

**Shenzhen Global Test Service Co.,Ltd.**

1F, Building No. 13A, Zhonghaixin Science and Technology City, No.12,6 Road, Ganli Industrial Park, Buji Street, Longgang District, Shenzhen, Guangdong

FCC PART 15 SUBPART C TEST REPORT**FCC PART 15.247****Report Reference No.....: GTSR17050270-02****FCC ID..... : 2AMHW-NV3013**

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Date of issue.....: Jun. 19, 2017

Representative Laboratory Name.: Shenzhen Global Test Service Co.,Ltd.

Address: 1F, Building No. 13A, Zhonghaixin Science and Technology City,
No.12,6 Road, Ganli Industrial Park, Buji Street, Longgang District,
Shenzhen, Guangdong

Applicant's name.....: Beijing Xiaoyuer Network Technology Co.,Ltd.

Address: F/3,Building 10,No.18 Ziyuelu, Science and Technology Industrial
Park,Chaoyang District,Beijing

Test specification

Standard: **FCC Part 15.247: Operation within the bands 902-928 MHz,
2400-2483.5 MHz and 5725-5850 MHz**

TRF Originator: Shenzhen Global Test Service Co.,Ltd.

Master TRF.....: Dated 2014-12

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Test item description Internet Smart Device

Trade Mark: /

Manufacturer: **Beijing Xiaoyuer Network Technology Co.,Ltd.**

Model/Type reference.....: NV3013

Listed Models: /

Operation Frequency.....: From 2412MHz to 2462MHz

Hardware Version: E248779

Software Version: V1.0

Rating: AC 100-240V 50/60Hz 0.55A

Result.....: **PASS**

TEST REPORT

Test Report No. :	GTSR17050270-02	Jun. 19, 2017
		Date of issue

Equipment under Test : Internet Smart Device

Model /Type : NV3013

Listed Models : /

Applicant : **Beijing Xiaoyuer Network Technology Co.,Ltd.**

Address : F/3,Building 10, No.18 Ziyuelu,Science and Technology Industrial Park,Chaoyang District,Beijing

Manufacturer : **Beijing Xiaoyuer Network Technology Co.,Ltd.**

Address : F/3,Building 10, No.18 Ziyuelu,Science and Technology Industrial Park,Chaoyang District,Beijing

Test Result:	PASS
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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.

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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

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	May. 27, 2017
Testing commenced on	:	May. 27, 2017
Testing concluded on	:	Jun. 19, 2017

2.2. Product Description

Name of EUT	Internet Smart Device
Trade Mark:	/
Model Number	NV3013
Listed Models	/
FCC ID	2AMHW-NV3013
Power Supply	DC 12V
Adapter information:	Model:GS-P120020C831 Input: AC 100-240V~50/60Hz 0.55A Output:DC 12V 2A
WLAN	Supported 802.11b/802.11g/802.11n HT20/802.11n HT40
Modulation Type	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 802.11b:2412-2462MHz IEEE 802.11g:2412-2462MHz IEEE 802.11n HT20:2412-2462MHz IEEE 802.11n HT40:2422-2452MHz
Antenna Type	Internal Antenna
Antenna gain	-0.72dBi

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)	

DC 12V From Adapter AC 120V/60Hz

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

This is a Internet Smart Device.

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

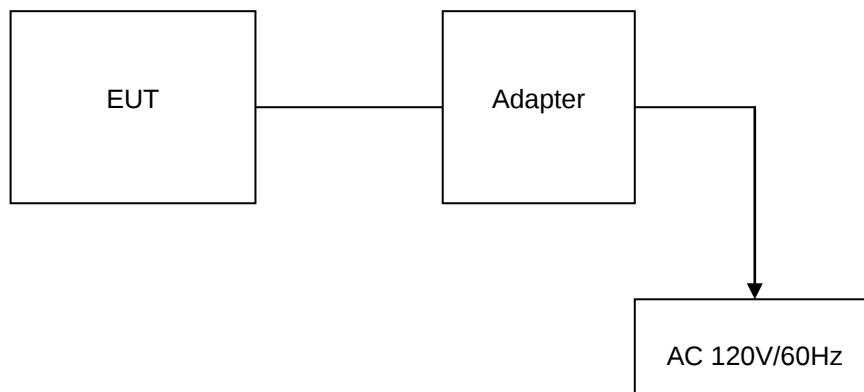
2.5. EUT operation mode

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: 2AMHW-NV3013** 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.

1F, Building No. 13A, Zhonghaixin Science and Technology City, No.12,6 Road, Ganli Industrial Park, Buji Street, Longgang District, Shenzhen, Guangdong

Shenzhen CTL Testing Technology Co.,Ltd.

1/F.-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, Guangdong, China

3.2. Test Facility

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

FCC-Registration No.: 964637

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. Registration 964637, Jul 24, 2015.

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.

FCC-Registration No.: 970318

Shenzhen CTL Testing Technology 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. Registration 970318, December 19, 2013.

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~10 th 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

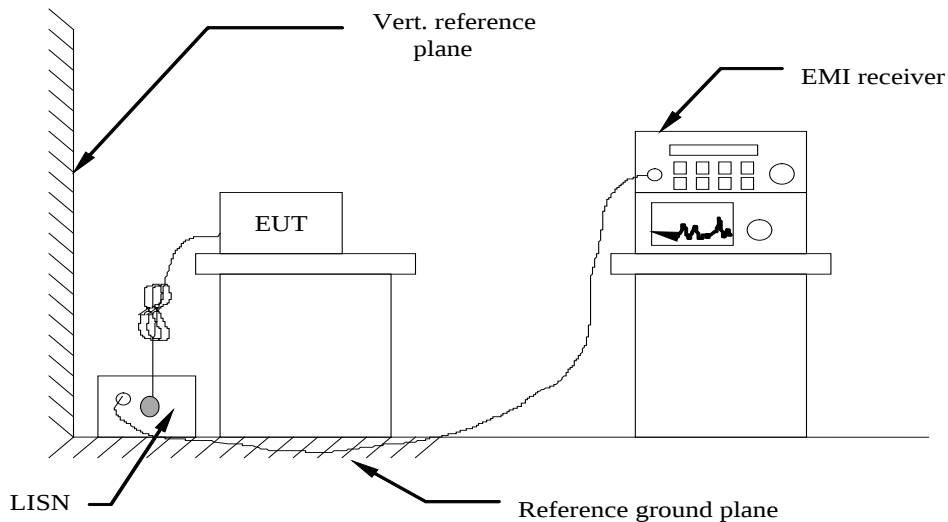
Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.08	2017/05/28	2018/05/27
LISN	R&S	ESH2-Z5	893606/008	2017/05/27	2018/05/26
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2017/06/02	2018/06/01
EMI Test Receiver	R&S	ESCI	101102	2016/06/26	2017/06/25
Spectrum Analyzer	Agilent	N9020A	MY48010425	2017/06/17	2018/06/16
Controller	EM Electronics	Controller EM 1000	N/A	2017/05/21	2018/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2017/05/21	2018/05/20
Active Loop Antenna	SCHWARZBEC K	FMZB1519	1519-037	2017/05/19	2018/05/18
Amplifier	Agilent	8349B	3008A02306	2017/05/19	2018/05/18
Amplifier	Agilent	8447D	2944A10176	2017/05/19	2018/05/18
Temperature/Humidity Meter	Gangxing	CTH-608	02	2017/05/20	2018/05/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2017/05/20	2018/05/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2017/05/20	2018/05/19
Data acquisition card	Agilent	U2531A	TW53323507	2017/05/20	2018/05/19
Power Sensor	Agilent	U2021XA	MY5365004	2017/05/20	2018/05/19
RF Cable	HUBER+SUHNER	RG214	N/A	2017/05/20	2018/05/19

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

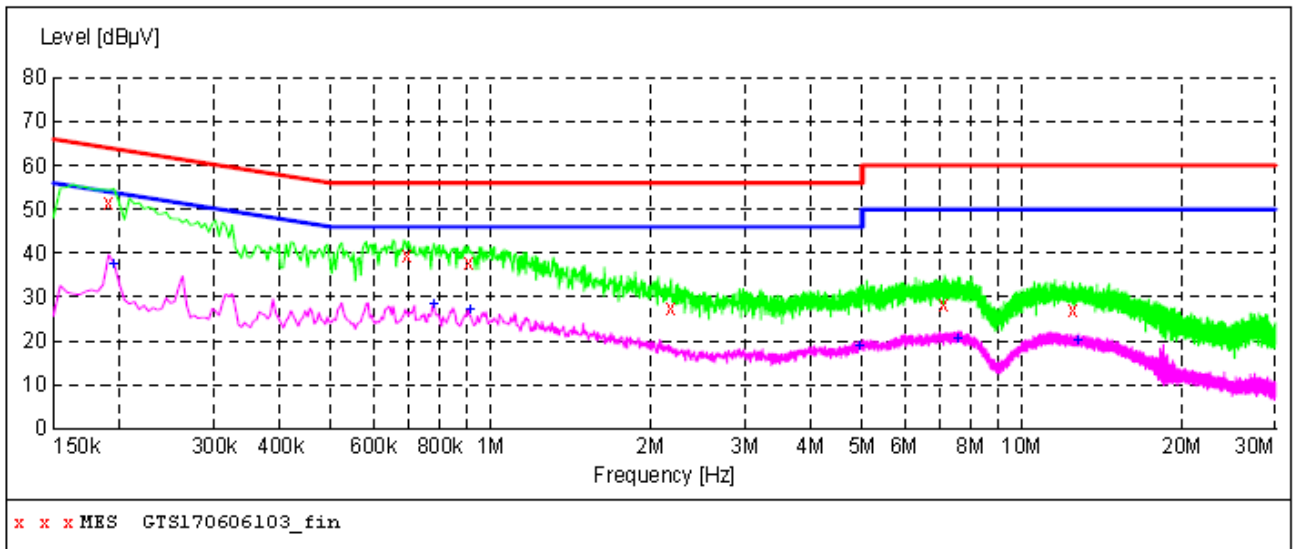
Remark: We tested at 802.11b/802.11g/802.11n HT20/802.11n HT40 mode in AC 120V/60Hz and 240V/60Hz, the worst case was recorded .

Power supply:

DC 12V from Adapter
AC 120V/60Hz

Polarization

L

**MEASUREMENT RESULT: "GTS170606103_fin"**

6/6/2017 9:17AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.190500	51.70	10.0	64	12.3	QP	L1	GND
0.694500	39.60	9.7	56	16.4	QP	L1	GND
0.910500	37.90	9.6	56	18.1	QP	L1	GND
2.188500	27.60	9.5	56	28.4	QP	L1	GND
7.143000	28.40	9.1	60	31.6	QP	L1	GND
12.457500	27.00	8.5	60	33.0	QP	L1	GND

MEASUREMENT RESULT: "GTS170606103_fin2"

6/6/2017 9:17AM

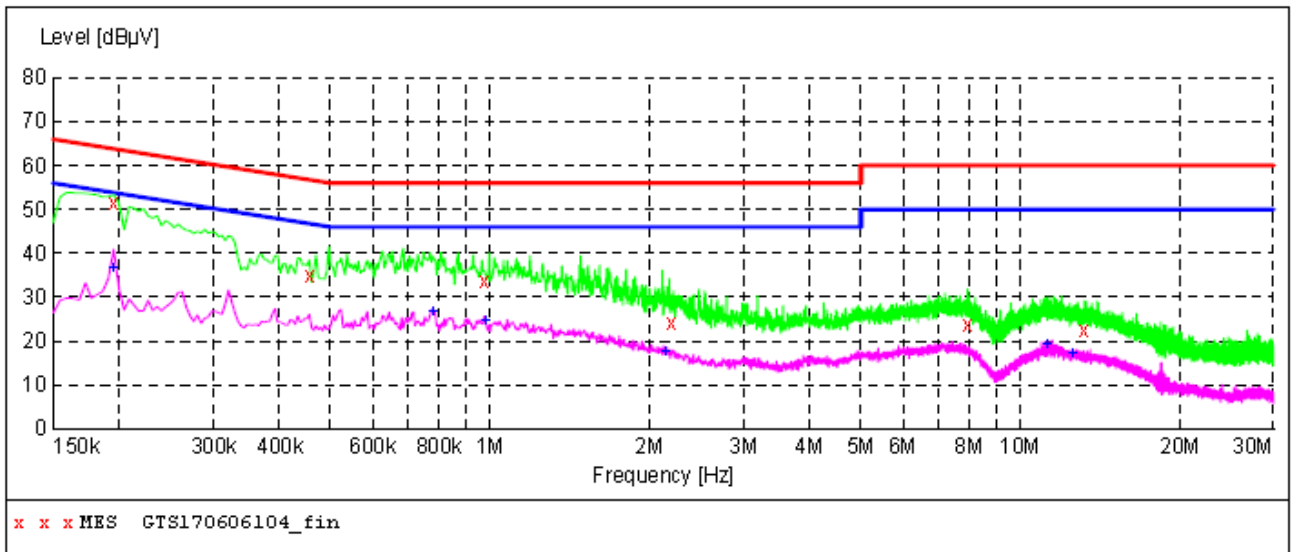
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.195000	37.60	10.0	54	16.2	AV	L1	GND
0.780000	28.40	9.7	46	17.6	AV	L1	GND
0.910500	26.90	9.6	46	19.1	AV	L1	GND
4.924500	18.90	9.3	46	27.1	AV	L1	GND
7.552500	20.50	9.1	50	29.5	AV	L1	GND
12.777000	19.90	8.5	50	30.1	AV	L1	GND

Power supply:

DC 12V from Adapter
AC 120V/60Hz

Polarization

N

**MEASUREMENT RESULT: "GTS170606104_fin"**

6/6/2017 9:21AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.195000	51.40	10.0	64	12.4	QP	N	GND
0.456000	35.00	9.8	57	21.8	QP	N	GND
0.973500	33.90	9.6	56	22.1	QP	N	GND
2.202000	24.30	9.5	56	31.7	QP	N	GND
7.930500	23.60	9.0	60	36.4	QP	N	GND
13.177500	22.50	8.4	60	37.5	QP	N	GND

MEASUREMENT RESULT: "GTS170606104_fin2"

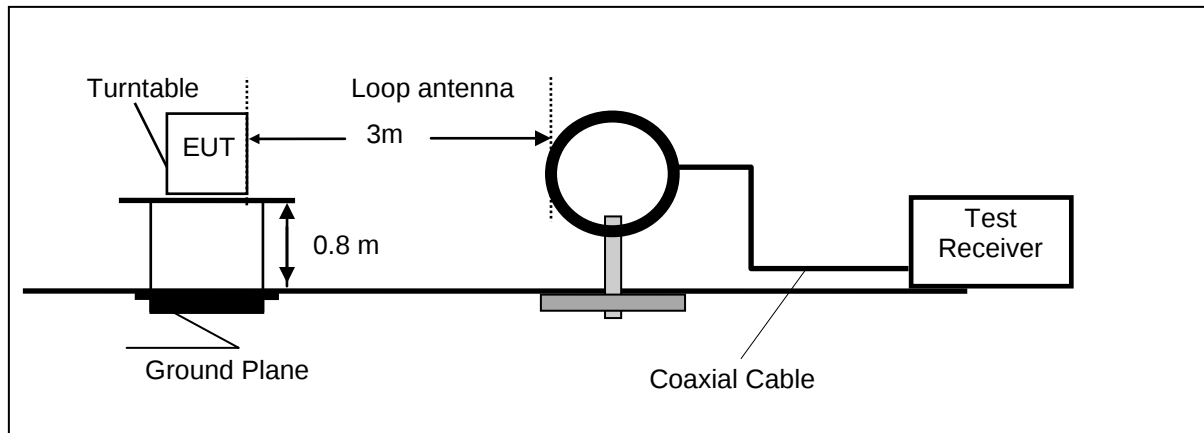
6/6/2017 9:21AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.195000	36.60	10.0	54	17.2	AV	N	GND
0.780000	26.70	9.7	46	19.3	AV	N	GND
0.978000	24.70	9.6	46	21.3	AV	N	GND
2.139000	17.60	9.5	46	28.4	AV	N	GND
11.242500	19.10	8.7	50	30.9	AV	N	GND
12.538500	17.00	8.5	50	33.0	AV	N	GND

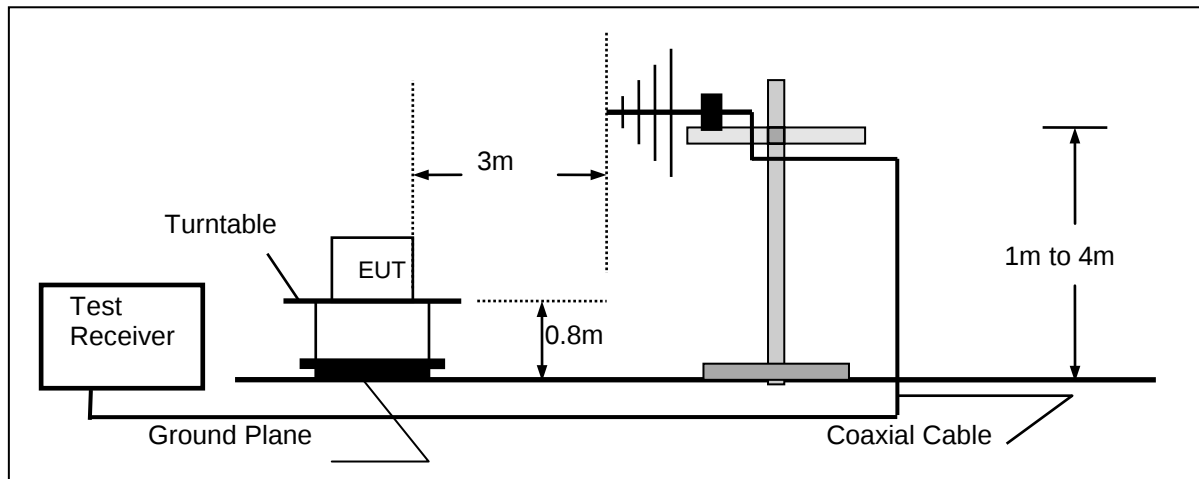
4.2. Radiated Emission

TEST CONFIGURATION

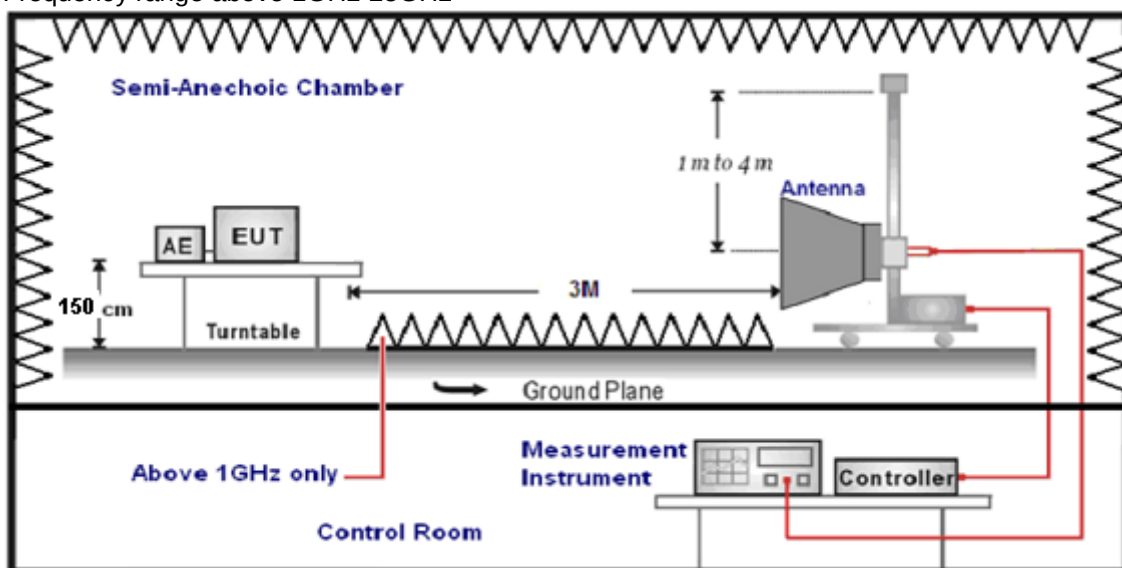
Frequency range 9 KHz – 30MHz



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 Antenna	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	

$$\text{Transd}=AF +CL-AG$$

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 the 100kHz 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	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	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

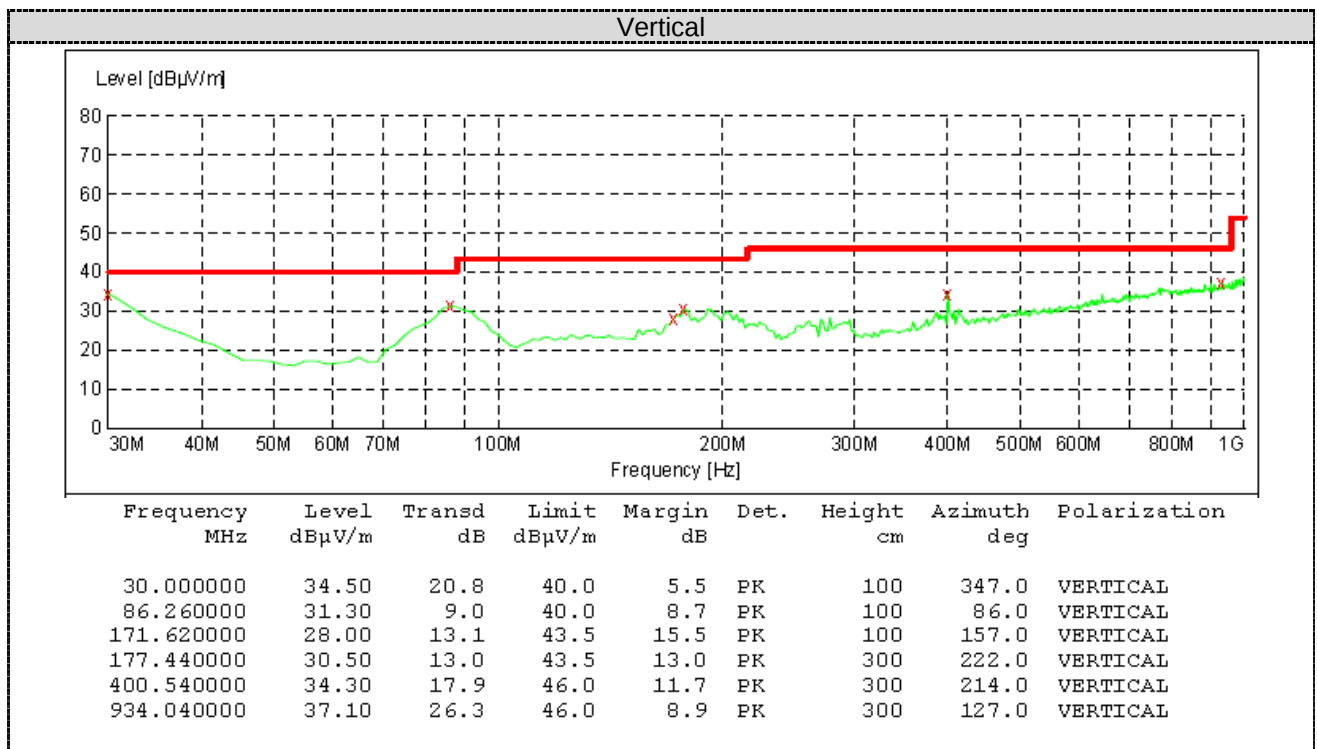
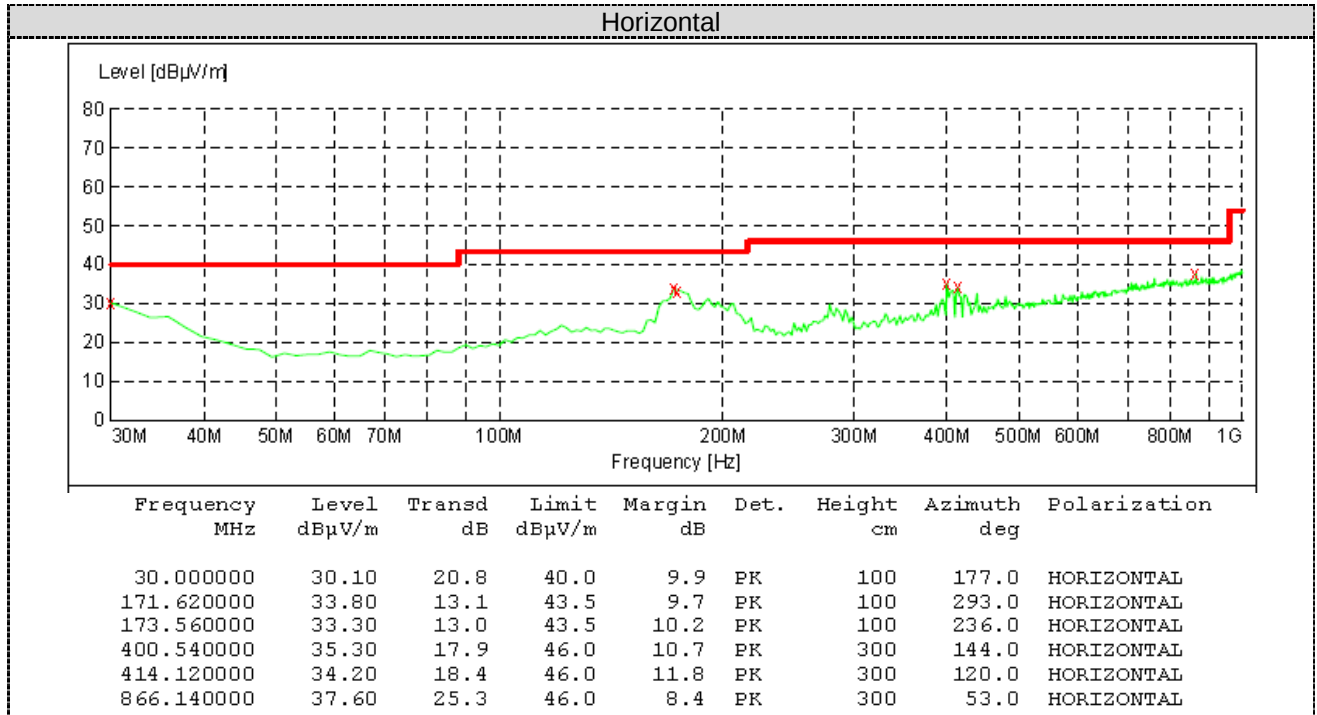
TEST RESULTS

Remark: We tested at 802.11b/802.11g/802.11n HT20/802.11n HT40 mode from 9 KHz to 25GHz in AC 120V/60Hz and AC 240V/60Hz and the worst case was recorded.

Test site: Shenzhen CTL Testing Technology Co., Ltd.

For 9 KHz-30MHz

Frequency (MHz)	Corrected Reading (dBuV/m)@3m	FCC Limit (dBuV/m) @3m	Margin (dB)	Detector	Result
0.44	48.75	94.74	45.99	QP	PASS
4.98	40.67	69.54	28.87	QP	PASS
17.52	41.55	69.54	27.99	QP	PASS
26.39	41.69	69.54	27.85	QP	PASS

For 30MHz-1GHz

For 1GHz to 25GHz

802.11b Mode (above 1GHz)

Frequency(MHz):				2412			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4824	47.58	PK	74	26.42	1.00	59	45.48	31.6	7.00	36.5	2.10
1	4824	36.81	AV	54	17.19	1.00	59	34.71	31.6	7.00	36.5	2.10
2	7236	46.29	PK	74	27.71	1.00	241	35.36	37.33	8.90	35.3	10.93
2	7236	37.15	AV	54	16.85	1.00	241	26.22	37.33	8.90	35.3	10.93

Frequency(MHz):				2412			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4824	48.05	PK	74	25.95	1.00	118	45.95	31.60	7.00	36.50	2.10
1	4824	36.53	AV	54	17.47	1.00	118	34.43	31.60	7.00	36.50	2.10
2	7236	47.26	PK	74	26.74	1.00	234	36.33	37.33	8.90	35.30	10.93
2	7236	37.28	AV	54	16.72	1.00	234	26.35	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4874.00	47.69	PK	74.00	26.31	1.00	306	45.57	31.02	7.60	36.5	2.12
1	4874.00	37.18	AV	54.00	16.82	1.00	306	35.06	31.02	7.60	36.5	2.12
2	7311.00	46.59	PK	74.00	27.41	1.00	157	35.51	37.28	8.60	34.8	11.08
2	7311.00	36.22	AV	54.00	17.78	1.00	157	25.14	37.28	8.60	34.8	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4874.00	46.39	PK	74.00	27.61	1.00	159	44.27	31.02	7.60	36.5	2.12
1	4874.00	37.48	AV	54.00	16.52	1.00	159	35.36	31.02	7.60	36.5	2.12
2	7311.00	47.28	PK	74.00	26.72	1.00	246	36.20	37.28	8.60	34.8	11.08
2	7311.00	36.89	AV	54.00	17.11	1.00	246	25.81	37.28	8.60	34.8	11.08

Frequency(MHz):				2462			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4924.00	48.05	PK	74.00	25.95	1.00	307	44.85	31.58	7.82	36.2	3.20
1	4924.00	37.22	AV	54.00	16.78	1.00	307	34.02	31.58	7.82	36.2	3.20
2	7386.00	47.69	PK	74.00	26.31	1.00	129	35.75	38.51	8.73	35.3	11.94
2	7386.00	36.54	AV	54.00	17.46	1.00	129	24.60	38.51	8.73	35.3	11.94

Frequency(MHz):				2462			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4924.00	47.56	PK	74.00	26.44	1.00	237	44.36	31.58	7.82	36.2	3.20
1	4924.00	36.28	AV	54.00	17.72	1.00	237	33.08	31.58	7.82	36.2	3.20
2	7386.00	46.99	PK	74.00	27.01	1.00	164	35.05	38.51	8.73	35.3	11.94
2	7386.00	36.74	AV	54.00	17.26	1.00	164	24.80	38.51	8.73	35.3	11.94

802.11g Mode (above 1GHz)

Frequency(MHz):				2412			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4824	47.59	PK	74	26.41	1.00	143	45.49	31.6	7.00	36.5	2.10
1	4824	36.47	AV	54	17.53	1.00	143	34.37	31.6	7.00	36.5	2.10
2	7236	48.12	PK	74	25.88	1.00	294	37.19	37.33	8.90	35.3	10.93
2	7236	36.59	AV	54	17.41	1.00	294	25.66	37.33	8.90	35.3	10.93

Frequency(MHz):				2412			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4824	47.18	PK	74	26.82	1.00	175	45.08	31.60	7.00	36.50	2.10
1	4824	36.93	AV	54	17.07	1.00	175	34.83	31.60	7.00	36.50	2.10
2	7236	47.29	PK	74	26.71	1.00	228	36.36	37.33	8.90	35.30	10.93
2	7236	35.29	AV	54	18.71	1.00	228	24.36	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4874.00	46.29	PK	74.00	27.71	1.00	310	44.17	31.02	7.60	36.5	2.12
1	4874.00	36.77	AV	54.00	17.23	1.00	310	34.65	31.02	7.60	36.5	2.12
2	7311.00	47.23	PK	74.00	26.77	1.00	169	36.15	37.28	8.60	34.8	11.08
2	7311.00	36.24	AV	54.00	17.76	1.00	169	25.16	37.28	8.60	34.8	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4874.00	47.11	PK	74.00	26.89	1.00	152	44.99	31.02	7.60	36.5	2.12
1	4874.00	36.52	AV	54.00	17.48	1.00	152	34.40	31.02	7.60	36.5	2.12
2	7311.00	48.43	PK	74.00	25.57	1.00	271	37.35	37.28	8.60	34.8	11.08
2	7311.00	37.29	AV	54.00	16.71	1.00	271	26.21	37.28	8.60	34.8	11.08

Frequency(MHz):				2462			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4924.00	46.39	PK	74.00	27.61	1.00	163	43.19	31.58	7.82	36.2	3.20
1	4924.00	35.89	AV	54.00	18.11	1.00	163	32.69	31.58	7.82	36.2	3.20
2	7386.00	47.12	PK	74.00	26.88	1.00	298	35.18	38.51	8.73	35.3	11.94
2	7386.00	36.57	AV	54.00	17.43	1.00	298	24.63	38.51	8.73	35.3	11.94

Frequency(MHz):				2462			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4924.00	46.33	PK	74.00	27.67	1.00	167	43.13	31.58	7.82	36.2	3.20
1	4924.00	36.74	AV	54.00	17.26	1.00	167	33.54	31.58	7.82	36.2	3.20
2	7386.00	47.21	PK	74.00	26.79	1.00	235	35.27	38.51	8.73	35.3	11.94
2	7386.00	36.52	AV	54.00	17.48	1.00	235	24.58	38.51	8.73	35.3	11.94

802.11n HT20 Mode (above 1GHz)

Frequency(MHz):				2412			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4824	46.39	PK	74	27.61	1.00	136	44.29	31.6	7.00	36.5	2.10
1	4824	37.44	AV	54	16.56	1.00	136	35.34	31.6	7.00	36.5	2.10
2	7236	47.25	PK	74	26.75	1.00	109	36.32	37.33	8.90	35.3	10.93
2	7236	36.71	AV	54	17.29	1.00	109	25.78	37.33	8.90	35.3	10.93

Frequency(MHz):				2412			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4824	47.92	PK	74	26.08	1.00	118	45.82	31.60	7.00	36.50	2.10
1	4824	36.71	AV	54	17.29	1.00	118	34.61	31.60	7.00	36.50	2.10
2	7236	46.82	PK	74	27.18	1.00	196	35.89	37.33	8.90	35.30	10.93
2	7236	36.27	AV	54	17.73	1.00	196	25.34	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4874.00	48.12	PK	74.00	25.88	1.00	217	46.00	31.02	7.60	36.5	2.12
1	4874.00	37.34	AV	54.00	16.66	1.00	217	35.22	31.02	7.60	36.5	2.12
2	7311.00	46.55	PK	74.00	27.45	1.00	130	35.47	37.28	8.60	34.8	11.08
2	7311.00	36.89	AV	54.00	17.11	1.00	130	25.81	37.28	8.60	34.8	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4874.00	47.25	PK	74.00	26.75	1.00	269	45.13	31.02	7.60	36.5	2.12
1	4874.00	36.31	AV	54.00	17.69	1.00	269	34.19	31.02	7.60	36.5	2.12
2	7311.00	47.28	PK	74.00	26.72	1.00	301	36.20	37.28	8.60	34.8	11.08
2	7311.00	37.01	AV	54.00	16.99	1.00	301	25.93	37.28	8.60	34.8	11.08

Frequency(MHz):				2462			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4924.00	47.01	PK	74.00	26.99	1.00	179	43.81	31.58	7.82	36.2	3.20
1	4924.00	36.25	AV	54.00	17.75	1.00	179	33.05	31.58	7.82	36.2	3.20
2	7386.00	46.38	PK	74.00	27.62	1.00	297	34.44	38.51	8.73	35.3	11.94
2	7386.00	37.52	AV	54.00	16.48	1.00	297	25.58	38.51	8.73	35.3	11.94

Frequency(MHz):				2462			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4924.00	46.55	PK	74.00	27.45	1.00	283	43.35	31.58	7.82	36.2	3.20
1	4924.00	36.52	AV	54.00	17.48	1.00	283	33.32	31.58	7.82	36.2	3.20
2	7386.00	47.38	PK	74.00	26.62	1.00	97	35.44	35.51	8.73	35.3	11.94
2	7386.00	36.79	AV	54.00	17.21	1.00	97	24.85	35.51	8.73	35.3	11.94

802.11n HT40 Mode (above 1GHz)

Frequency(MHz):				2422			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4844	46.63	PK	74	27.37	1.00	182	44.49	31.62	7.02	36.5	2.14
1	4844	35.28	AV	54	18.72	1.00	182	33.14	31.62	7.02	36.5	2.14
2	7266	46.11	PK	74	27.89	1.00	261	35.13	37.35	8.93	35.3	10.98
2	7266	36.03	AV	54	17.97	1.00	261	25.05	37.35	8.93	35.3	10.98

Frequency(MHz):				2422			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4844	47.46	PK	74	26.54	1.00	155	45.32	31.62	7.02	36.5	2.14
1	4844	36.27	AV	54	17.73	1.00	155	34.13	31.62	7.02	36.5	2.14
2	7266	48.33	PK	74	25.67	1.00	274	37.35	37.35	8.93	35.3	10.98
2	7266	35.98	AV	54	18.02	1.00	274	25.00	37.35	8.93	35.3	10.98

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4874.00	47.18	PK	74.00	26.82	1.00	168	45.06	31.02	7.60	36.5	2.12
1	4874.00	36.55	AV	54.00	17.45	1.00	168	34.43	31.02	7.60	36.5	2.12
2	7311.00	46.29	PK	74.00	27.71	1.00	293	35.21	37.28	8.60	34.8	11.08
2	7311.00	37.44	AV	54.00	16.56	1.00	293	26.36	37.28	8.60	34.8	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4874.00	46.57	PK	74.00	27.43	1.00	83	44.45	31.02	7.60	36.5	2.12
1	4874.00	36.29	AV	54.00	17.71	1.00	83	34.17	31.02	7.60	36.5	2.12
2	7311.00	47.39	PK	74.00	26.61	1.00	167	36.31	37.28	8.60	34.8	11.08
2	7311.00	37.01	AV	54.00	16.99	1.00	167	25.93	37.28	8.60	34.8	11.08

Frequency(MHz):				2452			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4904.00	47.22	PK	74.00	26.78	1.00	219	44.07	31.55	7.80	36.2	3.15
1	4904.00	36.47	AV	54.00	17.53	1.00	219	33.32	31.55	7.80	36.2	3.15
2	7356.00	48.11	PK	74.00	25.89	1.00	183	36.25	38.47	8.69	35.3	11.86
2	7356.00	37.29	AV	54.00	16.71	1.00	183	25.43	38.47	8.69	35.3	11.86

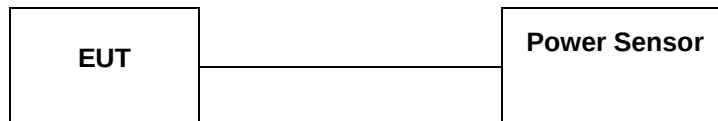
Frequency(MHz):				2452			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4904.00	48.35	PK	74.00	25.65	1.00	149	45.20	31.55	7.80	36.2	3.15
1	4904.00	37.59	AV	54.00	16.41	1.00	149	34.44	31.55	7.80	36.2	3.15
2	7356.00	47.22	PK	74.00	26.78	1.00	248	35.36	38.47	8.69	35.3	11.86
2	7356.00	36.54	AV	54.00	17.46	1.00	248	24.68	38.47	8.69	35.3	11.86

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor
3. Margin value = Limit value - Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the 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 detector 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

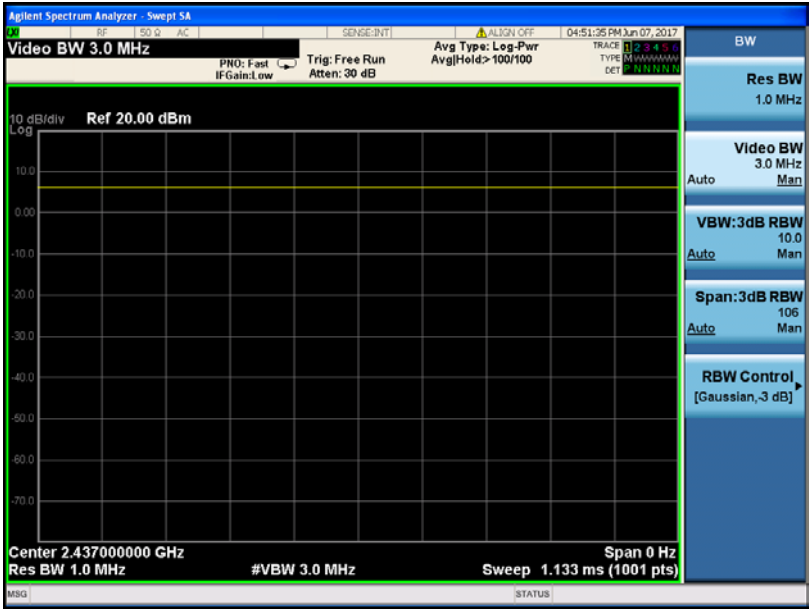
The Maximum Peak Output Power Measurement is 30dBm.

TEST RESULTS

Type	Channel	Output power PK (dBm)	Output power AV (dBm)	Limit (dBm)	Result
802.11b	01	11.86	8.95	30.00	Pass
	06	11.92	8.84		
	11	11.84	8.92		
802.11g	01	11.72	8.49	30.00	Pass
	06	11.11	8.22		
	11	11.21	8.29		
802.11n(HT20)	01	10.67	6.57	30.00	Pass
	06	10.54	6.66		
	11	10.34	6.47		
802.11n(HT40)	03	7.87	3.39	30.00	Pass
	06	7.64	3.21		
	09	7.52	3.14		

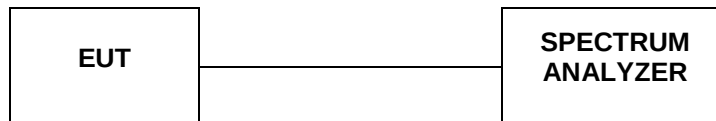
Note: The test results including the cable lose.

Duty cycle used in all test items: 100%



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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \text{ RBW}$.
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.

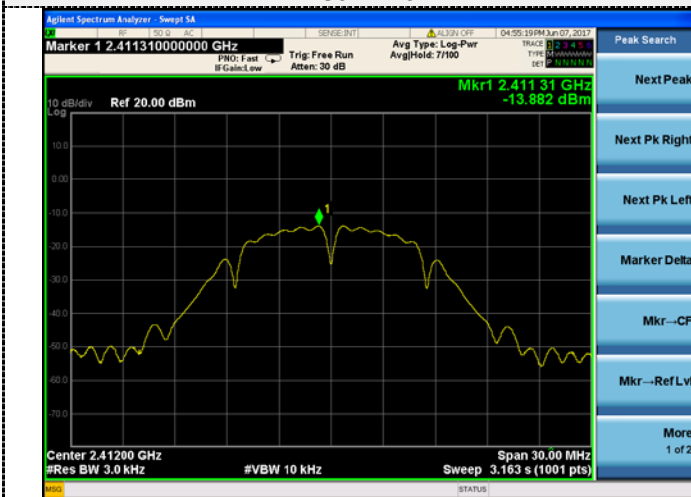
LIMIT

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.

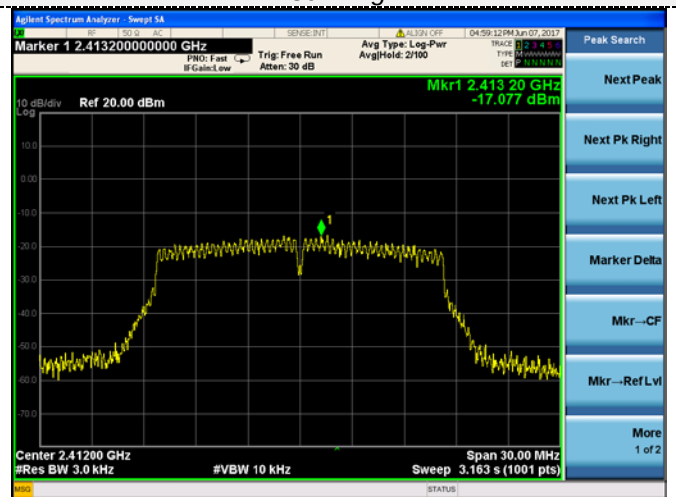
TEST RESULTS

Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-13.882	8.00	Pass
	06	-15.012		
	11	-13.914		
802.11g	01	-17.077	8.00	Pass
	06	-15.816		
	11	-14.922		
802.11n(HT20)	01	-15.353	8.00	Pass
	06	-15.490		
	11	-15.275		
802.11n(HT40)	03	-19.567	8.00	Pass
	06	-19.085		
	09	-18.920		

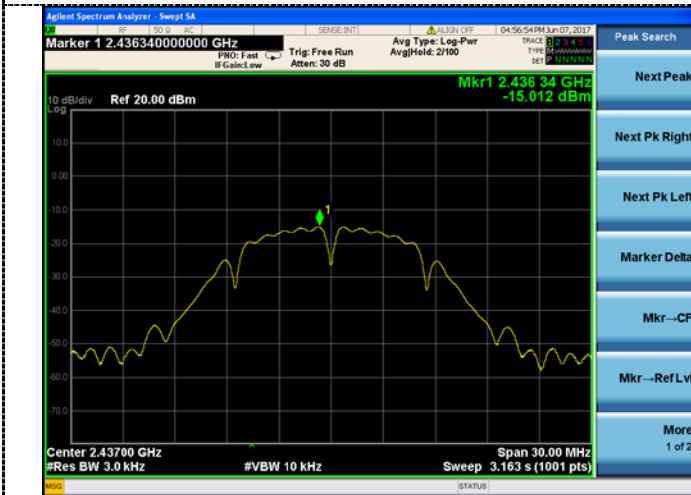
802.11b



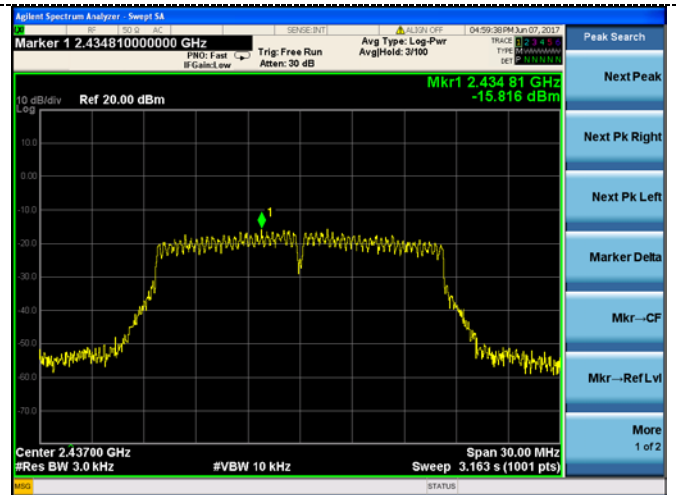
802.11g



CH01



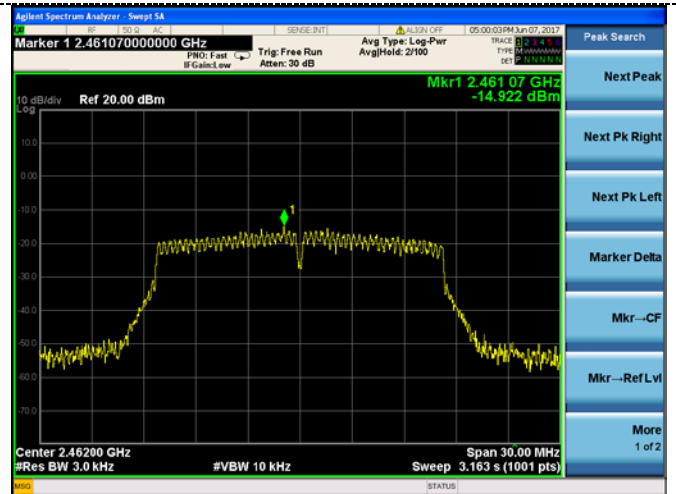
CH01



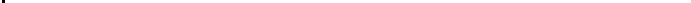
CH06



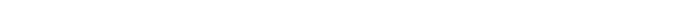
CH06

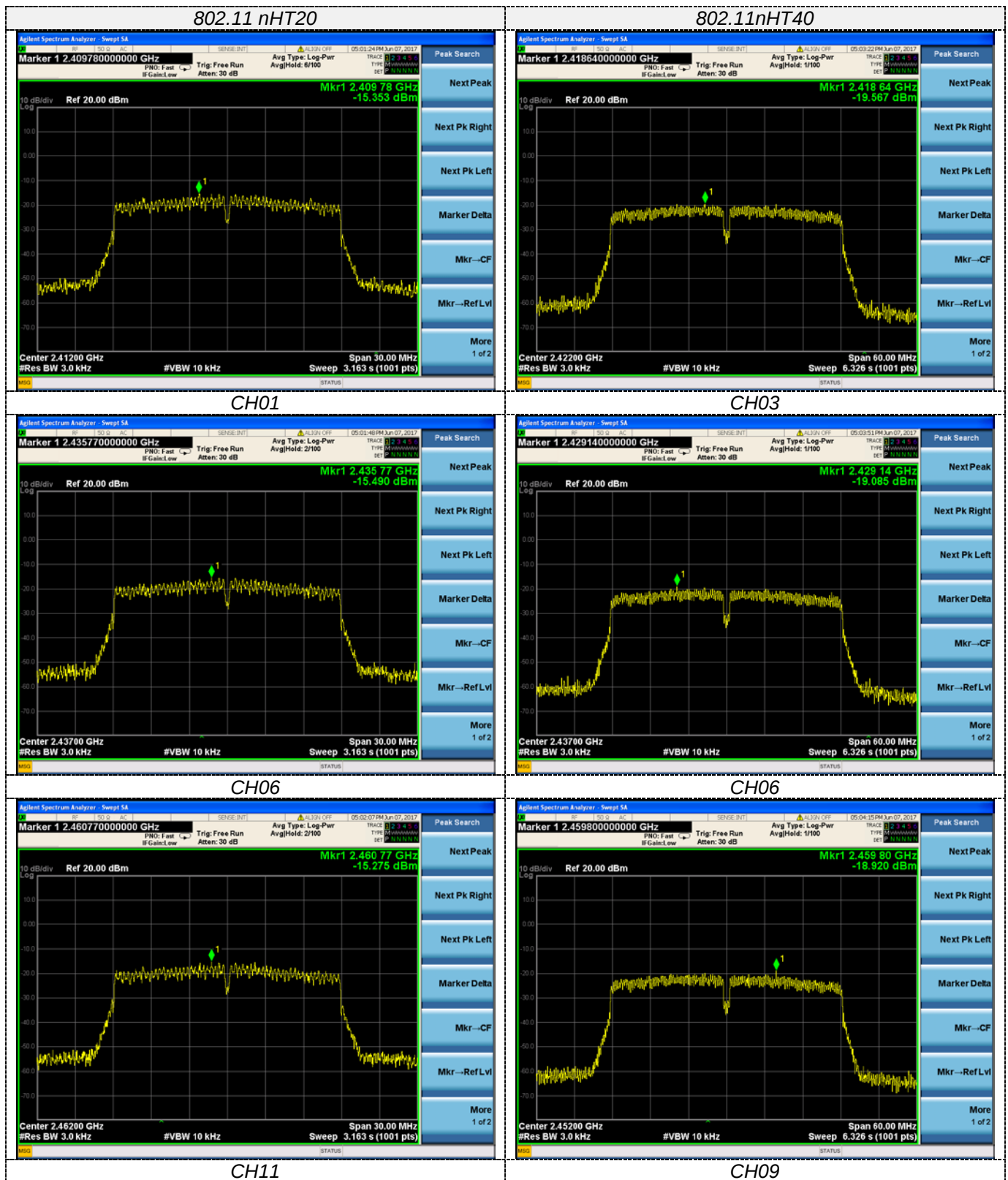


CH11



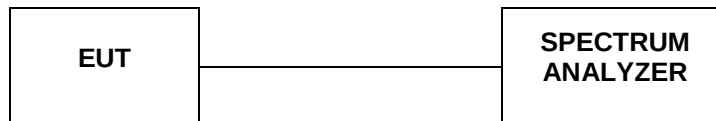
CH11





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.

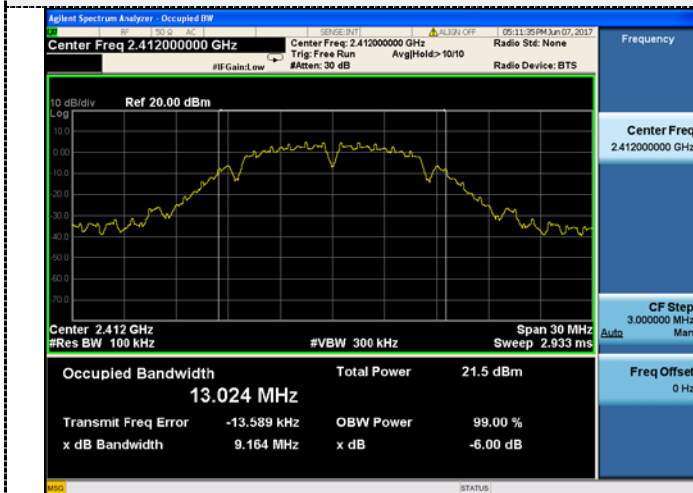
LIMIT

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

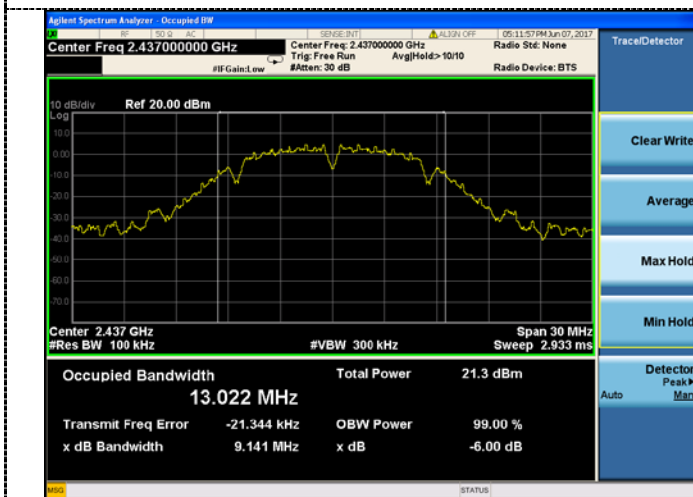
TEST RESULTS

Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11b	01	9.16	≥ 500	Pass
	06	9.14		
	11	9.13		
802.11g	01	16.42	≥ 500	Pass
	06	16.41		
	11	16.41		
802.11nHT20	01	17.61	≥ 500	Pass
	06	17.62		
	11	17.61		
802.11nHT40	03	36.39	≥ 500	Pass
	06	36.40		
	09	36.34		

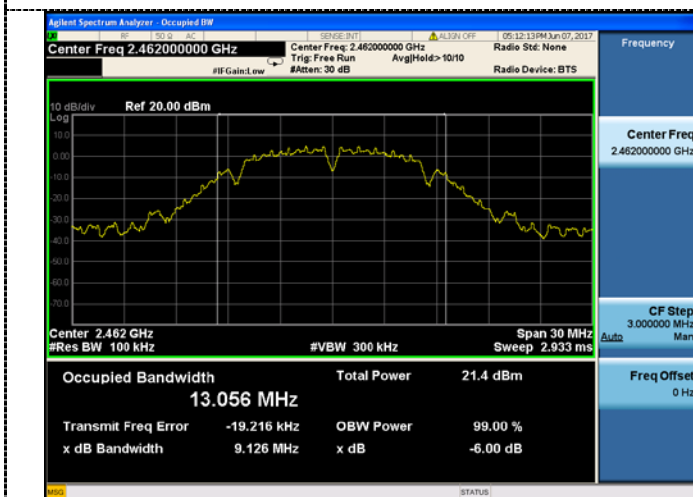
802.11b



CH01

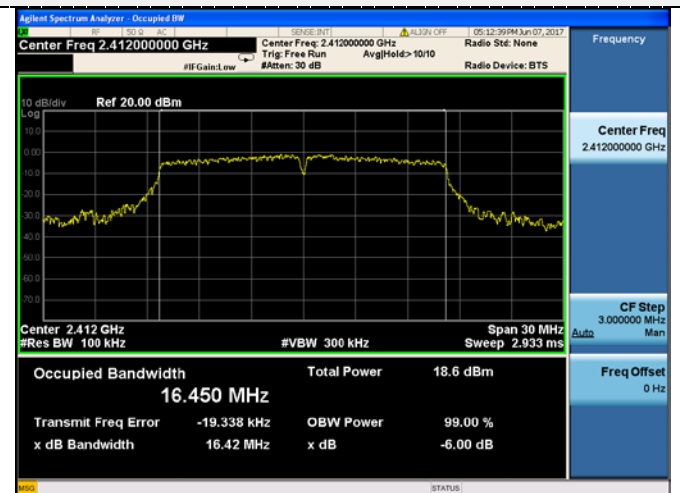


CH06

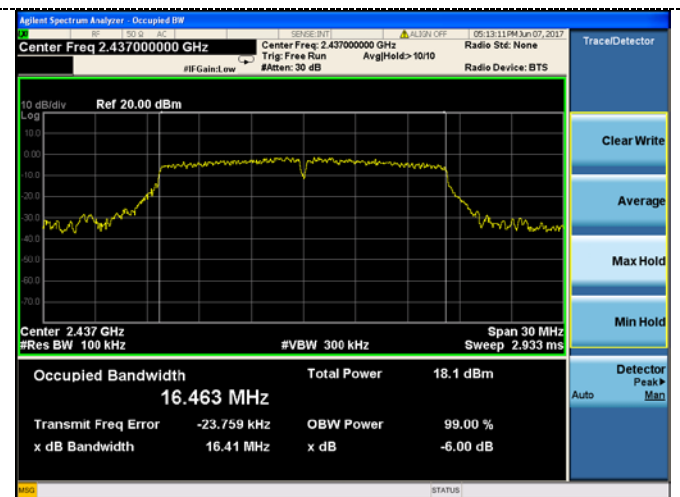


CH11

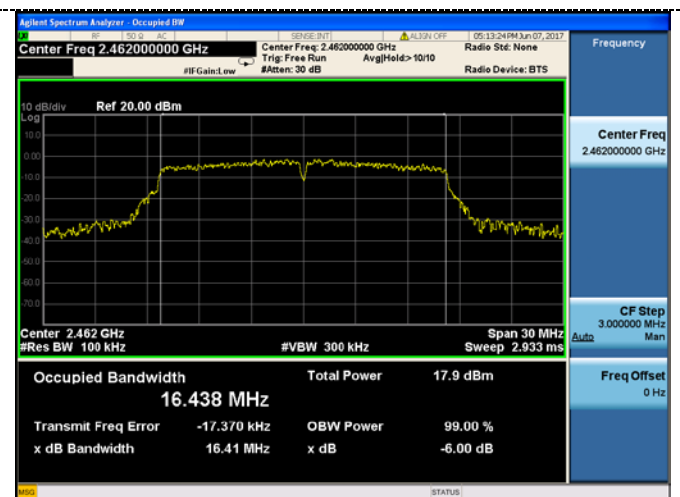
802.11g



CH01

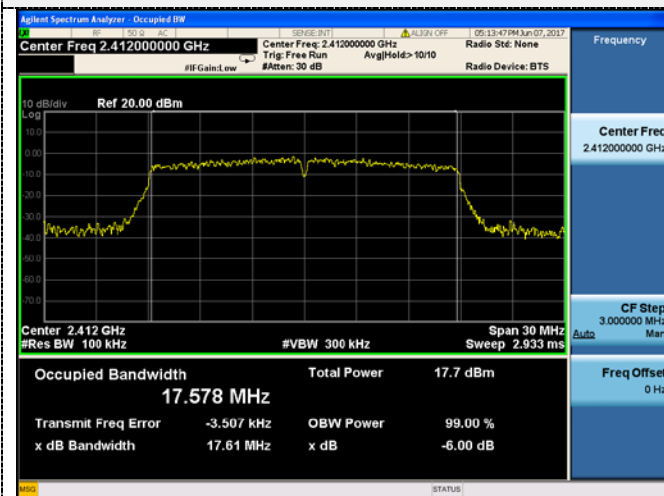


CH06

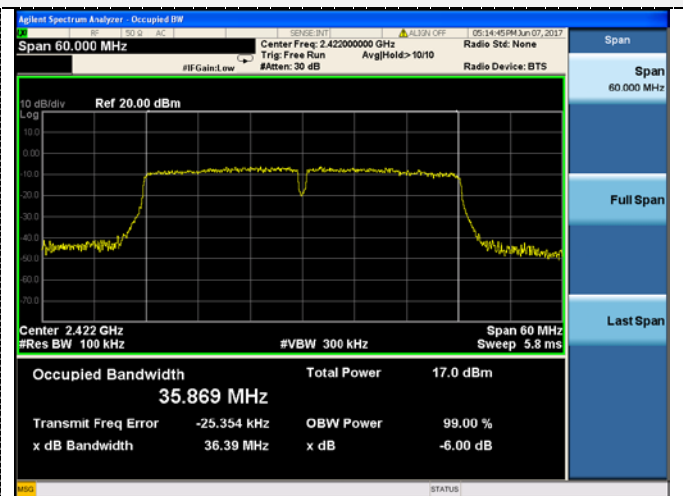


CH11

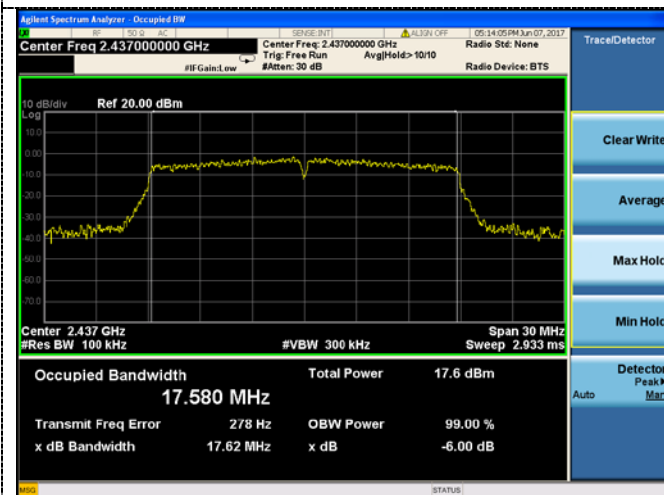
802.11n HT20



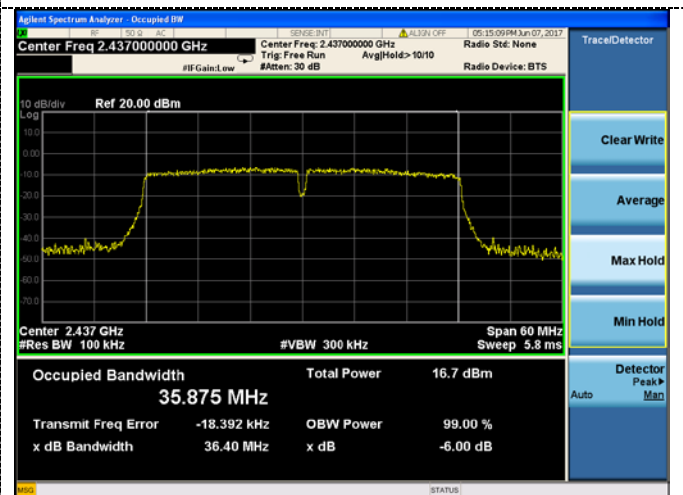
802.11n HT40



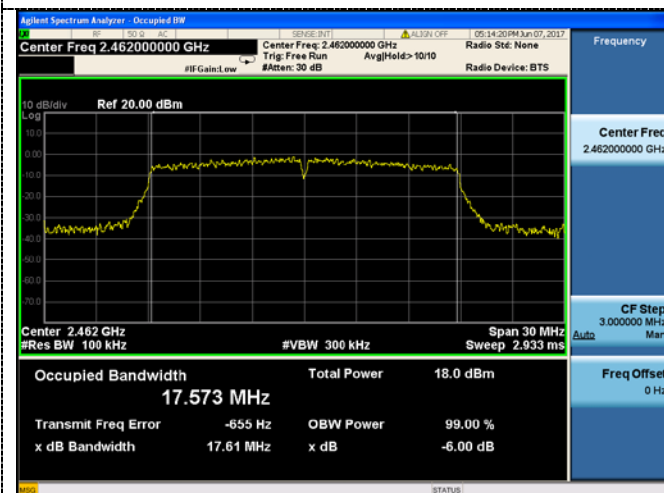
CH01



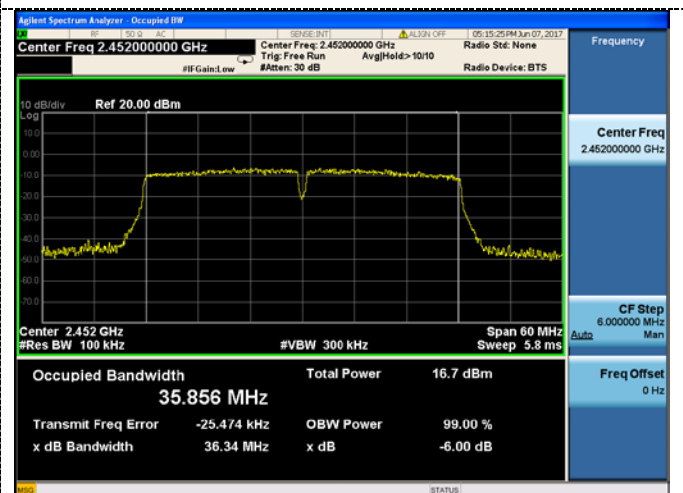
CH03



CH06



CH06



CH11



CH09



4.6. Band Edge Compliance of RF Emission

TEST REQUIREMENT

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)).

TEST PROCEDURE

According to KDB 558074 D01 for Antenna-port conducted measurement. Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=10Hz for average detector.
4. 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.
5. Repeat above procedures until all measured frequencies were complete.
6. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency (see 12.2.2, 12.2.3, and 12.2.4 for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
7. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
8. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
9. For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
10. Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$$E = \text{EIRP} - 20\log D + 104.8$$

where:

E = electric field strength in dB μ V/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

11. Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.
12. Compare the resultant electric field strength level to the applicable regulatory limit.
13. Perform radiated spurious emission test dures until all measured frequencies were complete.

LIMIT

Below -20dB of the highest emission level in operating band.

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).

TEST RESULTS

Test site: Shenzhen CTL Testing Technology Co., Ltd.

4.6.1 For Radiated Bandedge Measurement**802.11b**

Frequency(MHz):			2412			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	46.28	PK	74.00	27.72	1.00	165	51.59	27.49	3.32	36.12	-5.31
2390.00	37.04	AV	54.00	16.96	1.00	165	42.35	27.49	3.32	36.12	-5.31
Frequency(MHz):			2412			Polarity:			VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	47.31	PK	74.00	26.69	1.00	238	52.62	27.49	3.32	36.12	-5.31
2390.00	37.48	AV	54.00	16.52	1.00	238	42.79	27.49	3.32	36.12	-5.31
Frequency(MHz):			2462			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	46.59	PK	74.00	27.41	1.00	144	52.31	27.45	3.38	36.55	-5.72
2483.50	36.44	AV	54.00	17.56	1.00	144	42.16	27.45	3.38	36.55	-5.72
Frequency(MHz):			2462			Polarity:			VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	47.23	PK	74.00	26.77	1.00	263	52.95	27.45	3.38	36.55	-5.72
2483.50	36.85	AV	54.00	17.15	1.00	263	42.57	27.45	3.38	36.55	-5.72

802.11g

Frequency(MHz):			2412			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	47.33	PK	74.00	26.67	1.00	335	52.64	27.49	3.32	36.12	-5.31
2390.00	36.48	AV	54.00	17.52	1.00	335	41.79	27.49	3.32	36.12	-5.31
Frequency(MHz):			2412			Polarity:			VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	46.29	PK	74.00	27.71	1.00	169	51.60	27.49	3.32	36.12	-5.31
2390.00	37.05	AV	54.00	16.95	1.00	169	42.36	27.49	3.32	36.12	-5.31
Frequency(MHz):			2462			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	47.24	PK	74.00	26.76	1.00	205	52.96	27.45	3.38	36.55	-5.72
2483.50	36.58	AV	54.00	17.42	1.00	205	42.30	27.45	3.38	36.55	-5.72
Frequency(MHz):			2462			Polarity:			VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	46.59	PK	74.00	27.41	1.00	178	52.31	27.45	3.38	36.55	-5.72
2483.50	37.12	AV	54.00	16.88	1.00	178	42.84	27.45	3.38	36.55	-5.72

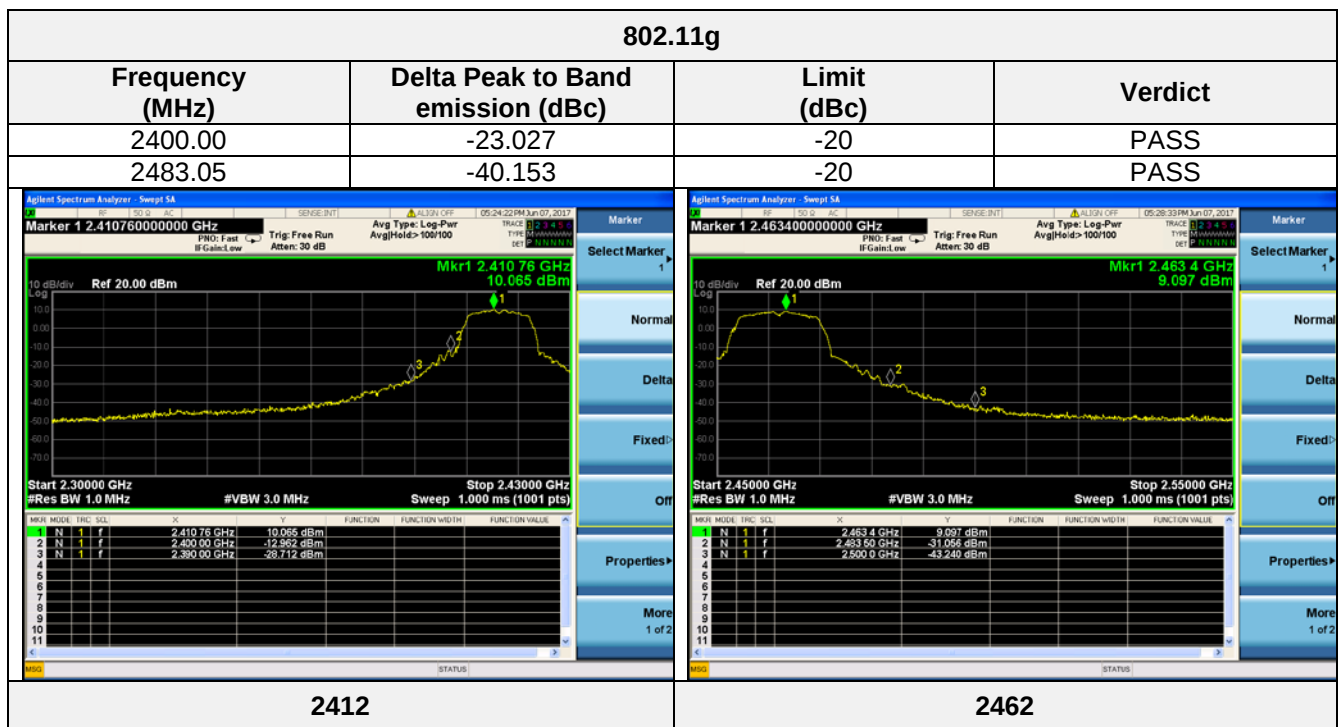
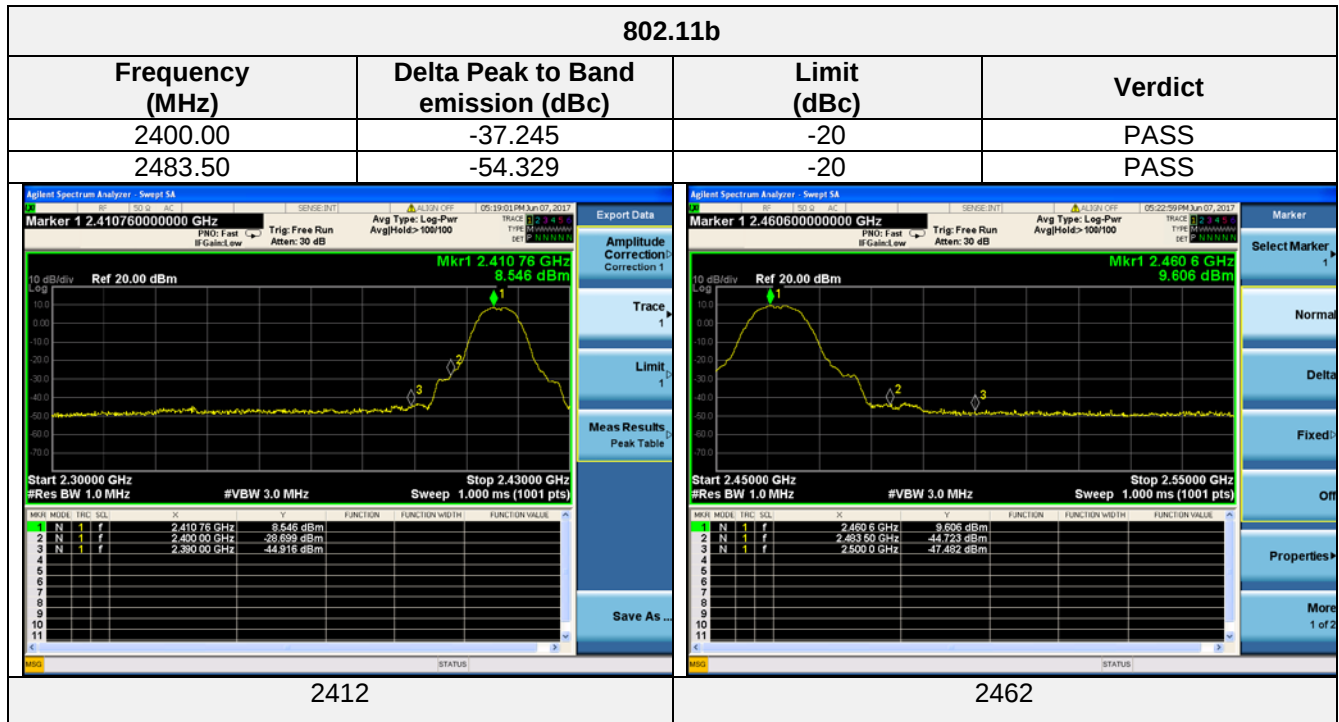
802.11n HT20

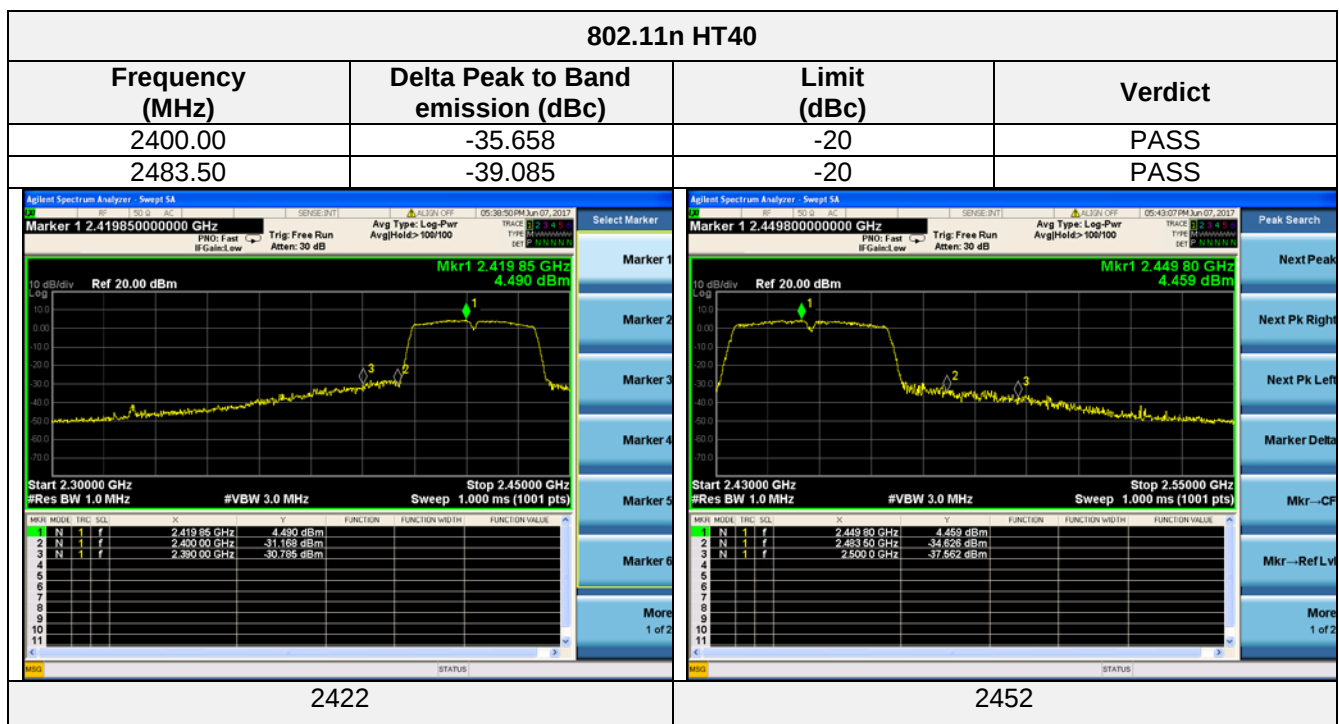
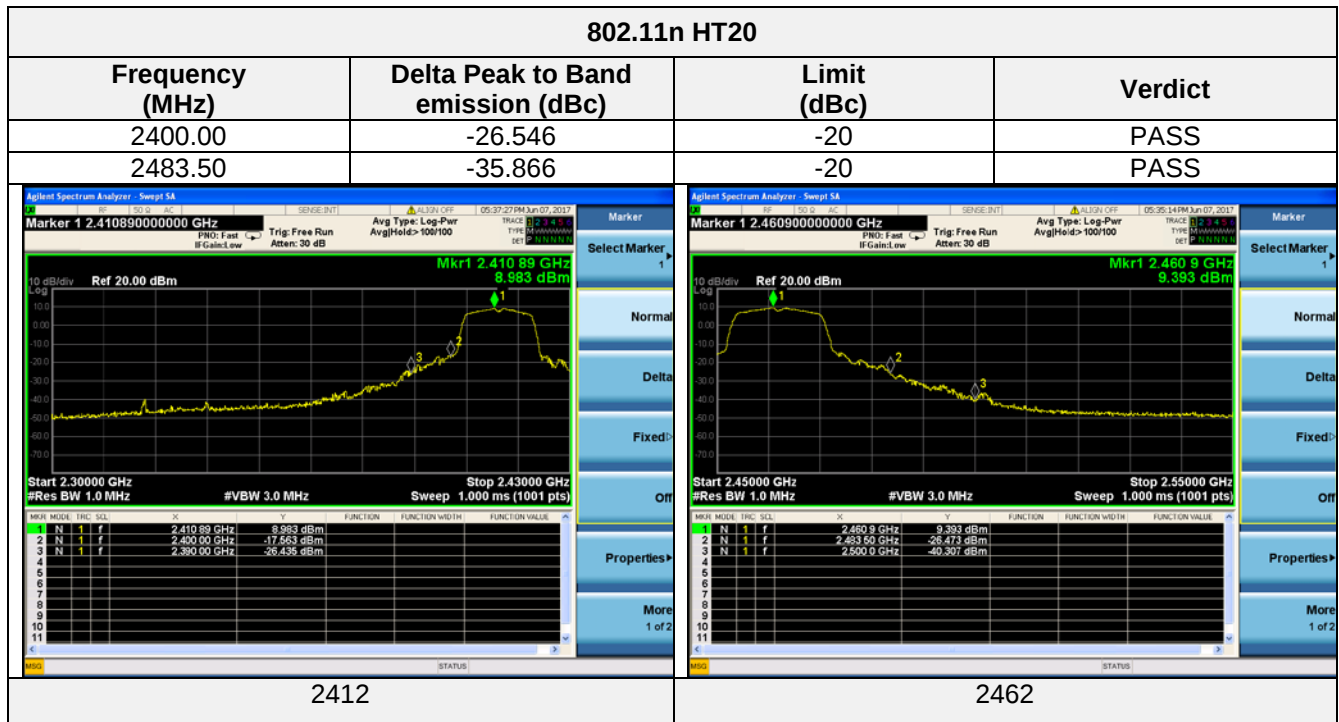
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Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	47.46	PK	74.00	26.54	1.00	264	52.77	27.49	3.32	36.12	-5.31
2390.00	36.52	AV	54.00	17.48	1.00	264	41.83	27.49	3.32	36.12	-5.31
Frequency(MHz):			2412			Polarity:			VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	46.58	PK	74.00	27.42	1.00	288	51.89	27.49	3.32	36.12	-5.31
2390.00	36.15	AV	54.00	17.85	1.00	288	41.46	27.49	3.32	36.12	-5.31
Frequency(MHz):			2462			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	47.35	PK	74.00	26.65	1.00	134	53.07	27.45	3.38	36.55	-5.72
2483.50	36.42	AV	54.00	17.58	1.00	134	42.14	27.45	3.38	36.55	-5.72
Frequency(MHz):			2462			Polarity:			VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	46.82	PK	74.00	27.18	1.00	269	52.54	27.45	3.38	36.55	-5.72
2483.50	37.12	AV	54.00	16.88	1.00	269	42.84	27.45	3.38	36.55	-5.72

802.11n HT40

Frequency(MHz):			2422			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	47.16	PK	74.00	26.84	1.00	124	52.47	27.49	3.32	36.12	-5.31
2390.00	36.78	AV	54.00	17.22	1.00	124	42.09	27.49	3.32	36.12	-5.31
Frequency(MHz):			2422			Polarity:			VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	46.38	PK	74.00	27.62	1.00	311	51.69	27.49	3.32	36.12	-5.31
2390.00	36.21	AV	54.00	17.79	1.00	311	41.52	27.49	3.32	36.12	-5.31
Frequency(MHz):			2452			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	48.15	PK	74.00	25.85	1.00	233	53.87	27.45	3.38	36.55	-5.72
2483.50	37.94	AV	54.00	16.06	1.00	233	43.66	27.45	3.38	36.55	-5.72
Frequency(MHz):			2452			Polarity:			VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	48.23	PK	74.00	25.77	1.00	106	53.95	27.45	3.38	36.55	-5.72
2483.50	38.02	AV	54.00	15.98	1.00	106	43.74	27.45	3.38	36.55	-5.72

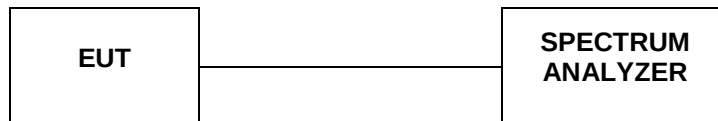
4.6.2 For Conducted Bandedge Measurement





4.7. Spurious RF Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2013, For 9KHz-150kHz, Set RBW=1kHz and VBW= 3KHz; For 150KHz-10MHz, Set RBW=10kHz and VBW= 30KHz; For 10MHz-25GHz, Set RBW=100kHz and VBW= 300KHz in order to measure the peak field strength, and measure frequency range from 9KHz to 25GHz.

LIMIT

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.
3. For below 30MHz, For 9KHz-150kHz, 150K-10MHz, We use the RBW 1KHz, 10KHz, So the limit need to be calculated by " $10\lg(BW1/BW2)$ ". for example For 9KHz-150kHz, RBW 1KHz, The Limit= the highest emission level-20-10log(100/1)= the highest emission level-40.

TEST RESULTS

Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data.

Test Mode:	802.11b	Test channel :	01
Agilent Spectrum Analyzer - Swept SA Marker 1 2.411490000000 GHz PRF: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: >100/100 05:47:37 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M Modulation DET P 11.111.11.11 10 dB/div Ref 20.00 dBm Mkr1 2.411 49 GHz 4.360 dBm Center 2.41200 GHz #Res BW 100 kHz #VBW 300 kHz Span 30.00 MHz Sweep 2.933 ms (1001 pts) STATUS Marker Select Marker 1 Normal Delta Fixed Off Properties More 1 of 2			
Channel 01			
Agilent Spectrum Analyzer - Swept SA Marker 1 9.0000000 kHz PRF: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: >100/100 05:52:47 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M Modulation DET P 11.111.11.11 10 dB/div Ref 20.00 dBm Mkr1 9.000 kHz -48.338 dBm Start 9.00 kHz #Res BW 1.0 kHz #VBW 3.0 kHz Stop 150.00 kHz Sweep 134.8 ms (1001 pts) STATUS DC Coupled Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2			
9KHz~150KHz			
Agilent Spectrum Analyzer - Swept SA Marker 1 150.0000000 kHz PRF: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 93/100 05:54:19 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M Modulation DET P 11.111.11.11 10 dB/div Ref 20.00 dBm Mkr1 150.00 kHz -61.060 dBm Start 150 kHz #Res BW 10 kHz #VBW 30 kHz Stop 10.000 MHz Sweep 94.20 ms (1001 pts) STATUS DC Coupled Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2			
150KHz ~10MHz			

Test Mode:	802.11b	Test channel :	01								
Agilent Spectrum Analyzer - Swept SA Marker 1 26.860000000 MHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 90/100 05:52:26 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 26.86 MHz -61.555 dBm Start 10.00 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.933 ms (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 10MHz ~30MHz <tr><td colspan="4"> Agilent Spectrum Analyzer - Swept SA Marker 1 2.640630000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 10/100 05:52:40 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 2.6406 GHz -57.618 dBm Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 283.9 ms (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 30MHz ~3GHz <tr><td colspan="4"> Agilent Spectrum Analyzer - Swept SA Marker 1 24.450000000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 30/100 05:52:54 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 24.450 GHz -47.886 dBm Start 3.00 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.103 s (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 3GHz~25GHz </td></tr> </td></tr>				Agilent Spectrum Analyzer - Swept SA Marker 1 2.640630000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 10/100 05:52:40 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 2.6406 GHz -57.618 dBm Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 283.9 ms (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 30MHz ~3GHz <tr><td colspan="4"> Agilent Spectrum Analyzer - Swept SA Marker 1 24.450000000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 30/100 05:52:54 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 24.450 GHz -47.886 dBm Start 3.00 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.103 s (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 3GHz~25GHz </td></tr>				Agilent Spectrum Analyzer - Swept SA Marker 1 24.450000000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 30/100 05:52:54 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 24.450 GHz -47.886 dBm Start 3.00 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.103 s (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 3GHz~25GHz			
Agilent Spectrum Analyzer - Swept SA Marker 1 2.640630000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 10/100 05:52:40 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 2.6406 GHz -57.618 dBm Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 283.9 ms (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 30MHz ~3GHz <tr><td colspan="4"> Agilent Spectrum Analyzer - Swept SA Marker 1 24.450000000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 30/100 05:52:54 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 24.450 GHz -47.886 dBm Start 3.00 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.103 s (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 3GHz~25GHz </td></tr>				Agilent Spectrum Analyzer - Swept SA Marker 1 24.450000000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 30/100 05:52:54 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 24.450 GHz -47.886 dBm Start 3.00 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.103 s (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 3GHz~25GHz							
Agilent Spectrum Analyzer - Swept SA Marker 1 24.450000000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 30/100 05:52:54 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 24.450 GHz -47.886 dBm Start 3.00 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.103 s (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 3GHz~25GHz											

Test Mode:	802.11b	Test channel :	06
Agilent Spectrum Analyzer - Swept SA Display Line -15.37 dBm 10 dB/div Ref 20.00 dBm Mkr1 2.435 50 GHz 4.634 dBm Center 2.43700 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms (1001 pts) Display Annotation▶ Title▶ Graticule Off Display Line -15.37 dBm Off System Display▶ Settings			
Channel 06			
Agilent Spectrum Analyzer - Swept SA Marker 1 9.423000 kHz 10 dB/div Ref 20.00 dBm Mkr1 9.423 kHz -49.884 dBm Start 9.00 kHz #Res BW 1.0 kHz #VBW 3.0 kHz Sweep 134.8 ms (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2			
9KHz~150KHz			
Agilent Spectrum Analyzer - Swept SA Marker 1 150.000000 kHz 10 dB/div Ref 20.00 dBm Mkr1 150.00 kHz -61.260 dBm Start 150 kHz #Res BW 10 kHz #VBW 30 kHz Sweep 94.20 ms (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2			
150KHz ~10MHz			

Test Mode:	802.11b	Test channel :	06
Agilent Spectrum Analyzer - Swept SA Marker 1 15.360000000 MHz PRF: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg Hold: 99/100 05:58:39 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Mkr1 15.36 MHz -61.648 dBm Start 10.00 MHz #Res BW 100 kHz #VBW 300 kHz Stop 30.00 MHz Sweep 1.933 ms (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2			
10MHz ~30MHz			
Agilent Spectrum Analyzer - Swept SA Marker 1 2.658450000000 GHz PRF: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg Hold: 16/100 05:59:04 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Mkr1 2.658 5 GHz -57.887 dBm Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 3.000 GHz Sweep 283.9 ms (1001 pts) Trace/Detector Select Trace 1 Clear Write Trace Average Max Hold Min Hold View Blank Trace On More 1 of 3			
30MHz ~3GHz			
Agilent Spectrum Analyzer - Swept SA Marker 1 24.582000000000 GHz PRF: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg Hold: 3/100 05:59:30 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Mkr1 24.582 GHz -46.898 dBm Start 3.00 GHz #Res BW 100 kHz #VBW 300 kHz Stop 25.00 GHz Sweep 2.103 s (1001 pts) Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2			
3GHz~25GHz			

Test Mode:	802.11b	Test channel :	11								
Agilent Spectrum Analyzer - Swept SA Display Line -15.75 dBm PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 100/100 06:02:45 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 2.460 50 GHz 4.376 dBm 10 dB/div Log Ref 20.00 dBm Center 2.46200 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms (1001 pts) STATUS Display Annotation▶ Title▶ Graticule On Off Display Line On -15.75 dBm Off System Display▶ Settings Channel 11 <tr><td colspan="4"> Agilent Spectrum Analyzer - Swept SA Marker 1 9.282000 kHz PRN: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 90/100 06:04:11 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 9.282 kHz -47.907 dBm 10 dB/div Log Ref 20.00 dBm Start 9.00 kHz #Res BW 1.0 kHz #VBW 3.0 kHz Sweep 134.8 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2 9KHz~150KHz <tr><td colspan="4"> Agilent Spectrum Analyzer - Swept SA Marker 1 199.250000 kHz PRN: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 99/100 06:04:41 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 199.25 kHz -60.867 dBm 10 dB/div Log Ref 20.00 dBm Start 150 kHz #Res BW 10 kHz #VBW 30 kHz Sweep 94.20 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2 150KHz ~10MHz </td></tr> </td></tr>				Agilent Spectrum Analyzer - Swept SA Marker 1 9.282000 kHz PRN: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 90/100 06:04:11 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 9.282 kHz -47.907 dBm 10 dB/div Log Ref 20.00 dBm Start 9.00 kHz #Res BW 1.0 kHz #VBW 3.0 kHz Sweep 134.8 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2 9KHz~150KHz <tr><td colspan="4"> Agilent Spectrum Analyzer - Swept SA Marker 1 199.250000 kHz PRN: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 99/100 06:04:41 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 199.25 kHz -60.867 dBm 10 dB/div Log Ref 20.00 dBm Start 150 kHz #Res BW 10 kHz #VBW 30 kHz Sweep 94.20 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2 150KHz ~10MHz </td></tr>				Agilent Spectrum Analyzer - Swept SA Marker 1 199.250000 kHz PRN: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 99/100 06:04:41 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 199.25 kHz -60.867 dBm 10 dB/div Log Ref 20.00 dBm Start 150 kHz #Res BW 10 kHz #VBW 30 kHz Sweep 94.20 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2 150KHz ~10MHz			
Agilent Spectrum Analyzer - Swept SA Marker 1 9.282000 kHz PRN: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 90/100 06:04:11 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 9.282 kHz -47.907 dBm 10 dB/div Log Ref 20.00 dBm Start 9.00 kHz #Res BW 1.0 kHz #VBW 3.0 kHz Sweep 134.8 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2 9KHz~150KHz <tr><td colspan="4"> Agilent Spectrum Analyzer - Swept SA Marker 1 199.250000 kHz PRN: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 99/100 06:04:41 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 199.25 kHz -60.867 dBm 10 dB/div Log Ref 20.00 dBm Start 150 kHz #Res BW 10 kHz #VBW 30 kHz Sweep 94.20 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2 150KHz ~10MHz </td></tr>				Agilent Spectrum Analyzer - Swept SA Marker 1 199.250000 kHz PRN: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 99/100 06:04:41 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 199.25 kHz -60.867 dBm 10 dB/div Log Ref 20.00 dBm Start 150 kHz #Res BW 10 kHz #VBW 30 kHz Sweep 94.20 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2 150KHz ~10MHz							
Agilent Spectrum Analyzer - Swept SA Marker 1 199.250000 kHz PRN: Wide IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 99/100 06:04:41 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P Mkr1 199.25 kHz -60.867 dBm 10 dB/div Log Ref 20.00 dBm Start 150 kHz #Res BW 10 kHz #VBW 30 kHz Sweep 94.20 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2 150KHz ~10MHz											

Test Mode:	802.11b	Test channel :	11
Agilent Spectrum Analyzer - Swept SA Marker 1 17.880000000 MHz PRB: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 70/100 06:02:50 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 17.88 MHz -61.819 dBm -15.75 dBm Start 10.00 MHz #Res BW 100 kHz #VBW 300 kHz Stop 30.00 MHz Sweep 1.933 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2			
10MHz ~30MHz			
Agilent Spectrum Analyzer - Swept SA Marker 1 2.649540000000 GHz PRB: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 12/100 06:02:00 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 2.649 5 GHz -58.220 dBm -15.75 dBm Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 3.000 GHz Sweep 283.9 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2			
30MHz ~3GHz			
Agilent Spectrum Analyzer - Swept SA Marker 1 24.494000000000 GHz PRB: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 6/100 06:02:35 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P 10 dB/div Ref 20.00 dBm Log Mkr1 24.484 GHz -46.285 dBm -15.75 dBm Start 3.00 GHz #Res BW 100 kHz #VBW 300 kHz Stop 25.00 GHz Sweep 2.103 s (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2			
3GHz~25GHz			

Test Mode:	802.11g	Test channel :	01
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Agilent Spectrum Analyzer - Swept SA

Display Line -20.86 dBm

PRF: Fast
IF Gain: Low

Trig: Free Run
Atten: 30 dB

Avg Type: Log-Pwr
Avg/Hold: 100/100

06:07:49 PM Jun 07, 2017

TRACE 1 3 4 5 6
TYPE M VAWWWWW
DET P N L L L L L L

10 dB/div
Log

Ref 20.00 dBm

Mkr1 2.411 07 GHz
-0.797 dBm

Center 2.41200 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 30.00 MHz
Sweep 2.933 ms (1001 pts)

STATUS

Display

Annotation▶

Title▶

Graticule
On Off

Display Line
-20.86 dBm
On Off

System
Display▶
Settings

Channel 01

Agilent Spectrum Analyzer - Swept SA

Marker 1 13.089000 kHz

PRF: Wide
IF Gain: Low

Trig: Free Run
Atten: 30 dB

Avg Type: Log-Pwr
Avg/Hold: 93/100

06:11:42 PM Jun 07, 2017

TRACE 1 3 4 5 6
TYPE M VAWWWWW
DET P N L L L L L L

10 dB/div
Log

Ref 20.00 dBm

Mkr1 13.089 kHz
-49.601 dBm

Start 9.00 kHz
#Res BW 1.0 kHz
#VBW 3.0 kHz
Stop 150.00 kHz
Sweep 134.8 ms (1001 pts)

STATUS DC Coupled

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr---CF

Mkr---Ref Lvl

More
1 of 2

9KHz~150KHz

Agilent Spectrum Analyzer - Swept SA

Marker 1 169.700000 kHz

PRF: Wide
IF Gain: Low

Trig: Free Run
Atten: 30 dB

Avg Type: Log-Pwr
Avg/Hold: 72/100

06:12:05 PM Jun 07, 2017

TRACE 1 3 4 5 6
TYPE M VAWWWWW
DET P N L L L L L L

10 dB/div
Log

Ref 20.00 dBm

Mkr1 169.70 kHz
-62.723 dBm

Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz
Stop 10.000 MHz
Sweep 94.20 ms (1001 pts)

STATUS DC Coupled

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr---CF

Mkr---Ref Lvl

More
1 of 2

150KHz ~10MHz

Test Mode:	802.11g	Test channel :	01
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Agilent Spectrum Analyzer - Swept SA

Marker 1 13.480000000 MHz

PRN: Fast
IF Gain: Low

Trig: Free Run

Atten: 30 dB

Avg Type: Log-Pwr

Avg/Hold: 84/100

06:00:06 PM Jun 07, 2017

TRACE 1 3 4 5 6

TYPE M

DET P

10 dB/div

Ref 20.00 dBm

Log

Mkr1 13.48 MHz

-61.978 dBm

Start 10.00 MHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 1.933 ms (1001 pts)

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref Lvl

More 1 of 2

10MHz ~30MHz

Agilent Spectrum Analyzer - Swept SA

Marker 1 2.628750000000 GHz

PRN: Fast
IF Gain: Low

Trig: Free Run

Atten: 30 dB

Avg Type: Log-Pwr

Avg/Hold: 9/100

06:00:16 PM Jun 07, 2017

TRACE 1 3 4 5 6

TYPE M

DET P

10 dB/div

Ref 20.00 dBm

Log

Mkr1 2.628 8 GHz

-57.952 dBm

Start 30 MHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 283.9 ms (1001 pts)

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref Lvl

More 1 of 2

30MHz ~3GHz

Agilent Spectrum Analyzer - Swept SA

Marker 1 24.494000000000 GHz

PRN: Fast
IF Gain: Low

Trig: Free Run

Atten: 30 dB

Avg Type: Log-Pwr

Avg/Hold: 2/100

06:00:26 PM Jun 07, 2017

TRACE 1 3 4 5 6

TYPE M

DET P

10 dB/div

Ref 20.00 dBm

Log

Mkr1 24.494 GHz

-46.630 dBm

Start 3.00 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 2.103 s (1001 pts)

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref Lvl

More 1 of 2

3GHz~25GHz

Test Mode:	802.11g	Test channel :	06
Agilent Spectrum Analyzer - Swept SA Display Line -21.64 dBm PRF: Fast IF Gain: Low Trig: Free Run Atten: 30 dB SENSE INT ALN OFF 06:13:55 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P MULTI M 10 dB/div Ref 20.00 dBm Mkr1 2.438 65 GHz -1.638 dBm 1 Center 2.43700 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms (1001 pts) Span 30.00 MHz STATUS Display Annotation Title Graticule Off Display Line -21.64 dBm Off System Display Settings			
Channel 06			
Agilent Spectrum Analyzer - Swept SA Marker 1 9.141000 kHz PRF: Wide IF Gain: Low Trig: Free Run Atten: 30 dB SENSE INT ALN OFF 06:19:30 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P MULTI M 10 dB/div Ref 20.00 dBm Mkr1 9.141 kHz -48.804 dBm 1 Start 9.00 kHz #Res BW 1.0 kHz #VBW 3.0 kHz Sweep 134.8 ms (1001 pts) Stop 150.00 kHz STATUS DC Coupled Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2			
9KHz~150KHz			
Agilent Spectrum Analyzer - Swept SA Marker 1 150.000000 kHz PRF: Wide IF Gain: Low Trig: Free Run Atten: 30 dB SENSE INT ALN OFF 06:19:27 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M DET P MULTI M 10 dB/div Ref 20.00 dBm Mkr1 150.00 kHz -60.287 dBm 1 Start 150 kHz #Res BW 10 kHz #VBW 30 kHz Sweep 94.20 ms (1001 pts) Stop 10.000 MHz STATUS DC Coupled Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr---CF Mkr---Ref Lvl More 1 of 2			
150KHz ~10MHz			

Test Mode:	802.11g	Test channel :	06
Agilent Spectrum Analyzer - Swept SA Marker 1 21.860000000 MHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 100/100 06:16:20 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M Vectors DET P NORM 10 dB/div Ref 20.00 dBm Log Mkr1 21.86 MHz -61.237 dBm Start 10.00 MHz #Res BW 100 kHz #VBW 300 kHz Stop 30.00 MHz Sweep 1.933 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 10MHz ~30MHz Agilent Spectrum Analyzer - Swept SA Marker 1 2.6940900000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 12/100 06:16:30 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M Vectors DET P NORM 10 dB/div Ref 20.00 dBm Log Mkr1 2.694 1 GHz -57.137 dBm Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 3.000 GHz Sweep 283.9 ms (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 30MHz ~3GHz Agilent Spectrum Analyzer - Swept SA Marker 1 24.5160000000000 GHz PRN: Fast IF Gain: Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 2/100 06:16:51 PM Jun 07, 2017 TRACE 1 3 4 5 6 TYPE M Vectors DET P NORM 10 dB/div Ref 20.00 dBm Log Mkr1 24.516 GHz -47.666 dBm Start 3.00 GHz #Res BW 100 kHz #VBW 300 kHz Stop 25.00 GHz Sweep 2.103 s (1001 pts) STATUS Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr--CF Mkr--Ref Lvl More 1 of 2 3GHz~25GHz			