
TEST REPORT

Report No.: SRTC2014-H024-E0062

Product Name: GSM/GPRS/EDGE/UMTS

Digital Mobile Phone with Bluetooth and WiFi

Marketing Name: ONE TOUCH 7042A

Product Model: Yaris-5

Applicant: TCT Mobile Limited

Manufacturer: TCT Mobile Limited

Specification: FCC Part 15, Subpart C (October 9, 2012 edition)

FCC ID: RAD525

The State Radio_monitoring_center Testing Center (SRTC)

No.80 Beilishi Road Xicheng District Beijing, China

Tel: 86-10-68009202 Fax: 86-10-68009205

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1. General information

1.1 Notes of the test report

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The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company: The State Radio_monitoring_center Testing Center (SRTC)
Address: No.80 Beilishi Road, Xicheng District, Beijing China
City: Beijing
Country or Region: China
Contacted person: Wang Junfeng
Tel: +86 10 68009181 +86 10 68009202
Fax: +86 10 68009195 +86 10 68009205
Email: wangjf@srrc.org.cn / wangjunfeng@srtc.org.cn

1.3 Applicant's details

Company: TCT Mobile Limited
Address: 5F, C building, No. 232, Liang Jing Road ZhangJiang
High-Tech Park, Pudong Area
City: Shanghai
Country or Region: P.R.China
Grantee Code: RAD
Contacted person: Gong Zhizhou
Tel: +86-21-61460890
Fax: +86-21-61460602
Email: zhizhou.gong@tcl.com

1.4 Manufacturer's details

Company: TCT Mobile Limited
Address: 5F, C building, No. 232, Liang Jing Road ZhangJiang
High-Tech Park, Pudong Area
City: Shanghai
Country or Region: P.R.China
Contacted person: Gong Zhizhou
Tel: +86-21-61460890
Fax: +86-21-61460602
Email: zhizhou.gong@tcl.com

1.5 Application details

Date of reception of test sample: 9th September 2013

Date of test: 9th September 2013 to 1st September 2014

1.6 Reference specification

FCC Part 15, Subpart C (October 9, 2012 edition)

1.7 Information of EUT

1.7.1 General information

Name of EUT	GSM/GPRS/EDGE/UMTS Digital Mobile Phone with Bluetooth and WiFi
FCC ID	RAD525
Frequency Range	2.4GHz~2.4835GHz
Number of Channel	11
Modulation Type	DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM
Duplex Mode	TDD
Channel Spacing	5MHz
Data Rate	1Mbps/2Mbps/5.5Mbps/11Mbps/6Mbps/9Mbps/12Mbps /18Mbps/24Mbps/36Mbps/48Mbps/54Mbps/6.5Mbps /13.0Mbps/13.5Mbps/19.5Mbps/26.0Mbps/27.0Mbps /39.0Mbps/40.5Mbps/52.0Mbps/58.5Mbps/65Mbps /81.0Mbps/108.0Mbps/121.5Mbps/135.0Mbps
Transmit Mode	Continuously
Duty Cycles	98%
Antenna Type	Fixed Internal
Power Supply	Battery or Charger
Rated Power Supply Voltage	3.8V
HW Version	SBA33A10001E
SW Version	vAQW

1.7.2 EUT details

Product Name	Marketing Name	Product Model	IMEI
GSM/GPRS/EDGE/UMTS Digital Mobile Phone with Bluetooth and WiFi	ONE TOUCH 7042A	Yaris-5	863603020000078 865867020000051

1.7.3 Auxiliary equipment details

Equipment	Charger
Manufacturer	Ten Pao Industrial Co., Ltd.
Model Number	S005UU0500100
Input Voltage	100V-240V a.c.
Output Voltage	5.0V d.c.
Frequency	50/60Hz

Equipment	Charger
Manufacturer	HUIZHOU BYD ELECTRONIC CO., LTD.
Model Number	TUUS050100-A00
Input Voltage	100V-240V a.c.
Output Voltage	5.0V d.c.
Frequency	50/60Hz

Equipment	Battery
Manufacturer	BYD COMPANY LIMITED
Model Number	TLi020F1
Capacity	2000mAh
Rated Voltage	4.35V d.c.

Equipment	Battery
Manufacturer	BYD COMPANY LIMITED
Model Number	TLi019B1
Capacity	1900mAh
Rated Voltage	4.35V d.c.

Equipment	Battery
Manufacturer	SCUD (FUJIAN) Electronics Co., Ltd.
Model Number	TLi019B2
Capacity	1900mAh
Rated Voltage	4.35V d.c.

Equipment	Data Cable
Manufacturer	Shenzhen Juwei Electronics Co., Ltd.
Model Number	CDA3122002C1

Equipment	Data Cable
Manufacturer	Huizhou Shenghua Industry Co., Ltd.
Model Number	CDA3122002C2

Equipment	Data Cable
Manufacturer	Shenzhen Juwei Electronics Co., Ltd.
Model Number	CDA3122005C1

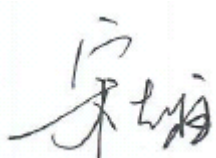
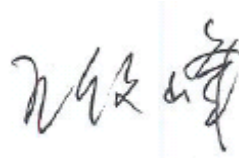
Equipment	Data Cable
Manufacturer	Huizhou Shenghua Industry Co., Ltd.
Model Number	CDA3122005C2

Note: As the information described above, there are two different models of charger manufactured by two different companies, three different models of battery manufactured by two different companies and four different models of data cable manufactured by two different companies. The relevant tests have been performed in order to verify in which combination case (EUT exercised by only one model of charger, one model of battery and one model of data cable) the EUT would have the worst features. So all the tests shown in this test report are performed when the EUT exercised by the charger S005UU0500100, the battery TLi020F1 and the data cable CDA3122002C1.

2. Test information

2.1 Summary of the test results

No.	Test case	FCC reference	Verdict
1	Peak Power Output	15.247(b)(3)	Pass
2	Occupied Bandwidth	15.247(a)(2)	Pass
3	Transmitter Power Spectral Density	15.247(e)	Pass
4	Conducted Out of band emission measurement	15.247(d)	Pass
5	Spurious Radiated Emissions	15.247(d)/15.35(b)/15.209	Pass
6	AC Power line Conducted Emission	15.207	Pass

This Test Report Is Issued by: Mr. Song Qizhu Director of the test lab 	Checked by: Mr. Wang Junfeng Deputy director of the test lab 
Tested by: Mr. Li Bin Test engineer 	Issued date: 2014.08.18

2.2 Test result

2.2.1 Peak Power Output

2.2.1.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.1kPa

2.2.1.2 Test Description

A transmitter antenna terminal of EUT is connected to the power meter. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies.

2.2.1.3 Test limit

Fcc Part15.247(b)(3)

The maximum permissible conducted output power is 1 Watt.

Used conversion factor: Limit (dBm) = 10 log (Limit (W)/1mW)

==> Maximum Output Power: 30 dBm

2.2.1.4 Test Procedure Used

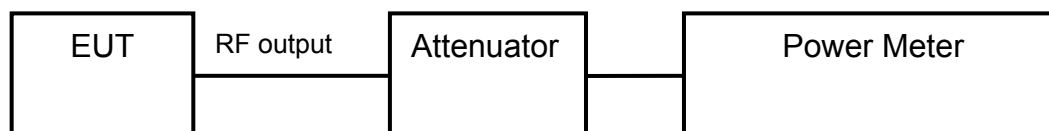
KDB 558074 D01 v03r01 - Section 9.1.3

2.2.1.5 Test Settings

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.

2.2.1.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



2.2.1.7 Test result

Modulation type		Average power output (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462MHz (Ch11)
11b	1 Mbps	15.74	15.74	15.92
	2 Mbps	15.72	15.73	15.79
	5.5 Mbps	16.51	16.57	16.68
	11 Mbps	16.13	16.25	16.17
11g	6 Mbps	12.91	13.82	12.80
	9 Mbps	12.95	13.86	12.93
	12 Mbps	12.79	13.78	12.96
	18 Mbps	12.89	13.78	13.02
	24 Mbps	12.91	13.96	12.84
	36 Mbps	12.71	14.12	12.97
	48 Mbps	12.76	14.19	12.99
	54 Mbps	12.70	13.79	13.18
11n HT20	6.5 Mbps	12.75	14.18	13.17
	13 Mbps	12.80	13.92	12.96
	19.5 Mbps	12.83	13.96	13.19
	26 Mbps	12.90	14.03	13.02
	39 Mbps	12.68	13.90	13.03
	52 Mbps	12.79	13.95	13.13
	58.5 Mbps	12.75	13.92	13.10
	65 Mbps	12.89	14.05	13.19

Modulation type		Average power output (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2462MHz (Ch11)
11n HT40	13.5 Mbps	10.66	13.72	13.75
	27 Mbps	10.67	13.79	13.82
	40.5 Mbps	10.57	13.72	13.67
	54 Mbps	10.79	13.79	14.23
	81 Mbps	10.43	13.57	13.87
	108 Mbps	10.39	13.67	13.56
	121.5 Mbps	10.58	13.89	13.91
	135 Mbps	10.77	14.01	13.94

Modulation type		Peak power output (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462MHz (Ch11)
11b	1 Mbps	18.74	18.87	19.02
	2 Mbps	18.64	18.69	18.87
	5.5 Mbps	18.69	18.71	18.93
	11 Mbps	18.71	18.84	18.92
11g	6 Mbps	21.92	22.99	22.54
	9 Mbps	21.75	22.88	22.37
	12 Mbps	21.80	22.74	22.49
	18 Mbps	21.88	22.92	22.44
	24 Mbps	21.77	22.94	22.58
	36 Mbps	21.98	23.07	22.66
	48 Mbps	21.87	22.77	22.46
	54 Mbps	21.90	22.89	22.55
11n HT20	6.5 Mbps	22.19	22.98	22.11
	13 Mbps	22.00	22.74	21.99
	19.5 Mbps	22.07	22.87	22.01
	26 Mbps	21.89	22.91	21.89
	39 Mbps	21.90	22.77	21.97
	52 Mbps	21.87	22.89	21.84
	58.5 Mbps	22.01	22.83	21.91
	65 Mbps	21.99	22.82	21.93

Modulation type		Peak power output (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2462MHz (Ch11)
11n HT40	13.5 Mbps	22.28	22.43	22.35
	27 Mbps	22.17	22.29	22.16
	40.5 Mbps	22.13	22.18	22.23
	54 Mbps	22.22	22.31	22.12
	81 Mbps	22.11	22.18	22.09
	108 Mbps	22.24	22.24	22.31
	121.5 Mbps	22.12	22.21	22.26
	135 Mbps	22.23	22.41	22.05

* The data rate 1Mbps, 36Mbps, 6.5Mbps, 13.5Mbps are selected as worse condition, and the following cases are performed with this condition.

2.2.2 Occupied Bandwidth

2.2.2.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.1kPa

2.2.2.2 Test Description

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer and Bluetooth test set via a power splitter with a known loss. Which connected to the transmitter antenna terminal of the EUT while the EUT is operating at maximum power and at the appropriate frequencies. All modes of operation were investigated and the worst case configuration results are reported in this section.

2.2.2.3 Test limit

FCC Part15.247(a)(2)

The minimum permissible 6dB bandwidth is 500 kHz

2.2.2.4 Test Procedure Used

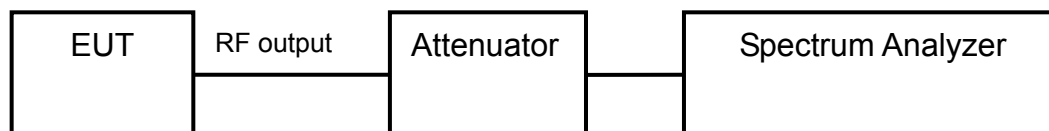
KDB 558074 D01 v03r01 - Section 8.1 Option 1

2.2.2.5 Test Settings

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) 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.

2.2.2.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

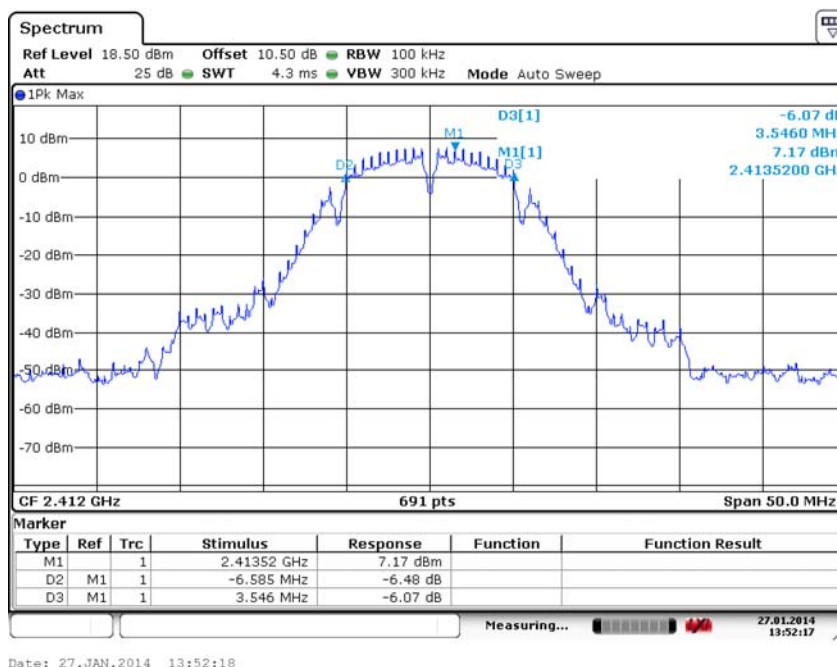


2.2.2.7 Test result

The results derive from Report No.: SRTC2013-H24-E0013

Test Mode: 802.11b

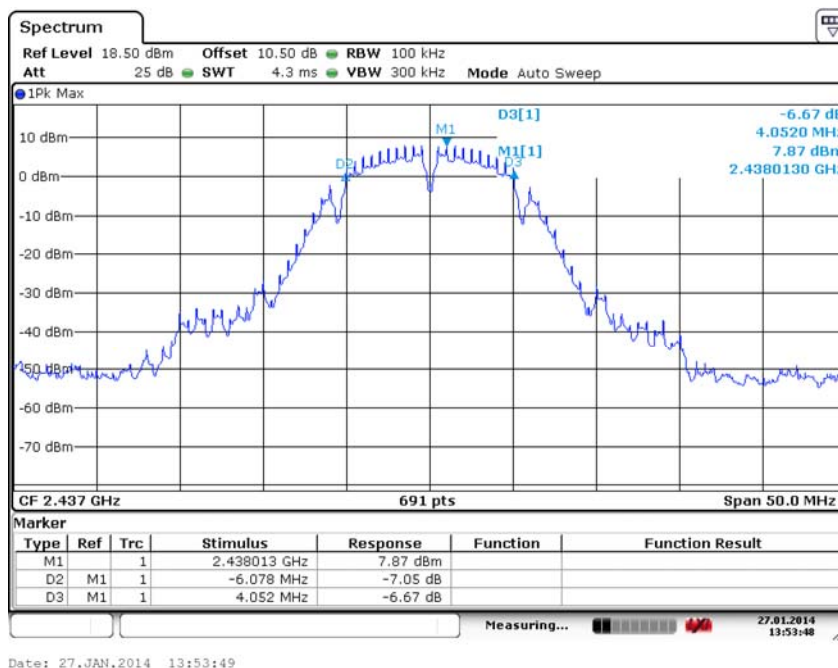
Carrier frequency (MHz)	Channel No.	6 dB bandwidth(MHz)
2412	1	10.13
2437	6	10.13
2462	11	10.13



Carrier frequency (MHz): 2412

Channel No.:1

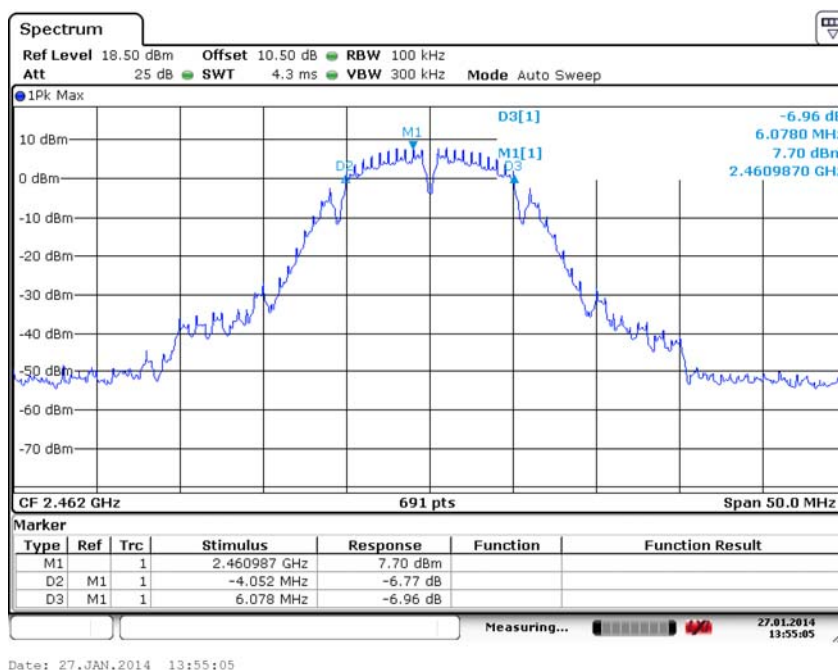
Test Mode: 802.11b



Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11b



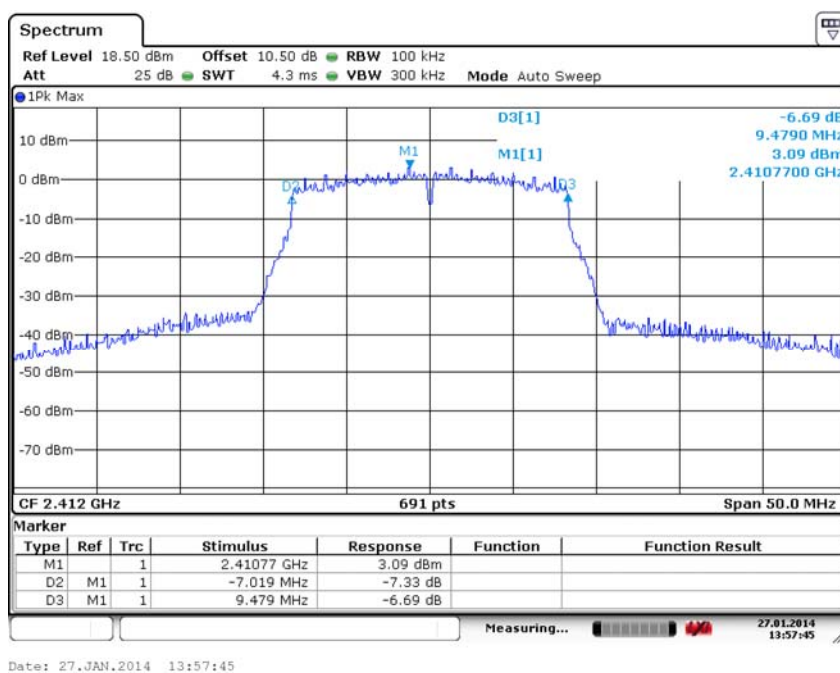
Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Test Mode: 802.11g

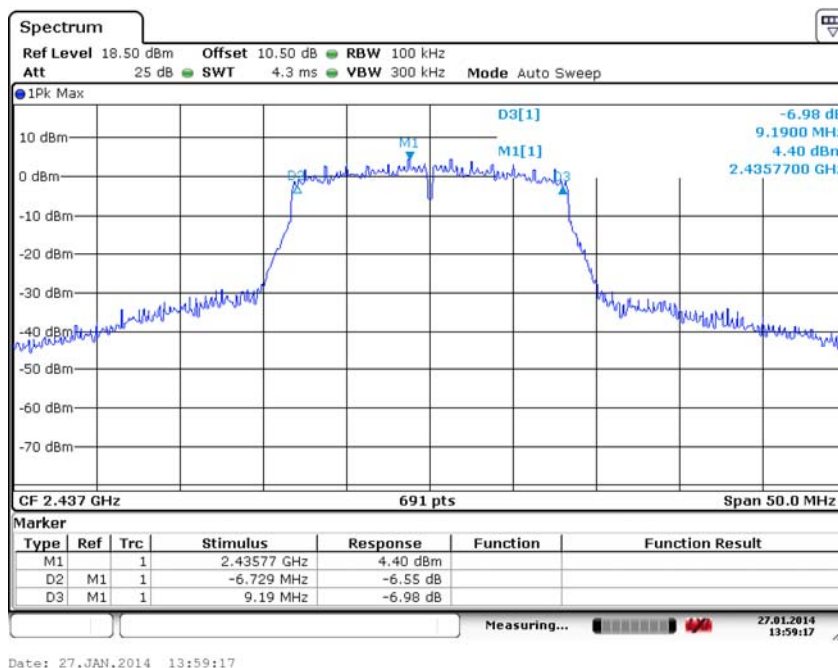
Carrier frequency (MHz)	Channel No.	6 dB bandwidth(MHz)
2412	1	16.50
2437	6	15.92
2462	11	16.43



Carrier frequency (MHz): 2412

Channel No.:1

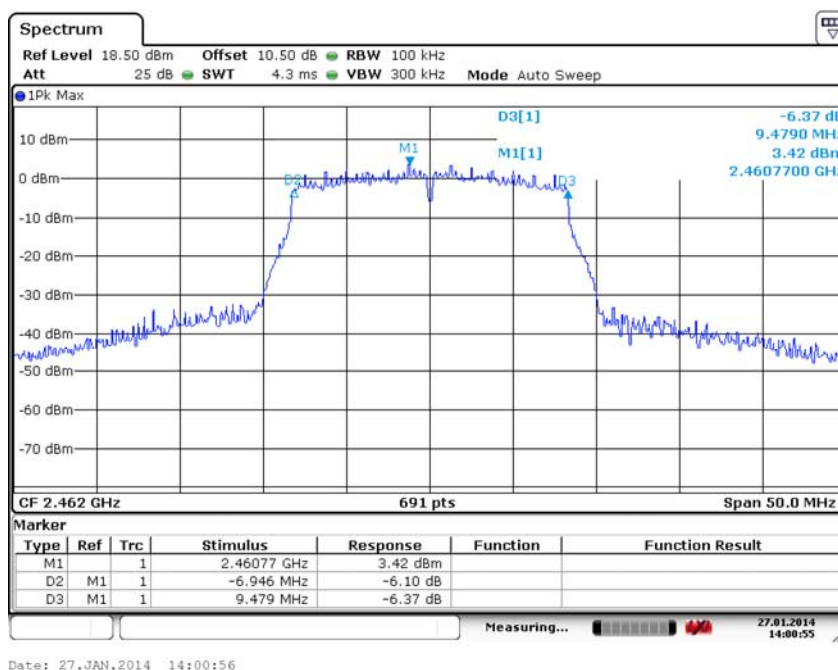
Test Mode: 802.11g



Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11g



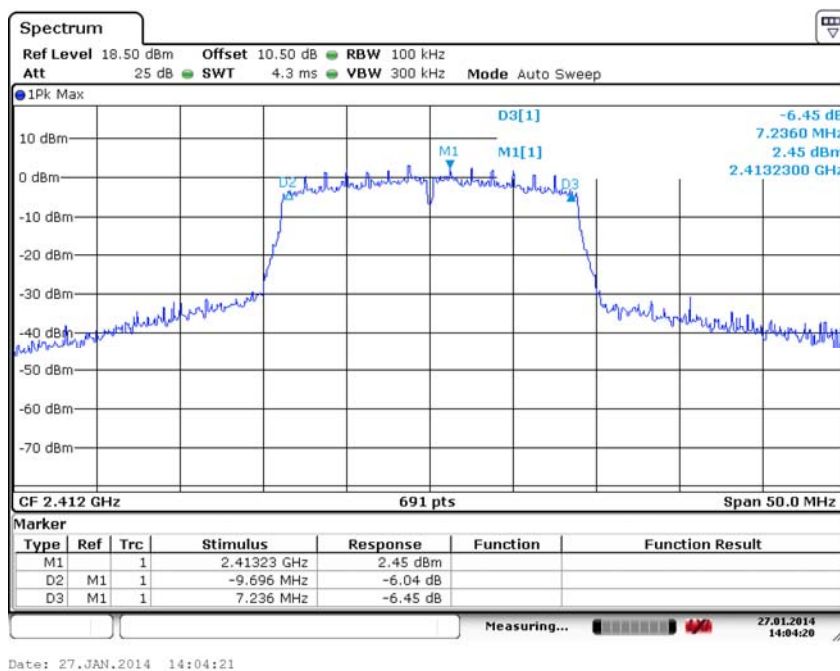
Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Test Mode: 802.11n(HT20)

Carrier frequency (MHz)	Channel No.	6 dB bandwidth(MHz)
2412	1	16.93
2437	6	15.20
2462	11	16.43

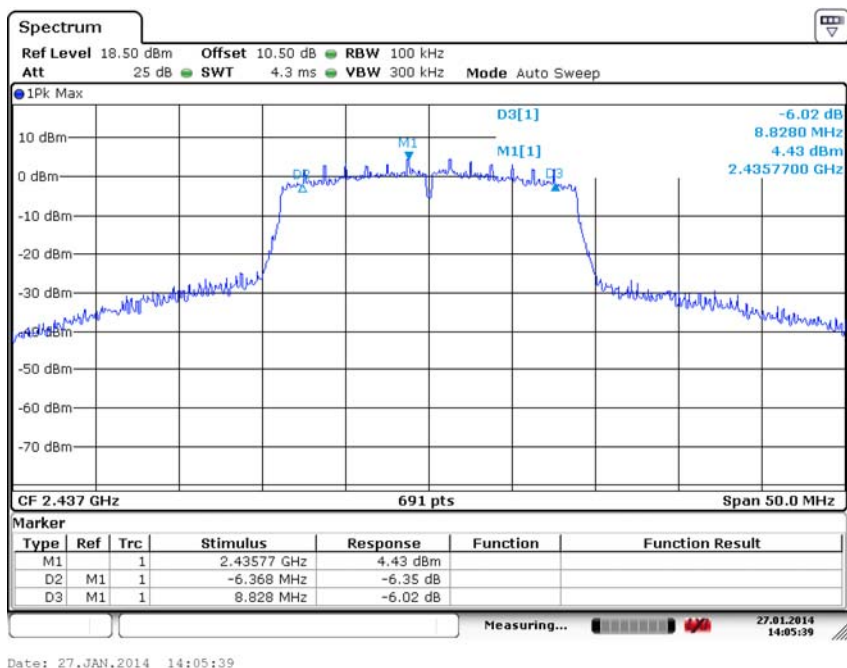


Date: 27.JAN.2014 14:04:21

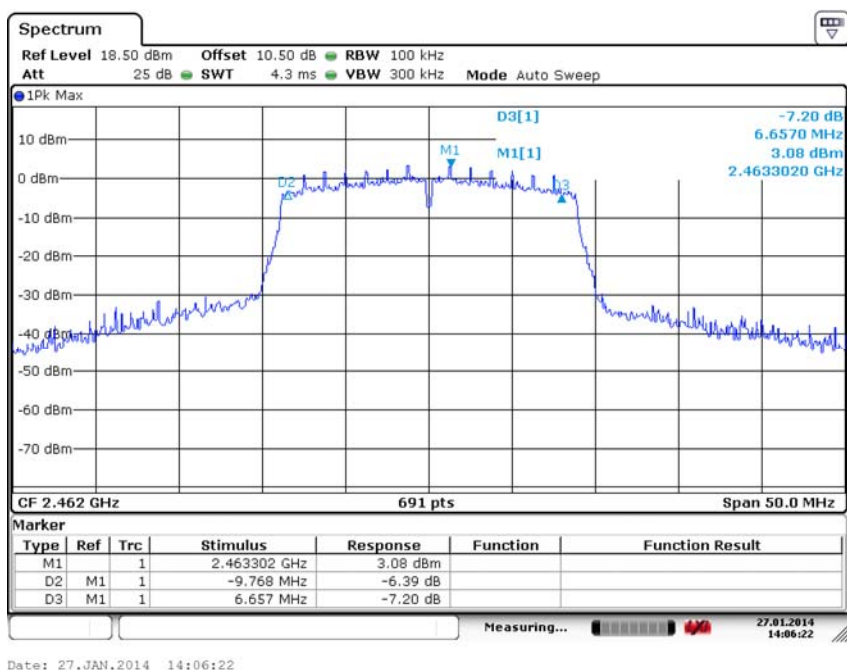
Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)



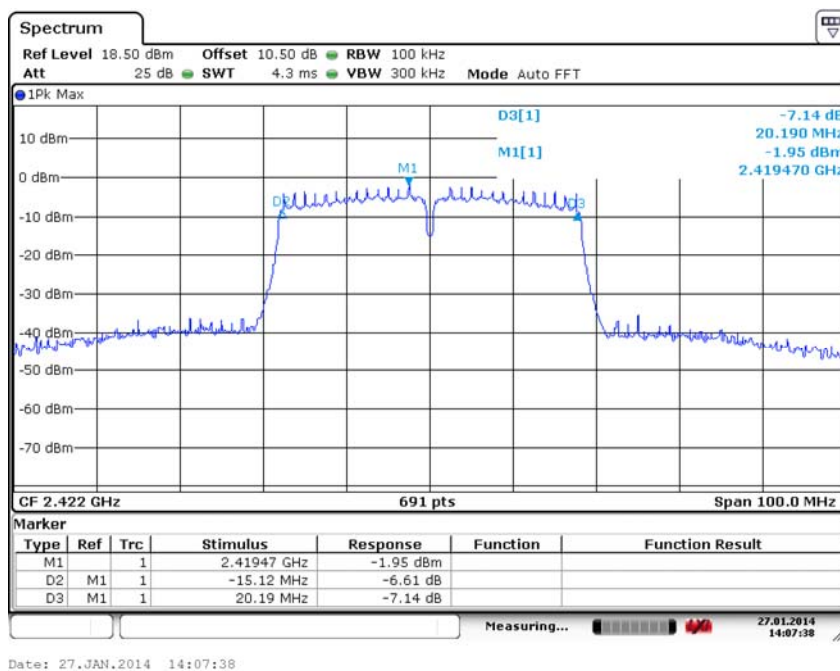
Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11n(HT20)



Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11n(HT20)

Test Mode: 802.11n(HT40)

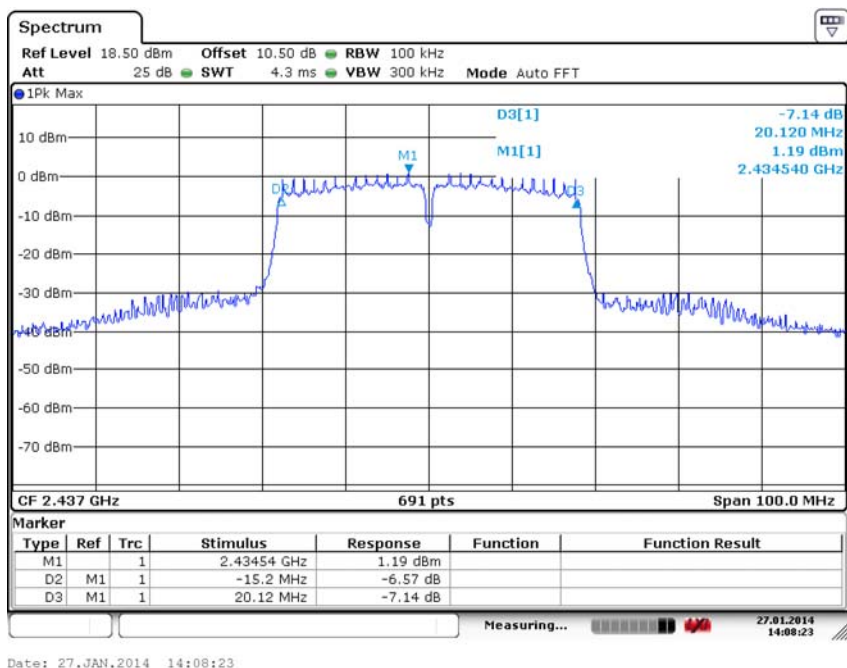
Carrier frequency (MHz)	Channel No.	6 dB bandwidth(MHz)
2422	3	35.31
2437	6	35.32
2462	11	35.32



Carrier frequency (MHz): 2422

Channel No.:3

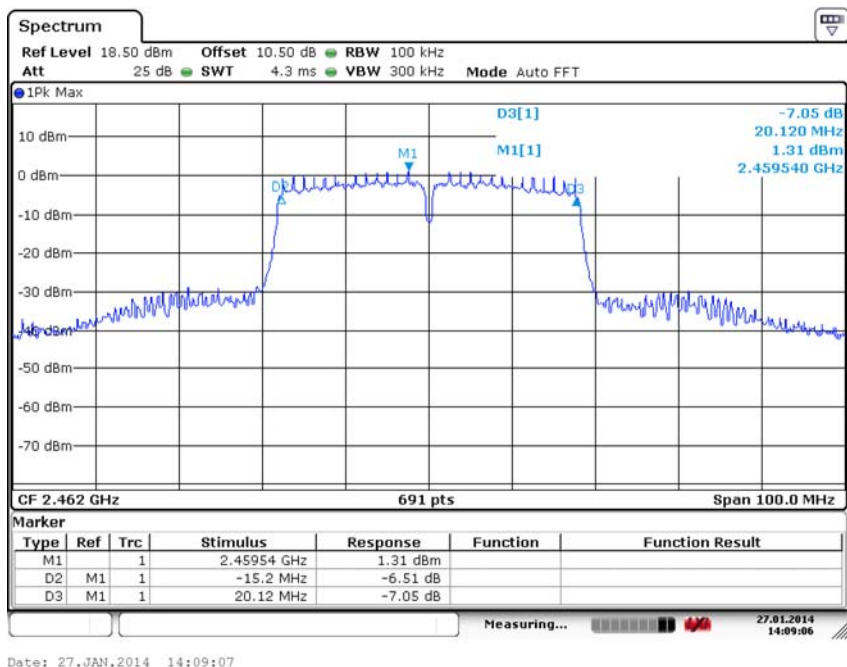
Test Mode: 802.11n(HT40)



Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11n(HT40)



Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT40)

2.2.3 Transmitter Power Spectral Density

2.2.3.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.1kPa

2.2.3.2 Test Description

The peak power density is measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies. All data rates were investigated and the worst case configuration results are reported in this section.

2.2.3.3 Test limit

Fcc Part15.247(e)

The maximum permissible power spectral density is 8 dBm in any 3 kHz band.

2.2.3.4 Test Procedure Used

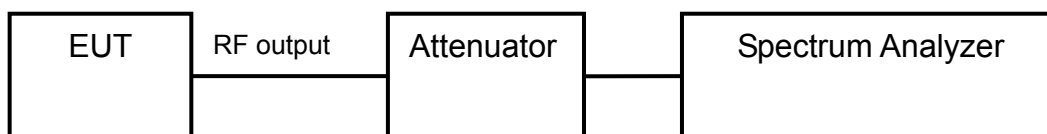
KDB 558074 D01 v03r01 Section 10.2.

2.2.3.5 Test Settings

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

2.2.3.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

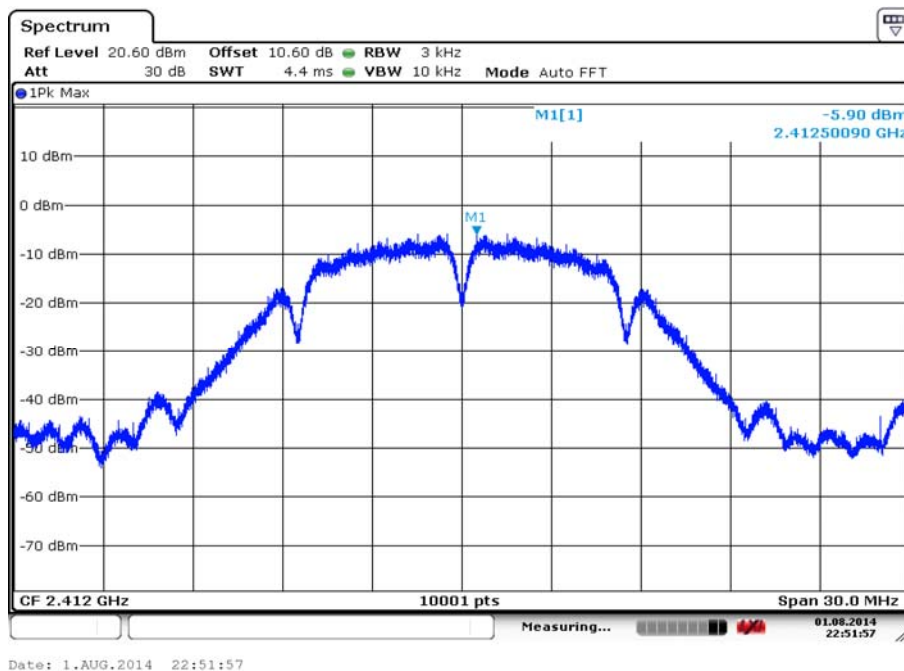


2.2.3.7 Test result

The results derive from Report No.: SRTC2013-H24-E0013

Test Mode: 802.11b

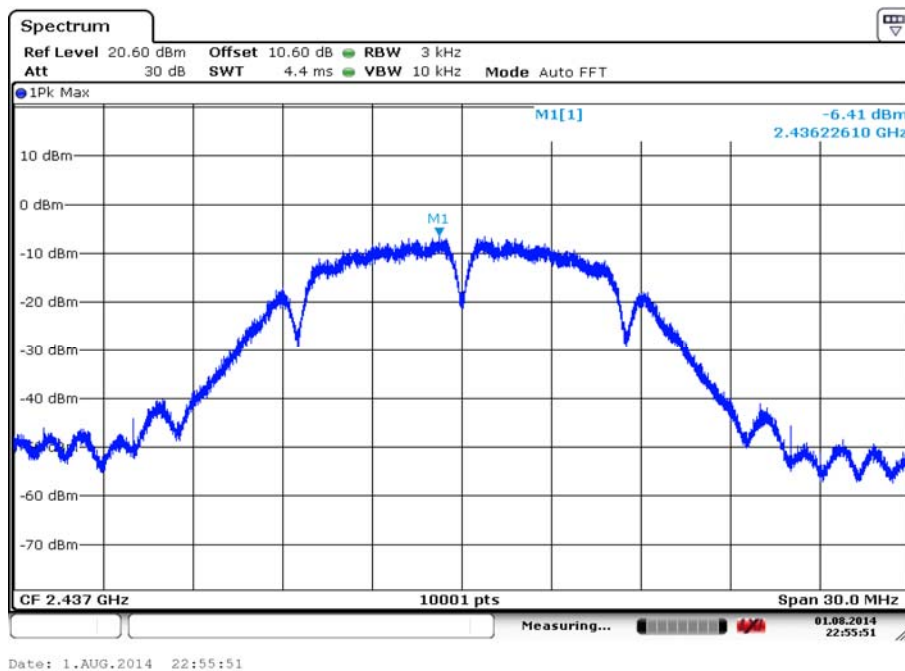
Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-5.90
2437	6	-6.41
2462	11	-6.22



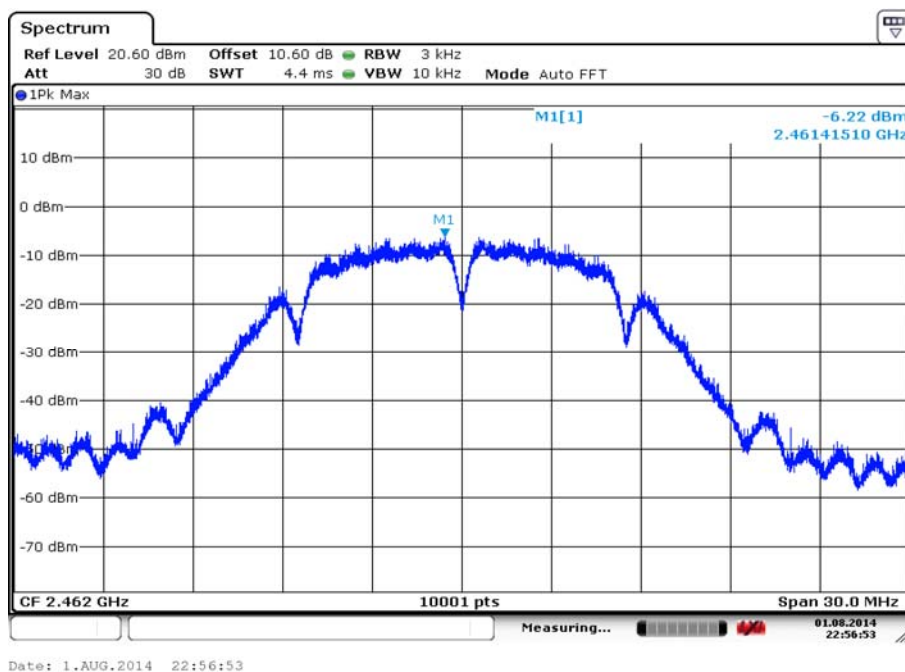
Carrier frequency (MHz): 2412

Channel No.1

Test Mode: 802.11b



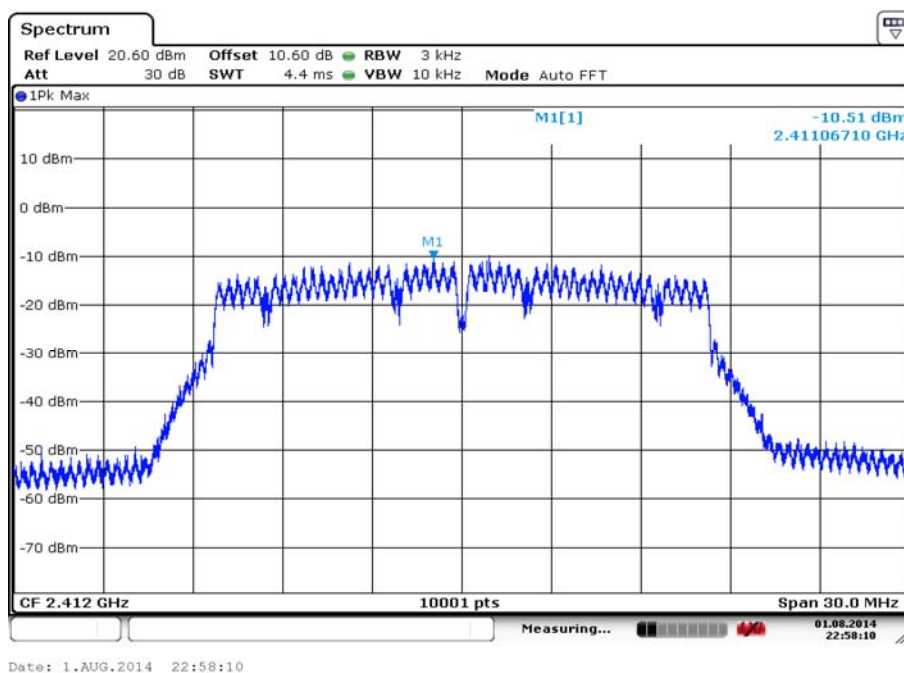
Carrier frequency (MHz): 2437
Channel No.6
Test Mode: 802.11b



Carrier frequency (MHz): 2462
Channel No.11
Test Mode: 802.11b

Test Mode: 802.11g

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-10.51
2442	6	-7.64
2472	11	-10.47

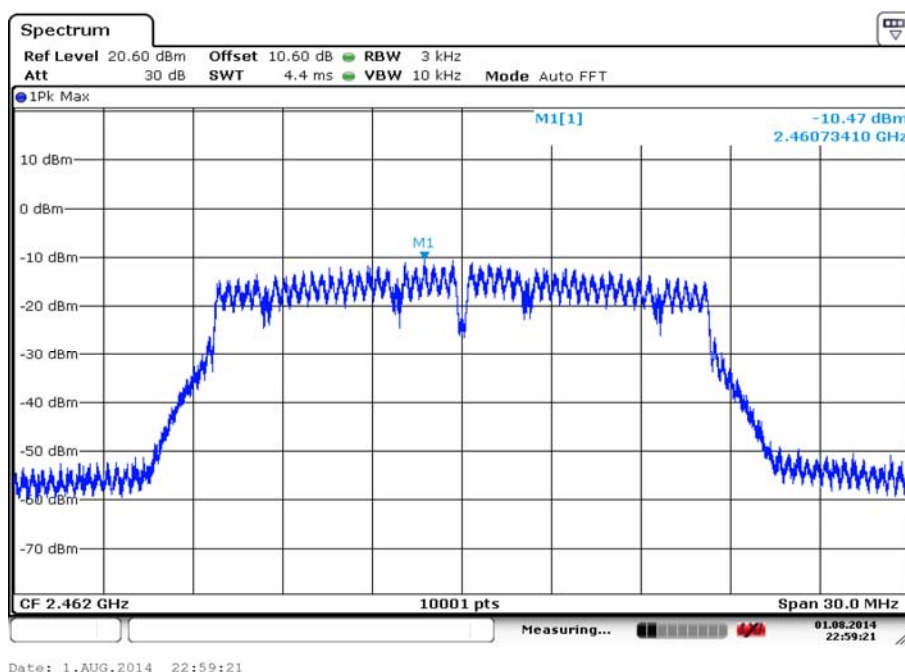
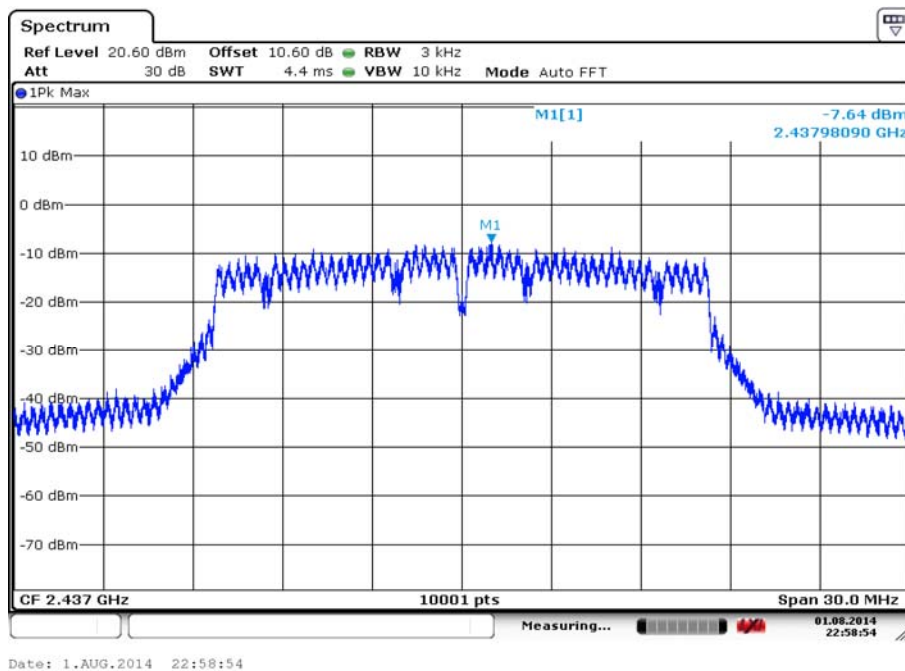


Date: 1.AUG.2014 22:58:10

Carrier frequency (MHz): 2412

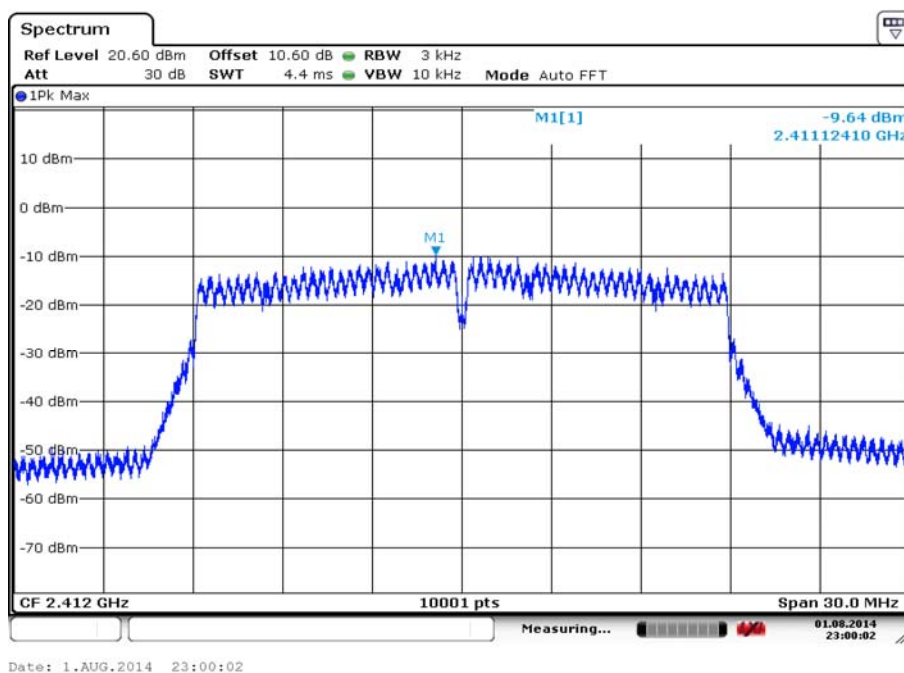
Channel No.1

Test Mode: 802.11g

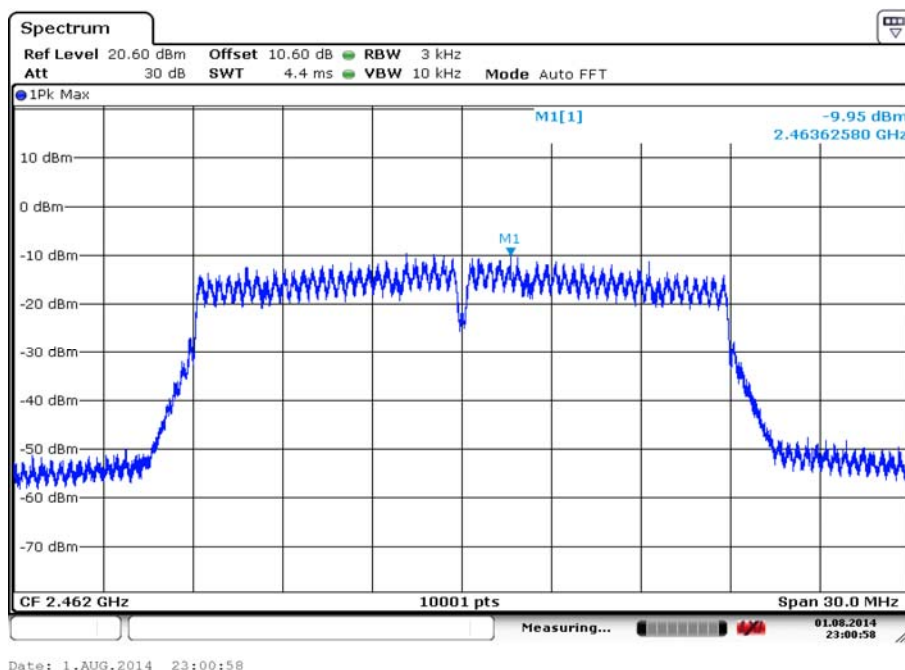
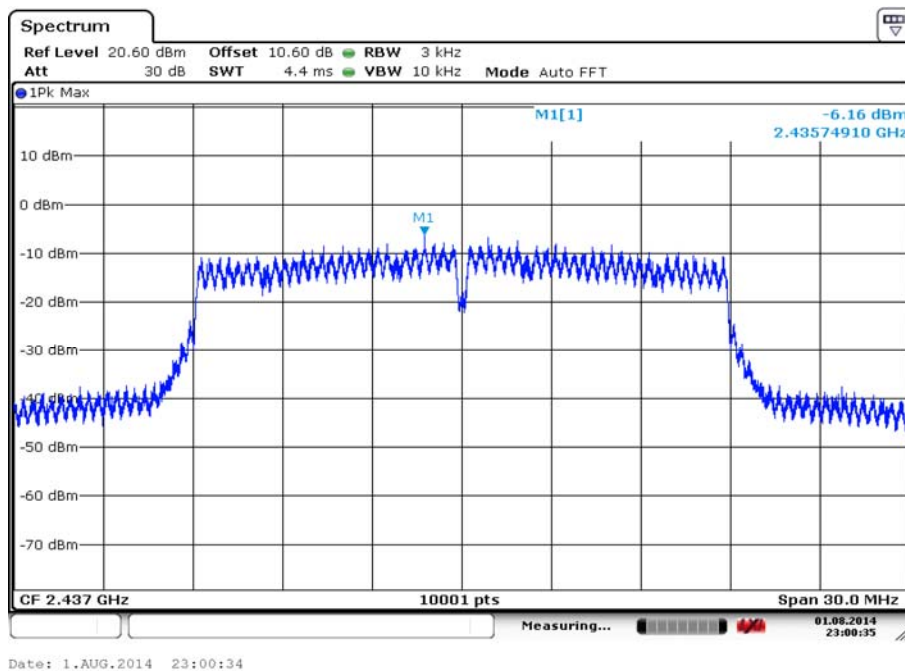


Test Mode: 802.11n(HT20)

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-9.64
2437	6	-6.16
2462	11	-9.95

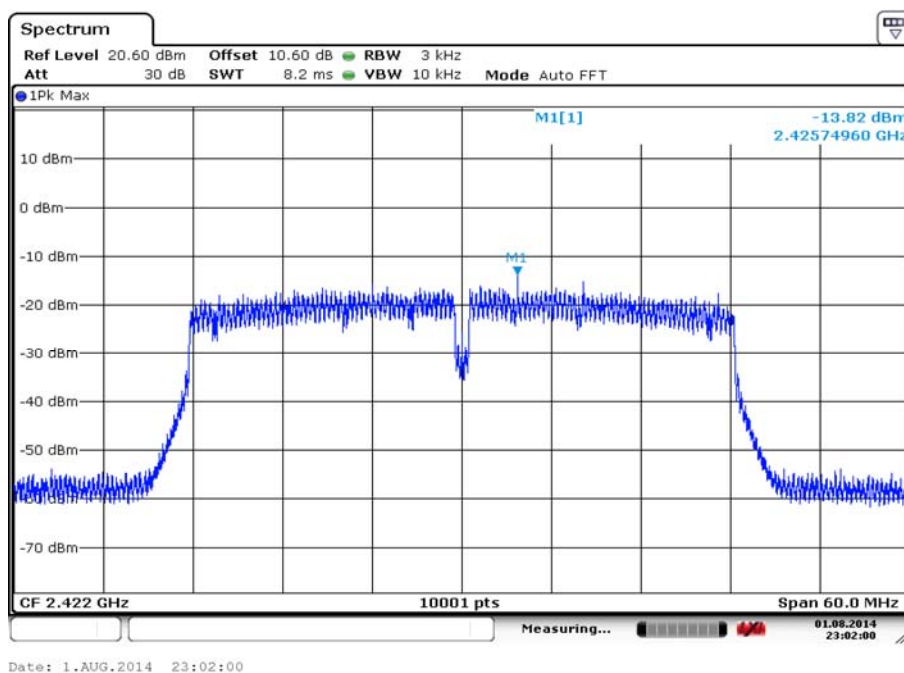


Carrier frequency (MHz): 2412
Channel No.1
Test Mode: 802.11n(HT20)

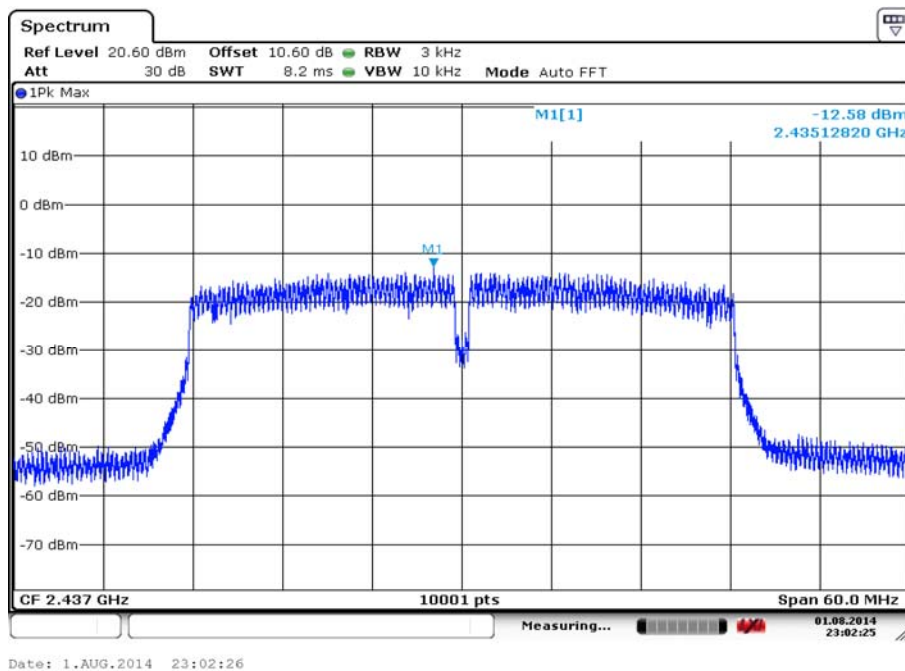


Test Mode: 802.11n(HT40)

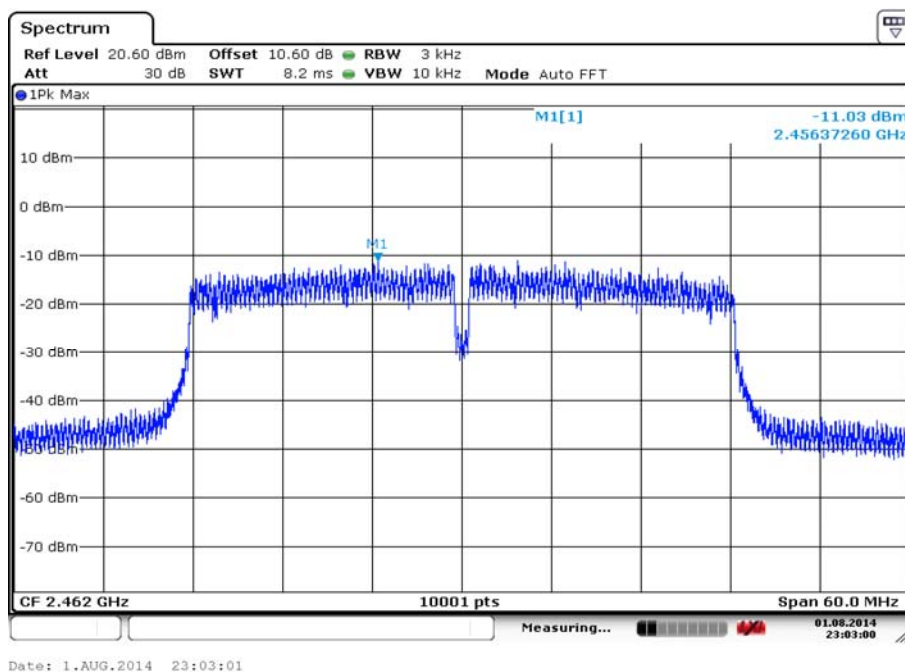
Carrier frequency (MHz)	Channel No	Power Density (dBm)
2422	3	-13.82
2437	6	-12.58
2462	11	-11.03



Carrier frequency (MHz): 2422
Channel No.3
Test Mode: 802.11n(HT40)



Carrier frequency (MHz): 2437
Channel No.6
Test Mode: 802.11n(HT40)



Carrier frequency (MHz): 2462
Channel No.11
Test Mode: 802.11n(HT40)

2.2.4 Conducted Out of band emission measurement

2.2.4.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.1kPa

2.2.4.2 Test Description

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration.

2.2.4.3 Test limit

FCC Part 15.247(d)

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth.

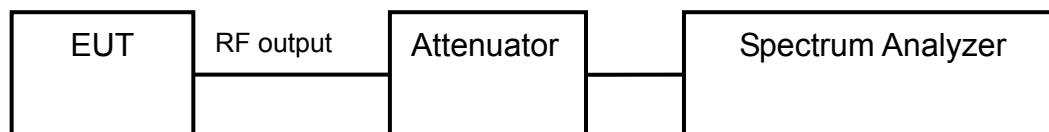
2.2.4.4 Test Procedure Used

KDB 558074 D01 v03r01 Section 11.3

2.2.4.5 Test Settings

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100KHz.
- c) Set the VBW $\geq$ 300KHz.
- d) Detector = peak.
- e) Set span to encompass the spectrum to be examined
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level.

2.2.4.6 Test Setup

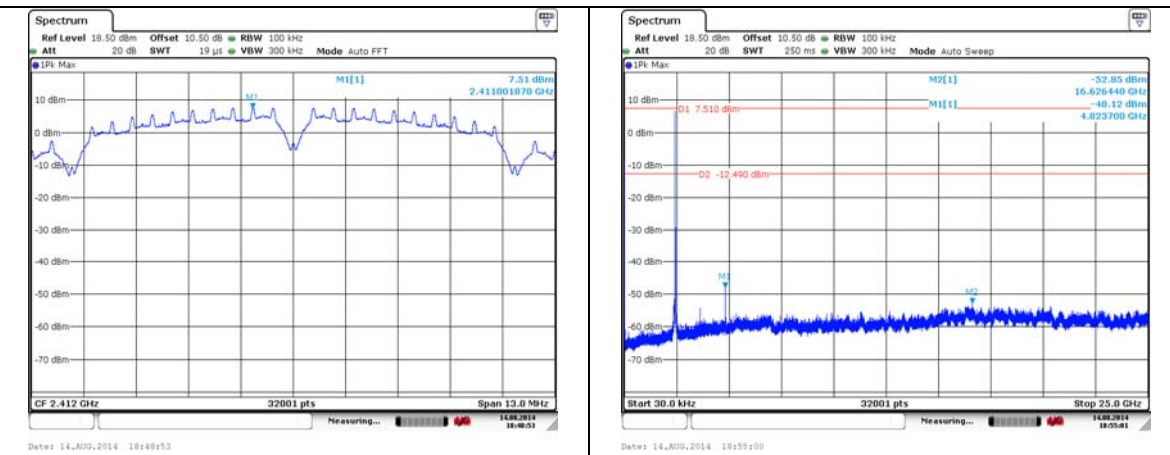


2.2.4.7 Test result

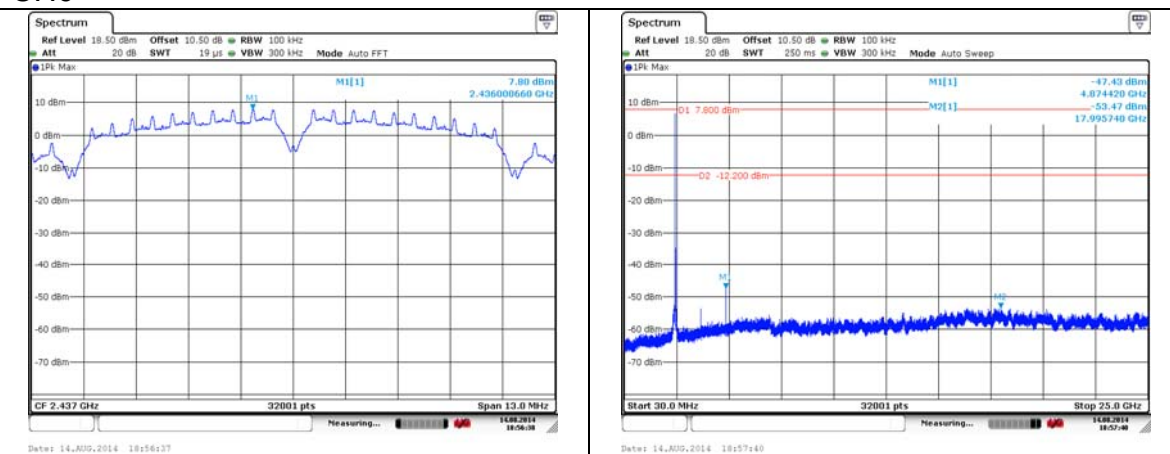
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

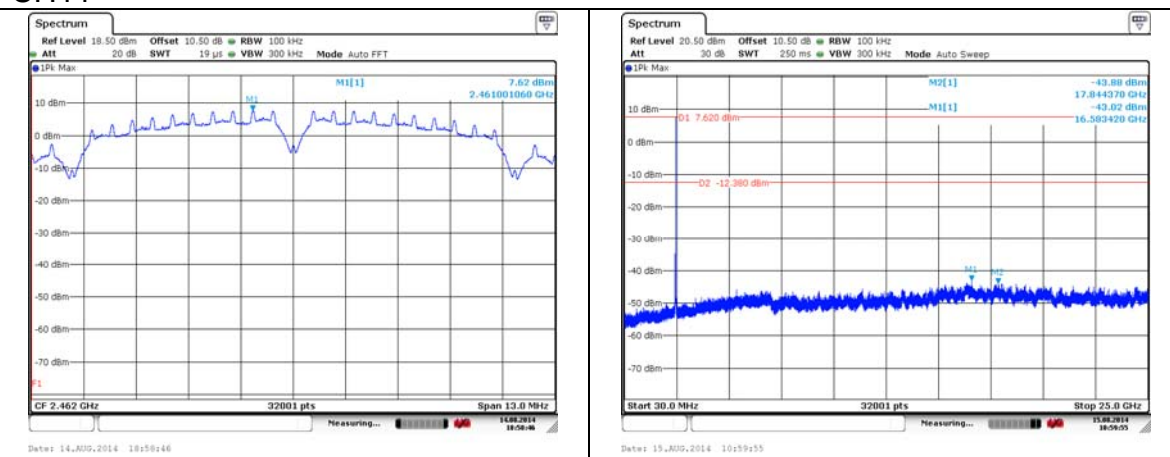
CH1



CH6

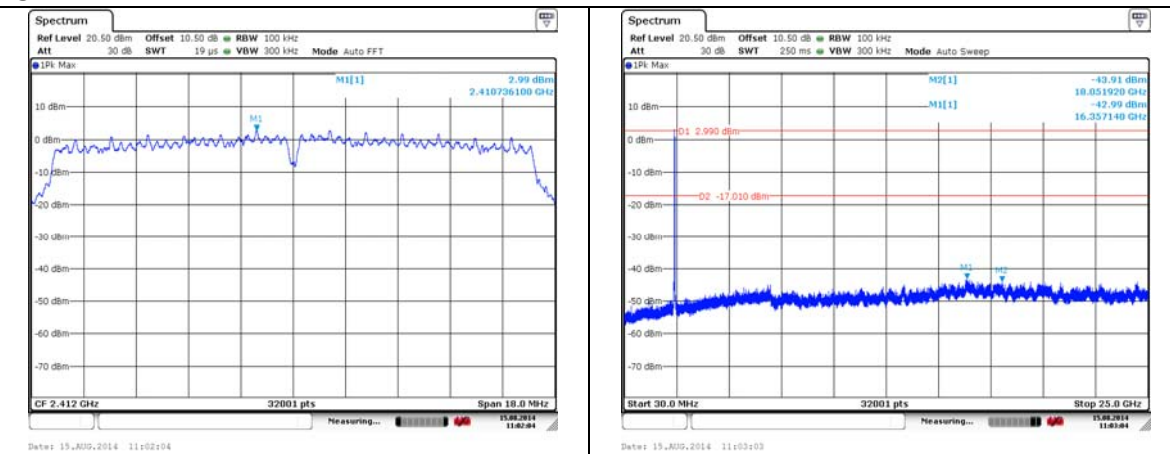


CH11

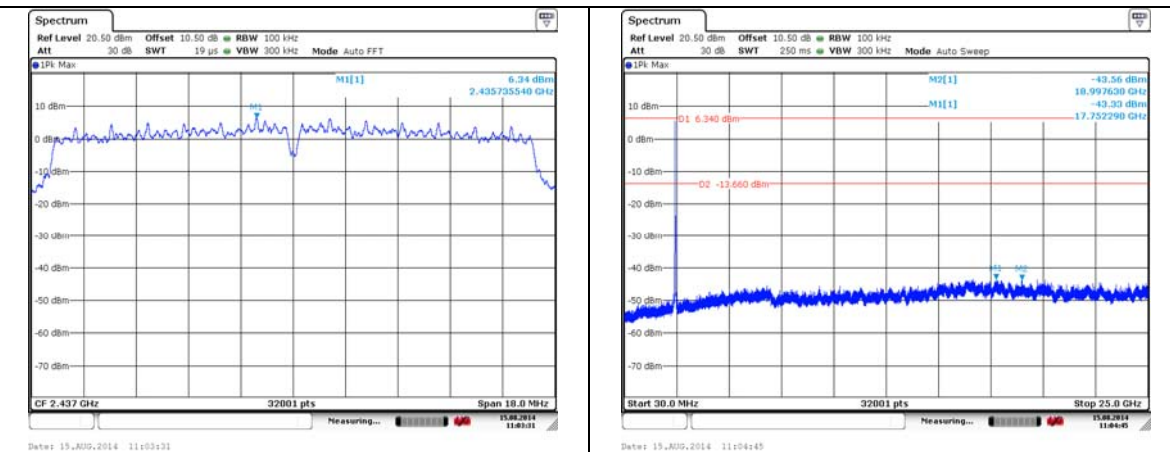


802.11g

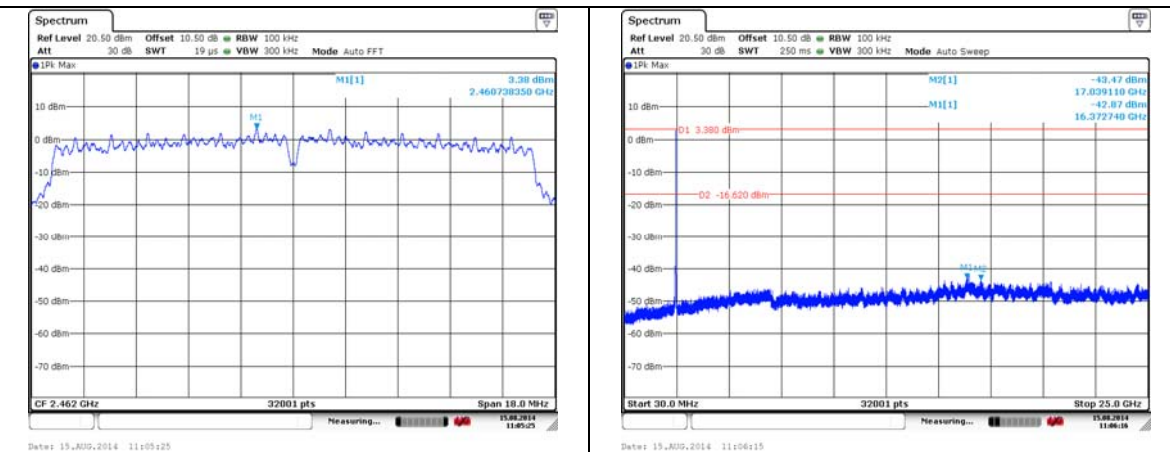
CH1



CH6

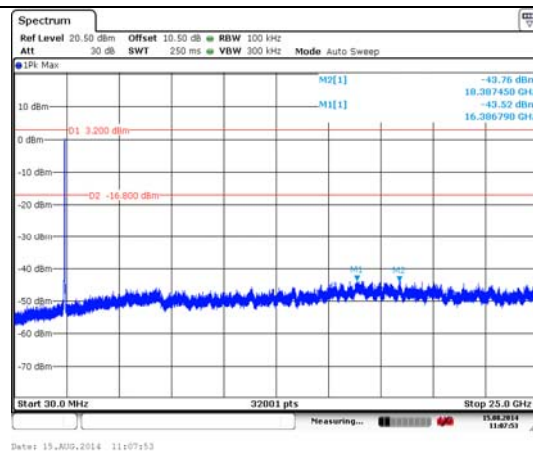
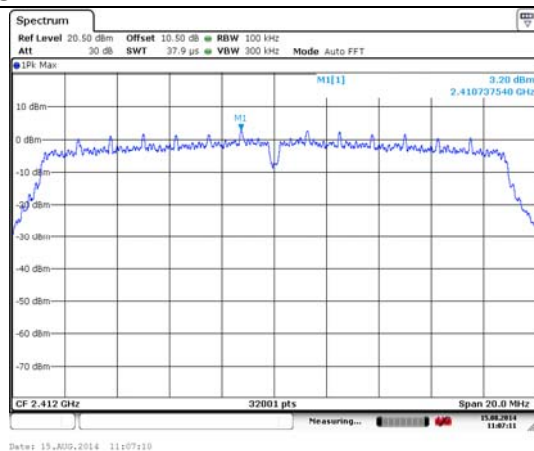


CH11

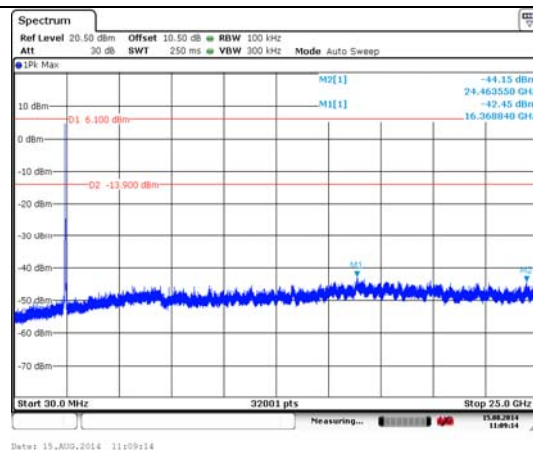
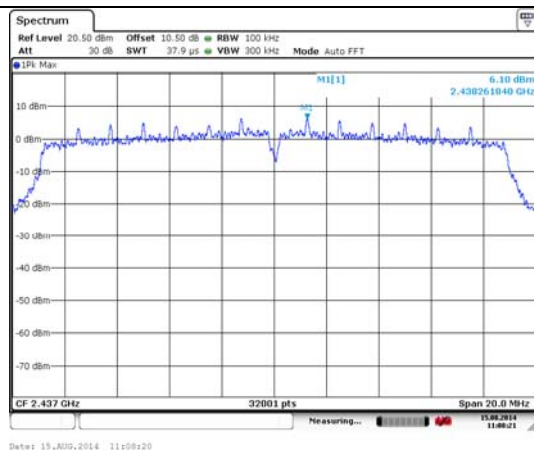


802.11n(20MHz)

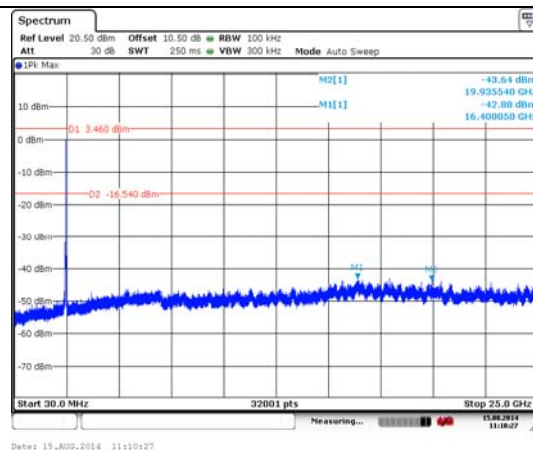
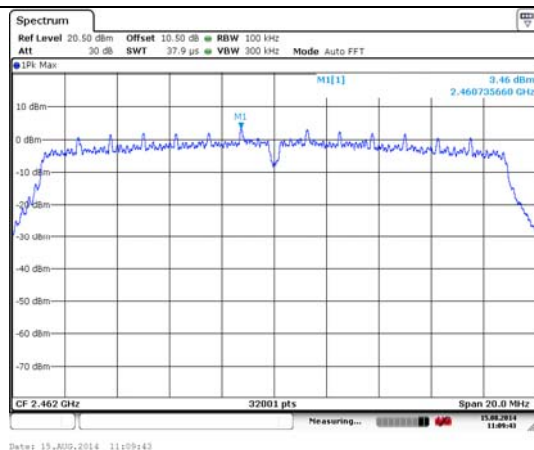
CH1



CH6

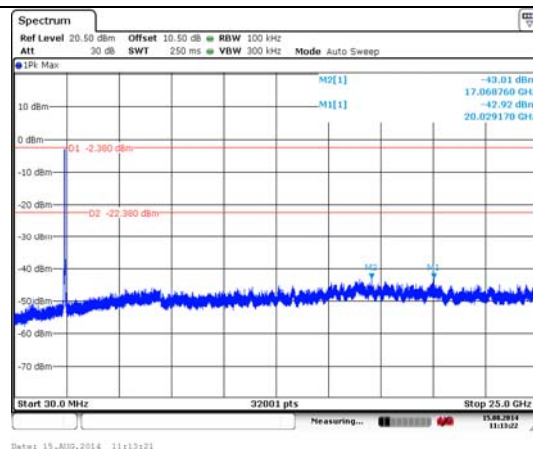
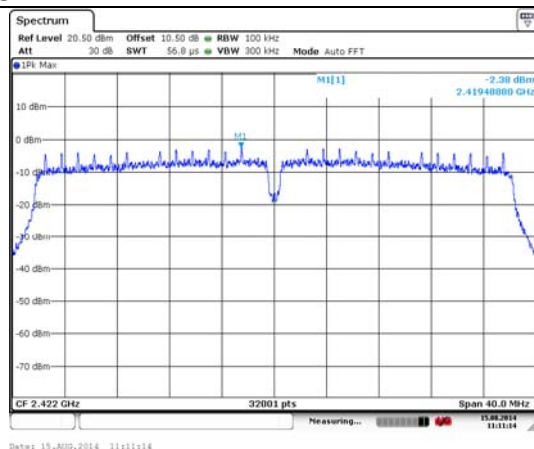


CH11

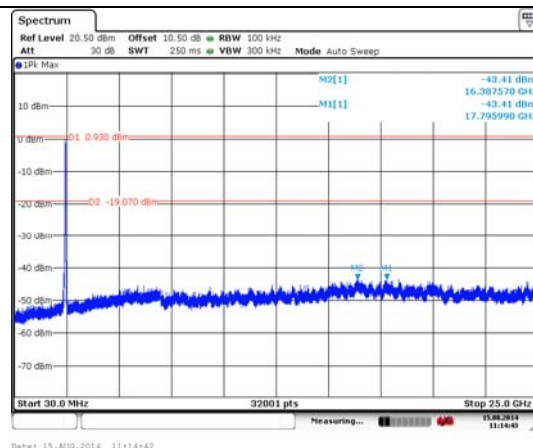
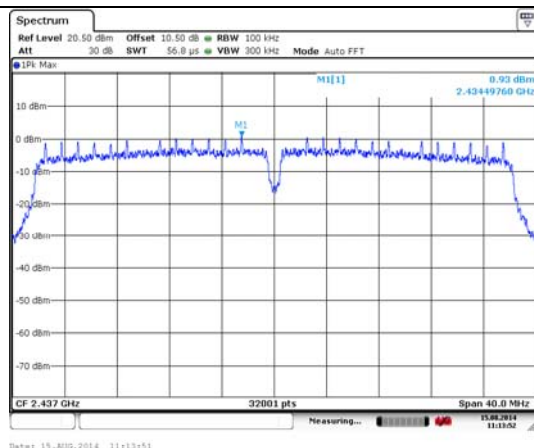


802.11n (40MHz)

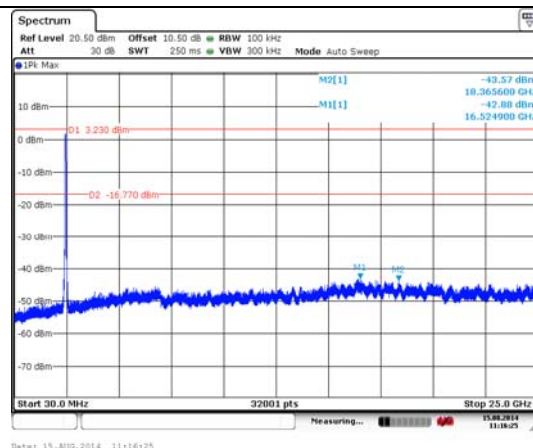
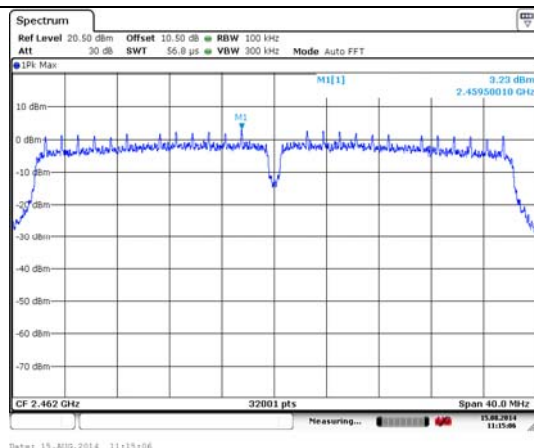
CH1



CH6



CH11



2.2.5 Spurious Radiated Emissions

2.2.5.1 Ambient condition

Temperature	Relative humidity	Pressure
20°C	35%	101.4kPa

2.2.5.2 Test Description

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

2.2.5.3 Test limit

FCC Part15.205, 15.209, 15.247(d);

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)). ***All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in below Table per Section 15.209.***

Frequency [MHz]	Field strength [$\mu\text{V/m}$]	Measured Distance [meters]
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Radiated Limits

FCC Part15.35(b):

there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit

Used conversion factor: $\text{Limit (dB}\mu\text{V/m)} = 20 \log (\text{Limit } (\mu\text{V/m})/1\mu\text{V/m)}$

Frequency [MHz]	Detector	Unit (dB $\mu\text{V/m}$)
30~88	Quasi-peak	40.0
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46.0
960~1000	Quasi-peak	54.0
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54.0
	Peak	74.0

Conversion Radiated limits

2.2.5.4 Test Procedure Used

- KDB 558074 D01 v03r01 - Section 12.2.5 (average power measurements)
KDB 558074 D01 v03r01 - Section 12.2.4 (peak power measurements)

2.2.5.5 Test Settings

Average Field Strength Measurements per Section 12.2.5.1 of KDB 558074 v03r01

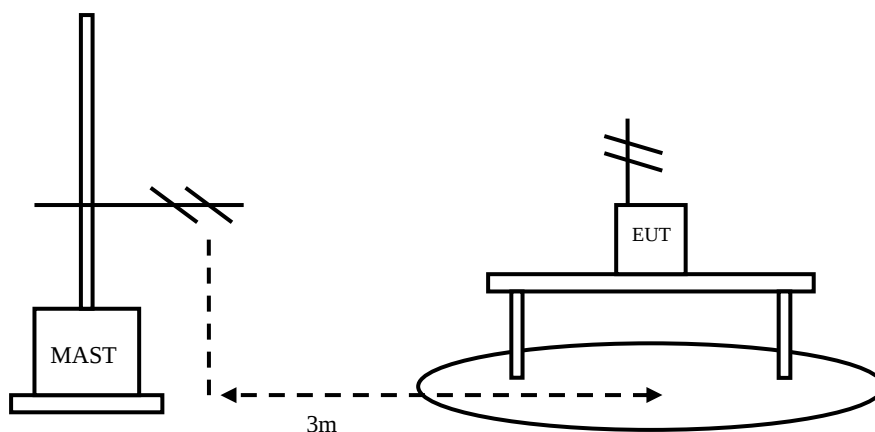
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be $> 2 \times \text{span/RBW}$)
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces

Peak Field Strength Measurements per Section 12.2.4 of KDB 558074 v03r01

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

2.2.5.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below



The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration. Then start the test software ES-K1. Sweep the whole frequency band through the range from 30MHz to 1GHz or above, using receive log period antenna HL562 or Ridge horn antenna HF906. During the test, the antenna height and EUT azimuth were varied in order to identify the maximum level of emission from the EUT. The height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees. The measurements shall be repeated with orthogonal polarization of the test antenna. The results shall be showed the worst case of the three orthogonal axes.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

2.2.5.7 Test result

The worst case attitude: The mobile lay down.

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	100.15	66.15	N/A	N/A	8.90	25.10
2	2390	55.93	21.93	-18.07	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	96.69	62.69	N/A	N/A	8.90	25.10
2	2390	54.71	20.71	-19.29	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	94.75	60.75	N/A	N/A	8.90	25.10
2	2390	42.97	8.97	-11.03	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	86.71	52.71	N/A	N/A	8.90	25.10
2	2390	42.58	8.58	-11.42	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	100.93	66.93	N/A	N/A	8.90	25.10
2	2483.5	57.37	23.37	-16.63	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	95.70	61.70	N/A	N/A	8.90	25.10
2	2483.5	57.41	23.41	-16.59	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	93.11	59.11	N/A	N/A	8.90	25.10
2	2483.5	42.25	8.25	-11.75	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	88.26	54.26	N/A	N/A	8.90	25.10
2	2483.5	41.77	7.77	-12.23	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	102.58	68.58	N/A	N/A	8.90	25.10
2	2390	56.00	22.00	-18.00	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	94.31	60.31	N/A	N/A	8.90	25.10
2	2390	57.25	23.25	-16.75	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	92.11	58.11	N/A	N/A	8.90	25.10
2	2390	42.11	8.11	-11.89	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	85.78	51.78	N/A	N/A	8.90	25.10
2	2390	41.84	7.84	-12.16	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	101.99	67.99	N/A	N/A	8.90	25.10
2	2483.5	54.60	20.60	-19.40	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	96.73	62.73	N/A	N/A	8.90	25.10
2	2483.5	54.50	20.50	-19.50	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	93.29	59.29	N/A	N/A	8.90	25.10
2	2483.5	42.75	8.75	-11.25	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	86.01	52.01	N/A	N/A	8.90	25.10
2	2483.5	42.41	8.41	-11.59	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	100.38	66.38	N/A	N/A	8.90	25.10
2	2390	54.79	20.79	-19.21	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	98.54	64.54	N/A	N/A	8.90	25.10
2	2390	54.85	20.85	-19.15	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	91.62	57.62	N/A	N/A	8.90	25.10
2	2390	42.02	8.02	-11.98	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	86.74	52.74	N/A	N/A	8.90	25.10
2	2390	42.84	8.84	-11.16	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	101.20	67.20	N/A	N/A	8.90	25.10
2	2483.5	57.10	23.10	-16.90	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	95.10	61.10	N/A	N/A	8.90	25.10
2	2483.5	56.83	22.83	-17.17	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	92.47	58.47	N/A	N/A	8.90	25.10
2	2483.5	41.23	7.23	-12.77	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	88.16	54.16	N/A	N/A	8.90	25.10
2	2483.5	42.59	8.59	-11.41	54.00	8.90	25.10

Carrier frequency (MHz): 2422

Channel No.:3

Test Mode: 802.11n(HT40)

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2422	100.35	66.35	N/A	N/A	8.90	25.10
2	2390	57.16	23.16	-16.84	74.00	8.90	25.10

Carrier frequency (MHz): 2422

Channel No.:3

Test Mode: 802.11n(HT40)

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2422	97.23	63.23	N/A	N/A	8.90	25.10
2	2390	55.57	21.57	-18.43	74.00	8.90	25.10

Carrier frequency (MHz): 2422

Channel No.:3

Test Mode: 802.11n(HT40)

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2422	93.72	59.72	N/A	N/A	8.90	25.10
2	2390	42.84	8.84	-11.16	54.00	8.90	25.10

Carrier frequency (MHz): 2422

Channel No.:3

Test Mode: 802.11n(HT40)

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2422	86.58	52.58	N/A	N/A	8.90	25.10
2	2390	42.35	8.35	-11.65	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT40)

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	101.85	67.85	N/A	N/A	8.90	25.10
2	2483.5	55.37	21.37	-18.63	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT40)

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	95.56	61.56	N/A	N/A	8.90	25.10
2	2483.5	55.99	21.99	-18.01	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT40)

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	91.96	57.96	N/A	N/A	8.90	25.10
2	2483.5	42.35	8.35	-11.65	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.11

Test Mode: 802.11n(HT40)

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	88.20	54.20	N/A	N/A	8.90	25.10
2	2483.5	41.37	7.37	-12.63	54.00	8.90	25.10

Sample Calculations

Determining Spurious Emissions Levels

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

Result= $P_{mea} + A_{Rpl}$

The worst case attitude: The mobile lay down.

For 802.11b

Frequency (MHz)	Result (dBuV/m)	A _{Rpl} (dB)	P _{mea} (dBuV/m)	Polarity	Limit (dBuV/m)
46.773547	25.10	11.1	14	Vertical	40.0
74.368737	14.40	7.4	7	Vertical	40.0
87.895792	25.20	8.4	16.8	Vertical	40.0
100.340681	19.70	9.3	10.4	Vertical	43.5
511.823647	17.80	18.6	-0.8	Horizontal	46.0
941.082164	25.40	25.4	0	Vertical	46.0

For 802.11g

Frequency (MHz)	Result (dBuV/m)	A _{Rpl} (dB)	P _{mea} (dBuV/m)	Polarity	Limit (dBuV/m)
44.609218	29.30	12.6	16.7	Vertical	40.0
74.368737	12.50	7.4	5.1	Vertical	40.0
87.895792	23.40	8.4	15	Vertical	40.0
97.094188	21.10	9.1	12	Vertical	43.5
548.296593	18.00	19.1	-1.1	Horizontal	46.0
941.082164	25.60	25.4	0.2	Horizontal	46.0

For 802.11n(HT20)

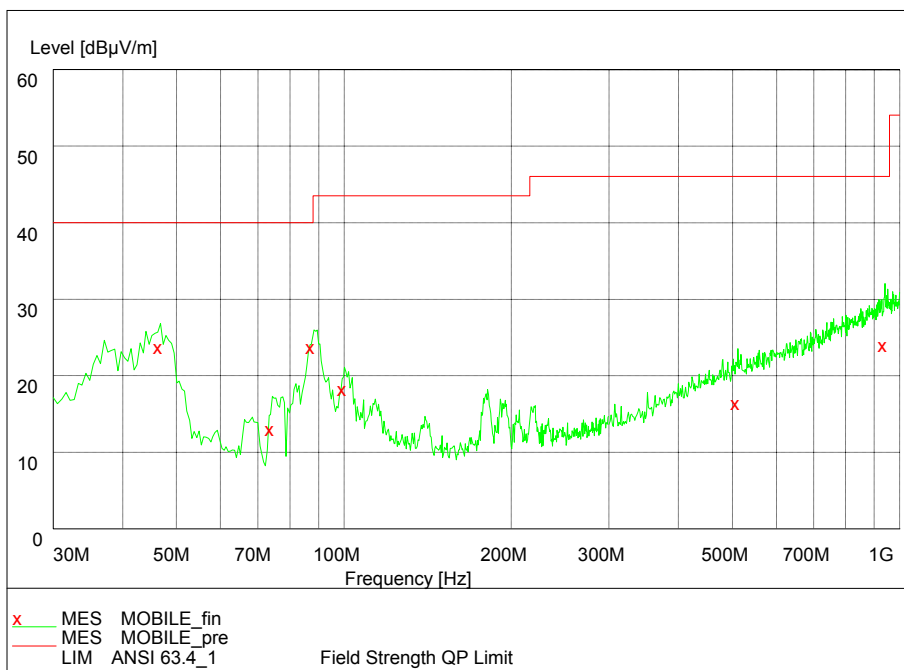
Frequency (MHz)	Result (dBuV/m)	A _{Rpl} (dB)	P _{mea} (dBuV/m)	Polarity	Limit (dBuV/m)
44.068136	23.00	13.0	10	Vertical	40.0
87.354709	24.10	8.4	15.7	Vertical	40.0
97.094188	14.60	9.1	5.5	Vertical	43.5
215.050100	11.80	8.9	2.9	Vertical	43.5
556.713427	18.30	19.30	-1	Vertical	46.0
952.304609	25.40	25.40	0	Horizontal	46.0

For 802.11n(HT40)

Frequency (MHz)	Result (dBuV/m)	A _{Rpl} (dB)	P _{mea} (dBuV/m)	Polarity	Limit (dBuV/m)
46.232465	25.70	11.5	14.2	Vertical	40.0
77.615230	16.60	7.6	9	Vertical	40.0
87.895792	24.30	8.4	15.9	Vertical	40.0
100.881764	19.70	9.3	10.4	Vertical	43.5
511.823647	17.80	18.6	-0.8	Vertical	46.0
941.082164	25.40	25.40	0	Vertical	46.0

Carrier frequency (MHz): 2437

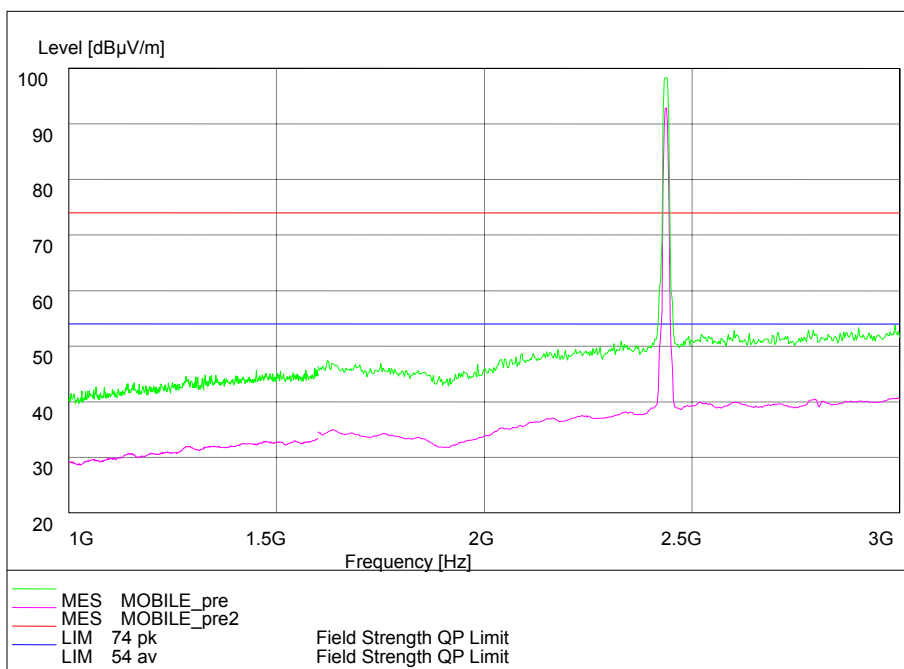
Channel No.:6



Frequency Range: 30MHz -1GHz

Detector: QP mode

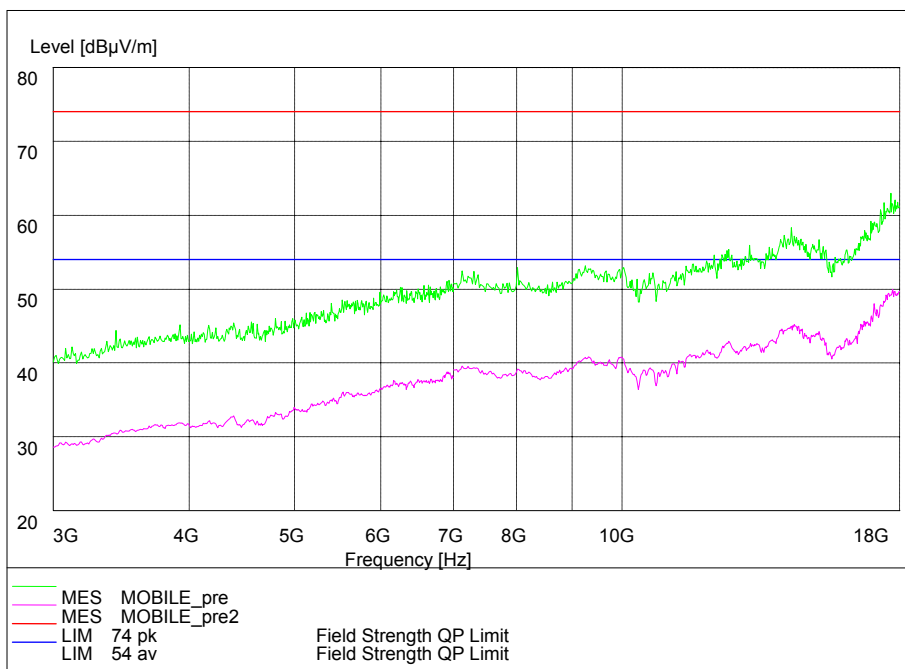
Test Mode: 802.11b



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

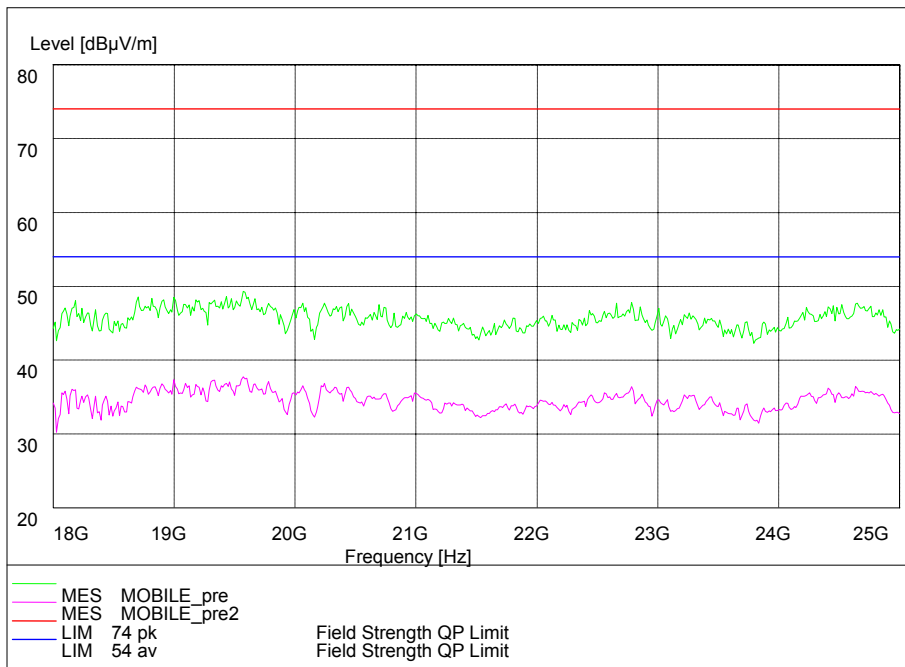
Modulation type: 802.11b



Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

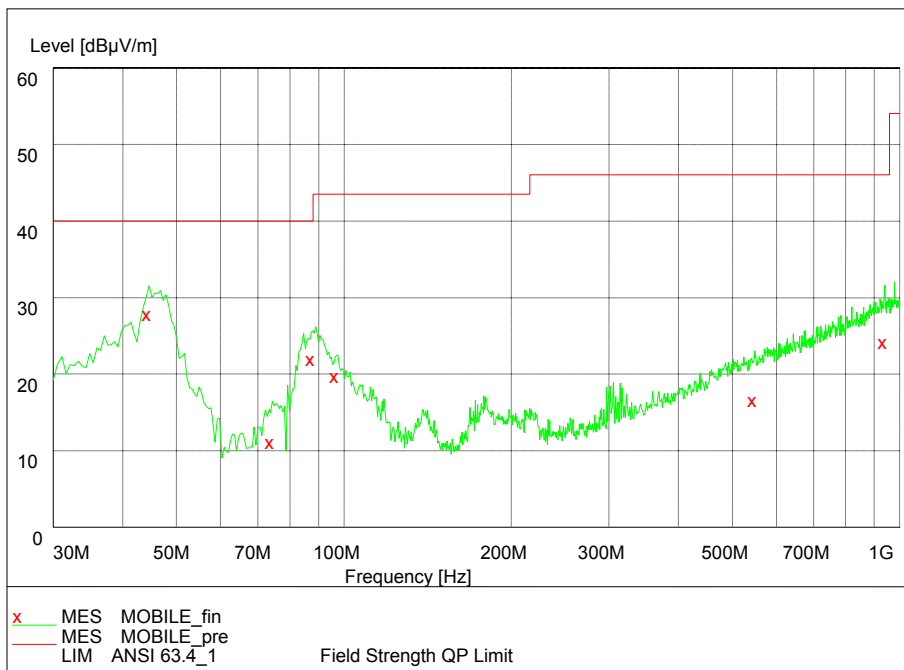
Modulation type: 802.11b



Frequency Range: 18GHz -25GHz

Detector: Av mode and PK mode

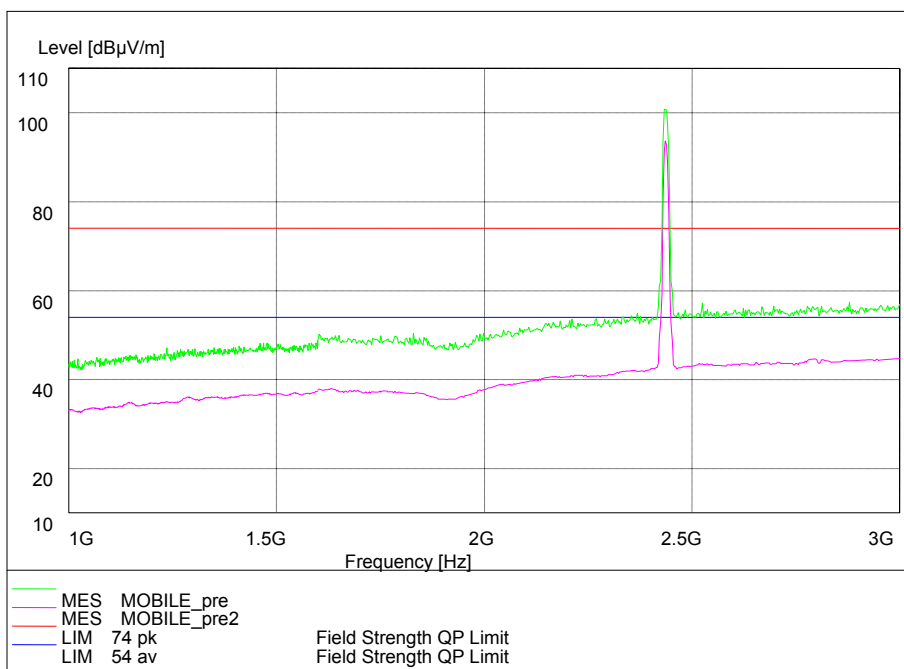
Modulation type: 802.11b



Frequency Range: 30MHz -1GHz

Detector: QP mode

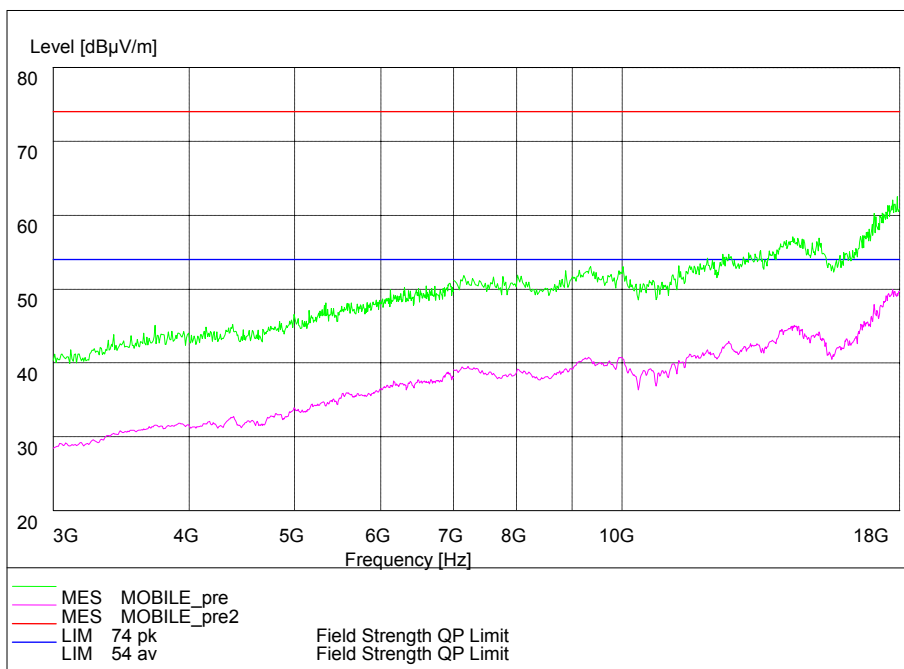
Modulation type: 802.11g



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

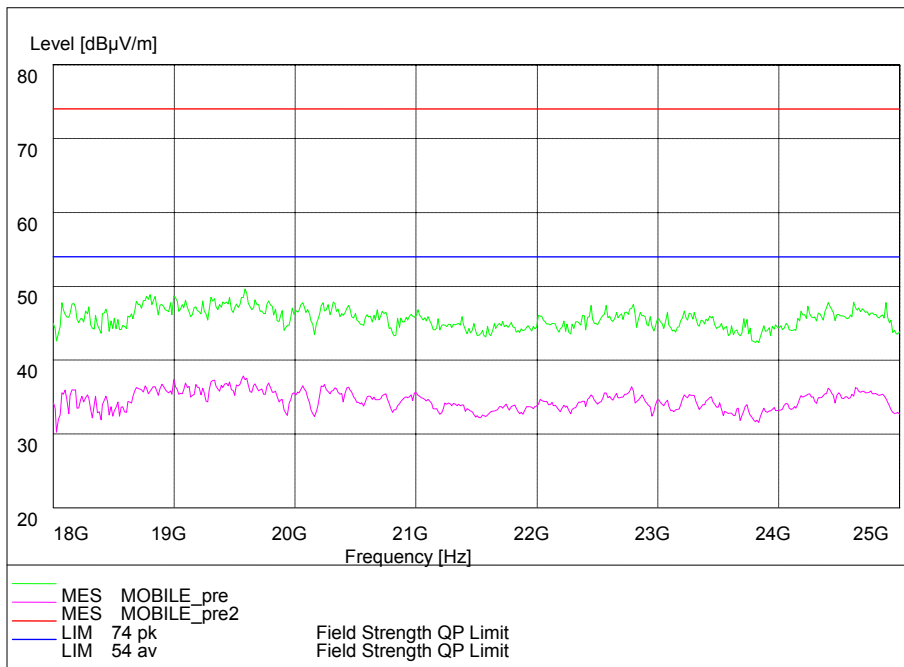
Modulation type: 802.11g



Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

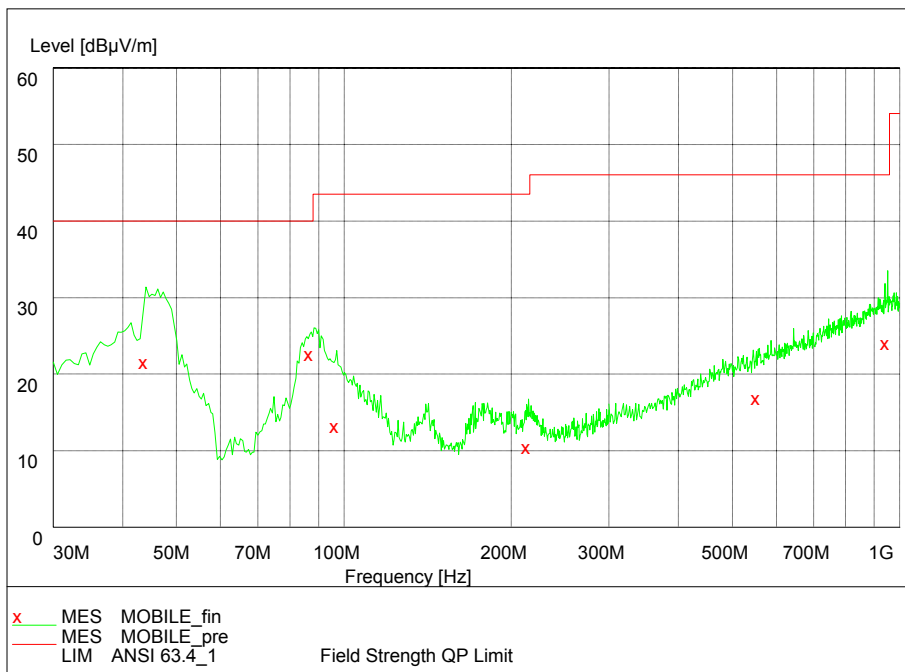
Modulation type: 802.11g



Frequency Range: 18GHz -25GHz

Detector: Av mode and PK mode

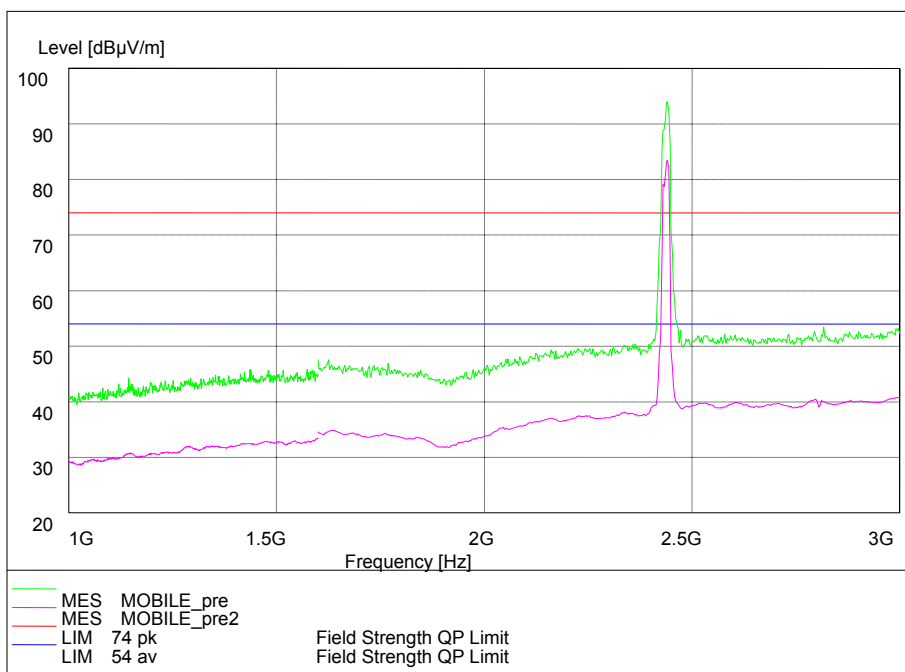
Modulation type: 802.11g



Frequency Range: 30MHz -1GHz

Detector: QP mode

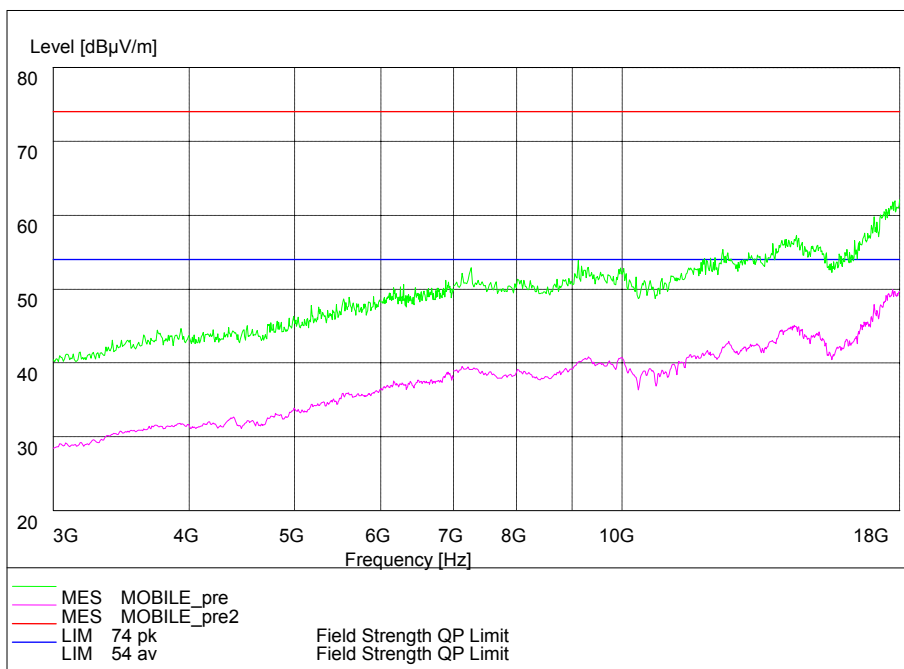
Test Mode: 802.11n(HT20)



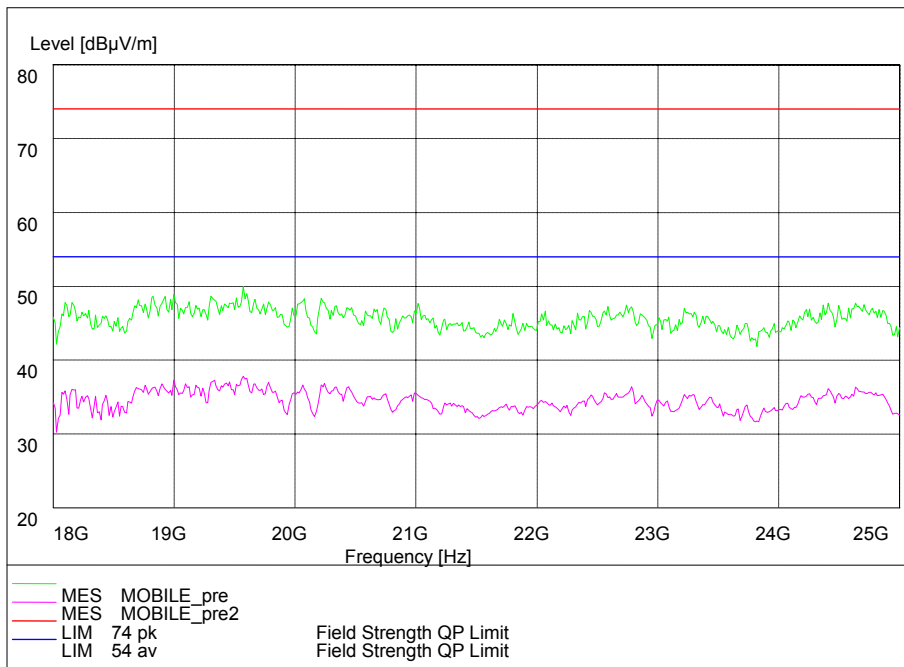
Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

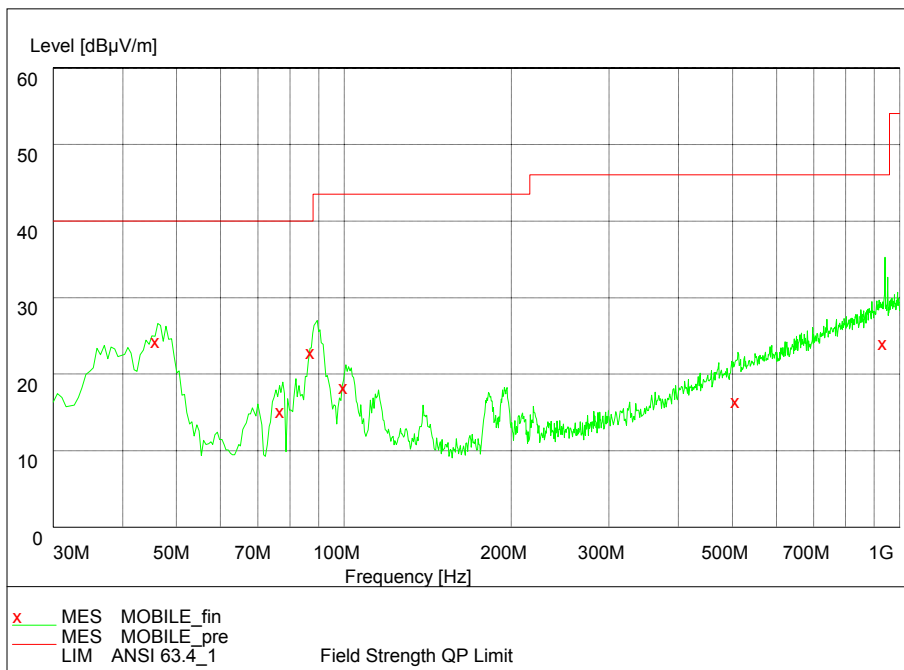
Modulation type: 802.11n(HT20)



Frequency Range: 3GHz -18GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT20)



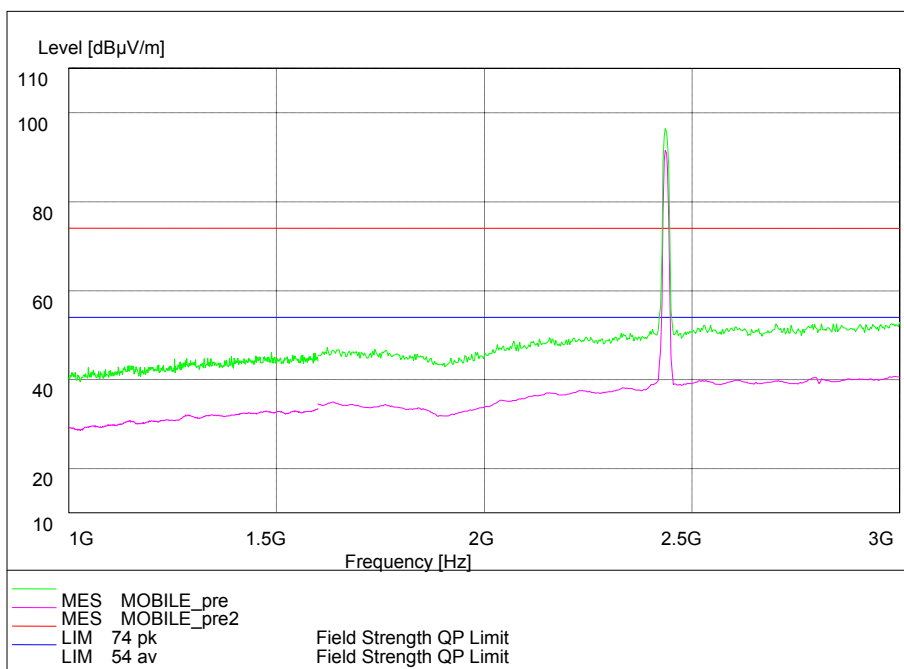
Frequency Range: 18GHz -25GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT20)



Frequency Range: 30MHz -1GHz

Detector: QP mode

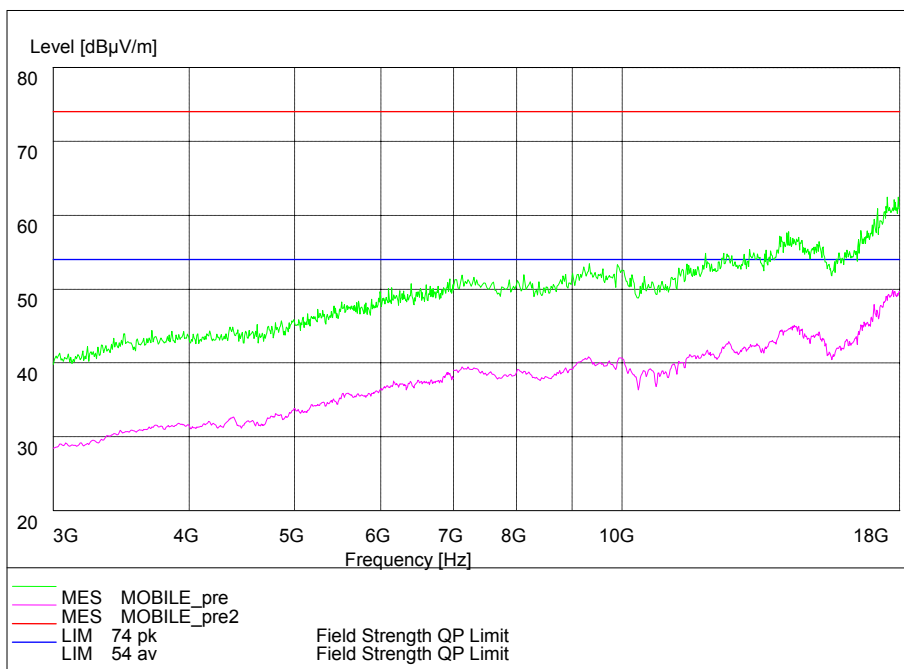
Modulation type: 802.11n(HT40)



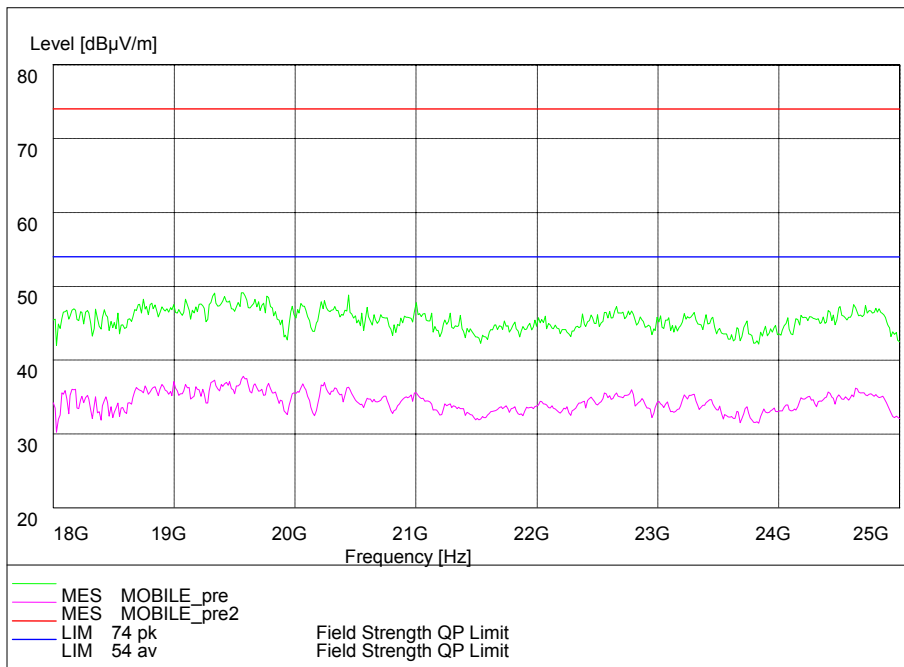
Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

Modulation type: 802.11n(HT40)



Frequency Range: 3GHz -18GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT40)



Frequency Range: 18GHz -25GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT40)

2.2.6 AC Power line Conducted Emission

2.2.6.1 Ambient condition

Temperature	Relative humidity	Pressure
20°C	35%	101.4kPa

2.2.6.2 Test limit

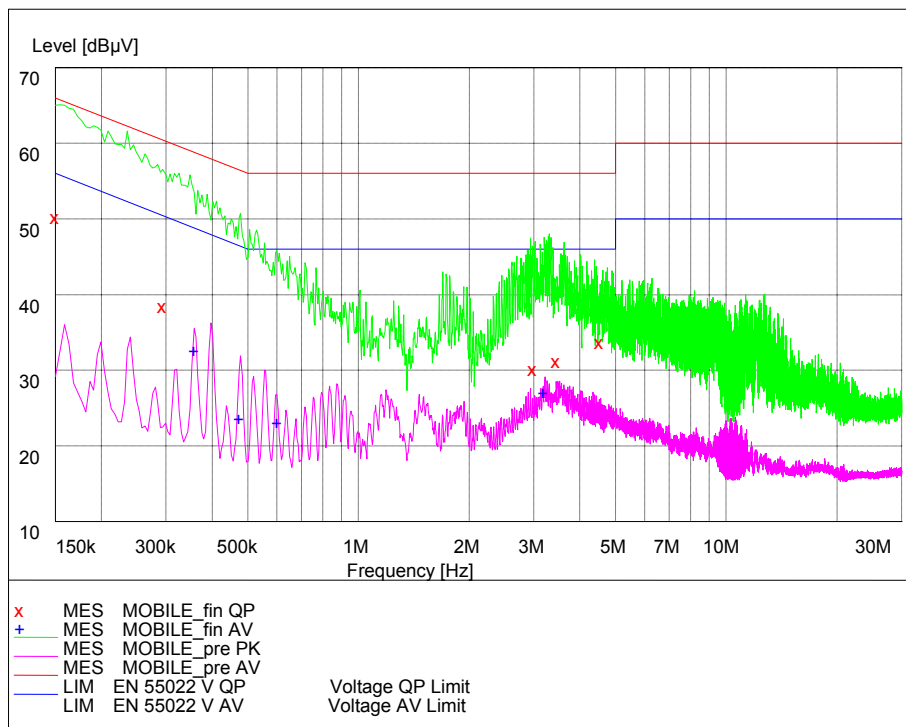
FCC Part15.207

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

The measurement is made according to ANSI C63.4-2009

2.2.6.3 Test result



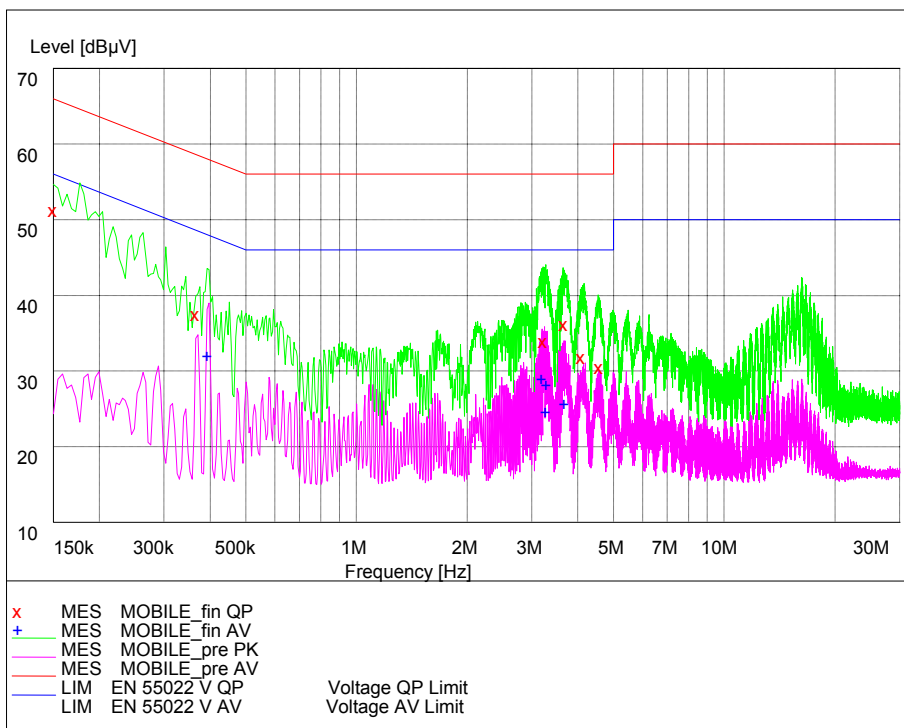
L Line

MEASUREMENT RESULT: "MOBILE_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.150000	51.70	20.1	66	14.3	---	---
0.294000	39.90	20.2	60	20.6	---	---
2.985000	31.60	20.3	56	24.4	---	---
3.453000	32.60	20.3	56	23.4	---	---
4.524000	35.10	20.4	56	20.9	---	---

MEASUREMENT RESULT: "MOBILE_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.357000	34.00	20.1	49	14.8	---	---
0.474000	25.00	20.1	46	21.4	---	---
0.600000	24.50	20.1	46	21.5	---	---
3.183000	28.40	20.3	46	17.6	---	---



N Line

MEASUREMENT RESULT: "MOBILE_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.150000	52.70	20.1	66	13.3	---	---
0.366000	39.00	20.1	59	19.6	---	---
3.219000	35.40	20.3	56	20.6	---	---
3.669000	37.60	20.3	56	18.4	---	---
4.092000	33.30	20.3	56	22.7	---	---
4.578000	31.90	20.4	56	24.1	---	---

MEASUREMENT RESULT: "MOBILE_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.393000	33.40	20.1	48	14.6	---	---
3.192000	30.30	20.3	46	15.7	---	---
3.273000	26.00	20.3	46	20.0	---	---
3.282000	29.50	20.3	46	16.5	---	---
3.678000	27.00	20.3	46	19.0	---	---

2.3. Measurement Uncertainty

Items	Uncertainty	
Occupied Bandwidth	3kHz	
Peak power output	0.67dB	
Band edge compliance	1.20dB	
Transmitter Power Spectral Density	0.75dB	
Spurious emissions	30MHz~1GHz	2.83dB
	1GHz~12.75GHz	2.50dB
	12.75GHz~25GHz	2.75dB

2.4. List of test equipment

No.	Name/Model	Manufacturer	S/N	Cal Due date
1.	Spectrum Analyzer FSV	ROHDE&SCHWARZ	101065	2014.8
2.	Signal Generator MG3700A	Anritsu	6200677084	2014.8
3.	Attenuation 6810.17.B	HUBER+SUHNER	768710	2014.8
4.	Cable 104EA	SUCOFLEX	9272/4EA	2014.8
5.	Cable 104EA	SUCOFLEX	9266/4EA	2014.8
6.	Power Meter E4416A	Agilent	MY52370013	2015.2
7.	Peak Power Sensor E9327A	Agilent	MY52420006	2015.2
8.	12.65m×8.03m×7.50m Fully-Anechoic Chamber	FRANKONIA	----	----
9.	23.18m×16.88m×9.60m Semi-Anechoic Chamber	FRANKONIA	---	----
10.	Turn table Diameter:1m	HD	----	----
11.	Turn table Diameter:5m	HD	----	----
12.	Antenna master FAC(MA4.0)	MATURO	----	----
13.	Antenna master SAC(MA4.0)	MATURO	----	----
14.	9.080m×5.255m×3.525m Shielding room	FRANKONIA	----	----
15.	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100030	2014.8
16.	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100029	2014.8
17.	HL562 Ultra log antenna	R&S	100016	2014.8
18.	3160-09 Receive antenna	SCHWARZ-BECK	002058-002	2014.8
19.	ESI 40 EMI test receiver	R&S	100015	2014.8
20.	Radio tester	CMU 200	114667	2014.8
21.	ESCS30 EMI test receiver	R&S	100029	2014.8
22.	HL562 Receive antenna	R&S	100167	2014.8
23.	ESH3-Z5 LISN	R&S	100020	2014.8

Appendix

Appendix1 Test Setup