FCC- TEST REPORT

Report Number	:	**68.910.19.0024.01** Date of Issue: 28 November 2019
Model	:	**T800A; T800B; T800C; T800D; T800E; T8; T8B; T800; T800F; T800G; T800H; T800J; T8Pro; T8W; T800K; T800L; T800M; T800N; T8X; T8Y; D6; D6S; D6Pro**
Product Type	:	Robotic Vacuum Cleaner
Applicant	:	Shenzhen Hua Xin Information Technology Co., Ltd.
Address	:	Section A 10/F, Block 1, No.7 Industrial Park, Yulu Community, Yutang, Guangming New District, 518132 ShenZhen, PEOPLE'S REPUBLIC OF CHINA
Production Facility	:	Shenzhen Hua Xin Information Technology Co., Ltd.
Address	:	Section A 10/F, Block 1, No.7 Industrial Park, Yulu Community, Yutang, Guangming New District, 518132 ShenZhen, PEOPLE'S REPUBLIC OF CHINA
Test Result	:	■ **Positive** ☐ **Negative**
Total pages including Appendices	:	53

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1 Table of Contents

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2 Details about the Test Laboratory

Details about the Test Laboratory
Test Site 1

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China
FCC Registration Number:	514049
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3 Description of the Equipment under Test

Description of the Equipment Under Test

Product:	Robotic Vacuum Cleaner
Model no.:	T800A; T800B; T800C; T800D; T800E; T8; T8B; T800; T800F; T800G; T800H; T800J; T8Pro; T8W; T800K; T800L; T800M; T800N; T8X; T8Y; D6; D6S; D6Pro
FCC ID:	2AMYQ-2019T800ST
Options and accessories:	NIL
Rated Input:	100-240VAC, 50/60Hz (for Adapter); 19VDC (for Cleaner)
RF Transmission Frequency:	2412-2462MHz
No. of Operated Channel:	11
Modulation:	CCK, DQPSK, DBPSK for 802.11b QPSK,BPSK for 802.11g/n20
Duty Cycle:	100%
Antenna Type:	Integral Antenna
Antenna Gain:	3dBi
Description of the EUT:	Tested with external approved adaptor : Model: GSCU0600S019V12E (by Hu Nan Giantsun Power Electronics Co., Ltd): Input: 100-240V~; 50/60Hz; Max 0,5A Output: 19Vdc; 0.6A; Model: YJS015D-1900600U (by Dongguan Yingju Power Co., Ltd): Input: 100-240V~; 50/60Hz; Max 0,5A Output: 19Vdc; 0.6A

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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2018 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB558074 D01 v05r02 DTS Measurement Guidance and ANSI C63.10 (2013).

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5 Summary of Test Results

Technical Requirements				
FCC Part 15 Subpart C				
Test Condition		Pages	Test Result	Test Site
§15.207	Conducted emission AC power port	11	Pass	Site 1
§15.247(b)(1)	Conducted peak output power	16	Pass	Site 1
§15.247(e)	Power spectral density*	24	Pass	Site 1
§15.247(a)(2)	6dB bandwidth	18	Pass	Site 1
§15.247(a)(1)	20dB bandwidth and 99% Occupied Bandwidth	18	Pass	Site 1
§15.247(a)(1)	Carrier frequency separation	--	N/A	--
§15.247(a)(1)(iii)	Number of hopping frequencies	--	N/A	--
§15.247(a)(1)(iii)	Dwell Time	--	N/A	--
§15.247(d)	Spurious RF conducted emissions	30	Pass	Site 1
§15.247(d)	Band edge	40	Pass	Site 1
§15.247(d) & §15.209 &	Spurious radiated emissions for transmitter	44	Pass	Site 1
§15.203	Antenna requirement	See note 2	Pass	--

Remark 1: N/A – Not Applicable.
Note 1: The EUT uses a permanently integral antenna, which gain is 3dBi. According to §15.203, it is considered sufficiently to comply with the provisions of this section.

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6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AMYQ-2019T800ST, complies with Section 15.207, 15.209, 15.205, 15.247 of the FCC Part 15, Subpart C rules.

This product is a Robotic Vacuum Cleaner with Wi-Fi function.

Description:	Robotic Vacuum Cleaner
Models:	T800A; T800B; T800C; T800D; T800E; T8; T8B; T800; T800F; T800G; T800H; T800J; T8Pro; T8W; T800K; T800L; T800M; T800N; T8X; T8Y; D6; D6S; D6Pro
Ratings:	100-240VAC; 50/60Hz; Max. 0,5A (for adapter) 19Vdc; 600mA (for robotic vacuum cleaner)
Adaptor:	Model: GSCU0600S019V12E (by Hu Nan Giantsun Power Electronics Co., Ltd): Input: 100-240V~; 50/60Hz; Max 0,5A Output: 19Vdc; 0.6A; Model: YJS015D-1900600U (by Dongguan Yingju Power Co., Ltd): Input: 100-240V~; 50/60Hz; Max 0,5A Output: 19Vdc; 0.6A
Battery pack	INR18650 M26-4S1P(BYD Company Limited)
	INR18650 M26-4S1P(Yiyang Corun Battery Co., Ltd)
Model No. of motor for driver wheel	MP5FN-14165WB-RC
	RP356-ST/14175
TX Frequency	2412MHz-2462MHz for 802.11b/g/n-HT20
RX Frequency	2412MHz-2462MHz for 802.11b/g/n-HT20
Antenna Gain	3.0dBi for internal Antenna
RF Output Power	15.5dBm

1. Rechargeable battery-powered robotic vacuum cleaner with docking station for indoor use only.
2. All models are the same except model No and appearance.

Trade mark	Model No.
Meatsvor	T800A; T800B; T800C; T800D; T800E; T8; T8B; T800; T800F; T800G; T800H; T800J; T8Pro; T8W; T800K; T800L; T800M; T800N; T8X; T8Y
ZIGLINT	D6; D6S; D6Pro

The difference of all models is described as above and all models have the same WIFI module, Unless otherwise specified, the model T800A(with Adapter: GSCU0600S019V12E, Motor: MP5FN-14165WB-RC and Battery Pack : INR18650 M26-4S1P(BYD Company Limited)) was chosen as the representative model to perform all the tests, selected test items of Conducted Emission and Spurious Emissions(30M-1GHz) Test was applied on T800B(with Adapter: YJS015D-1900600U, Motor: RP356-ST/14175 and Battery Pack : INR18650 M26-4S1P (Yiyang Corun Battery Co., Ltd)) the others are deemed to fulfill relevant EMC requirement without further testing.

Remark 1: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
Remark 2: Radiated spurious emissions were performed at all conditions.
Remark 3: The EUT has multiple work modes, the worst test results are listed in the report.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date: March 28, 2019

Testing Start Date: March 28, 2019

Testing End Date: June 28, 2019

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch -

Reviewed by:	Prepared by:	Tested by:
Laurent Yuan	Dawi Xu	Tree Zhan
EMC Project Manager	EMC Project Engineer	EMC Test Engineer

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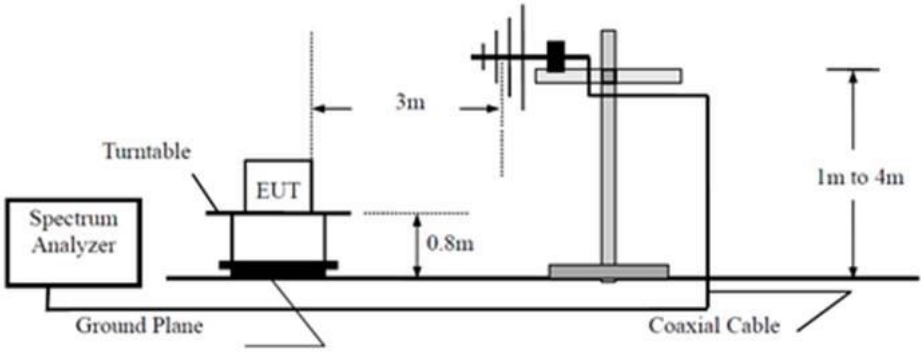
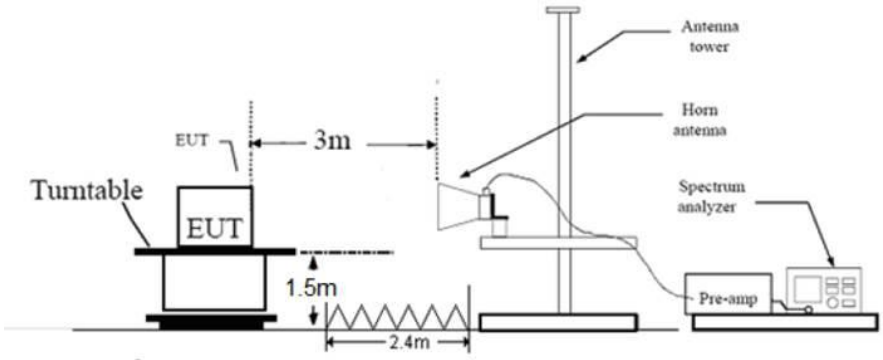
7 Test Setups

7.1 Radiated test setups

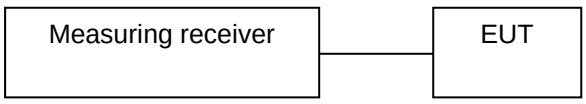
Below 1GHz



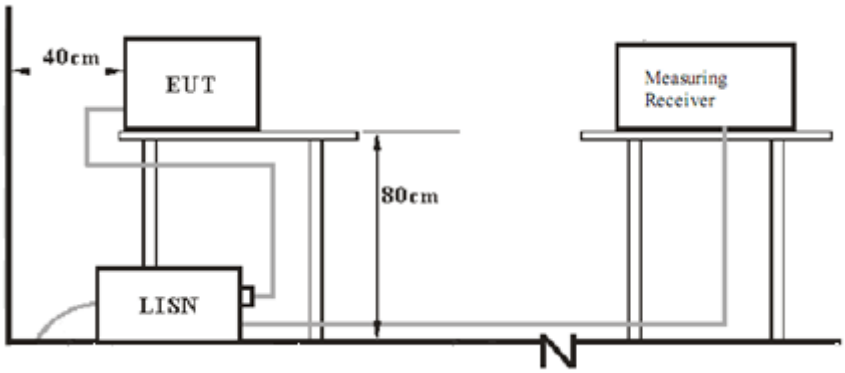
Above 1GHz



7.2 Conducted RF test setups



7.3 AC Power Line Conducted Emission test setups



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8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Mobile Phone	Huawei	P9	---

Test software: RF test tool

The system was configured to channel 1, 6 and 11 for the test.

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9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

Limit

According to §15.207, conducted emissions limit as below:

Frequency MHz	QP Limit dBµV	AV Limit dBµV
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Remark：
Level=Reading Level + Correction Factor
Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)
"*" Decreasing linearly with logarithm of the frequency

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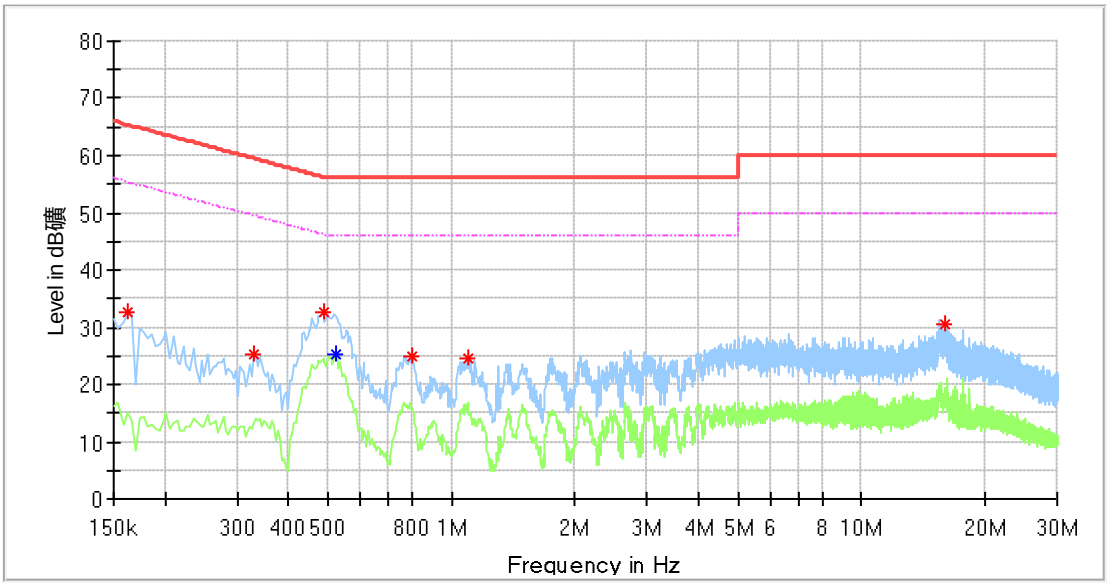
Conducted Emission Test 150kHz – 30MHz

M/N: T800A
Op Cond.: Charging + Wi-Fi transmiting
Test Spec.: Power Line, Live
Comment: AC 120V/60Hz

Temperature (°C): 22.5 Relative Humidity (%): 46.7 Atmospheric Pressure(mbar) : 1012



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.162000	32.51	---	65.36	32.85	L1	10.2
0.330000	25.18	---	59.45	34.27	L1	10.2
0.486000	32.67	---	56.24	23.56	L1	10.3
0.522000	---	25.26	46.00	20.74	L1	10.3
0.806000	24.79	---	56.00	31.21	L1	10.3
1.098000	24.54	---	56.00	31.46	L1	10.3
15.970000	30.62	---	60.00	29.38	L1	10.8

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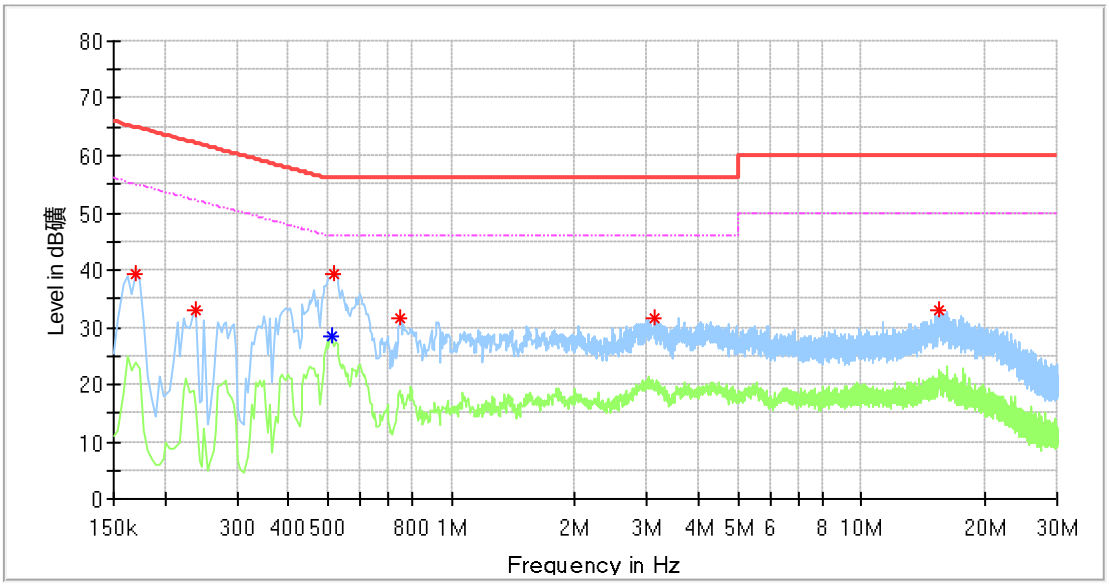
Conducted Emission Test 150kHz – 30MHz

M/N: T800A
Op Cond.: Charging + Wi-Fi transmiting
Test Spec.: Power Line, Neutral
Comment: AC 120V/60Hz

Temperature (°C): 22.5 Relative Humidity (%): 46.7 Atmospheric Pressure(mbar) : 1012



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.170000	39.16	---	64.96	25.80	N	10.2
0.238000	32.89	---	62.17	29.27	N	10.2
0.510000	---	28.50	46.00	17.50	N	10.3
0.518000	39.43	---	56.00	16.57	N	10.3
0.750000	31.63	---	56.00	24.37	N	10.3
3.134000	31.59	---	56.00	24.41	N	10.4
15.486000	32.85	---	60.00	27.15	N	10.9

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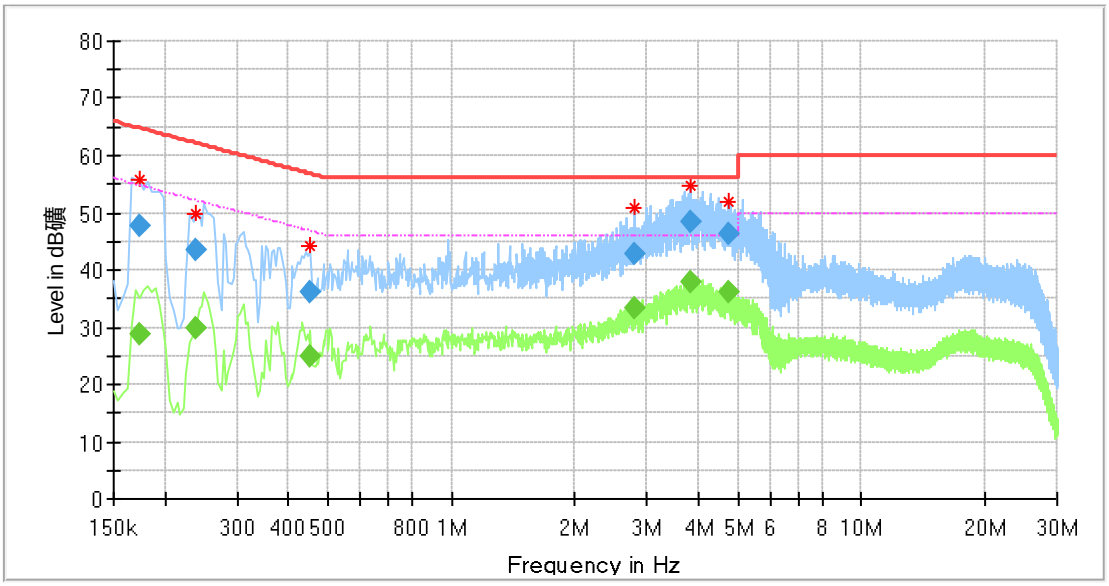
Conducted Emission Test 150kHz – 30MHz

M/N: T800B
Op Cond.: Charging + Wi-Fi transmiting
Test Spec.: Power Line, Live
Comment: AC 120V/60Hz

Temperature (°C): 22.5 Relative Humidity (%): 46.7 Atmospheric Pressure(mbar) : 1012



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.174500	---	28.72	54.74	26.02	L1	10.2
0.174500	47.64	---	64.74	17.10	L1	10.2
0.237500	---	29.79	52.18	22.39	L1	10.2
0.237500	43.67	---	62.18	18.51	L1	10.2
0.453500	---	25.05	46.81	21.76	L1	10.3
0.453500	36.02	---	56.81	20.79	L1	10.3
2.793500	---	33.26	46.00	12.74	L1	10.3
2.793500	42.67	---	56.00	13.33	L1	10.3
3.849500	---	37.99	46.00	8.01	L1	10.4
3.849500	48.27	---	56.00	7.73	L1	10.4
4.722500	---	36.26	46.00	9.74	L1	10.4
4.722500	46.35	---	56.00	9.65	L1	10.4

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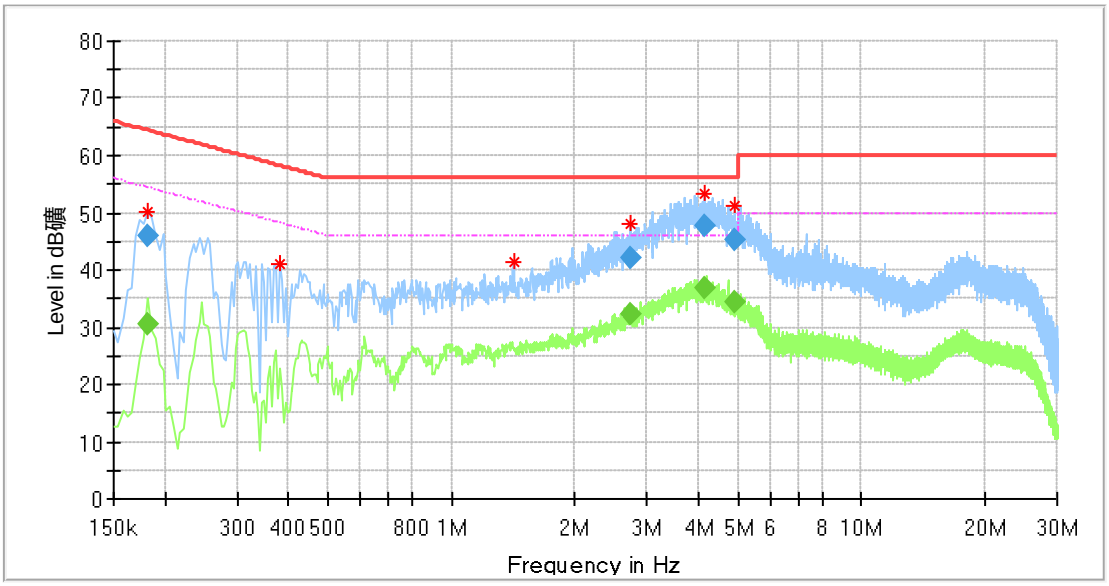
Conducted Emission Test 150kHz – 30MHz

M/N: T800B
Op Cond.: Charging + Wi-Fi transmiting
Test Spec.: Power Line, Neutral
Comment: AC 120V/60Hz

Temperature (°C): 22.5 Relative Humidity (%): 46.7 Atmospheric Pressure(mbar) : 1012



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.181500	---	30.41	54.42	24.01	N	10.2
0.181500	46.08	---	64.42	18.34	N	10.2
2.721500	---	32.17	46.00	13.83	N	10.4
2.721500	41.94	---	56.00	14.06	N	10.4
4.165500	---	36.99	46.00	9.01	N	10.4
4.165500	47.67	---	56.00	8.33	N	10.4
4.926500	---	34.50	46.00	11.50	N	10.5
4.926500	45.26	---	56.00	10.74	N	10.5

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9.2 Conducted peak output power

Test Method

1. Connect the power meter to the EUT
   a) The EUT is configured to transmit continuously, or to transmit with a constant duty factor.
   b) At all times the EUT is transmitting at its maximum power control level.
   c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3. Adjust the measurement in dBm by adding 10log (1/x), where x is the duty cycle to the measurement result.

Limits

According to §15.247 (b) (1), conducted peak output power limit as below:

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1	≤30

Test result as below table

802.11b

Frequency MHz	Conducted Peak Output Power dBm	Result
Top channel 2412MHz	14.0	Pass
Middle channel 2437MHz	14.2	Pass
Bottom channel 2462MHz	14.2	Pass

802.11g

Frequency MHz	Conducted Peak Output Power dBm	Result
Top channel 2412MHz	15.4	Pass
Middle channel 2437MHz	15.5	Pass
Bottom channel 2462MHz	15.2	Pass

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802.11nHT20

Frequency	Conducted Peak Output Power	Result
MHz	**dBm**	
Top channel 2412MHz	15.2	Pass
Middle channel 2437MHz	15.3	Pass
Bottom channel 2462MHz	15.2	Pass

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9.3 6dB and 99% bandwidth

Test Method

1. Use the following spectrum analyzer settings:
   RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

Limit [kHz]
≥500

Test result

802.11b

Frequency MHz	6dB bandwidth KHz	99 bandwidth KHz	Result
Bottom channel 2412MHz	7160	12627	Pass
Middle channel 2437MHz	7160	12587	Pass
Top channel 2462MHz	7160	12547	Pass

802.11g

Frequency MHz	6dB bandwidth KHz	99 bandwidth KHz	Result
Bottom channel 2412MHz	15560	16903	Pass
Middle channel 2437MHz	15440	16943	Pass
Top channel 2462MHz	15200	16903	Pass

802.11nHT20

Frequency MHz	6dB bandwidth KHz	99 bandwidth KHz	Result
Bottom channel 2412MHz	15160	17702	Pass
Middle channel 2437MHz	16160	17702	Pass
Top channel 2462MHz	16160	17702	Pass

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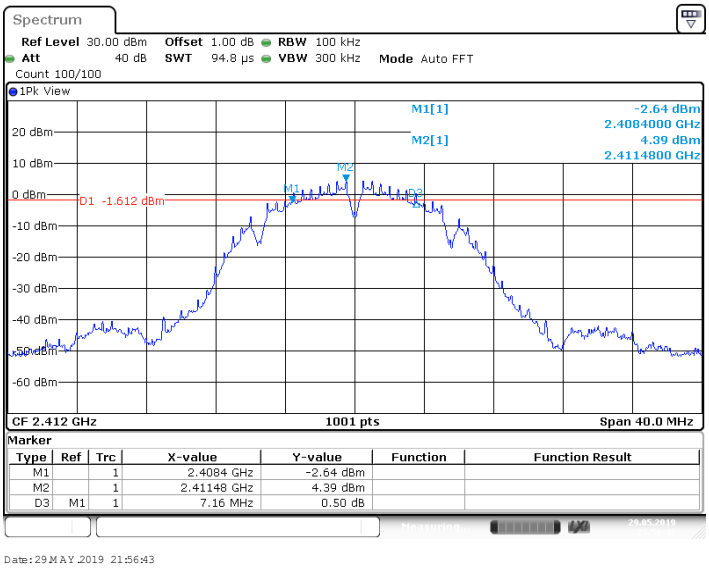
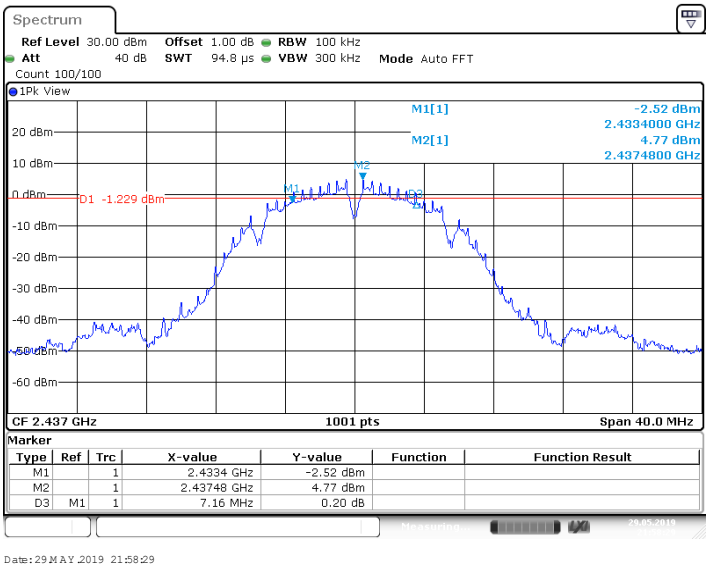
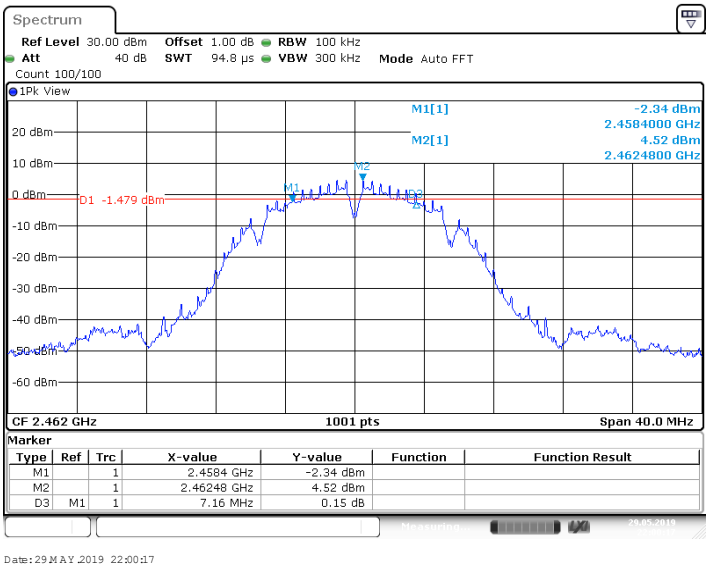
802.11b



2412MHz

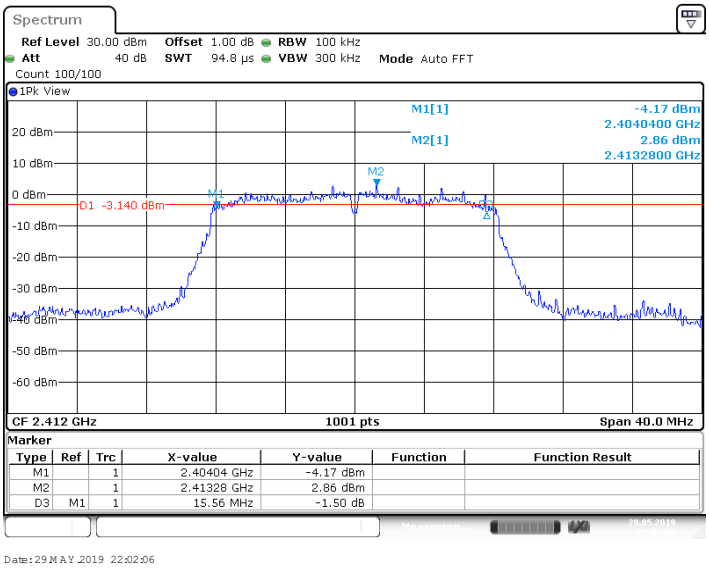


2437MHz

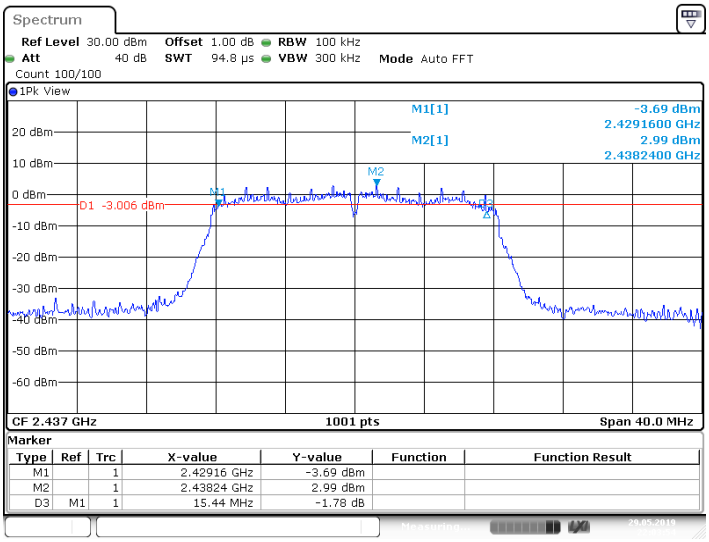


2462MHz

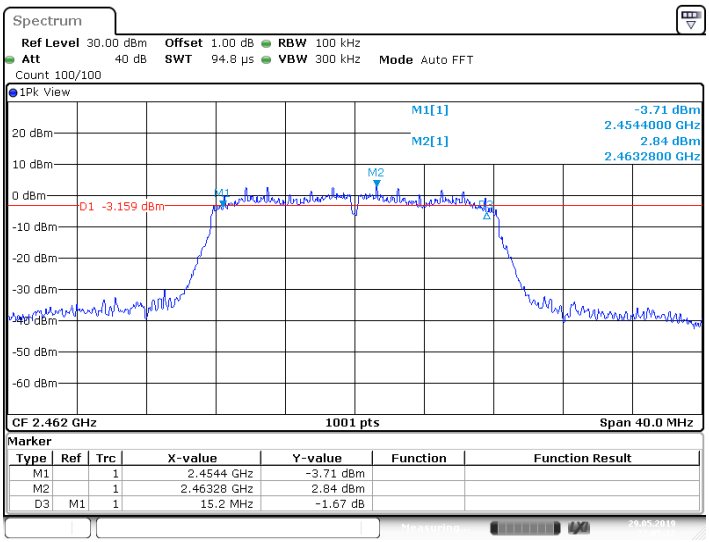
802.11g



2412MHz



2437MHz



2462MHz

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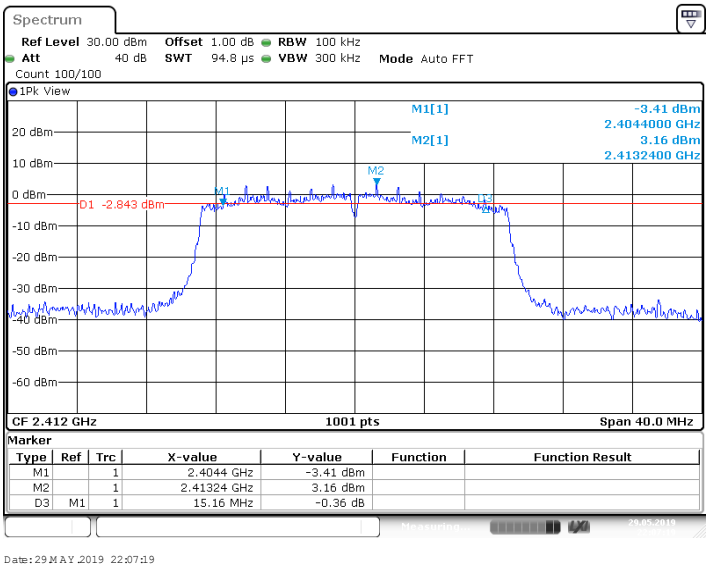
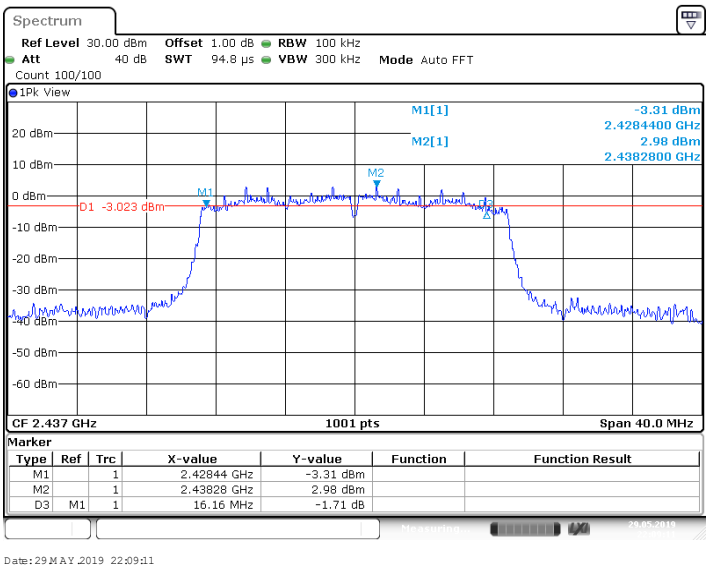
802.11nHT20



2412MHz



2437MHz

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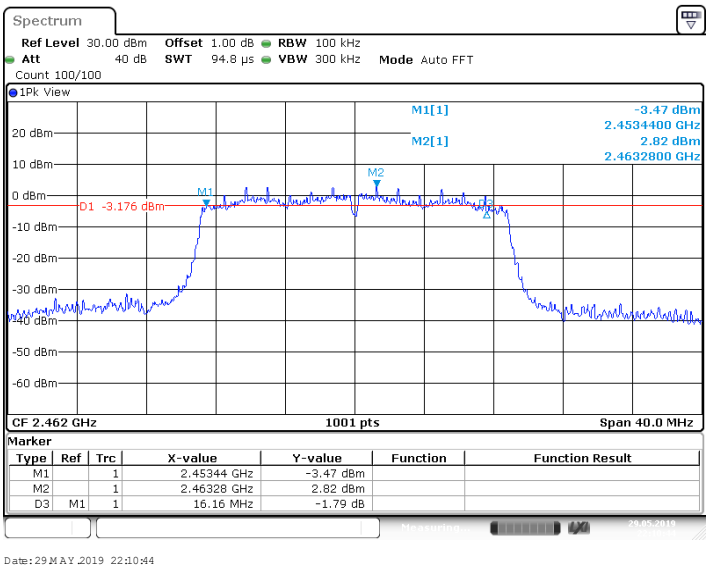
Spectrum
Ref Level 30.00 dBm Offset 1.00 dB RBW 100 kHz
Att 40 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
Count 100/100
1Pk View
M1[1] -3.47 dBm
2.4534400 GHz
M2[1] 2.82 dBm
2.4632800 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -3.176 dBm
M1
M2
CF 2.462 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.45344 GHz -3.47 dBm
M2 1 2.46328 GHz 2.82 dBm
D3 M1 1 16.16 MHz -1.79 dB
Date: 29.MAY.2019 22:10:44

2462MHz

9.4 Power spectral density

Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency. RBW=3kHz, VBW≥3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed.

Limit

Limit [dBm]
≤8

Test result

802.11b

Frequency MHz	Power spectral density dBm/3KHz	Result
Top channel 2412MHz	-9.76	Pass
Middle channel 2437MHz	-9.43	Pass
Bottom channel 2462MHz	-9.74	Pass

802.11g

Frequency MHz	Power spectral density dBm/3KHz	Result
Top channel 2412MHz	-10.47	Pass
Middle channel 2437MHz	-10.41	Pass
Bottom channel 2462MHz	-10.72	Pass

802.11nHT20

Frequency MHz	Power spectral density dBm/3KHz	Result
Top channel 2412MHz	-9.03	Pass
Middle channel 2437MHz	-10.32	Pass
Bottom channel 2462MHz	-10.71	Pass

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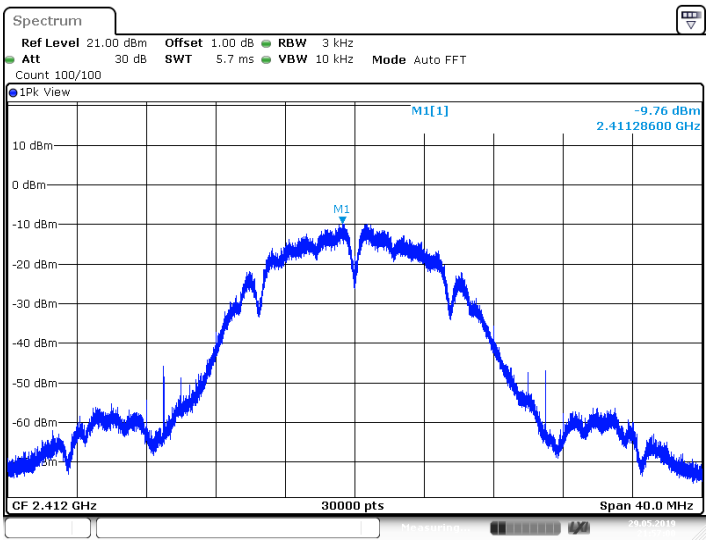
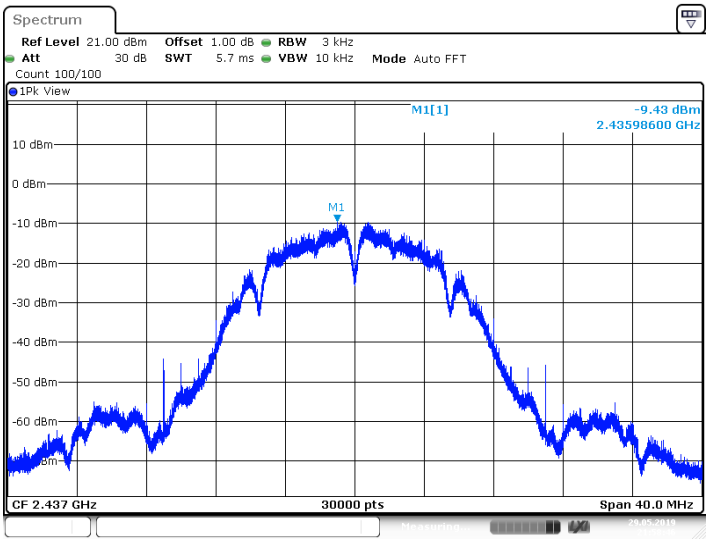
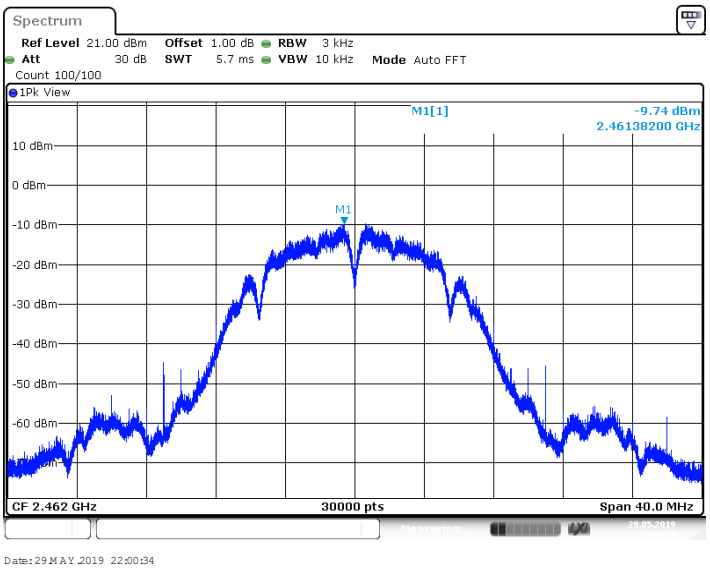
802.11b



2412MHz

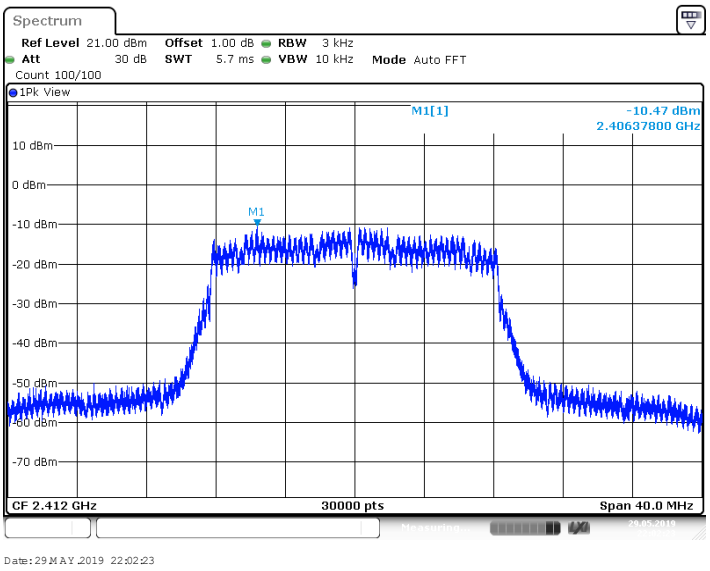


2437MHz



2462MHz

802.11g



2412MHz

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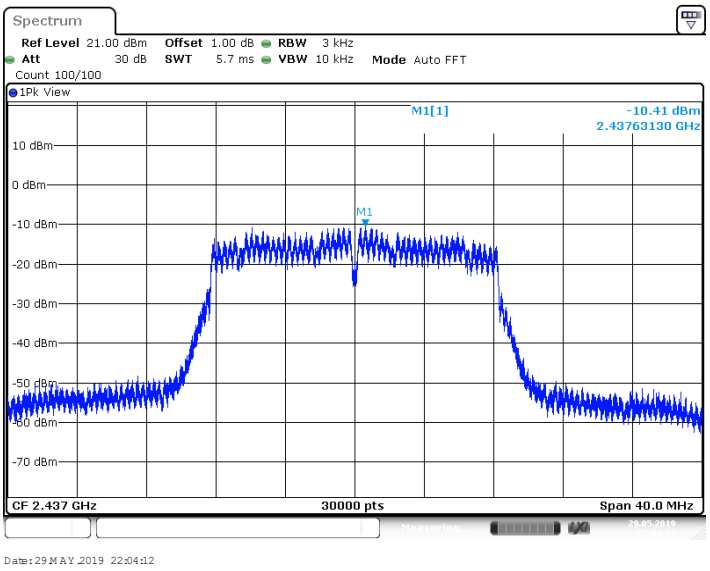
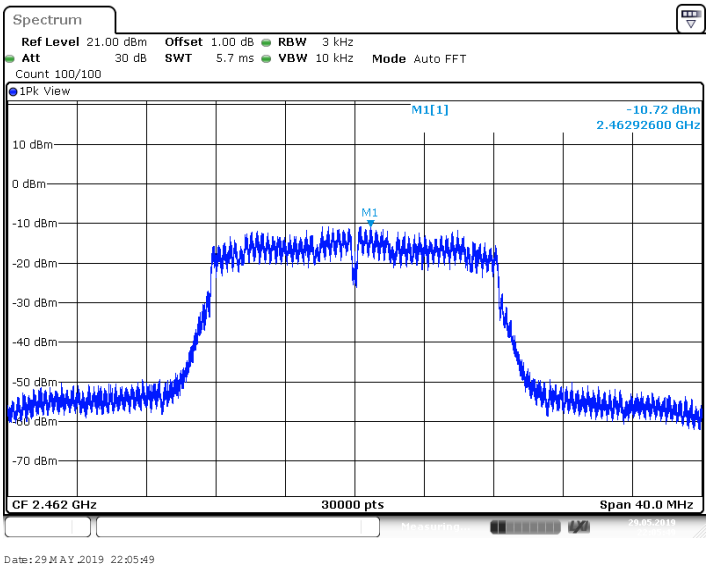


2437MHz



2462MHz

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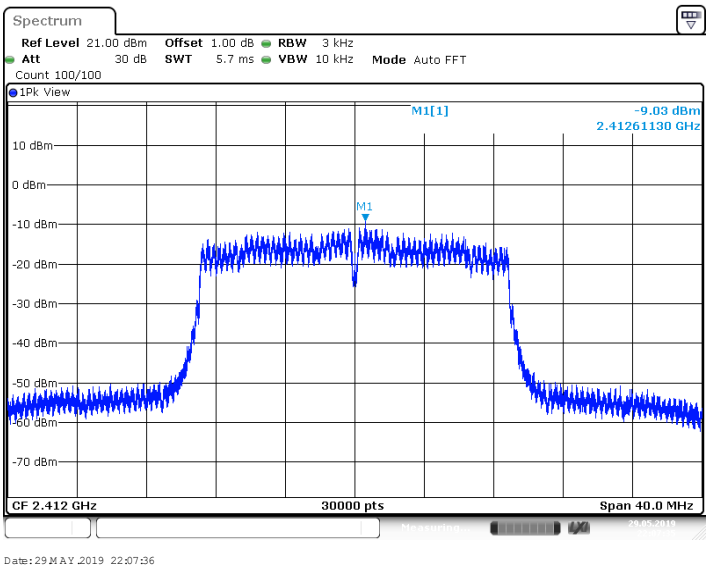
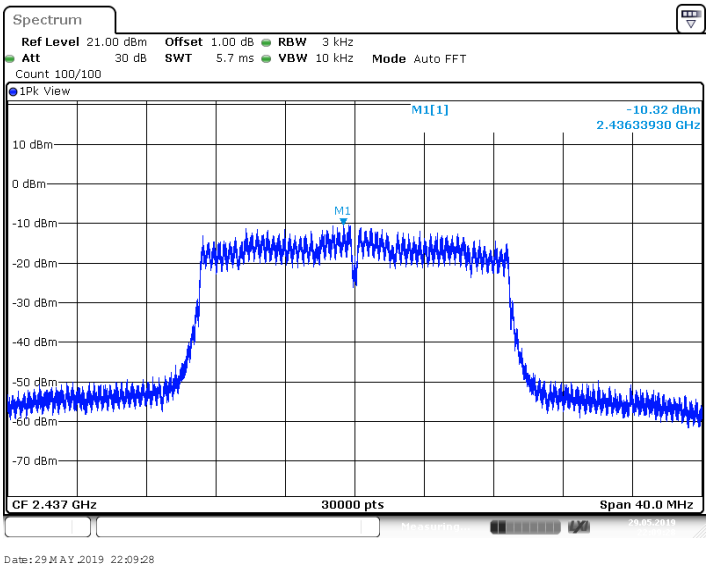
802.11nHT20



2412MHz



2437MHz

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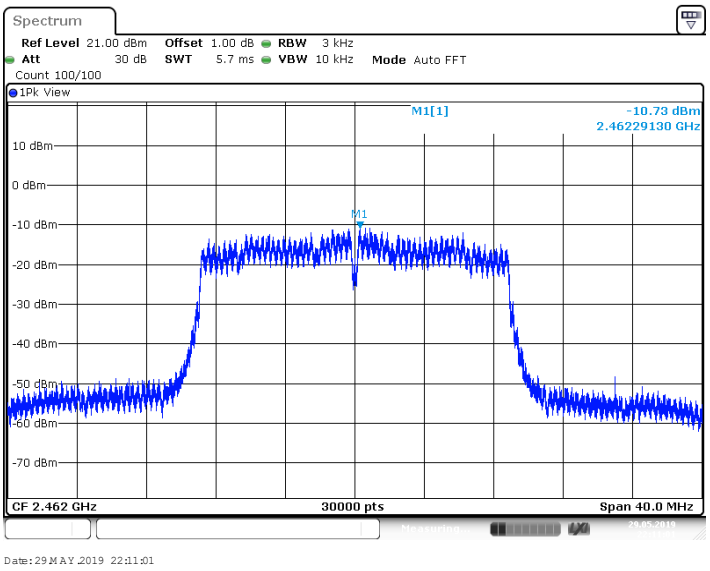

2462MHz

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9.5 Spurious RF conducted emissions

Test Method

1. Establish a reference level by using the following procedure:
   a. Set RBW=100 kHz. VBW≥3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
   b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
2. Use the maximum PSD level to establish the reference level.
   a. Set the center frequency and span to encompass frequency range to be measured.
   b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
3. Repeat above procedures until other frequencies measured were completed.

Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

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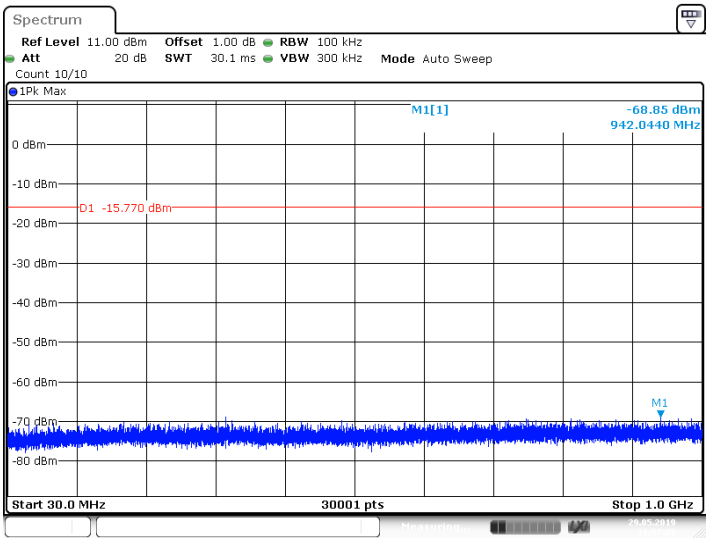
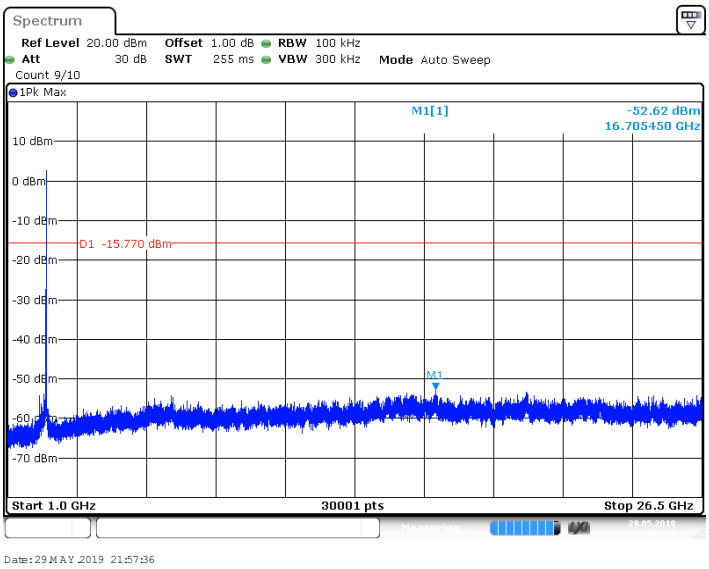
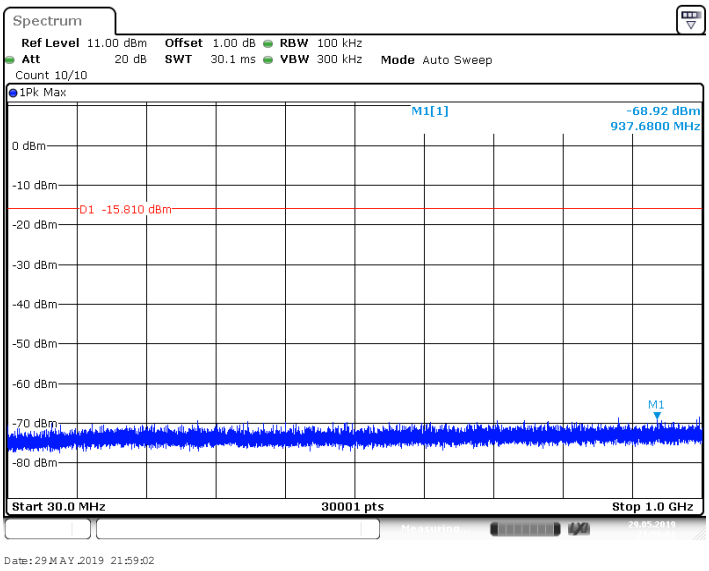
Spurious RF conducted emissions

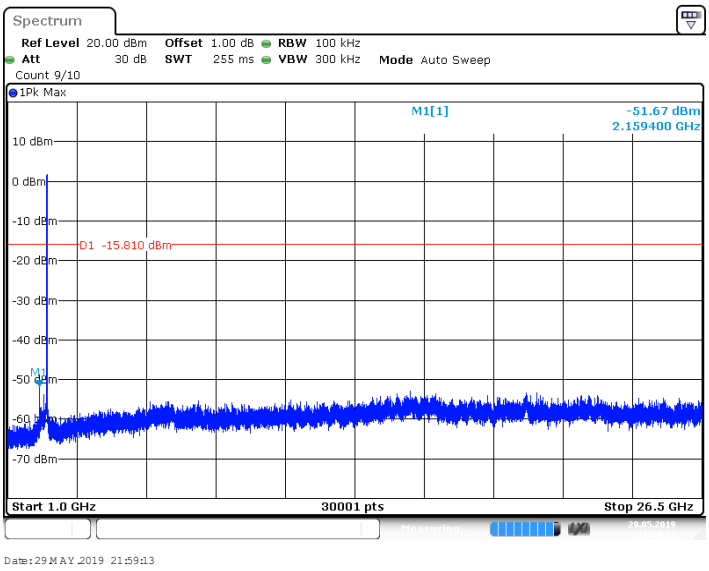
802.11b





2412MHz





2437MHz

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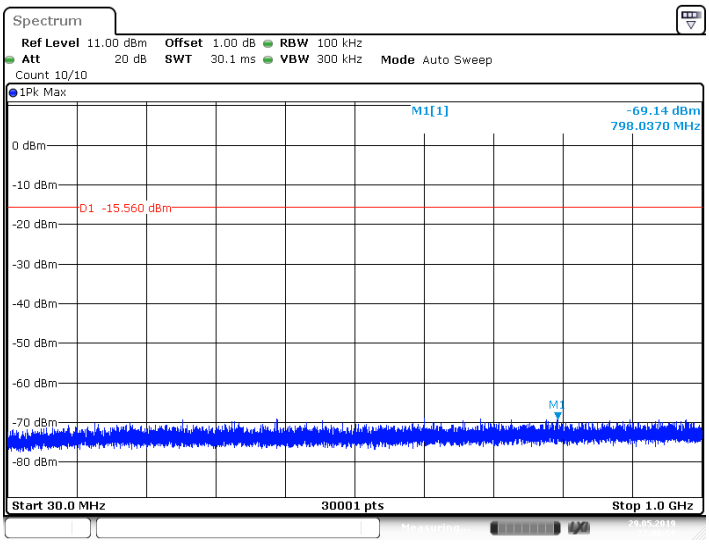
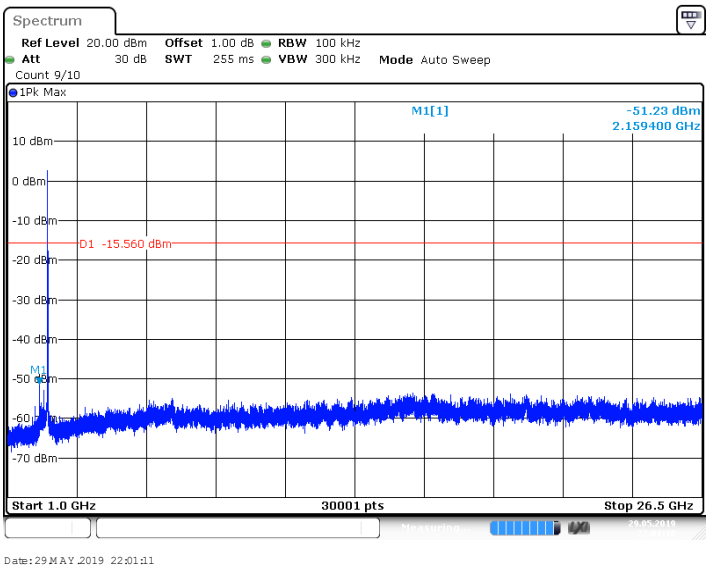
Spurious RF conducted emissions





2462MHz

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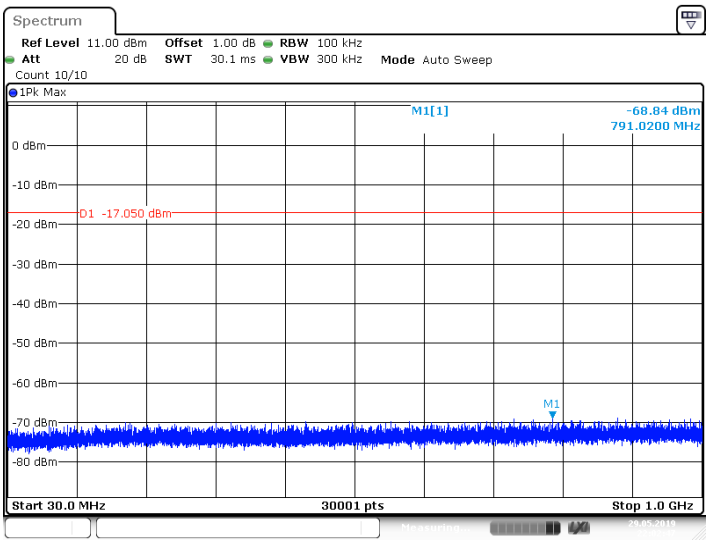
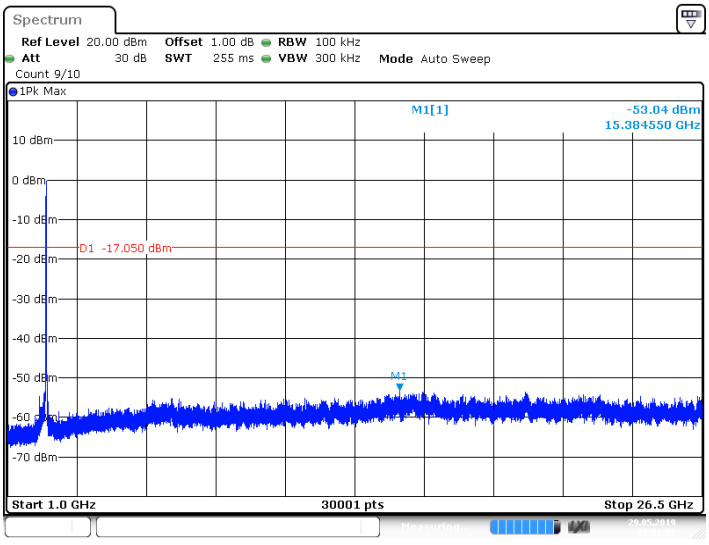
802.11g





2412MHz

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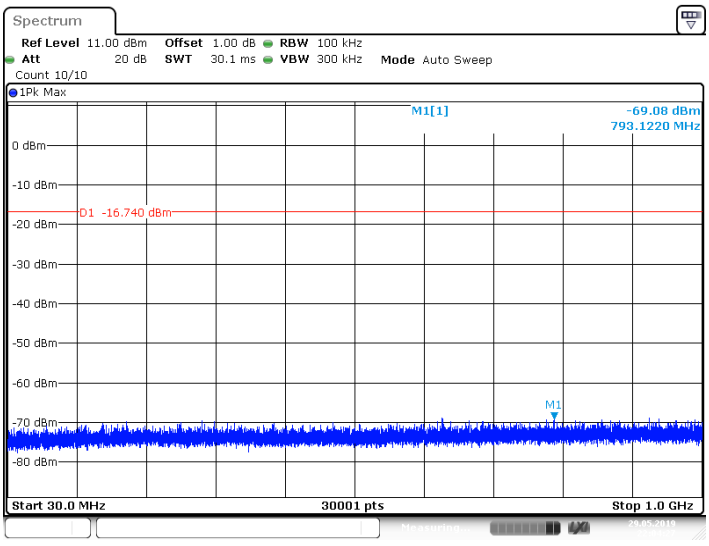
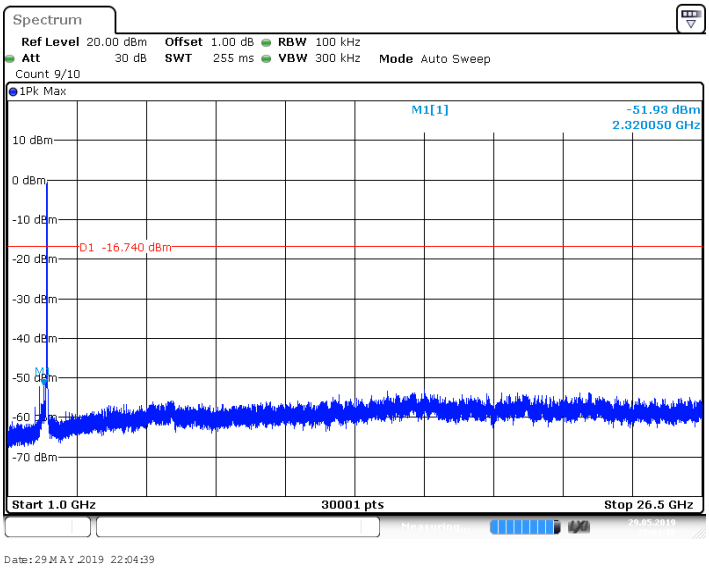
Spurious RF conducted emissions





2437MHz

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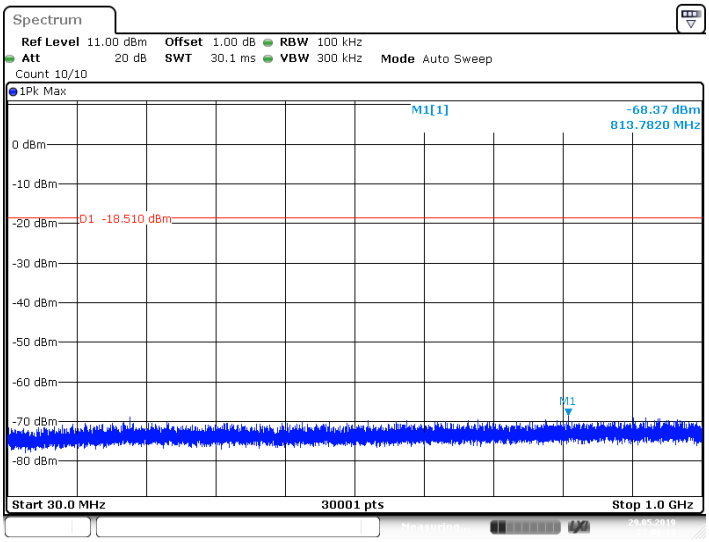

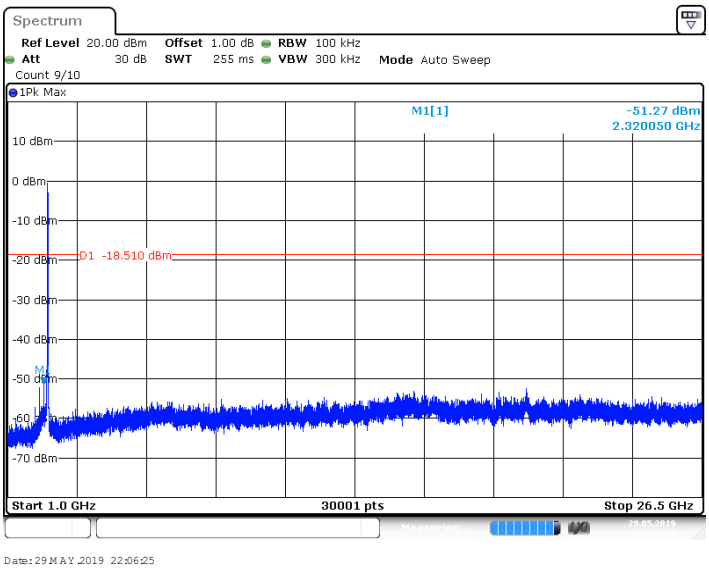

2462MHz

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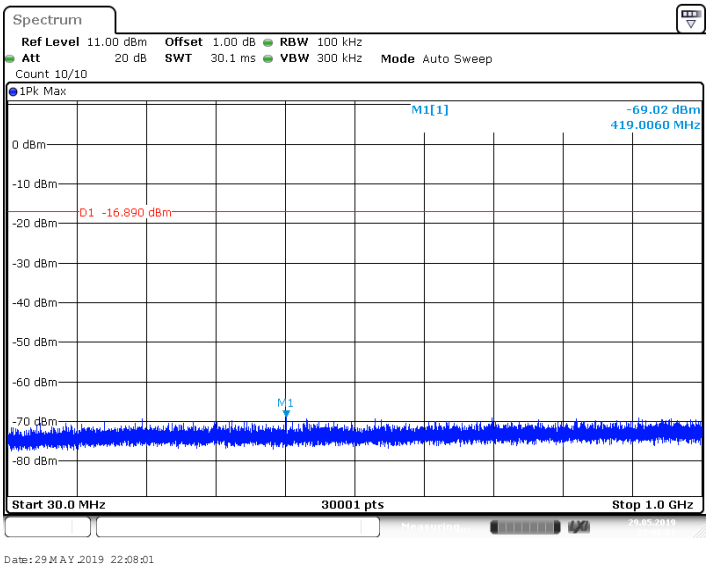
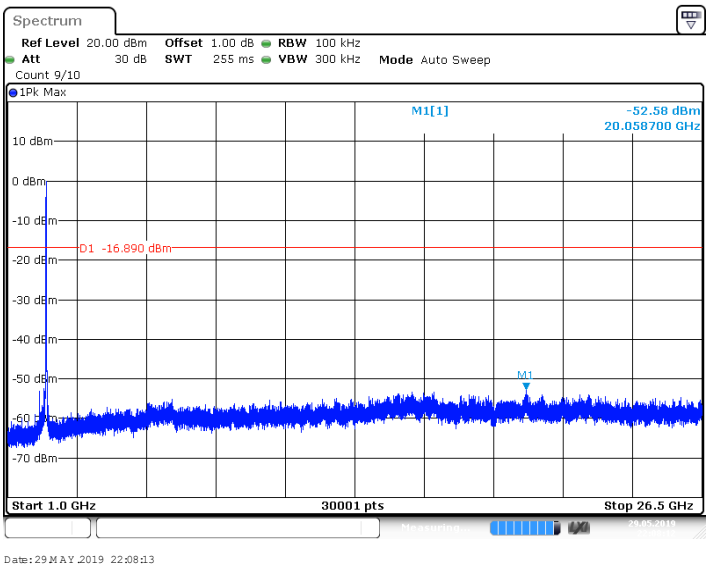
Spurious RF conducted emissions

802.11nHT20





2412MHz

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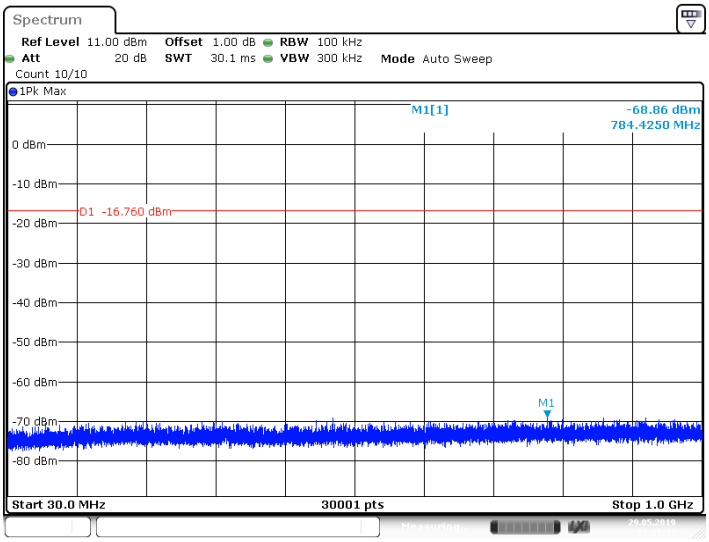

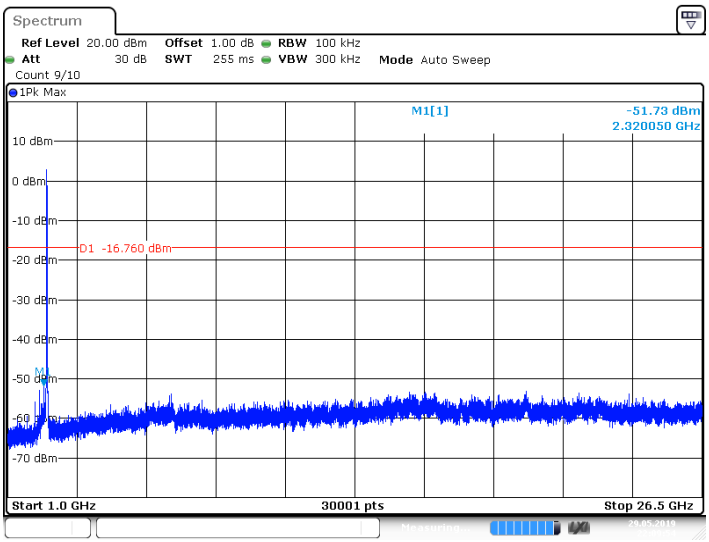

2437MHz

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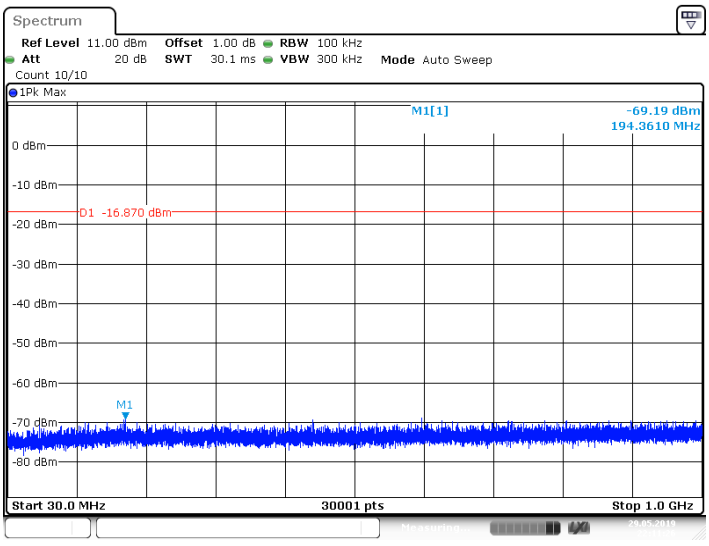
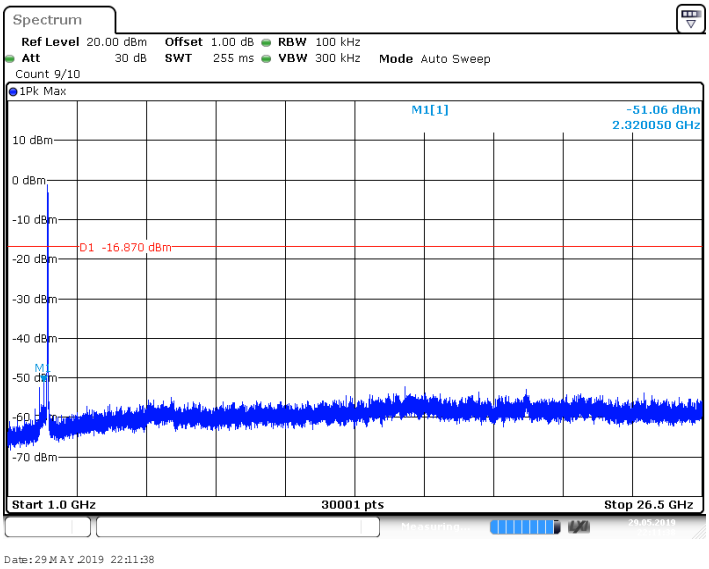
Spurious RF conducted emissions





2462MHz

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9.6 Band edge

Test Method

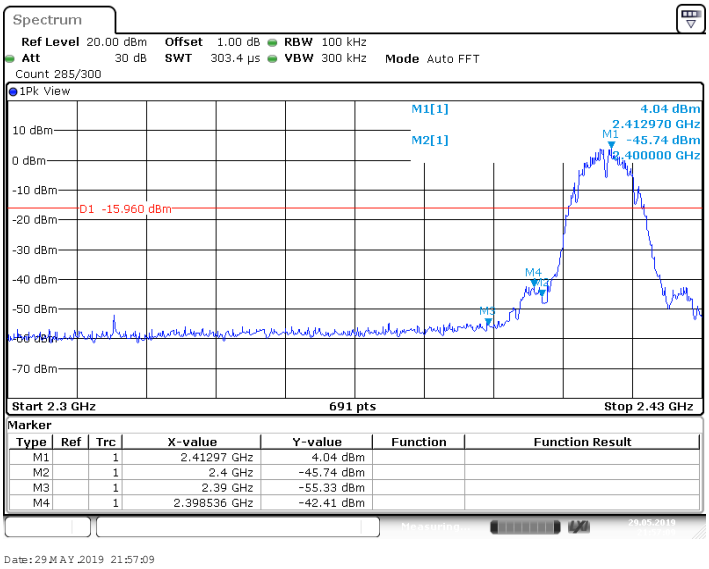
1 Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold.
2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
3 The level displayed must comply with the limit specified in this Section.

Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

Test result

802.11b



2412MHz

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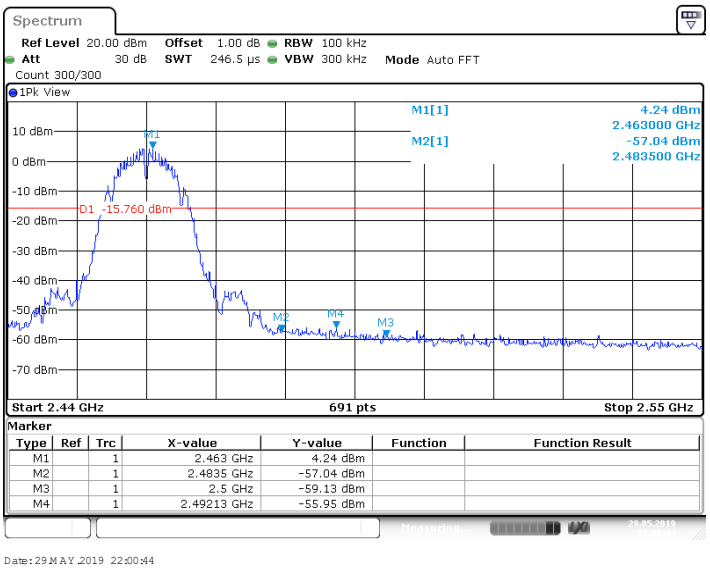
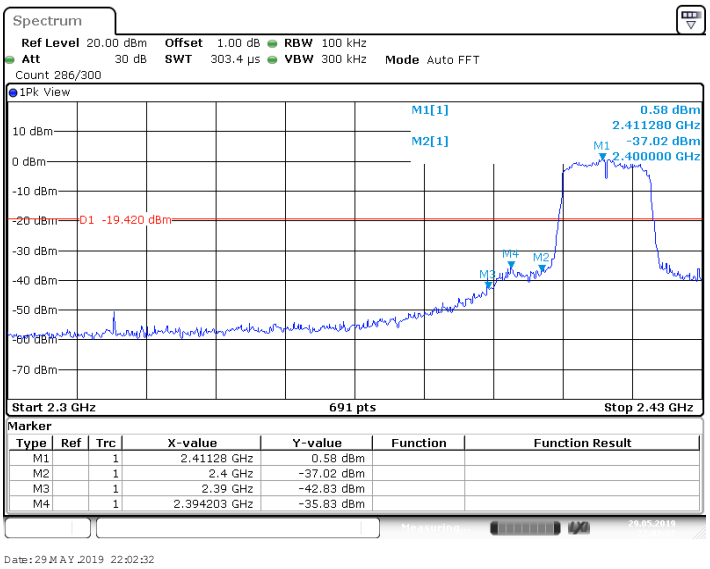
Band edge



2462MHz

802.11g



2412MHz

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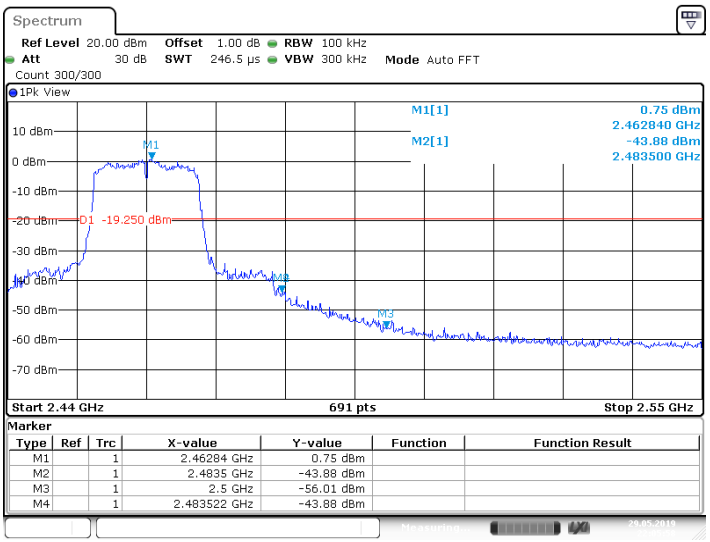
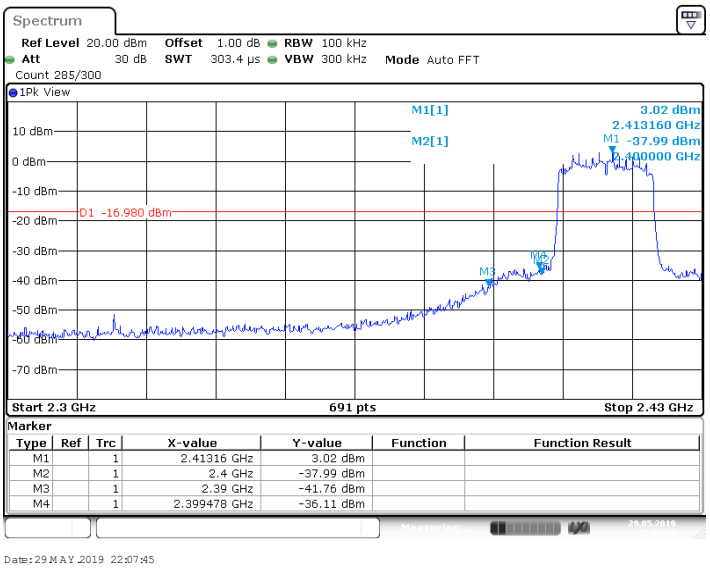
Band edge



2462MHz

802.11nHT20



2412MHz

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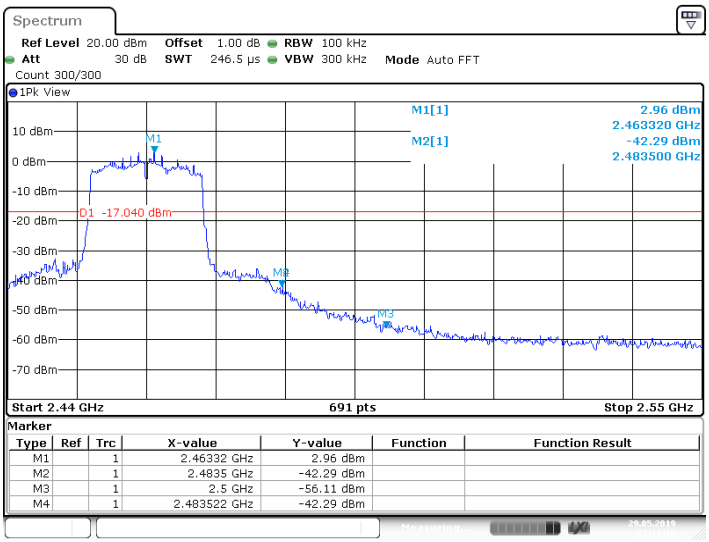
Band edge



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9.7 Spurious radiated emissions for transmitter

Test Method

1: The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
3: The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4: For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5: Use the following spectrum analyzer settings According to C63.10:
For Below 1GHz
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious RBW = 100 KHz to 120KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

For Peak unwanted emissions Above 1GHz:
Span = wide enough to capture the peak level of the in-band emission and all spurious RBW = 1MHz, VBW≥RBW for peak measurement ,Sweep = auto, Detector function = peak, Trace = max hold.

Procedures for average unwanted emissions measurements above 1000 MHz
a) RBW = 1 MHz.
b) VBW \ [3 × RBW].
c) Detector = RMS (power averaging), if [span / (# of points in sweep)] \ RBW / 2. Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.
d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)
e) Sweep time = auto.
f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D,where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)
g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
1) If power averaging (rms) mode was used in the preceding step e), then the correction

factor is [10 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.
2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is [20 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Limit

The radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

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Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Transmitting spurious emission test result as below:

802.11b

2412MHz (30MHz – 1GHz)(for T800A)

Frequency	Emission Level	Polarization	Limit	Detector	Result	Corr. (dB)
MHz	dBuV/m		dBµV/m			
148.663	32.92	Horizontal	43.5	QP	Pass	-31.1
448.01	30.21	Vertical	46.0	QP	Pass	-23.1

2412MHz (30MHz – 1GHz)(for T800B)

Frequency	Emission Level	Polarization	Limit	Detector	Result	Corr. (dB)
MHz	dBuV/m		dBµV/m			
152.16	32.92	Horizontal	43.5	QP	Pass	-30.8
256.01	27.88	Vertical	46.0	QP	Pass	-24.8

2412MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result	Corr. (dB)
MHz	dBuV/m		dBµV/m			
2410.87	38.79	Horizontal	74.00	PK	Pass	-5.9
2411.31	43.96	Vertical	74.00	PK	Pass	-5.9

Remark:

(1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

(2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(3) Level=Reading Level + Correction Factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

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2437MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
--	--	Horizontal	--	QP	Pass
--	--	Vertical	--	QP	Pass

2437MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result	Corr. (dB)
MHz	dBuV/m		dBµV/m			
2437.62	48.1	Horizontal	54.00	PK	Pass	-5.7
2437.87	47.3	Vertical	74.00	PK	Pass	-5.7

Remark:

(1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

(2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(3) Level=Reading Level + Correction Factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

2462MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
--	--	Horizontal	--	QP	Pass
--	--	Vertical	--	QP	Pass

2462MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result	Corr. (dB)
MHz	dBuV/m		dBµV/m			
2372.00*	38.40	Horizontal	74.00	PK	Pass	-6.1
2320.12*	39.76	Vertical	74.00	PK	Pass	-6.6

Remark:

(1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

(2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(3) Level=Reading Level + Correction Factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

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802.11g

2412MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBµV/m	Detector	Result
		Horizontal		QP	Pass
		Vertical		QP	Pass

2412MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBµV/m	Detector	Result	Corr. (dB)
2410.50	40.01	Horizontal	74.00	PK	Pass	-5.9
2411.25	43.93	Vertical	74.00	PK	Pass	-5.9

2437MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBµV/m	Detector	Result
--	--	Horizontal	--	QP	Pass
--	--	Vertical	--	QP	Pass

2437MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBµV/m	Detector	Result	Corr. (dB)
2370.43*	44.39	Horizontal	74.00	PK	Pass	-6.1
2358.37*	35.00	Vertical	74.00	PK	Pass	-6.2

Remark:

(1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

(2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(3) Level=Reading Level + Correction Factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

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2462MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
--	--	Horizontal	--	QP	Pass
--	--	Vertical	--	QP	Pass

2462MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result	Corr. (dB)
MHz	dBuV/m		dBµV/m			
2370.87*	38.74	Horizontal	74.00	PK	Pass	-6.1
2358.00*	37.57	Vertical	74.00	PK	Pass	-6.2

802.11nHT20

2412MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
--	--	Horizontal	--	QP	Pass
--	--	Vertical	--	QP	Pass

2412MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result	Corr. (dB)
MHz	dBuV/m		dBµV/m			
1594.68*	32.5	Horizontal	74.00	PK	Pass	-10.8
2412.56	37.6	Vertical	74.00	PK	Pass	-5.9

Remark:

(1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

(2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(3) Level=Reading Level + Correction Factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

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2437MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
--	--	Horizontal	--	QP	Pass
--	--	Vertical	--	QP	Pass

2437MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result	Corr. (dB)
MHz	dBuV/m		dBµV/m			
2436.31	46.22	Horizontal	74.00	PK	Pass	-5.7
2438.50*	41.32	Vertical	74.00	PK	Pass	-5.7

2462MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
--	--	Horizontal	--	QP	Pass
--	--	Vertical	--	QP	Pass

2462MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Result	Corr. (dB)
MHz	dBuV/m		dBµV/m			
2461.25*	33.83	Horizontal	74.00	PK	Pass	-5.5
2358.06*	41.19	Vertical	74.00	PK	Pass	-6.2

Remark:

(1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

(2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(3) Level=Reading Level + Correction Factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

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10 Test Equipment List

List of Test Instruments

Conducted Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2019-7-6
LISN	Rohde & Schwarz	ENV4200	100249	2019-7-6
LISN	Rohde & Schwarz	ENV432	101318	2019-7-6
LISN	Rohde & Schwarz	ENV216	100326	2019-7-6
ISN	Rohde & Schwarz	ENY81	100177	2019-7-6
ISN	Rohde & Schwarz	ENY81-CA6	101664	2019-7-6
High Voltage Probe	Rohde & Schwarz	TK9420(VT9420)	9420-584	2019-6-30
RF Current Probe	Rohde & Schwarz	EZ-17	100816	2019-6-30
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2019-7-6
Test software	Rohde & Schwarz	EMC32	Version9.15.00	N/A

TS8997 Test System

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	108272	2019-7-6
Vector Signal Generator	Rohde & Schwarz	SMBV100A	262825	2019-7-6
Communication Synthetical Test Instrument	Rohde & Schwarz	CMW 270	101251	2019-5-31
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2019-7-6
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	2019-7-6
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2019-7-6
Power Splitter	Weinschel	1580	SC319	2019-7-5
10dB Attenuator	Weinschel	4M-10	43152	2019-7-6
10dB Attenuator	R&S	DNF	DNF-001	2019-7-6
10dB Attenuator	R&S	DNF	DNF-002	2019-7-6
10dB Attenuator	R&S	DNF	DNF-003	2019-7-6
10dB Attenuator	R&S	DNF	DNF-004	2019-7-6
Test software	Rohde & Schwarz	EMC32	Version 10.38.00	N/A
Test software	Tonscend	System for BT/WIFI	Version 2.6	N/A

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Radiated Spurious Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101031	2019-7-6
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	708	2019-7-4
Horn Antenna	Rohde & Schwarz	HF907	102295	2019-7-4
Wideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG	12827	2019-7-12
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2019-7-6
Pre-amplifier	Rohde & Schwarz	SCU 40A	100432	2019-7-6
Fully Anechoic Chamber	TDK	8X4X4	--	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

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11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Radiated Spurious Emission 25MHz-3000MHz	Horizontal: 4.80dB; Vertical: 4.87dB;
Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.59dB; Vertical: 4.58dB;
Uncertainty for Radiated Spurious Emission 18000MHz-40000MHz	Horizontal: 5.05dB; Vertical: 5.04dB;
Uncertainty for Conducted RF test with TS 8997	RF Power Conducted: 1.16dB Frequency test involved: 0.6×10-7 or 1%
Uncertainty Evaluation for Power Spectral Density Conducted measurement	1.17dB
Uncertainty Evaluation for Spurious emissions Conducted measurement	1.43dB
Uncertainty for Conducted Emission 150kHz-30MHz (for test using AMN ENV432 or ENV4200)	3.21dB

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