TESTREPORT

Applicant Name :	ARICH INTERNATIONAL INC
Address :	360 SUMMERVIEW CT SAN RAMON CA 94583-4463 SAN RAMON California United States
Report Number :	RA230330-15712E-RF-00C
FCC ID:	2ADZTCARPLAYGO

Test Standard (s)

FCC PART 15.407

Sample Description

Product Type:	CarplayGo
Model No.:	CarplayGo
Multiple Model(s) No.:	AutoCast
Trade Mark:	TUNAI
Date Received:	2023/03/30
Report Date:	2023/04/28

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Andy Yu
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★ ".
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230330-15712E-RF-00C	Original Report	2023/04/28

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Type	CarplayGo
Model No.	CarplayGo
Multiple Model(s) No.	AutoCast (model difference see product declaration letter of similarity)
Frequency Range	5G Wi-Fi: 5150-5250MHz
Mode	802.11a/n20/n40/ac20/ac40/ax20/ax40
Maximum Conducted Average Output Power	5150-5250 MHz: 9.96dBm
Modulation Technique	OFDM
Antenna Specification*	2.7dBi (provided by the applicant)
Voltage Range	DC 5V from USB port
Sample serial number	23UB_2 for Conducted and Radiated Emissions Test 23UB_1 for RF Conducted Test (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, section 15.203, 15.205, 15.209 and 15.407 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. And KDB789033 D02 General U-NII Test Procedures New Rules v02r01.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		$0.082*10^{-7}$
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
	26.5GHz - 40GHz	4.72dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 30241.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which was provided by manufacturer.

The device support 802.11a/n20/n40/ac20/ac40/ax20/ax40, the 802.11n20/n40 mode was reduce test as it's identical parameter to 802.11ac20/ac40 mode

For 5150-5250MHz Band, 6 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240

For 802.11a/ ac20/ax20 mode: channel 36, 40, 48 were tested;
For 802.11ac40/ax40 mode: channel 38, 46 were tested;

EUT Exercise Software

"SecureCRT" Exercise Software was used and the power level as below.

U-NII	Mode	Data rate	Power Level		
			Low Channel	Middle Channel	High Channel
5150 – 5250MHz	802.11a	6Mbps	Default	Default	Default
	802.11ac20	MCS0	Default	Default	Default
	802.11ac40	MCS0	Default	/	Default
	802.11ax20	MCS0	Default	Default	Default
	802.11ax40	MCS0	Default	/	Default

The worse-case data rates are determined to be as follows for each mode based upon investigations by measuring the output power and PSD across all data rated bandwidths, and modulations.

For the 802.11ax mode, the device only support full RU mode.

The power level was provided by the manufacturer.

Duty cycle

Test Result: Pass. Please refer to the Appendix.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

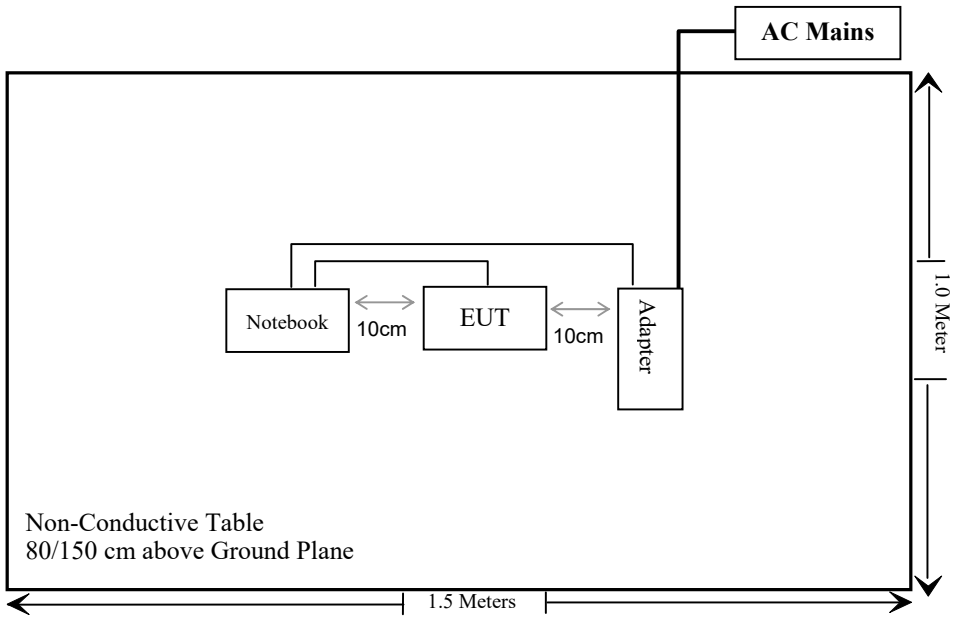
Manufacturer	Description	Model	Serial Number
Lenovo	Notebook	T430	23447YC
GUANG BAO	Adapter	42T4416	11S42T4416ZGWF12O7A1

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielding Detachable AC Cable	1.0	AC Mains	Adapter
Un-shielding Un-Detachable DC Cable	1.2	Adapter	Notebook
Un-shielding Detachable USB Cable	1.0	Notebook	EUT

Block Diagram of Test Setup

For Radiated Emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b) & §2.1091	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.407(b)(9)& §15.207(a)	Conducted Emissions	Not Applicable*
§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliant
§15.407(a) (e)	26 dB Emission Bandwidth & 6dB Bandwidth	Compliant
§15.407(a)	Conducted Transmitter Output Power	Compliant
§15.407 (a)	Power Spectral Density	Compliant
§15.407 (h)	Transmit Power Control (TPC)	Not Applicable
§15.407 (h)	Dynamic Frequency Selection (DFS)	Not Applicable

Not Applicable: the EUT has not operate within DFS frequency band.
Not Applicable*: the device is intend for vehicle use.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	837	2023/02/22	2026/02/21
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2022/12/26	2025/12/25
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.11	N1000	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.12	N040	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.14	N800	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.15	N600	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.16	N650	2022/11/25	2023/11/24
CD	Band Reject Filter	BRM-5.15/5.35g-45	075	2022/11/25	2023/11/24
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101495	2022/11/25	2023/11/24
Tonscend	RF Control Unit	JS0806-2	19G8060182	2022/10/24	2023/10/23
WEINSCHEL	10dB Attenuator	5324	AU 3842	2022/11/25	2023/11/24
Agilent	USB wideband power sensor	U2021XA	MY54250003	2022/6/27	2023/6/26
Unknown	RF Coaxial Cable	No.31	RF-01	Each time	/

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307 (b) (3) & §2.1091- RF Exposure

Applicable Standard

According to subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power(ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] to support an exemptionfrom further evaluation from 300 kHz through 100 GHz.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

Ris the minimum separation distance in meters
f = frequency in MHz

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Result

Mode	Frequency (MHz)	Tune up conducted power	Antenna Gain		ERP		Evaluation Distance (m)	ERP Limit (mW)
		(dBm)	(dBi)	(dBd)	(dBm)	(mW)		
BT	2402-2480	6.0	2.5	0.35	6.35	4.32	0.2	768
BLE	2402-2480	6.0	2.5	0.35	6.35	4.32	0.2	768
Wi-Fi	5180-5240	10	2.7	0.55	10.55	11.35	0.2	768

Note: 1. The BT or BLE can transmit at same time with Wi-Fi
2. The tune up conducted power and antenna gain was declared by the applicant.

Simultaneous transmitting consideration (worst case):

The ratio=ERP_{BT}/Limit+$ERP_{Wi\text{-}Fi}$/Limit=4.32/768+11.35/768=0.02＜1.0, so simultaneous exposure is compliant.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to § 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one internal antenna which was permanently attached, and the maximum antenna gain is 2.7dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

§15.205 & §15.209 & §15.407(B)– UNDESIRABLE EMISSION

Applicable Standard

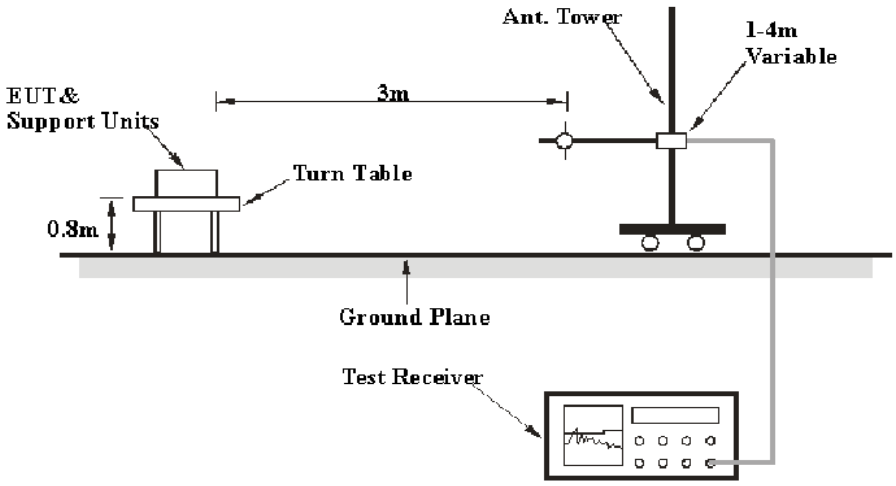
FCC §15.407 (b); §15.209; §15.205;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band:
(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

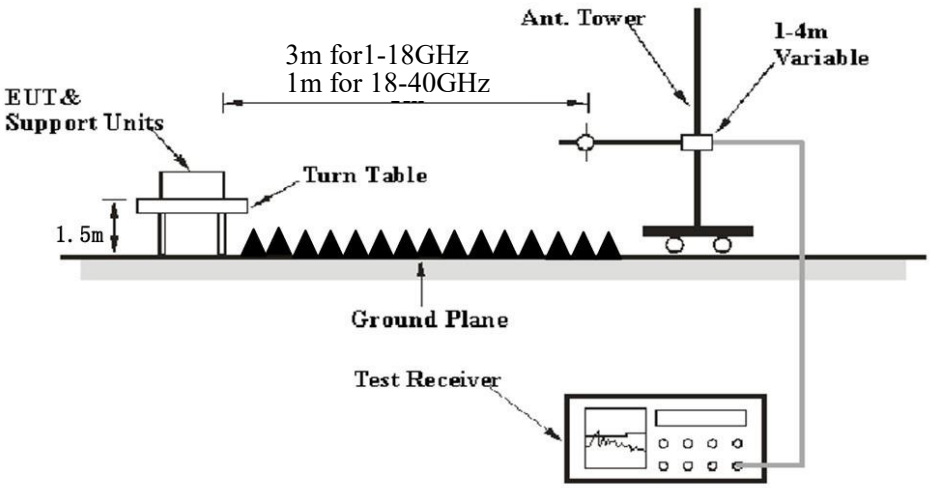
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

EUT Setup

Below 1 GHz:



Above 1 GHz:



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC 15.209 and FCC 15.407 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1MHz	10 Hz Note 1	/	Average
	1MHz	＞1/T Note 2	/	Average

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 98%

Test Procedure

Radiated Spurious Emission

During the radiated emission test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all the installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

According to ANSI C63.10-2013,9.4: For field strength measurements made at other than the distance at which the applicable limit is specified, extrapolate the measured field strength to the field strength at the distance specified by the limit using an inverse distance correction factor (20 dB/decade of distance). In some cases, a different distance correction factor may be required;

$$E_{\mathrm{SpecLimit}} = E_{\mathrm{Meas}} + 20\log\left(\frac{d_{\mathrm{Meas}}}{d_{\mathrm{SpecLimit}}}\right)$$

where

$E_{\mathrm{SpecLimit}}$	is the field strength of the emission at the distance specified by the limit, in dBμV/m
E_{Meas}	is the field strength of the emission at the measurement distance, in dBμV/m
d_{Meas}	is the measurement distance, in m
$d_{\mathrm{SpecLimit}}$	is the distance specified by the limit, in m

So the extrapolation factor of 1m is 20*log(1/3)= -9.5 dB, for 18-40GHz range, the limit of 1m distance was added by 9.5dB from limit of 3m to compared with the result measurement at 1m distance.

Factor & Margin Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "**Over Limit/Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

Over Limit/Margin = Level / Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

Temperature:	24~25.5℃
Relative Humidity:	52~56%
ATM Pressure:	101.0 kPa

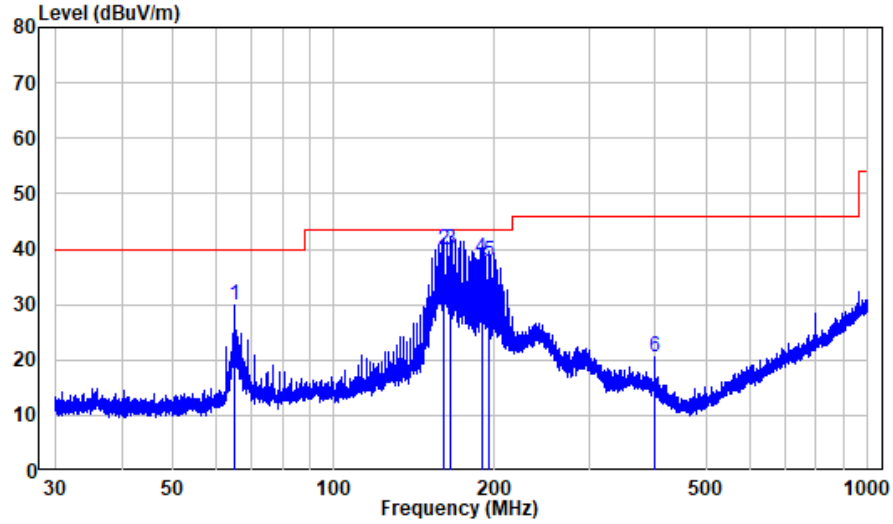
The testing was performed by Jimi Zheng on 2023-04-17 for below 1GHz and Level Li on 2023-04-21 for above 1GHz.

EUT operation mode: Transmitting (Pre-scan in the X,Y and Z axes of orientation, the worst case of X-axes orientation was recorded)

30 MHz – 1 GHz: *(worst case is 802.11a, 5180MHz)*

Note: When the test result of Peak was more than 6dB below the limit of QP, just the Peak value was recorded.

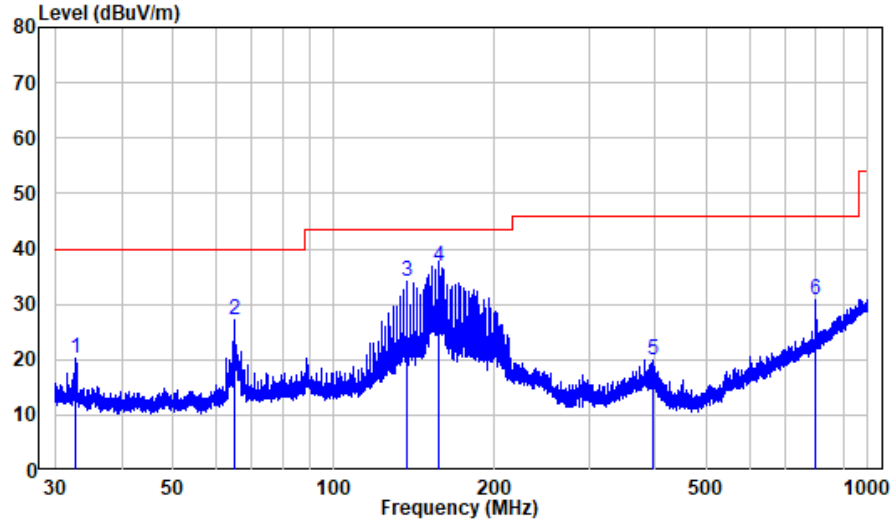
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA230330-15712E-RF
Test Mode: 5G WIFI Transmitting

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	64.972	-13.76	43.74	29.98	40.00	-10.02	Peak
2	160.909	-10.29	50.21	39.92	43.50	-3.58	QP
3	164.908	-10.29	50.10	39.81	43.50	-3.69	QP
4	188.909	-10.31	48.71	38.40	43.50	-5.10	QP
5	194.880	-10.39	48.05	37.66	43.50	-5.84	QP
6	400.081	-12.24	32.85	20.61	46.00	-25.39	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA230330-15712E-RF
Test Mode: 5G WIFI Transmitting

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	32.720	-14.37	34.58	20.21	40.00	-19.79	Peak
2	64.943	-13.76	40.88	27.12	40.00	-12.88	Peak
3	136.939	-10.56	44.81	34.25	43.50	-9.25	Peak
4	156.870	-10.32	47.00	36.68	43.50	-6.82	QP
5	395.374	-11.84	31.79	19.95	46.00	-26.05	Peak
6	800.031	-4.35	35.22	30.87	46.00	-15.13	Peak

Above 1GHz:

5150-5250 MHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected. Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11A									
5180MHz									
4500	66.57	PK	207	2.5	H	-6.44	60.13	74	-13.87
4500	53.60	Ave.	207	2.5	H	-6.44	47.16	54	-6.84
4500	65.20	PK	179	1.4	V	-6.44	58.76	74	-15.24
4500	53.27	Ave.	179	1.4	V	-6.44	46.83	54	-7.17
5150	68.06	PK	204	2.1	H	-4.91	63.15	74	-10.85
5150	55.25	Ave.	204	2.1	H	-4.91	50.34	54	-3.66
5150	67.48	PK	6	1.1	V	-4.91	62.57	74	-11.43
5150	55.09	Ave.	6	1.1	V	-4.91	50.18	54	-3.82
10360	54.53	PK	272	2.3	H	5.36	59.89	68.2	-8.31
10360	54.05	PK	326	2.3	V	5.36	59.41	68.2	-8.79
5200MHz									
10400	54.16	PK	145	2.5	H	5.66	59.82	68.2	-8.38
10400	53.89	PK	191	2.5	V	5.66	59.55	68.2	-8.65
5240MHz									
5350	63.64	PK	346	1.9	H	-3.89	59.75	74	-14.25
5350	51.96	Ave.	346	1.9	H	-3.89	48.07	54	-5.93
5350	62.99	PK	111	1.1	V	-3.89	59.10	74	-14.90
5350	51.68	Ave.	111	1.1	V	-3.89	47.79	54	-6.21
5460	61.45	PK	198	2	H	-3.24	58.21	74	-15.79
5460	50.66	Ave.	198	2	H	-3.24	47.42	54	-6.58
5460	61.29	PK	118	2	V	-3.24	58.05	74	-15.95
5460	48.87	Ave.	118	2	V	-3.24	45.63	54	-8.37
10480	54.37	PK	19	1.9	H	5.52	59.89	68.2	-8.31
10480	54.29	PK	252	1.9	V	5.52	59.81	68.2	-8.39

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected. Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11AC20									
5180MHz									
4500	65.78	PK	324	1.4	H	-6.44	59.34	74	-14.66
4500	53.47	Ave.	324	1.4	H	-6.44	47.03	54	-6.97
4500	65.02	PK	324	1.2	V	-6.44	58.58	74	-15.42
4500	53.01	Ave.	324	1.2	V	-6.44	46.57	54	-7.43
5150	67.30	PK	42	2.2	H	-4.91	62.39	74	-11.61
5150	55.25	Ave.	42	2.2	H	-4.91	50.34	54	-3.66
5150	66.76	PK	10	2	V	-4.91	61.85	74	-12.15
5150	55.13	Ave.	10	2	V	-4.91	50.22	54	-3.78
10360	54.36	PK	265	1.1	H	5.36	59.72	68.2	-8.48
10360	54.08	PK	320	1.1	V	5.36	59.44	68.2	-8.76
5200MHz									
10400	54.29	PK	313	2.3	H	5.66	59.95	68.2	-8.25
10400	54.11	PK	214	2.3	V	5.66	59.77	68.2	-8.43
5240MHz									
5350	64.09	PK	287	1.3	H	-3.89	60.20	74	-13.80
5350	50.97	Ave.	287	1.3	H	-3.89	47.08	54	-6.92
5350	63.80	PK	185	1.4	V	-3.89	59.91	74	-14.09
5350	50.85	Ave.	185	1.4	V	-3.89	46.96	54	-7.04
5460	62.46	PK	79	1.7	H	-3.24	59.22	74	-14.78
5460	49.50	Ave.	79	1.7	H	-3.24	46.26	54	-7.74
5460	62.09	PK	99	1.6	V	-3.24	58.85	74	-15.15
5460	49.25	Ave.	99	1.6	V	-3.24	46.01	54	-7.99
10480	54.76	PK	284	2.1	H	5.52	60.28	68.2	-7.92
10480	54.62	PK	33	2.1	V	5.52	60.14	68.2	-8.06

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected. Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11AC40									
5190MHz									
4500	66.61	PK	338	1.6	H	-6.44	60.17	74	-13.83
4500	54.43	Ave.	338	1.6	H	-6.44	47.99	54	-6.01
4500	64.90	PK	103	1.2	V	-6.44	58.46	74	-15.54
4500	54.07	Ave.	103	1.2	V	-6.44	47.63	54	-6.37
5150	67.78	PK	15	1.9	H	-4.91	62.87	74	-11.13
5150	55.75	Ave.	15	1.9	H	-4.91	50.84	54	-3.16
5150	67.45	PK	106	1.6	V	-4.91	62.54	74	-11.46
5150	55.54	Ave.	106	1.6	V	-4.91	50.63	54	-3.37
10380	54.54	PK	123	1.7	H	5.51	60.05	68.2	-8.15
10380	54.35	PK	287	1.7	V	5.51	59.86	68.2	-8.34
5230MHz									
5350	64.18	PK	286	1.5	H	-3.89	60.29	74	-13.71
5350	51.56	Ave.	286	1.5	H	-3.89	47.67	54	-6.33
5350	63.80	PK	348	2.2	V	-3.89	59.91	74	-14.09
5350	51.05	Ave.	348	2.2	V	-3.89	47.16	54	-6.84
5460	62.55	PK	48	1.6	H	-3.24	59.31	74	-14.69
5460	49.49	Ave.	48	1.6	H	-3.24	46.25	54	-7.75
5460	62.10	PK	274	2.5	V	-3.24	58.86	74	-15.14
5460	49.06	Ave.	274	2.5	V	-3.24	45.82	54	-8.18
10460	55.70	PK	184	1.8	H	5.51	61.21	68.2	-6.99
10460	55.32	PK	106	1.8	V	5.51	60.83	68.2	-7.37

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected. Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11AX20									
5180MHz									
4500	65.56	PK	51	1.6	H	-6.44	59.12	74	-14.88
4500	54.68	Ave.	51	1.6	H	-6.44	48.24	54	-5.76
4500	65.28	PK	60	1.5	V	-6.44	58.84	74	-15.16
4500	53.15	Ave.	60	1.5	V	-6.44	46.71	54	-7.29
5150	67.20	PK	157	1.1	H	-4.91	62.29	74	-11.71
5150	55.67	Ave.	157	1.1	H	-4.91	50.76	54	-3.24
5150	66.79	PK	65	2.4	V	-4.91	61.88	74	-12.12
5150	55.46	Ave.	65	2.4	V	-4.91	50.55	54	-3.45
10360	54.66	PK	320	1.7	H	5.36	60.02	68.2	-8.18
10360	54.28	PK	206	1.7	V	5.36	59.64	68.2	-8.56
5200MHz									
10400	54.10	PK	256	2.2	H	5.66	59.76	68.2	-8.44
10400	53.67	PK	283	2.2	V	5.66	59.33	68.2	-8.87
5240MHz									
5350	64.38	PK	25	2.3	H	-3.89	60.49	74	-13.51
5350	51.36	Ave.	25	2.3	H	-3.89	47.47	54	-6.53
5350	63.57	PK	88	2.3	V	-3.89	59.68	74	-14.32
5350	51.12	Ave.	88	2.3	V	-3.89	47.23	54	-6.77
5460	62.45	PK	335	2.4	H	-3.24	59.21	74	-14.79
5460	49.54	Ave.	335	2.4	H	-3.24	46.30	54	-7.70
5460	60.89	PK	72	2.1	V	-3.24	57.65	74	-16.35
5460	49.03	Ave.	72	2.1	V	-3.24	45.79	54	-8.21
10480	54.14	PK	276	2	H	5.52	59.66	68.2	-8.54
10480	53.60	PK	243	2	V	5.52	59.12	68.2	-9.08

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected. Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11AX40									
5190MHz									
4500	66.57	PK	303	2	H	-6.44	60.13	74	-13.87
4500	54.40	Ave.	303	2	H	-6.44	47.96	54	-6.04
4500	66.28	PK	1	2.2	V	-6.44	59.84	74	-14.16
4500	53.94	Ave.	1	2.2	V	-6.44	47.50	54	-6.50
5150	67.97	PK	101	1.1	H	-4.91	63.06	74	-10.94
5150	55.84	Ave.	101	1.1	H	-4.91	50.93	54	-3.07
5150	67.60	PK	346	1.4	V	-4.91	62.69	74	-11.31
5150	55.63	Ave.	346	1.4	V	-4.91	50.72	54	-3.28
10380	53.90	PK	72	1.9	H	5.51	59.41	68.2	-8.79
10380	53.54	PK	327	1.9	V	5.51	59.05	68.2	-9.15
5230MHz									
5350	63.89	PK	102	2.5	H	-3.89	60.00	74	-14.00
5350	51.86	Ave.	102	2.5	H	-3.89	47.97	54	-6.03
5350	63.58	PK	39	2.1	V	-3.89	59.69	74	-14.31
5350	51.79	Ave.	39	2.1	V	-3.89	47.90	54	-6.10
5460	62.66	PK	256	1.6	H	-3.24	59.42	74	-14.58
5460	50.41	Ave.	256	1.6	H	-3.24	47.17	54	-6.83
5460	60.84	PK	101	1.4	V	-3.24	57.60	74	-16.40
5460	50.13	Ave.	101	1.4	V	-3.24	46.89	54	-7.11
10460	54.64	PK	255	1.7	H	5.51	60.15	68.2	-8.05
10460	54.42	PK	178	1.7	V	5.51	59.93	68.2	-8.27

Simultaneous transmitting condition:

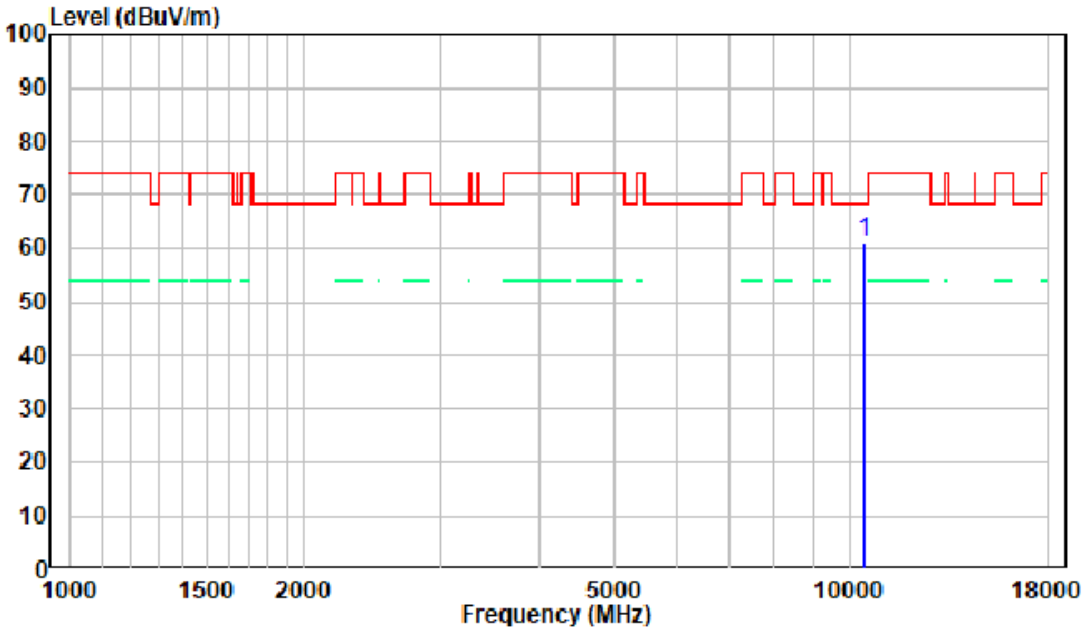
Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected. Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
BLE+Wi-Fi									
Worst case BLE 1M Low channel+802.11a high channel									
3251.29	68.05	PK	334	2.1	H	-10.01	58.04	74	-15.96
3251.29	54.64	AV	334	2.1	H	-10.01	44.63	54	-9.37
3251.29	65.84	PK	234	2.1	V	-10.01	55.83	74	-18.17
3251.29	51.59	AV	234	2.1	V	-10.01	41.58	54	-12.42
3738.56	64.55	PK	132	1.6	H	-8.59	55.96	74	-18.04
3738.56	49.84	AV	132	1.6	H	-8.59	41.25	54	-12.75
3738.56	63.48	PK	131	1.5	V	-8.59	54.89	74	-19.11
3738.56	48.77	AV	131	1.5	V	-8.59	40.18	54	-13.82
BDR/EDR+Wi-Fi									
Worst case GFSK Low channel+802.11a low channel									
3198.26	67.58	PK	97	1.6	H	-10.66	56.92	74	-17.08
3198.26	53.21	AV	97	1.6	H	-10.66	42.55	54	-11.45
3198.26	64.39	PK	313	1.7	V	-10.66	53.73	74	-20.27
3198.26	50.82	AV	313	1.7	V	-10.66	40.16	54	-13.84
3744.35	65.12	PK	248	1.3	H	-8.94	56.18	74	-17.82
3744.35	50.39	AV	248	1.3	H	-8.94	41.45	54	-12.55
3744.35	64.29	PK	125	1.8	V	-8.94	55.35	74	-18.65
3744.35	49.18	AV	125	1.8	V	-8.94	40.24	54	-13.76

Note:
Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is in the noise floor level was not recorded.

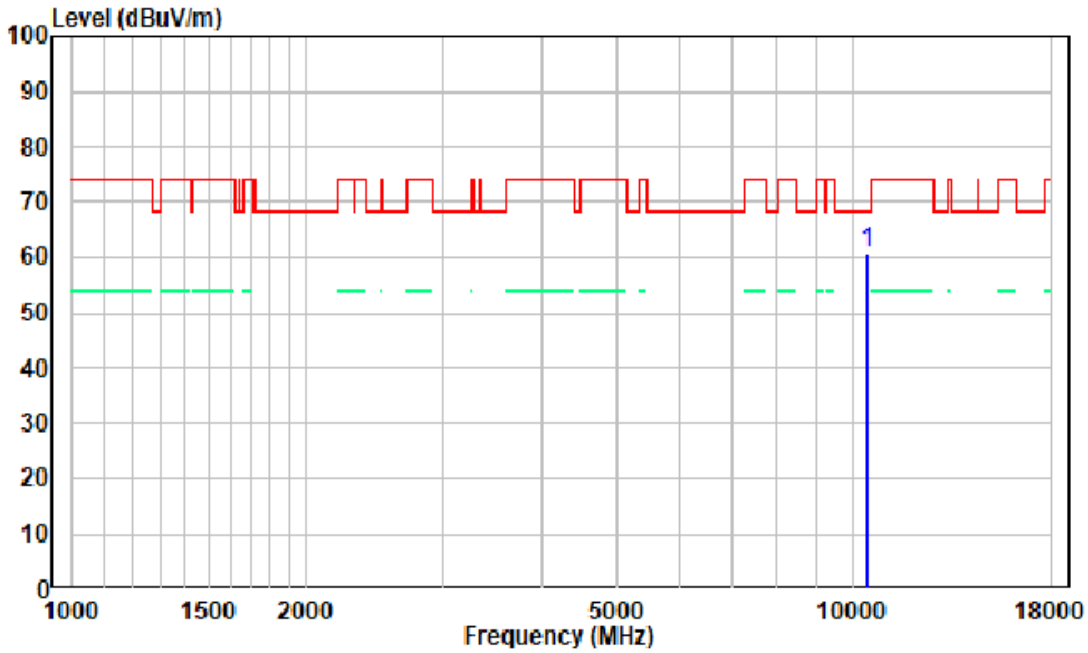
1 GHz - 18 GHz: (Pre-Scan plots)

802.11 ac20, 5240MHz

Horizontal



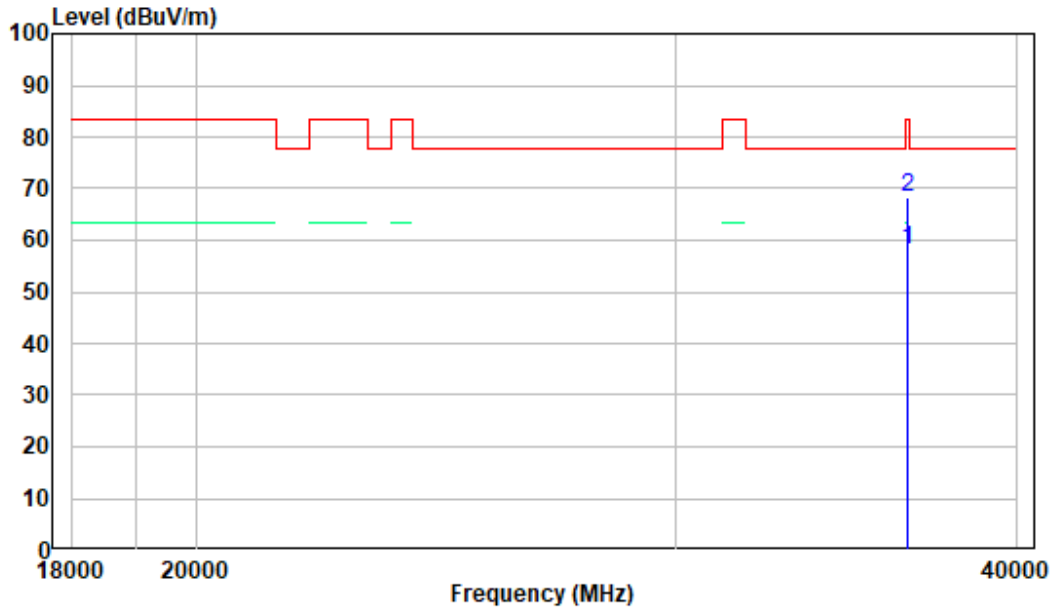
Vertical



18-40GHz: (Pre-Scan plots)

802.11 ac20, 5240MHz

Horizontal



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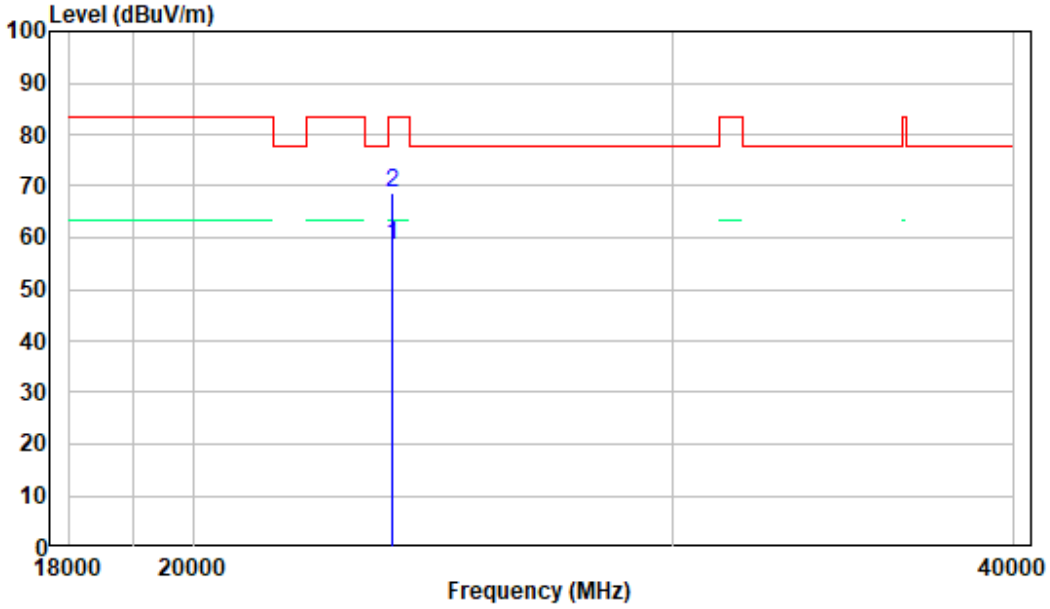


FCC §15.407(a),(e) – 26 dB & 6dB EMISSION BANDWIDTH

Applicable Standard

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

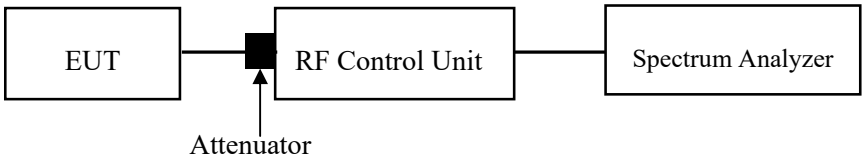
Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

According to KDB789033 D02 section II.C. and section II.D.

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. **Minimum Emission Bandwidth for the band 5.725-5.85 GHz**
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	60%
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-04-18 and 2023-04-28.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

FCC §15.407(a) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

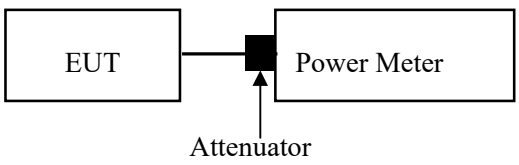
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure

According to KDB789033 D02 section II.E.3.b).

a) Place the EUT on a bench and set it in transmitting mode.
b) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
c) Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	60%
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-04-18.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

FCC §15.407(a) - POWER SPECTRAL DENSITY

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

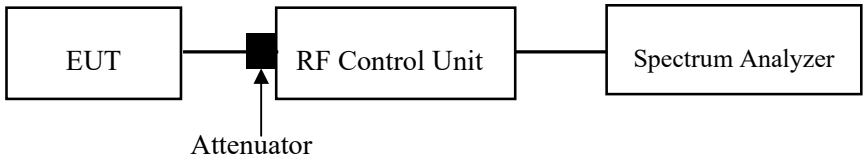
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure

According to KDB789033 D02 section II.F, Method SA-2 should be applied.

a) Set span to encompass the entire EBW(or, alternatively, the entire 99% occupied Bandwidth) of the signal.
b) Set sweep trigger to “free run.”
c) Set RBW=1MHz/VBW>3 MHz
d) Number of points in sweep>2 x span/RBW.(This ensures that bin-to-bin spacing is <RBW/2. so that narrowband signals are not lost between frequency bins.)
e) Sweep time = auto.
f) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
g) Do not use sweep triggering. Allow the sweep to “free run.”
h) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
i) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	60%
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-04-18.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

APPENDIX

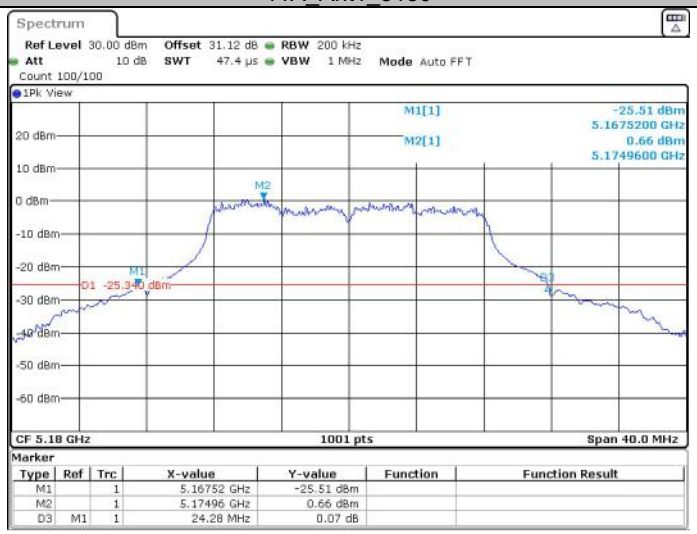
Appendix A1: Emission Bandwidth

Test Result

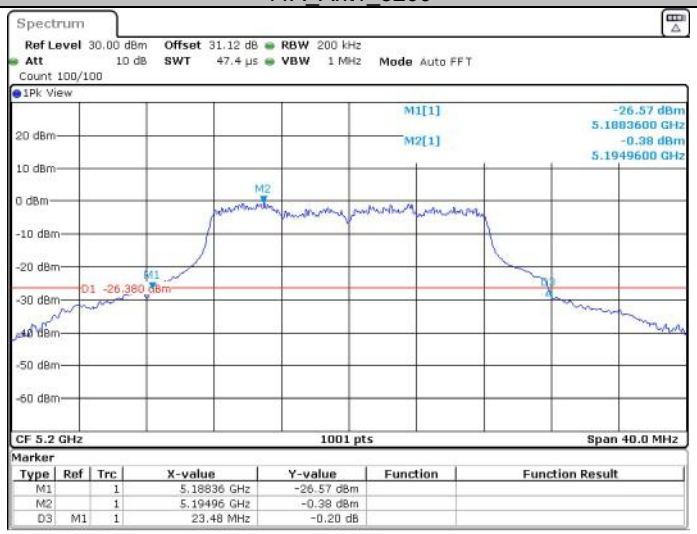
Test Mode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	24.28	5167.52	5191.80	---	---
		5200	23.48	5188.36	5211.84	---	---
		5240	23.60	5228.24	5251.84	---	---
11AC20SISO	Ant1	5180	23.72	5168.16	5191.88	---	---
		5200	24.72	5187.12	5211.84	---	---
		5240	24.36	5227.52	5251.88	---	---
11AC40SISO	Ant1	5190	50.64	5164.24	5214.88	---	---
		5230	50.24	5204.56	5254.80	---	---
11AX20SISO	Ant1	5180	24.60	5167.28	5191.88	---	---
		5200	23.68	5188.24	5211.92	---	---
		5240	24.44	5227.48	5251.92	---	---
11AX40SISO	Ant1	5190	47.84	5165.60	5213.44	---	---
		5230	47.60	5205.76	5253.36	---	---

Test Graphs

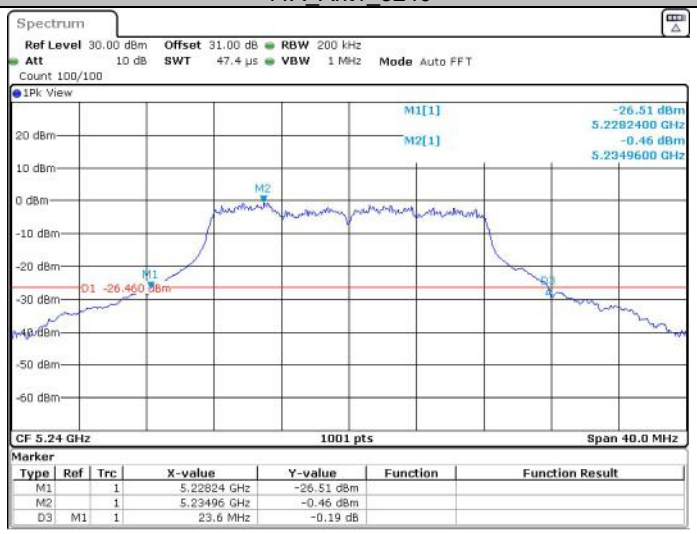
11A_Ant1_5180



11A_Ant1_5200



11A_Ant1_5240



Date: 18.APR.2023 01:05:09

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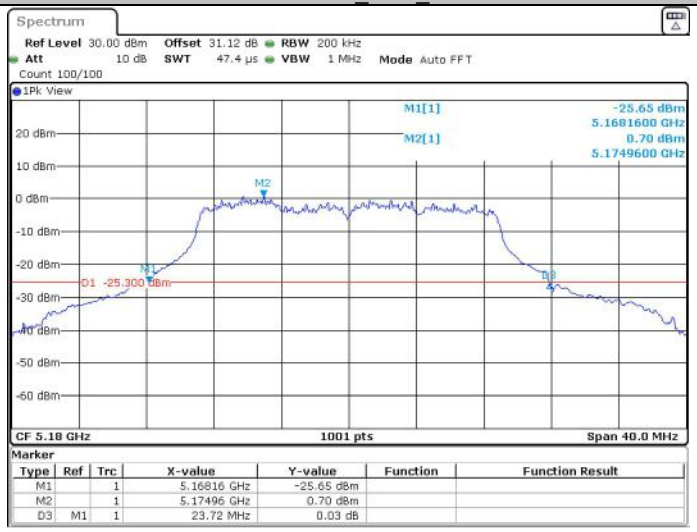

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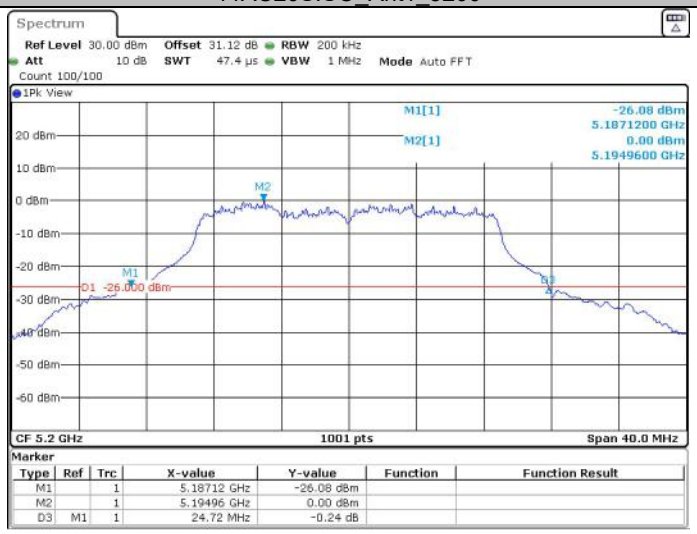

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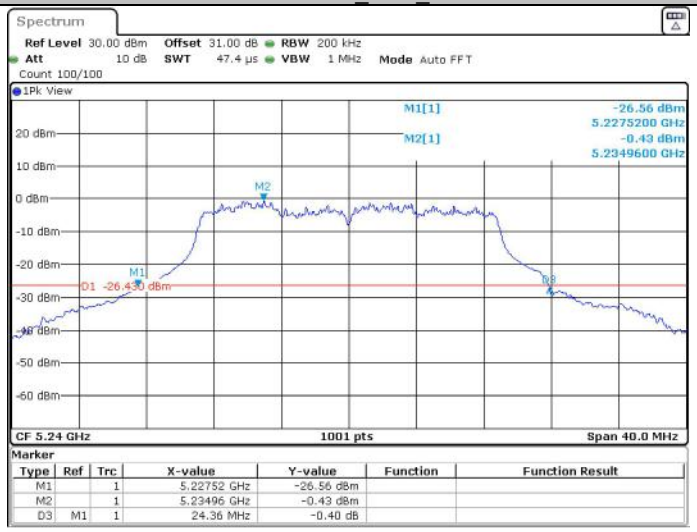
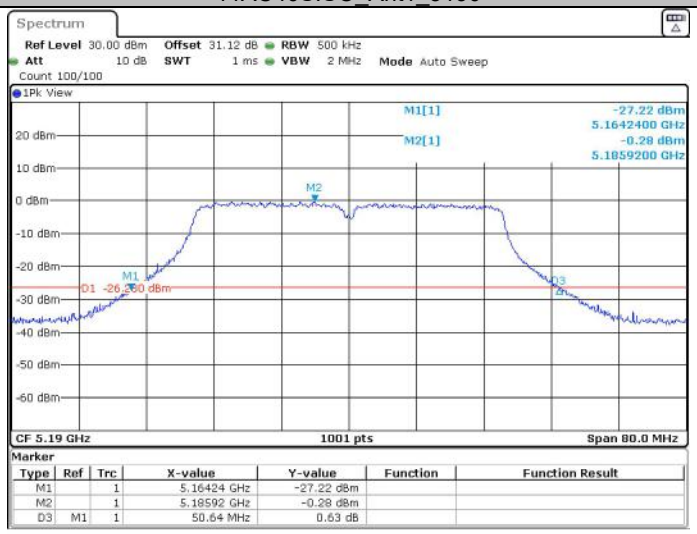
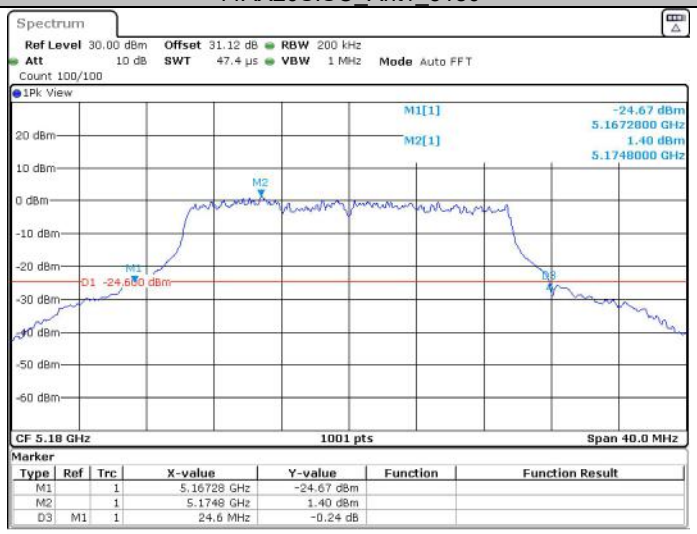


11AC40SISO_Ant1_5190

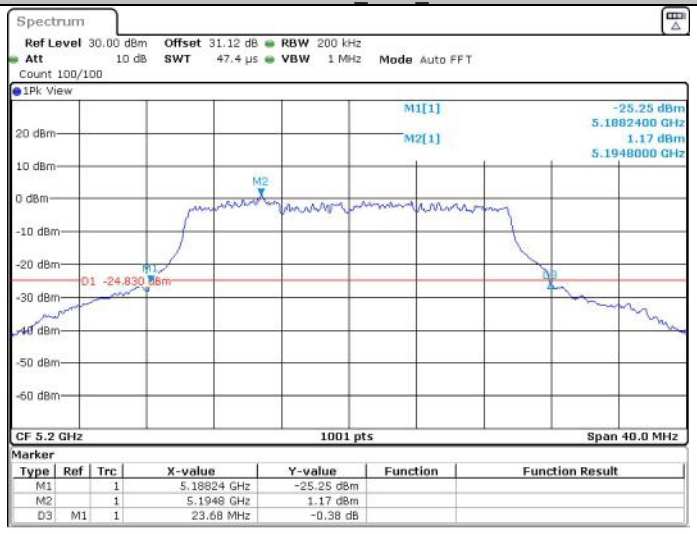


11AC40SISO_Ant1_5230

11AX20SISO_Ant1_5180



11AX20SISO_Ant1_5200



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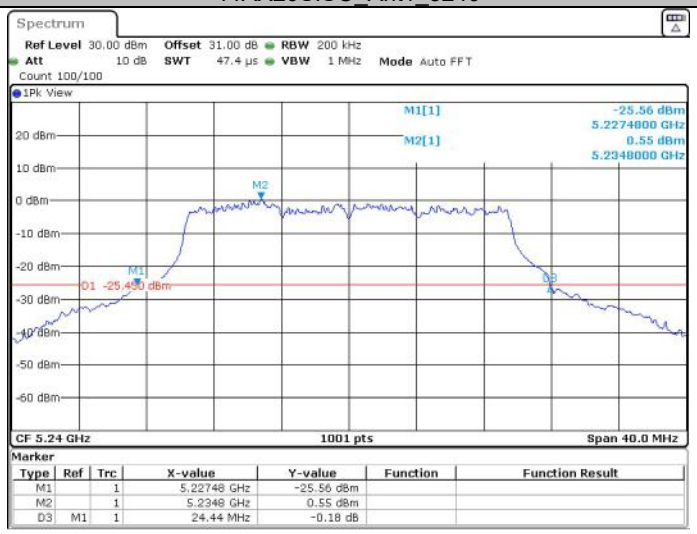
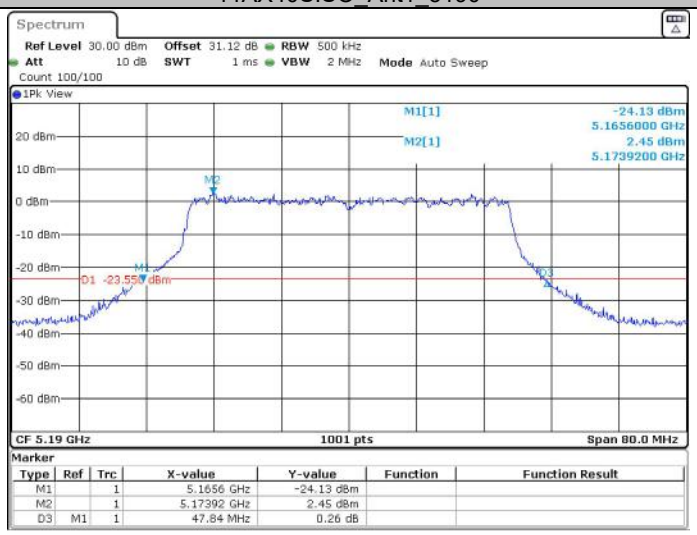
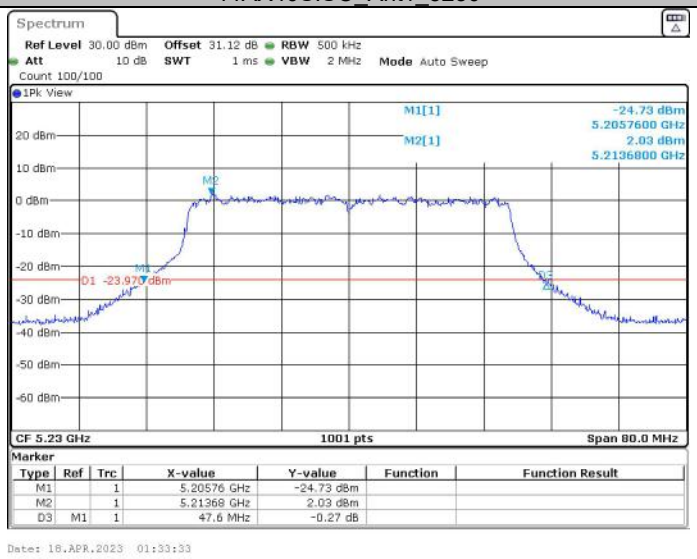


11AX40SISO_Ant1_5190



11AX40SISO_Ant1_5230



Appendix A2: Occupied channel bandwidth

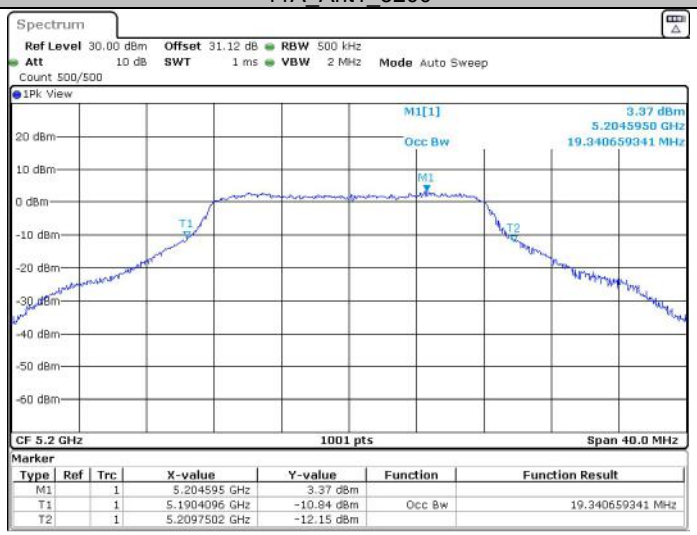
Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.221	5170.290	5189.510	---	---
		5200	19.341	5190.410	5209.750	---	---
		5240	19.261	5230.370	5249.630	---	---
11AC20SISO	Ant1	5180	20.38	5169.570	5189.950	---	---
		5200	20.46	5189.730	5210.190	---	---
		5240	19.58	5230.010	5249.590	---	---
11AC40SISO	Ant1	5190	38.601	5170.500	5209.101	---	---
		5230	38.362	5210.659	5249.021	---	---
11AX20SISO	Ant1	5180	20.06	5169.930	5189.990	---	---
		5200	20.1	5189.970	5210.070	---	---
		5240	20.02	5229.770	5249.790	---	---
11AX40SISO	Ant1	5190	38.841	5170.579	5209.421	---	---
		5230	38.761	5210.659	5249.421	---	---

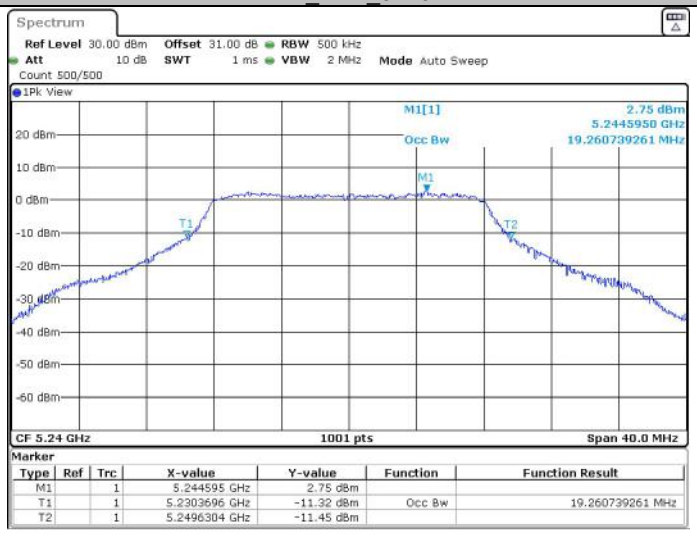
Test Graphs

11A_Ant1_5180

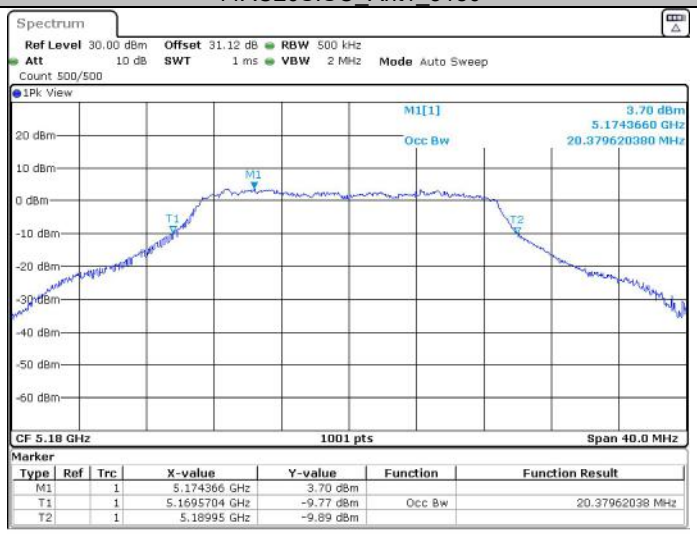
11A_Ant1_5200



11A_Ant1_5240



11AC20SISO_Ant1_5180



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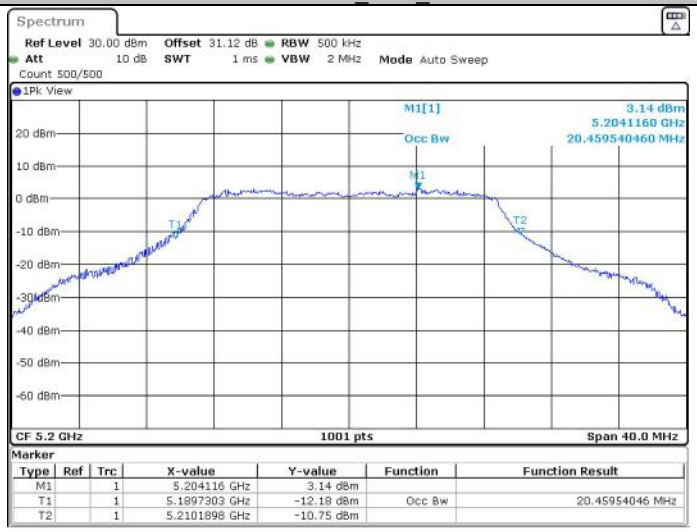

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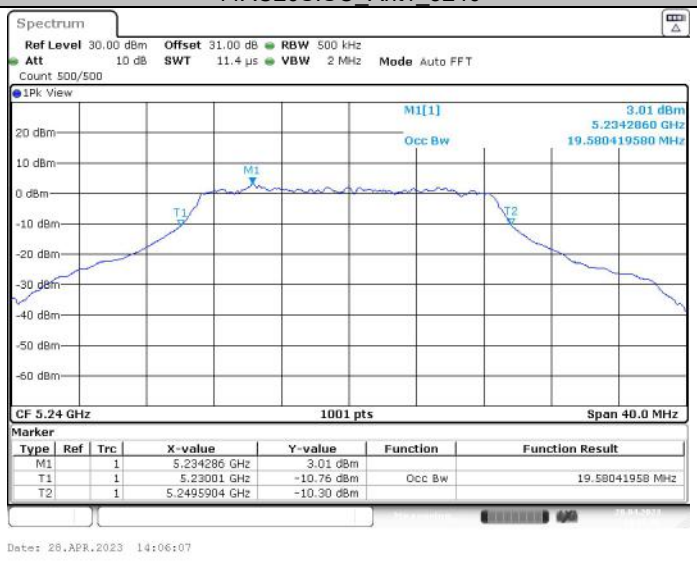

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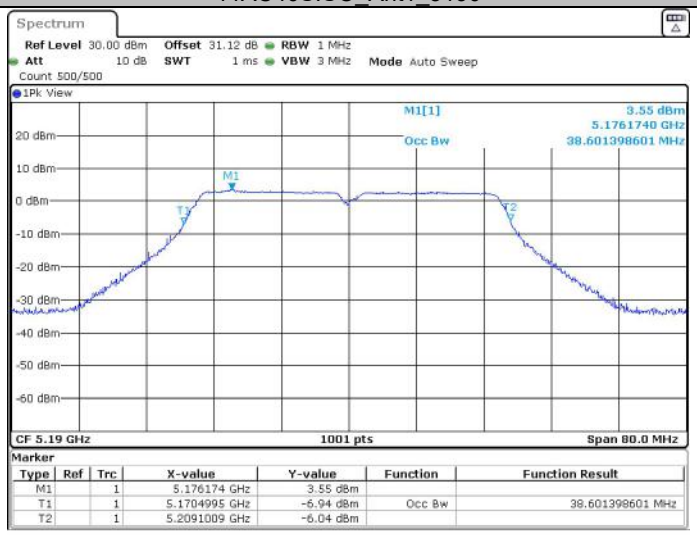
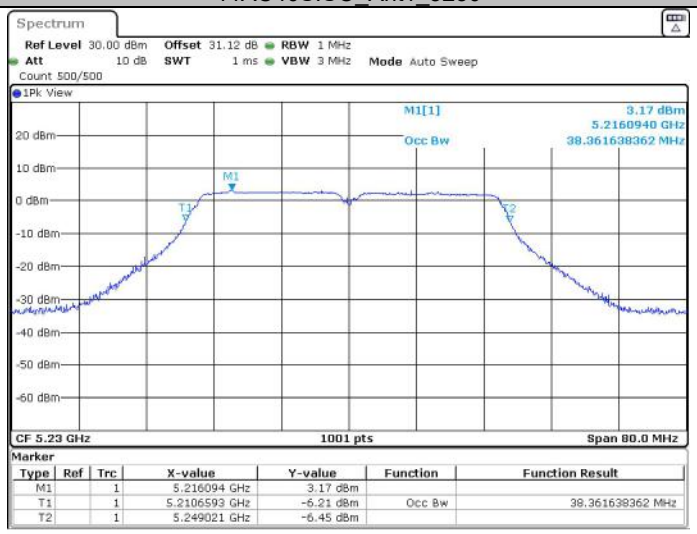


11AC40SISO_Ant1_5230



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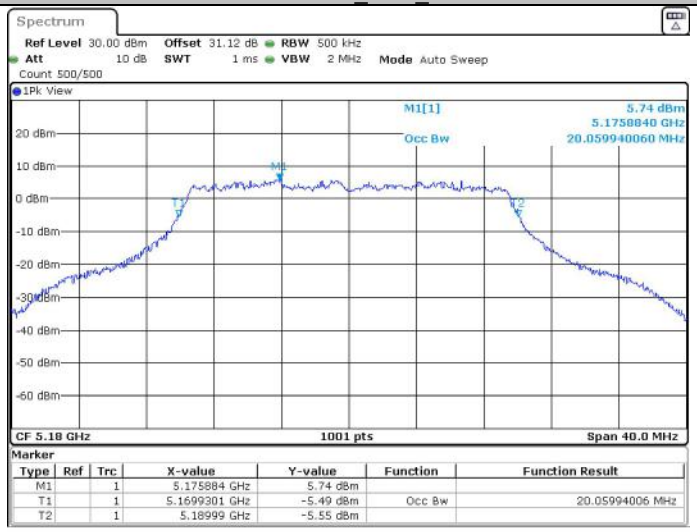

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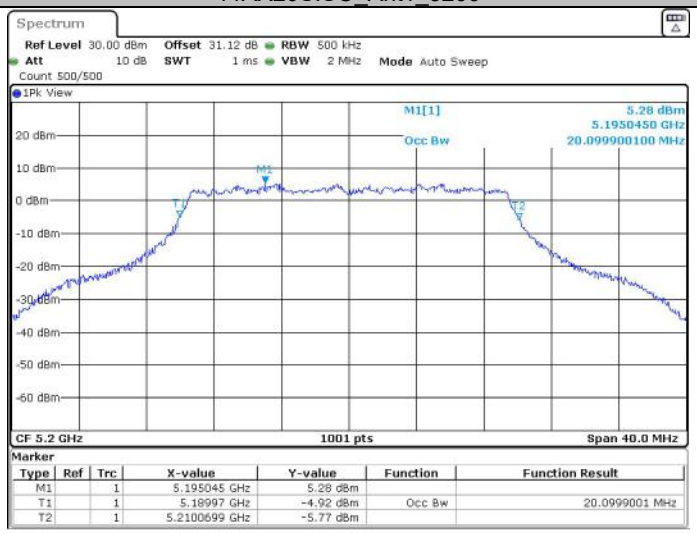

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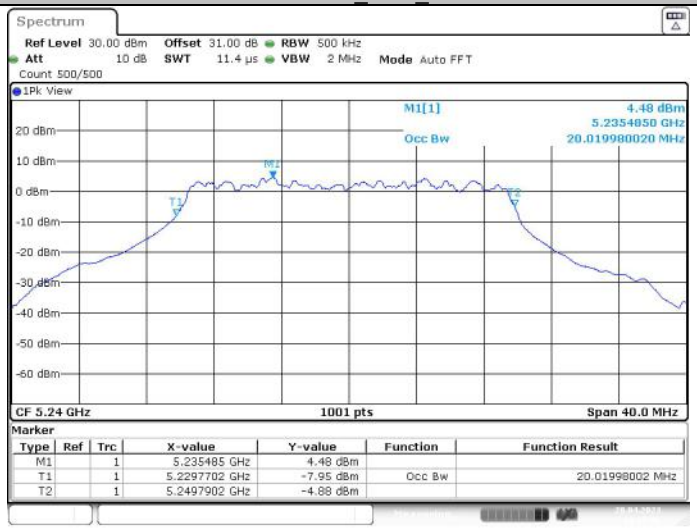

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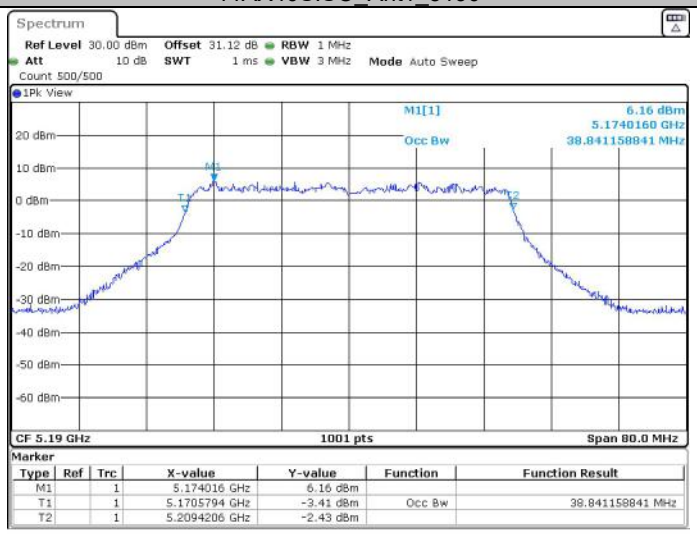
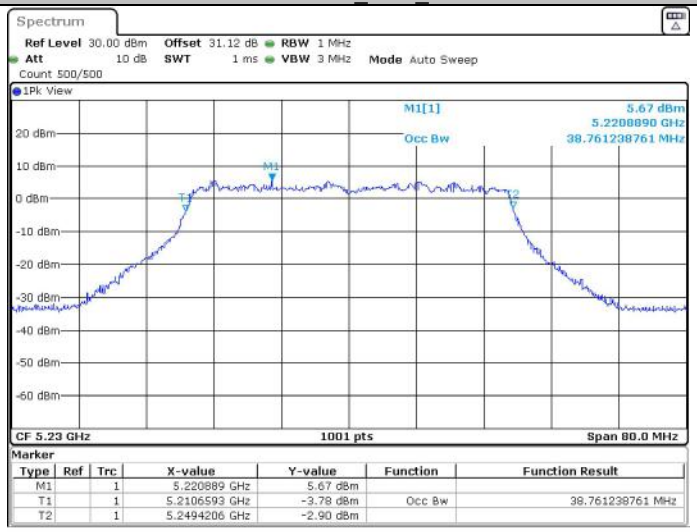


11AX40SISO_Ant1_5230



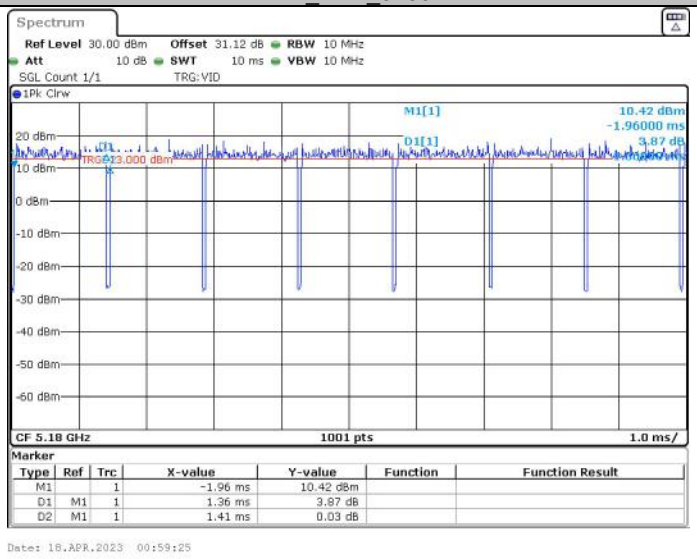
Appendix B: Duty Cycle

Test Result

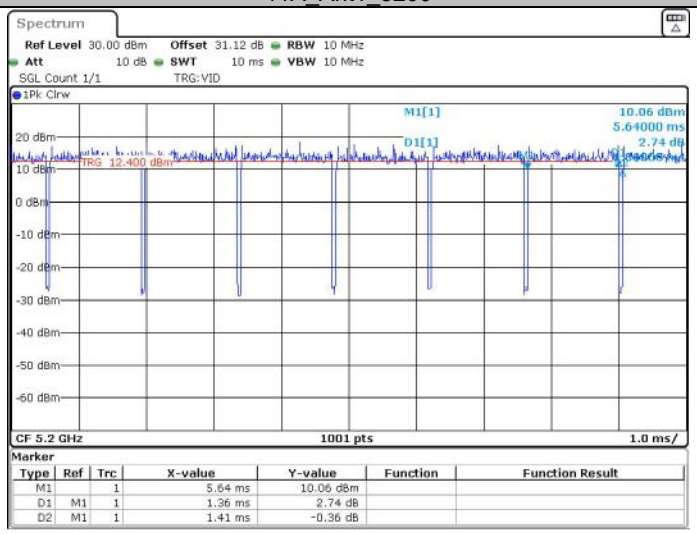
Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]	1/T [kHz]	VBW [kHz]
11A	Ant1	5180	1.36	1.41	96.45	0.16	0.74	1.1
		5200	1.36	1.41	96.45	0.16	0.74	1.0
		5240	1.36	1.41	96.45	0.16	0.74	1.0
11AC20SISO	Ant1	5180	1.28	1.33	96.24	0.17	0.78	1.0
		5200	1.28	1.33	96.24	0.17	0.78	1.0
		5240	1.28	1.33	96.24	0.17	0.78	1.0
11AC40SISO	Ant1	5190	0.64	0.74	86.49	0.63	1.56	2.0
		5230	0.64	0.70	91.43	0.39	1.56	2.0
11AX20SISO	Ant1	5180	0.99	1.05	94.29	0.26	1.01	2.0
		5200	0.99	1.05	94.29	0.26	1.01	2.0
		5240	0.99	1.04	95.19	0.21	1.01	2.0
11AX40SISO	Ant1	5190	0.51	0.57	89.47	0.48	1.96	2.0
		5230	0.51	0.57	89.47	0.48	1.96	2.0

Test Graphs

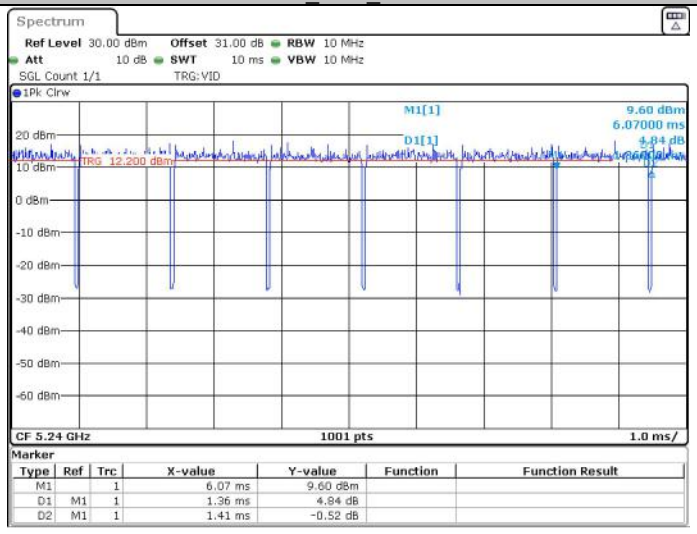
11A_Ant1_5180



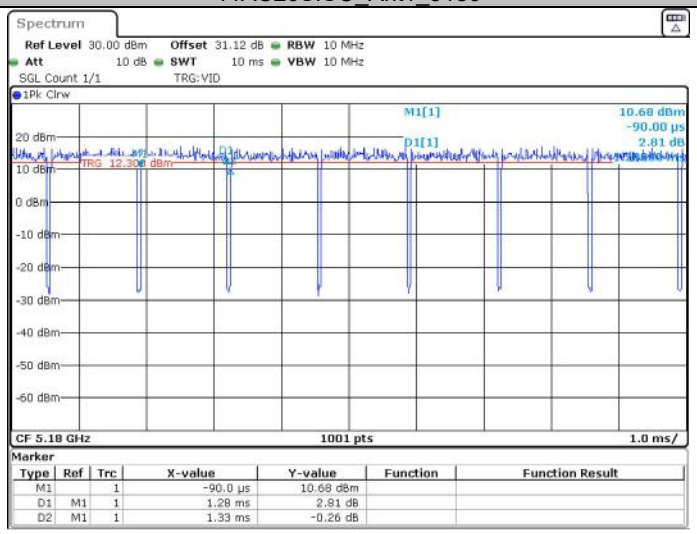
11A_Ant1_5200



11A_Ant1_5240



11AC20SISO_Ant1_5180



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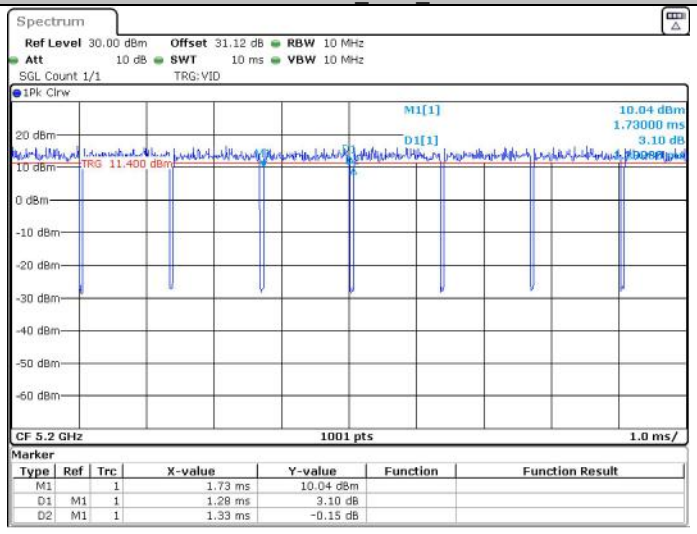

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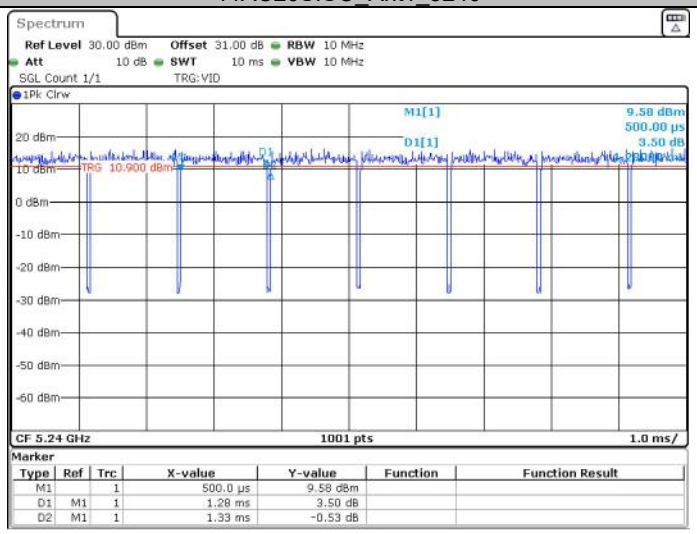

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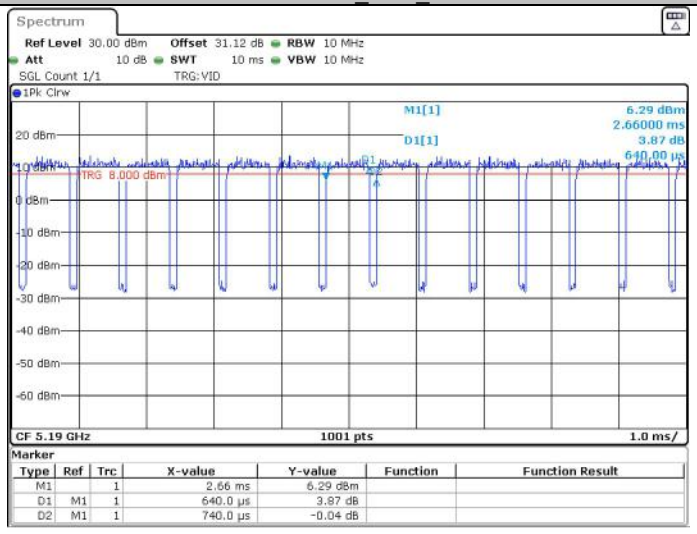
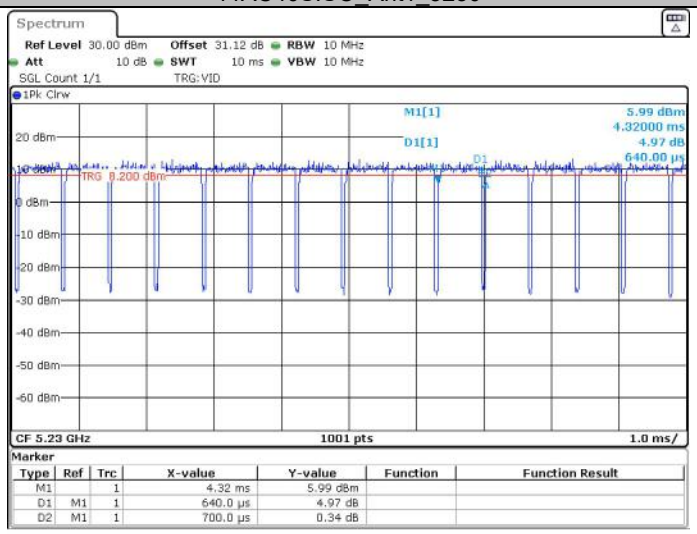
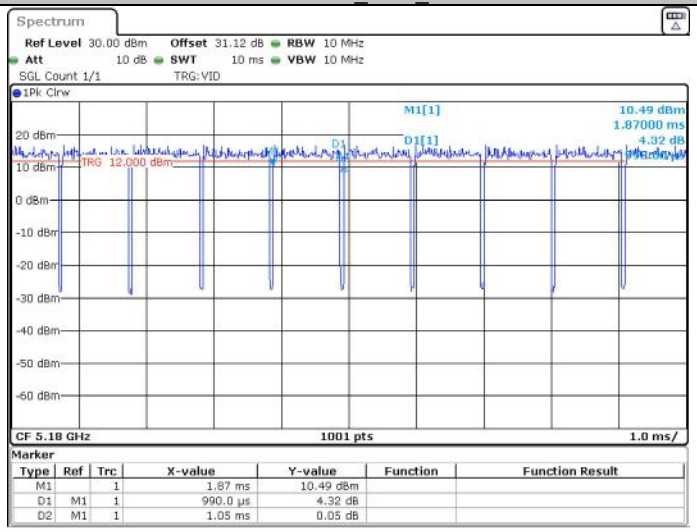


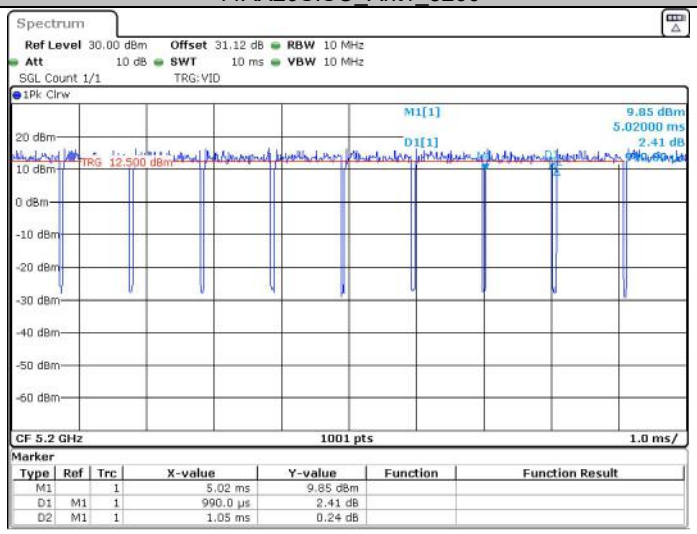
11AC40SISO_Ant1_5230



11AX20SISO_Ant1_5180



11AX20SISO_Ant1_5200



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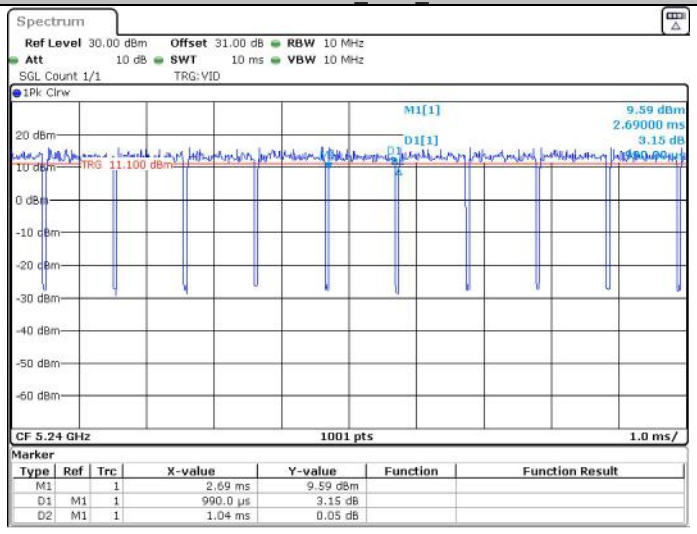
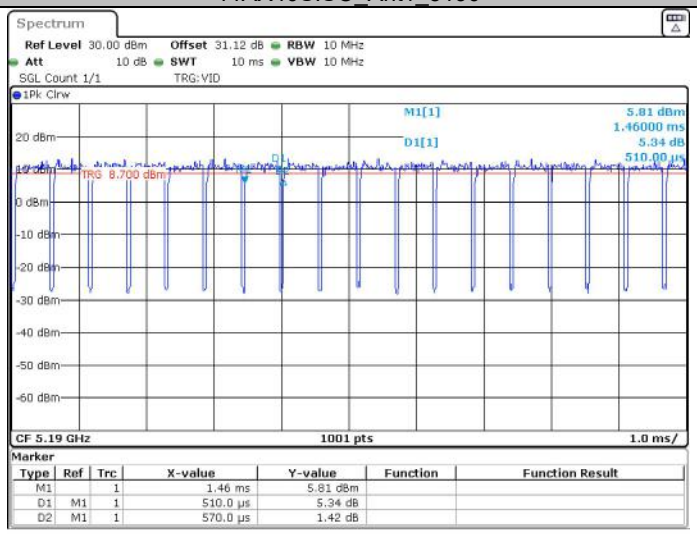
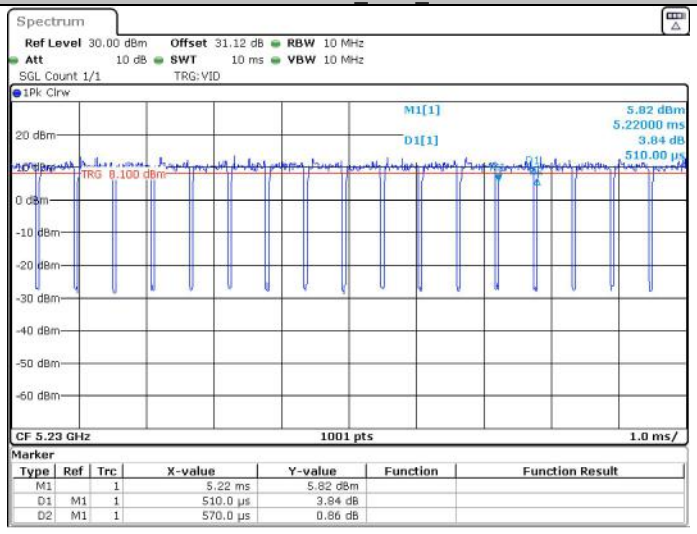


11AX40SISO_Ant1_5190



11AX40SISO_Ant1_5230



Appendix C: Maximum conducted output power

Test Result Channel Power

Test Mode	Antenna	Frequency[MHz]	Channel Powert [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	9.61	96.45	0.16	9.77	≤30	PASS
		5200	9.19	96.45	0.16	9.35	≤30	PASS
		5240	8.69	96.45	0.16	8.85	≤30	PASS
11AC20SISO	Ant1	5180	9.67	96.24	0.17	9.84	≤30	PASS
		5200	9.22	96.24	0.17	9.39	≤30	PASS
		5240	8.72	96.24	0.17	8.89	≤30	PASS
11AC40SISO	Ant1	5190	8.99	86.49	0.63	9.62	≤30	PASS
		5230	8.79	91.43	0.39	9.18	≤30	PASS
11AX20SISO	Ant1	5180	9.70	94.29	0.26	9.96	≤30	PASS
		5200	9.27	94.29	0.26	9.53	≤30	PASS
		5240	8.76	95.19	0.21	8.97	≤30	PASS
11AX40SISO	Ant1	5190	8.86	89.47	0.48	9.34	≤30	PASS
		5230	8.80	89.47	0.48	9.28	≤30	PASS

Note: the device operation mode is AP.

Appendix D: Maximum power spectral density

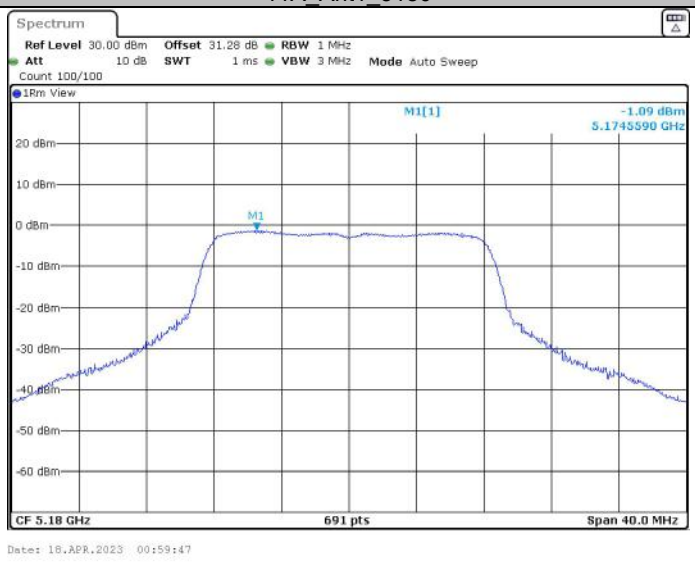
Test Result

Test Mode	Antenna	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	-1.09	≤17.00	PASS
		5200	-1.74	≤17.00	PASS
		5240	-2.29	≤17.00	PASS
11AC20SISO	Ant1	5180	-1.38	≤17.00	PASS
		5200	-1.99	≤17.00	PASS
		5240	-2.34	≤17.00	PASS
11AC40SISO	Ant1	5190	-4.86	≤17.00	PASS
		5230	-5.36	≤17.00	PASS
11AX20SISO	Ant1	5180	-1.57	≤17.00	PASS
		5200	-1.98	≤17.00	PASS
		5240	-2.73	≤17.00	PASS
11AX40SISO	Ant1	5190	-4.91	≤17.00	PASS
		5230	-5.39	≤17.00	PASS

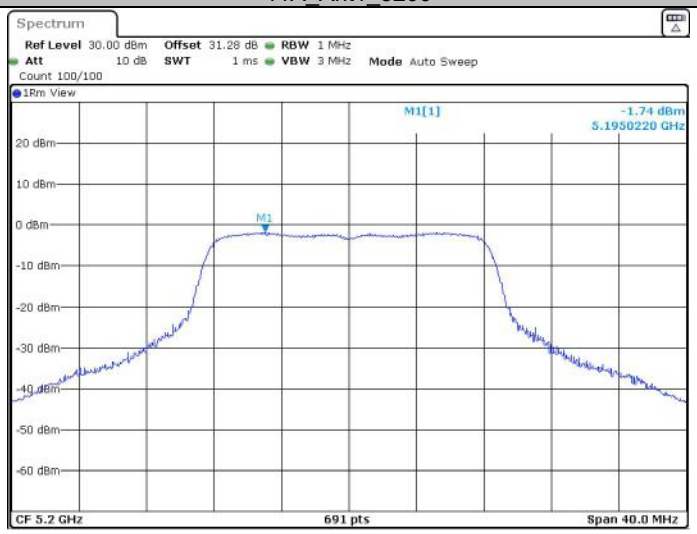
Note: The Duty Cycle Factor and RBW Factor are compensated in the graph.

Test Graphs

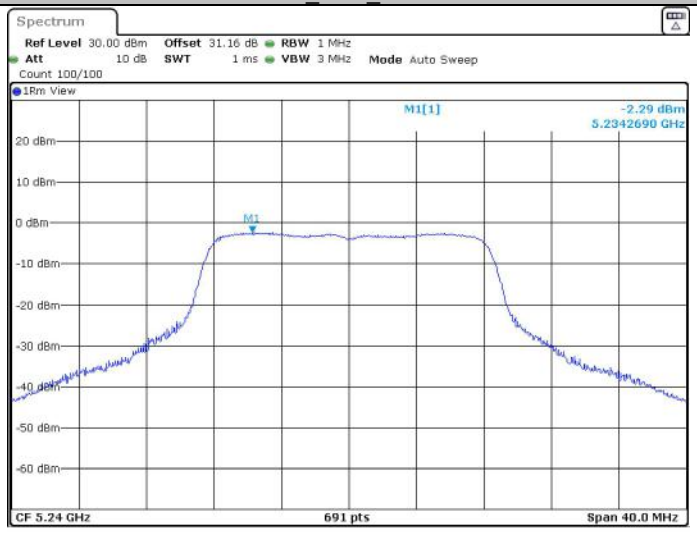
11A_Ant1_5180



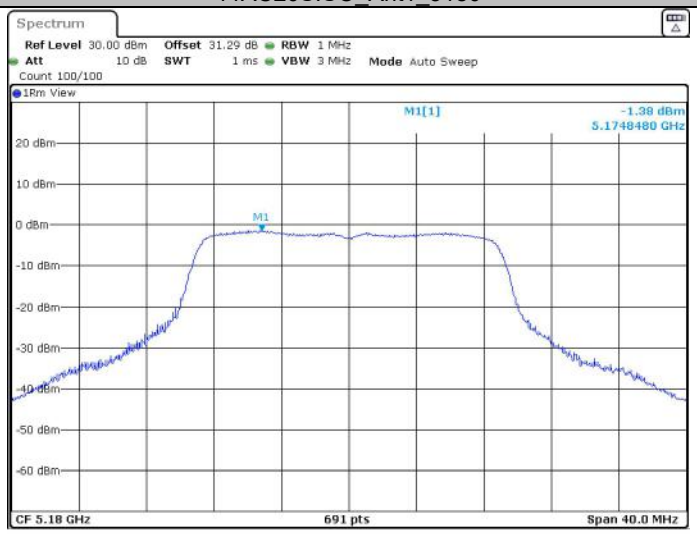
11A_Ant1_5200



11A_Ant1_5240



11AC20SISO_Ant1_5180



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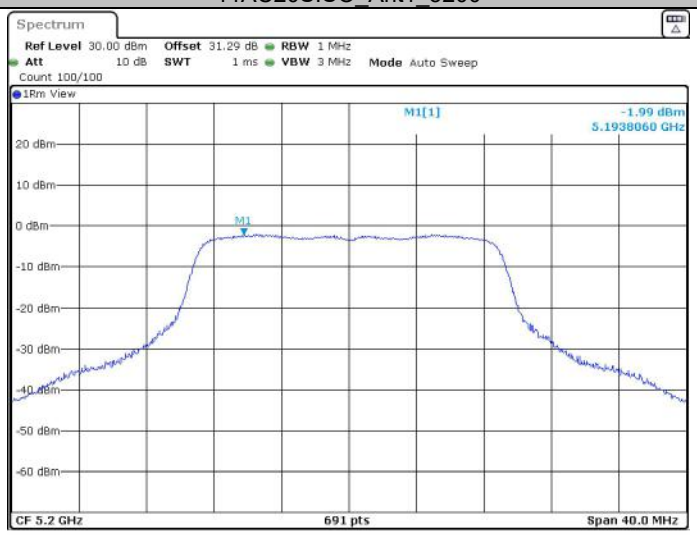

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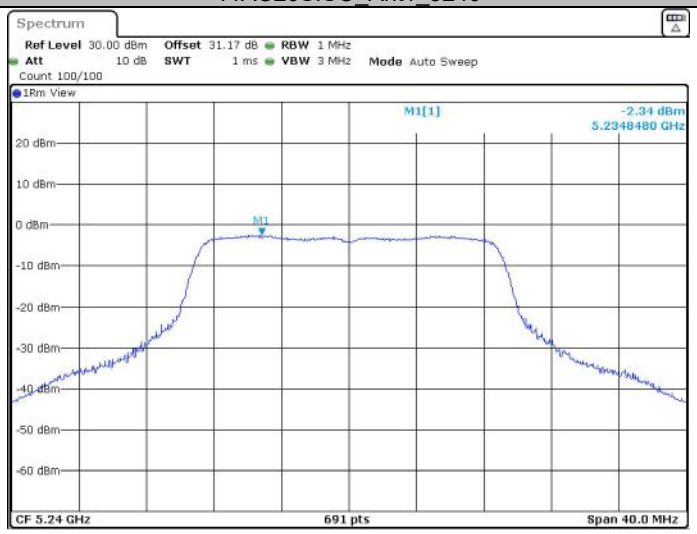
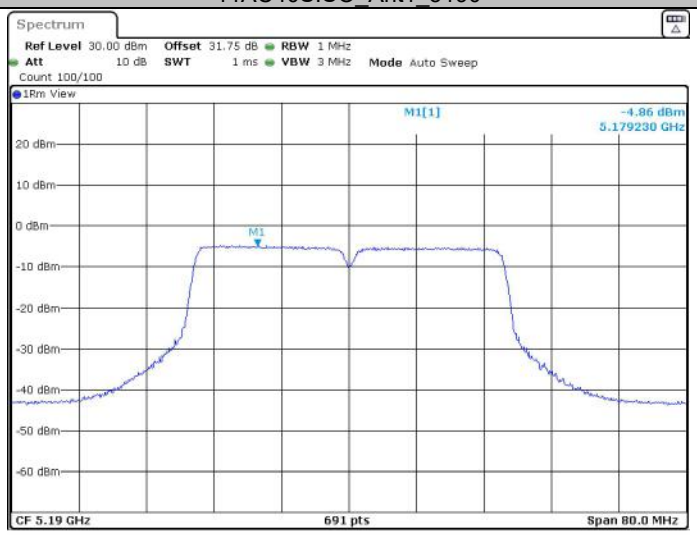
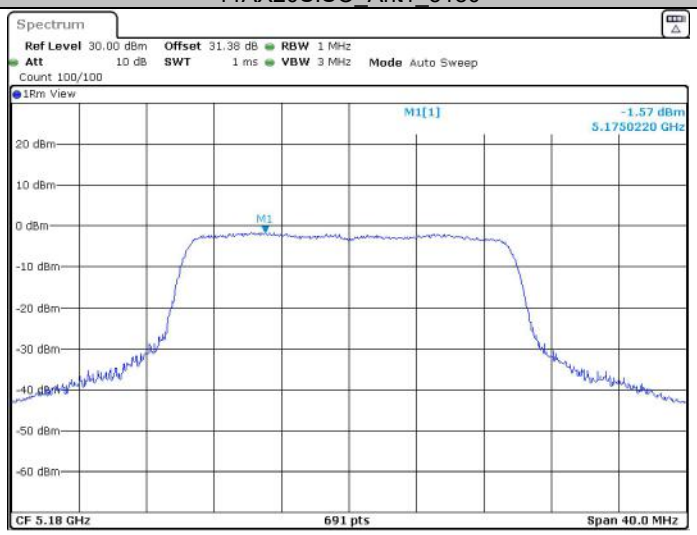


11AC40SISO_Ant1_5190



11AC40SISO_Ant1_5230

11AX20SISO_Ant1_5180



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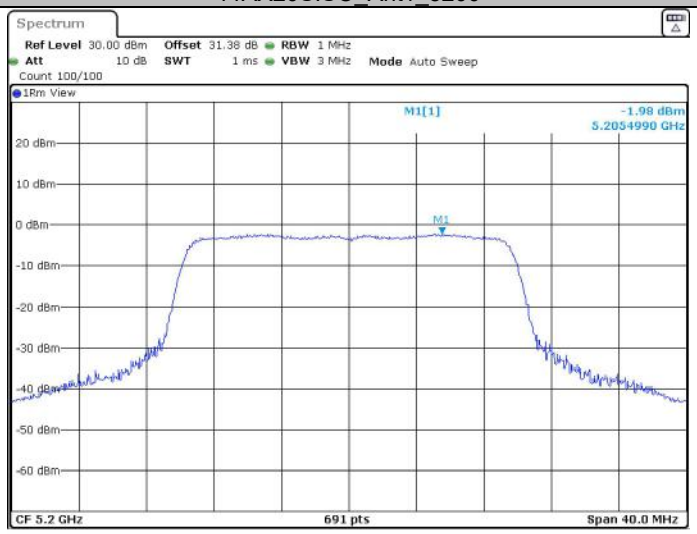

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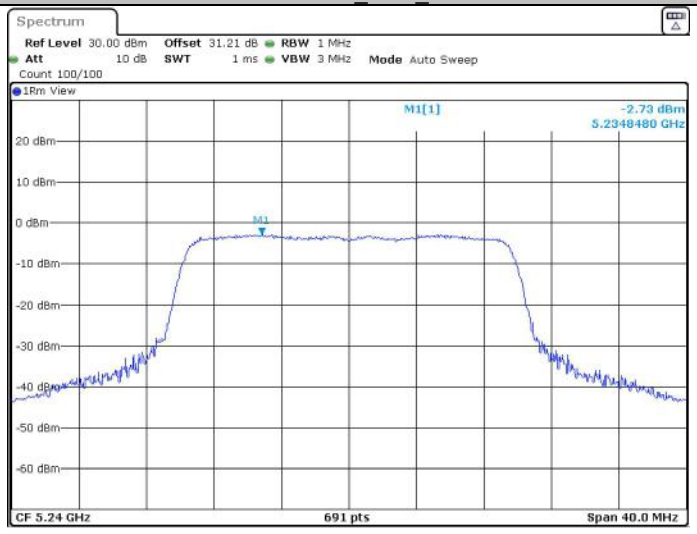

11AX40SISO_Ant1_5190

11AX40SISO_Ant1_5230

******* END OF REPORT *******