TEST REPORT

Product	:	Hachi Infinite K1
Trade mark	:	N/A
Model/Type reference	:	HP23ATQC
Serial Number	:	N/A
Report Number	:	EED32N80153703
FCC ID	:	2AWMI-HP23ATQC
Date of Issue	:	Nov. 11, 2021
Test Standards	:	47 CFR Part 15Subpart C
Test result	:	PASS

Prepared for:

Beijing Puppy Robotics Co., Ltd.
Room 710, 63 E 3rd Ring Rd Middle, Chaoyang, Beijing, China

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Compiled by:	Ware xin	Reviewed by:	Aaron Ma
	Ware xin		Aaron Ma
Approved by:	David Wang	Date:	Nov. 11, 2021
	David Wang		

Check No.:9113240321

2 Version

Version No.	Date	Description
00	Nov. 11, 2021	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Conducted Peak Output Power	47 CFR Part 15 Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013	PASS
Power Spectral Density	47 CFR Part 15 Subpart C Section 15.247 (e)	ANSI C63.10-2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
Radiated Spurious Emissions	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

Remark:
Test according to ANSI C63.4-2014 & ANSI C63.10-2013.
Company Name and Address shown on Report, the sample(s) and sample Information were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

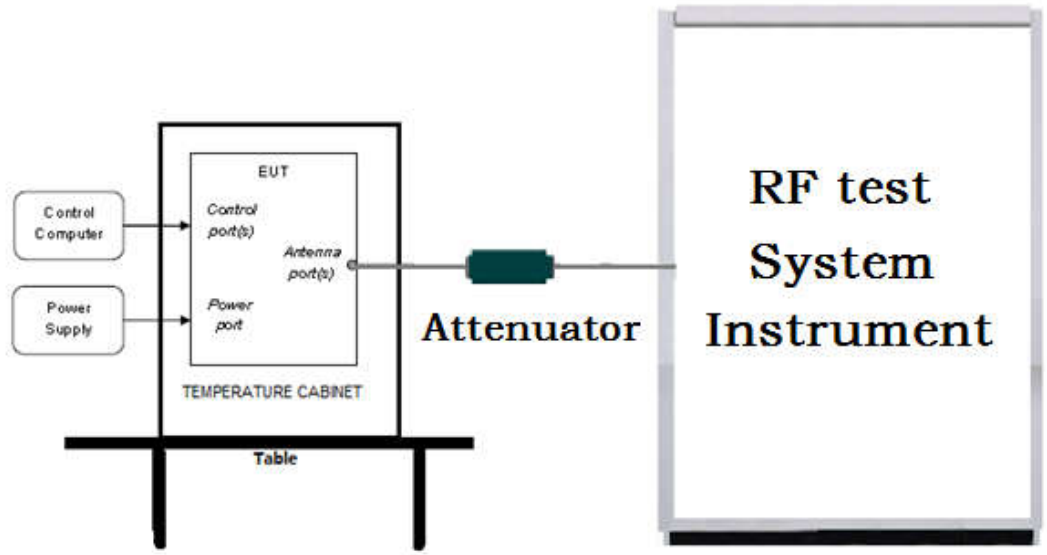
4 Content

1 COVER PAGE 1
2 VERSION 2
3 TEST SUMMARY 3
4 CONTENT 4
5 TEST REQUIREMENT 5
5.1 TEST SETUP 5
5.1.1 For Conducted test setup 5
5.1.2 For Radiated Emissions test setup 5
5.1.3 For Conducted Emissions test setup 6
5.2 TEST ENVIRONMENT 6
5.3 TEST CONDITION 6
6 GENERAL INFORMATION 8
6.1 CLIENT INFORMATION 8
6.2 GENERAL DESCRIPTION OF EUT 8
6.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD 8
6.4 DESCRIPTION OF SUPPORT UNITS 10
6.5 TEST LOCATION 10
6.6 DEVIATION FROM STANDARDS 10
6.7 ABNORMALITIES FROM STANDARD CONDITIONS 10
6.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER 10
6.9 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2) 10
7 EQUIPMENT LIST 11
8 RADIO TECHNICAL REQUIREMENTS SPECIFICATION 14
Appendix A): Conducted Peak Output Power 16
Appendix B): 6dB Occupied Bandwidth 24
Appendix C): Band-edge for RF Conducted Emissions 39
Appendix D): RF Conducted Spurious Emissions 45
Appendix E): Power Spectral Density 64
Appendix F): Antenna Requirement 72
Appendix G): AC Power Line Conducted Emission 73
Appendix H): Restricted bands around fundamental frequency (Radiated) 76
Appendix I): Radiated Spurious Emissions 93
PHOTOGRAPHS OF TEST SETUP 102
PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS 105

5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

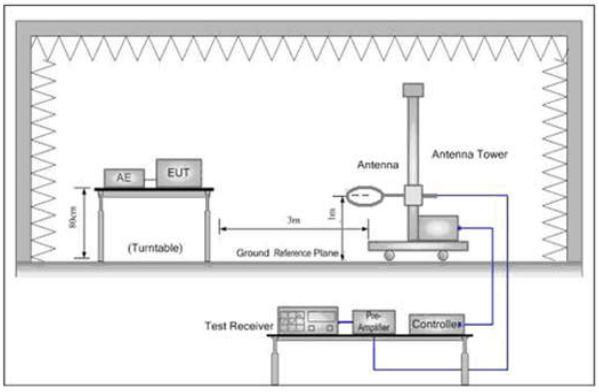


Figure 1. Below 30MHz

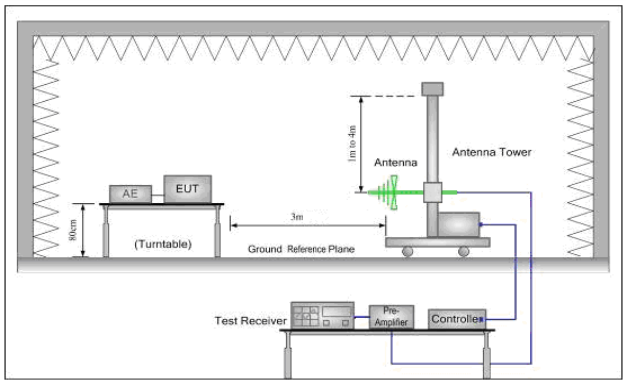


Figure 2. 30MHz to 1GHz

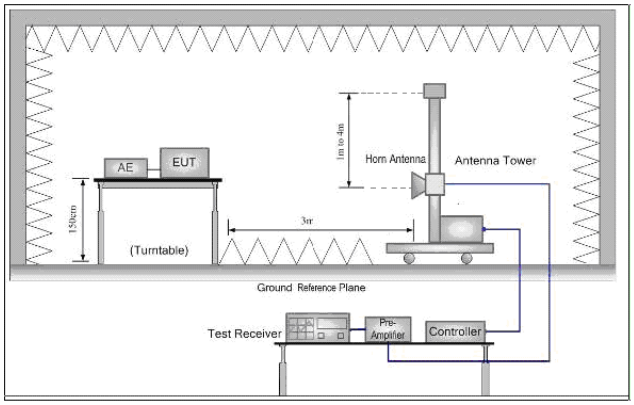
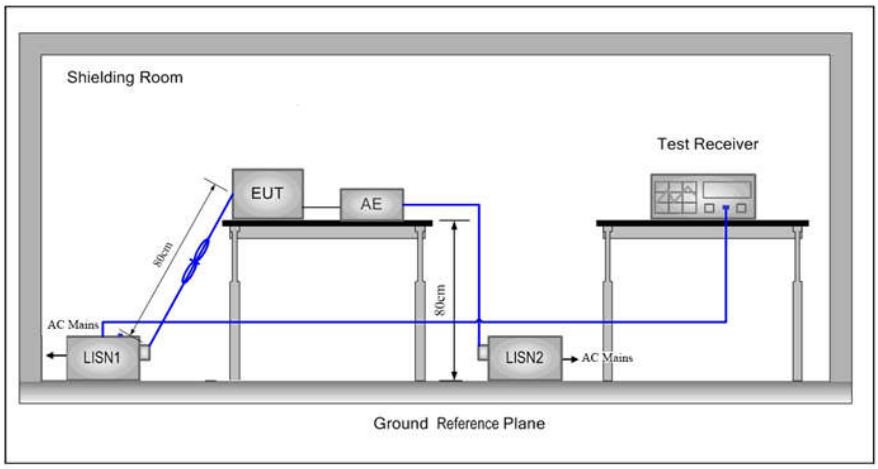


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
802.11b/g/n(HT20)	2412MHz ~2462 MHz	Channel 1	Channel 6	Channel11
		2412MHz	2437MHz	2462MHz
802.11n(HT40)	2422MHz ~2452 MHz	Channel 1	Channel 4	Channel7
		2422MHz	2437MHz	2452MHz
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.			

Test mode:

Pre-scan under all rate at lowest channel 1

Mode	802.11b				
Data Rate	1Mbps	2Mbps	5.5Mbps	11Mbps	
Power(dBm)	11.45	11.43	11.42	11.38	

Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power(dBm)	10.01	10.88	10.96	10.91	10.93	10.93	10.88	10.85

Mode	802.11n (HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power(dBm)	9.8	9.76	16.75	9.73	9.7	9.68	9.66	9.63
Mode	802.11n (HT40)							
Data Rate	13.5Mbps	27Mbps	40.5Mbps	54Mbps	81Mbps	108Mbps	121.5Mbps	135Mbps
Power(dBm)	9.48	9.46	9.43	9.41	9.38	9.42	9.33	9.37

Through Pre-scan, 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of802.11n(HT40).

6 General Information

6.1 Client Information

Applicant:	Beijing Puppy Robotics Co., Ltd.
Address of Applicant:	Room 710, 63 E 3rd Ring Rd Middle, Chaoyang, Beijing, China
Manufacturer:	Beijing Puppy Robotics Co., Ltd.
Address of Manufacturer:	Room 710, 63 E 3rd Ring Rd Middle, Chaoyang, Beijing, China
Factory:	Zhangzhou Wanlida Technology Co., Ltd.
Address of Factory:	Wanlida Industrial Zone, Jingcheng Town, Nanjing, Zhangzhou, Fujian, China

6.2 General Description of EUT

Product Name:	Hachi Infinite K1	
Model No.(EUT):	HP23ATQC	
Trade mark:	N/A	
EUT Supports Radios application:	802.11b/g/n(HT20)(HT40): 2412MHz ~2462 MHz	
Power Supply:	AC Adapter	Model:TPA-131A120300CW01 Input:100-240V~ 50/60Hz 1.2A Output:12.0V⎓3.0A
Sample Received Date:	May 05, 2021	
Sample tested Date:	May 05, 2021 to Nov. 04, 2021	

6.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE for 802.11g OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) OFDM (64QAM, 16QAM, QPSK, BPSK)
Test Power Grade:	Default
Test Software of EUT:	QRCT
Antenna Type and Gain:	Type: FPC antenna Gain:3.4 dBi
Test Voltage:	AC120V/60Hz

Operation Frequency each of channel(802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Operation Frequency each of channel(802.11n HT40)					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2422MHz	4	2437MHz	7	2452MHz
2	2427MHz	5	2442MHz		
3	2432MHz	6	2447MHz		

6.4 Description of Support Units

The EUT has been tested with associated equipment below.

Associated equipment name		Manufacture	model	S/N serial number	Supplied by	Certification
AE1	Notebook	DELL	DELL 3490	D245DX2	DELL	CE&FCC

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd
Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China
Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385
No tests were sub-contracted.
FCC Designation No.: CN1164

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.3dB (30MHz-1GHz)
		4.5dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

7 Equipment List

RF test system					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. Date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Spectrum Analyzer	Keysight	N9010A	MY54510339	08-28-2020 08-26-2021	08-27-2021 08-25-2022
Signal Generator	Keysight	N5182B	MY53051549	12-28-2020	12-27-2021
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	06-25-2020 06-23-2021	06-24-2021 06-22-2022
High-pass filter	Sinoscite	FL3CX03WG18N M12-0398-002	---	---	---
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	---	---
DC Power	Keysight	E3642A	MY56376072	12-28-2020	12-27-2021
PC-1	Lenovo	R4960d	---	---	---
BT&WI-FI Automatic control	R&S	OSP120	101374	12-28-2020	12-27-2021
RF control unit	JS Tonscend	JS0806-2	158060006	12-28-2020	12-27-2021
BT&WI-FI Automatic test software	JS Tonscend	JS1120-3	---	---	---

Conducted disturbance Test					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Receiver	R&S	ESCI	100435	04-15-2021	04-14-2022
Temperature/ Humidity Indicator	Defu	TH128	/	---	---
LISN	R&S	ENV216	100098	03-04-2021	03-03-2024
Barometer	changchun	DYM3	1188	---	---

3M Semi/full-anechoic Chamber					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-24-2019	05-23-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	05-18-2020 05-16-2021	05-17-2021 05-15-2022
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-15-2021	04-14-2024
Receiver	R&S	ESCI7	100938-003	10-16-2020 10-15-2021	10-15-2021 10-14-2022
Multi device Controller	maturo	NCD/070/10711112	---	---	---
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	06-24-2021	06-23-2022
Cable line	Fulai(7M)	SF106	5219/6A	---	---
Cable line	Fulai(6M)	SF106	5220/6A	---	---
Cable line	Fulai(3M)	SF106	5216/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---

3M full-anechoic Chamber					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	---	---
Receiver	Keysight	N9038A	MY57290136	03-04-2021	03-03-2022
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-04-2021	03-03-2022
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-04-2021	03-03-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-28-2021	04-27-2024
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-15-2021	04-14-2024
Horn Antenna	ETS-LINDGREN	3117	00057407	07-06-2018 07-04-2021	07-05-2021 07-03-2024
Preamplifier	EMCI	EMC184055SE	980596	05-22-2020 05-20-2021	05-21-2021 05-19-2022
Preamplifier	EMCI	EMC001330	980563	04-15-2021	04-14-2022
Preamplifier	JS Tonscend	980380	EMC051845 SE	12-31-2020	12-30-2021
Temperature/ Humidity Indicator	biaozhi	GM1360	EE1186631	04-16-2021	04-15-2022
Fully Anechoic Chamber	TDK	FAC-3	---	01-09-2021	01-08-2024
Filter bank	JS Tonscend	JS0806-F	188060094	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	---	---
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	---	---
Cable line	Times	EMC104-NMNM-1000	SN160710	---	---
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	---	---
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	---	---
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	---	---
Cable line	Times	HF160-KMKM-3.00M	393493-0001	---	---

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15C	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices

Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part15C Section 15.247 (b)(3)	ANSI C63.10	Conducted Peak Output Power	PASS	Appendix A)
Part15C Section 15.247 (a)(2)	ANSI C63.10	6dB Occupied Bandwidth	PASS	Appendix B)
Part15C Section 15.247(d)	ANSI C63.10	Band-edge for RF Conducted Emissions	PASS	Appendix C)
Part15C Section 15.247(d)	ANSI C63.10	RF Conducted Spurious Emissions	PASS	Appendix D)
Part15C Section 15.247 (e)	ANSI C63.10	Power Spectral Density	PASS	Appendix E)
Part15C Section 15.203/15.247 (c)	ANSI C63.10	Antenna Requirement	PASS	Appendix F)
Part15C Section 15.207	ANSI C63.10	AC Power Line Conducted Emission	PASS	Appendix G)
Part15C Section 15.205/15.209	ANSI C63.10	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix H)
Part15C Section 15.205/15.209	ANSI C63.10	Radiated Spurious Emissions	PASS	Appendix I)

EUT DUTY CYCLE

Result Table

TestMode	Antenna	Channel	TransmissionDuration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	49.97	50.00	99.94	---	PASS
		2437	32.94	32.96	99.94	---	PASS
		2462	49.96	50.00	99.92	---	PASS
11G	Ant1	2412	5.48	5.49	99.82	---	PASS
		2437	5.48	5.49	99.79	---	PASS
		2462	5.48	5.49	99.82	---	PASS
11N20SISO	Ant1	2412	5.08	5.09	99.80	---	PASS
		2437	5.08	5.09	99.80	---	PASS
		2462	5.08	5.09	99.80	---	PASS
11N40SISO	Ant1	2422	5.08	5.09	99.78	---	PASS
		2437	5.08	5.09	99.75	---	PASS
		2452	5.08	5.09	99.78	---	PASS

Appendix A): Conducted Peak Output Power

Test Limit

According to §15.247(b)(3),

Peak output power：

For systems using digital modulation in the 2400-2483.5 MHz: 1 Watt(30 dBm), base on the use of antennas with directional gain not exceed 6 dBi. If transmitting antennas of directional gain greater than 6dBi are used the peak output power the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)] ☐ Point-to-point operation：

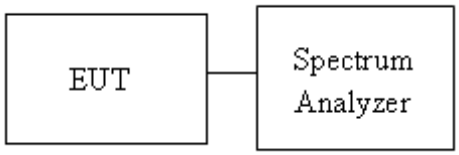
Average output power：For reporting purposes only.

Test Procedure

Test method Refer as KDB 558074 D01.

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power. in the test report.

Test Setup



Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	11.14	<=30	PASS
		2437	10.24	<=30	PASS
		2462	9.58	<=30	PASS
11G	Ant1	2412	10.70	<=30	PASS
		2437	9.77	<=30	PASS
		2462	9.70	<=30	PASS
11N20SISO	Ant1	2412	10.37	<=30	PASS
		2437	9.67	<=30	PASS
		2462	9.63	<=30	PASS
11N40SISO	Ant1	2422	9.07	<=30	PASS
		2437	9.10	<=30	PASS
		2452	9.36	<=30	PASS

Test Graph

11B_Ant1_2412

11B_Ant1_2437

11B_Ant1_2462

11G_Ant1_2412

11G_Ant1_2437

11G_Ant1_2462

11N20SISO_Ant1_2412

11N20SISO_Ant1_2437

11N20SISO_Ant1_2462

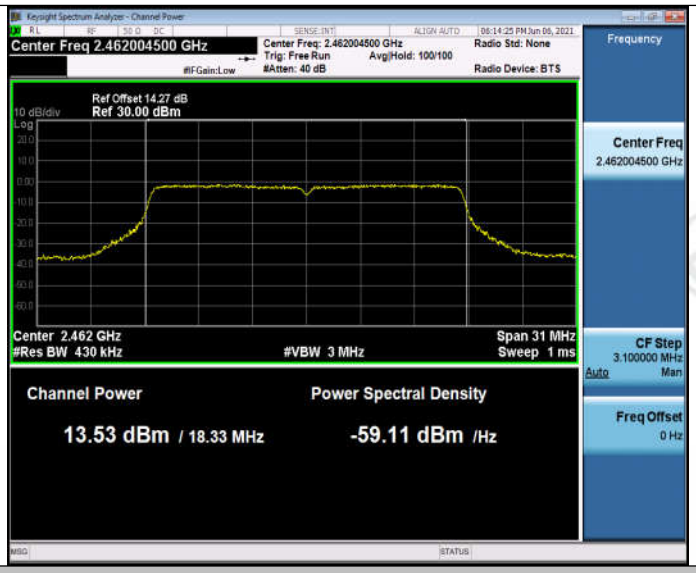
11N40SISO_Ant1_2422

11N40SISO_Ant1_2437

11N40SISO_Ant1_2452

11A_Ant1_2412

11A_Ant1_2437



11A_Ant1_2462

Appendix B): 6dB Occupied Bandwidth

Test Limit

According to §15.247(a)(2),

6 dB Bandwidth :

Limit	Shall be at least 500kHz

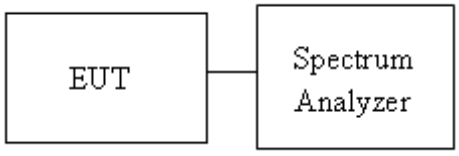
Occupied Bandwidth(99%) : For reporting purposes only.

Test Procedure

Test method Refer as KDB 558074 D01 and ANSI C63.10: 2013 clause 6.9.2,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW =100KHz , VBW = 300KHz and Detector = Peak, to measurement 6dB Bandwidth
4. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth
5. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

Test Setup



Result Table

6dB Occupied Bandwidth

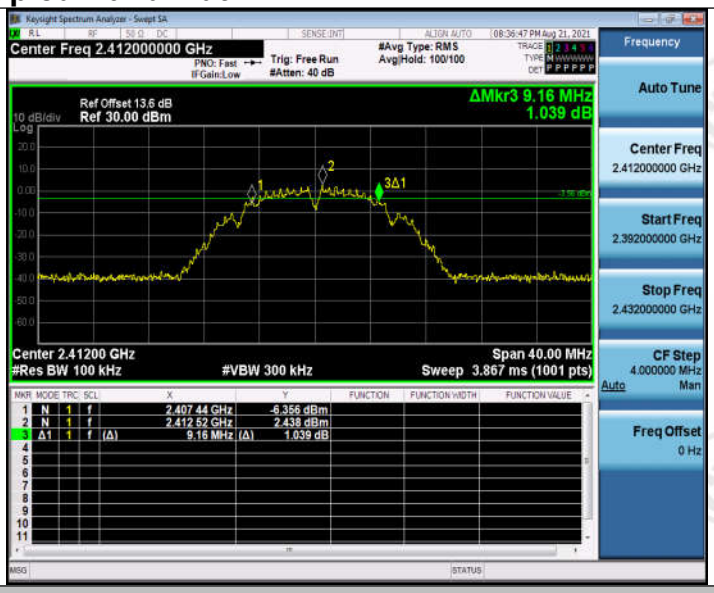
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.160	2407.440	2416.600	0.5	PASS
		2437	8.600	2432.480	2441.080	0.5	PASS
		2462	8.640	2457.480	2466.120	0.5	PASS
11G	Ant1	2412	16.400	2403.840	2420.240	0.5	PASS
		2437	16.200	2429.000	2445.200	0.5	PASS
		2462	16.560	2453.720	2470.280	0.5	PASS
11N20SISO	Ant1	2412	16.960	2403.720	2420.680	0.5	PASS
		2437	17.200	2428.480	2445.680	0.5	PASS
		2462	16.680	2453.640	2470.320	0.5	PASS
11N40SISO	Ant1	2422	34.080	2405.520	2439.600	0.5	PASS
		2437	35.280	2419.400	2454.680	0.5	PASS
		2452	34.480	2434.480	2468.960	0.5	PASS

99% Occupied Bandwidth

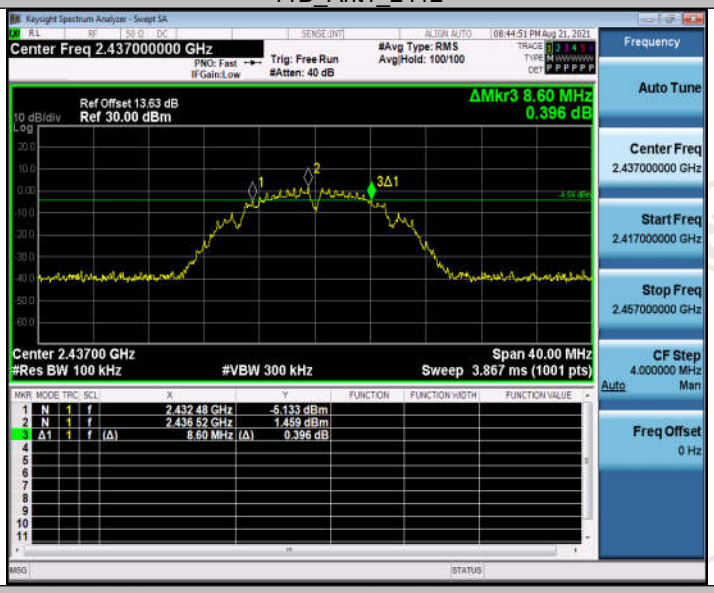
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.130	2405.510	2418.640	---	PASS
		2437	13.171	2430.441	2443.612	---	PASS
		2462	13.244	2455.365	2468.609	---	PASS
11G	Ant1	2412	16.873	2403.658	2420.531	---	PASS
		2437	16.868	2428.584	2445.452	---	PASS
		2462	16.896	2453.529	2470.425	---	PASS
11N20SISO	Ant1	2412	17.781	2403.181	2420.962	---	PASS
		2437	17.853	2428.123	2445.976	---	PASS
		2462	17.764	2453.113	2470.877	---	PASS
11N40SISO	Ant1	2422	36.347	2403.964	2440.311	---	PASS
		2437	36.395	2418.858	2455.253	---	PASS
		2452	36.378	2433.790	2470.168	---	PASS

Test Graph

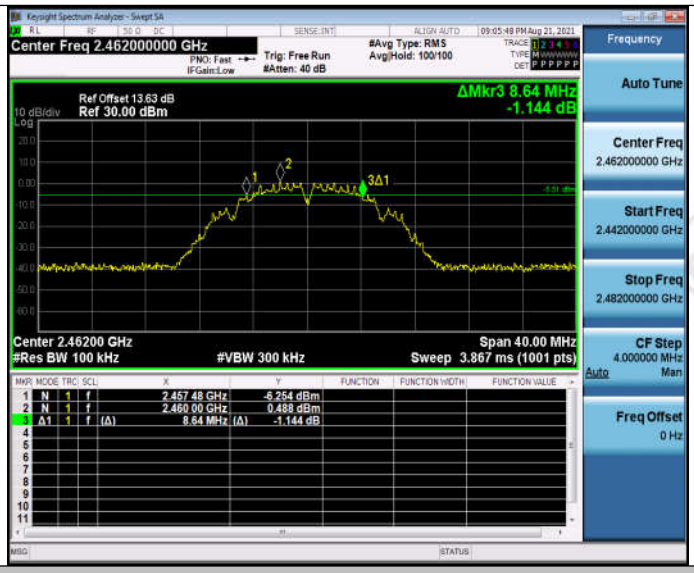
6dB Occupied Bandwidth



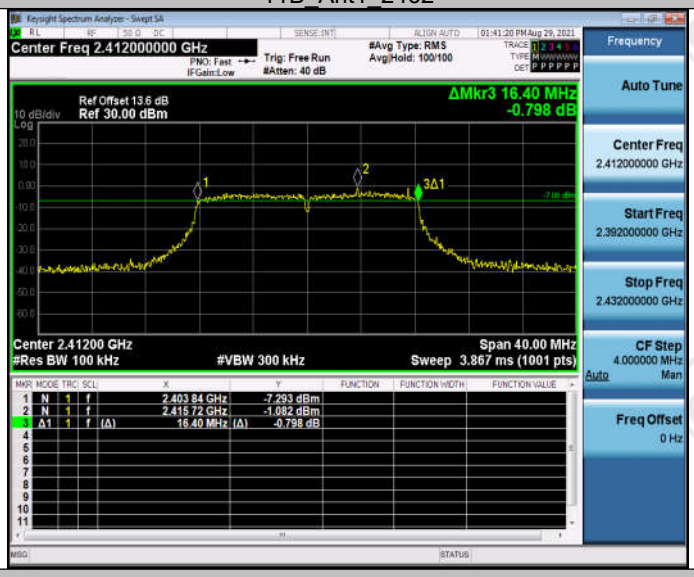
11B_Ant1_2412



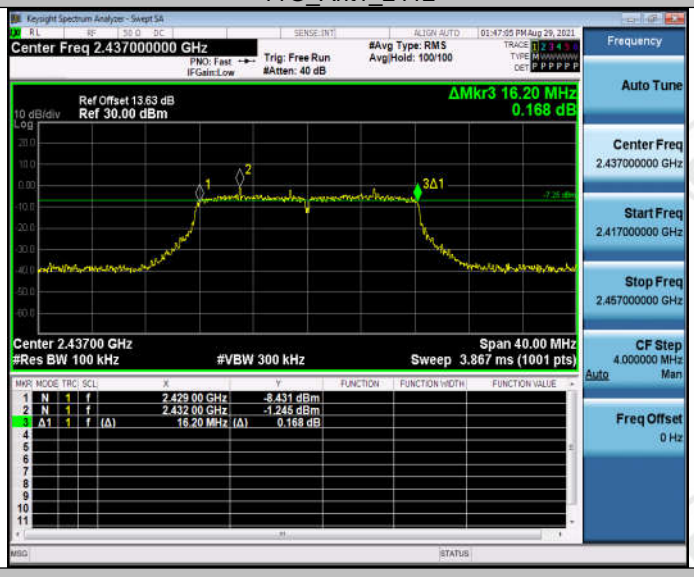
11B_Ant1_2437



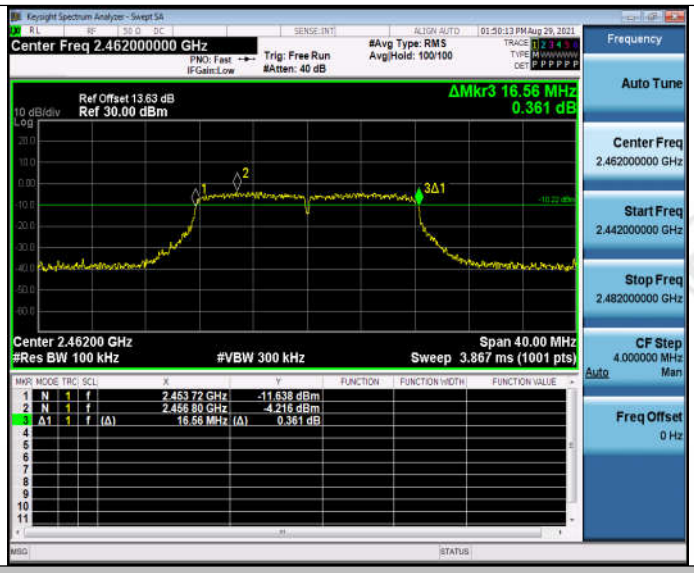
11B_Ant1_2462



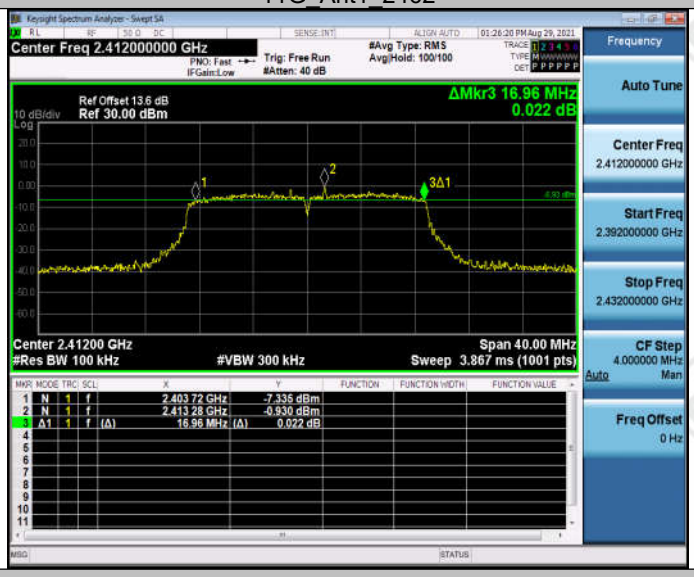
11G_Ant1_2412



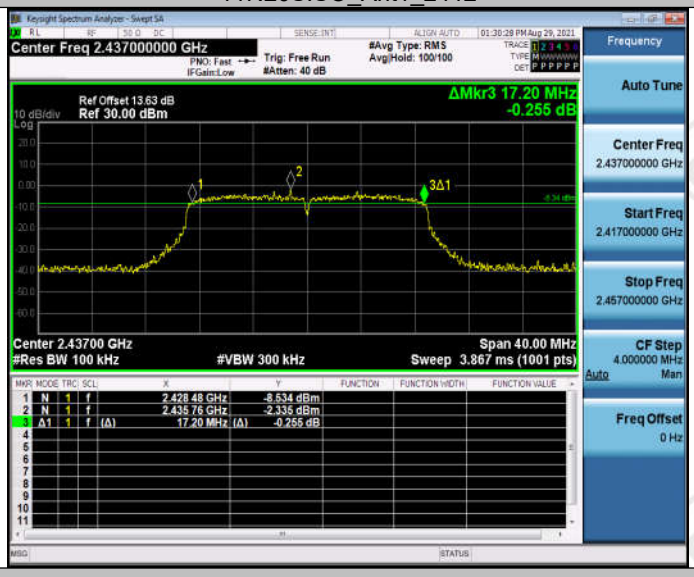
11G_Ant1_2437



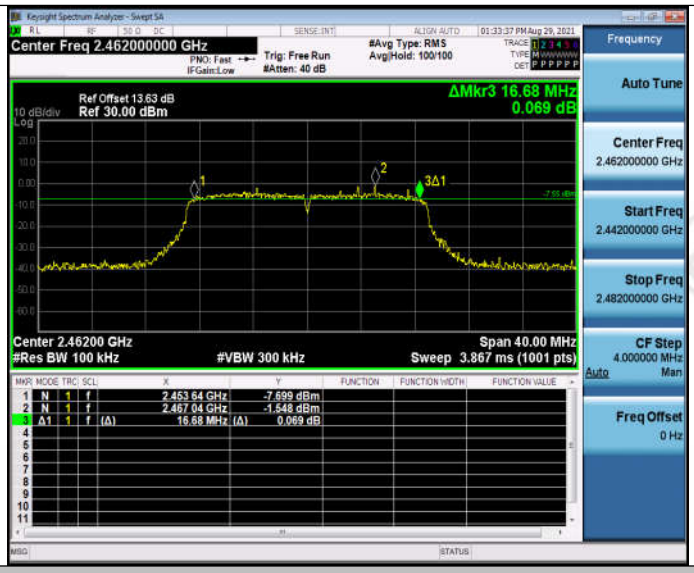
11G_Ant1_2462



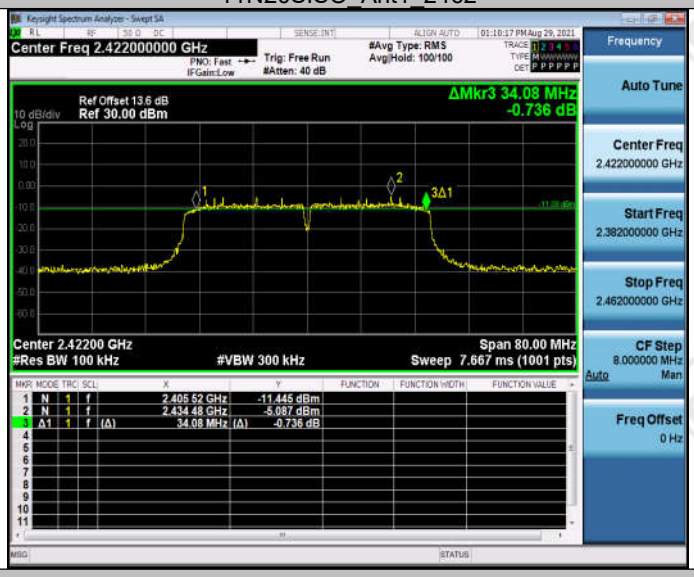
11N20SISO_Ant1_2412



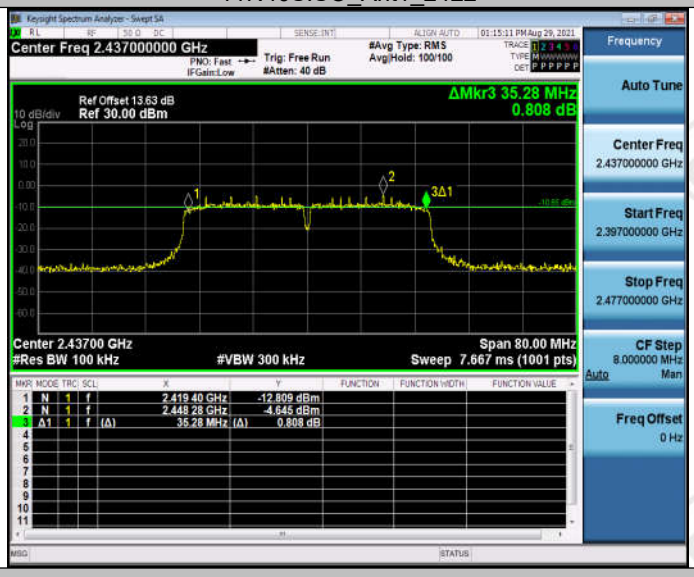
11N20SISO_Ant1_2437



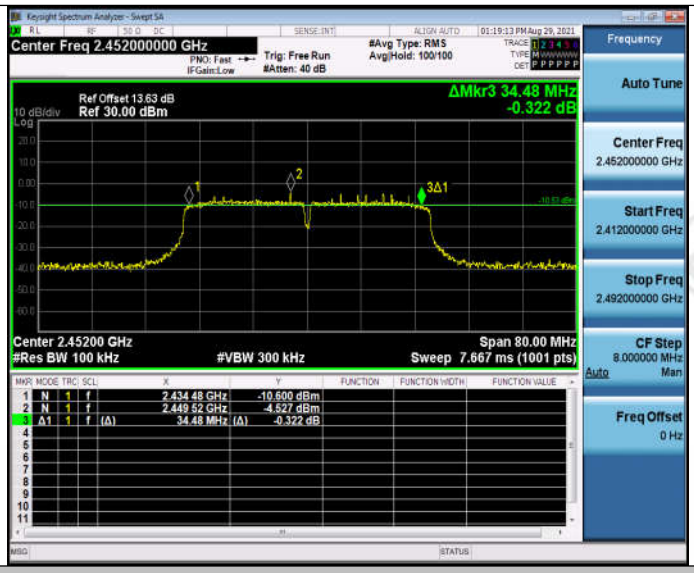
11N20SISO_Ant1_2462



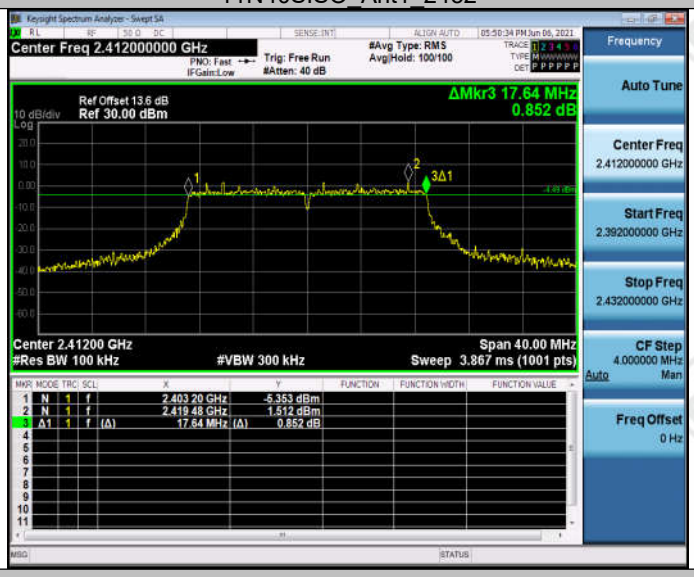
11N40SISO_Ant1_2422



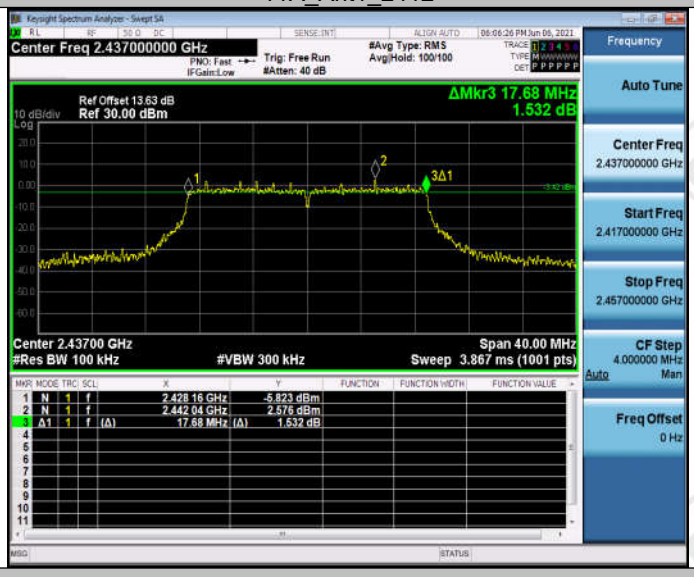
11N40SISO_Ant1_2437



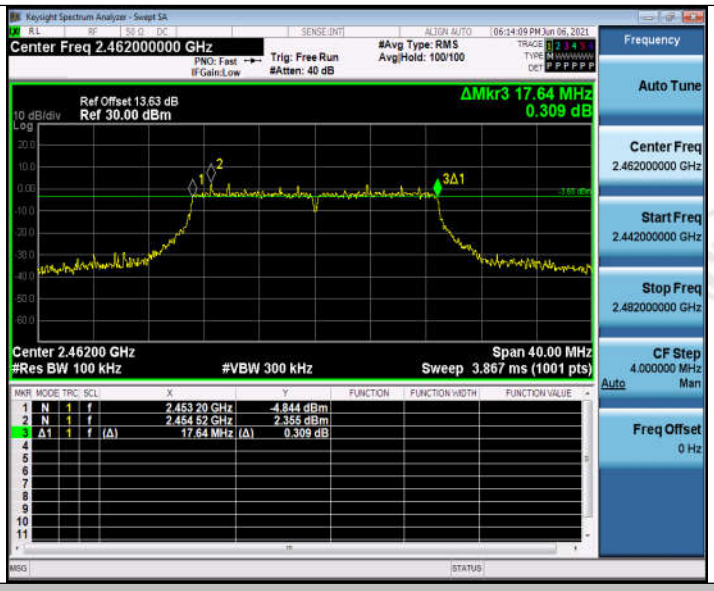
11N40SISO_Ant1_2452



11A_Ant1_2412



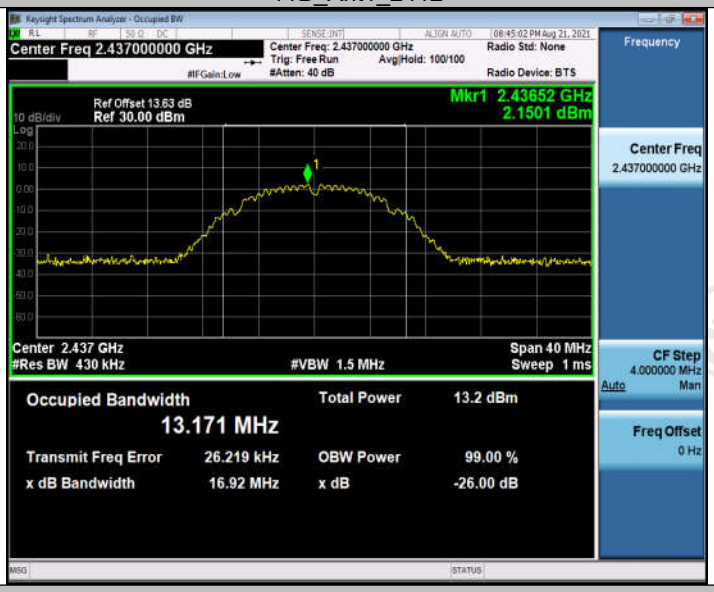
11A_Ant1_2437



11A_Ant1_2462

99% Occupied Bandwidth

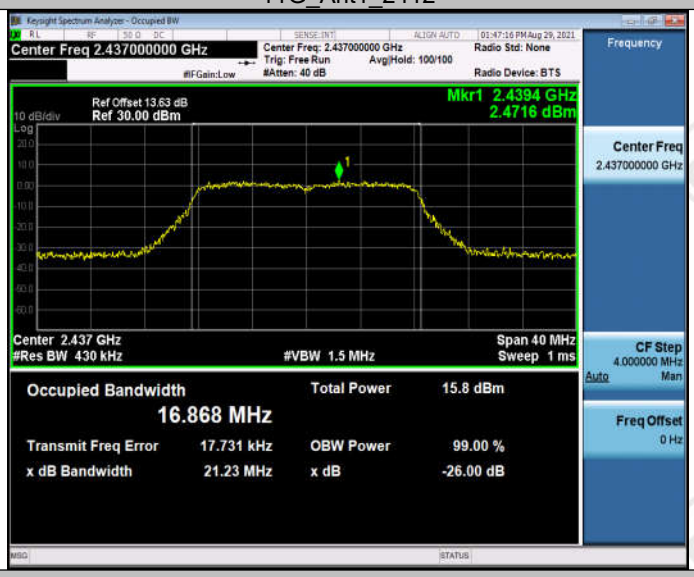
11B_Ant1_2412



11B_Ant1_2437

11B_Ant1_2462

11G_Ant1_2412



11G_Ant1_2437

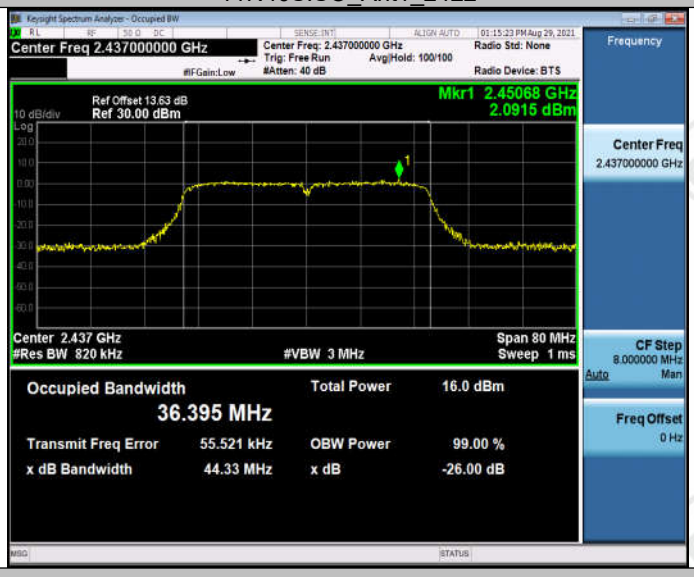
11G_Ant1_2462

11N20SISO_Ant1_2412

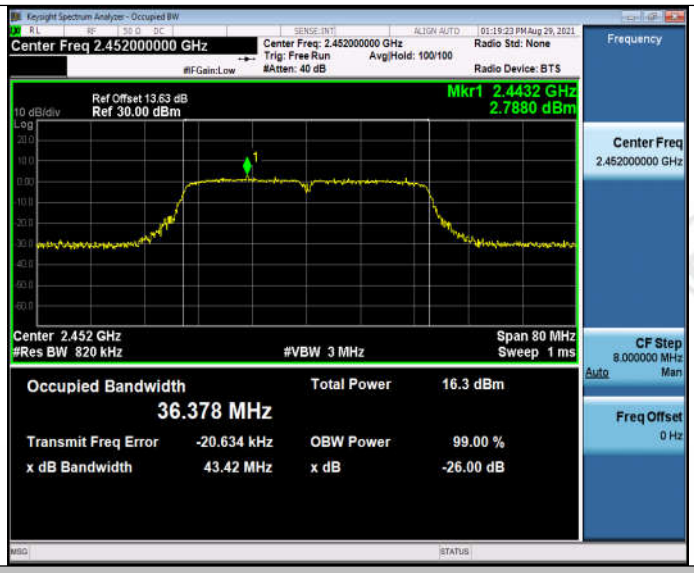
11N20SISO_Ant1_2437

11N20SISO_Ant1_2462

11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452

11A_Ant1_2412

11A_Ant1_2437

11A_Ant1_2462

Appendix C): Band-edge for RF Conducted Emissions

Test Limit

According to §15.247(d),

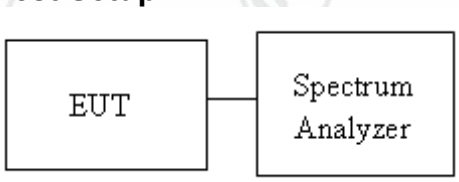
In any 100 kHz bandwidth outside the authorized frequency band,
Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Test Procedure

Test method Refer as KDB 558074 D01.

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.
2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.
3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. f the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

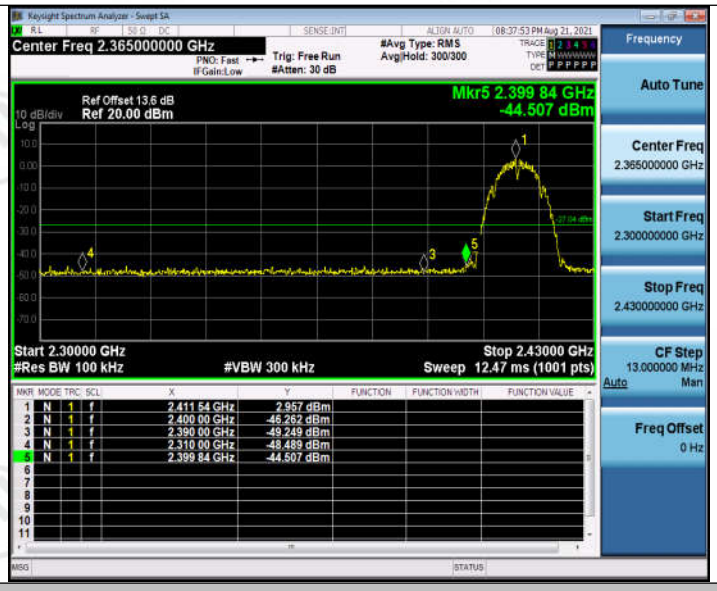
Test Setup



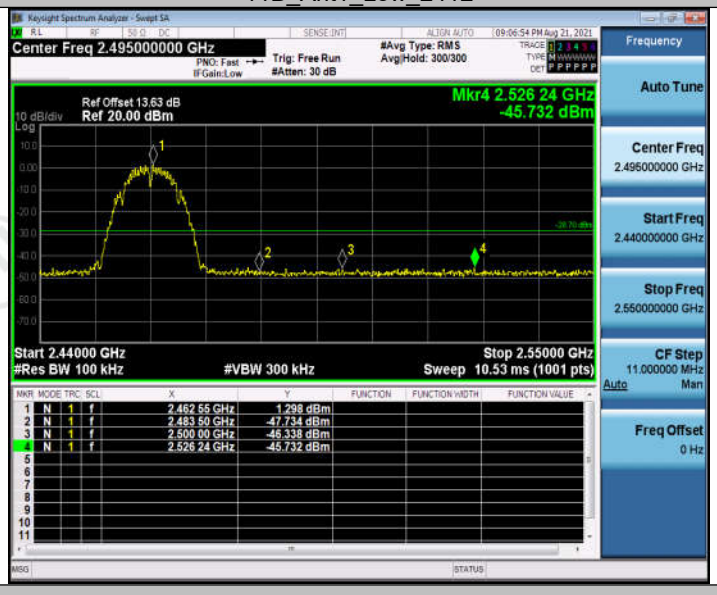
Result Table

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	2.96	-44.51	<=-27.04	PASS
		High	2462	1.30	-45.73	<=-28.7	PASS
11G	Ant1	Low	2412	-0.41	-37.67	<=-30.41	PASS
		High	2462	-2.46	-45.68	<=-32.46	PASS
11N20SISO	Ant1	Low	2412	-0.28	-37.74	<=-30.28	PASS
		High	2462	-1.31	-45.11	<=-31.31	PASS
11N40SISO	Ant1	Low	2422	-4.96	-39.7	<=-34.96	PASS
		High	2452	-4.51	-44.41	<=-34.51	PASS

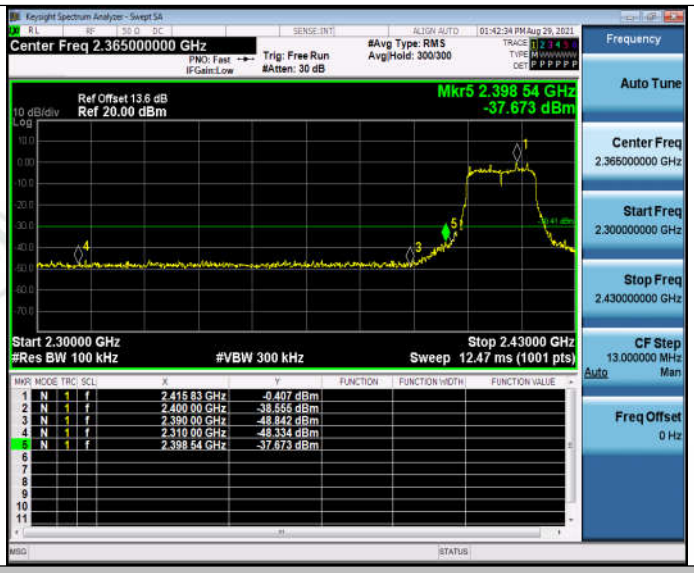
Test Graph



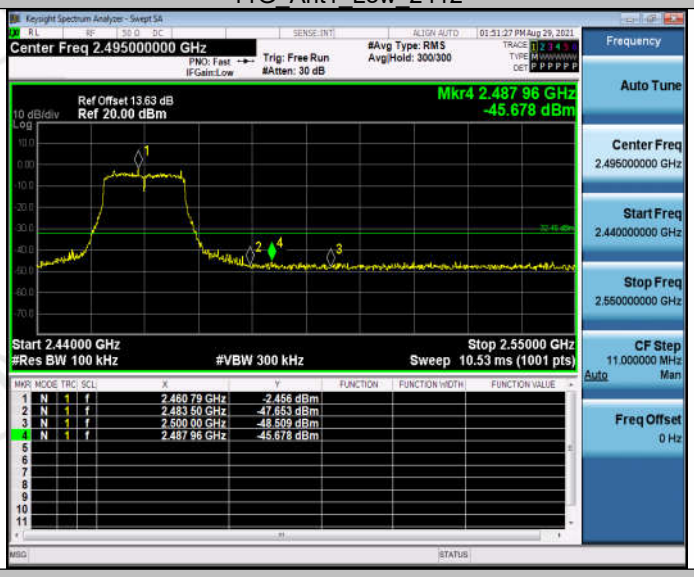
11B_Ant1_Low_2412



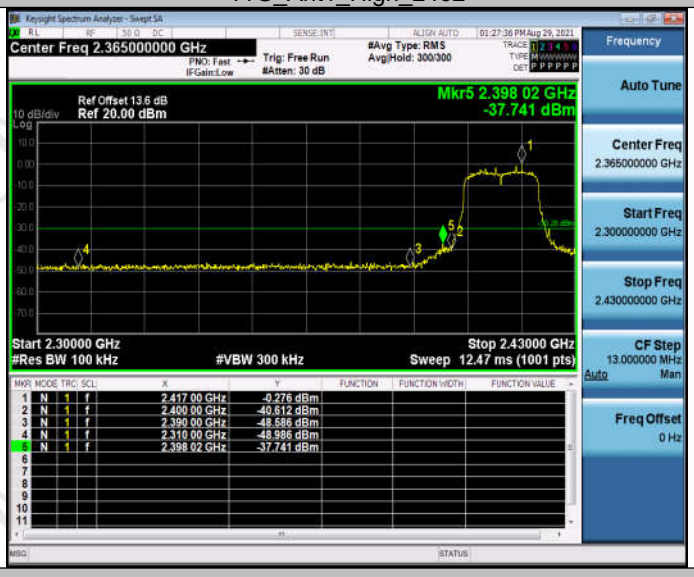
11B_Ant1_High_2462



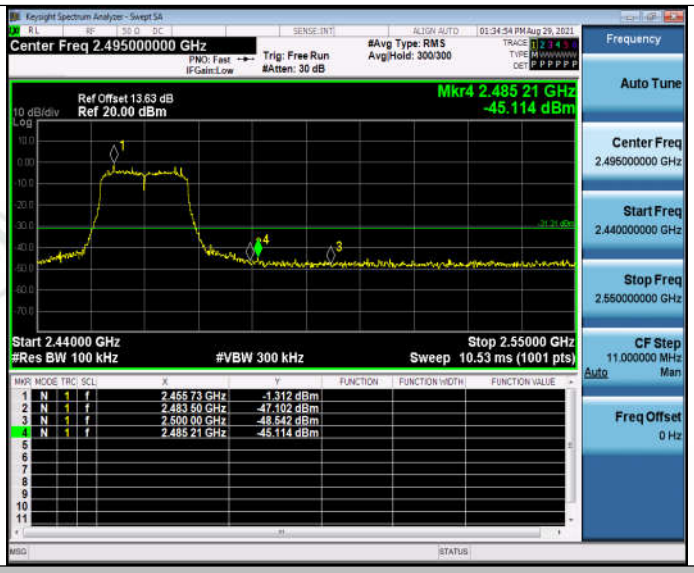
11G_Ant1_Low_2412



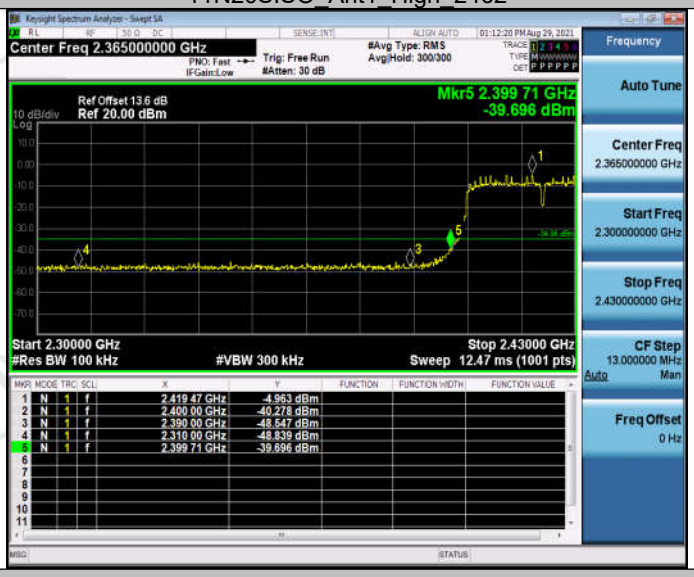
11G_Ant1_High_2462



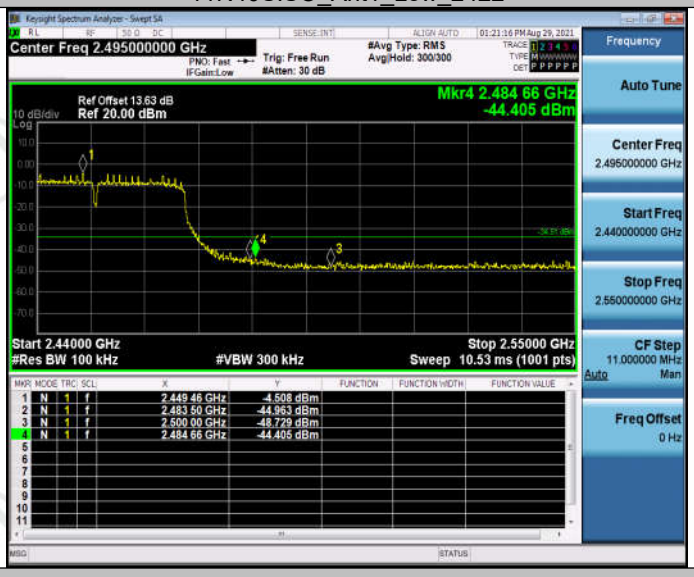
11N20SISO_Ant1_Low_2412



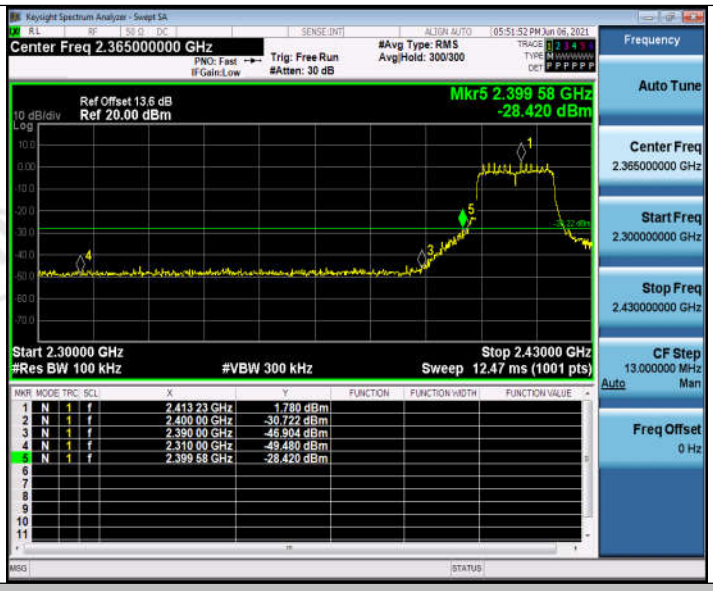
11N20SISO_Ant1_High_2462



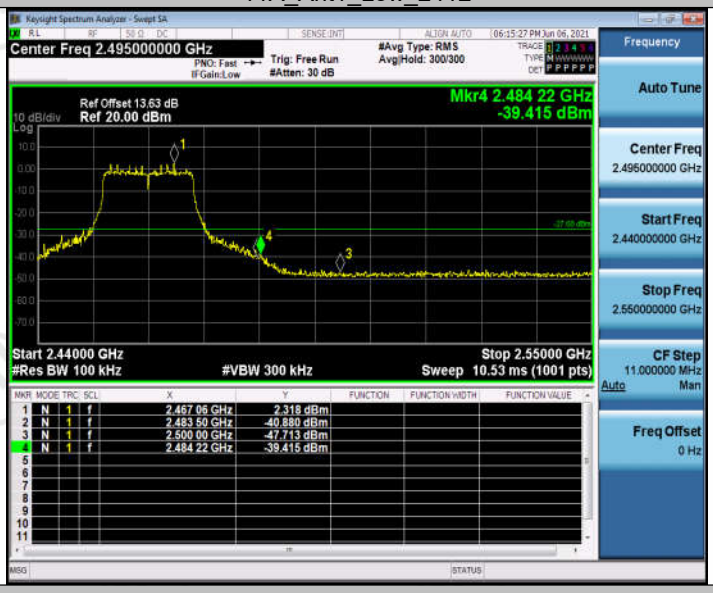
11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452



11A_Ant1_Low_2412



11A_Ant1_High_2462

Appendix D): RF Conducted Spurious Emissions

Test Limit

According to §15.247(d),

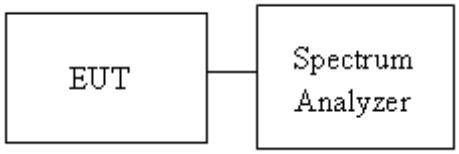
In any 100 kHz bandwidth outside the authorized frequency band,
Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Test Procedure

Test method Refer as KDB 558074 D01.

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.
2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.
3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. f the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Test Setup



Result Table

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	2.12	2.12	---	PASS
			30~1000	---	-58.292	<=-17.881	PASS
			1000~26500	---	-48.989	<=-17.881	PASS
		2437	Reference	1.67	1.67	---	PASS
			30~1000	---	-57.463	<=-18.334	PASS
			1000~26500	---	-49.413	<=-18.334	PASS
		2462	Reference	0.95	0.95	---	PASS
			30~1000	---	-58.214	<=-19.047	PASS
			1000~26500	---	-49.291	<=-19.047	PASS
11G	Ant1	2412	Reference	-0.57	-0.57	---	PASS
			30~1000	---	-56.178	<=-20.567	PASS
			1000~26500	---	-49.551	<=-20.567	PASS
		2437	Reference	-2.89	-2.89	---	PASS
			30~1000	---	-56.856	<=-22.888	PASS
			1000~26500	---	-49.642	<=-22.888	PASS
		2462	Reference	-2.01	-2.01	---	PASS
			30~1000	---	-56.94	<=-22.008	PASS
			1000~26500	---	-48.911	<=-22.008	PASS
11N20SISO	Ant1	2412	Reference	-0.78	-0.78	---	PASS
			30~1000	---	-56.766	<=-20.777	PASS
			1000~26500	---	-49.379	<=-20.777	PASS
		2437	Reference	-2.26	-2.26	---	PASS
			30~1000	---	-57.09	<=-22.256	PASS
			1000~26500	---	-43.986	<=-22.256	PASS
		2462	Reference	-2.28	-2.28	---	PASS
			30~1000	---	-55.936	<=-22.28	PASS
			1000~26500	---	-49.484	<=-22.28	PASS
11N40SISO	Ant1	2422	Reference	-4.86	-4.86	---	PASS
			30~1000	---	-55.252	<=-24.858	PASS
			1000~26500	---	-37.367	<=-24.858	PASS
		2437	Reference	-5.29	-5.29	---	PASS
			30~1000	---	-55.529	<=-25.289	PASS
			1000~26500	---	-49.795	<=-25.289	PASS

		2452	Reference	-4.89	-4.89	---	PASS
			30~1000	---	-56.506	<=-24.888	PASS
			1000~26500	---	-49.518	<=-24.888	PASS

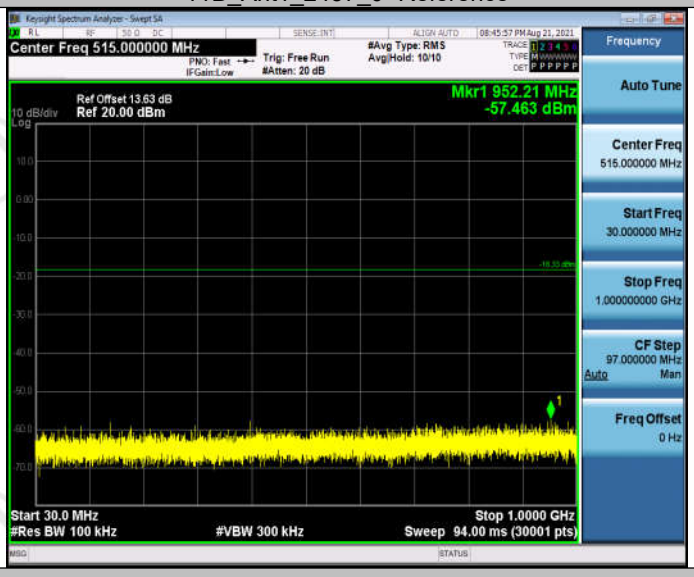
Test Graph

11B_Ant1_2412_0~Reference

11B_Ant1_2412_30~1000

11B_Ant1_2412_1000~26500

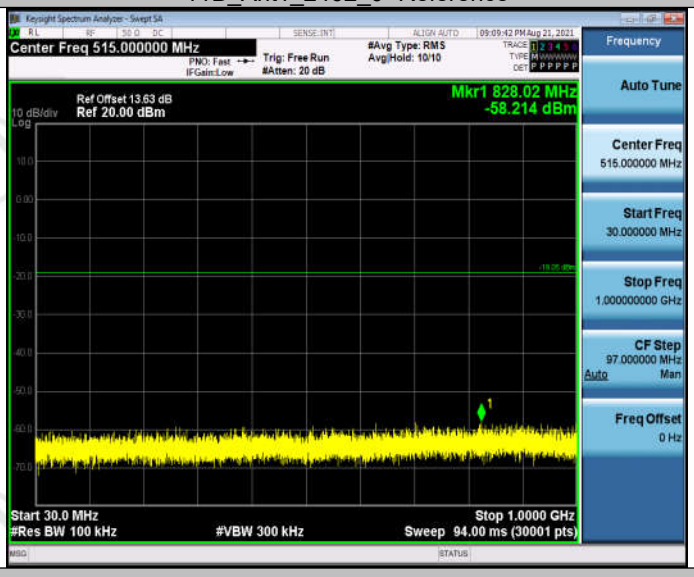
11B_Ant1_2437_0~Reference



11B_Ant1_2437_30~1000

11B_Ant1_2437_1000~26500

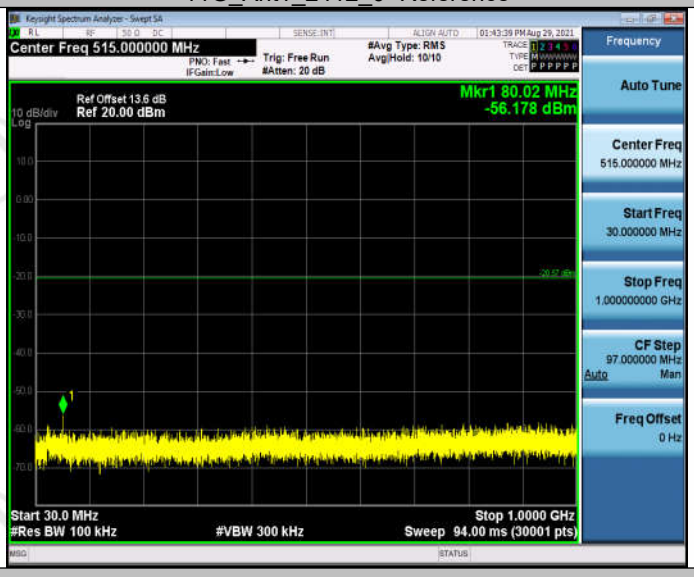
11B_Ant1_2462_0~Reference



11B_Ant1_2462_30~1000

11B_Ant1_2462_1000~26500

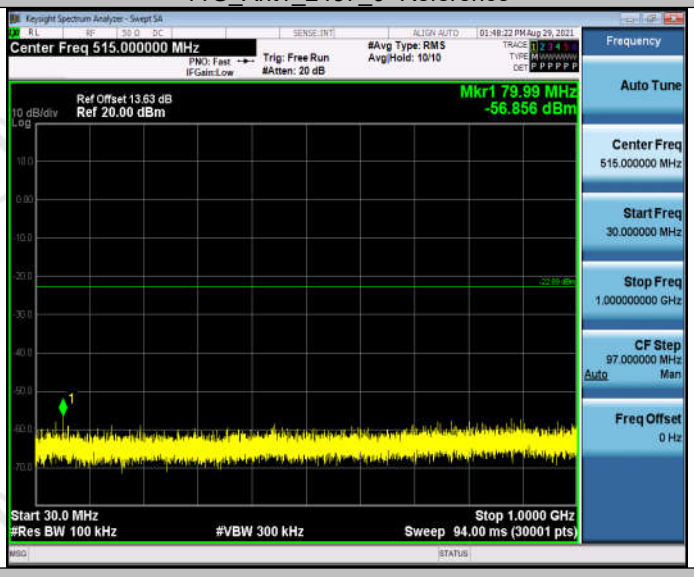
11G_Ant1_2412_0~Reference



11G_Ant1_2412_30~1000

11G_Ant1_2412_1000~26500

11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000

11G_Ant1_2437_1000~26500

11G_Ant1_2462_0~Reference

11G_Ant1_2462_30~1000

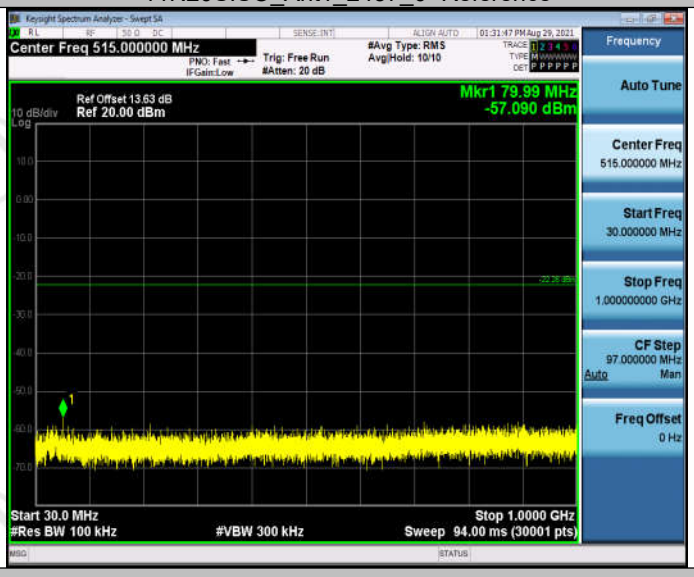
11G_Ant1_2462_1000~26500

11N20SISO_Ant1_2412_0~Reference

11N20SISO_Ant1_2412_30~1000

11N20SISO_Ant1_2412_1000~26500

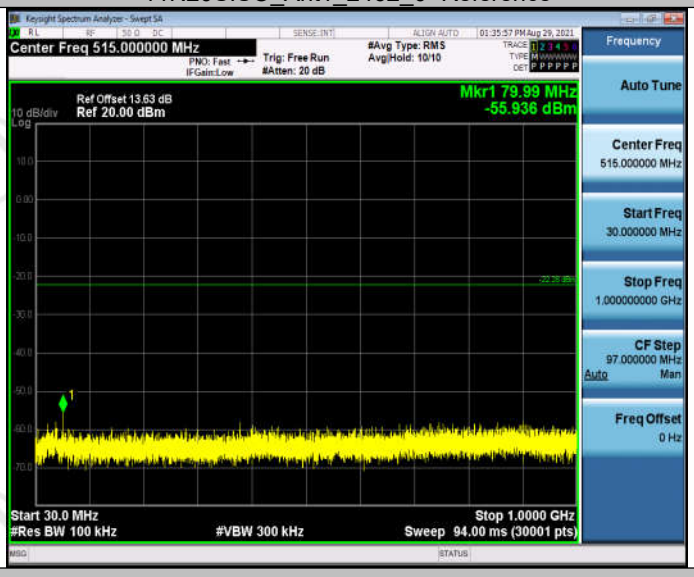
11N20SISO_Ant1_2437_0~Reference



11N20SISO_Ant1_2437_30~1000

11N20SISO_Ant1_2437_1000~26500

11N20SISO_Ant1_2462_0~Reference



11N20SISO_Ant1_2462_30~1000