中国认可
国际互认
检测
TESTING
CNAS L3163

CE Radio Test Report

Project No.	:	2304C059A
Equipment	:	Slot-in PC Module
Brand Name	:	ViewSonic
Test Model	:	VS19693
Series Model	:	VPC33-W33-G1, VPC35-W53-G1, VPC37-W53-G1
Applicant	:	ViewSonic Corporation
Address	:	10 Pointe Dr. Suite 200. Brea, CA92821, USA
Manufacturer	:	ViewSonic Corporation
Address	:	10 Pointe Dr. Suite 200. Brea, CA92821, USA
Date of Receipt	:	May 17, 2023
Date of Test	:	May 18, 2023 ~ Jul. 26, 2023
Issued Date	:	Aug. 18, 2023
Report Version	:	R01
Test Sample	:	Engineering Sample No.: DG2023051798
Standard(s)	:	ETSI EN 300 440 V2.1.1 (2017-03)

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.(Dongguan).

Prepared by : Sheldon Ou

Approved by : Ethan Ma

No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.
Tel: +86-769-8318-3000 Web: www.newbtl.com Service mail: btl_qa@newbtl.com

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any other agency.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

Table of Contents Page

Table of Contents Page

Table of Contents Page

REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-ETSP-6-2304C059A	R00	This is a copy report which referencing test data are provided from test report (BTL-ETSP-6-2304C059). The product name, brand name, model name, applicant and manufacturer information are changed which does not affect the test results, the rest are kept the same.	Aug. 14, 2023	Invalid
BTL-ETSP-6-2304C059A	R01	Modified the issued date.	Aug. 18, 2023	Valid

1. RF EMISSIONS MEASUREMENT

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-CB15 / TR13 / TR15 / TR17** at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.

1.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor) k=1.96 or k=2(which provide confidence levels of respectively 95% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).
Measurement Uncertainty for a Level of Confidence of 95.45%, U=2xUc(y).

The BTL measurement uncertainty as below table:

Parameters	**Uncertainty**
Radio frequency	±53.46 Hz
RF power (conducted)	±0.95 dB
Radiated emission of transmitter/receiver (25MHz ~ 1GHz)	±3.50 dB
Radiated emission of transmitter/receiver (1GHz ~ 18GHz)	±3.54 dB
Radiated emission of transmitter/receiver (18GHz ~ 40GHz)	±3.94 dB
Temperature	±0.08 °C
Humidity	±1.5 %
Voltage (DC)	±1 %
Voltage (AC, < 10 kHz)	±2 %

1.3 TEST CONDITIONS

	Normal Test Conditions	Extreme Test Conditions
Temperature	+15°C to +35°C	0°C to +45°C
Relative Humidity	20% to 75%	N/A
Supply Voltage	DC 19V	DC 17.1-20.9V Note: (2)

Test Item	Temperature	Humidity	Test Voltage	□ested By	Test Data
Equivalent isotropically radiated power (e.i.r.p.)	Normal & Extreme	50%	Normal & Extreme	Chen Mo	Jun. 07, 2023
Permitted range of operating frequencies	Normal & Extreme	50%	Normal & Extreme	Tember Zhuang	Jun. 07, 2023
Unwanted emissions in the spurious domain	25-27°C	48-50%	DC 19V	Zack Zhang Tember Zhuang	May 25, 2023 Jun. 13, 2023
Duty cycle	25°C	50%	DC 19V	Tember Zhuang	Jun. 07, 2023
Adjacent channel selectivity	23.4°C	53.3%	DC 19V	Jaden Kong	Jun. 18, 2023
Blocking or desensitization	23.4°C	53.3%	DC 19V	Jaden Kong	Jun. 18, 2023
Spurious radiations	25-27°C	48-50%	DC 19V	Zack Zhang Tember Zhuang	May 25, 2023 Jun. 13, 2023

Note:

(1) For tests at extreme temperatures, measurements shall be made in accordance with the procedures specified in clause 5.4.1.1, at the upper and lower temperatures of one of the following ranges, either:

The temperature range as declared by the manufacturer	0°C to +45°C	√
Category I (General):	-20°C to +55°C	
Category II (Portable):	-10°C to +55°C	
Category III (Equipment for normal indoor use):	5°C to +35°C	

(2) **Mains voltage:**

1) The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages, for which the equipment was designed.
2) The extreme test voltages for equipment to be connected to an ac mains source shall be the nominal mains voltage ±10 %. For equipment that operates over a range of mains voltages clause 5.7.2.4 applies.

Battery power sources

1) When the radio equipment is intended for operation with the usual types of battery power source, the normal test voltage shall be 1,1 multiplied by the nominal voltage of the battery (e.g. 6 V, 12 V, etc.).
2) When the radio equipment is intended for operation from the usual type of battery power sources the extreme test voltages shall be 1,3 and 0,9 multiplied by the nominal voltage of the battery (6 V, 12 V, etc.).
   For float charge applications using "gel-cell" type batteries the extreme voltage shall be 1,15 and 0,85 multiplied by the nominal voltage of the declared battery voltage.

Power sources using other types of batteries

The lower extreme test voltages for equipment with power sources using batteries shall be as follows:

- for equipment with a battery indicator, the end point voltage as indicated;
- for equipment without a battery indicator the following end point voltages shall be used:
  - for the Leclanché or the lithium type of battery:
    - 0,85 multiplied by the nominal voltage of the battery;
  - for the nickel-cadmium type of battery:
    - 0,9 multiplied by the nominal voltage of the battery;
- for other types of battery or equipment, the lower extreme test voltage for the discharged condition shall be declared by the equipment manufacturer.

The nominal voltage is considered to be the upper extreme test voltage in this case.

Other power sources

1) For operation from other power sources or types of battery (primary or secondary), the normal test voltage shall be that declared by the equipment manufacturer and agreed to by the accredited test laboratory. Such values shall be stated in the test report.
2) For equipment using other power sources, or capable of being operated from a variety of power sources, the extreme test voltages shall be those agreed between the equipment manufacturer and the test laboratory. This shall be recorded in the test report.

1.4 TEST CHANNEL

IEEE 802.11a / IEEE 802.11n(HT20) / IEEE 802.11ac(VHT20) / IEEE 802.11ax(HE20)		
Test Channel	EUT Channel	Test Frequency
Low	CH149	5745 MHz
Middle	CH157	5785 MHz
High	CH165	5825 MHz

IEEE 802.11n(HT40) / IEEE 802.11ac(VHT40) / IEEE 802.11ax(HE40)		
Test Channel	EUT Channel	Test Frequency
Low	CH151	5755 MHz
High	CH159	5795 MHz

IEEE 802.11ac(VHT80) / IEEE 802.11ax(HE80)		
Test Channel	EUT Channel	Test Frequency
High	CH155	5775 MHz

1.5 TEST METHODOLOGY AND RESULTS

Harmonised Standard ETSI EN 300 440					
Requirement			Requirement Conditionality		Observations
No	Description	Reference: Clause No	U/C	Condition	
1	e.i.r.p.	4.2.2	C	Applies to all devices with transmitters	PASS
2	Permitted range of operating frequencies	4.2.3	C	Applies to all devices with transmitters	PASS
3	Unwanted emissions in the spurious domain	4.2.4	C	Applies to all devices with transmitters	PASS **Note (2)**
4	Duty cycle	4.2.5.4	C	Transmitting devices which do not use LBT, DAA, or RFID transmitters operating in the 2 446 to 2 454 MHz band transmitting more than 500 mW e.i.r.p. power level	PASS
5	Additional requirements for FHSS equipment	4.2.6	C	Equipment utilizing FHSS modulation	N/A
6	Adjacent channel selectivity	4.3.3	C	Applies to equipment Category 1 receivers	PASS
7	Blocking or desensitization	4.3.4	C	Applies to category 1 and 2 receivers	PASS
8	Spurious radiations	4.3.5	C	Applies to all receivers, except receivers used in combination with permanently co-located transmitters continuously transmitting	PASS
9	Spectrum access techniques	4.4	C	Equipment which are not using duty cycle restrictions for media access	N/A
10	GBSAR antenna pattern	4.6.4	C	Applies only GBSAR systems	N/A
11	Limits for GBSAR	Annex F	C	Applies only GBSAR systems	N/A

Note:
(1) “U/C”: Indicates whether the requirement is unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).
”N/A”: indicates test is not applicable to this device.
(2) The emission of the transmitter on standby mode is equal to that of receiving mode.

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Slot-in PC Module
Brand Name	ViewSonic
Test Model	VS19693
Series Model	VPC33-W33-G1, VPC35-W53-G1, VPC37-W53-G1
Model Difference(s)	Only the model name is different.
Power Source	DC voltage supplied from AC adapter.(Support unit)
Power Rating	12-19V⎓8A
Operation Frequency	5725 MHz ~ 5850 MHz
Modulation Type	IEEE 802.11a/n/ac: OFDM IEEE 802.11ax: OFDMA
Bit Rate of Transmitter	IEEE 802.11a: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 300 Mbps IEEE 802.11ac: up to 1733.4 Mbps IEEE 802.11ax: up to 2402 Mbps
Max. e.i.r.p.	IEEE 802.11a: 13.91 dBm (24.60 mW) IEEE 802.11n(HT20): 13.88 dBm (24.43 mW) IEEE 802.11n(HT40): 13.80 dBm (23.99 mW) IEEE 802.11ac(VHT20): 13.95 dBm (24.83 mW) IEEE 802.11ac(VHT40): 13.96 dBm (24.89 mW) IEEE 802.11ac(VHT80): 13.61 dBm (22.96 mW) IEEE 802.11ax(HE20): 13.94 dBm (24.77 mW) IEEE 802.11ax(HE40): 13.77 dBm (23.82 mW) IEEE 802.11ax(HE80): 13.79 dBm (23.93 mW)
Categorization	☒ Receiver category 1 ☐ Receiver category 2 ☐ Receiver category 3

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20) IEEE 802.11ax(HE20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40) IEEE 802.11ax(HE40)		IEEE 802.11ac(VHT80) IEEE 802.11ax(HE80)	
Band 4		Band 4		Band 4	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	B&T	AG-011520-1007	Dipole	SMA-J	2
2	B&T	AG-011520-1007	Dipole	SMA-J	2

Note:

1) The EUT incorporates a CDD function. Physically, the EUT provides two completed transmitters and receivers (2T2R).
2) The antenna gain is provided by the manufacturer.

4. The worst case for 2TX as follow:

Operating Mode / TX Mode	2TX
IEEE 802.11a	V (Ant. 1+Ant. 2)
IEEE 802.11n(HT20)	V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT20)	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT40)	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT80)	V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE20)	V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE40)	V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE80)	V (Ant. 1+Ant. 2)

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test Items	Mode	Data Rate	Channel
Equivalent isotropically radiated power	IEEE 802.11a	6 Mbps	149/157/165
	IEEE 802.11n(HT20)	MCS0	
	IEEE 802.11ac(VHT20)	MCS0	
	IEEE 802.11ax(HE20)	MCS0	
	IEEE 802.11n(HT40)	MCS0	151/159
	IEEE 802.11ac(VHT40)	MCS0	
	IEEE 802.11ax(HE40)	MCS0	
	IEEE 802.11ac(VHT80)	MCS0	155
	IEEE 802.11ax(HE80)	MCS0	
Permitted range of operating frequencies	IEEE 802.11a	6 Mbps	149/165
	IEEE 802.11ac(VHT20)	MCS0	
	IEEE 802.11ax(HE20)	MCS0	
	IEEE 802.11ac(VHT40)	MCS0	151/159
	IEEE 802.11ax(HE40)	MCS0	
	IEEE 802.11ac(VHT80)	MCS0	155
	IEEE 802.11ax(HE80)	MCS0	
Unwanted emissions in the spurious domain - Operating / Standby (25MHz~1GHz)	IEEE 802.11ac(VHT40)	MCS0	151/159
Unwanted emissions in the spurious domain - Operating / Standby (Above 1GHz)	IEEE 802.11a	6 Mbps	149/165
	IEEE 802.11ac(VHT20)	MCS0	
	IEEE 802.11ax(HE20)	MCS0	
	IEEE 802.11ac(VHT40)	MCS0	151/159
	IEEE 802.11ax(HE40)	MCS0	
	IEEE 802.11ac(VHT80)	MCS0	155
	IEEE 802.11ax(HE80)	MCS0	
Duty cycle	IEEE 802.11a	6 Mbps	149
Adjacent channel selectivity	IEEE 802.11a	6 Mbps	157
Blocking	IEEE 802.11a	6 Mbps	149/165
Spurious radiation - Receiver (25MHz~1GHz)	IEEE 802.11ac(VHT40)	MCS0	151/159
Spurious radiation - Receiver (Above 1GHz)	IEEE 802.11ac(VHT40)	MCS0	151/159

Note :

(1) The measurements for Power were tested, the worst case were IEEE 802.11a mode, IEEE 802.11ac(VHT20) mode, IEEE 802.11ac(VHT40) mode, IEEE 802.11ac(VHT80) mode, IEEE 802.11ax(HE20) mode, IEEE 802.11ax(HE40) mode and IEEE 802.11ax(HE80) mode, only worst case were documented for other test items.

(2) For radiated spurious emissions below 1 GHz and receiver spurious emissions above 1 GHz test, the IEEE 802.11ac(VHT40) channel 151/19 are found to be the worst case and recorded.

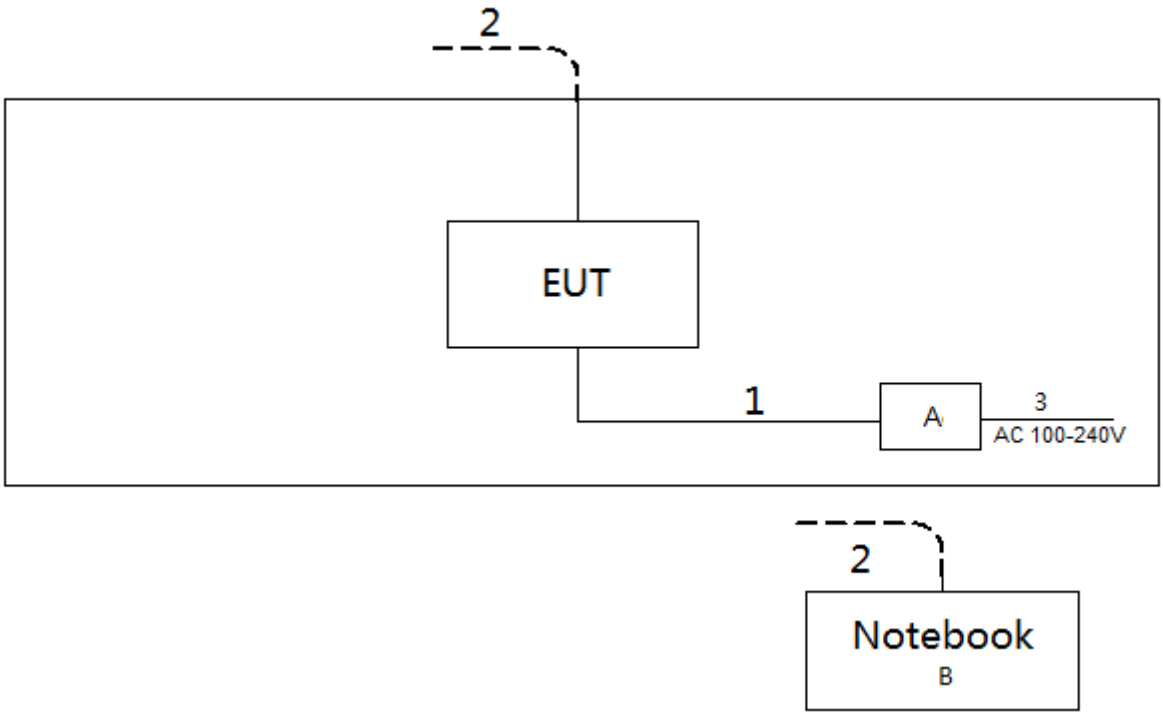
(3) IEEE 802.11ax mode only supports full RU, so only the full RU is evaluated and measured inside report.

2.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test Software Version	V1.0		
Frequency (MHz)	5745	5785	5825
IEEE 802.11a	10	10	10.5
IEEE 802.11n(HT20)	10.5	10.5	10.5
IEEE 802.11ac(VHT20)	10.5	10.5	10.5
IEEE 802.11ax(HE20)	10.5	10.5	10.5
Frequency (MHz)	5755	5795	
IEEE 802.11n(HT40)	9.5	10	
IEEE 802.11ac(VHT40)	10	10.5	
IEEE 802.11ax(HE40)	10.5	10.5	
Frequency (MHz)	5775		
IEEE 802.11ac(VHT80)	9.5		
IEEE 802.11ax(HE80)	10		

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model No.	Series No.
A	Adapter	GangQi Electornic	GQ150-1900630-E1	N/A
B	Notebook	Dell	Inspiron 15-7559	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1.2m
2	RJ45 Cable	NO	NO	10m
3	AC Cable	NO	NO	1.5m

3. EQUIVALENT ISOTROPICALLY RADIATED POWER (E.I.R.P.)

3.1 LIMITS

Clause	4.2.2.4
Test Item	Equivalent isotropically radiated power (e.i.r.p.)
Limits	The transmitter maximum e.i.r.p. under normal and extreme test conditions.

Frequency Bands	Power	Application	Notes
2 400 MHz to 2 483,5 MHz	10 mW e.i.r.p.	Non-specific short range devices	
2 400 MHz to 2 483,5 MHz	25 mW e.i.r.p.	Radio determination devices	
(a) 2 446 MHz to 2 454 MHz	500 mW e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and annex D
(b) 2 446 MHz to 2 454 MHz	4 W e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and annex D
5 725 MHz to 5 875 MHz	25 mW e.i.r.p.	Non-specific short range devices	
9 200 MHz to 9 500 MHz	25 mW e.i.r.p.	Radio determination devices	
9 500 MHz to 9 975 MHz	25 mW e.i.r.p.	Radio determination devices	
10,5 GHz to 10,6 GHz	500 mW e.i.r.p.	Radio determination devices	
13,4 GHz to 14,0 GHz	25 mW e.i.r.p.	Radio determination devices	
17,1 GHz to 17,3 GHz	400 mW e.i.r.p.	Radio determination devices	See annex F
24,00 GHz to 24,25 GHz	100 mW e.i.r.p.	Non-specific short range devices and Radio determination devices	

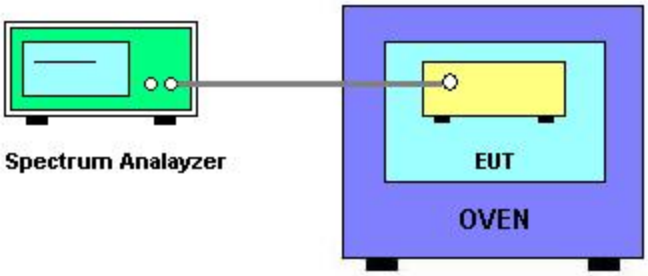
3.2 TEST PROCEDURES

Refer to ETSI EN 300 440, chapter 4.2.2.3.

3.3 TEST SETUP LAYOUT

Normal Condition:

Extreme Condition:



3.4 TEST DEVIATION

There is no deviation with the original standard.

3.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

3.6 TEST RESULTS

Please refer to the Appendix A.

4. PERMITTED RANGE OF OPERATING FREQUENCIES

4.1 LIMITS

Clause	4.2.3.5
Test Item	Permitted range of operating frequencies
Limits	The width of the power spectrum envelope is f_H -f_L for a given operating frequency. In equipment that allows adjustment or selection of different operating frequencies, the power envelope takes up different positions in the allowed band. The frequency range is determined by the lowest value of f_L and the highest value of f_H resulting from the adjustment of the equipment to the lowest and highest operating frequencies. The occupied bandwidth (i.e. the bandwidth in which 99 % of the wanted emission is contained) of the transmitter shall fall within the assigned frequency band. For all equipment the frequency range shall lie within the frequency band given by clause 4.2.2.4, table 2. For non-harmonized frequency bands the available frequency range may differ between national administrations.

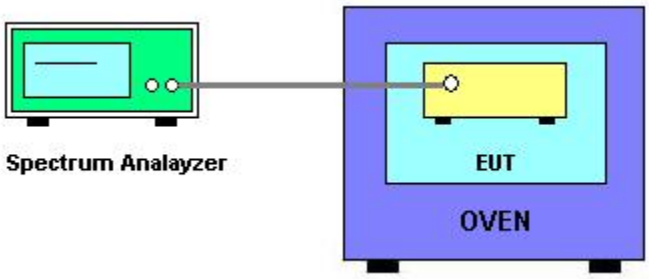
4.2 TEST PROCEDURES

Refer to ETSI EN 300 440, chapter 4.2.3.3 / 4.2.3.4 (FHSS modulation).

4.3 TEST SETUP LAYOUT

Normal Condition:

Extreme Condition:



4.4 TEST DEVIATION

There is no deviation with the original standard.

4.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

4.6 TEST RESULTS

Please refer to the Appendix B.

5. UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

5.1 LIMITS

<table>
<tr><td>Clause</td><td>4.2.4.4</td></tr>
<tr><td>Test Item</td><td>Unwanted emissions in the spurious domain</td></tr>
<tr><td>Limits</td><td>The maximum power limits of any unwanted emissions in the spurious domain are given.
<table>
<tr><th>Frequency ranges
State</th><th>47 MHz to 74 MHz
87,5 MHz to 108 MHz
174 MHz to 230 MHz
470 MHz to 862 MHz</th><th>Other frequencies
≤ 1 000 MHz</th><th>Frequencies
> 1 000 MHz</th></tr>
<tr><td>Operating</td><td>4 nW</td><td>250 nW</td><td>1 µW</td></tr>
<tr><td>Standby</td><td>2 nW</td><td>2 nW</td><td>20 nW</td></tr>
</table>
Note: Operating: transmitter switched on, Standby: transmitter switched off.</td></tr>
</table>

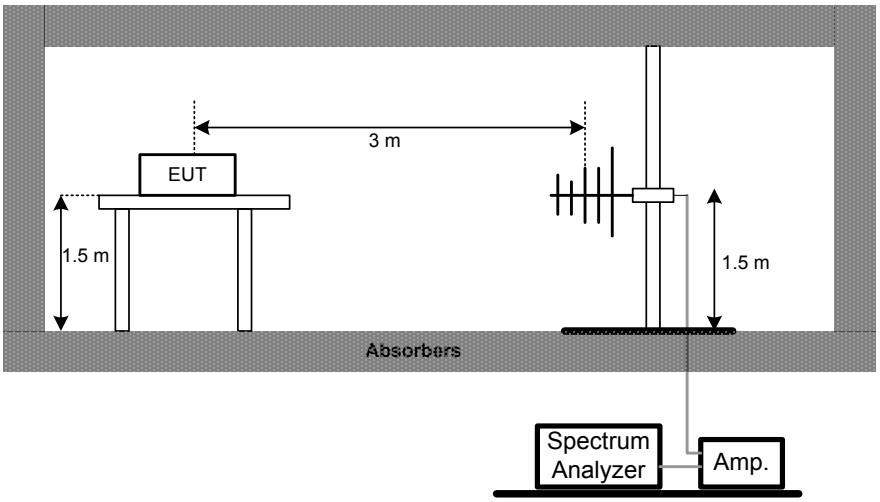
5.2 TEST PROCEDURES

Refer to ETSI EN 300 440, chapter 4.2.4.3.

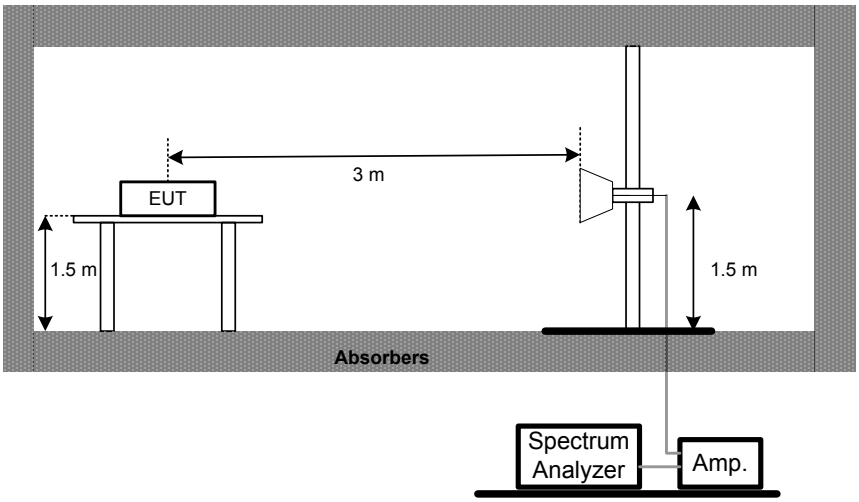
5.3 TEST SETUP LAYOUT

Conducted Measurement

Radiated Measurement Test Set-Up Frequency Below 1 GHz



Radiated Measurement Test Set-Up Frequency Above 1 GHz



5.4 TEST DEVIATION

There is no deviation with the original standard.

5.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

5.6 TEST RESULTS (25MHZ TO 1000MHZ)

Please refer to the Appendix C for operating mode.
Please refer to the Appendix D for standby mode.

5.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix E for operating mode.
Please refer to the Appendix F for standby mode.

6. DUTY CYCLE

6.1 LIMITS

Clause	4.2.5.4
Test Item	Duty cycle
Limits	See table below

Frequency Band	Duty cycle	Application	Notes
2 400 MHz to 2 483,5 MHz	No Restriction	Generic use	
2 400 MHz to 2 483,5 MHz	No Restriction	Detection, movement and alert applications	
(a) 2 446 MHz to 2 454 MHz	No Restriction	RFID	Limits shown in annex D shall apply
(b) 2 446 MHz to 2 454 MHz	≤ 15 %	RFID	Limits shown in annex D shall apply
5 725 MHz to 5 875 MHz	No Restriction	Generic use	
9 200 MHz to 9 500 MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
9 500 MHz to 9 975 MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
10,5 GHz to 10,6 GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
13,4 GHz to 14,0 GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
17,1 GHz to 17,3 GHz	DAA or equivalent techniques	Radiodetermination: GBSAR detecting and movement and alert applications	Limits shown in annex F shall apply
24,00 GHz to 24,25 GHz	No Restriction	Generic use and for Radiodetermination: radar, detection, movement and alert applications	

Note: The maximum duty cycle within a 1 hour period.

6.2 TEST PROCEDURES

Refer to ETSI EN 300 440, chapter 4.2.5.3.

6.3 TEST SETUP LAYOUT

6.4 TEST DEVIATION

There is no deviation with the original standard.

6.5 EUT OPERATION DURING TEST

The measurements shall be performed during normal transmitting.

6.6 TEST RESULTS

Please refer to the Appendix G.

7. ADJACENT CHANNEL SELECTIVITY

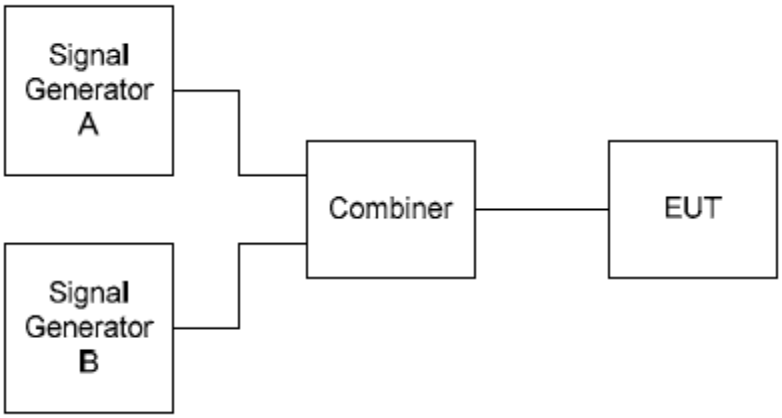
7.1 LIMITS

Clause	4.3.3.4
Test Item	Adjacent channel selectivity
Limits	The adjacent channel selectivity of the equipment under specified conditions shall not be less than -30 dBm + k. The correction factor, k, is as follows: $k = -20\log f - 10\log BW$ Where: - *f* is the frequency in GHz; - *BW* is the occupied bandwidth in MHz. The factor *k* is limited within the following: - -40 dB < k < 0 dB.

7.2 TEST PROCEDURES

Refer to ETSI EN 300 440, chapter 4.3.3.3.

7.3 TEST SETUP LAYOUT



7.4 TEST DEVIATION

There is no deviation with the original standard.

7.5 EUT OPERATION DURING TEST

The measurements shall be performed during normal receiving.

7.6 TEST RESULTS

Please refer to the Appendix H.

8. BLOCKING OR DESENSITIZATION

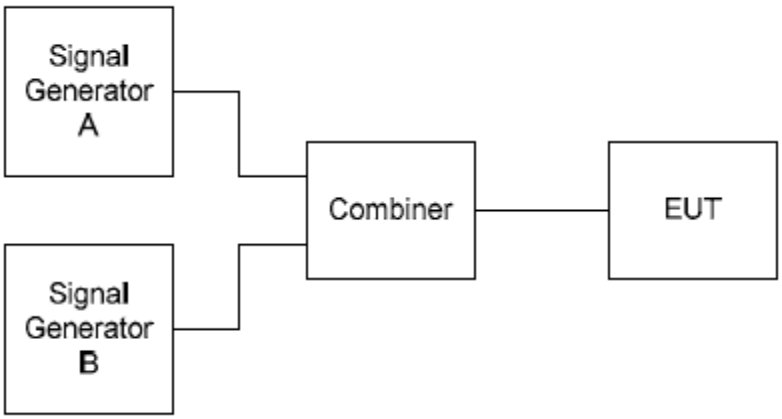
8.1 LIMITS

<table>
<tr><td>Clause</td><td>4.3.4.4</td></tr>
<tr><td>Test Item</td><td>Blocking or desensitization</td></tr>
<tr><td>Limits</td><td>The blocking level, for any frequency within the specified ranges, shall not be less than the values given in table, except at frequencies on which spurious responses are found.
<table>
<tr><th>Receiver category</th><th>Limit</th></tr>
<tr><td>1</td><td>-30 dBm + k</td></tr>
<tr><td>2</td><td>-45 dBm + k</td></tr>
<tr><td>3</td><td>No limit</td></tr>
</table>
The correction factor, k, is as follows:
$k = -20\log f - 10\log BW$
Where:
- f is the frequency in GHz;
- BW is the occupied bandwidth in MHz.
The factor k is limited within the following:
- -40 dB < k < 0 dB.</td></tr>
</table>

8.2 TEST PROCEDURES

Refer to ETSI EN 300 440, chapter 4.3.4.3.

8.3 TEST SETUP LAYOUT



8.4 TEST DEVIATION

There is no deviation with the original standard.

8.5 EUT OPERATION DURING TEST

The measurements shall be performed during normal receiving.

8.6 TEST RESULTS

Please refer to the Appendix I.

9. SPURIOUS RADIATIONS

9.1 LIMITS

<table>
<tr><td>Clause</td><td>4.3.5.4</td></tr>
<tr><td>Test Item</td><td>Spurious radiations</td></tr>
<tr><td>Limits</td><td>The power of any spurious emission shall not exceed 2 nW in the range 25 MHz to 1 GHz and shall not exceed 20 nW on frequencies above 1 GHz.
<table>
<tr><td>Other frequencies
25 MHz to 1000 MHz</td><td>Frequencies
Above 1000 MHz</td></tr>
<tr><td>2 nW (-57dBm)</td><td>20 nW (-47dBm)</td></tr>
</table></td></tr>
</table>

9.2 TEST PROCEDURES

Refer to ETSI EN 300 440, chapter 4.3.5.3.

9.3 TEST SETUP LAYOUT

Refer to clause 5.3.

9.4 TEST DEVIATION

There is no deviation with the original standard.

9.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously receiving.

9.6 TEST RESULTS (25MHZ TO 1000MHZ)

Please refer to the Appendix J.

9.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix K.

10. MEASUREMENT INSTRUMENTS LIST

Equivalent Isotropically Radiated Power (e.i.r.p.)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Table top type high and low temperature test chamber	CEPREI	CEEC-M64T-40	15-008	Jan. 08, 2024
2	Power Sensor	Agilent	U2021XA	MY53320006	Jan. 08, 2024
3	Power Sensor	Agilent	U2021XA	MY53340001	Jan. 08, 2024
4	Power Sensor	Agilent	U2021XA	MY53340005	Jan. 08, 2024
5	Power Sensor	Agilent	U2021XA	MY53340007	Jan. 08, 2024
6	Cable	Woke	20210802 001	N/A	N/A
7	Cable	Woke	60CM	N/A	N/A
8	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A

Permitted Range of Operating Frequency					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Jul. 03, 2023
2	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A
3	Const Temp. & Humidity Chamber	CEPREI	CEEC-M64T-40	15-008	Jan. 08, 2024
4	Cable	Woke	20210802 001	N/A	N/A

Transmitter and Receiver Spurious Emission (Conducted Measurement)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Agilent	N9010A	MY54200164	Jan. 08, 2024
2	Cable	RegalWay	20210802 013	N/A	N/A
3	Cable	RegalWay	20210802 021	N/A	N/A
4	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A

Transmitter and Receiver Spurious Emission (Radiated Measurement)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Amplifier	HP	8447D	2944A11203	Jan. 08, 2024
2	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Jan. 08, 2024
3	Controller	Innco Systems Gmbh	CO3000-4port	CO3000/1155/45430119/P	N/A
4	Trilog-Broadband Antenna	Schwarzbeck	VULB9160	9160-3232	Feb. 24, 2024
5	Cable	Talent microwave	L6-NMNM-10M	N/A	N/A
6	Cable	Talent microwave	S02-181212-270	N/A	N/A
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	DRG Horn Antenna	ETS	3117-PA	221576	Mar. 04, 2024
9	Preamplifier	ETS	3117-PA	221576	Jul. 03, 2023
10	Cable	Talent microwave	A81-SMAMSMAM-12.5M	N/A	N/A
11	Cable	RegalWay	A4.0-2.9M2.9M -2.5m	N/A	Now. 30, 2023
12	Cable	Tonscend	HF160-KMKM-3M	N/A	Now. 30, 2023
13	EXA Signal Analyzer	Keysight	N9010A	MY56480488	Jan. 16, 2024
14	DRG Horn Antenna	ETS	3116C	218942	Mar. 02, 2024
15	Pre-Amplifier	EMC INSTRUMENT	EMC184045SE	980409	Jan. 08, 2024

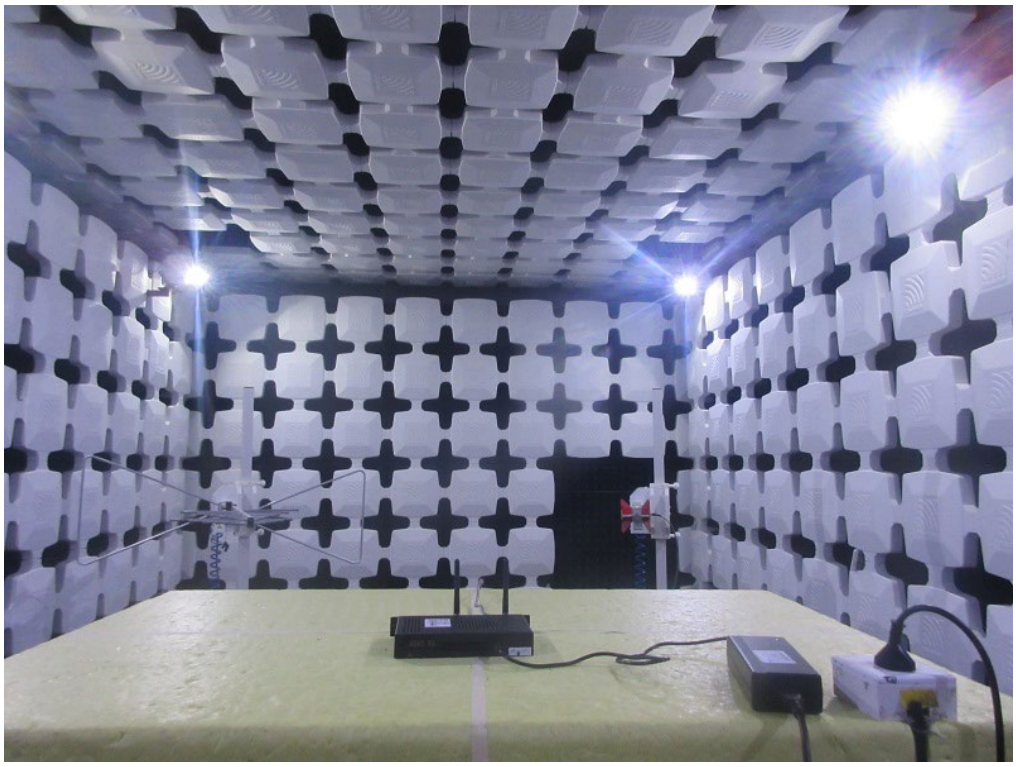
Duty Cycle					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Jul. 03, 2023
2	Cable	emci	EMC104-SM-SM-9000 (0.01GHz-26.5GHz)	N/A	N/A
3	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A

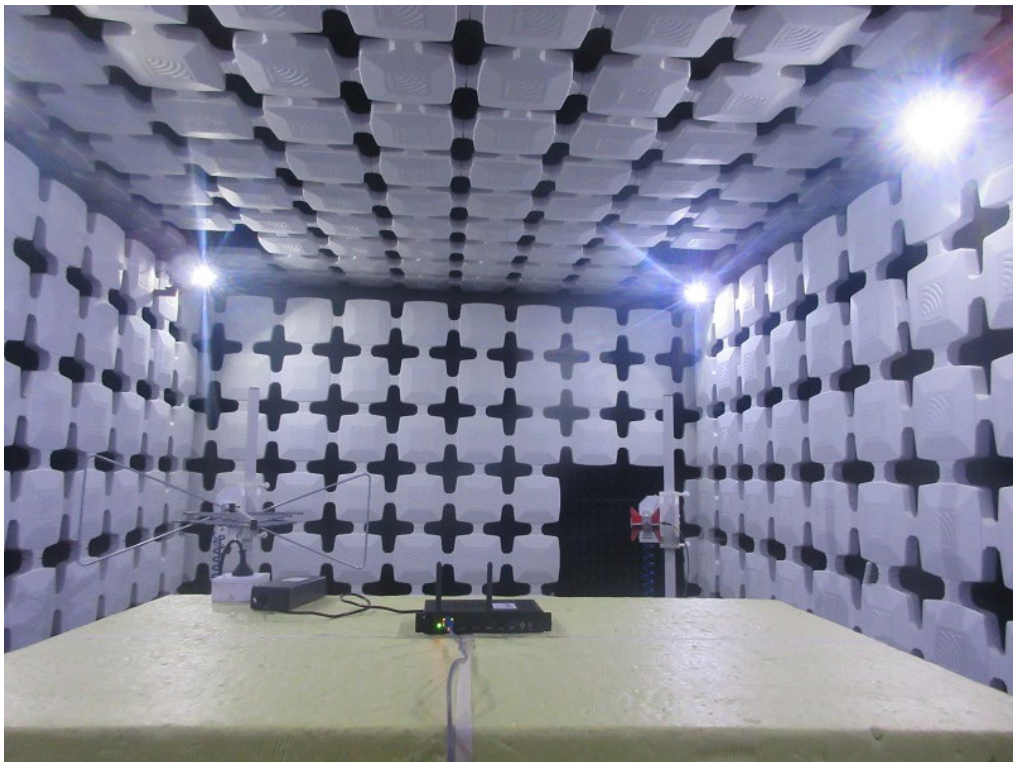
Adjacent channel selectivity & Blocking					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	wideband radio communication tester	R&S	CMW500	152372	Jan. 08, 2024
2	EXG-B RF Vector Signal Generator	Keysight	N5172B	MY53051637	Jan. 08, 2024
3	Shielding box	Jiachen	JC-PB2009	200917D0184A	Jan. 08, 2024
4	Power divider	N/A	PD-2SF-2080	N/A	Jan. 08, 2024
5	Cable	RegalWay	20210802 013	N/A	N/A
6	Cable	RegalWay	20210802 021	N/A	N/A

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

11. EUT TEST PHOTO

Radiated Emissions Test Photos





APPENDIX A - EQUIVALENT ISOTROPICALLY RADIATED POWER

Test Mode: IEEE 802.11a Mode						
Test Conditions				Average e.i.r.p. (dBm)		
				CH149	CH157	CH165
T_{nom} (°C)	20	V_{nom} (V)	19.0	13.58	13.65	13.69
T_{min} (°C)	0	V_{max} (V)	20.9	13.51	13.72	13.65
		V_{min} (V)	17.1	13.56	13.71	13.62
T_{max} (°C)	45	V_{max} (V)	20.9	13.61	13.76	13.87
		V_{min} (V)	17.1	13.65	13.77	13.91
Max. e.i.r.p.				13.91		
Limits				13.98dBm (25mW)		
Result				Pass		

Test Mode: IEEE 802.11n(HT20) Mode						
Test Conditions				Average e.i.r.p. (dBm)		
				CH149	CH157	CH165
T_{nom} (°C)	20	V_{nom} (V)	19.0	13.70	13.72	13.75
T_{min} (°C)	0	V_{max} (V)	20.9	13.75	13.85	13.61
		V_{min} (V)	17.1	13.80	13.80	13.64
T_{max} (°C)	45	V_{max} (V)	20.9	13.76	13.64	13.88
		V_{min} (V)	17.1	13.75	13.66	13.87
Max. e.i.r.p.				13.88		
Limits				13.98dBm (25mW)		
Result				Pass		

Test Mode: IEEE 802.11n(HT40) Mode					
Test Conditions				Average e.i.r.p. (dBm)	
				CH151	CH159
T_{nom} (°C)	20	V_{nom} (V)	19.0	13.55	13.58
T_{min} (°C)	0	V_{max} (V)	20.9	13.36	13.68
		V_{min} (V)	17.1	13.34	13.72
T_{max} (°C)	45	V_{max} (V)	20.9	13.49	13.80
		V_{min} (V)	17.1	13.47	13.74
Max. e.i.r.p.				13.80	
Limits				13.98dBm (25mW)	
Result				Pass	

Test Mode: IEEE 802.11ac(VHT20) Mode						
Test Conditions				Average e.i.r.p. (dBm)		
				CH149	CH157	CH165
T_{nom} (°C)	20	V_{nom} (V)	19.0	13.85	13.95	13.81
T_{min} (°C)	0	V_{max} (V)	20.9	13.83	13.90	13.64
		V_{min} (V)	17.1	13.83	13.91	13.65
T_{max} (°C)	45	V_{max} (V)	20.9	13.83	13.92	13.93
		V_{min} (V)	17.1	13.77	13.89	13.90
Max. e.i.r.p.				13.95		
Limits				13.98dBm (25mW)		
Result				Pass		

Test Mode: IEEE 802.11ac(VHT40) Mode					
Test Conditions				Average e.i.r.p. (dBm)	
				CH151	CH159
T_{nom} (°C)	20	V_{nom} (V)	19.0	13.57	13.80
T_{min} (°C)	0	V_{max} (V)	20.9	13.68	13.94
		V_{min} (V)	17.1	13.69	13.96
T_{max} (°C)	45	V_{max} (V)	20.9	13.72	13.81
		V_{min} (V)	17.1	13.71	13.85
Max. e.i.r.p.				13.96	
Limits				13.98dBm (25mW)	
Result				Pass	

Test Mode: IEEE 802.11ac(VHT80) Mode				
Test Conditions				Average e.i.r.p. (dBm)
				CH155
T_{nom} (°C)	20	V_{nom} (V)	19.0	13.39
T_{min} (°C)	0	V_{max} (V)	20.9	13.55
		V_{min} (V)	17.1	13.54
T_{max} (°C)	45	V_{max} (V)	20.9	13.56
		V_{min} (V)	17.1	13.61
Max. e.i.r.p.				13.61
Limits				13.98dBm (25mW)
Result				Pass

Test Mode: IEEE 802.11ax(HE20) Mode						
Test Conditions				Average e.i.r.p. (dBm)		
				CH149	CH157	CH165
T_{nom} (°C)	20	V_{nom} (V)	19.0	13.59	13.59	13.39
T_{min} (°C)	0	V_{max} (V)	20.9	13.64	13.78	13.43
		V_{min} (V)	17.1	13.65	13.76	13.46
T_{max} (°C)	45	V_{max} (V)	20.9	13.93	13.93	13.76
		V_{min} (V)	17.1	13.93	13.94	13.76
Max. e.i.r.p.				13.94		
Limits				13.98dBm (25mW)		
Result				Pass		

Test Mode: IEEE 802.11ax(HE40) Mode					
Test Conditions				Average e.i.r.p. (dBm)	
				CH151	CH159
T_{nom} (°C)	20	V_{nom} (V)	19.0	13.66	13.57
T_{min} (°C)	0	V_{max} (V)	20.9	13.75	13.77
		V_{min} (V)	17.1	13.70	13.75
T_{max} (°C)	45	V_{max} (V)	20.9	13.63	13.62
		V_{min} (V)	17.1	13.65	13.63
Max. e.i.r.p.				13.77	
Limits				13.98dBm (25mW)	
Result				Pass	

Test Mode: IEEE 802.11ax(HE80) Mode				
Test Conditions				Average e.i.r.p. (dBm)
				CH155
T_{nom} (°C)	20	V_{nom} (V)	19.0	13.20
T_{min} (°C)	0	V_{max} (V)	20.9	13.75
		V_{min} (V)	17.1	13.77
T_{max} (°C)	45	V_{max} (V)	20.9	13.77
		V_{min} (V)	17.1	13.79
Max. e.i.r.p.				13.79
Limits				13.98dBm (25mW)
Result				Pass

APPENDIX B - PERMITTED RANGE OF OPERATING FREQUENCIES

Test Mode: IEEE 802.11a Mode					
Test Conditions				Frequency Range (MHz)	
				f_L CH149	f_H CH165
T_{nom} (°C)	25	V_{nom} (V)	19.0	5736.6000	5833.6000
T_{min} (°C)	0	V_{max} (V)	20.9	5736.3000	5833.6000
		V_{min} (V)	17.1	5736.3000	5833.6000
T_{max} (°C)	45	V_{max} (V)	20.9	5736.5000	5833.6000
		V_{min} (V)	17.1	5736.3000	5833.6000
Min. f_L / Max. f_H Band Edges				5736.3000	5833.6000
Limits				f_L > 5725.0 MHz	f_H < 5875.0 MHz
Result				Pass	

Test Mode: IEEE 802.11a Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		CH149	CH165
T_{nom} (°C)	25	17.10	17.10
F_L OBW		5736.50	-
F_H OBW		-	5833.60
Limits		f_L > 5725.0 MHz	f_H < 5875.0 MHz

Test Mode: IEEE 802.11ac(VHT20) Mode					
Test Conditions				Frequency Range (MHz)	
				f_L CH149	f_H CH165
T_{nom} (°C)	25	V_{nom} (V)	19.0	5735.9000	5834.2000
T_{min} (°C)	0	V_{max} (V)	20.9	5735.9000	5834.2000
		V_{min} (V)	17.1	5735.9000	5834.2000
T_{max} (°C)	45	V_{max} (V)	20.9	5735.9000	5834.2000
		V_{min} (V)	17.1	5735.9000	5834.2000
Min. f_L / Max. f_H Band Edges				5735.9000	5834.2000
Limits				f_L > 5725.0 MHz	f_H < 5875.0 MHz
Result				Pass	

Test Mode: IEEE 802.11ac(VHT20) Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		CH149	CH165
T_{nom} (°C)	25	18.00	18.10
F_L OBW		5736.10	-
F_H OBW		-	5834.10
Limits		f_L > 5725.0 MHz	f_H < 5875.0 MHz

Test Mode: IEEE 802.11ac(VHT40) Mode					
Test Conditions				Frequency Range (MHz)	
				f_L CH151	f_H CH159
T_{nom} (°C)	25	V_{nom} (V)	19.0	5736.8000	5813.4000
T_{min} (°C)	0	V_{max} (V)	20.9	5736.8000	5813.4000
		V_{min} (V)	17.1	5736.8000	5813.4000
T_{max} (°C)	45	V_{max} (V)	20.9	5736.8000	5813.4000
		V_{min} (V)	17.1	5736.8000	5813.4000
Min. f_L / Max. f_H Band Edges				5736.8000	5813.4000
Limits				f_L > 5725.0 MHz	f_H < 5875.0 MHz
Result				Pass	

Test Mode: IEEE 802.11ac(VHT40) Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		CH151	CH159
T_{nom} (°C)	25	36.60	36.60
F_L OBW		5736.80	-
F_H OBW		-	5813.40
Limits		f_L > 5725.0 MHz	f_H < 5875.0 MHz

Test Mode: IEEE 802.11ac(VHT80) Mode					
Test Conditions				Frequency Range (MHz)	
				f_L CH155	f_H CH155
T_{nom} (°C)	25	V_{nom} (V)	19.0	5737.0000	5813.4000
T_{min} (°C)	0	V_{max} (V)	20.9	5737.0000	5813.4000
		V_{min} (V)	17.1	5737.0000	5813.4000
T_{max} (°C)	45	V_{max} (V)	20.9	5737.0000	5813.4000
		V_{min} (V)	17.1	5737.0000	5813.4000
Min. f_L / Max. f_H Band Edges				5737.0000	5813.4000
Limits				f_L > 5725.0 MHz	f_H < 5875.0 MHz
Result				Pass	

Test Mode: IEEE 802.11ac(VHT80) Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		CH155	
T_{nom} (°C)	25	75.60	
F_L OBW		5737.40	
F_H OBW		5813.00	
Limits		f_L > 5725.0 MHz	f_H < 5875.0 MHz

Test Mode: IEEE 802.11ax(HE20) Mode					
Test Conditions				Frequency Range (MHz)	
				f_L CH149	f_H CH165
T_{nom} (°C)	25	V_{nom} (V)	19.0	5735.5000	5834.7000
T_{min} (°C)	0	V_{max} (V)	20.9	5735.4000	5834.7000
		V_{min} (V)	17.1	5735.5000	5834.7000
T_{max} (°C)	45	V_{max} (V)	20.9	5735.5000	5834.7000
		V_{min} (V)	17.1	5735.5000	5834.7000
Min. f_L / Max. f_H Band Edges				5735.4000	5834.7000
Limits				f_L > 5725.0 MHz	f_H < 5875.0 MHz
Result				Pass	

Test Mode: IEEE 802.11ax(HE20) Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		CH149	CH165
T_{nom} (°C)	25	19.10	19.10
F_L OBW		5735.50	-
F_H OBW		-	5834.60
Limits		f_L > 5725.0 MHz	f_H < 5875.0 MHz

Test Mode: IEEE 802.11ax(HE40) Mode					
Test Conditions				Frequency Range (MHz)	
				f_L CH151	f_H CH159
T_{nom} (°C)	25	V_{nom} (V)	19.0	5736.0000	5814.2000
T_{min} (°C)	0	V_{max} (V)	20.9	5736.0000	5814.2000
		V_{min} (V)	17.1	5736.0000	5814.2000
T_{max} (°C)	45	V_{max} (V)	20.9	5736.0000	5814.2000
		V_{min} (V)	17.1	5736.0000	5814.2000
Min. f_L / Max. f_H Band Edges				5736.0000	5814.2000
Limits				f_L > 5725.0 MHz	f_H < 5875.0 MHz
Result				Pass	

Test Mode: IEEE 802.11ax(HE40) Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		CH151	CH159
T_{nom} (°C)	25	38.00	38.00
F_L OBW		5736.00	-
F_H OBW		-	5814.00
Limits		f_L > 5725.0 MHz	f_H < 5875.0 MHz

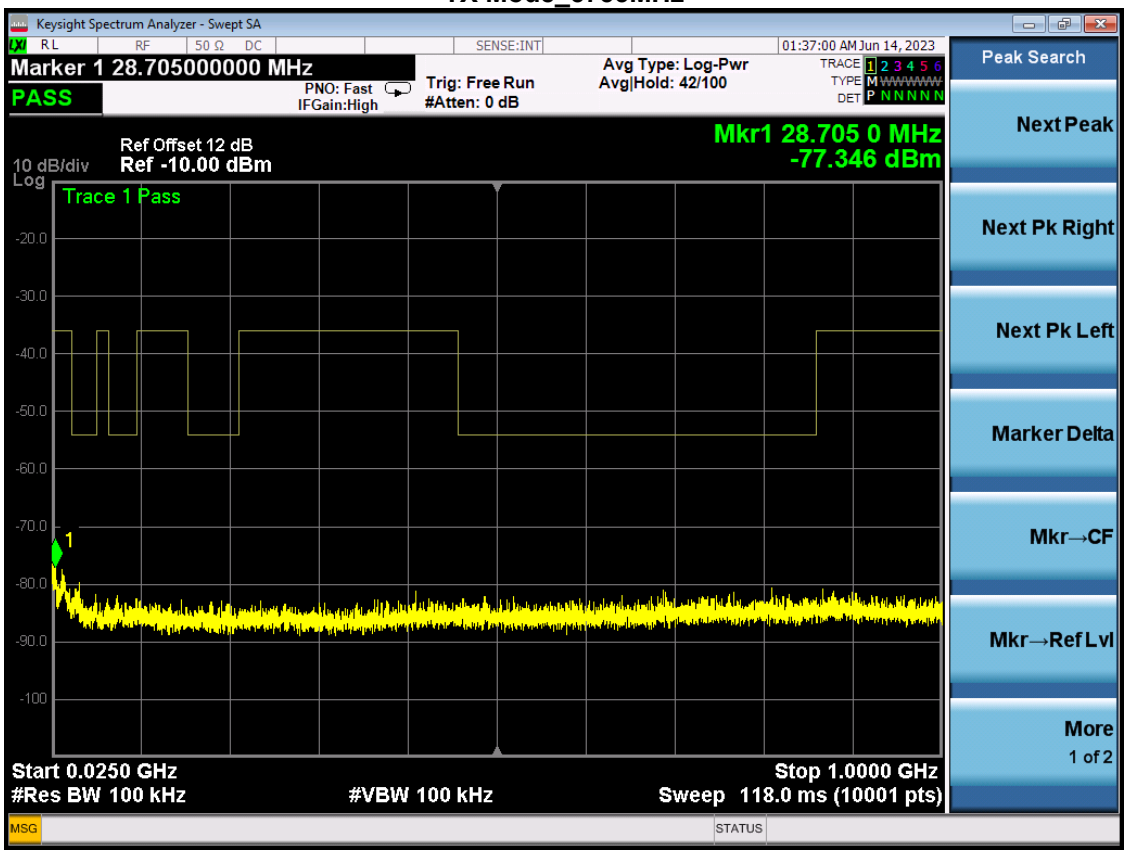
Test Mode: IEEE 802.11ax(HE80) Mode					
Test Conditions				Frequency Range (MHz)	
				f_L CH155	f_H CH155
T_{nom} (°C)	25	V_{nom} (V)	19.0	5736.2000	5814.2000
T_{min} (°C)	0	V_{max} (V)	20.9	5736.2000	5814.2000
		V_{min} (V)	17.1	5735.8000	5814.2000
T_{max} (°C)	45	V_{max} (V)	20.9	5736.2000	5814.2000
		V_{min} (V)	17.1	5736.2000	5814.2000
Min. f_L / Max. f_H Band Edges				5735.8000	5814.2000
Limits				f_L > 5725.0 MHz	f_H < 5875.0 MHz
Result				Pass	

Test Mode: IEEE 802.11ax(HE80) Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		CH155	
T_{nom} (°C)	25	77.20	
F_L OBW		5736.60	
F_H OBW		5813.80	
Limits		f_L > 5725.0 MHz	f_H < 5875.0 MHz

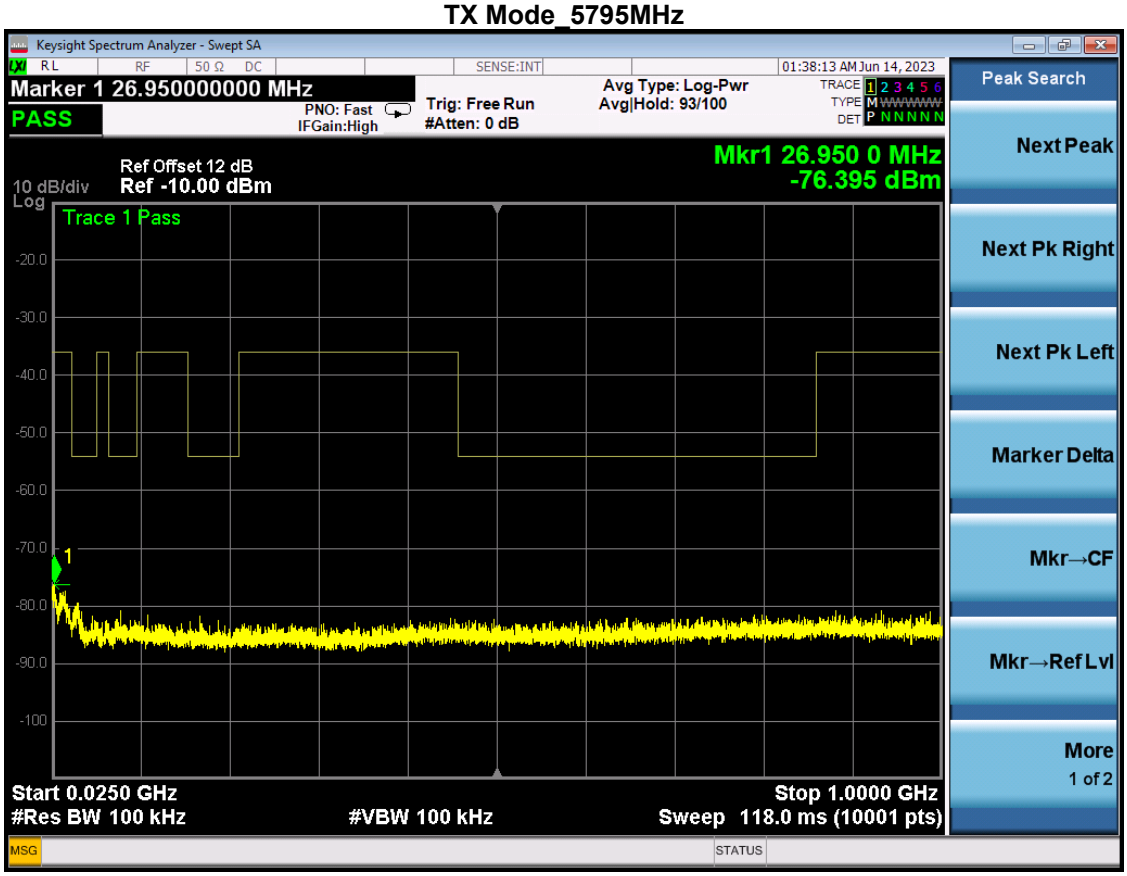
APPENDIX C - UNWANTED EMISSIONS IN THE SPRIOUS DOMAIN - OPERATING (25MHZ TO 1000MHZ)

Test Mode	TX IEEE 802.11ac(VHT40)_Ant. 1

TX Mode_5755MHz

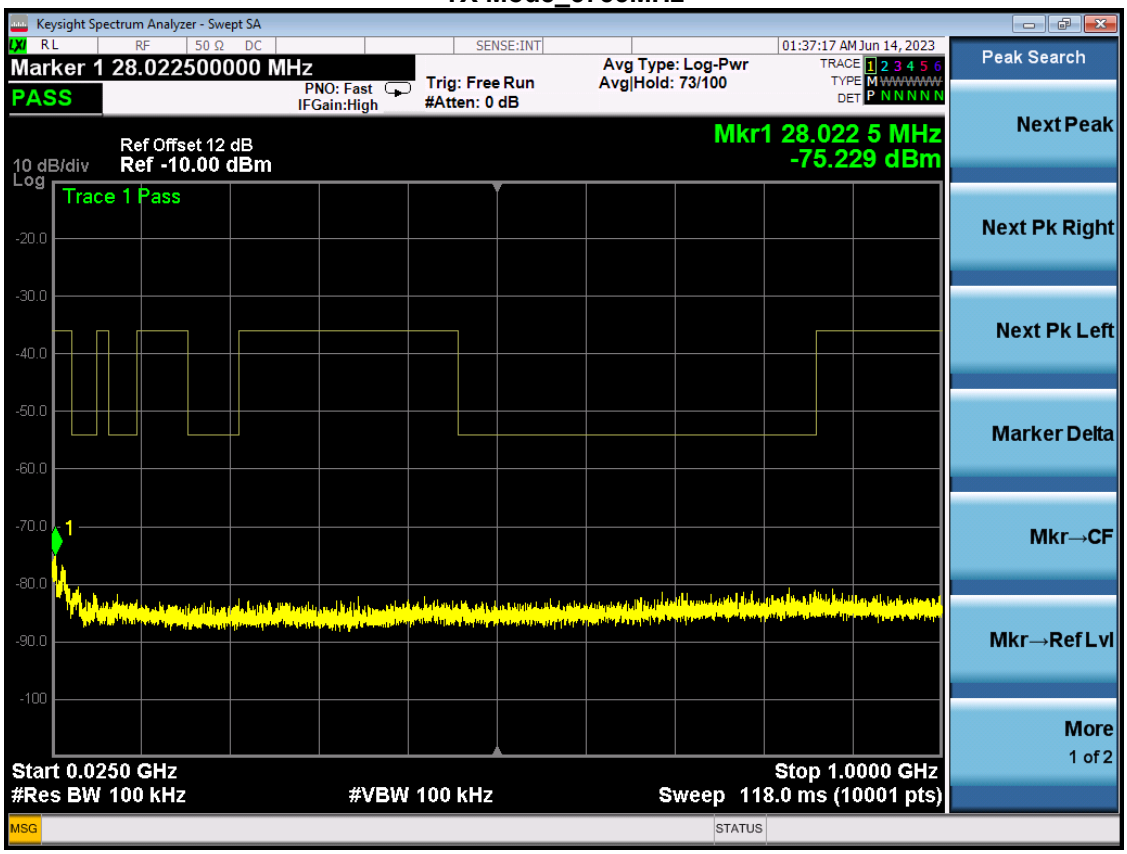


TX Mode_5795MHz

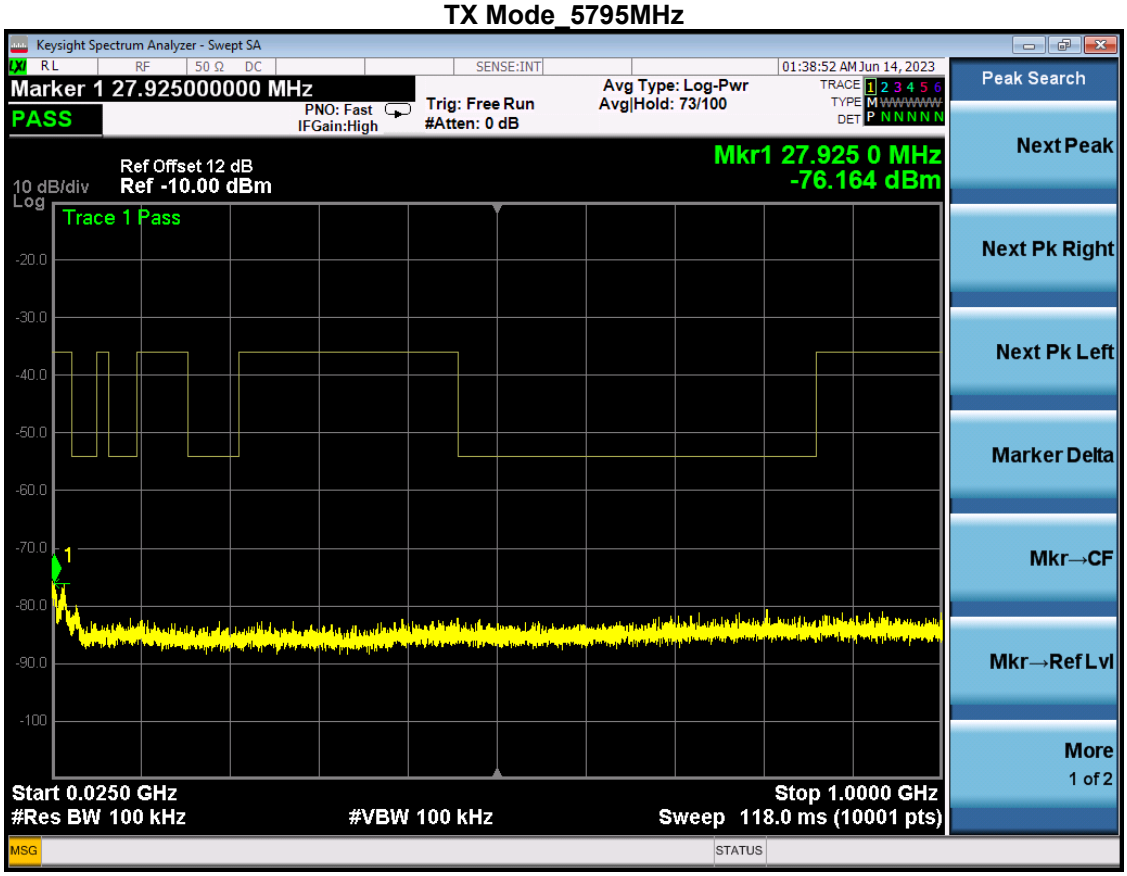


Test Mode	TX IEEE 802.11ac(VHT40)_Ant. 2

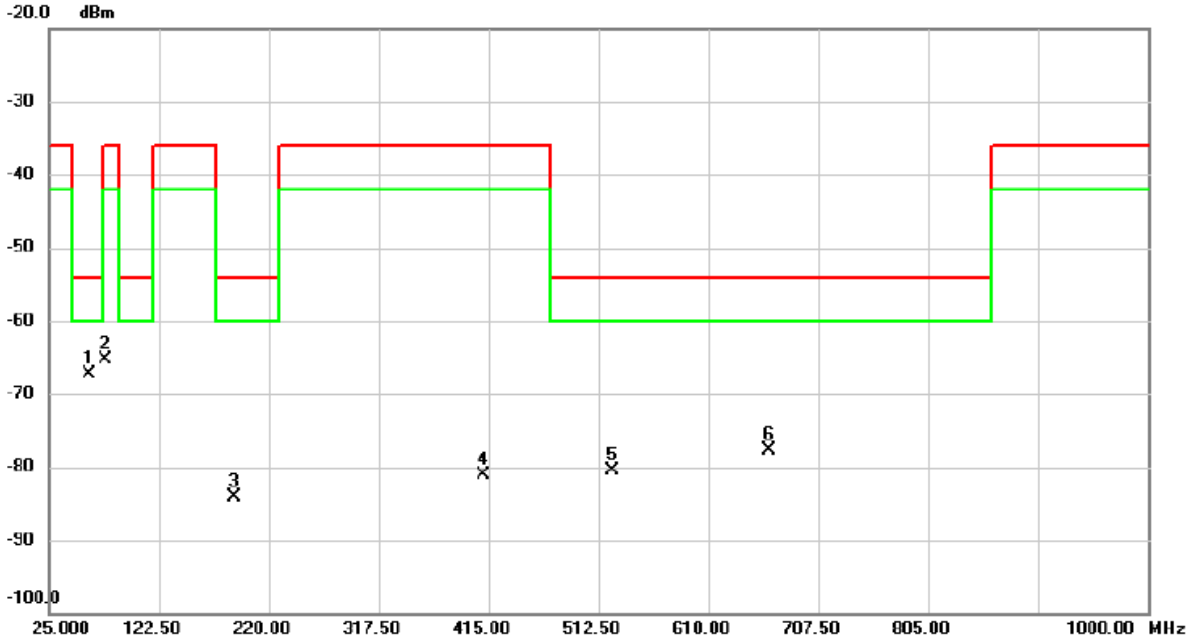
TX Mode_5755MHz



TX Mode_5795MHz

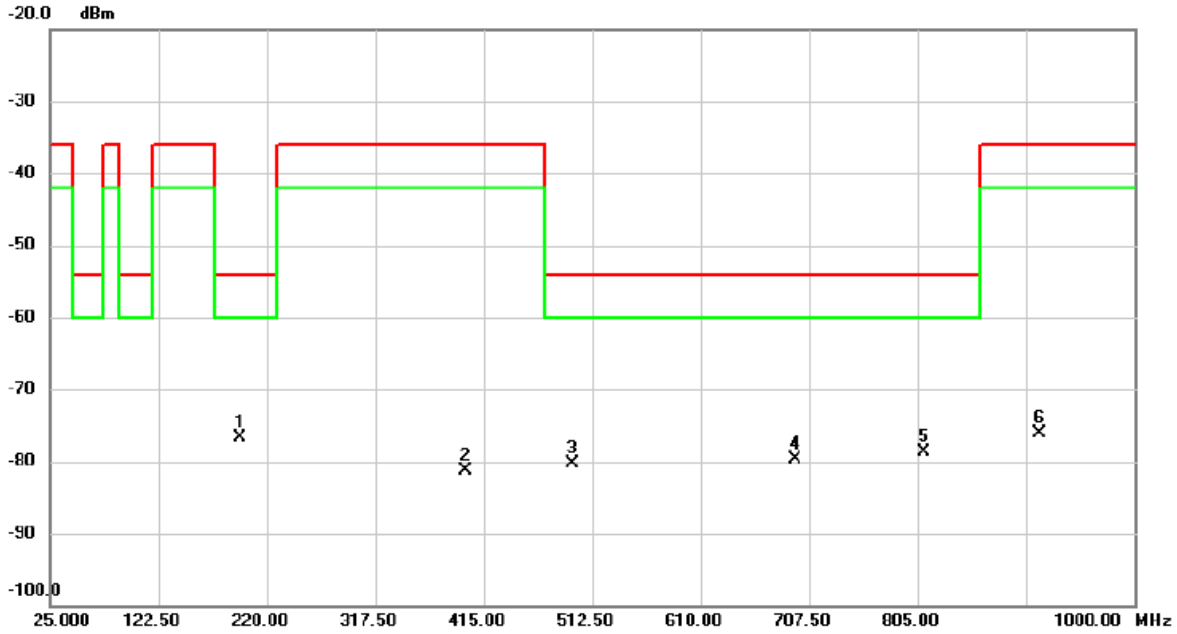


Test Mode	TX IEEE 802.11ac(VHT40) Mode 5755 MHz	Polarization	Vertical



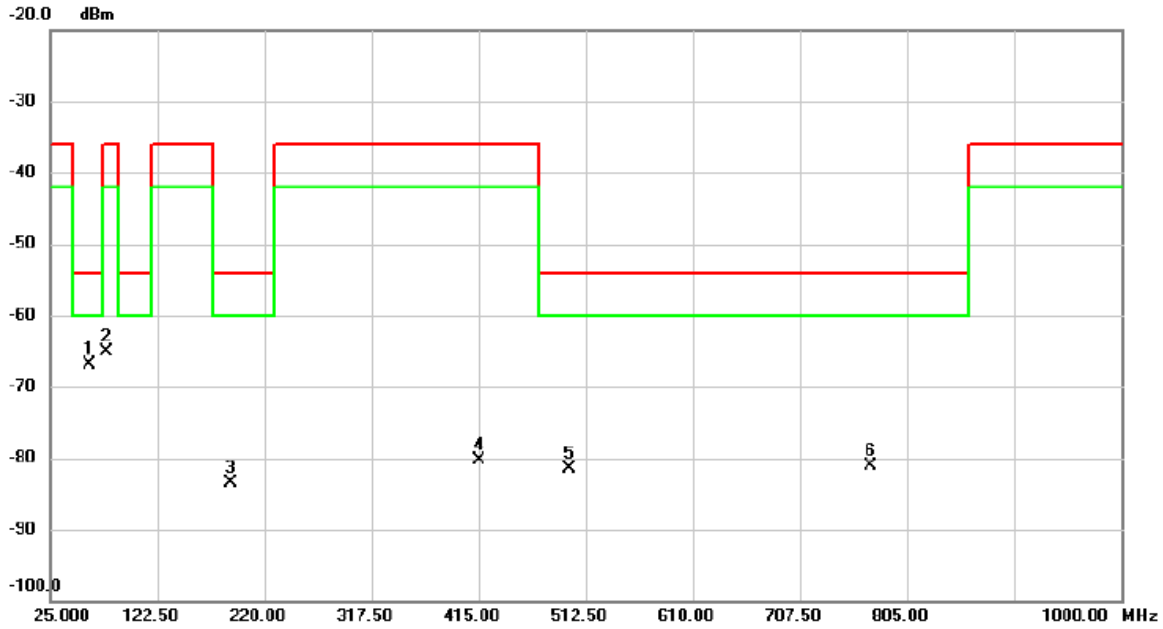
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	60.977	-63.55	-3.70	-67.25	-54.00	-13.25	peak	
2		75.213	-66.26	0.98	-65.28	-36.00	-29.28	peak	
3		189.580	-72.29	-11.90	-84.19	-54.00	-30.19	peak	
4		410.223	-73.67	-7.49	-81.16	-36.00	-45.16	peak	
5		524.785	-74.26	-6.26	-80.52	-54.00	-26.52	peak	
6		663.820	-73.54	-4.21	-77.75	-54.00	-23.75	peak	

Test Mode	TX IEEE 802.11ac(VHT40) Mode 5755 MHz	Polarization	Horizontal



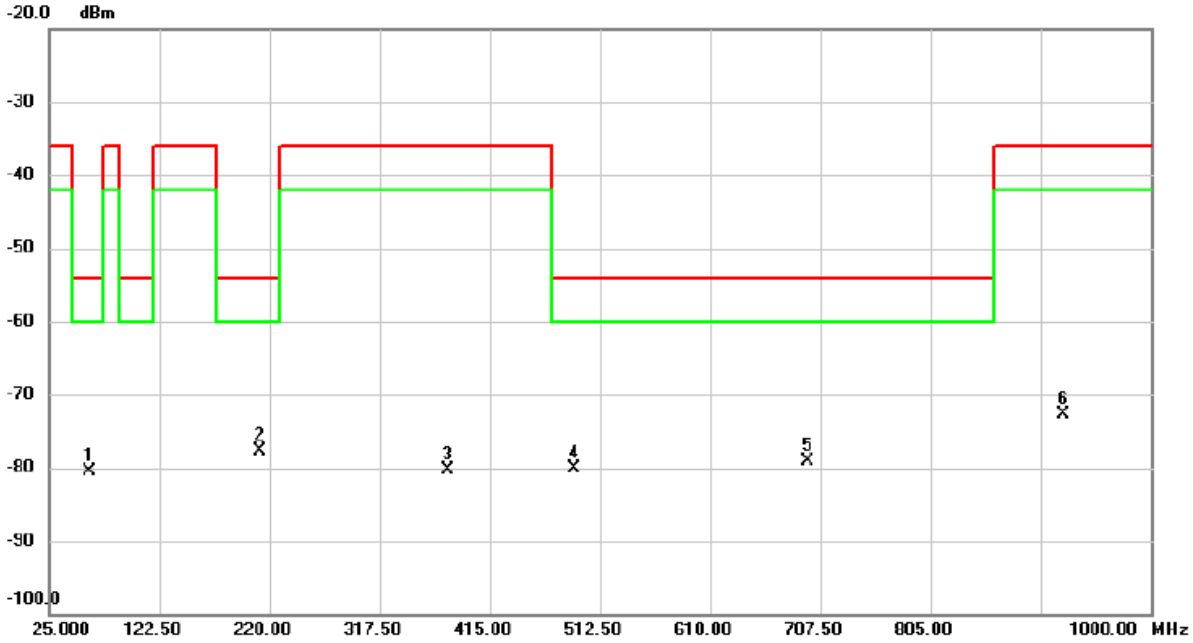
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	196.113	-64.88	-11.77	-76.65	-54.00	-22.65	peak	
2		398.327	-73.84	-7.37	-81.21	-36.00	-45.21	peak	
3		494.365	-74.16	-6.09	-80.25	-54.00	-26.25	peak	
4		695.020	-77.40	-2.36	-79.76	-54.00	-25.76	peak	
5		811.435	-77.52	-1.10	-78.62	-54.00	-24.62	peak	
6		915.175	-76.91	0.80	-76.11	-36.00	-40.11	peak	

Test Mode	TX IEEE 802.11ac(VHT40) Mode 5795 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	60.295	-63.77	-3.04	-66.81	-54.00	-12.81	peak	
2		76.285	-65.87	0.68	-65.19	-36.00	-29.19	peak	
3		188.898	-71.63	-11.82	-83.45	-54.00	-29.45	peak	
4		415.975	-73.00	-7.29	-80.29	-36.00	-44.29	peak	
5		497.875	-74.79	-6.69	-81.48	-54.00	-27.48	peak	
6		772.240	-79.06	-1.98	-81.04	-54.00	-27.04	peak	

Test Mode	TX IEEE 802.11ac(VHT40) Mode 5795 MHz	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		60.392	-68.89	-11.64	-80.53	-54.00	-26.53	peak	
2	*	211.225	-67.31	-10.32	-77.63	-54.00	-23.63	peak	
3		378.340	-72.75	-7.63	-80.38	-36.00	-44.38	peak	
4		489.587	-73.80	-6.23	-80.03	-54.00	-26.03	peak	
5		696.775	-76.81	-2.30	-79.11	-54.00	-25.11	peak	
6		922.780	-73.63	0.93	-72.70	-36.00	-36.70	peak	

APPENDIX D - UNWANTED EMISSIONS IN THE SPRIOUS DOMAIN - STANDBY (25MHZ TO 1000MHZ)

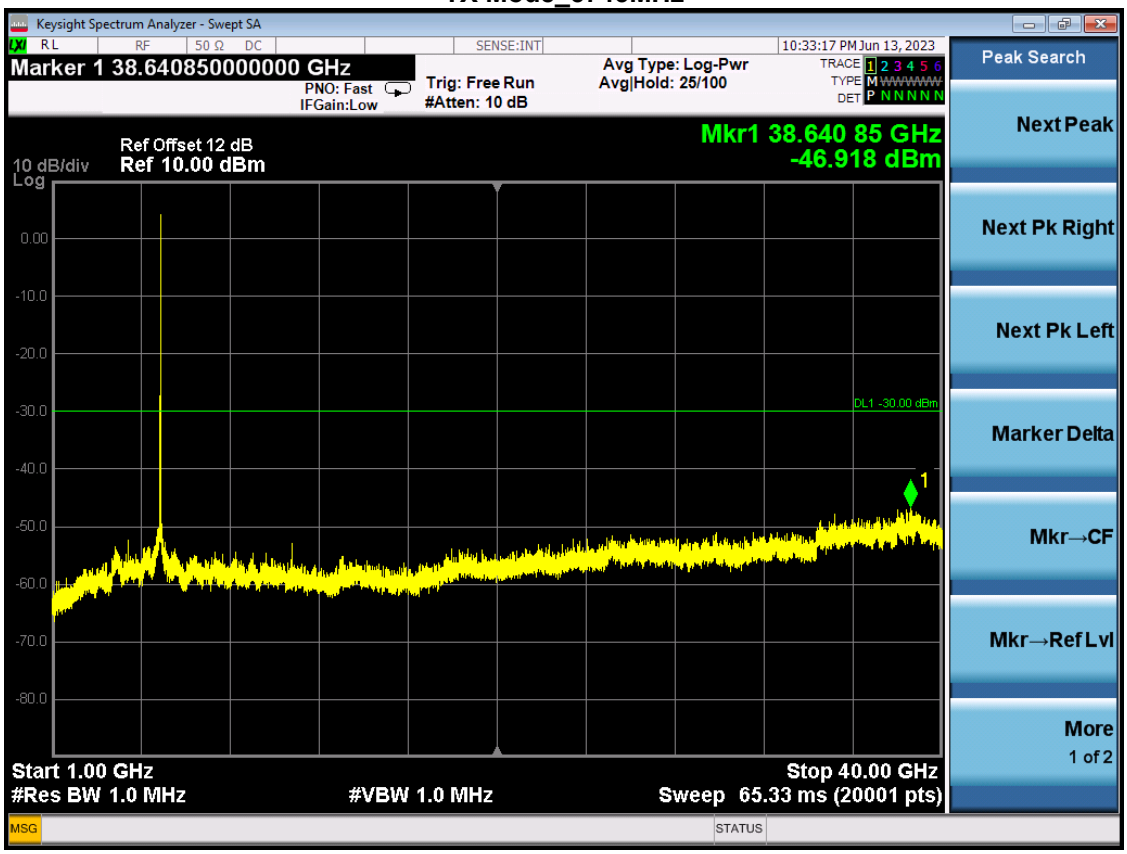
Test Mode: N/A

Note: “N/A” denotes test is not applicable to this device.

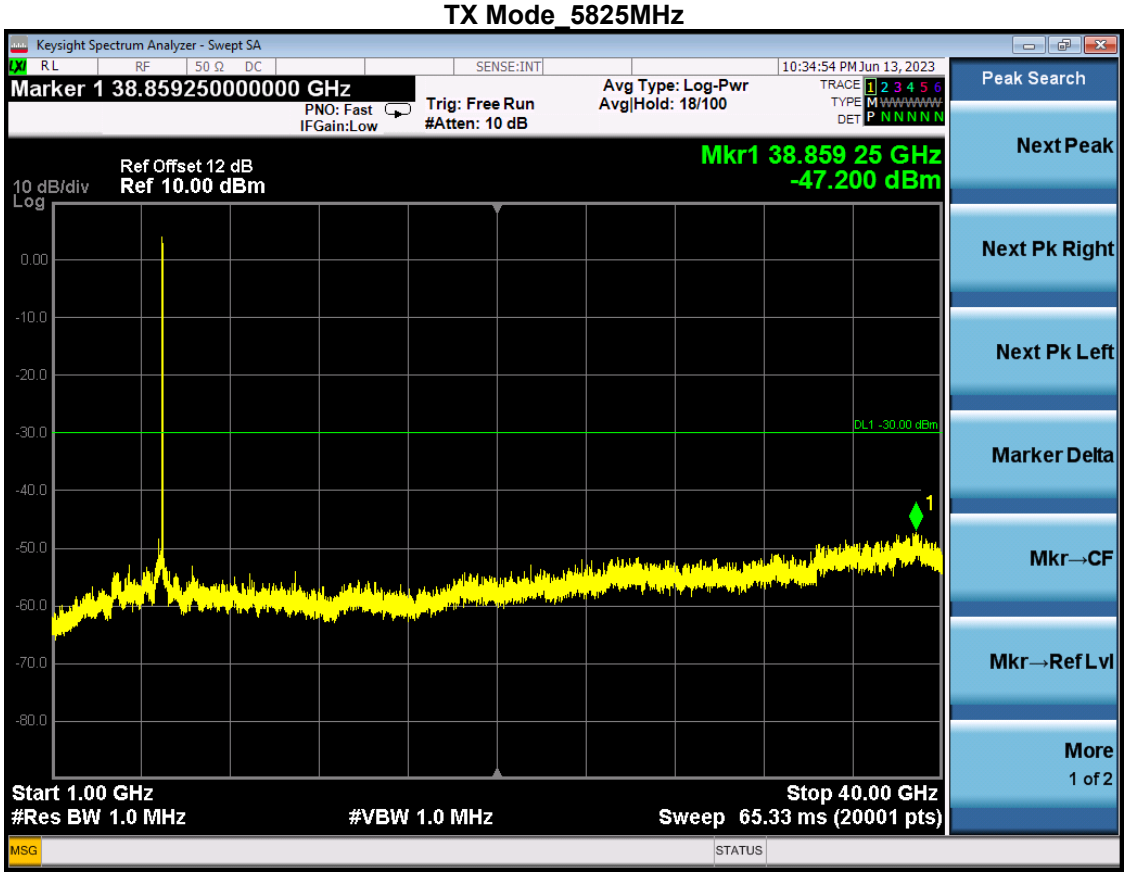
APPENDIX E - UNWANTED EMISSIONS IN THE SPRIOUS DOMAIN - OPERATING (ABOVE 1000MHZ)

Test Mode	TX IEEE 802.11a_Ant. 1

TX Mode_5745MHz

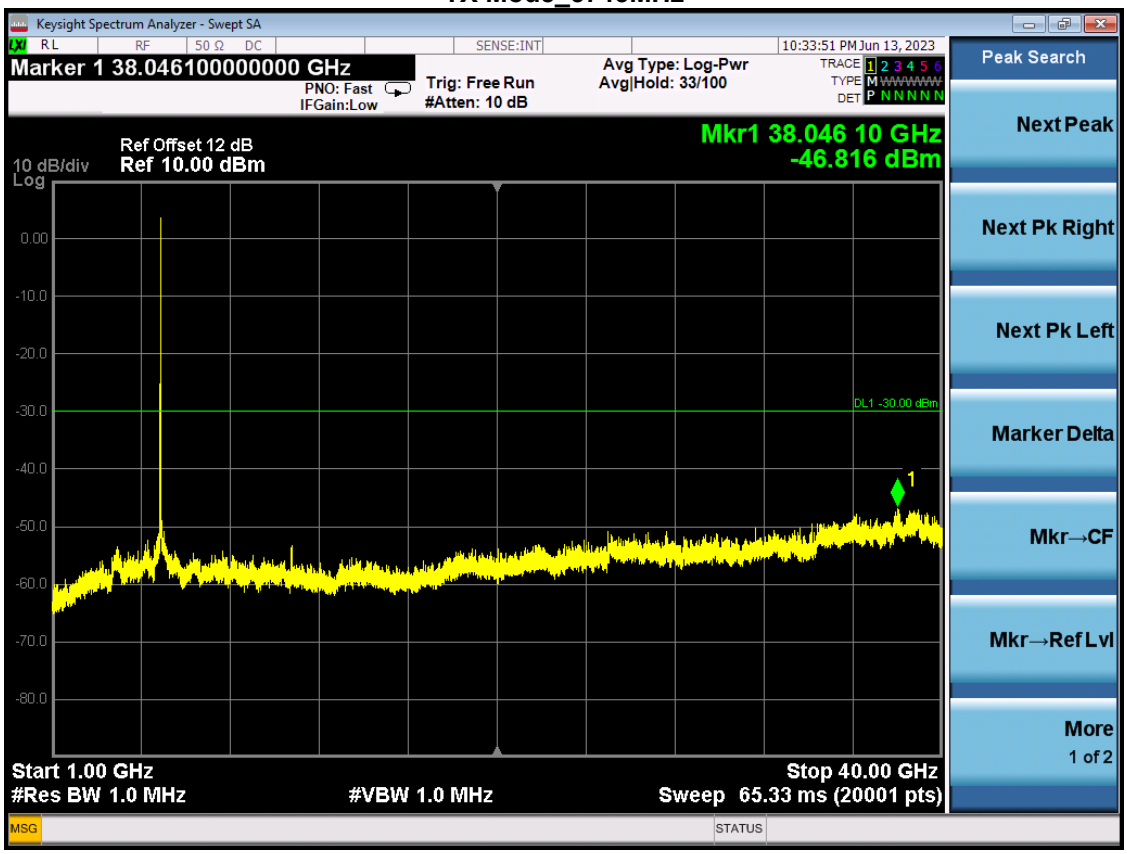


TX Mode_5825MHz

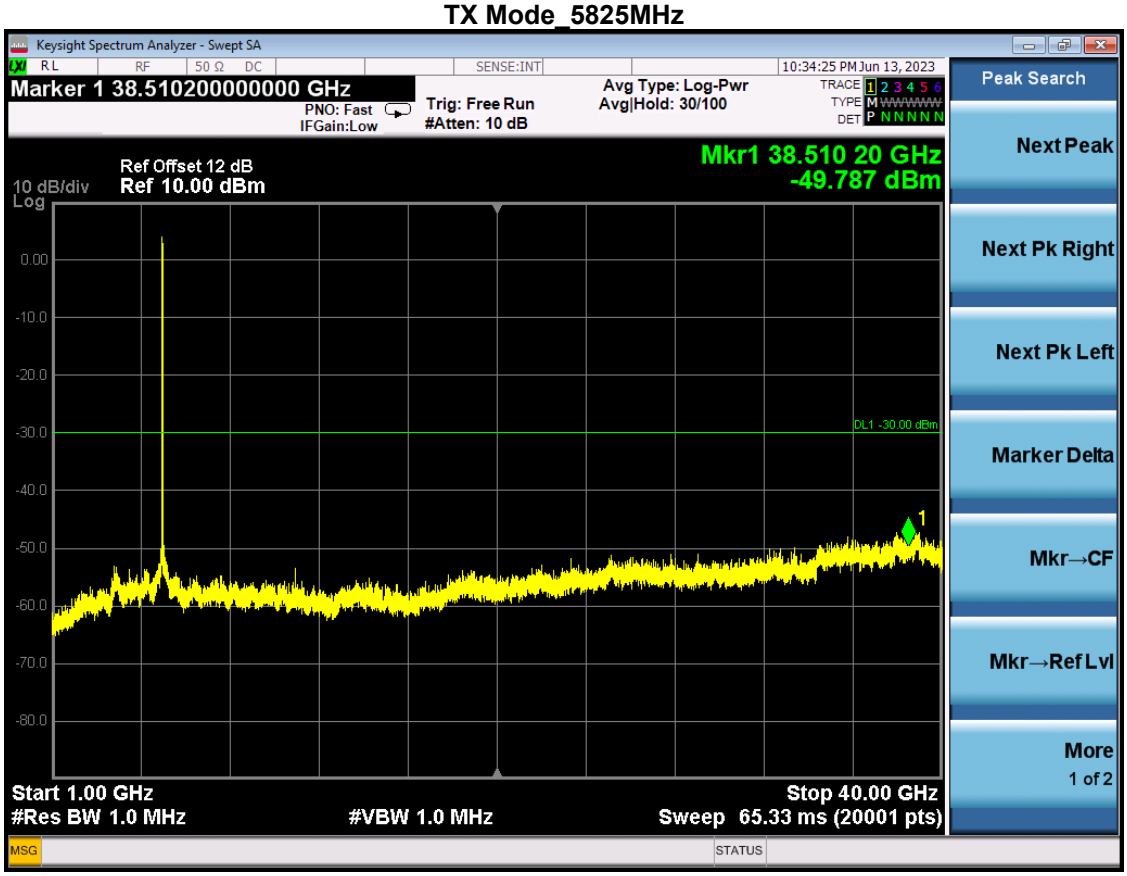


Test Mode	TX IEEE 802.11a_Ant. 2

TX Mode_5745MHz

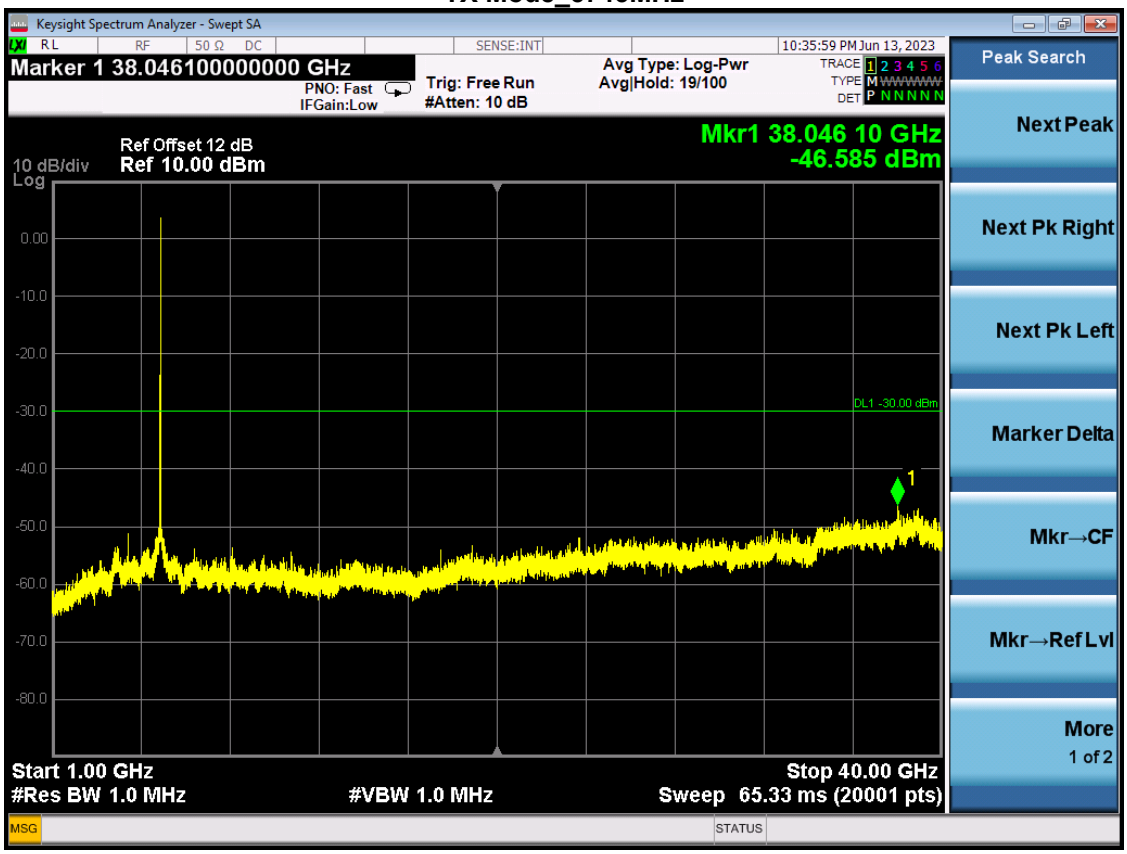


TX Mode_5825MHz

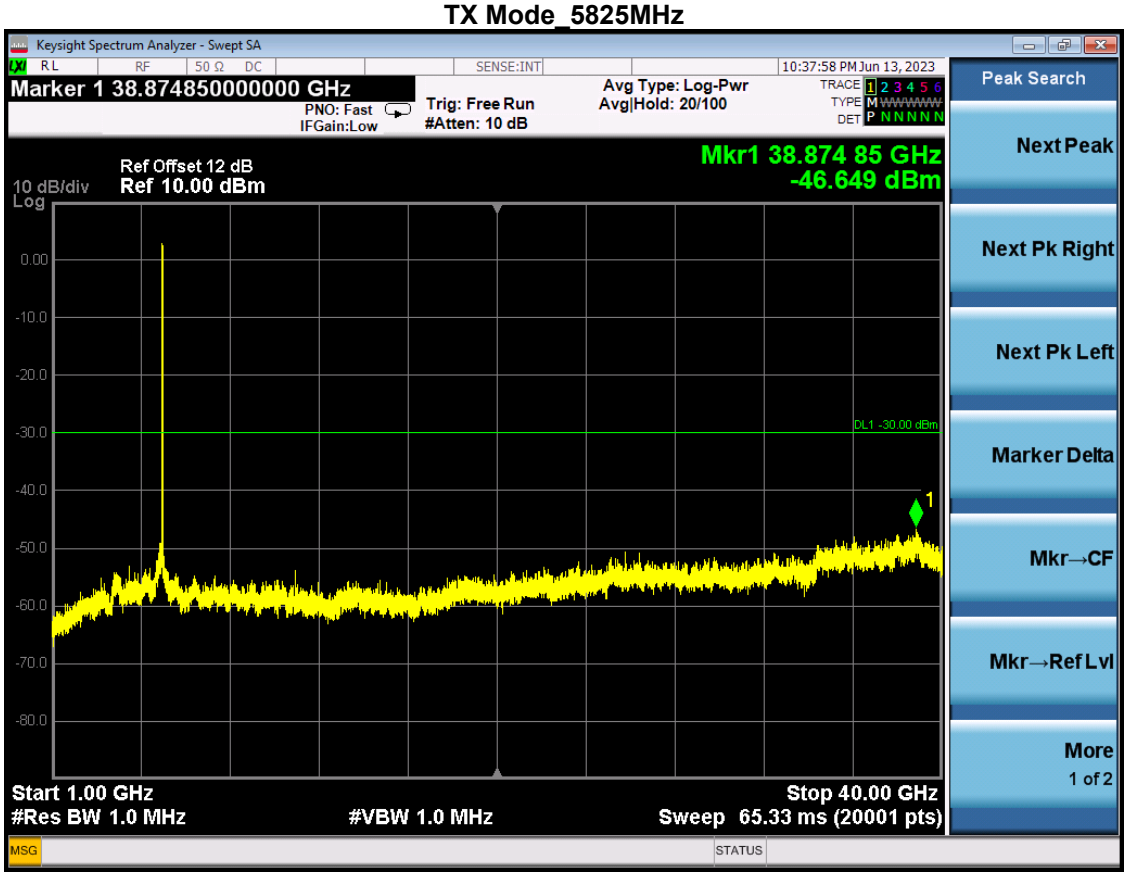


Test Mode	TX IEEE 802.11ac(VHT20)_Ant. 1

TX Mode_5745MHz

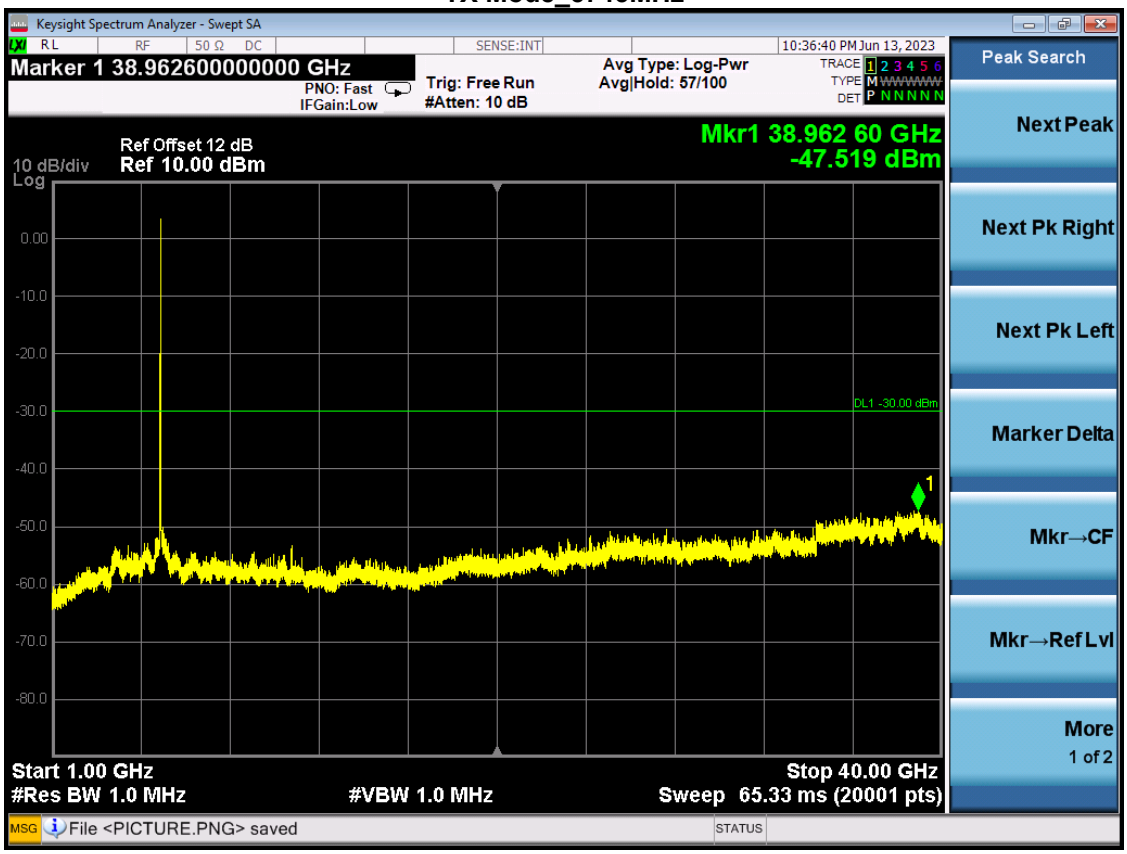


TX Mode_5825MHz

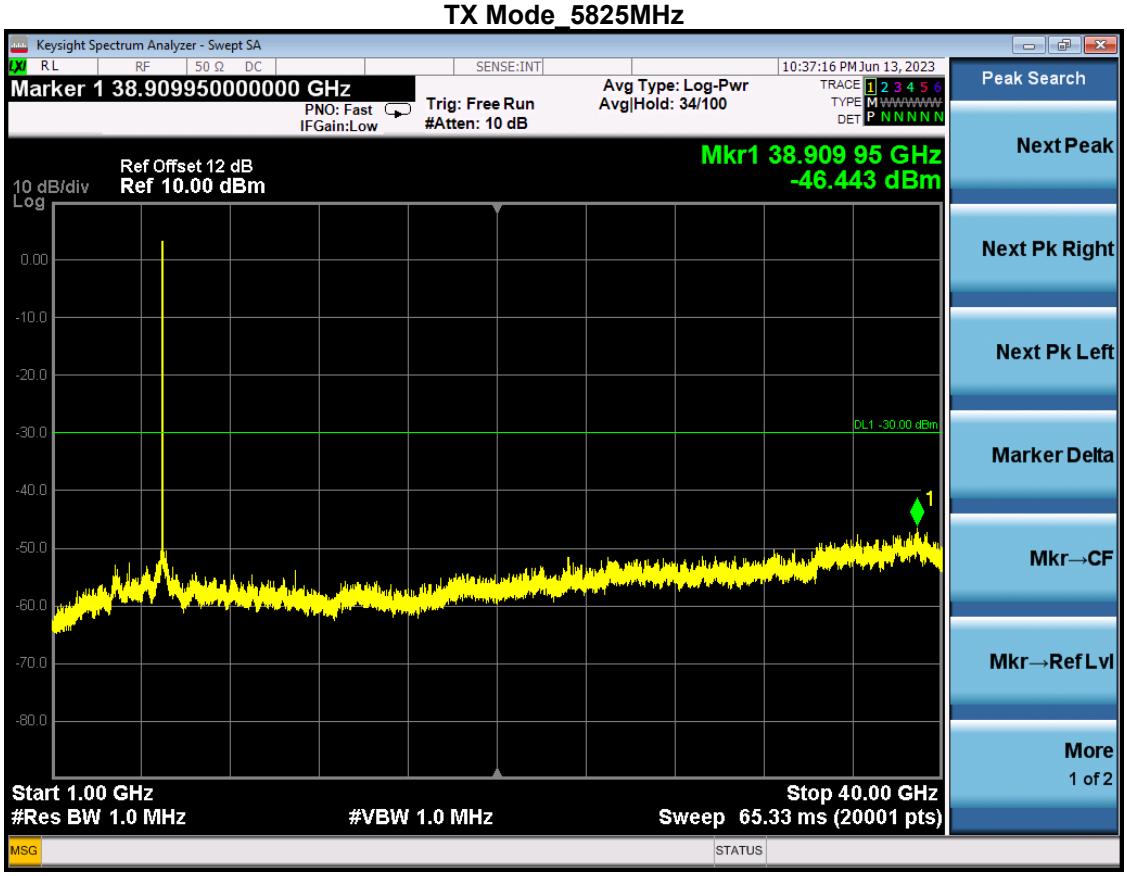


Test Mode	TX IEEE 802.11ac(VHT20)_Ant. 2

TX Mode_5745MHz

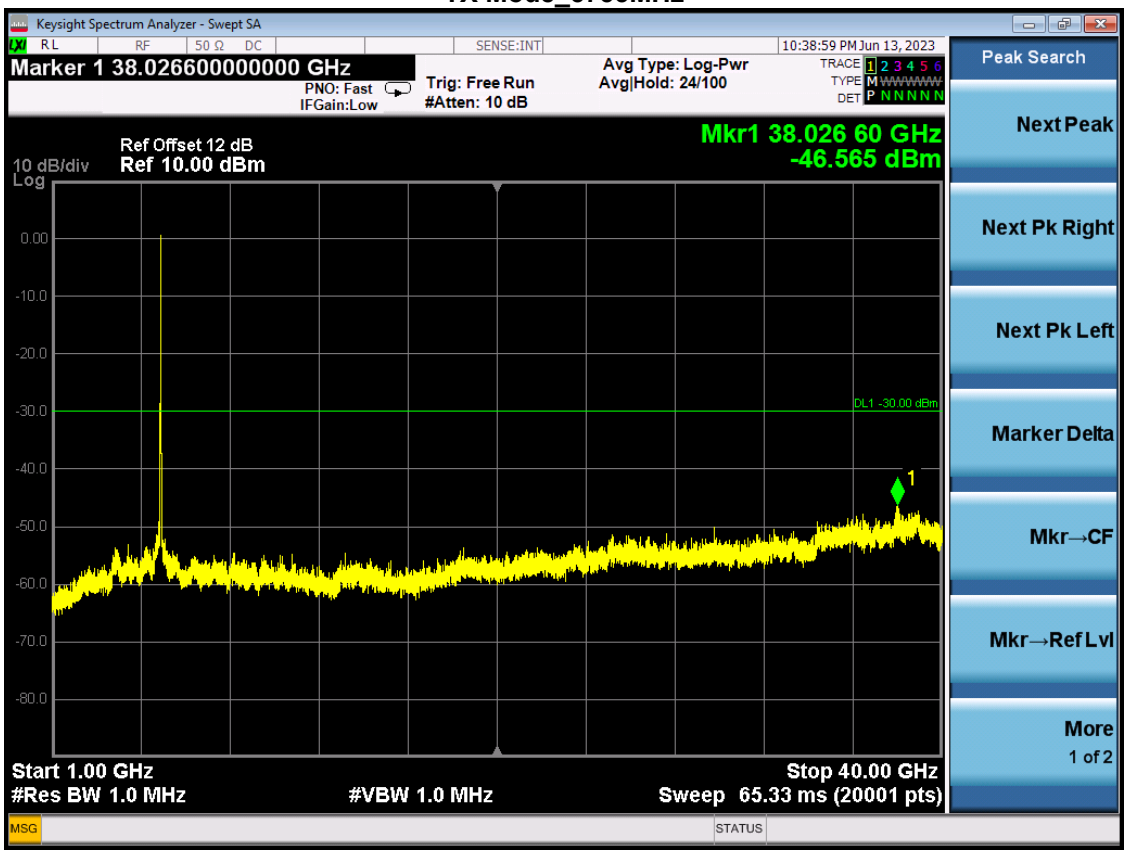


TX Mode_5825MHz

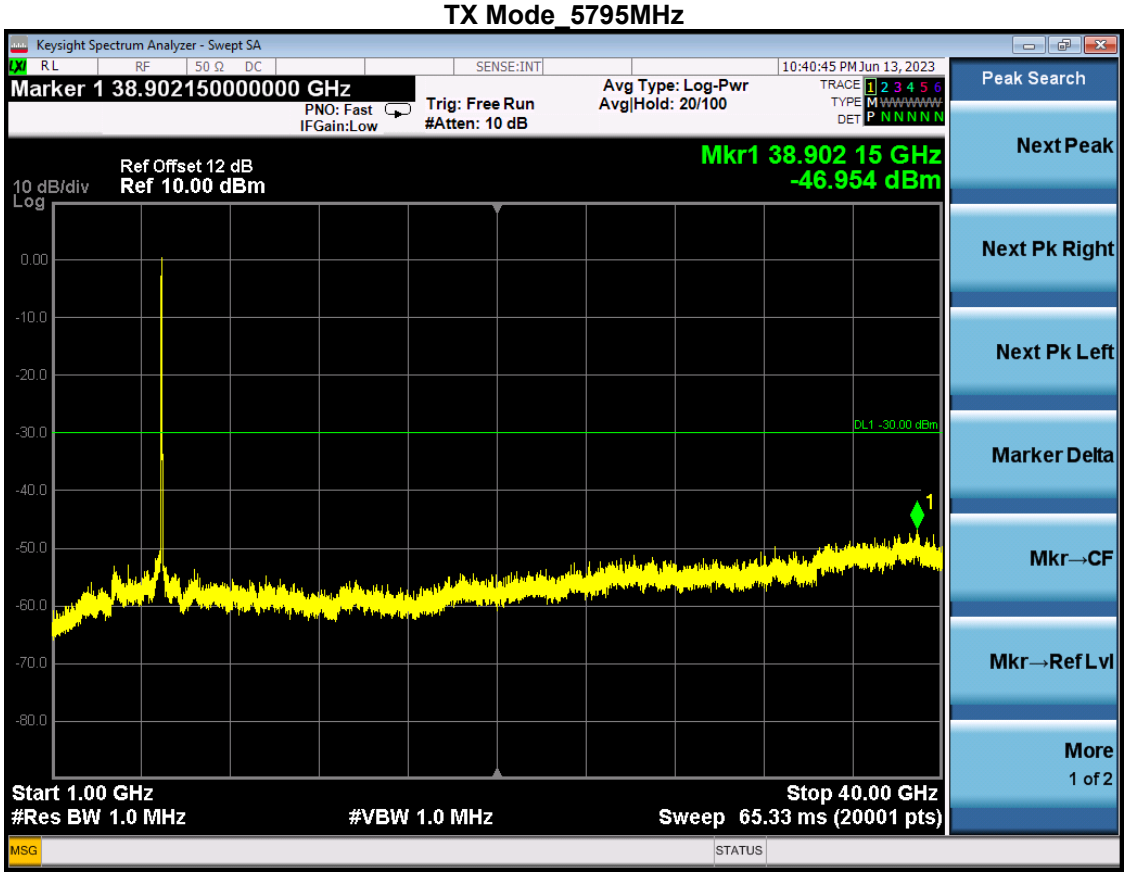


Test Mode	TX IEEE 802.11ac(VHT40)_Ant. 1

TX Mode_5755MHz

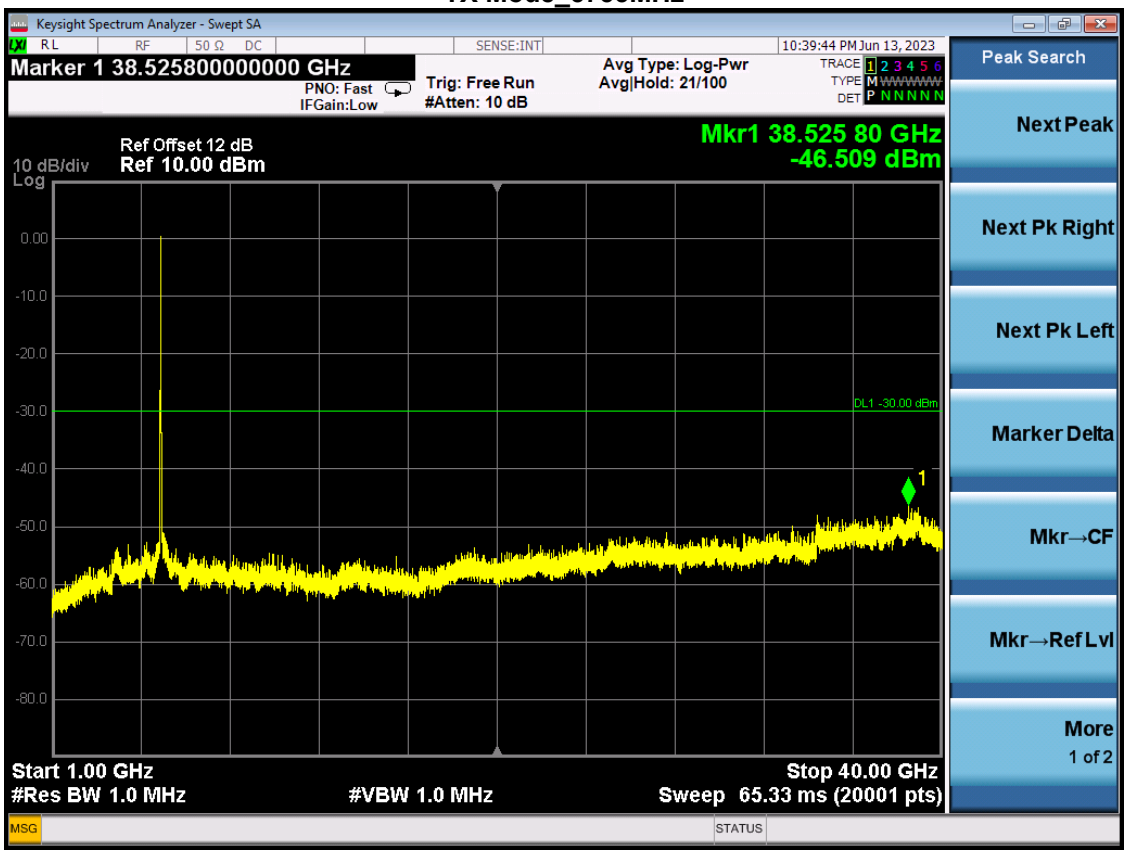


TX Mode_5795MHz

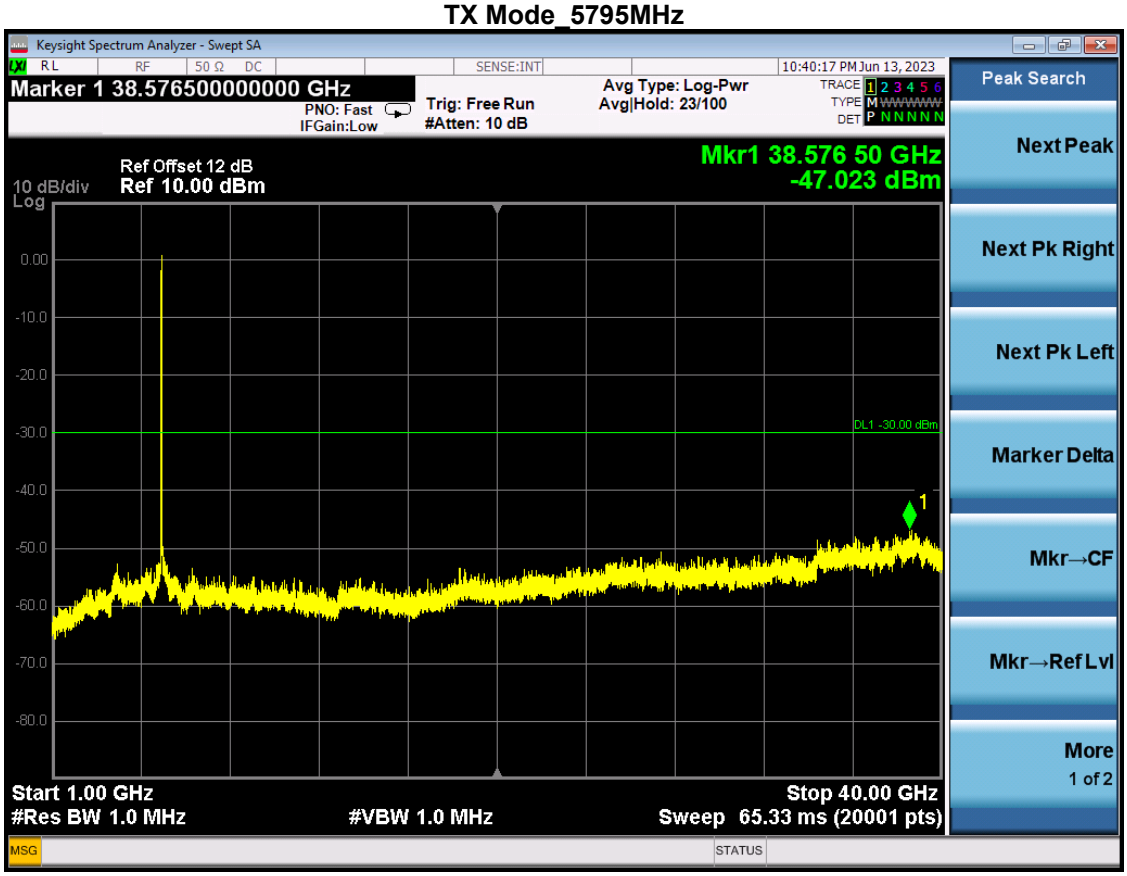


Test Mode	TX IEEE 802.11ac(VHT40)_Ant. 2

TX Mode_5755MHz

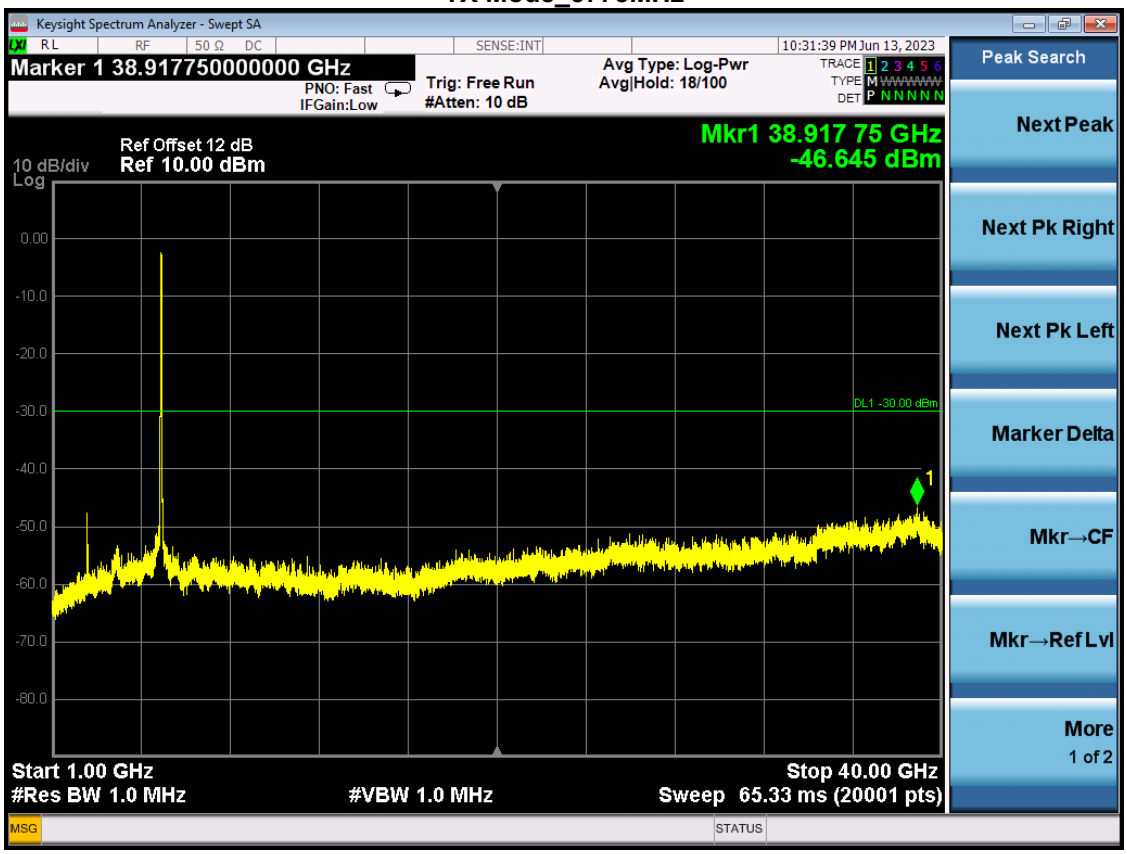


TX Mode_5795MHz



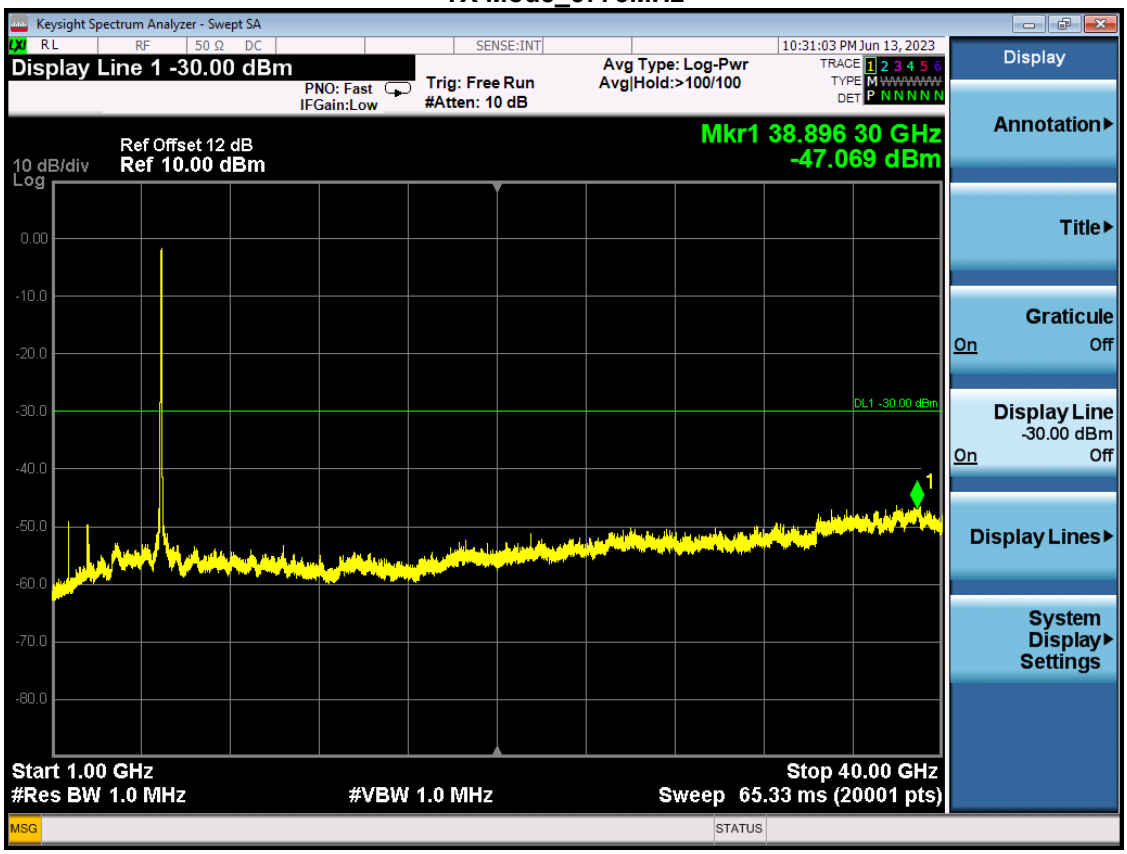
Test Mode	TX IEEE 802.11ac(VHT80)_Ant. 1

TX Mode_5775MHz



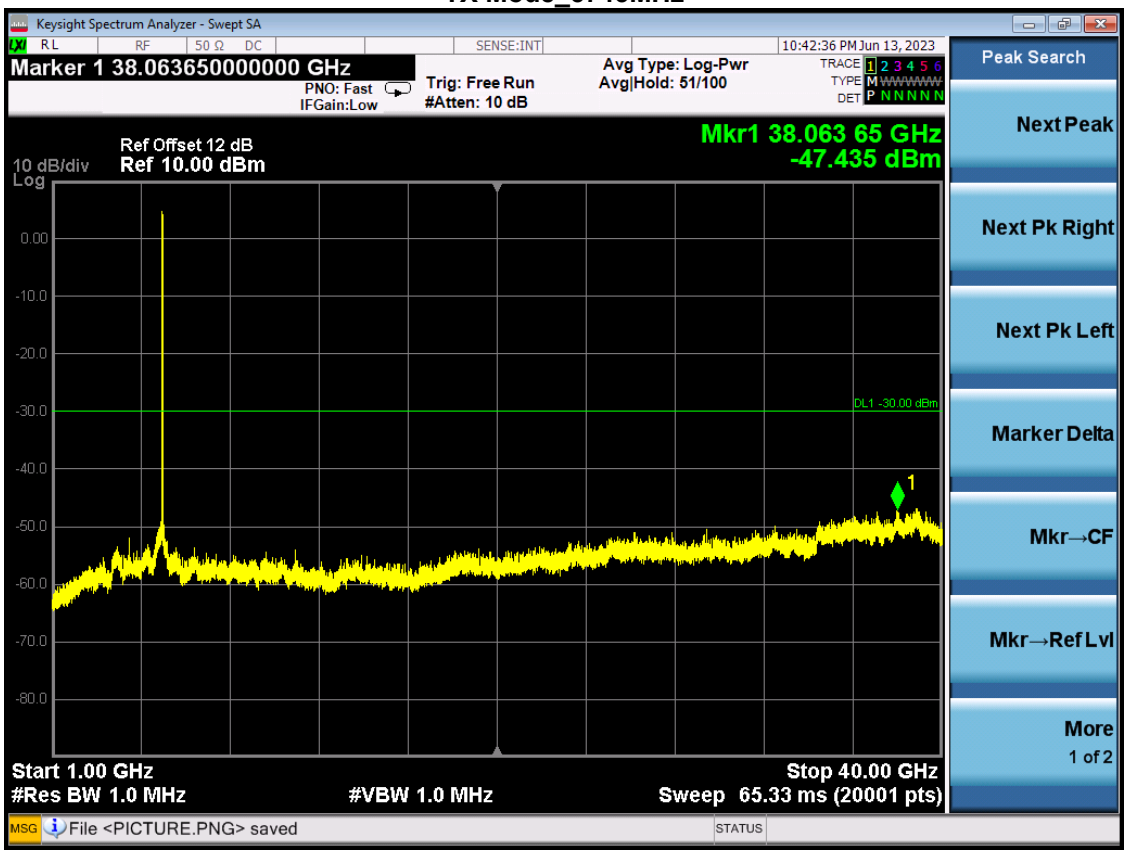
Test Mode	TX IEEE 802.11ac(VHT80)_Ant. 2

TX Mode_5775MHz

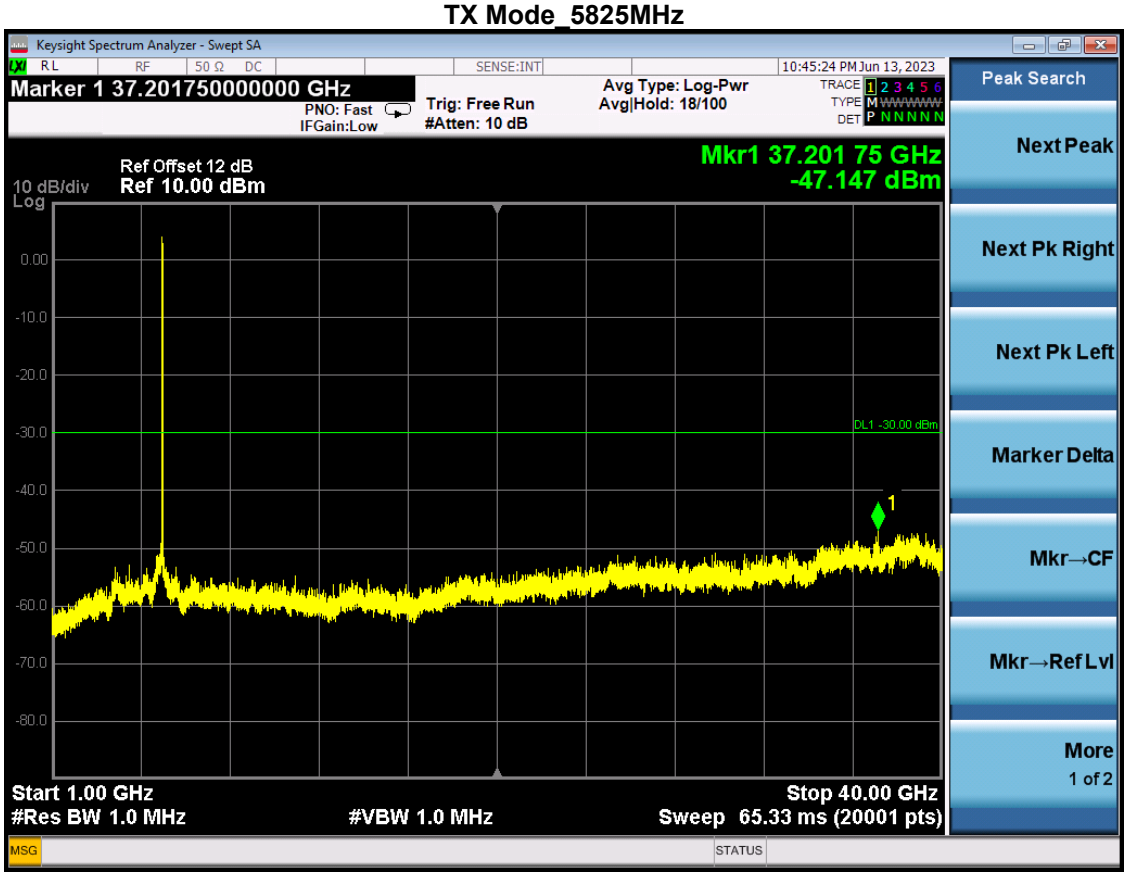


Test Mode	TX IEEE 802.11ax(HE20)_Ant. 1

TX Mode_5745MHz

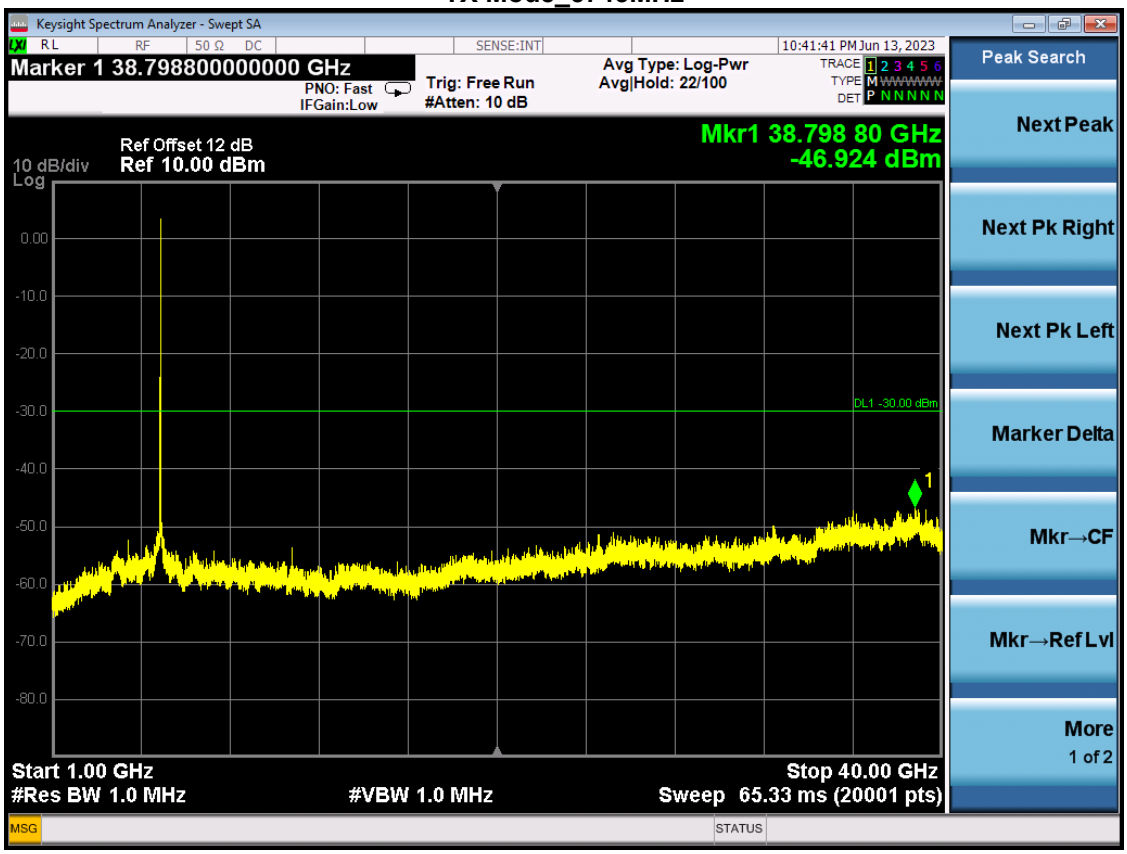


TX Mode_5825MHz

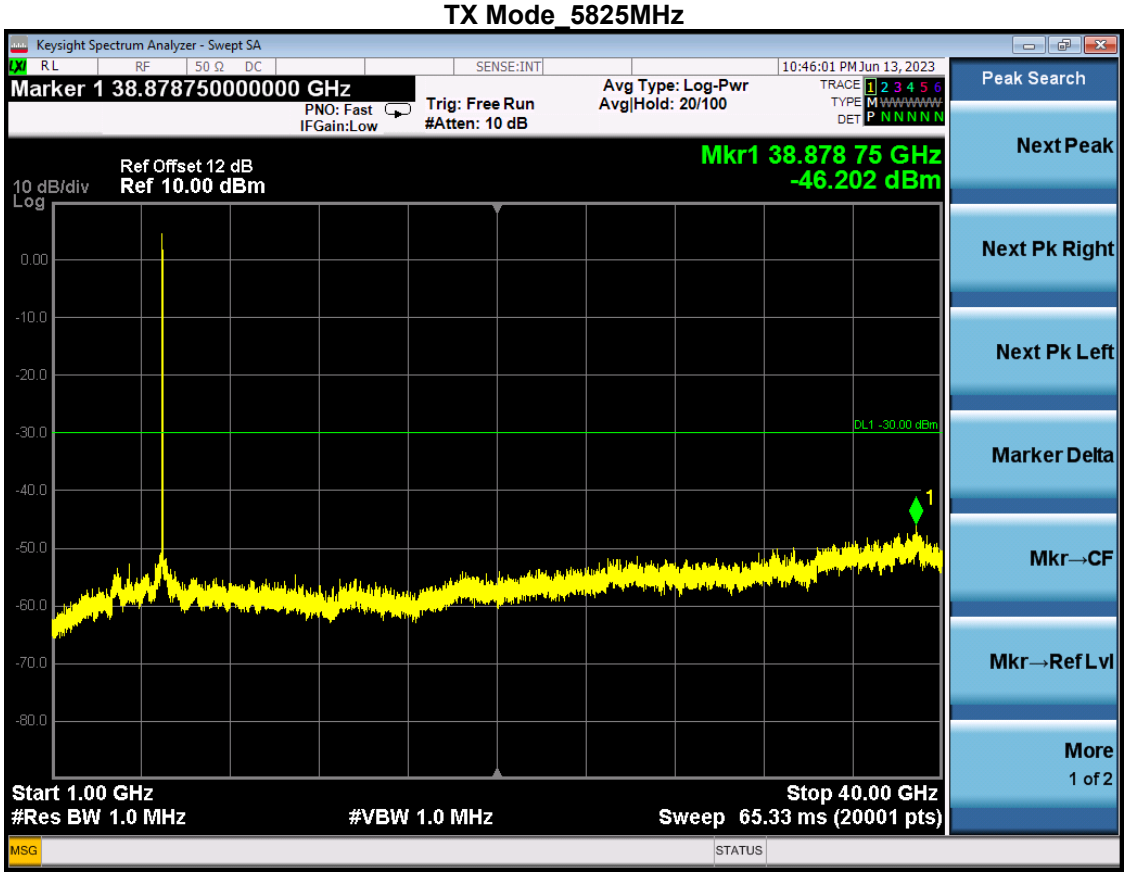


Test Mode	TX IEEE 802.11ax(HE20)_Ant. 2

TX Mode_5745MHz

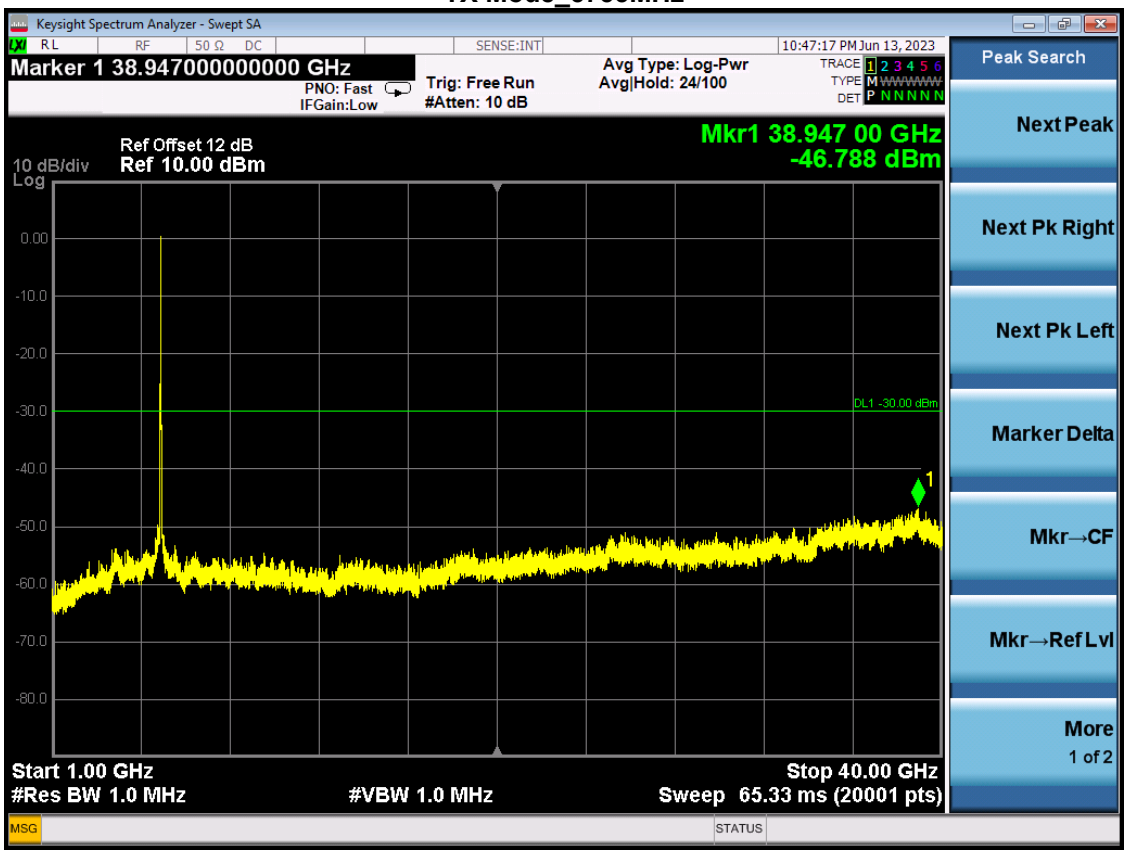


TX Mode_5825MHz

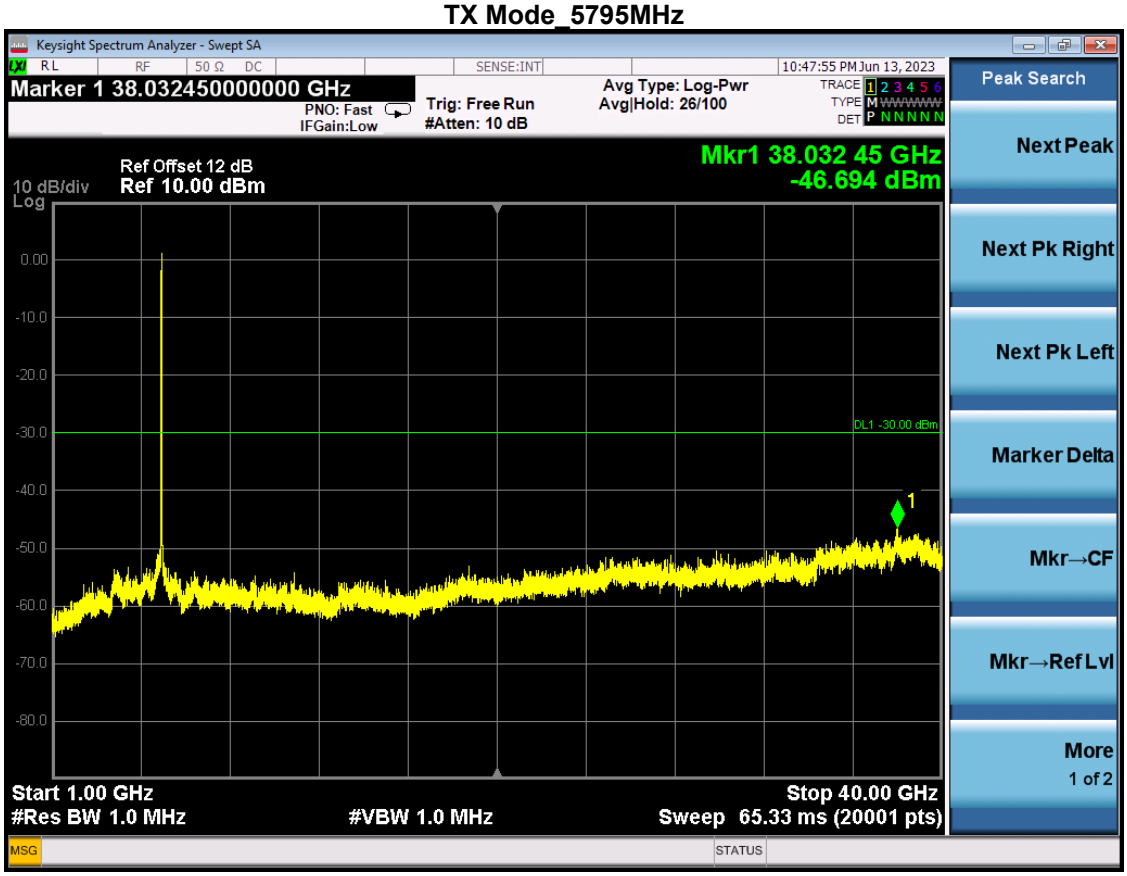


Test Mode	TX IEEE 802.11ax(HE40)_Ant. 1

TX Mode_5755MHz

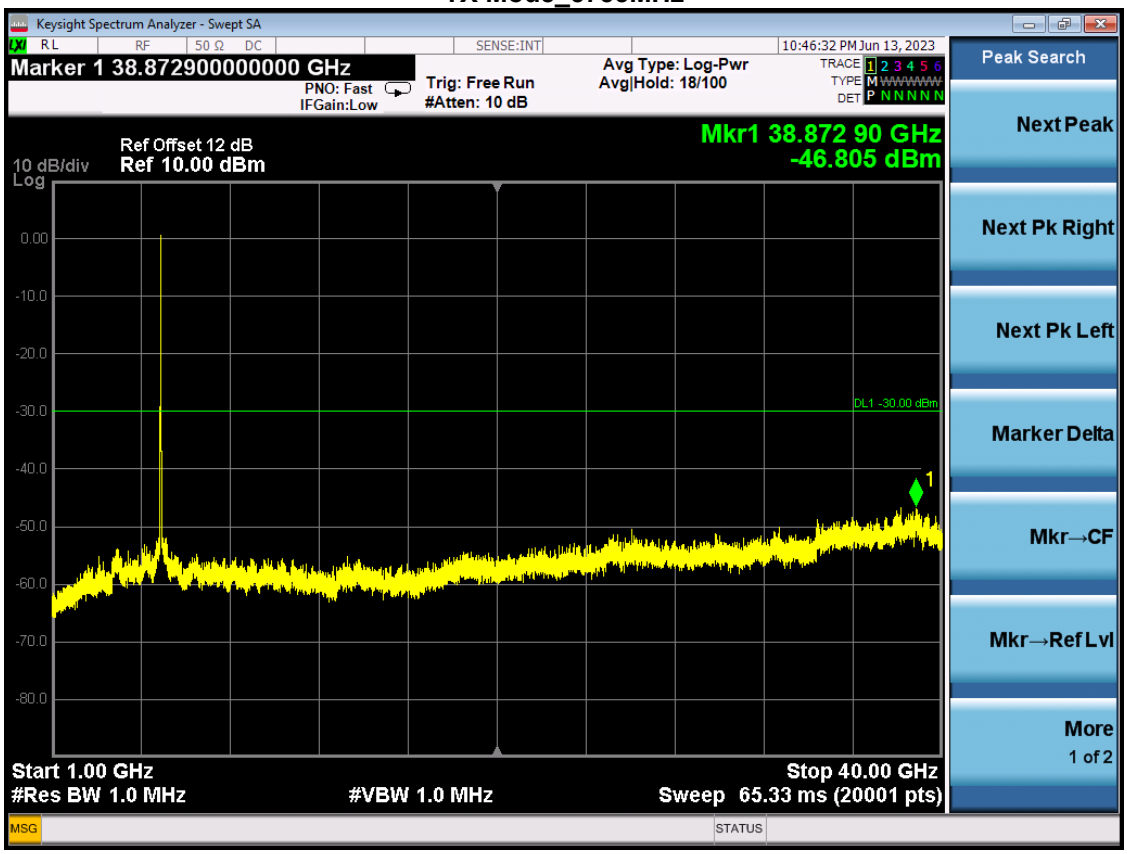


TX Mode_5795MHz

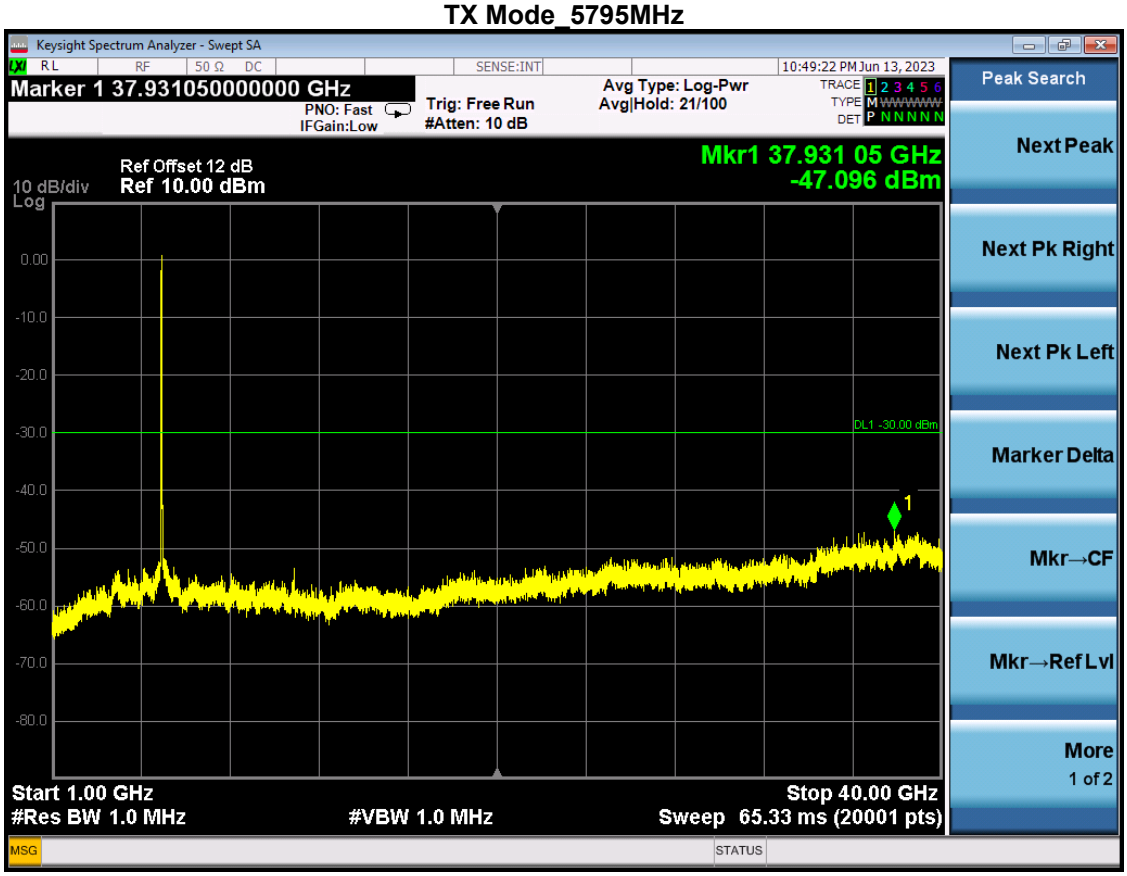


Test Mode	TX IEEE 802.11ax(HE40)_Ant. 2

TX Mode_5755MHz

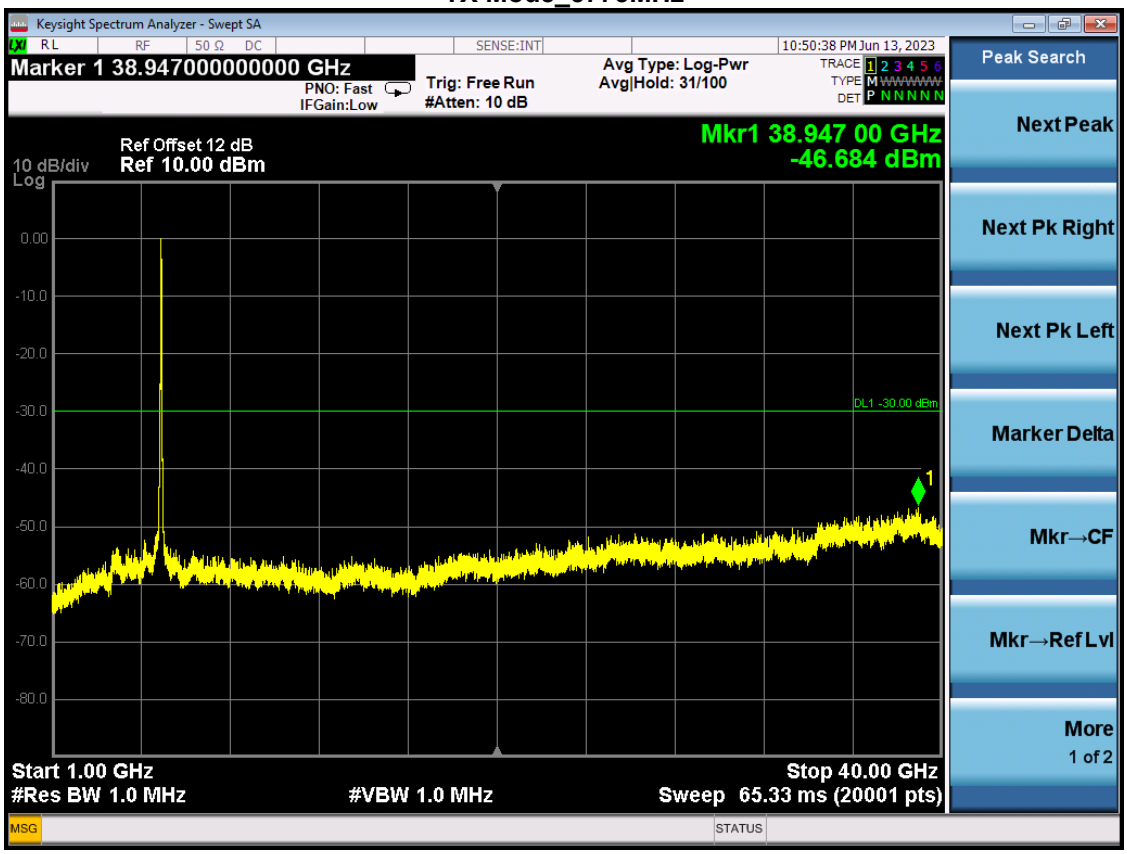


TX Mode_5795MHz



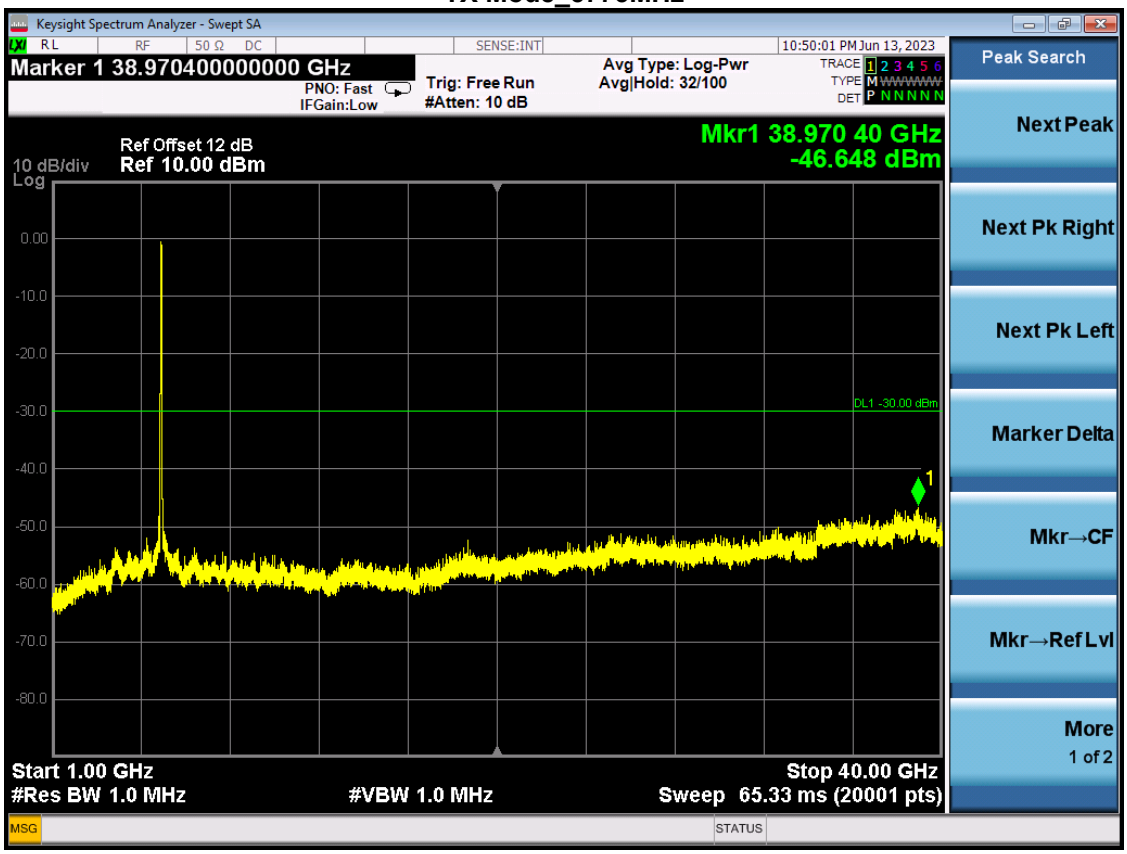
Test Mode	TX IEEE 802.11ax(HE80)_Ant. 1

TX Mode_5775MHz

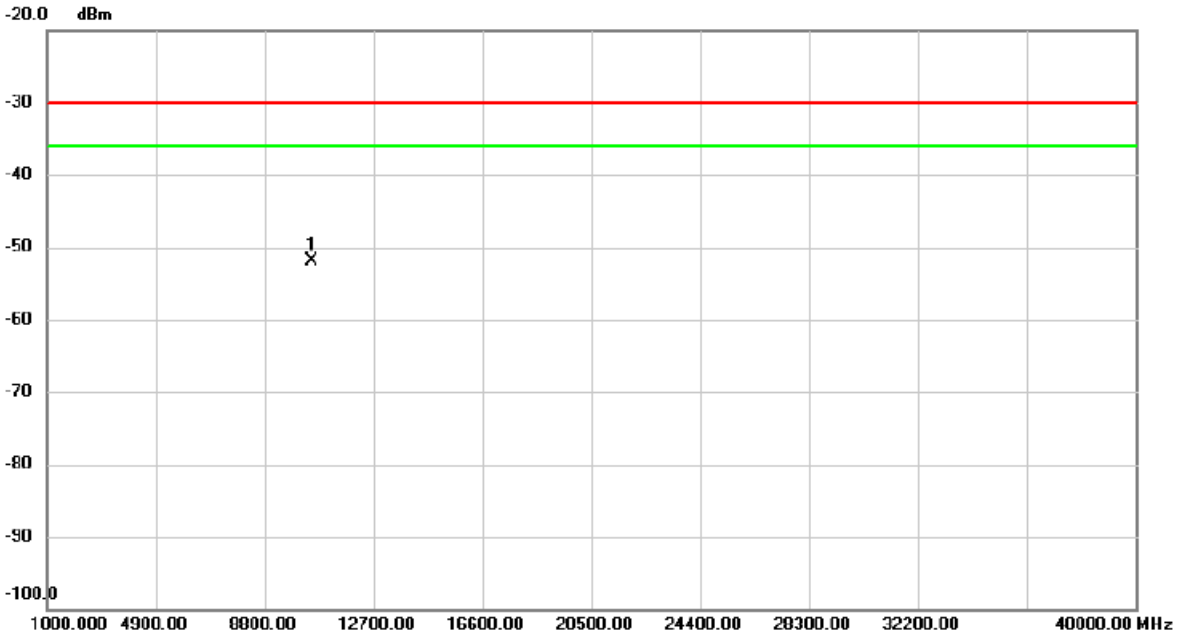


Test Mode	TX IEEE 802.11ax(HE80)_Ant. 2

TX Mode_5775MHz

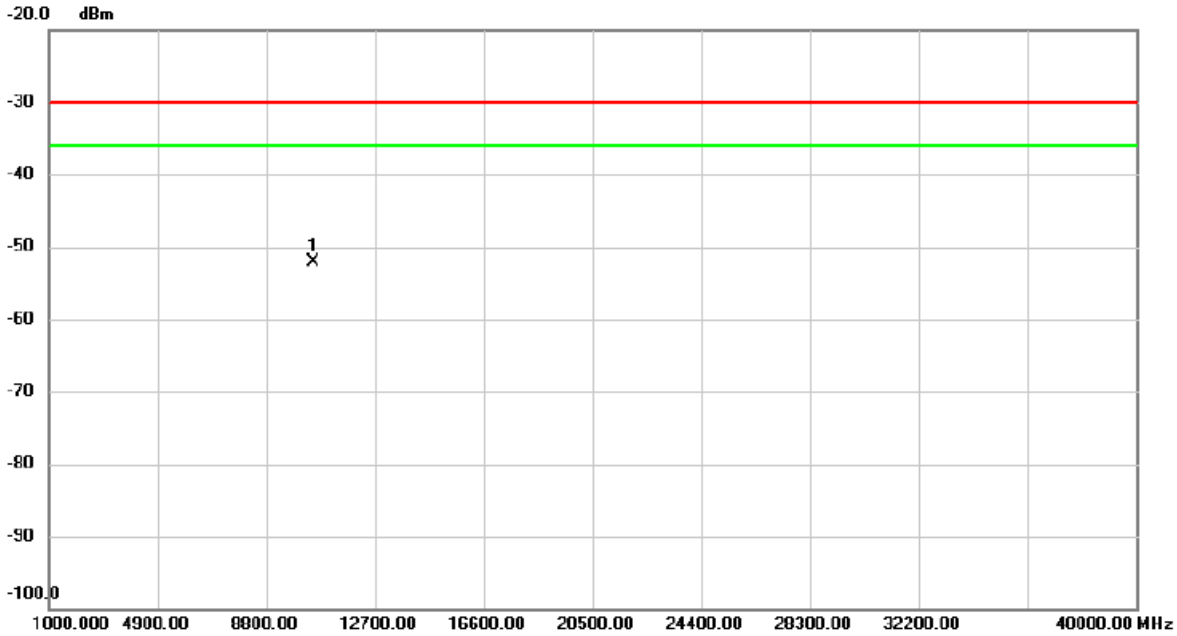


Test Mode	TX IEEE 802.11a Mode 5745 MHz	Polarization	Vertical



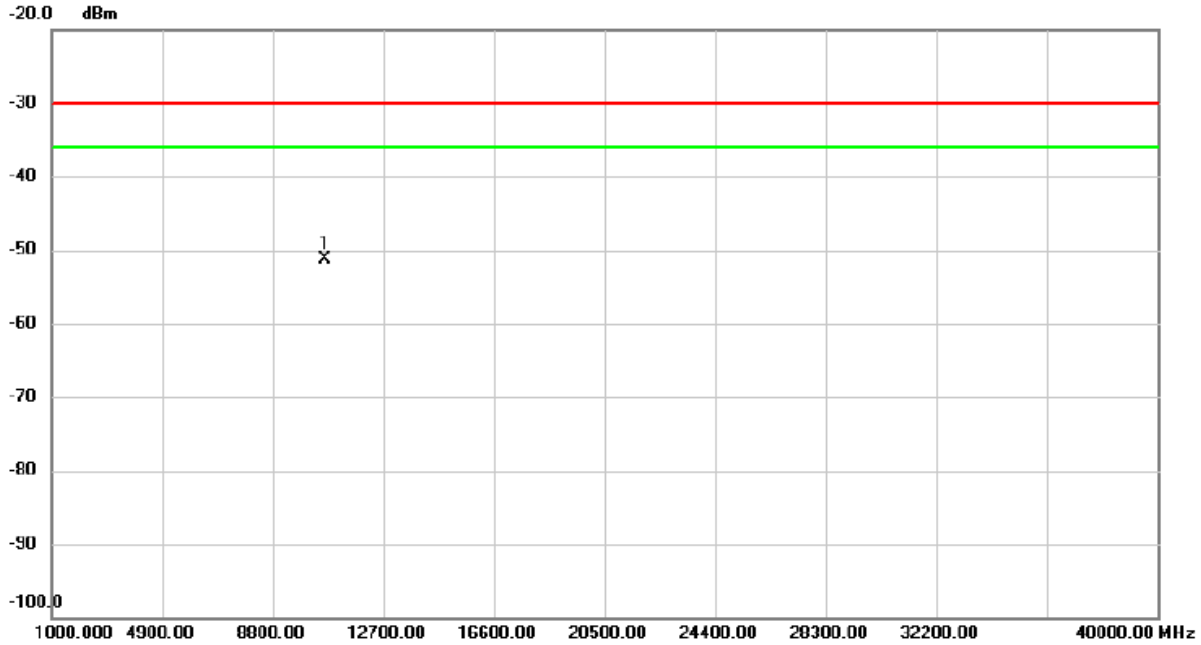
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10479.980	-56.35	4.47	-51.88	-30.00	-21.88	peak	

Test Mode	TX IEEE 802.11a Mode 5745 MHz	Polarization	Horizontal



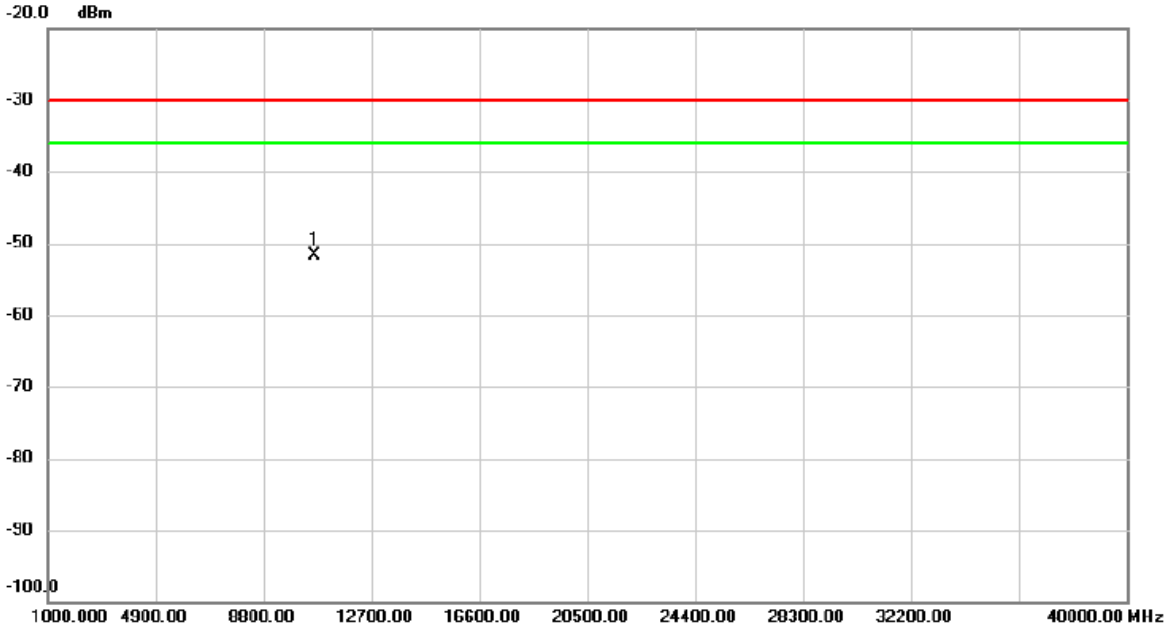
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10486.653	-56.51	4.37	-52.14	-30.00	-22.14	peak	

Test Mode	TX IEEE 802.11a Mode 5825 MHz	Polarization	Vertical



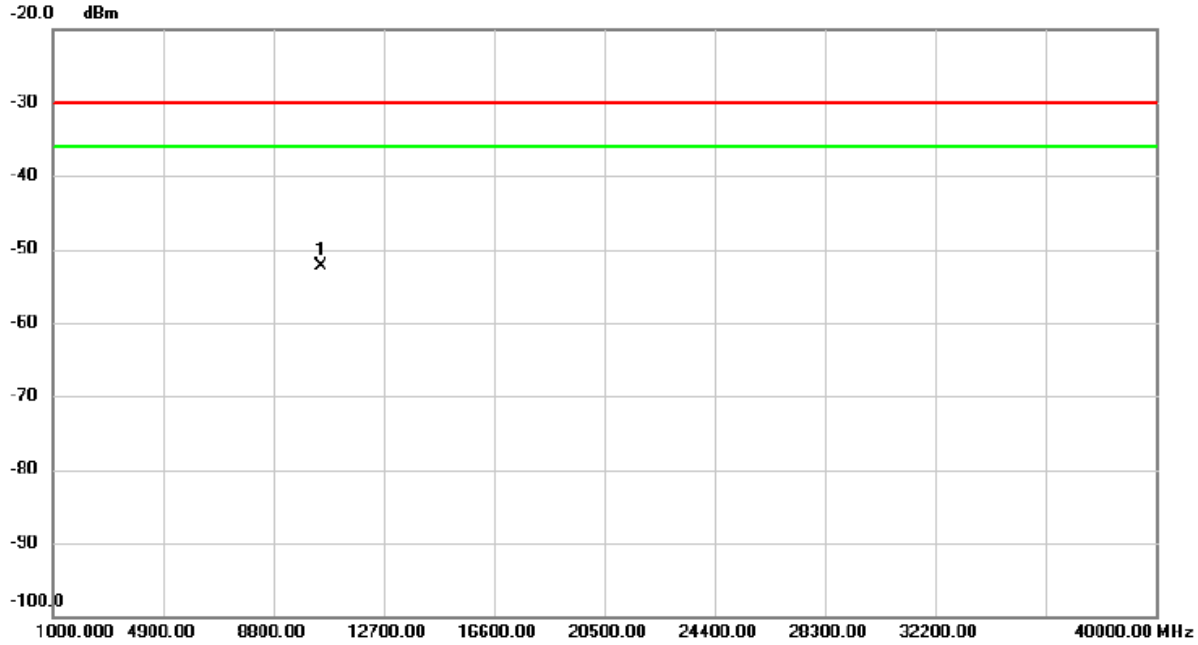
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10641.660	-56.07	4.68	-51.39	-30.00	-21.39	peak	

Test Mode	TX IEEE 802.11a Mode 5825 MHz	Polarization	Horizontal



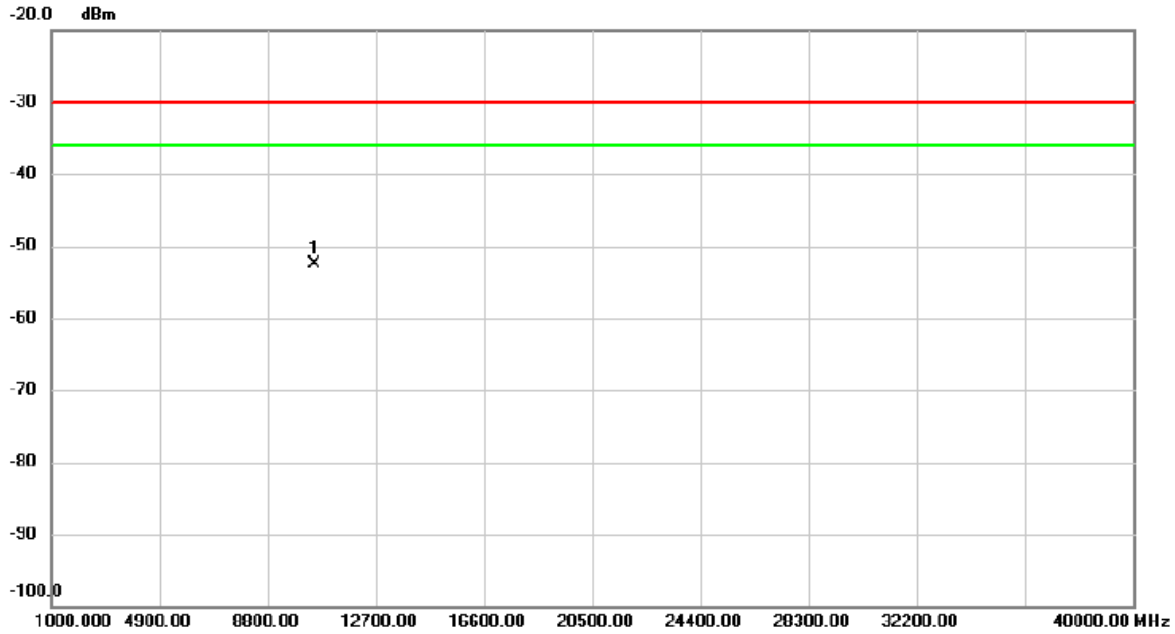
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10630.325	-56.27	4.60	-51.67	-30.00	-21.67	peak	

Test Mode	TX IEEE 802.11ac(VHT20) Mode 5745 MHz	Polarization	Vertical



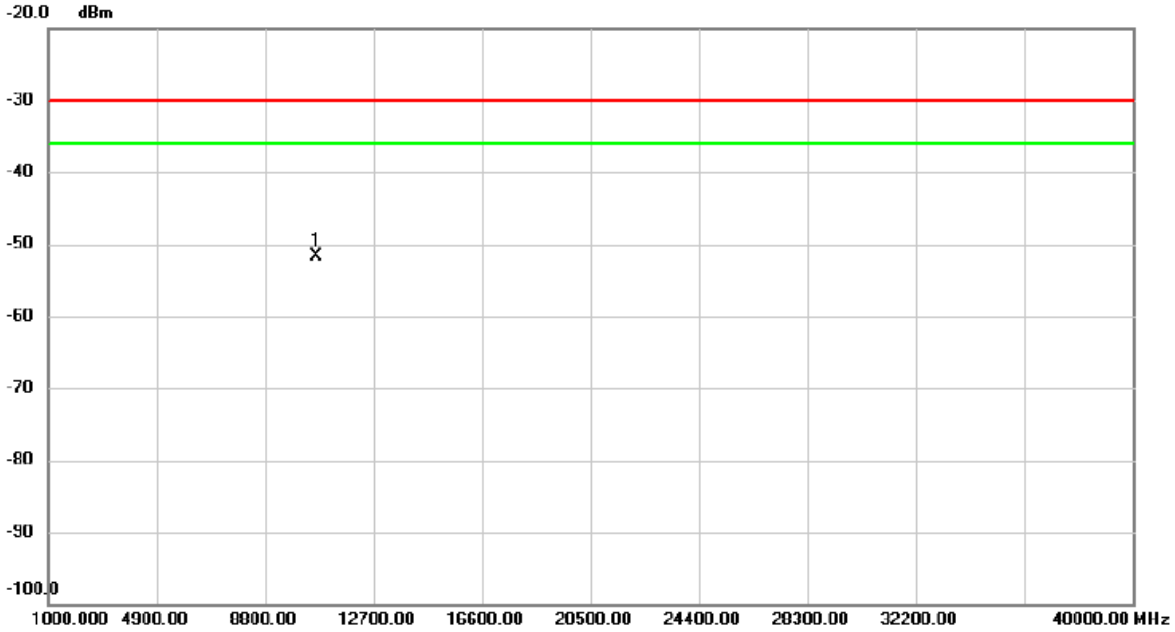
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10500.577	-56.77	4.49	-52.28	-30.00	-22.28	peak	

Test Mode	TX IEEE 802.11ac(VHT20) Mode 5745 MHz	Polarization	Horizontal



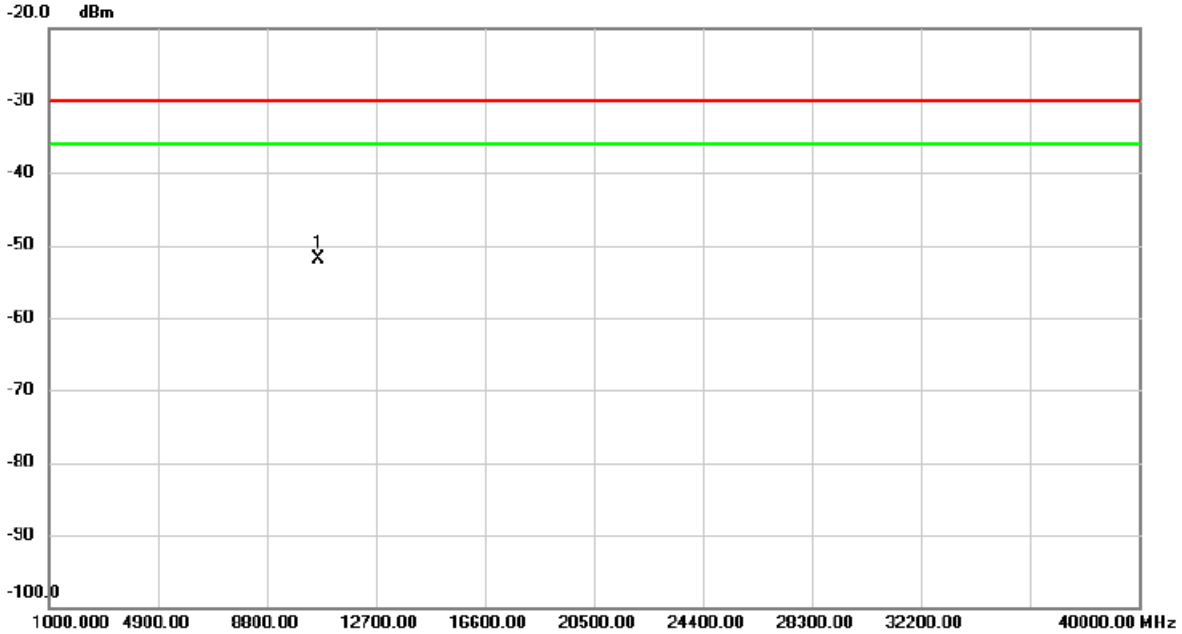
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10466.978	-56.88	4.35	-52.53	-30.00	-22.53	peak	

Test Mode	TX IEEE 802.11ac(VHT20) Mode 5825 MHz	Polarization	Vertical



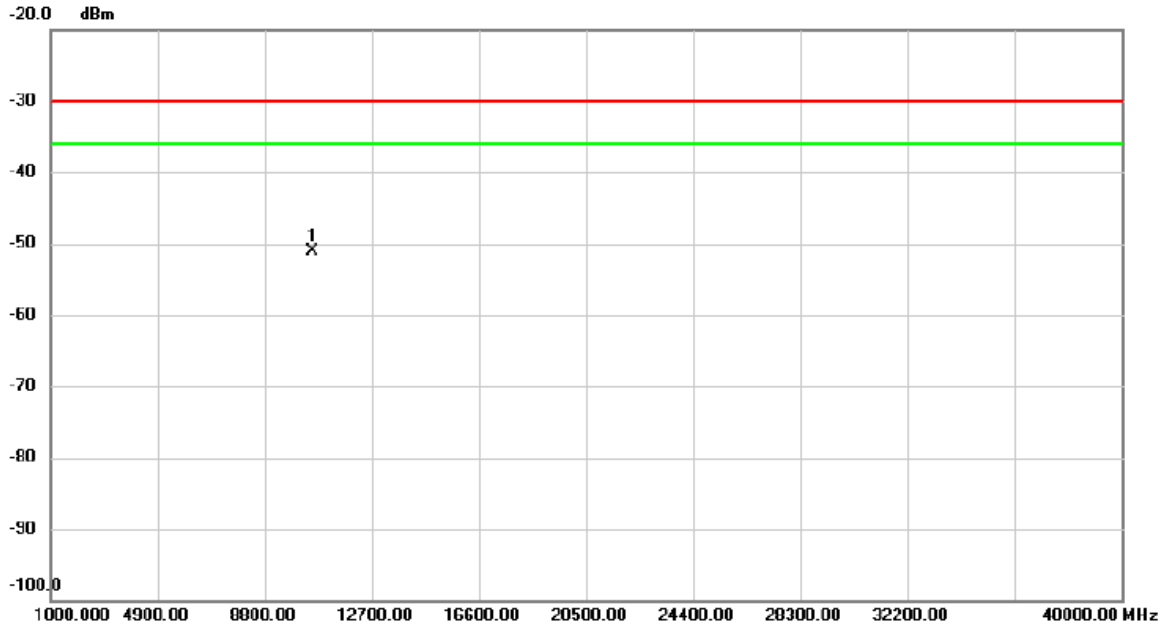
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10655.427	-56.44	4.70	-51.74	-30.00	-21.74	peak	

Test Mode	TX IEEE 802.11ac(VHT20) Mode 5825 MHz	Polarization	Horizontal



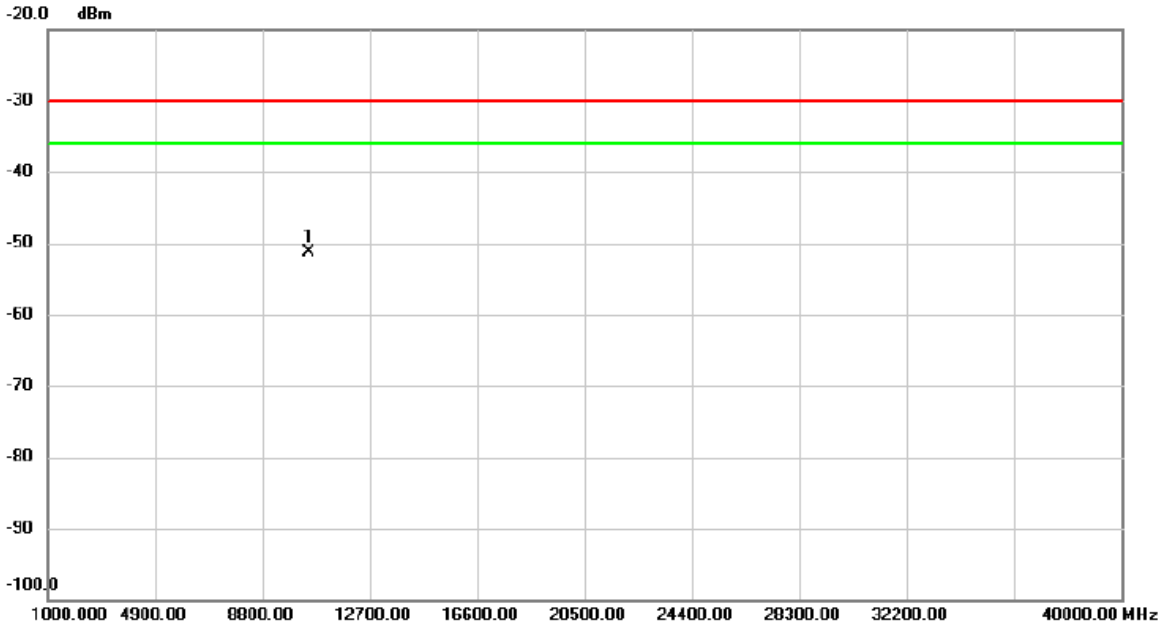
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10637.728	-56.55	4.61	-51.94	-30.00	-21.94	peak	

Test Mode	TX IEEE 802.11ac(VHT40) Mode 5755 MHz	Polarization	Vertical



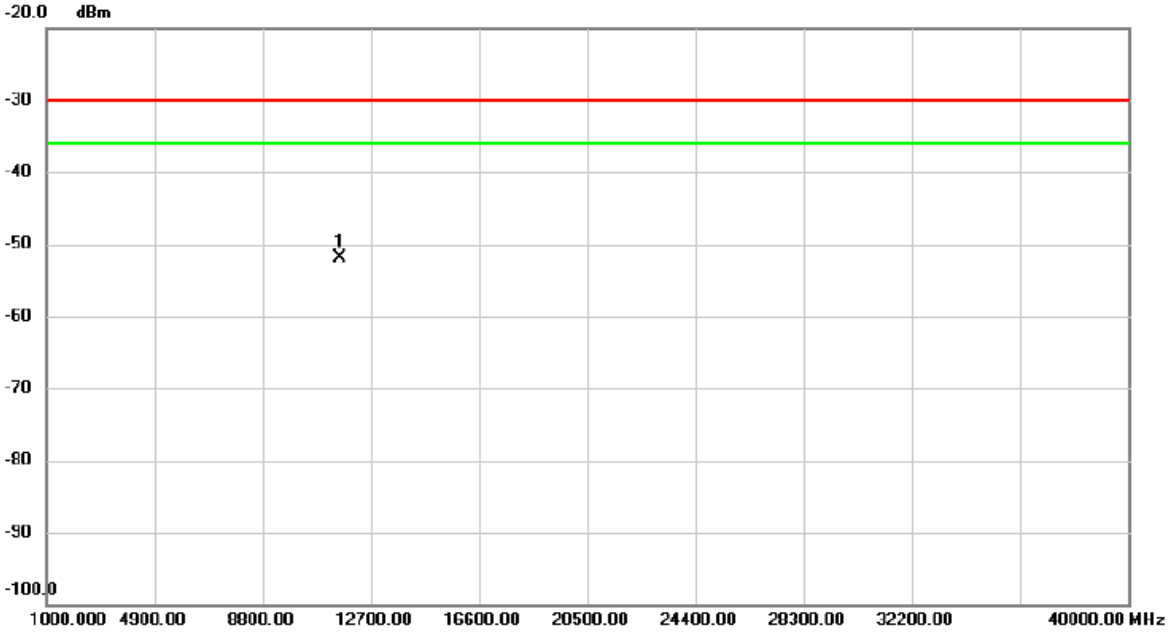
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10528.260	-55.71	4.53	-51.18	-30.00	-21.18	peak	

Test Mode	TX IEEE 802.11ac(VHT40) Mode 5755 MHz	Polarization	Horizontal



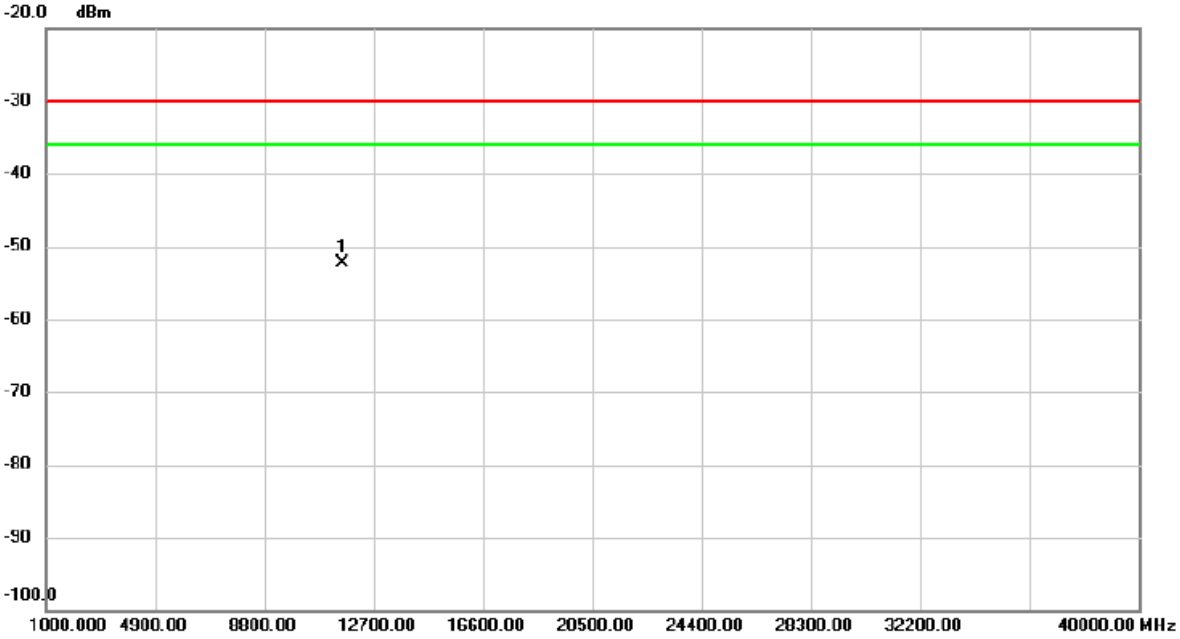
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10513.725	-55.78	4.40	-51.38	-30.00	-21.38	peak	

Test Mode	TX IEEE 802.11ac(VHT40) Mode 5795 MHz	Polarization	Vertical



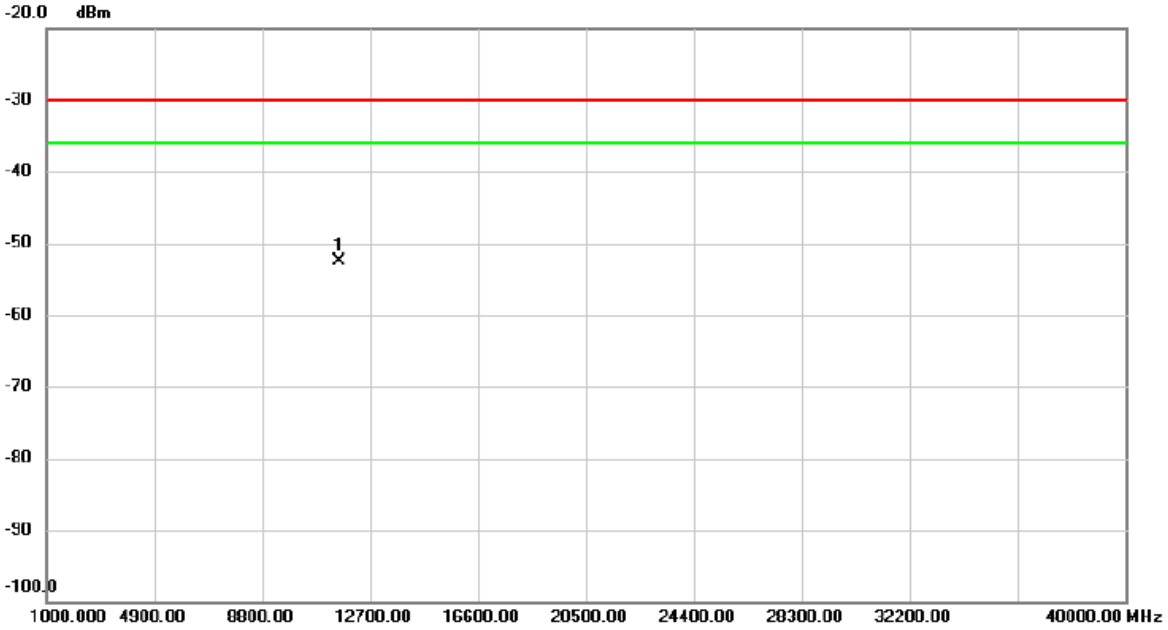
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	11586.130	-57.89	5.92	-51.97	-30.00	-21.97	peak	

Test Mode	TX IEEE 802.11ac(VHT40) Mode 5795 MHz	Polarization	Horizontal



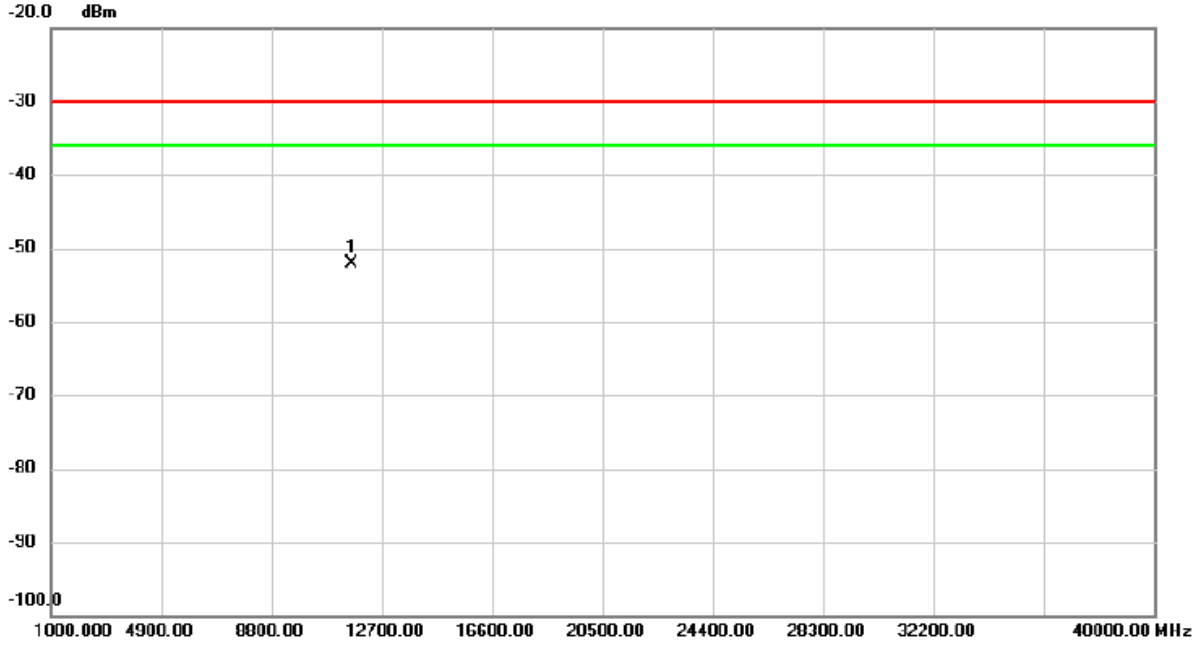
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	11583.795	-58.31	6.00	-52.31	-30.00	-22.31	peak	

Test Mode	TX IEEE 802.11ac(VHT80) Mode 5775 MHz	Polarization	Vertical



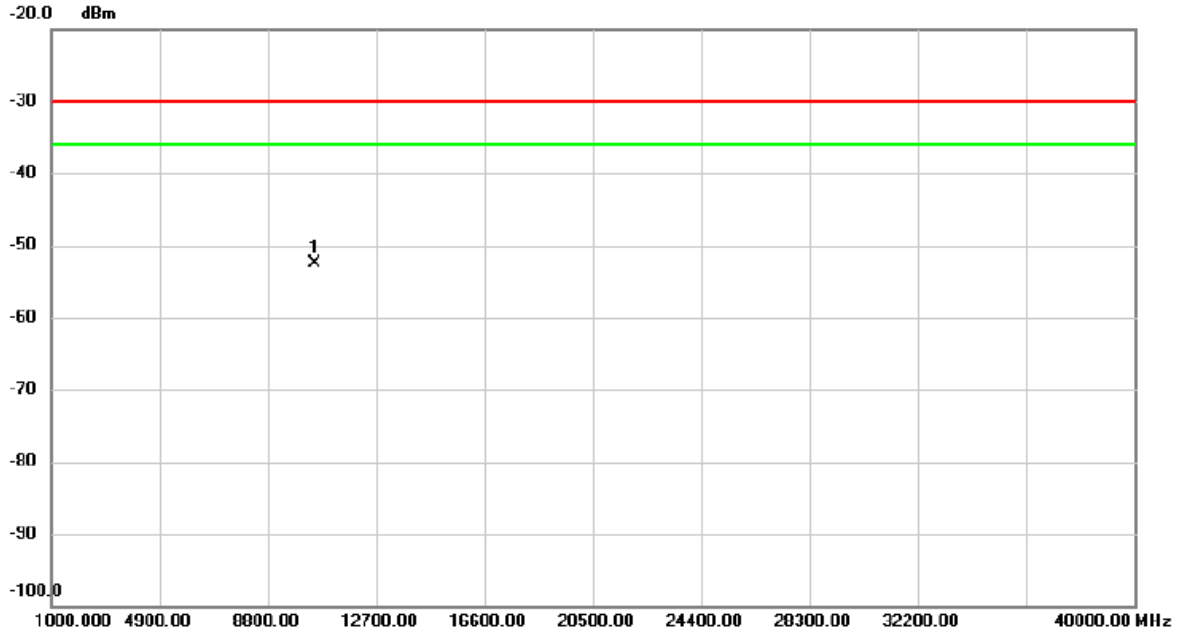
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	11587.550	-58.37	5.92	-52.45	-30.00	-22.45	peak	

Test Mode	TX IEEE 802.11ac(VHT80) Mode 5775 MHz	Polarization	Horizontal



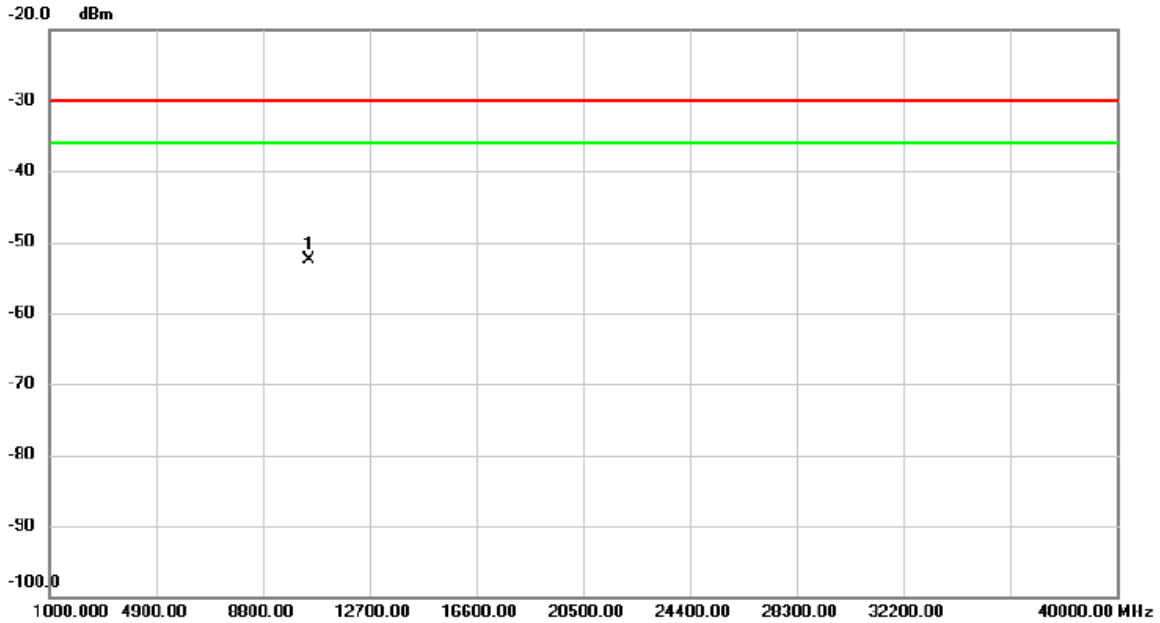
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	11652.030	-58.02	6.01	-52.01	-30.00	-22.01	peak	

Test Mode	TX IEEE 802.11ax(HE20) Mode 5745 MHz	Polarization	Vertical



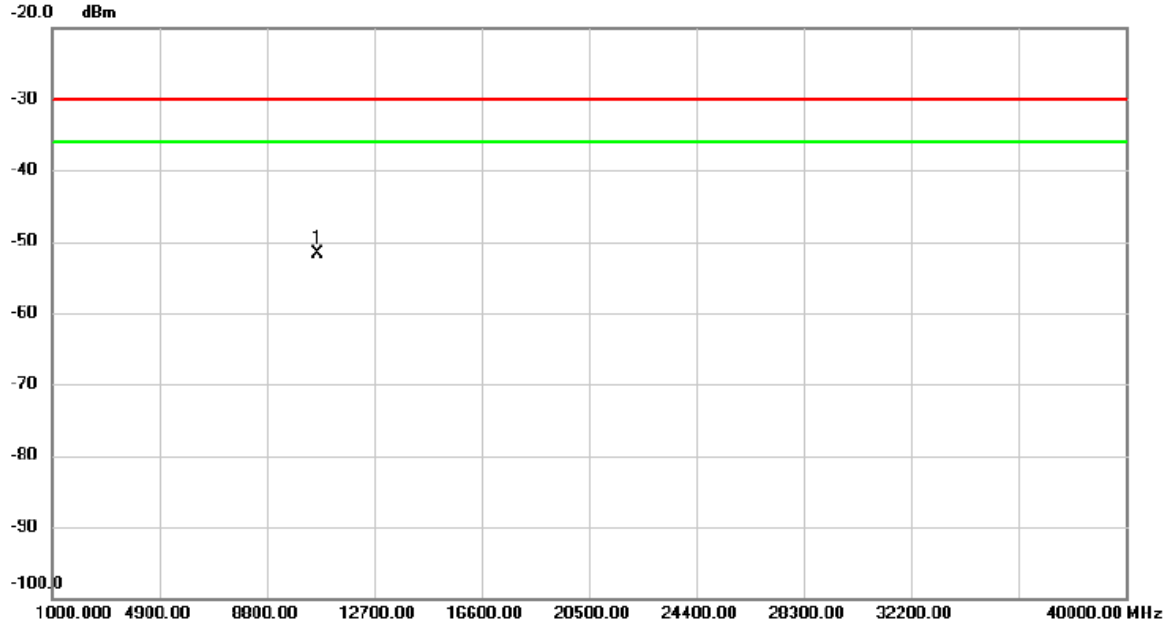
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10491.915	-56.93	4.48	-52.45	-30.00	-22.45	peak	

Test Mode	TX IEEE 802.11ax(HE20) Mode 5745 MHz	Polarization	Horizontal



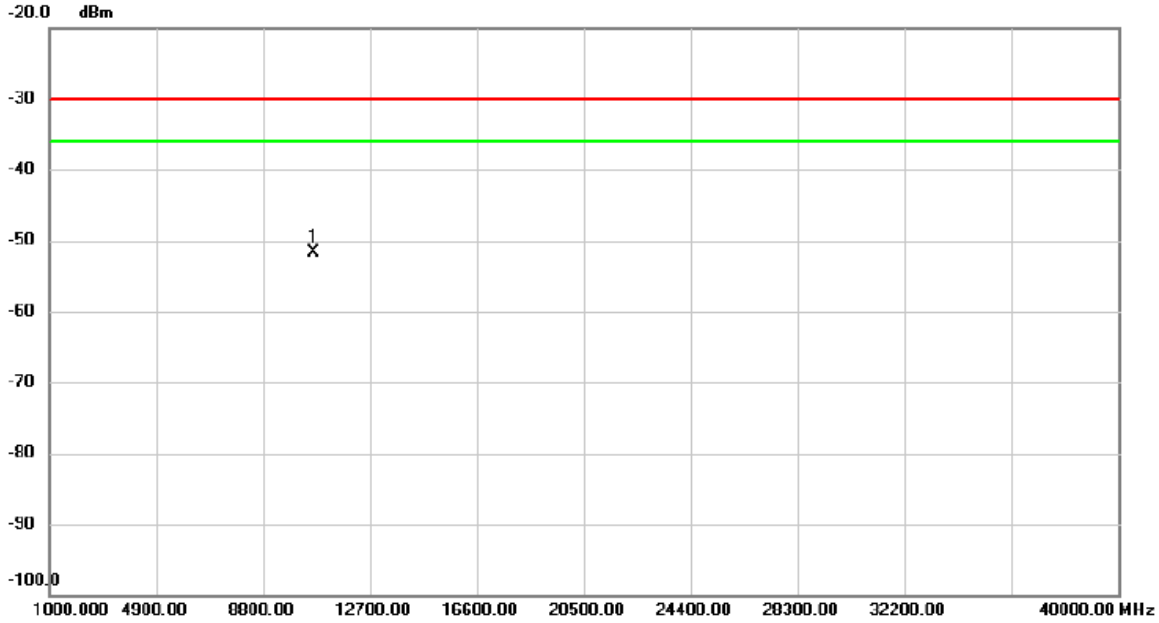
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10472.610	-56.80	4.35	-52.45	-30.00	-22.45	peak	

Test Mode	TX IEEE 802.11ax(HE20) Mode 5825 MHz	Polarization	Vertical



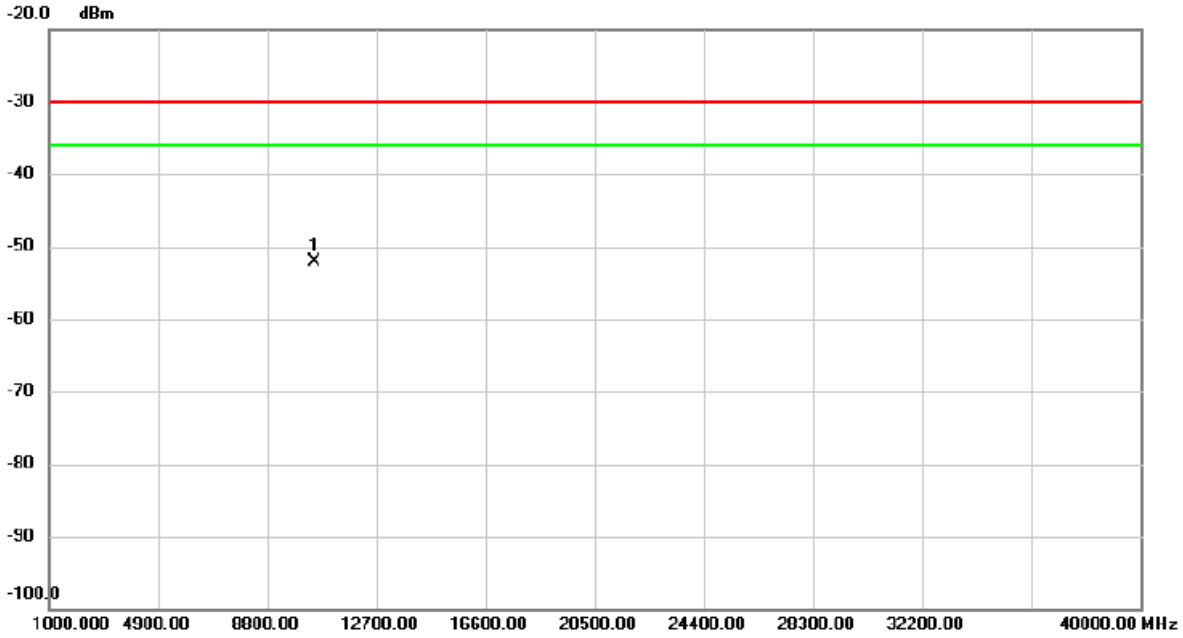
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10660.170	-56.39	4.70	-51.69	-30.00	-21.69	peak	

Test Mode	TX IEEE 802.11ax(HE20) Mode 5825 MHz	Polarization	Horizontal



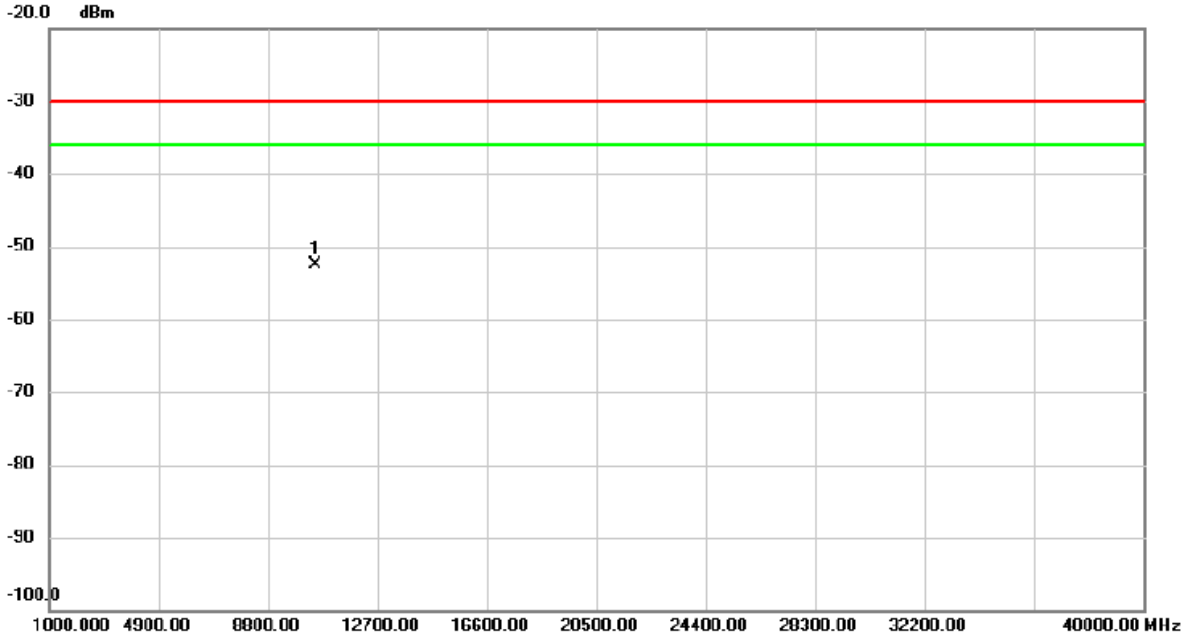
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10632.048	-56.39	4.60	-51.79	-30.00	-21.79	peak	

Test Mode	TX IEEE 802.11ax(HE40) Mode 5755 MHz	Polarization	Vertical



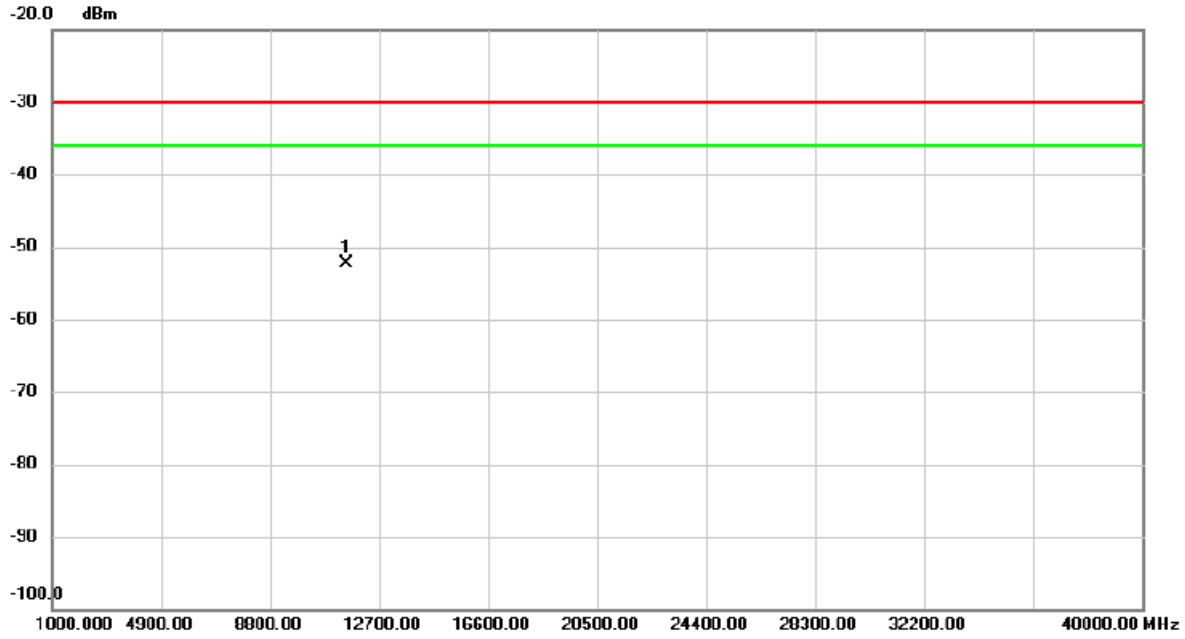
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10485.325	-56.48	4.48	-52.00	-30.00	-22.00	peak	

Test Mode	TX IEEE 802.11ax(HE40) Mode 5755 MHz	Polarization	Horizontal



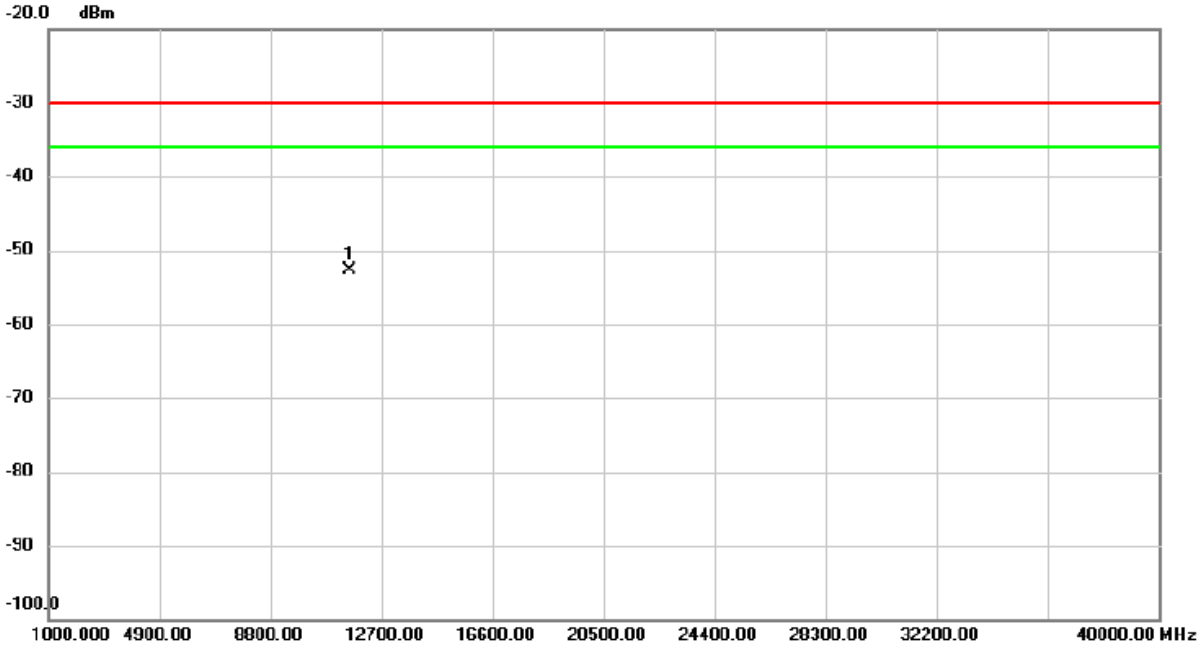
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	10486.690	-56.78	4.37	-52.41	-30.00	-22.41	peak	

Test Mode	TX IEEE 802.11ax(HE40) Mode 5795 MHz	Polarization	Vertical



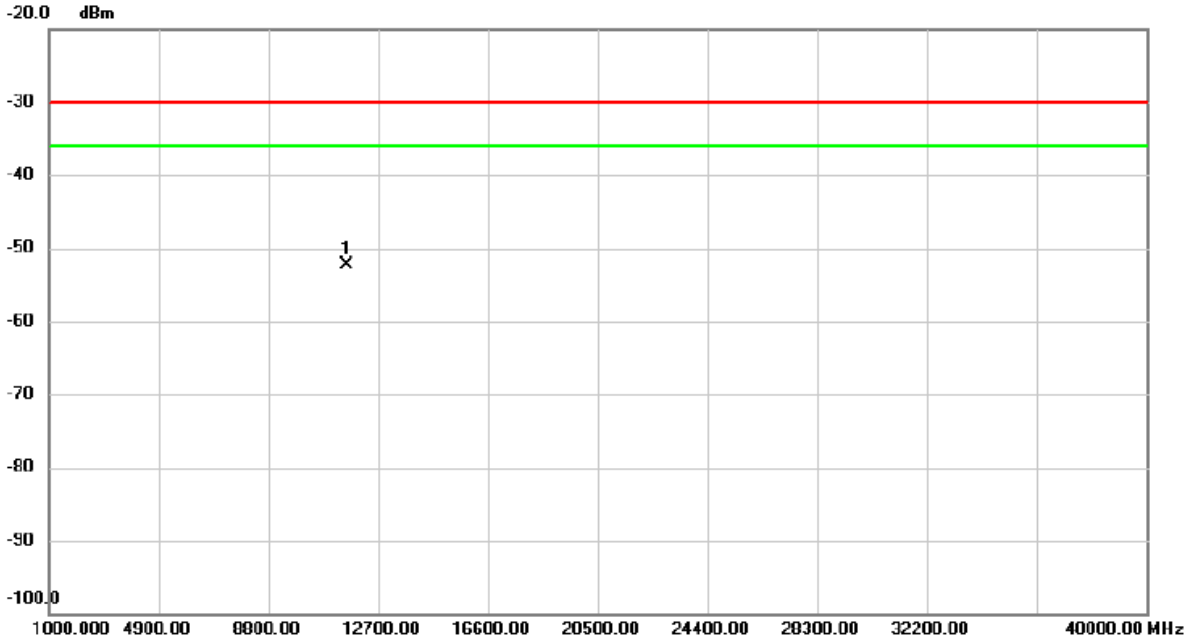
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	11526.020	-58.20	5.84	-52.36	-30.00	-22.36	peak	

Test Mode	TX IEEE 802.11ax(HE40) Mode 5795 MHz	Polarization	Horizontal



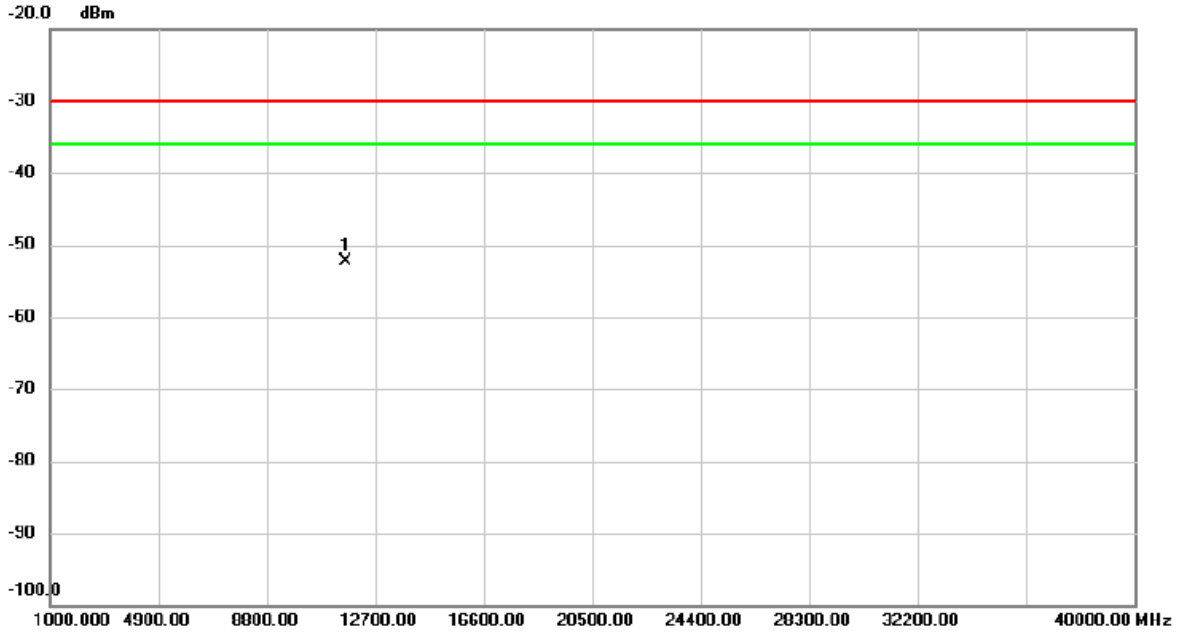
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	11591.000	-58.61	6.00	-52.61	-30.00	-22.61	peak	

Test Mode	TX IEEE 802.11ax(HE80) Mode 5775 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	11606.030	-58.16	5.94	-52.22	-30.00	-22.22	peak	

Test Mode	TX IEEE 802.11ax(HE80) Mode 5775 MHz	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	11615.250	-58.26	6.00	-52.26	-30.00	-22.26	peak	

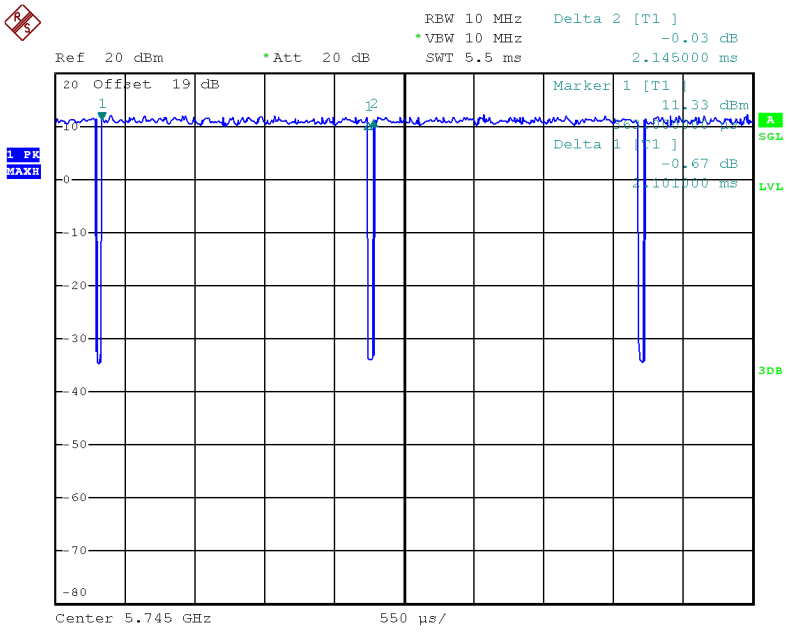
APPENDIX F - UNWANTED EMISSIONS IN THE SPRIOUS DOMAIN - STANDBY (ABOVE 1000MHZ)

Test Mode: N/A

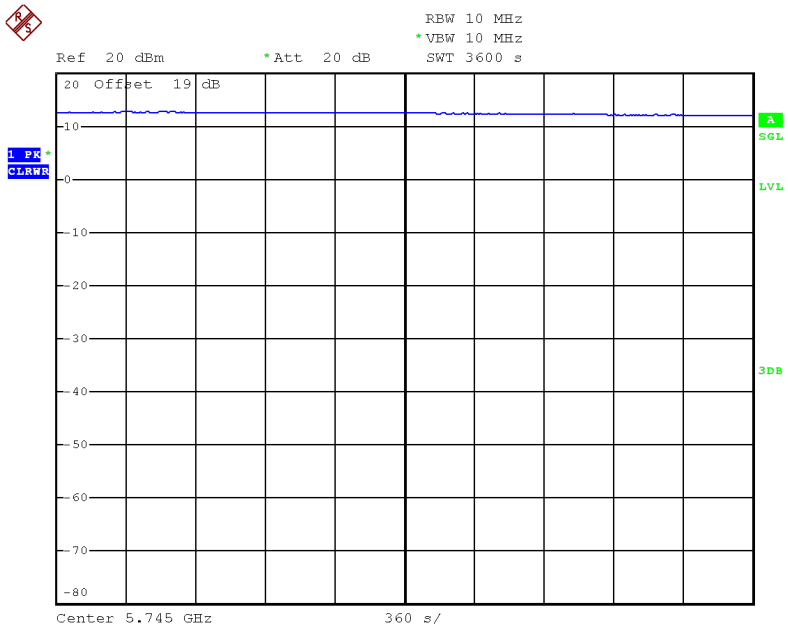
Note: “N/A” denotes test is not applicable to this device.

APPENDIX G - DUTY CYCLE

Test Mode	TX IEEE 802.11a Mode 5745 MHz



Date: 7.JUN.2023 11:23:27



Date: 7.JUN.2023 13:34:26

On time (ms)	Total time (ms)	1H On time (s)	Duty Cycle (%)	Limit	Test Result
2.101	2.145	3600.00	100.00	No Restriction	Pass

APPENDIX H - ADJACENT CHANNEL SELECTIVITY

Test Mode	RX IEEE 802.11a Mode 5785 MHz

Frequency (MHz)	99% OBW (MHz)
5785	17.10

Adjacent channel centre freq. (MHz)		k(-40<k<0) (dB)	Power level of unwanted signal (dBm)	Limit (dBm)	Result
Lower	5745	-27.52	-33.00	-57.52	Complies
Upper	5825	-27.64	-29.00	-57.64	Complies

APPENDIX I - BLOCKING

Test Mode	RX IEEE 802.11a Mode 5745 MHz

Frequency (MHz)	99% OBW (MHz)	99% OBW-F_L (MHz)	99% OBW-F_H (MHz)		
5745	17.10	5736.50	5753.60		
Times of OBW	Unwanted signal freq. (MHz)	k(-40<k<0) (dB)	Power level of unwanted signal (dBm)	Limit (dBm)	Result
10	5565.50	-27.24	-21.00	-57.24	Complies
	5924.60	-27.78	-24.00	-57.78	Complies
20	5394.50	-26.97	21.00	-56.97	Complies
	6095.60	-28.03	-26.00	-58.03	Complies
50	4881.50	-26.10	-24.00	-56.10	Complies
	6608.60	-28.73	-26.00	-58.73	Complies

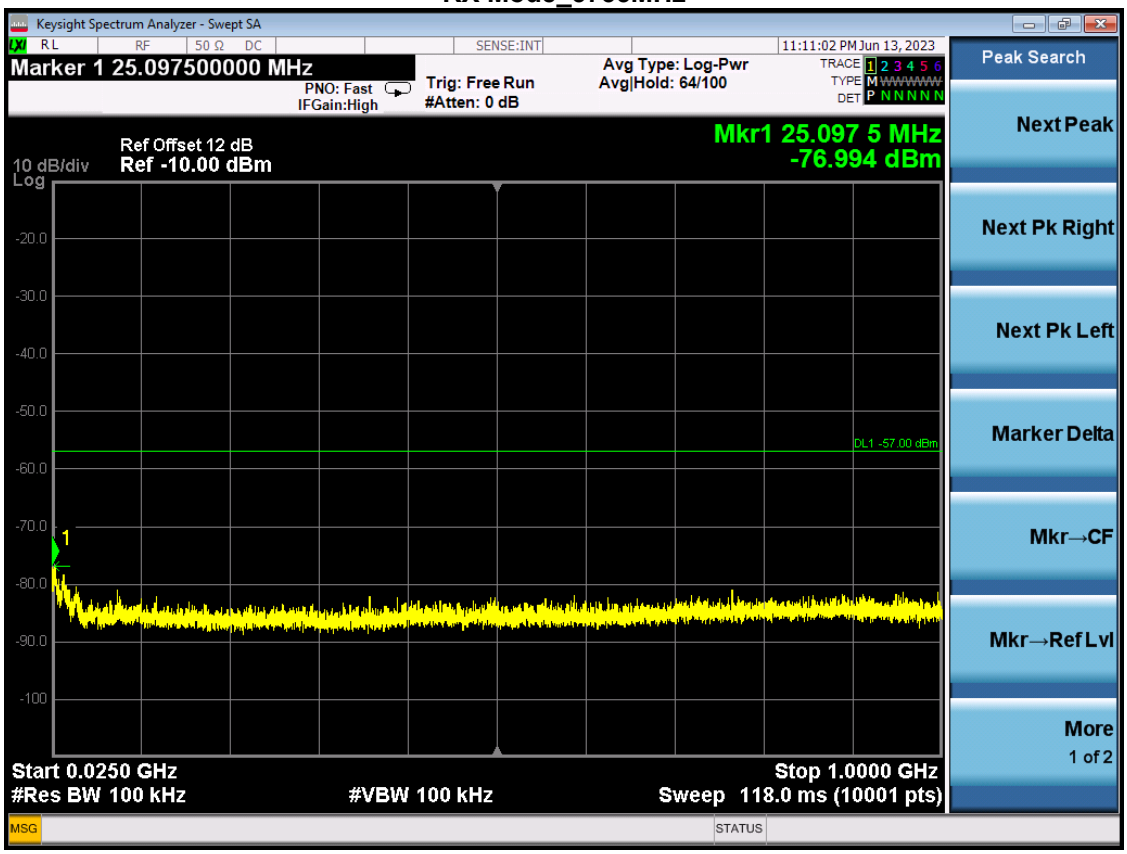
Test Mode	RX IEEE 802.11a Mode 5825 MHz

Frequency (MHz)	99% OBW (MHz)	99% OBW-F_L (MHz)	99% OBW-F_H (MHz)		
5825	17.10	5816.50	5833.60		
Times of OBW	Unwanted signal freq. (MHz)	k(-40<k<0) (dB)	Power level of unwanted signal (dBm)	Limit (dBm)	Result
10	5645.50	-27.36	-26.00	-57.36	Complies
	6004.60	-27.90	-39.00	-57.90	Complies
20	5474.50	-27.10	-24.00	-57.10	Complies
	6175.60	-28.14	-29.00	-58.14	Complies
50	4961.50	-26.24	-26.00	-56.24	Complies
	6688.60	-28.84	-29.00	-58.84	Complies

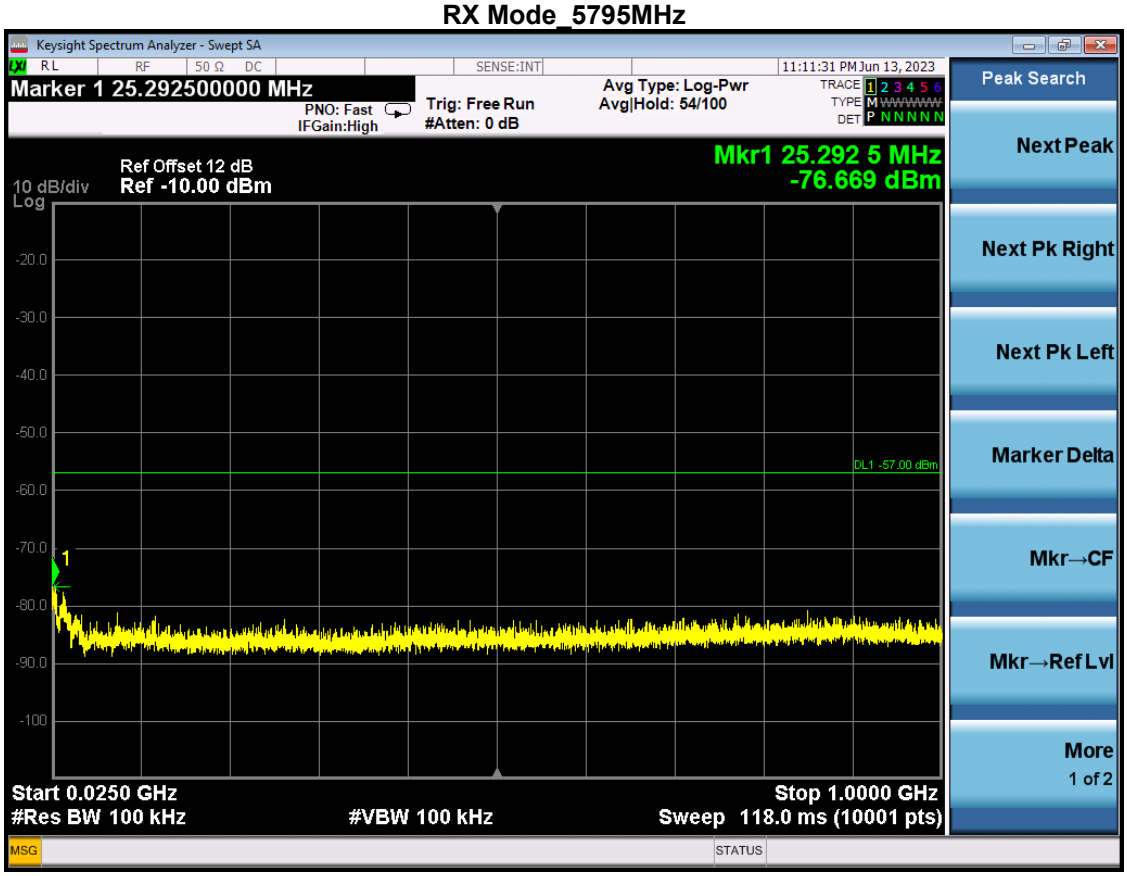
APPENDIX J - SPURIOUS EMISSIONS - RECEIVER (25MHZ TO 1000MHZ)

Test Mode	RX IEEE 802.11ac(VHT40)_Ant. 1

RX Mode_5755MHz

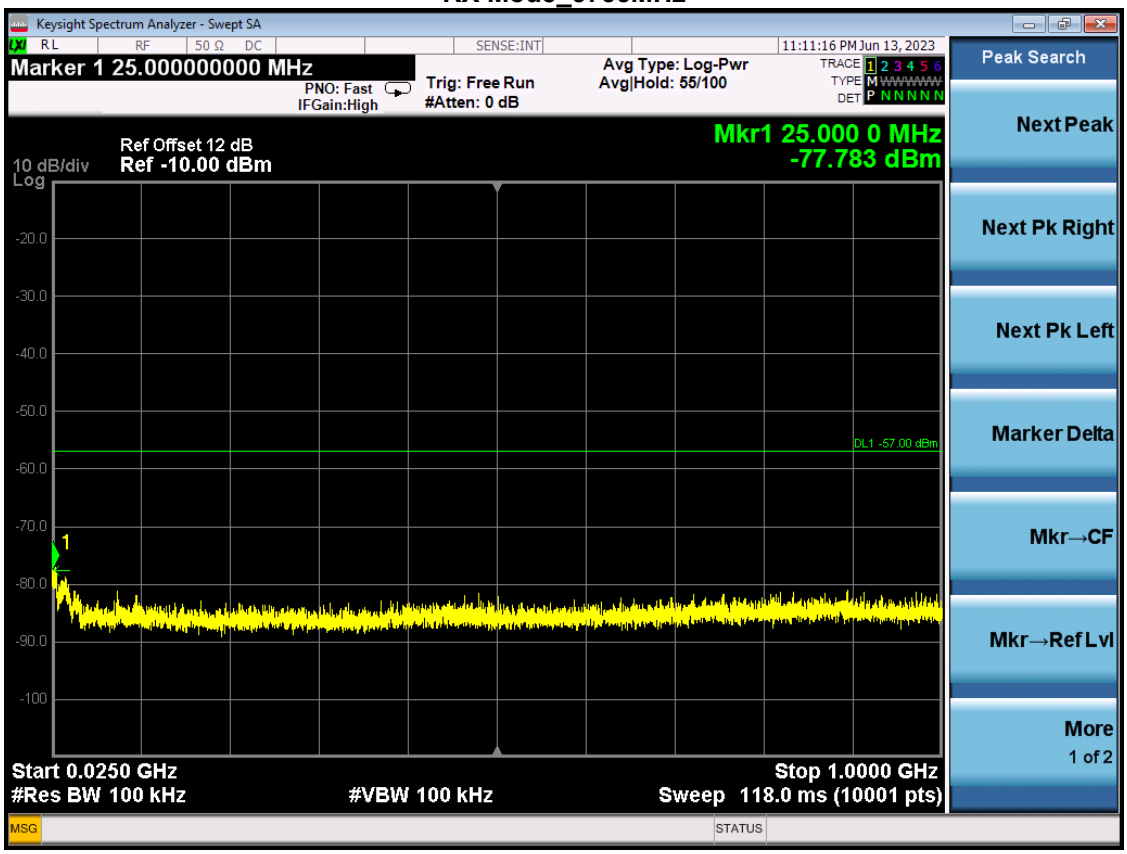


RX Mode_5795MHz

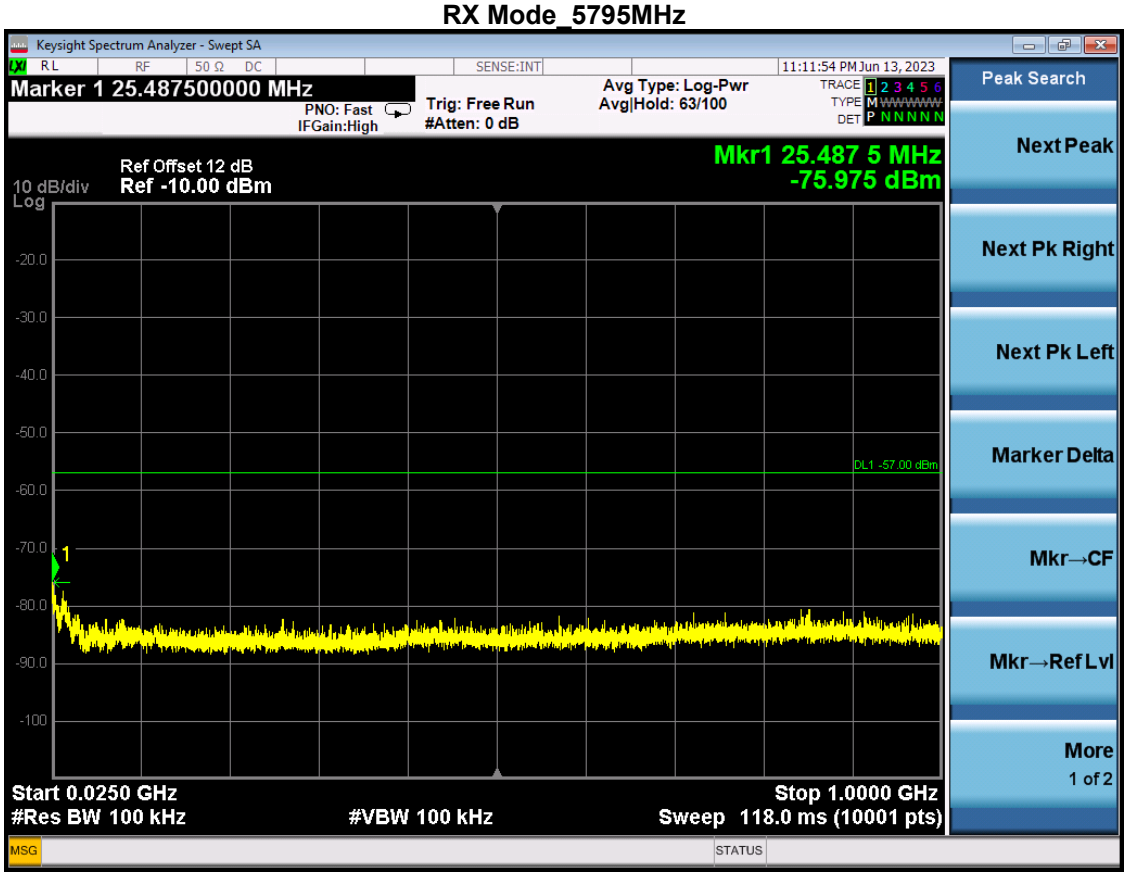


Test Mode	RX IEEE 802.11ac(VHT40)_Ant. 2

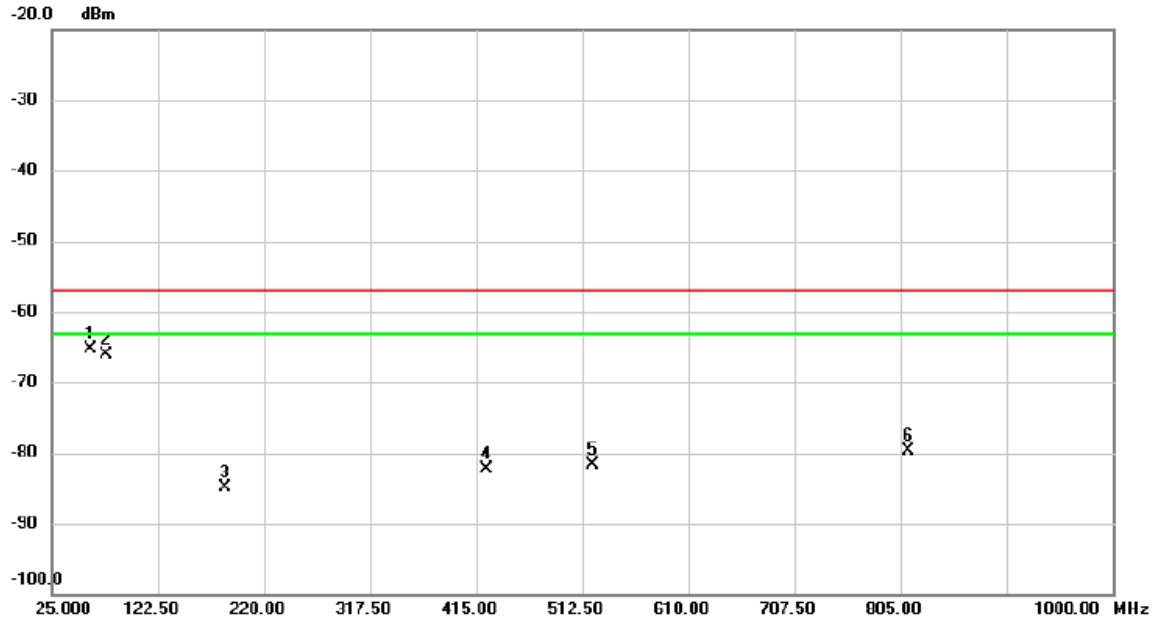
RX Mode_5755MHz



RX Mode_5795MHz

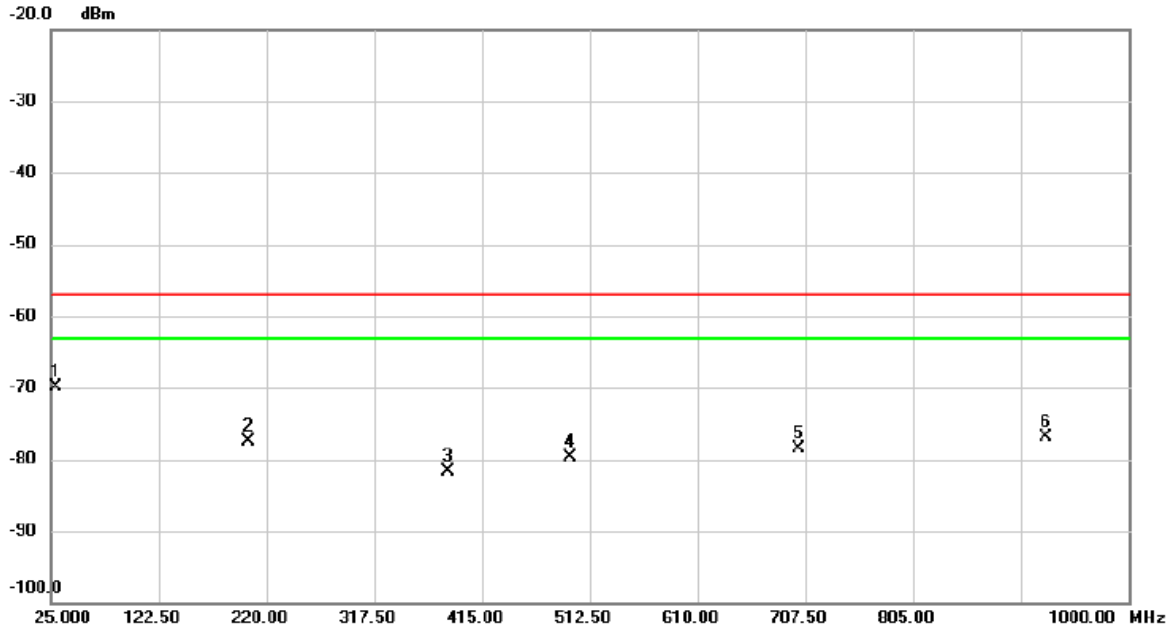


Test Mode	RX IEEE 802.11ac(VHT40) Mode 5755 MHz	Polarization	Vertical



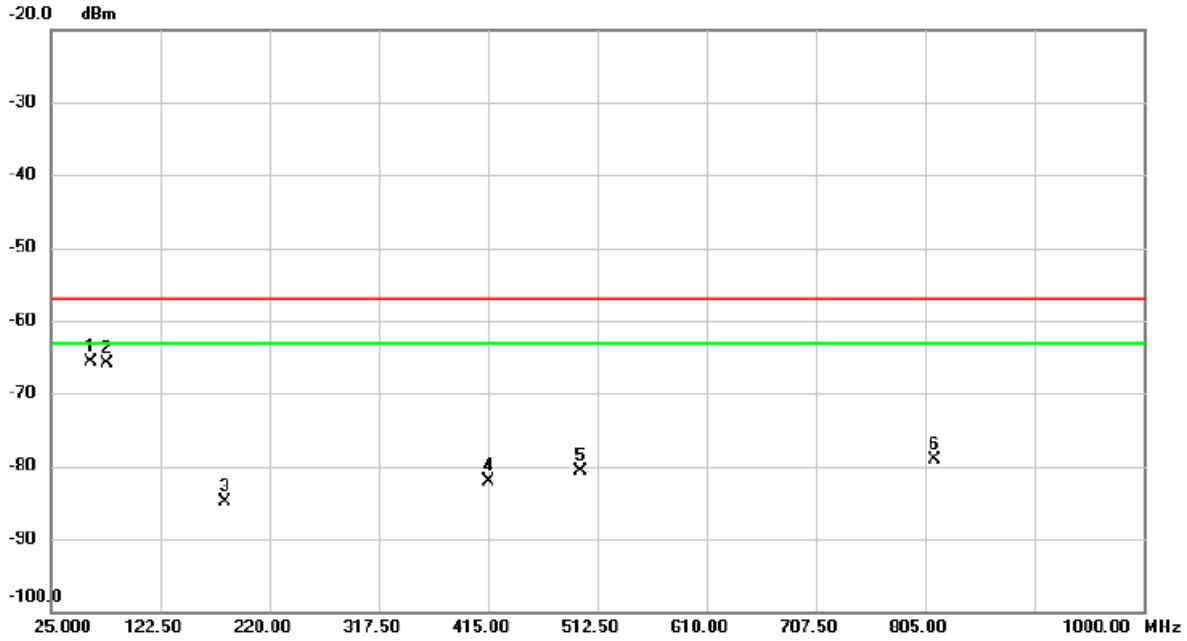
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	60.880	-61.67	-3.61	-65.28	-57.00	-8.28	peak	
2		75.505	-66.95	0.90	-66.05	-57.00	-9.05	peak	
3		183.632	-73.64	-11.17	-84.81	-57.00	-27.81	peak	
4		424.360	-75.01	-7.21	-82.22	-57.00	-25.22	peak	
5		522.055	-75.44	-6.30	-81.74	-57.00	-24.74	peak	
6		811.923	-77.80	-1.99	-79.79	-57.00	-22.79	peak	

Test Mode	RX IEEE 802.11ac(VHT40) Mode 5755 MHz	Polarization	Horizontal



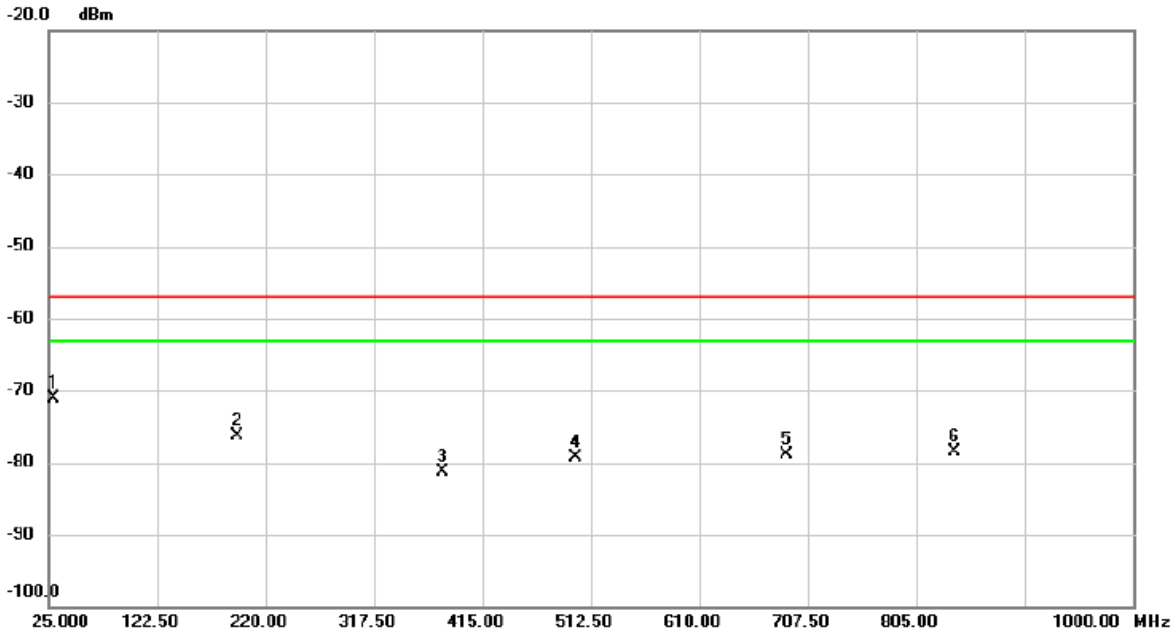
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	30.070	-62.16	-7.70	-69.86	-57.00	-12.86	peak	
2		203.132	-66.18	-11.25	-77.43	-57.00	-20.43	peak	
3		385.067	-74.10	-7.54	-81.64	-57.00	-24.64	peak	
4		494.658	-73.69	-6.08	-79.77	-57.00	-22.77	peak	
5		701.163	-76.32	-2.20	-78.52	-57.00	-21.52	peak	
6		925.413	-77.84	0.98	-76.86	-57.00	-19.86	peak	

Test Mode	RX IEEE 802.11ac(VHT40) Mode 5795 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	60.490	-62.50	-3.23	-65.73	-57.00	-8.73	peak	
2		74.823	-66.74	0.78	-65.96	-57.00	-8.96	peak	
3		180.025	-74.08	-10.73	-84.81	-57.00	-27.81	peak	
4		415.975	-74.76	-7.29	-82.05	-57.00	-25.05	peak	
5		497.973	-74.00	-6.69	-80.69	-57.00	-23.69	peak	
6		812.898	-77.03	-1.99	-79.02	-57.00	-22.02	peak	

Test Mode	RX IEEE 802.11ac(VHT40) Mode 5795 MHz	Polarization	Horizontal

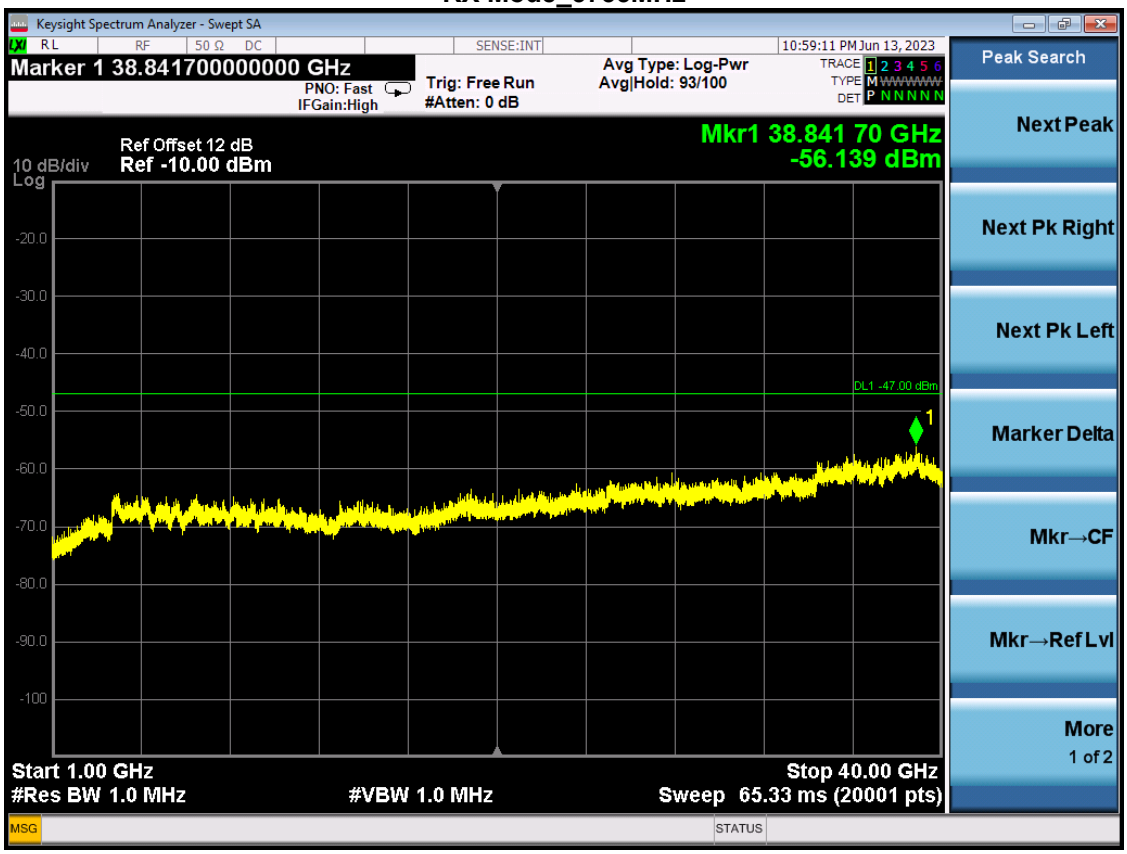


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	29.777	-68.90	-2.15	-71.05	-57.00	-14.05	peak	
2		195.137	-64.44	-11.79	-76.23	-57.00	-19.23	peak	
3		379.510	-73.65	-7.62	-81.27	-57.00	-24.27	peak	
4		498.850	-73.42	-5.95	-79.37	-57.00	-22.37	peak	
5		688.487	-76.41	-2.55	-78.96	-57.00	-21.96	peak	
6		839.710	-78.05	-0.51	-78.56	-57.00	-21.56	peak	

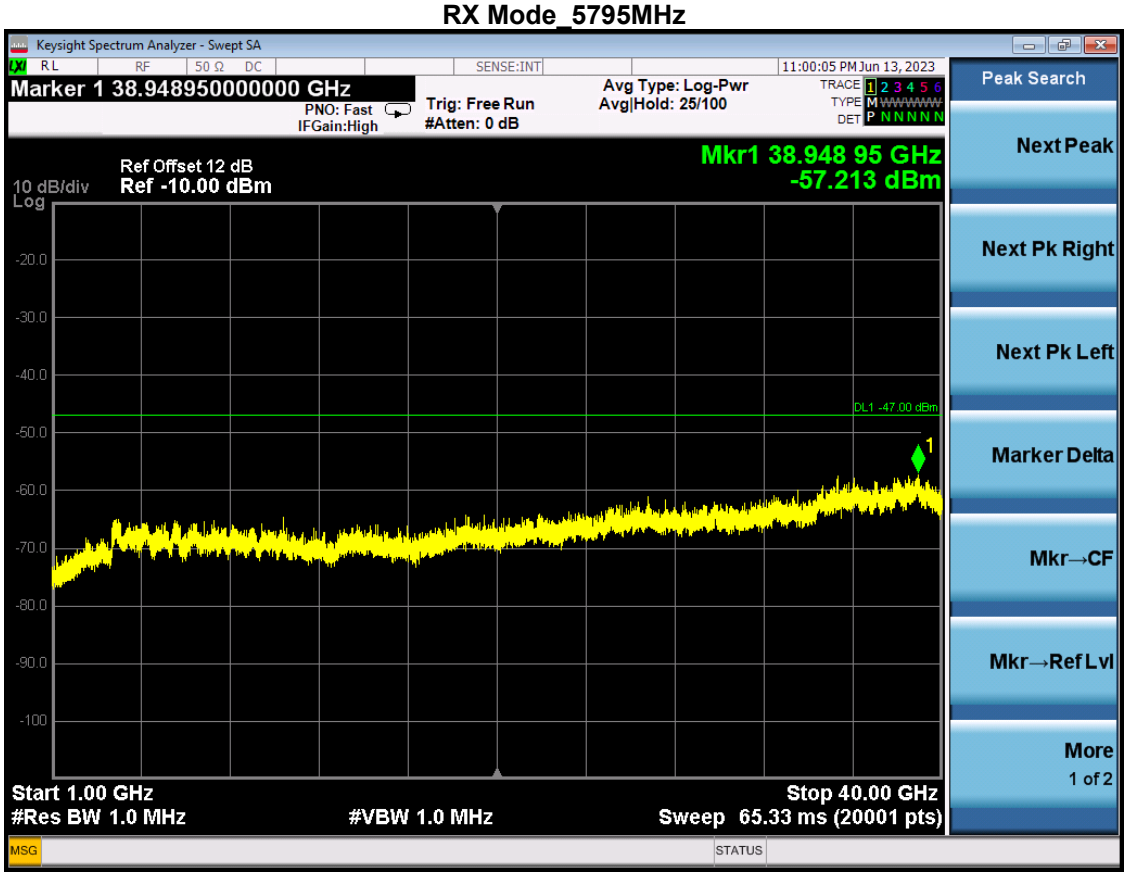
APPENDIX K - SPURIOUS EMISSIONS - RECEIVER (ABOVE 1000MHZ)

Test Mode	RX IEEE 802.11ac(VHT40)_Ant. 1

RX Mode_5755MHz



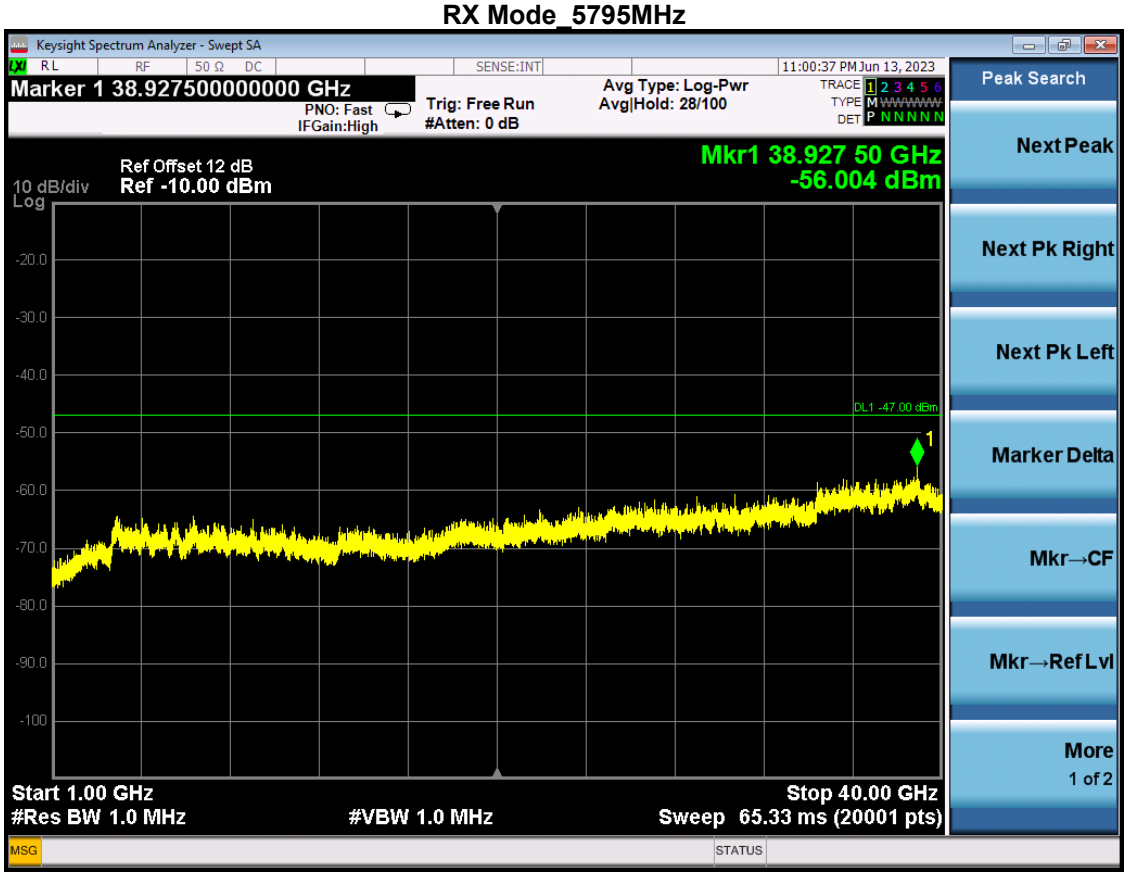
RX Mode_5795MHz



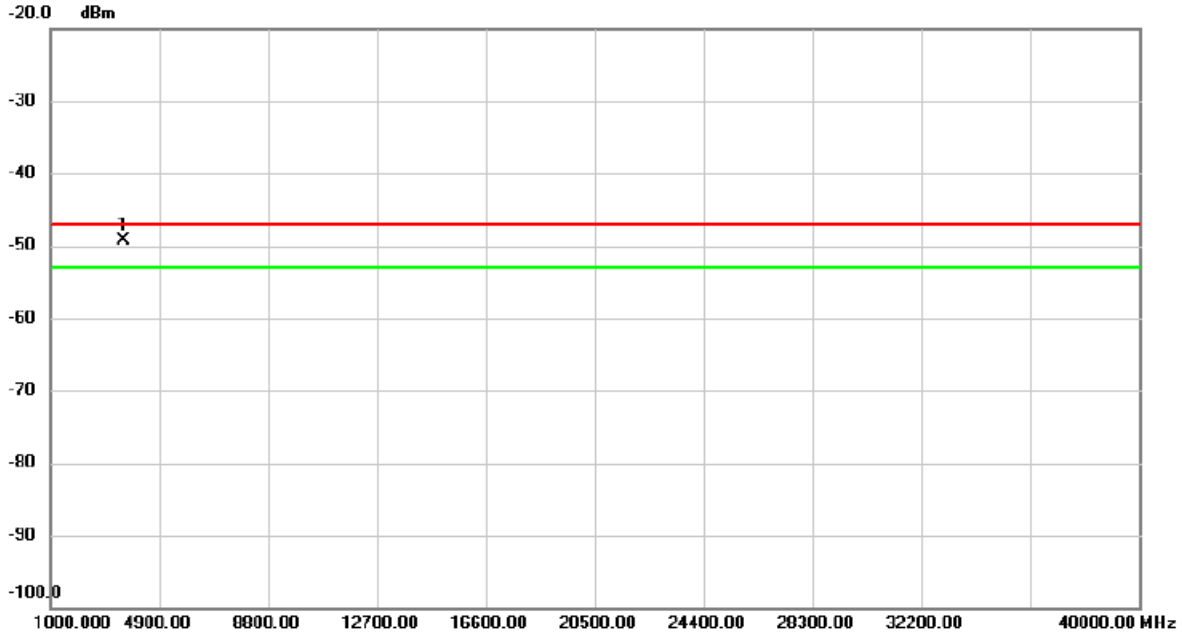
Test Mode	RX IEEE 802.11ac(VHT40)_Ant. 2

RX Mode_5755MHz

RX Mode_5795MHz

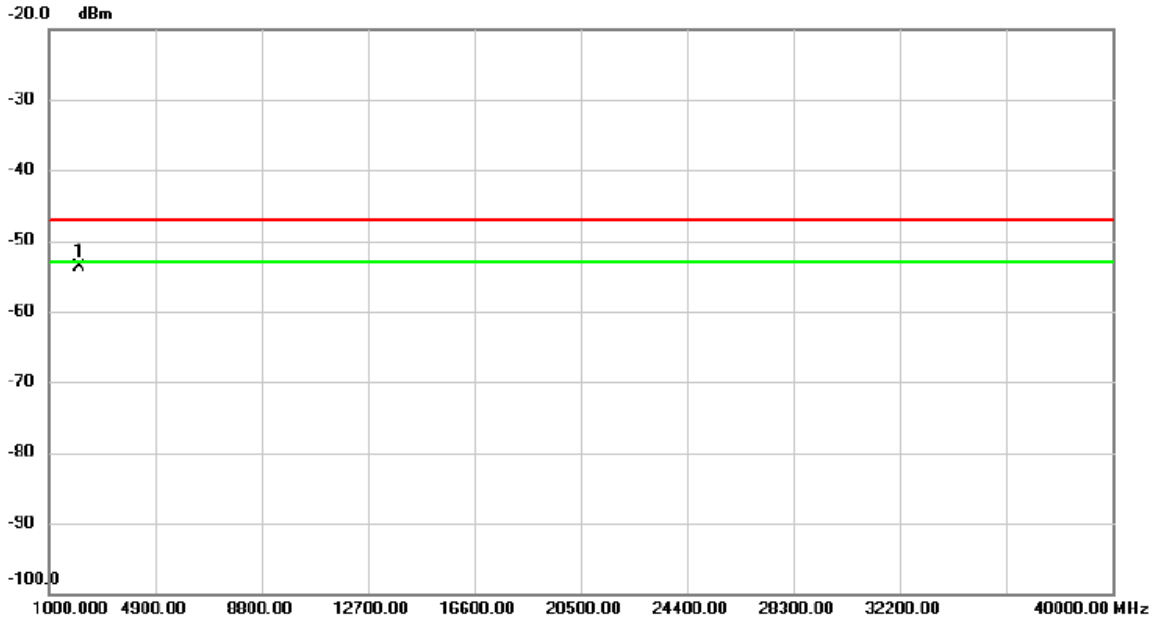


Test Mode	RX IEEE 802.11ac(VHT40) Mode 5755 MHz	Polarization	Vertical



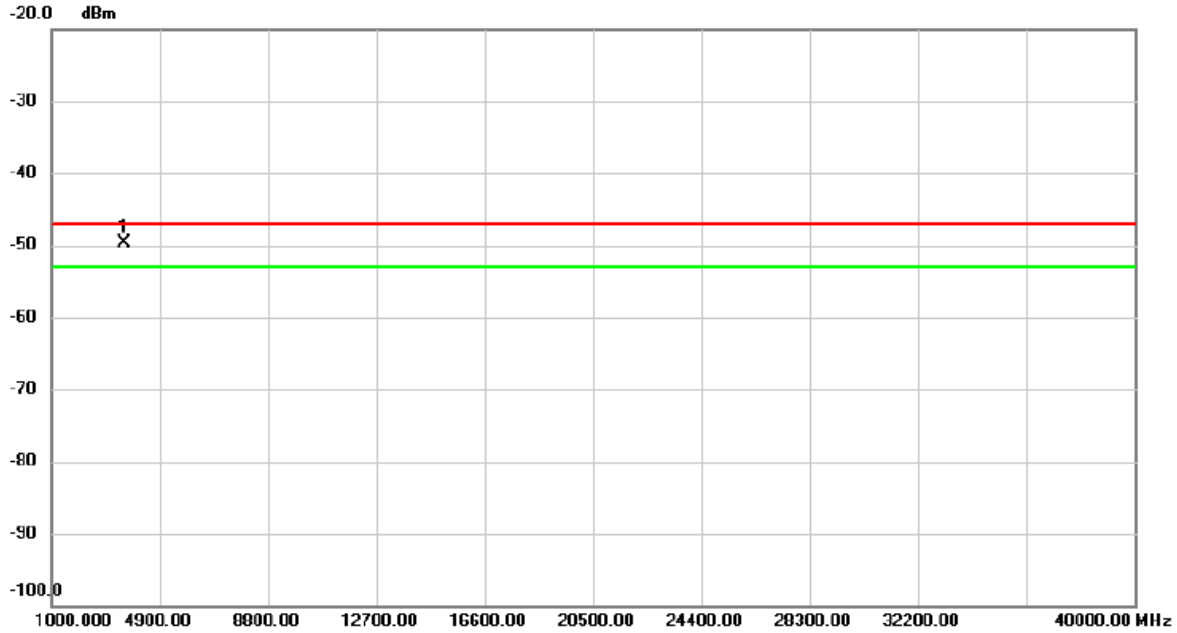
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3615.505	-47.68	-1.52	-49.20	-47.00	-2.20	peak	

Test Mode	RX IEEE 802.11ac(VHT40) Mode 5755 MHz	Polarization	Horizontal



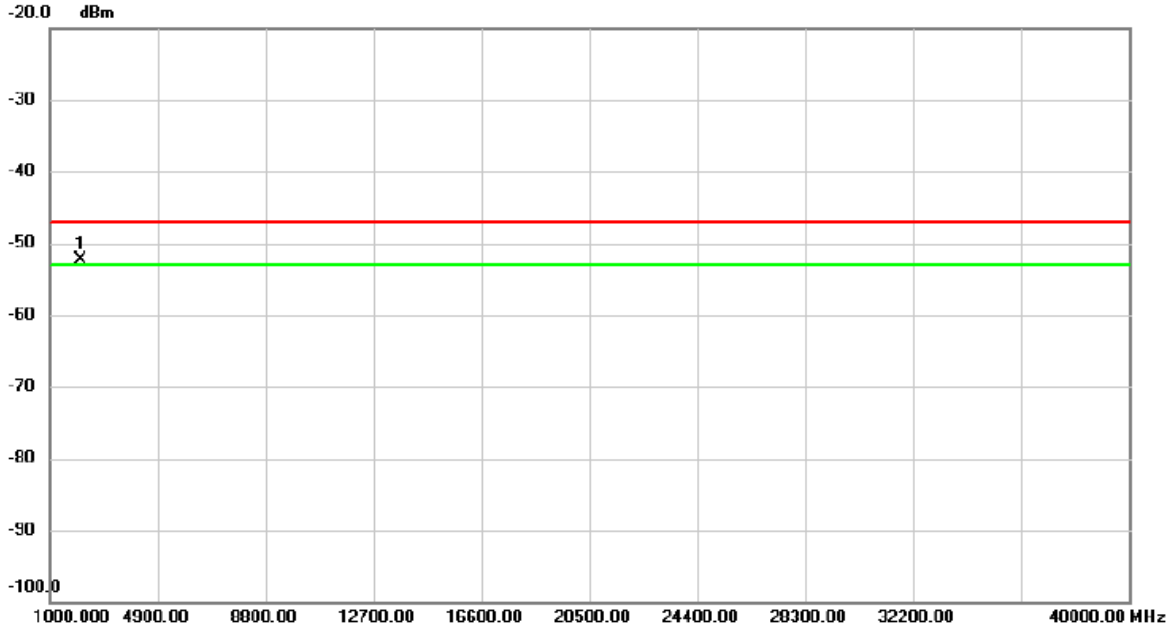
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	2127.398	-48.63	-5.04	-53.67	-47.00	-6.67	peak	

Test Mode	RX IEEE 802.11ac(VHT40) Mode 5795 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3620.445	-48.15	-1.53	-49.68	-47.00	-2.68	peak	

Test Mode	RX IEEE 802.11ac(VHT40) Mode 5795 MHz	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	2130.751	-47.28	-5.02	-52.30	-47.00	-5.30	peak	

End of Test Report