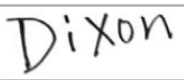
FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.247

Report Reference No.....:	**MWR161000105**	
FCC ID.....:	**RQQHLT-L55UTM**	
Compiled by (position+printed name+signature)..:	File administrators Martin Ao	
Supervised by (position+printed name+signature)..:	Test Engineer Yuchao Wang	
Approved by (position+printed name+signature)..:	Manager Dixon Hao	
Date of issue.....:	October 24,2016	
Representative Laboratory Name .:	**Maxwell International Co., Ltd.**	
Address .....:	Room 509, Hongfa center building, Baoan District, Shenzhen, Guangdong, China	
Testing Laboratory Name .....:	**Shenzhen CTL Testing Technology Co., Ltd.**	
Address .....:	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055	
Applicant's name.....:	**HYUNDAI CORPORATION**	
Address .....:	140-2, Kye-dong, Chongro-ku, Seoul, South Korea	
Test specification .....**:**		
Standard .....:	**FCC Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**	
TRF Originator.....:	Maxwell International Co., Ltd.	

Test item description .....:	Mobile Phone
Trade Mark .....:	HYUNDAI
Manufacturer.....:	**Shenzhen Rainbow Time Technology Co.,Ltd**
Model/Type reference.....:	TITAN LTE
Listed Models .....:	/
Modulation Type .....:	DSSS(CCK,DQPSK,DBPSK),OFDM(64QAM,16QAM,QPSK, BPSK)
Operation Frequency.....:	From 2412MHz to 2462MHz
Rating .....:	DC 3.80V
Hardware version .....:	5101SP_S52
Software version .....:	V1.0
Result.....:	**PASS**

T E S T R E P O R T

Test Report No. :	MWR161000105	October 24,2016 Date of issue

Equipment under Test	:	Mobile Phone
Model /Type	:	TITAN LTE
Listed Models	:	/
Applicant	:	**HYUNDAI CORPORATION**
Address	:	140-2, Kye-dong, Chongro-ku, Seoul, South Korea
Manufacturer	:	**Shenzhen Rainbow Time Technology Co.,Ltd**
Address	:	Room 905, ChangHong Technology Building, Science and Technology Park, Nanshan District, Shenzhen, China

Test Result:	**PASS**

Revison History

Revision	Issue Date	Revisions	Revised By
00	2016-10-24	Initial Issue	Dixon Hao

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 V03: 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	:	September 18, 2016
Testing commenced on	:	September 19, 2016
Testing concluded on	:	October 24, 2016

2.2 Product Description

The **HYUNDAI CORPORATION**'s Model: TITAN LTE or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	Mobile Phone
Model Number	TITAN LTE
Modilation Type	GMSK for GSM/GPRS/EDGE, 8-PSK for EDGE only downlink, QPSK for UMTS, QPSK/16QAM for LTE
Antenna Type	Internal
UMTS Operation Frequency Band	Device supported UMTS FDD Band II, FDD Band V
WLAN FCC Operation frequency	IEEE 802.11b:2412-2462MHz IEEE 802.11g:2412-2462MHz IEEE 802.11n HT20:2412-2462MHz IEEE 802.11n HT40:2422-2452MHz
BT FCC Operation frequency	2402MHz-2480MHz
HSDPA Release Version	Release 10
HSUPA Release Version	Release 6
DC-HSUPA Release Version	Not Supported
WCDMA Release Version	R99
WLAN FCC 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)
BT Modulation Type	GFSK,8DPSK,π/4DQPSK(BT3.0+EDR),GFSK(BLE)
Hardware version	5101SP_S52
Software version	V1.0
Android version	Android 5.1
GPS function	Supported
WLAN	Supported 802.11b/802.11g/802.11n
Bluetooth	Supported BT 4.0/BT 3.0+EDR
GSM/EDGE/GPRS	Supported GSM/GPRS/EDGE
GSM/EDGE/GPRS Power Class	GSM850:Power Class 4/ PCS1900:Power Class 1
GSM/EDGE/GPRS Operation Frequency	GSM850 :824.2MHz-848.8MHz/PCS1900:1850.2MHz-1909.8MHz
GSM/EDGE/GPRS Operation Frequency Band	GSM850/PCS1900/GPRS850/GPRS1900/EDGE850/EDGE1900
GSM Release Version	R99
GPRS/EDGE Multislot Class	GPRS: Multi-slot Class 12
Extreme temp. Tolerance	-30°C to +50°C
Extreme vol. Limits	3.40VDC to 4.20VDC (nominal: 3.80VDC)
GPRS operation mode	Class B

2.3 Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 3.80V

2.4 Description of the test mode

IEEE 802.11b/g/n: The product support Third channels but only use Eleventh channels in USA.

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		

2.5 Short description of the Equipment under Test (EUT)

2.5.1 General Description

TITAN LTE is subscriber equipment in the WCDMA/GSM system. The HSPA/UMTS frequency band is Band I, Band II and Band V; The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only Band II, Band V , GSM850 and PCS1900 bands test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and SIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

2.5.2 Test Modes

Test Case	Test Conditions	
	Configuration	Description
DTS (6 dB) Bandwidth	Measurement Method	FCC KDB 558074 §8.2 Option 2
	Test Environment	NTNV
	EUT Configuration	11b_L,11b_M,11b_H 11g_L,11g_M,11g_H 11n HT20_L, 11n HT20_M, 11n HT20_H 11n HT40_L, 11n HT40_M, 11n HT40_H
Maximum Peak Conducted Output Power	Measurement Method	FCC KDB 558074§9.1.2
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11b_L,11b_M,11b_H 11g_L,11g_M,11g_H 11n HT20_L, 11n HT20_M, 11n HT20_H 11n HT40_L, 11n HT40_M, 11n HT40_H
Maximum Power Spectral Density Level	Measurement Method	FCC KDB 558074 §10.2 (peak PSD).
	Test Environment	NTNV
	EUT Configuration	11b_L,11b_M,11b_H 11g_L,11g_M,11g_H 11n HT20_L, 11n HT20_M, 11n HT20_H 11n HT40_L, 11n HT40_M, 11n HT40_H
Unwanted Emissions into Non-	Measurement Method	FCC KDB 558074§11.0.

Restricted Frequency Bands	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11b_L,11b_M,11b_H 11g_L,11g_M,11g_H 11n HT20_L, 11n HT20_M, 11n HT20_H 11n HT40_L, 11n HT40_M, 11n HT40_H
Unwanted Emissions into Restricted Frequency Bands (Conducted)	Measurement Method	FCC KDB 558074§12.2, Conducted (antenna-port).
	Test Environment	NTNV
	EUT Configuration	11b_L,11b_M,11b_H 11g_L,11g_M,11g_H 11n HT20_L, 11n HT20_M, 11n HT20_H 11n HT40_L, 11n HT40_M, 11n HT40_H
Unwanted Emissions into Restricted	Measurement Method	FCC KDB 558074§12.1,Radiated(cabinet/case emissions with Impedance matching for antenna-port).
	Test Environment	NTNV
	EUT Configuration	11b_L,11b_M,11b_H 11g_L,11g_M,11g_H 11n HT20_L, 11n HT20_M, 11n HT20_H 11n HT40_L, 11n HT40_M, 11n HT40_H

Test Case	Test Conditions	
	Configuration	Description
AC Power Line Conducted Emissions	Measurement Method	AC mains conducted.
	Test Environment	NTNV
	EUT Configuration	11g_M (Worst Conf.).

Remark:
1. For Radiated Emissions, By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "Z axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.
2. Typical working modes for each IEEE 802.11mode are selected to perform tests. The manufacturer provide special test software to control TX duty cycle >98% for TX test; recorded worst case at difference data rate as follows:
3. For AC Main conducted emission measured at both AC power adapter and charge from PC, recorded worst case in test report.
4. For AC Main conducted emission measured at both AC 120V/60Hz and AC 240V/50Hz, recorded worst case in test report.

Test Mode	Test Modes Description
IEEE 802.11b	IEEE 802.11b with data rate of 1 Mbps using SISO mode.
IEEE 802.11g	IEEE 802.11g with data rate of 6 Mbps using SISO mode.
IEEE 802.11n HT20	IEEE 802.11n with data date of MCS0 and bandwidth of 20MHz using SISO mode.
IEEE 802.11n HT40	IEEE 802.11n with data date of MCS7 and bandwidth of 40MHz using SISO mode.

2.6 EUT operation mode

Test Mode	RF Ch.	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]
IEEE 802.11b	L	Ch No. 1 / 2412MHz	---	20
	M	Ch No. 6 / 2437 MHz	---	20
	H	Ch No. 11/ 2462MHz	---	20
IEEE 802.11g	L	Ch No. 1 / 2412MHz	---	20
	M	Ch No. 6 / 2437 MHz	---	20
	H	Ch No. 11/ 2462MHz	---	20
IEEE 802.11n HT20	L	Ch No. 1 / 2412MHz	---	20
	M	Ch No. 6 / 2437 MHz	---	20
	H	Ch No. 11/ 2462MHz	---	20
IEEE 802.11n HT40	L	Ch No. 3/ 2422MHz	---	40
	M	Ch No. 6 / 2437 MHz	---	40
	H	Ch No. 9/ 2452 MHz	---	40

2.7 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

2.8 Internal Identification of AE used during the test

AE ID*	Description
AE1	Charger

AE1
Model: DC500
INPUT: AC180-240V~ 50/60Hz 0.15A
OUTPUT: DC 5.0V 1000mA

*AE ID: is used to identify the test sample in the lab internally.

2.9 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: RQQHLT-L55UTM** filing to comply with FCC Part 15.247 Rules

2.10 Modifications

No modifications were implemented to meet testing criteria.

2.11 Test Environments

NOTE: The values used in the test report maybe stringent than the declared.

Environment Parameter	Selected Values During Tests		
NTNV	Temperature	Voltage	Relative Humidity
	Ambient	3.80VDC	Ambient

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4, CISPR 22/EN 55022 and CISPR16-4-1 SVSWR requirements.

3.2 Test Facility

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

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

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 Item	FCC Part No.	Requirements	Verdict
DTS (6 dB) Bandwidth	15.247(a)(2)	≥ 500 kHz.	PASS
Maximum Peak Conducted Output Power	15.247(b)(3)	For directional gain:< 30dBm – (G[dBi] –6 [dB]),peak; Otherwise :< 30dBm, peak.	PASS
Maximum Power Spectral Density Level	15.247(e)	For directional gain :< 8dBm/3 kHz – (G[dBi] –6[dB]), peak. Otherwise :< 8dBm/3 kHz, peak.	PASS
Band Edges Compliance	15.247(d)	< -20dBr/100 kHz if total peak power ≤power limit.	PASS
Unwanted Emissions into Non-Restricted Frequency Bands	15.247(d)	< -20dBr/100 kHz if total peak power ≤power limit.	PASS
Unwanted Emissions into Restricted Frequency Bands (Conducted)	15.247(d) 15.209	< -20dBr/100 kHz if total peak power ≤power limit.	PASS
Unwanted Emissions into Restricted Frequency Bands (Radiated)	15.247(d) 15.209	FCC Part 15.209 field strength limit;	PASS
AC Power Line Conducted Emissions	15.207	FCC Part 15.207 conducted limit;	PASS

Remark: The measurement uncertainty is not included in the test result.

3.5 Summary of measurement results

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)(1)	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	☒ 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

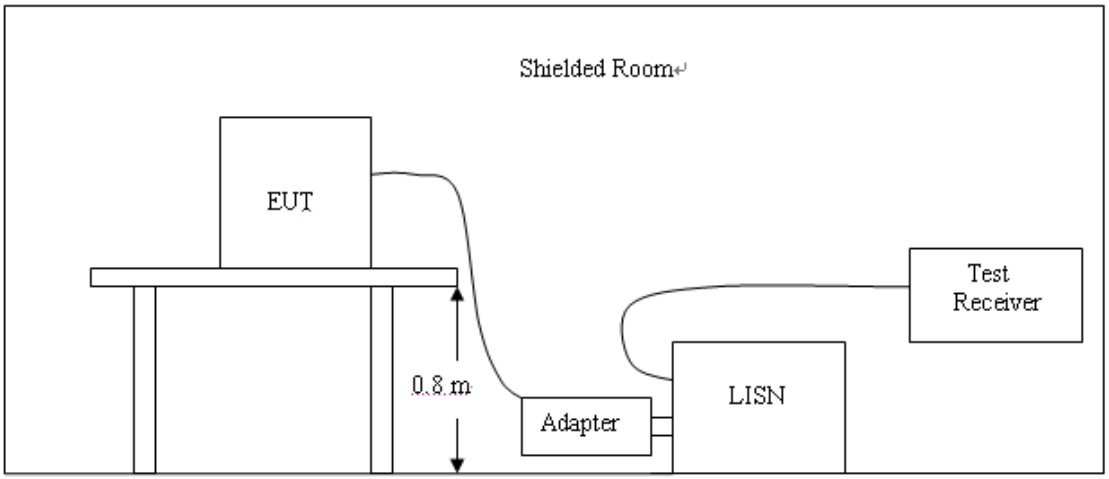
3.6 Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2016/06/02	2017/06/01
EMI Test Receiver	R&S	ESCI	103710	2016/06/02	2017/06/01
Spectrum Analyzer	Agilent	N9030A	MY49430428	2016/05/21	2017/05/20
Controller	EM Electronics	Controller EM 1000	N/A	2016/05/21	2017/05/20
Horn Antenna	SCHWARZBECK	BBHA9170D	BBH A9170179	2016/05/19	2017/05/18
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2016/05/19	2017/05/18
EMC Test Software	R&S	ES-K1	N/A	N/A	N/A
EMC Test Software	Audix	E3	N/A	N/A	N/A
Active Loop Antenna	SCHWARZBECK	FMZB1519	1519-037	2016/05/19	2017/05/18
Amplifier	Agilent	8349B	3008A02306	2016/05/19	2017/05/18
Amplifier	Agilent	8447D	2944A10176	2016/05/19	2017/05/18
Temperature/ Humidity Meter	Gangxing	CTH-608	02	2016/05/20	2017/05/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2016/05/20	2017/05/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2016/05/20	2017/05/19
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	2016/06/02	2017/06/01
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2016/06/02	2017/06/01
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2016/06/02	2017/06/01
RF Cable	Megalon	RF-A303	N/A	2016/06/02	2017/06/01
Power Sensor	R&S	NRP-Z4	823.3618.03	2016/06/02	2017/06/01
Power Meter	R&S	NRVS	1020.1809.02	2016/06/02	2017/06/01
System Simulator	R&S	CMU200	115419	2016.05.22	2017.05.21

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 DC5V power from the adapter, the adapter received AC120V/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 (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

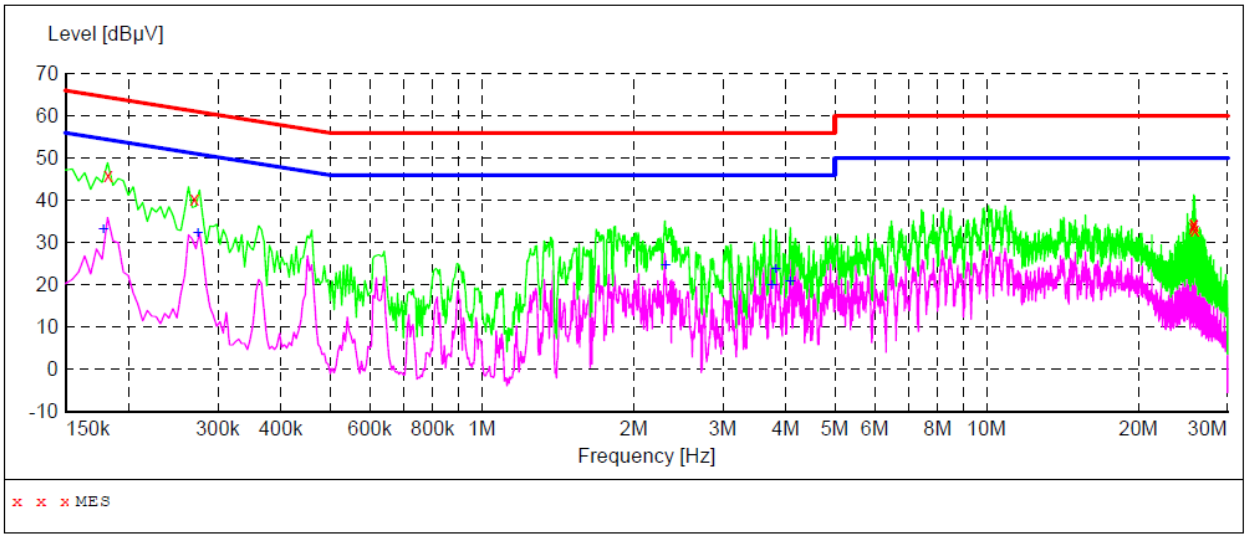
* Decreasing linearly with the logarithm of the frequency

TEST RESULTS

Remark:
1. The AC Power Conducted Emission measurement is performed the each test mode (b/g/n) and channel (low/mid/high), the datum recorded below (IEEE 802.11b mode, the middle channel) is the worst case for all the test modes and channels.
2. Measured at power adapter charge and USB charge also at both AC 120V/60Hz and AC 240V/50Hz, recorded worst case at AC 120V/60Hz.

L:

SCAN TABLE: "Voltage (9K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.182000	45.90	10.2	64	18.5	QP	L1	GND
0.270000	40.30	10.2	61	20.8	QP	L1	GND
25.658000	33.60	11.1	60	26.4	QP	L1	GND
25.718000	34.30	11.1	60	25.7	QP	L1	GND
25.778000	34.10	11.1	60	25.9	QP	L1	GND
25.838000	33.10	11.1	60	26.9	QP	L1	GND

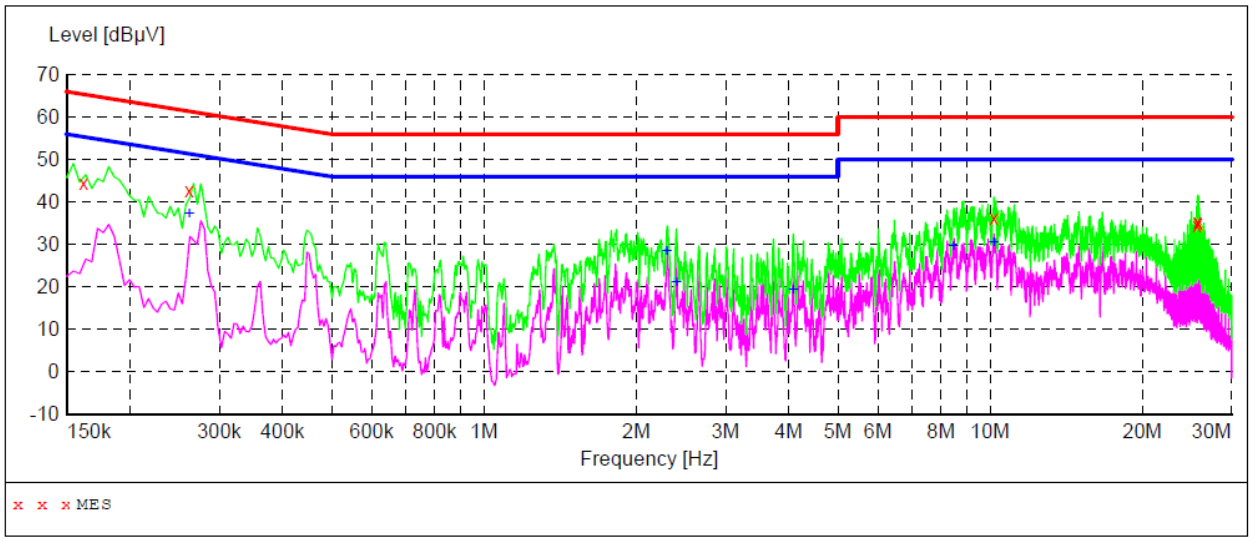
MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	33.20	10.2	55	21.4	AV	L1	GND
0.274000	32.30	10.2	51	18.7	AV	L1	GND
2.312000	24.90	10.4	46	21.1	AV	L1	GND
3.758000	20.00	10.4	46	26.0	AV	L1	GND
3.824000	23.80	10.4	46	22.2	AV	L1	GND
4.088000	20.80	10.4	46	25.2	AV	L1	GND

N:

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.162000	44.50	10.2	65	20.9	QP	N	GND
0.262000	42.60	10.2	61	18.8	QP	N	GND
10.178000	36.30	10.6	60	23.7	QP	N	GND
25.658000	34.50	11.1	60	25.5	QP	N	GND
25.718000	35.30	11.1	60	24.7	QP	N	GND
25.778000	35.10	11.1	60	24.9	QP	N	GND

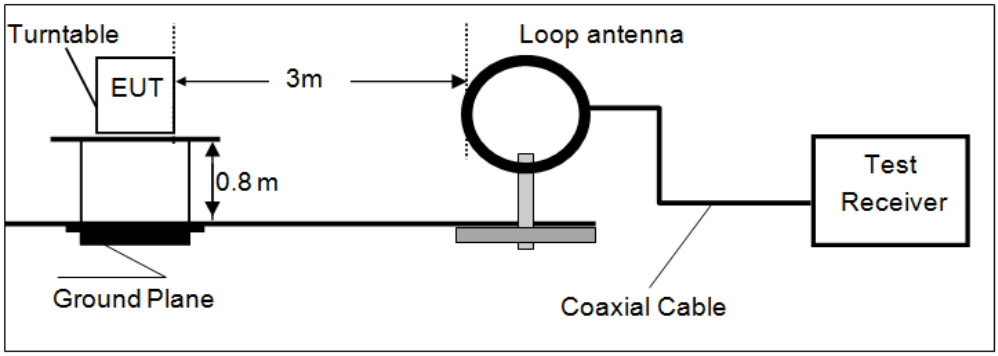
MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.262000	37.50	10.2	51	13.9	AV	N	GND
2.300000	28.70	10.4	46	17.3	AV	N	GND
2.402000	21.20	10.4	46	24.8	AV	N	GND
4.088000	19.40	10.4	46	26.6	AV	N	GND
8.462000	29.60	10.6	50	20.4	AV	N	GND
10.160000	30.70	10.6	50	19.3	AV	N	GND

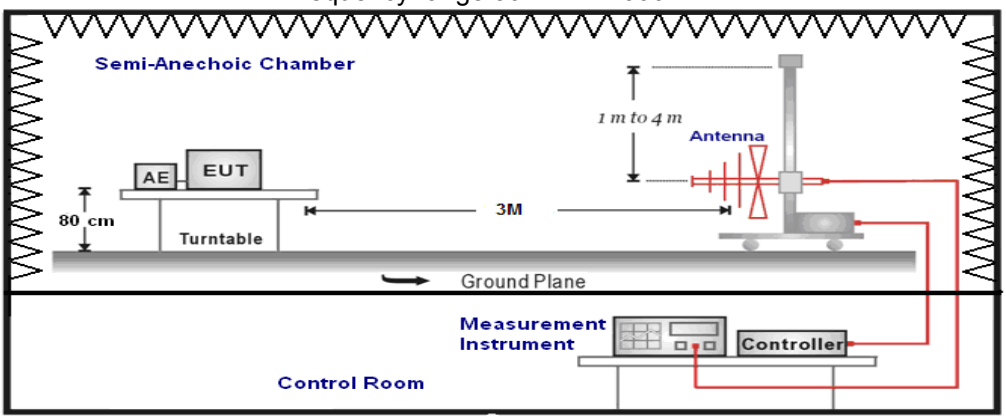
4.2 Radiated Emission

TEST CONFIGURATION

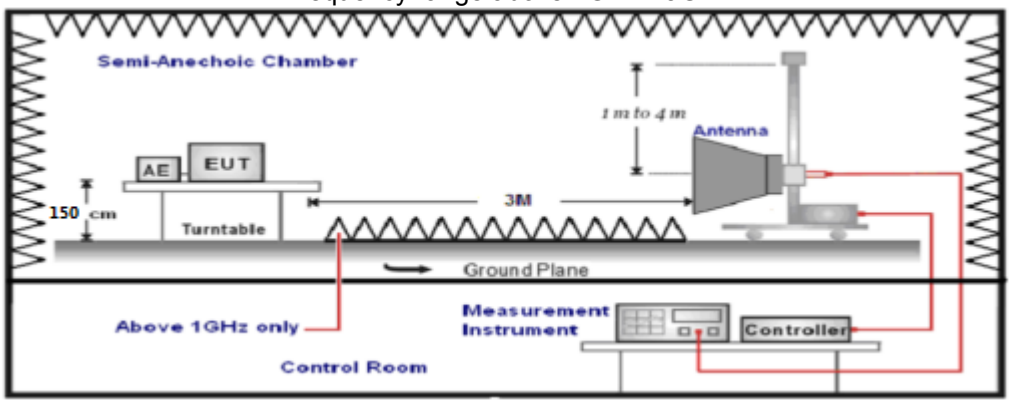
Frequency range 9 KHz – 30MHz



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 for below 1GHz and 1.50m above ground plane for above 1GHz.
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. The EUT minimum operation frequency was 32.768 KHz and maximum operation frequency was 2480MHz.so radiated emission test frequency band from 9 KHz 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	Bilog Antenna	3
1GHz-18GHz	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	Peak
	Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

More procudre as follows;

1) Sequence of testing 9 kHz to 30 MHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
--- If the EUT is a floor standing device, it is placed on the ground.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.

Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna height is 1.0 meter.
--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:
--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QP detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.

Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna is polarized vertical and horizontal.
--- The antenna height changes from 1 to 4 meter.
--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:
--- The final measurement will be performed with minimum the six highest peaks.
--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.
--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.

Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna is polarized vertical and horizontal.
--- The antenna height scan range is 1 meter to 2.5 meter.
--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:
--- The final measurement will be performed with minimum the six highest peaks.
--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 1 meter.
--- The EUT was set into operation.

Premeasurement:
--- The antenna is moved spherical over the EUT in different polarizations of the antenna.
Final measurement:
--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

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	

For example

Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
300.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.
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)

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	300	20log(2400/F(KHz))+80	2400/F(KHz)
0.49-1.705	30	20log(24000/F(KHz))+40	24000/F(KHz)
1.705-30	30	20log(30)+40	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

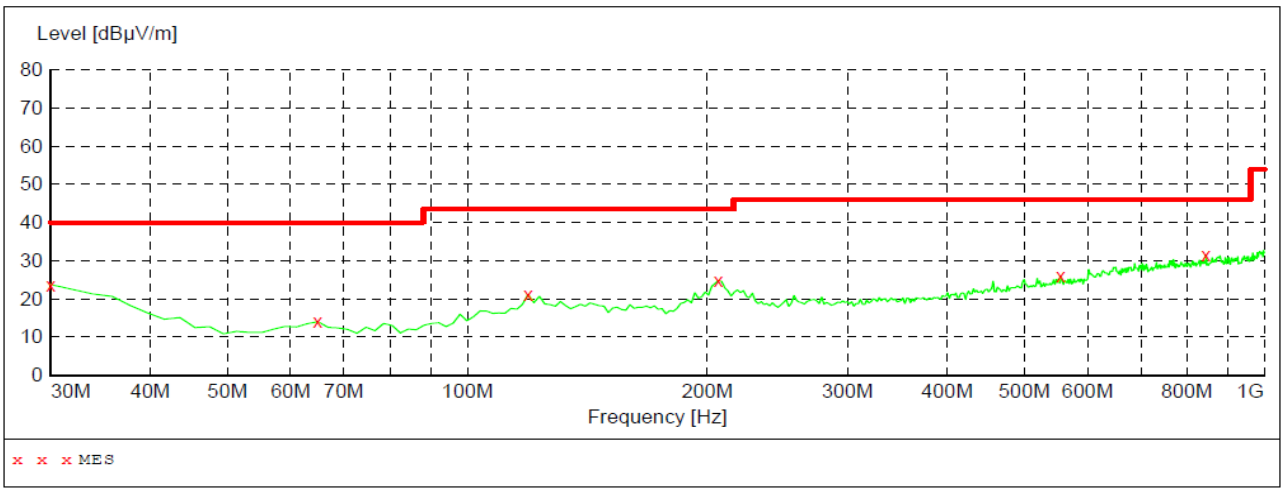
TEST RESULTS

Remark:
1. The radiated measurement are performed the each test mode (b/g/n) and channel (low/mid/high), the data recorded below (IEEE 802.11b mode, the middle channel) is the worst case for all the test mode and channel.
2. Bilog Antenna for the radiation emission test below 1G.
3. HORN ANTENNA for the radiation emission test above 1G.
4. "---" means not recorded as emission levels lower than limit.
6. Margin= Limit - Level

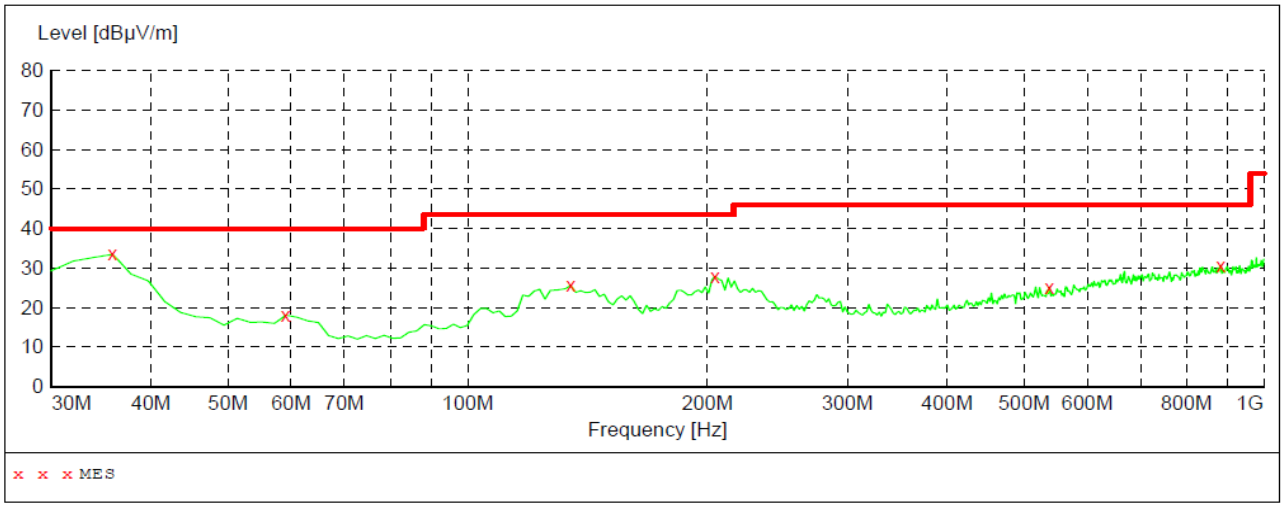
For 9KHz to 30MHz

Frequency (MHz)	Corrected Reading (dBμV/m)@3m	FCC Limit (dBμV/m) @3m	Margin (dB)	Detector	Result
15.85	48.97	69.54	20.57	QP	PASS
25.79	46.49	69.54	23.05	QP	PASS

For 30MHz to 1000MHz



Frequency	Level	Transd	Limit	Margin	Det.	Height	Azimuth	Polarization
MHz	dBµV/m	dB	dBµV/m	dB		cm	deg	
30.000000	23.91	20.84	40.00	16.09	Peak	104.00	124.00	HORIZONTAL
65.780000	14.00	8.12	40.00	26.00	Peak	100.00	311.00	HORIZONTAL
118.890000	21.31	14.75	43.50	22.19	Peak	150.00	300.00	HORIZONTAL
207.160000	25.91	14.16	43.50	17.59	Peak	200.00	250.00	HORIZONTAL
556.020000	26.39	21.13	46.00	19.61	Peak	100.00	107.00	HORIZONTAL
845.240000	31.64	25.11	46.00	14.36	Peak	300.00	131.00	HORIZONTAL



Frequency	Level	Transd	Limit	Margin	Det.	Height	Azimuth	Polarization
MHz	dBµV/m	dB	dBµV/m	dB		cm	deg	
35.780000	34.97	16.23	40.00	5.03	Peak	100.00	179.00	VERTICAL
60.040000	18.14	8.04	40.00	21.86	Peak	100.00	245.00	VERTICAL
136.010000	26.06	14.43	43.50	17.44	Peak	100.00	44.00	VERTICAL
204.610000	28.55	14.17	43.50	14.95	Peak	108.00	197.00	VERTICAL
541.260000	25.22	20.65	46.00	20.78	Peak	100.00	264.00	VERTICAL
880.330000	31.19	25.66	46.00	14.81	Peak	100.00	313.00	VERTICAL

For 1GHz to 25GHz

Low Channel @ Channel 1 @ 2412 MHz

Item (Mark)	Frequency (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBµV/m)	Limit Line (dBµV/m)	Margin (dB)	Detector	Polarization
1	4824.00	73.67	34.47	30.27	8.24	61.23	74.00	12.77	Peak	Horizontal
2	4804.00	60.80	34.47	30.27	8.24	48.36	54.00	5.64	AV[1]	Horizontal
3	7236.00	75.64	37.12	31.34	11.39	58.47	74.00	15.53	Peak	Horizontal
4	7236.00	61.36	37.12	31.34	11.39	44.19	54.00	9.81	AV[1]	Horizontal

Item (Mark)	Frequency (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBµV/m)	Limit Line (dBµV/m)	Margin (dB)	Detector	Polarization
1	4824.00	72.38	34.47	30.27	8.24	59.94	74.00	14.06	Peak	Vertical
2	4804.00	59.48	34.47	30.27	8.24	47.04	54.00	6.96	AV[1]	Vertical
3	7236.00	73.79	37.12	31.34	11.39	56.62	74.00	17.38	Peak	Vertical
4	7236.00	60.04	37.12	31.34	11.39	42.87	54.00	11.13	AV[1]	Vertical

Middle Channel @ Channel 6 @ 2437 MHz

Item (Mark)	Frequency (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBµV/m)	Limit Line (dBµV/m)	Margin (dB)	Detector	Polarization
1	4874.00	75.87	34.51	30.33	8.55	63.14	74.00	10.86	Peak	Horizontal
2	4874.00	63.34	34.51	30.33	8.55	50.61	54.00	3.39	AV[1]	Horizontal
3	7311.00	76.80	37.26	31.94	12.11	59.37	74.00	14.63	Peak	Horizontal
4	7311.00	62.31	37.26	31.94	12.11	44.88	54.00	9.12	AV[1]	Horizontal

Item (Mark)	Frequency (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector	Polarization
1	4874.00	74.47	34.51	30.33	8.55	61.74	74.00	12.26	Peak	Vertical
2	4874.00	61.59	34.51	30.33	8.55	48.86	54.00	5.14	AV[1]	Vertical
3	7311.00	74.60	37.26	31.94	12.11	57.17	74.00	16.83	Peak	Vertical
4	7311.00	60.69	37.26	31.94	12.11	43.26	54.00	10.74	AV[1]	Vertical

High Channel @ Channel 11 @ 2462 MHz

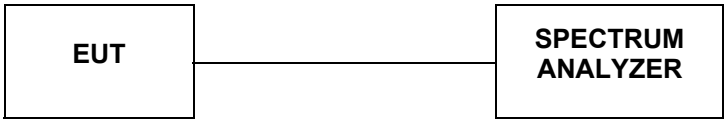
Item (Mark)	Frequency (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector	Polarization
1	4924.00	75.01	34.92	30.24	10.09	60.24	74.00	13.76	Peak	Horizontal
2	4924.00	62.04	34.92	30.24	10.09	47.27	54.00	6.73	AV[1]	Horizontal
3	7386.00	78.09	38.17	31.55	13.35	58.12	74.00	15.88	Peak	Horizontal
4	7386.00	63.19	38.17	31.55	13.35	43.22	54.00	10.78	AV[1]	Horizontal

Item (Mark)	Frequency (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector	Polarization
1	4924.00	73.54	34.92	30.24	10.09	58.77	74.00	15.23	Peak	Vertical
2	4924.00	61.23	34.92	30.24	10.09	46.46	54.00	7.54	AV[1]	Vertical
3	7386.00	76.59	38.17	31.55	13.35	56.62	74.00	17.38	Peak	Vertical
4	7386.00	62.78	38.17	31.55	13.35	42.81	54.00	11.19	AV[1]	Vertical

Remark:
1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. The other emission levels were very low against the limit.
3. Margin = Limit - Emission Level.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. Detector AV is setting spectrum/receiver. RBW=1MHz/VBW=10Hz/Sweep time=Auto/Detector=Peak;
6."---" Mean the PK detector measured value is below average limit.
7. We measured IEEE 802.11b, IEEE 802.11g, IEEE 802.11n HT20 and IEEE 802.11n HT40, rcorded the worst case at IEEE 802.11 b Mode.
8. Measured output power at difference data rate for each mode and recorded worst case for each mode.
9. Worst case data at 1Mbps at IEEE 802.11 b; 6Mbps at IEEE 802.11 g; 6.5Mbps at IEEE 802.11 n HT20; 13.5Mbps at IEEE 802.11 n HT40;

4.3 Duty Cycle

TEST CONFIGURATION



LIMIT

The Maximum Peak Output Power Measurement is 30dBm.
Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%).

TEST PROCEDURE

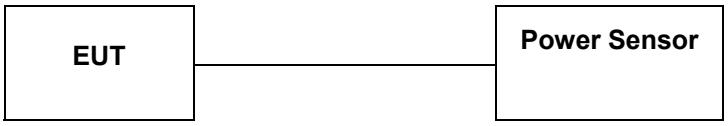
a. A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal.
b. The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

TEST RESULTS

The Manufacturer provide engineer mode *#3646633#* to setup 100% continuous transmit for WLAN;

4.4 Maximum Output Power

TEST CONFIGURATION



TEST PROCEDURE

According to KDB558074 D01 DTS Meas Guidance:
PKPM1 Peak power meter method: 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.
Maximum conducted (average) output power: As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
1. The EUT is configured to transmit continuously, or to transmit with a constant duty factor.
2. At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
3. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
If the transmitter does not transmit continuously, measure the duty cycle (x) of the transmitter output signal as described in Section 6.0.
Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
Adjust the measurement in dBm by adding 10log (1/x), where x is the duty cycle to the measurement result.

LIMIT

The Maximum Peak Output Power Measurement is 30dBm.

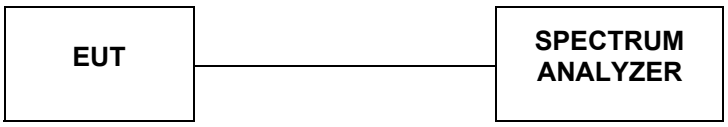
TEST RESULTS

Test Mode	Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Limits (dBm)	Verdict
IEEE 802.11 b	1	2412	19.87	30	PASS
	6	2437	19.82		
	11	2462	19.82		
IEEE 802.11 g	1	2412	20.85	30	PASS
	6	2437	22.35		
	11	2462	20.98		
IEEE 802.11 n HT20	1	2412	21.12	30	PASS
	6	2437	22.66		
	11	2462	20.95		
IEEE 802.11 n HT40	3	2422	19.26	30	PASS
	6	2437	20.96		
	9	2452	19.08		

Remark:
1. *Measured output power at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 1Mbps at IEEE 802.11 b; 6Mbps at IEEE 802.11 g; 6.5Mbps at IEEE 802.11 n HT20; 13.5Mbps at IEEE 802.11 n HT40;*

4.5 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.

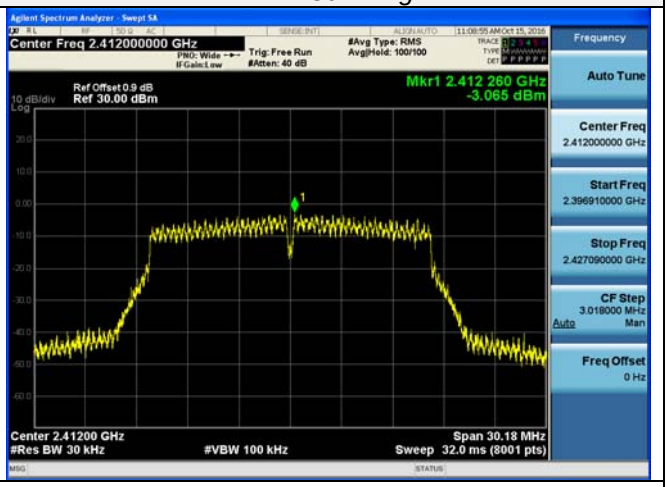
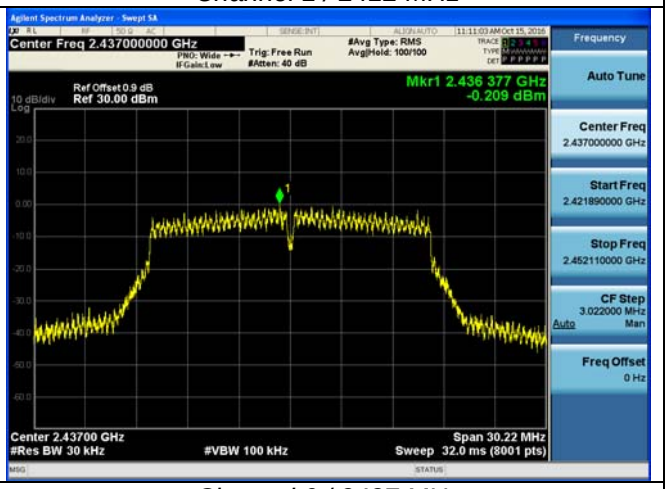
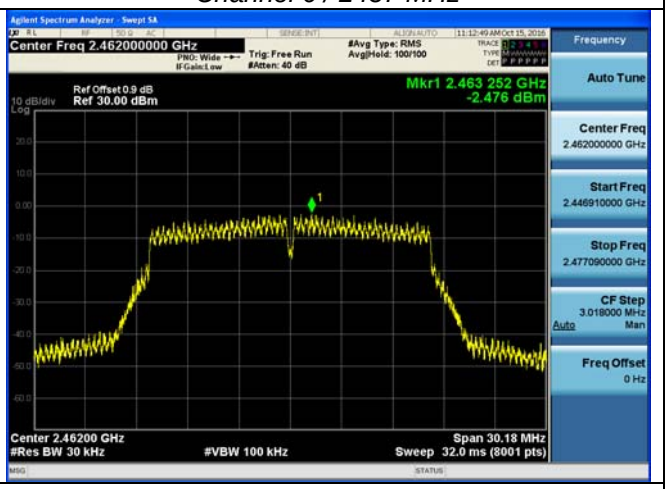
LIMIT

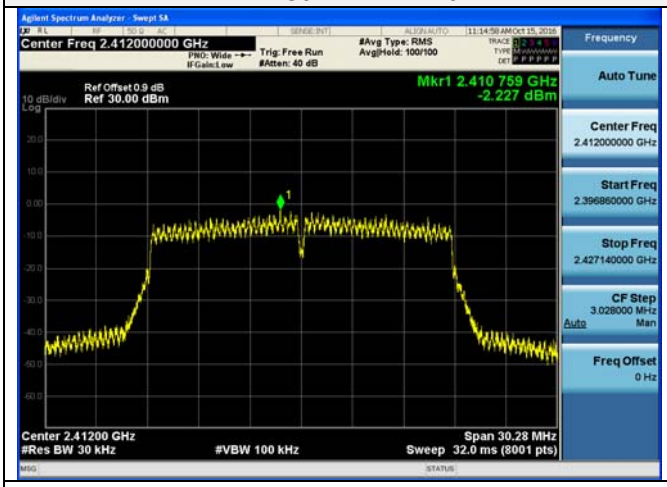
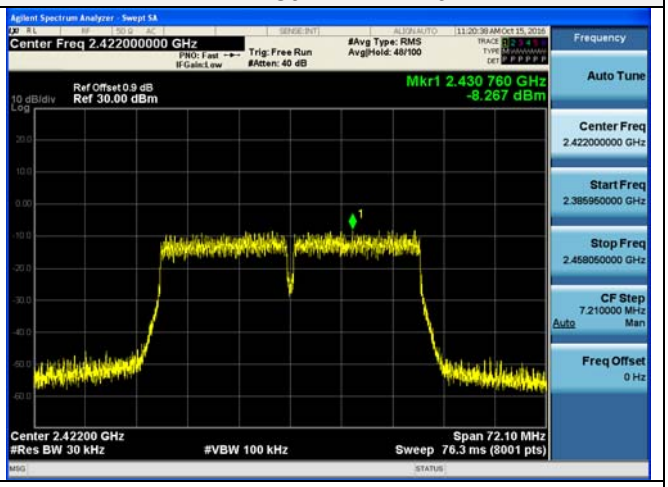
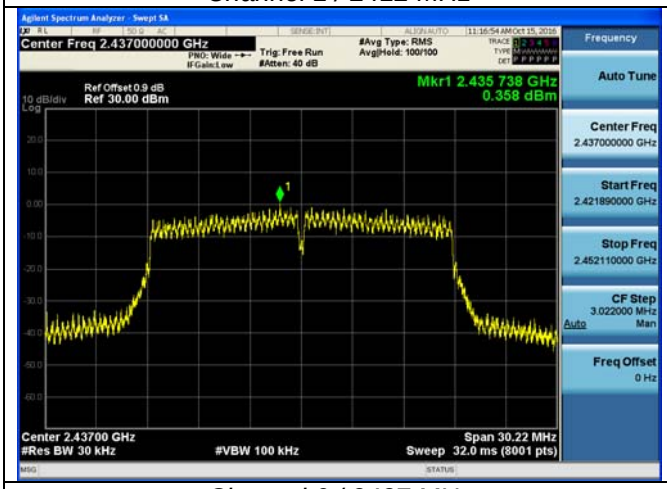
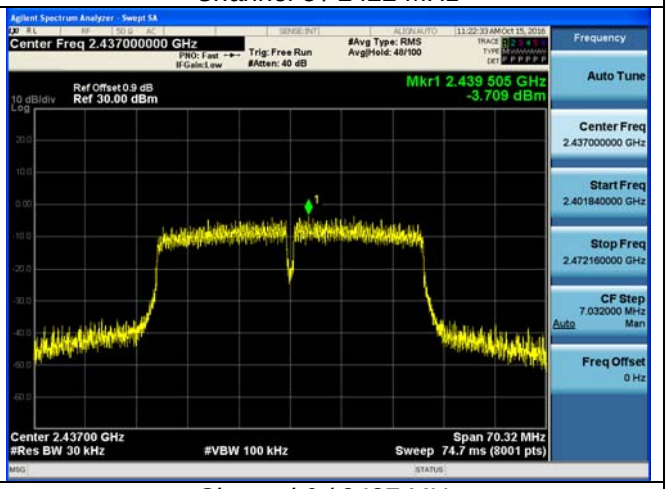
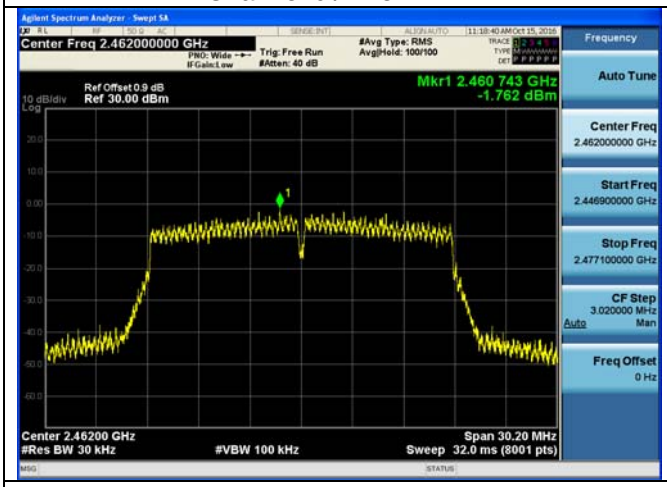
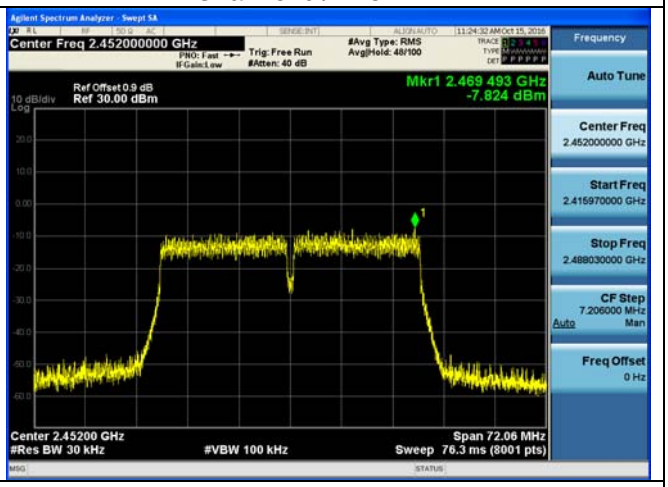
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST RESULTS

Test Mode	Channel	Frequency (MHz)	Measured Peak Power Spectral Density (dBm/100KHz)	Limits (dBm/3KHz)	Verdict
IEEE 802.11 b	1	2412	4.835	8	PASS
	6	2437	7.788		
	11	2462	3.807		
IEEE 802.11 g	1	2412	-3.065	8	PASS
	6	2437	-0.209		
	11	2462	-2.476		
IEEE 802.11 n HT20	1	2412	-2.227	8	PASS
	6	2437	0.358		
	11	2462	-1.762		
IEEE 802.11 n HT40	3	2422	-8.267	8	PASS
	6	2437	-3.709		
	9	2452	-7.824		

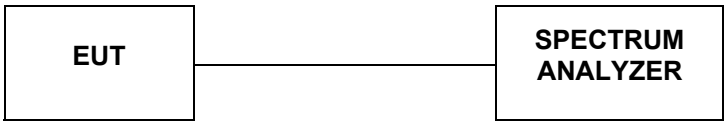
Remark:
1. *Measured output power at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 1Mbps at IEEE 802.11 b; 6Mbps at IEEE 802.11 g; 6.5Mbps at IEEE 802.11 n HT20; 13.5Mbps at IEEE 802.11 n HT40;*
4. *please refer to following plots;*

Peak Power Spectral Density	
IEEE 802.11 b	IEEE 802.11 g
	
Channel 1 / 2412 MHz	Channel 1 / 2412 MHz
	
Channel 6 / 2437 MHz	Channel 6 / 2437 MHz
	
Channel 11 / 2462 MHz	Channel 11 / 2462 MHz

Peak Power Spectral Density	
IEEE 802.11 n HT20	IEEE 802.11 n HT40
	
Channel 1 / 2412 MHz	Channel 3 / 2422 MHz
	
Channel 6 / 2437 MHz	Channel 6 / 2437 MHz
	
Channel 11 / 2462 MHz	Channel 9 / 2452 MHz

4.6 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 C63.10-2013with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100 kHz and VBW= 300 KHz to measure the peak field strength, and measure frequency range from 9 KHz to 25GHz.

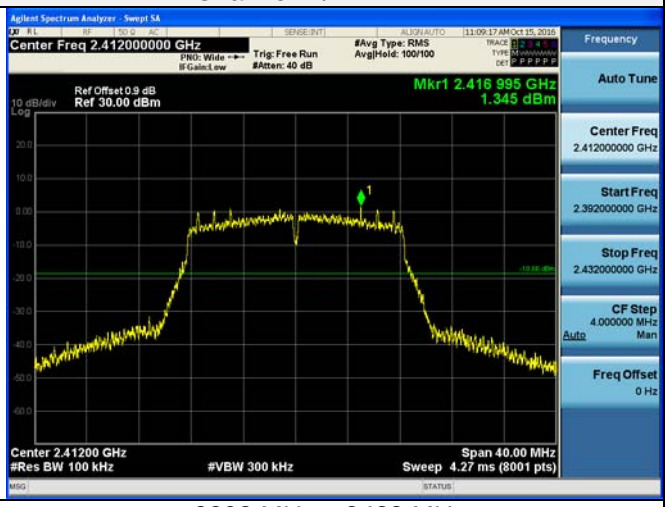
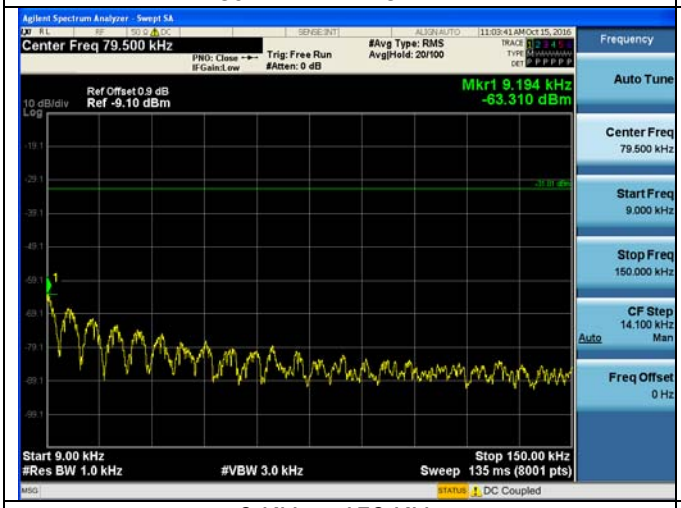
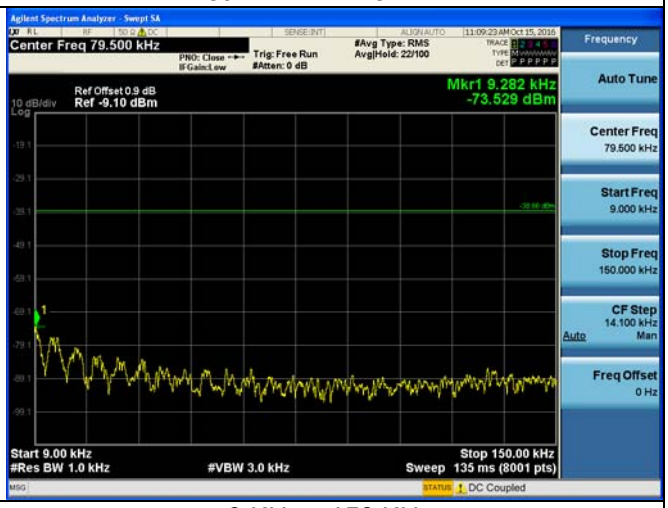
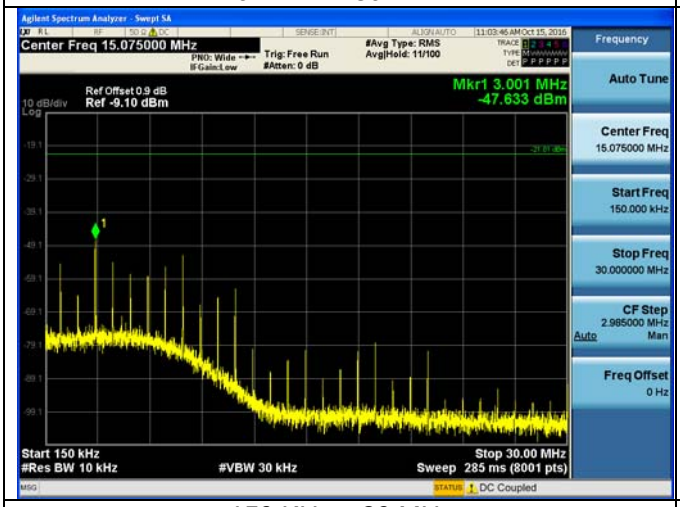
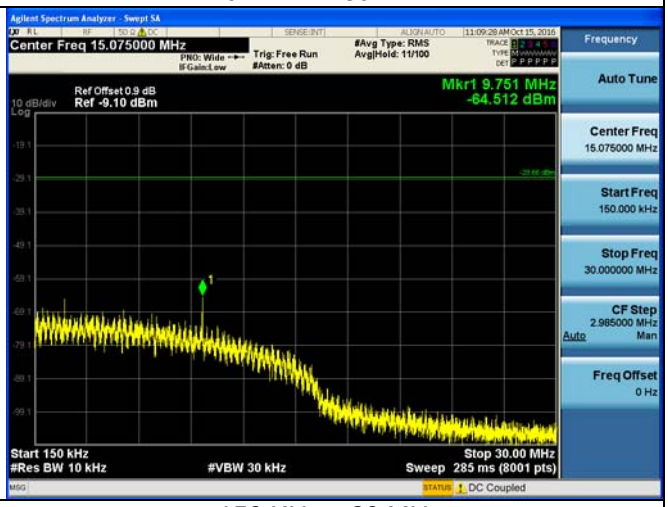
LIMIT

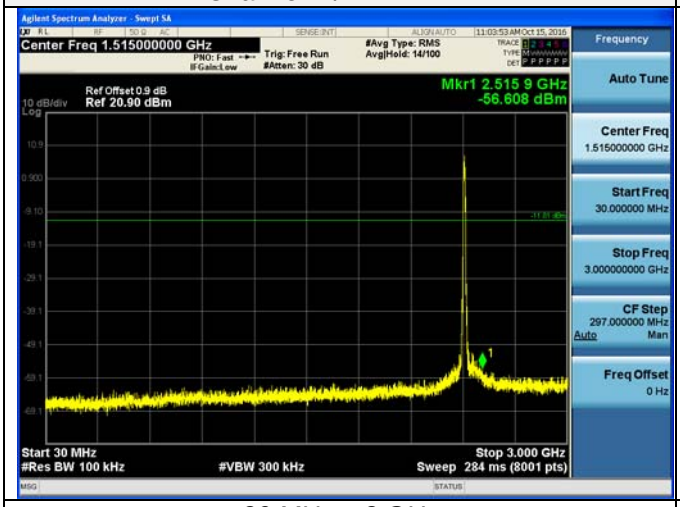
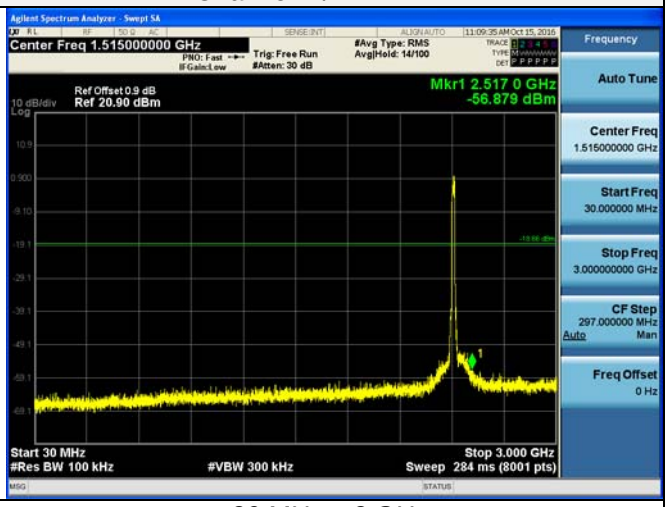
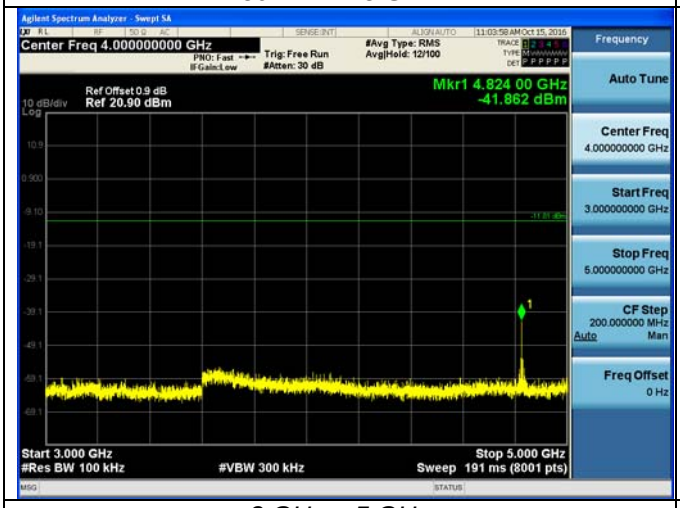
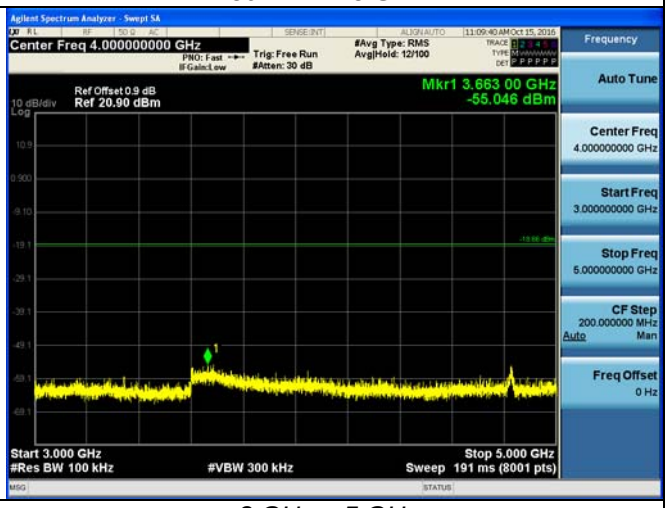
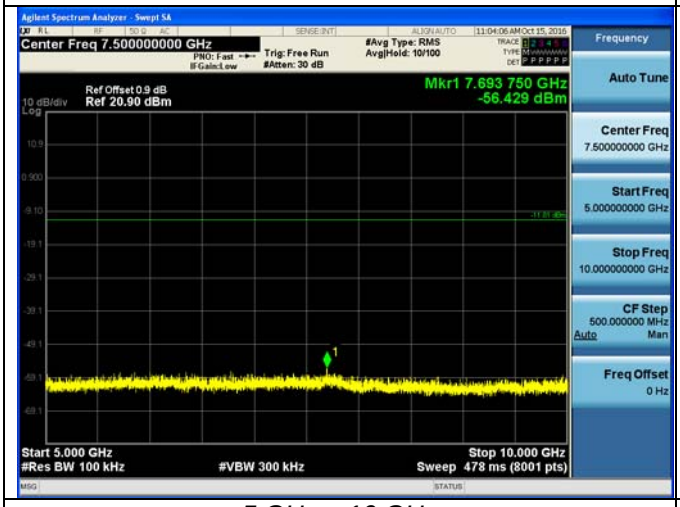
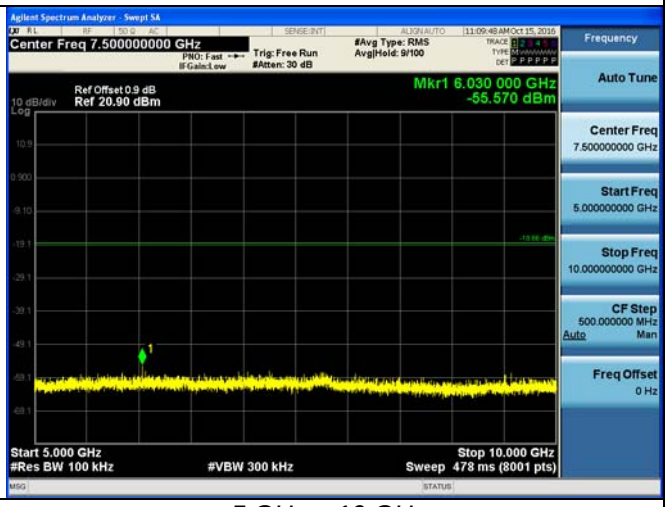
1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

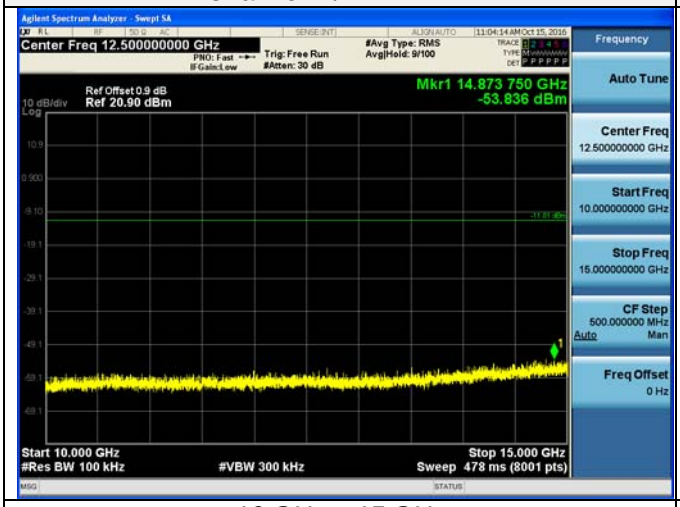
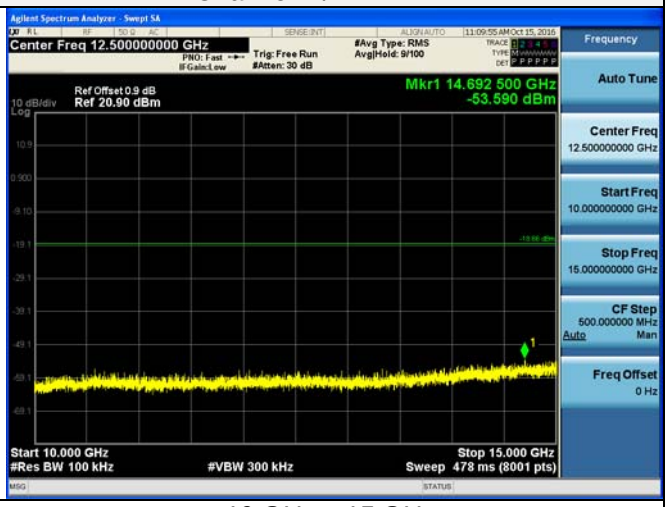
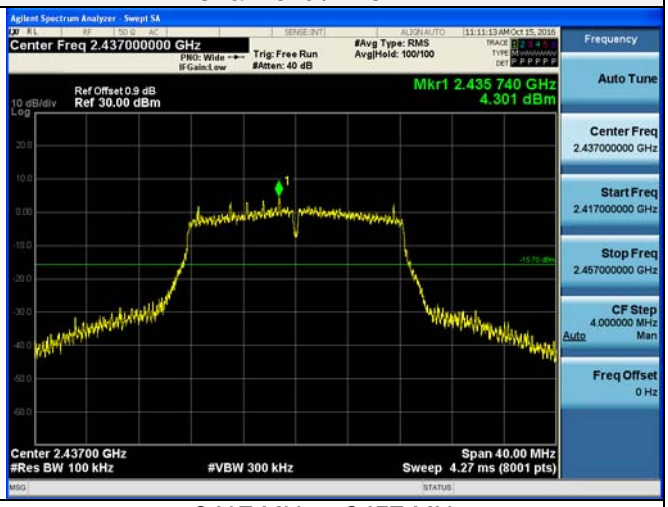
TEST RESULTS

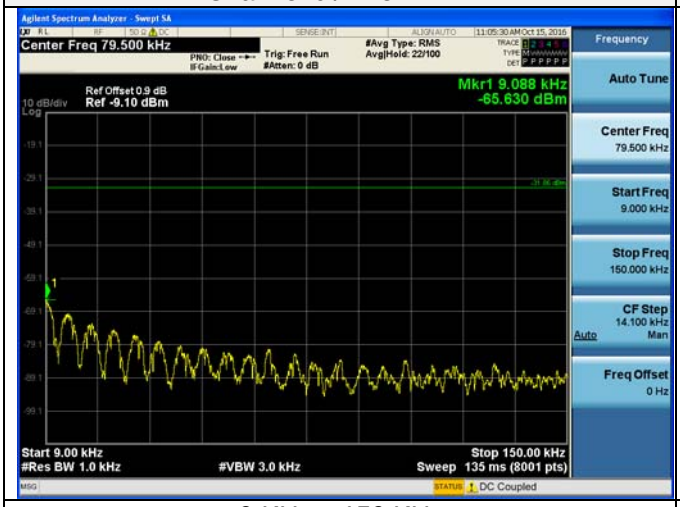
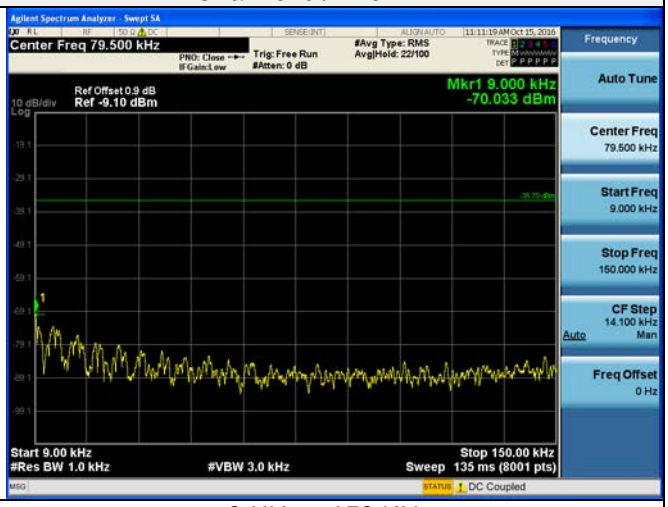
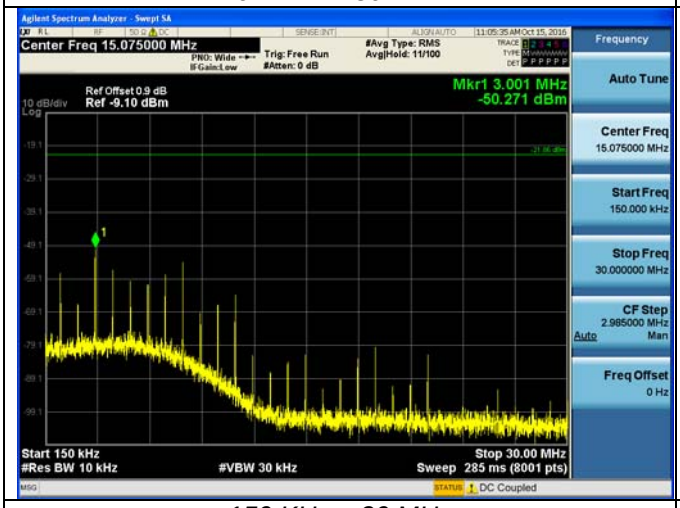
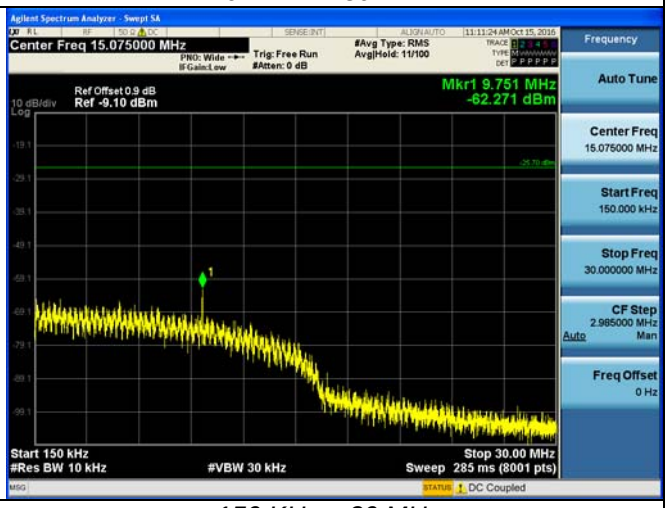
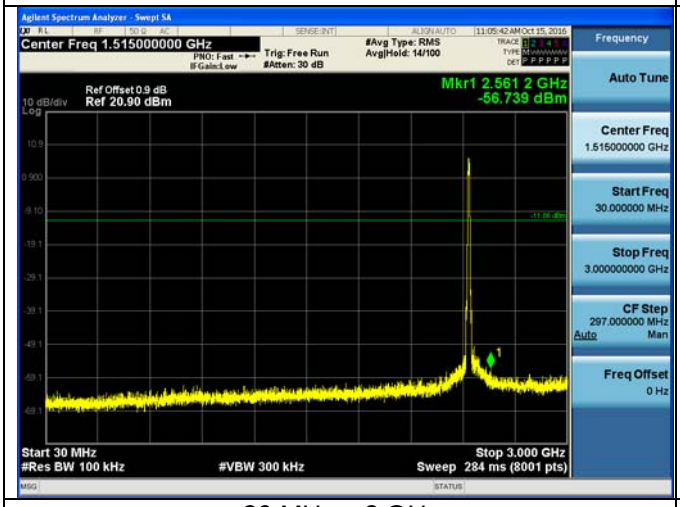
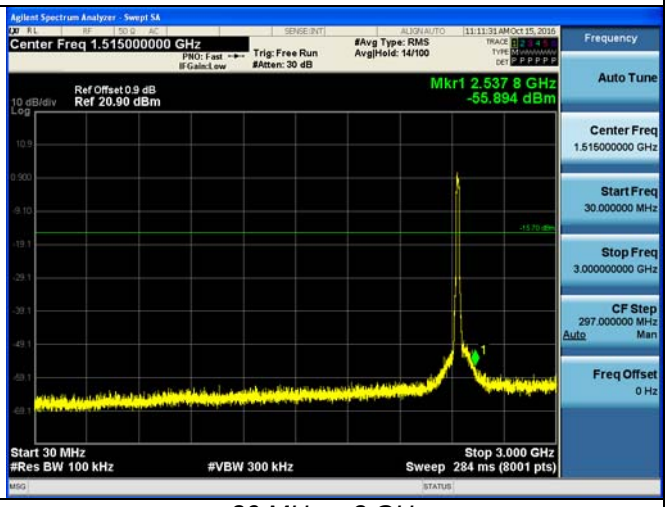
Test Mode	Channel	Frequency (MHz)	Spurious RF Conducted Emission (dBc)	Limits (dBc)	Verdict
IEEE 802.11 b	1	2412	<-20dBc	-20	PASS
	6	2437	<-20dBc	-20	
	11	2462	<-20dBc	-20	
IEEE 802.11 g	1	2412	<-20dBc	-20	PASS
	6	2437	<-20dBc	-20	
	11	2462	<-20dBc	-20	
IEEE 802.11 n HT20	1	2412	<-20dBc	-20	PASS
	6	2437	<-20dBc	-20	
	11	2462	<-20dBc	-20	
IEEE 802.11 n HT40	3	2422	<-20dBc	-20	PASS
	6	2437	<-20dBc	-20	
	9	2452	<-20dBc	-20	

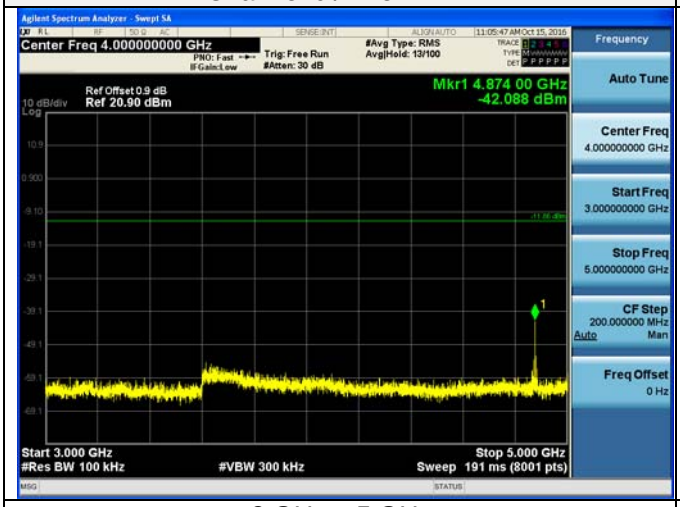
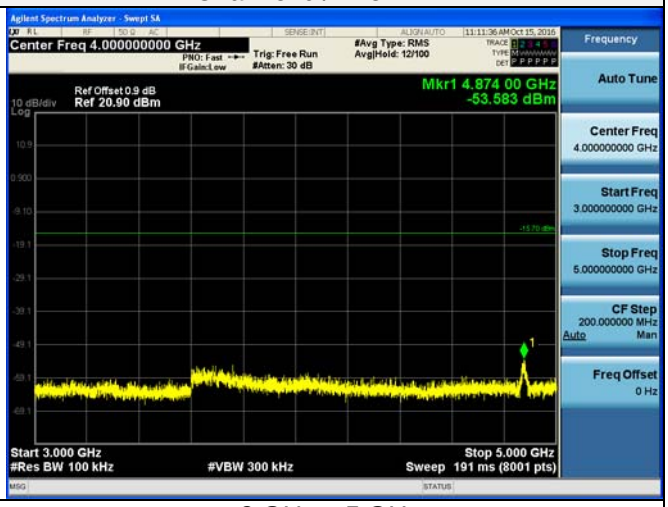
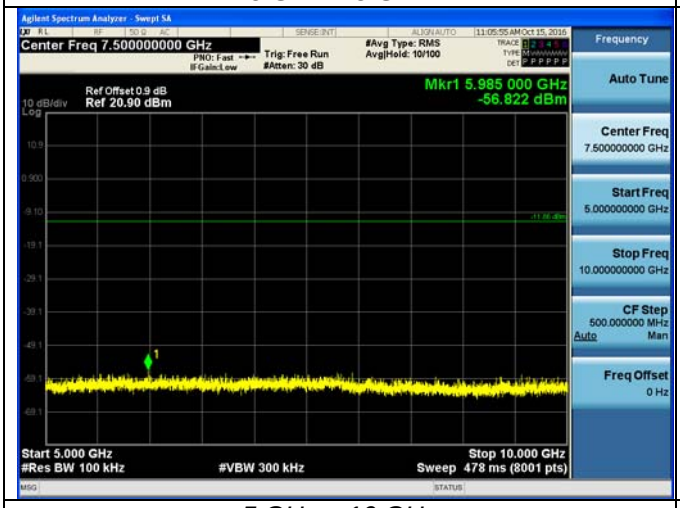
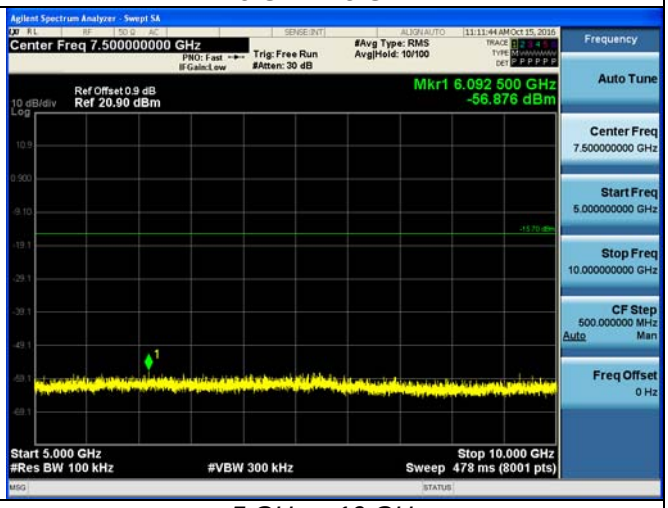
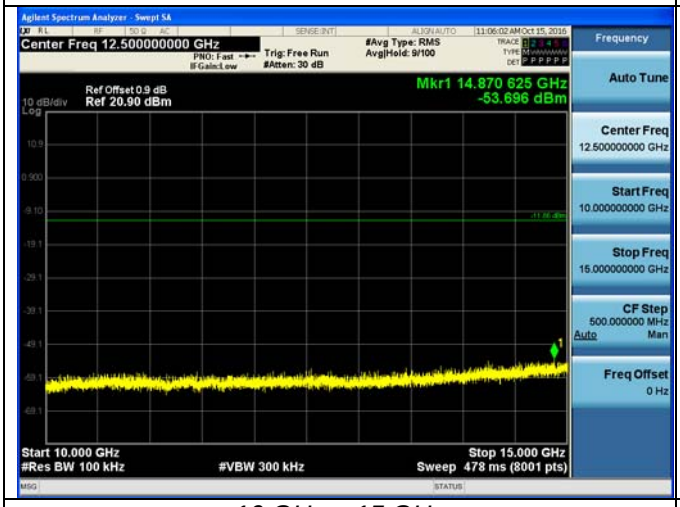
Remark:
1. *Measured output power at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 1Mbps at IEEE 802.11 b; 6Mbps at IEEE 802.11 g; 6.5Mbps at IEEE 802.11 n HT20; 13.5Mbps at IEEE 802.11 n HT40;*
4. *"---" means that the fundamental frequency not for 15.209 limits requirement.*
5. *please refer to following plots;*

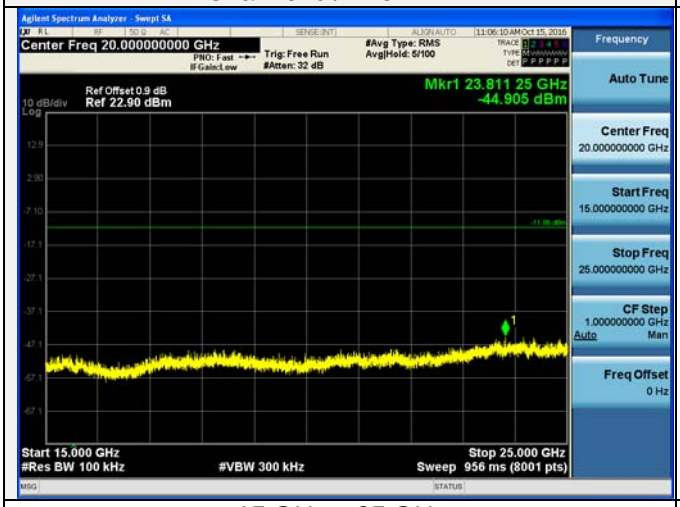
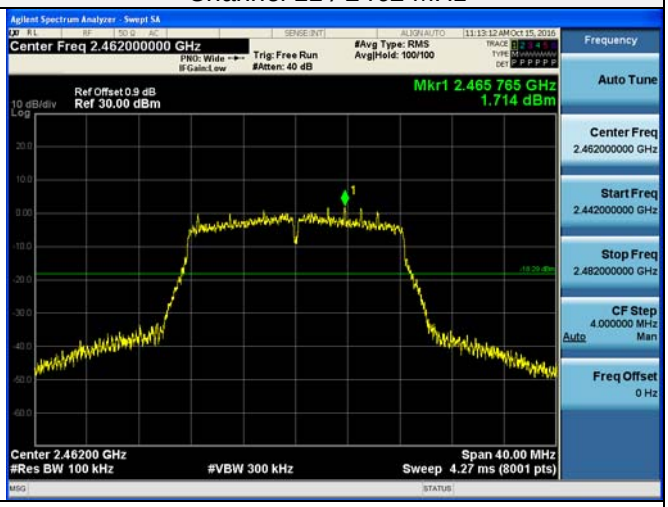
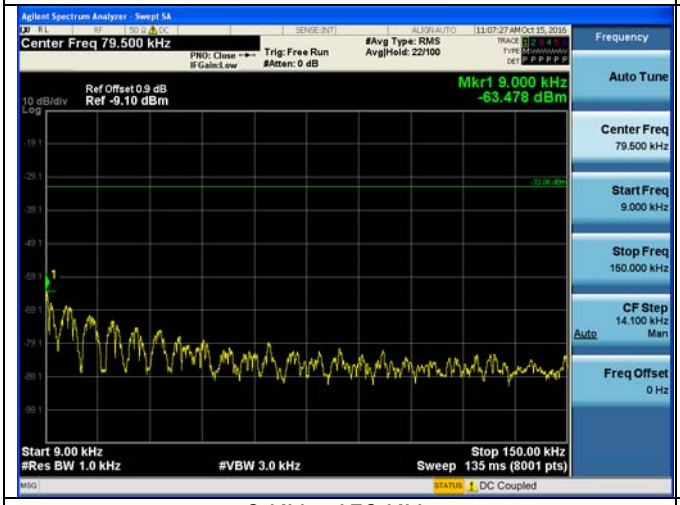
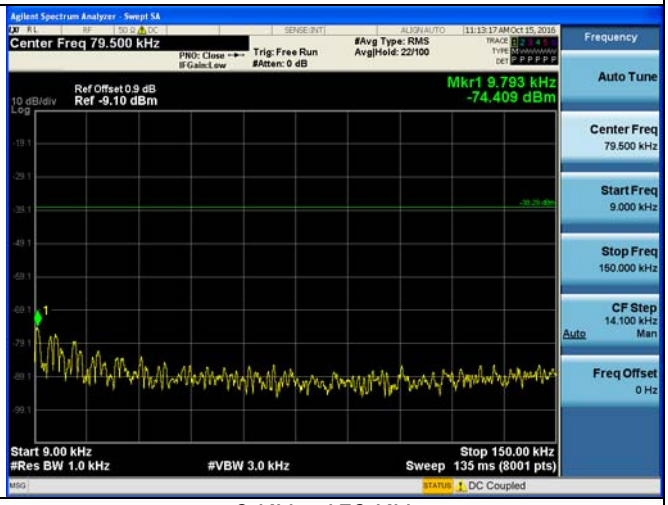
Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 b	*IEEE 802.11 g*
Channel 1 / 2412 MHz	*Channel 1 / 2412 MHz*
	
2392 MHz – 2432 MHz	*2392 MHz – 2432 MHz*
	
9 KHz – 150 KHz	*9 KHz – 150 KHz*
	
150 KHz – 30 MHz	*150 KHz – 30 MHz*

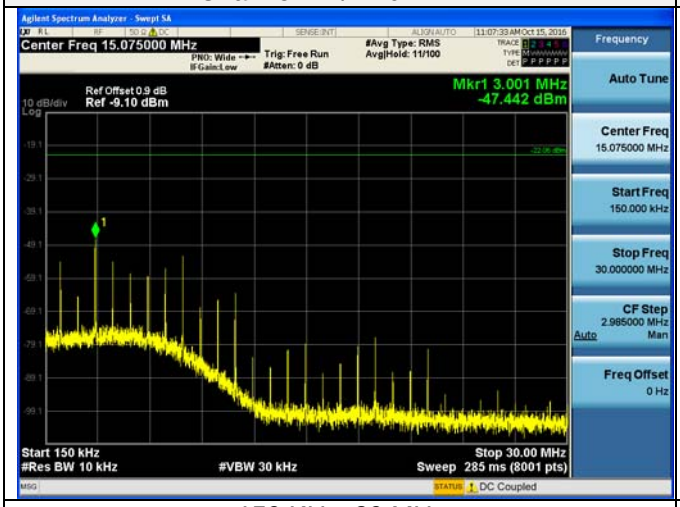
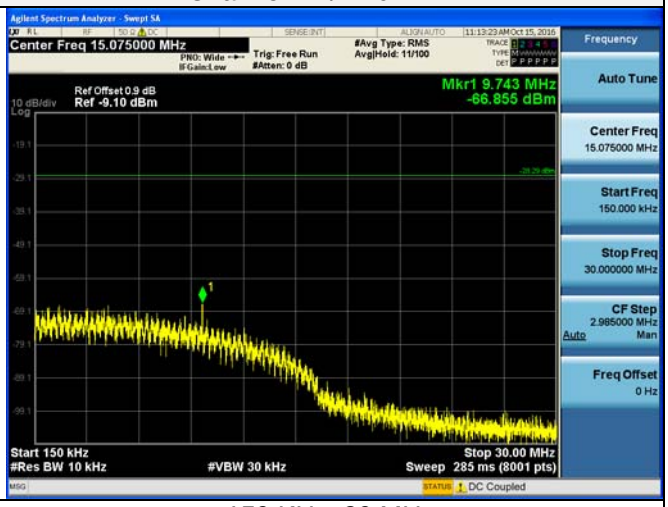
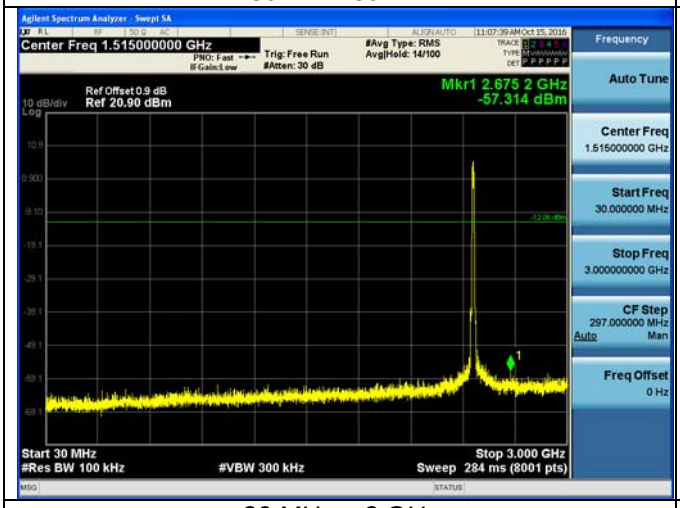
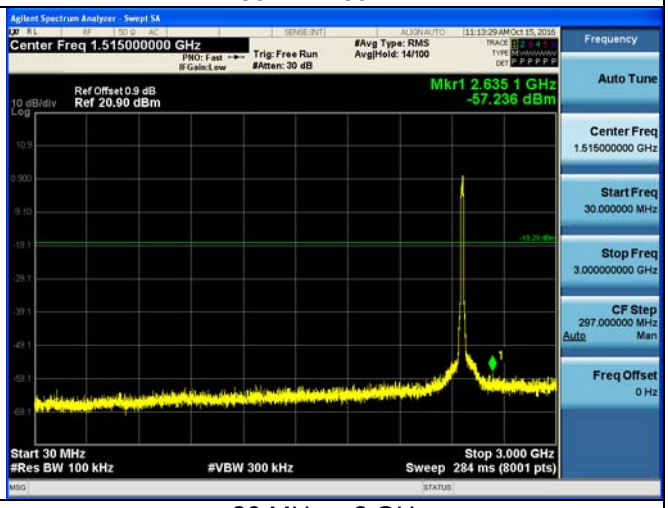
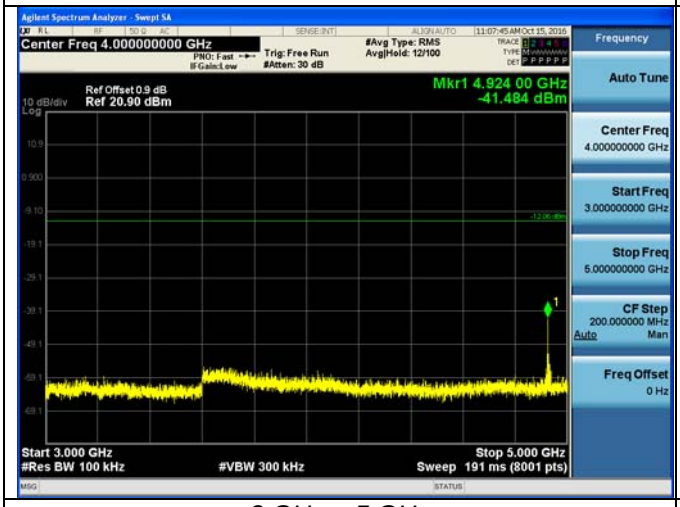
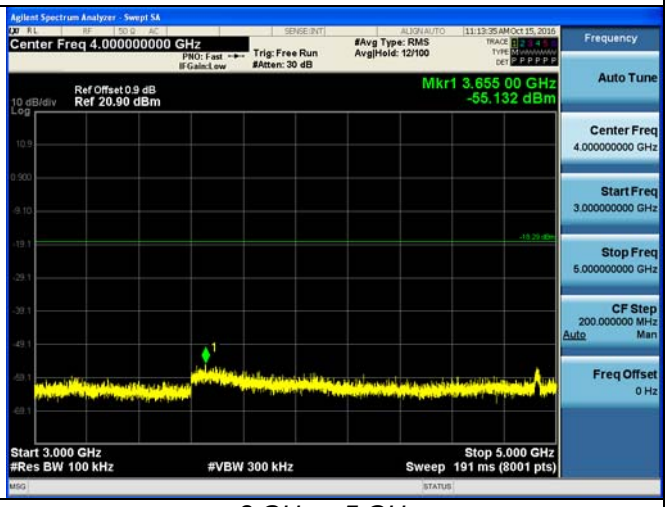
Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 b	*IEEE 802.11 g*
Channel 1 / 2412 MHz	*Channel 1 / 2412 MHz*
	
30 MHz – 3 GHz	*30 MHz – 3 GHz*
	
3 GHz – 5 GHz	*3 GHz – 5 GHz*
	
5 GHz – 10 GHz	*5 GHz – 10 GHz*

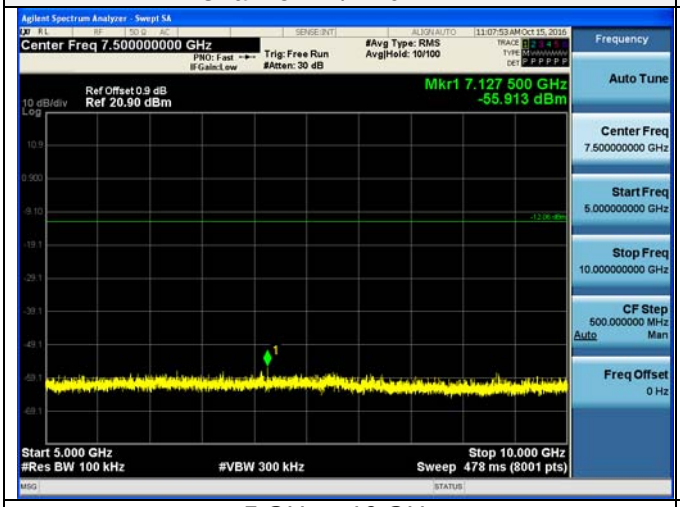
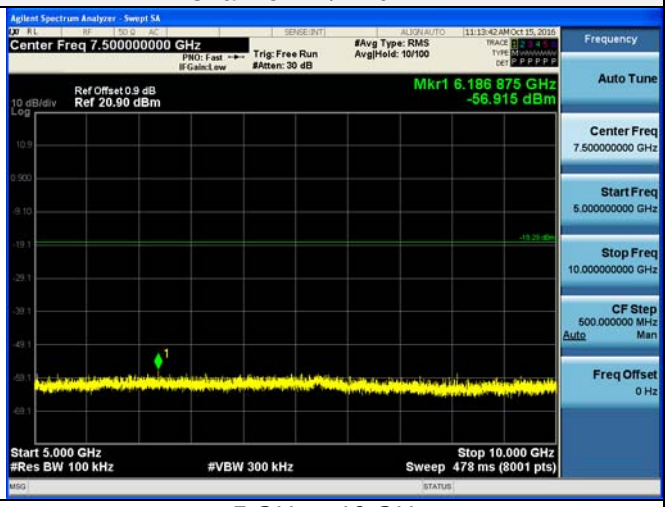
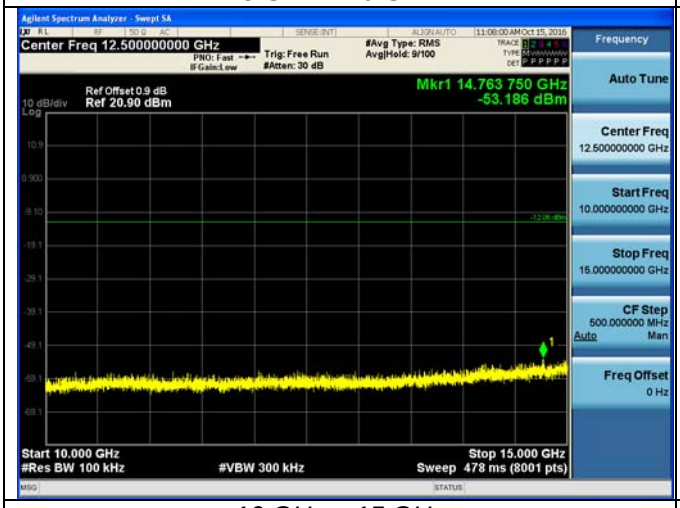
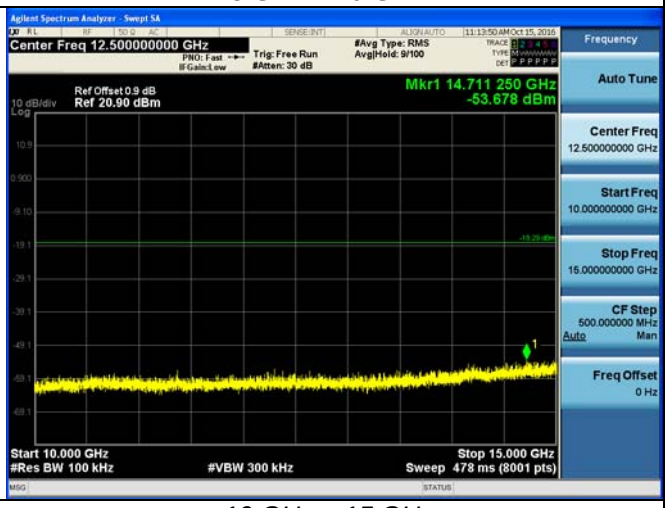
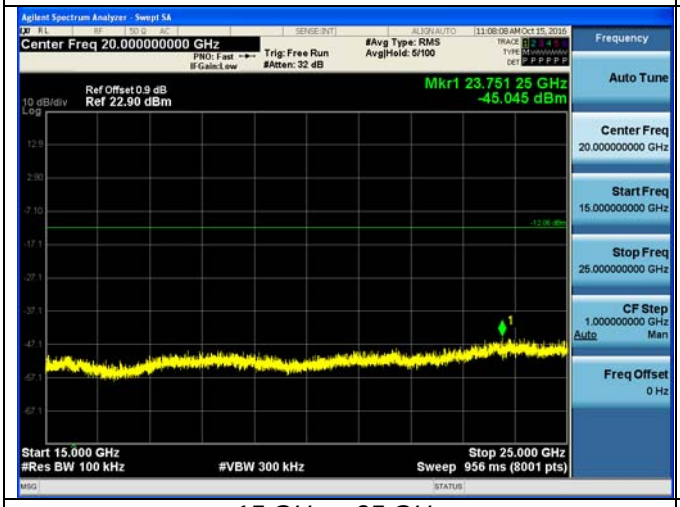
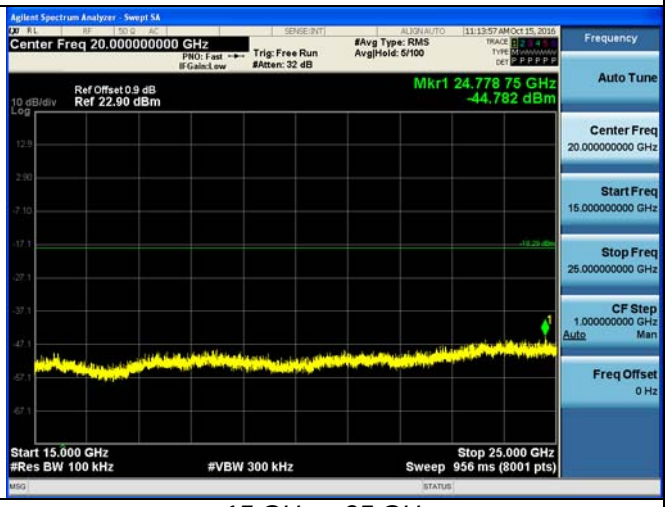
Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 b	*IEEE 802.11 g*
Channel 1 / 2412 MHz	*Channel 1 / 2412 MHz*
	
10 GHz – 15 GHz	*10 GHz – 15 GHz*
	
15 GHz – 25 GHz	*15 GHz – 25 GHz*
IEEE 802.11b	*IEEE 802.11g*
Channel 6 / 2437 MHz	*Channel 6 / 2437 MHz*
	
2417 MHz – 2457 MHz	*2417 MHz – 2457 MHz*

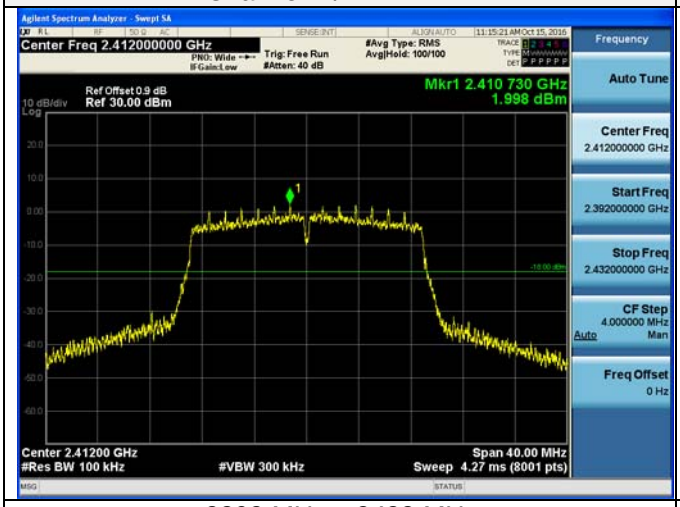
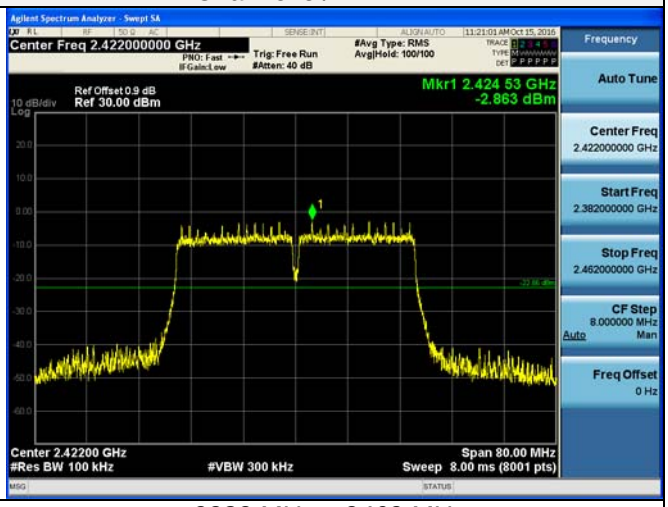
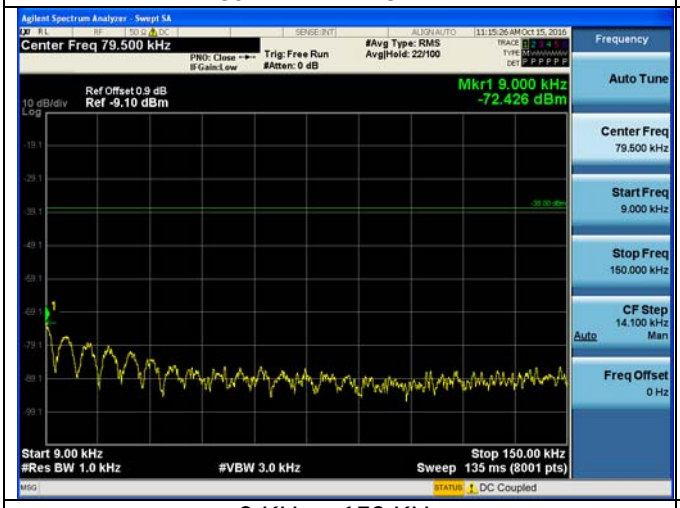
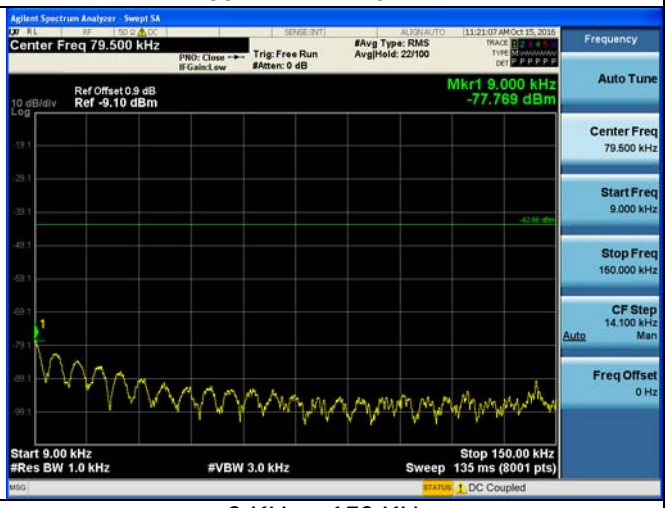
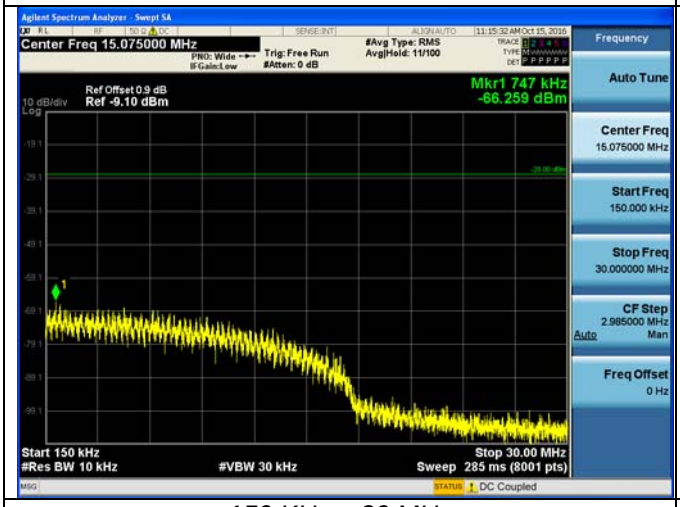
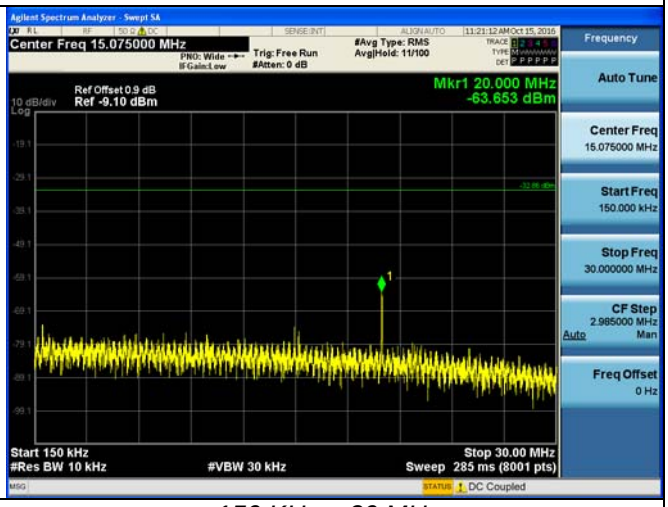
Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 b	IEEE 802.11 g
Channel 6 / 2437 MHz	Channel 6 / 2437 MHz
	
9 KHz – 150 KHz	9 KHz – 150 KHz
	
150 KHz – 30 MHz	150 KHz – 30 MHz
	
30 MHz – 3 GHz	30 MHz – 3 GHz

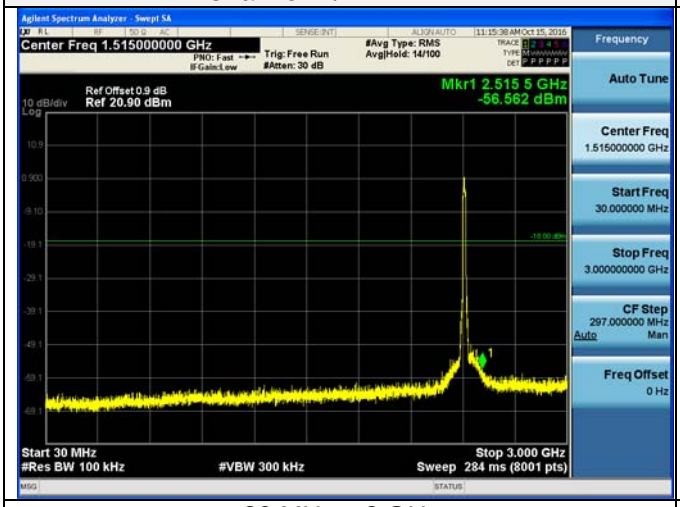
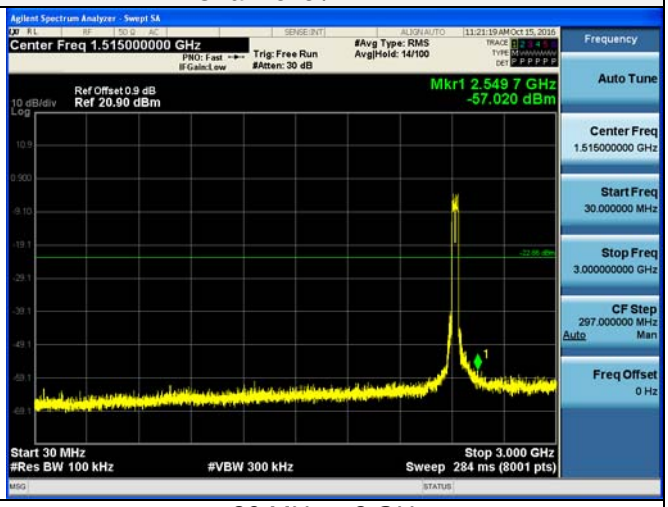
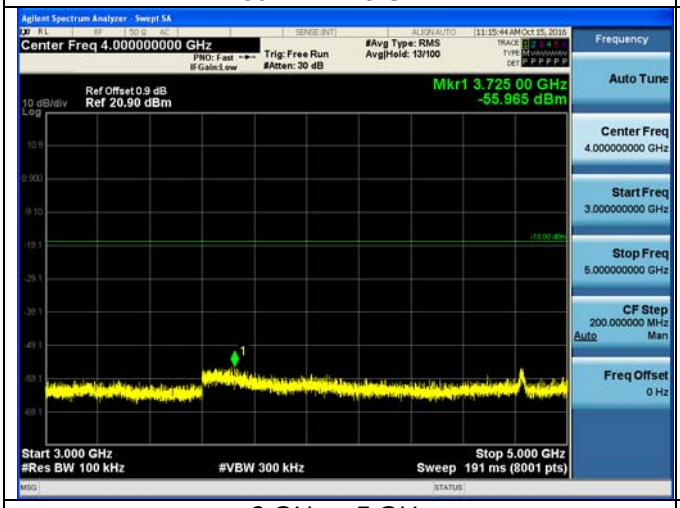
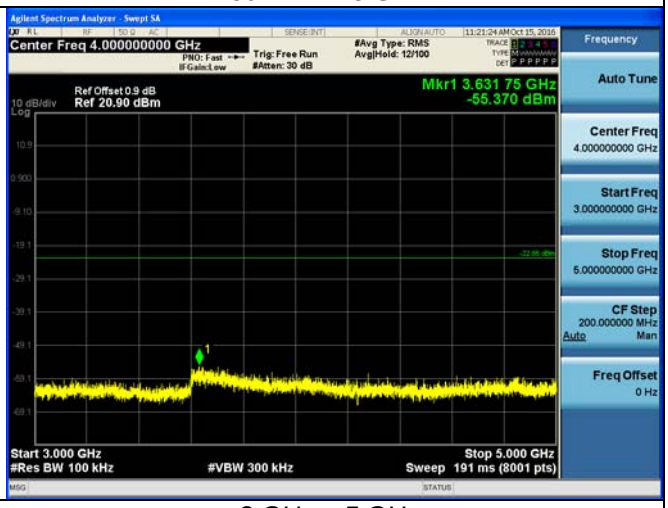
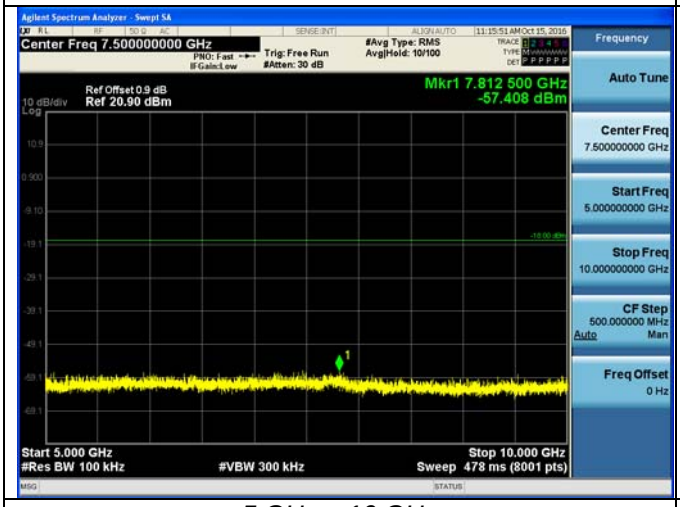
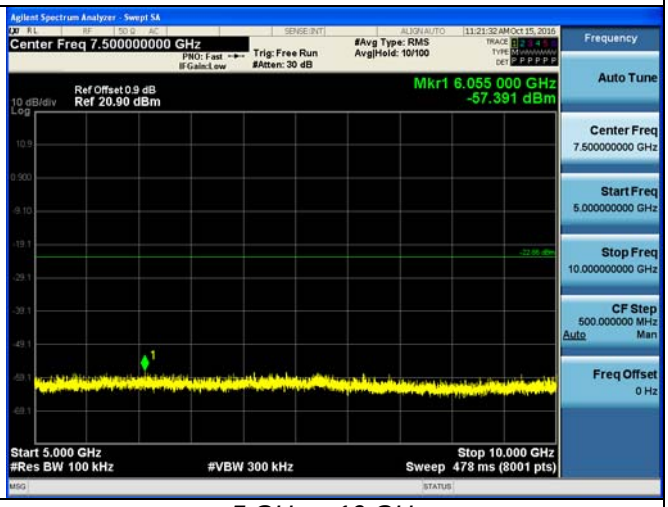
Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 b	*IEEE 802.11 g*
Channel 6 / 2437 MHz	*Channel 6 / 2437 MHz*
	
3 GHz – 5 GHz	*3 GHz – 5 GHz*
	
5 GHz – 10 GHz	*5 GHz – 10 GHz*
	
10 GHz – 15 GHz	*10 GHz – 15 GHz*

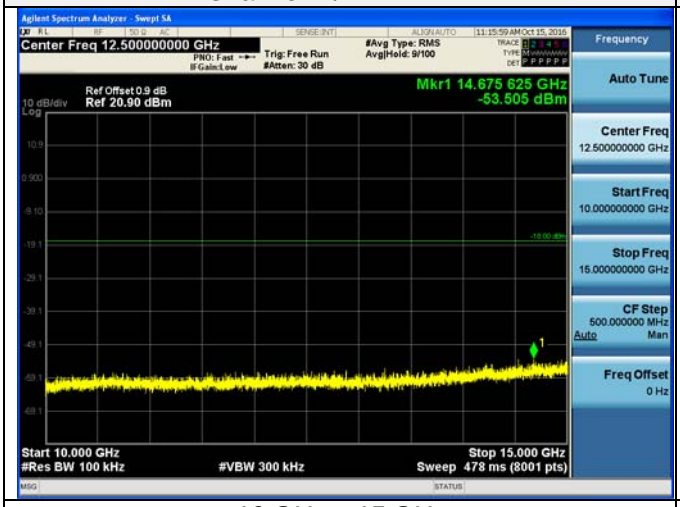
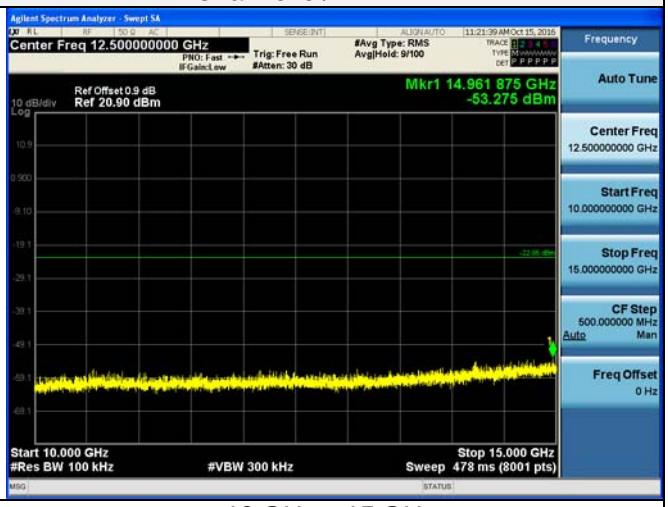
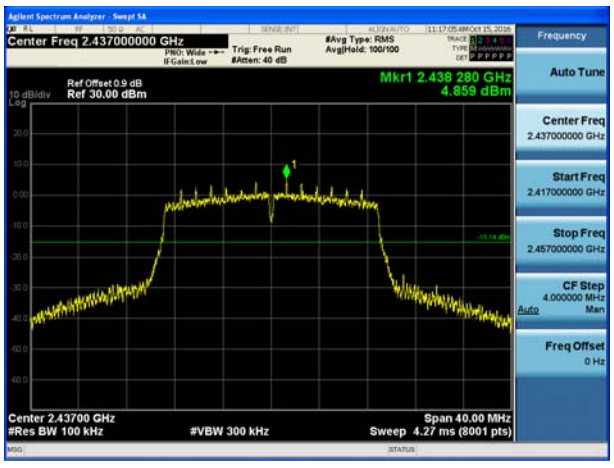
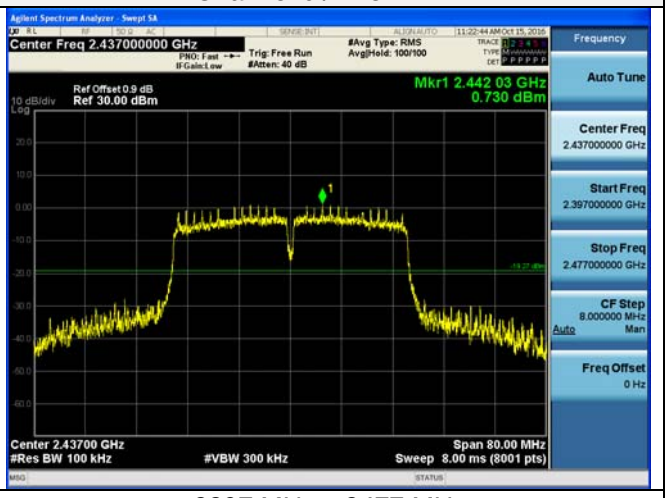
Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 b	*IEEE 802.11 g*
Channel 6 / 2437 MHz	*Channel 6 / 2437 MHz*
	
15 GHz – 25 GHz	*15 GHz – 25 GHz*
IEEE 802.11b	*IEEE 802.11g*
Channel 11 / 2462 MHz	*Channel 11 / 2462 MHz*
	
2422 MHz – 2482 MHz	*2422 MHz – 2482 MHz*
	
9 KHz–150 KHz	*9 KHz–150 KHz*

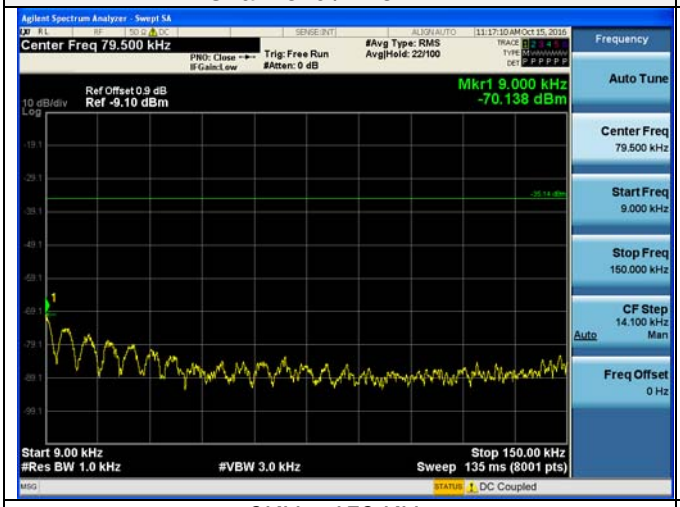
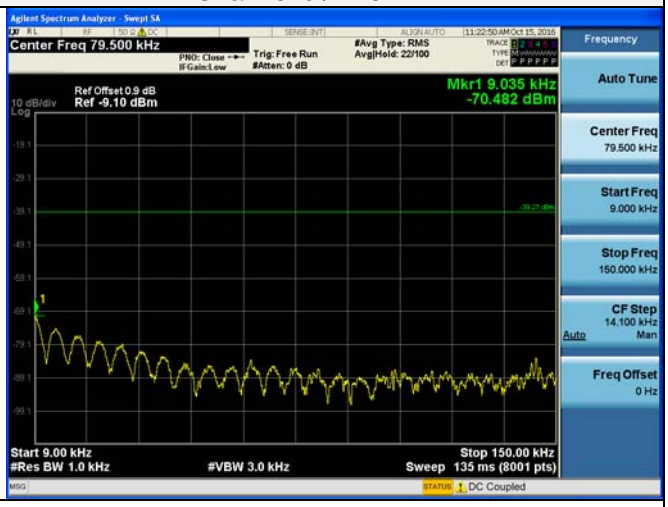
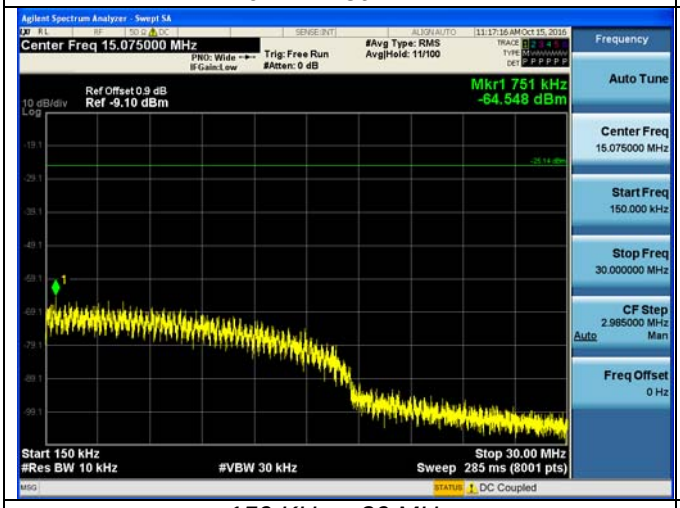
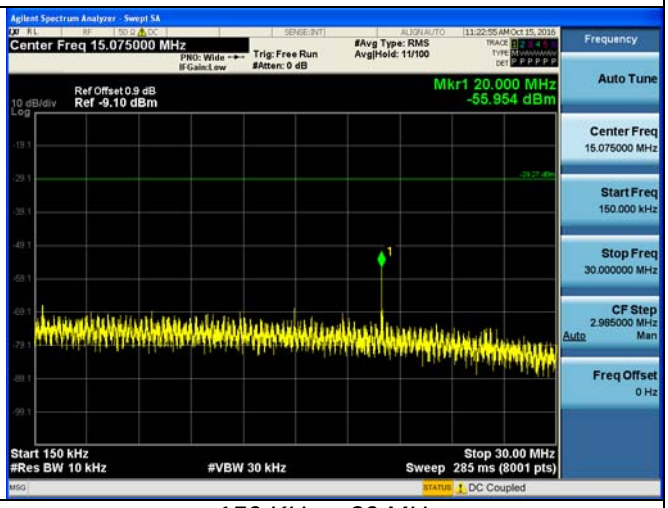
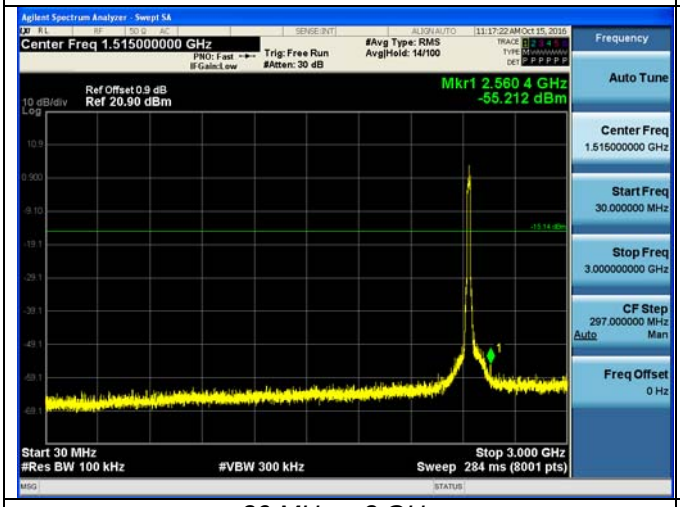
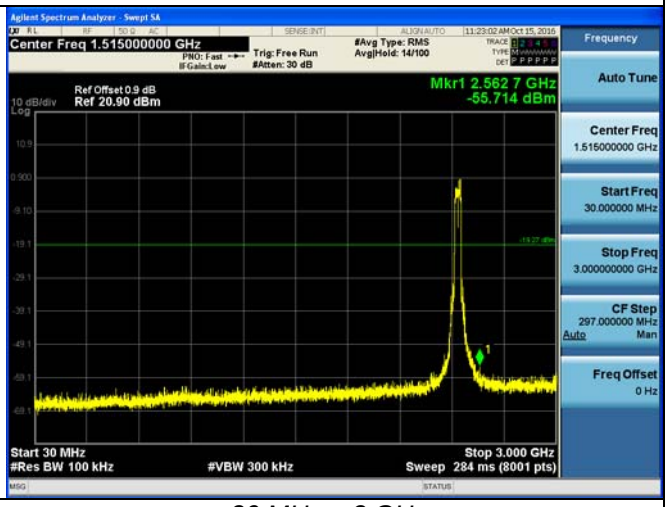
Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 b	*IEEE 802.11 g*
Channel 11 / 2462 MHz	*Channel 11 / 2462 MHz*
	
150 KHz–30 MHz	*150 KHz–30 MHz*
	
30 MHz – 3 GHz	*30 MHz – 3 GHz*
	
3 GHz – 5 GHz	*3 GHz – 5 GHz*

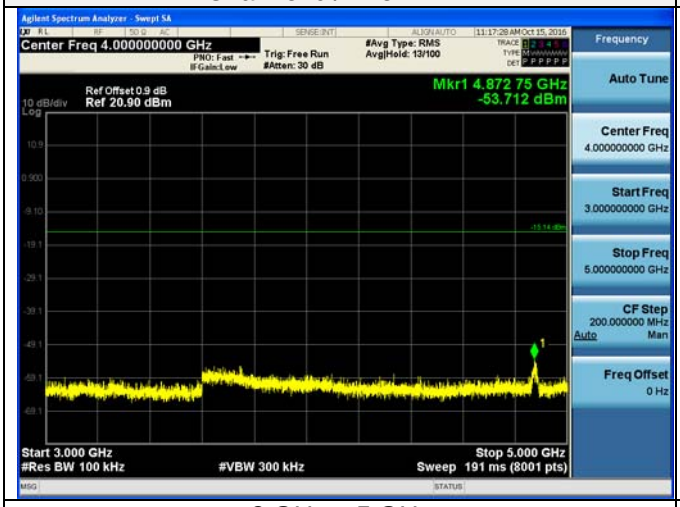
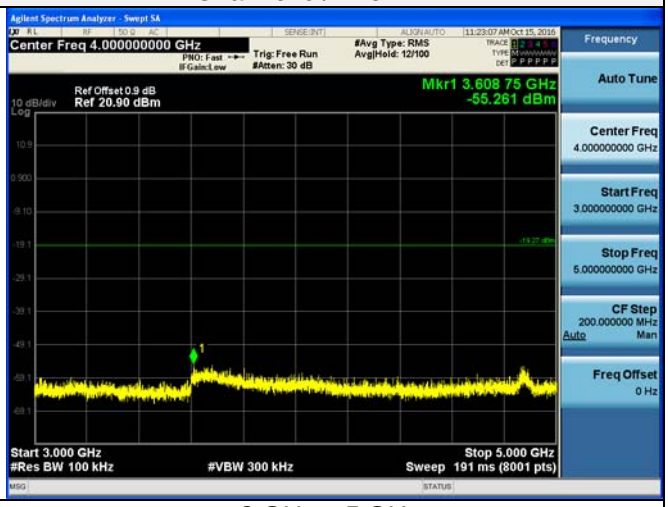
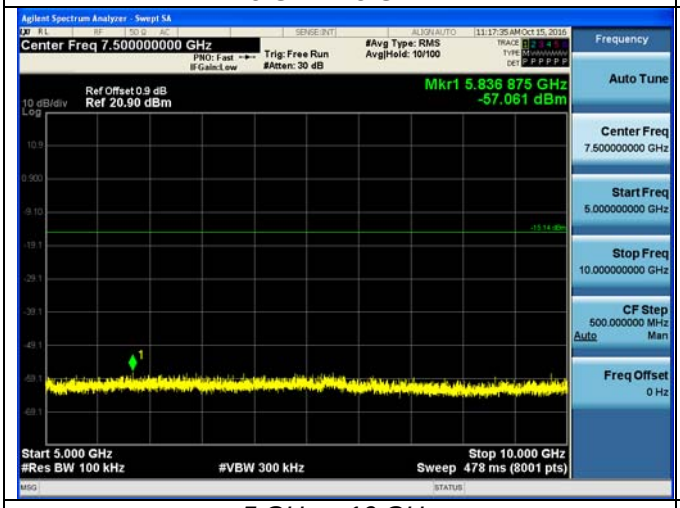
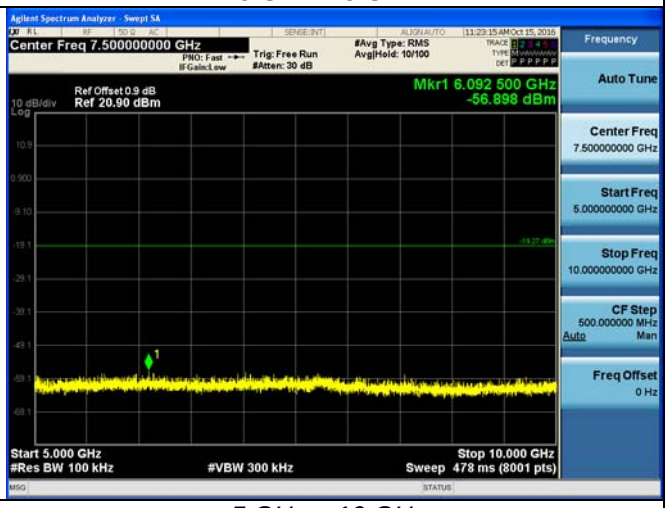
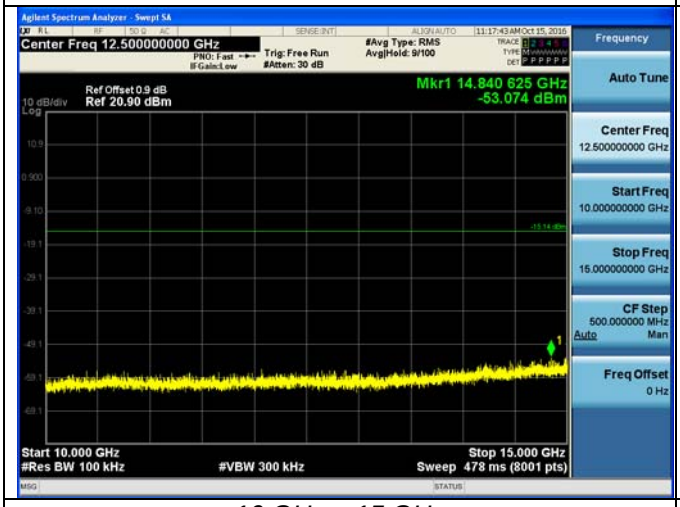
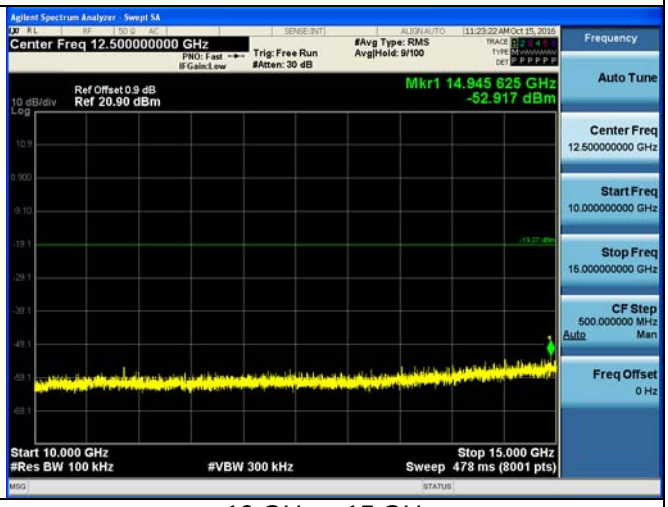
Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 b	*IEEE 802.11 g*
Channel 11 / 2462 MHz	*Channel 11 / 2462 MHz*
	
5 GHz – 10 GHz	*5 GHz – 10 GHz*
	
10 GHz – 15 GHz	*10 GHz – 15 GHz*
	
15 GHz – 25 GHz	*15 GHz – 25 GHz*

Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
Channel 1 / 2412 MHz	*Channel 3 / 2422 MHz*
	
2392 MHz – 2432 MHz	*2382 MHz – 2462 MHz*
	
9 KHz – 150 KHz	*9 KHz – 150 KHz*
	
150 KHz – 30 MHz	*150 KHz – 30 MHz*

Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
Channel 1 / 2412 MHz	*Channel 3 / 2422 MHz*
	
30 MHz – 3 GHz	*30 MHz – 3 GHz*
	
3 GHz – 5 GHz	*3 GHz – 5 GHz*
	
5 GHz – 10 GHz	*5 GHz – 10 GHz*

Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
Channel 1 / 2412 MHz	*Channel 3 / 2422 MHz*
	
10 GHz – 15 GHz	*10 GHz – 15 GHz*
	
15 GHz – 25 GHz	*15 GHz – 25 GHz*
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
Channel 6 / 2437 MHz	*Channel 6 / 2437 MHz*
	
2417 MHz – 2457 MHz	*2397 MHz – 2477 MHz*

Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
Channel 6 / 2437 MHz	*Channel 6 / 2437 MHz*
	
9KHz -150 KHz	
	
150 KHz – 30 MHz	*150 KHz – 30 MHz*
	
30 MHz – 3 GHz	*30 MHz – 3 GHz*

Band-edge Masurements for RF Conducted Emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
Channel 6 / 2437 MHz	*Channel 6 / 2437 MHz*
	
3 GHz – 5 GHz	*3 GHz – 5 GHz*
	
5 GHz – 10 GHz	*5 GHz – 10 GHz*
	
10 GHz – 15 GHz	*10 GHz – 15 GHz*