

TEST REPORT

Product : PROJECTOR
Trade mark : Victsing
Model/Type reference : BH486A
Serial Number : N/A
Report Number : EED32M00257801
FCC ID : 2AIL4-BH486A
Date of Issue : Nov. 19, 2020
Test Standards : 47 CFR Part 15Subpart C
Test result : PASS

Prepared for:

VTIN TECHNOLOGY CO., LIMITED
UNIT D 16/F ONE CAPITAL PLACE 21
LUARD ROAD WAN CHAI HK

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:

Sunlight Sun

Reviewed by:

Tom Chen

Sunlight Sun

Tom Chen

Approved by:

Aaron Ma

Date:

Nov. 19, 2020

Aaron Ma



Check No.:4762139138

2 Version

Version No.	Date	Description
00	Nov. 19, 2020	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 was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

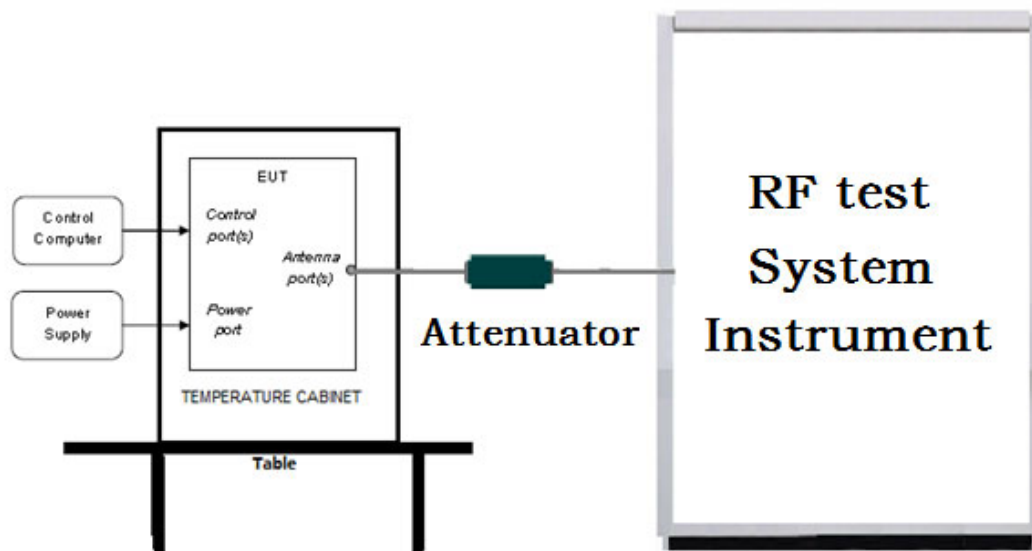
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5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

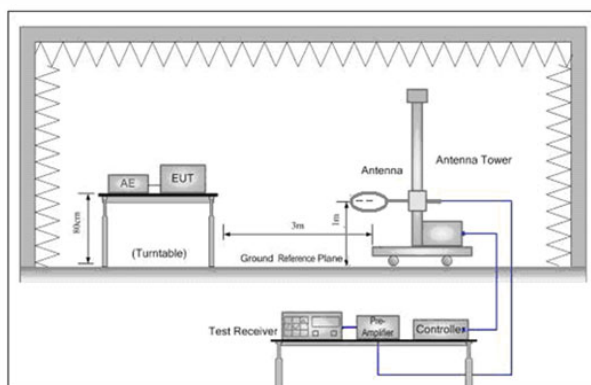


Figure 1. Below 30MHz

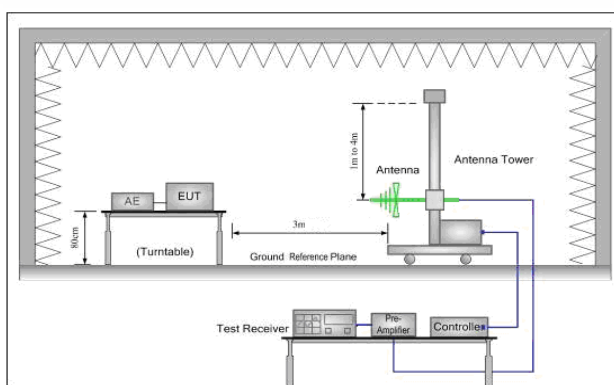


Figure 2. 30MHz to 1GHz

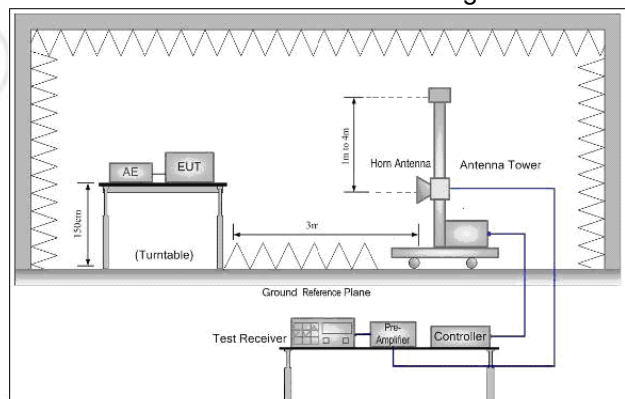
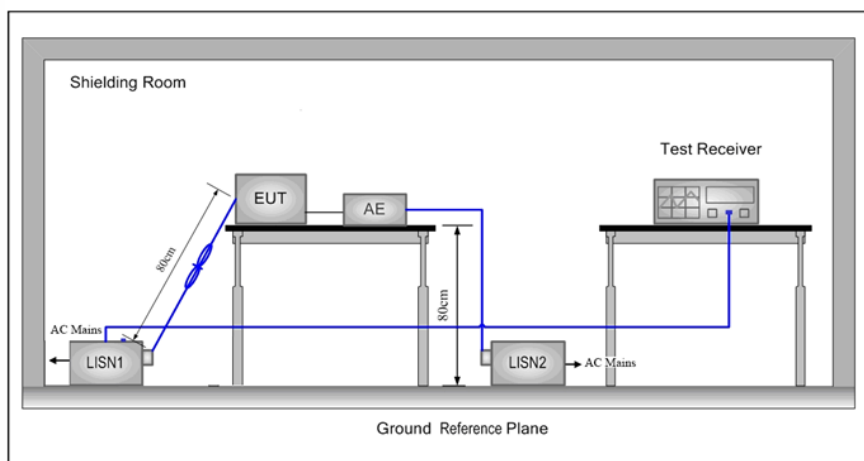


Figure 3. Above 1GHz

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)	9.63	9.6	9.57	9.55				
Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power(dBm)	7.92	7.90	7.87	7.85	7.82	7.80	7.77	7.75
Mode	802.11n (HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power(dBm)	7.87	7.85	7.82	7.80	7.77	7.74	7.72	7.71
Mode	802.11n (HT40)							
Data Rate	13.5Mbps	27Mbps	40.5Mbps	54Mbps	81Mbps	108Mbps	121.5Mbps	135Mbps
Power(dBm)	7.53	7.51	7.48	7.45	7.42	7.39	7.37	7.34

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

6 General Information

6.1 Client Information

Applicant:	VTIN TECHNOLOGY CO., LIMITED
Address of Applicant:	UNIT D 16/F ONE CAPITAL PLACE 21 LUARD ROAD WAN CHAI HK
Manufacturer:	VTIN TECHNOLOGY CO., LIMITED
Address of Manufacturer:	UNIT D 16/F ONE CAPITAL PLACE 21 LUARD ROAD WAN CHAI HK
Factory:	VTIN TECHNOLOGY CO., LIMITED
Address of Factory:	UNIT D 16/F ONE CAPITAL PLACE 21 LUARD ROAD WAN CHAI HK

6.2 General Description of EUT

Product Name:	PROJECOR
Model No.(EUT):	BH486A
Trade mark:	Victsing
EUT Supports Radios application:	IEEE 802.11 b/g/n(HT20)(HT40): 2412MHz to 2462MHz
Power Supply:	AC 100-240V~ 50/60Hz
Sample Received Date:	Aug.24, 2020
Sample tested Date:	Aug.24, 2020 to Oct. 10, 2020

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:	Secure CRT
Antenna Type and Gain:	Type:Internal antenna Gain: 2dBi
Test Voltage:	AC 120V/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	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	HP	HP ProBook 430 G3	5CG5192QSM	CTI	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	02-17-2020	02-16-2021
Signal Generator	Keysight	N5182B	MY53051549	02-17-2020	02-16-2021
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	06-29-2020	06-28-2021
High-pass filter	Sinoscite	FL3CX03WG18N M12-0398-002	---	---	---
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	---	---
DC Power	Keysight	E3642A	MY56376072	02-17-2020	02-16-2021
PC-1	Lenovo	R4960d	---	---	---
BT&WI-FI Automatic control	R&S	OSP120	101374	02-17-2020	02-16-2021
RF control unit	JS Tonscend	JS0806-2	158060006	02-17-2020	02-16-2021
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	04-28-2020	04-27-2021
Temperature/ Humidity Indicator	Defu	TH128	/	---	---
LISN	R&S	ENV216	100098	03-05-2020	03-04-2021
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	05-16-2020	05-15-2021
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-25-2018	04-24-2021
Receiver	R&S	ESCI7	100938-003	10-21-2019	10-20-2020
Multi device Controller	maturo	NCD/070/107 11112	---	---	---
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	06-29-2020	06-28-2021
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	03-05-2020	03-04-2021
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-05-2020	03-04-2021
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-05-2020	03-04-2021
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-25-2018	04-24-2021
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-25-2018	04-24-2021
Horn Antenna	ETS-LINDGREN	3117	00057407	07-10-2018	07-09-2021
Preamplifier	EMCI	EMC184055SE	980596	05-20-2020	05-19-2021
Preamplifier	EMCI	EMC001330	980563	04-22-2020	04-21-2021
Preamplifier	JS Tonscend	980380	EMC051845 SE	01-09-2020	01-08-2021
Temperature/Humidity Indicator	biaozhi	GM1360	EE1186631	04-27-2020	04-26-2021
Fully Anechoic Chamber	TDK	FAC-3	---	01-17-2018	01-16-2021
Filter bank	JS Tonscend	JS0806-F	188060094	04-10-2018	04-09-2021
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 Unlicensed Wireless Devices

Test Results List:

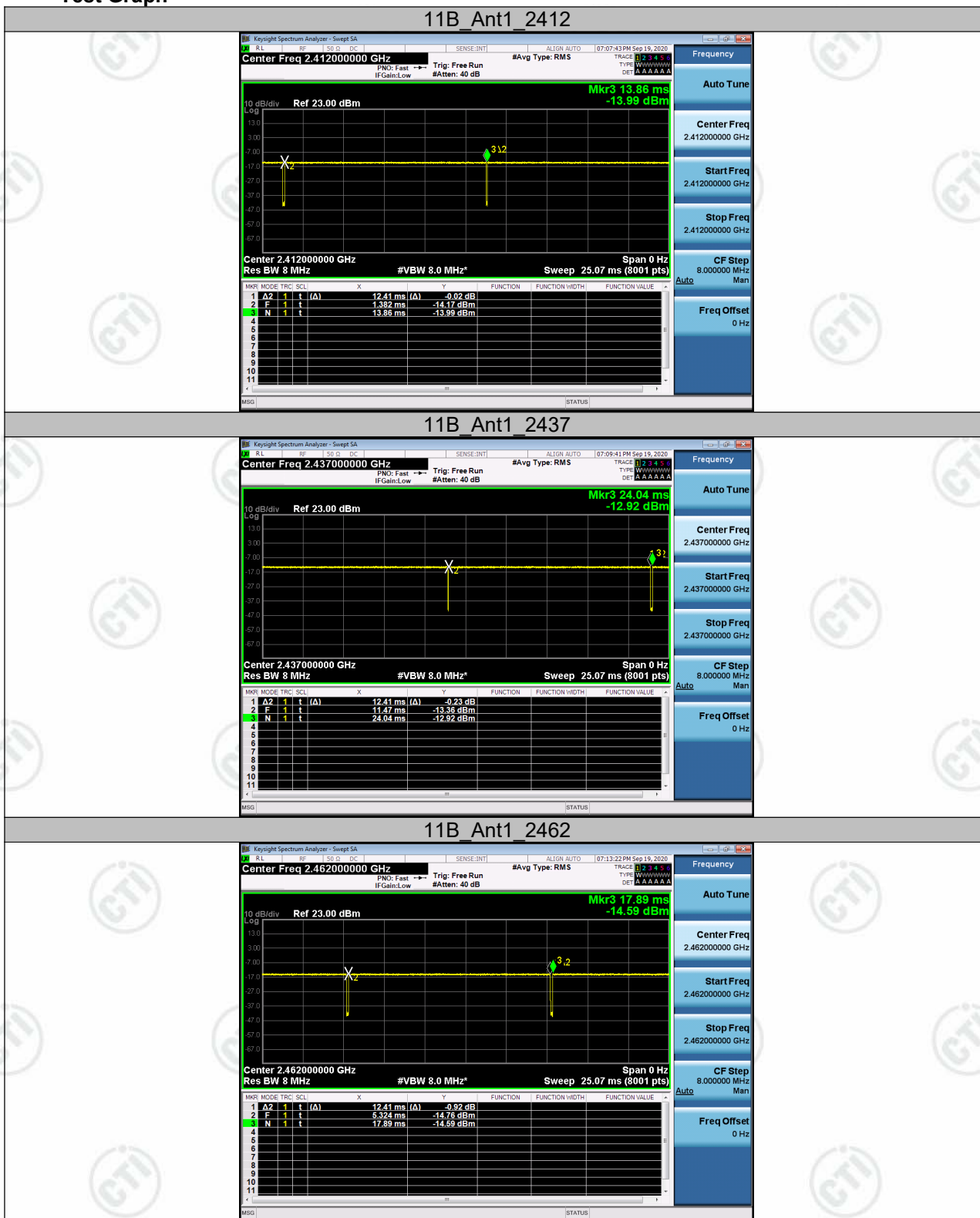
Test Requirement	Test method	Test item	Verdict	Note
Part15C Section 15.247 (b)(3)	ANSI C63.10	Conducted Peak Output Power	PASS	Appendix A)
Part15C Section 15.247 (a)(2)	ANSI C63.10	6dB Occupied Bandwidth	PASS	Appendix B)
Part15C Section 15.247(d)	ANSI C63.10	Band-edge for RF Conducted Emissions	PASS	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)

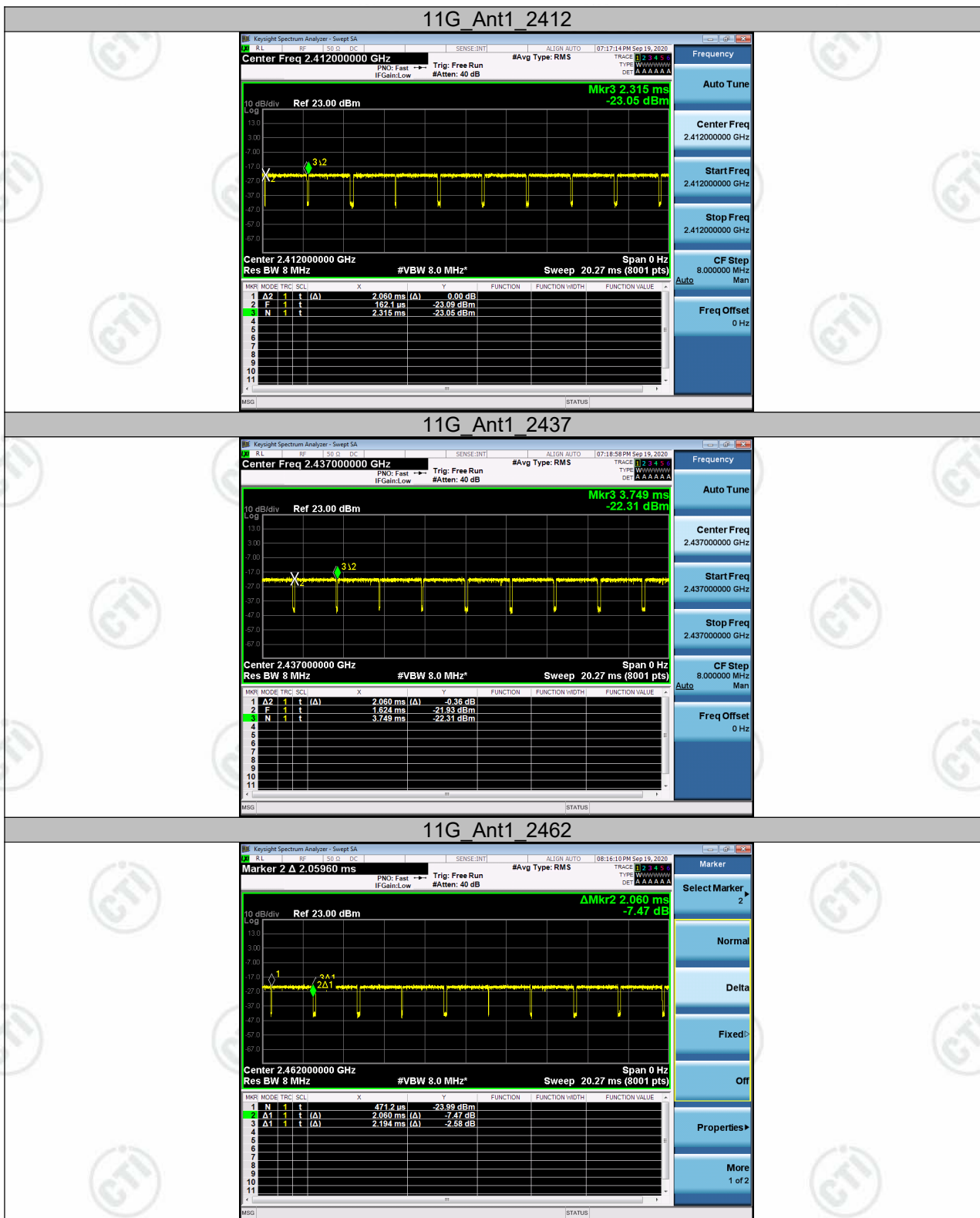
EUT DUTY CYCLE

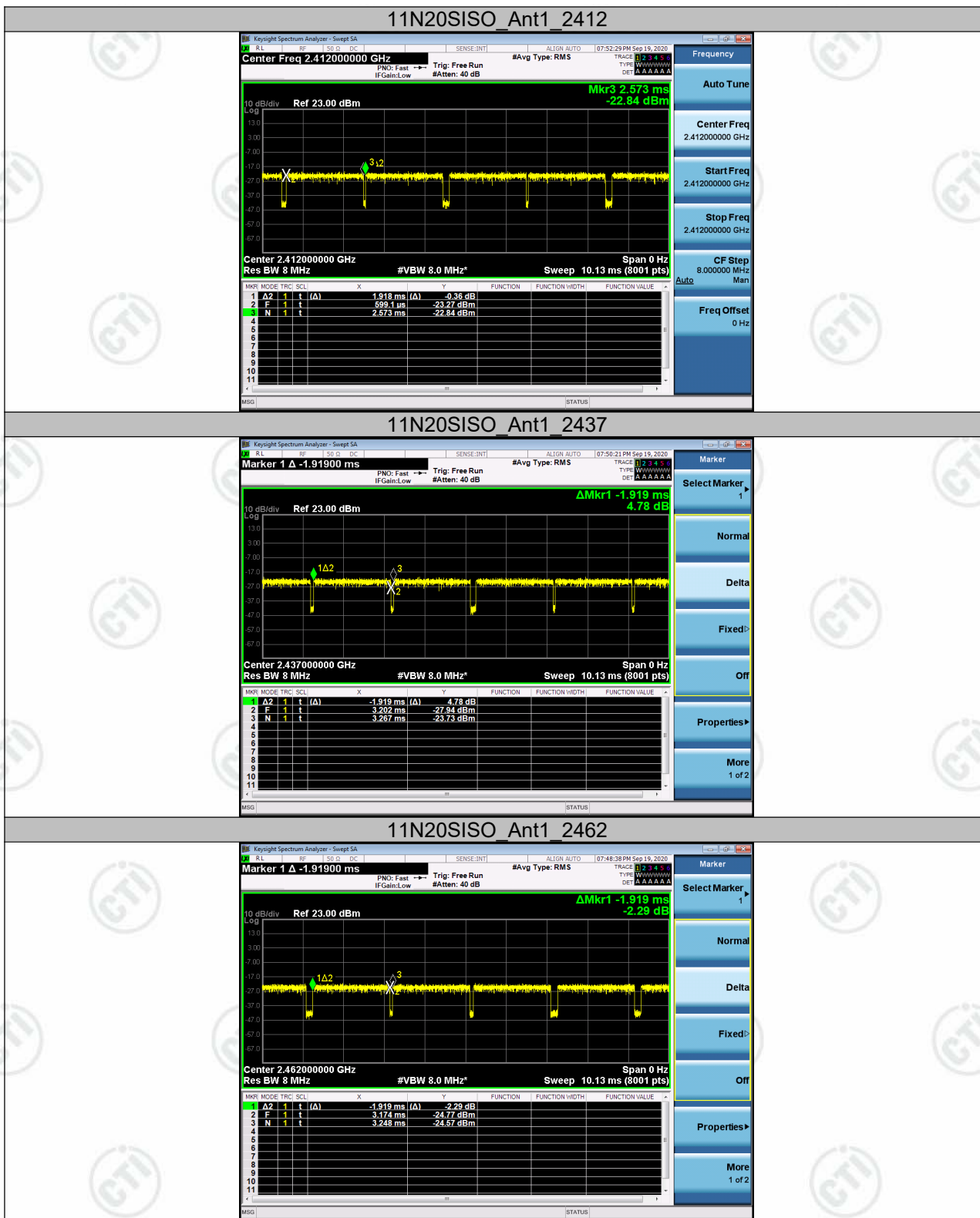
Result Table

Test Mode	Antenna	Channel	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	99.52	---	PASS
	Ant1	2437	98.8	---	PASS
	Ant1	2462	98.75	---	PASS
11G	Ant1	2412	95.65	---	PASS
	Ant1	2437	96.9	---	PASS
	Ant1	2462	93.9	---	PASS
11N20SISO	Ant1	2412	97.2	---	PASS
	Ant1	2437	98.0	---	PASS
	Ant1	2462	97.7	---	PASS
11N40SISO	Ant1	2422	91.3	---	PASS
	Ant1	2437	87.3	---	PASS
	Ant1	2452	97.5	---	PASS

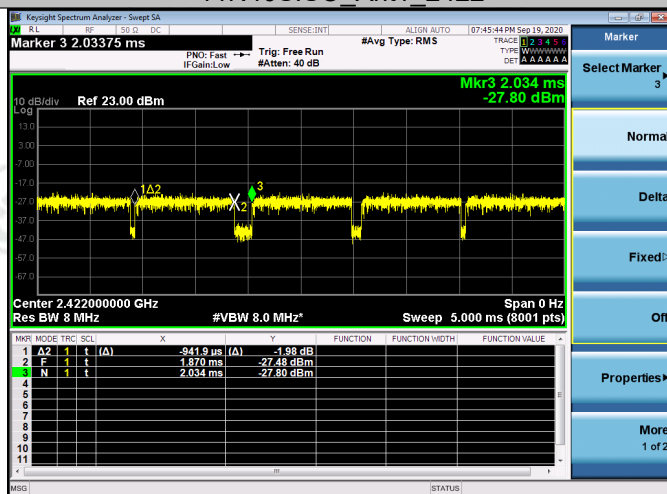
Test Graph



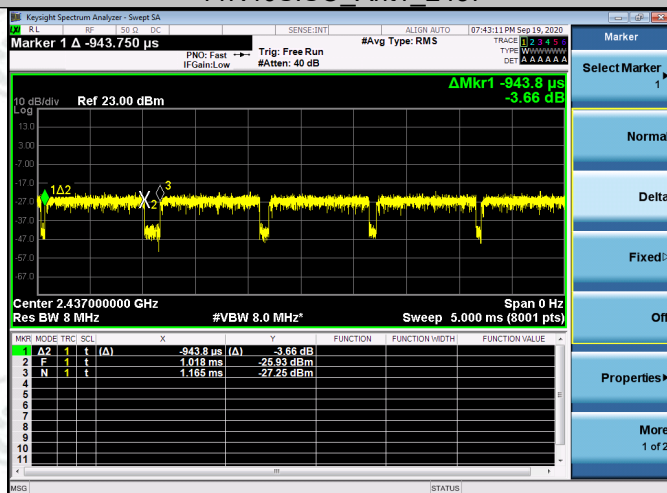




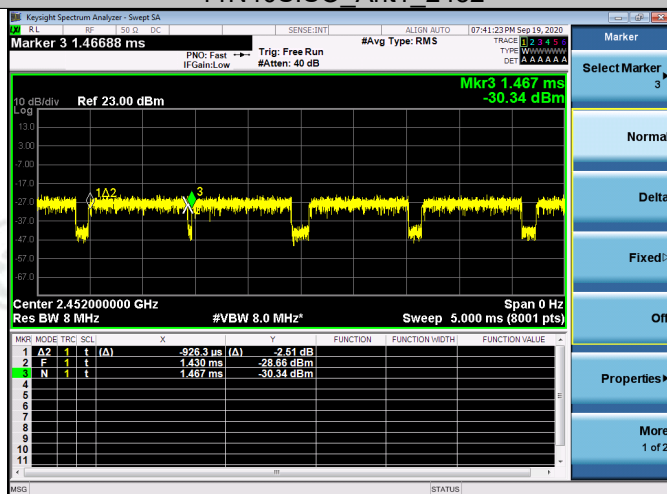
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



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:
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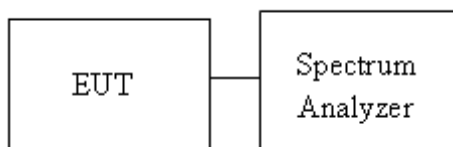
Average output power: For reporting purposes only.

Test Procedure

Test method Refer as KDB 558074 D01.

1. The EUT RF output connected to spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT.
3. Spectrum analyzer settings are as follows :
 - a) Set the RBW = 1 MHz.
 - b) Set the VBW $\geq [3 \times \text{RBW}]$.
 - c) Set the span $\geq [1.5 \times \text{DTS bandwidth}]$.
 - d) Detector = peak.
 - e) Sweep time = auto couple.
 - f) Trace mode = max hold.
 - g) Allow trace to fully stabilize.
 - h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges
4. Measure and record the result in the test report.

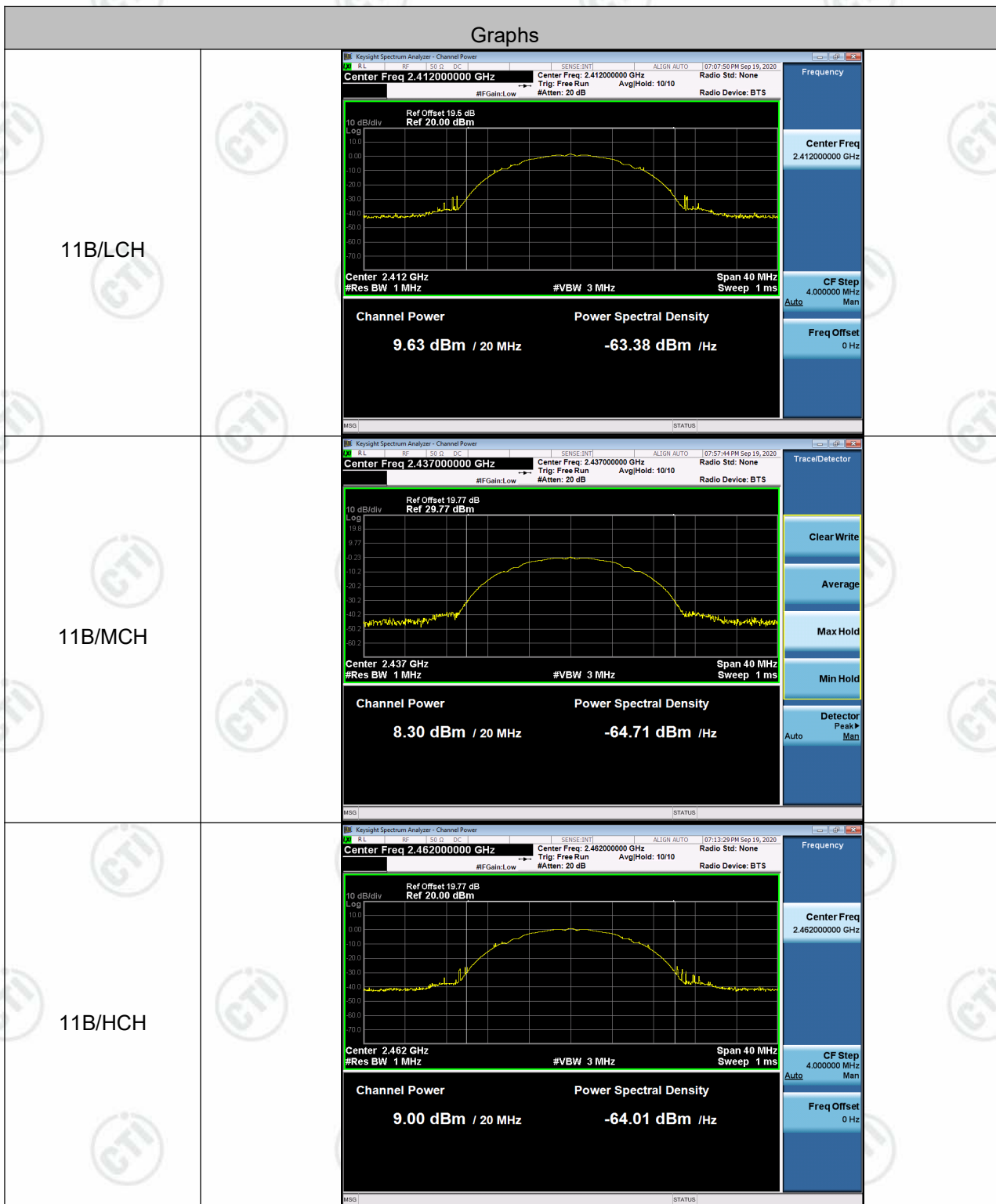
Test Setup

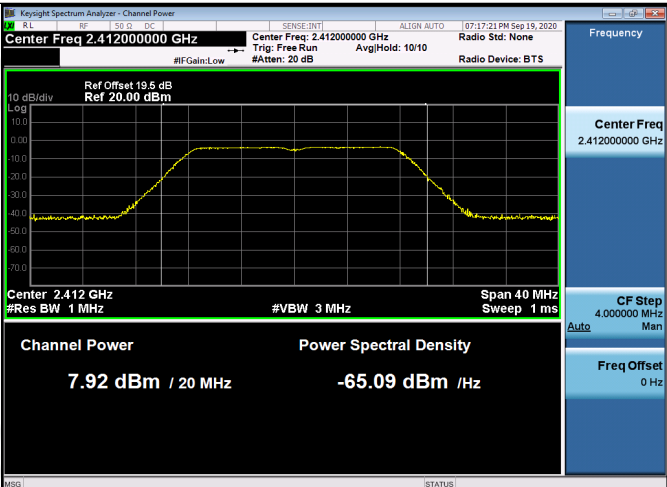
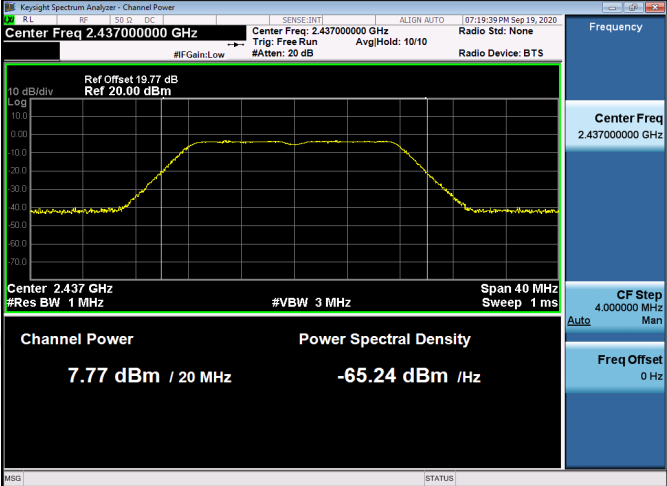
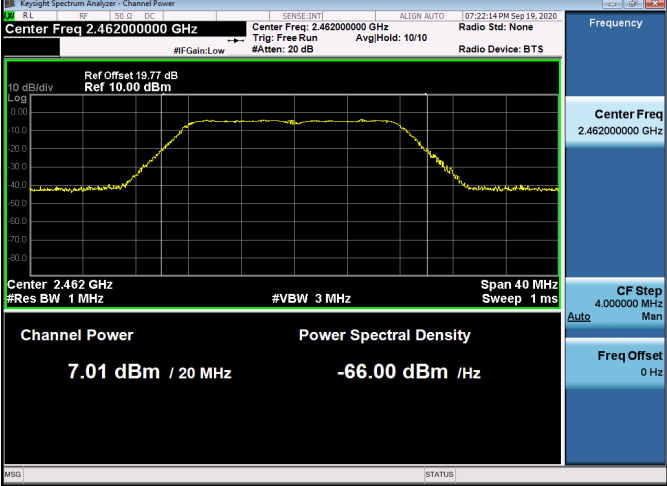


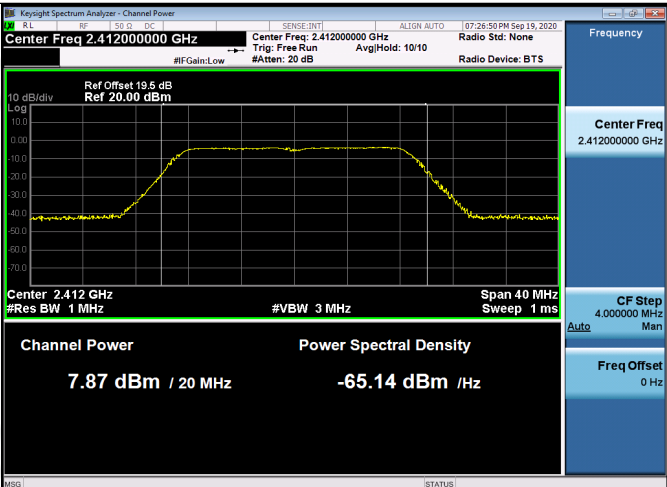
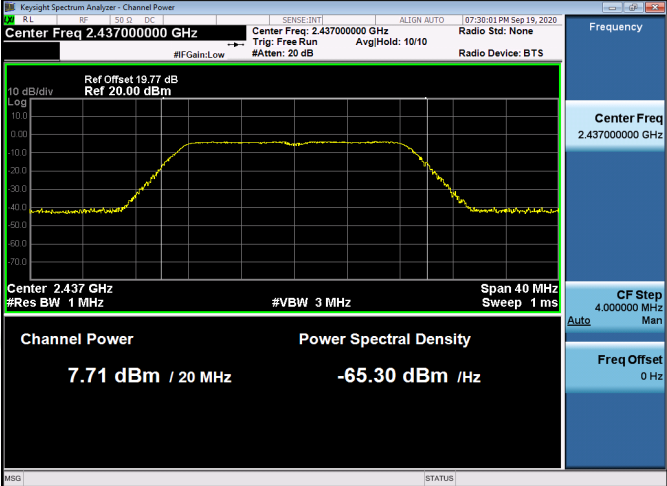
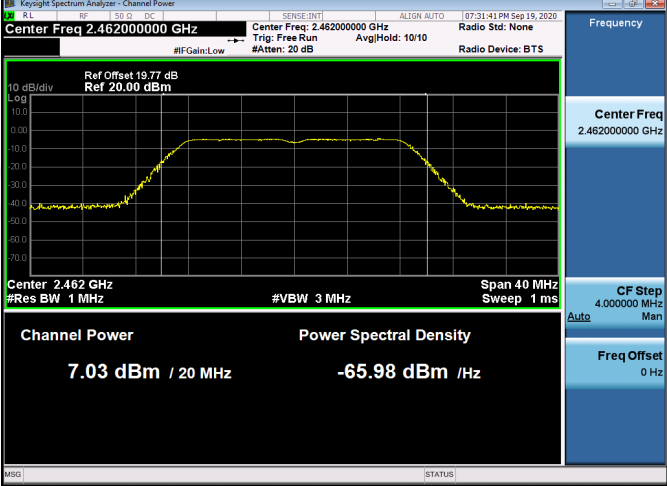
Test Result

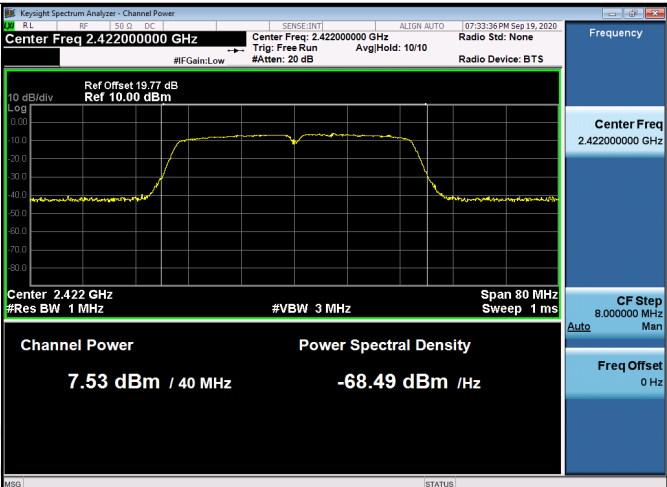
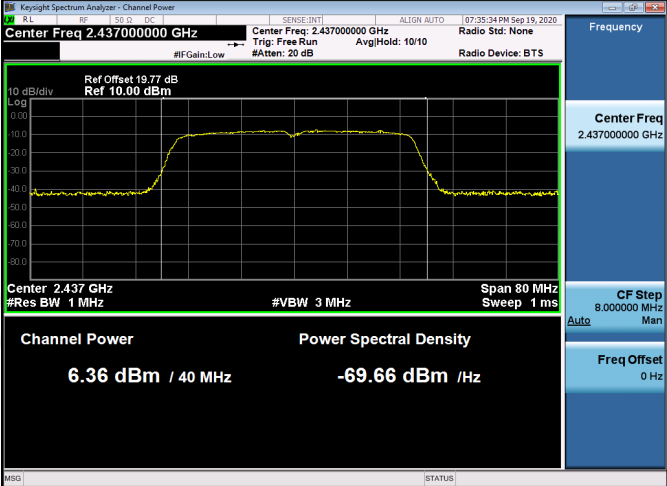
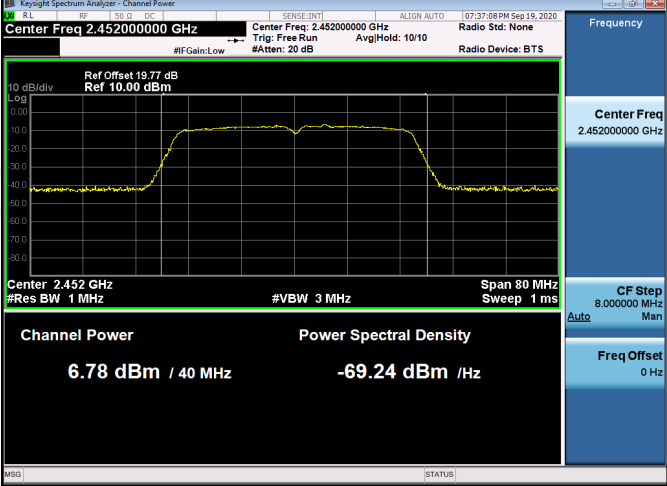
Mode	Channel	Conducted Peak Output Power [dBm]	Verdict
11B	LCH	9.63	PASS
11B	MCH	8.30	PASS
11B	HCH	9.00	PASS
11G	LCH	7.92	PASS
11G	MCH	7.77	PASS
11G	HCH	7.01	PASS
11N20SISO	LCH	7.87	PASS
11N20SISO	MCH	7.71	PASS
11N20SISO	HCH	7.03	PASS
11N40SISO	LCH	7.53	PASS
11N40SISO	MCH	6.36	PASS
11N40SISO	HCH	6.78	PASS

Test Graph



11G/LCH	 KeySight Spectrum Analyzer - Channel Power Center Freq 2.412000000 GHz Ref Offset 19.5 dB Ref 20.00 dBm Channel Power: 7.92 dBm / 20 MHz Power Spectral Density: -65.09 dBm / Hz Center Freq: 2.412 GHz #Res BW: 1 MHz #VBW: 3 MHz Span: 40 MHz Sweep: 1 ms
11G/MCH	 KeySight Spectrum Analyzer - Channel Power Center Freq 2.437000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Channel Power: 7.77 dBm / 20 MHz Power Spectral Density: -65.24 dBm / Hz Center Freq: 2.437 GHz #Res BW: 1 MHz #VBW: 3 MHz Span: 40 MHz Sweep: 1 ms
11G/HCH	 KeySight Spectrum Analyzer - Channel Power Center Freq 2.462000000 GHz Ref Offset 19.77 dB Ref 10.00 dBm Channel Power: 7.01 dBm / 20 MHz Power Spectral Density: -66.00 dBm / Hz Center Freq: 2.462 GHz #Res BW: 1 MHz #VBW: 3 MHz Span: 40 MHz Sweep: 1 ms

11N20SISO/LCH	 KeySight Spectrum Analyzer - Channel Power Center Freq 2.412000000 GHz Ref Offset 19.5 dB Ref 20.00 dBm Channel Power: 7.87 dBm / 20 MHz Power Spectral Density: -65.14 dBm / Hz Center 2.412 GHz #Res BW 1 MHz #VBW 3 MHz Span 40 MHz Sweep 1 ms
11N20SISO/MCH	 KeySight Spectrum Analyzer - Channel Power Center Freq 2.437000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Channel Power: 7.71 dBm / 20 MHz Power Spectral Density: -65.30 dBm / Hz Center 2.437 GHz #Res BW 1 MHz #VBW 3 MHz Span 40 MHz Sweep 1 ms
11N20SISO/HCH	 KeySight Spectrum Analyzer - Channel Power Center Freq 2.462000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Channel Power: 7.03 dBm / 20 MHz Power Spectral Density: -65.98 dBm / Hz Center 2.462 GHz #Res BW 1 MHz #VBW 3 MHz Span 40 MHz Sweep 1 ms

11N40SISO/LCH	
11N40SISO/MCH	
11N40SISO/HCH	

Appendix B): 6dB Occupied Bandwidth

Test Limit

According to §15.247(a)(2),

6 dB Bandwidth :

Limit	Shall be at least 500kHz
-------	--------------------------

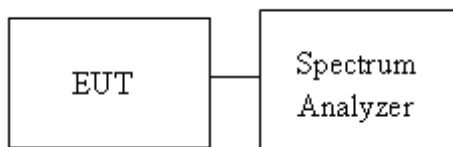
Occupied Bandwidth(99%) : For reporting purposes only.

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.

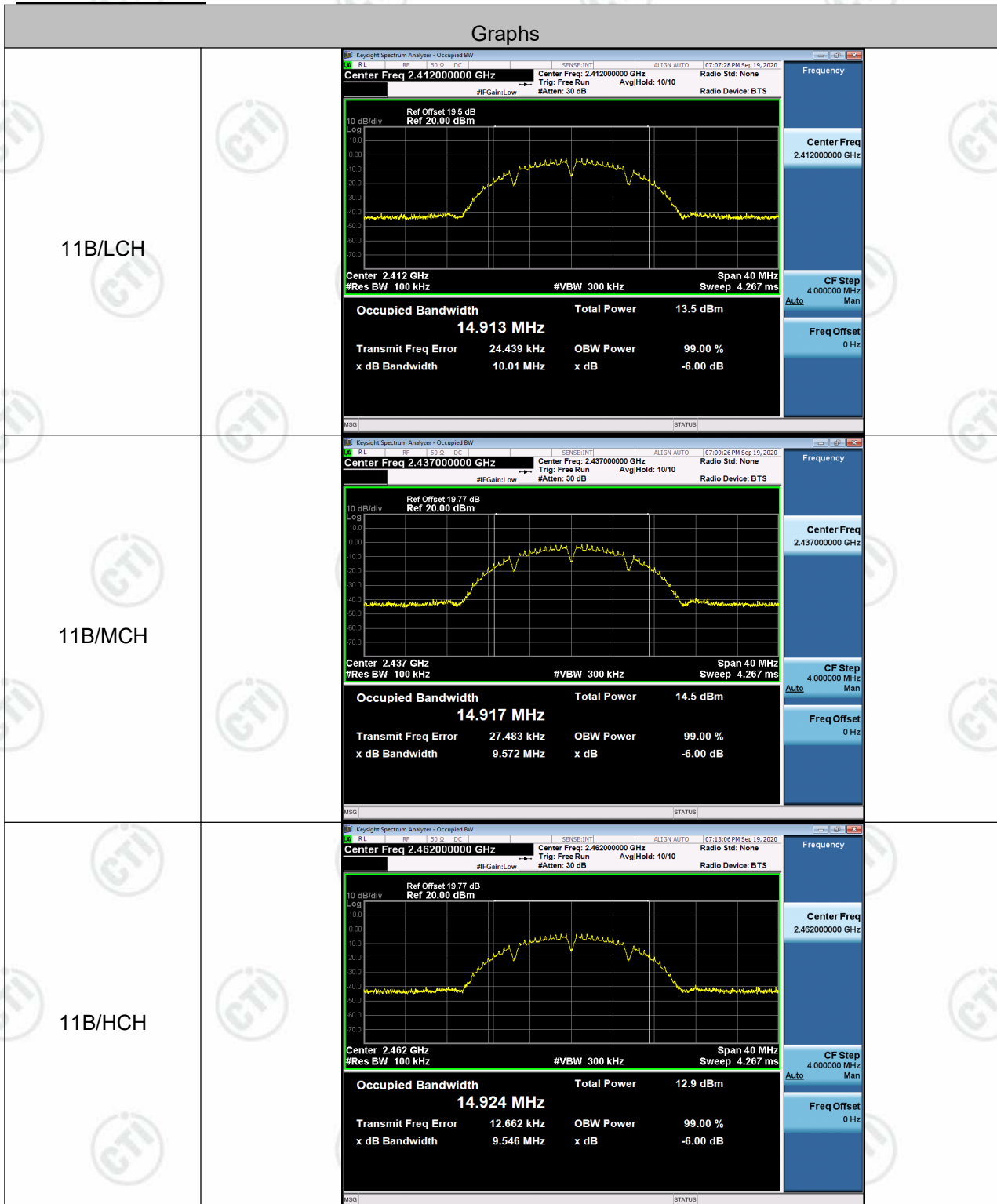
Test Setup

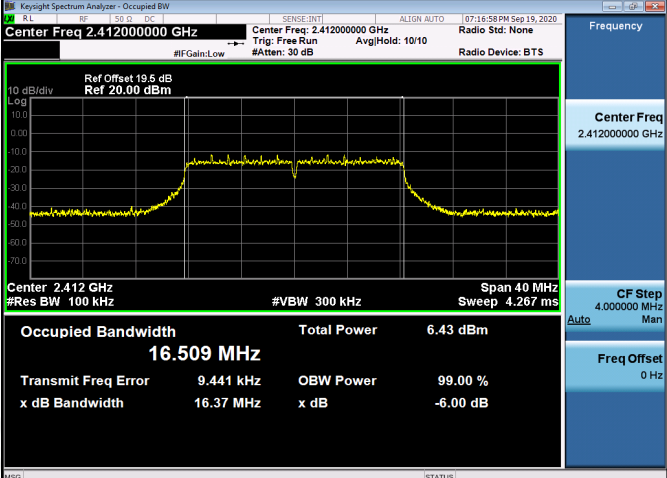
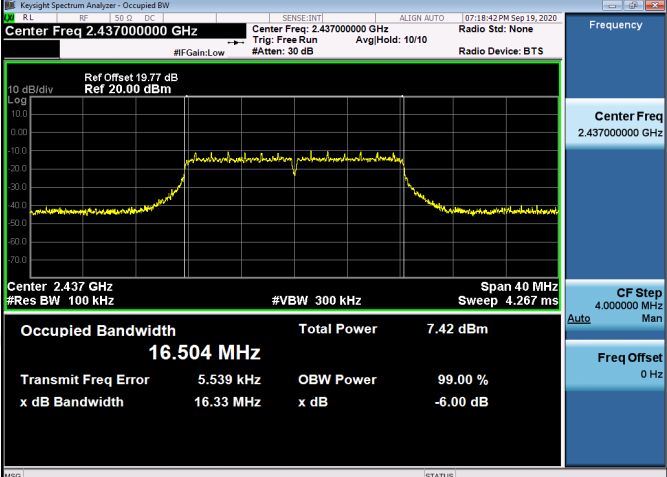
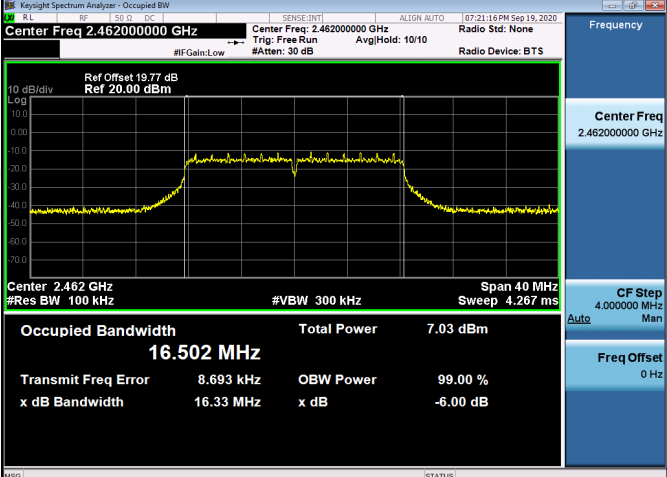


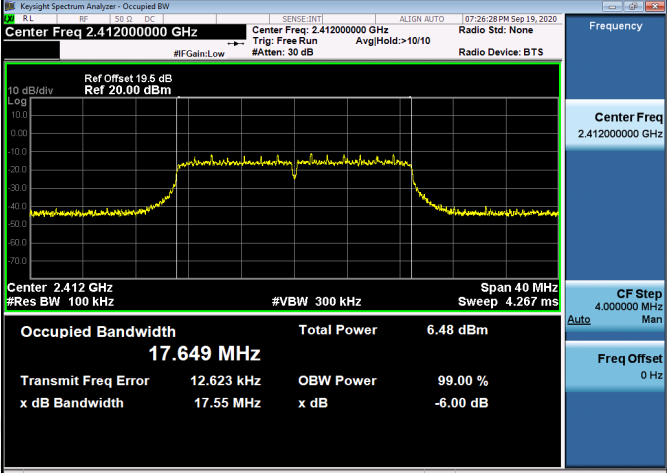
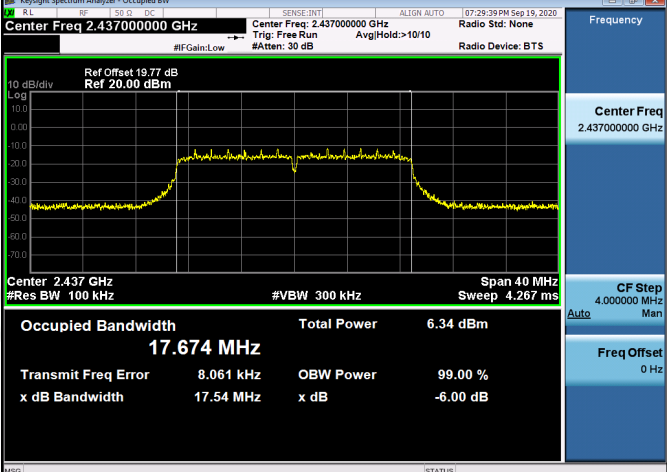
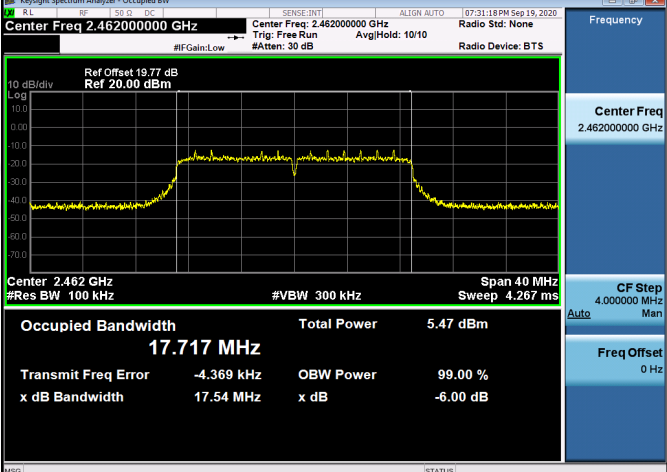
Test Result

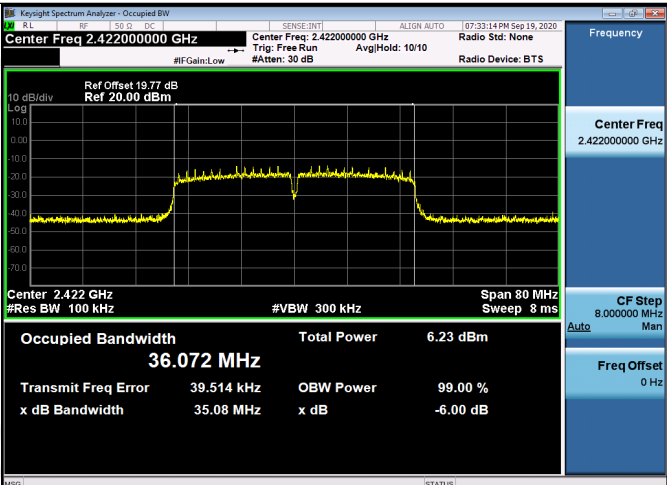
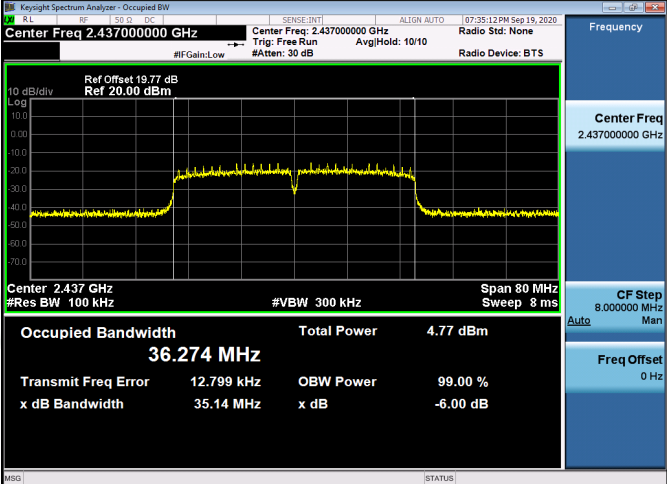
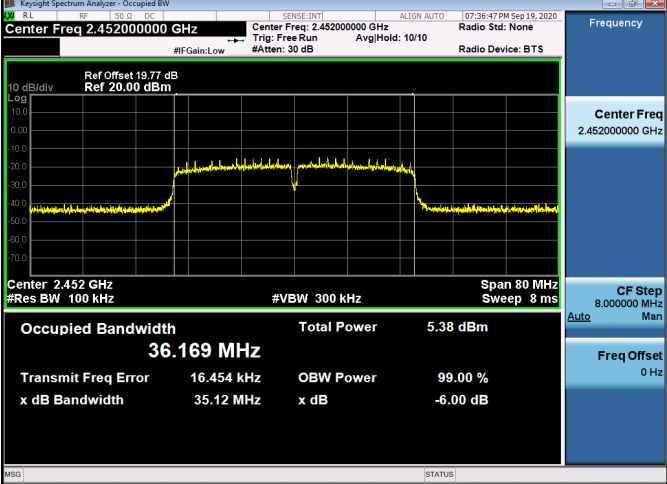
Mode	Channel	6dB Bandwidth [MHz]	99% OBW [MHz]	Verdict
11B	LCH	10.01	15.135	PASS
11B	MCH	9.572	15.102	PASS
11B	HCH	9.546	15.140	PASS
11G	LCH	16.37	16.975	PASS
11G	MCH	16.33	17.041	PASS
11G	HCH	16.33	16.915	PASS
11N20SISO	LCH	17.55	17.960	PASS
11N20SISO	MCH	17.54	18.106	PASS
11N20SISO	HCH	17.54	18.116	PASS
11N40SISO	LCH	35.08	36.250	PASS
11N40SISO	MCH	35.14	36.536	PASS
11N40SISO	HCH	35.12	36.455	PASS

Test Graph
6 dB Bandwidth

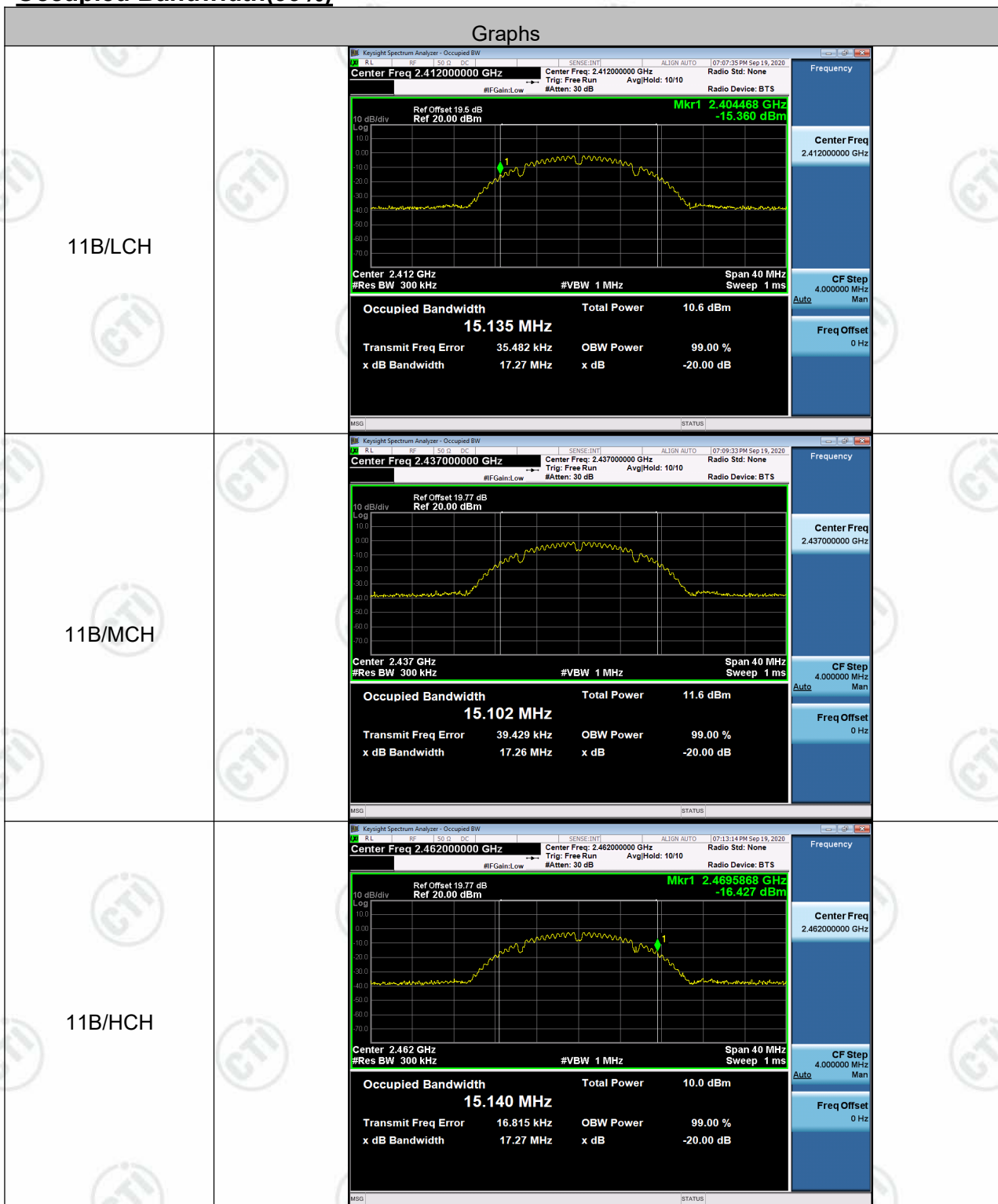


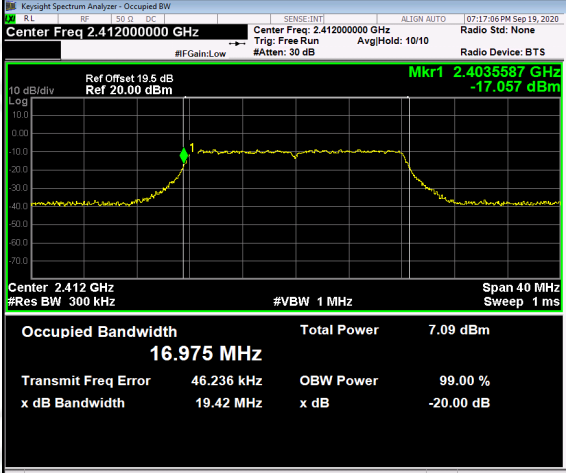
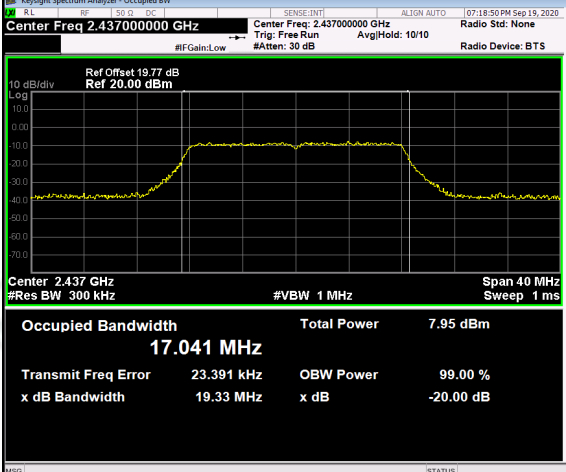
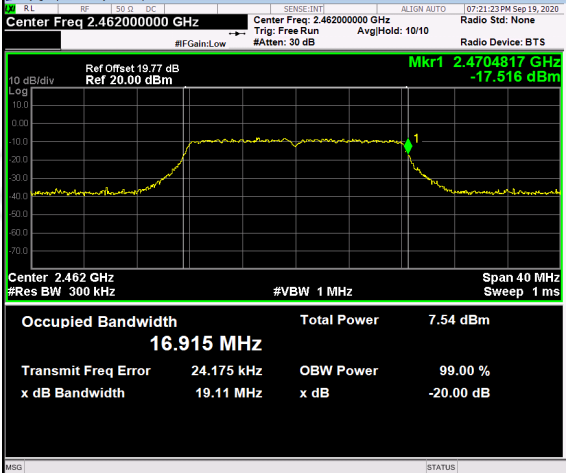
11G/LCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Ref Offset 19.5 dB Ref 20.00 dBm Center 2.412 GHz #Res BW 100 kHz Occupied Bandwidth 16.509 MHz Total Power 6.43 dBm Transmit Freq Error 9.441 kHz x dB Bandwidth 16.37 MHz OBW Power 99.00 % x dB -6.00 dB Frequency Center Freq 2.412000000 GHz CF Step 4.000000 MHz Freq Offset 0 Hz
11G/MCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Center 2.437 GHz #Res BW 100 kHz Occupied Bandwidth 16.504 MHz Total Power 7.42 dBm Transmit Freq Error 5.539 kHz x dB Bandwidth 16.33 MHz OBW Power 99.00 % x dB -6.00 dB Frequency Center Freq 2.437000000 GHz CF Step 4.000000 MHz Freq Offset 0 Hz
11G/HCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Center 2.462 GHz #Res BW 100 kHz Occupied Bandwidth 16.502 MHz Total Power 7.03 dBm Transmit Freq Error 8.693 kHz x dB Bandwidth 16.33 MHz OBW Power 99.00 % x dB -6.00 dB Frequency Center Freq 2.462000000 GHz CF Step 4.000000 MHz Freq Offset 0 Hz

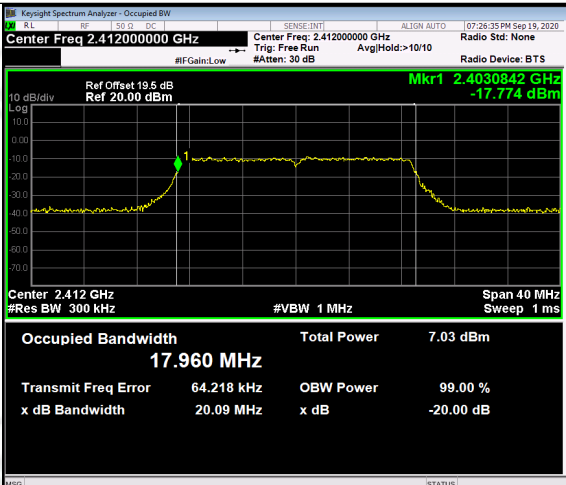
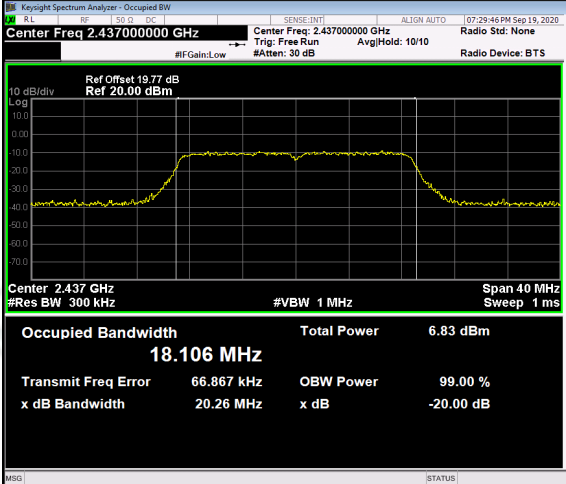
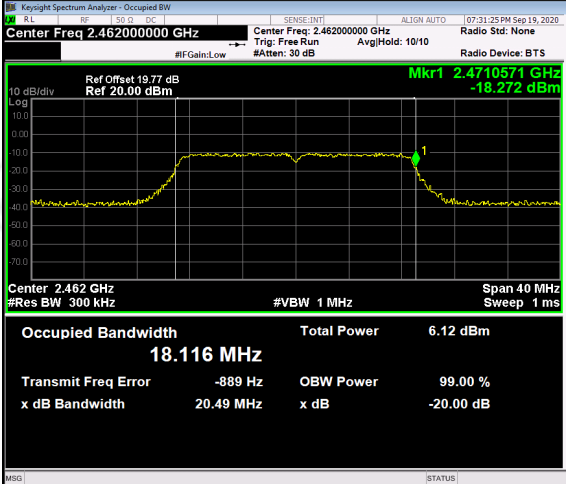
11N20SISO/LCH	 Key Sight Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Ref Offset 19.5 dB Ref 20.00 dBm Center Freq 2.412000000 GHz Trig: Free Run Avg/Hold: >10/10 Radio Std: None Radio Device: BTS Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 4.267 ms Occupied Bandwidth 17.649 MHz Total Power 6.48 dBm Transmit Freq Error 12.623 kHz OBW Power 99.00 % x dB Bandwidth 17.55 MHz x dB -6.00 dB Frequency Center Freq 2.412000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz
11N20SISO/MCH	 Key Sight Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Center Freq 2.437000000 GHz Trig: Free Run Avg/Hold: >10/10 Radio Std: None Radio Device: BTS Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 4.267 ms Occupied Bandwidth 17.674 MHz Total Power 6.34 dBm Transmit Freq Error 8.061 kHz OBW Power 99.00 % x dB Bandwidth 17.54 MHz x dB -6.00 dB Frequency Center Freq 2.437000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz
11N20SISO/HCH	 Key Sight Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Center Freq 2.462000000 GHz Trig: Free Run Avg/Hold: >10/10 Radio Std: None Radio Device: BTS Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 4.267 ms Occupied Bandwidth 17.717 MHz Total Power 5.47 dBm Transmit Freq Error -4.369 kHz OBW Power 99.00 % x dB Bandwidth 17.54 MHz x dB -6.00 dB Frequency Center Freq 2.462000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz

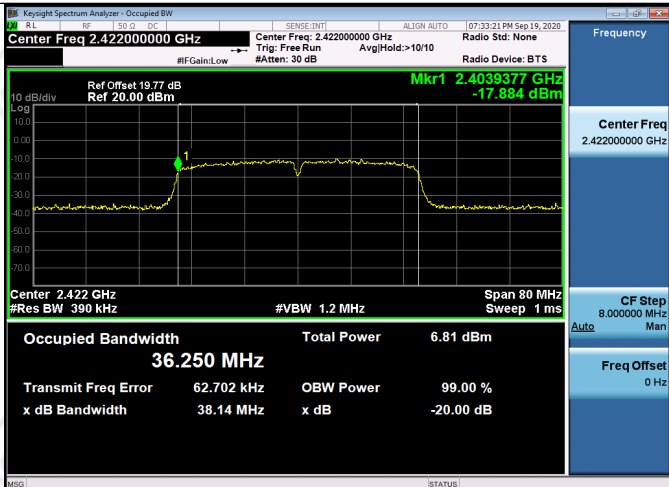
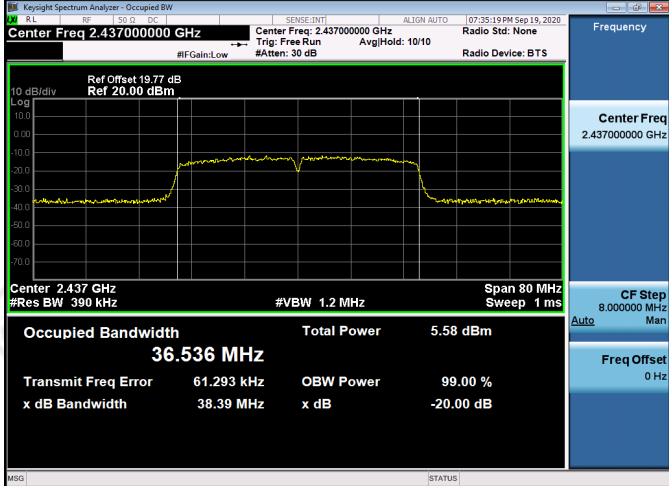
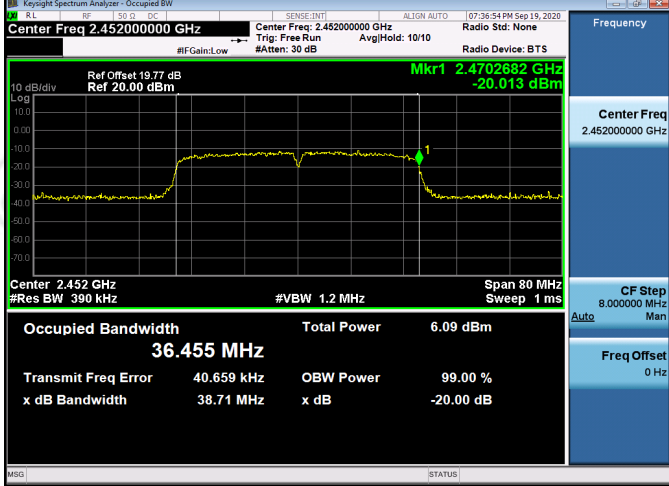
11N40SISO/LCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.422000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Center 2.422 GHz #Res BW 100 kHz #VBW 300 kHz Span 80 MHz Sweep 8 ms Occupied Bandwidth 36.072 MHz Total Power 6.23 dBm Transmit Freq Error 39.514 kHz OBW Power 99.00 % x dB Bandwidth 35.08 MHz x dB -6.00 dB Frequency Center Freq 2.422000000 GHz CF Step 8.000000 MHz Freq Offset 0 Hz
11N40SISO/MCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 80 MHz Sweep 8 ms Occupied Bandwidth 36.274 MHz Total Power 4.77 dBm Transmit Freq Error 12.799 kHz OBW Power 99.00 % x dB Bandwidth 35.14 MHz x dB -6.00 dB Frequency Center Freq 2.437000000 GHz CF Step 8.000000 MHz Freq Offset 0 Hz
11N40SISO/HCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.452000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Center 2.452 GHz #Res BW 100 kHz #VBW 300 kHz Span 80 MHz Sweep 8 ms Occupied Bandwidth 36.169 MHz Total Power 5.38 dBm Transmit Freq Error 16.454 kHz OBW Power 99.00 % x dB Bandwidth 35.12 MHz x dB -6.00 dB Frequency Center Freq 2.452000000 GHz CF Step 8.000000 MHz Freq Offset 0 Hz

Occupied Bandwidth(99%)



11G/LCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Ref Offset 19.8 dB Ref 20.00 dBm Mkr1 2.4035587 GHz -17.057 dBm Center 2.412 GHz #Res BW 300 kHz #VBW 1 MHz Span 40 MHz Sweep 1 ms Occupied Bandwidth 16.975 MHz Total Power 7.09 dBm Transmit Freq Error 46.236 kHz OBW Power 99.00 % x dB Bandwidth 19.42 MHz x dB -20.00 dB
11G/MCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Mkr1 2.437000000 GHz -17.057 dBm Center 2.437 GHz #Res BW 300 kHz #VBW 1 MHz Span 40 MHz Sweep 1 ms Occupied Bandwidth 17.041 MHz Total Power 7.95 dBm Transmit Freq Error 23.391 kHz OBW Power 99.00 % x dB Bandwidth 19.33 MHz x dB -20.00 dB
11G/HCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Mkr1 2.4704817 GHz -17.516 dBm Center 2.462 GHz #Res BW 300 kHz #VBW 1 MHz Span 40 MHz Sweep 1 ms Occupied Bandwidth 16.915 MHz Total Power 7.54 dBm Transmit Freq Error 24.175 kHz OBW Power 99.00 % x dB Bandwidth 19.11 MHz x dB -20.00 dB

11N20SISO/LCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Ref Offset 19.8 dB Ref 20.00 dBm Occupied Bandwidth 17.960 MHz Total Power 7.03 dBm Transmit Freq Error 64.218 kHz x dB Bandwidth 20.09 MHz x dB -20.00 dB
11N20SISO/MCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Occupied Bandwidth 18.106 MHz Total Power 6.83 dBm Transmit Freq Error 66.867 kHz x dB Bandwidth 20.26 MHz x dB -20.00 dB
11N20SISO/HCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Ref Offset 19.77 dB Ref 20.00 dBm Occupied Bandwidth 18.116 MHz Total Power 6.12 dBm Transmit Freq Error -889 Hz x dB Bandwidth 20.49 MHz x dB -20.00 dB

11N40SISO/LCH	
11N40SISO/MCH	
11N40SISO/HCH	

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. If 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.

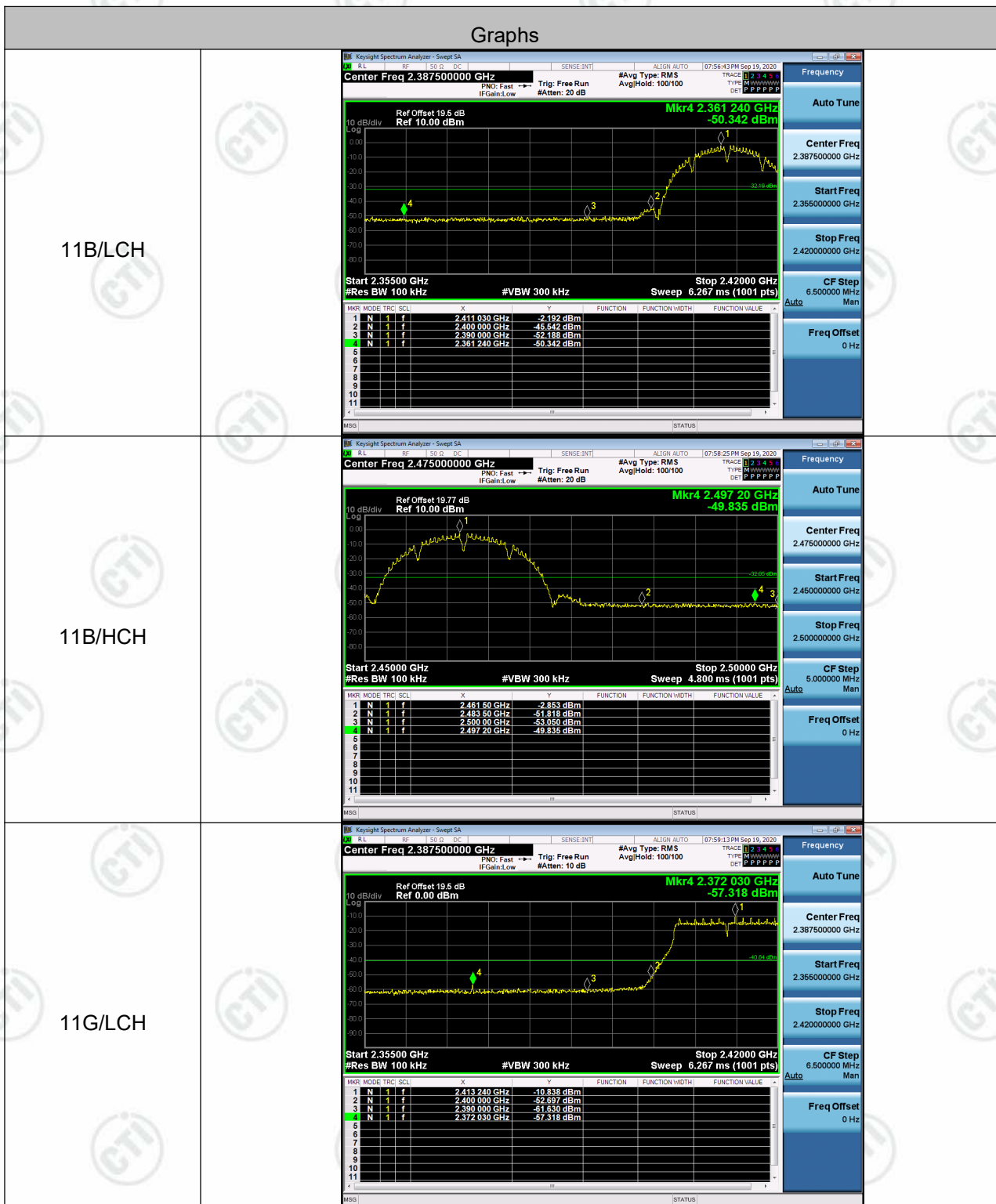
Test Setup



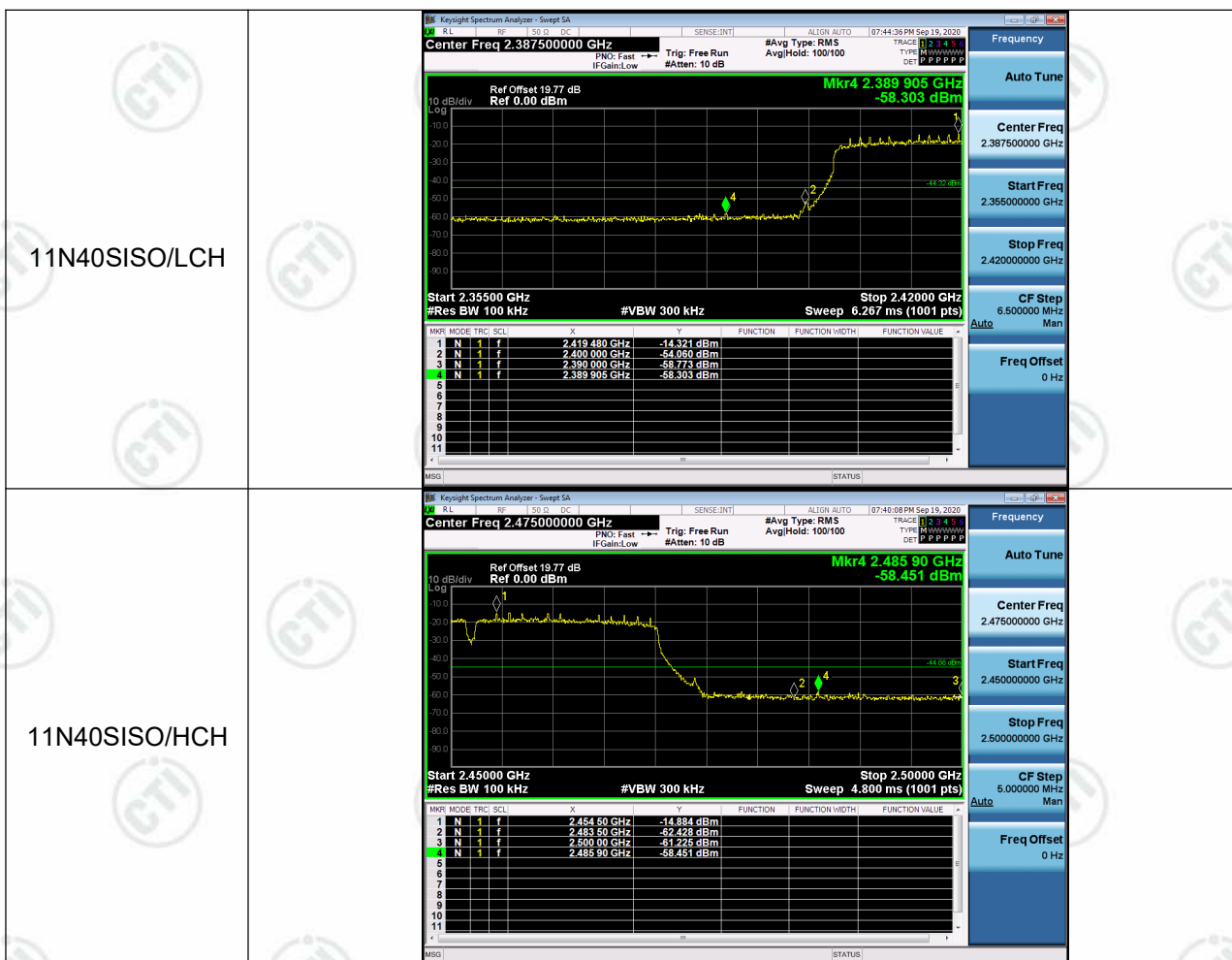
Result Table

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-2.192	-50.342	-32.19	PASS
11B	HCH	-2.853	-49.835	-32.85	PASS
11G	LCH	-10.838	-57.318	-40.84	PASS
11G	HCH	-12.443	-59.583	-42.44	PASS
11N20SISO	LCH	-11.380	-57.975	-41.38	PASS
11N20SISO	HCH	-12.063	-58.935	-42.06	PASS
11N40SISO	LCH	-14.321	-58.303	-44.32	PASS
11N40SISO	HCH	-14.884	-58.451	-44.88	PASS

Test Graph



11G/HCH	Keylight Spectrum Analyzer - Sweep SA Center Freq 2.475000000 GHz Ref Offset 19.77 dB Ref 0.00 dBm Mkr4 2.491 20 GHz -59.583 dBm Start 2.45000 GHz #Res BW 100 kHz Stop 2.50000 GHz #VBW 300 kHz Sweep 4.800 ms (1001 pts) <table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.467 00 GHz</td><td>-12.443 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.483 50 GHz</td><td>-61.878 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.500 00 GHz</td><td>-62.107 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.491 20 GHz</td><td>-59.583 dBm</td><td></td><td></td><td></td></tr></tbody></table> Frequency Auto Tune Center Freq 2.475000000 GHz Start Freq 2.450000000 GHz Stop Freq 2.500000000 GHz CF Step 5.000000 MHz Man Freq Offset 0 Hz	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.467 00 GHz	-12.443 dBm				2	N	1	f	2.483 50 GHz	-61.878 dBm				3	N	1	f	2.500 00 GHz	-62.107 dBm				4	N	1	f	2.491 20 GHz	-59.583 dBm			
MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																						
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4	N	1	f	2.491 20 GHz	-59.583 dBm																																									
11N20SISO/LCH	Keylight Spectrum Analyzer - Sweep SA Center Freq 2.387500000 GHz Ref Offset 19.5 dB Ref 0.00 dBm Mkr4 2.371 965 GHz -57.975 dBm Start 2.35500 GHz #Res BW 100 kHz Stop 2.42000 GHz #VBW 300 kHz Sweep 6.267 ms (1001 pts) <table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.414 475 GHz</td><td>-11.380 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.400 000 GHz</td><td>-62.417 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.390 000 GHz</td><td>-61.191 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.371 965 GHz</td><td>-57.975 dBm</td><td></td><td></td><td></td></tr></tbody></table> Frequency Auto Tune Center Freq 2.387500000 GHz Start Freq 2.355000000 GHz Stop Freq 2.420000000 GHz CF Step 6.500000 MHz Man Freq Offset 0 Hz	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.414 475 GHz	-11.380 dBm				2	N	1	f	2.400 000 GHz	-62.417 dBm				3	N	1	f	2.390 000 GHz	-61.191 dBm				4	N	1	f	2.371 965 GHz	-57.975 dBm			
MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																						
1	N	1	f	2.414 475 GHz	-11.380 dBm																																									
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4	N	1	f	2.371 965 GHz	-57.975 dBm																																									
11N20SISO/HCH	Keylight Spectrum Analyzer - Sweep SA Center Freq 2.475000000 GHz Ref Offset 19.77 dB Ref 0.00 dBm Mkr4 2.485 95 GHz -58.935 dBm Start 2.45000 GHz #Res BW 100 kHz Stop 2.50000 GHz #VBW 300 kHz Sweep 4.800 ms (1001 pts) <table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.463 25 GHz</td><td>-12.063 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.483 50 GHz</td><td>-61.701 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.500 00 GHz</td><td>-61.870 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.485 95 GHz</td><td>-58.935 dBm</td><td></td><td></td><td></td></tr></tbody></table> Frequency Auto Tune Center Freq 2.475000000 GHz Start Freq 2.450000000 GHz Stop Freq 2.500000000 GHz CF Step 5.000000 MHz Man Freq Offset 0 Hz	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.463 25 GHz	-12.063 dBm				2	N	1	f	2.483 50 GHz	-61.701 dBm				3	N	1	f	2.500 00 GHz	-61.870 dBm				4	N	1	f	2.485 95 GHz	-58.935 dBm			
MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																						
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3	N	1	f	2.500 00 GHz	-61.870 dBm																																									
4	N	1	f	2.485 95 GHz	-58.935 dBm																																									



Appendix D): RF Conducted Spurious Emissions

Test Limit

According to §15.247(d),

In any 100 kHz bandwidth outside the authorized frequency band,

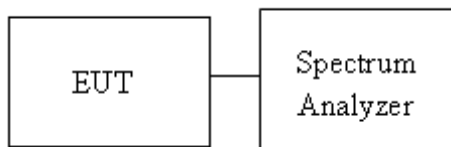
Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

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. If 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

Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
11B	LCH	-2.184	<Limit	PASS
11B	MCH	-3.214	<Limit	PASS
11B	HCH	-3.133	<Limit	PASS
11G	LCH	-11.404	<Limit	PASS
11G	MCH	-11.514	<Limit	PASS
11G	HCH	-11.777	<Limit	PASS
11N20SISO	LCH	-11.297	<Limit	PASS
11N20SISO	MCH	-10.869	<Limit	PASS
11N20SISO	HCH	-11.648	<Limit	PASS
11N40SISO	LCH	-13.911	<Limit	PASS
11N40SISO	MCH	-15.331	<Limit	PASS
11N40SISO	HCH	-14.834	<Limit	PASS

Test Graph

