

FCC Part 15C Test Report

FCC ID: ZNPWD-R1200U

Product Name:	Dual Band WiFi Repeater
Trademark:	N/A
Model Name :	WD-R1200U WD-R1201U, WD-R1202U, WD-R1203U
Prepared For : Address :	Shenzhen Century Xinyang Tech Co., Ltd 3F, North Building, Bantian High-tech industrial Zone, No. 2 of Bell Road, Longgang, Shenzhen, Guangdong, China
Prepared By : Address :	Shenzhen BCTC Testing Co., Ltd. BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Test Date:	Jun. 10, 2019 to Jun. 25, 2019
Date of Report :	Jun. 25, 2019
Report No.:	BCTC-LH190500195-1E

TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Century Xinyang Tech Co., Ltd
Address : 3F, North Building, Bantian High-tech industrial Zone, No. 2 of
Bell Road, Longgang, Shenzhen, Guangdong, China
Manufacture's Name : Shenzhen Century Xinyang Tech Co., Ltd
Address : 3F, North Building, Bantian High-tech industrial Zone, No. 2 of
Bell Road, Longgang, Shenzhen, Guangdong, China
Product description
Product name : Dual Band WiFi Repeater
Model and/or type reference : WD-R1200U
Standards : FCC Part15.247
ANSI C63.10:2013
KDB558074 D01 15.247 Meas Guidance v05r02

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen BCTC Testing Co., Ltd.

Add. : BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 712850

Test site MRA number: CN1212

IC Registered No.: 23583

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Dual Band WiFi Repeater	
Trade Name	N/A	
Model Name	WD-R1200U WD-R1201U, WD-R1202U, WD-R1203U	
Model Difference	The product is different for model number and outlook color.	
Product Description	The EUT is a Dual Band WiFi Repeater	
	Operation Frequency:	802.11b/g/n20MHz:2412~2462 MHz 802.11n40MHz:2422~2452 MHz
	Modulation Type:	WIFI: OFDM/DSSS
	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n Up to 300Mbps
	Number Of Channel	802.11b/g/n20MHz:11 CH 802.11n40MHz: 7 CH
	Antenna Designation:	Please see Note 3.
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.		
Channel List	Please refer to the Note 2.	
Power	AC100-240V 50/60Hz	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

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

2.

Channel List for 802.11b/g/n(20)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

Channel List for 802.11n(40)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	05	2432	07	2442	09	2452
04	2427	06	2437	08	2447		

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	External antenna	N/A	2	
2	N/A	N/A	External antenna	N/A	2	

Note1: Directional Gain=2dBi+10log(2)=5.01dBi

Note2: The EUT 802.11n (20) and 802.11n(40) is support MIMO mode.

2.2 DESCRIPTION OF TEST MODES

Pretest Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH9
Mode 5	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

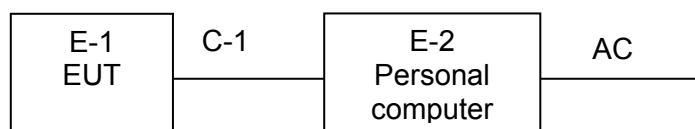
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH9

Note:

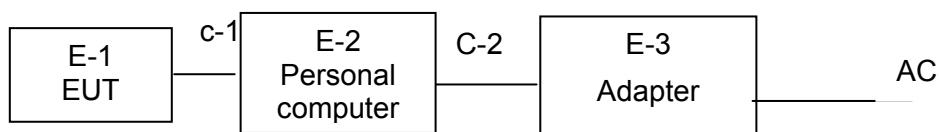
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Dual Band WiFi Repeater	N/A	WD-R1200U	N/A	EUT
E-2	Personal computer	Lenovo	S2	N/A	N/A
E-3	Adapter	Lenovo	SA10E75793	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.5M	USB cable unshielded
C-2	NO	NO	1.5M	DC cable unshielded

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4407B	MY45109572	Jul. 09, 2018	Jul. 08, 2019
2	Test Receiver (9kHz-7GHz)	R&S	ESRP	101154	Jul. 09, 2018	Jul. 08, 2019
3	Bilog Antenna (30MHz-3GHz)	SCHWARZBEC K	VULB9163	VULB9163-942	Jul. 09, 2018	Jul. 08, 2019
4	Horn Antenna (1GHz-18GHz)	SCHWARZBEC K	BBHA9120D	1541	Jul. 09, 2018	Jul. 08, 2019
5	Horn Antenna (18GHz-40GHz)	SCHWARZBEC K	BBHA9170	822	Aug. 14, 2018	Aug. 13, 2019
6	Amplifier (9KHz-6GHz)	SCHWARZBEC K	BBV9744	9744-0037	Jul. 09, 2018	Jul. 08, 2019
7	Amplifier (0.5GHz-18GHz)	SCHWARZBEC K	BBV9718	9718-309	Jul. 09, 2018	Jul. 08, 2019
8	Amplifier (18GHz-40GHz)	MITEQ	TTA1840-35-H G	2034381	Aug. 12, 2018	Aug. 11, 2019
9	Loop Antenna (9KHz-30MHz)	SCHWARZBEC K	FMZB1519B	014	Aug. 12, 2018	Aug. 11, 2019
10	RF cables1 (9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Aug. 12, 2018	Aug. 11, 2019
11	RF cables2 (30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	Aug. 12, 2018	Aug. 11, 2019
12	RF cables3 (1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	Aug. 06, 2018	Aug. 05, 2019
13	Power Metter	Keysight	E4419	\	Aug. 06, 2018	Aug. 05, 2019
14	Power Sensor (AV)	Keysight	E9300A	\	Aug. 06, 2018	Aug. 05, 2019
15	Signal Analyzer 20kHz-26.5GHz	KEYSIGHT	N9020A	MY49100060	Aug. 06, 2018	Aug. 05, 2019
16	Test Receiver 9kHz-40GHz	R&S	FSP40	100550	Aug. 06, 2018	Aug. 05, 2019
17	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
18	Software	Frad	EZ-EMC	FA-03A2 RE	\	\

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESR3	102075	Jul. 09, 2018	Jul. 08, 2019
2	LISN	SCHWARZBECK	NSLK8127	8127739	Jul. 09, 2018	Jul. 08, 2019
3	LISN	R&S	ENV216	101375	Jul. 09, 2018	Jul. 08, 2019
4	RF cables	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jul. 09, 2018	Jul. 08, 2019
5	Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

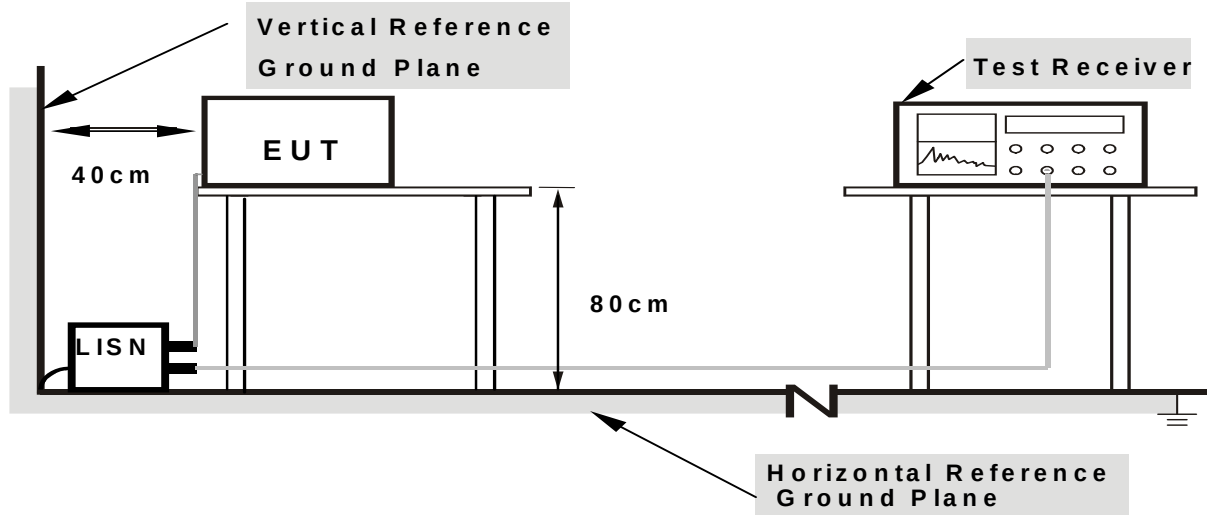
3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

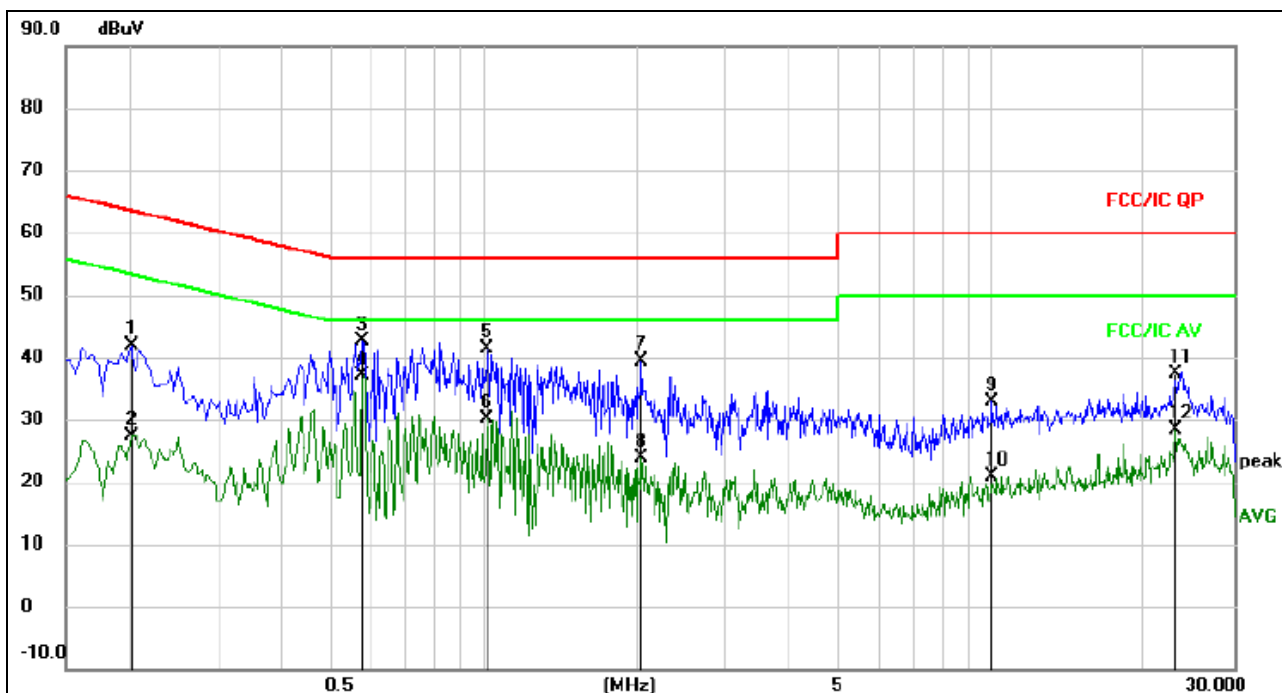
3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

3.1.6 TEST RESULTS

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 5

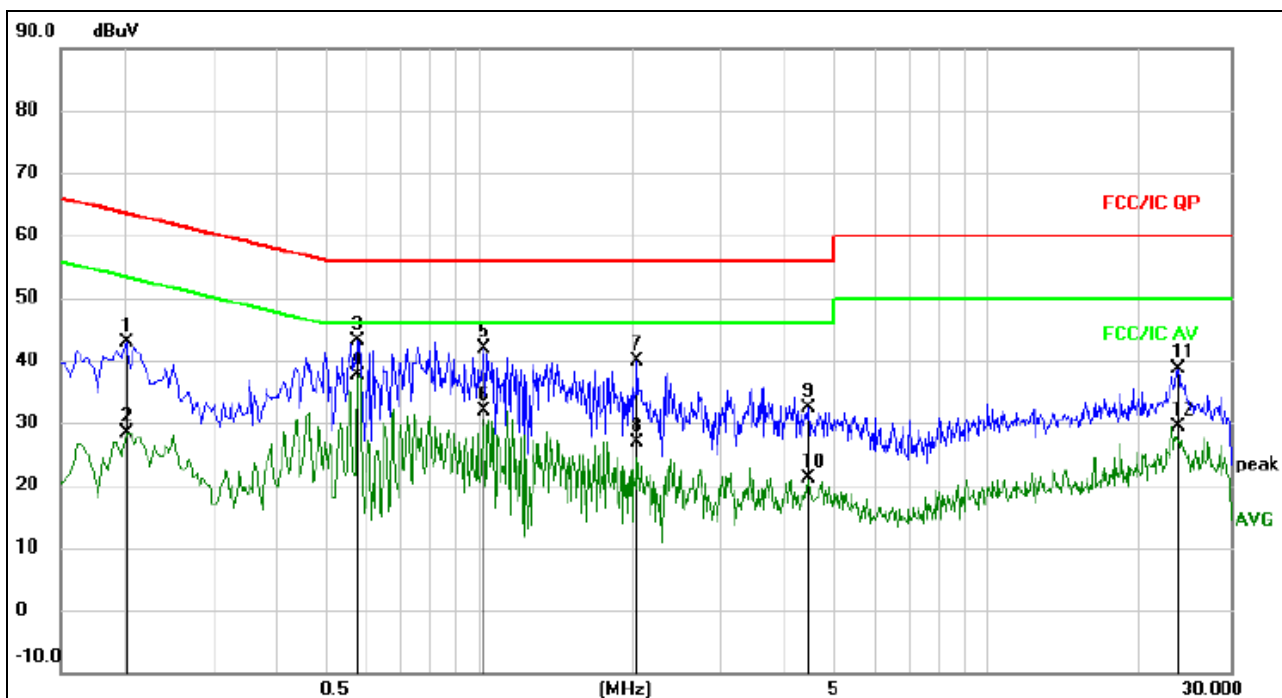


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2020	32.49	9.46	41.95	63.53	-21.58	QP	
2		0.2020	17.96	9.46	27.42	53.53	-26.11	AVG	
3		0.5780	32.72	9.91	42.63	56.00	-13.37	QP	
4	*	0.5780	27.15	9.91	37.06	46.00	-8.94	AVG	
5		1.0180	31.73	9.57	41.30	56.00	-14.70	QP	
6		1.0180	20.51	9.57	30.08	46.00	-15.92	AVG	
7		2.0540	29.81	9.59	39.40	56.00	-16.60	QP	
8		2.0540	14.27	9.59	23.86	46.00	-22.14	AVG	
9		10.0580	23.17	9.69	32.86	60.00	-27.14	QP	
10		10.0580	11.07	9.69	20.76	50.00	-29.24	AVG	
11		23.1259	27.60	9.76	37.36	60.00	-22.64	QP	
12		23.1259	18.63	9.76	28.39	50.00	-21.61	AVG	

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 5


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2020	33.49	9.46	42.95	63.53	-20.58	QP	
2		0.2020	18.96	9.46	28.42	53.53	-25.11	AVG	
3		0.5779	33.22	9.91	43.13	56.00	-12.87	QP	
4	*	0.5779	27.65	9.91	37.56	46.00	-8.44	AVG	
5		1.0220	32.23	9.57	41.80	56.00	-14.20	QP	
6		1.0220	22.27	9.57	31.84	46.00	-14.16	AVG	
7		2.0539	30.31	9.59	39.90	56.00	-16.10	QP	
8		2.0539	17.41	9.59	27.00	46.00	-19.00	AVG	
9		4.4500	22.58	9.76	32.34	56.00	-23.66	QP	
10		4.4500	11.28	9.76	21.04	46.00	-24.96	AVG	
11		23.6660	28.77	9.76	38.53	60.00	-21.47	QP	
12		23.6660	19.63	9.76	29.39	50.00	-20.61	AVG	

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	25GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

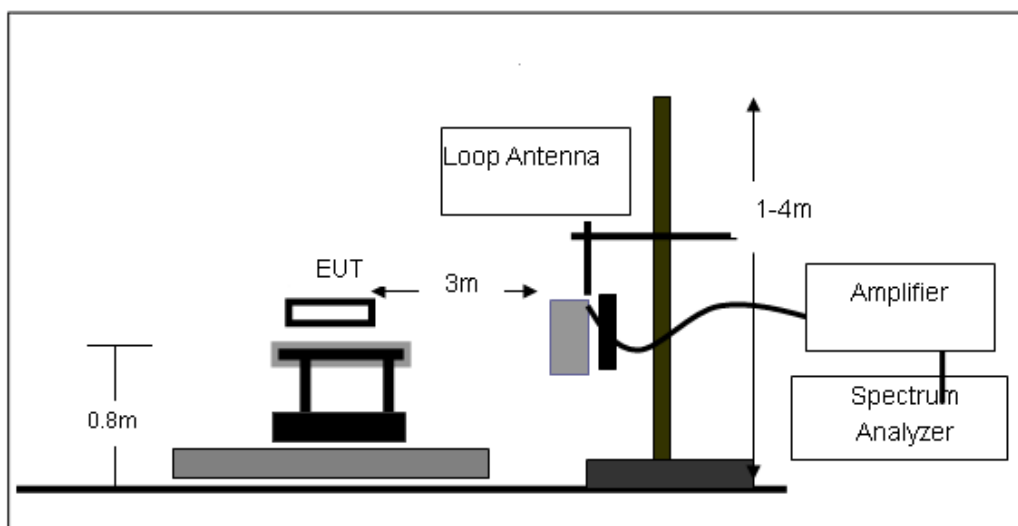
We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

3.2.3 DEVIATION FROM TEST STANDARD

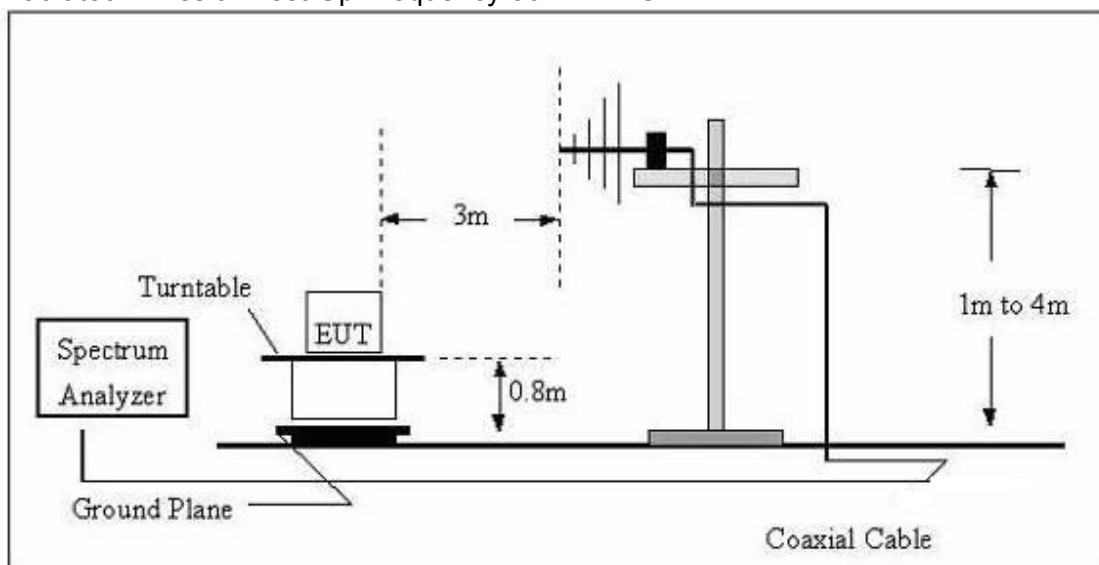
No deviation

3.2.4 TEST SETUP

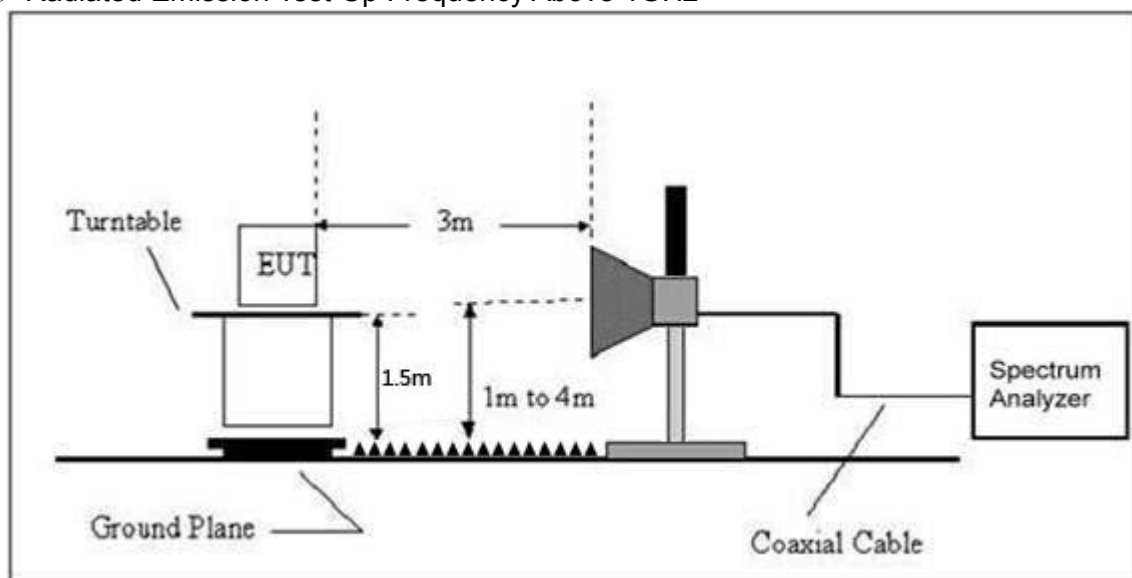
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

Temperature:	20℃	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 5	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

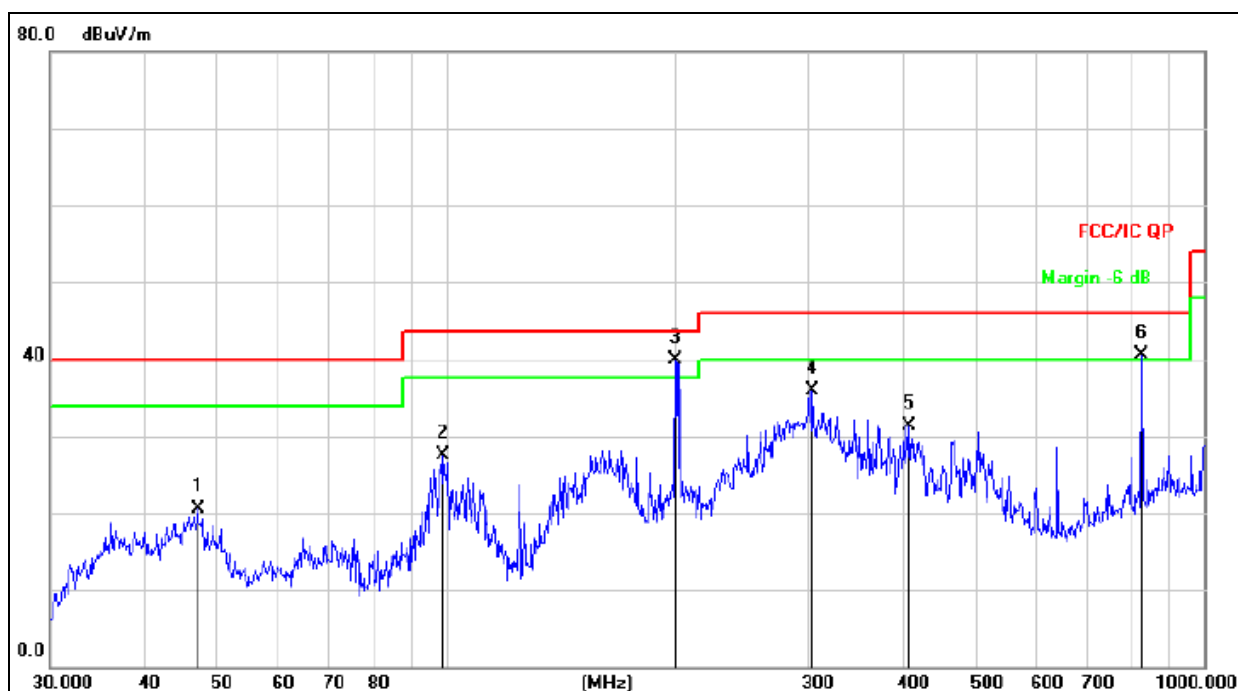
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Voltage :	AC 120V/60Hz		
Test Mode :	Mode 5		

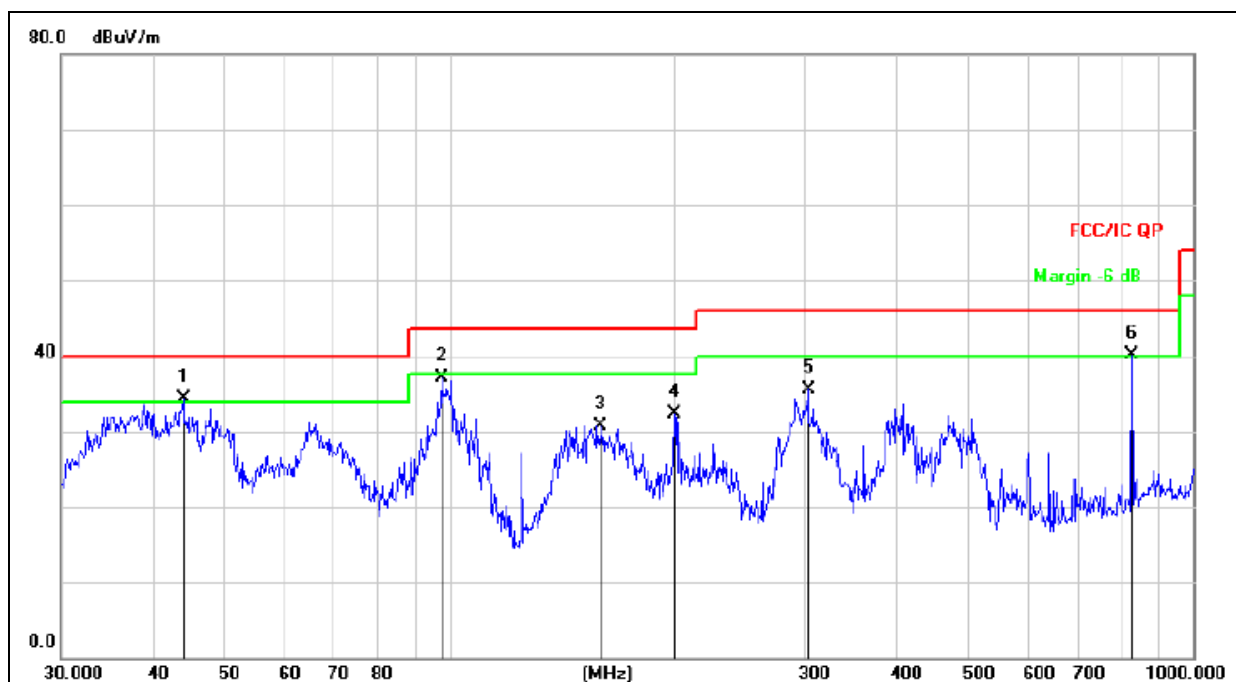


Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		46.9948	35.54	-15.02	20.52	40.00	-19.48	QP
2		99.1797	43.84	-16.43	27.41	43.50	-16.09	QP
3	*	200.6881	56.11	-16.28	39.83	43.50	-3.67	QP
4		304.6099	49.34	-13.47	35.87	46.00	-10.13	QP
5		408.9460	42.24	-10.89	31.35	46.00	-14.65	QP
6	!	827.4934	43.54	-3.02	40.52	46.00	-5.48	QP

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Vertical
Test Voltage :	AC 120V/60Hz		
Test Mode :	Mode 5		



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	43.8119	49.41	-15.20	34.21	40.00	-5.79	QP
2		97.4560	53.77	-16.74	37.03	43.50	-6.47	QP
3		159.7844	49.66	-18.87	30.79	43.50	-12.71	QP
4		200.6881	48.63	-16.28	32.35	43.50	-11.15	QP
5		303.5437	49.10	-13.50	35.60	46.00	-10.40	QP
6	!	827.4934	43.17	-3.02	40.15	46.00	-5.85	QP

3.2.8 TEST RESULTS (1GHZ~25GHZ)

802.11b									
Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2412									
V	4824.00	66.01	39.55	7.85	25.66	59.97	74	-14.03	PK
V	4824.00	49.47	39.55	7.85	25.66	43.43	54	-10.57	AV
V	7236.00	66.25	38.33	7.52	24.55	59.99	74	-14.01	PK
V	7236.00	47.55	38.33	7.52	24.55	41.29	54	-12.71	AV
V	15450.00	50.83	35.23	6.75	26.59	48.94	74	-25.06	PK
H	4824.00	63.05	39.55	7.85	25.66	57.01	74	-16.99	PK
H	4824.00	49.28	39.55	7.85	25.66	43.24	54	-10.76	AV
H	7236.00	69.01	38.33	7.52	23.55	61.75	74	-12.25	PK
H	7236.00	50.81	38.33	7.52	23.22	43.22	54	-10.78	AV
H	15450.00	45.69	35.45	6.75	27.88	44.87	74	-29.13	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2437									
V	4874.00	65.56	38.89	7.57	25.45	59.69	74	-14.31	PK
V	4874.00	48.65	38.89	7.57	25.45	42.78	54	-11.22	AV
V	7311.00	66.68	38.78	7.35	24.78	60.03	74	-13.97	PK
V	7311.00	48.25	38.78	7.35	24.78	41.60	54	-12.40	AV
V	15450.00	52.36	35.89	6.42	26.47	49.36	74	-24.64	PK
H	4874.00	64.89	38.89	7.57	25.45	59.02	74	-14.98	PK
H	4874.00	49.55	38.89	7.57	25.45	43.68	54	-10.32	AV
H	7311.00	70.35	38.78	7.35	24.78	63.70	74	-10.30	PK
H	7311.00	48.81	38.78	7.35	24.78	42.16	54	-11.84	AV
H	15450.00	48.69	36.68	6.45	26.65	45.11	74	-28.89	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2462									
V	4924.00	67.56	38.75	7.46	25.45	61.72	74	-12.28	PK
V	4924.00	48.65	38.75	7.46	25.45	42.81	54	-11.19	AV
V	7386.00	68.68	38.65	7.22	24.78	62.03	74	-11.97	PK
V	7386.00	49.25	38.65	7.22	24.78	42.60	54	-11.40	AV
V	15450.00	53.36	35.58	6.35	26.47	50.60	74	-23.40	PK
H	4924.00	66.89	38.75	7.46	25.45	61.05	74	-12.95	PK
H	4924.00	50.59	38.75	7.46	25.45	44.75	54	-9.25	AV
H	7386.00	69.35	38.65	7.22	24.78	62.70	74	-11.30	PK
H	7386.00	48.56	38.65	7.22	24.78	41.91	54	-12.09	AV
H	15450.00	49.69	36.42	6.32	26.65	46.24	74	-27.76	PK

Remark:

- Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
- If peak below the average limit, the average emission was no test.
- The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

802.11g									
Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2412									
V	4824.00	66.23	39.55	7.85	25.66	60.19	74	-13.81	PK
V	4824.00	49.58	39.55	7.85	25.66	43.54	54	-10.46	AV
V	7236.00	66.39	38.33	7.52	24.55	60.13	74	-13.87	PK
V	7236.00	47.67	38.33	7.52	24.55	41.41	54	-12.59	AV
V	15450.00	50.95	35.23	6.75	26.59	49.06	74	-24.94	PK
H	4824.00	63.25	39.55	7.85	25.66	57.21	74	-16.79	PK
H	4824.00	49.49	39.55	7.85	25.66	43.45	54	-10.55	AV
H	7236.00	69.35	38.33	7.52	23.55	62.09	74	-11.91	PK
H	7236.00	50.47	38.33	7.52	23.22	42.88	54	-11.12	AV
H	15450.00	45.78	35.45	6.75	27.88	44.96	74	-29.04	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2437									
V	4874.00	65.78	38.89	7.57	25.45	59.91	74	-14.09	PK
V	4874.00	48.96	38.89	7.57	25.45	43.09	54	-10.91	AV
V	7311.00	66.45	38.78	7.35	24.78	59.80	74	-14.20	PK
V	7311.00	48.78	38.78	7.35	24.78	42.13	54	-11.87	AV
V	15450.00	52.59	35.89	6.42	26.47	49.59	74	-24.41	PK
H	4874.00	64.23	38.89	7.57	25.45	58.36	74	-15.64	PK
H	4874.00	49.75	38.89	7.57	25.45	43.88	54	-10.12	AV
H	7311.00	70.89	38.78	7.35	24.78	64.24	74	-9.76	PK
H	7311.00	48.78	38.78	7.35	24.78	42.13	54	-11.87	AV
H	15450.00	48.75	36.68	6.45	26.65	45.17	74	-28.83	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2462									
V	4924.00	67.89	38.75	7.46	25.45	62.05	74	-11.95	PK
V	4924.00	48.45	38.75	7.46	25.45	42.61	54	-11.39	AV
V	7386.00	68.57	38.65	7.22	24.78	61.92	74	-12.08	PK
V	7386.00	49.78	38.65	7.22	24.78	43.13	54	-10.87	AV
V	15450.00	53.66	35.58	6.35	26.47	50.90	74	-23.10	PK
H	4924.00	66.55	38.75	7.46	25.45	60.71	74	-13.29	PK
H	4924.00	50.44	38.75	7.46	25.45	44.60	54	-9.40	AV
H	7386.00	69.37	38.65	7.22	24.78	62.72	74	-11.28	PK
H	7386.00	48.88	38.65	7.22	24.78	42.23	54	-11.77	AV
H	15450.00	49.74	36.42	6.32	26.65	46.29	74	-27.71	PK

Remark:

- Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
- If peak below the average limit, the average emission was no test.
- The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

802.11n(20MHz)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2412									
V	4824.00	67.22	39.55	7.85	25.66	61.18	74	-12.82	PK
V	4824.00	48.88	39.55	7.85	25.66	42.84	54	-11.16	AV
V	7236.00	66.95	38.33	7.52	24.55	60.69	74	-13.31	PK
V	7236.00	48.56	38.33	7.52	24.55	42.30	54	-11.70	AV
V	15450.00	51.45	35.23	6.75	26.59	49.56	74	-24.44	PK
H	4824.00	68.25	39.55	7.85	25.66	62.21	74	-11.79	PK
H	4824.00	49.44	39.55	7.85	25.66	43.40	54	-10.60	AV
H	7236.00	69.31	38.33	7.52	23.55	62.05	74	-11.95	PK
H	7236.00	52.41	38.33	7.52	23.22	44.82	54	-9.18	AV
H	15450.00	47.32	35.45	6.75	27.88	46.50	74	-27.50	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2437									
V	4874.00	66.94	38.89	7.57	25.45	61.07	74	-12.93	PK
V	4874.00	49.56	38.89	7.57	25.45	43.69	54	-10.31	AV
V	7311.00	67.25	38.78	7.35	24.78	60.60	74	-13.40	PK
V	7311.00	47.55	38.78	7.35	24.78	40.90	54	-13.10	AV
V	15450.00	52.11	35.89	6.42	26.47	49.11	74	-24.89	PK
H	4874.00	65.78	38.89	7.57	25.45	59.91	74	-14.09	PK
H	4874.00	49.71	38.89	7.57	25.45	43.84	54	-10.16	AV
H	7311.00	69.56	38.78	7.35	24.78	62.91	74	-11.09	PK
H	7311.00	48.77	38.78	7.35	24.78	42.12	54	-11.88	AV
H	15450.00	49.25	36.68	6.45	26.65	45.67	74	-28.33	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2462									
V	4924.00	68.25	38.75	7.46	25.45	62.41	74	-11.59	PK
V	4924.00	50.78	38.75	7.46	25.45	44.94	54	-9.06	AV
V	7386.00	67.56	38.65	7.22	24.78	60.91	74	-13.09	PK
V	7386.00	49.25	38.65	7.22	24.78	42.60	54	-11.40	AV
V	15450.00	53.22	35.58	6.35	26.47	50.46	74	-23.54	PK
H	4924.00	66.11	38.75	7.46	25.45	60.27	74	-13.73	PK
H	4924.00	50.35	38.75	7.46	25.45	44.51	54	-9.49	AV
H	7386.00	69.78	38.65	7.22	24.78	63.13	74	-10.87	PK
H	7386.00	48.96	38.65	7.22	24.78	42.31	54	-11.69	AV
H	15450.00	50.47	36.42	6.32	26.65	47.02	74	-26.98	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

802.11n(40MHz)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2422									
V	4844.000	68.11	39.55	7.77	25.66	61.99	74	-12.01	PK
V	4844.000	48.44	39.55	7.77	25.66	42.32	54	-11.68	AV
V	7266.000	67.25	38.33	7.30	24.55	60.77	74	-13.23	PK
V	7266.000	48.86	38.33	7.30	24.55	42.38	54	-11.62	AV
V	15450.00	51.75	35.23	6.60	26.59	49.71	74	-24.29	PK
H	4844.000	68.78	39.55	7.77	25.66	62.66	74	-11.34	PK
H	4844.000	49.98	39.55	7.77	25.66	43.86	54	-10.14	AV
H	7266.000	69.74	38.33	7.30	23.55	62.26	74	-11.74	PK
H	7266.000	52.62	38.33	7.30	23.22	44.81	54	-9.19	AV
H	15450.00	48.58	35.45	6.60	27.88	47.61	74	-26.39	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2437									
V	4874.00	66.74	38.89	7.57	25.45	60.87	74	-13.13	PK
V	4874.00	49.35	38.89	7.57	25.45	43.48	54	-10.52	AV
V	7311.00	67.35	38.78	7.35	24.78	60.70	74	-13.30	PK
V	7311.00	47.57	38.78	7.35	24.78	40.92	54	-13.08	AV
V	15450.00	52.48	35.89	6.42	26.47	49.48	74	-24.52	PK
H	4874.00	65.68	38.89	7.57	25.45	59.81	74	-14.19	PK
H	4874.00	49.25	38.89	7.57	25.45	43.38	54	-10.62	AV
H	7311.00	69.23	38.78	7.35	24.78	62.58	74	-11.42	PK
H	7311.00	48.71	38.78	7.35	24.78	42.06	54	-11.94	AV
H	15450.00	49.63	36.68	6.42	26.65	46.02	74	-27.98	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2452									
V	4904.00	68.66	38.75	7.38	25.45	62.74	74	-11.26	PK
V	4904.00	50.85	38.75	7.38	25.45	44.93	54	-9.07	AV
V	7356.00	67.32	38.65	7.15	24.78	60.60	74	-13.40	PK
V	7356.00	49.47	38.65	7.15	24.78	42.75	54	-11.25	AV
V	15450.00	53.69	35.58	6.25	26.47	50.83	74	-23.17	PK
H	4904.00	66.36	38.75	7.38	25.45	60.44	74	-13.56	PK
H	4904.00	50.47	38.75	7.38	25.45	44.55	54	-9.45	AV
H	7356.00	69.69	38.65	7.15	24.78	62.97	74	-11.03	PK
H	7356.00	48.75	38.65	7.15	24.78	42.03	54	-11.97	AV
H	15450.00	50.25	36.42	6.25	26.65	46.73	74	-27.27	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.3 RADIATED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.205

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

3.3.2 TEST PROCEDURE

Above 1GHz test procedure as below:

- a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel,the Highest channel

Note:

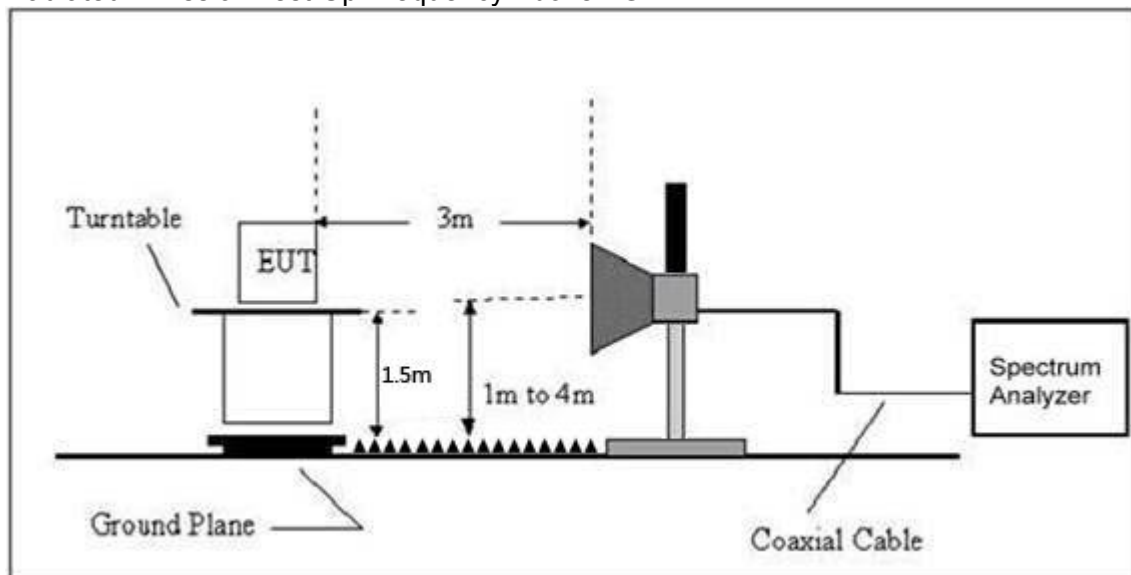
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



3.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.6 TEST RESULT

802.11b

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2412							
V	2390.00	38.05	13.83	51.88	74.00	-22.12	PK
V	2390.00	26.43	13.83	40.26	54.00	-13.74	AV
V	2400.00	38.26	13.85	52.11	74.00	-21.89	PK
V	2400.00	25.99	13.85	39.84	54.00	-14.16	AV
H	2390.00	38.35	13.83	52.18	74.00	-21.82	PK
H	2390.00	26.46	13.83	40.29	54.00	-13.71	AV
V	2400.00	38.21	13.85	52.06	74.00	-21.94	PK
V	2400.00	26.40	13.85	40.25	54.00	-13.75	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2462							
V	2483.50	38.26	14.02	52.28	74.00	-21.72	PK
V	2483.50	26.68	14.02	40.70	54.00	-13.30	AV
V	2500.00	38.20	14.06	52.26	74.00	-21.74	PK
V	2500.00	26.10	14.06	40.16	54.00	-13.84	AV
H	2483.50	38.39	14.02	52.41	74.00	-21.59	PK
H	2483.50	26.72	14.02	40.74	54.00	-13.26	AV
H	2500.00	38.00	14.06	52.06	74.00	-21.94	PK
H	2500.00	26.98	14.06	41.04	54.00	-12.96	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

802.11b

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2412							
V	2390.00	37.74	13.83	51.57	74.00	-22.43	PK
V	2390.00	26.21	13.83	40.04	54.00	-13.96	AV
V	2400.00	37.95	13.85	51.80	74.00	-22.20	PK
V	2400.00	25.79	13.85	39.64	54.00	-14.36	AV
H	2390.00	38.04	13.83	51.87	74.00	-22.13	PK
H	2390.00	26.24	13.83	40.07	54.00	-13.93	AV
V	2400.00	37.90	13.85	51.75	74.00	-22.25	PK
V	2400.00	26.18	13.85	40.03	54.00	-13.97	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2462							
V	2483.50	37.95	14.02	51.97	74.00	-22.03	PK
V	2483.50	26.46	14.02	40.48	54.00	-13.52	AV
V	2500.00	37.89	14.06	51.95	74.00	-22.05	PK
V	2500.00	25.89	14.06	39.95	54.00	-14.05	AV
H	2483.50	38.08	14.02	52.10	74.00	-21.90	PK
H	2483.50	26.50	14.02	40.52	54.00	-13.48	AV
H	2500.00	37.69	14.06	51.75	74.00	-22.25	PK
H	2500.00	26.76	14.06	40.82	54.00	-13.18	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

802.11n(20MHz)

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2412							
V	2390.00	37.85	13.83	51.68	74.00	-22.32	PK
V	2390.00	26.29	13.83	40.12	54.00	-13.88	AV
V	2400.00	38.06	13.85	51.91	74.00	-22.09	PK
V	2400.00	25.86	13.85	39.71	54.00	-14.29	AV
H	2390.00	38.15	13.83	51.98	74.00	-22.02	PK
H	2390.00	26.32	13.83	40.15	54.00	-13.85	AV
V	2400.00	38.01	13.85	51.86	74.00	-22.14	PK
V	2400.00	26.26	13.85	40.11	54.00	-13.89	AV

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2462							
V	2483.50	38.06	14.02	52.08	74.00	-21.92	PK
V	2483.50	26.54	14.02	40.56	54.00	-13.44	AV
V	2500.00	38.00	14.06	52.06	74.00	-21.94	PK
V	2500.00	25.96	14.06	40.02	54.00	-13.98	AV
H	2483.50	38.19	14.02	52.21	74.00	-21.79	PK
H	2483.50	26.58	14.02	40.60	54.00	-13.40	AV
H	2500.00	37.80	14.06	51.86	74.00	-22.14	PK
H	2500.00	26.83	14.06	40.89	54.00	-13.11	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

802.11n(40MHz)

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2422							
V	2390.00	38.17	13.83	52.00	74.00	-22.00	PK
V	2390.00	26.51	13.83	40.34	54.00	-13.66	AV
V	2400.00	38.38	13.85	52.23	74.00	-21.77	PK
V	2400.00	26.07	13.85	39.92	54.00	-14.08	AV
H	2390.00	38.46	13.83	52.29	74.00	-21.71	PK
H	2390.00	26.54	13.83	40.37	54.00	-13.63	AV
V	2400.00	38.33	13.85	52.18	74.00	-21.82	PK
V	2400.00	26.48	13.85	40.33	54.00	-13.67	AV

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2452							
V	2483.50	38.38	14.02	52.40	74.00	-21.60	PK
V	2483.50	26.76	14.02	40.78	54.00	-13.22	AV
V	2500.00	38.32	14.06	52.38	74.00	-21.62	PK
V	2500.00	26.18	14.06	40.24	54.00	-13.76	AV
H	2483.50	38.50	14.02	52.52	74.00	-21.48	PK
H	2483.50	26.80	14.02	40.82	54.00	-13.18	AV
H	2500.00	38.12	14.06	52.18	74.00	-21.82	PK
H	2500.00	27.06	14.06	41.12	54.00	-12.88	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

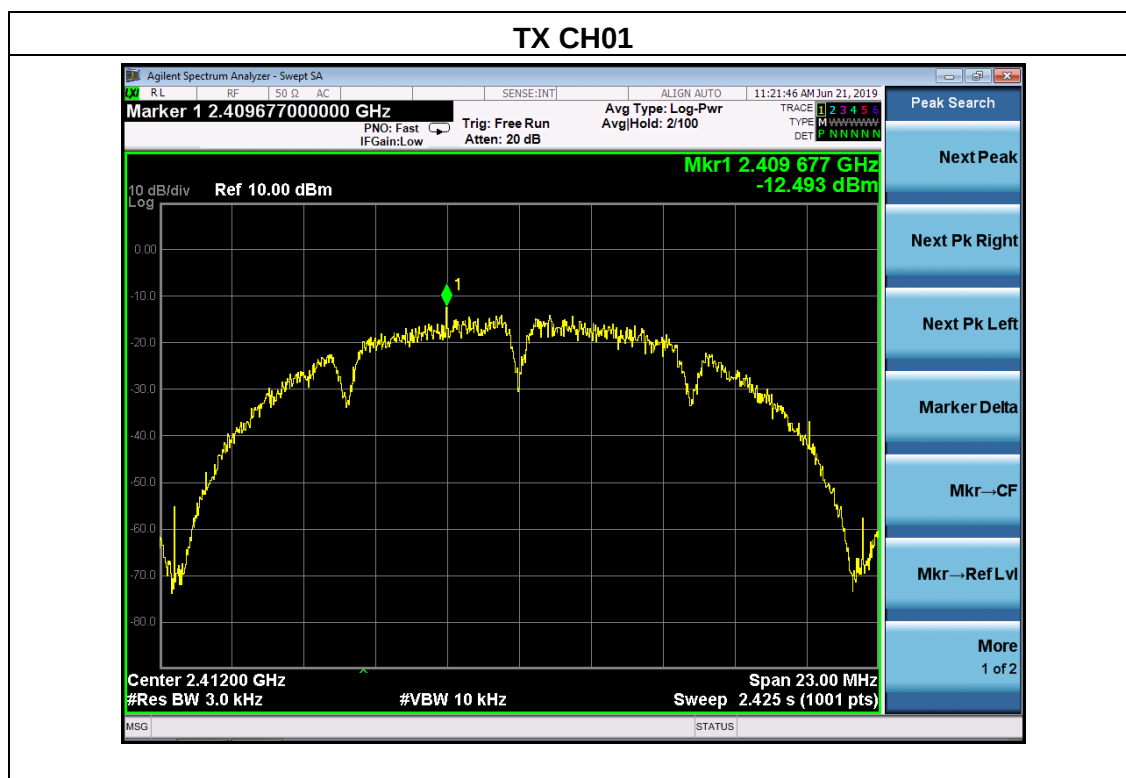
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX b Mode		

Frequency	Power Density (dBm/3KHz)		Limit (dBm/3KHz)	Result
2412 MHz	Ant.1	-12.49	8	PASS
	Ant.2	-4.66		
2437 MHz	Ant.1	-8.45	8	PASS
	Ant.2	-11.76		
2462 MHz	Ant.1	-8.73	8	PASS
	Ant.2	-8.68		

Ant. 1





TX CH06

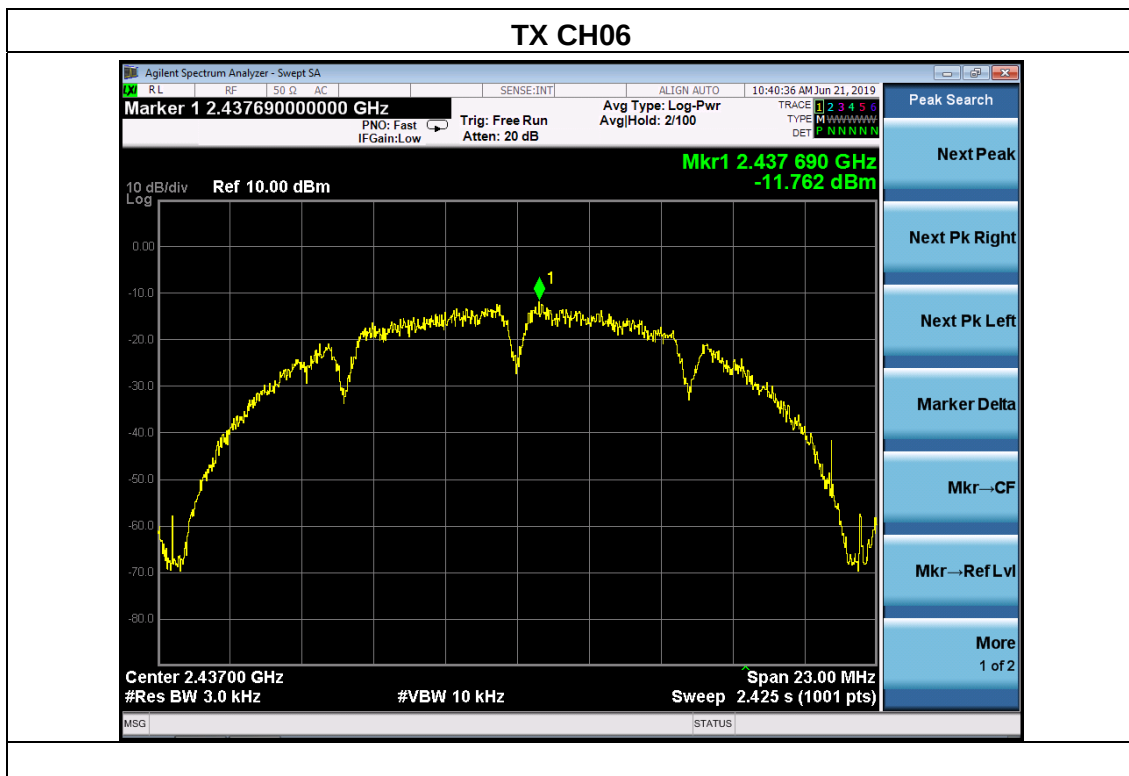
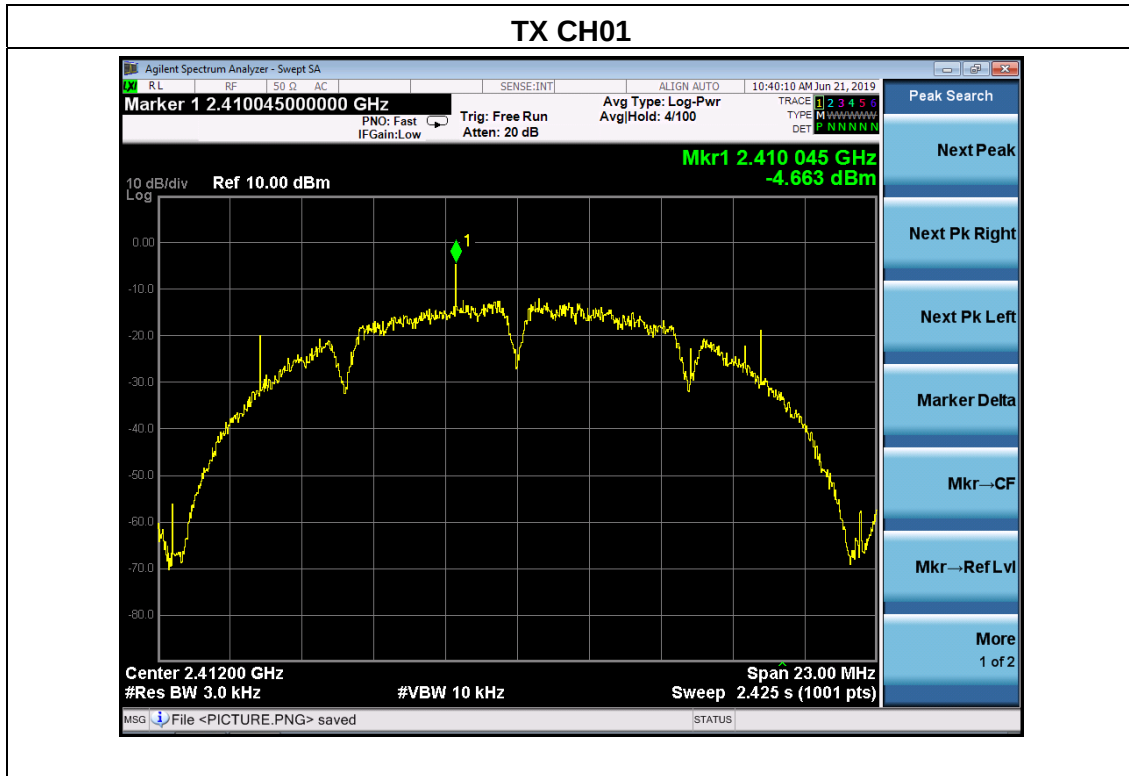


TX CH11





Ant. 2





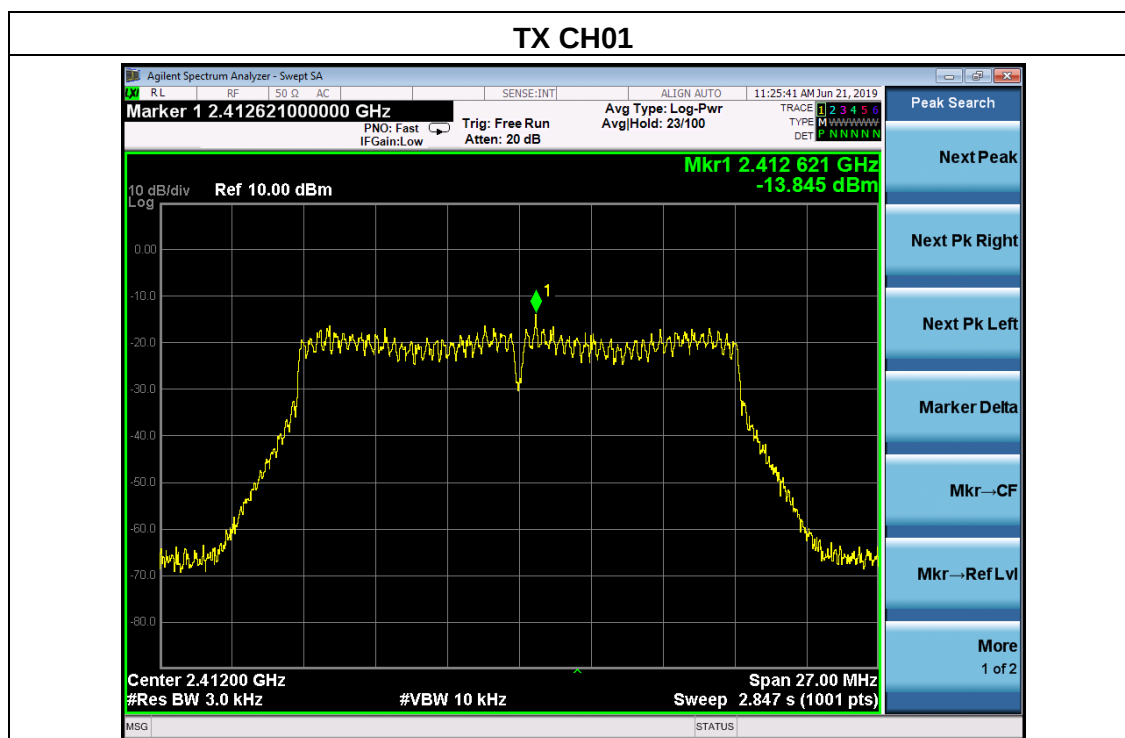
TX CH11



Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX g Mode		

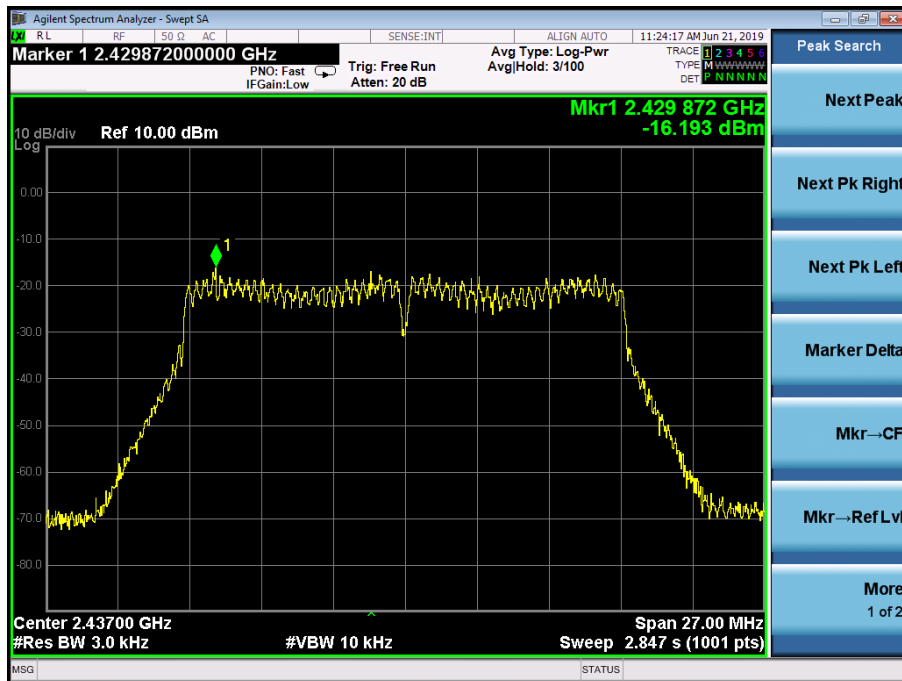
Frequency	Power Density (dBm/3KHz)		Limit (dBm/3KHz)	Result
2412 MHz	Ant.1	-13.85	8	PASS
	Ant.2	-13.43		
2437 MHz	Ant.1	-16.19	8	PASS
	Ant.2	-13.76		
2462 MHz	Ant.1	-15.60	8	PASS
	Ant.2	-13.33		

Ant.1

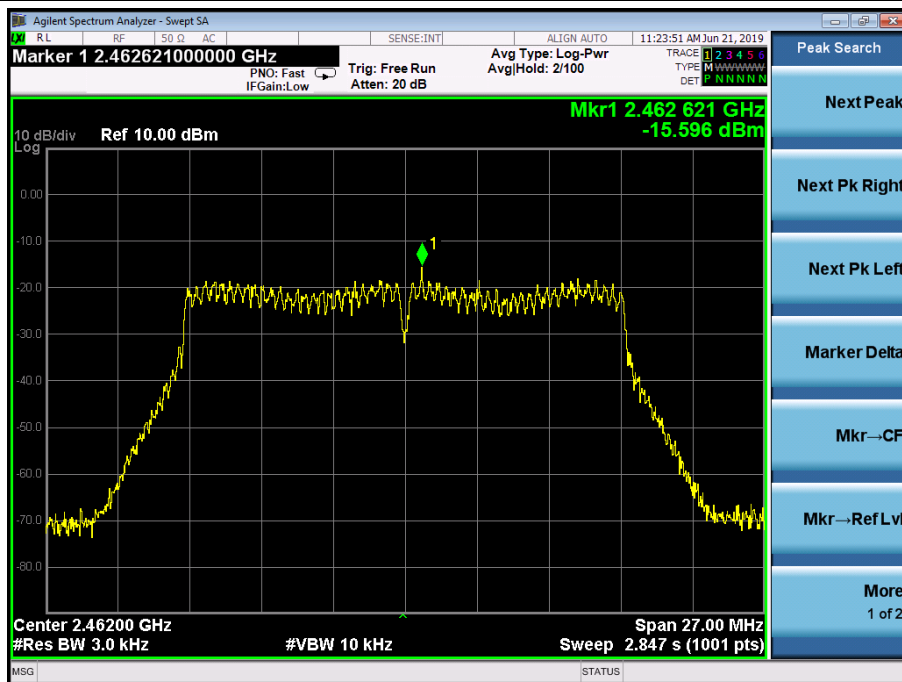




TX CH06

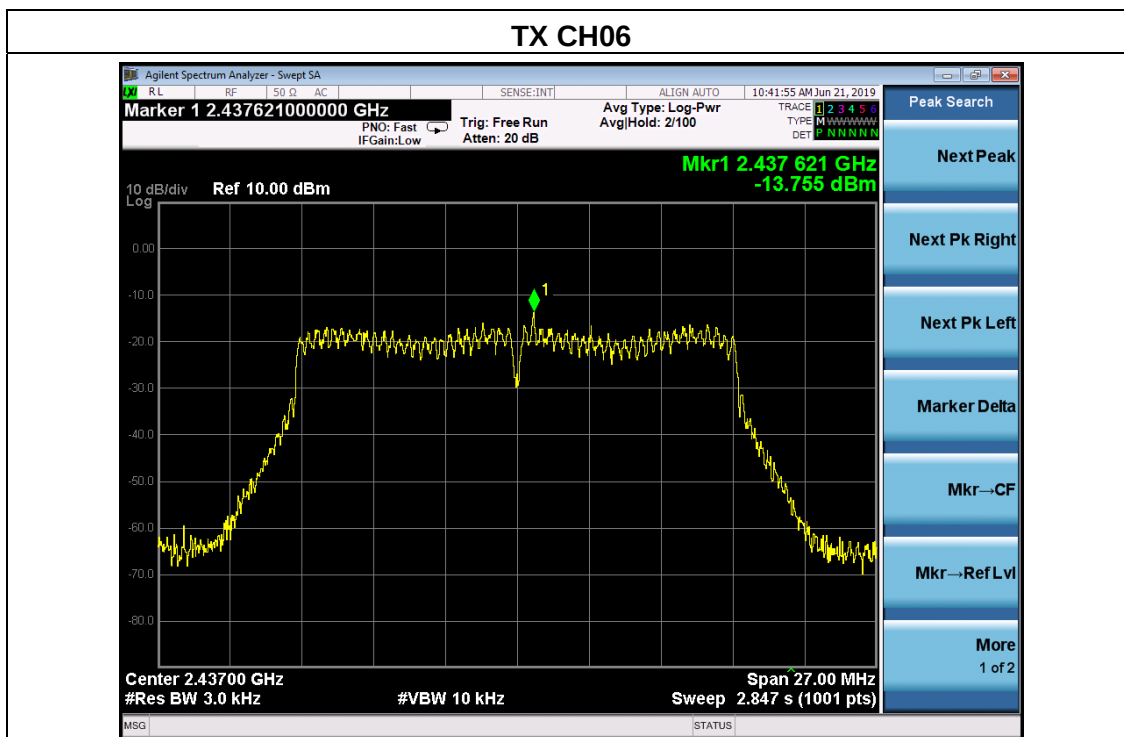
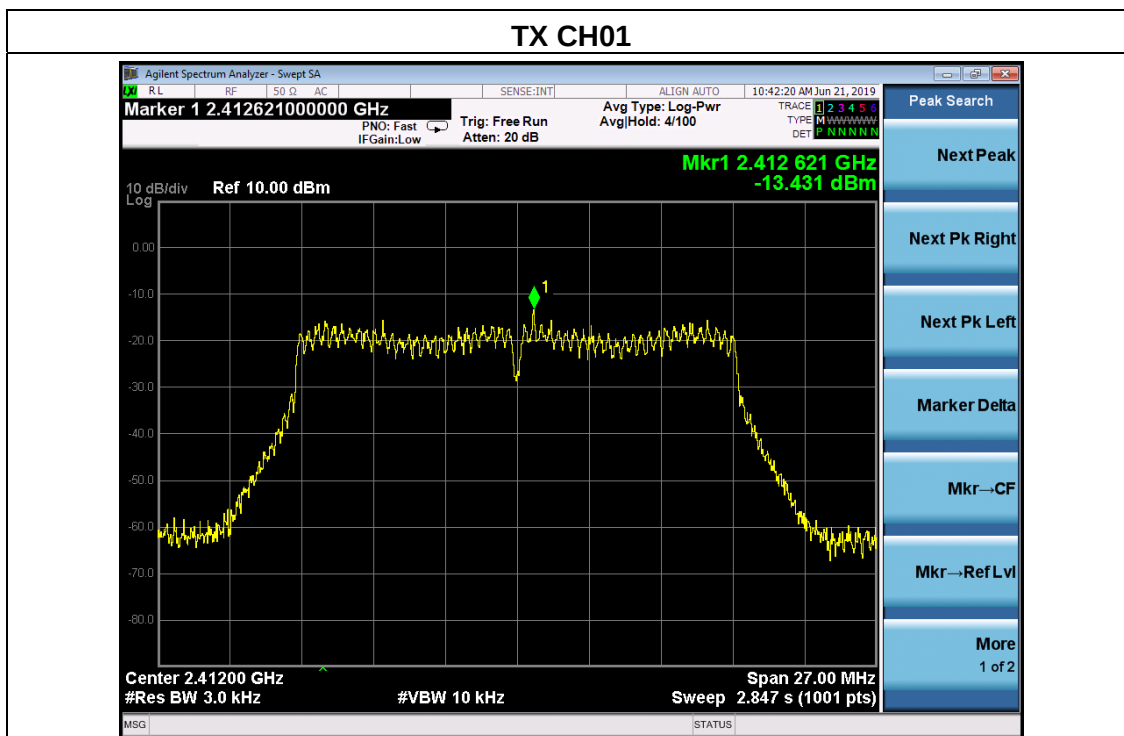


TX CH11



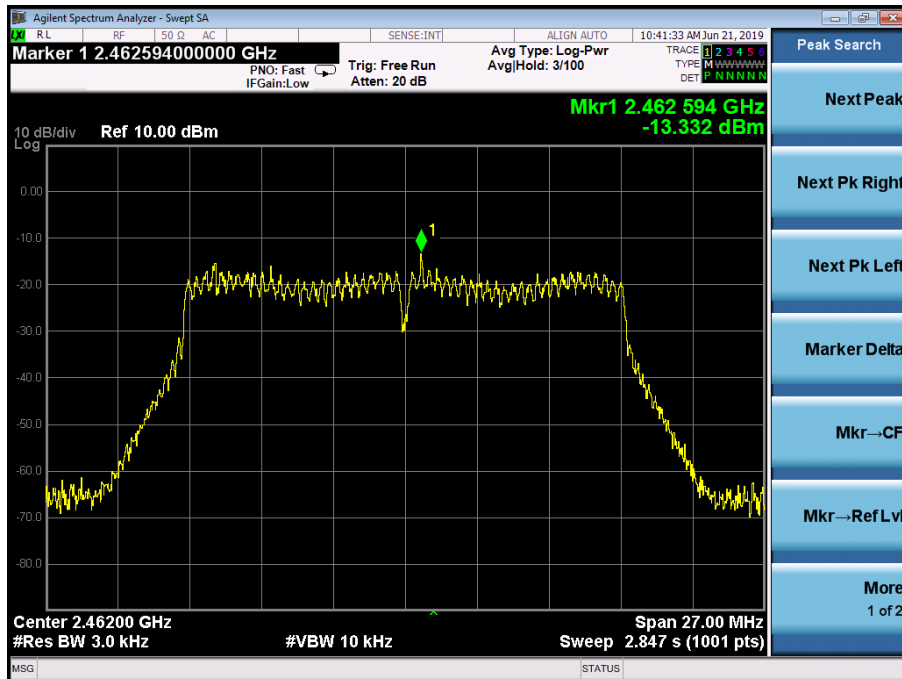


Ant.2





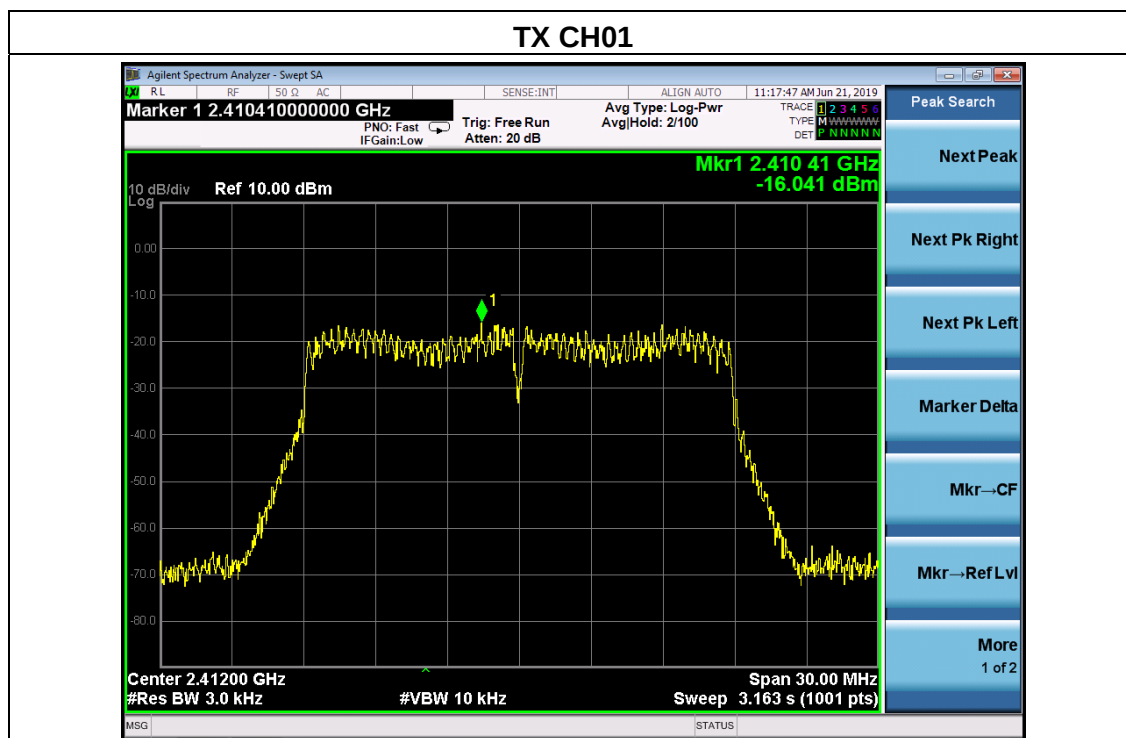
TX CH11



Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX n Mode(20M)		

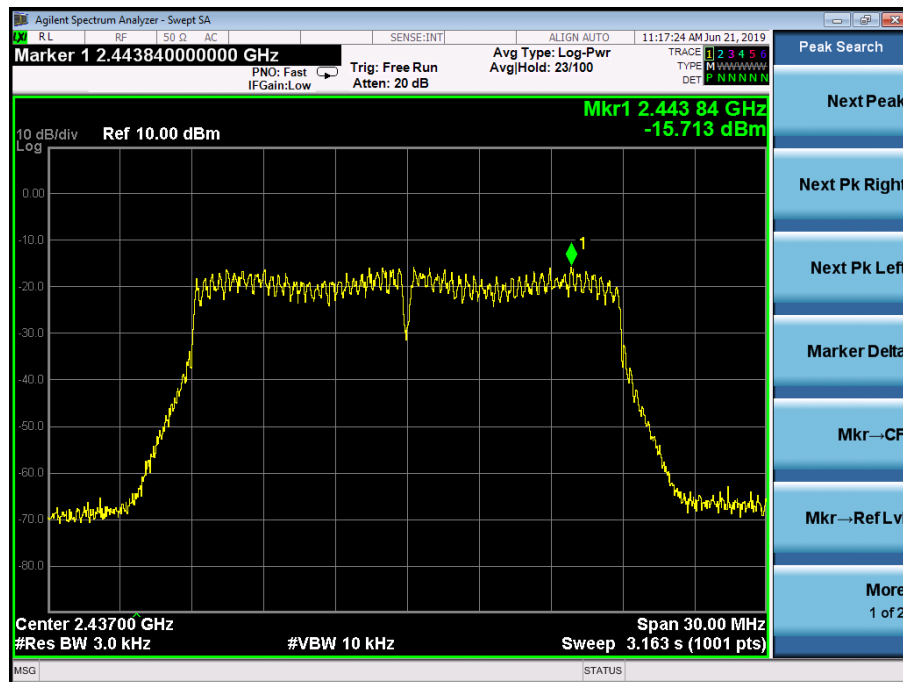
Frequency	Read Level (dBm/3KHz)		Total Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
2412 MHz	Ant.1	-16.04	-13.16	8	PASS
	Ant.2	-16.31			
2437 MHz	Ant.1	-15.71	-12.89	8	PASS
	Ant.2	-16.10			
2462 MHz	Ant.1	-13.37	-11.71	8	PASS
	Ant.2	-16.70			

Ant.1

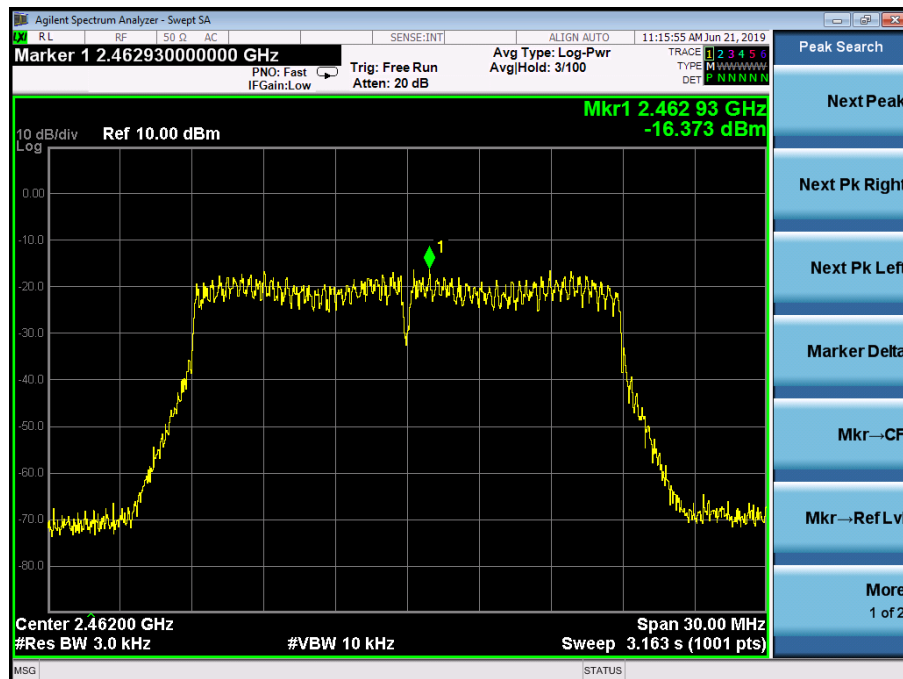




TX CH06

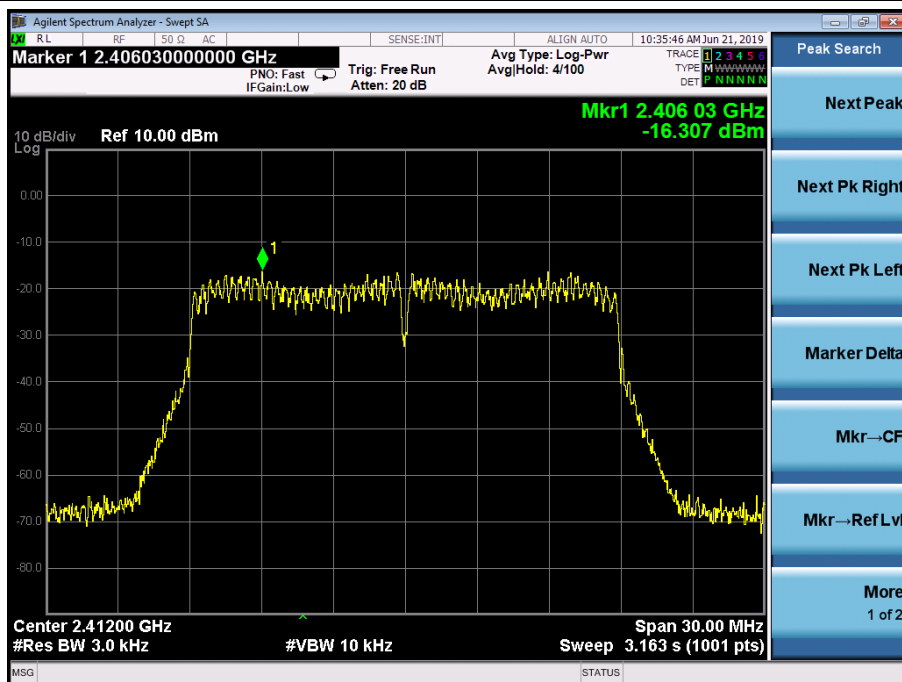


TX CH11

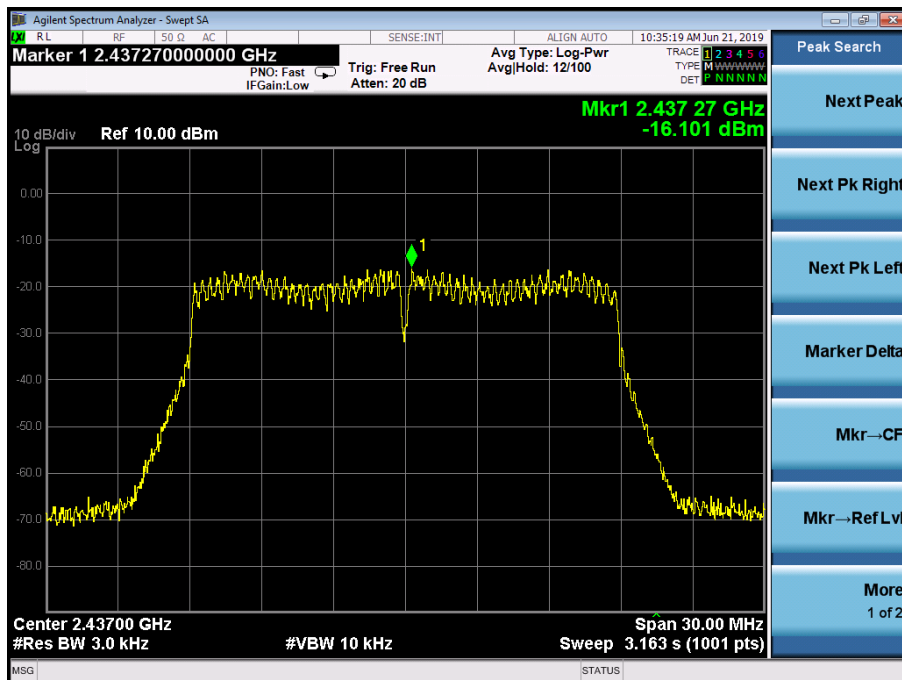




TX CH01

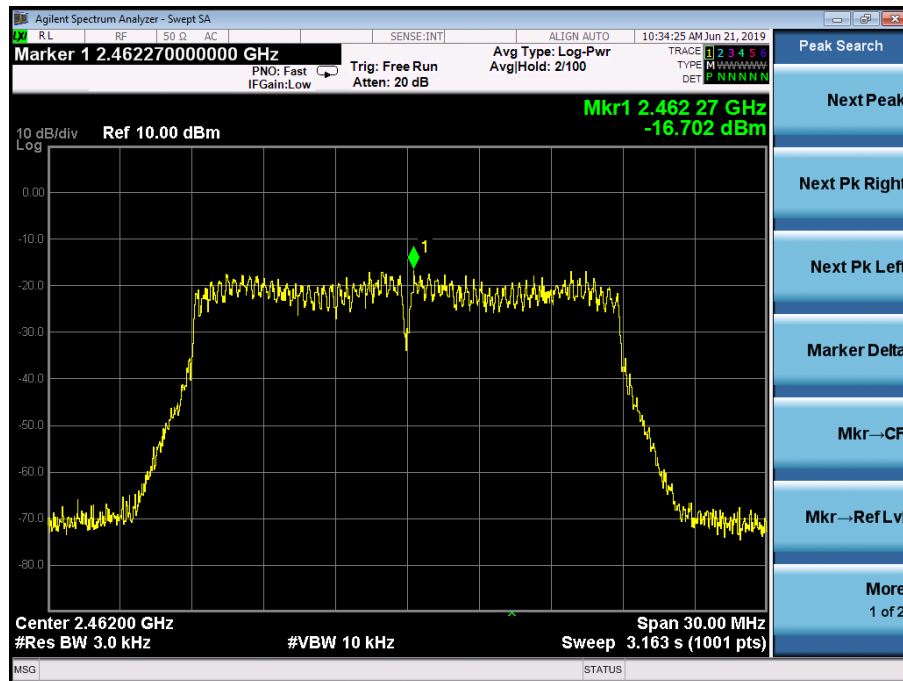


TX CH06





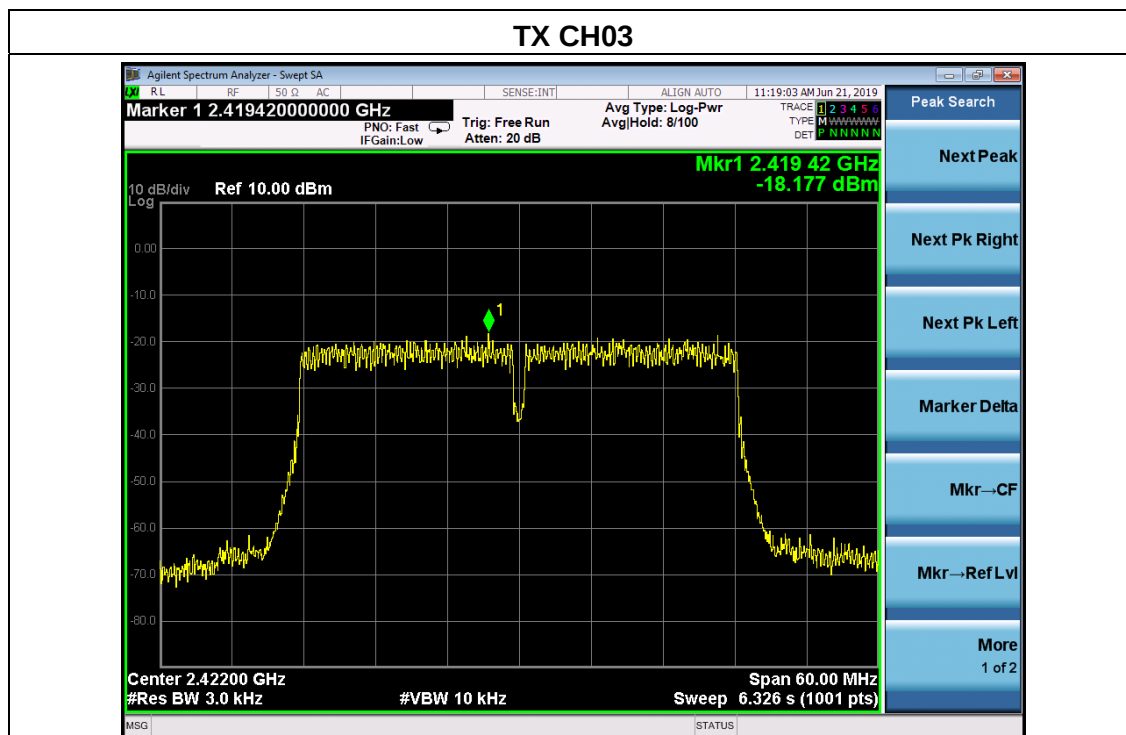
TX CH11



Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX n Mode(40M)		

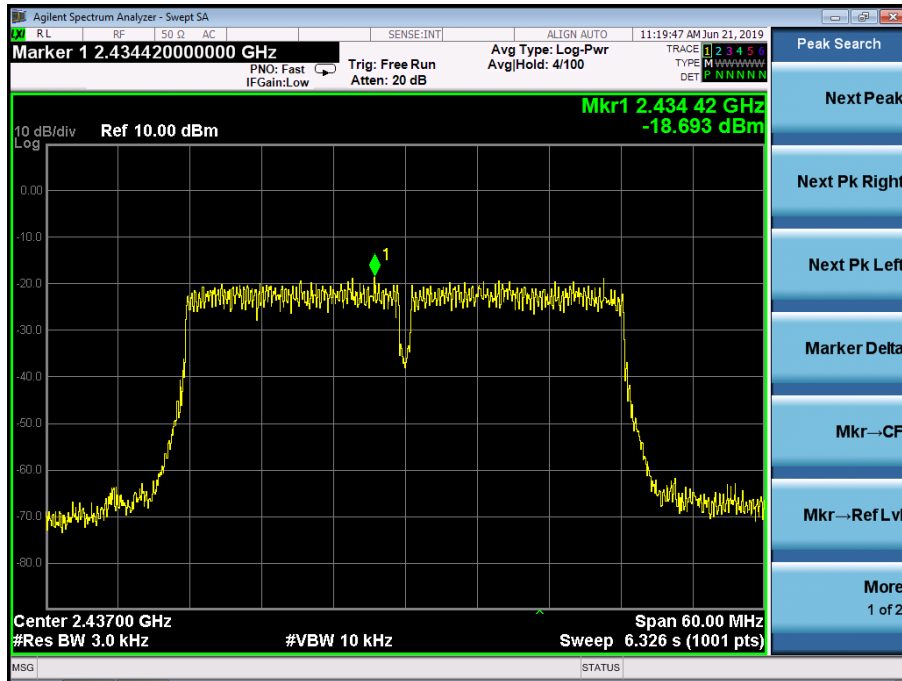
Frequency	Read Level (dBm/3KHz)		Total Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
2422 MHz	Ant.1	-18.18	-14.91	8	PASS
	Ant.2	-17.68			
2437 MHz	Ant.1	-18.69	-15.11	8	PASS
	Ant.2	-17.62			
2452 MHz	Ant.1	-18.23	-15.21	8	PASS
	Ant.2	-18.21			

Ant.1

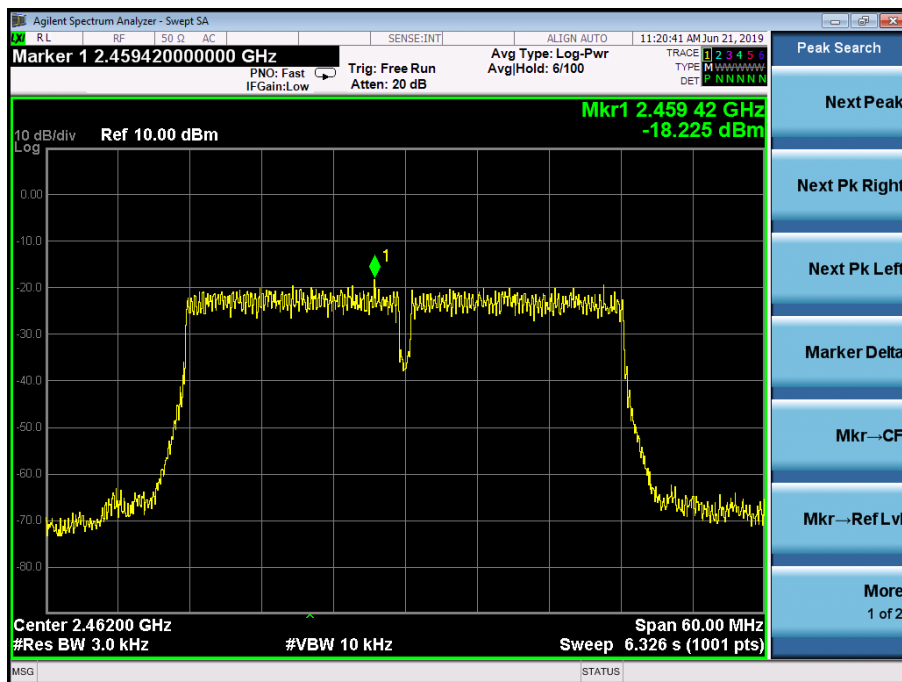




TX CH06

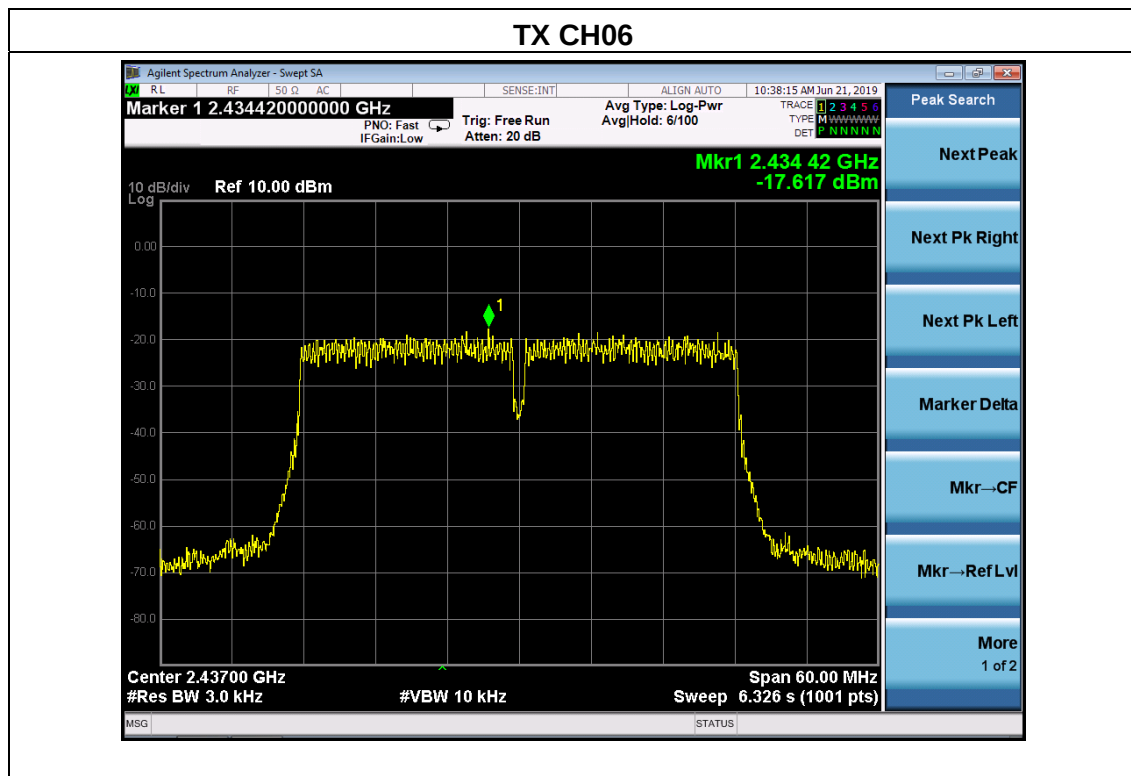
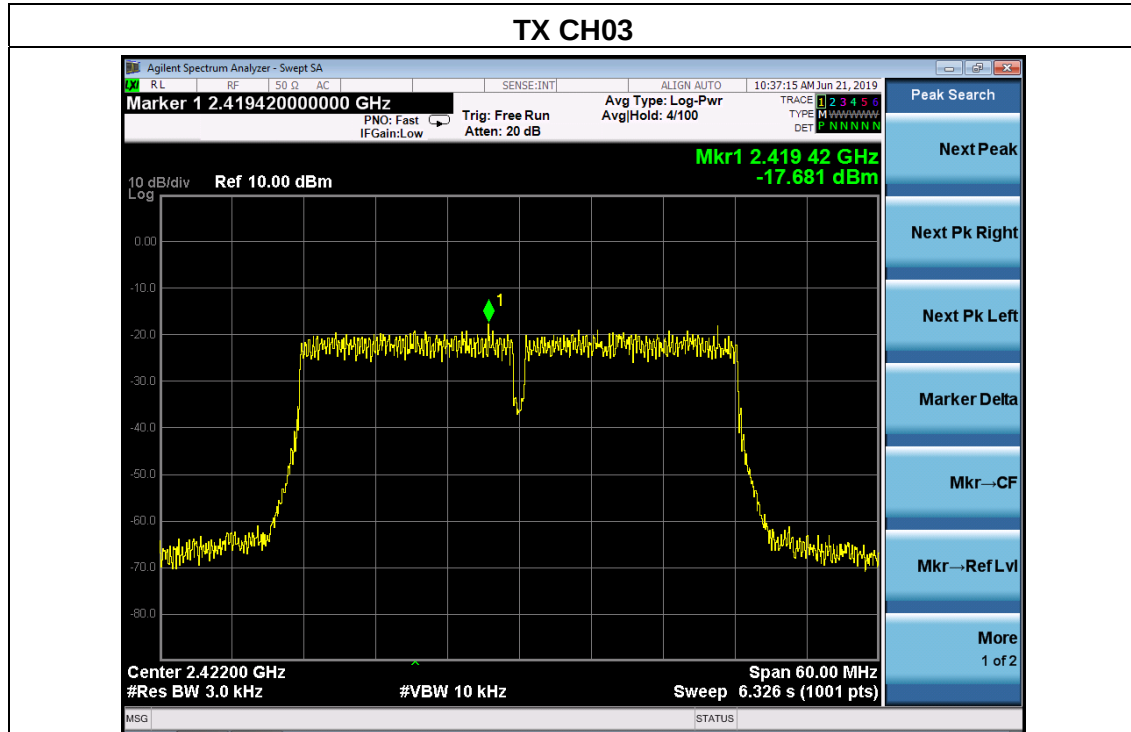


TX CH09



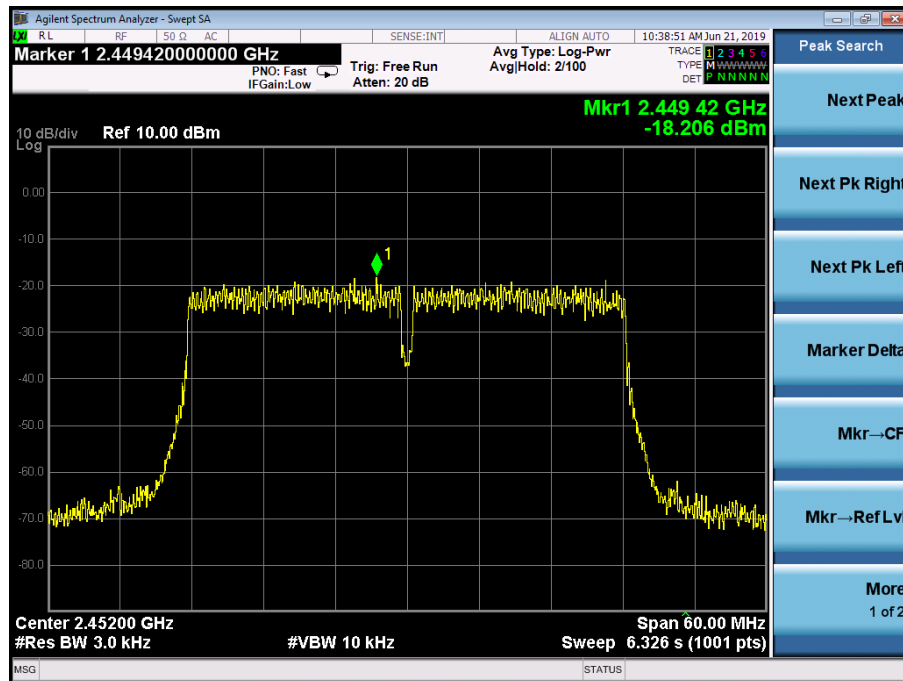


Ant.2





TX CH09



5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

5.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. 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.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

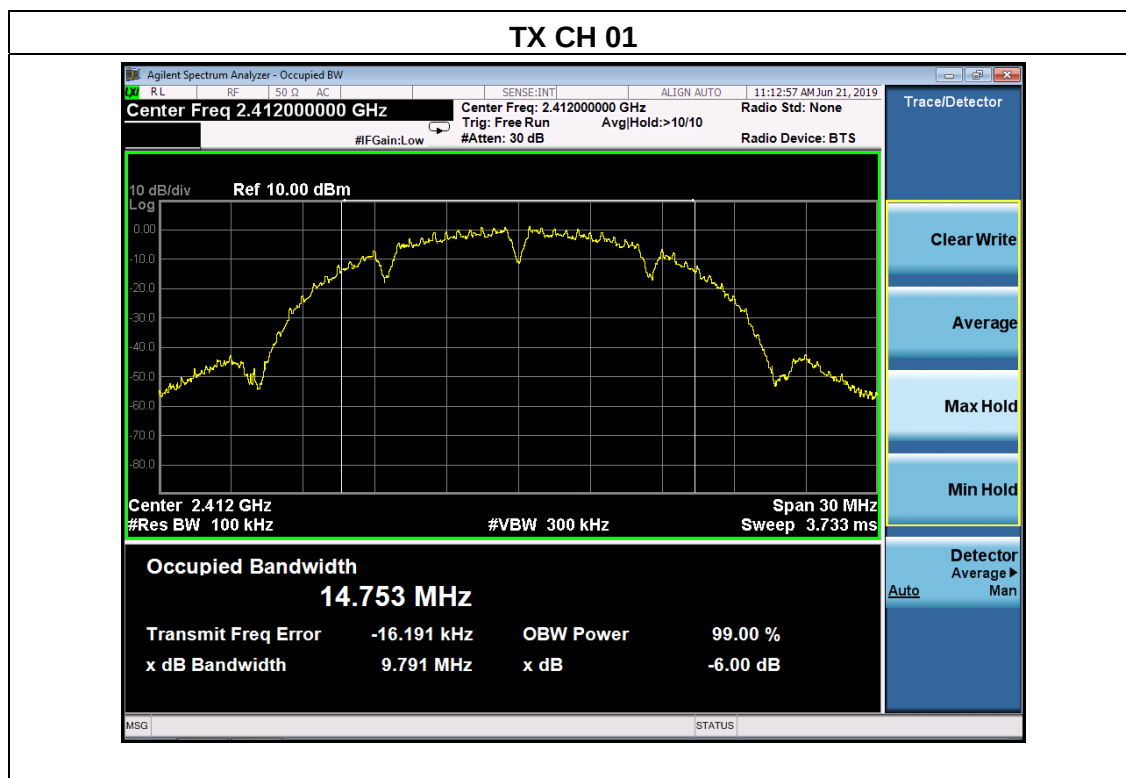
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

Temperature :	25°C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX b Mode		

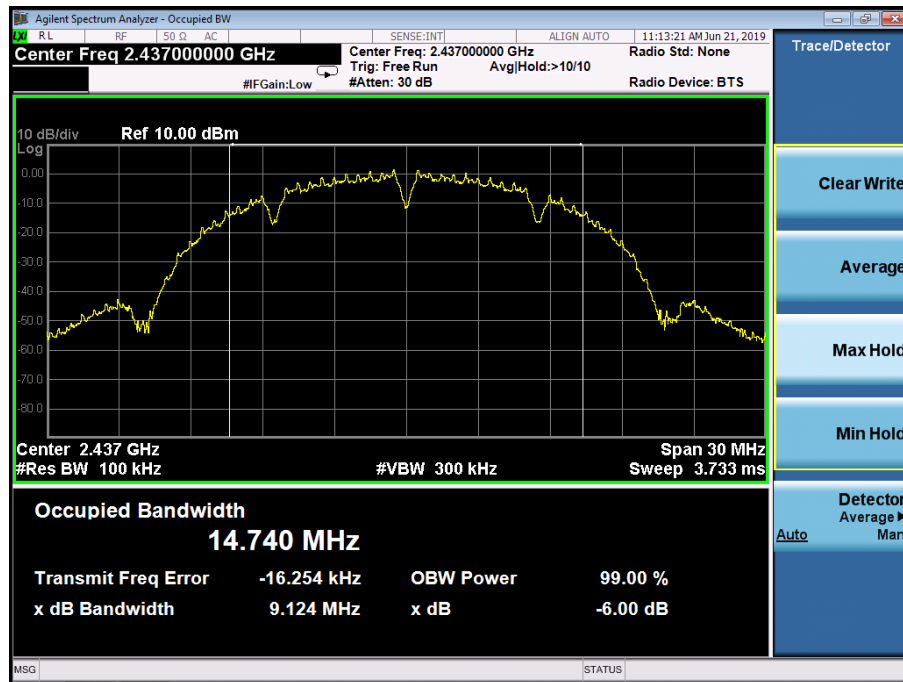
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2412	Ant.1	9.791	500	Pass
		Ant.2	9.323	500	Pass
Middle	2437	Ant.1	9.124	500	Pass
		Ant.2	9.562	500	Pass
High	2462	Ant.1	9.569	500	Pass
		Ant.2	9.099	500	Pass

Ant.1

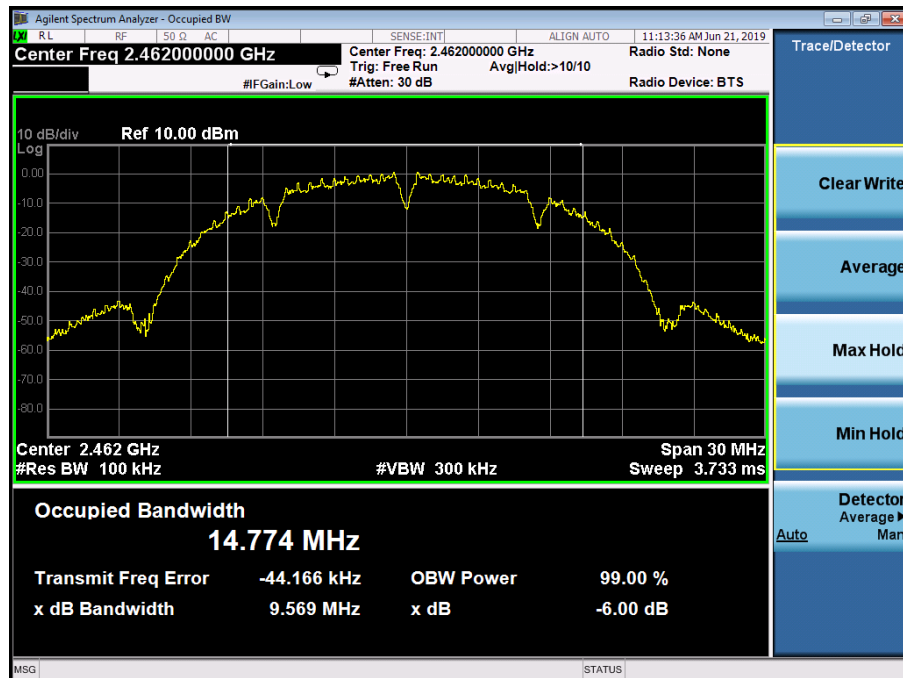




TX CH 06

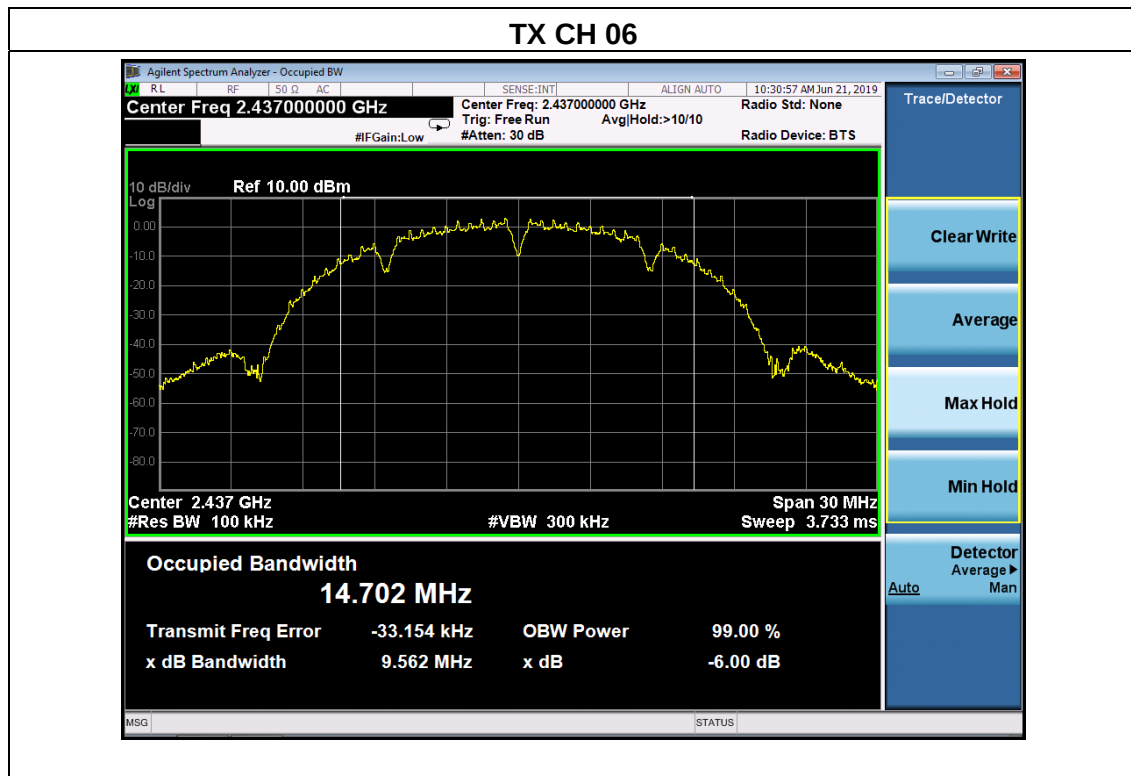
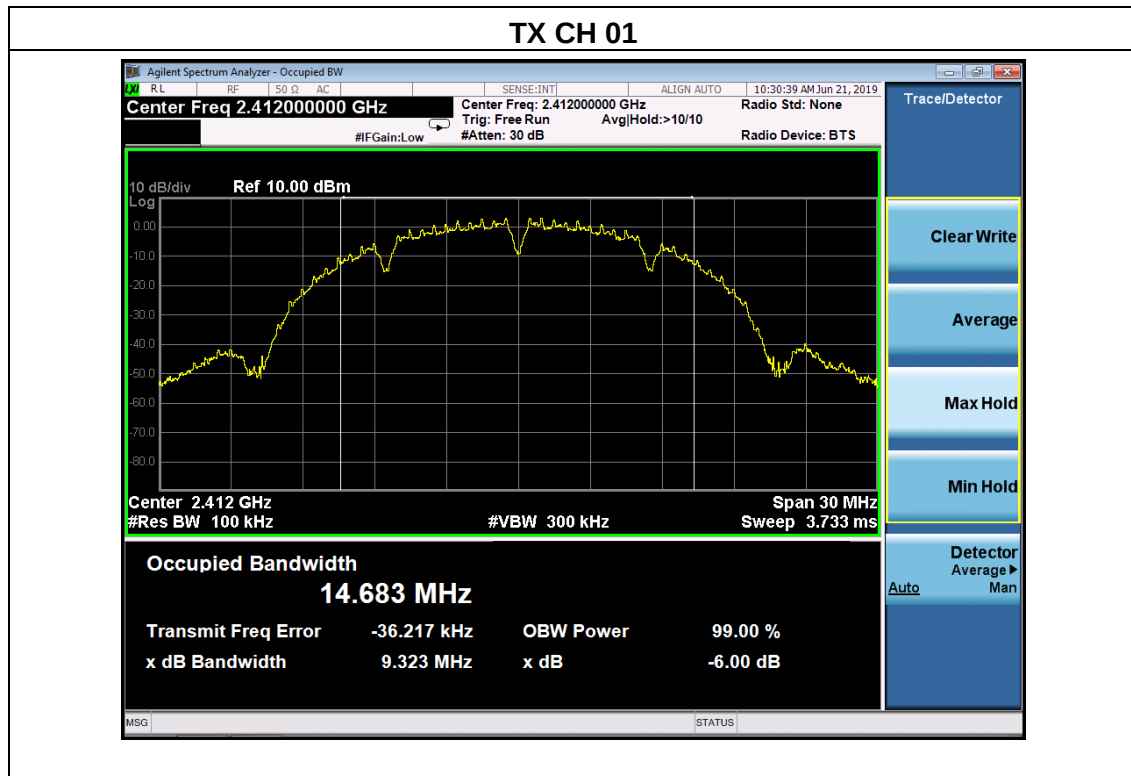


TX CH 11



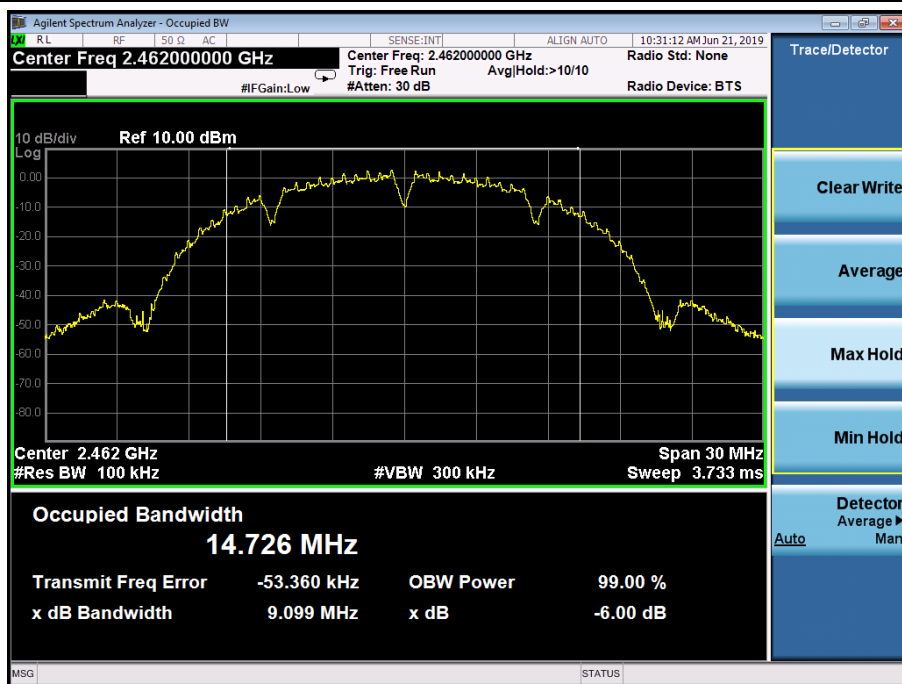


Ant.2





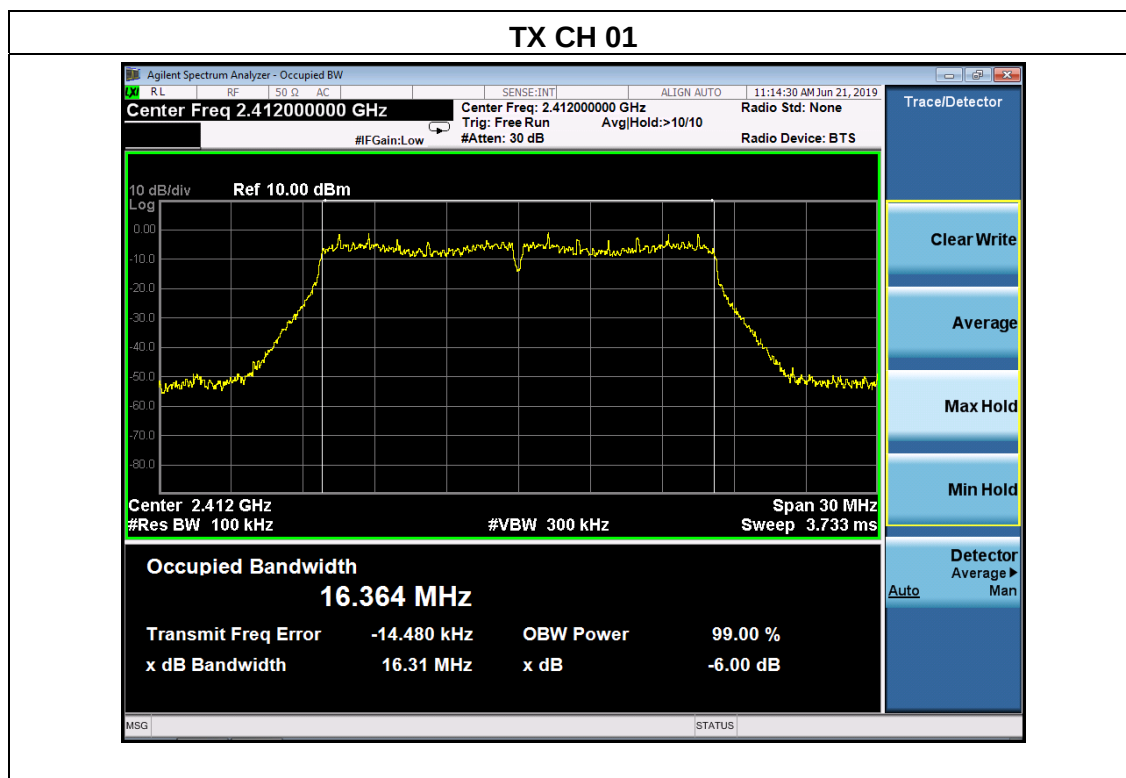
TX CH 11



Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX g Mode		

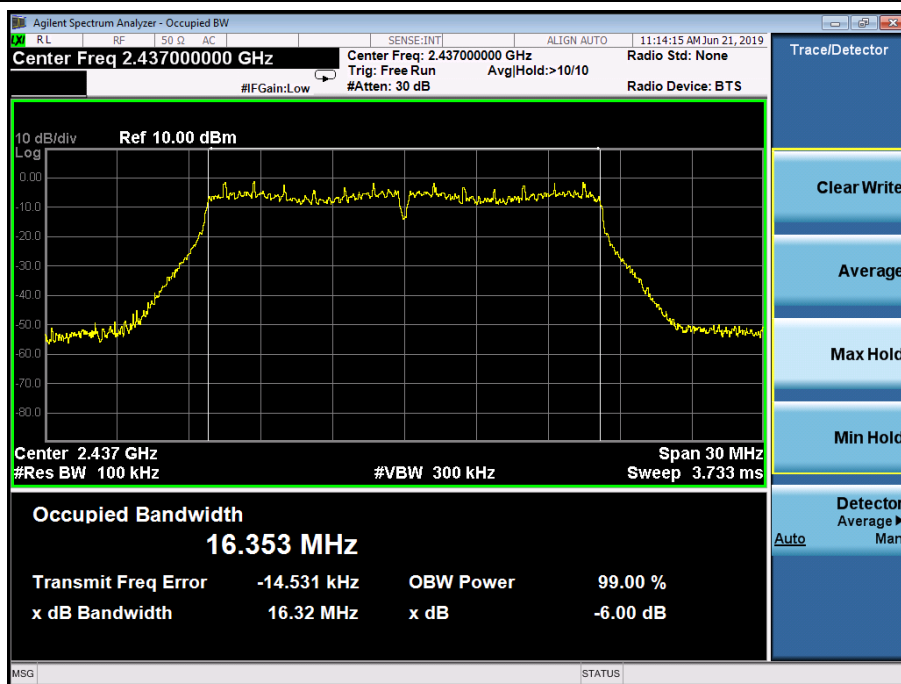
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2412	Ant.1	16.31	500	Pass
		Ant.2	16.32	500	Pass
Middle	2437	Ant.1	16.32	500	Pass
		Ant.2	16.30	500	Pass
High	2462	Ant.1	16.32	500	Pass
		Ant.2	16.31	500	Pass

Ant.1

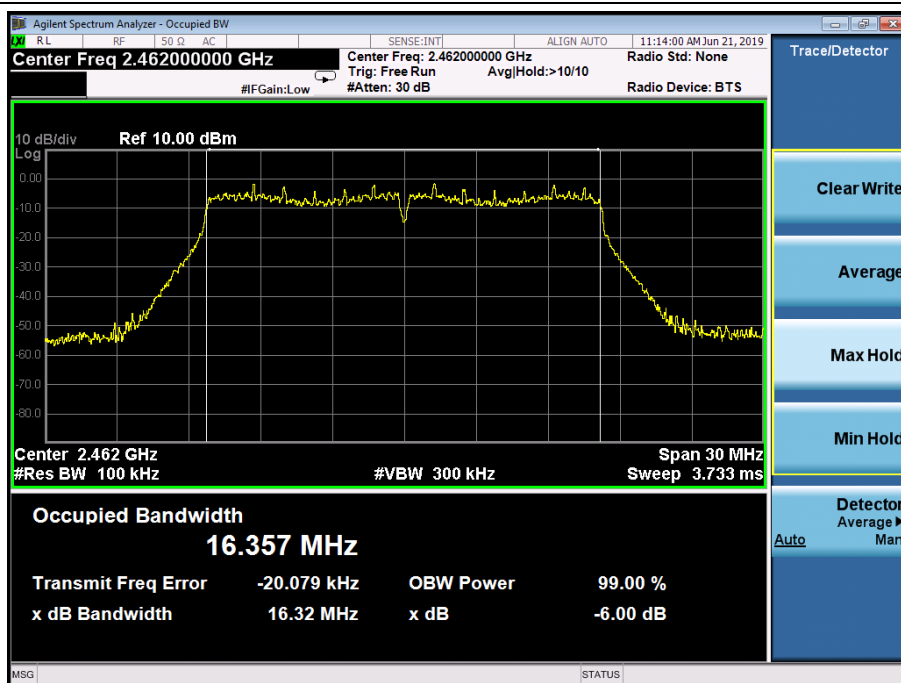




TX CH 06

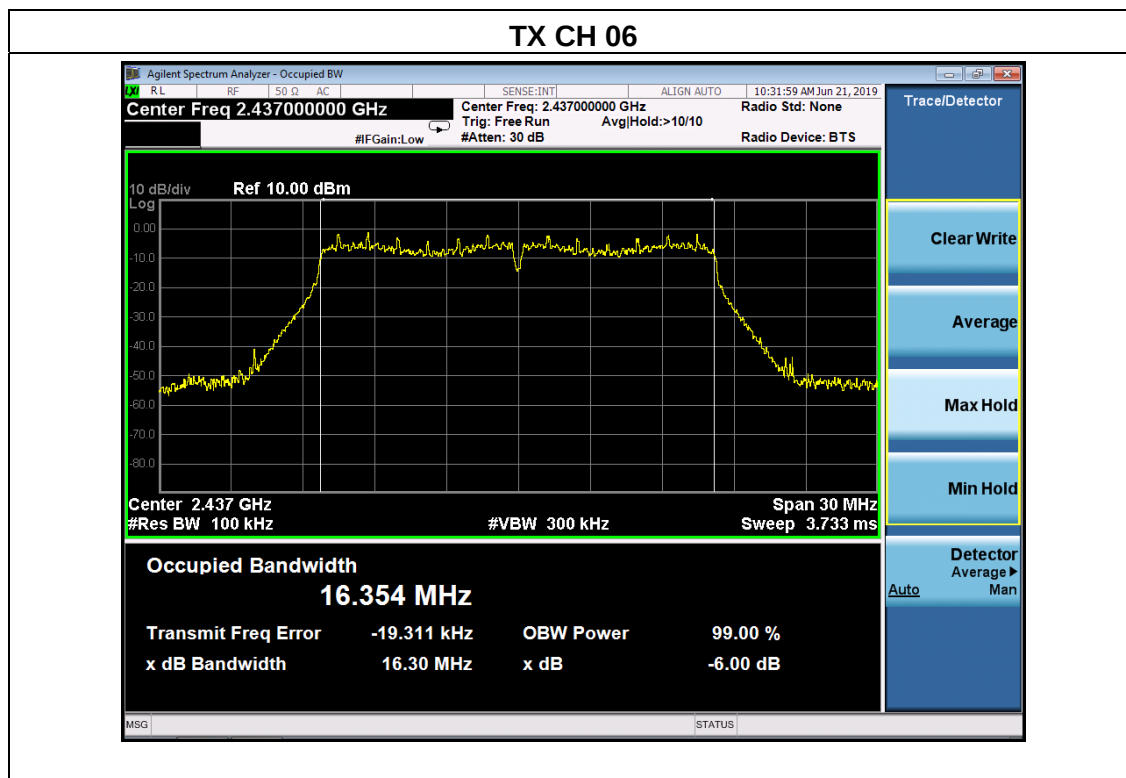
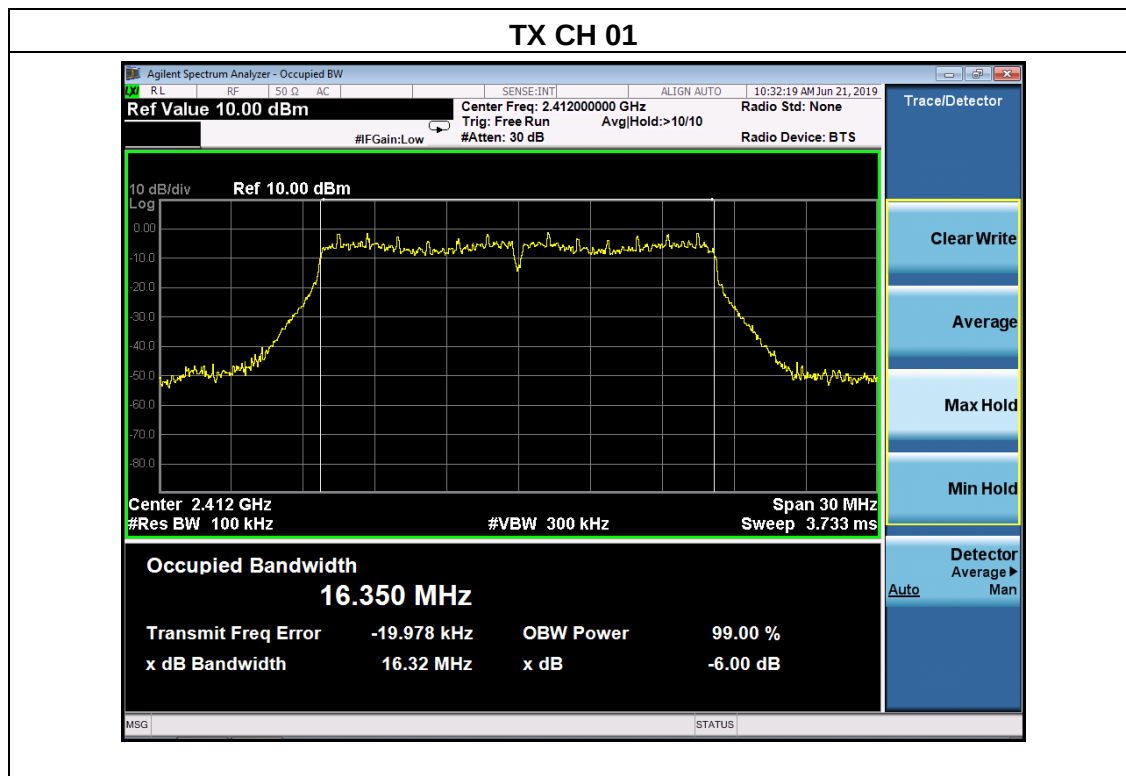


TX CH 11



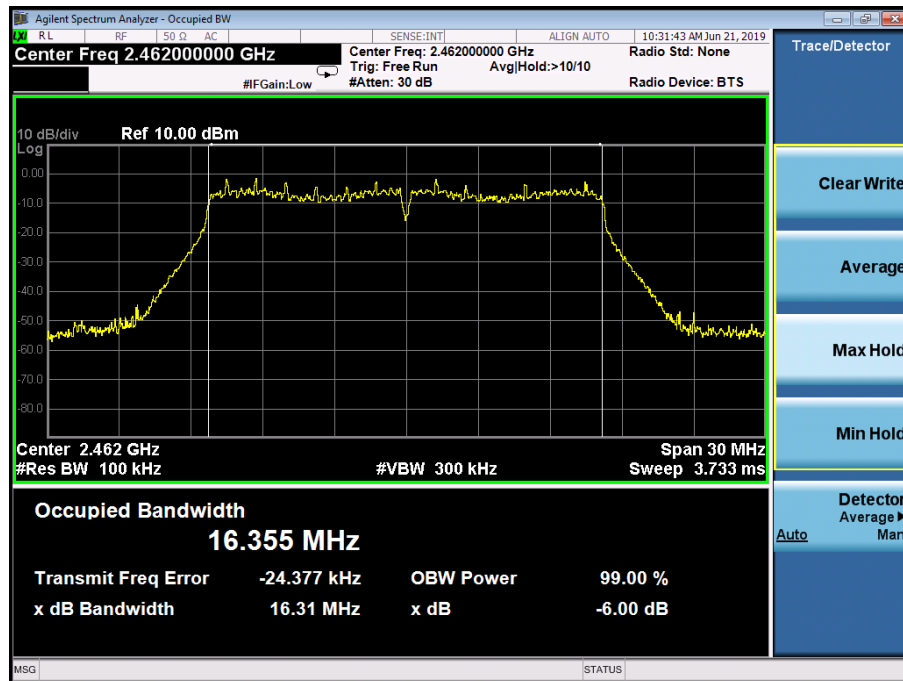


Ant.2





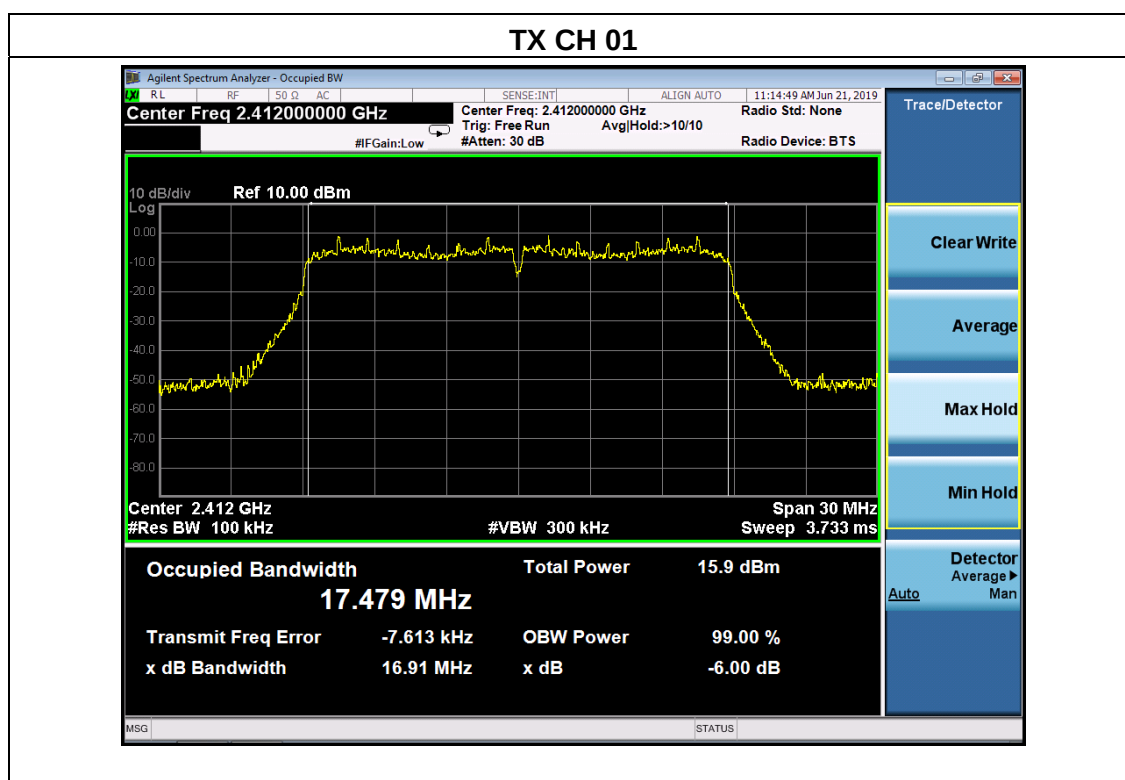
TX CH 11



Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX n Mode(20M)		

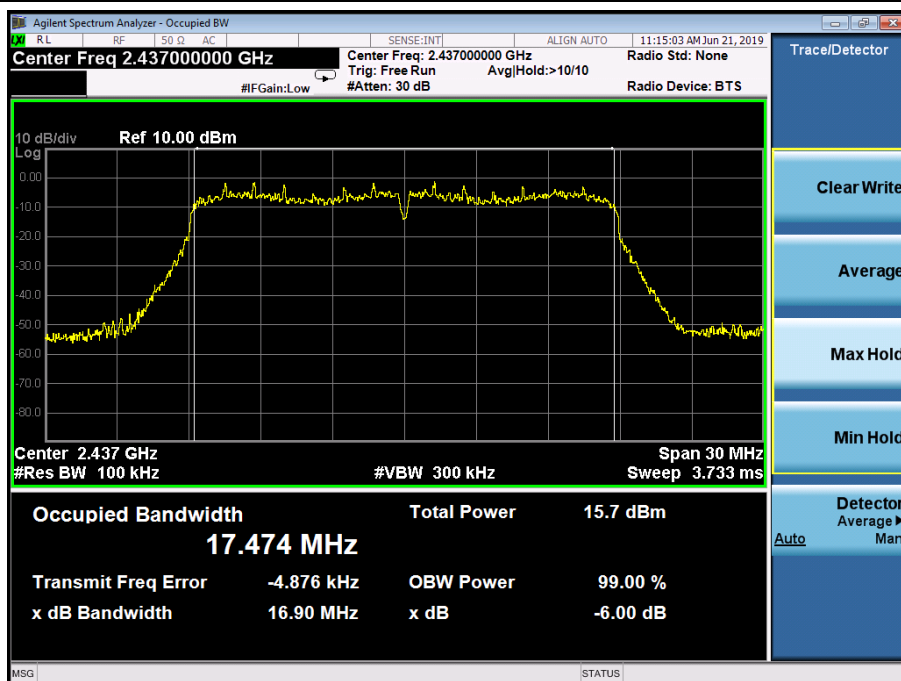
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2412	Ant.1	16.91	500	Pass
		Ant.2	16.54	500	Pass
Middle	2437	Ant.1	16.90	500	Pass
		Ant.2	16.29	500	Pass
High	2462	Ant.1	16.92	500	Pass
		Ant.2	16.68	500	Pass

Ant.1

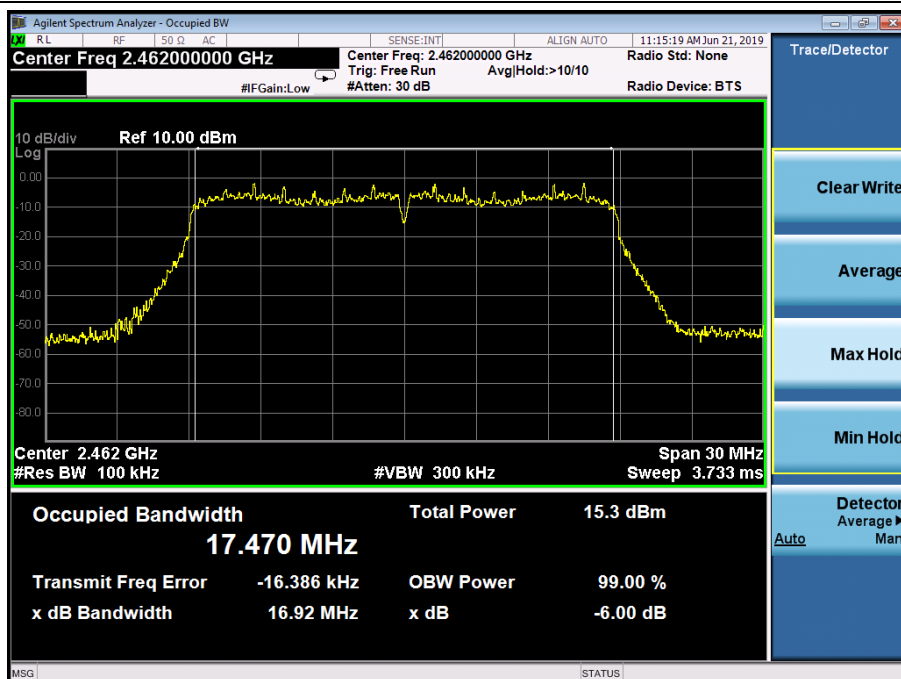




TX CH 06

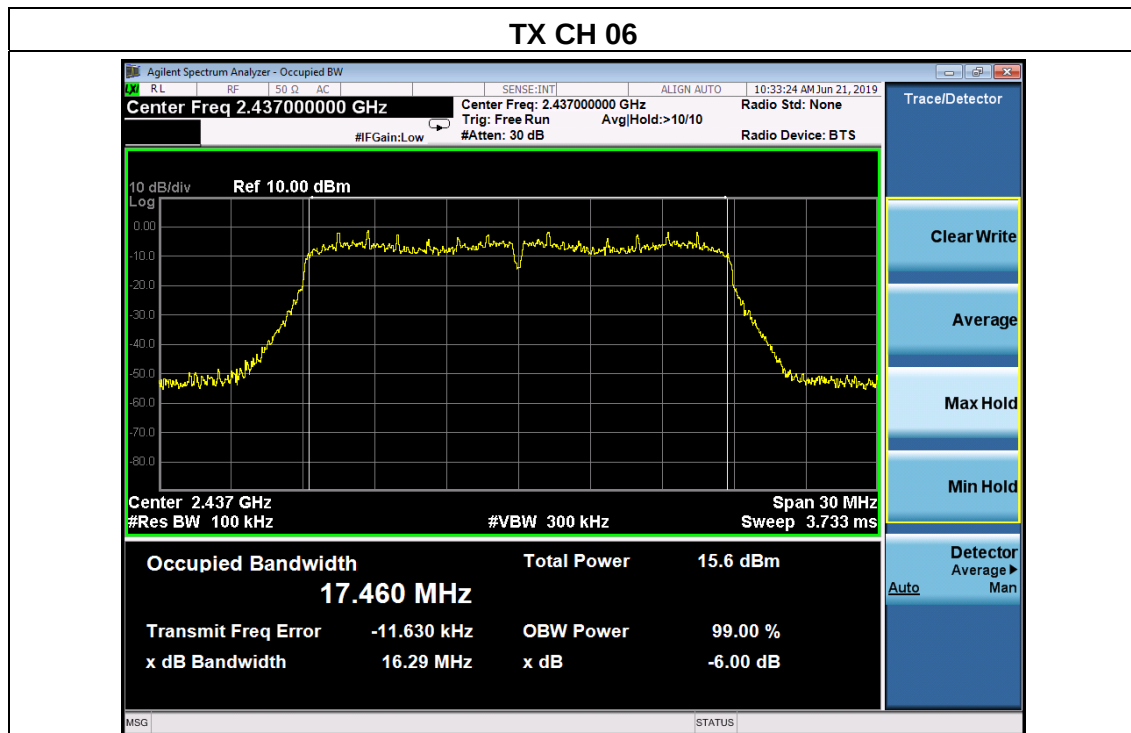
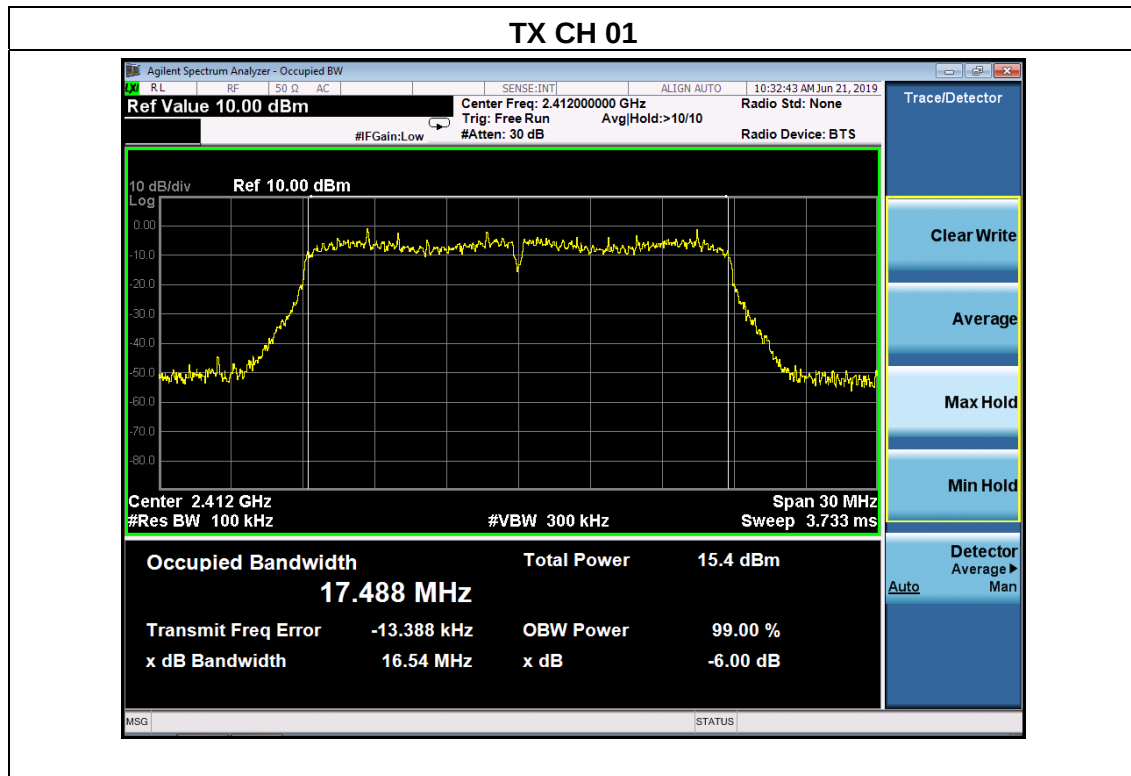


TX CH 11



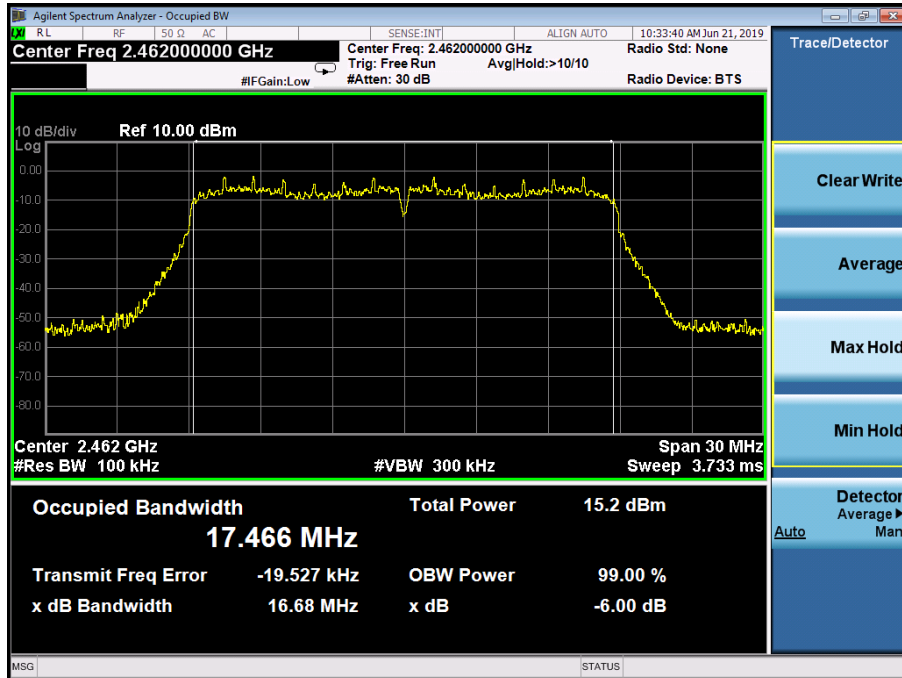


Ant.2





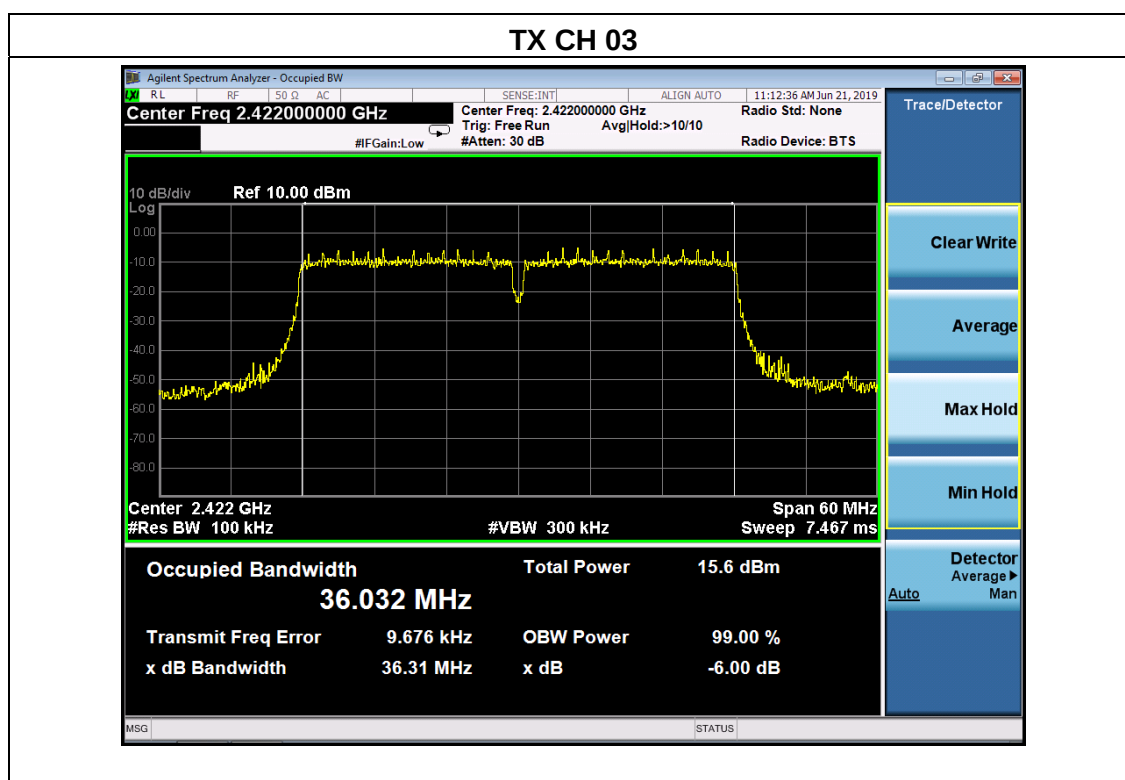
TX CH 11



Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX n Mode(40M)		

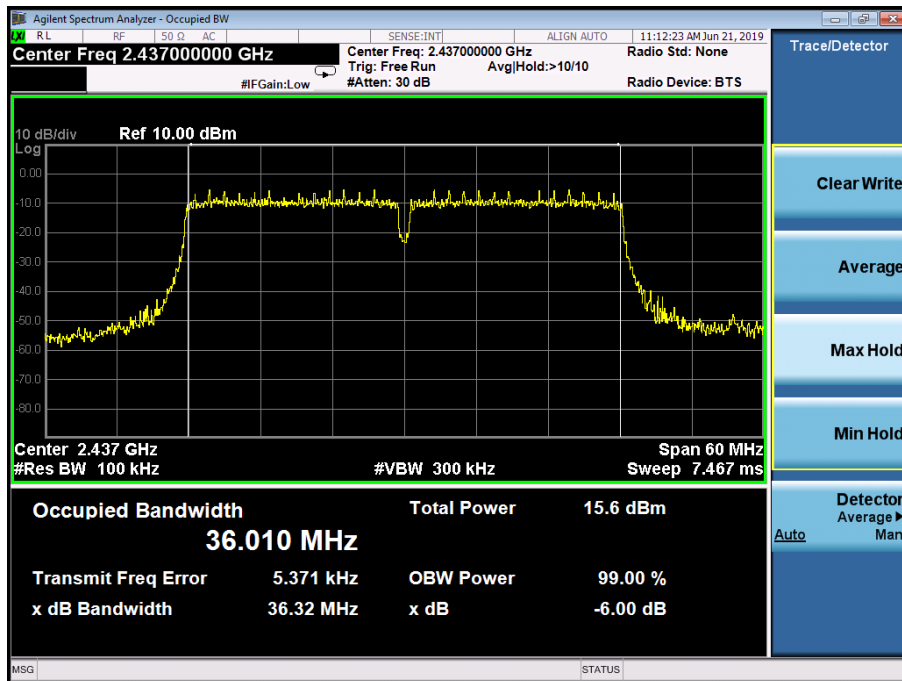
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2422	Ant.1	36.31	500	Pass
		Ant.2	36.31	500	Pass
Middle	2437	Ant.1	36.32	500	Pass
		Ant.2	36.29	500	Pass
High	2452	Ant.1	36.30	500	Pass
		Ant.2	36.31	500	Pass

Ant.1

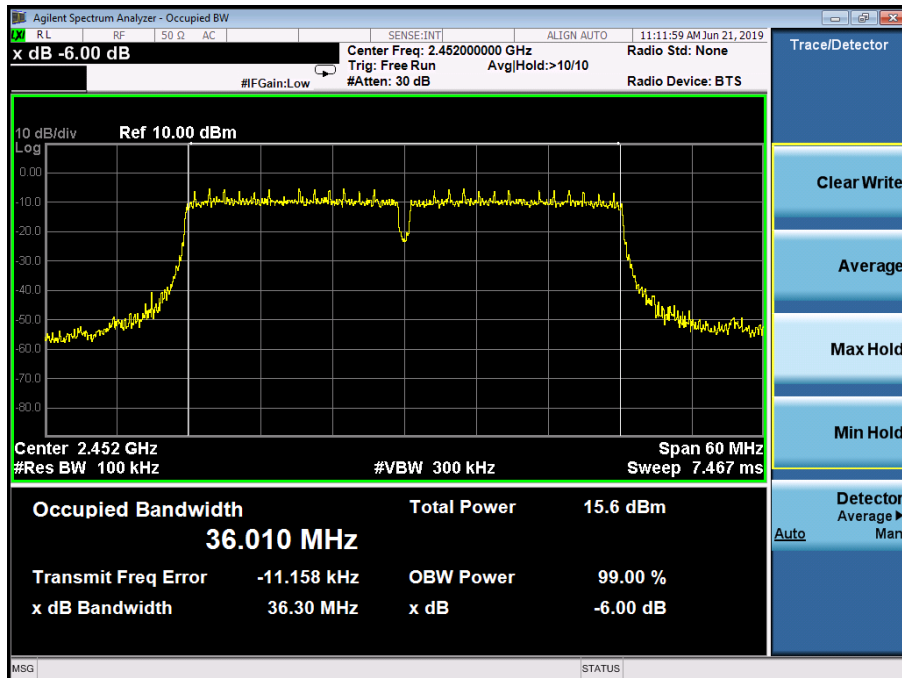




TX CH 06

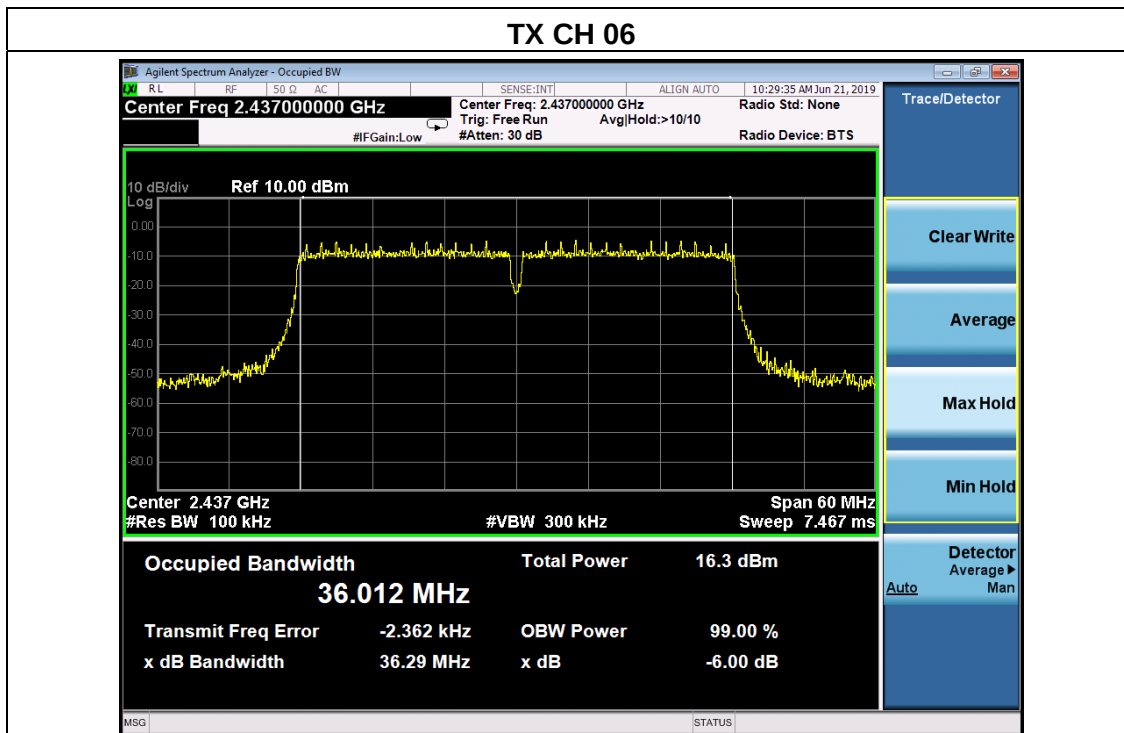
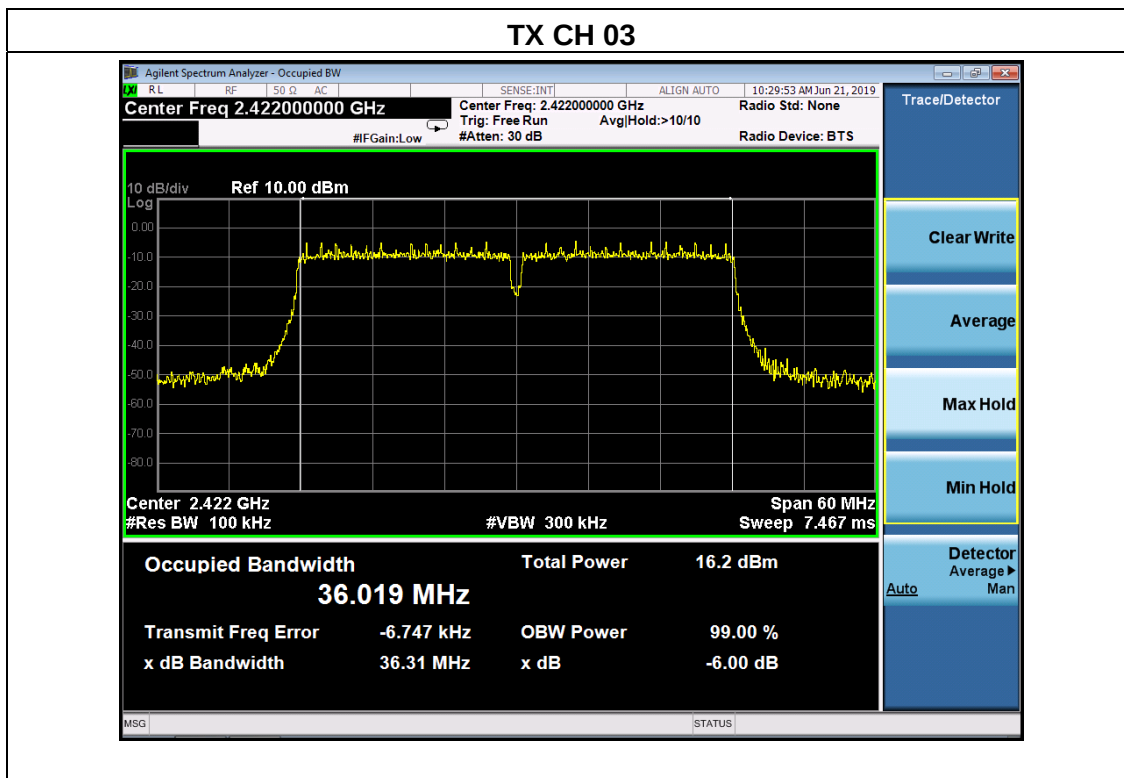


TX CH 09



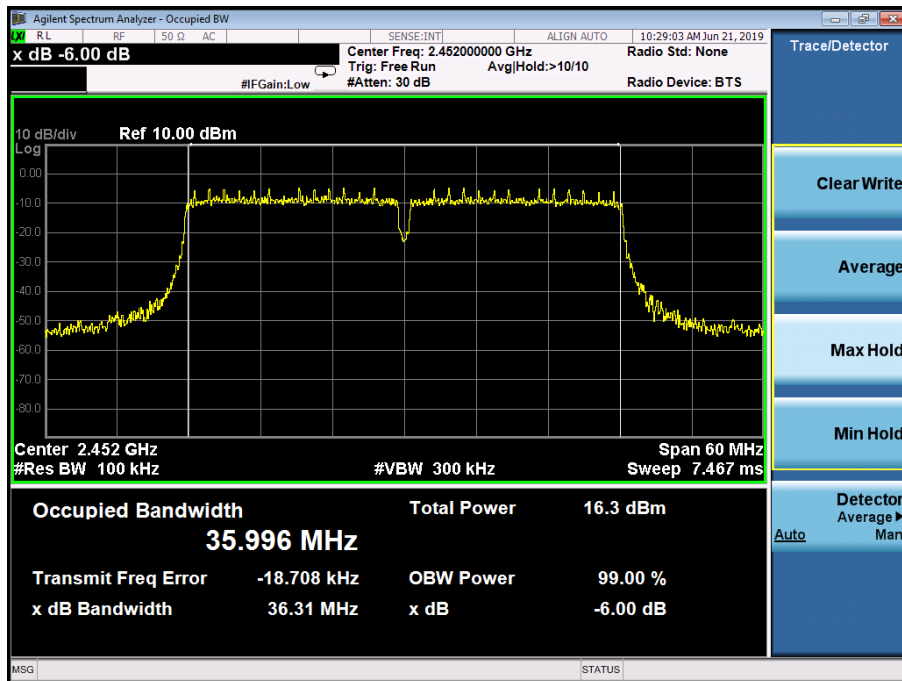


Ant.2





TX CH 09



6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz

	Frequency	Antenna port	Maximum Conducted Output Power(PK)	Total Conducted Output Power(PK)	LIMIT
	(MHz)		(dBm)	(dBm)	dBm
802.11b	2412	Ant.1	13.85	N/A	30
		Ant.2	13.55		
	2437	Ant.1	13.63	N/A	30
		Ant.2	13.45		
	2462	Ant.1	13.57	N/A	30
		Ant.2	13.51		
802.11g	2412	Ant.1	13.86	N/A	30
		Ant.2	13.48		
	2437	Ant.1	13.69	N/A	30
		Ant.2	13.37		
	2462	Ant.1	13.35	N/A	30
		Ant.2	13.05		
802.11n20	2412	Ant.1	12.74	15.62	30
		Ant.2	12.48		
	2437	Ant.1	12.39	15.43	30
		Ant.2	12.45		
	2462	Ant.1	12.69	15.49	30
		Ant.2	12.25		
802.11n40	2422	Ant.1	11.87	14.68	30
		Ant.2	11.46		
	2437	Ant.1	11.57	14.61	30
		Ant.2	11.63		
	2452	Ant.1	11.76	14.72	30
		Ant.2	11.65		

7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

7.1 APPLICABLE STANDARD

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions 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) (see §15.205(c)).

7.2 TEST PROCEDURE

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- Repeat above procedures until all measured frequencies were complete.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP





7.5 EUT OPERATION CONDITIONS

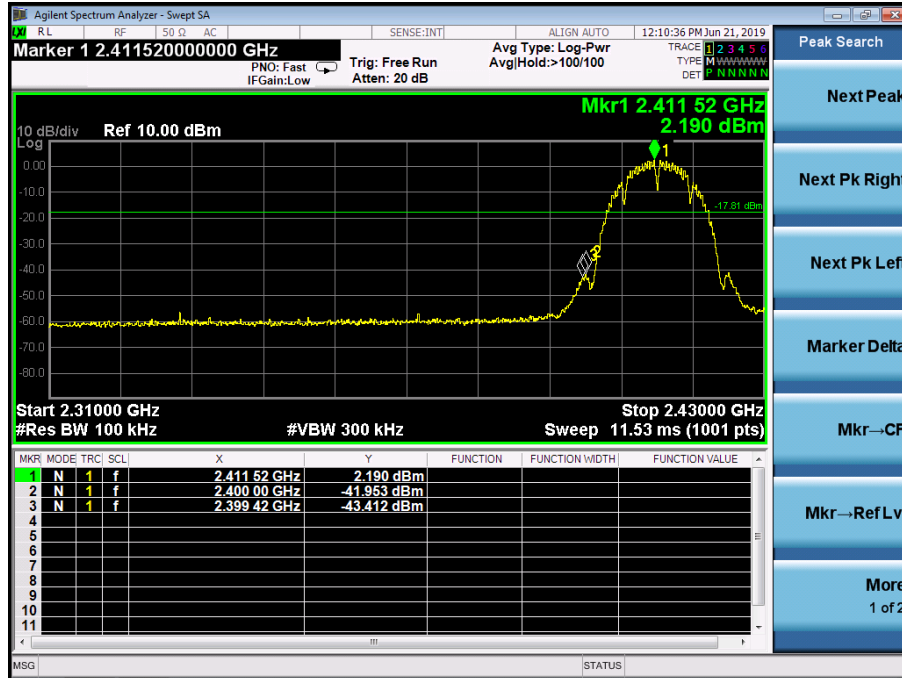
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1 TEST RESULTS

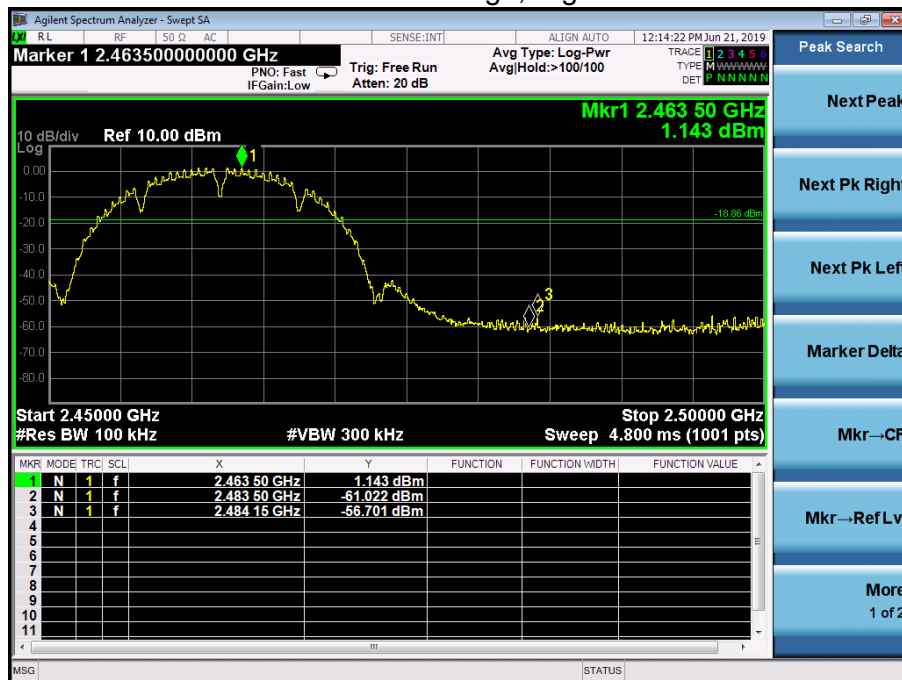


Ant.1

802.11b: Band Edge, Left Side

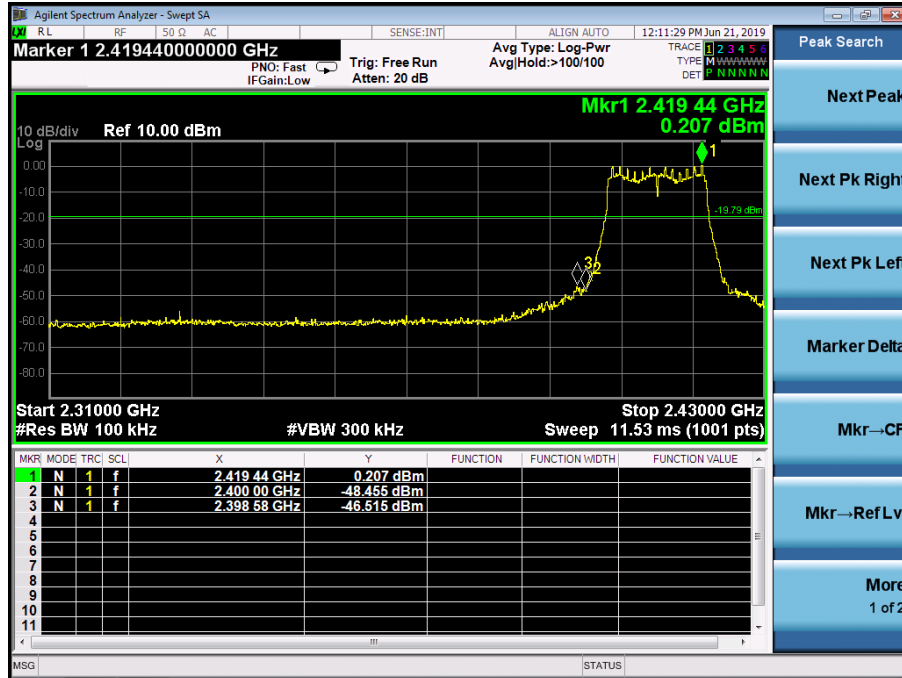


802.11b: Band Edge, Right Side

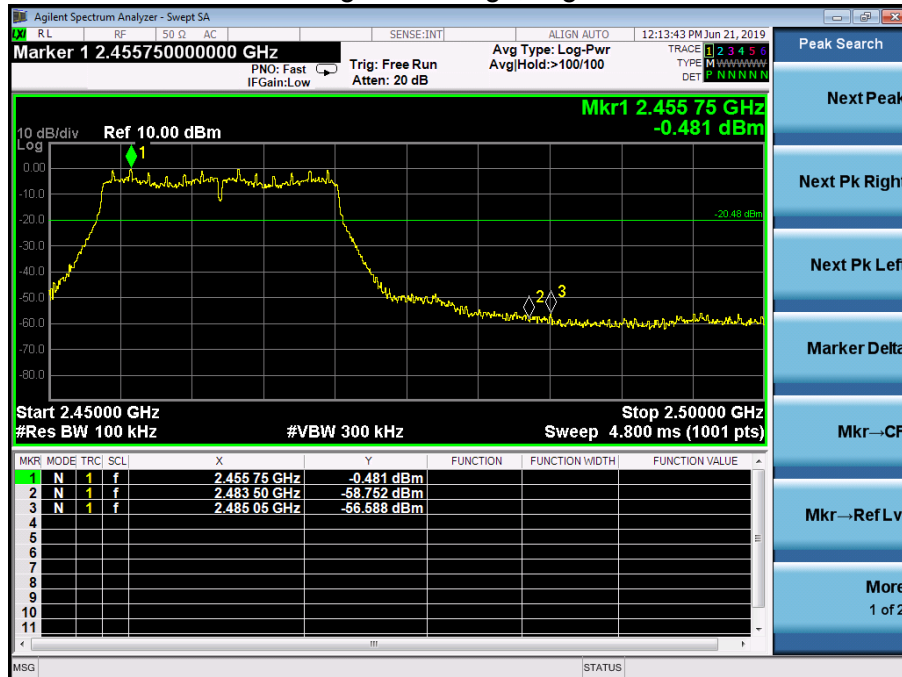




802.11g: Band Edge, Left Side

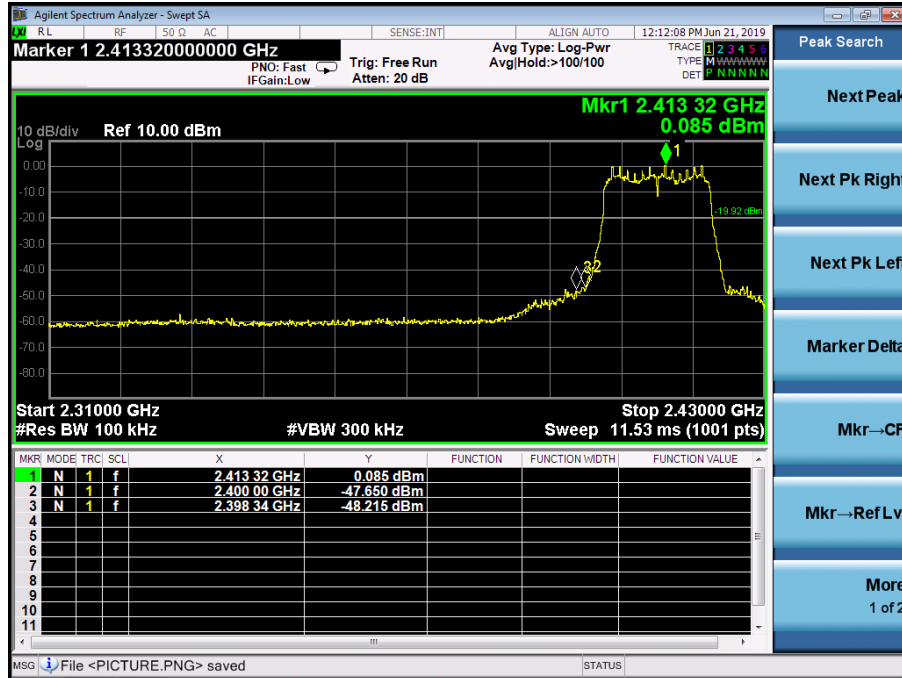


802.11g: Band Edge, Right Side

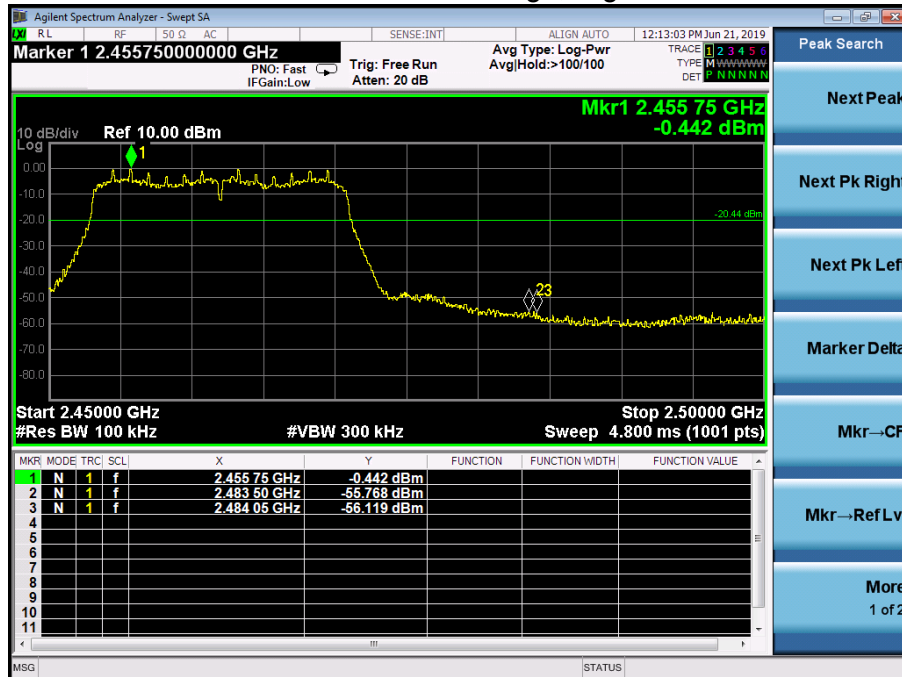




802.11n-HT20: Band Edge, Left Side

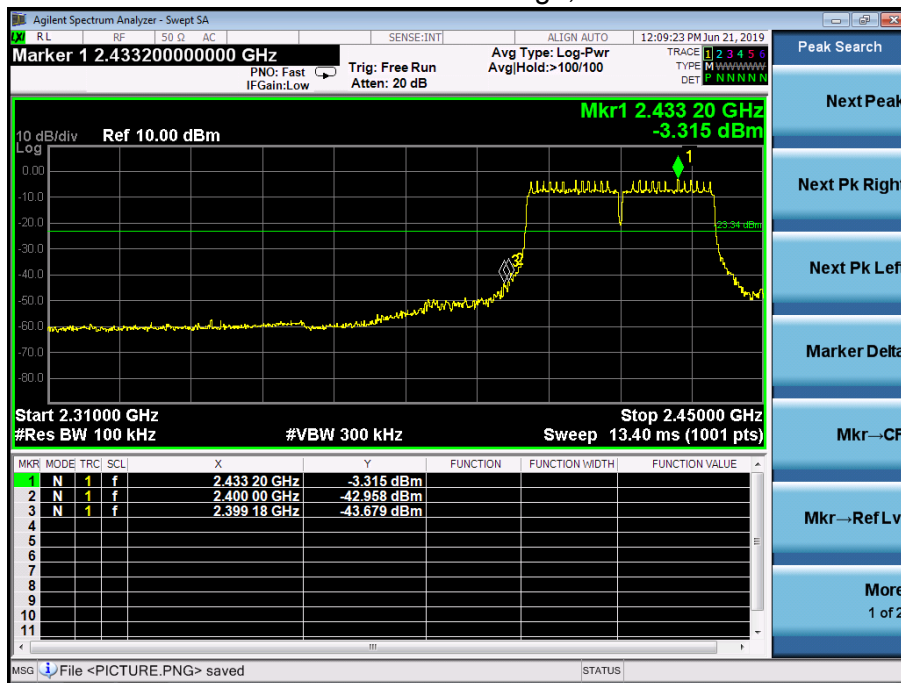


802.11n-HT20: Band Edge, Right Side

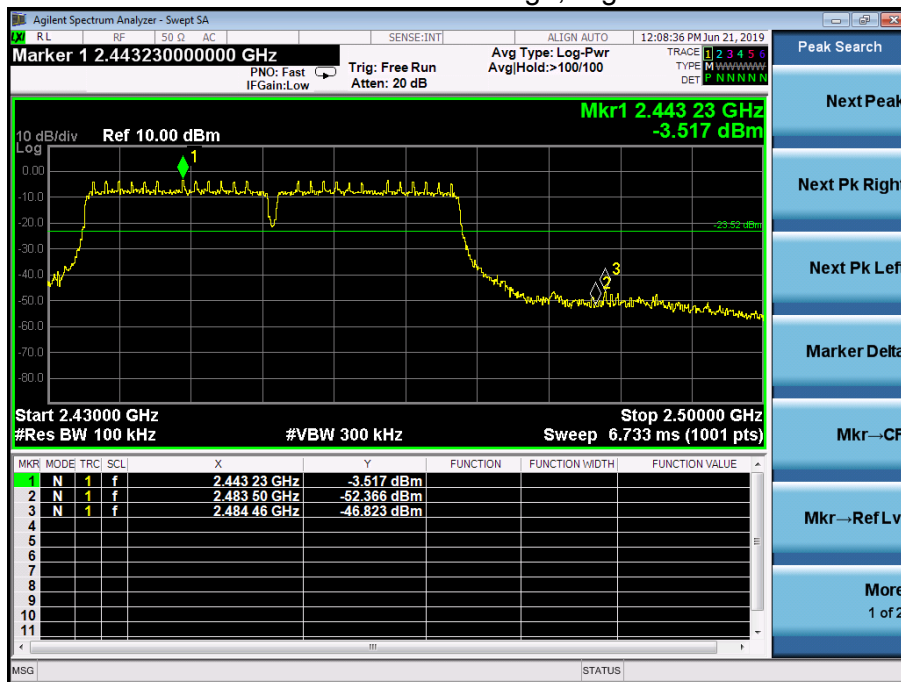




802.11n-HT40: Band Edge, Left Side



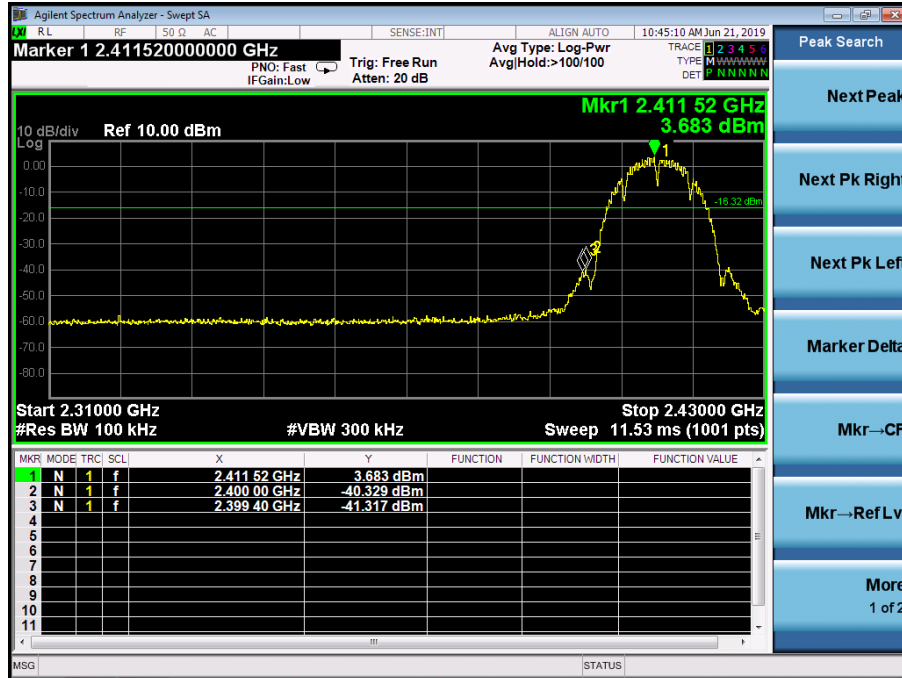
802.11n-HT40: Band Edge, Right Side



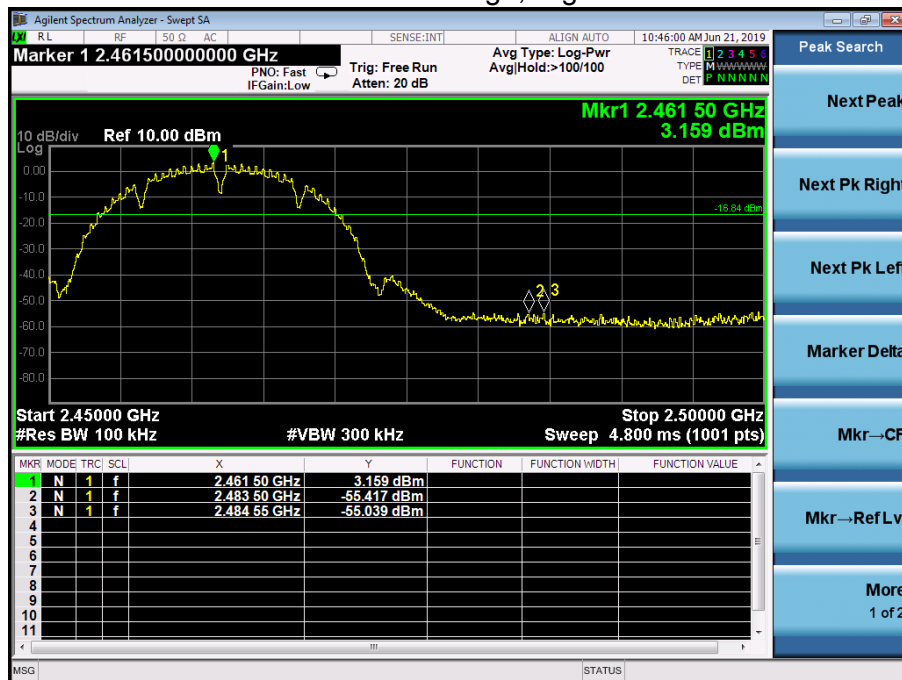


Ant.2

802.11b: Band Edge, Left Side

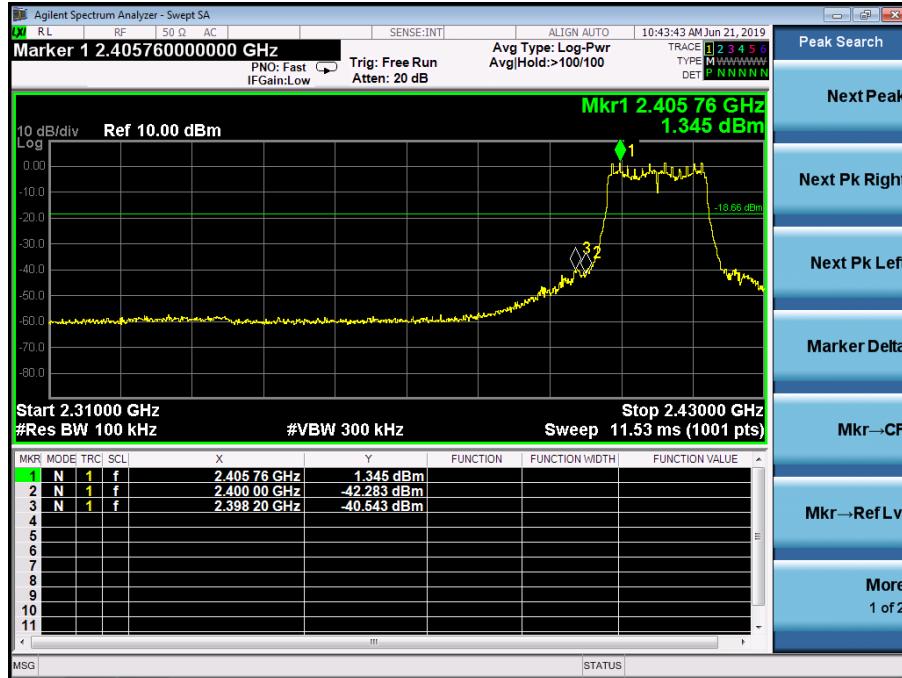


802.11b: Band Edge, Right Side

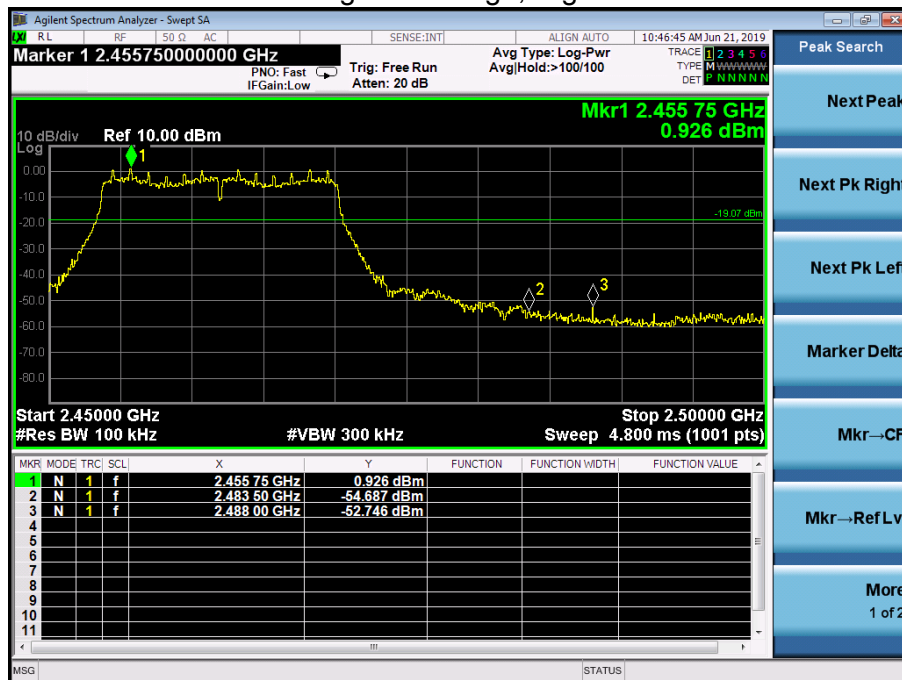




802.11g: Band Edge, Left Side

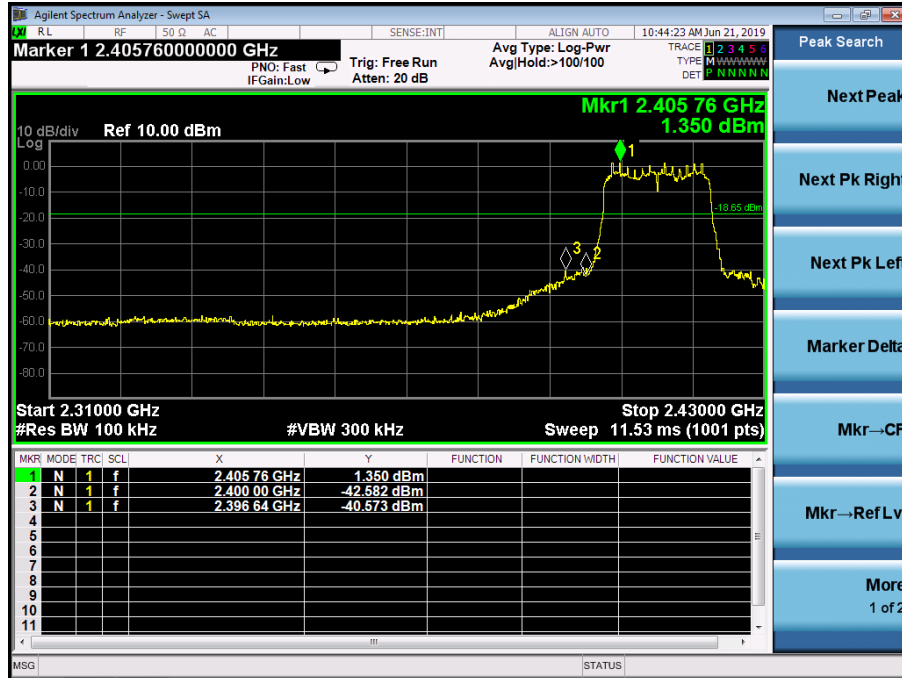


802.11g: Band Edge, Right Side

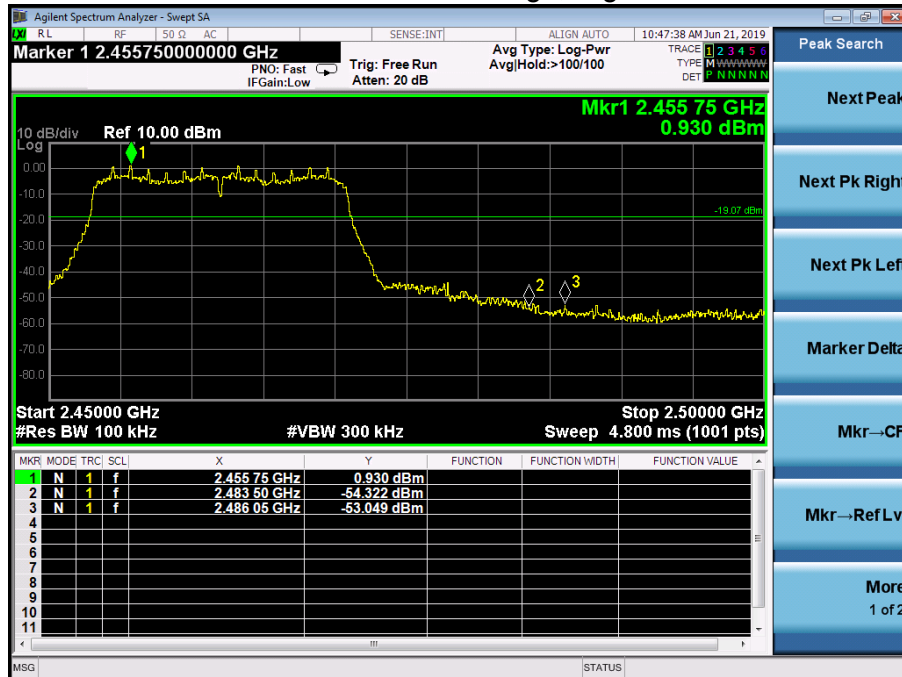




802.11n-HT20: Band Edge, Left Side

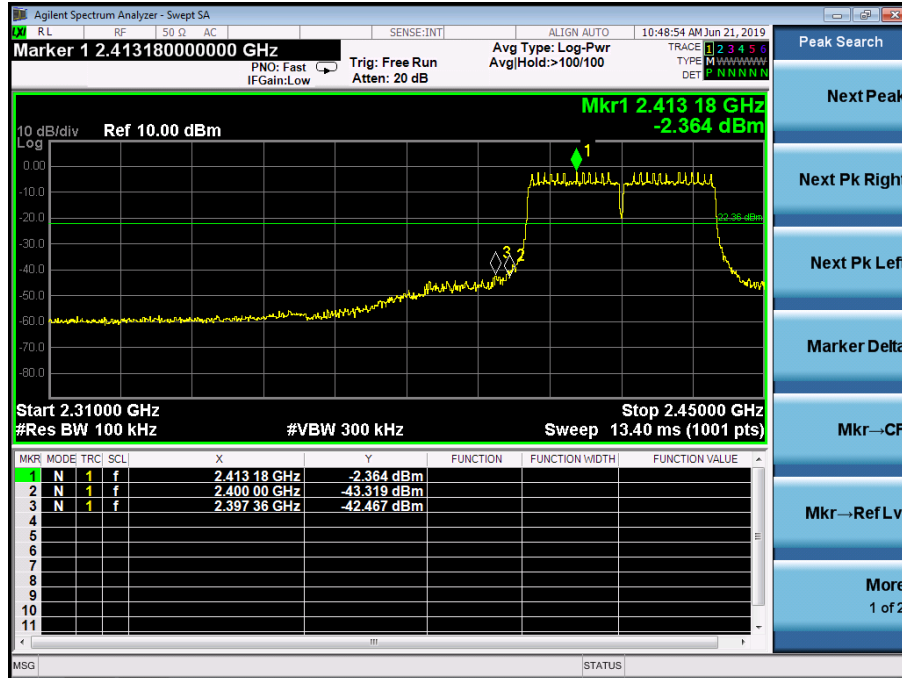


802.11n-HT20: Band Edge, Right Side

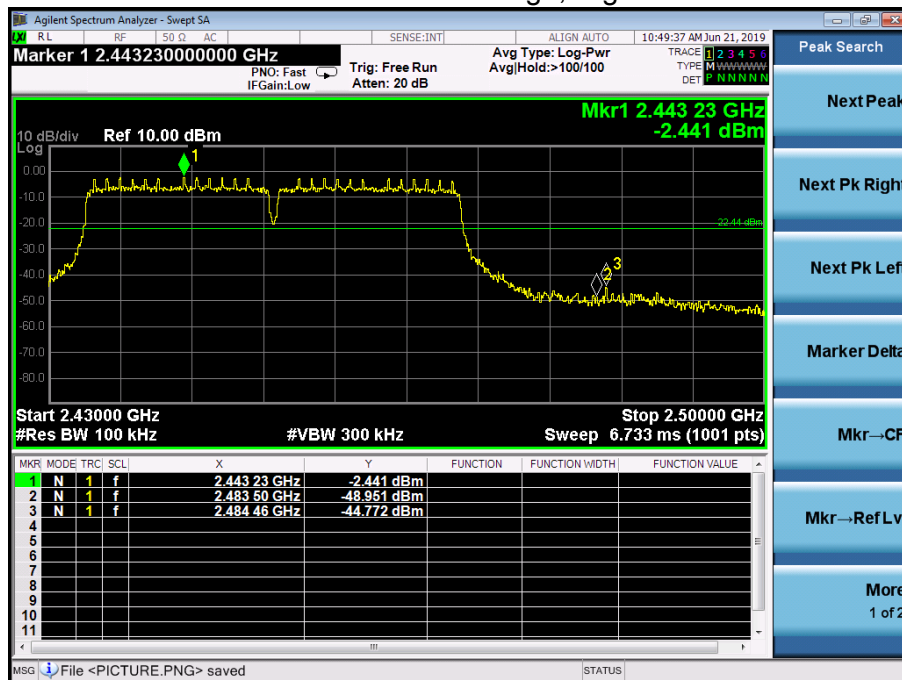




802.11n-HT40: Band Edge, Left Side



802.11n-HT40: Band Edge, Right Side



CONDUCTED EMISSION MEASUREMENT

Ant.1

802.11b

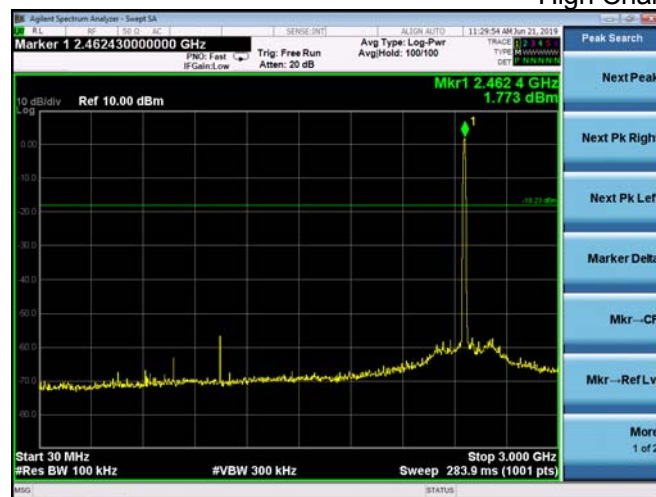
Low Channel 2412MHz



Middle Channel 2437MHz



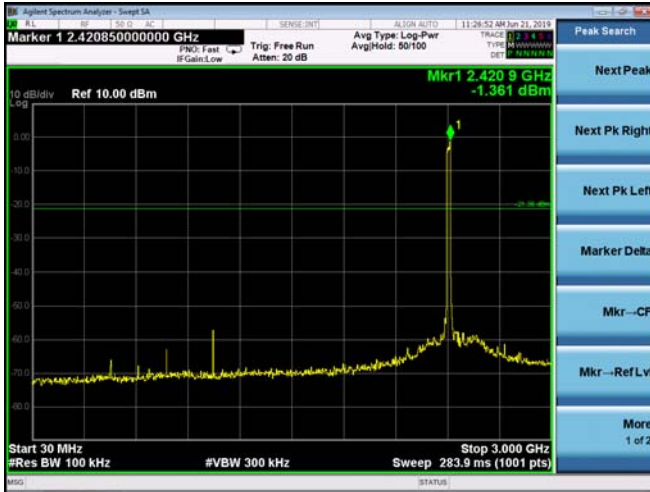
High Channel 2462MHz



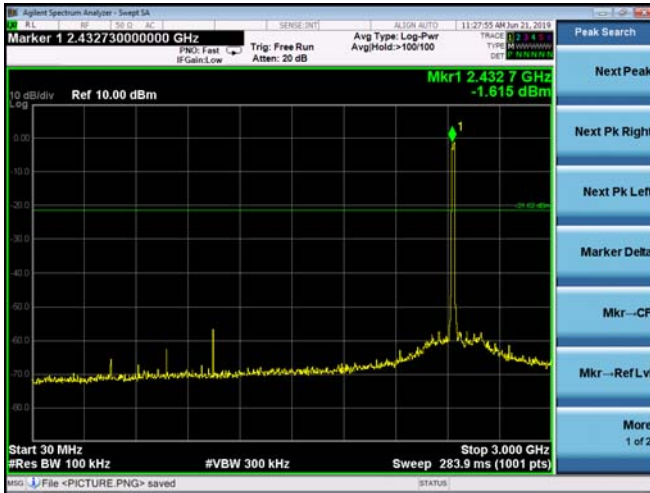


802.11g

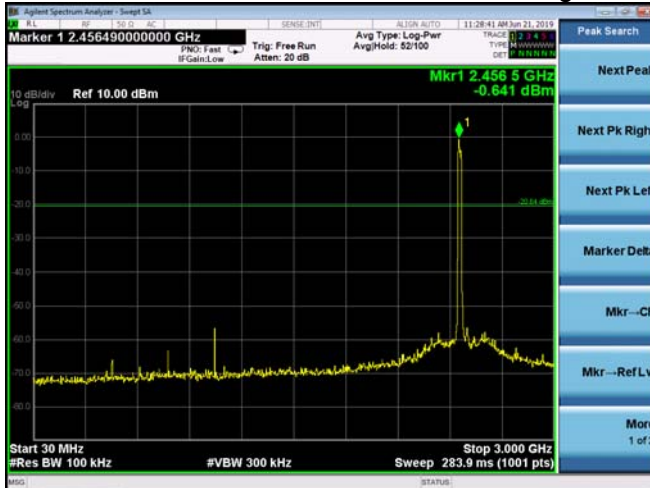
Low Channel 2412MHz



Middle Channel 2437MHz



High Channel 2462MHz





802.11n20

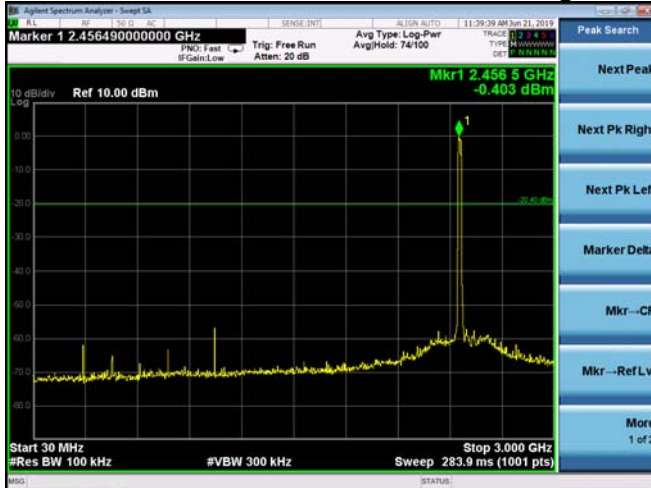
Low Channel 2412MHz



Middle Channel 2437MHz



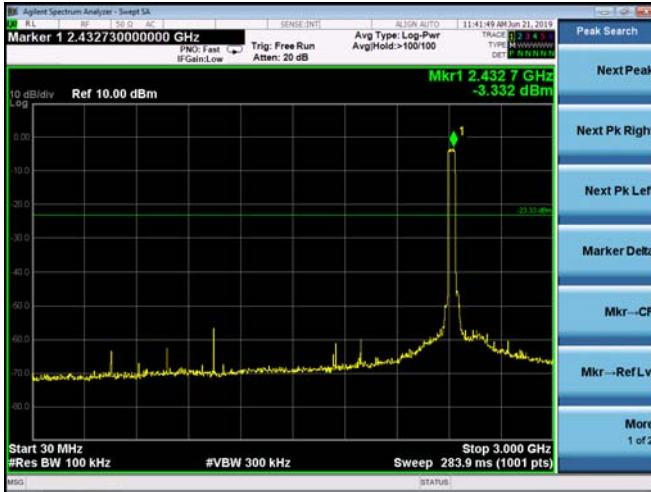
High Channel 2462MHz





802.11n40

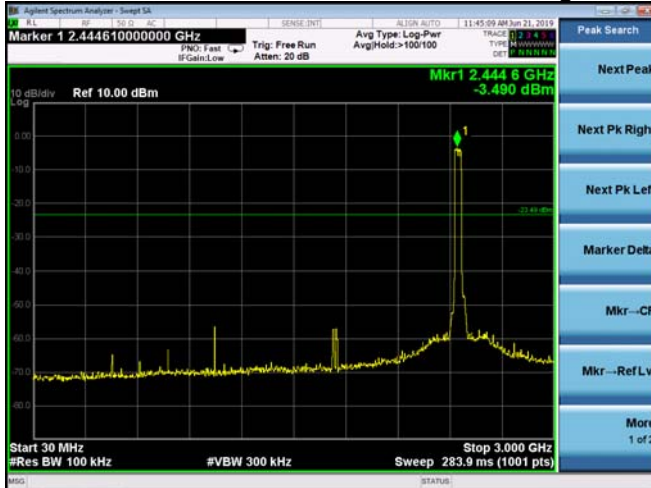
Low Channel 2422MHz



Middle Channel 2437MHz



High Channel 2452MHz





Ant.2

802.11b

Low Channel 2412MHz



Middle Channel 2437MHz



High Channel 2462MHz



802.11g

Low Channel 2412MHz



Middle Channel 2437MHz



High Channel 2462MHz





802.11n20

Low Channel 2412MHz



Middle Channel 2437MHz

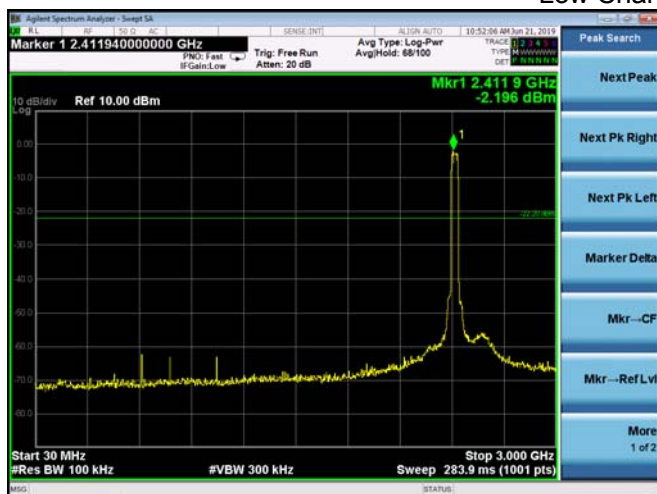


High Channel 2462MHz

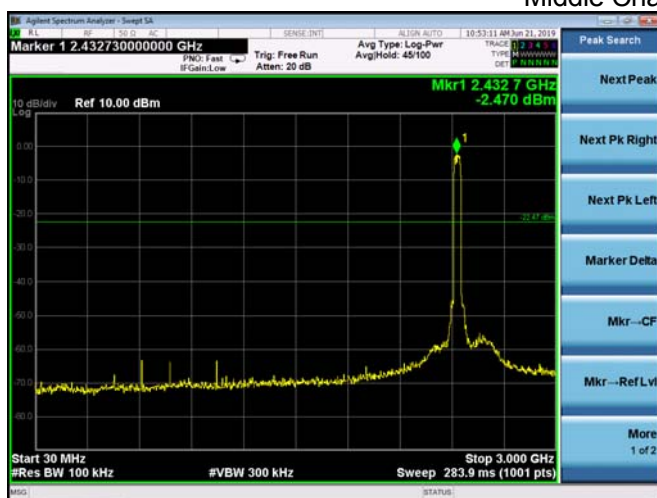


802.11n40

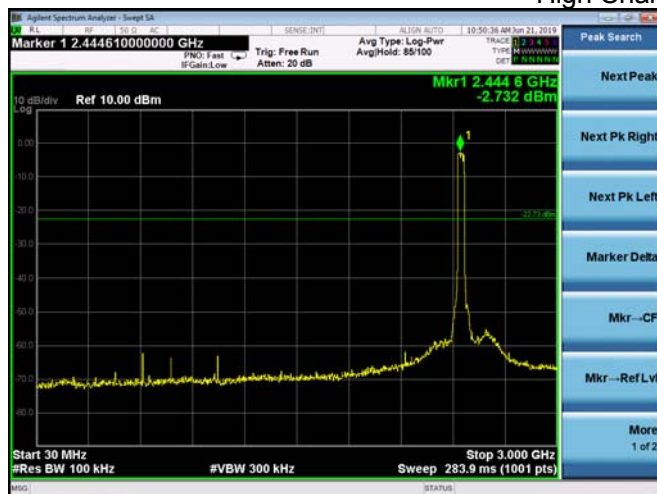
Low Channel 2422MHz



Middle Channel 2437MHz



High Channel 2452MHz





8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, 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.

8.2 EUT ANTENNA

The EUT antenna is External antenna. It complies with the standard requirement.

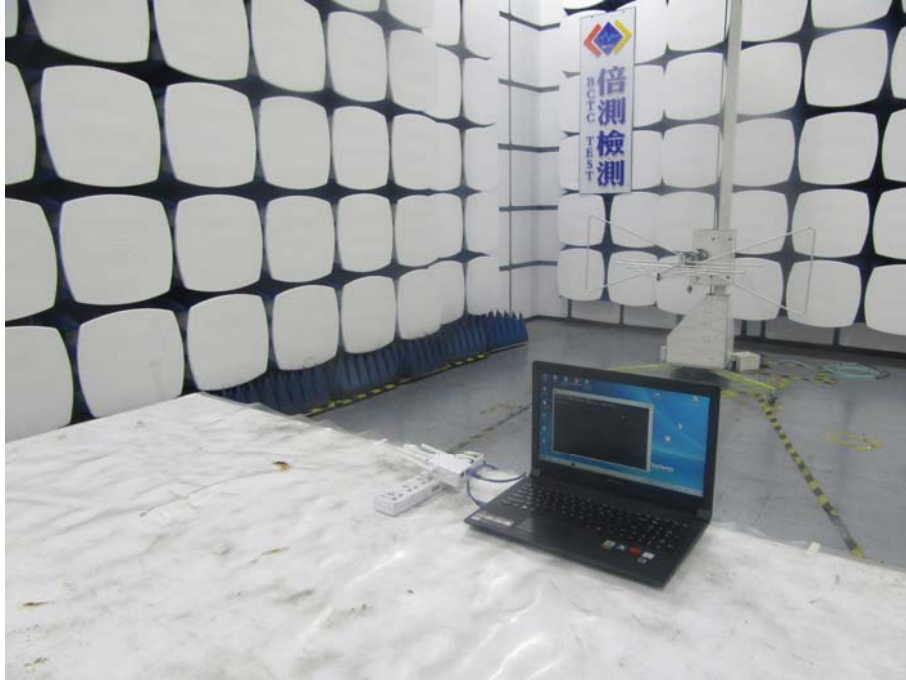
9. EUT TEST PHOTO

Conducted Measurement Photos





Radiated Measurement Photos



Radiated Measurement Photos





10. EUT PHOTO



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