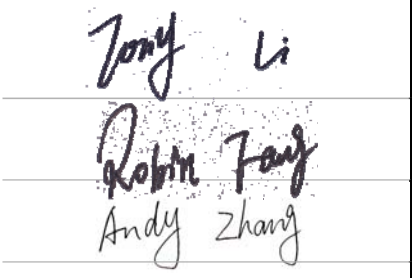
FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.247

Report Reference No.....:	**A15N0166217-WLAN**
FCC ID..... :	**2ACWO-MT7**
Compiled by (position+printed name+signature)..:	File administrators Tony Li
Supervised by (position+printed name+signature)..:	Technique principal Robin Fang
Approved by (position+printed name+signature)..:	Manager Andy Zhang
Date of issue.....:	Nov,25 2015



Representative Laboratory Name ....:	Shenzhen CTL Electron Technology Co., Ltd.
Address .....:	A0402, Block 1, Kefa Industrial District, Huanguan Nan Rd, Xintian community, Guanlan, Baoan, Shenzhen, China
Testing Laboratory Name.....:	Dongguan Dongdian Testing Service Co.,Ltd
Address .....:	No.17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China
Applicant's name.....:	**AURA TECHNOLOGY LIMTED**
Address .....:	FLAT/RM810, Star House, 3 Salisbury Road, Tsimshatsui, Hong Kong
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 CTL Electron Technology Co., Ltd.
Master TRF.....:	Dated 2012-06

Test item description .....:	TELPAD
Trade Mark .....:	/
Model/Type reference.....:	MT7
Listed Models .....:	/
Manufacturer .....:	**SHENZHEN KWANG SUNG ELECTRONICS CO.,LTD**
Operation Frequency.....:	From 2412MHz to 2462MHz
Rating .....:	DC 3.70V
Hardware version .....:	V01.00.22
Software version .....:	V01
Result.....:	**PASS**

T E S T R E P O R T

Test Report No. :	A15N0166217-WLAN	Nov,25 2015 Date of issue

Equipment under Test	:	TELPAD
Model /Type	:	MT7
Listed Models	:	/
Applicant	:	**AURA TECHNOLOGY LIMTED**
Address	:	FLAT/RM810, Star House, 3 Salisbury Road, Tsimshatsui, Hong Kong
Manufacturer	:	**SHENZHEN KWANG SUNG ELECTRONICS CO.,LTD**
Address	:	Shitoushan Industrial Zone, Shi Yan Town, Baoan District, Shenzhen, PRC

Test Result:	**PASS**

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

Revison History

Revision	Issue Date	Revisions	Revised By
00	2015-11-25	Initial Issue	Andy Zhang

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 C63.10-2009: American National Standard for Testing Unlicensed Wireless Devices
KDB558074 D01 V03r03: 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	:	Nov 15, 2015
Testing commenced on	:	Nov 15, 2015
Testing concluded on	:	Nov 24, 2015

2.2. Product Description

The **AURA TECHNOLOGY LIMTED**'s Model: MT7 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	TELPAD
Model Number	MT7
FCC ID	2ACWO-MT7
Modilation Type	GMSK for GSM/GPRS, 8-PSK for EDGE,QPSK for UMTS
Antenna Type	Internal
UMTS Operation Frequency Band	Device supported UMTS 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 8
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(BT 3.0+HS)
Hardware version	V01.00.22
Software version	V01
Android version	Android 4.4.2
GPS function	Supported
WLAN	Supported 802.11b/802.11g/802.11n
Bluetooth	Supported BT 4.0/BT 3.0+HS
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/EDGE: Multi-slot Class 12
Extreme temp. Tolerance	-30°C to +50°C
Extreme vol. Limits	3.40VDC to 4.20VDC (nominal: 3.70VDC)
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 3.70V/DC 5.0V Adapter from AC 120V/60Hz

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

2.4.1 General Description

TELPAD is subscriber equipment in the WCDMA/GSM system. The HSPA/UMTS frequency band is Band V; The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only Band V and GSM850 and PCS1900 bands test data included in this report. The TELPAD 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 TELPAD, 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.

2.4.2 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-Restricted Frequency Bands	Measurement Method	FCC KDB 558074§11.0.
	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	11b_M (Worst Conf.).

Note:
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:

Test Mode	Test Modes Description
11b	IEEE 802.11b with data rate of 1 Mbps using SISO mode.
11g	IEEE 802.11g with data rate of 6 Mbps using SISO mode.
11n HT20	IEEE 802.11n with data date of MCS0 and bandwidth of 20MHz using SISO mode.
11n HT40	IEEE 802.11n with data date of MCS7 and bandwidth of 40MHz using SISO mode.

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.

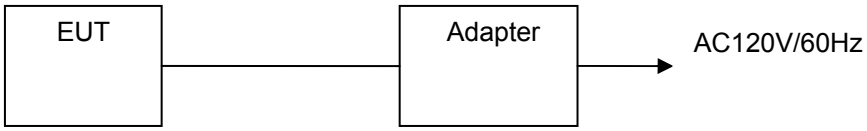
IEEE 802.11b/g/n: Thirteen channels are provided to the EUT.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	**2412**	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	**11**	**2462**
5	2432	12	2467
6	**2437**	13	2472
7	2442		

Test Mode	RF Ch.	BG Port	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]
IEEE 802. 11 b	L	BG 1	Ch No. 1 / 2412MHz	---	20
	M	BG 1	Ch No. 6 / 2437 MHz	---	20
	H	BG 1	Ch No. 11/ 2462MHz	---	20
IEEE 802. 11 g	L	BG 1	Ch No. 1 / 2412MHz	---	20
	M	BG 1	Ch No. 6 / 2437 MHz	---	20
	H	BG 1	Ch No. 11/ 2462MHz	---	20
IEEE 802. 11 n HT20	L	BG 1	Ch No. 1 / 2412MHz	---	20
	M	BG 1	Ch No. 6 / 2437 MHz	---	20
	H	BG 1	Ch No. 11/ 2462MHz	---	20
IEEE 802. 11 n HT40	L	BG 1	Ch No. 3 / 2422MHz	---	20
	M	BG 1	Ch No. 6 / 2437 MHz	---	20
	H	BG 1	Ch No. 9 / 2452MHz	---	20

2.6. Block Diagram of Test Setup

Fig. 2-1 Configuration of Tested System



Adapter:

MODEL:JY-05210
INPUT:100-240V～0.3A 50/60Hz 0.3A
OUTPUT: 5.0V DC 2.1A
◇ Shielded ◆ Unshielded

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

This submittal(s) (test report) is intended for **FCC ID: 2ACWO-MT7** 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.

2.9. NOTE

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	3.70VDC	Ambient

1. The EUT is a TELPAD with GSM/UMTS/WLAN and Bluetooth function,The functions of the EUT listed as below:

	Test Standards	Reference Report
GSM	FCC Part 22H/ FCC Part 24 E	A15N0166217-GSM
UMTS	FCC Part 22H	A15N0166217-WCDMA
WLAN	FCC Part 15.247	A15N0166217-WLAN
Bluetooth-BR	FCC Part 15.247	A15N0166217-BR
Bluetooth-LE	FCC Part 15.247	A15N0166217-LE
JBC	FCC Part 15 Subpart B	A15N0166217-JBC
SAR	FCC Per 47 CFR 2.1093(d)	A15N0166217-SAR

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
802.11b	√	—	—	—
802.11g	√	—	—	—
802.11n HT20	√	—	—	—
802.11n HT40	√	—	—	—

3. The EUT incorporates a SISO function,Physically,the EUT provides one completed transmitter and one completed receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n HT20	1TX
802.11n HT40	1TX

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Dongguan Dongdian Testing Service Co.,Ltd

No.17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

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

IC Registration No.: 10288A-1

The 3m alternate test site of Dongguan Dongdian Testing Service Co.,Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 10288A-1 on May, 2012.

FCC-Registration No.: 270092

Dongguan Dongdian Testing 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 270092, Mar, 2015.

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)(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

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

Test Items	Mode	Data Rate	Channel
Maximum Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9kHz~1GHz& Radiated Emission 1GHz~10th Harmonic	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n HT20/OFDM	6.5Mbps	1/6/11
	11n HT40/OFDM	13.5Mbps	3/6/9
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n HT20/OFDM	6.5Mbps	1/11
	11n HT40/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 ETSI TR 100 028 " Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics" and is documented in the Dongguan Dongdian Testing 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 Dongguan Dongdian Testing Service Co.,Ltd is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	3.14 dB	(1)
Radiated Emission	1~18GHz	2.56 dB	(1)
Radiated Emission	18-40GHz	3.90 dB	(1)
Conducted Disturbance	0.15~30MHz	2.44 dB	(1)
Conducted Power	9KHz~18GHz	0.60 dB	(1)
Power Spectral Density	9KHz~18GHz	1.20 dB	(1)
Spurious RF Conducted Emission	9KHz~40GHz	0.60 dB	(1)
Band Edge Compliance of RF Emission	9KHz~40GHz	0.60 dB	(1)
Occuiped Bandwidth	9KHz~40GHz	±1%	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

3.6. Equipments Used during the Test

Radiated Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	462	2014/04/12	3 years
2	EMI TEST Receiver	Rohde&Schwarz	ESU8	100316	2015/10/21	1 years
3	EMI TEST Software	Audix	E3	6.111111	N/A	N/A
4	Horn Anternna	EMCO	3116	00060095	2014/04/12	3 years
5	Pre-Amplifer	Rohde&Schwarz	SCU-01	10049	2015/10/21	1 years
6	Pre-Amplifer	A.H.	PAM0-0118	360	2015/10/21	1 years
7	Pre-Amplifer	A.H.	PAM-1840VH	562	2015/10/21	1 years
8	Double Ridged Horn Antenna	Rohde&Schwarz	HF907	100265	2014/04/12	3 years
9	Active Loop Antenna	Schwarz beck	FMZB1519	0.38	2014/04/12	3 years
11	TURNTABLE	MATURO	TT2.0	----	N/A	N/A
12	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A	N/A
13	Spectrum Analyzer	Rohde&Schwarz	FSU26	1166.1660.26	2015/10/21	1 years

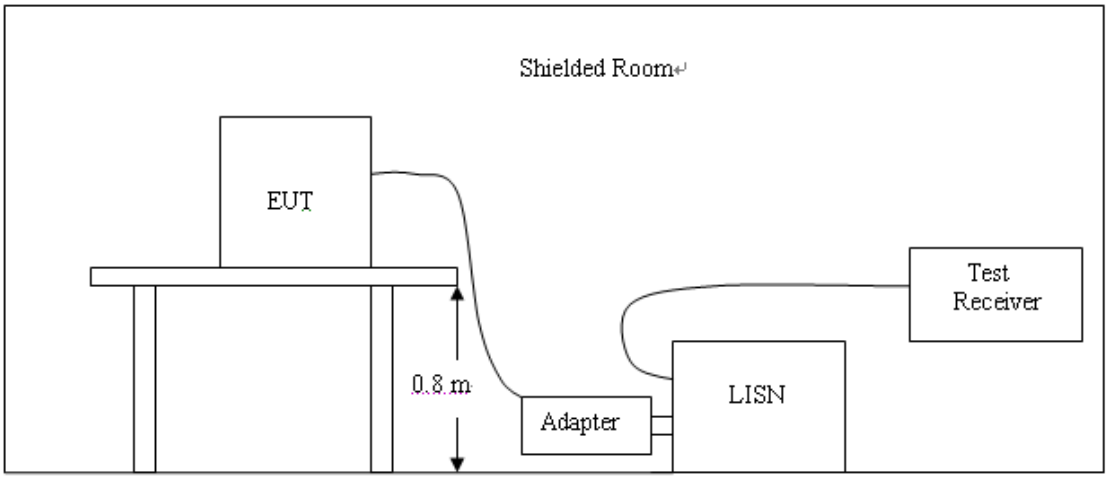
Maximum Peak Output Power / 20dB Bandwidth / Number of hopping frequency& Time of Occupancy / Band Edge Compliance of RF Emission / Spurious RF Conducted Emission/ Frequency Separation						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Power Sensor	Rohde&Schwarz	NRP-Z81	102638	2015/10/28	1 years
2	Spectrum Analyzer	Rohde&Schwarz	FSU26	1166.1660.26	2015/10/21	1 years

AC Power Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Artificial Mains	Rohde&Schwarz	ENV216	101109	2015/10/22	1 years
2	Artificial Mains	Rohde&Schwarz	ESH3-Z5	100309	2015/10/22	1 years
3	EMI Test Receiver	Rohde&Schwarz	ESU8	100316	2015/10/22	1 years
4	Pulse Limiter	Rohde&Schwarz	ESH3-Z2	101242	2015/10/22	1 years
5	EMI TEST Software	Audix	E3	6.111111	N/A	N/A

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 PC, the adapter of PC 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：

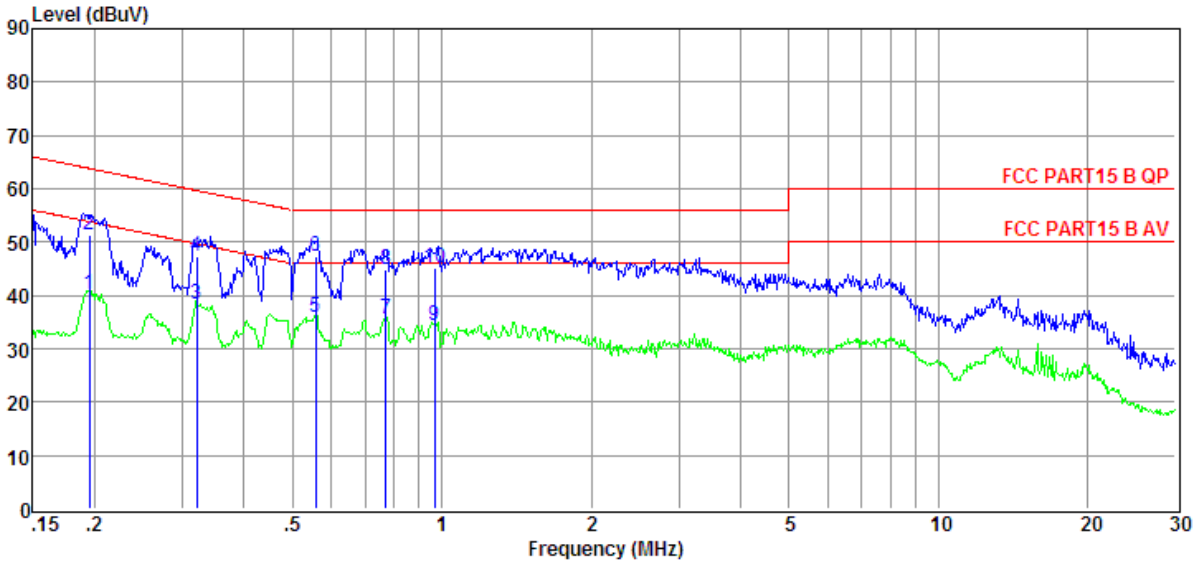
Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

TEST RESULTS

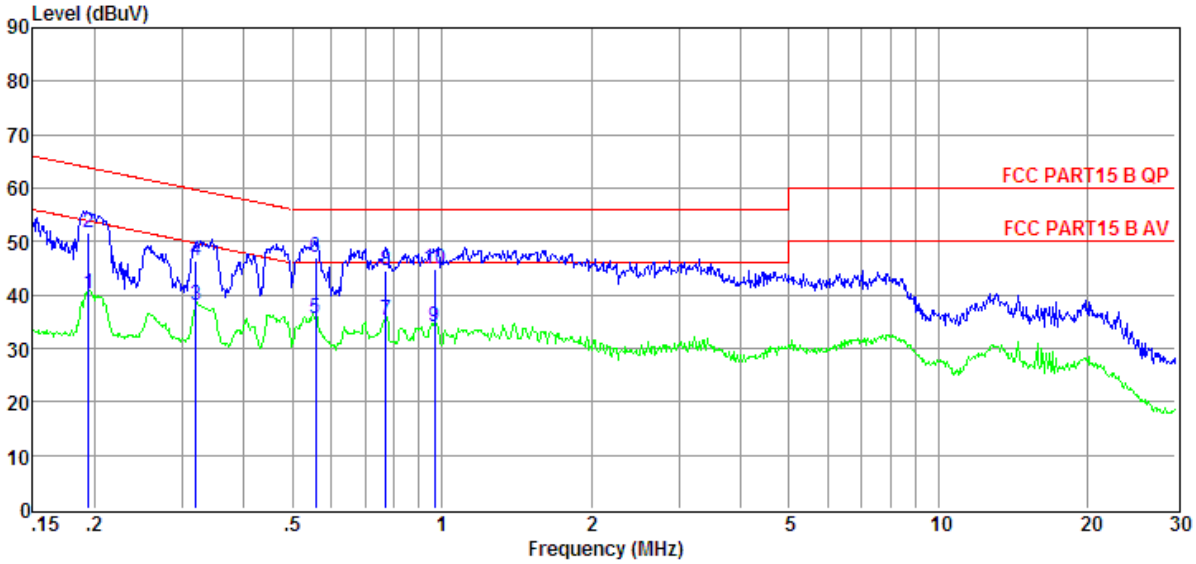
The AC Power Conducted Emission measurement are performed at WLAN Link mode.

For AC 120V/60Hz from Power Adapter



Item (Mark)	Freq (MHz)	Read Level (dBµV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBµV)	Limit Line (dBµV)	Over Limit (dB)	Detector	Phase
1	0.20	20.64	9.62	0.02	9.85	40.13	53.80	-13.67	Average	LINE
2	0.20	31.76	9.62	0.02	9.85	51.25	63.80	-12.55	QP	LINE
3	0.32	19.00	9.63	0.02	9.85	38.50	49.66	-11.16	Average	LINE
4	0.32	27.73	9.63	0.02	9.85	47.23	59.66	-12.43	QP	LINE
5	0.56	16.38	9.63	0.04	9.86	35.91	46.00	-10.09	Average	LINE
6	0.56	27.77	9.63	0.04	9.86	47.30	56.00	-8.70	QP	LINE
7	0.77	15.95	9.62	0.08	9.86	35.51	46.00	-10.49	Average	LINE
8	0.77	25.40	9.62	0.08	9.86	44.96	56.00	-11.04	QP	LINE
9	0.97	14.76	9.62	0.05	9.87	34.30	46.00	-11.70	Average	LINE
10	0.97	25.74	9.62	0.05	9.87	45.28	56.00	-10.72	QP	LINE

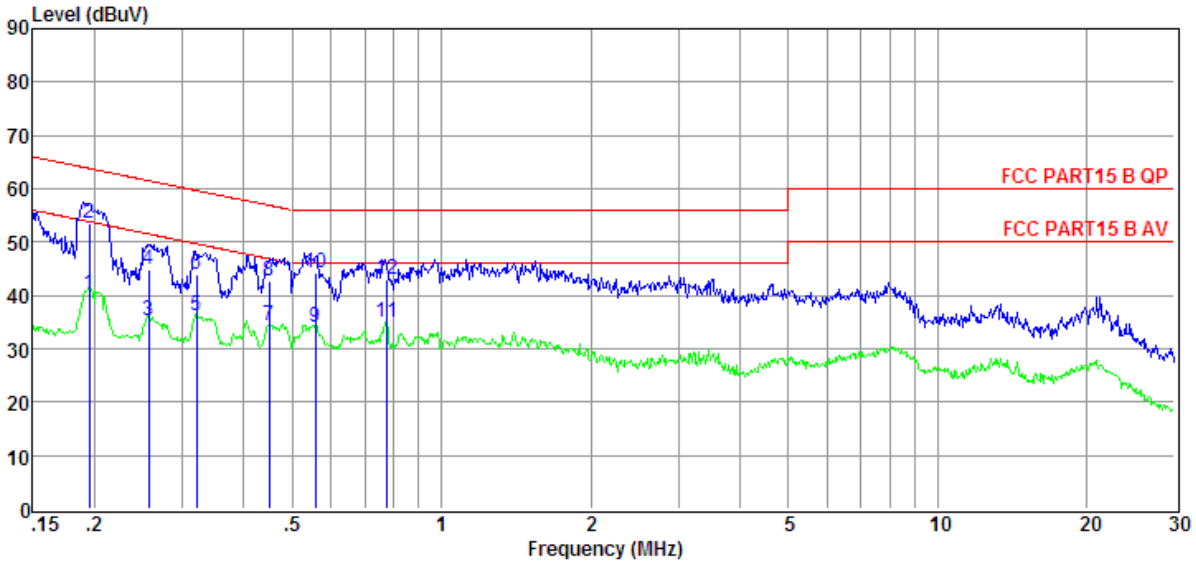
Note:
1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.



Item (Mark)	Freq (MHz)	Read Level (dBµV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBµV)	Limit Line (dBµV)	Over Limit (dB)	Detector	Phase
1	0.19	20.63	9.59	0.02	9.85	40.09	53.84	-13.75	Average	NEUTRAL
2	0.19	32.24	9.59	0.02	9.85	51.70	63.84	-12.14	QP	NEUTRAL
3	0.32	18.54	9.60	0.02	9.85	38.01	49.71	-11.70	Average	NEUTRAL
4	0.32	26.96	9.60	0.02	9.85	46.43	59.71	-13.28	QP	NEUTRAL
5	0.56	16.21	9.61	0.04	9.86	35.72	46.00	-10.28	Average	NEUTRAL
6	0.56	27.37	9.61	0.04	9.86	46.88	56.00	-9.12	QP	NEUTRAL
7	0.77	15.71	9.61	0.08	9.86	35.26	46.00	-10.74	Average	NEUTRAL
8	0.77	24.93	9.61	0.08	9.86	44.48	56.00	-11.52	QP	NEUTRAL
9	0.97	14.50	9.60	0.05	9.87	34.02	46.00	-11.98	Average	NEUTRAL
10	0.97	25.28	9.60	0.05	9.87	44.80	56.00	-11.20	QP	NEUTRAL

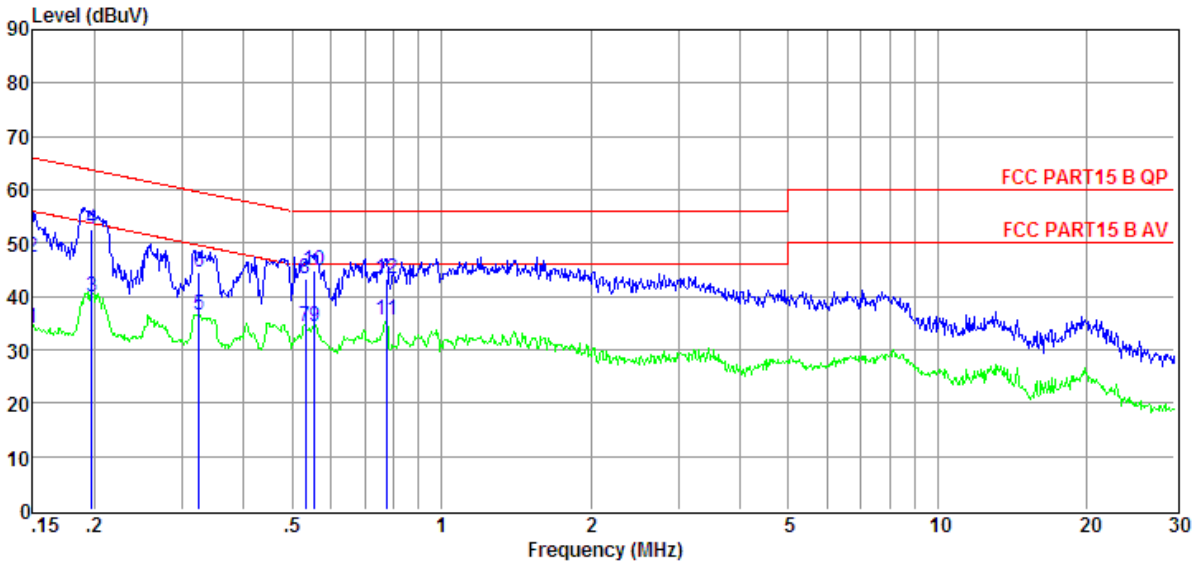
Note:
1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.

For USB from PC



Item (Mark)	Freq (MHz)	Read Level (dBµV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBµV)	Limit Line (dBµV)	Over Limit (dB)	Detector	Phase
1	0.20	20.62	9.59	0.02	9.85	40.08	53.80	-13.72	Average	NEUTRAL
2	0.20	34.01	9.59	0.02	9.85	53.47	63.80	-10.33	QP	NEUTRAL
3	0.26	15.87	9.60	0.02	9.85	35.34	51.51	-16.17	Average	NEUTRAL
4	0.26	25.24	9.60	0.02	9.85	44.71	61.51	-16.80	QP	NEUTRAL
5	0.32	16.63	9.60	0.02	9.85	36.10	49.66	-13.56	Average	NEUTRAL
6	0.32	24.57	9.60	0.02	9.85	44.04	59.66	-15.62	QP	NEUTRAL
7	0.45	14.82	9.61	0.03	9.87	34.33	46.89	-12.56	Average	NEUTRAL
8	0.45	23.22	9.61	0.03	9.87	42.73	56.89	-14.16	QP	NEUTRAL
9	0.56	14.66	9.61	0.04	9.86	34.17	46.00	-11.83	Average	NEUTRAL
10	0.56	24.67	9.61	0.04	9.86	44.18	56.00	-11.82	QP	NEUTRAL
11	0.78	15.55	9.61	0.08	9.86	35.10	46.00	-10.90	Average	NEUTRAL
12	0.78	23.45	9.61	0.08	9.86	43.00	56.00	-13.00	QP	NEUTRAL

Note:
1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.



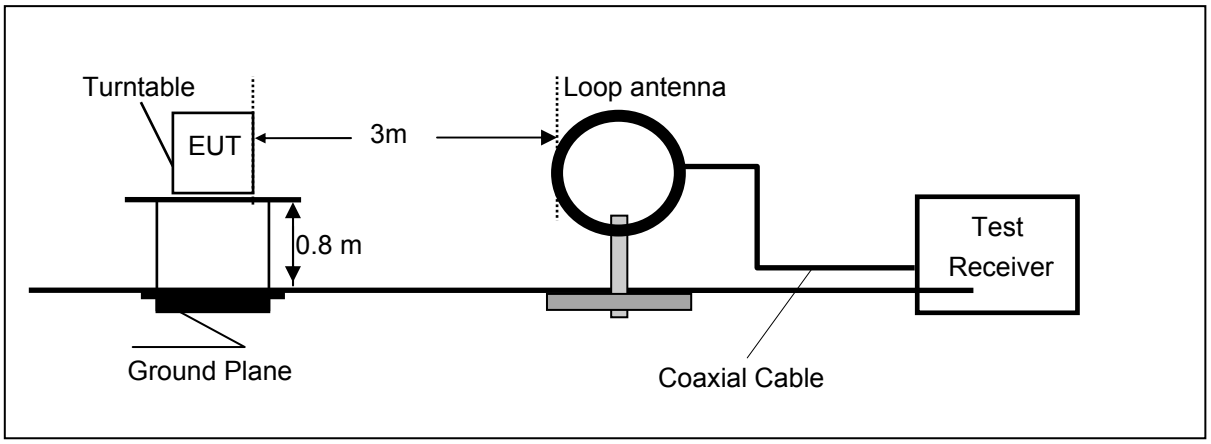
Item	Freq	Read Level	LISN Factor	Cable Loss	Pulse Limiter Factor	Result Level	Limit Line	Over Limit	Detector	Phase
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)		
1	0.15	14.71	9.61	0.01	9.84	34.17	56.00	-21.83	Average	LINE
2	0.15	27.99	9.61	0.01	9.84	47.45	66.00	-18.55	QP	LINE
3	0.20	20.34	9.62	0.02	9.85	39.83	53.71	-13.88	Average	LINE
4	0.20	33.13	9.62	0.02	9.85	52.62	63.71	-11.09	QP	LINE
5	0.33	16.97	9.63	0.02	9.85	36.47	49.57	-13.10	Average	LINE
6	0.33	25.09	9.63	0.02	9.85	44.59	59.57	-14.98	QP	LINE
7	0.53	14.72	9.63	0.04	9.87	34.26	46.00	-11.74	Average	LINE
8	0.53	23.84	9.63	0.04	9.87	43.38	56.00	-12.62	QP	LINE
9	0.56	14.83	9.63	0.04	9.86	34.36	46.00	-11.64	Average	LINE
10	0.56	25.34	9.63	0.04	9.86	44.87	56.00	-11.13	QP	LINE
11	0.78	16.08	9.62	0.08	9.86	35.64	46.00	-10.36	Average	LINE
12	0.78	23.87	9.62	0.08	9.86	43.43	56.00	-12.57	QP	LINE

Note:
1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.

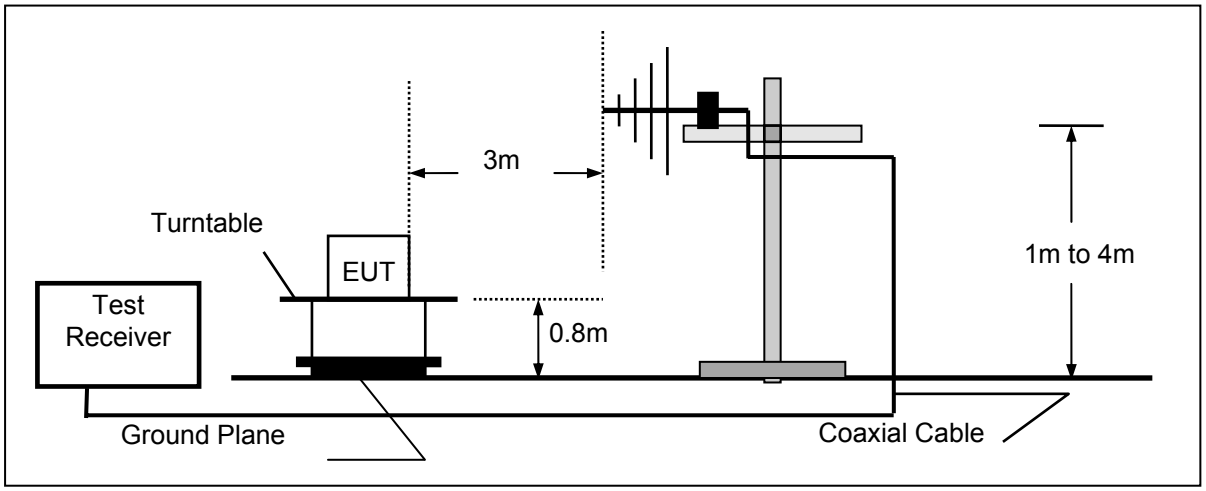
4.2. Radiated Emission

TEST CONFIGURATION

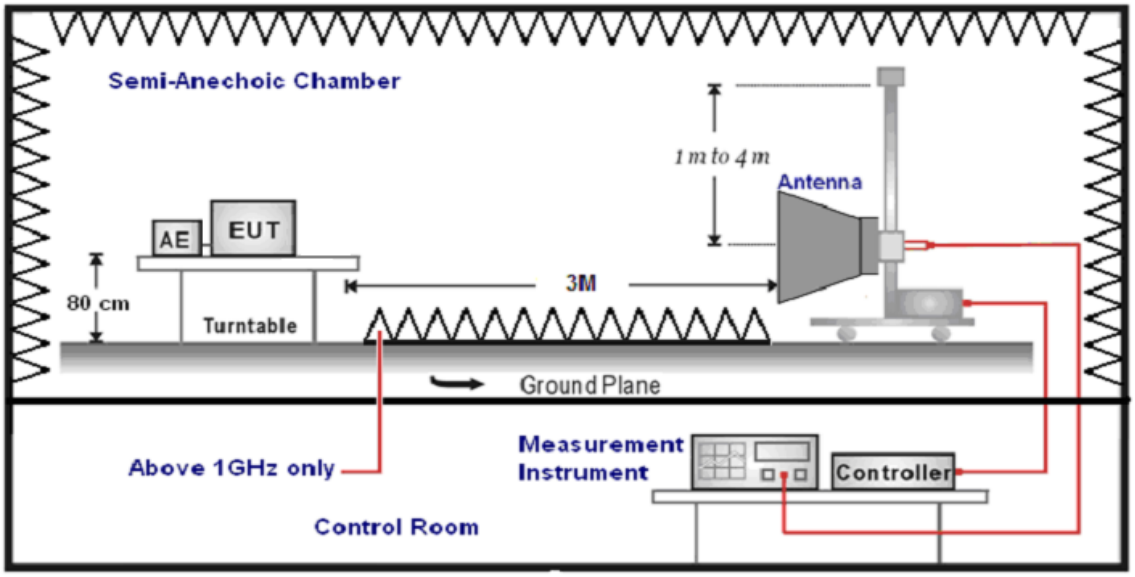
Frequency range 9KHz – 30MHz



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.

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 32.768KHz and maximum operation frequency was 2480MHz.so radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

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

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

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

Field Strength Calculation

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

FS = RA + AF + CL - AG

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

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

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

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

TEST RESULTS

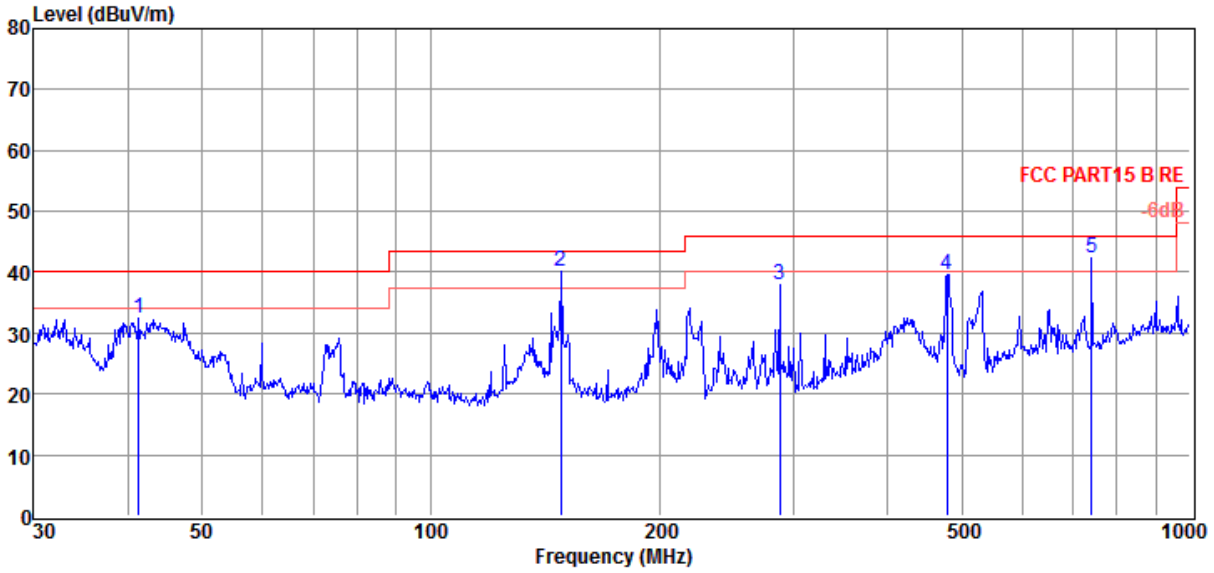
Remark: 1. We tested three positions and recorded worst case.
2. We tested WLAN IEEE 802.11b Link mode for below 1G;

For 9KHz to 30MHz

Frequency (MHz)	Corrected Reading (dBμV/m)@3m	FCC Limit (dBμV/m) @3m	Over Limit (dB)	Detector
---	---	---	---	***QP***

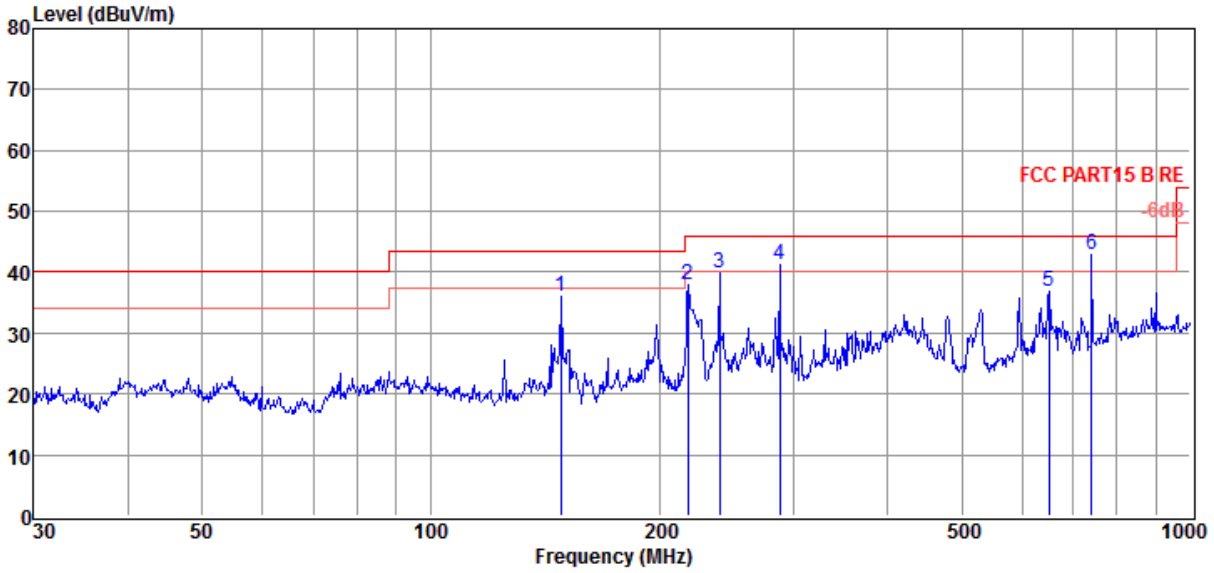
Remark:
1. Over Limit = Emission level - Limit value
2. "---" states emission level at least lower than limit 20dB, so without recorded any values;

For 30MHz to 1000MHz



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	41.28	17.47	14.00	1.00	32.47	40.00	-7.53	QP	VERTICAL
2	148.44	29.70	8.67	1.79	40.16	43.50	-3.34	QP	VERTICAL
3	287.99	20.92	14.25	2.67	37.84	46.00	-8.16	QP	VERTICAL
4	478.85	19.95	15.98	3.62	39.55	46.00	-6.45	QP	VERTICAL
5	742.26	18.64	19.26	4.50	42.40	46.00	-3.60	QP	VERTICAL

Note:
1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	148.44	25.60	8.67	1.79	36.06	43.50	-7.44	QP	HORIZONTAL
2	218.31	24.80	10.90	2.20	37.90	46.00	-8.10	QP	HORIZONTAL
3	239.99	25.86	11.70	2.32	39.88	46.00	-6.12	QP	HORIZONTAL
4	287.99	24.34	14.25	2.67	41.26	46.00	-4.74	QP	HORIZONTAL
5	651.94	14.23	18.40	4.21	36.84	46.00	-9.16	QP	HORIZONTAL
6	742.26	18.99	19.26	4.50	42.75	46.00	-3.25	QP	HORIZONTAL

Note:
1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

For 1GHz to 25GHz

802.11b Mode@ Low Channel @ Channel 1 @ 2412 MHz

Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4824.00	56.45	35.52	29.11	12.10	62.14	74.00	-11.86	Peak	Horizontal
1	4824.00	41.97	35.52	29.11	12.10	47.66	54.00	-6.34	AV[1]	Horizontal
2	7236.00	52.71	37.46	29.76	15.26	60.27	74.00	-13.73	Peak	Horizontal
2	7236.00	36.83	37.46	29.76	15.26	44.39	54.00	-9.61	AV[1]	Horizontal

Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4824.00	53.02	35.52	29.11	12.10	58.71	74.00	-15.29	Peak	Vertical
1	4824.00	38.59	35.52	29.11	12.10	44.28	54.00	-9.72	AV[1]	Vertical
2	7236.00	52.36	37.46	29.76	15.26	59.92	74.00	-14.08	Peak	Vertical
2	7236.00	37.27	37.46	29.76	15.26	44.83	54.00	-9.17	AV[1]	Vertical

802.11b Mode@ Middle Channel @ Channel 6 @ 2437 MHz

Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4874.00	55.40	35.51	29.08	12.04	61.01	74.00	-12.99	Peak	Horizontal
1	4874.00	40.27	35.51	29.08	12.04	45.88	54.00	-8.12	AV[1]	Horizontal
2	7311.00	49.57	37.30	29.88	15.32	57.47	74.00	-16.53	Peak	Horizontal
2	7311.00	36.46	37.30	29.88	15.32	44.36	54.00	-9.64	AV[1]	Horizontal

Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4874.00	51.56	35.51	29.08	12.04	57.17	74.00	-16.83	Peak	Vertical
1	4874.00	38.47	35.51	29.08	12.04	44.08	54.00	-9.92	AV[1]	Vertical
2	7311.00	48.09	37.30	29.88	15.32	55.99	74.00	-18.01	Peak	Vertical
2	7311.00	35.70	37.30	29.88	15.32	43.60	54.00	-10.40	AV[1]	Vertical

802.11b Mode@ High Channel @ Channel 11 @ 2462 MHz

Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4924.00	54.47	35.64	29.04	12.02	59.89	74.00	-14.11	Peak	Horizontal
1	4924.00	40.43	35.64	29.04	12.02	45.85	54.00	-8.15	AV[1]	Horizontal
2	7386.00	50.76	37.37	30.12	15.66	59.17	74.00	-14.83	Peak	Horizontal
2	7386.00	36.62	37.37	30.12	15.66	45.03	54.00	-8.97	AV[1]	Horizontal

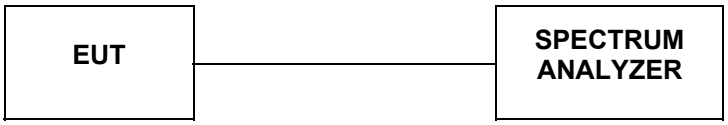
Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4924.00	51.37	35.64	29.04	12.02	56.79	74.00	-17.21	Peak	Vertical
1	4924.00	38.13	35.64	29.04	12.02	43.55	54.00	-10.45	AV[1]	Vertical
2	7386.00	49.73	37.37	30.12	15.66	58.14	74.00	-15.86	Peak	Vertical
2	7386.00	35.65	37.37	30.12	15.66	44.06	54.00	-9.94	AV[1]	Vertical

REMARKS:

1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. The other emission levels were very low against the limit.
3. Over Limit=Emission Level - Limit.
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. For Wireless 802.11b mode at 1Mbps.

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

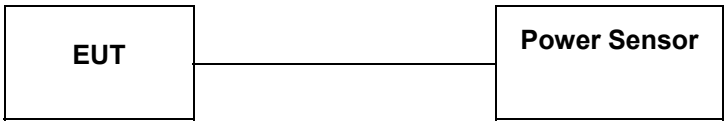
a. A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal.
b. The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient 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 setp 100% continuous transmit for WLAN;

4.4. 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 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.

LIMIT

The Maximum Peak Output Power Measurement is 30dBm.

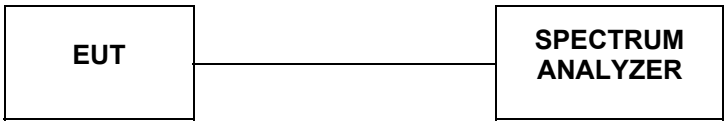
TEST RESULTS

Test Mode	Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Limits (dBm)	Verdict
IEEE 802.11 b	1	2412	19.96	30	PASS
	6	2437	19.64		
	11	2462	19.18		
IEEE 802.11 g	1	2412	20.64	30	PASS
	6	2437	20.69		
	11	2462	19.78		
IEEE 802.11 n HT20	1	2412	21.51	30	PASS
	6	2437	21.28		
	11	2462	20.64		
IEEE 802.11 n HT40	3	2422	20.97	30	PASS
	6	2437	20.84		
	9	2452	20.52		

Remark:
1. *Measured output power at difference data rate for each mode and recorded woest 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 V03 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.

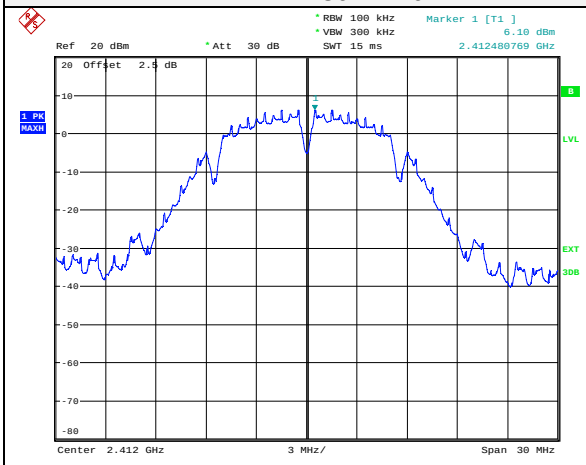
TEST RESULTS

Test Mode	Channel	Frequency (MHz)	Measured Peak Power Spectral Density (dBm/100KHz)	Limits (dBm/3KHz)	Verdict
IEEE 802.11 b	1	2412	6.10	8	PASS
	6	2437	6.07		
	11	2462	5.47		
IEEE 802.11 g	1	2412	-1.02	8	PASS
	6	2437	-0.66		
	11	2462	-1.56		
IEEE 802.11 n HT20	1	2412	-0.21	8	PASS
	6	2437	0.06		
	11	2462	-0.94		
IEEE 802.11 n HT40	3	2422	-3.86	8	PASS
	6	2437	-4.29		
	9	2452	-4.44		

Remark:
1. *Measured output power at difference data rate for each mode and recorded woest 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;*

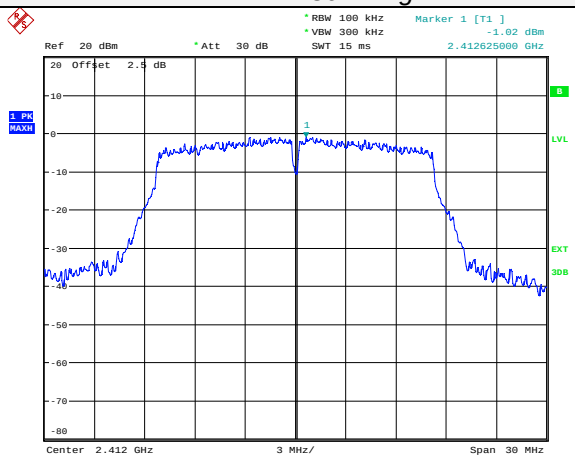
Peak Power Spectral Density

IEEE 802.11 b



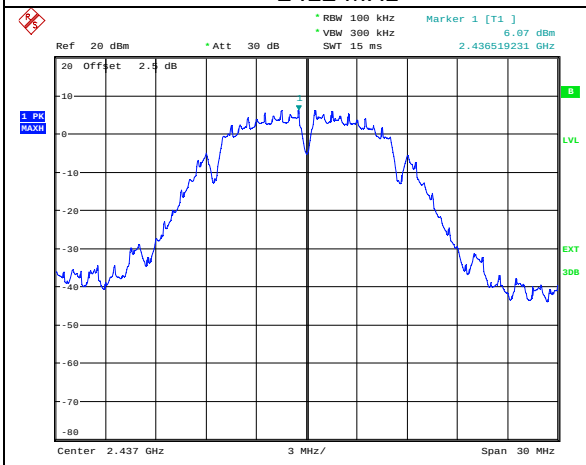
Date: 24.NOV.2015 12:53:06

IEEE 802.11 g



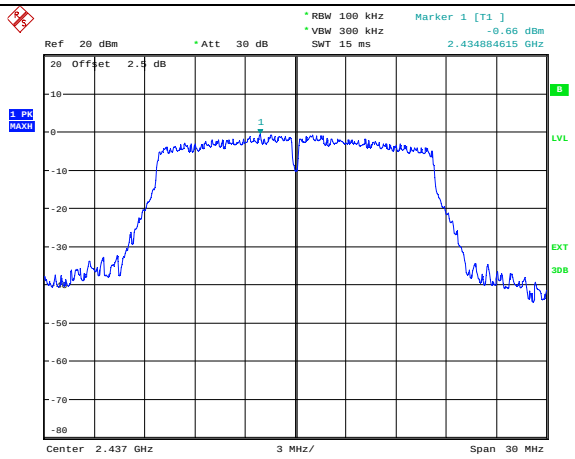
Date: 24.NOV.2015 14:04:32

2412 MHz



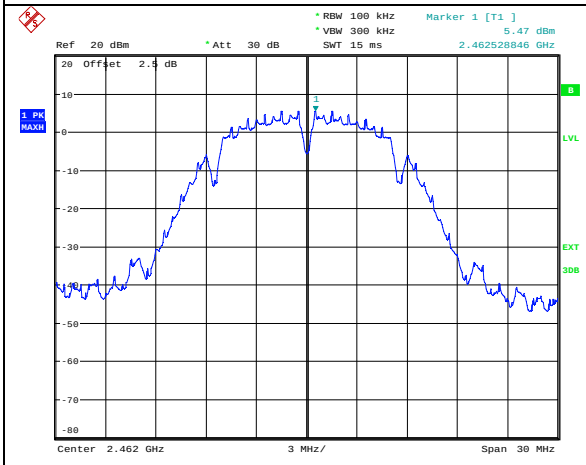
Date: 24.NOV.2015 12:53:22

2412 MHz



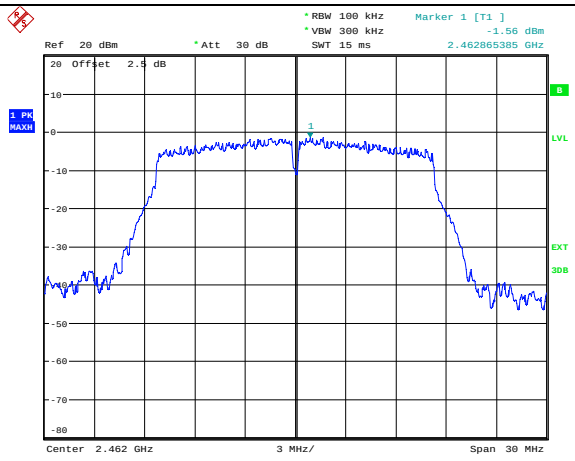
Date: 24.NOV.2015 14:04:54

2437 MHz



Date: 24.NOV.2015 12:53:39

2437 MHz



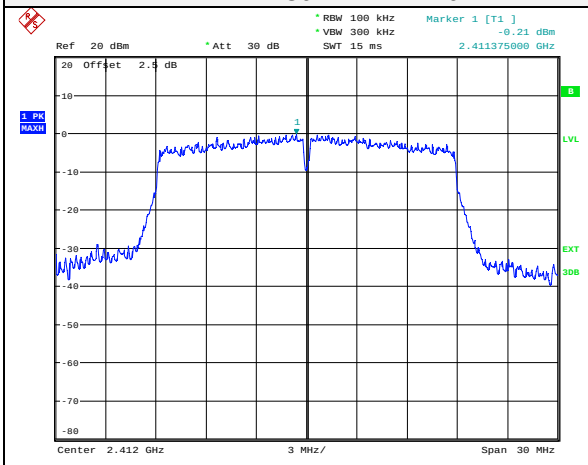
Date: 24.NOV.2015 14:05:16

2462 MHz

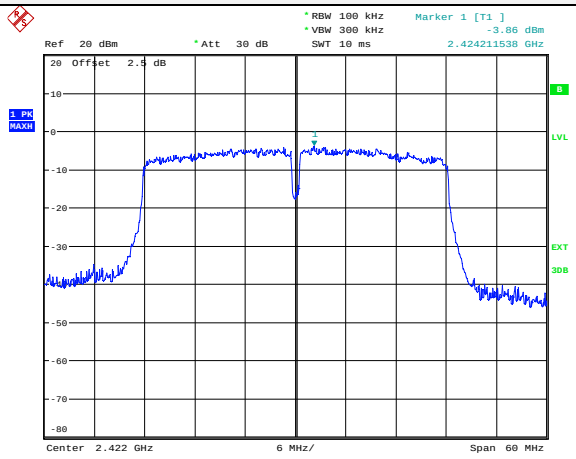
2462 MHz

Peak Power Spectral Density

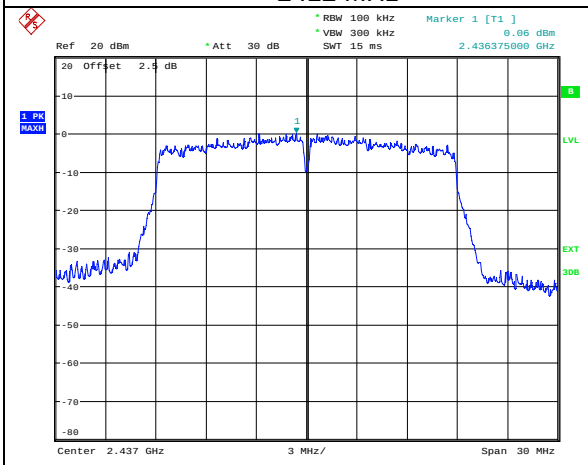
IEEE 802.11 n HT20



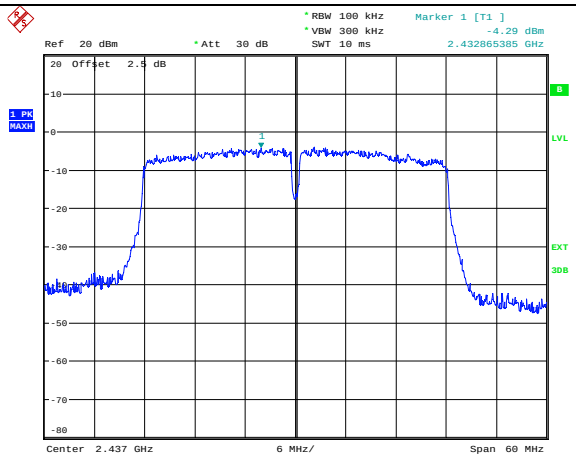
IEEE 802.11 n HT40



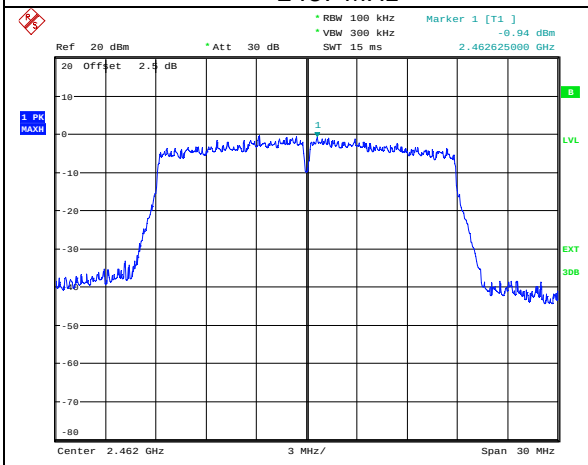
2412 MHz



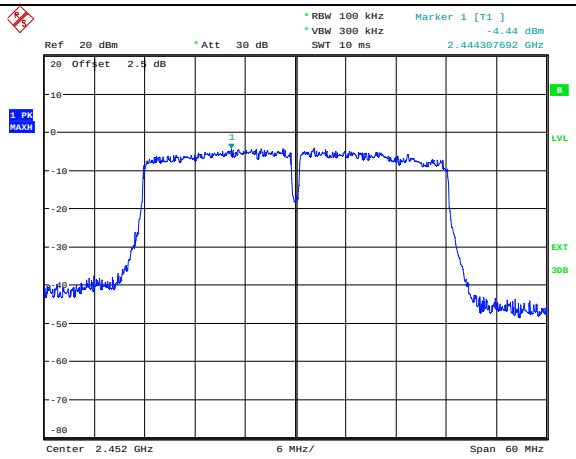
2422 MHz



2437 MHz



2437 MHz

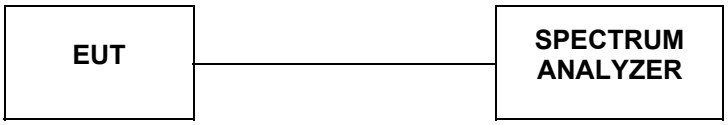


2462 MHz

2452 MHz

4.6. 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 V03 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

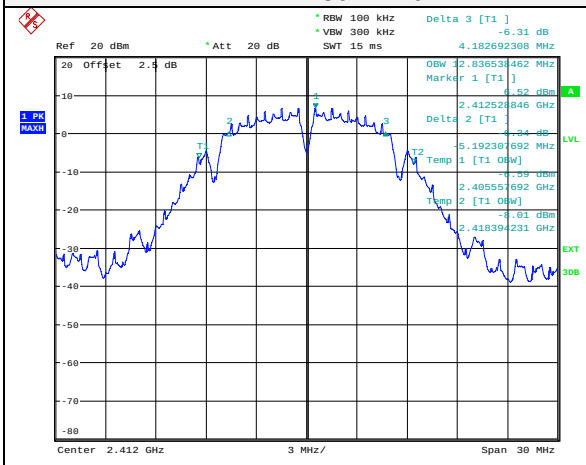
TEST RESULTS

Test Mode	Channel	Frequency (MHz)	Measured 6 dB Bandwidth (MHz)	Limits (MHz)	Verdict
IEEE 802.11 b	1	2412	9.3750	≥0.5000	PASS
	6	2437	9.2788		
	11	2462	9.1827		
IEEE 802.11 g	1	2412	16.4423	≥0.5000	PASS
	6	2437	16.4423		
	11	2462	16.4423		
IEEE 802.11 n HT20	1	2412	17.4038	≥0.5000	PASS
	6	2437	17.6442		
	11	2462	17.6923		
IEEE 802.11 n HT40	3	2422	36.5384	≥0.5000	PASS
	6	2437	36.2500		
	9	2452	36.3461		

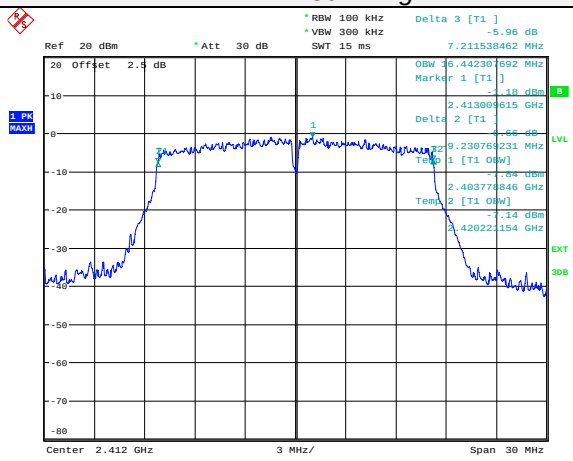
Remark:
1. *Measured output power at difference data rate for each mode and recorded woest case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 1Mbps at IEEE 802.11 b; 6Mbps at IEEE 802.11 g; 6.5Mbps at IEEE 802.11 n HT20; 13.5Mbps at IEEE 802.11 n HT40;*
4. *please refer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

6 dB Bandwidth

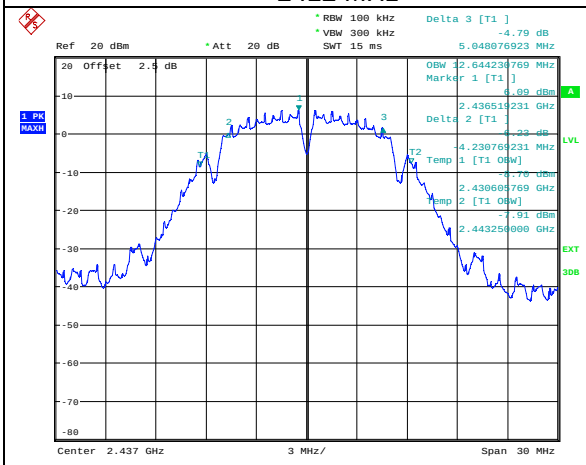
IEEE 802.11 b



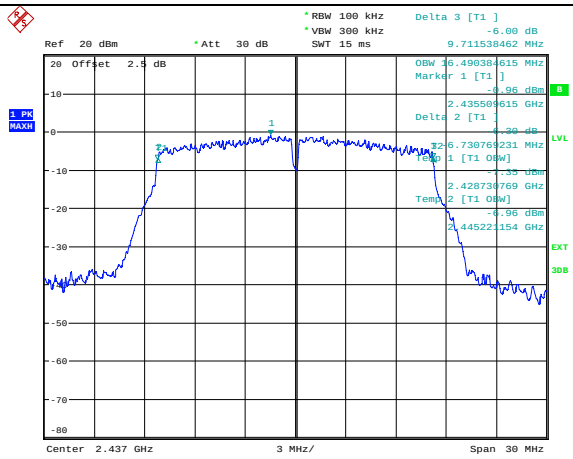
IEEE 802.11 g



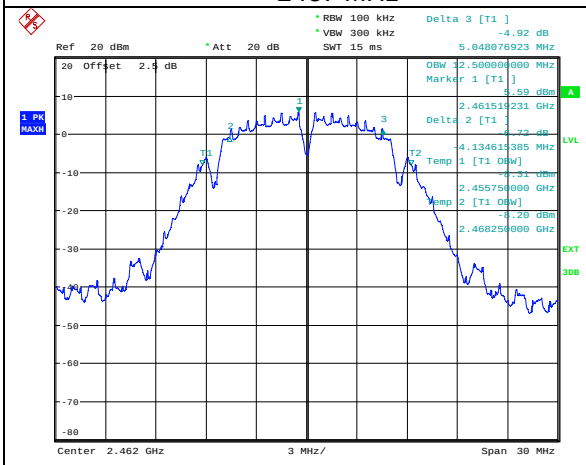
2412 MHz



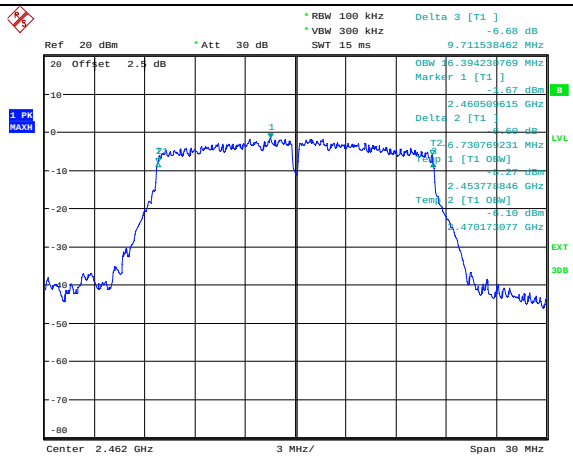
2412 MHz



2437 MHz



2437 MHz

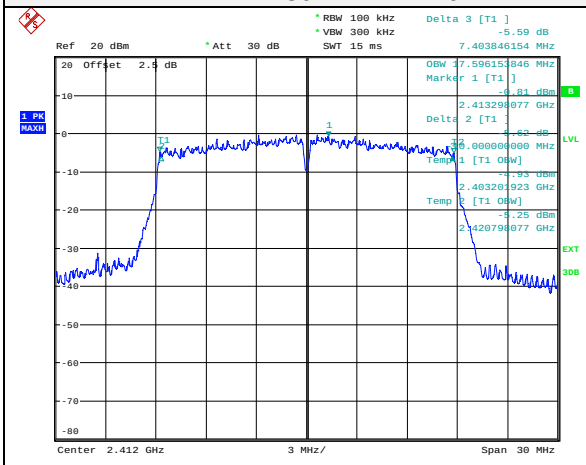


2462 MHz

2462 MHz

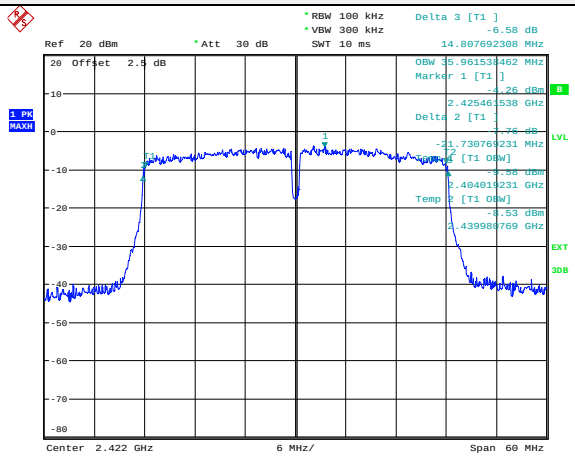
6 dB Bandwidth

IEEE 802.11 n HT20



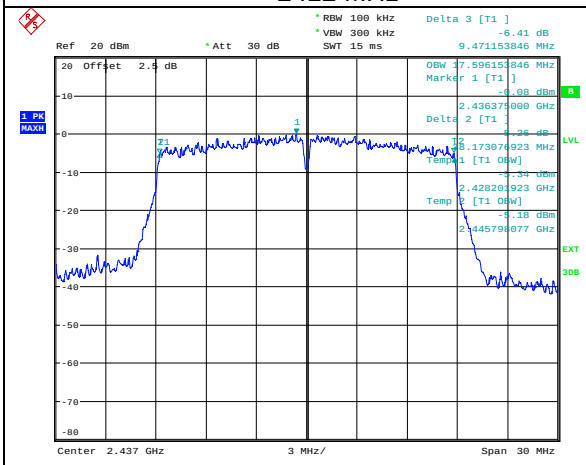
Date: 24.NOV.2015 14:19:49

IEEE 802.11 n HT40



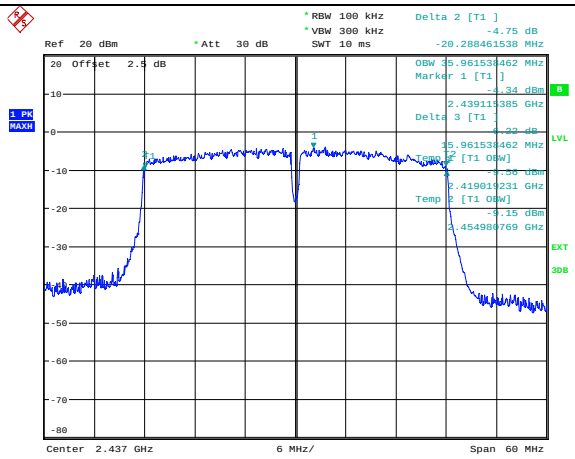
Date: 24.NOV.2015 14:39:40

2412 MHz



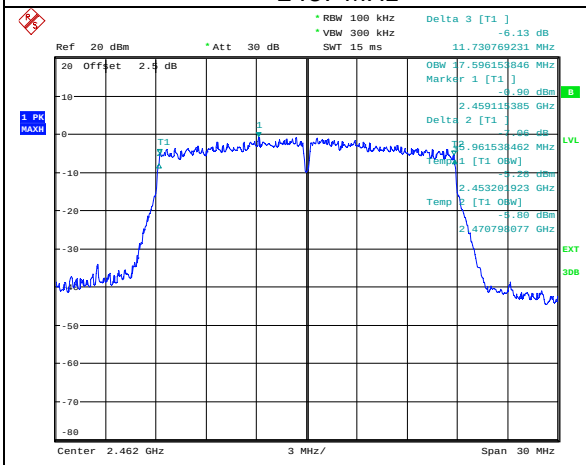
Date: 24.NOV.2015 14:20:37

2422 MHz



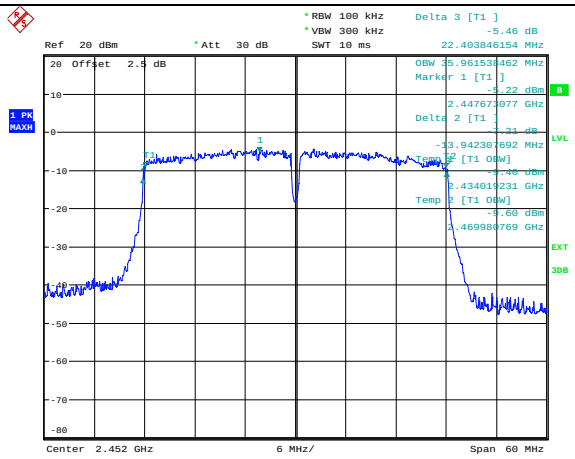
Date: 24.NOV.2015 14:41:23

2437 MHz



Date: 24.NOV.2015 14:21:21

2437 MHz



Date: 24.NOV.2015 14:42:04

2462 MHz

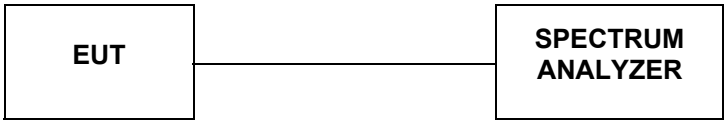
2452 MHz

4.7. Band-edge measurements for radiated emissions

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 CONFIGURATION



TEST PROCEDURE

According to KDB 558074 D01 V03 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 Peak 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:
    $E = EIRP - 20\log D + 104.8$

where:
E = electric field strength in dBμV/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

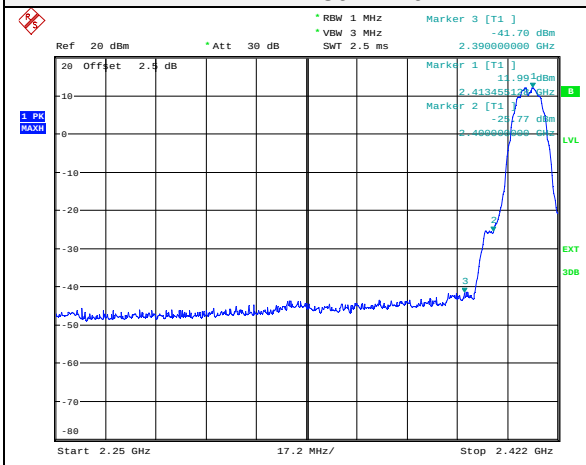
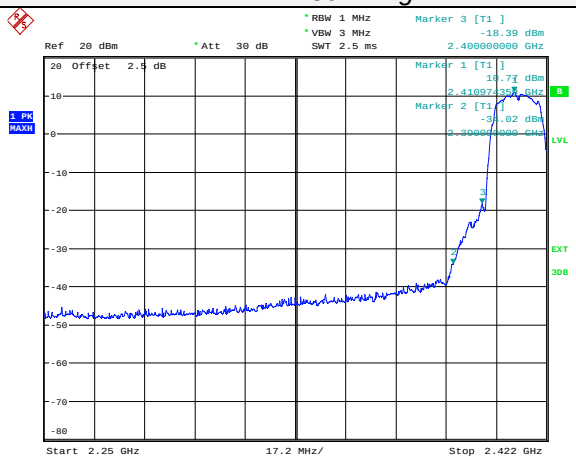
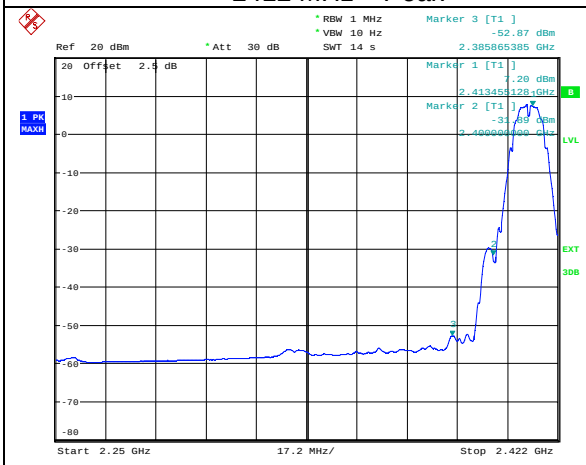
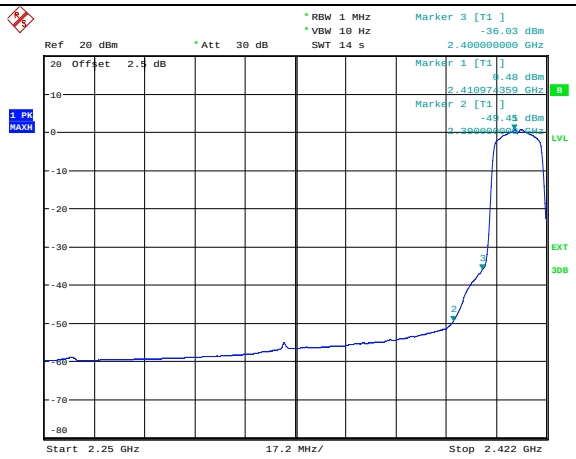
Below -20dB of the highest emission level in operating band.
Radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)

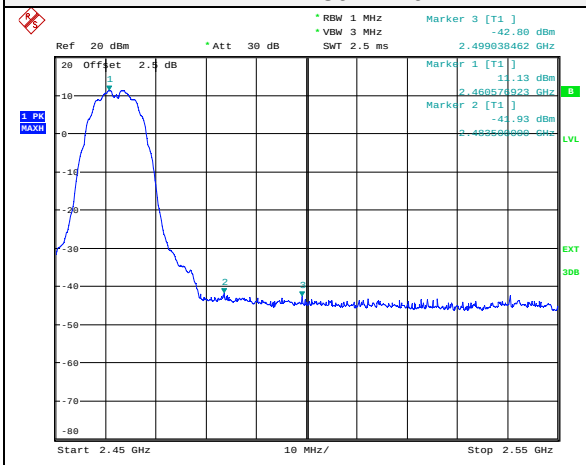
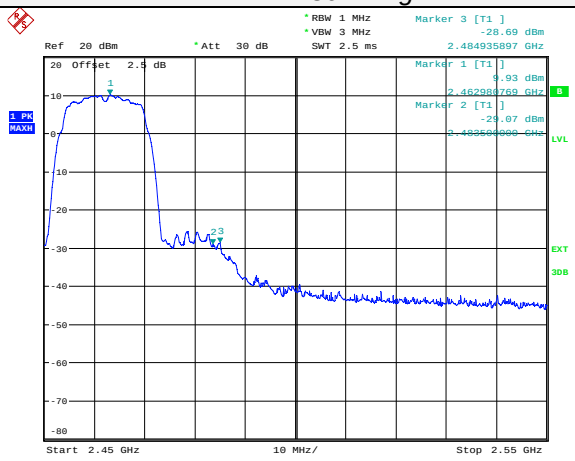
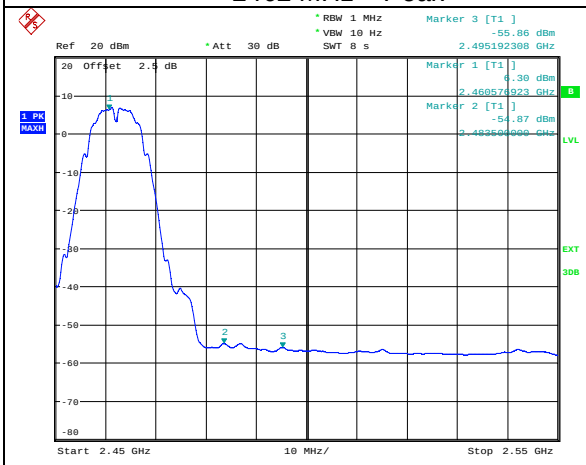
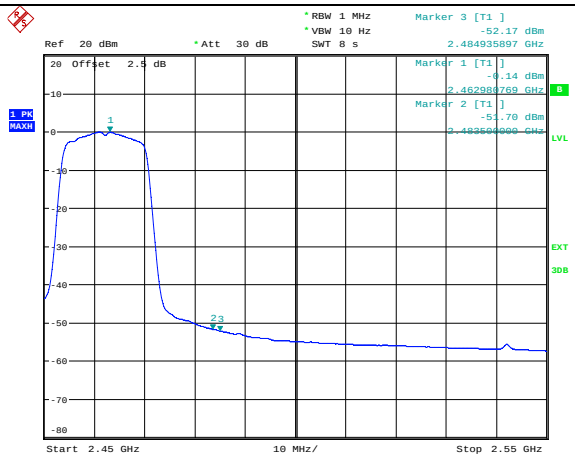
TEST RESULTS

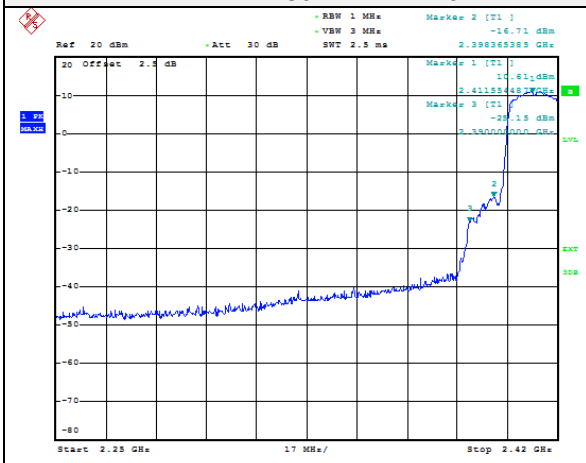
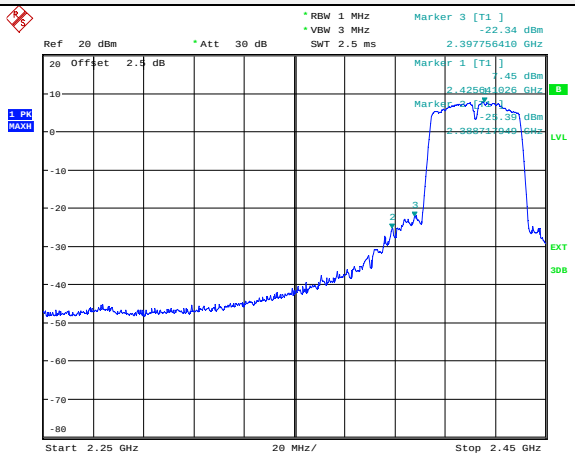
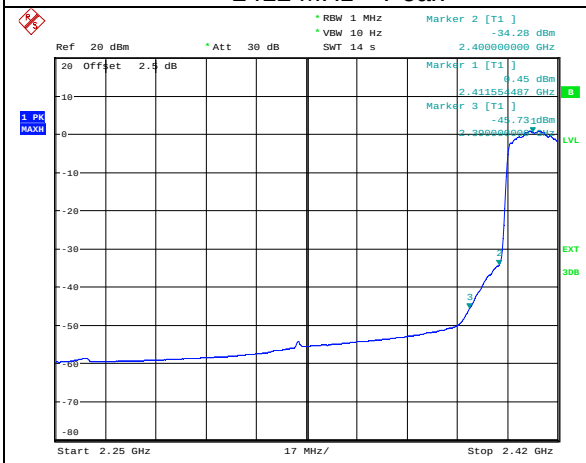
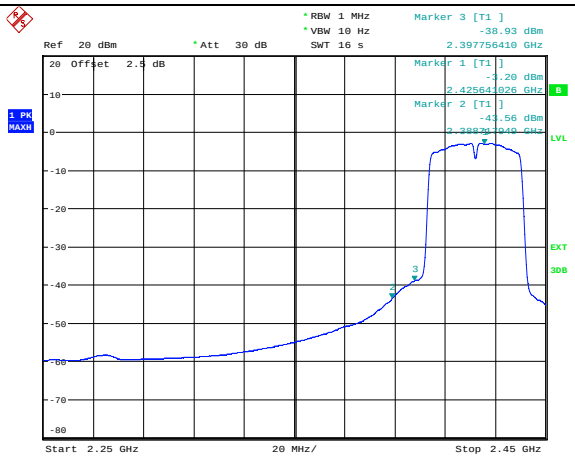
IEEE 802.11 b							
Frequency (MHz)	**Conducted Power (dBm)**	**Antenna Gain (dBi)**	**Ground Reflection Factor (dB)**	**Covert Radiated E Level At 3m (dBuV/m)**	**Detector**	**Limit (dBuV/m)**	**Verdict**
2390.00	-41.70	0.00	0.00	55.56	Peak	74.00	PASS
2385.87	-52.87	0.00	0.00	44.39	AV	54.00	PASS
2413.46	11.99	0.00	0.00	109.25	Peak	---	PASS
2413.46	7.20	0.00	0.00	104.46	AV	---	PASS
2460.58	11.13	0.00	0.00	108.39	Peak	---	PASS
2460.58	6.30	0.00	0.00	103.56	AV	---	PASS
2483.50	-41.93	0.00	0.00	55.33	Peak	74.00	PASS
2483.50	-54.87	0.00	0.00	42.39	AV	54.00	PASS
IEEE 802.11 g							
Frequency (MHz)	**Conducted Power (dBm)**	**Antenna Gain (dBi)**	**Ground Reflection Factor (dB)**	**Covert Radiated E Level At 3m (dBuV/m)**	**Detector**	**Limit (dBuV/m)**	**Verdict**
2390.00	-34.02	0.00	0.00	63.24	Peak	74.00	PASS
2390.00	-49.45	0.00	0.00	47.81	AV	54.00	PASS
2410.97	10.77	0.00	0.00	108.03	Peak	---	PASS
2410.97	0.48	0.00	0.00	97.74	AV	---	PASS
2462.98	9.93	0.00	0.00	107.19	Peak	---	PASS
2462.98	-0.14	0.00	0.00	97.12	AV	---	PASS
2484.94	-28.69	0.00	0.00	68.57	Peak	74.00	PASS
2483.50	-51.70	0.00	0.00	45.56	AV	54.00	PASS
IEEE 802.11 n HT20							
Frequency (MHz)	**Conducted Power (dBm)**	**Antenna Gain (dBi)**	**Ground Reflection Factor (dB)**	**Covert Radiated E Level At 3m (dBuV/m)**	**Detector**	**Limit (dBuV/m)**	**Verdict**
2390.00	-25.15	0.00	0.00	72.11	Peak	74.00	PASS
2390.00	-45.73	0.00	0.00	51.53	AV	54.00	PASS
2411.55	10.61	0.00	0.00	107.87	Peak	---	PASS
2411.55	0.45	0.00	0.00	97.71	AV	---	PASS
2461.21	9.98	0.00	0.00	107.24	Peak	---	PASS
2461.22	-0.45	0.00	0.00	96.81	AV	---	PASS
2485.74	-31.43	0.00	0.00	65.83	Peak	74.00	PASS
2483.50	-50.41	0.00	0.00	46.85	AV	54.00	PASS
IEEE 802.11 n HT40							
Frequency (MHz)	**Conducted Power (dBm)**	**Antenna Gain (dBi)**	**Ground Reflection Factor (dB)**	**Covert Radiated E Level At 3m (dBuV/m)**	**Detector**	**Limit (dBuV/m)**	**Verdict**
2388.72	-25.39	0.00	0.00	71.87	Peak	74.00	PASS
2388.72	-43.56	0.00	0.00	53.70	AV	54.00	PASS
2425.64	7.45	0.00	0.00	104.71	Peak	---	PASS
2425.64	-3.20	0.00	0.00	94.06	AV	---	PASS
2449.58	7.25	0.00	0.00	104.51	Peak	---	PASS
2449.58	-3.50	0.00	0.00	93.76	AV	---	PASS
2483.71	-31.50	0.00	0.00	65.76	Peak	74.00	PASS
2483.71	-49.15	0.00	0.00	48.11	AV	54.00	PASS

Remark:

1. *Measured output power at difference data rate for each mode and recorded woest 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;*

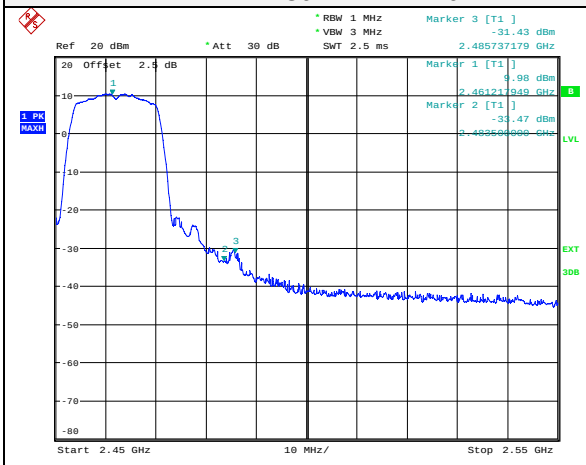
Band-edge measurements for radiated emissions	
IEEE 802.11 b	*IEEE 802.11 g*
 Date: 24.NOV.2015 13:08:10	 Date: 24.NOV.2015 14:17:26
2412 MHz – Peak	*2412 MHz – Peak*
 Date: 24.NOV.2015 13:08:43	 Date: 24.NOV.2015 14:17:57
2412 MHz – Average	*2412 MHz – Average*

Band-edge measurements for radiated emissions	
IEEE 802.11 b	*IEEE 802.11 g*
 Date: 24.NOV.2015 12:59:01	 Date: 24.NOV.2015 14:10:02
2462 MHz – Peak	*2462 MHz – Peak*
 Date: 24.NOV.2015 12:59:30	 Date: 24.NOV.2015 14:10:21
2462 MHz – Average	*2462 MHz – Average*

Band-edge measurements for radiated emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
 Date: 24.NOV.2015 14:33:46	 Date: 24.NOV.2015 14:55:21
2412 MHz – Peak	*2422 MHz – Peak*
 Date: 24.NOV.2015 14:34:23	 Date: 24.NOV.2015 14:55:45
2412 MHz – Average	*2422 MHz – Average*

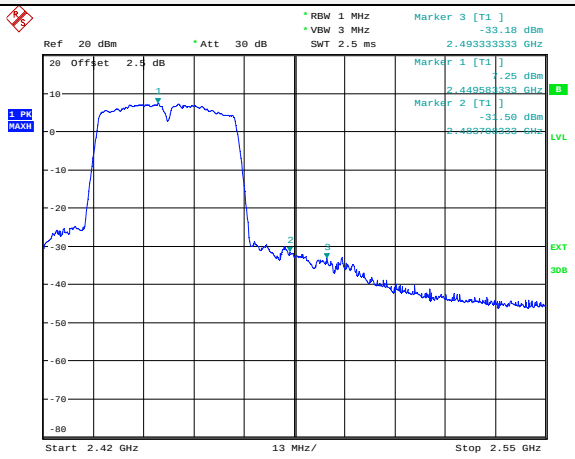
Band-edge measurements for radiated emissions

IEEE 802.11 n HT20



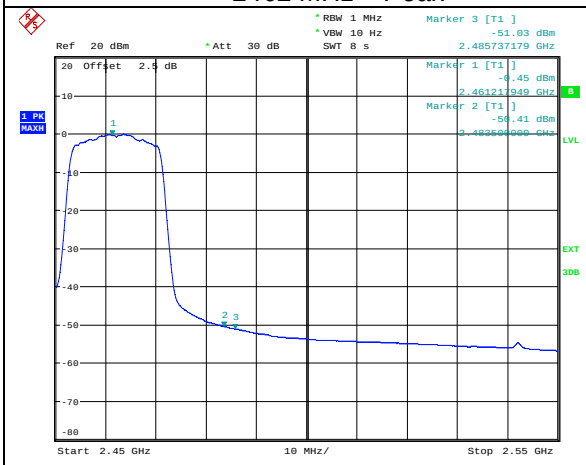
Date: 24.NOV.2015 14:27:46

IEEE 802.11 n HT40



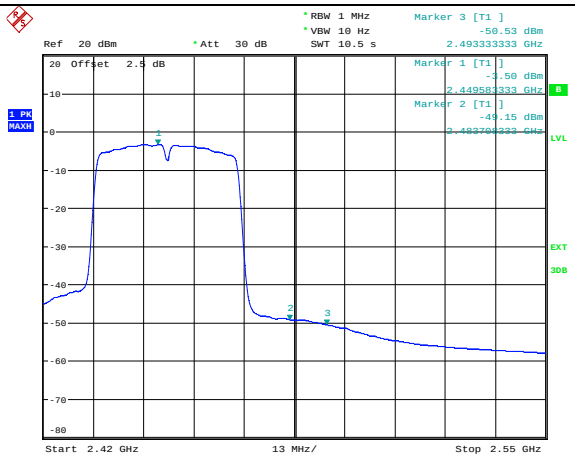
Date: 24.NOV.2015 14:49:08

2462 MHz – Peak



Date: 24.NOV.2015 14:28:00

2452 MHz – Peak



Date: 24.NOV.2015 14:49:29

2462 MHz – Average

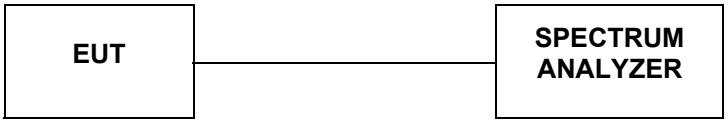
2452 MHz – Average

4.8. Band-edge measurements for RF conducted emissions

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 CONFIGURATION



TEST PROCEDURE

According to KDB 558074 D01 V03 for Antenna-port conducted measurement.

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,
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).

TEST RESULTS

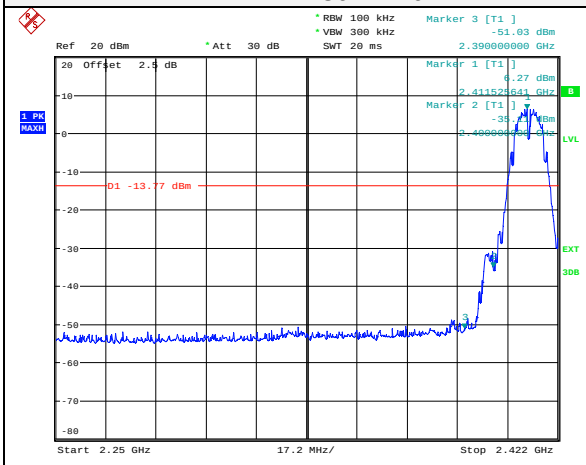
Test Mode	Channel	Frequency (MHz)	Conductd Band-edge Emission (dBc)	Limits (dBc)	Verdict
IEEE 802.11 b	1	2412	<-20dBc	-20	PASS
	11	2462	<-20dBc	-20	
IEEE 802.11 g	1	2412	<-20dBc	-20	PASS
	11	2462	<-20dBc	-20	
IEEE 802.11 n HT20	1	2412	<-20dBc	-20	PASS
	11	2462	<-20dBc	-20	
IEEE 802.11 n HT40	3	2422	<-20dBc	-20	PASS
	9	2452	<-20dBc	-20	

Remark:

1. *Measured output power at difference data rate for each mode and recorded woest 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;*

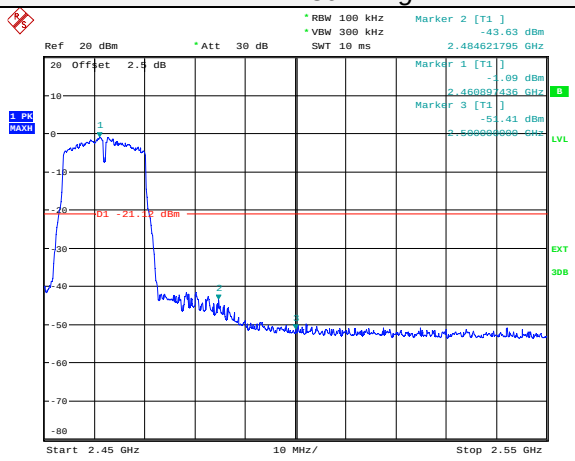
Band-edge measurements for RF conducted emissions

IEEE 802.11 b



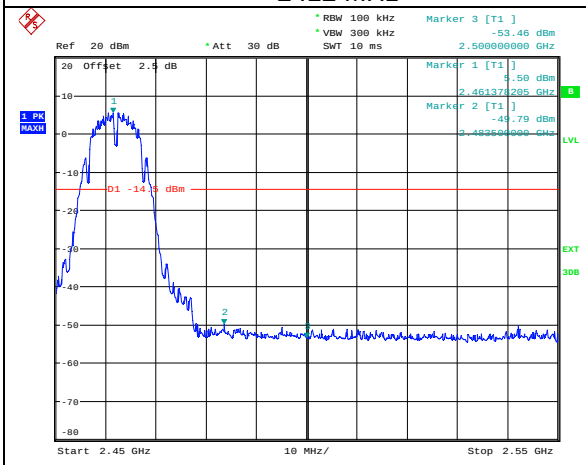
Date: 24.NOV.2015 13:07:29

IEEE 802.11 g



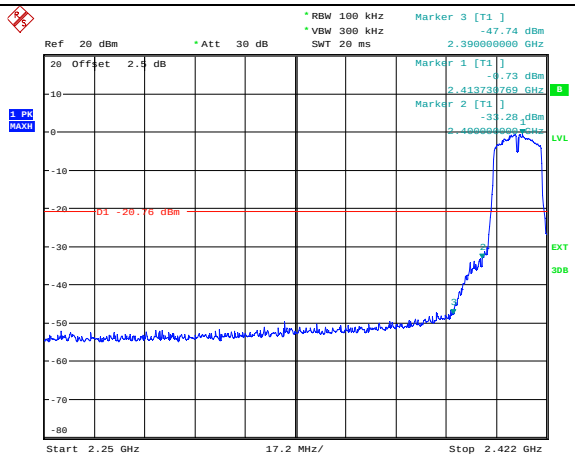
Date: 24.NOV.2015 14:09:33

2412 MHz



Date: 24.NOV.2015 12:58:24

2412 MHz



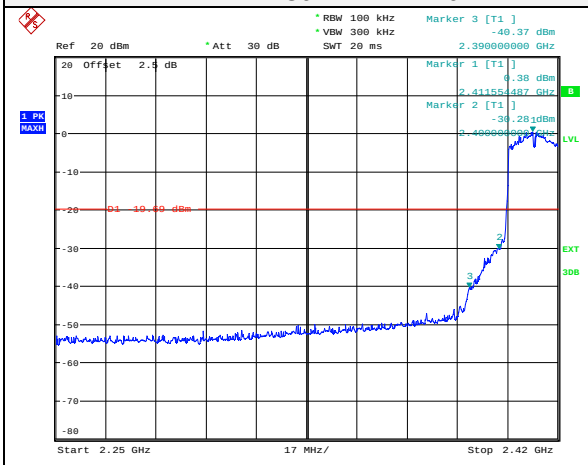
Date: 24.NOV.2015 14:16:50

2462 MHz

2462 MHz

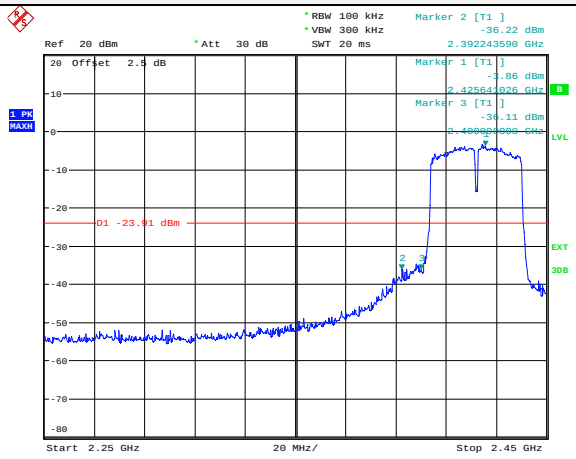
Band-edge measurements for RF conducted emissions

IEEE 802.11 n HT20



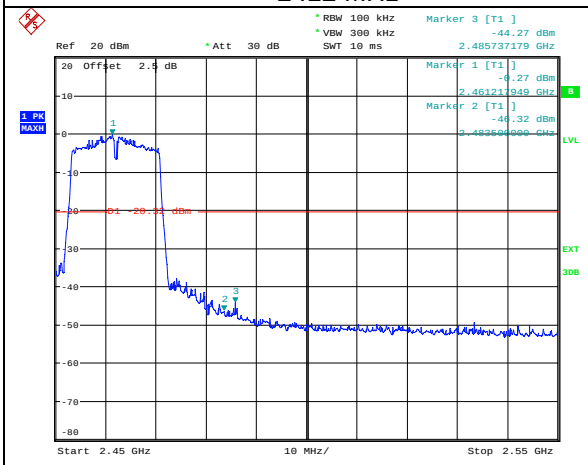
Date: 24.NOV.2015 14:33:19

IEEE 802.11 n HT40



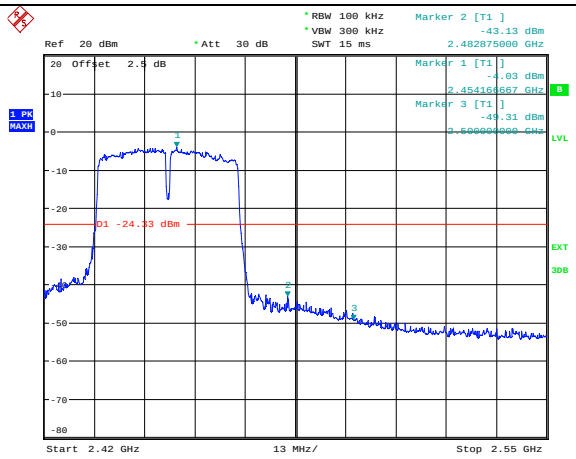
Date: 24.NOV.2015 14:54:38

2412 MHz



Date: 24.NOV.2015 14:27:13

2422 MHz



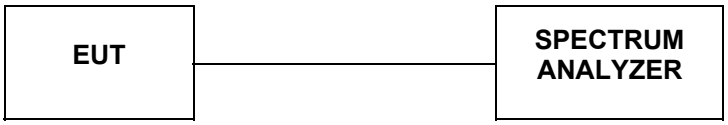
Date: 24.NOV.2015 14:48:17

2462 MHz

2452 MHz

4.9. 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 C63.10-2009 with 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=100kHz and VBW= 300KHz to measure the peak field strength , and mwasure frequeny range from 9KHz to 26.5GHz.

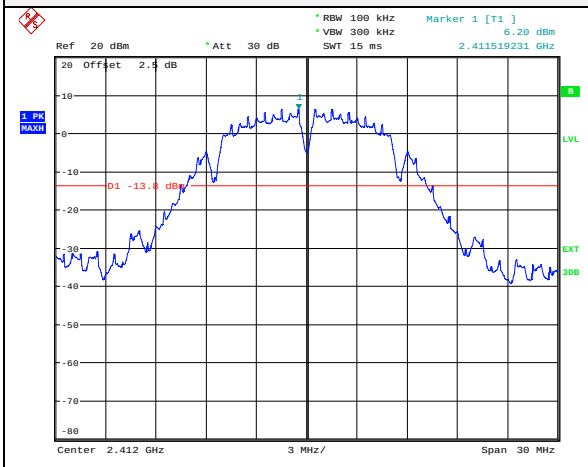
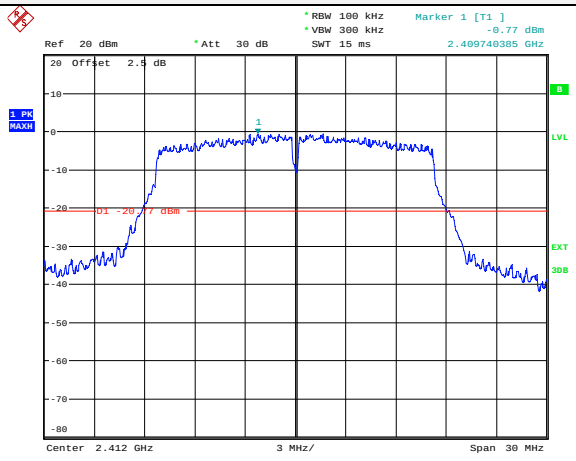
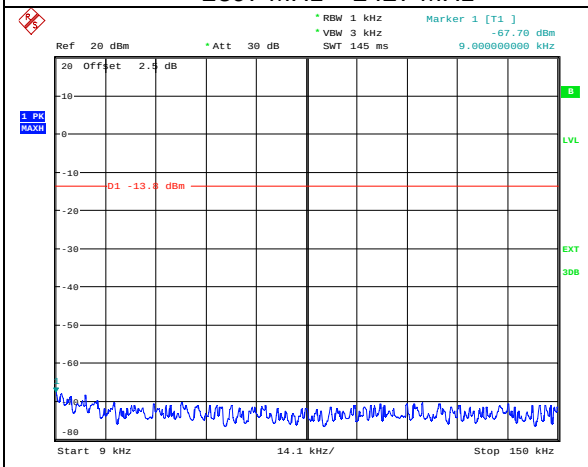
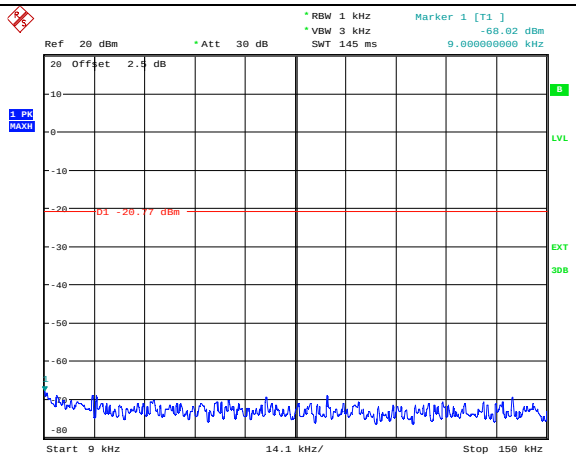
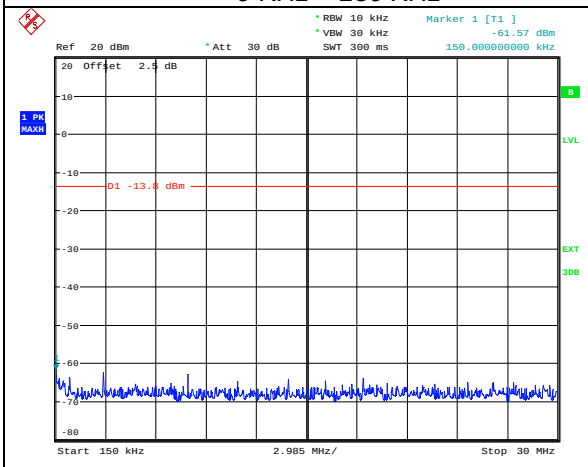
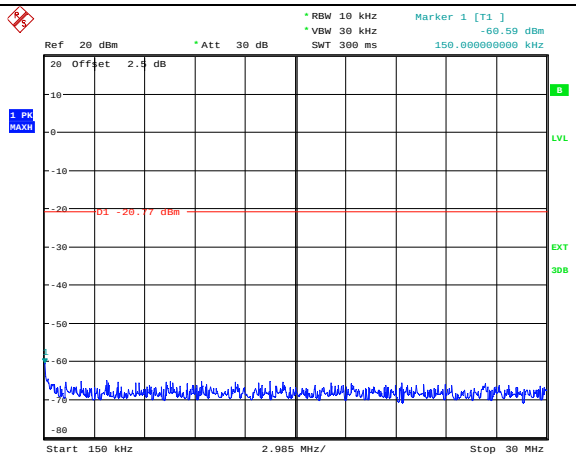
LIMIT

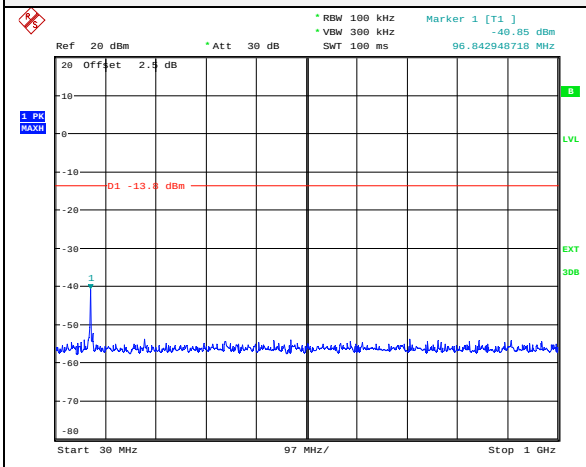
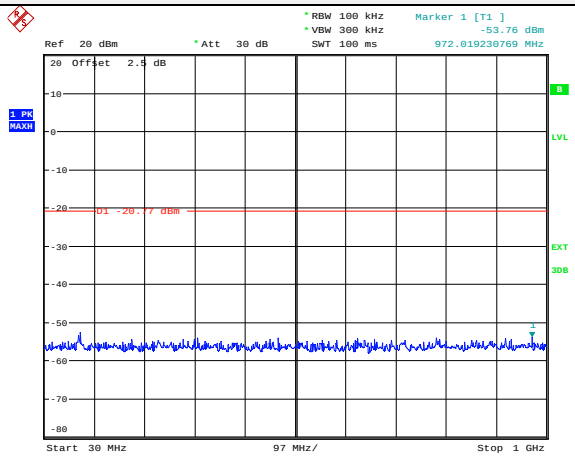
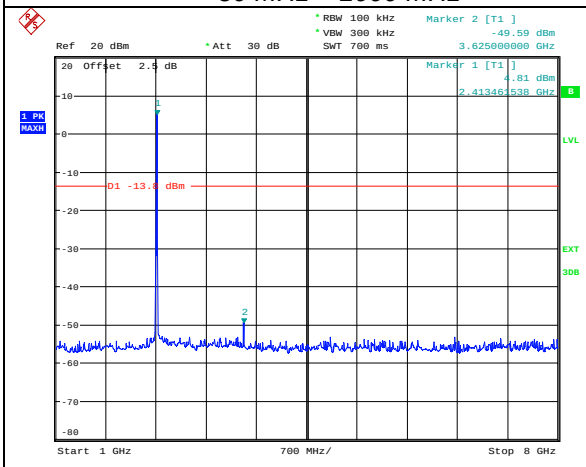
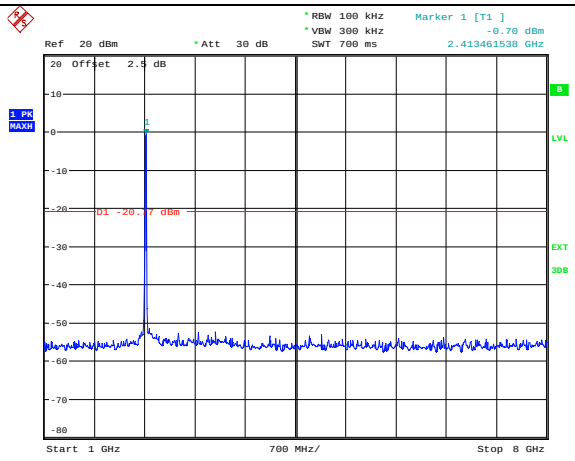
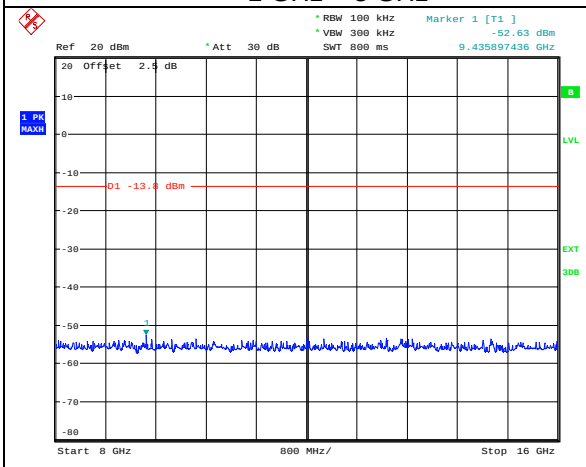
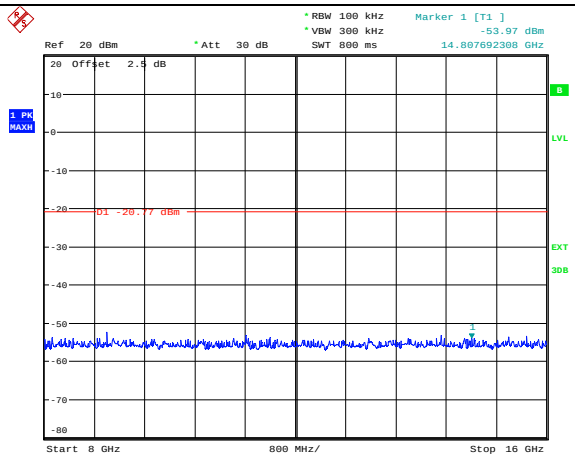
1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

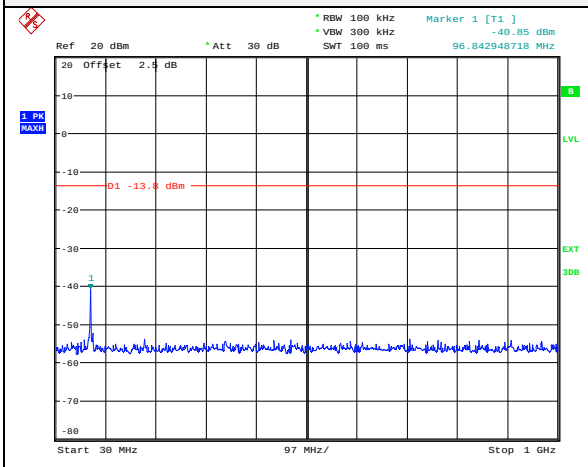
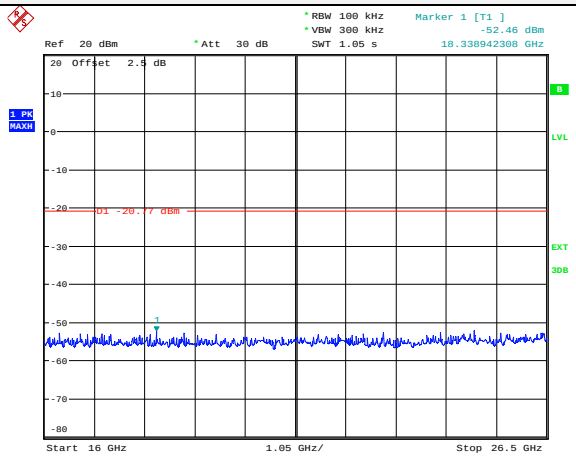
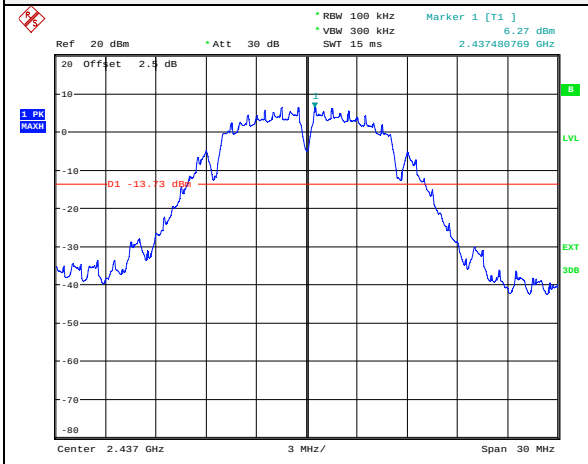
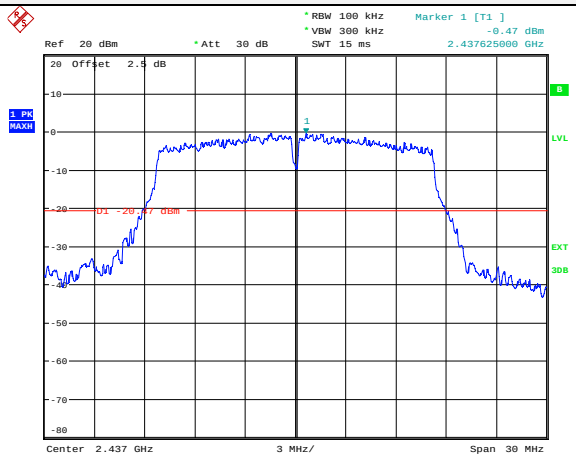
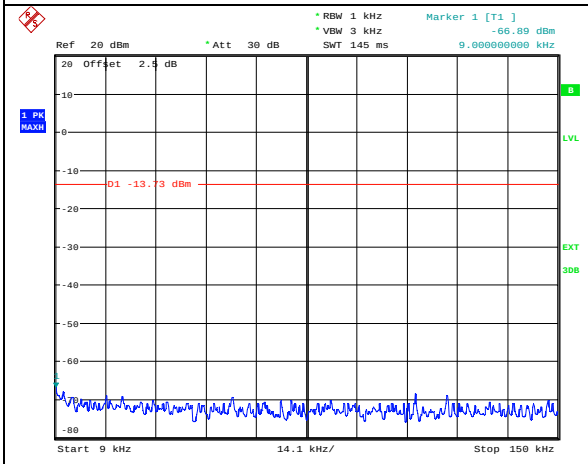
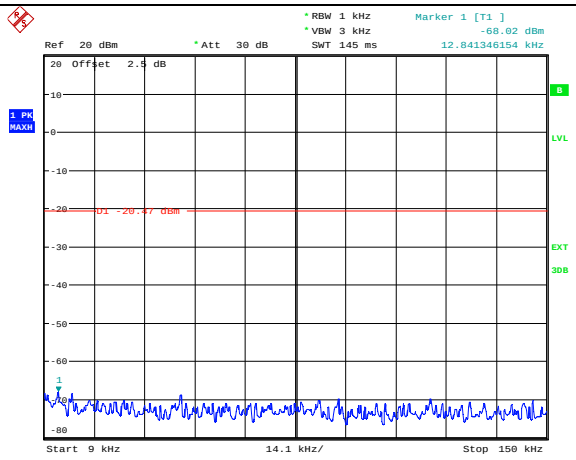
TEST RESULTS

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 woest 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 measurements for RF conducted emissions	
IEEE 802.11 b	*IEEE 802.11 g*
2412 MHz	*2412 MHz*
	
2397 MHz – 2427 MHz	*2397 MHz – 2427 MHz*
	
9 KHz – 150 KHz	*9 KHz – 150 KHz*
	
150 KHz – 30 MHz	*150 KHz – 30 MHz*

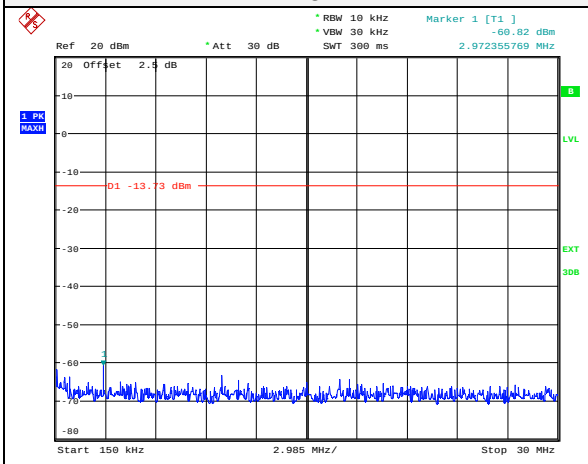
Band-edge measurements for RF conducted emissions	
IEEE 802.11 b	*IEEE 802.11 g*
2412 MHz	*2412 MHz*
	
30 MHz – 1000 MHz	*30 MHz – 1000 MHz*
	
1 GHz – 8 GHz	*1 GHz – 8 GHz*
	
8 GHz – 16 GHz	*18 GHz – 16 GHz*

Band-edge measurements for RF conducted emissions	
IEEE 802.11 b	*IEEE 802.11 g*
2412 MHz	*2412 MHz*
	
Date: 24.NOV.2015 13:05:46	Date: 24.NOV.2015 14:14:48
16 GHz – 26.5 GHz	*16 GHz – 26.5 GHz*
2437 MHz	*2437 MHz*
	
Date: 24.NOV.2015 13:01:31	Date: 24.NOV.2015 14:10:56
2422 MHz – 2452 MHz	*2422 MHz – 2452 MHz*
	
Date: 24.NOV.2015 13:01:50	Date: 24.NOV.2015 14:11:11
9 KHz – 150 KHz	*9 KHz – 150 KHz*

Band-edge measurements for RF conducted emissions

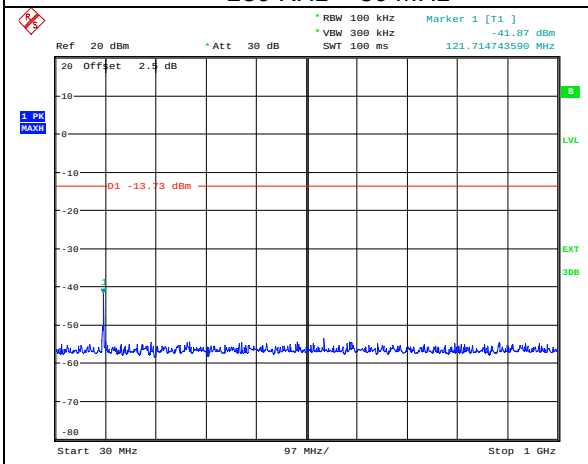
IEEE 802.11 b

2437 MHz



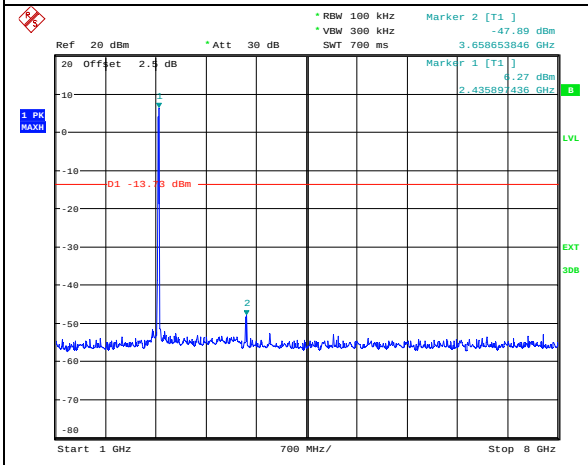
Date: 24.NOV.2015 13:02:08

150 KHz – 30 MHz



Date: 24.NOV.2015 13:02:21

30 MHz – 1000 MHz

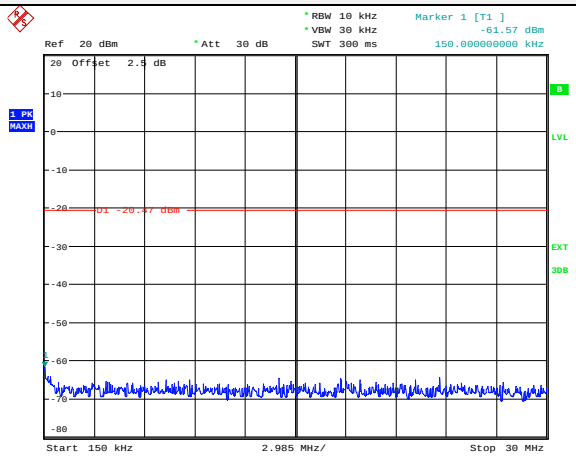


Date: 24.NOV.2015 13:02:33

1 GHz – 8 GHz

IEEE 802.11 g

2437 MHz



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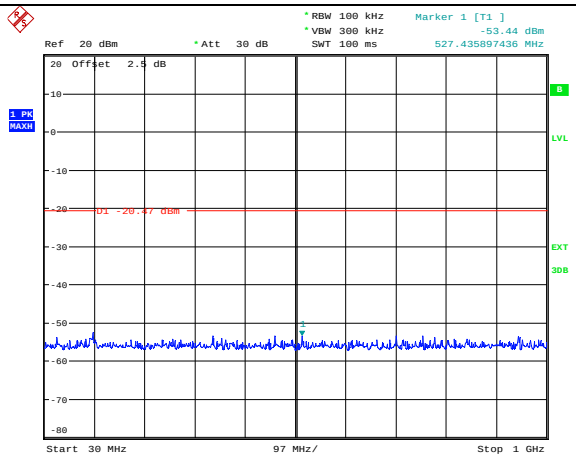
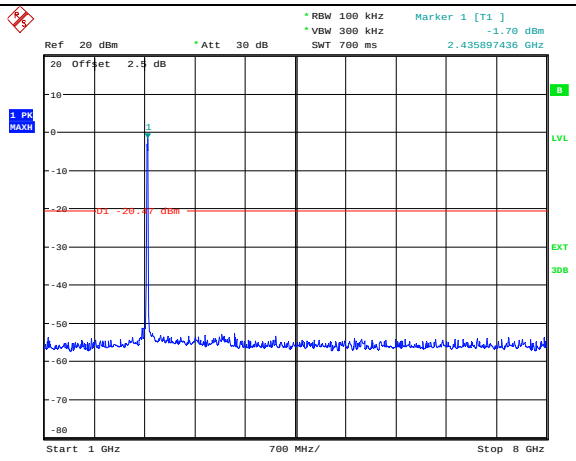
150 KHz – 30 MHz



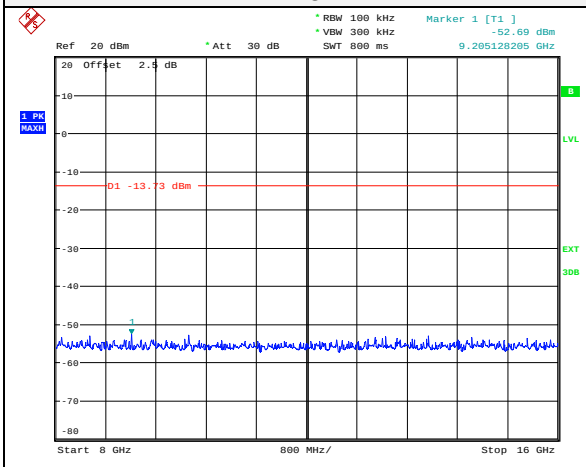
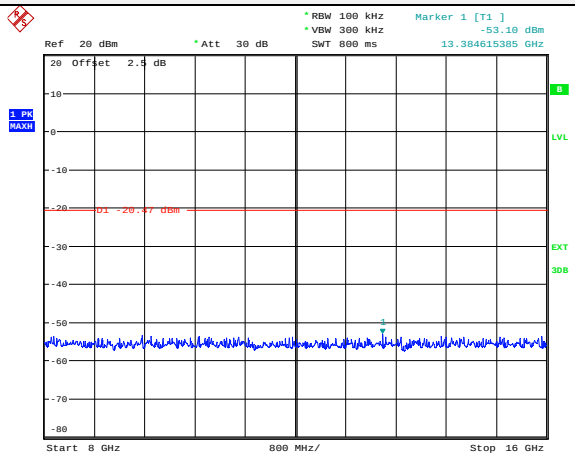
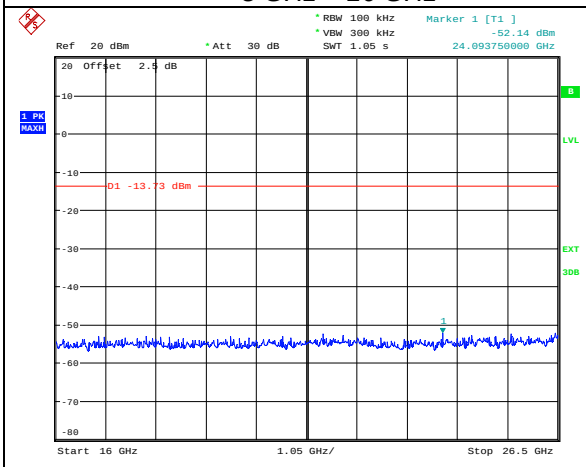
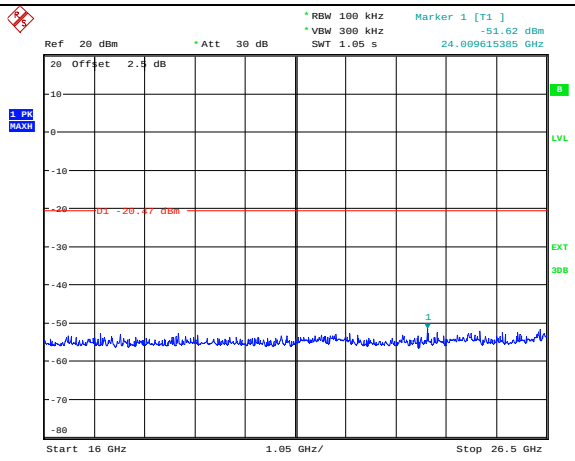
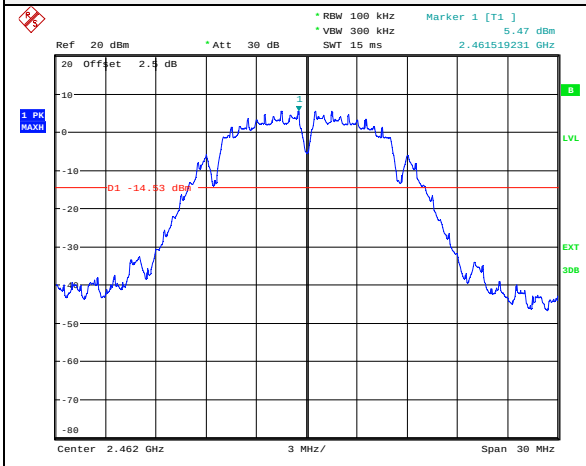
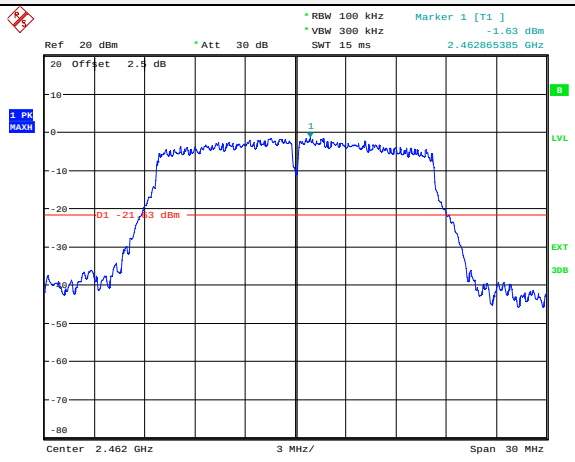
Date: 24.NOV.2015 14:11:45

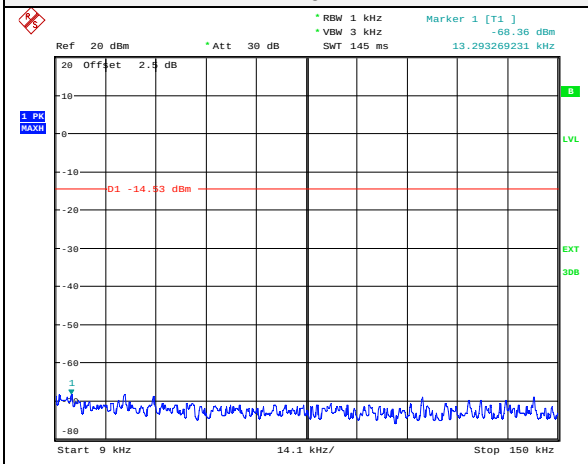
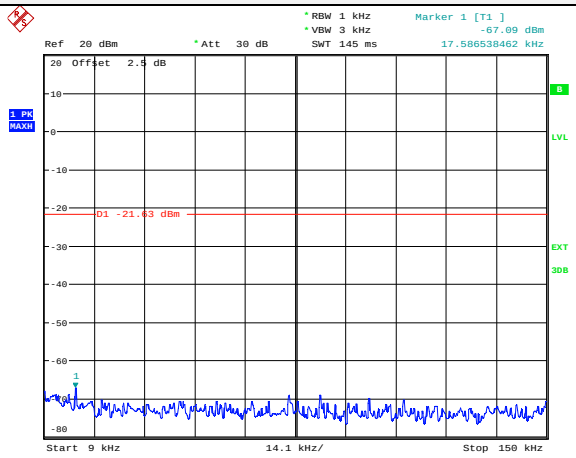
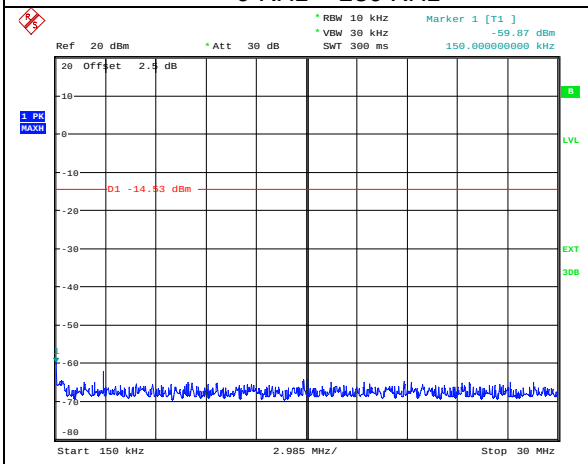
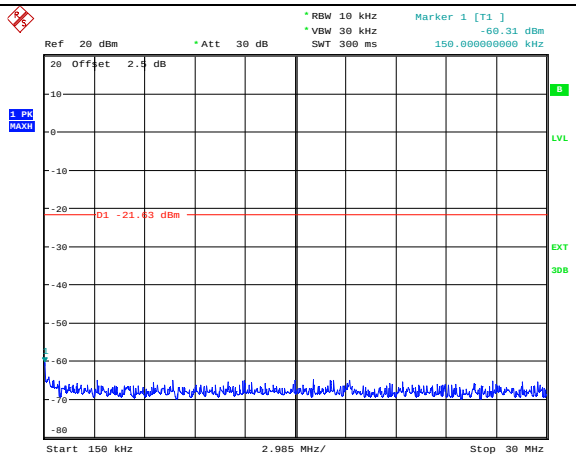
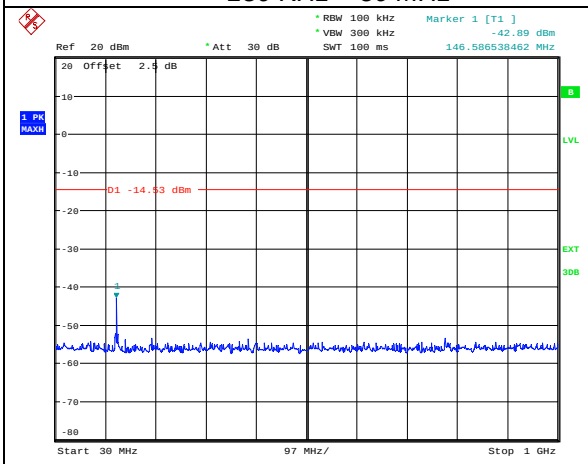
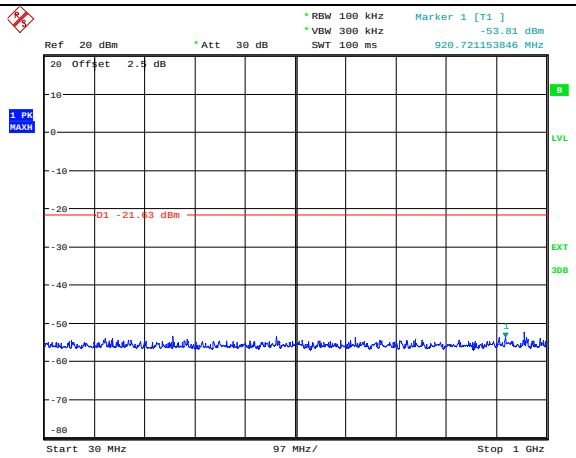
30 MHz – 1000 MHz



Date: 24.NOV.2015 14:11:54

1 GHz – 8 GHz

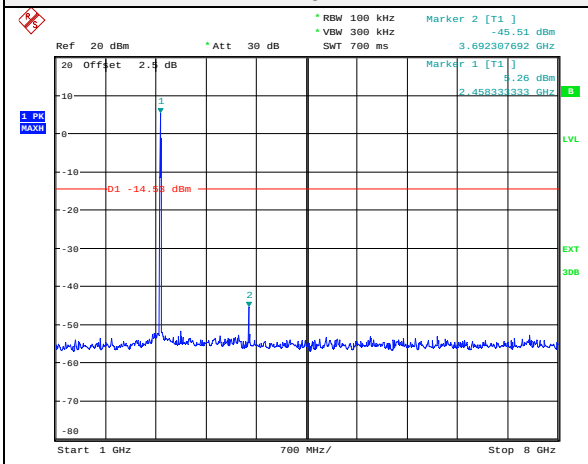
Band-edge measurements for RF conducted emissions	
IEEE 802.11 b	*IEEE 802.11 g*
2437 MHz	*2437 MHz*
	
Date: 24.NOV.2015 13:02:44	Date: 24.NOV.2015 14:12:05
8 GHz – 16 GHz	*8 GHz – 16 GHz*
	
Date: 24.NOV.2015 13:02:57	Date: 24.NOV.2015 14:12:18
16 GHz – 26.5 GHz	*16 GHz – 26.5 GHz*
2462 MHz	*2462 MHz*
	
Date: 24.NOV.2015 12:56:01	Date: 24.NOV.2015 14:06:49
2447 MHz – 2477 MHz	*2447 MHz – 2477 MHz*

Band-edge measurements for RF conducted emissions	
IEEE 802.11 b	*IEEE 802.11 g*
2462 MHz	*2462 MHz*
 Date: 24.NOV.2015 12:56:19	 Date: 24.NOV.2015 14:07:07
9 KHz – 150 KHz	*9 KHz – 150 KHz*
 Date: 24.NOV.2015 12:56:36	 Date: 24.NOV.2015 14:07:26
150 KHz – 30 MHz	*150 KHz – 30 MHz*
 Date: 24.NOV.2015 12:56:50	 Date: 24.NOV.2015 14:07:51
30 MHz – 1000 MHz	*30 MHz – 1000 MHz*

Band-edge measurements for RF conducted emissions

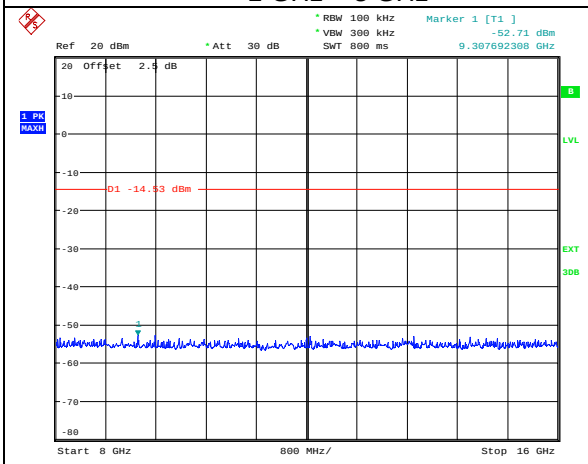
IEEE 802.11 b

2462 MHz



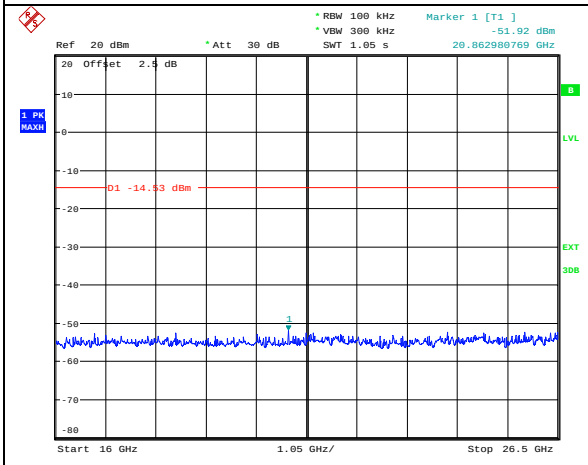
Date: 24.NOV.2015 12:57:04

1 GHz – 8 GHz



Date: 24.NOV.2015 12:57:24

8 GHz – 16 GHz

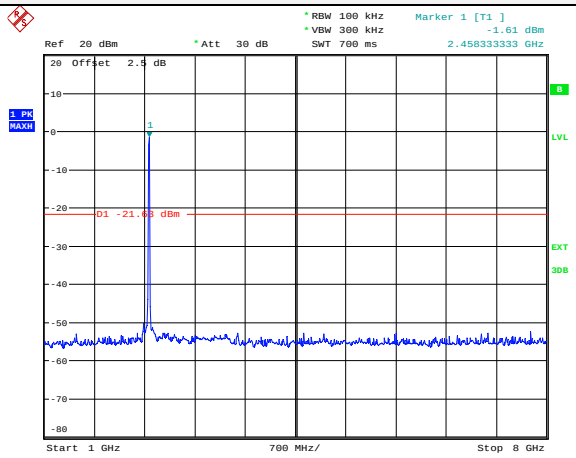


Date: 24.NOV.2015 12:57:37

16 GHz – 26.5 GHz

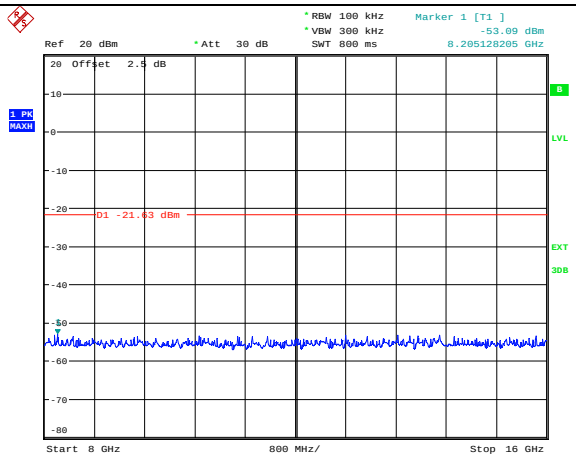
IEEE 802.11 g

2462 MHz



Date: 24.NOV.2015 14:08:16

1 GHz – 8 GHz



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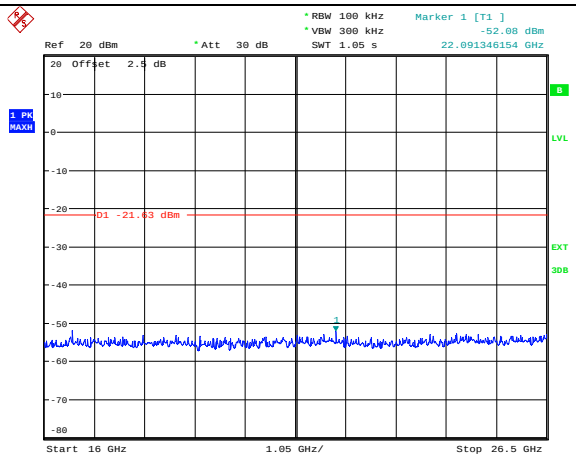
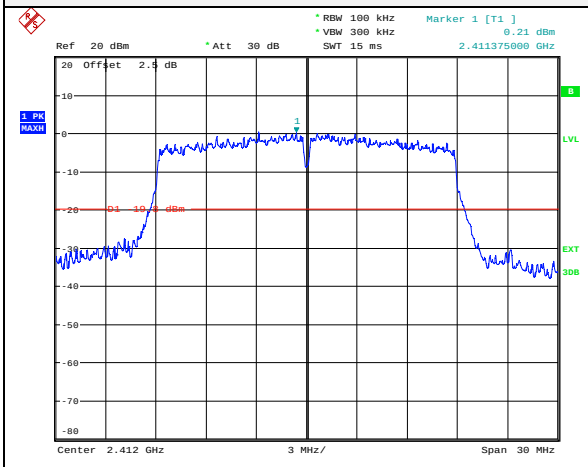
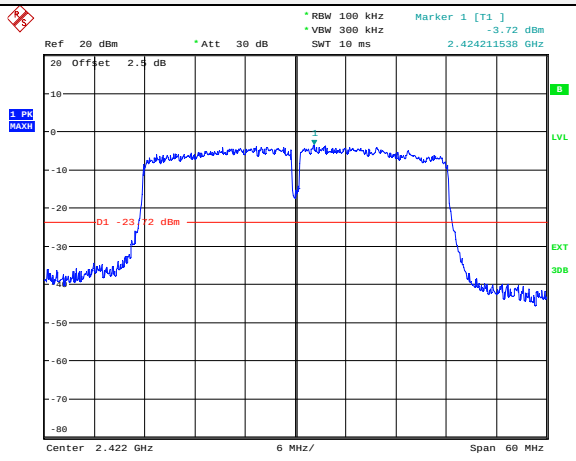
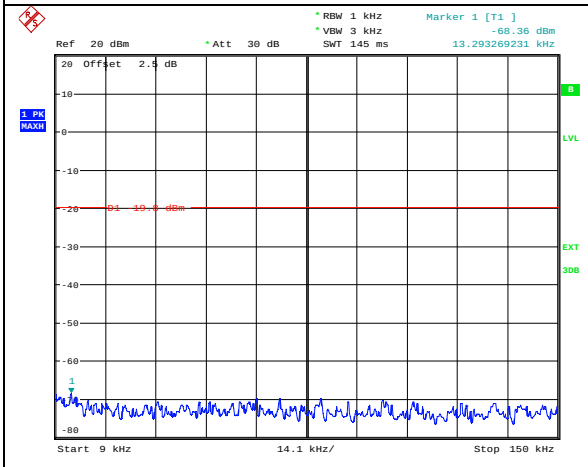
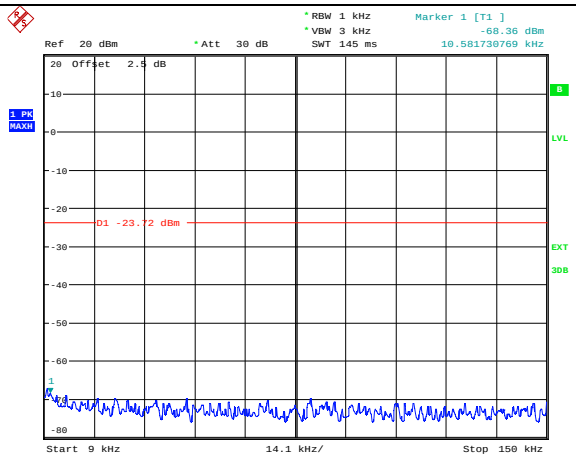
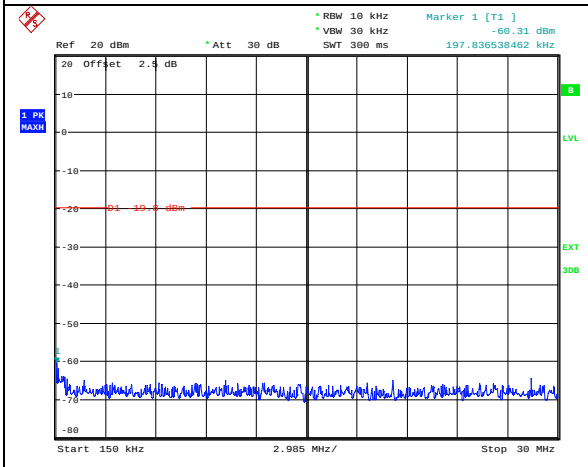
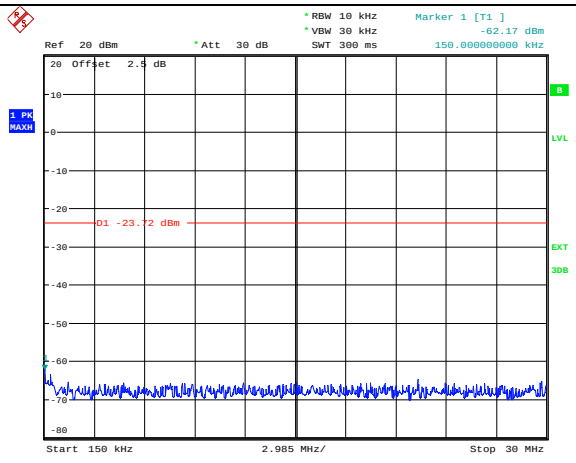
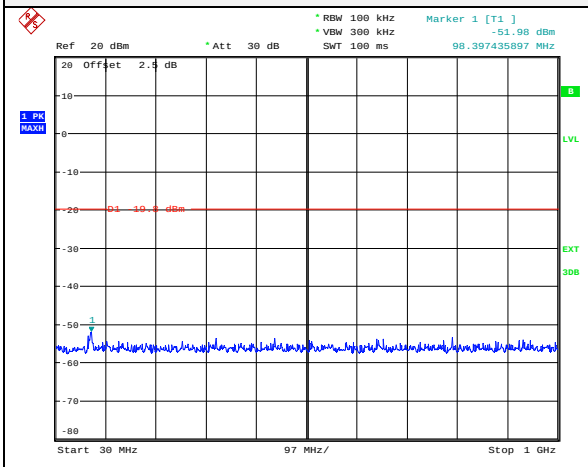
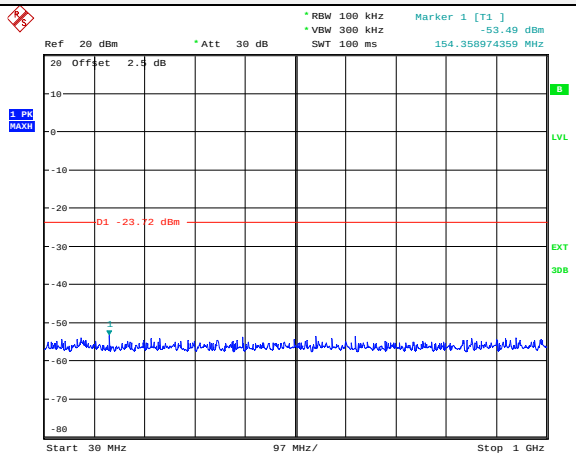
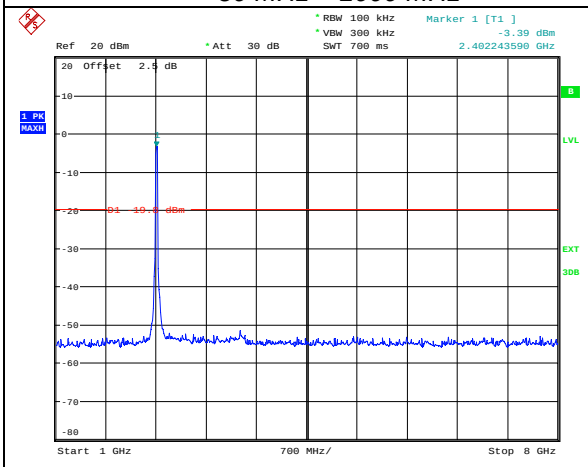
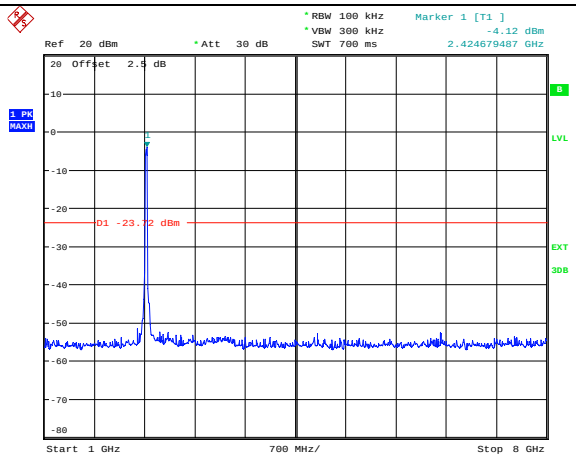
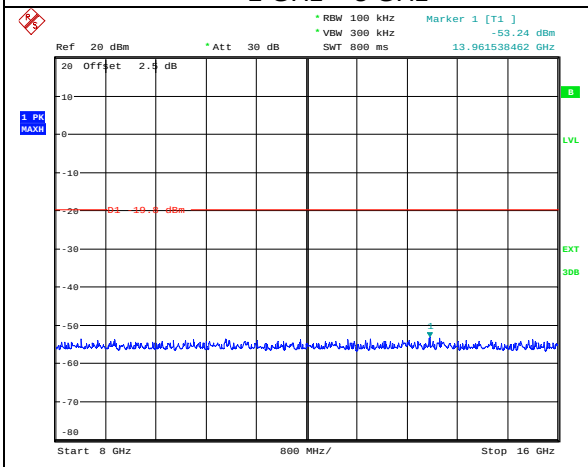
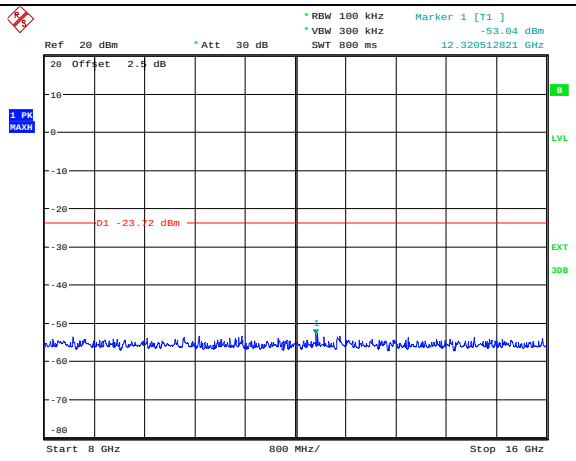
8 GHz – 16 GHz



Date: 24.NOV.2015 14:08:41

16 GHz – 26.5 GHz

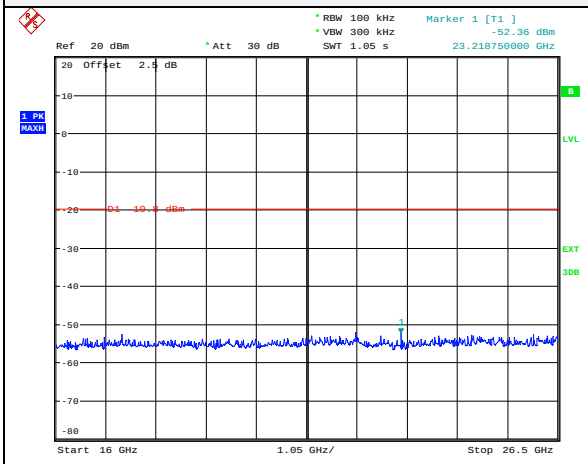
Band-edge measurements for RF conducted emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
2412 MHz	*2422 MHz*
	
2397 MHz – 2427 MHz	*2392 MHz – 2452 MHz*
	
9 KHz – 150 KHz	*9 KHz – 150 KHz*
	
150 KHz – 30 MHz	*150 KHz – 30 MHz*

Band-edge measurements for RF conducted emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
2412 MHz	*2422 MHz*
 Date: 24.NOV.2015 14:31:45	 Date: 24.NOV.2015 14:53:30
30 MHz – 1000 MHz	*30 MHz – 1000 MHz*
 Date: 24.NOV.2015 14:57:14	 Date: 24.NOV.2015 14:53:41
1 GHz – 8 GHz	*1 GHz – 8 GHz*
 Date: 24.NOV.2015 14:32:10	 Date: 24.NOV.2015 14:53:51
8 GHz – 16 GHz	*18 GHz – 16 GHz*

Band-edge measurements for RF conducted emissions

IEEE 802.11 n HT20

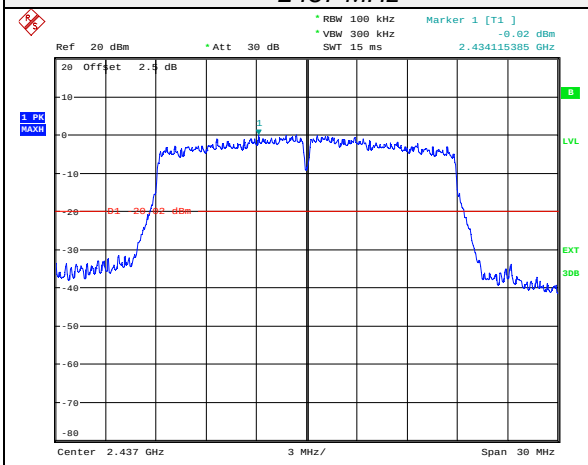
2412 MHz



Date: 24.NOV.2015 14:32:27

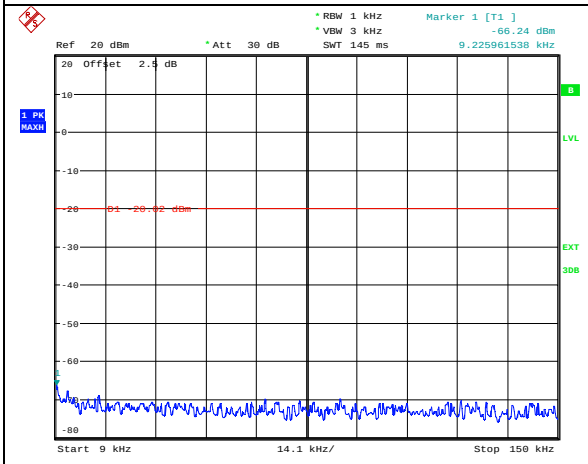
16 GHz – 26.5 GHz

2437 MHz



Date: 24.NOV.2015 14:29:19

2422 MHz – 2452 MHz

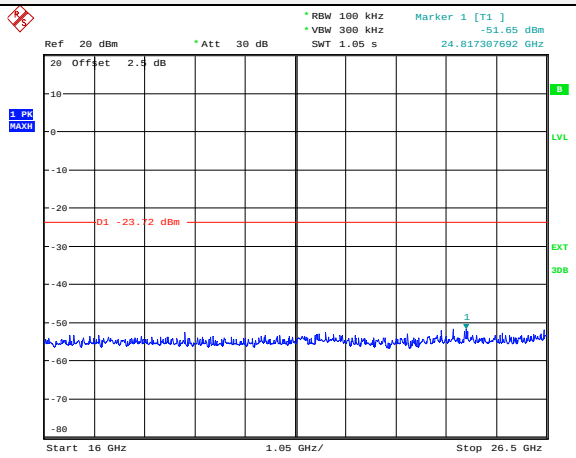


Date: 24.NOV.2015 14:29:36

9 KHz – 150 KHz

IEEE 802.11 n HT40

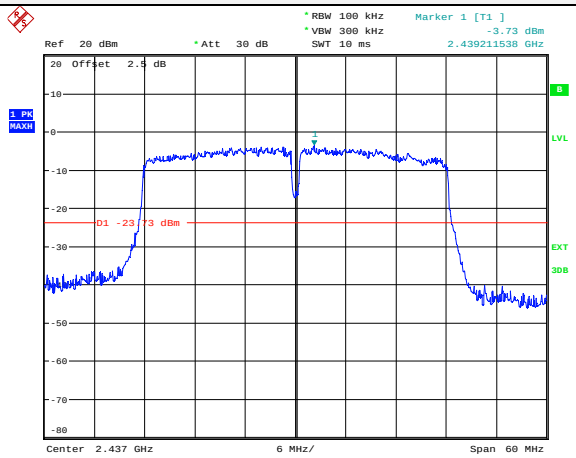
2422 MHz



Date: 24.NOV.2015 14:54:03

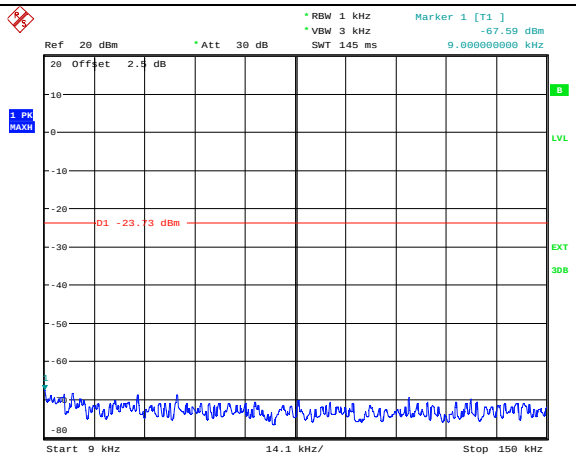
16 GHz – 26.5 GHz

2437 MHz



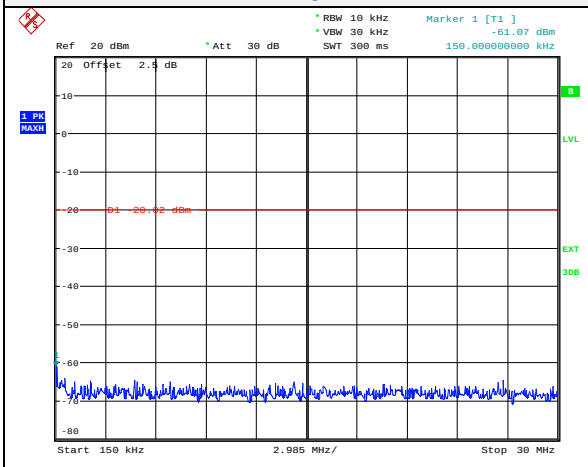
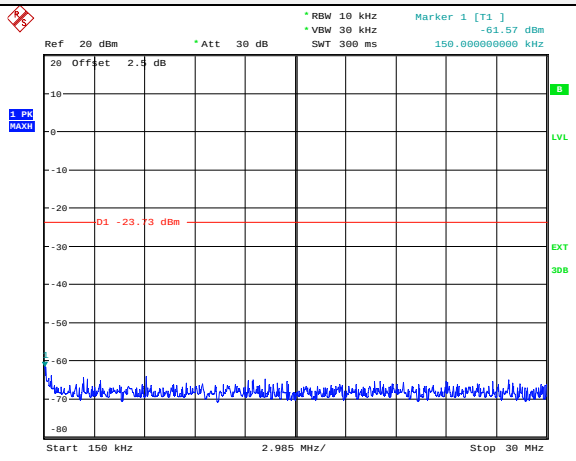
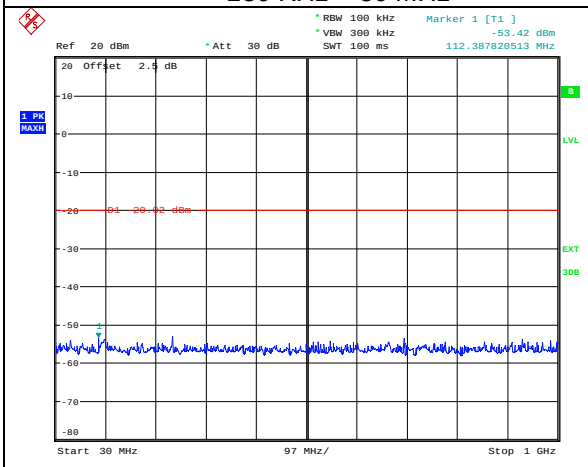
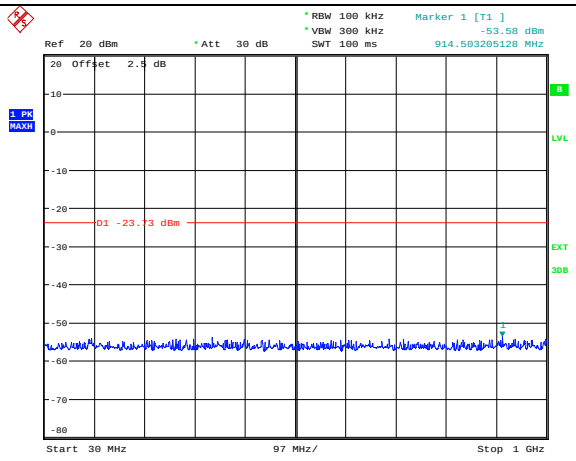
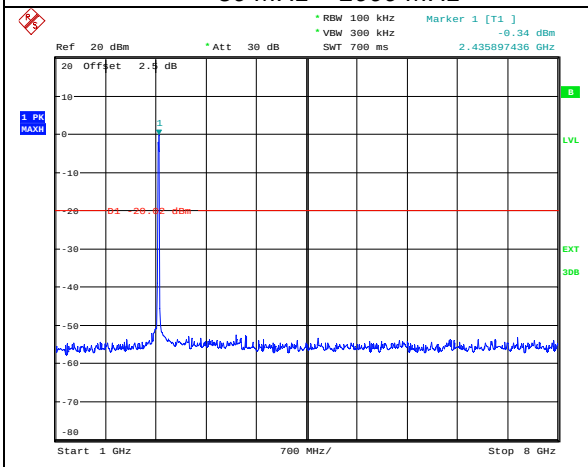
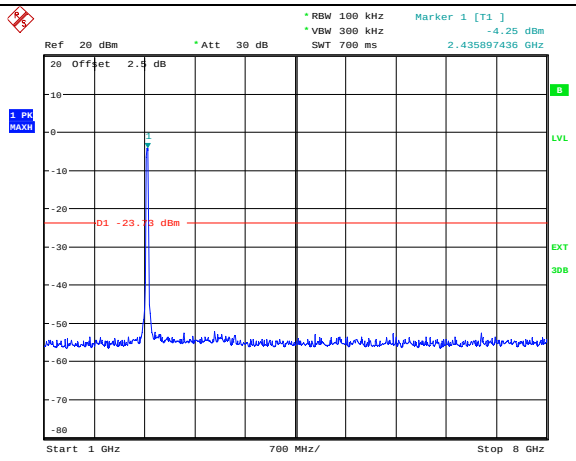
Date: 24.NOV.2015 14:50:33

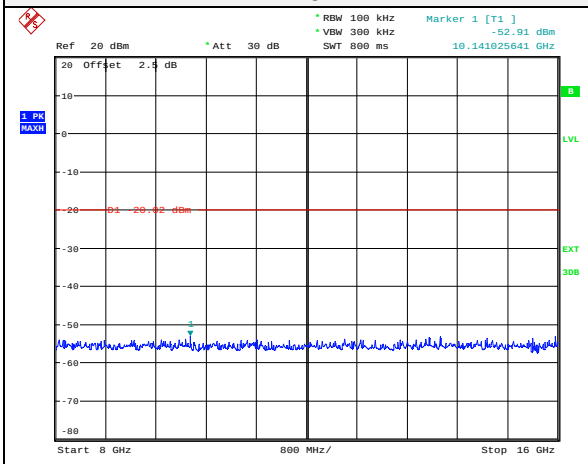
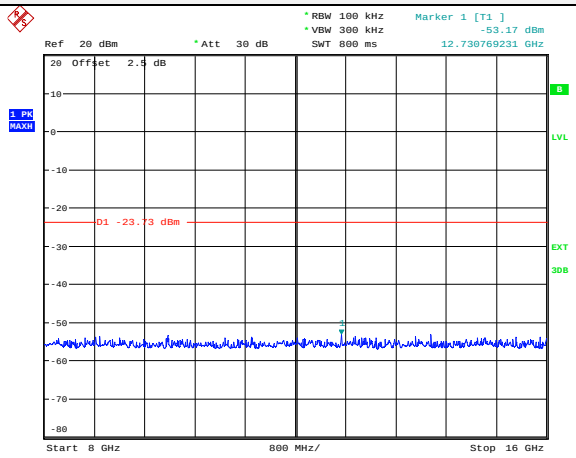
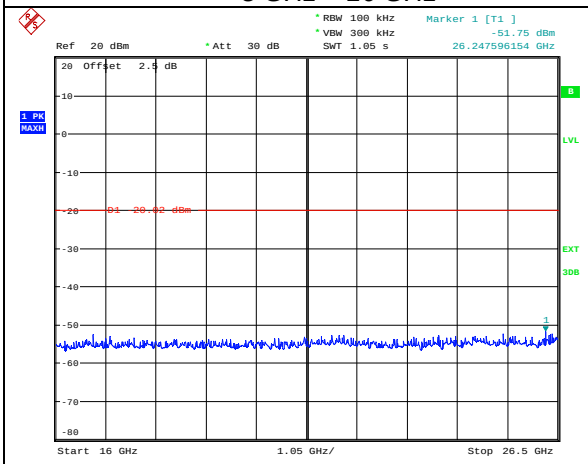
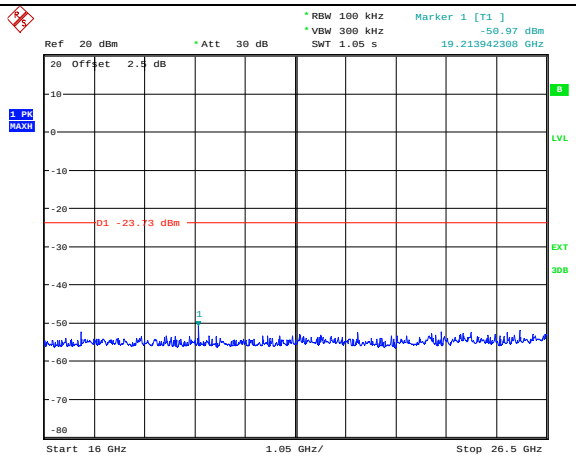
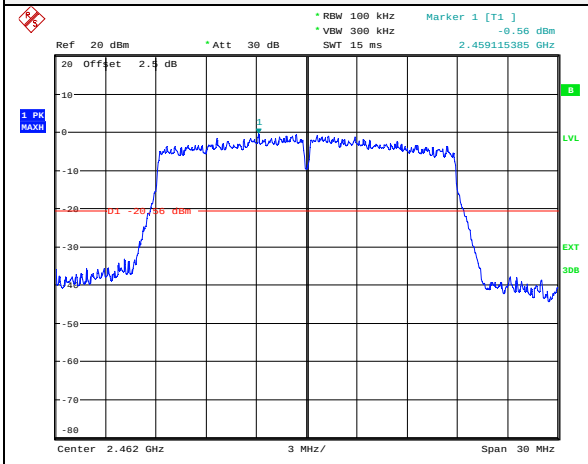
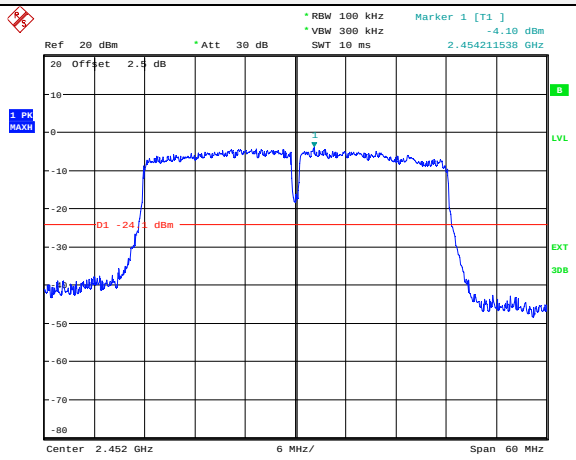
2407 MHz – 2467 MHz

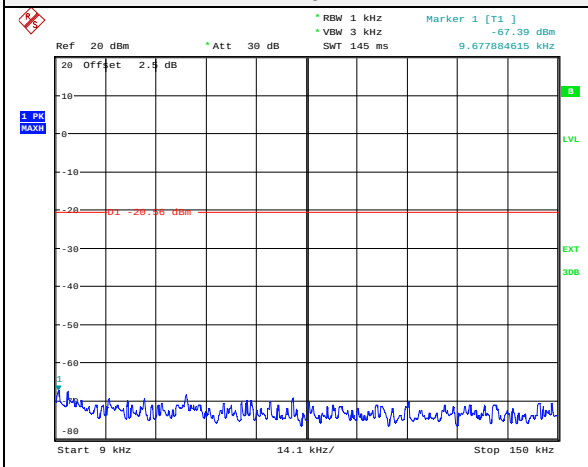
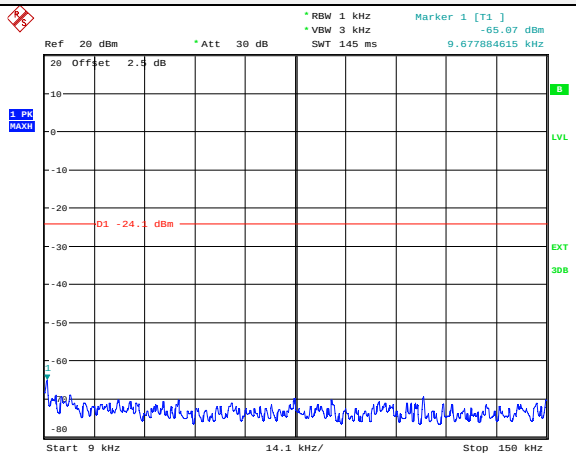
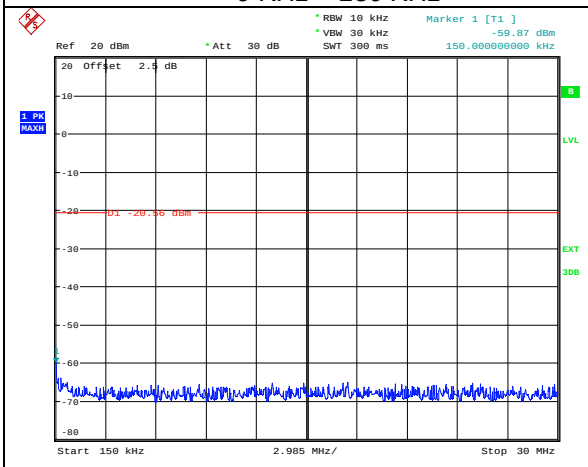
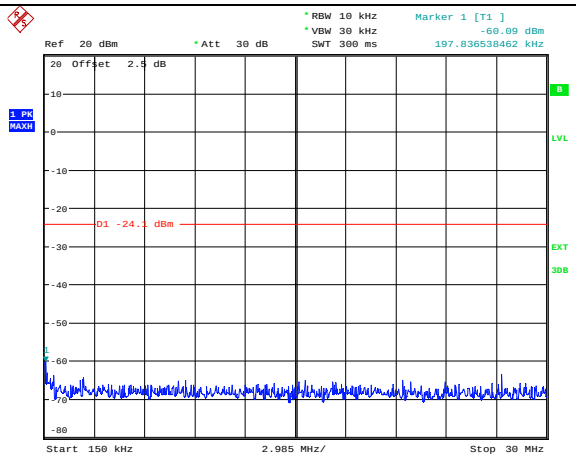
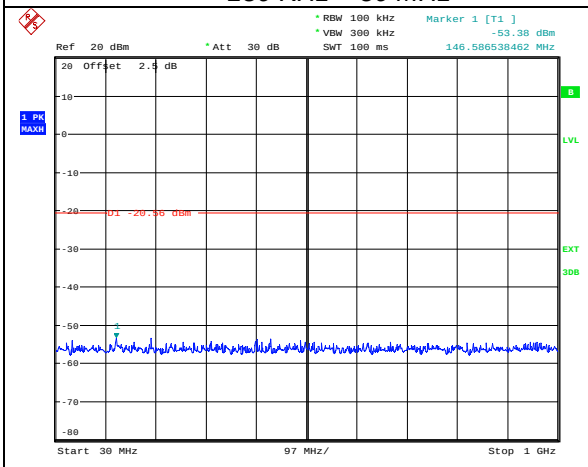
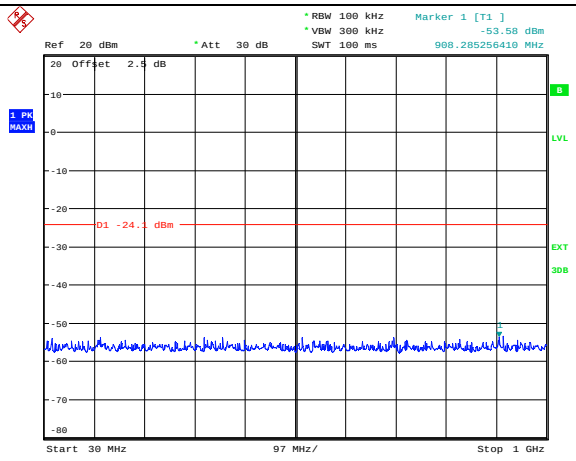


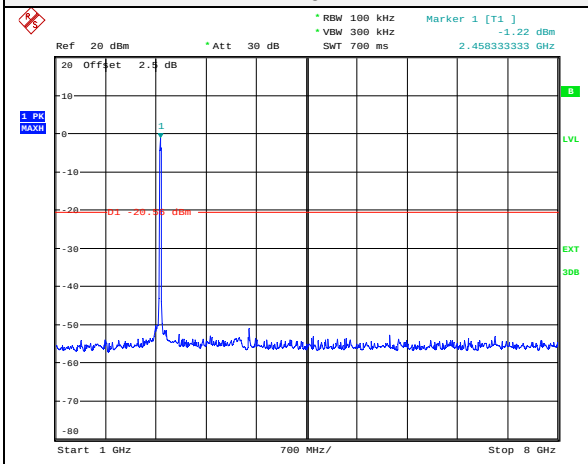
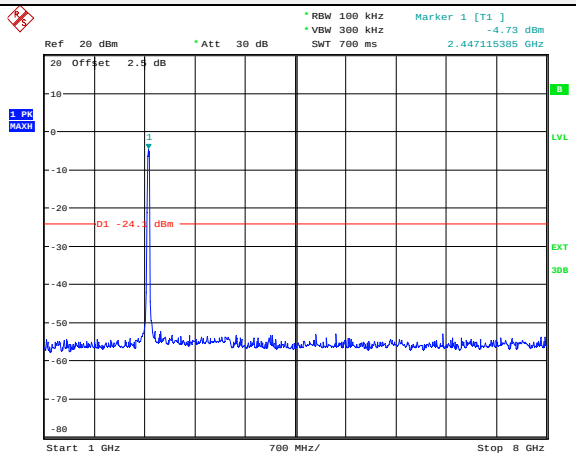
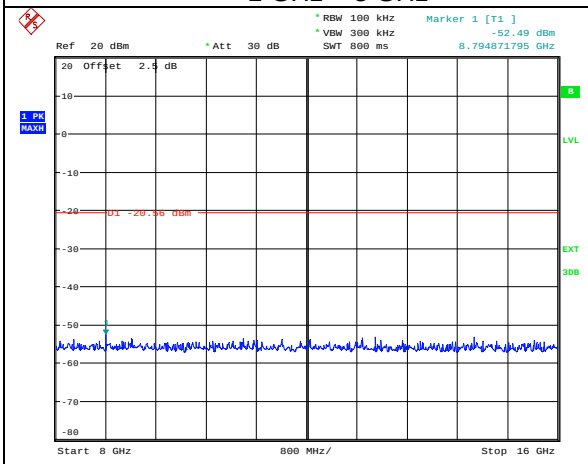
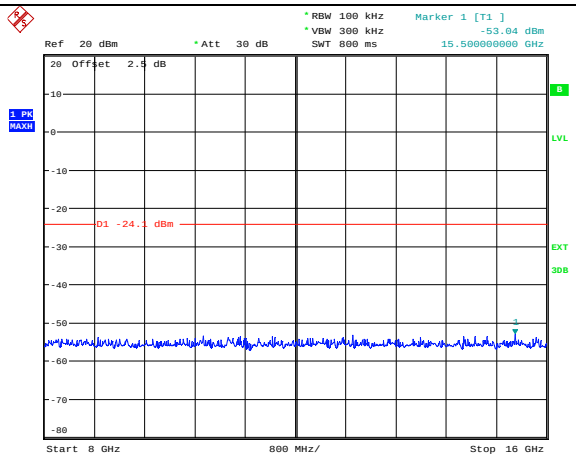
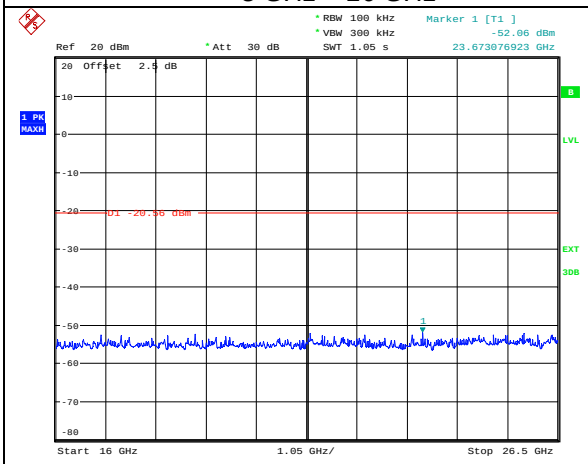
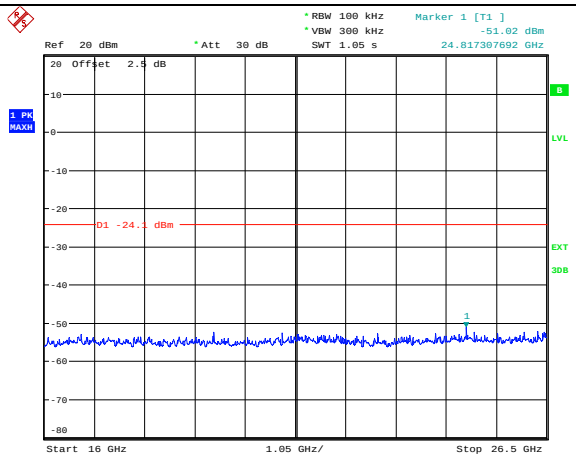
Date: 24.NOV.2015 14:50:47

9 KHz – 150 KHz

Band-edge measurements for RF conducted emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
2437 MHz	*2437 MHz*
	
150 KHz – 30 MHz	*150 KHz – 30 MHz*
	
30 MHz – 1000 MHz	*30 MHz – 1000 MHz*
	
1 GHz – 8 GHz	*1 GHz – 8 GHz*

Band-edge measurements for RF conducted emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
2437 MHz	*2437 MHz*
	
Date: 24.NOV.2015 14:30:23	Date: 24.NOV.2015 14:51:44
8 GHz – 16 GHz	*8 GHz – 16 GHz*
	
Date: 24.NOV.2015 14:30:36	Date: 24.NOV.2015 14:51:55
16 GHz – 26.5 GHz	*16 GHz – 26.5 GHz*
2462 MHz	*2452 MHz*
	
Date: 24.NOV.2015 14:24:51	Date: 24.NOV.2015 14:46:27
2447 MHz – 2477 MHz	*2422 MHz – 2482 MHz*

Band-edge measurements for RF conducted emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
2462 MHz	*2452 MHz*
 Date: 24.NOV.2015 14:25:10	 Date: 24.NOV.2015 14:46:40
9 KHz – 150 KHz	*9 KHz – 150 KHz*
 Date: 24.NOV.2015 14:25:24	 Date: 24.NOV.2015 14:46:53
150 KHz – 30 MHz	*150 KHz – 30 MHz*
 Date: 24.NOV.2015 14:25:39	 Date: 24.NOV.2015 14:47:06
30 MHz – 1000 MHz	*30 MHz – 1000 MHz*

Band-edge measurements for RF conducted emissions	
IEEE 802.11 n HT20	*IEEE 802.11 n HT40*
2462 MHz	*2452 MHz*
	
Date: 24.NOV.2015 14:25:50	Date: 24.NOV.2015 14:47:15
1 GHz – 8 GHz	*1 GHz – 8 GHz*
	
Date: 24.NOV.2015 14:26:02	Date: 24.NOV.2015 14:47:27
8 GHz – 16 GHz	*8 GHz – 16 GHz*
	
Date: 24.NOV.2015 14:26:14	Date: 24.NOV.2015 14:47:39
16 GHz – 26.5 GHz	*16 GHz – 26.5 GHz*

4.10. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Measurement

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.For normal WLAN devices, the DSSS mode is used.

Conducted power refer ANSI C63.10 :2009 Section 11.9 Output power test procedure for DTS devices
Radiated power refer to ANSI C63.10 :2009 Section 6.6.4 Radiated emissions tests.

Measurement parameters

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1MHz
Video bandwidth:	3MHz
Trace-Mode:	Max hold

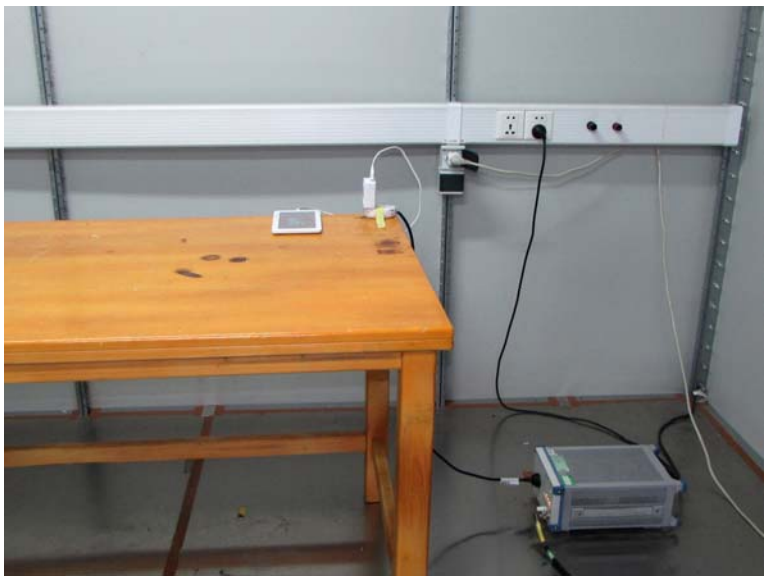
Limits

FCC	IC
Antenna Gain	
6 dBi	

Results

T_{nom}	V_{nom}	Lowest Channel 2412 MHz	Middle Channel 2437 MHz	Highest Channel 2462 MHz
Conducted power [dBm] Measured with DSSS modulation		12.01	11.72	11.25
Conducted power [dBm] Measured with DSSS modulation		10.26	10.87	9.72
Gain [dBi] Calculated		-1.75	-0.85	-1.53
Measurement uncertainty		± 0.60 dB (cond.) / ± 2.56 dB (rad.)		

5. Test Setup Photos of the EUT



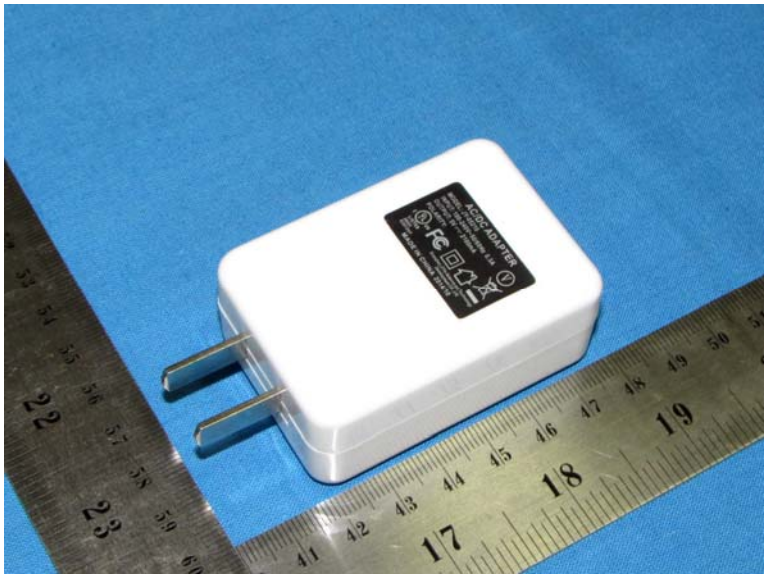
6. External and Internal Photos of the EUT

External Photos

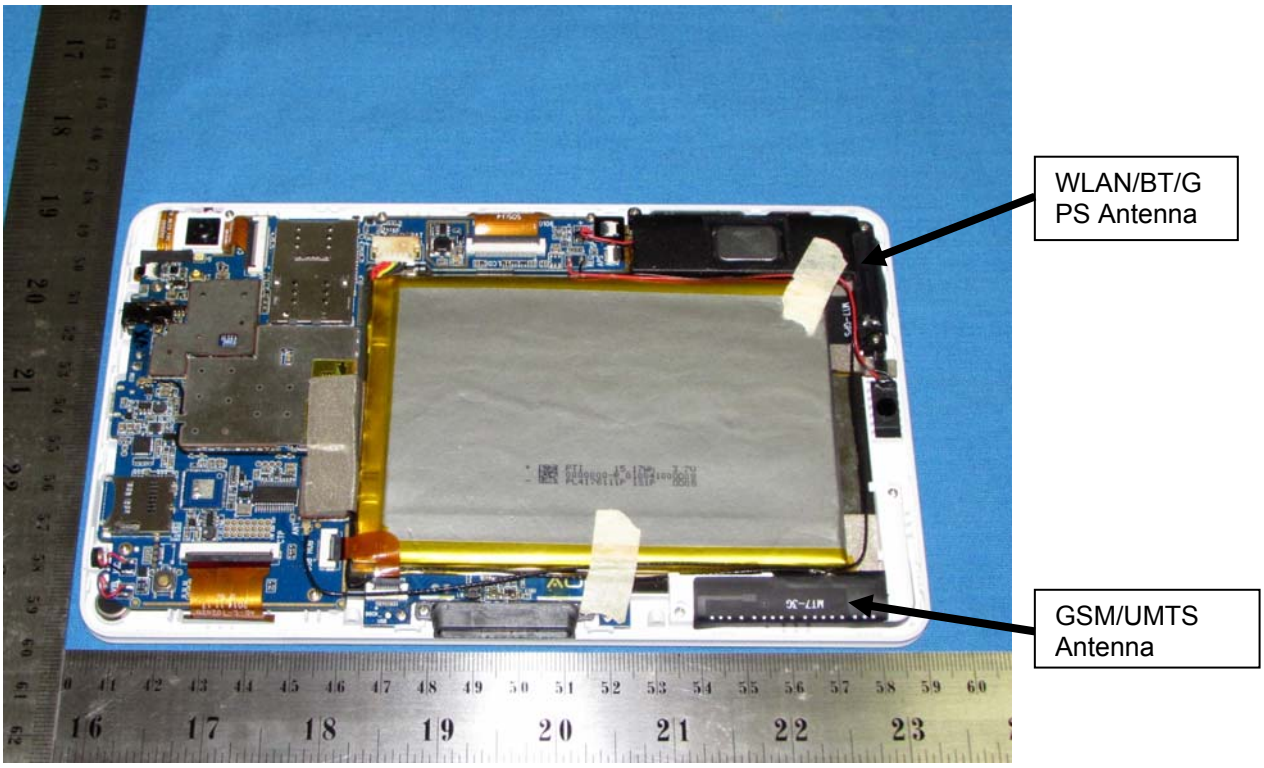

PLDT
HOME
TELPAD

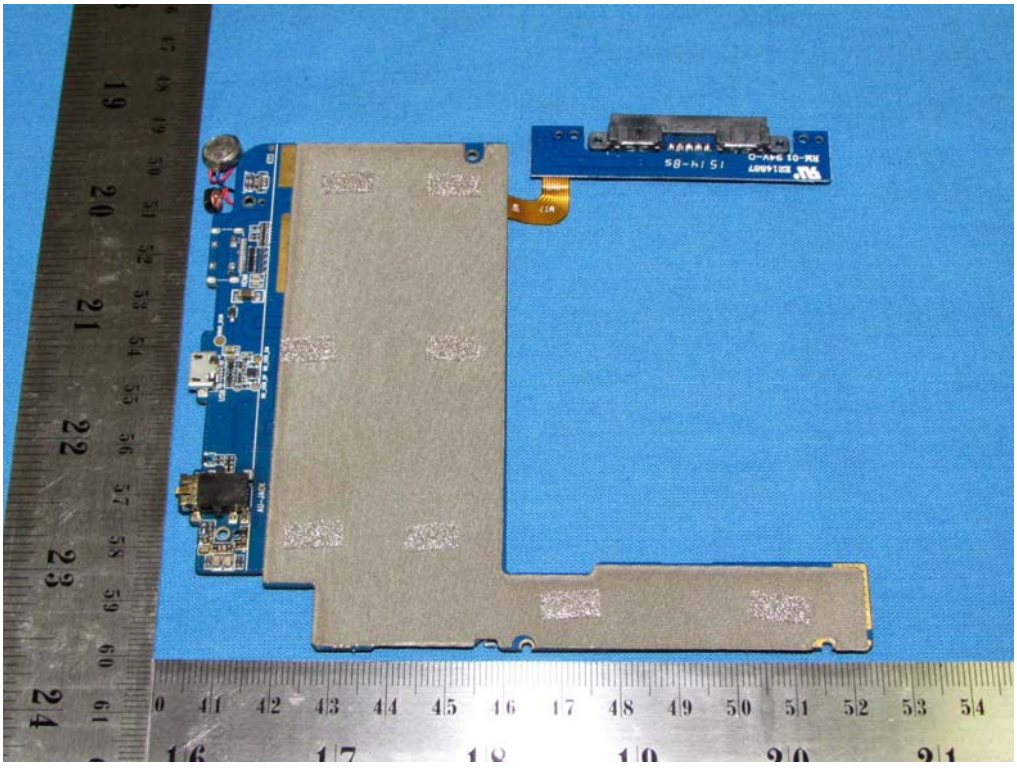

PLDT
HOME
TELPAD

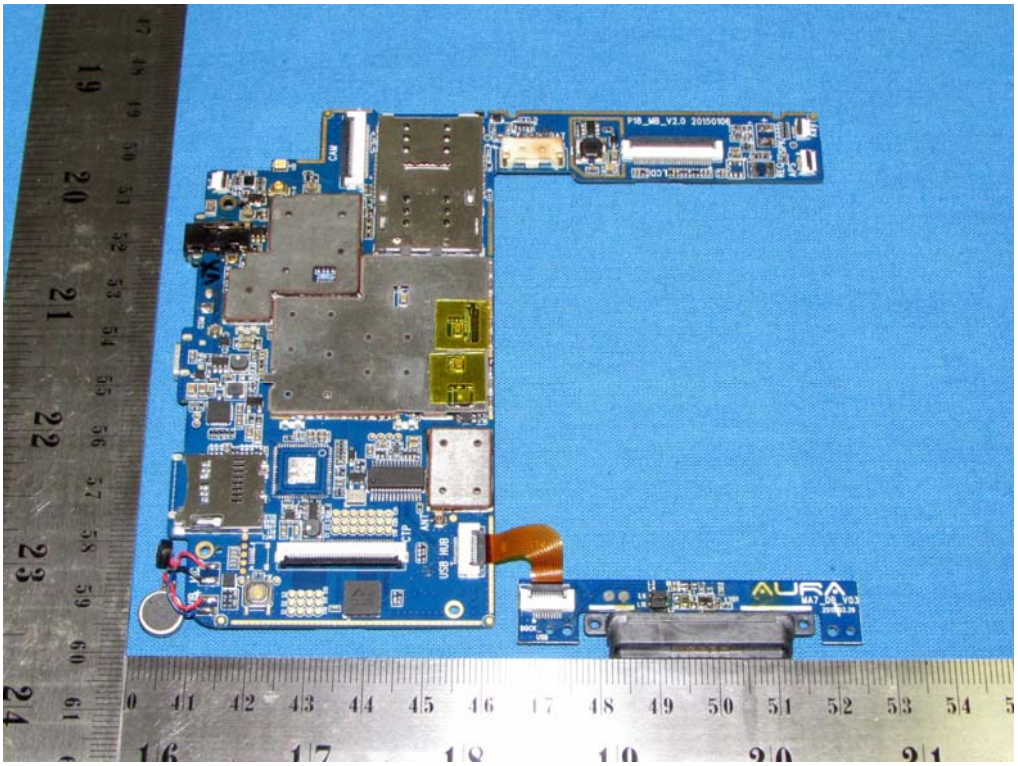

PLDT
HOME
TELPAD

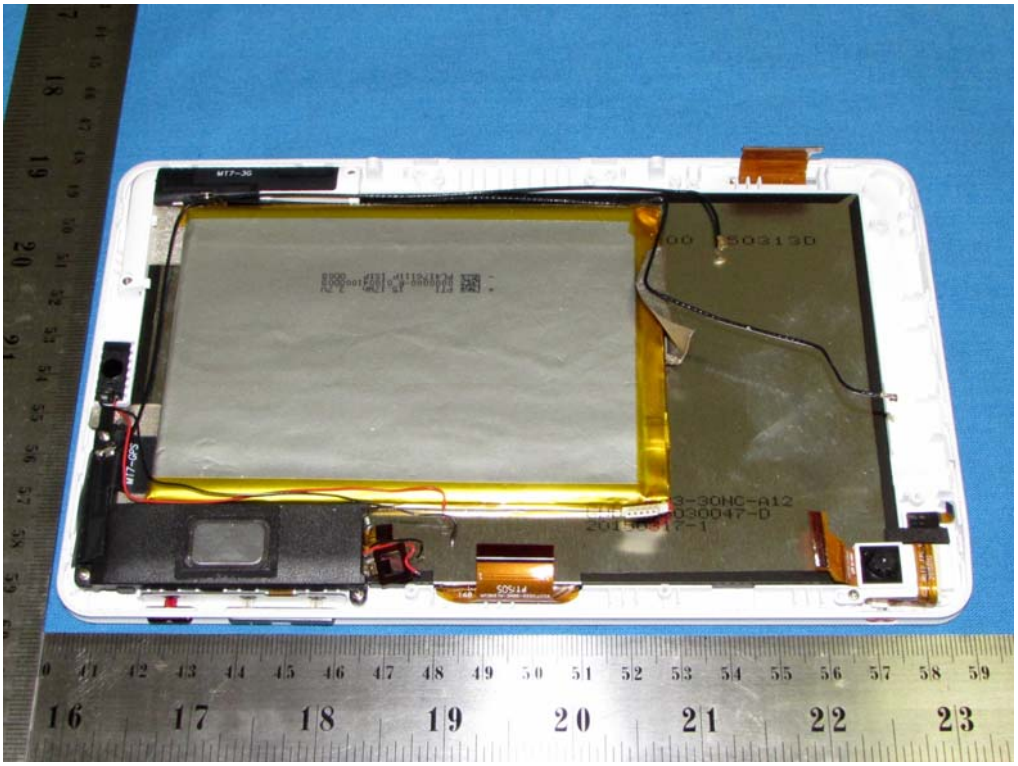


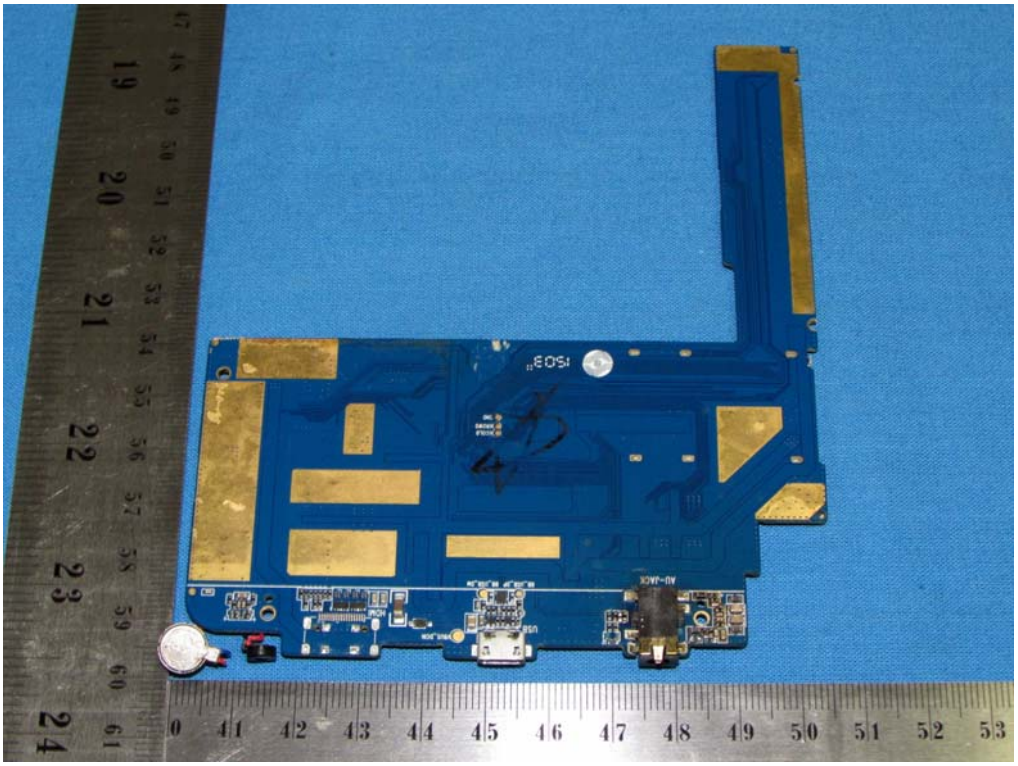
Internal Photos

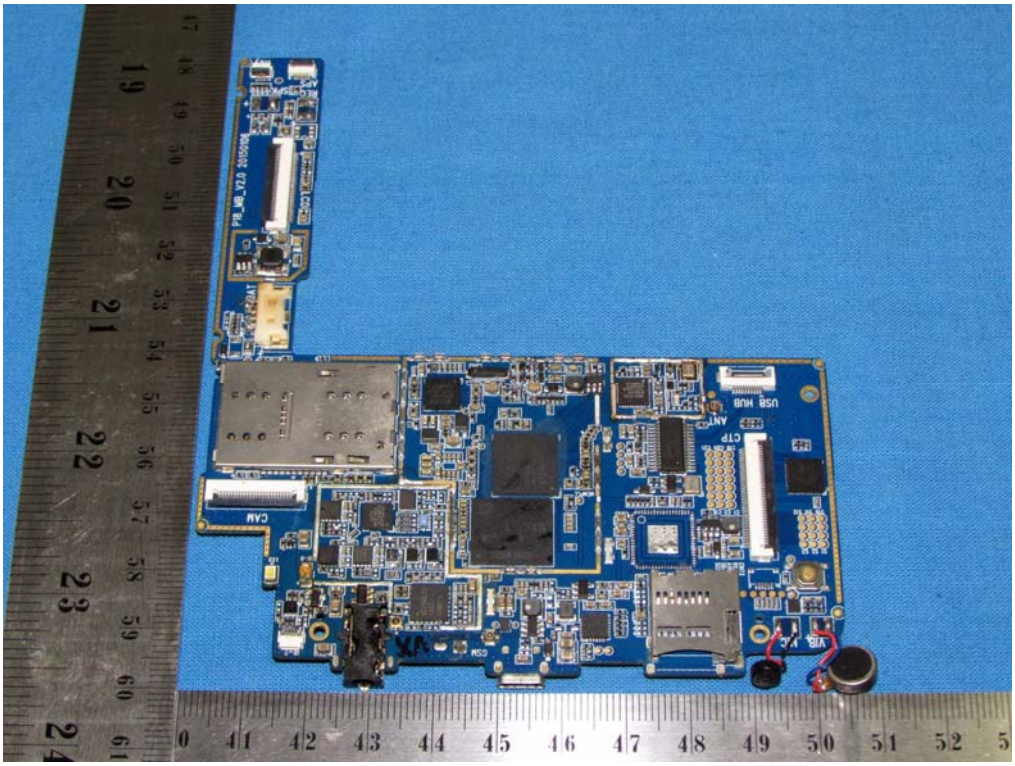












.....End of Report.....