Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.247

Report Reference No.:	**GTSR18050082-WLAN01**
FCC ID. :	**2AGN7-X20**
Compiled by (position+printed name+signature)..:	File administrators Jimmy Wang
Supervised by (position+printed name+signature)..:	Test Engineer Aaron Tan
Approved by (position+printed name+signature)..:	Manager Jason Hu
Date of issue:	May.25, 2018
Representative Laboratory Name .:	**Shenzhen Global Test Service Co.,Ltd.**
Address:	No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong
Applicant's name:	**Shenzhen Zidoo Technology Co.,Ltd.**
Address:	**Room 12 D, Block A CENTRAL GREAT SEARCHINGS, Xixiang Avenue, BaoAn District, Shenzhen, P.R.C**
Test specification :	
Standard:	**FCC Part 15.247**
TRF Originator:	Shenzhen Global Test Service Co.,Ltd.
Master TRF:	Dated 2014-12

Test item description :	**Media Player**
Trade Mark:	**/**
Manufacturer:	**Shenzhen Zidoo Technology Co.,Ltd.**
Model/Type reference:	**X20**
Listed Models:	**X20 PRO**
Difference:	All the same except the model number
Modulation Type:	IEEE 802.11a /802.11ac /802.11b/802.11g/802.11n
Operation Frequency:	From 2412 - 2462MHz &5180 - 5240MHz & 5745-5825 MHz
Hardware Version:	V1.0
Software Version:	Rev 1.1
Rating:	AC 120V~60Hz
Result:	**PASS**

T E S T R E P O R T

Test Report No. :	**GTSR18050082-WLAN01**	May . 25, 2018 Date of issue

Equipment under Test	:	**Media Player**
Model /Type	:	**X20**
Listed Models	:	**X20 PRO**
Applicant	:	**Shenzhen Zidoo Technology Co.,Ltd.**
Address	:	**Room 12 D, Block A CENTRAL GREAT SEARCHINGS, Xixiang Avenue, BaoAn District, Shenzhen, P.R.C**
Manufacturer	:	**Shenzhen Zidoo Technology Co.,Ltd.**
Address	:	**Room 12 D, Block A CENTRAL GREAT SEARCHINGS, Xixiang Avenue, BaoAn District, Shenzhen, P.R.C**

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices
KDB558074 D01 V04: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
KDB 662911 D01 Multiple Transmitter Output v02r01: Emissions Testing of Transmitters with Multiple Outputs in the Same Band

2 . SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	May. 14, 2018
Testing commenced on	:	May. 15, 2018
Testing concluded on	:	May. 25, 2018

2.2. Product Description

Name of EUT	**Media Player**
Trade Mark:	/
Model Number	**X20**
Listed Models	AC 120V/60Hz
Power Supply	**Media Player**
WLAN	Supported 802.11a/ 802.11ac/802.11b/802.11g/802.11n
Modulation Type	IEEE 802.11ac: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
Operation frequency	IEEE 802.11a/ac VHT20: 5180 - 5240MHz /5745MHz-5825MHz IEEE 802.11ac VHT 80: 5210MHz / 5775MHz IEEE 802.11b:2412-2462MHz IEEE 802.11g:2412-2462MHz IEEE 802.11n HT20:2412-2462MHz/5180 - 5240MHz /5745MHz-5825MHz IEEE 802.11n HT40 /ac CHT 40:2422-2452MHz/5190-5230MHz/5755-5795 MHz
Directional gain	@2.4G GANT +10log(N)dbi =0.83+10log2=3.84dbi ＜ 6 dbi @5G GANT +10log(N)dbi =2.17+10log2=5.18dbi ＜ 6 dbi
Antenna Type	external antenna
Antenna gain	0.83 dBi@2.4G , 2.17 dBi@5G
Bluetooth	Supported BT4.0
BT Modulation Type	GFSK
BT Operation frequency	2402MHz-2480MHz
Antenna Type	external antenna
Antenna gain	0.83 dBi@2.4G

2.3. Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	●	120V / 60Hz
		○	12 V DC	○	24 V DC
		○	Other (specified in blank below)		

/

2.4. Short description of the Equipment under Test (EUT)

This is a Media Player.

For more details, refer to the user's manual of the EUT.

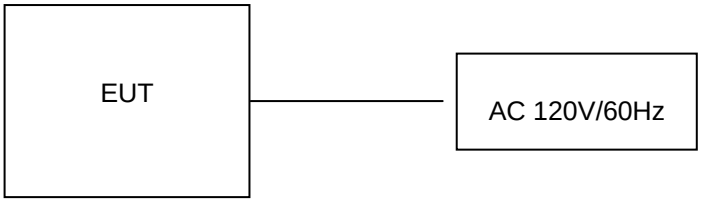
2.5. EUT operation mode

The application provider specific test software to control sample in continuous TX and RX (Duty Cycle >98%) for testing meet KDB558074 test requirement.

IEEE 802.11b/g/n: Thirteen channels are provided to the EUT.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2442		

2.6. Block Diagram of Test Setup



2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AGN7-X20** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.8. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 165725

Shenzhen Global Test Service Co.,Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

A2LA-Lab Cert. No.: 4758.01

Shenzhen Global Test Service Co.,Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

CNAS-Lab Code: L8169

Shenzhen Global Test Service Co.,Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories. Date of Registration: Dec. 11, 2015. Valid time is until Dec. 10, 2018.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Test Description

Test Specification clause	Test case	Test Mode	Test Channel	Recorded In Report		Pass	Fail	NA	NP	Remark
§15.247(b)(4)	Antenna gain	802.11b	☒ Lowest ☒ Middle ☒ Highest	802.11b	☒ Lowest ☒ Middle ☒ Highest	☒	☐	☐	☐	complies
§15.247(e)	Power spectral density	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	☒	☐	☐	☐	complies
§15.247(a)(2)	Spectrum bandwidth – 6 dB bandwidth	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	☒ ☒	☐	☐	☐	complies
§15.247(b)(1)	Maximum output power	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	☒ ☒ ☒	☐	☐	☐	complies
§15.247(d)	Band edge compliance conducted	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Highest	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Highest	☒ ☒	☐	☐	☐	complies
§15.205	Band edge compliance radiated	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Highest	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Highest	☒	☐	☐	☐	complies
§15.247(d)	TX spurious emissions conducted	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	☒ ☒	☐	☐	☐	complies
§15.247(d)	TX spurious emissions radiated	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	802.11b 802.11g 802.11n HT20 802.11n HT40	☒ Lowest ☒ Middle ☒ Highest	☒	☐	☐	☐	complies
§15.109	RX spurious emissions radiated	-/-	-/-	-/-	-/-	☐	☐	☒	☐	complies
§15.209(a)	TX spurious Emissions radiated < 30 MHz	802.11b	-/-	802.11b	-/-	☒	☐	☐	☐	complies
§15.107(a) §15.207	Conducted Emissions < 30 MHz	802.11b	-/-	802.11b	-/-	☒	☐	☐	☐	complies

Remark:
1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Maximum Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9KHz~1GHz& Radiated Emission 1GHz~10th Harmonic	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	6.5Mbps	1/6/11
	11n(40MHz)/OFDM	13.5Mbps	3/6/9
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11
	11n(40MHz)/OFDM	13.5Mbps	3/9

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6. Equipments Used during the Test

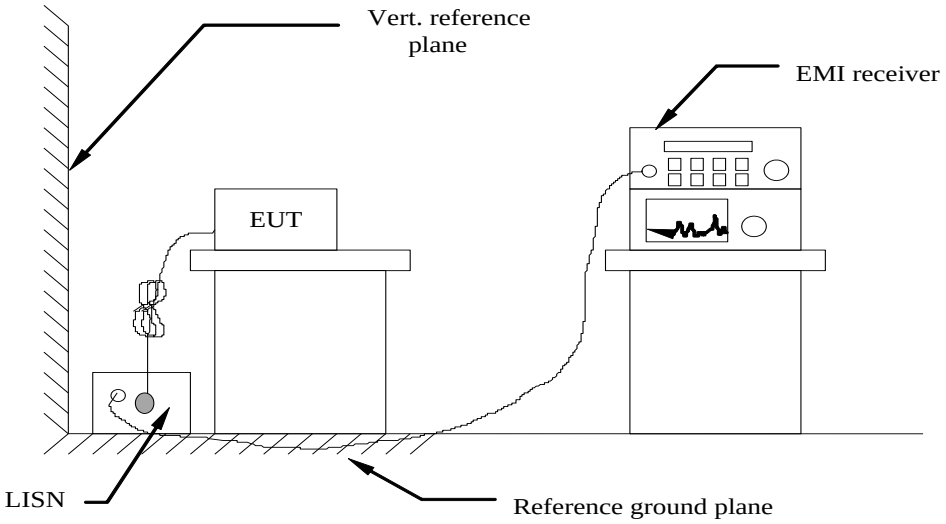
Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.08	2017/09/20	2018/09/19
LISN	R&S	ESH2-Z5	893606/008	2017/09/20	2018/09/19
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2017/09/20	2018/09/19
EMI Test Receiver	R&S	ESCI	101102	2017/09/20	2018/09/19
Spectrum Analyzer	Agilent	N9020A	MY48010425	2017/09/20	2018/09/19
Controller	EM Electronics	Controller EM 1000	N/A	2017/09/20	2018/09/19
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2017/09/20	2018/09/19
Active Loop Antenna	SCHWARZBECK	FMZB1519	1519-037	2017/09/20	2018/09/19
Amplifier	Agilent	8349B	3008A02306	2017/09/20	2018/09/19
Amplifier	Agilent	8447D	2944A10176	2017/09/20	2018/09/19
Temperature/Humidity Meter	Gangxing	CTH-608	02	2017/09/20	2018/09/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2017/09/20	2018/09/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2017/09/20	2018/09/19
Data acquisition card	Agilent	U2531A	TW53323507	2017/09/20	2018/09/19
Power Sensor	Agilent	U2021XA	MY5365004	2017/09/20	2018/09/19
RF Cable	HUBER+SUHNER	RG214	N/A	2017/09/20	2018/09/19

Note: The Cal.Interval was one year.

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
4 The EUT received DC 5V power from adapter, the adapter received AC120V/60Hz and AC 240V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT.The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

AC Power Conducted Emission Limit

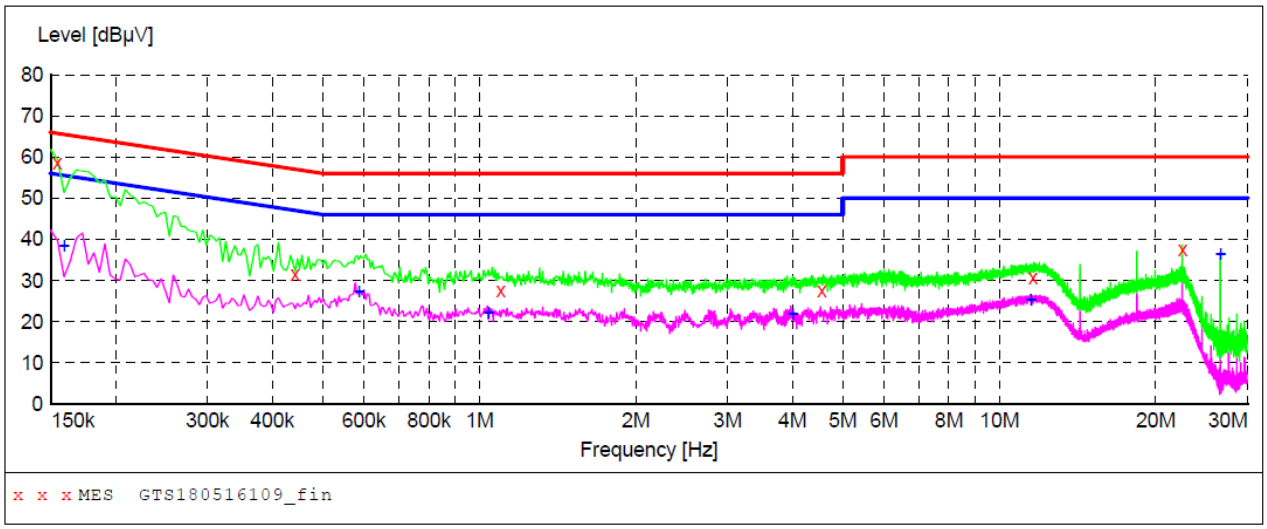
For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

TEST RESULTS

Remark: We measured Conducted Emission at 802.11b/802.11g/802.11n HT20/802.11n HT40 mode in AC 120V/60Hz, the worst case was recorded .

Power supply:	AC 120V/60Hz	Polarization	L



MEASUREMENT RESULT: "GTS180516109_fin"

5/16/2018 10:44AM

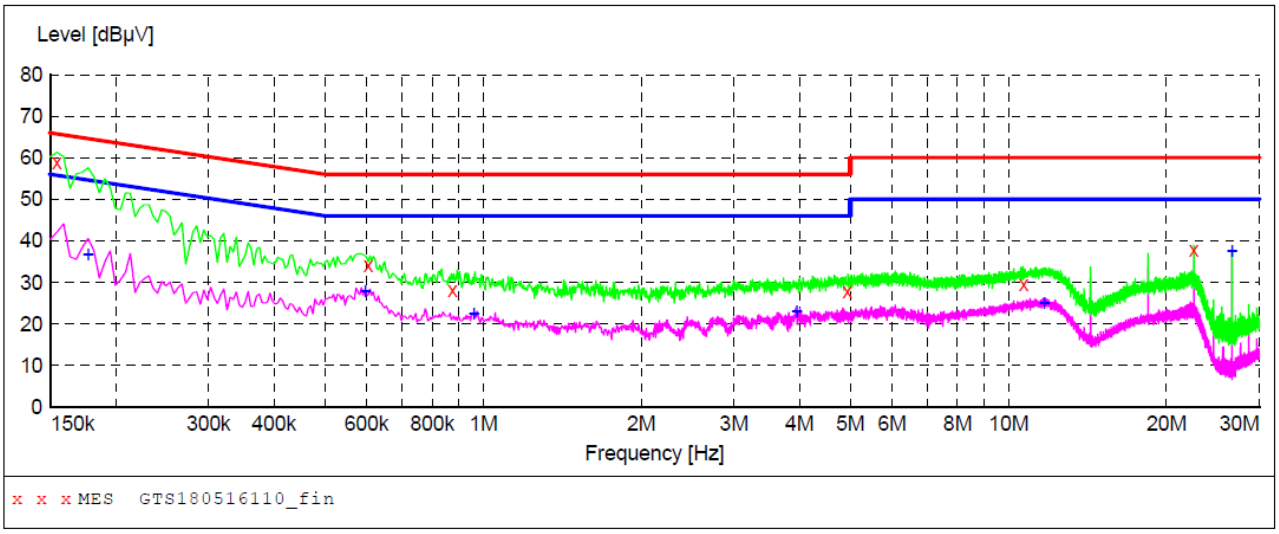
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	58.70	10.1	66	7.1	QP	N	GND
0.442500	31.50	9.8	57	25.5	QP	N	GND
1.099500	27.70	9.6	56	28.3	QP	N	GND
4.555500	27.50	9.3	56	28.5	QP	N	GND
11.611500	30.70	8.6	60	29.3	QP	N	GND
22.528500	37.60	9.0	60	22.4	QP	N	GND

MEASUREMENT RESULT: "GTS180516109_fin2"

5/16/2018 10:44AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	38.30	10.0	56	17.2	AV	N	GND
0.586500	27.30	9.7	46	18.7	AV	N	GND
1.041000	22.20	9.6	46	23.8	AV	N	GND
4.006500	21.90	9.4	46	24.1	AV	N	GND
11.485500	25.40	8.7	50	24.6	AV	N	GND
26.623500	36.50	9.0	50	13.5	AV	N	GND

Power supply:	AC 120V/60Hz	Polarization	N



MEASUREMENT RESULT: "GTS180516110_fin"

5/16/2018 10:47AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	58.80	10.1	66	7.0	QP	L1	GND
0.604500	34.20	9.7	56	21.8	QP	L1	GND
0.874500	28.10	9.6	56	27.9	QP	L1	GND
4.933500	27.90	9.3	56	28.1	QP	L1	GND
10.689000	29.50	8.8	60	30.5	QP	L1	GND
22.528500	37.80	9.0	60	22.2	QP	L1	GND

MEASUREMENT RESULT: "GTS180516110_fin2"

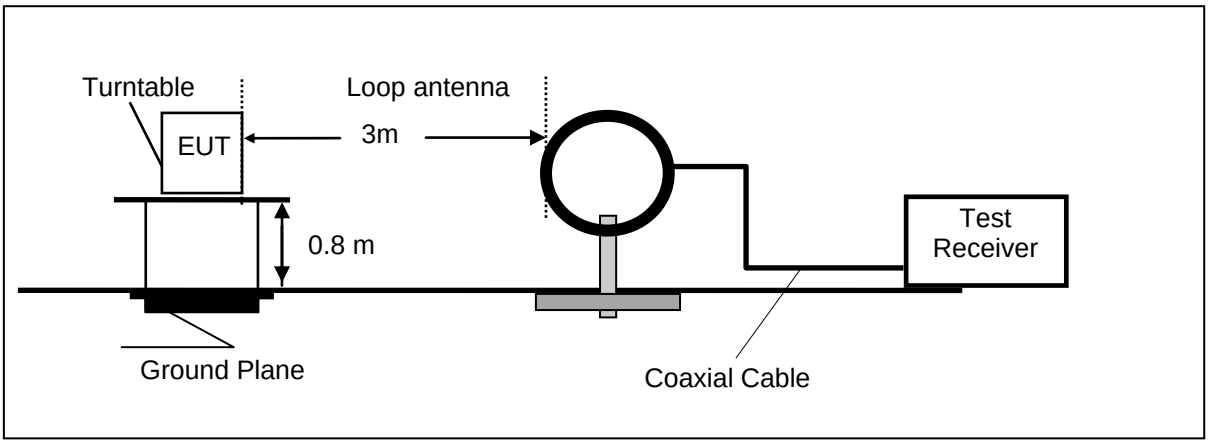
5/16/2018 10:47AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	36.70	10.0	55	17.9	AV	L1	GND
0.595500	27.90	9.7	46	18.1	AV	L1	GND
0.960000	22.50	9.6	46	23.5	AV	L1	GND
3.952500	23.00	9.4	46	23.0	AV	L1	GND
11.683500	25.00	8.6	50	25.0	AV	L1	GND
26.623500	37.40	9.0	50	12.6	AV	L1	GND

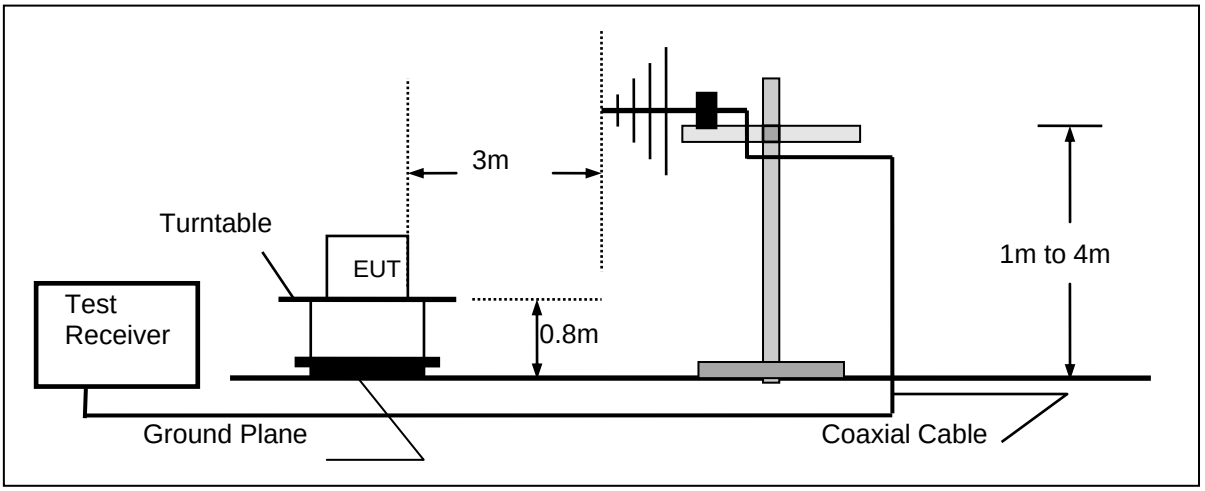
4.2. Radiated Emission

TEST CONFIGURATION

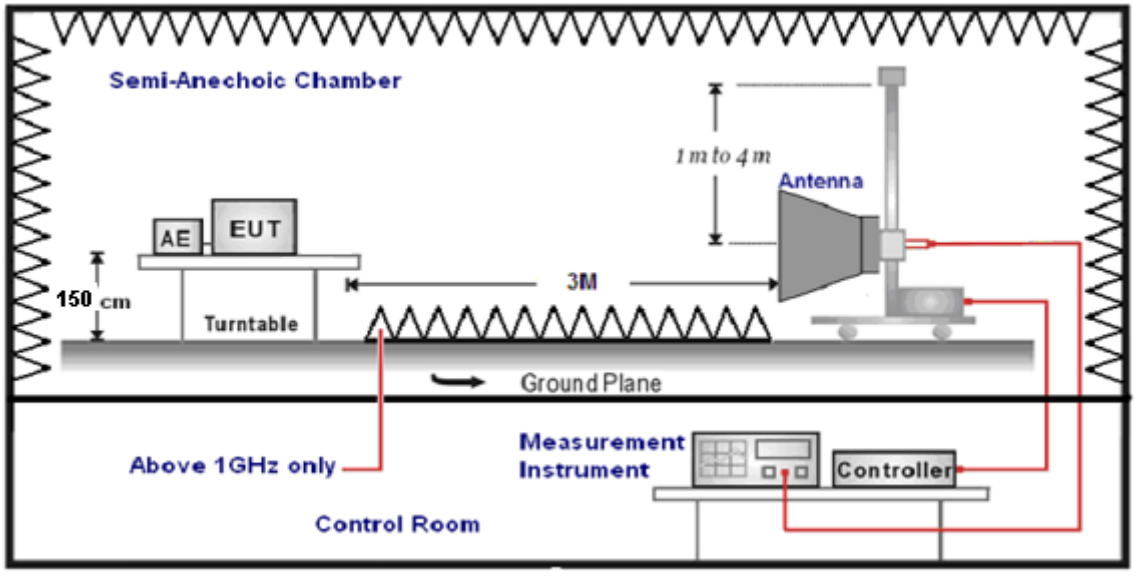
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Anternna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Transd=AF +CL-AG

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.

The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST RESULTS

Remark: We tested at 802.11b/802.11g/802.11n HT20/802.11n HT40 mode at the antenna single transmitting mode and 802.11n HT20/802.11n HT40 at the Mimo mode in AC 120V/60Hz, and recored the worst data at the antenna single transmitting mode.

For 9 KHz-30MHz

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

Note:

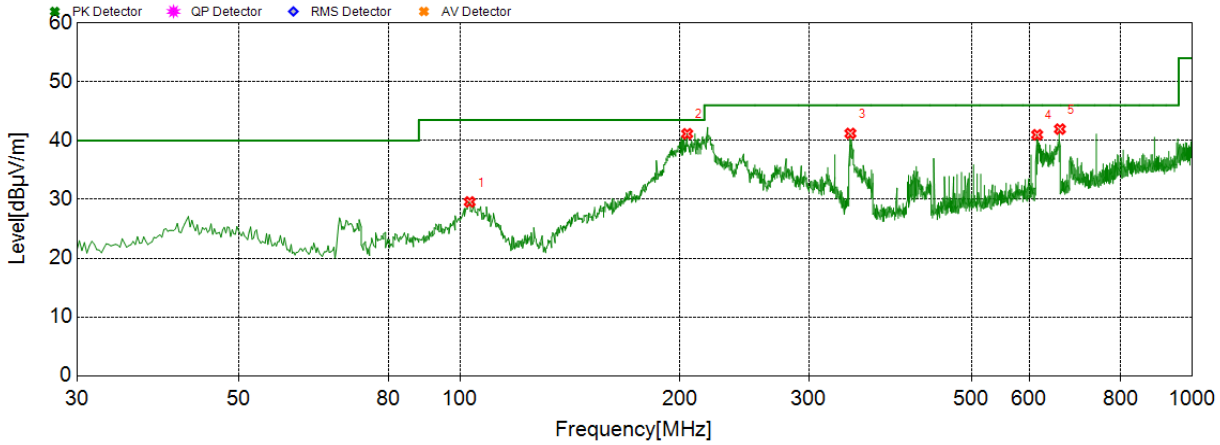
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

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

For 30MHz-1GHz

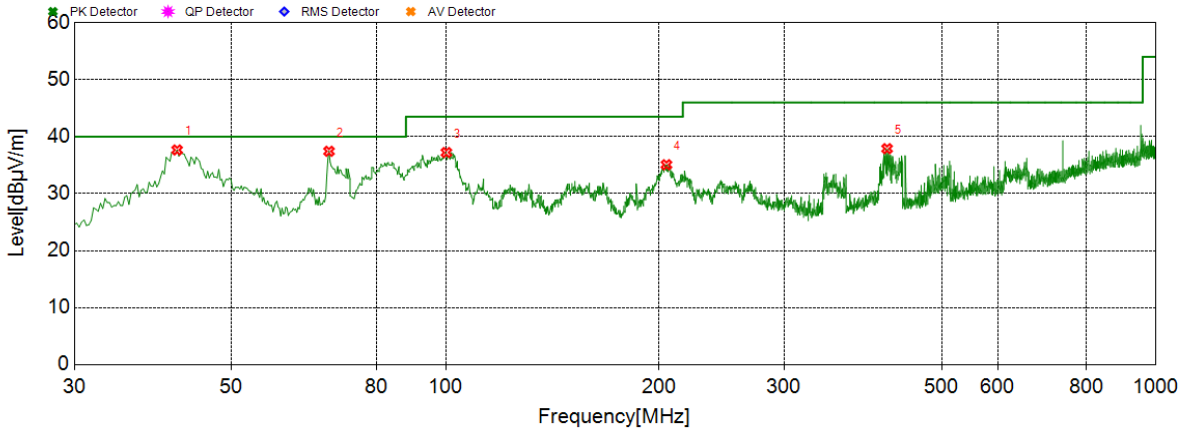
Horizontal



QP Limit PK

NO.	Freq. [MHz]	Reading [dBµV/m]	Result Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle[°]	Polarity
1	103.235	46.58	29.56	-17.02	43.50	13.94	128	315	Horizontal
2	204.600	57.48	41.14	-16.34	43.50	2.36	113	204	Horizontal
3	341.855	53.77	41.2	-12.57	46.00	4.80	135	190	Horizontal
4	615.153	48.35	40.97	-7.38	46.00	5.03	159	218	Horizontal
5	660.743	48.96	41.94	-7.02	46.00	4.06	124	204	Horizontal

Vertical



QP Limit PK

NO.	Freq. [MHz]	Reading [dBµV/m]	Result Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle[°]	Polarity
1	41.883	51.16	36.66	-14.50	40.00	3.34	105	266	Vertical
2	68.558	54.74	36.43	-18.31	40.00	3.57	112	266	Vertical
3	100.325	54.22	37.21	-17.01	43.50	6.29	121	36	Vertical
4	204.843	51.40	35.07	-16.33	43.50	8.43	108	215	Vertical
5	418.970	48.94	37.89	-11.05	46.00	8.11	100	207	Vertical

For 1GHz to 25GHz

Polar (H/V)	Frequency	Meter Reading	Antenna Factor	Cable loss	Preamp factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
802.11b-2412MHz									
V	4824	35.56	30.28	7.01	26.63	46.22	74	-27.78	Pk
H	4824	34.36	30.28	7.01	26.63	45.02	74	-28.98	PK
V	7236	27.13	36.59	8.91	24.98	47.65	74	-26.35	Pk
H	7236	26.45	36.59	8.91	24.98	46.97	74	-27.03	PK
802.11b-2437MHz									
V	4874	35.12	30.36	7.62	26.63	46.47	74	-27.53	Pk
H	4874	34.28	30.36	7.62	26.63	45.63	74	-28.37	PK
V	7311	27.38	36.61	8.84	24.98	47.85	74	-26.15	Pk
H	7311	27.86	36.61	8.84	24.98	48.33	74	-25.67	PK
802.11b-2462MHz									
V	4924	36.24	30.43	7.94	26.63	47.98	74	-26.02	Pk
H	4924	35.26	30.43	7.94	26.63	47.00	74	-27.00	PK
V	7386	27.96	36.78	8.45	24.98	48.21	74	-25.79	Pk
H	7386	26.58	36.78	8.45	24.98	46.83	74	-27.17	PK

Polar (H/V)	Frequency	Meter Reading	Antenna Factor	Cable loss	Preamp factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
802.11g-2412MHz									
V	4824	33.54	30.28	7.01	26.63	44.20	74	-29.80	Pk
H	4824	32.69	30.28	7.01	26.63	43.35	74	-30.65	PK
V	7236	28.04	36.59	8.91	24.98	48.56	74	-25.44	Pk
H	7236	25.48	36.59	8.91	24.98	46.00	74	-28.00	PK
802.11g-2437MHz									
V	4874	34.12	30.36	7.62	26.63	45.47	74	-28.53	Pk
H	4874	33.21	30.36	7.62	26.63	44.56	74	-29.44	PK
V	7311	26.59	36.61	8.84	24.98	47.06	74	-26.94	Pk
H	7311	26.41	36.61	8.84	24.98	46.88	74	-27.12	PK
802.11g-2462MHz									
V	4924	35.47	30.43	7.94	26.63	47.21	74	-26.79	Pk
H	4924	33.18	30.43	7.94	26.63	44.92	74	-29.08	PK
V	7386	25.42	36.78	8.45	24.98	45.67	74	-28.33	Pk
H	7386	25.18	36.78	8.45	24.98	45.43	74	-28.57	PK

Polar (H/V)	Frequency	Meter Reading	Antenna Factor	Cable loss	Preamp factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
802.11n20-2412MHz									
V	4824	31.96	30.28	7.01	26.63	42.62	74	-31.38	Pk
H	4824	32.48	30.28	7.01	26.63	43.14	74	-30.86	PK
V	7236	27.59	36.59	8.91	24.98	48.11	74	-25.89	Pk
H	7236	26.32	36.59	8.91	24.98	46.84	74	-27.16	PK
802.11n20-2437MHz									
V	4874	35.48	30.36	7.62	26.63	46.83	74	-27.17	Pk
H	4874	33.32	30.36	7.62	26.63	44.67	74	-29.33	PK
V	7311	26.94	36.61	8.84	24.98	47.41	74	-26.59	Pk
H	7311	25.86	36.61	8.84	24.98	46.33	74	-27.67	PK
802.11n20-2462MHz									
V	4924	34.18	30.43	7.94	26.63	45.92	74	-28.08	Pk
H	4924	33.27	30.43	7.94	26.63	45.01	74	-28.99	PK
V	7386	25.85	36.78	8.45	24.98	46.10	74	-27.90	Pk
H	7386	26.18	36.78	8.45	24.98	46.43	74	-27.57	PK

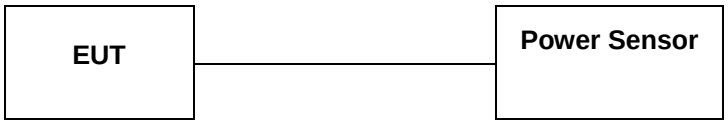
Polar (H/V)	Frequency	Meter Reading	Antenna Factor	Cable loss	Preamp factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
802.11n40-2422MHz									
V	4844	29.62	30.18	7.06	26.63	40.23	74	-33.77	Pk
H	4844	30.01	30.18	7.06	26.63	40.62	74	-33.38	PK
V	7266	24.18	36.61	9.02	24.98	44.83	74	-29.17	Pk
H	7266	25.24	36.61	9.02	24.98	45.89	74	-28.11	PK
802.11n40-2437MHz									
V	4874	30.15	30.36	7.62	26.63	41.50	74	-32.50	Pk
H	4874	29.68	30.36	7.62	26.63	41.03	74	-32.97	PK
V	7311	22.58	36.61	8.84	24.98	43.05	74	-30.95	Pk
H	7311	23.35	36.61	8.84	24.98	43.82	74	-30.18	PK
802.11n40-2452MHz									
V	4904	31.26	30.31	8.06	26.63	43.00	74	-31.00	Pk
H	4904	29.29	30.31	8.06	26.63	41.03	74	-32.97	PK
V	7356	21.86	36.56	8.45	24.98	41.89	74	-32.11	Pk
H	7356	23.28	36.56	8.45	24.98	43.31	74	-30.69	PK

REMARKS:

1. Emission level (dBuV/m) = Meter Reading+ antenna Factor+ cable loss- preamp factor
2. Margin value = Emission level-Limits
3. -- Mean the PK detector measured value is below average limit.
4. The other emission levels were very low against the limit.
5. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

4.3. Maximum Peak Output Power

TEST CONFIGURATION



TEST PROCEDURE

According to KDB558074 D01 DTS Measurement Guidance Section 9.1 Maximum peak conducted output power,9.1.2. and Average conducted output power, 9.2.3.1.

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

The maximum Average conducted output power may be measured using a wideband RF power meter with a thermocouple derector or equivalent. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

LIMIT

The Maximum Peak Output Power Measurement is 30dBm.

TEST RESULTS

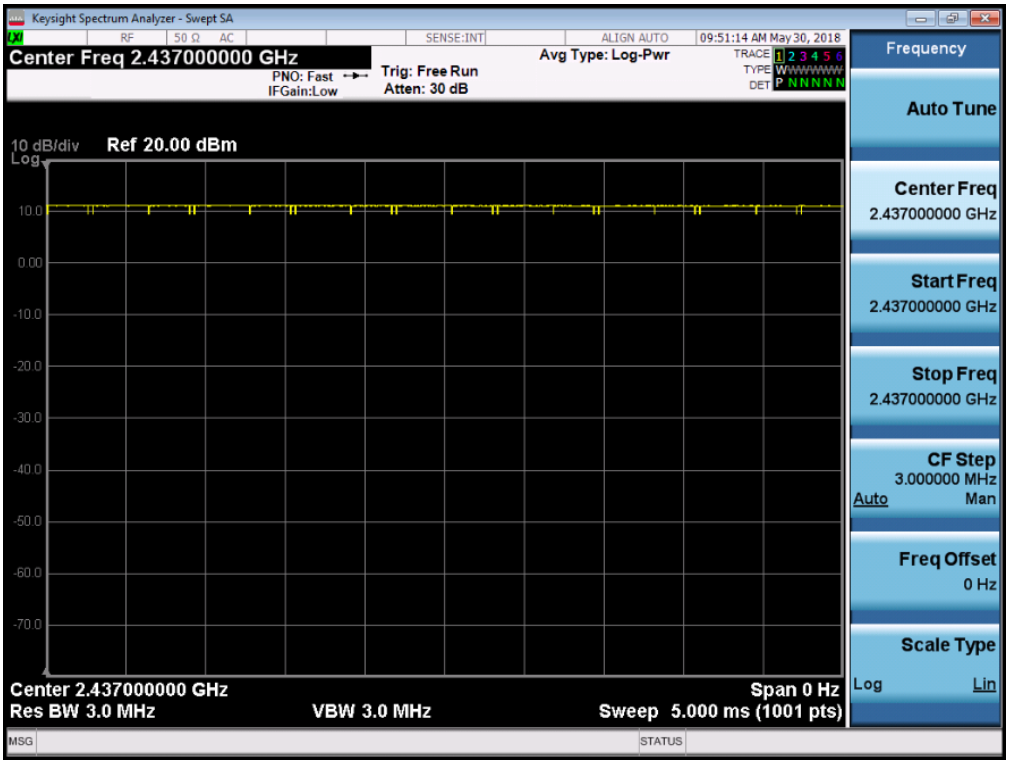
Antenna 1

Type	Channel	Output power PK (dBm)	Output power PK (dBm)	Output power Total (dBm)	Limit (dBm)	Result
		ANT 1	ANT 2			
802.11b	01	12.69	12.24	/	30.00	Pass
	06	13.57	13.86	/		
	11	13.38	13.87	/		
802.11g	01	10.81	10.87	/	30.00	Pass
	06	10.94	10.76	/		
	11	10.48	11.05	/		
802.11n(HT20)	01	9.75	9.98	12.877	30.00	Pass
	06	10.49	10.29	13.401		
	11	10.12	10.26	13.201		
802.11n(HT40)	03	8.68	8.39	11.548	30.00	Pass
	06	9.04	8.79	11.927		
	09	8.57	8.82	11.707		

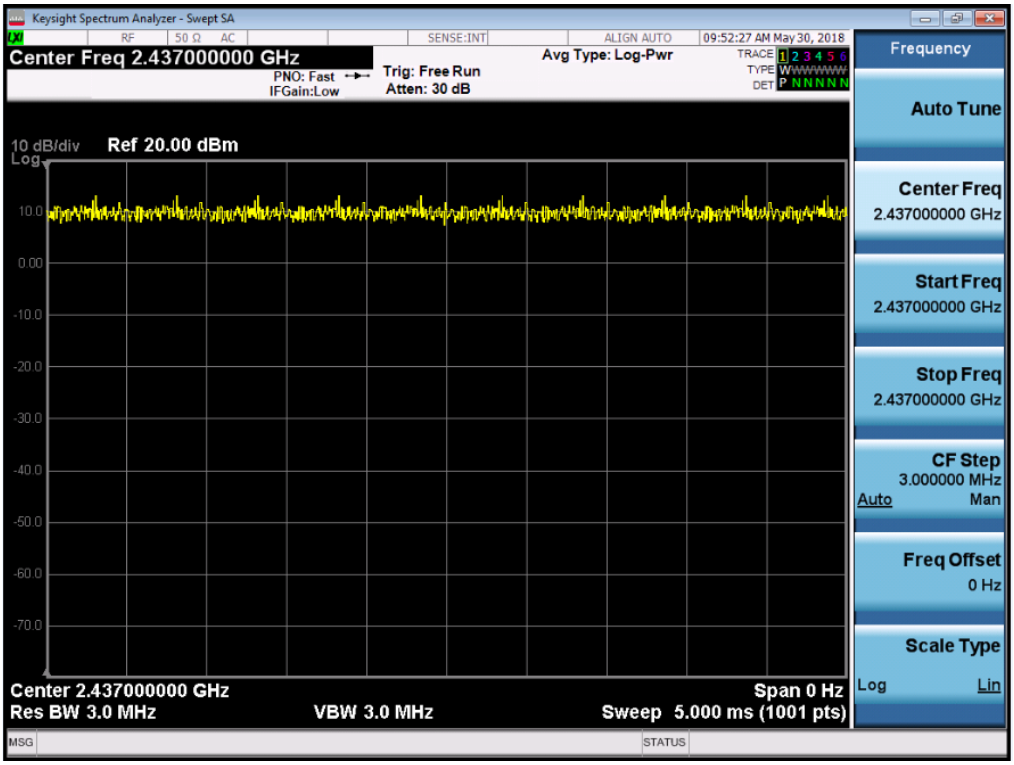
Note: 1.The test results including the cable lose.

Duty cycle used in all test items: 100%

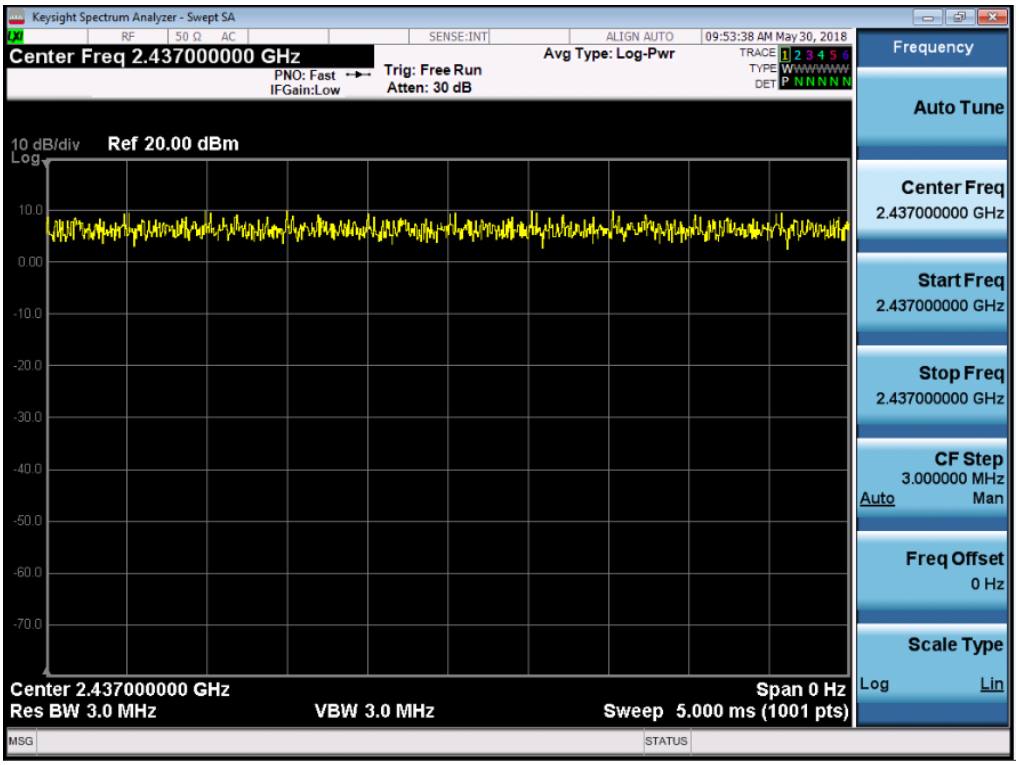
802.11b



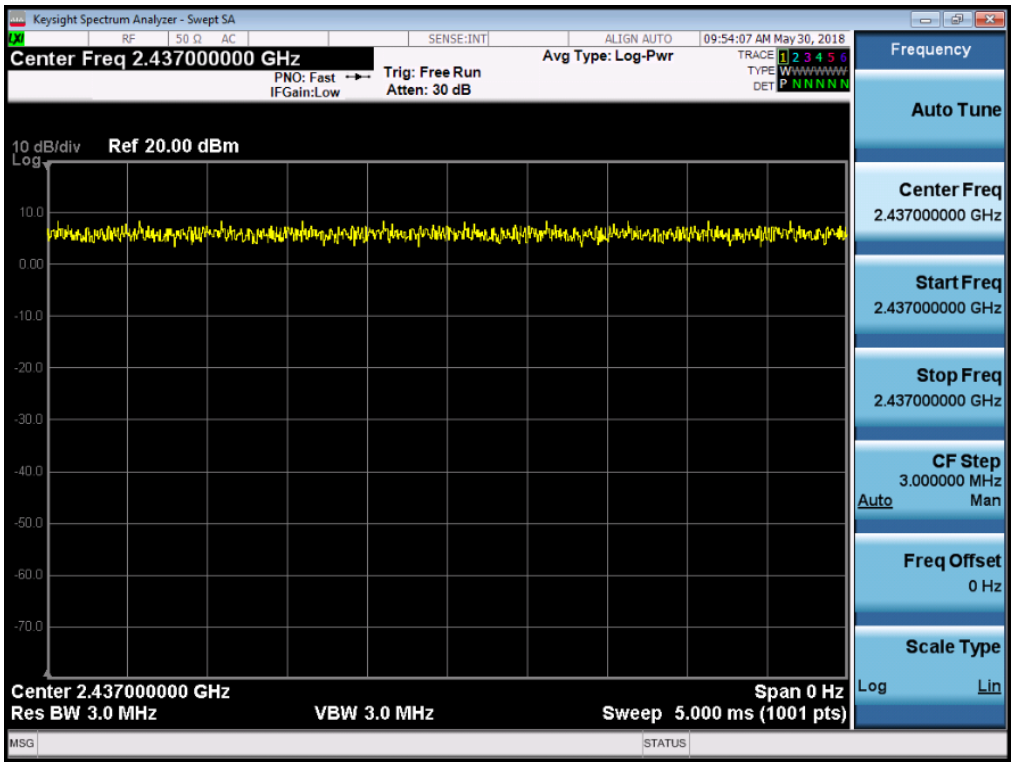
802.11g



802.11n20

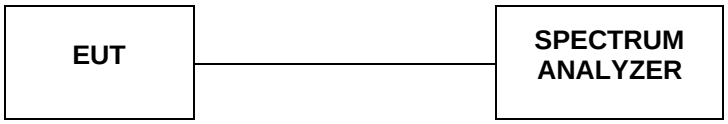


802.11n40



4.4. Power Spectral Density

TEST CONFIGURATION



TEST PROCEDURE

According to KDB 558074 D01 Method PKPSD (peak PSD) This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance, and is optional if the maximum conducted (average) output power was used to demonstrate compliance.

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 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 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.

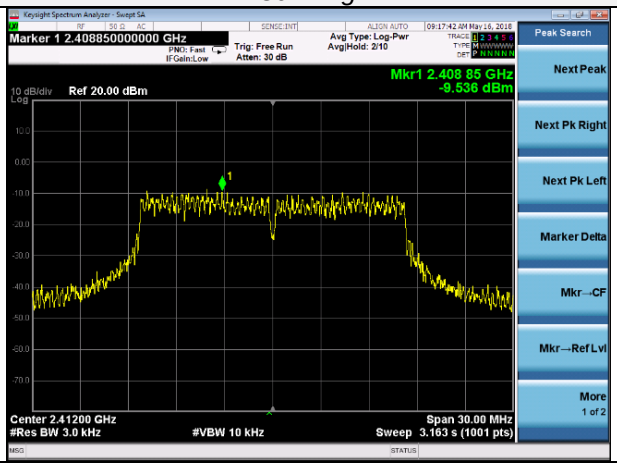
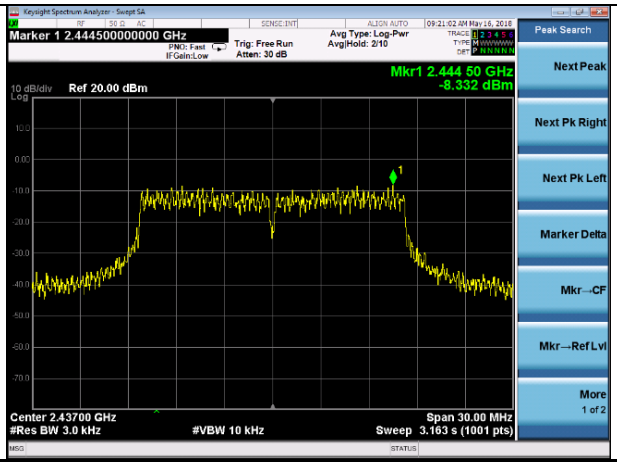
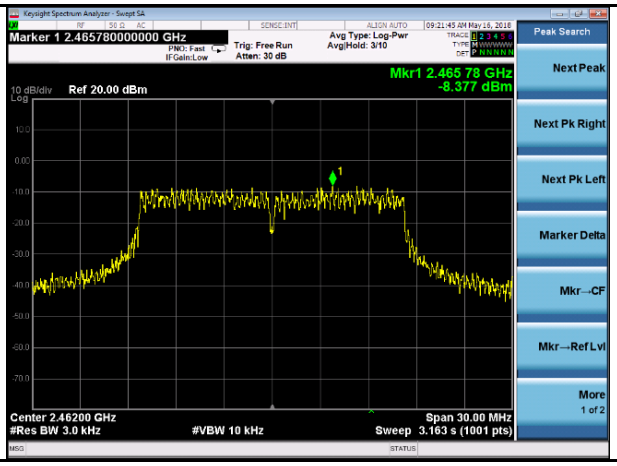
LIMIT

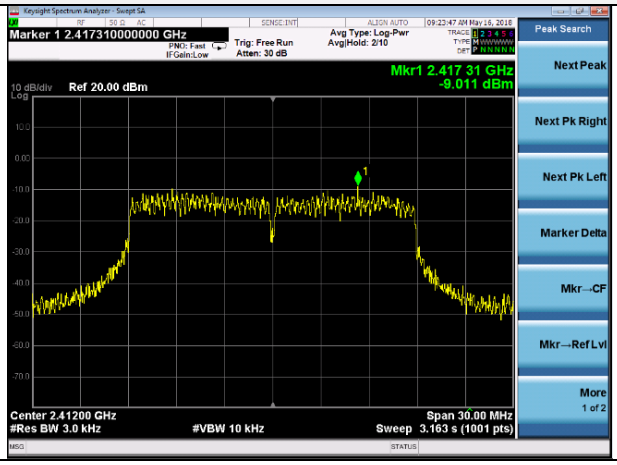
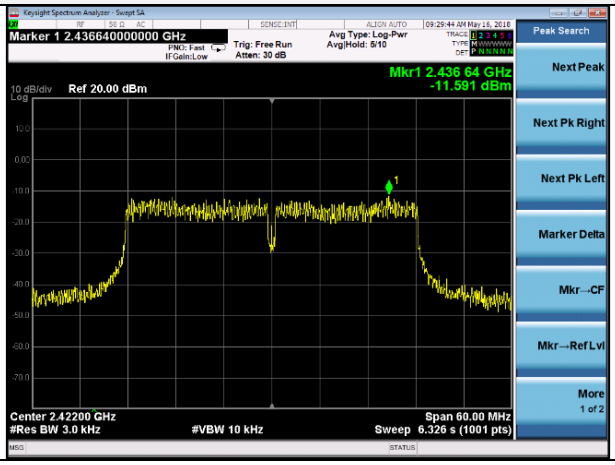
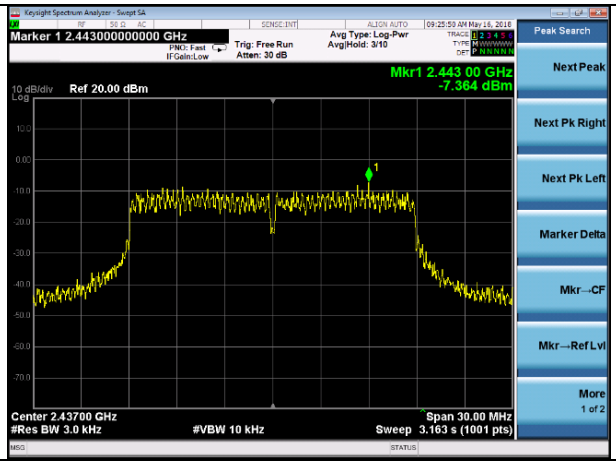
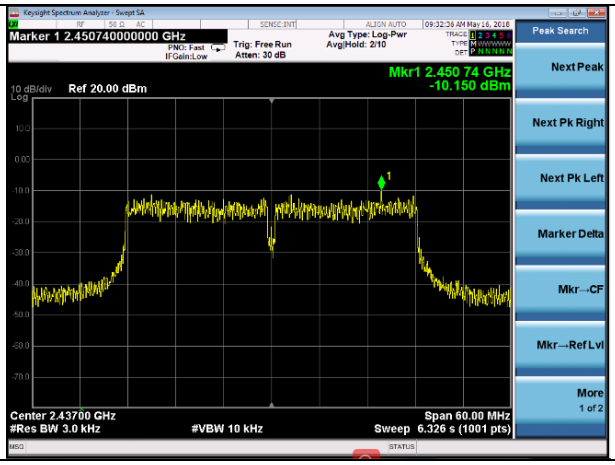
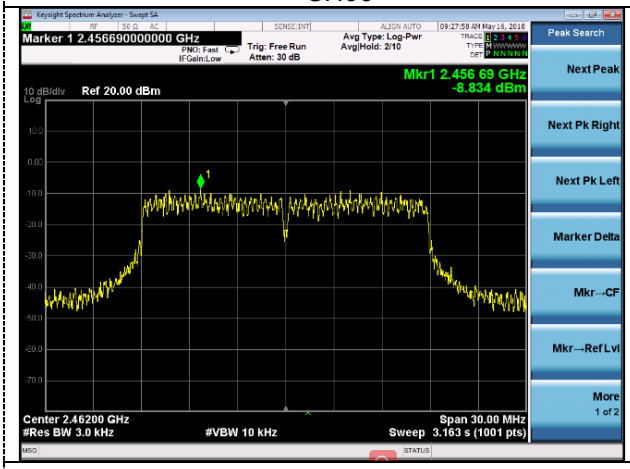
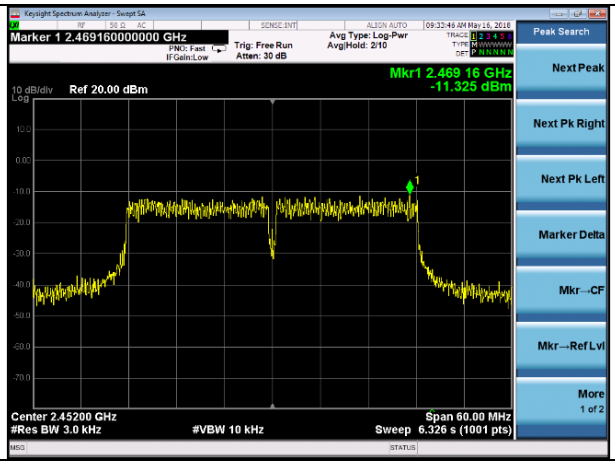
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST RESULTS

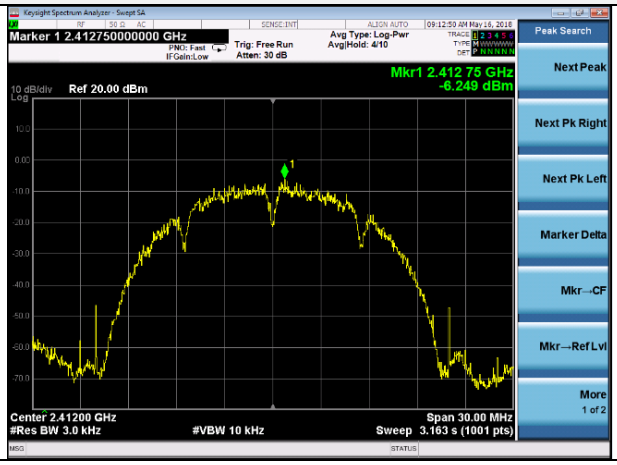
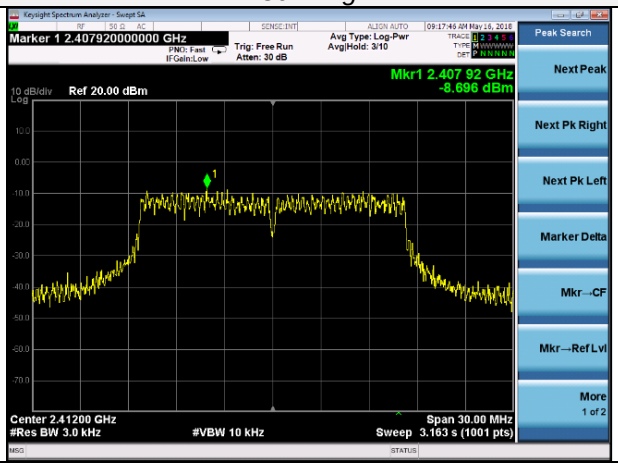
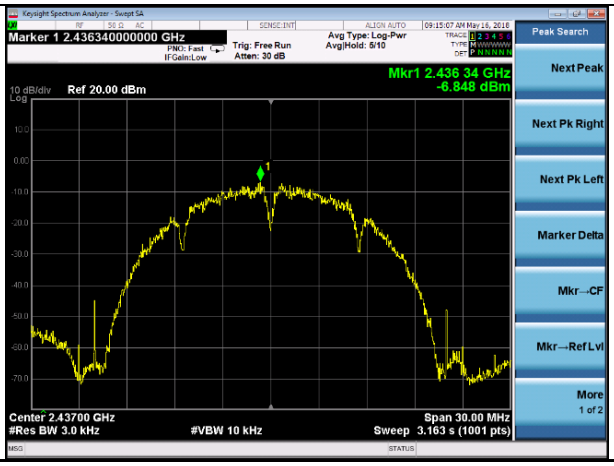
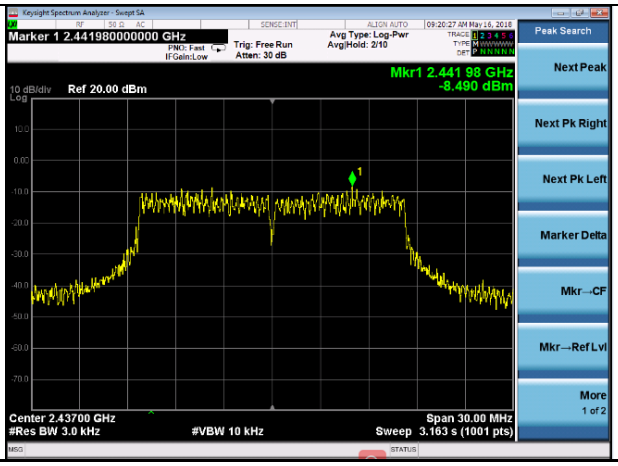
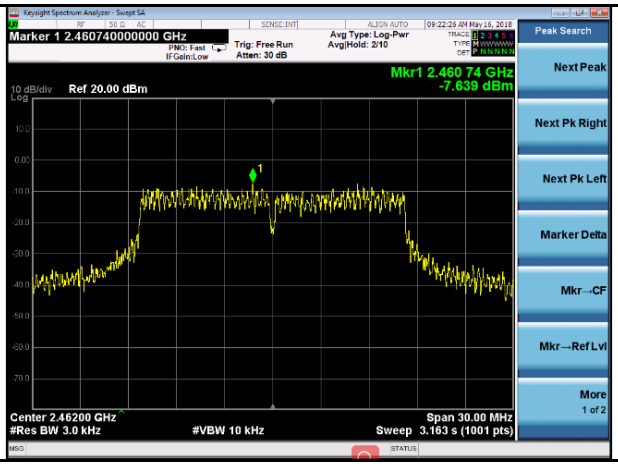
Type	Channel	Power Spectral Density (dBm/3KHz)	Power Spectral Density (dBm/3KHz)	Power Spectral Density Total(dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-6.614	-6.249	/	8.00	Pass
	06	-7.295	-6.848	/		
	11	-6.503	-5.127	/		
802.11g	01	-9.536	-8.696	/	8.00	Pass
	06	-8.332	-8.49	/		
	11	-8.377	-7.639	/		
802.11n(HT20)	01	-9.011	-8.458	-5.715	8.00	Pass
	06	-7.364	-7.955	-4.639		
	11	-8.834	-8.527	-5.667		
802.11n(HT40)	03	-11.591	-12.329	-8.934	8.00	Pass
	06	-10.15	-11.191	-7.629		
	09	-11.325	-11.128	-8.215		

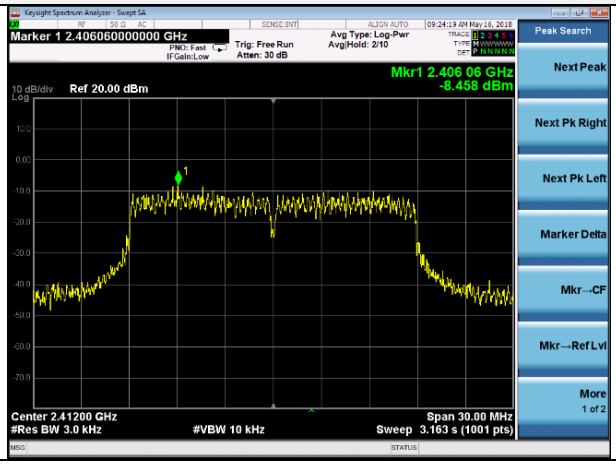
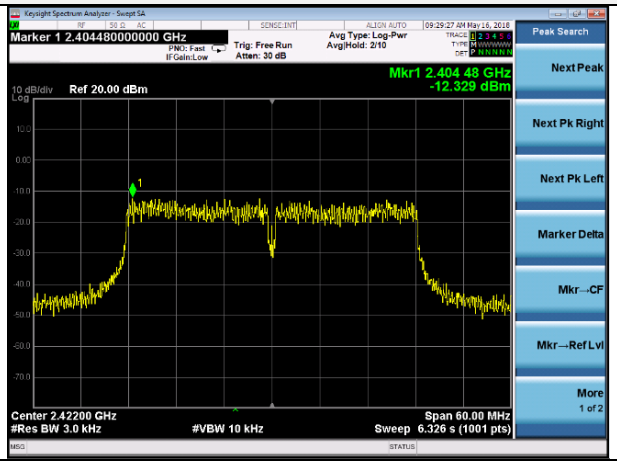
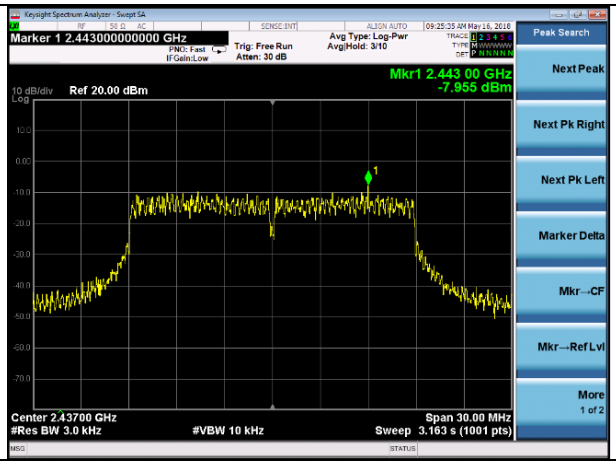
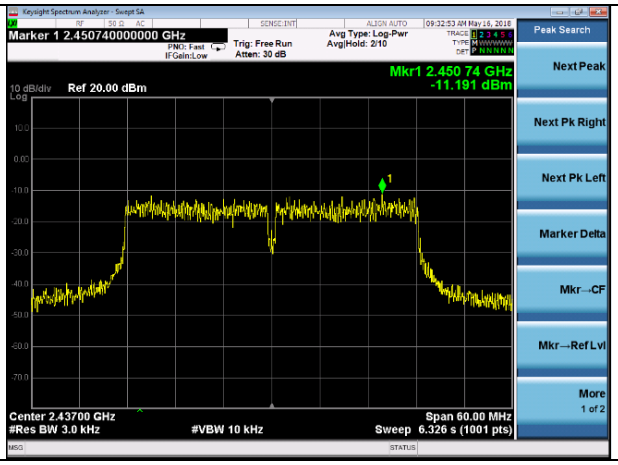
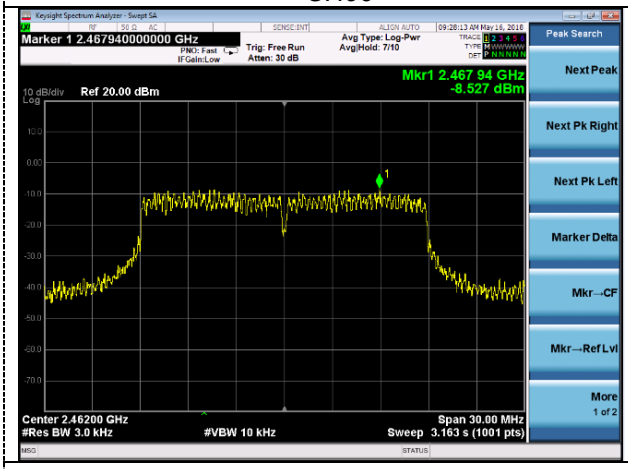
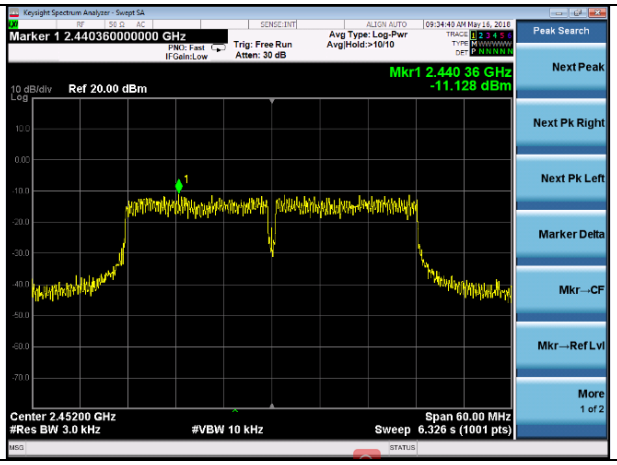
Antenna 1

802.11b	802.11g
	
CH01	CH01
	
CH06	CH06
	
CH11	CH11

802.11 nHT20	802.11nHT40
	
CH01	CH03
	
CH06	CH06
	
CH11	CH09

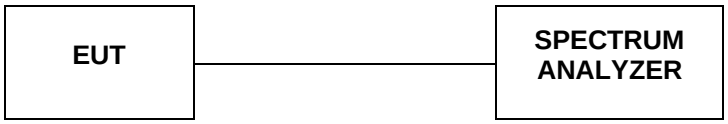
Antenna 2

802.11b	802.11g
	
CH01	CH01
	
CH06	CH06
	
CH11	CH11

802.11 nHT20	*802.11nHT40*
	
CH01	*CH03*
	
CH06	*CH06*
	
CH11	*CH09*

4.5. 6dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=100 KHz and VBW=300KHz.
The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.
According to KDB558074 D01 for one of the following procedures may be used to determine the modulated DTS device signal bandwidth.
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 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.

LIMIT

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz

TEST RESULTS

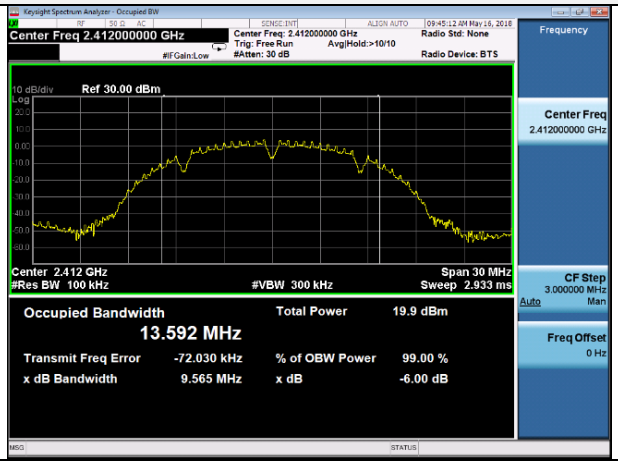
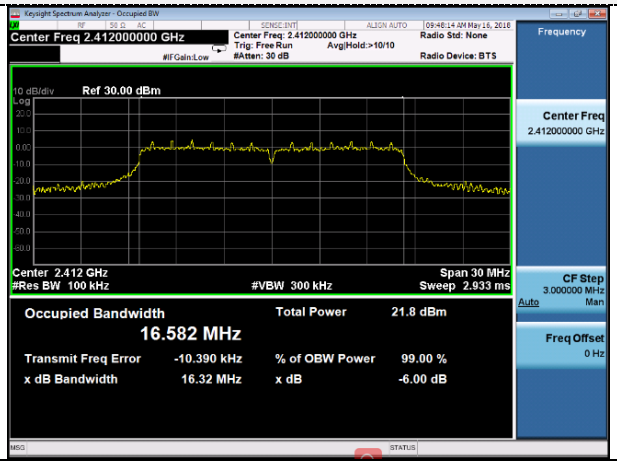
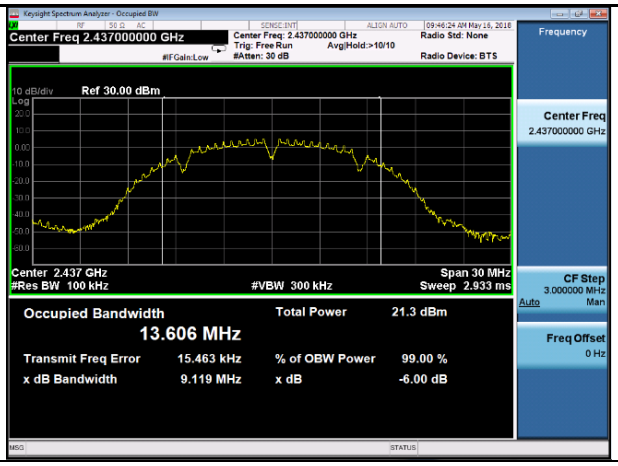
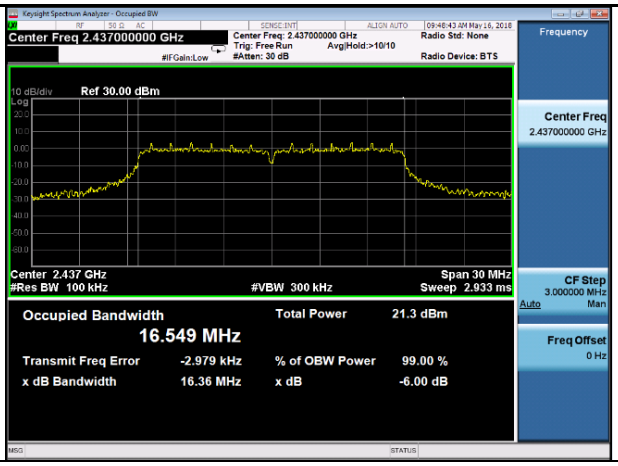
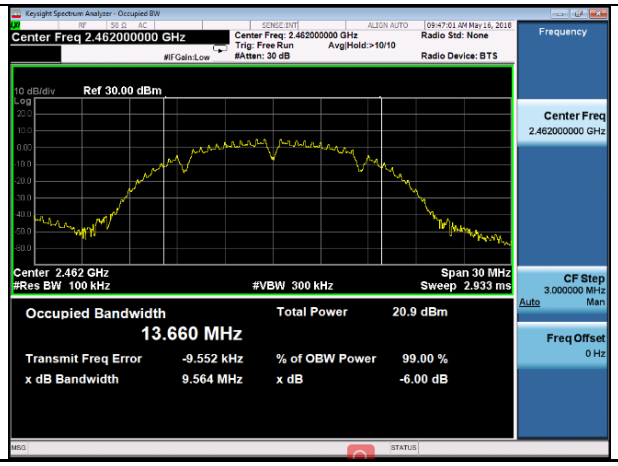
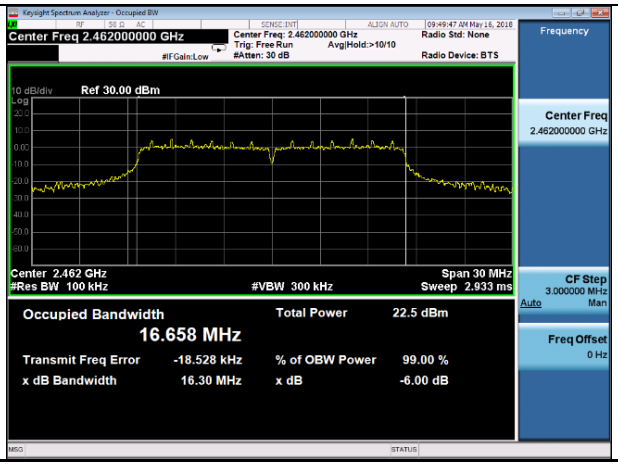
Antenna 1

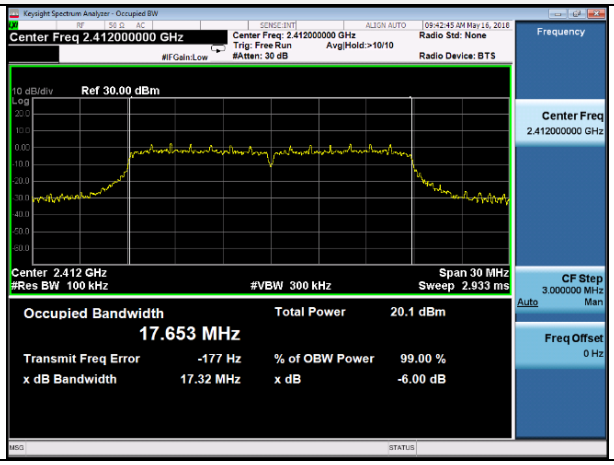
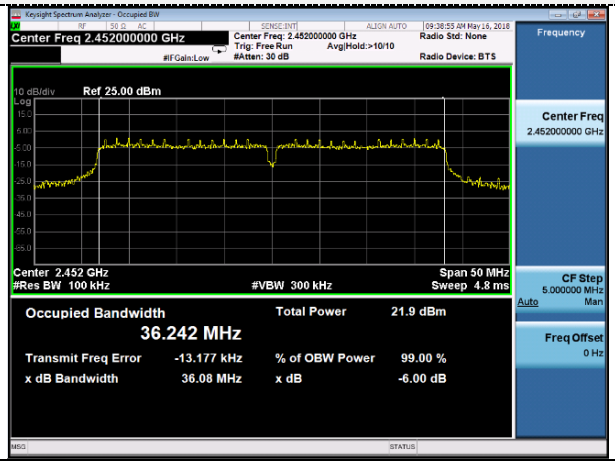
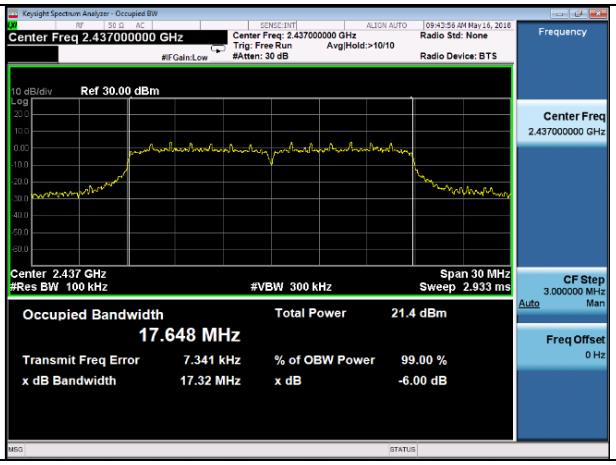
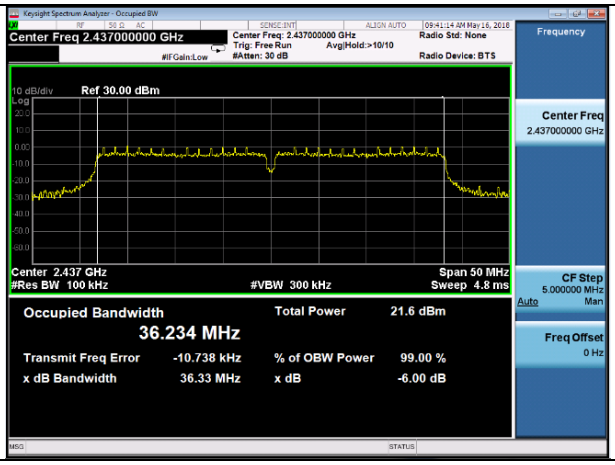
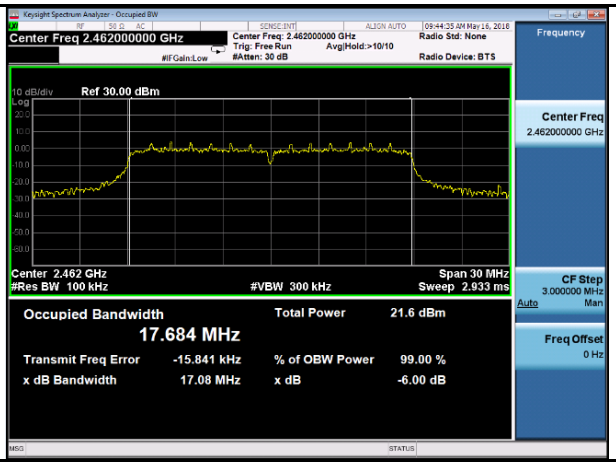
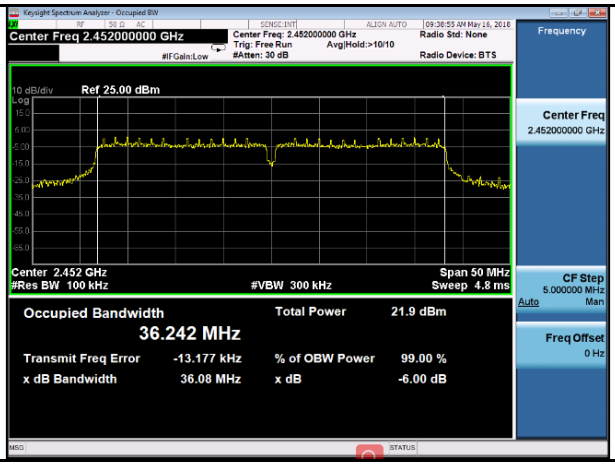
Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11b	01	9.565	≥500	Pass
	06	9.119		
	11	9.564		
802.11g	01	16.32	≥500	Pass
	06	16.36		
	11	16.30		
802.11nHT20	01	17.32	≥500	Pass
	06	17.32		
	11	17.08		
802.11nHT40	03	36.08	≥500	Pass
	06	36.33		
	09	36.08		

Antenna 2

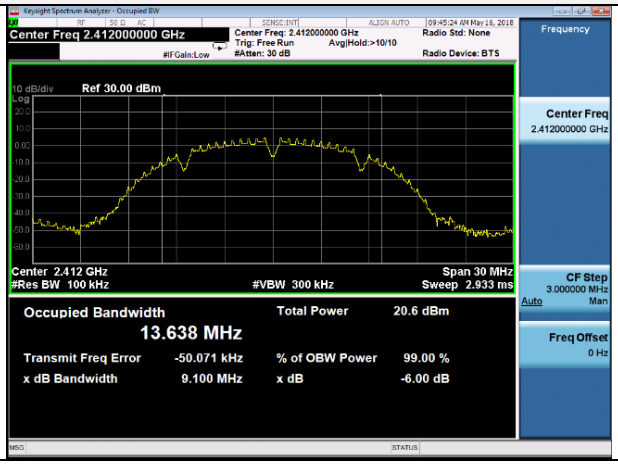
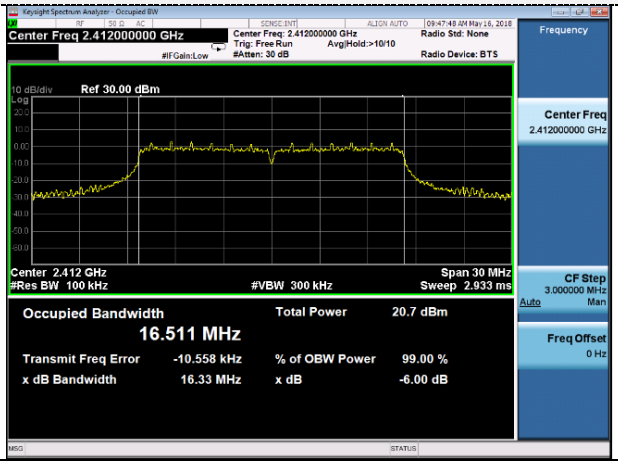
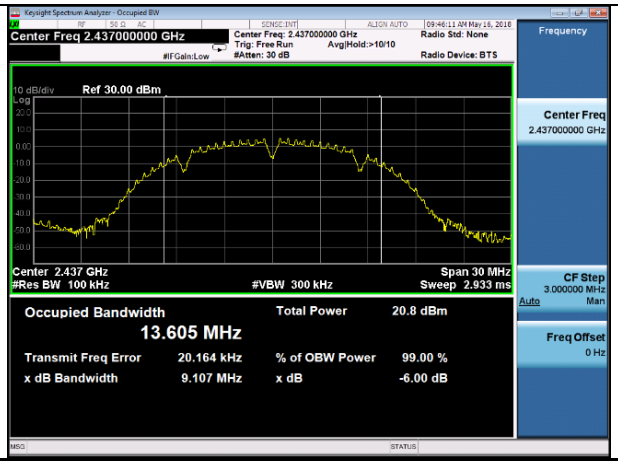
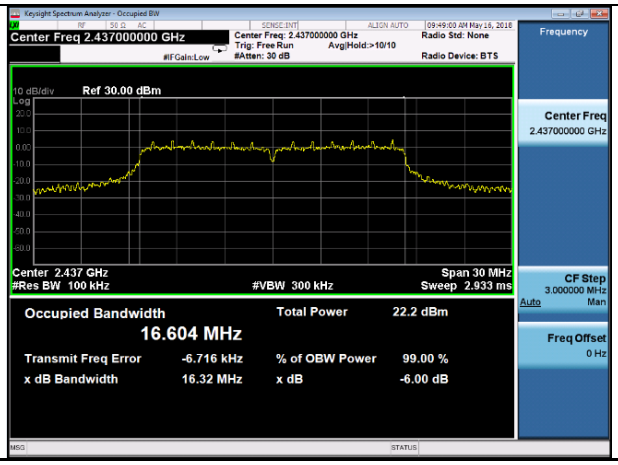
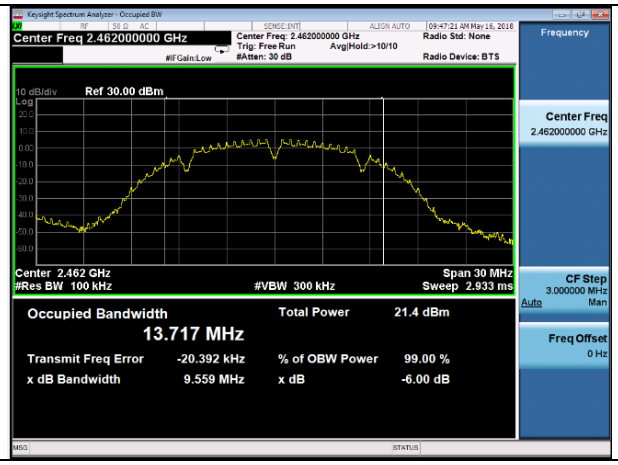
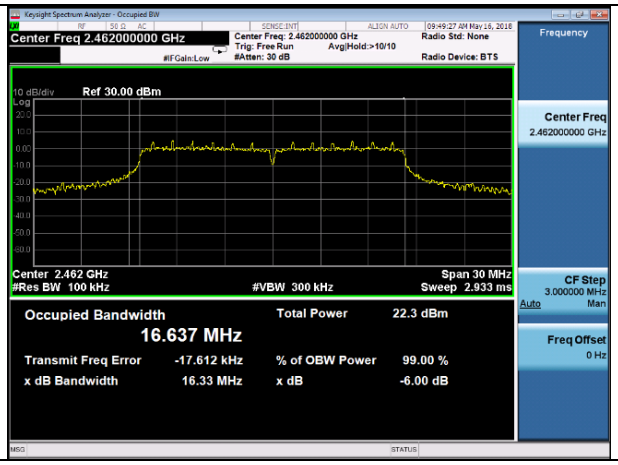
Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11b	01	9.100	≥500	Pass
	06	9.107		
	11	9.559		
802.11g	01	16.33	≥500	Pass
	06	16.32		
	11	16.33		
802.11nHT20	01	17.33	≥500	Pass
	06	17.08		
	11	17.08		
802.11nHT40	03	36.08	≥500	Pass
	06	36.32		
	09	35.72		

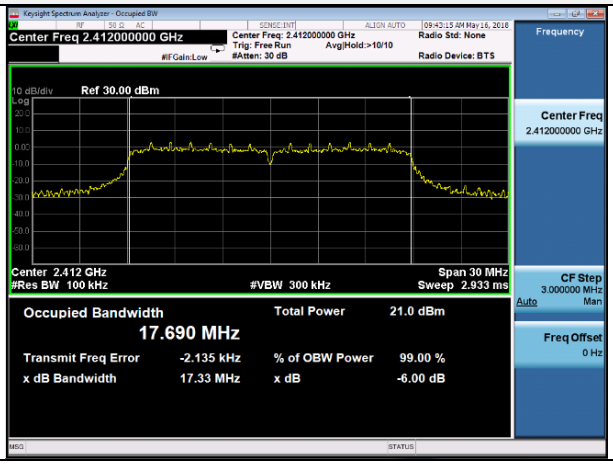
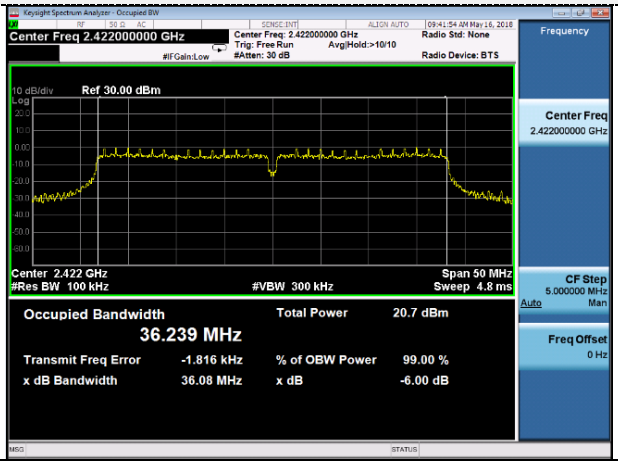
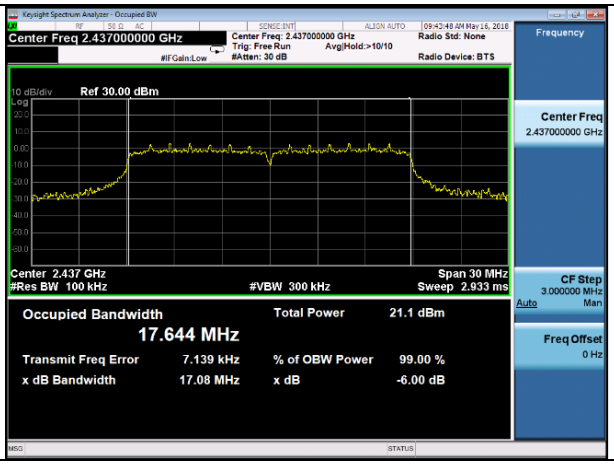
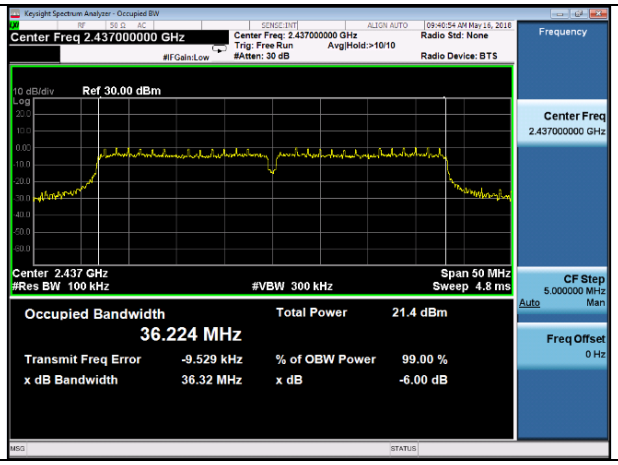
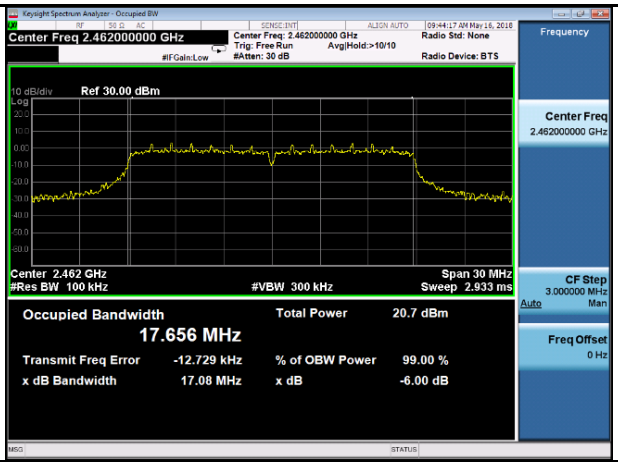
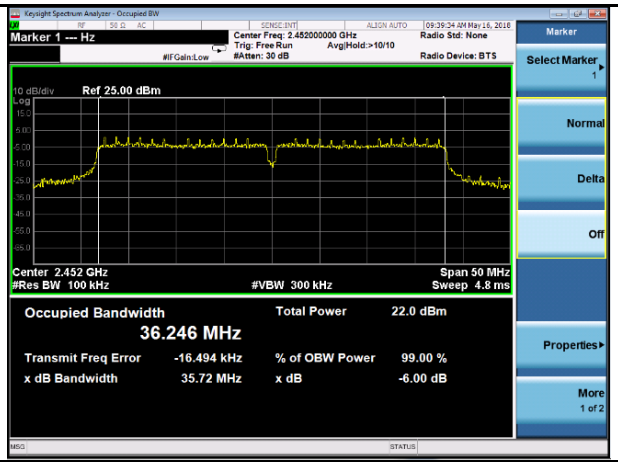
Antenna 1

802.11b	*802.11g*
	
CH01	*CH01*
	
CH06	*CH06*
	
CH11	*CH11*

802.11n HT20	*802.11n HT40*
	
CH01	*CH03*
	
CH06	*CH06*
	
CH11	*CH09*

Antenna 2

802.11b	802.11g
	
CH01	CH01
	
CH06	CH06
	
CH11	CH11

802.11n HT20	*802.11n HT40*
	
CH01	*CH03*
	
CH06	*CH06*
	
CH11	*CH09*