WIFI Test Report

Application Purpose	:	Original grant
Applicant Name:	:	Wavetec FZCO
FCC ID	:	2AGQF-WT-TDU
Equipment Type	:	TDU Lite
Model Name	:	M-13 TDU Lite with Bixilon Printer
Report Number	:	FCC15103235
Standard(S)	:	FCC Part 15 Subpart C
Date Of Receipt	:	January 14, 2016
Date Of Issue	:	January 23, 2016

Test By : Fall Ma

(Fall Ma)

Reviewed By : Robie Chen

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(Registration Number: 939433)

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	January 23, 2015	Valid	Original Report

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1. GENERAL INFORMATION

GENERAL DESCRIPTION OF EUT

Test Model	M-13 TDU Lite with Bixilon Printer
Derivative Model Name	M-13 TDU Lite with Custom Printer M-13 Feedback Lite
Model difference	All models are identical in circuitry and electrical, mechanical and physical construction, only different on model name and color. All tests are carried out on M-13 TDU Lite with Bixilon Printer
Applicant	Wavetec FZCO
Address	Light Industrial Unit #9 Dubai Silicon Oasis P.O.Box 341133 Dubai,United Arab Emirates
Manufacturer	Wavetec FZCO
Address	Light Industrial Unit #9 Dubai Silicon Oasis P.O.Box 341133 Dubai,United Arab Emirates
Equipment Type	TDU Lite
Brand Name	N/A
Hardware version:	N/A
Software version:	N/A
Extreme Temp. Tolerance	-10℃ to +50℃
EUT Power Rating	Input: AC110~240V 0.15A 35W
Operating Frequency	2412-2462MHz
Channels	11 for 802.11b/g/n HT-20 9 for 802.11n HT-40
Channel Spacing	5MHz
Modulation Type	CCK for IEEE 802.11b OFDM for IEEE 802.11g/n HT-20/n HT-40
Antenna Type:	Integral Antenna
Antenna gain:	2dBi
Data of receipt	December 14, 2015
Date of test	December 14, 2015 to December 24, 2015
Deviation	None
Condition of Test Sample	Normal

We hereby certify that:

The above equipment was tested by Shenzhen WST Testing Technology Co., Ltd.
1F,No.9 Building, TGK Science & Technology ParkYangtian Rd., NO.72 Bao'an Dist., GuangDong, China
Registration Number: 939433
The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2009. The sample tested as described in this report is in compliance with the FCC Rules Part15 Subpart C.
The test results of this report relate only to the tested sample identi

2. TEST DESCRIPTION

2.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±3.2dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(<1G)	±4.7dB
5	All emissions, radiated(>1G)	±4.7dB
6	Temperature	±0.5°C
7	Humidity	±2%

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11b
Mode 2	802.11g
Mode 3	802.11n20
Mode 4	802.11n40
Mode 5	Keep WIFI Transmitting

For Conducted Emission	
Final Test Mode	Description
Mode 5	Keep WIFI Transmitting

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b
Mode 2	802.11g
Mode 3	802.11n20
Mode 4	802.11n40
Mode 5	Keep WIFI Transmitting

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) Record the worst case of each test item in this report.

(3) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%

(4)Keep WIFI Transmitting is that the EUT was controlled by fixed-frequency software.

2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

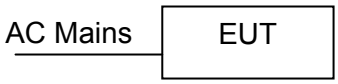
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of DSSS.

The wifi power control level, channel, bandwidth and transmitter rate are controlled by fix-frequency software.

Test software Version	N/A
Test program	N/A

Frequency(802.11b/g/n20)	2412 MHz	2437 MHz	2462 MHz
Frequency(802.11n40)	2422 MHz	2437 MHz	2452 MHz

2.4 CONFIGURATION OF SYSTEM UNDER TEST



(EUT: TDU Lite)

2.5 PERIPHERALS EQUIPMENT LIST

Item	Equipment	Model No.	ID or Specification	Remark
1	N/A	N/A	N/A	N/A

2.6 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	Adapter	N/A	WTA0502000USB1	N/A	Input: AC100-240V 50/60Hz 0.3A Output: DC 5.0V 2000mA

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) During test, the power level, channel, bandwidth and rate of WIFI transmitting are controlled by fixed-frequency software.
(3) The adapter supply by the applicant.

3. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.107 & 15.207	Conducted Emission Test	PASS	Complies
15.247(a)(2) Limit	Spectrum bandwidth of a Orthogonal Frequency Division Multiplex System Limit: 6dB bandwidth>500kHz	PASS	Complies
15.247(b)	Maximum peak outputpower Limit: max. 30dBm	PASS	Complies
15.109,15.205 & 15.209	Transmitter Radiated Emission Limit: Table 15.209	PASS	Complies
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Complies
15.247(d)	Out of Band Emission and Restricted Band Radiation Limit: 20dB less than peak value of fundamental frequency Restricted band limit: Table 15.209	PASS	Complies

NOTE:

(1)” N/A” denotes test is not applicable in this test report.

4. MEASUREMENT INSTRUMENTS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibrated	Calibrated until
ESPI Test Receiver	R&S	ESPI	100379	2015-08-19	2016-08-18
EMI Test Receiver	R&S	ESCI	100005	2015-08-19	2016-08-18
LISN	Mestec	AN3016	04/10040	2015-08-19	2016-08-18
Coaxial cable	Megalon	LMR400	C001	2015-08-19	2016-08-18
System Controller	CT	SC100	011208	2015-08-19	2016-08-18
Bi-log Antenna	Chase	CBL6111C	2576	2015-08-19	2016-08-18
Spectrum analyzer	R&S	FSU26	200409	2015-08-19	2016-08-18
Horn Antenna	SCHWARZBECK	9120D	1141	2015-08-19	2016-08-18
Loop Antenna	EMCO	6502	00042960	2015-08-22	2016-08-21
Pre Amplifier	H.P.	HP8447E	2945A02715	2015-10-13	2016-10-12
Pre-Amplifier	CDSI	PAP-1G18-38	7621	2015-10-13	2016-10-12
8*4*3 Anechoic	SAEMC	L×W×H 8×4×3	A001	2015-08-21	2016-08-20
9*6*6 Anechoic	SAEMC	L×W×H 9×6×6	A002	2015-08-21	2016-08-20
Power meter	Anritsu	ML2487A	6K00003613	2015-08-23	2016-08-22
MXA Signal Analyzer	Aglient	N9020A	54123254	2015-08-19	2016-08-18
Power sensor	Anritsu	MX248XD	95327410	2015-08-19	2016-08-18
RF cable	H+S	SUCOFLEX 102	R002	2015-08-19	2016-08-18
Horn Antenna	SCHWARZBECK	BBHA 9170	1123	2015-08-19	2016-08-18
Antenna connector	muRata	MM9329-2700	R003	2015-08-19	2016-08-18

I/O CABLES (Conducted Setup)

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
/	/	/	/	/	/	/

5. EMC EMISSION TEST

5.1 CONDUCTED EMISSION MEASUREMENT

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

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

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

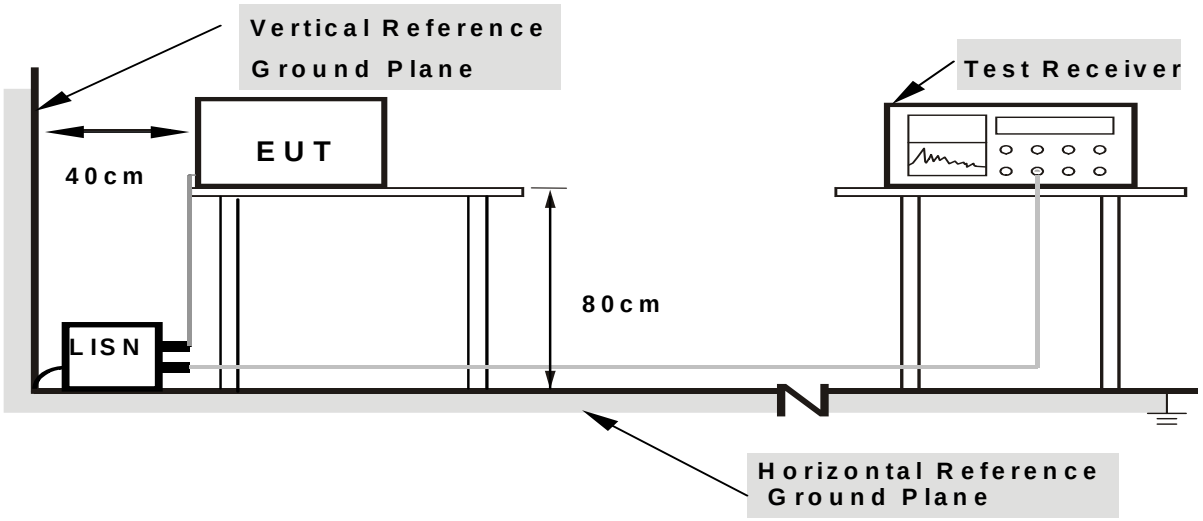
5.1.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.1.3 DEVIATION FROM TEST STANDARD

No deviation

5.1.4 TEST SETUP



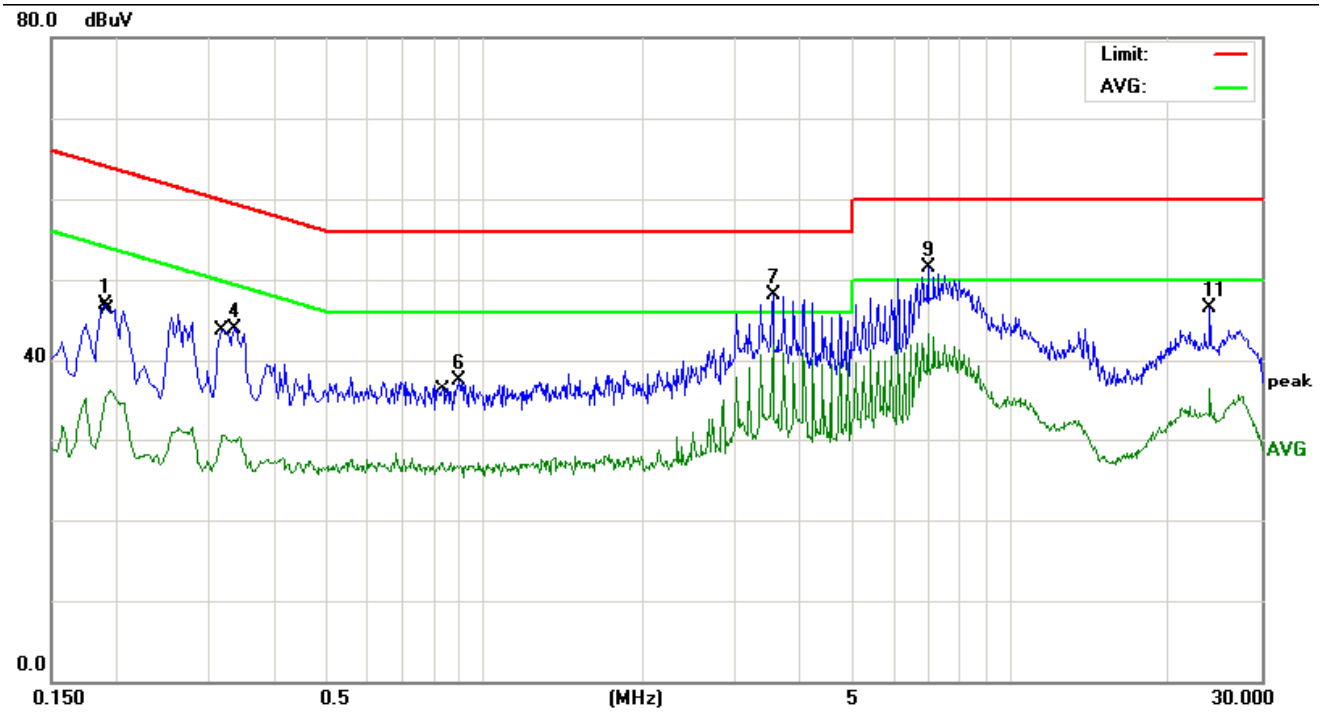
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

5.1.5 EUT OPERATING CONDITIONS

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

5.1.6 TEST RESULTS

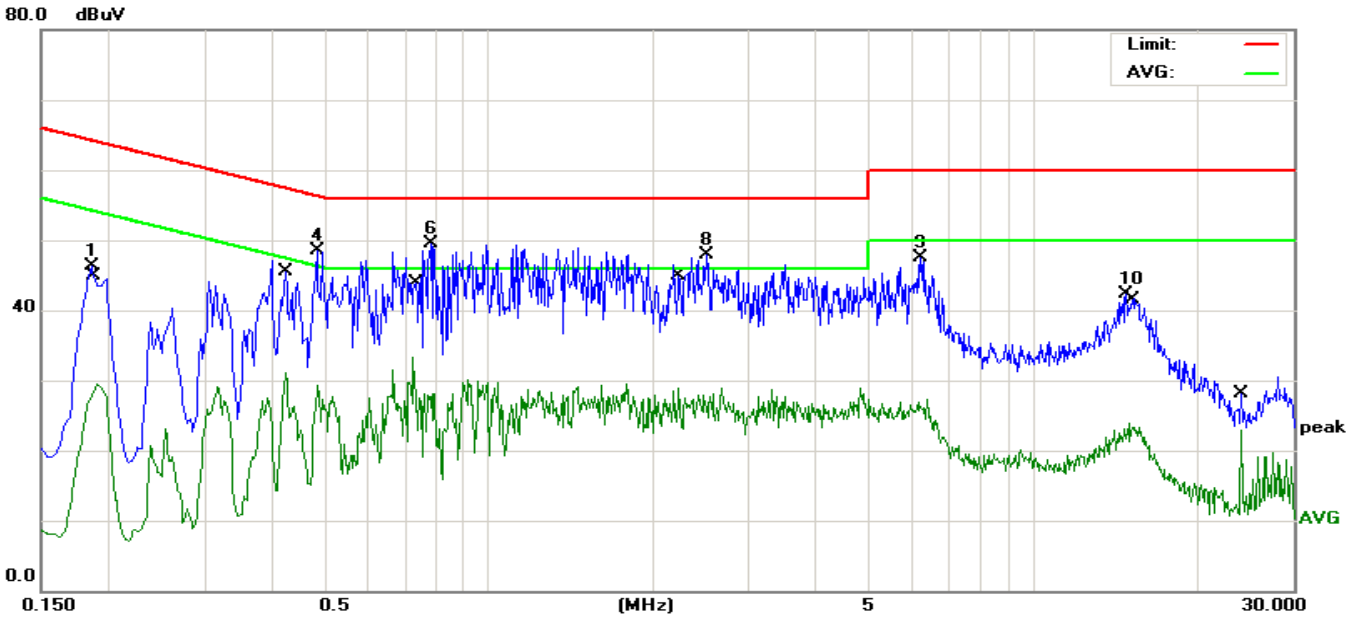
EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	26 ℃	Relative Humidity	54%
Pressure	1010hPa	Phase	L
Test Date	December 16, 2015	Test Mode	Keep WIFI Transmitting
Voltage	120V/60Hz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1900	36.49	10.33	46.82	64.03	-17.21	peak
2		0.1940	25.74	10.32	36.06	53.86	-17.80	AVG
3		0.3180	19.89	10.62	30.51	49.76	-19.25	AVG
4		0.3339	33.28	10.60	43.88	59.35	-15.47	peak
5		0.8340	16.52	10.65	27.17	46.00	-18.83	AVG
6		0.8980	26.63	10.94	37.57	56.00	-18.43	peak
7		3.5300	37.36	10.66	48.02	56.00	-7.98	peak
8	*	3.5300	31.22	10.66	41.88	46.00	-4.12	AVG
9		6.9740	40.99	10.52	51.51	60.00	-8.49	peak
10		6.9740	32.78	10.52	43.30	50.00	-6.70	AVG
11		24.0020	35.93	10.54	46.47	60.00	-13.53	peak
12		24.0020	25.67	10.54	36.21	50.00	-13.79	AVG

Remark: All the modes have been investigated, and only worst mode is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	26 ℃	Relative Humidity	54%
Pressure	1010hPa	Phase	N
Test Date	December 16, 2015	Test Mode	Keep WIFI Transmitting
Voltage	120V/60Hz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1860	35.88	10.34	46.22	64.21	-17.99	peak
2		0.1900	19.09	10.33	29.42	54.03	-24.61	AVG
3		0.4220	20.68	10.48	31.16	47.41	-16.25	AVG
4		0.4820	38.06	10.42	48.48	56.30	-7.82	peak
5		0.7260	22.47	10.80	33.27	46.00	-12.73	AVG
6	*	0.7820	38.89	10.57	49.46	56.00	-6.54	peak
7		2.2340	18.34	10.61	28.95	46.00	-17.05	AVG
8		2.5059	37.22	10.62	47.84	56.00	-8.16	peak
9		6.1940	36.82	10.62	47.44	60.00	-12.56	peak
10		14.7940	31.83	10.39	42.22	60.00	-17.78	peak
11		14.9660	13.43	10.39	23.82	50.00	-26.18	AVG
12		24.0340	12.46	10.37	22.83	50.00	-27.17	AVG

Remark: All the modes have been investigated, and only worst mode is presented in this report.

5.2 RADIATED EMISSION MEASUREMENT

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

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

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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

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

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

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

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

5.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

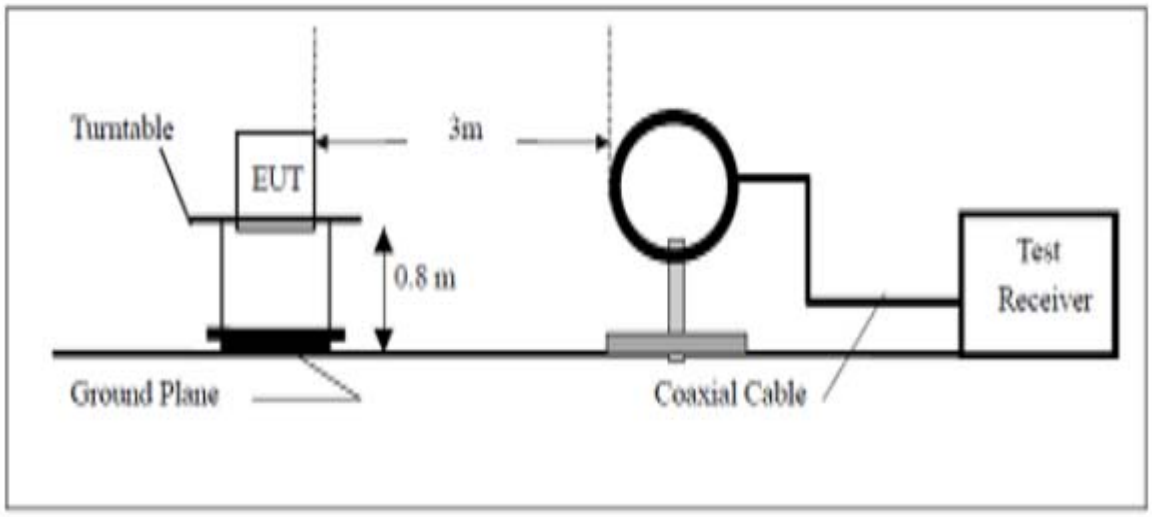
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

5.2.3 DEVIATION FROM TEST STANDARD

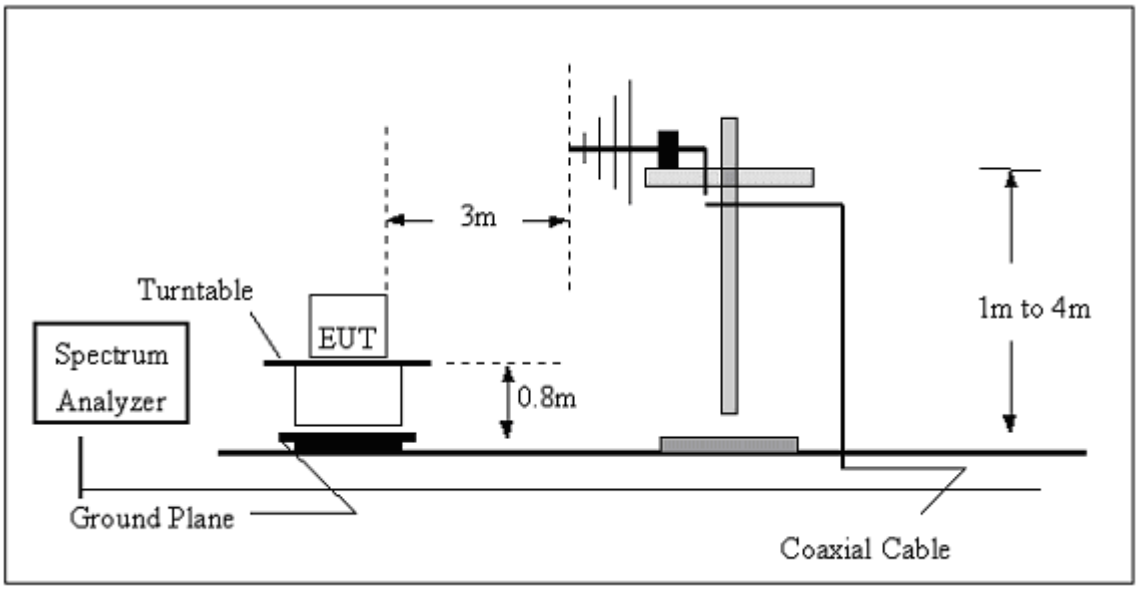
No deviation

5.2.4 TEST SETUP

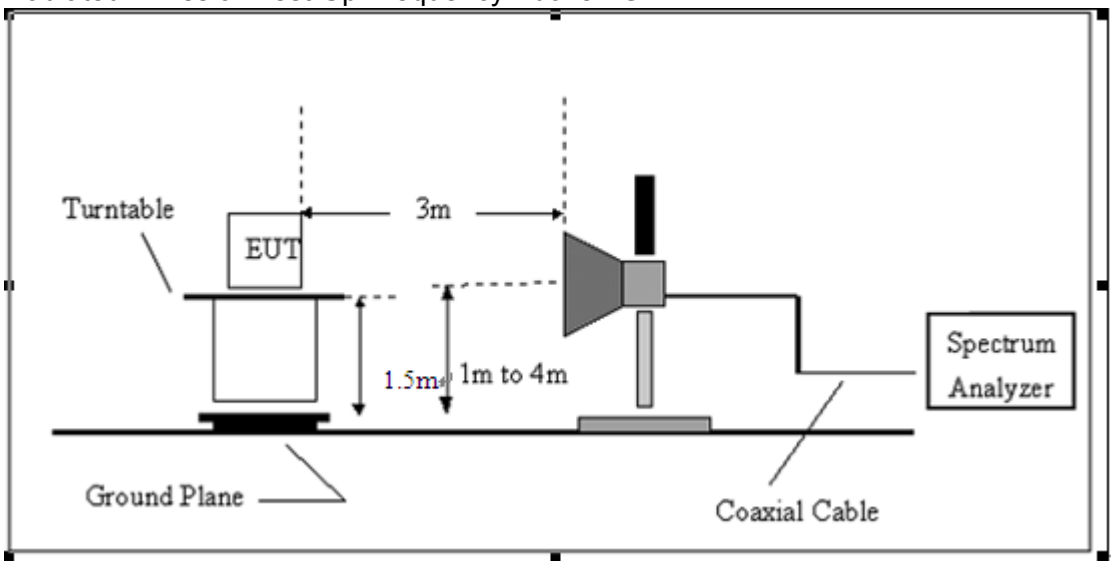
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



5.2.5 EUT OPERATING CONDITIONS

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

5.2.5.1 RESULTS (BELOW 30 MHZ)

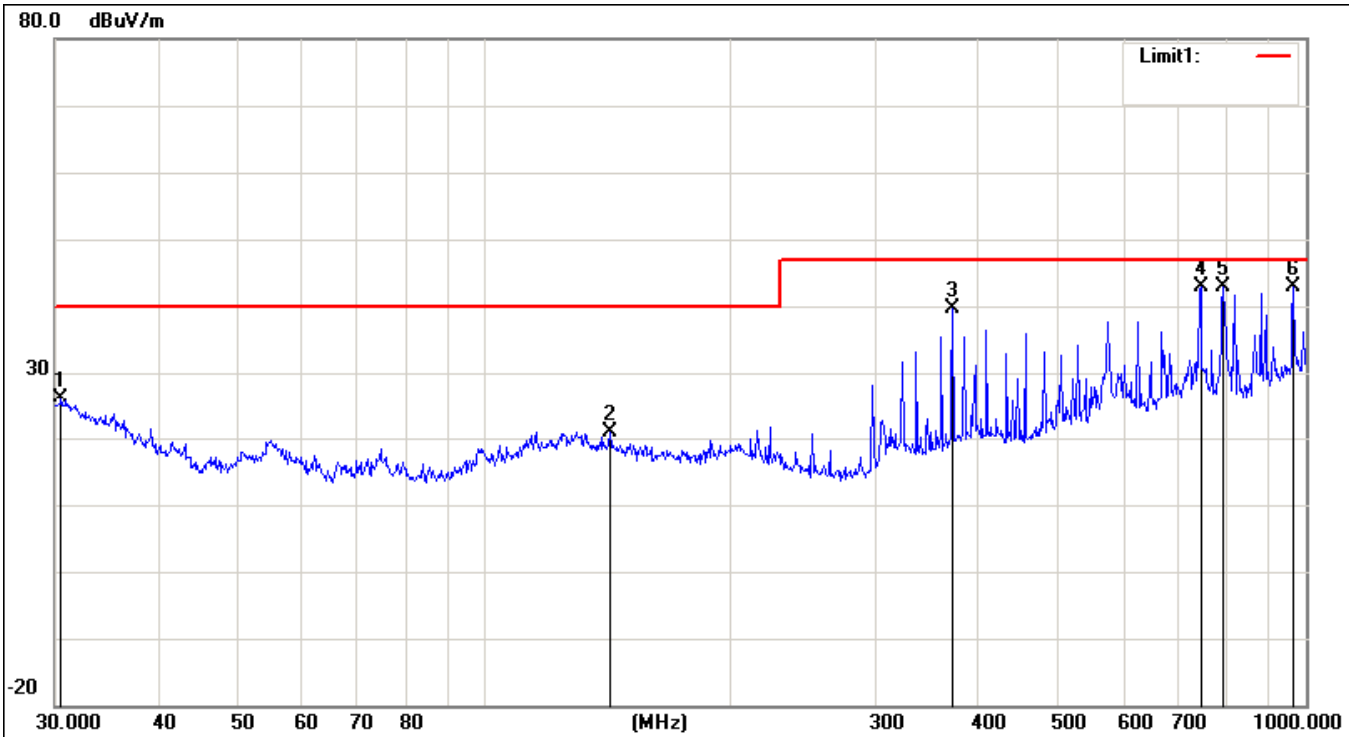
EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Polarization	---
Test Mode	Keep WIFI Transmitting	Test Date	December 16, 2015

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

NOTE:
No result in this part for margin above 20dB.
Distance extrapolation factor =20 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuV) + distance extrapolation factor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

5.2.5.2 TEST RESULTS (BETWEEN 30M – 1000 MHZ)

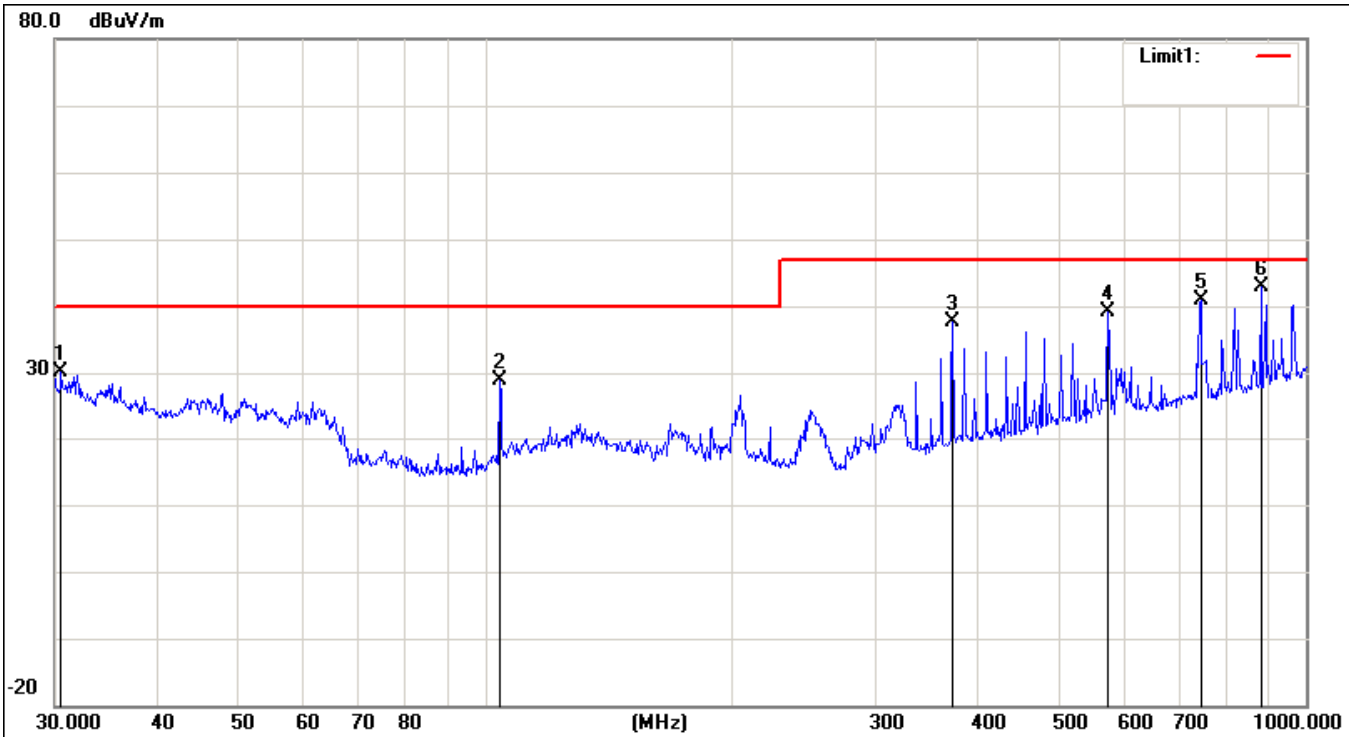
EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Polarization :	Horizontal
Test Mode	Keep WIFI Transmitting	Test Date	December 16, 2015



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		30.5304	23.08	3.13	26.21	40.00	-13.79	peak
2		141.8262	24.13	-3.19	20.94	40.00	-19.06	peak
3		372.0045	43.25	-3.55	39.70	47.00	-7.30	peak
4	*	744.8659	39.40	3.58	42.98	47.00	-4.02	peak
5		793.3958	38.71	4.09	42.80	47.00	-4.20	peak
6		965.5421	19.98	22.79	42.77	47.00	-4.23	peak

Remark: All the modes have been investigated, and only worst mode is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Polarization :	Vertical
Test Mode	Keep WIFI Transmitting	Test Date	December 16, 2015



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		30.5304	27.10	3.13	30.23	40.00	-9.77	peak
2		104.1701	34.01	-5.18	28.83	40.00	-11.17	peak
3		372.0045	41.14	-3.55	37.59	47.00	-9.41	peak
4		574.6258	38.57	0.59	39.16	47.00	-7.84	peak
5		744.8659	37.26	3.58	40.84	47.00	-6.16	peak
6	*	881.4067	37.71	5.08	42.79	47.00	-4.21	peak

Remark: All the modes have been investigated, and only worst mode is presented in this report.

5.2.5.3 TEST RESULTS (1GHZ TO 25GHZ)

Note：***the worst case is 1Mbps mode as result in this part.***

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 1 TX
Test Date	December 16, 2015	Frequency	2412MHz

Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	58.75	40.10	74	54	-15.25	-13.90
7236	V	59.21	39.87	74	54	-14.79	-14.13
4824	H	58.09	40.85	74	54	-15.91	-13.15
7236	H	58.44	39.44	74	54	-15.56	-14.56

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 1 TX
Test Date	December 16, 2015	Frequency	2437MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	58.63	39.08	74	54	-15.37	-14.92
7311	V	58.35	40.00	74	54	-15.65	-14.00
4874	H	59.16	39.35	74	54	-14.84	-14.65
7311	H	58.18	39.18	74	54	-15.82	-14.82

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 1 TX
Test Date	December 16, 2015	Frequency	2462MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	58.26	40.60	74	54	-15.74	-13.40
7386	V	59.00	40.11	74	54	-15.00	-13.89
4924	H	59.24	39.90	74	54	-14.76	-14.10
7386	H	58.95	39.95	74	54	-15.05	-14.05

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode2 TX
Test Date	December 16, 2015	Frequency	2412MHz

Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	58.75	40.12	74	54	-15.25	-13.88
7236	V	58.75	40.65	74	54	-15.25	-13.35
4824	H	59.89	39.37	74	54	-14.11	-14.63
7236	H	59.54	40.54	74	54	-14.46	-13.46

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 2 TX
Test Date	December 16, 2015	Frequency	2437MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	59.61	40.87	74	54	-14.39	-13.13
7311	V	58.56	40.94	74	54	-15.44	-13.06
4874	H	59.74	39.94	74	54	-14.26	-14.06
7311	H	59.43	40.43	74	54	-14.57	-13.57

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 2 TX
Test Date	December 16, 2015	Frequency	2462MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	59.12	40.01	74	54	-14.88	-13.99
7386	V	59.94	40.10	74	54	-14.06	-13.90
4924	H	58.54	40.46	74	54	-15.46	-13.54
7386	H	58.85	39.85	74	54	-15.15	-14.15

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode3 TX
Test Date	December 16, 2015	Frequency	2412MHz

Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	58.61	40.59	74	54	-15.39	-13.41
7236	V	59.45	39.78	74	54	-14.55	-14.22
4824	H	58.31	40.47	74	54	-15.69	-13.53
7236	H	58.27	39.27	74	54	-15.73	-14.73

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 3 TX
Test Date	December 16, 2015	Frequency	2437MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	58.22	39.37	74	54	-15.78	-14.63
7311	V	58.86	39.11	74	54	-15.14	-14.89
4874	H	58.64	39.20	74	54	-15.36	-14.80
7311	H	59.18	40.18	74	54	-14.82	-13.82

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 2 TX
Test Date	December 16, 2015	Frequency	2462MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	58.04	39.92	74	54	-15.96	-14.08
7386	V	58.83	40.23	74	54	-15.17	-13.77
4924	H	58.91	40.58	74	54	-15.09	-13.42
7386	H	58.15	39.15	74	54	-15.85	-14.85

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode4 TX
Test Date	December 16, 2015	Frequency	2422MHz

Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4844	V	59.92	41.55	74	54	-14.08	-12.45
7266	V	59.64	39.90	74	54	-14.36	-14.10
4844	H	59.65	39.91	74	54	-14.35	-14.09
7266	H	59.62	40.62	74	54	-14.38	-13.38

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 4 TX
Test Date	December 16, 2015	Frequency	2437MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	58.44	40.00	74	54	-15.56	-14.00
7311	V	58.99	40.81	74	54	-15.01	-13.19
4874	H	59.72	40.97	74	54	-14.28	-13.03
7311	H	58.43	39.43	74	54	-15.57	-14.57

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

EUT	TDU Lite	Model Name	M-13 TDU Lite with Bixilon Printer
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 4 TX
Test Date	December 16, 2015	Frequency	2452MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4904	V	58.99	41.78	74	54	-15.01	-12.22
7356	V	59.84	39.33	74	54	-14.16	-14.67
4904	H	58.07	39.77	74	54	-15.93	-14.23
7356	H	58.44	39.44	74	54	-15.56	-14.56

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

6. ANTENNA PORT CONDUCTED EMISSION

6.1 Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C section 15.203 and 15.247

FCC part 15C section 15.247 requirements: Systems operating in the 2412-2462MHz band that are used exclusively for fixed.

6.2 Test Procedure

1. The EUT was connected to spectrum analyzer with RF cable.
2. Keep wifi transmitting at low channel of 802.11b.
3. Set the start frequency=1GHz, stop frequency = 25GHz, RBW =1MHz, VBW =3MHz, allow the trace to stabilize, mark the max value, and mark a line which the value reduce 20dBm, mark the max value under the line.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep point = 20001.
7. Hold the line, change the start frequency=30MHz, stop frequency=1GHz, RBW =100 kHz, VBW =300 kHz, mark the max value, and record.
8. Repeat all of the above steps until the middle channel, the high channel of 802.11b, 802.11g, 802.11n20 and 802.11n40 are done.
9. Record all the result.

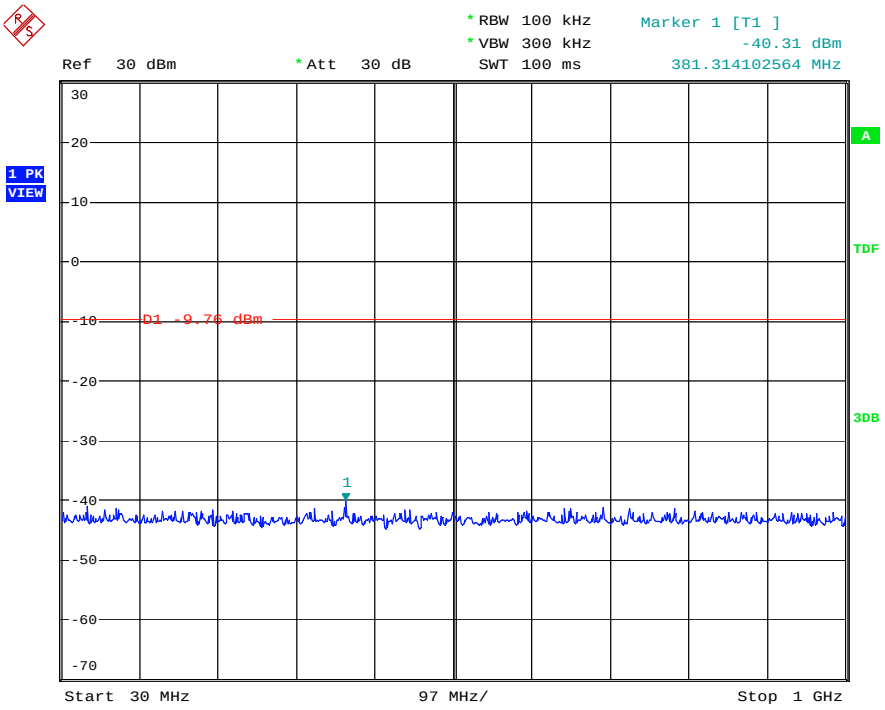
6.3 Result

The antenna's gain is 2.0 dBi and meets the requirement.

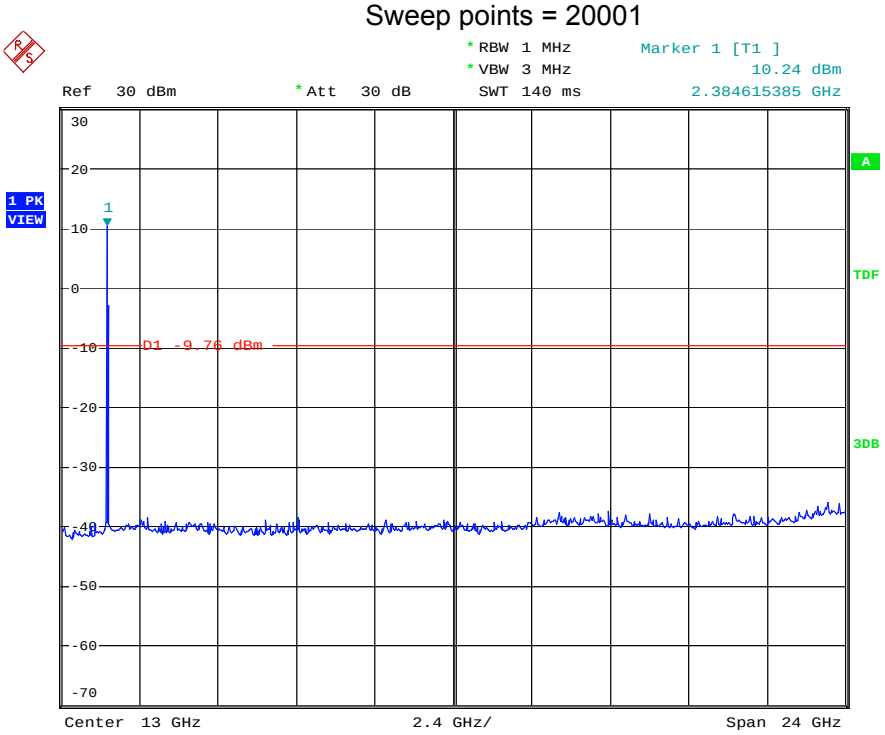
Antenna port conducted spurious emissions

802.11b:

Low channel

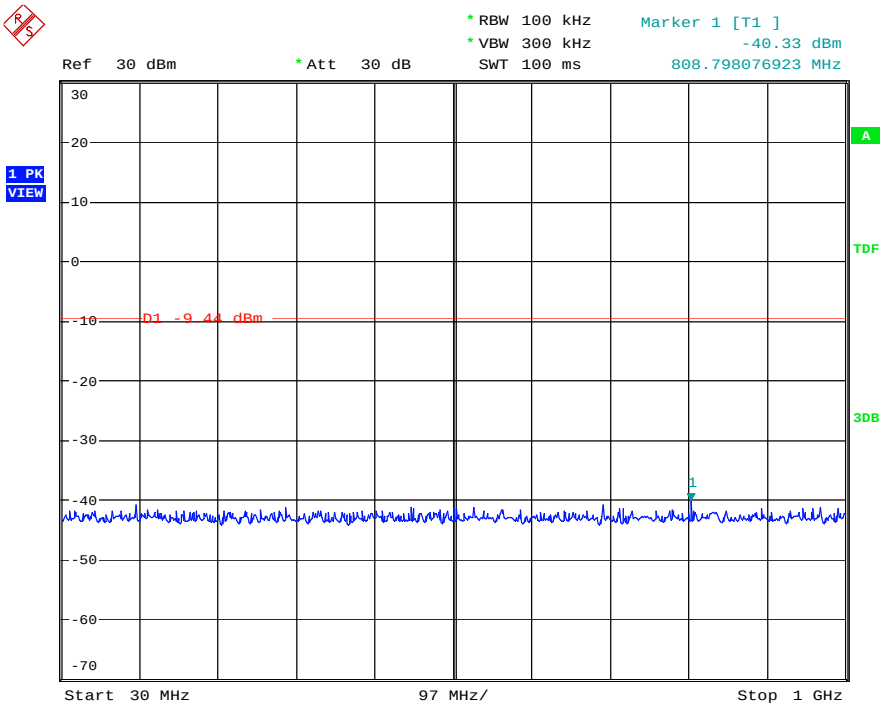


Sweep points = 20001



Sweep points = 20001

Middle channel



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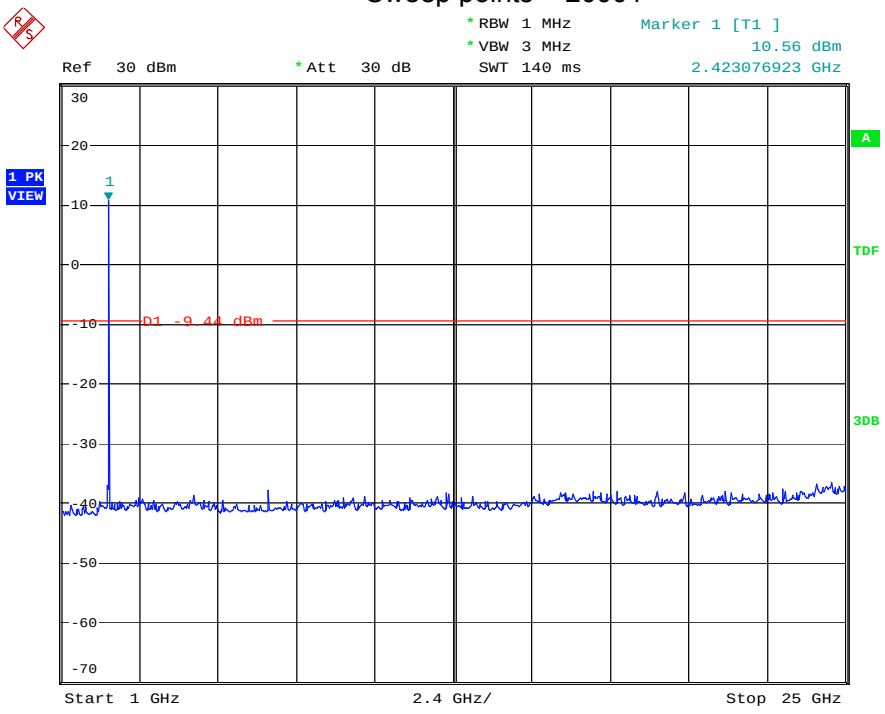
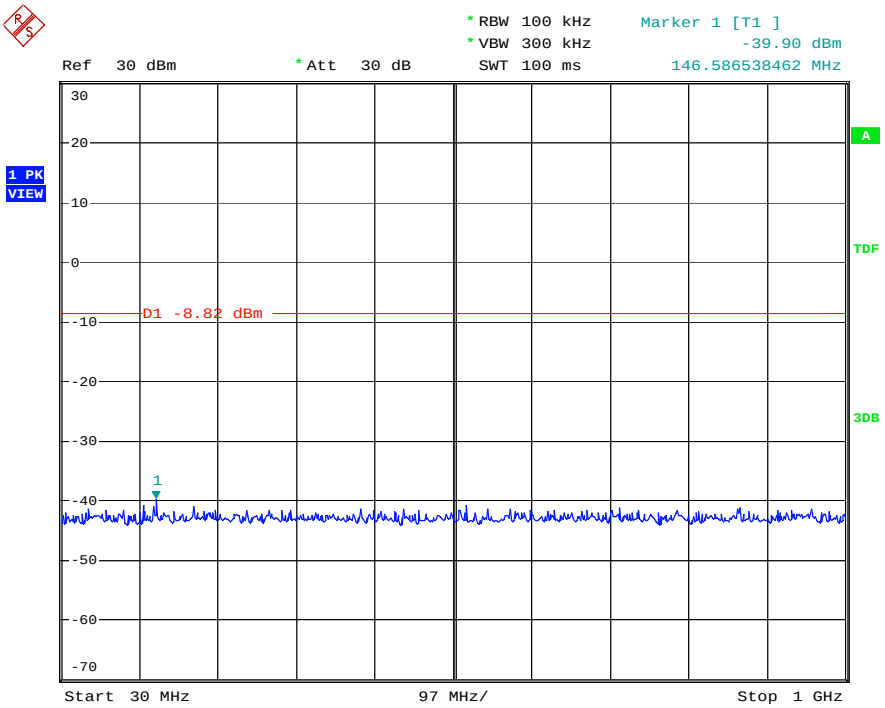
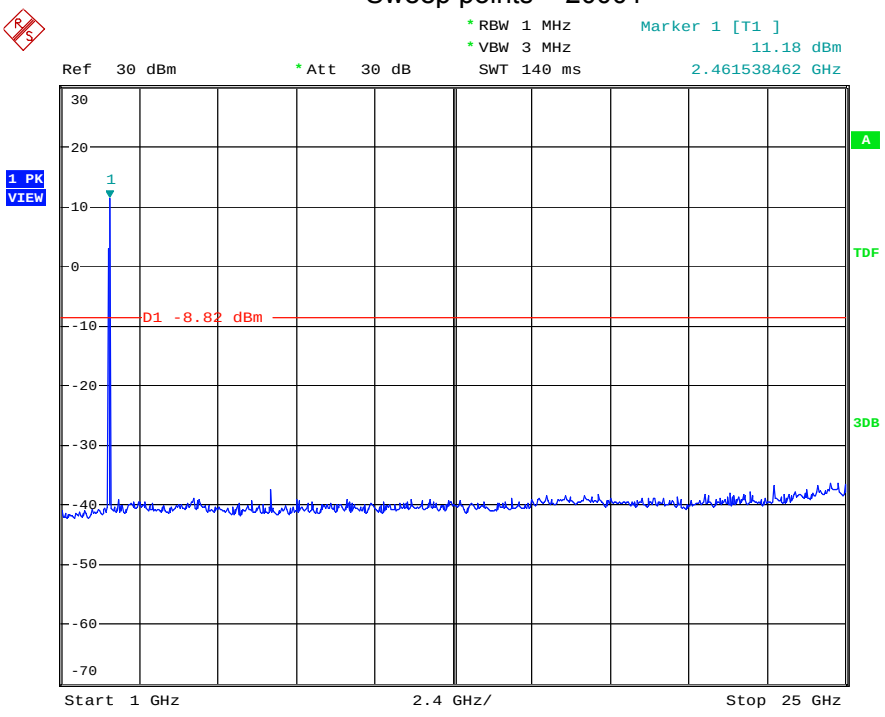


Sweep points = 20001

High channel



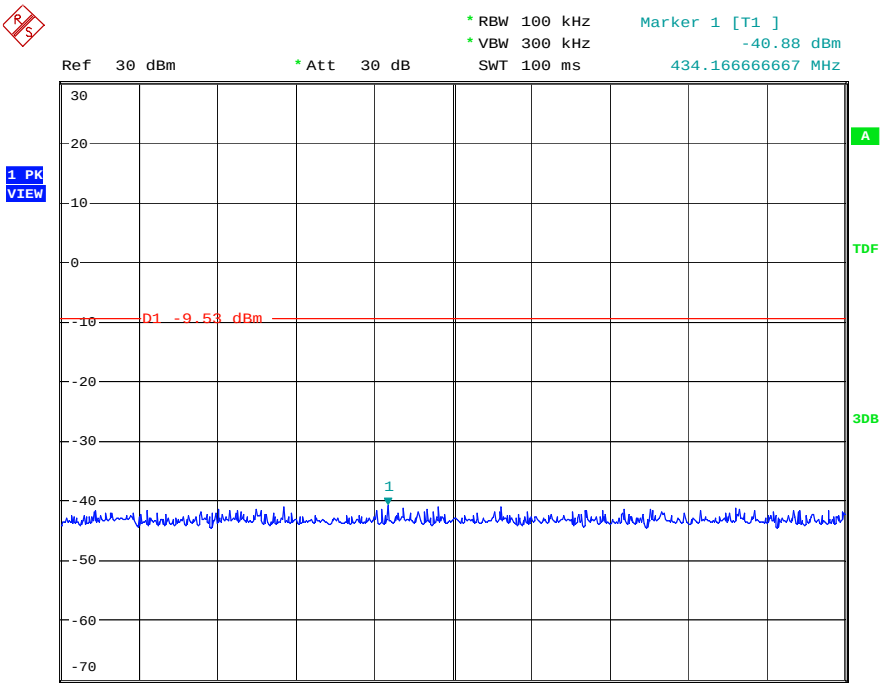
Sweep points = 20001



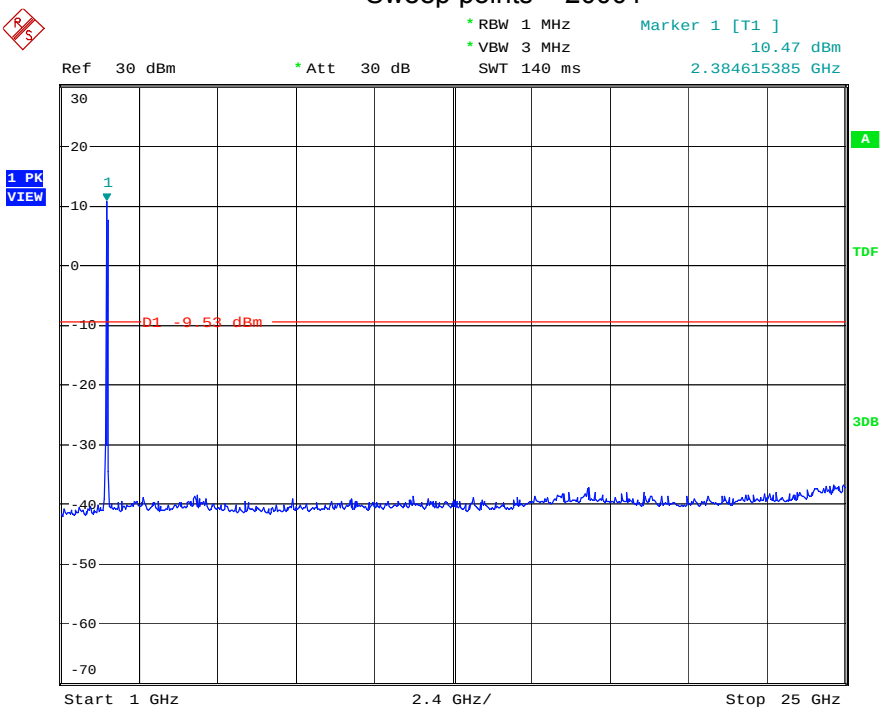
Sweep points = 20001

802.11g:

Low channel

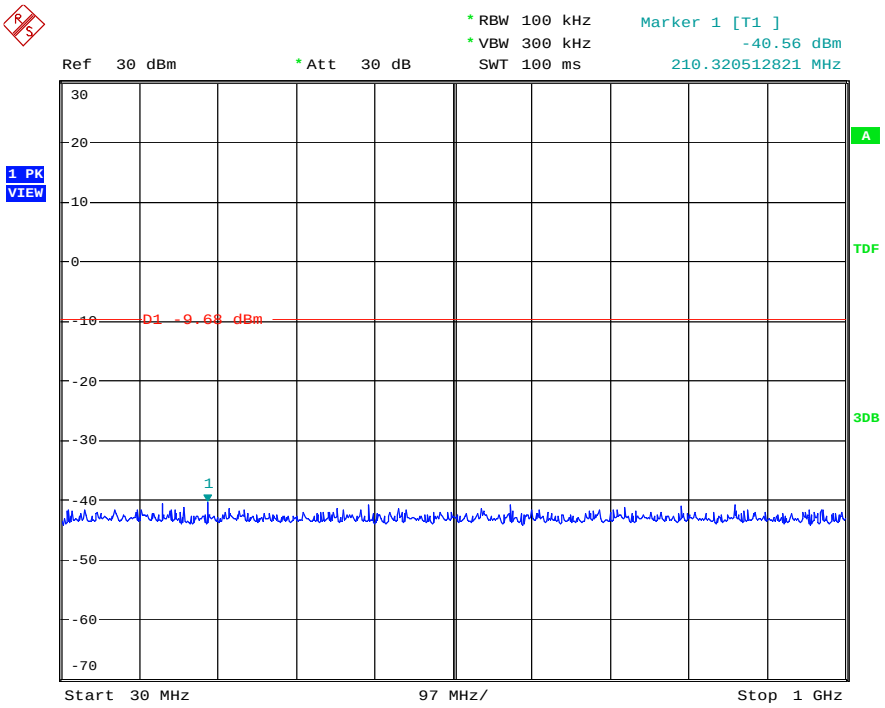


Sweep points = 20001



Sweep points = 20001

Middle channel



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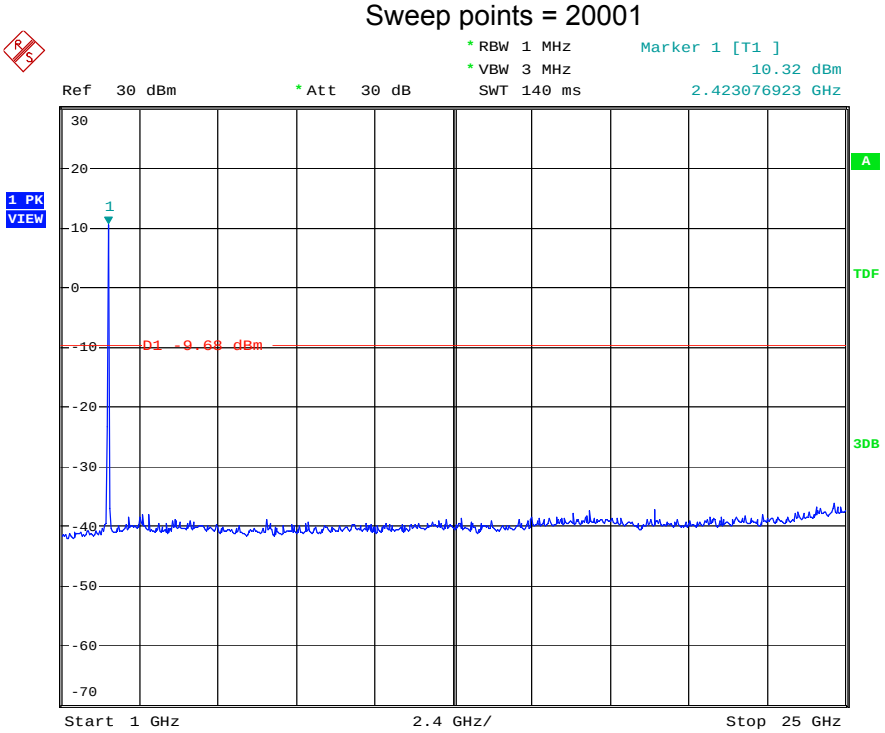
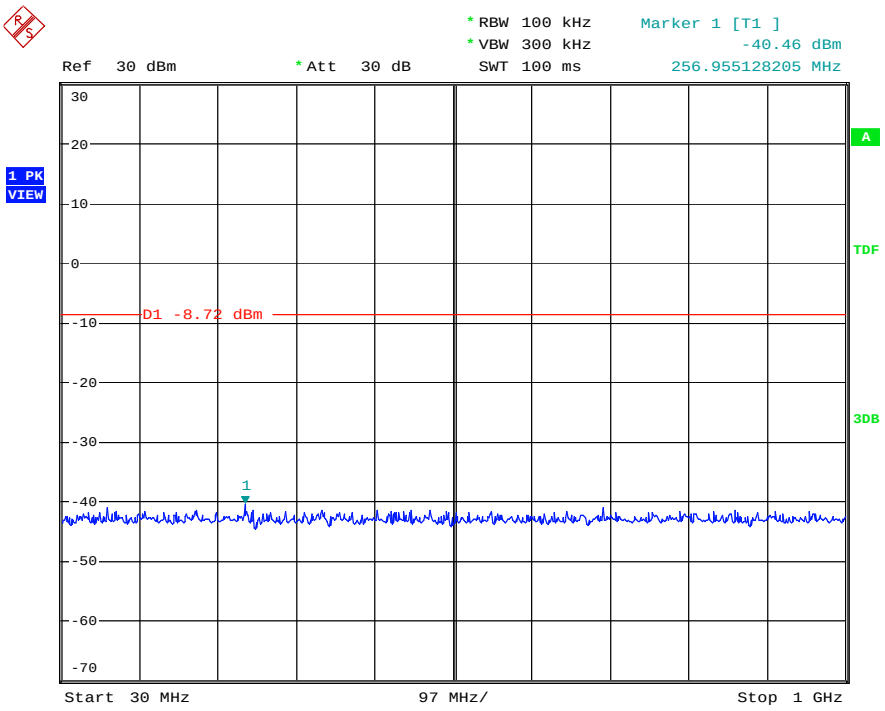
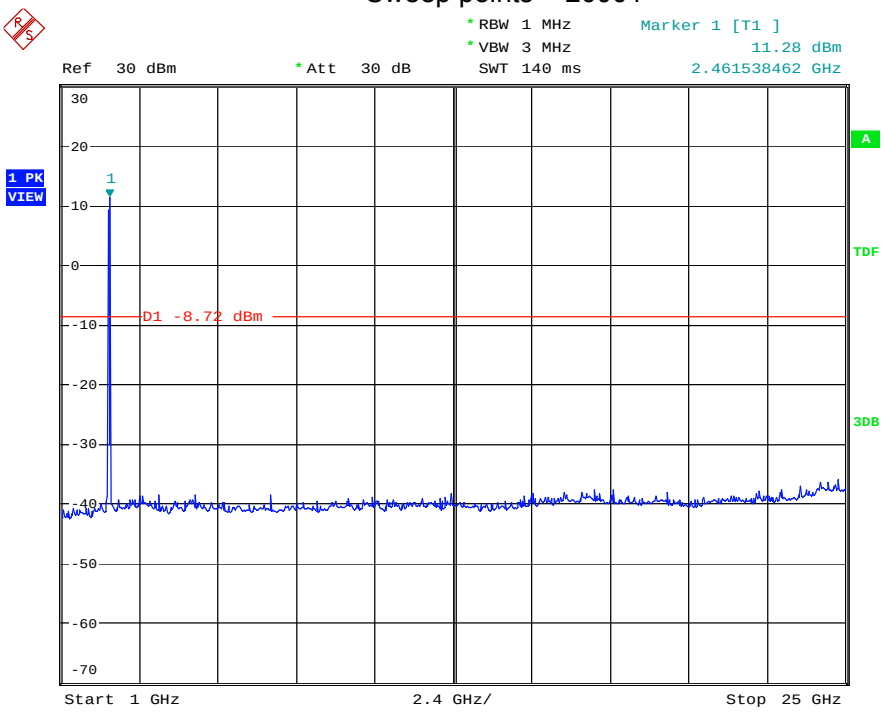


Sweep points = 20001

High channel



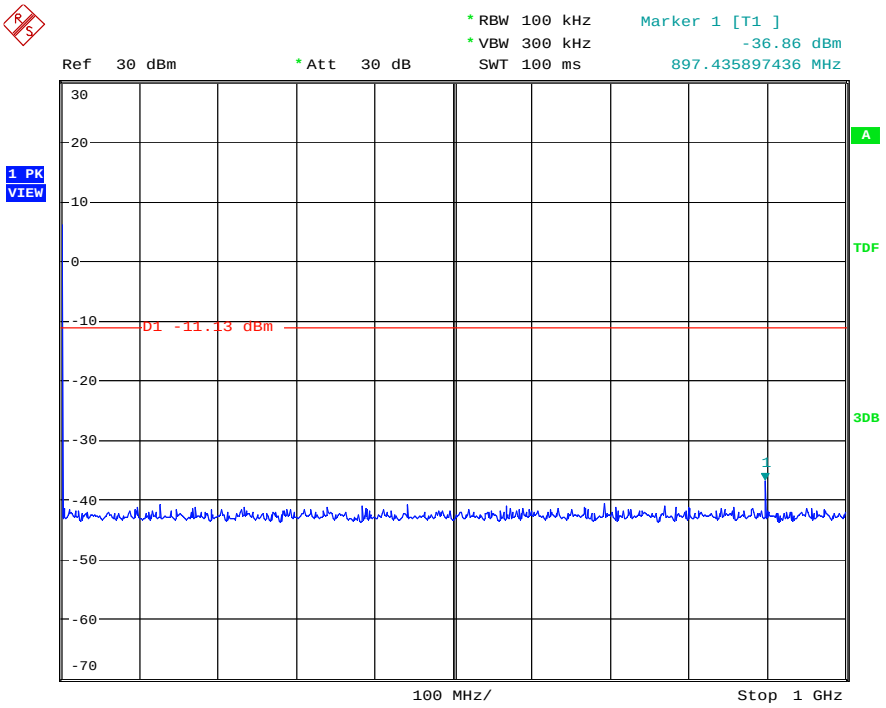
Sweep points = 20001



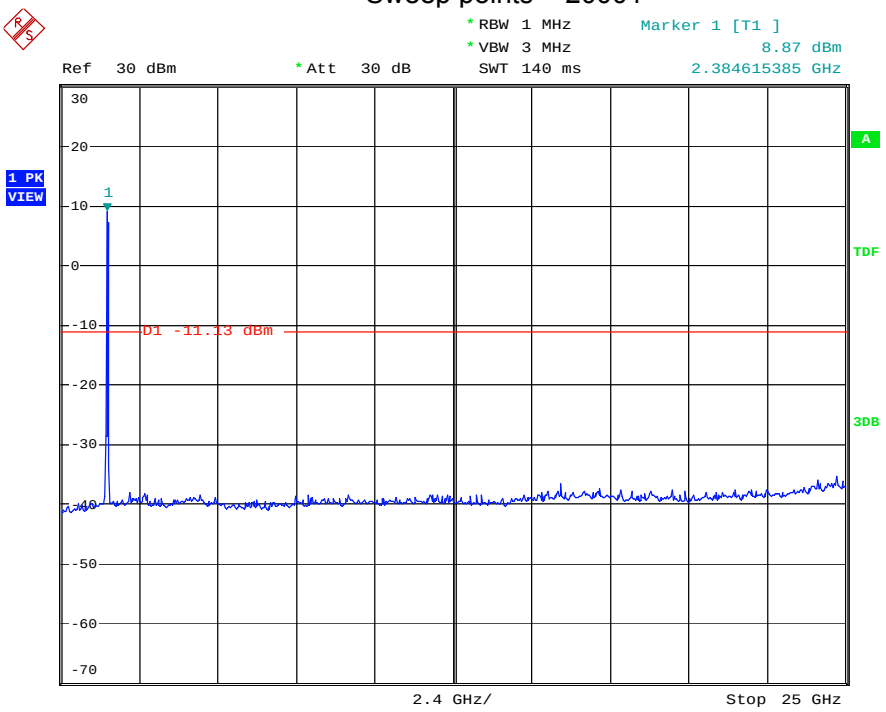
Sweep points = 20001

802.11n HT20

Low channel

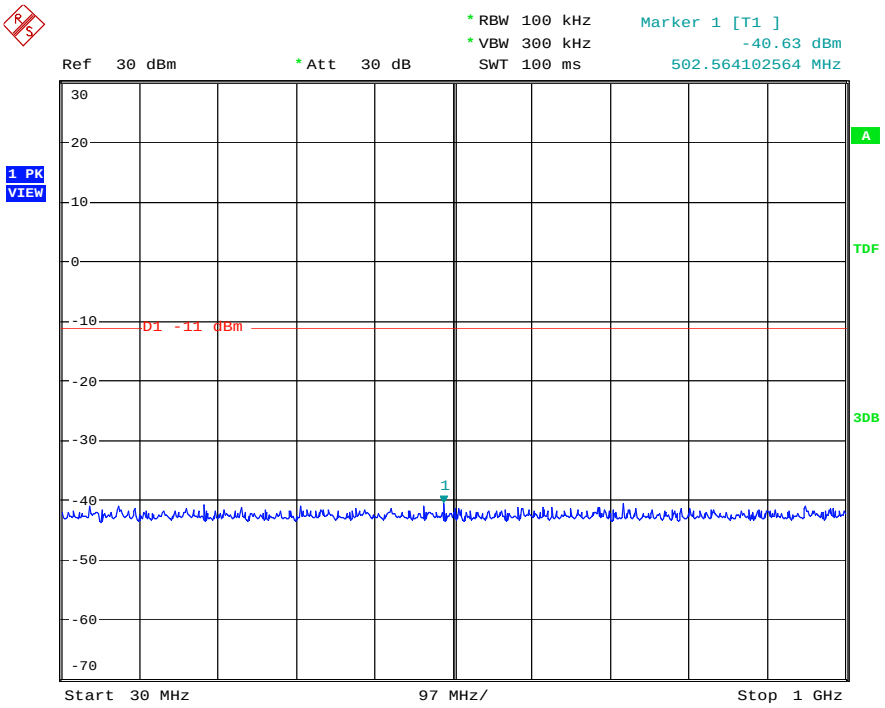


Sweep points = 20001

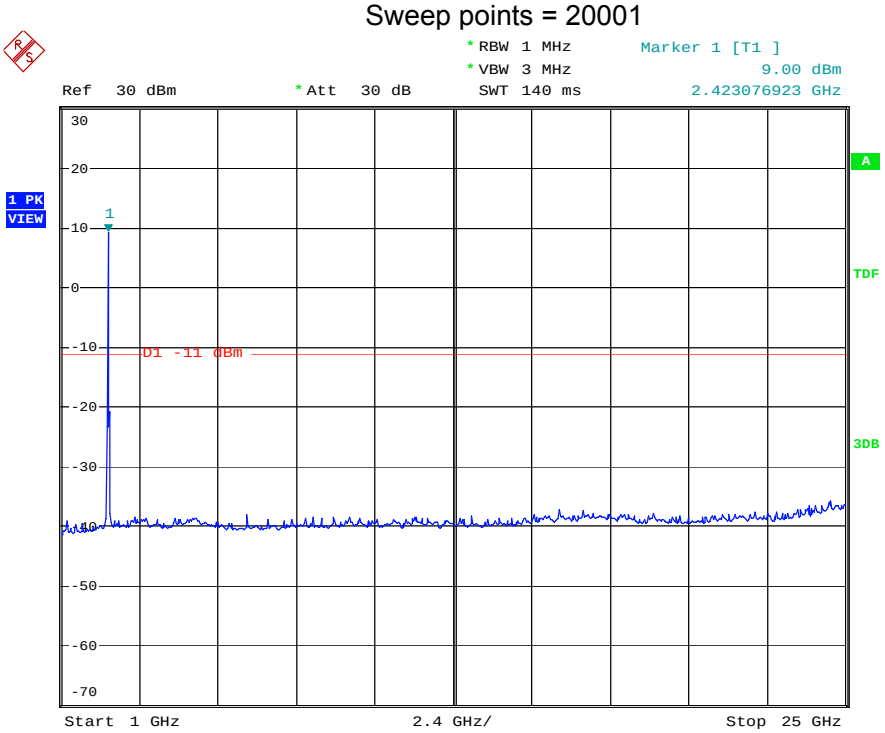


Sweep points = 20001

Middle channel

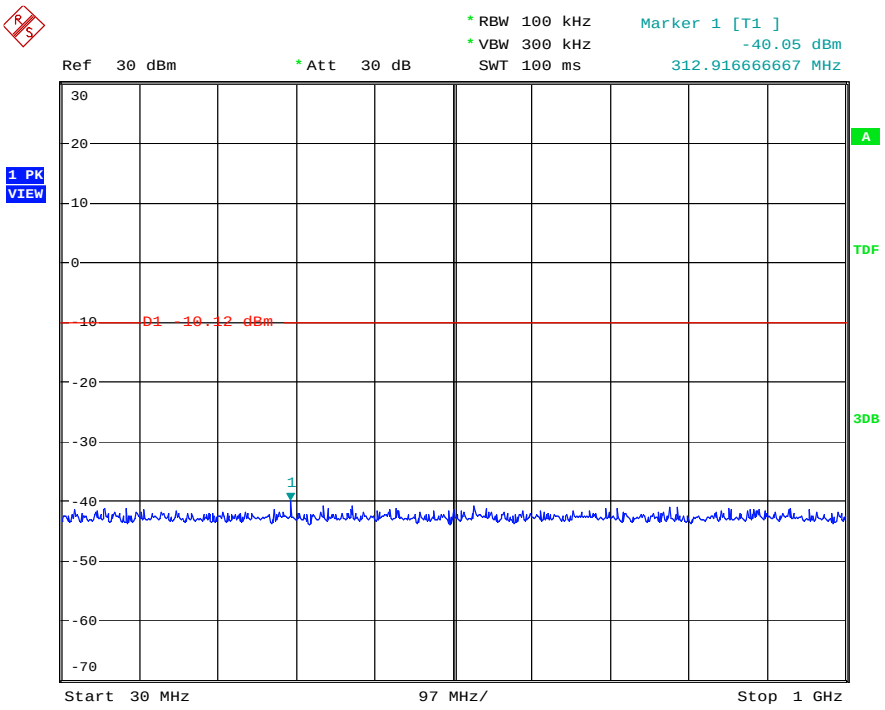


Sweep points = 20001

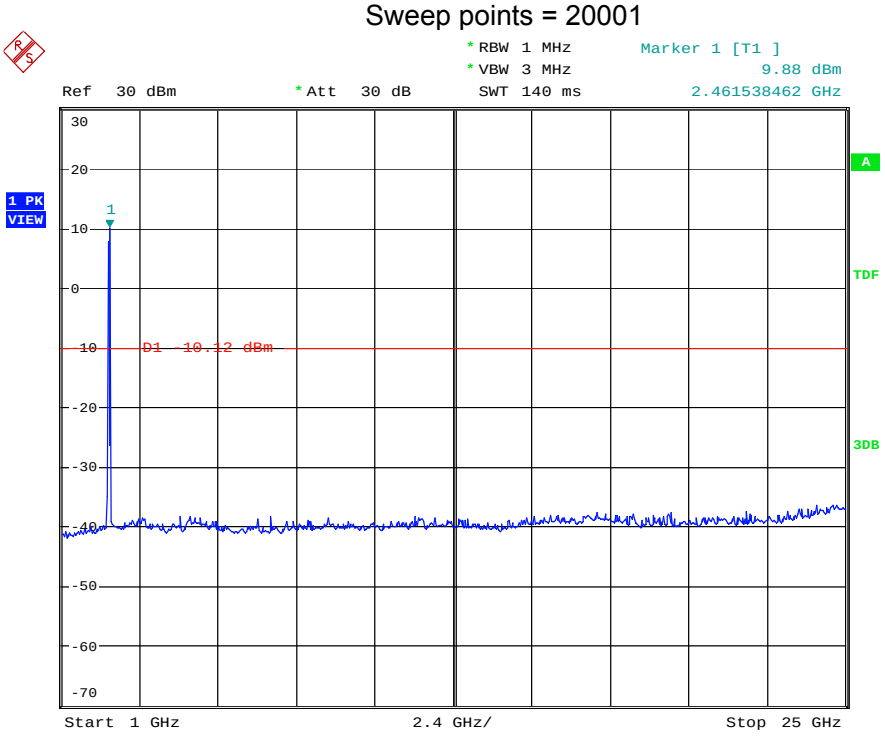


Sweep points = 20001

High channel



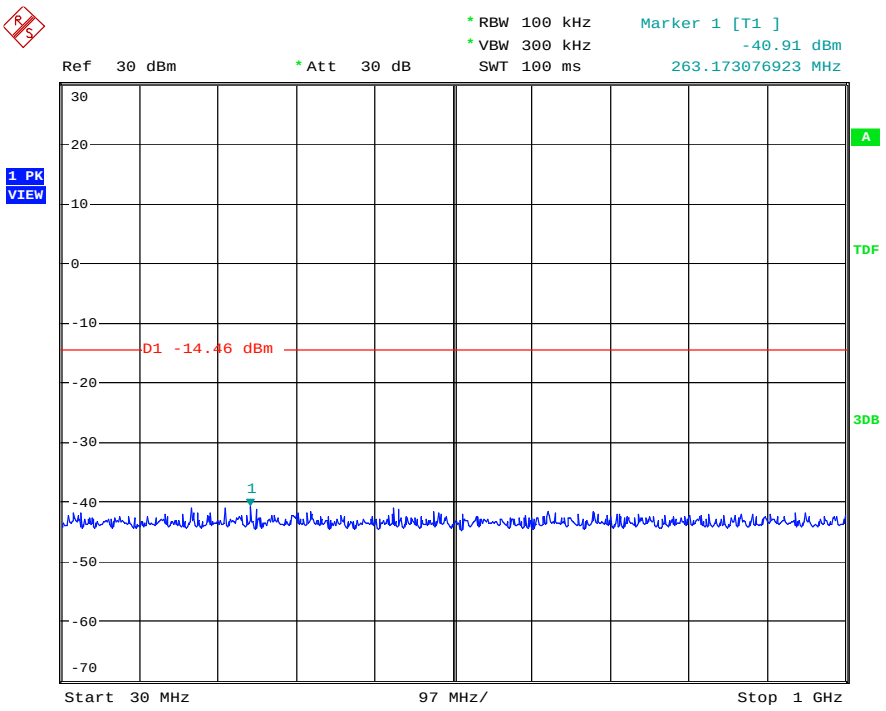
Sweep points = 20001



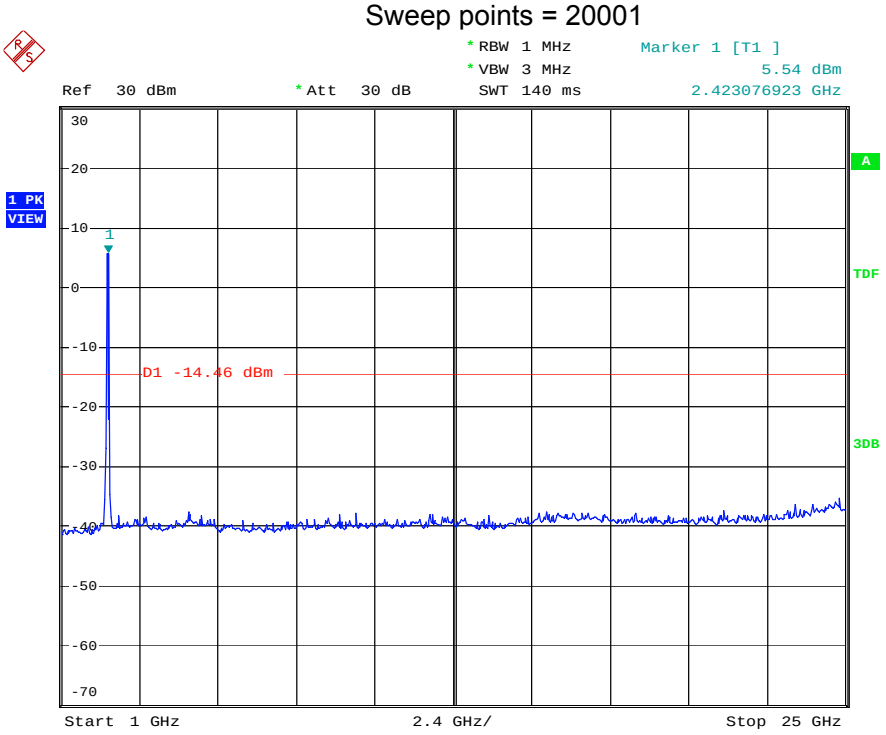
Sweep points = 20001

802.11n HT40:

Low channel

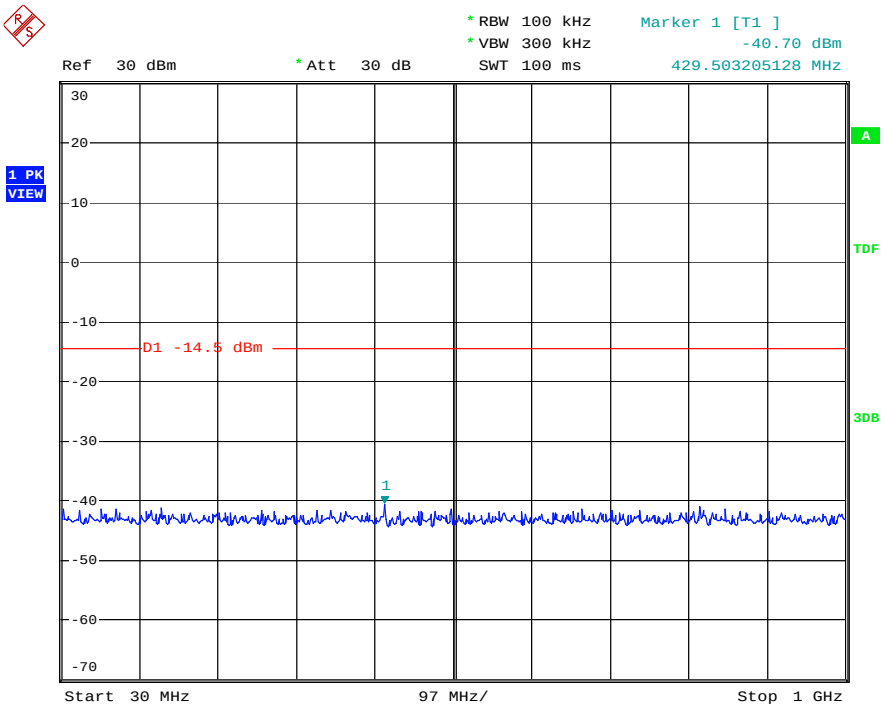


Sweep points = 20001



Sweep points = 20001

Middle channel



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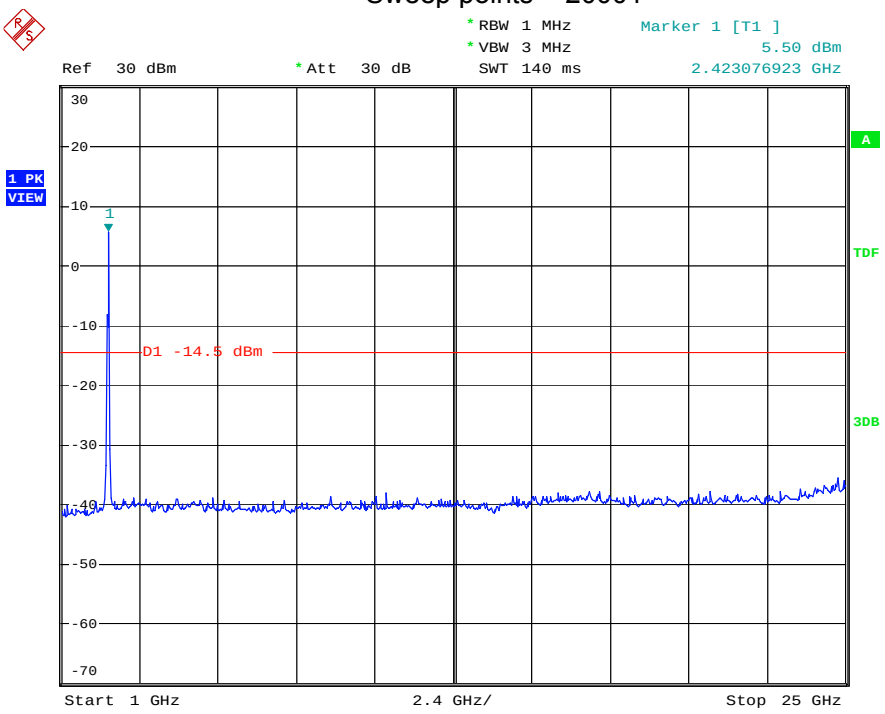
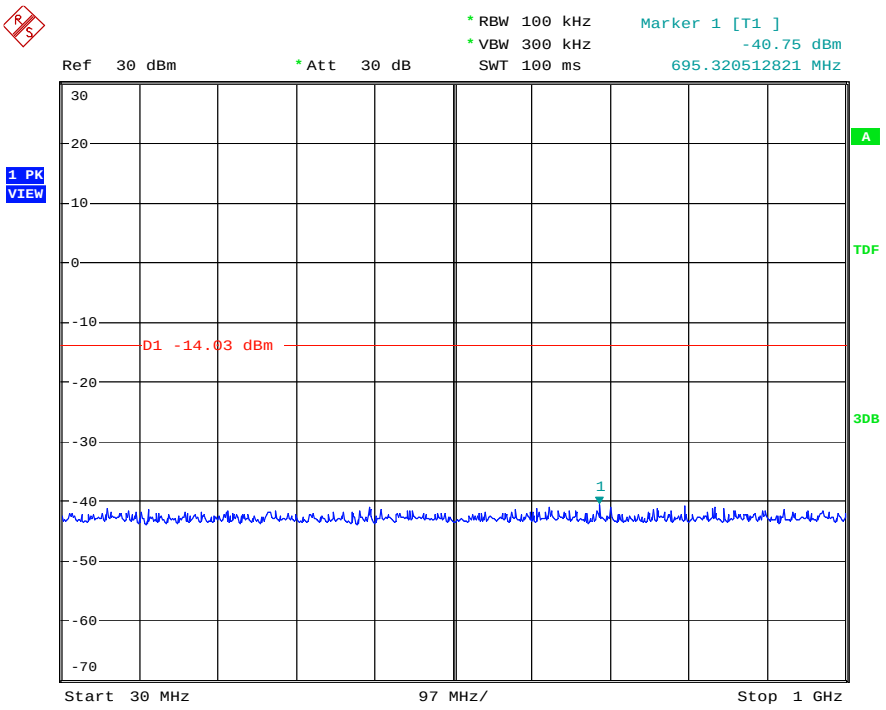
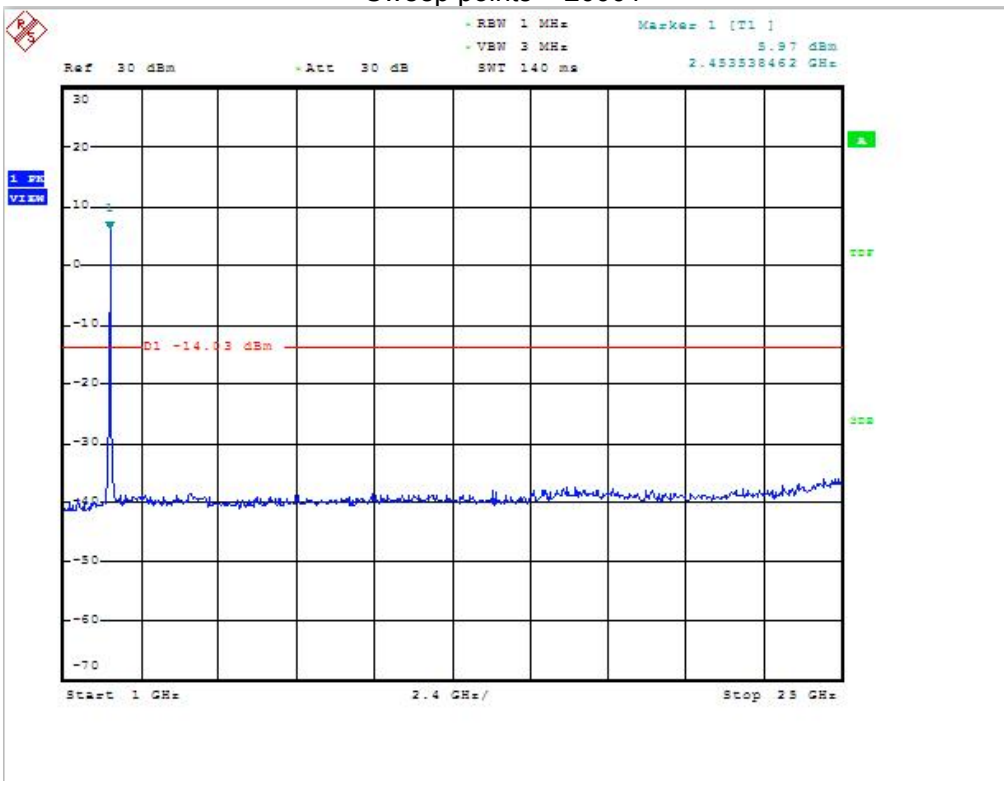


Sweep points = 20001

High channel



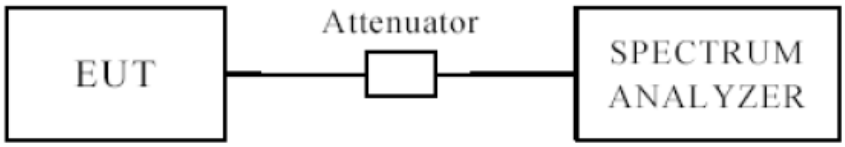
Sweep points = 20001



Sweep points = 20001

7.0. 6DB BANDWIDTH MEASUREMENT

7.1 TEST SETUP



7.2 LIMITS OF 6DB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is >500 kHz

7.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth (VBW) ≥ 3 x 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) that are attenuated by 6 dB relative to the maximum level measured
in the fundamental emission.

7.4 TEST RESULT

6dB Occupied Bandwidth

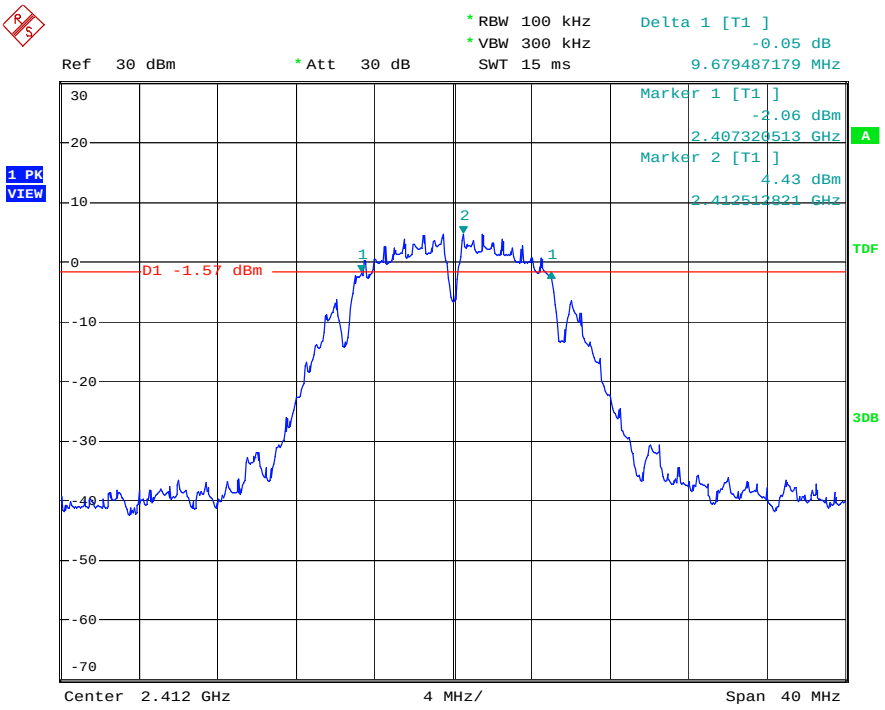
EUT		TDU Lite	Model		M-13 TDU Lite with Bixilon Printer
Mode		802.11b	Humidity		56% RH
Temperature		24 deg. C,			
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (kHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412	1	9679.5	0.5	Pass
6	2437	1	9679.5	0.5	Pass
11	2462	1	9679.5	0.5	Pass

EUT		TDU Lite	Model		M-13 TDU Lite with Bixilon Printer
Mode		802.11g	Humidity		56% RH
Temperature		24 deg. C,			
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (kHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412	6	16410.2	0.5	Pass
6	2437	6	16410.2	0.5	Pass
11	2462	6	16410.2	0.5	Pass

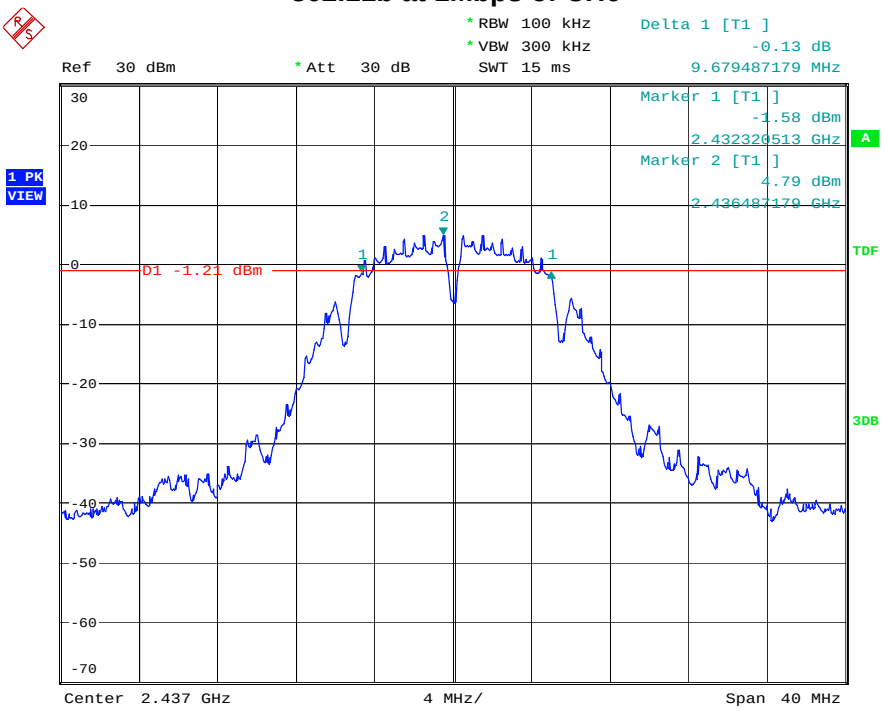
EUT		TDU Lite		Model		M-13 TDU Lite with Bixilon Printer
Mode		802.11n20		Humidity		56% RH
Temperature		24 deg. C,				
Channel	Channel Frequency (MHz)		Data Transfer Rate (Mbps)	6 dB Bandwidth (kHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412		6.5	17692.3	0.5	Pass
6	2437		6.5	17692.3	0.5	Pass
11	2462		6.5	17692.3	0.5	Pass

EUT		TDU Lite		Model		M-13 TDU Lite with Bixilon Printer
Mode		802.11n40		Humidity		56% RH
Temperature		24 deg. C,				
Channel	Channel Frequency (MHz)		Data Transfer Rate (Mbps)	6 dB Bandwidth (kHz)	Minimum Limit (MHz)	Pass/ Fail
3	2422		13.5	36153.8	0.5	Pass
6	2437		13.5	36250.0	0.5	Pass
9	2452		13.5	36346.2	0.5	Pass

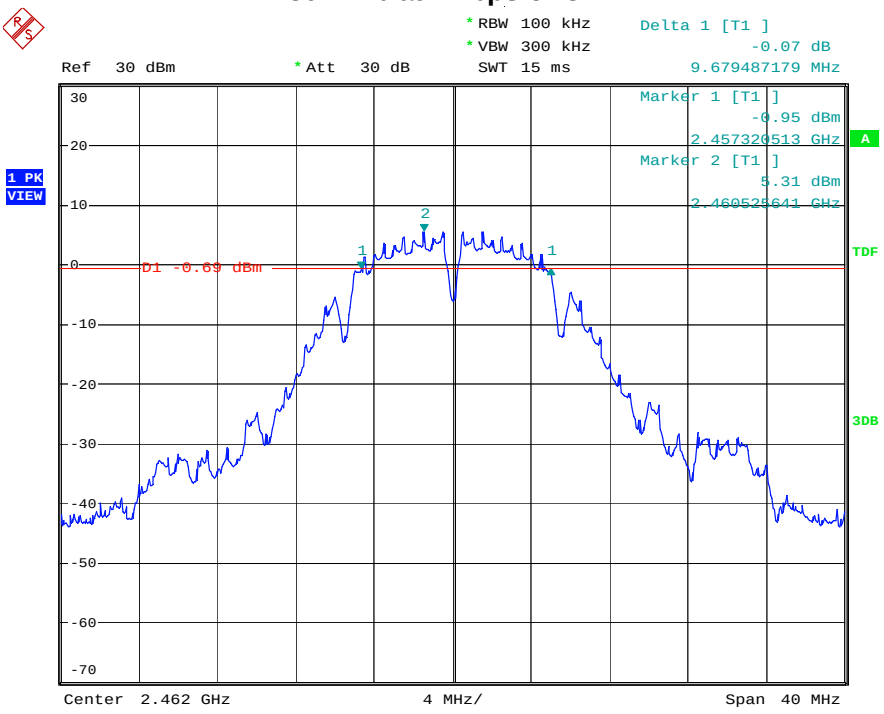
802.11b at 1Mbps of CH1



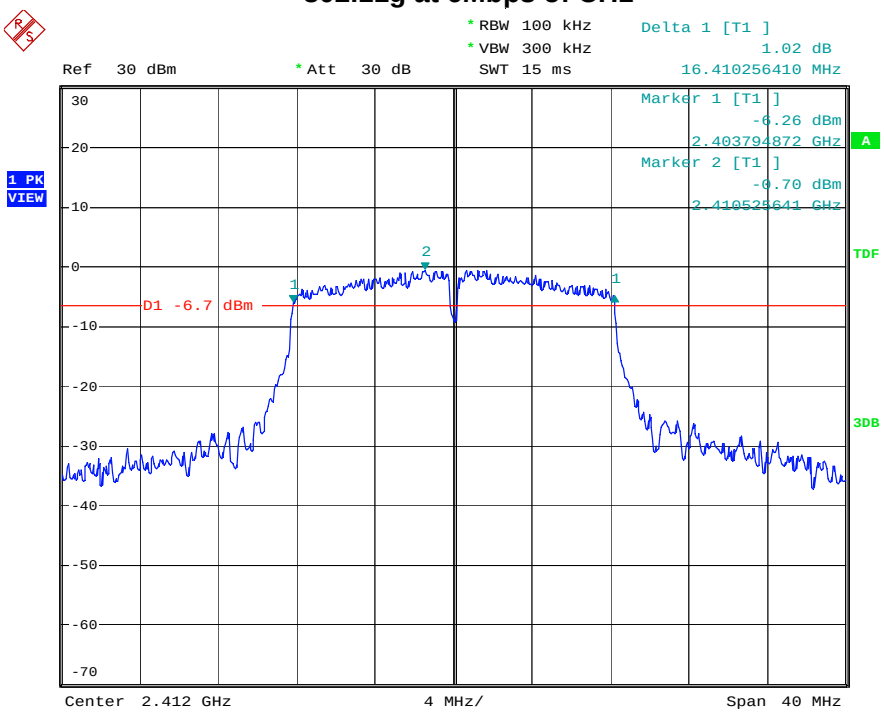
802.11b at 1Mbps of CH6



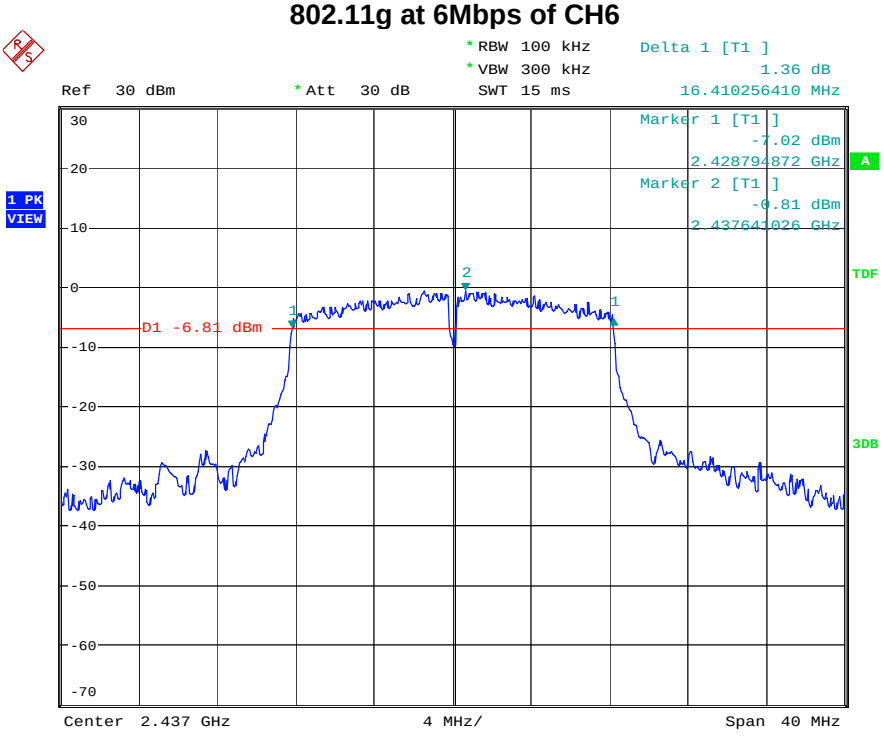
802.11b at 1Mbps of CH11



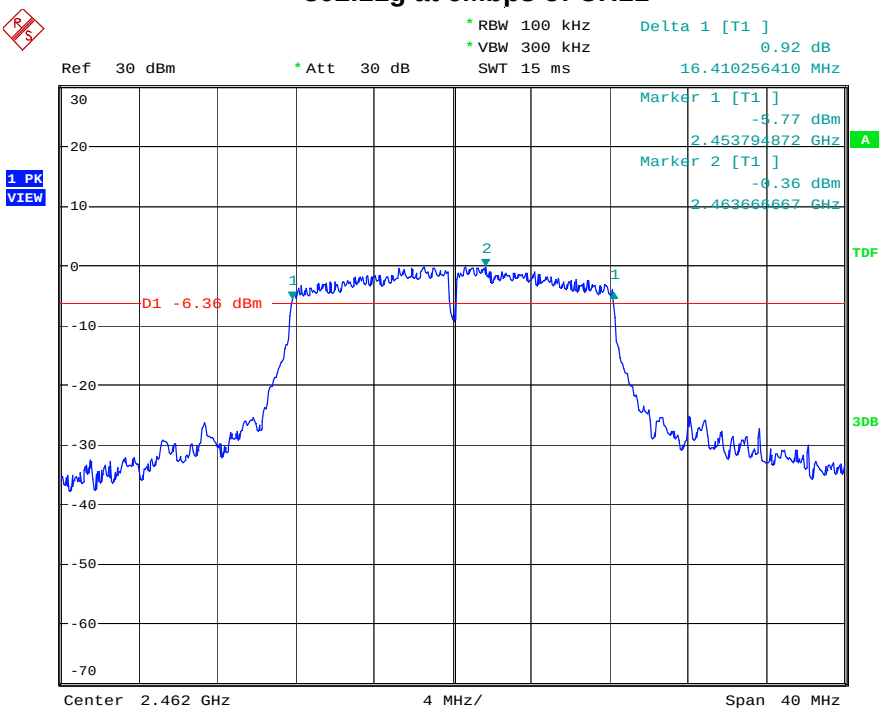
802.11g at 6Mbps of CH1



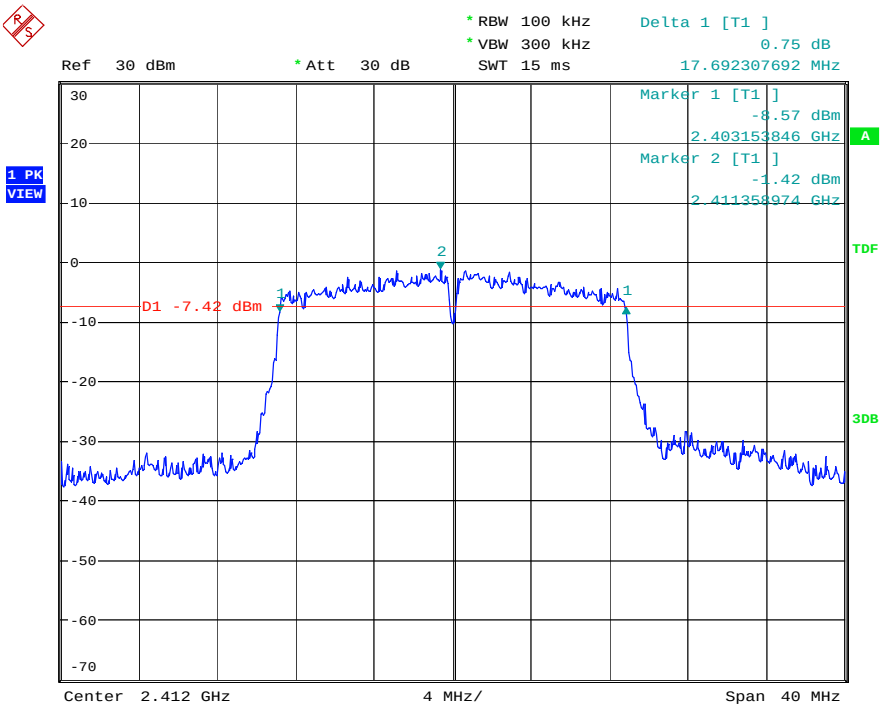
802.11g at 6Mbps of CH6



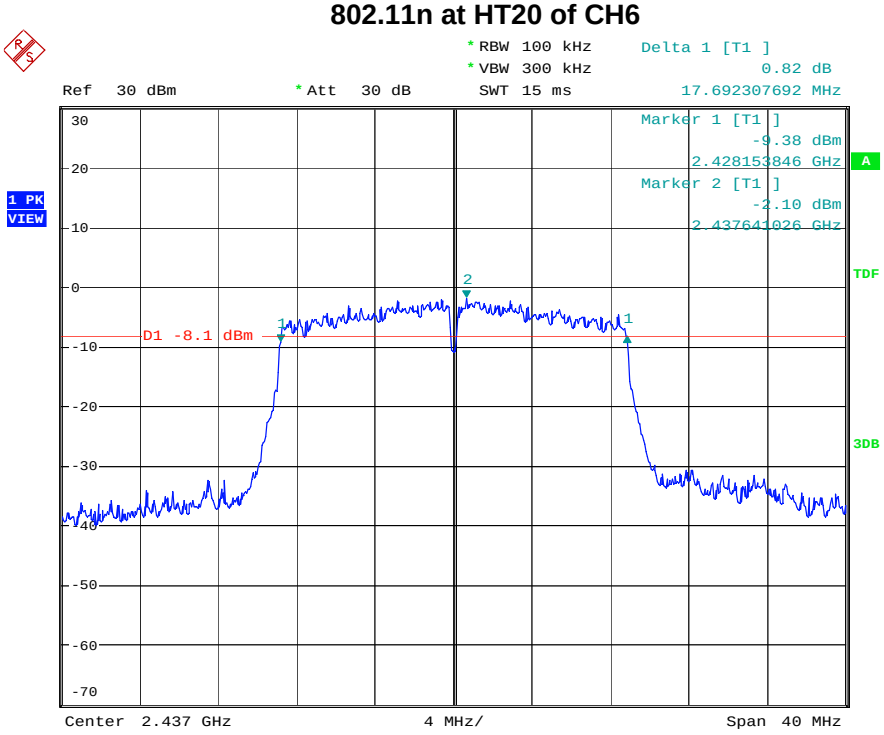
802.11g at 6Mbps of CH11



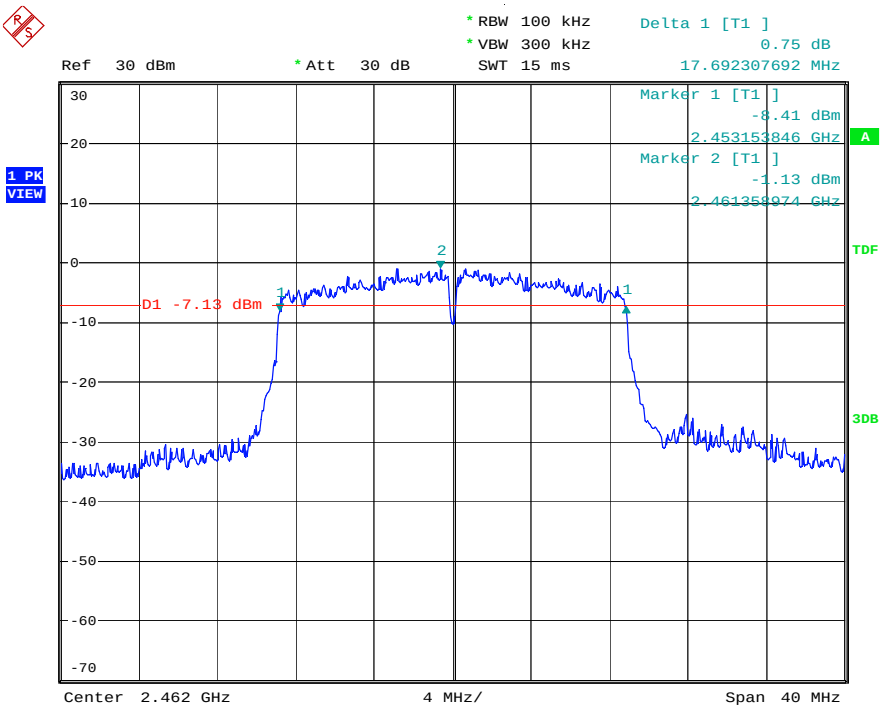
802.11n at HT20 of CH1



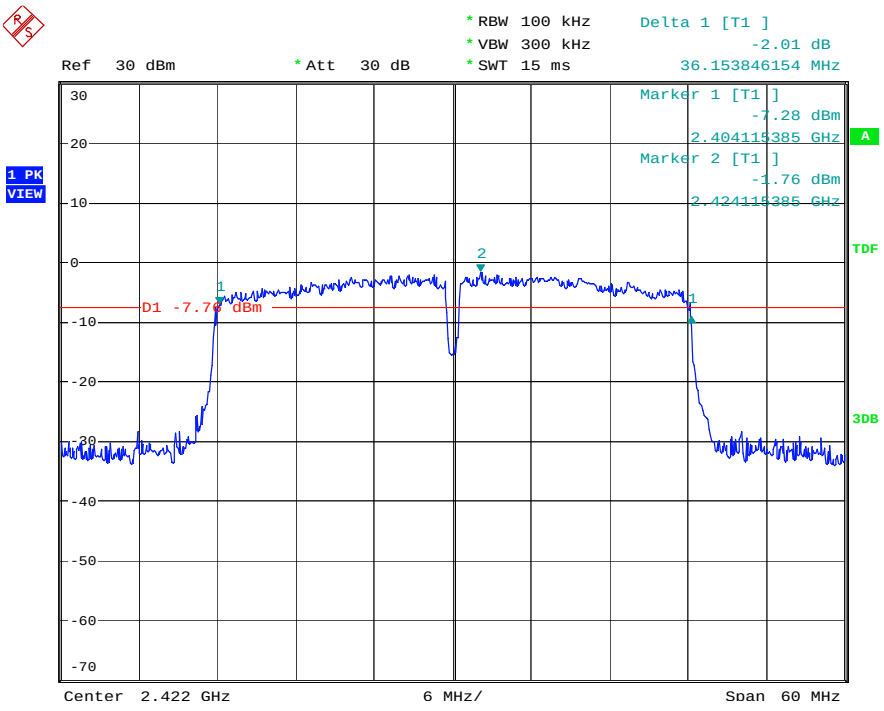
802.11n at HT20 of CH6



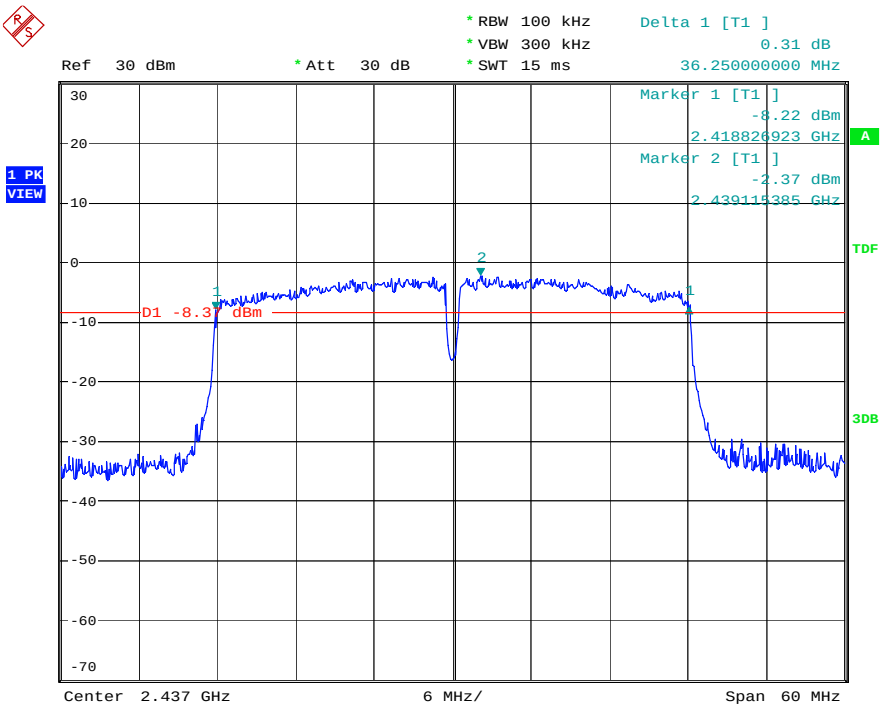
802.11n at HT20 of CH11



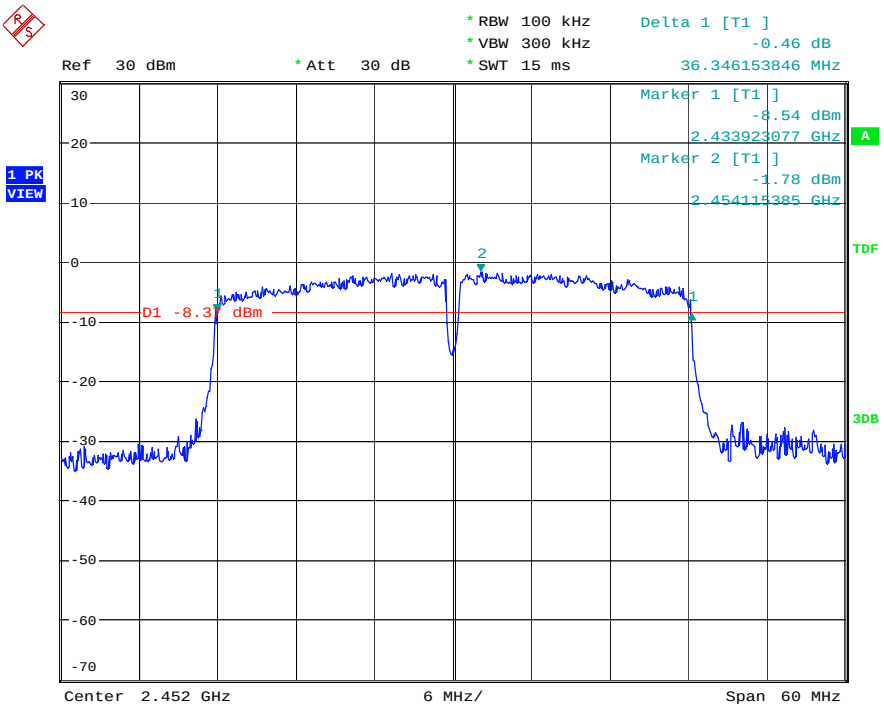
802.11n at HT40 of CH3



802.11n at HT40 of CH6



802.11n at HT40 of CH9

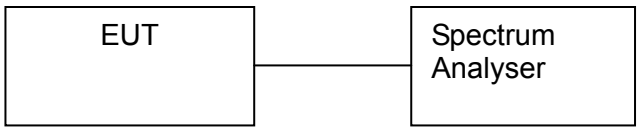


Date: 7.DEC.2015 09:48:25

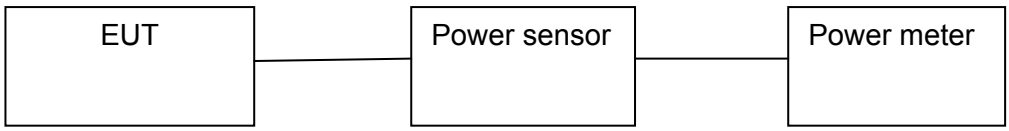
8.0. PEAK OUTPUT POWER

8.1 TEST SETUP

Peak power



Average power



8.2 LIMITS OF MAXIMUM PEAK OUTPUT POWER

The Maximum Peak Output Power Measurement is 30dBm.

8.3 TEST PROCEDURE

The RF power output was measured with a Power meter connected to the RF Antenna connector measurement while EUT was operating in transmit mode at the appropriate centre frequency.

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram by the power sensor. The sample with a program test port is used to test.

b. Setting : RBW = 1MHz, VBW = 3MHz

Span ≥ approximately 2 times the bandwidth for 802.11b/g/n20, and 1.5 times for 802.11n40, centered on a low channel, middle channel and high channel

Sweep = auto

Detector function = peak

Trace = max hold

Note: the peak power was measured.

8.4 TEST RESULTS

EUT	TDU Lite	Model	M-13 TDU Lite with Bixilon Printer
Mode	802.11b	Humidity	56% RH
Temperature	24 deg. C,		

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
1	2412	18.01	30	Pass
6	2437	18.64	30	Pass
11	2462	19.19	30	Pass

Note: 1. At finial test to get the worst-case emission at 1Mbps for CH1, CH6 and CH11
2. The result basic equation calculation as follow:
Peak Power Output = Peak Power Reading + Cable loss + Attenuator
3. The worse case was recorded

EUT	TDU Lite	Model	M-13 TDU Lite with Bixilon Printer
Mode	802.11g	Humidity	56% RH
Temperature	24 deg. C,		

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
1	2412	20.38	30	Pass
6	2437	20.78	30	Pass
11	2462	21.37	30	Pass

Note: 1. At finial test to get the worst-case emission at 6 Mbps for CH1, CH6 and CH11
2. The result basic equation calculation as follow:
Peak Power Output = Peak Power Reading + Cable loss + Attenuator
3. The worse case was recorded

EUT	TDU Lite	Model	M-13 TDU Lite with Bixilon Printer
Mode	802.11n(HT20)	Humidity	56% RH
Temperature	24 deg. C,		

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
1	2412	20.83	30	Pass
6	2437	20.70	30	Pass
11	2462	21.79	30	Pass

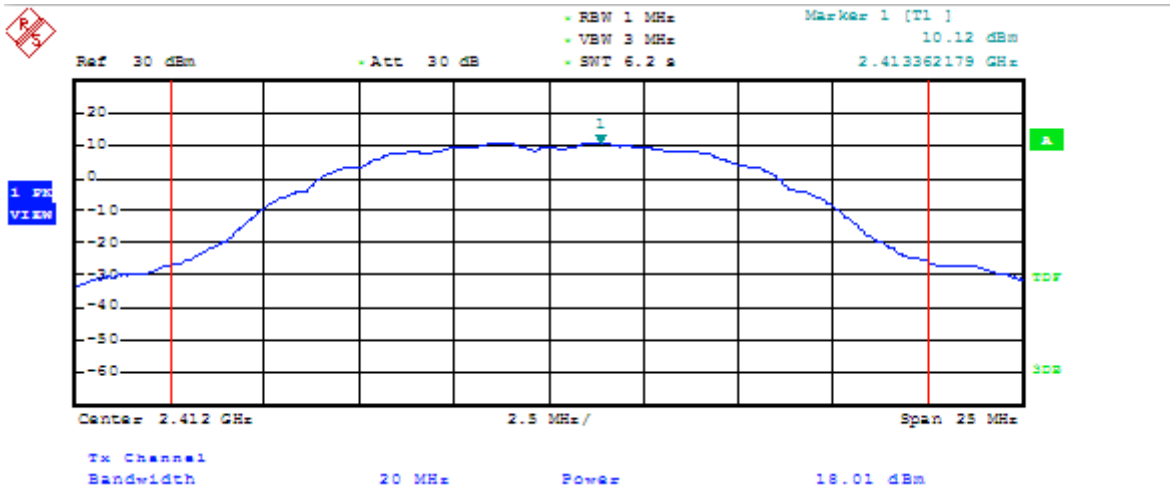
Note: 1. At finial test to get the worst-case emission at 6.5Mbps for CH1, CH6 and CH11
2. The result basic equation calculation as follow:
Peak Power Output = Peak Power Reading + Cable loss + Attenuator
3. The worse case was recorded

EUT	TDU Lite	Model	M-13 TDU Lite with Bixilon Printer
Mode	802.11n (HT40)	Humidity	56% RH
Temperature	24 deg. C,		

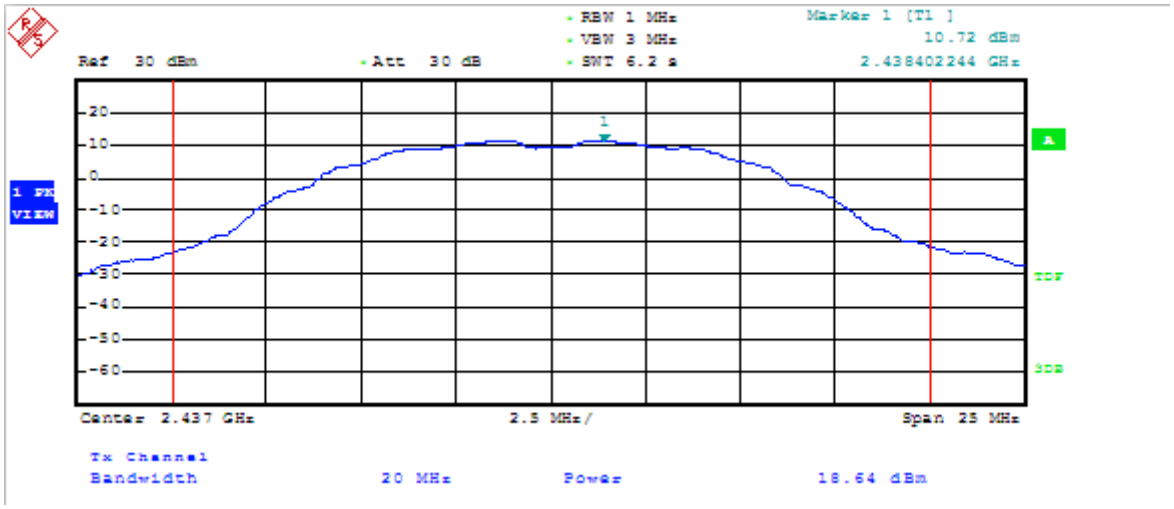
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
3	2422	18.90	30	Pass
6	2437	19.61	30	Pass
9	2452	20.38	30	Pass

Note: 1. At finial test to get the worst-case emission at 13.5Mbps for CH3, CH6 and CH9
2. The result basic equation calculation as follow:
Peak Power Output = Peak Power Reading + Cable loss + Attenuator
3. The worse case was recorded.

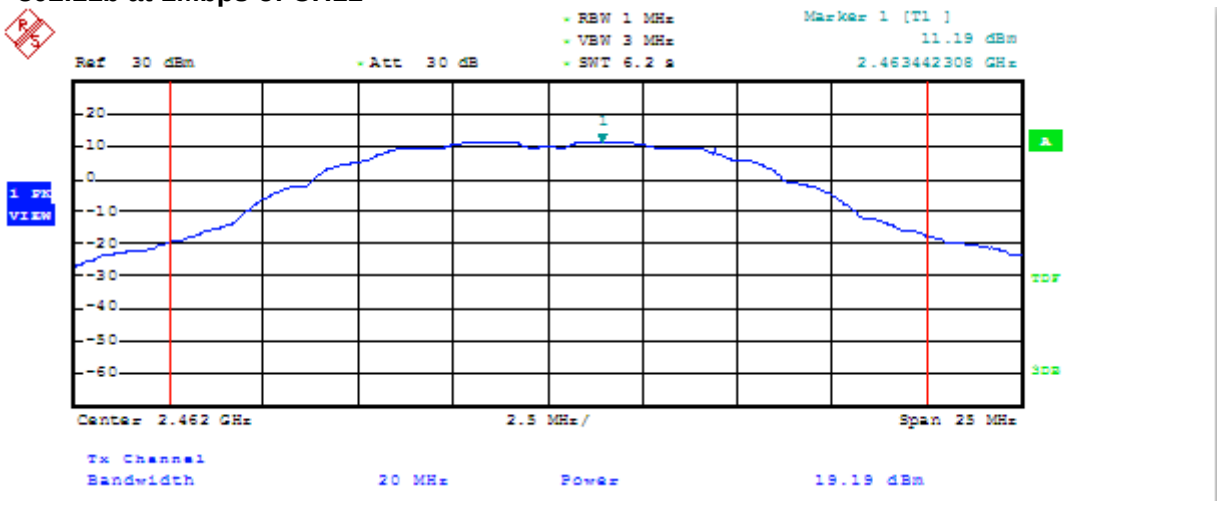
802.11b at 1Mbps of CH1



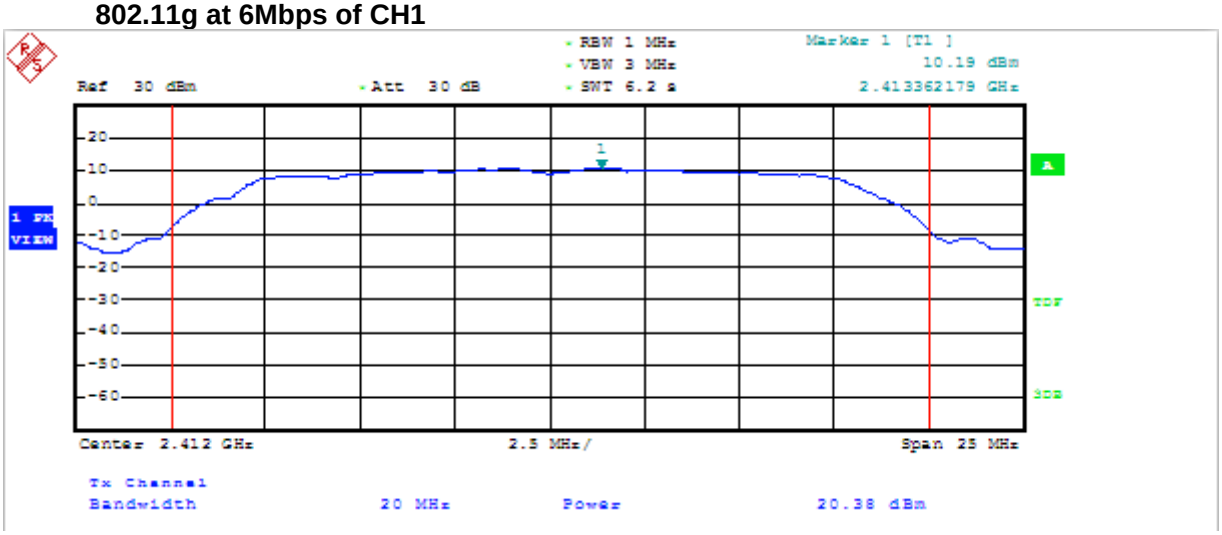
802.11b at 1Mbps of CH6



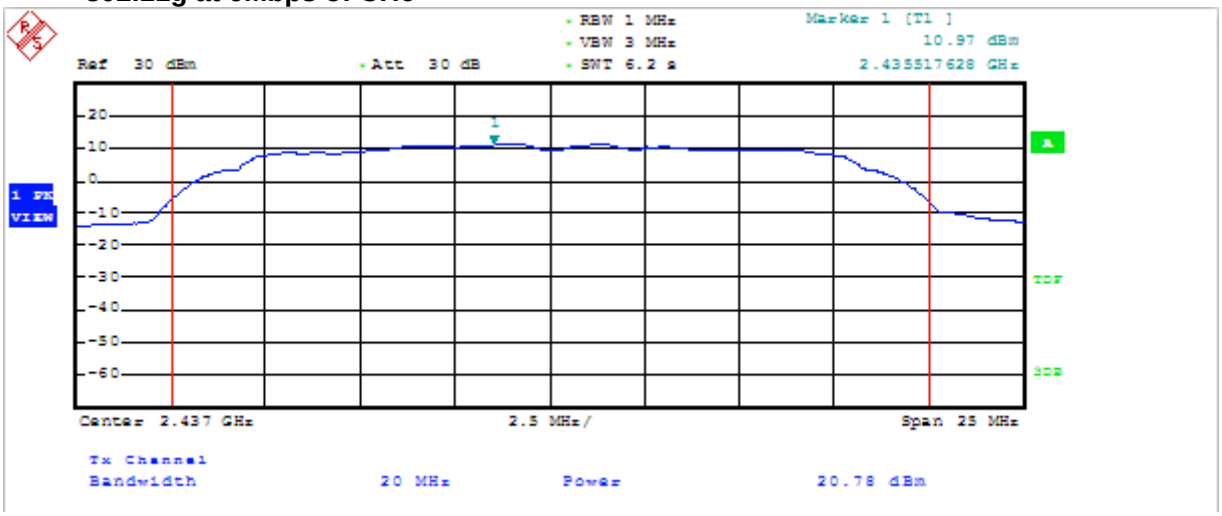
802.11b at 1Mbps of CH11



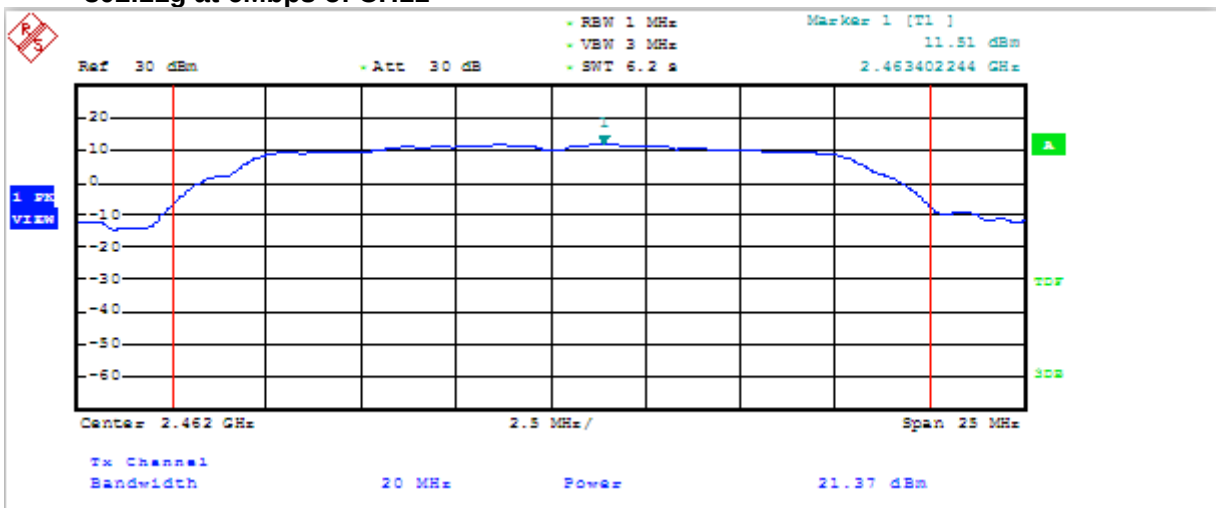
802.11g at 6Mbps of CH1



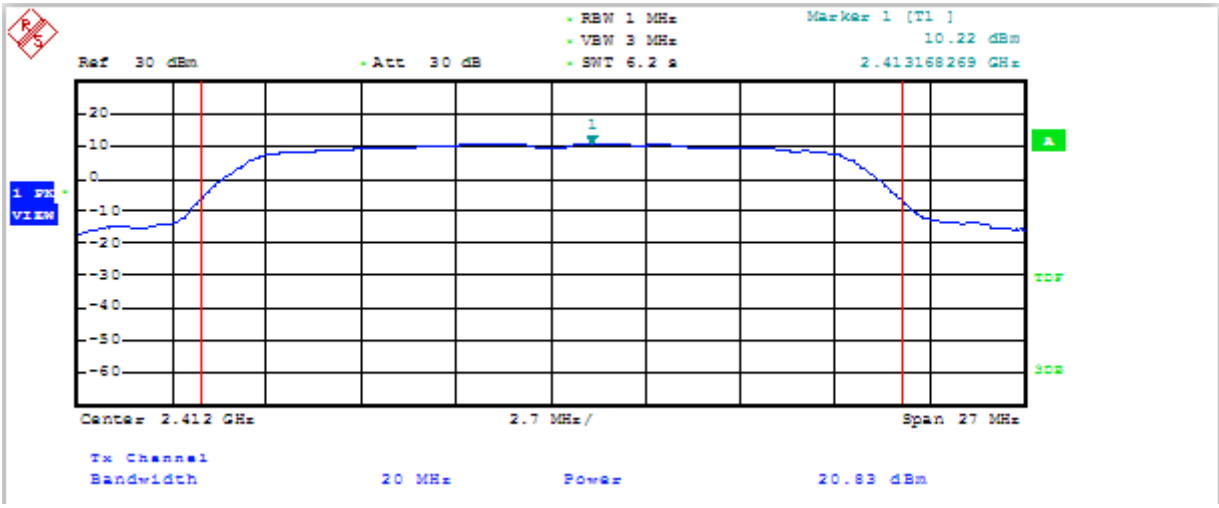
802.11g at 6Mbps of CH6



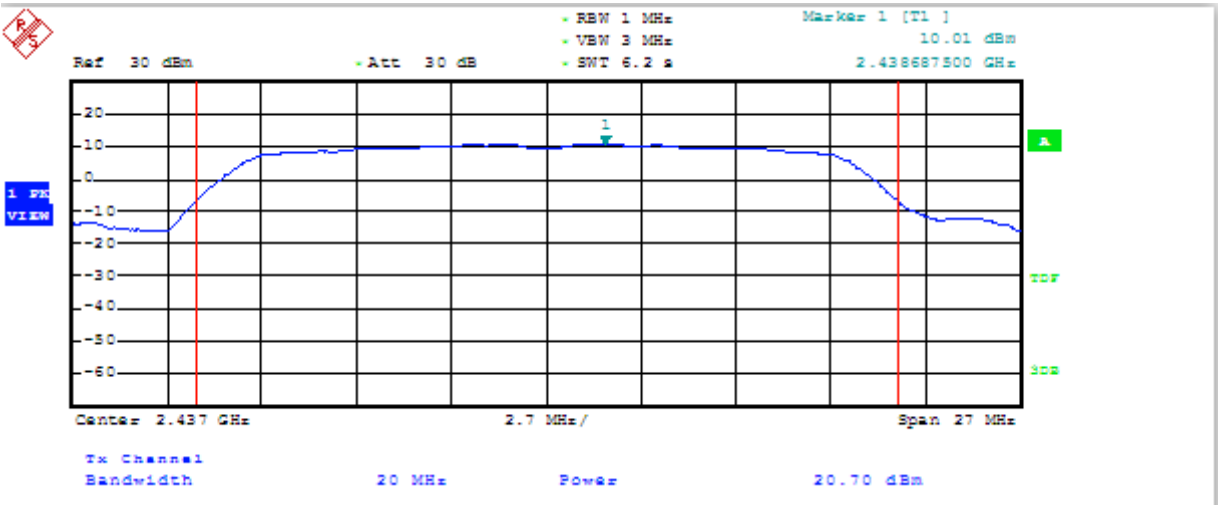
802.11g at 6Mbps of CH11



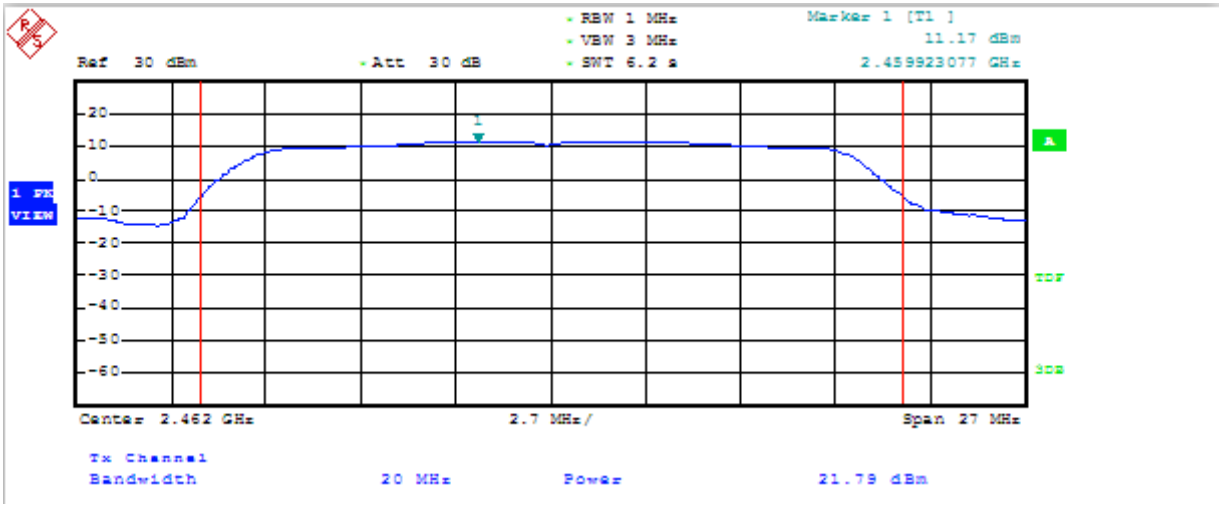
802.11n at HT20 of CH1



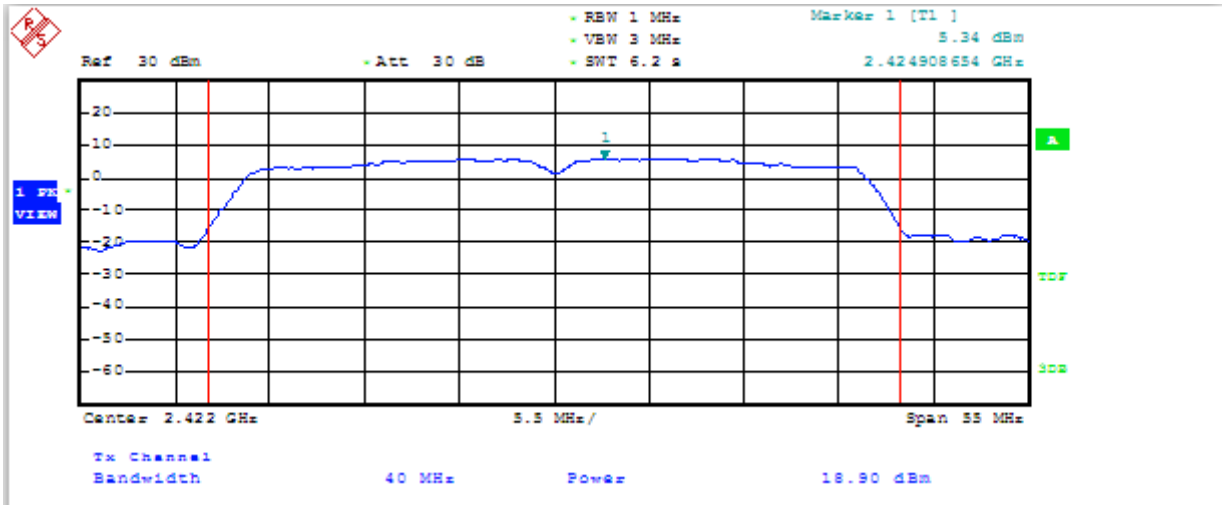
802.11n at HT20 of CH6



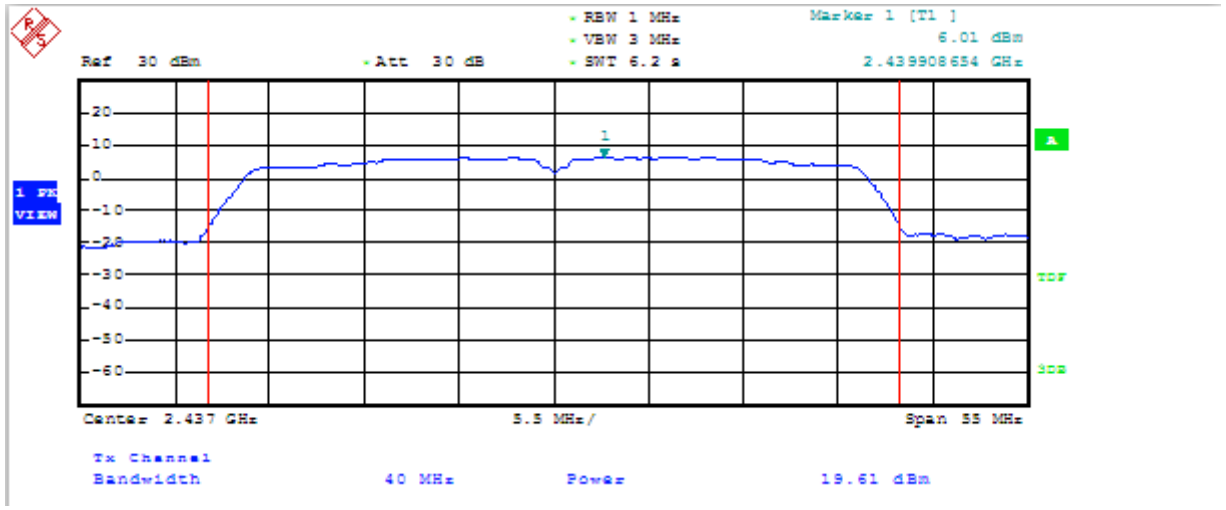
802.11n at HT20 of CH11



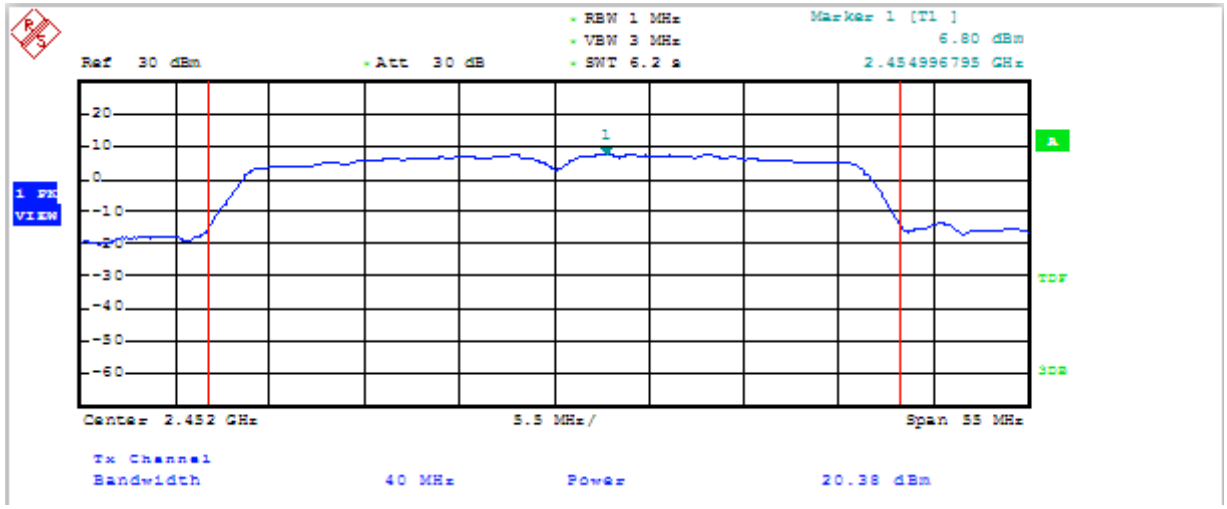
802.11n at HT40 of CH3



802.11n at HT40 of CH6



802.11n at HT40 of CH9

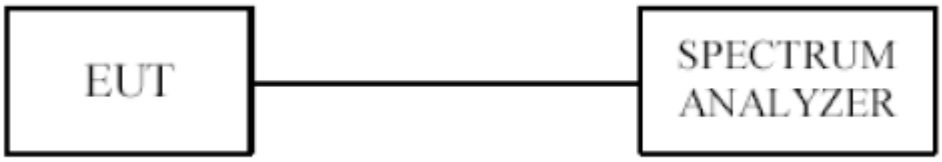


Average power:

Wi-Fi 2412-2462 MHz	Channel	Average Power (dBm) for Data Rates (Mbps)							
		1	2	5.5	11	/	/	/	/
802.11b	1	14.23	14.19	14.16	14.20	/	/	/	/
	6	14.21	14.18	14.30	14.29	/	/	/	/
	11	14.35	14.28	14.29	14.32	/	/	/	/
802.11g	Channel	6	9	12	18	24	36	48	54
	1	13.44	13.38	13.34	13.34	13.52	13.46	13.42	13.49
	6	13.37	13.38	13.40	13.47	13.41	13.35	13.44	13.46
	11	13.36	13.39	13.33	13.48	13.45	13.40	13.37	13.49
802.11n (20M)	Channel	6.5	13	19.5	26	39	52	58.5	65
	1	12.74	12.82	12.85	12.80	12.89	12.78	12.84	12.86
	6	12.89	12.74	12.78	12.86	12.88	12.89	12.73	12.81
	11	12.77	12.75	12.75	12.91	12.74	12.90	12.81	12.81
802.11n (40M)	Channel	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	3	8.32	8.34	8.34	8.42	8.50	8.34	8.43	8.50
	6	8.41	8.33	8.35	8.49	8.39	8.42	8.41	8.36
	9	8.39	8.47	8.49	8.38	8.38	8.49	8.50	8.32

9. POWER SPECTRAL DENSITY MEASUREMENT

9.1 TEST SETUP



The sample with a test program port is used to test. The EUT test port and Spectrum Analyzer are connected by the RF Cable.

9.2 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum Power Spectral Density Measurement is 8dBm.

9.3 TEST PROCEDURE

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used todemonstrate compliance.
2. Set the RBW = 3 kHz.
3. Set the VBW =10 kHz.
4. Set the span to 1.5 times the DTS channel bandwidth.
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.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be ≤ 8 dBm.

9.4 TEST RESULT

EUT	TDU Lite	Model	M-13 TDU Lite with Bixilon Printer
Mode	802.11b	Humidity	56% RH
Temperature	24 deg. C,		

Channel	Channel Frequency (MHz)	Final RF Power Level in (dBm/3KHz)	Maximum Limit (dBm/3KHz)	Pass/ Fail
1Mbps				
1	2412	-13.88	8	Pass
6	2437	-13.47	8	Pass
11	2462	-12.85	8	Pass

EUT	TDU Lite	Model	M-13 TDU Lite with Bixilon Printer
Mode	802.11g	Humidity	56% RH
Temperature	24 deg. C,		

Channel	Channel Frequency (MHz)	Final RF Power Level in (dBm/3KHz)	Maximum Limit (dBm/3KHz)	Pass/ Fail
6Mbps				
1	2412	-14.86	8	Pass
6	2437	-14.45	8	Pass
11	2462	-13.98	8	Pass

EUT	TDU Lite	Model	M-13 TDU Lite with Bixilon Printer
Mode	802.11n HT20	Humidity	56% RH
Temperature	24 deg. C,		

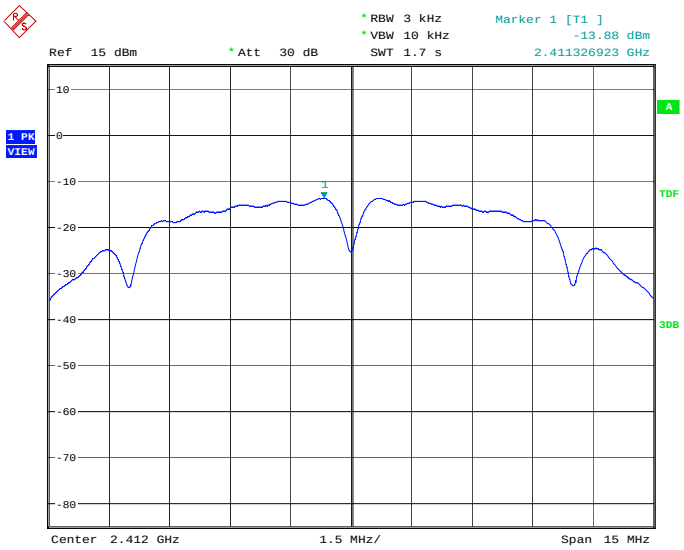
Channel	Channel Frequency (MHz)	Final RF Power Level in (dBm/3KHz)	Maximum Limit (dBm/3KHz)	Pass/ Fail
6.5Mbps				
1	2412	-15.20	8	Pass
6	2437	-14.74	8	Pass
11	2462	-14.14	8	Pass

EUT	TDU Lite	Model	M-13 TDU Lite with Bixilon Printer
Mode	802.11n HT40	Humidity	56% RH
Temperature	24 deg. C,		

Channel	Channel Frequency (MHz)	Final RF Power Level in (dBm/3KHz)	Maximum Limit (dBm/3KHz)	Pass/ Fail
13.5Mbps				
3	2422	-17.99	8	Pass
6	2437	-17.86	8	Pass
9	2452	-16.71	8	Pass

Remark: All of the modes have been investigated, and only worst mode is presented in this report.

802.11b at 1Mbps of CH1



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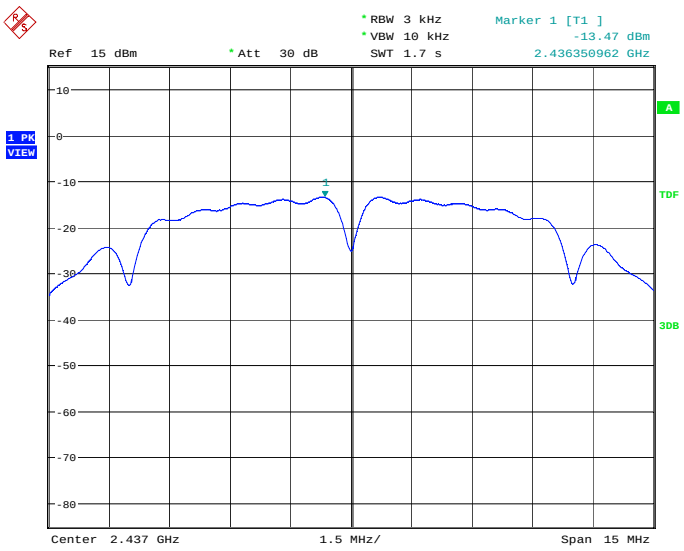
802.11b at 1Mbps at CH6



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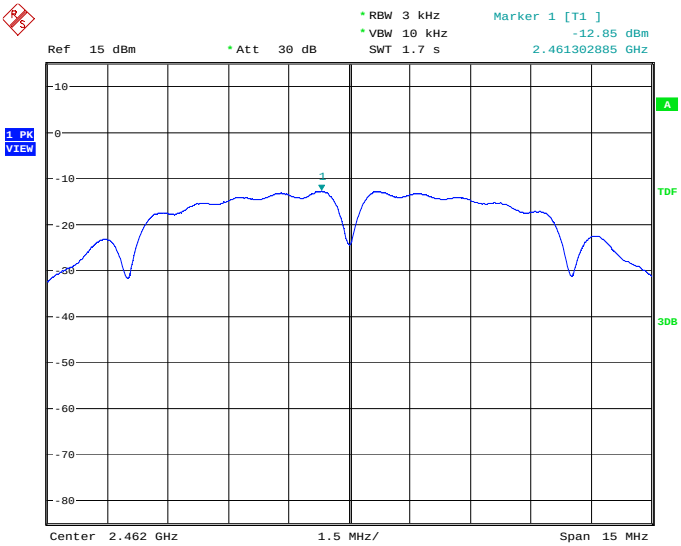
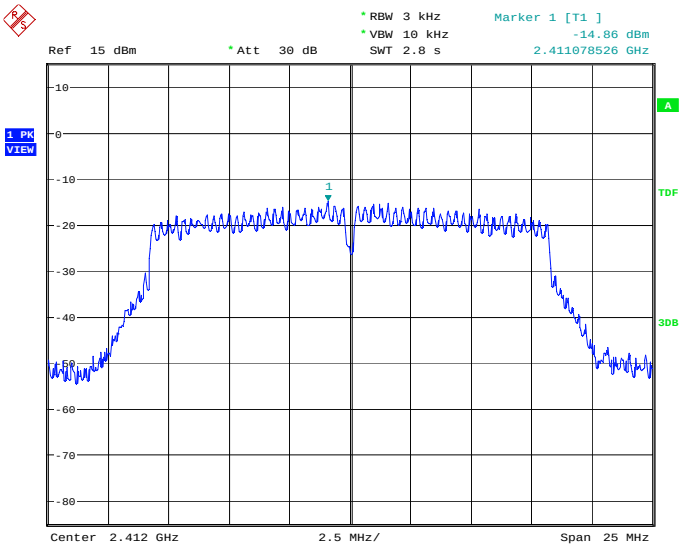
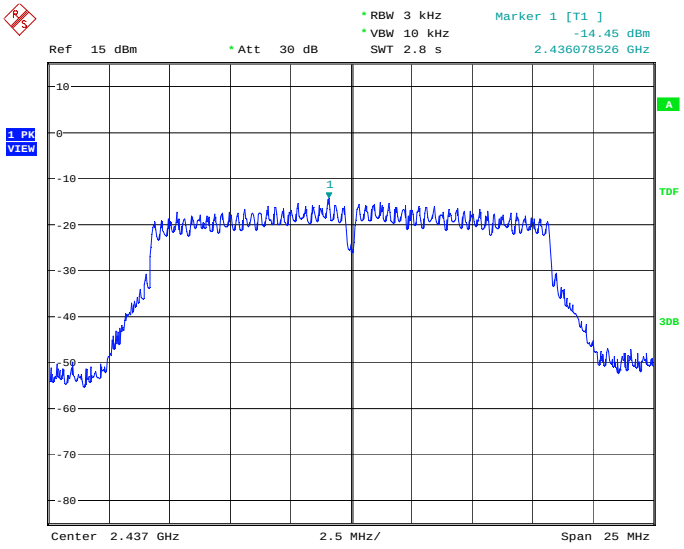
802.11b at 1Mbps of CH11



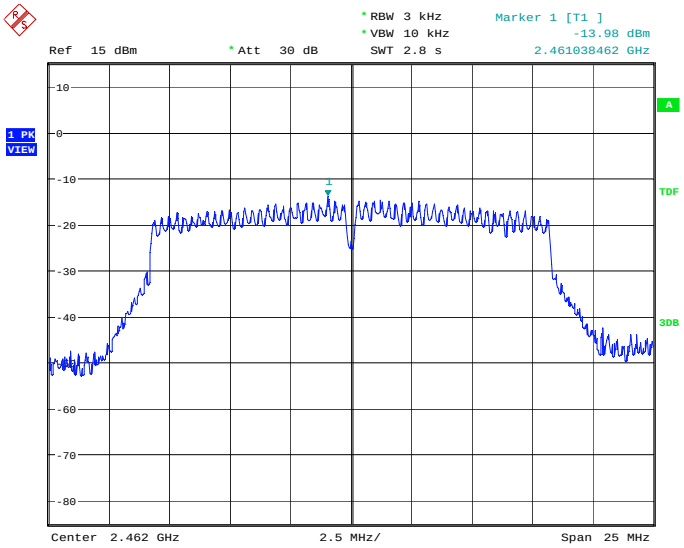
802.11g at 6Mbps of CH1



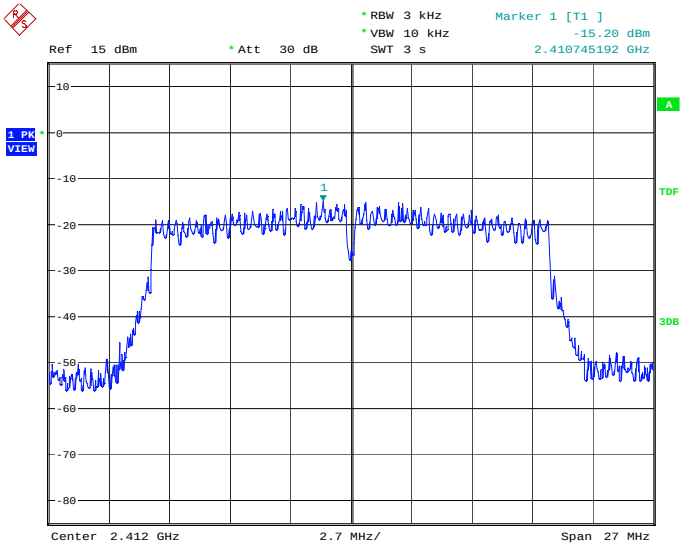
802.11g at 6Mbps of CH6



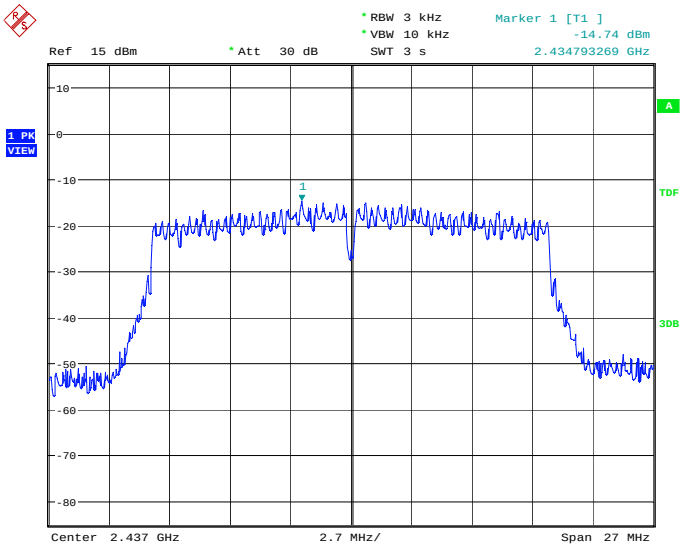
802.11g at 6Mbps of CH11



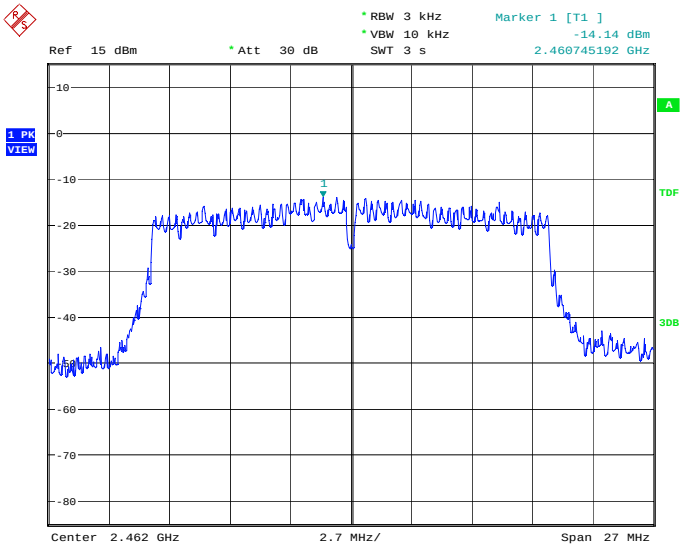
802.11n HT20 at 6.5Mbps of CH1



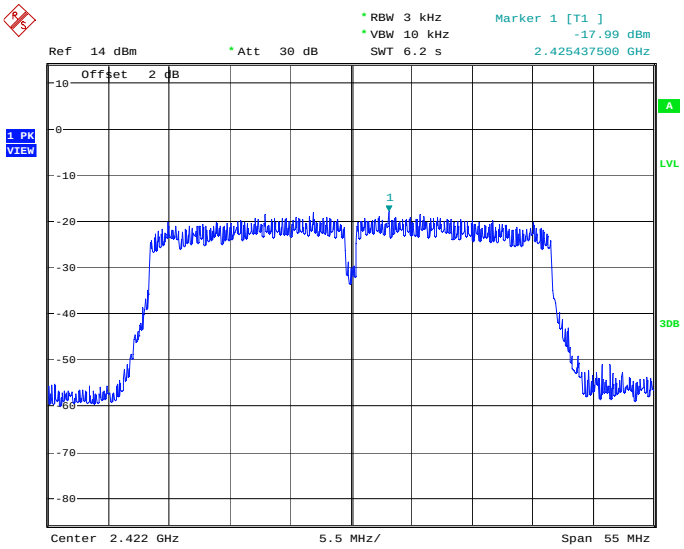
802.11n HT20 at 6.5Mbps of CH6



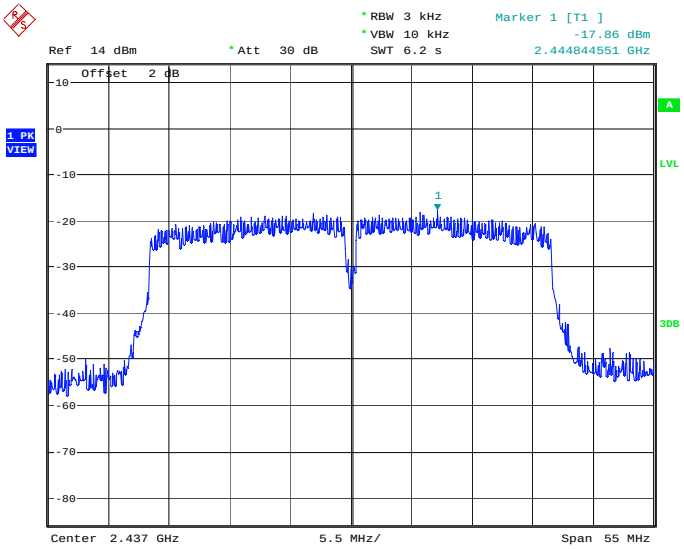
802.11n HT20 at 6.5Mbps of CH11



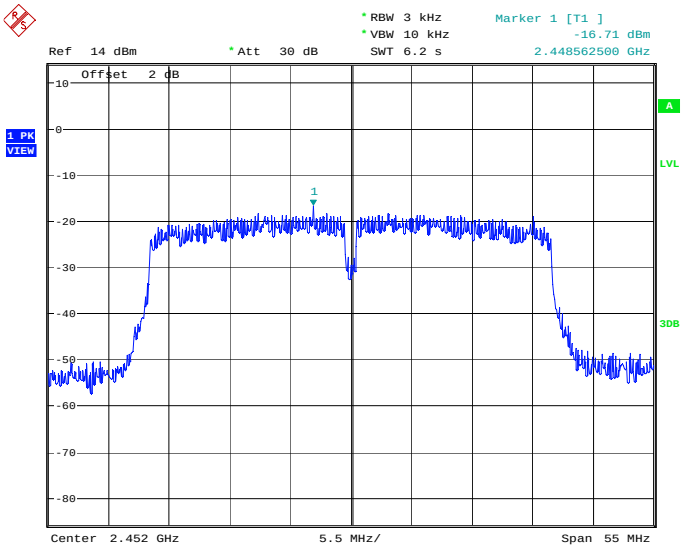
802.11n HT40 at13.5Mbps of CH3



802.11n HT40 at 13.5Mbps of CH6

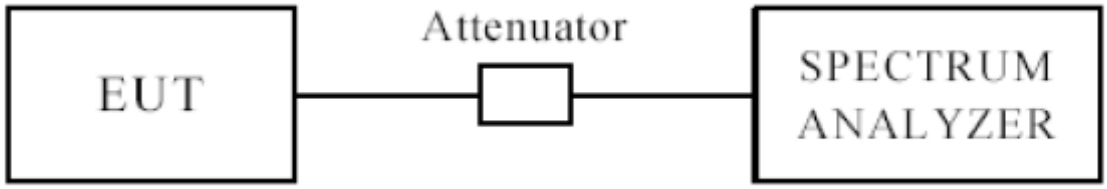


802.11n HT40 at 13.5Mbps of CH9



10. OUT OF BAND MEASUREMENT

10.1 TEST SETUP FOR BAND EDGE



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

10.2 LIMITS OF OUT OF BAND EMISSIONS MEASUREMENT

1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

10.3 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

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

10.4 TEST RESULT

Please see next pages
Note: This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

Radiated measurement:

802.11b

Indicated		result (PK/AV)	Antenna Polar (H/V)	Correction Factor			FCC Part 15.247		
Frequency (MHz)	Receiver Reading (dBμV/m)			Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2412MHz)									
2390	30.61	AV	V	30.3	4.1	33.1	31.91	54	22.09
2390	30.20	AV	H	30.3	4.1	33.1	31.50	54	22.50
2390	39.27	PK	V	30.3	4.1	33.1	40.57	74	33.43
2390	41.63	PK	H	30.3	4.1	33.1	42.93	74	31.07
High Channel (2462MHz)									
2483.5	31.16	AV	V	31	4.4	32.7	33.86	54	20.14
2483.5	30.03	AV	H	31	4.4	32.7	32.73	54	21.27
2483.5	40.57	PK	V	31	4.4	32.7	43.27	74	30.73
2483.5	39.80	PK	H	31	4.4	32.7	42.50	74	31.50

802.11g

Indicated		result (PK/AV)	Antenna Polar (H/V)	Correction Factor(dB)			FCC Part 15.247		
Frequency (MHz)	Receiver Reading (dBμV/m)			Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2412MHz)									
2390	35.12	AV	V	30.3	4.1	33.1	36.42	54	17.58
2390	34.53	AV	H	30.3	4.1	33.1	35.83	54	18.17
2390	50.84	PK	V	30.3	4.1	33.1	52.14	74	21.86
2390	50.95	PK	H	30.3	4.1	33.1	52.25	74	21.75
High Channel (2462MHz)									
2483.5	29.55	AV	V	31	4.4	32.7	32.25	54	21.75
2483.5	32.23	AV	H	31	4.4	32.7	34.93	54	19.07
2483.5	41.85	PK	V	31	4.4	32.7	44.55	74	29.45
2483.5	41.78	PK	H	31	4.4	32.7	44.48	74	29.52

Note:
1. The BAND EDGE RESTRICTED BANDS emission is too low at least 20dB to the Fundamental.
2. Correction Factor(dB)=Ant. Factor(dB/m)+Cable Loss(dB)- Pre-Amp. Gain(dB)
3. Cod. Amp.(dBμV/m)=Receiver Reading(dBμV/m)+ Correction Factor(dB)
3. Margin(dB)=Limit(dBμV/m)-Cod. Amp.(dBμV/m)

802.11n HT20

Indicated		result (PK/AV)	Antenna Polar (H/V)	Correction Factor			FCC Part 15.247		
Frequency (MHz)	Receiver Reading (dBμV/m)			Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2412MHz)									
2390	33.96	AV	V	30.3	4.1	33.1	35.26	54	18.74
2390	33.42	AV	H	30.3	4.1	33.1	34.72	54	19.28
2390	51.22	PK	V	30.3	4.1	33.1	52.52	74	21.48
2390	51.83	PK	H	30.3	4.1	33.1	53.13	74	20.87
High Channel (2462MHz)									
2483.5	29.99	AV	V	31	4.4	32.7	32.69	54	21.31
2483.5	29.60	AV	H	31	4.4	32.7	32.30	54	21.70
2483.5	40.94	PK	V	31	4.4	32.7	43.64	74	30.36
2483.5	39.56	PK	H	31	4.4	32.7	42.26	74	31.74

802.11n HT40

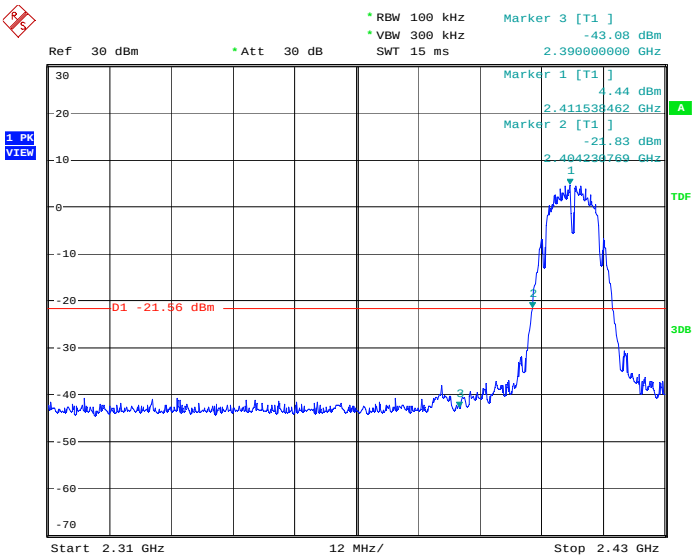
Indicated		result (PK/AV)	Antenna Polar (H/V)	Correction Factor			FCC Part 15.247		
Frequency (MHz)	Receiver Reading (dBμV/m)			Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2422MHz)									
2390	36.57	AV	V	30.3	4.1	33.1	37.87	54	16.13
2390	37.60	AV	H	30.3	4.1	33.1	38.90	54	15.10
2390	53.46	PK	V	30.3	4.1	33.1	54.76	74	19.24
2390	53.42	PK	H	30.3	4.1	33.1	54.72	74	19.28
High Channel (2452MHz)									
2483.5	31.83	AV	V	31	4.4	32.7	34.53	54	19.47
2483.5	31.98	AV	H	31	4.4	32.7	34.68	54	19.32
2483.5	46.45	PK	V	31	4.4	32.7	49.15	74	24.85
2483.5	46.62	PK	H	31	4.4	32.7	49.32	74	24.68

Note:
1. The BAND EDGE RESTRICTED BANDS emission is too low at least 20dB to the Fundamental.
2. Correction Factor(dB)=Ant. Factor(dB/m)+Cable Loss(dB)- Pre-Amp. Gain(dB)
3. Cod. Amp.(dBμV/m)=Receiver Reading(dBμV/m)+ Correction Factor(dB)
3. Margin(dB)=Limit(dBμV/m)-Cod. Amp.(dBμV/m)

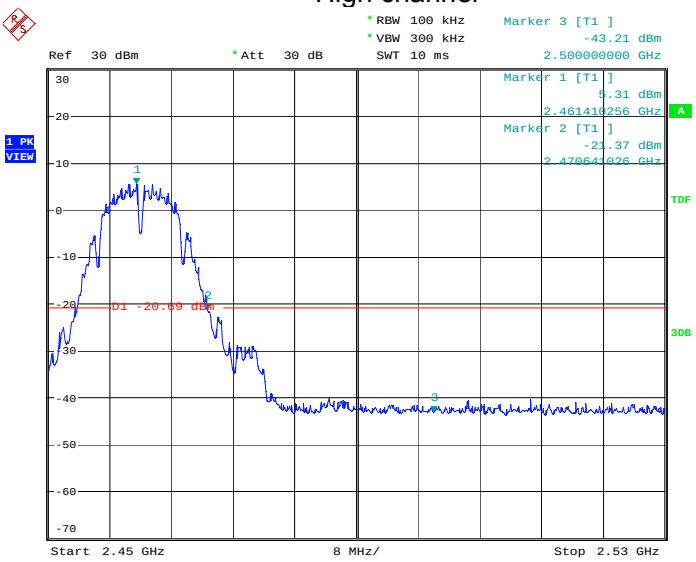
Conducted measurement：

802.11b:

Low channel

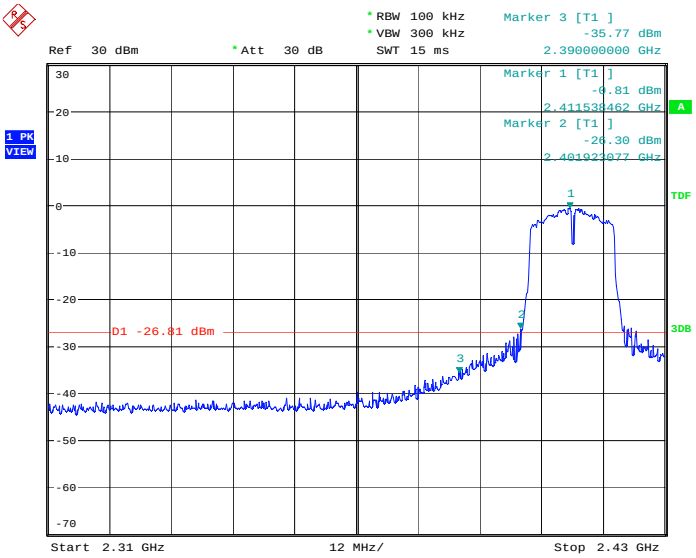


High channel

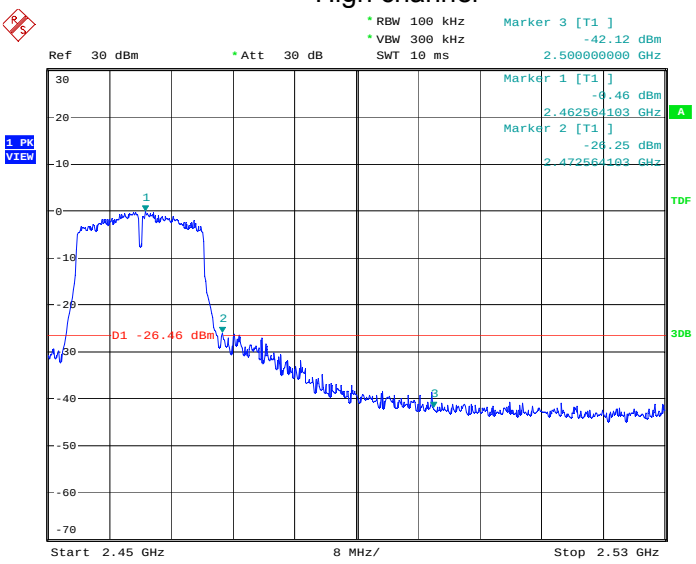


802.11g:

Low channel

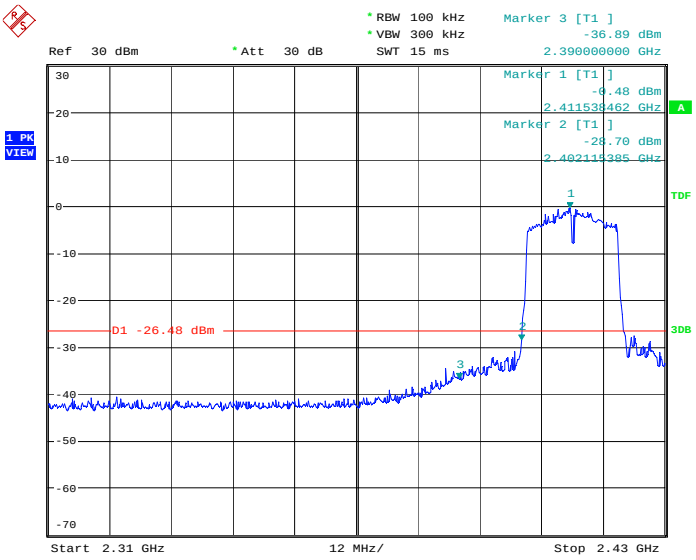


High channel

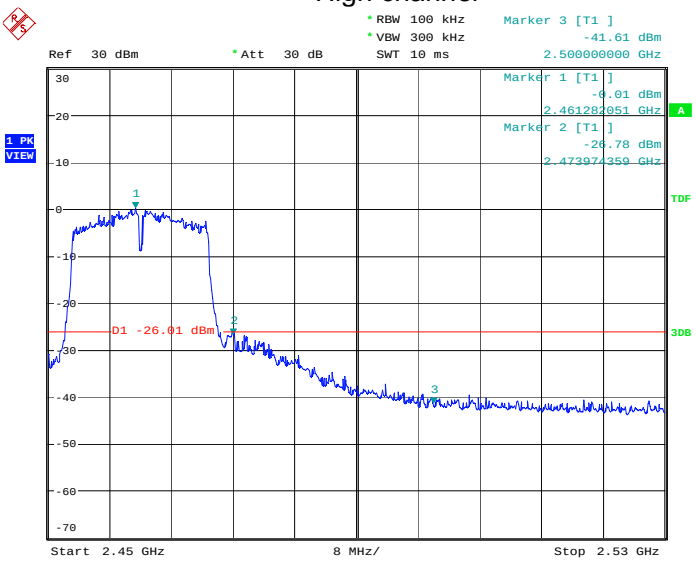


802.11n HT20:

Low channel

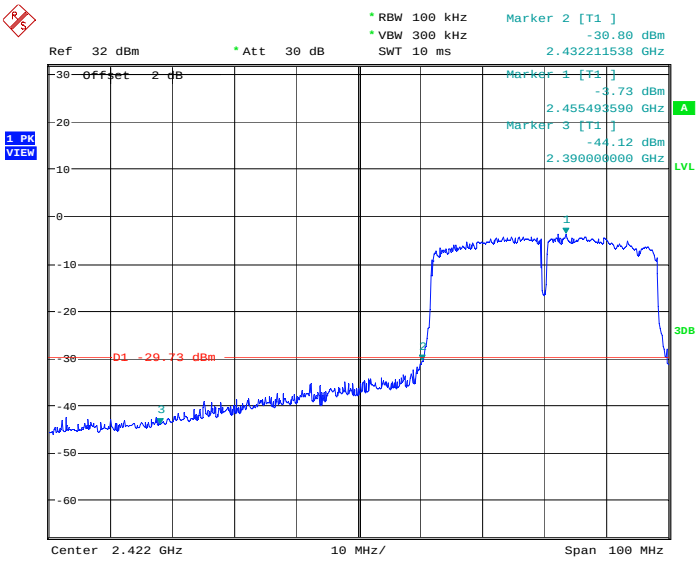


High channel

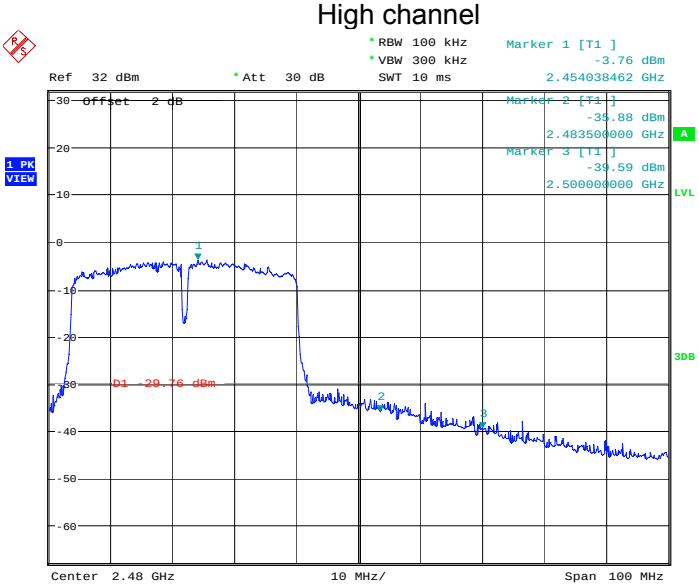


802.11n HT40:

Low channel



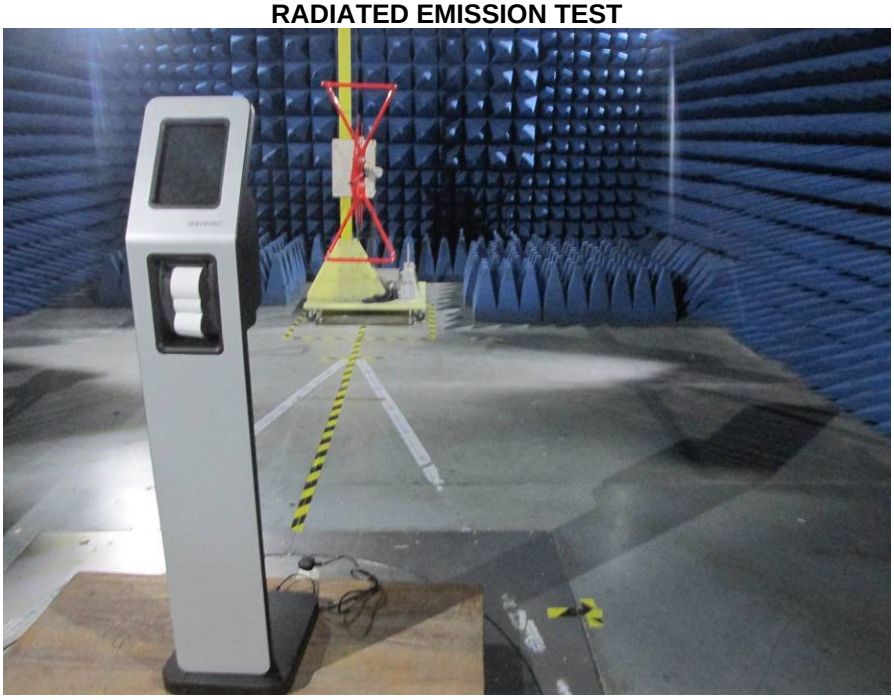
High channel



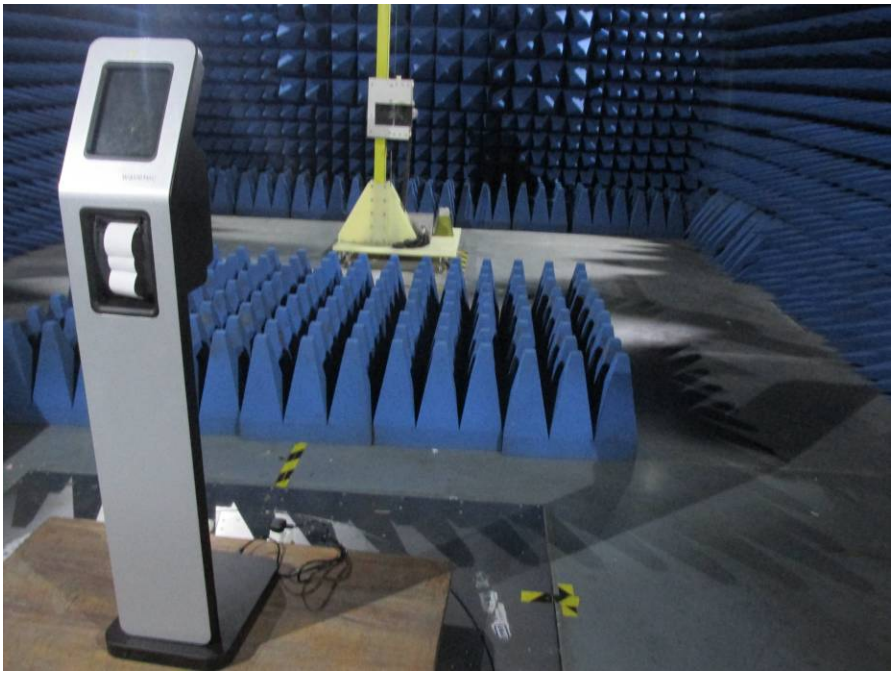
11. PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST



RADIATED EMISSION TEST



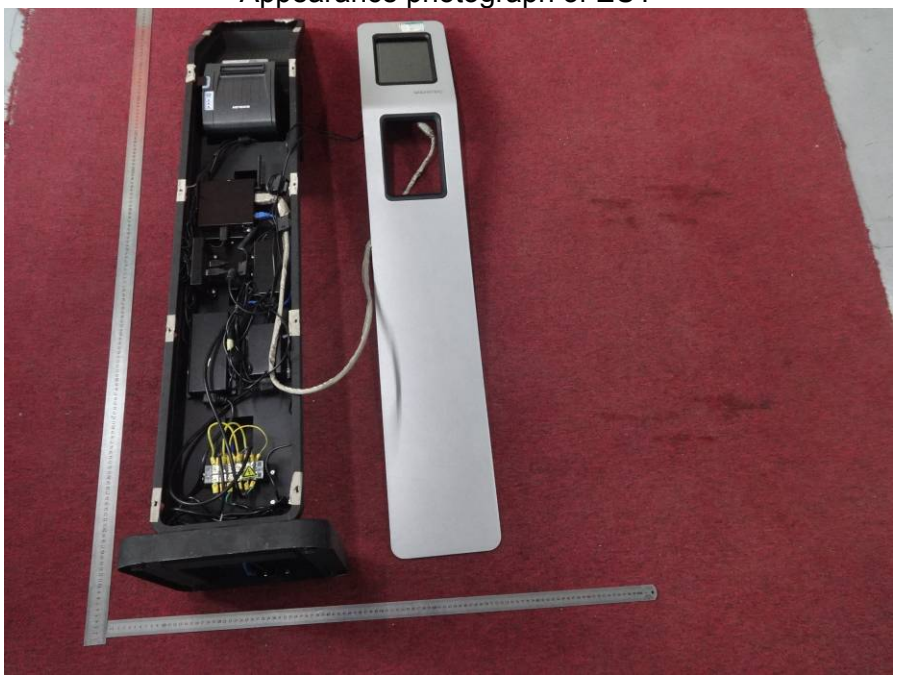
RF TEST

12. PHOTOGRAPHS OF EUT

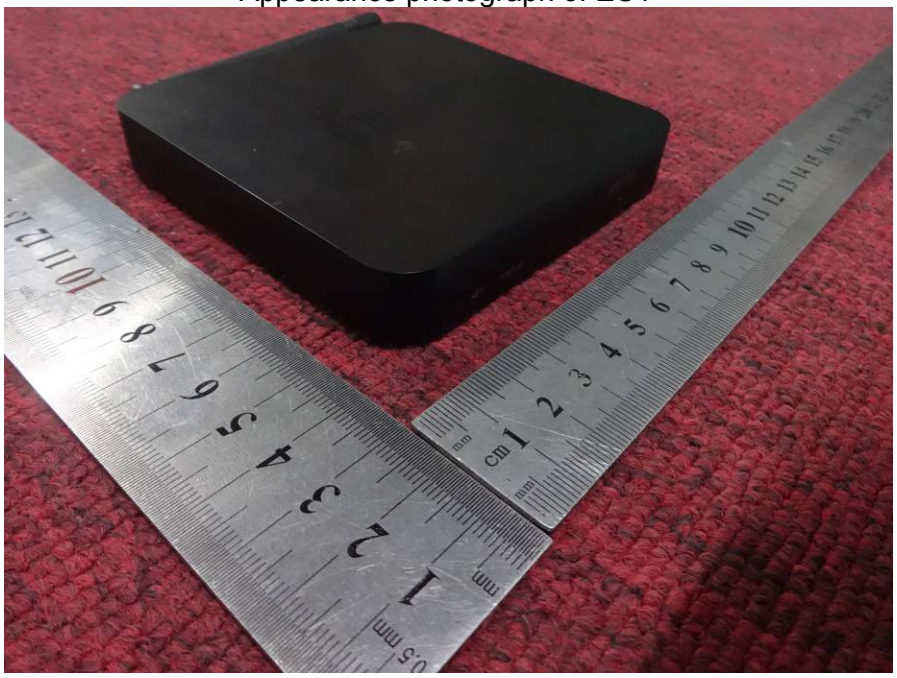
Appearance photograph of EUT

Appearance photograph of EUT

Appearance photograph of EUT

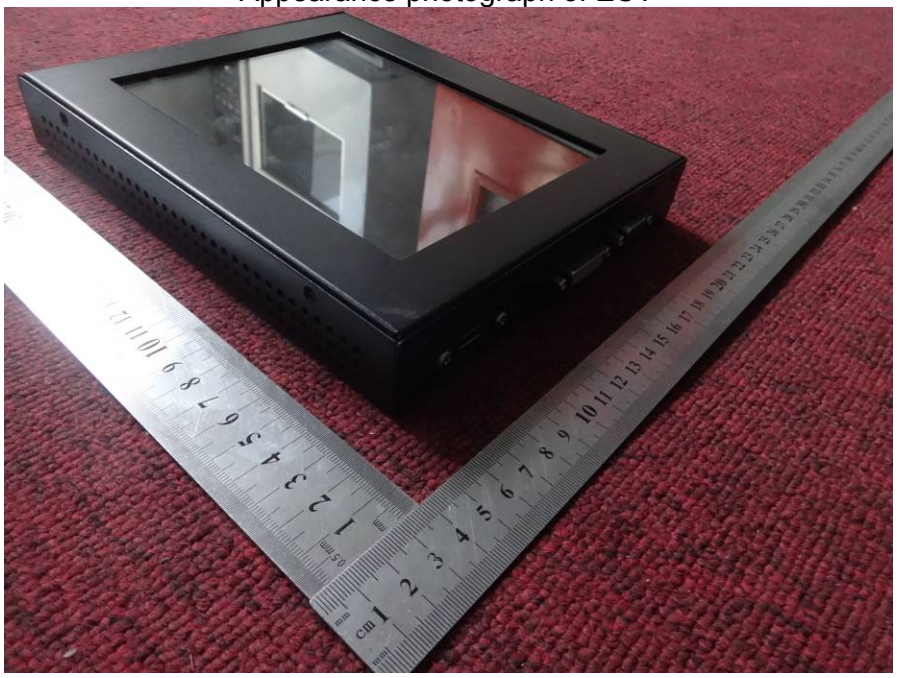


Appearance photograph of EUT



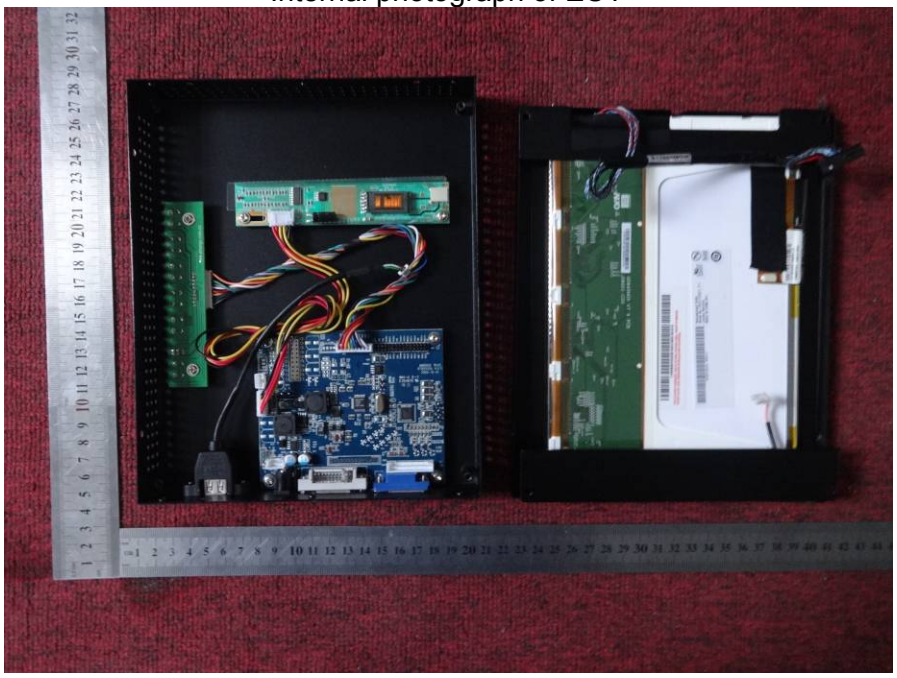
Appearance photograph of EUT

Appearance photograph of EUT

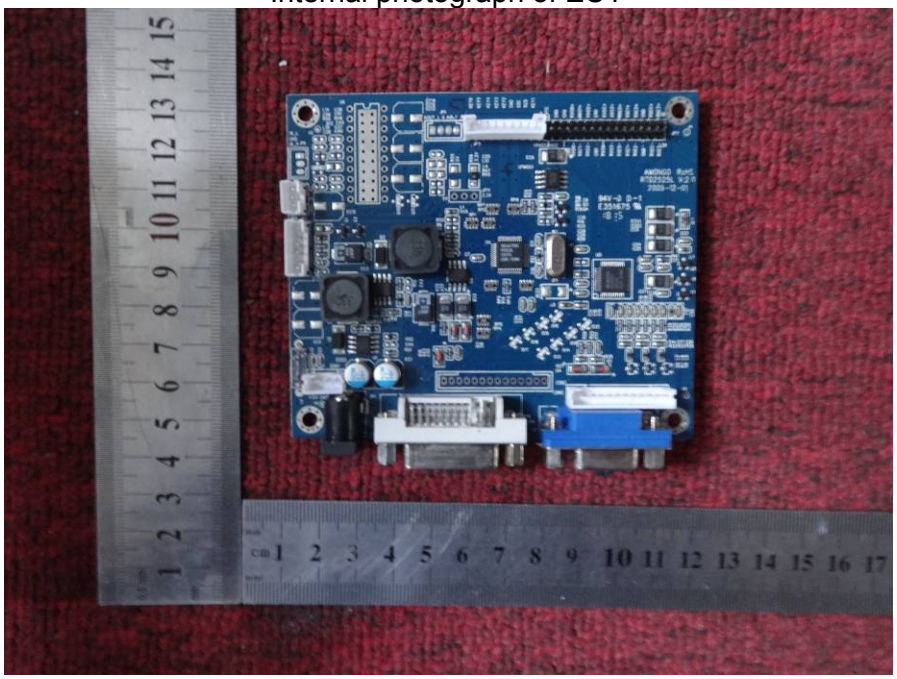


Appearance photograph of EUT

Internal photograph of EUT



Internal photograph of EUT



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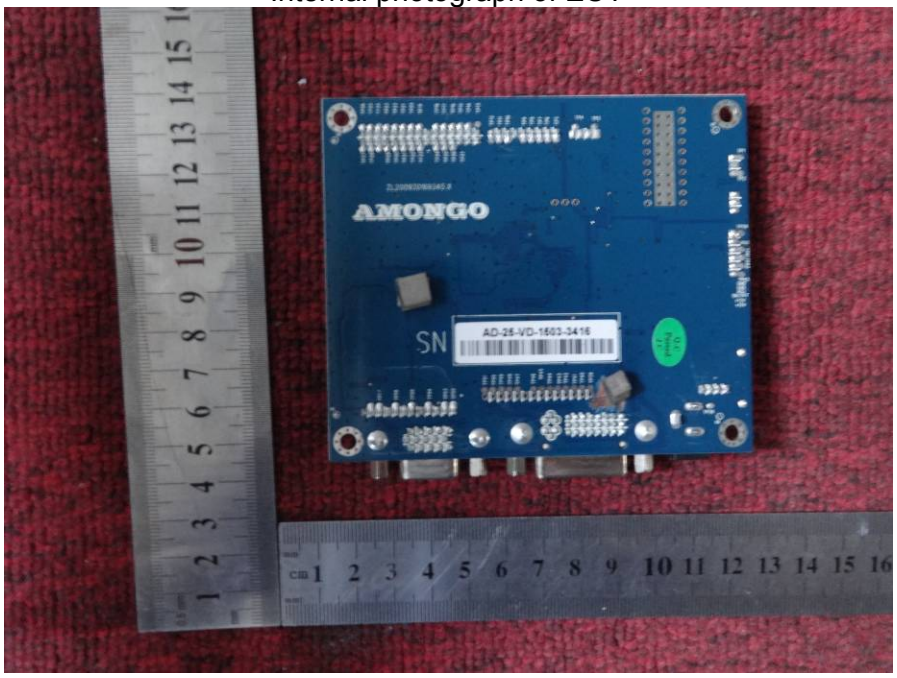
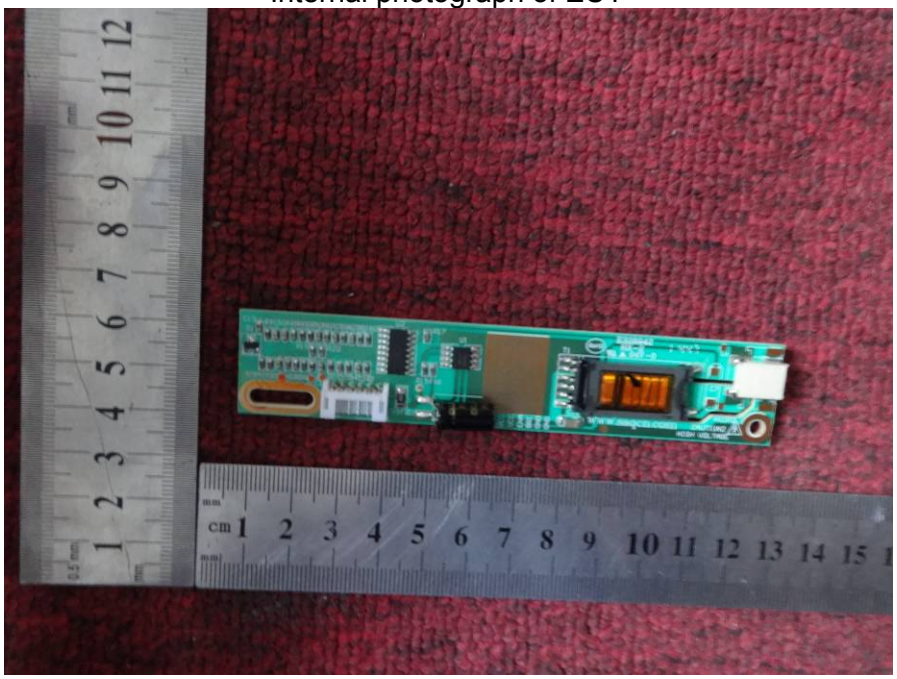
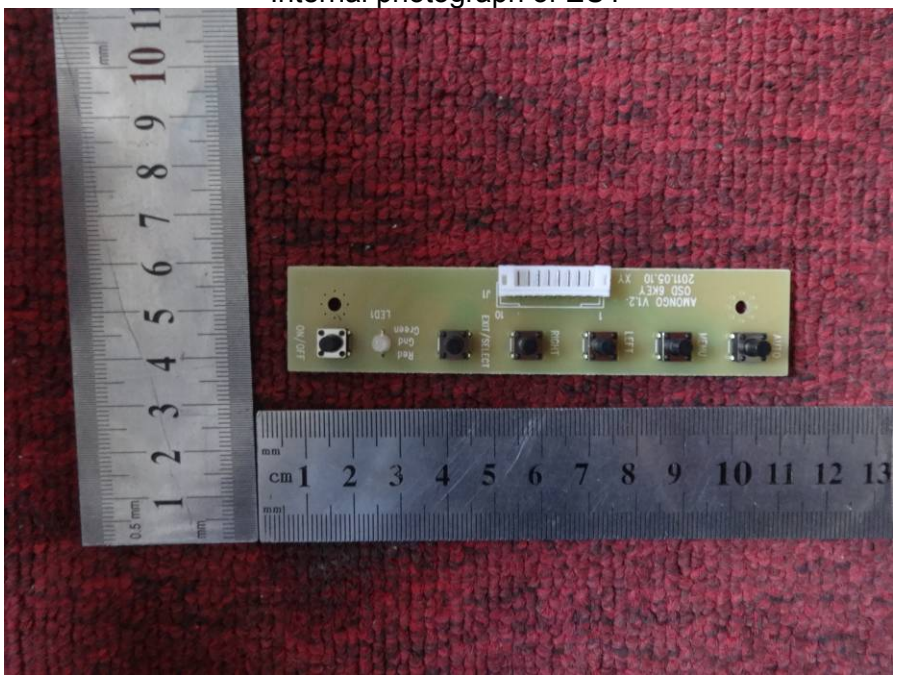


Internal photograph of EUT

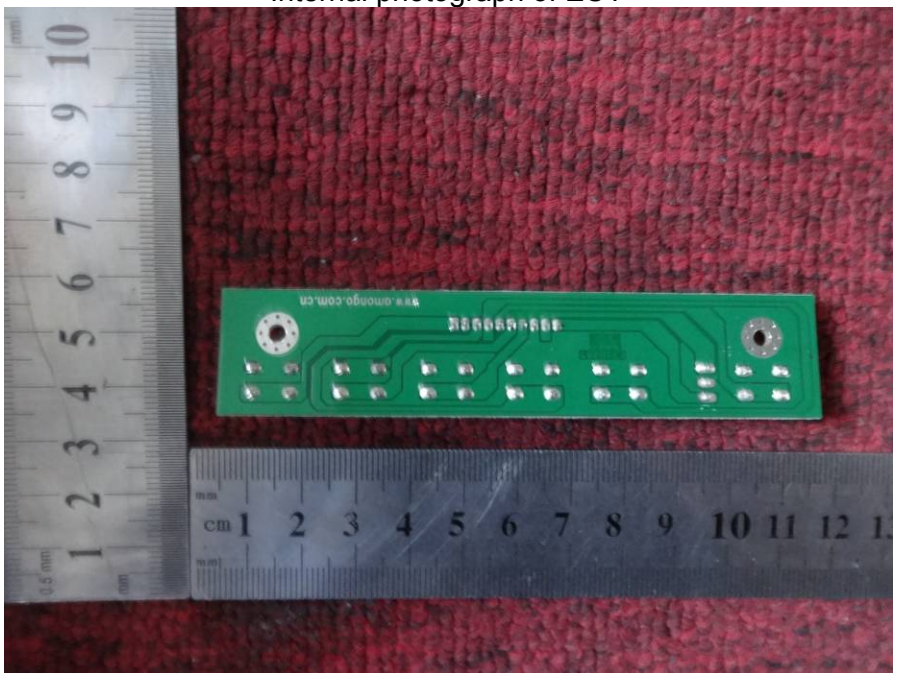


Internal photograph of EUT

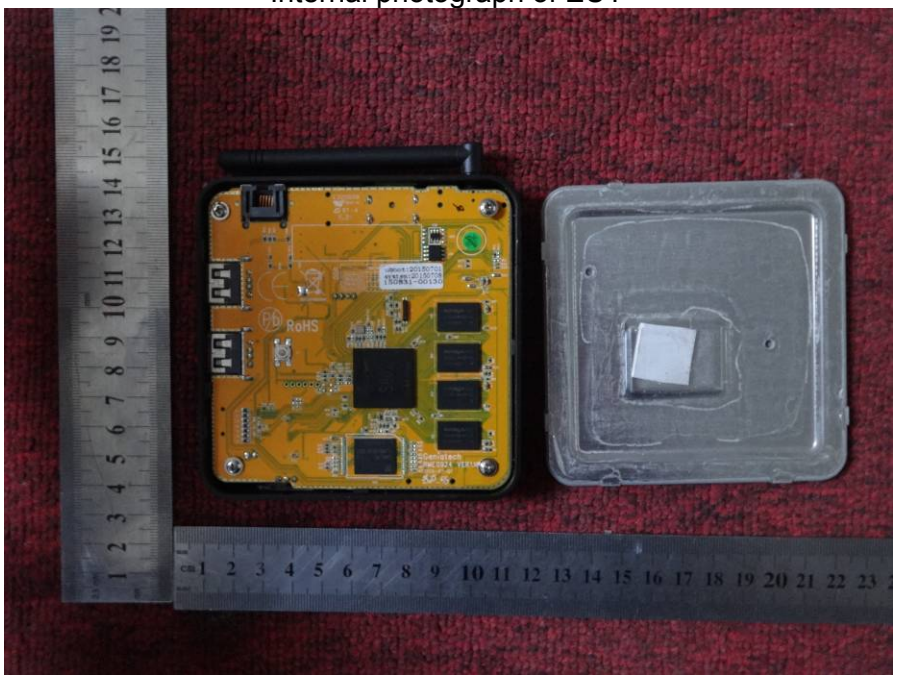
Internal photograph of EUT



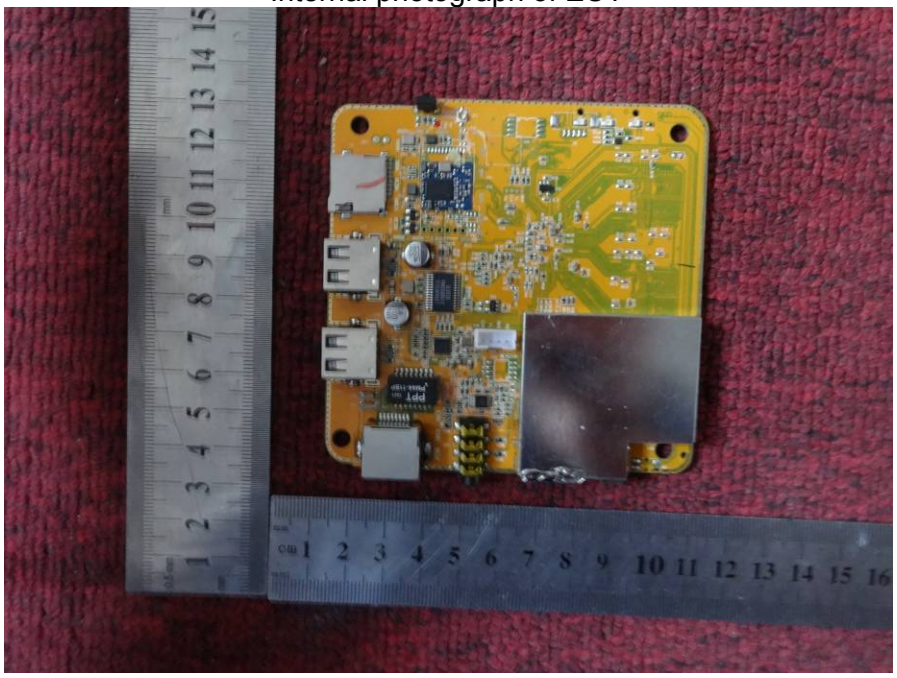
Internal photograph of EUT



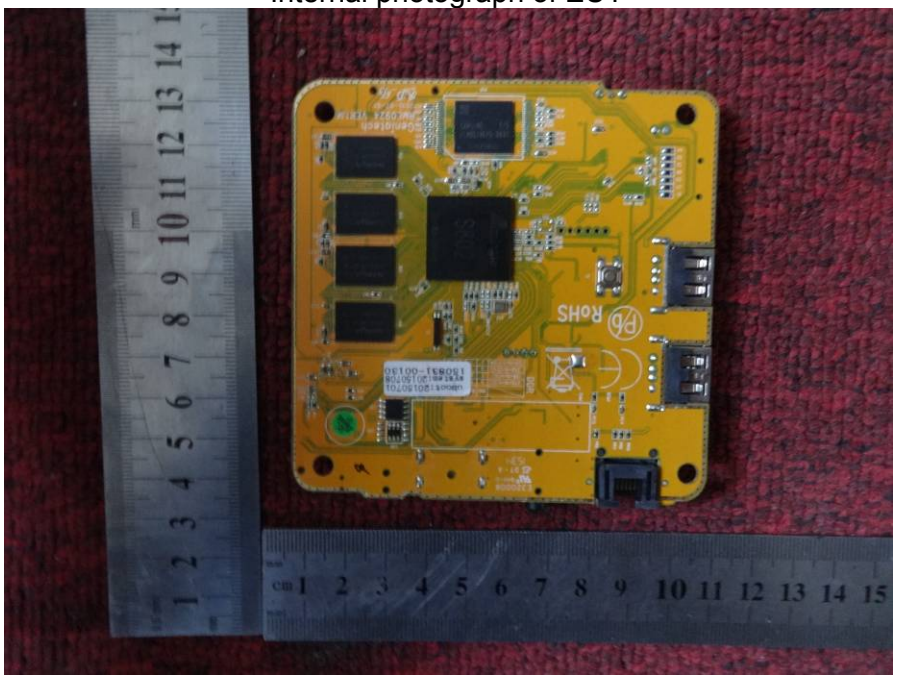
Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



——END OF REPORT——