MHz,Ant0



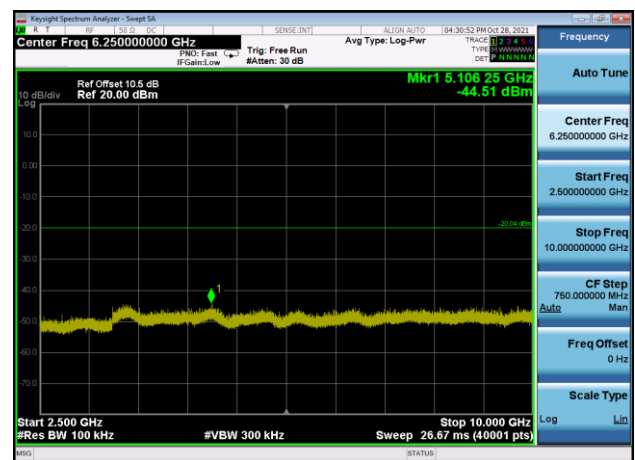
,Plot 4,2500MHz~10000MHz-802.11b

,2437MHz,Ant0

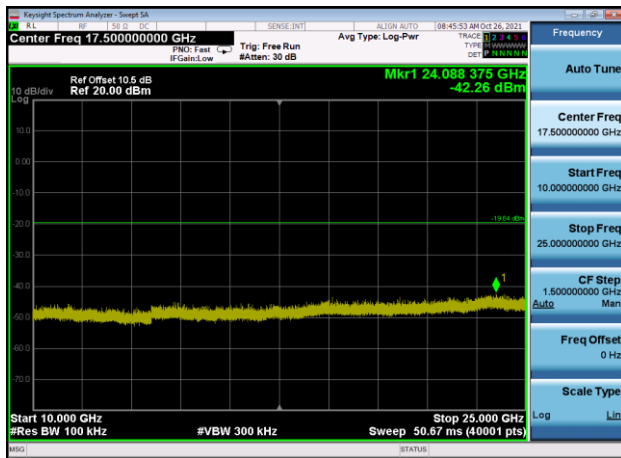


,Plot 4,2500MHz~10000MHz-802.11b

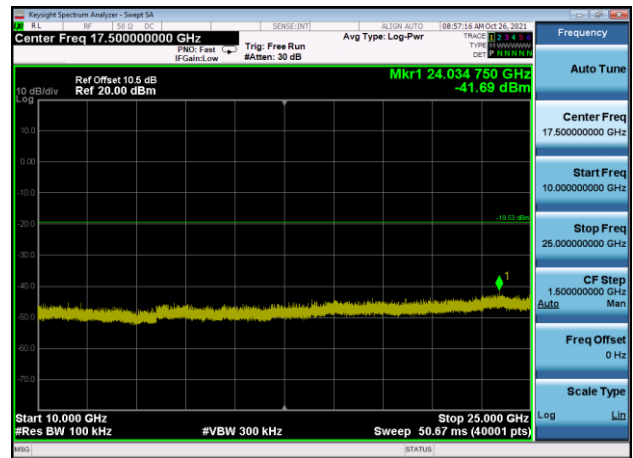
,2462MHz,Ant0



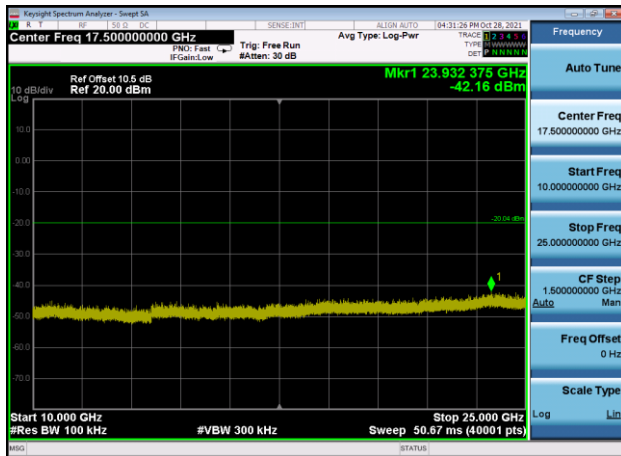
,Plot 5,10000MHz~25000MHz-802.11b
,2412MHz,Ant0



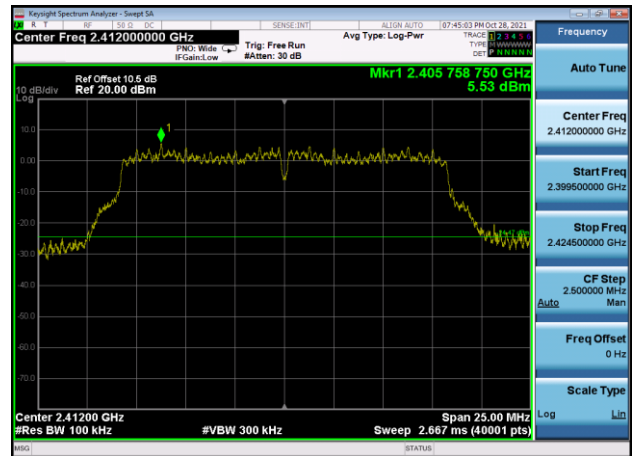
,Plot 5,10000MHz~25000MHz-802.11b
,2437MHz,Ant0



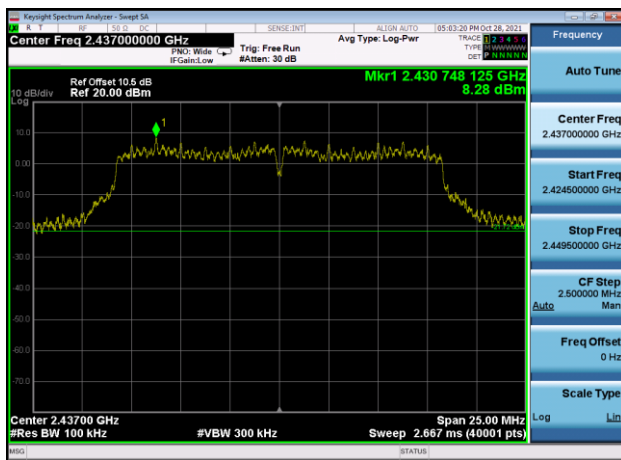
,Plot 5,10000MHz~25000MHz-802.11b
,2462MHz,Ant0



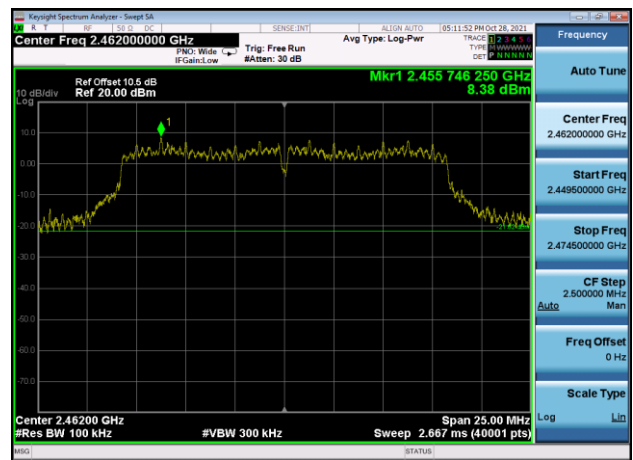
,Plot 1,Reference Level-802.11g
,2412MHz,Ant0



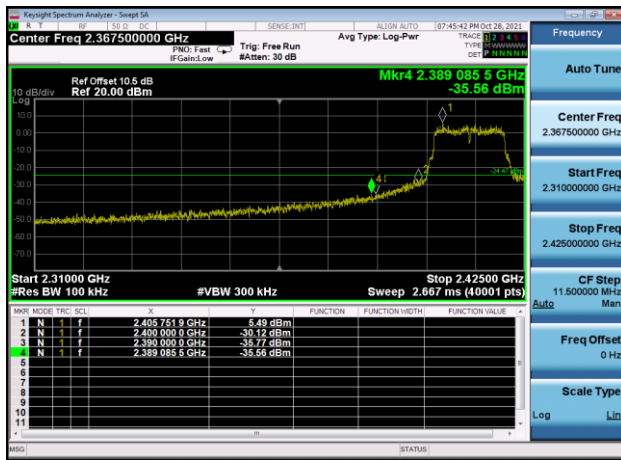
,Plot 1,Reference Level-802.11g
,2437MHz,Ant0



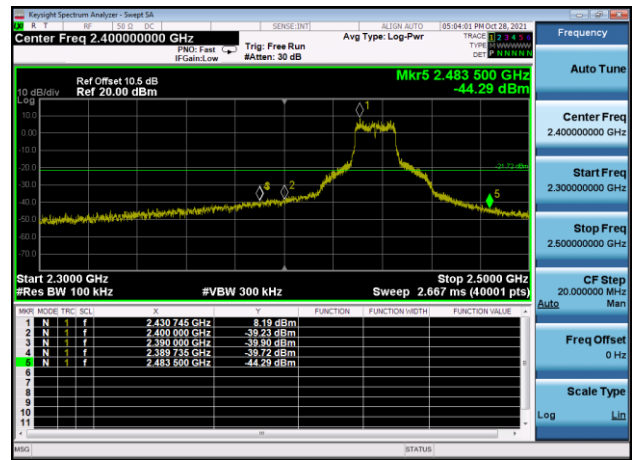
,Plot 1,Reference Level-802.11g
,2462MHz,Ant0



,Plot 2,Band Edge-802.11g,2412MHz
,Ant0



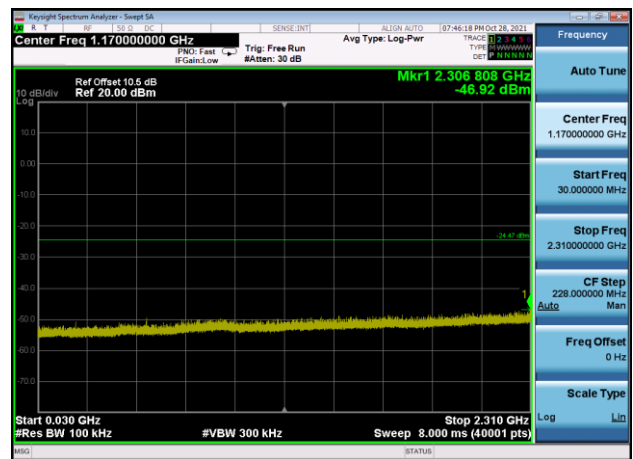
,Plot 2,Band Edge-802.11g,2437MHz
,Ant0



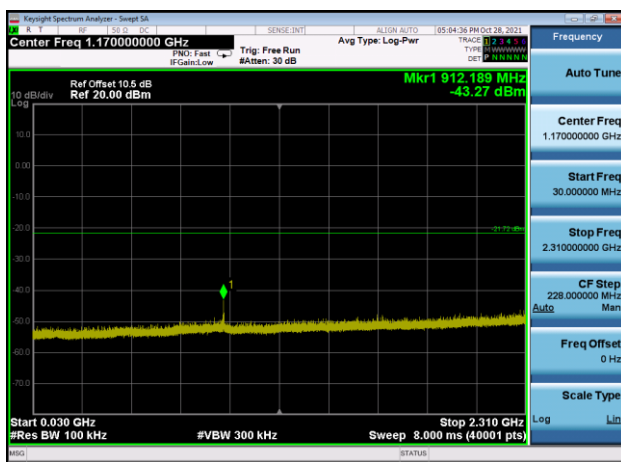
,Plot 2,Band Edge-802.11g,2462MHz
,Ant0



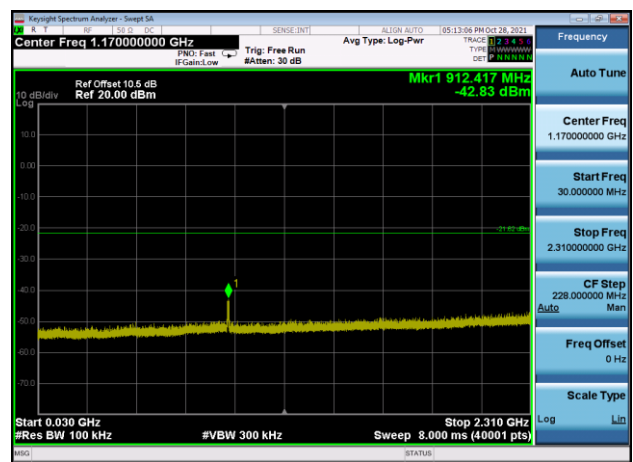
,Plot 3,30MHz~2310MHz-802.11g,2412MHz
,Ant0



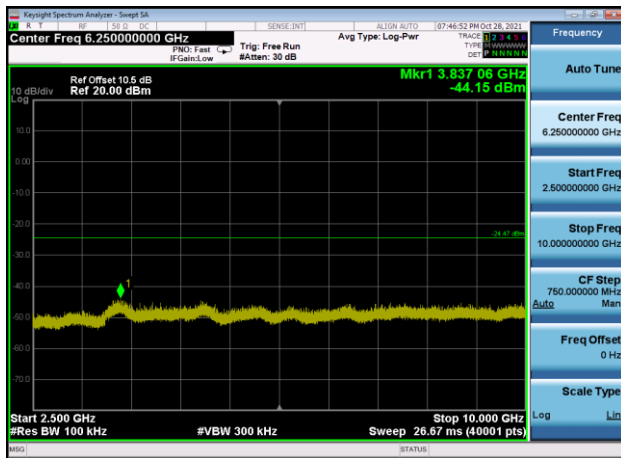
,Plot 3,30MHz~2310MHz-802.11g,2437MHz
,Ant0



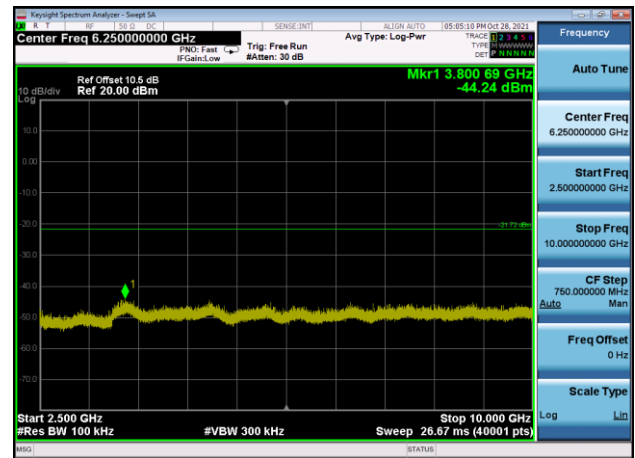
,Plot 3,30MHz~2310MHz-802.11g,2462MHz
,Ant0



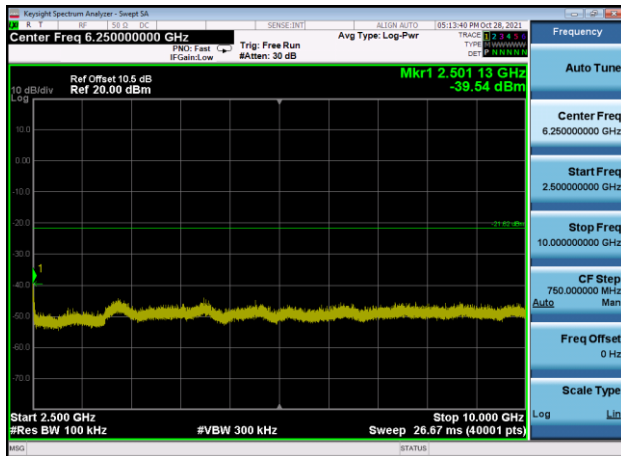
,Plot 4,2500MHz~10000MHz-802.11g
,2412MHz,Ant0



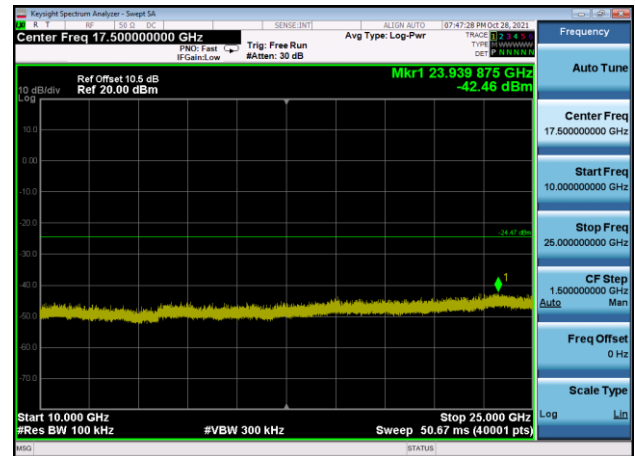
,Plot 4,2500MHz~10000MHz-802.11g
,2437MHz,Ant0



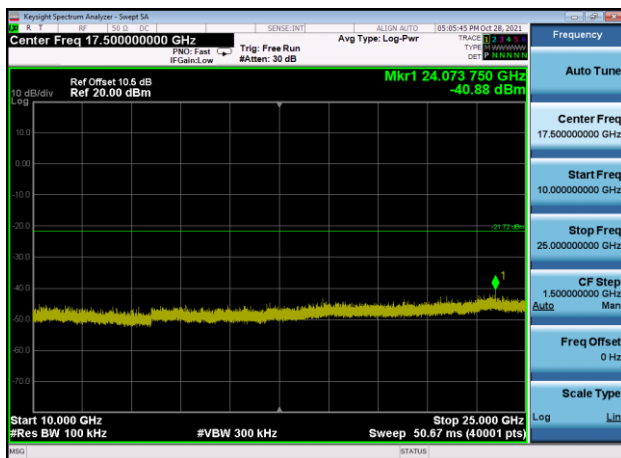
,Plot 4,2500MHz~10000MHz-802.11g
,2462MHz,Ant0



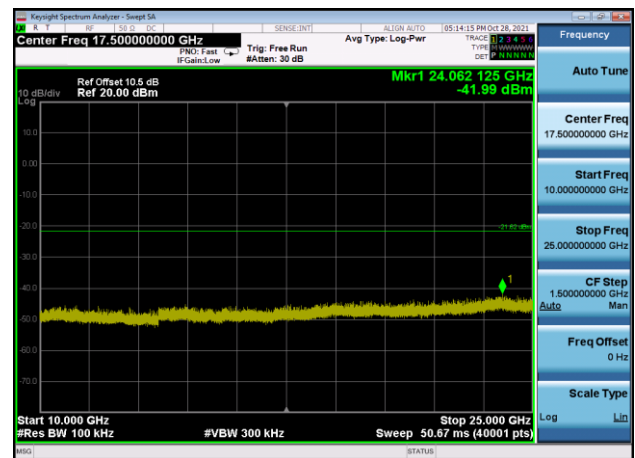
,Plot 5,10000MHz~25000MHz-802.11g
,2412MHz,Ant0



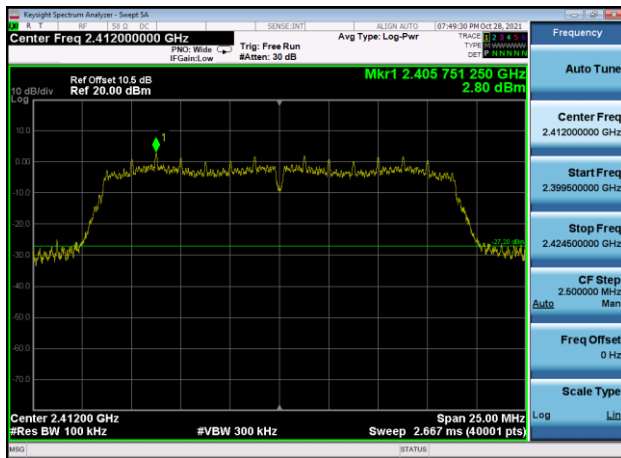
,Plot 5,10000MHz~25000MHz-802.11g
,2437MHz,Ant0



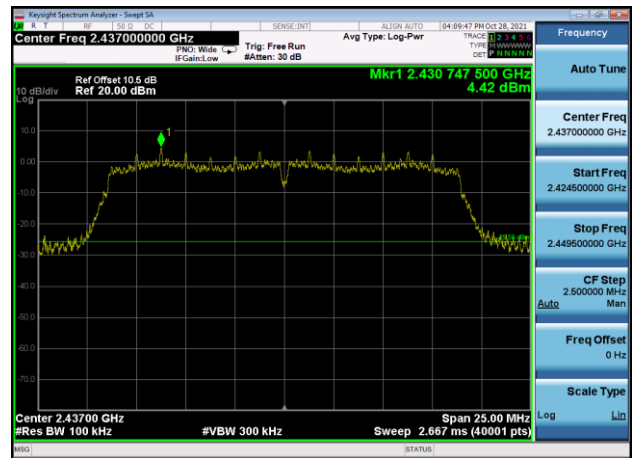
,Plot 5,10000MHz~25000MHz-802.11g
,2462MHz,Ant0



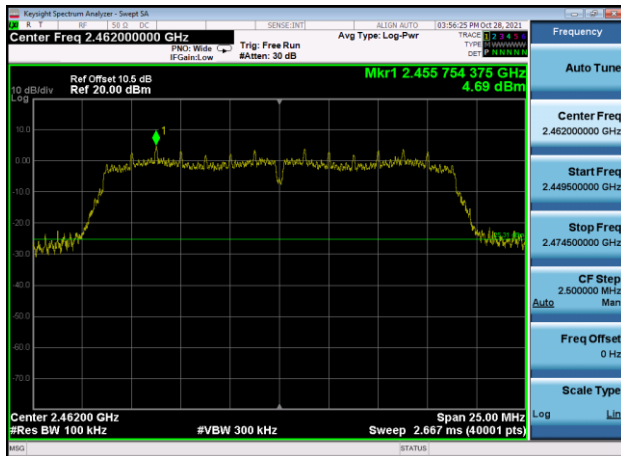
,Plot 1,Reference Level-802.11n(HT20)
,2412MHz,Ant0



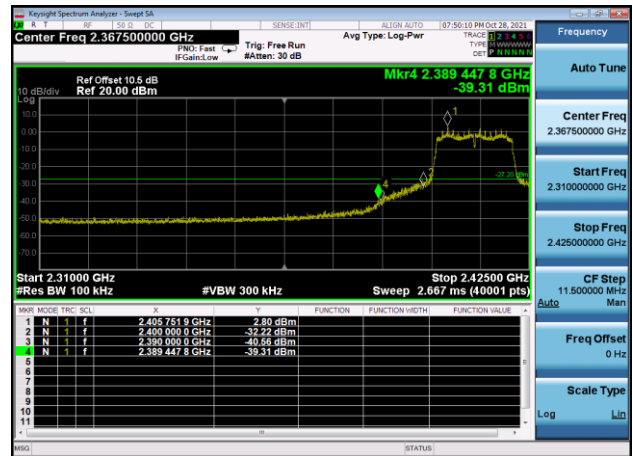
,Plot 1,Reference Level-802.11n(HT20)
,2437MHz,Ant0



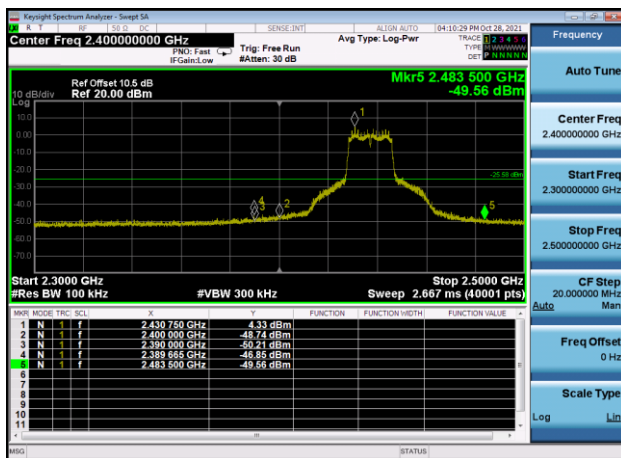
,Plot 1,Reference Level-802.11n(HT20)
,2462MHz,Ant0



,Plot 2,Band Edge-802.11n(HT20)
,2412MHz,Ant0



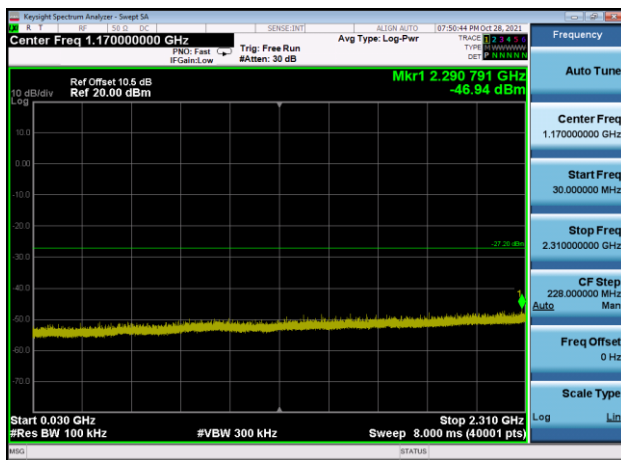
,Plot 2,Band Edge-802.11n(HT20)
,2437MHz,Ant0



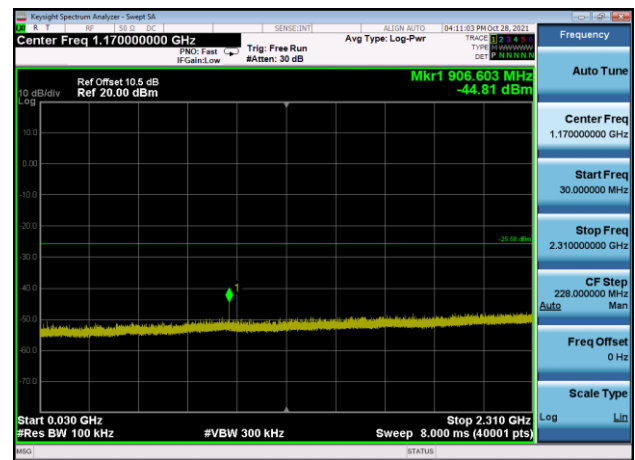
,Plot 2,Band Edge-802.11n(HT20)
,2462MHz,Ant0



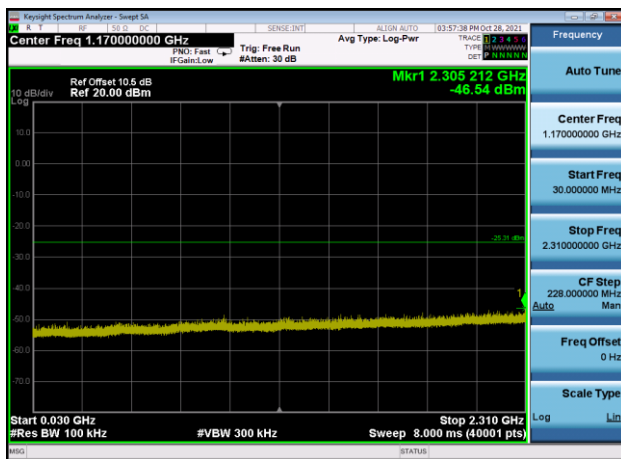
,Plot 3,30MHz~2310MHz-802.11n(HT20)
,2412MHz,Ant0



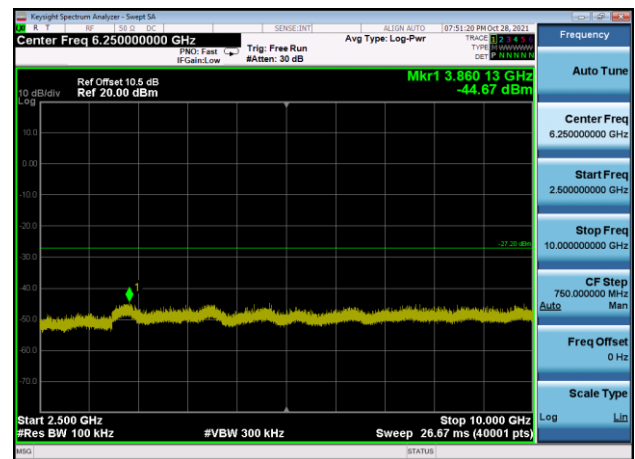
,Plot 3,30MHz~2310MHz-802.11n(HT20)
,2437MHz,Ant0



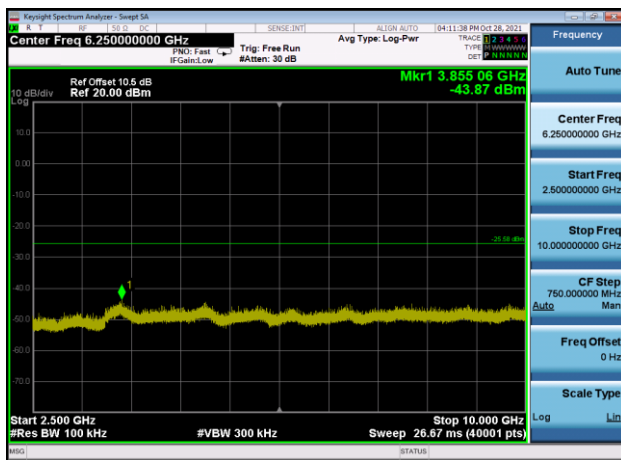
,Plot 3,30MHz~2310MHz-802.11n(HT20)
,2462MHz,Ant0



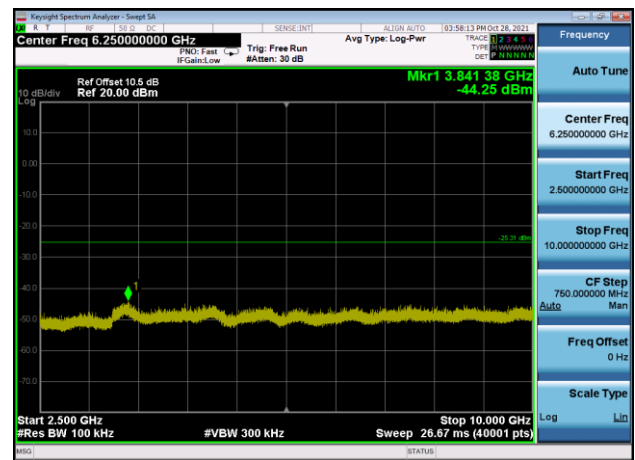
,Plot 4,2500MHz~10000MHz-802.11n(HT20)
,2412MHz,Ant0



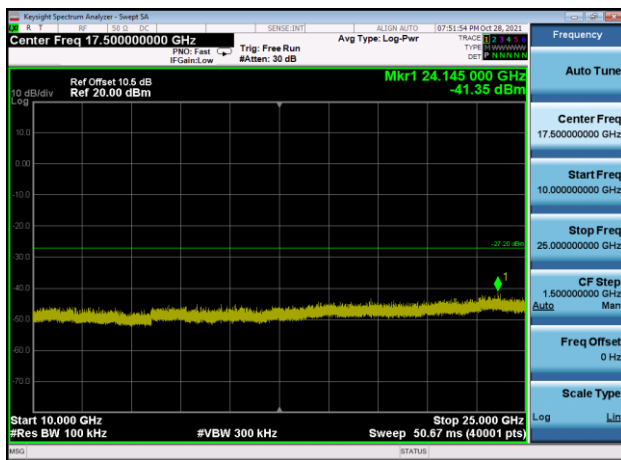
,Plot 4,2500MHz~10000MHz-802.11n(HT20)
,2437MHz,Ant0



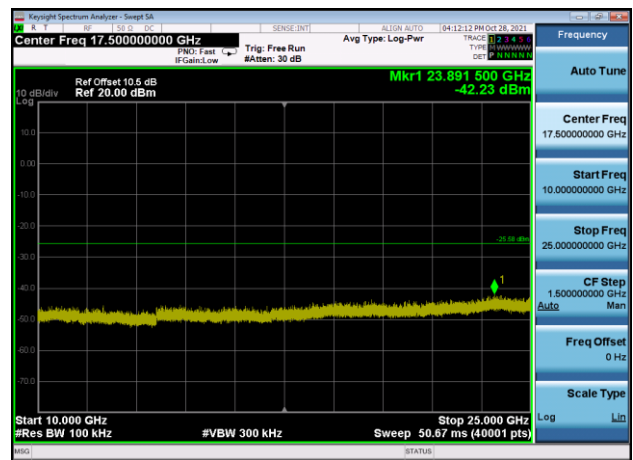
,Plot 4,2500MHz~10000MHz-802.11n(HT20)
,2462MHz,Ant0



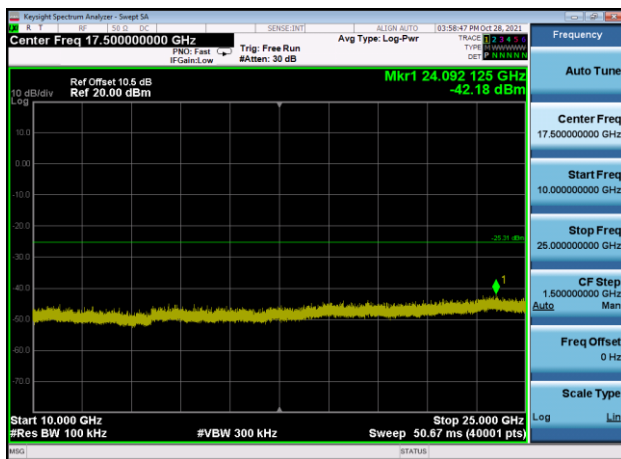
,Plot 5,10000MHz~25000MHz-802.11n(HT2
0),2412MHz,Ant0



,Plot 5,10000MHz~25000MHz-802.11n(HT2
0),2437MHz,Ant0



,Plot 5,10000MHz~25000MHz-802.11n(HT2
0),2462MHz,Ant0



END OF REPORT