FCC/IC - TEST REPORT

Report Number	:	**68.950.19.0065.01**	Date of Issue:	**March 14, 2019**
Model / HVIN	:	**TEMI S1**		
Product Type	:	Temi Personal Computer Robot		
Applicant	:	Roboteam Home Technology (Shenzhen) Co., Ltd		
Address	:	22F, CHANGFU JINMAO BUILDING NO.5 SHIHUA ROAD, FUTIAN DISTRICT, SHENZHEN, CHINA		
Manufacturer	:	Roboteam Home Technology (Shenzhen) Co., Ltd		
Address	:	22F, CHANGFU JINMAO BUILDING NO.5 SHIHUA ROAD, FUTIAN DISTRICT, SHENZHEN, CHINA		
Test Result	:	■ **Positive** ☐ **Negative**		
Total pages including Appendices	:	**43**		

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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 No.:	514049
IC Registration No.:	10320A
Telephone:	86 755 8828 6998
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3 Description of the Equipment Under Test

Product:	Temi Personal Computer Robot
Model no.:	TEMI S1
Hardware Version Identification No. (HVIN)	TEMI S1
FCC ID:	2ASJLTEMIS1
IC:	24774-TEMIS1
Options and accessories:	Charger and power Cable
Rating:	Supplied by 14.4Vdc, 15.6Ah Li-ion Battery 19Vdc, 5.0A Charged by an external adapter
Adapter information:	Adapter Model: AY120BA-ZF190500M Adapter Input: 100-240Vac, 50/60Hz; 1.8A Max Adapter Output: 19.0Vdc, 5.0A
RF Transmission Frequency:	144KHz for WPT 2402MHz-2480MHz for Bluetooth 2412MHz-2462MHz for 802.11b/g/n20 (WiFi) 5150-5350, 5470-5825MHz for 802.11a/n20/n40/ac20/ac40/ac80 (WiFi)
No. of Operated Channel:	79 for Bluetooth 11 for 802.11b/g/n20 (WiFi) 43 for for 802.11a/n20/n40/ac20/ac40/ac80 (WiFi)
Modulation:	GFSK, π/4-DQPSK, 8DPSK for Bluetooth DSSS, OFDM for WiFi
Antenna Type:	Integrated antenna
Antenna Gain:	2.0dBi Max for 2.4GHz 2.5dBi Max for 5GHz
Description of the EUT:	The Equipment Under Test (EUT) is a smart robot which support WiFi at 2.4GHz and 5GHz, Bluetooth function operated at 2.4GHz

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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
RSS-Gen Issue 5 April 2018	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 2 February 2017	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices

All the test methods were according to KDB 558074 D01 15.247 Meas Guidance v05 Measurement Guidance and ANSI C63.10 (2013).

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5 Summary of Test Results

Technical Requirements						
FCC Part 15 Subpart C/ RSS-247 Issue 2/RSS-Gen Issue 5						
Test Condition		Pages	Test Site	Test Result		
				Pass	Fail	N/A
§15.207 & RSS-GEN 8.8	Conducted emission AC power port	10	Site 1	☒	☐	☐
§15.247 (b) (1) & RSS-247 5.4(d)	Conducted peak output power	13	Site 1	☒	☐	☐
§15.247(a)(1) & RSS-247 5.1(b)	20dB bandwidth	---	---	☐	☐	☒
§15.247(a)(1) & RSS-247 5.1(b)	Carrier frequency separation	---	---	☐	☐	☒
§15.247(a)(1)(iii) & RSS-247 5.1(d)	Number of hopping frequencies	---	---	☐	☐	☒
§15.247(a)(1)(iii) & RSS-247 5.1(d)	Dwell Time	---	---	☐	☐	☒
§15.247(a)(2) & RSS-247 5.2(a) & RSS-GEN 6.7	6dB bandwidth and 99% Occupied Bandwidth	14	Site 1	☒	☐	☐
§15.247(e) & RSS-247 5.2(b)	Power spectral density	24	Site 1	☒	☐	☐
§15.247(d) & RSS-247 5.5	Spurious RF conducted emissions	25	Site 1	☒	☐	☐
§15.247(d) & RSS-247 5.5	Band edge	40	Site 1	☒	☐	☐
§15.247(d) & §15.209 & RSS-247 5.5 & RSS-Gen 6.13	Spurious radiated emissions for transmitter	44	Site 1	☒	☐	☐
§15.203 & RSS-Gen 6.8	Antenna requirement	See note 1		☒	☐	☐

Note 1: N/A=Not Applicable.

Note 2: The EUT uses an internal antenna, which gain is 2.0dBi. In accordance to §15.203 and RSS-Gen 6.8, 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: 2ASJLTEMIS1, IC: 24774-TEMIS1, complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C rules and RSS-247, RSS-GEN.

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: February 25, 2019

Testing Start Date: February 27, 2019

Testing End Date: March 6, 2019

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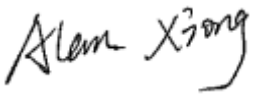
Reviewed by:	Prepared by:	Tested by:
		
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Project Manager	Project Engineer	Test Engineer

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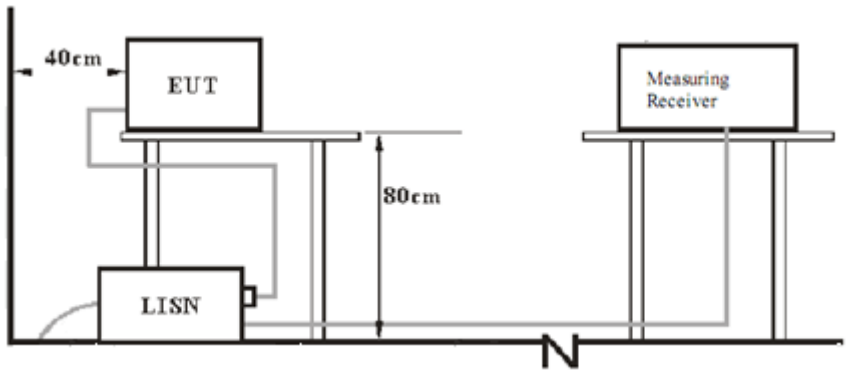
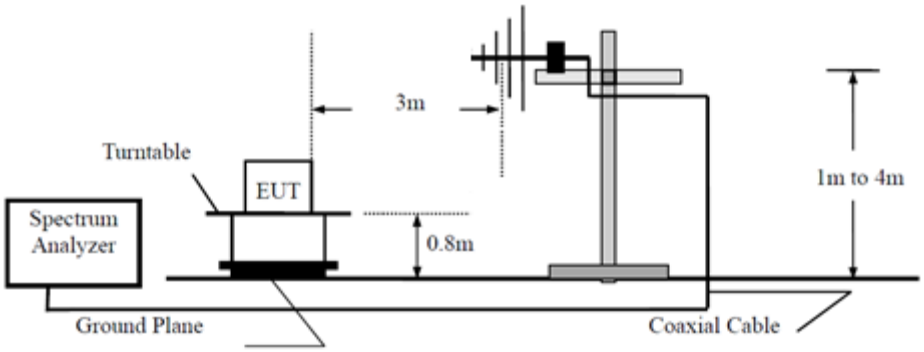
7 Test Setups

7.1 AC Power Line Conducted Emission test setups

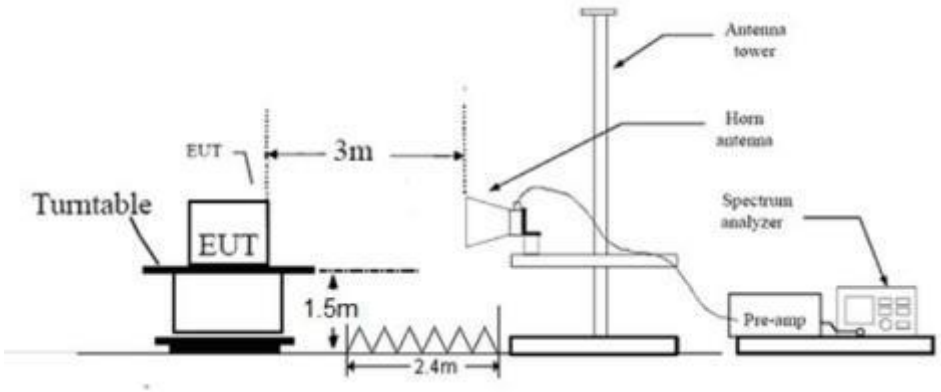


7.2 Radiated test setups

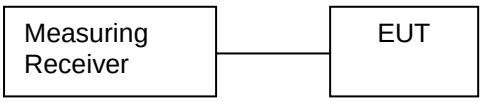
Below 1GHz



Above 1GHz



7.3 Conducted RF test setups



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8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
PC	Lenovo	X240	---

The system was configured to non-hopping mode.

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power.

Through pre-scan all kind of modulation and all kind of rates, find the 1Mbps of rate is the worst case of 802.11b; the 6Mbps of rate is the worst case of 802.11g; the 6.5Mbps of rate is the worst case of 802.11N20, only the worst case transmitter rate data mode in recorded in the report.

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9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. Both sides of AC line were checked for maximum conducted interference.
6. The frequency range from 150 kHz to 30 MHz was searched.
7. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

Limit

According to §15.207 & RSS-GEN 8.8, 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

Decreasing linearly with logarithm of the frequency

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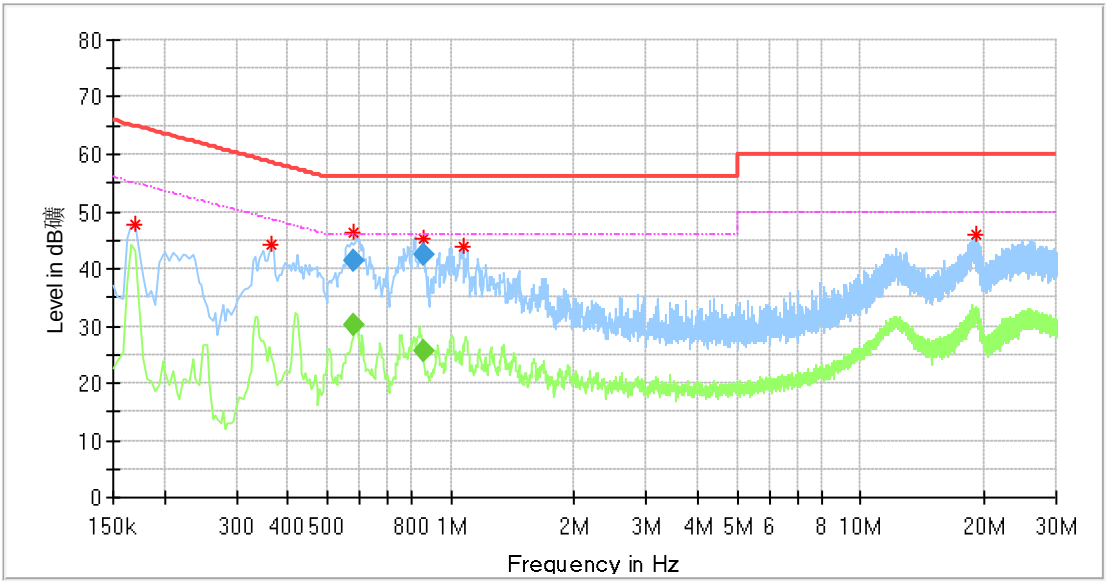
Conducted Emission

Product Type : Temi Personal Computer Robot
M/N : TEMI S1
Operating Condition : Charging Mode
Test Specification : Line
Comment : AC 120V/60Hz



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Read Level (dBµV)	Corr. (dB)
0.170000	47.78	---	64.96	17.18	L1	37.58	10.2
0.366000	44.25	---	58.59	14.34	L1	33.95	10.3
0.581500	46.25	---	56.00	9.75	L1	35.95	10.3
0.581500	---	30.23	46.00	15.77	L1	19.93	10.3
0.581500	41.47	---	56.00	14.53	L1	31.17	10.3
0.857500	---	25.67	46.00	20.33	L1	15.37	10.3
1.070000	43.76	---	56.00	12.24	L1	33.46	10.3
19.074000	46.11	---	60.00	13.89	L1	35.11	11.0

Remark:
Max Peak= Read level + Corrector factor
Correct factor=cable loss + LISN factor

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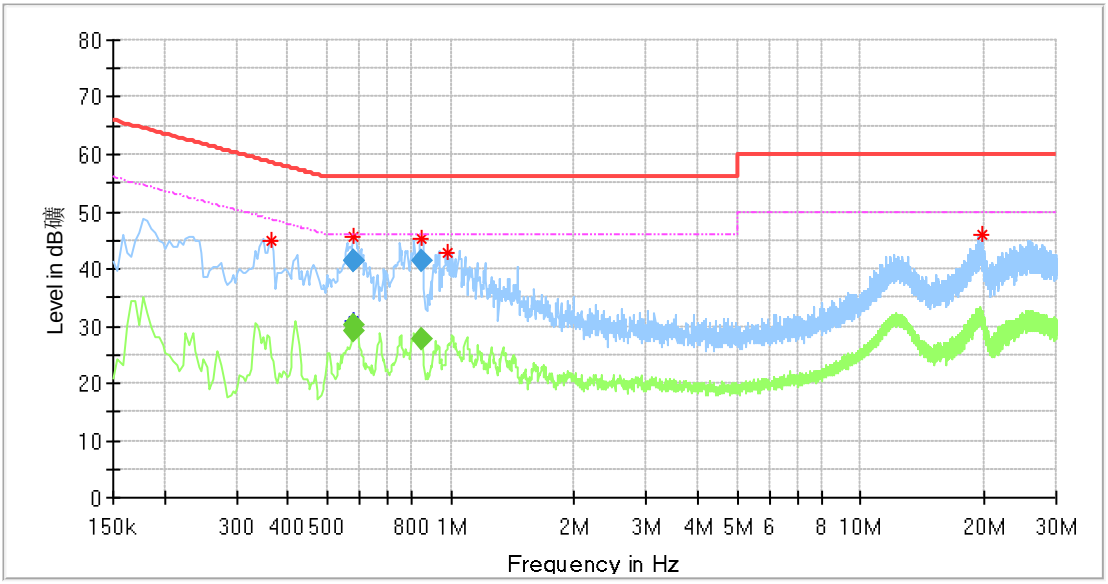
Conducted Emission

Product Type : Temi Personal Computer Robot
M/N : TEMI S1
Operating Condition : Charging Mode
Test Specification : Neutral
Comment : AC 120V/60Hz



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Read Level (dBµV)	Corr. (dB)
0.366000	44.75	---	58.59	13.84	N	34.45	10.3
0.577500	---	29.13	46.00	16.87	N	18.83	10.3
0.577500	41.56	---	56.00	14.44	N	31.26	10.3
0.581500	---	30.33	46.00	15.67	N	20.03	10.3
0.581500	41.25	---	56.00	14.75	N	30.95	10.3
0.849500	---	27.67	46.00	18.33	N	17.37	10.3
0.849500	41.28	---	56.00	14.72	N	30.98	10.3
0.982000	42.88	---	56.00	13.12	N	32.58	10.3
19.690000	46.11	---	60.00	13.89	N	34.91	11.2

Remark:
Max Peak= Read level + Corrector factor
Correct factor=cable loss + LISN factor

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9.2 Conducted peak output power

Test Method

1. The RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following test receiver settings:
   Span = approximately 5 times the 20dB bandwidth, centered on a hopping channel
   RBW > the 20dB bandwidth of the emission being measured, VBW≥RBW,
   Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power and record the results in the test report.
5. Repeat above procedures until all frequencies measured were complete.

Limits

According to §15.247 (b) (1) & RSS-247 5.4(d), 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_SISO modulation Test Result

Frequency (MHz)	Conducted Peak Output Power (dBm)		Limit (dBm)	Result
	Ant 1	Ant 2		
Low channel 2412MHz	14.3	15.2	30	Pass
Middle channel 2437MHz	15.0	15.7	30	Pass
High channel 2462MHz	15.5	16.0	30	Pass

802.11g_SISO modulation Test Result

Frequency (MHz)	Conducted Peak Output Power (dBm)		Limit (dBm)	Result
	Ant 1	Ant 2		
Low channel 2412MHz	14.0	15.4	30	Pass
Middle channel 2437MHz	14.8	15.6	30	Pass
High channel 2462MHz	15.2	16.0	30	Pass

802.11n20_MIMO modulation Test Result

Frequency (MHz)	Conducted Peak Output Power (dBm)			Limit (dBm)	Result
	Ant 1	Ant 2	SUM		
Low channel 2412MHz	14.0	15.0	17.3	30	Pass
Middle channel 2437MHz	14.9	15.8	18.2	30	Pass
High channel 2462MHz	15.2	15.7	18.6	30	Pass

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9.3 6dB bandwidth and 99% Occupied Bandwidth

Test Method for 6 dB Bandwidth

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.

Test Method for 99 % Bandwidth

1. Use the following spectrum analyzer settings:
RBW=1% to 5% of the actual occupied, VBW≥3RBW, Sweep = auto,
Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, 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

802.11b modulation Test Result

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (MHz)	Result
Low channel 2412MHz	8.160	11.868	0.5	Pass
Middle channel 2437MHz	8.160	11.948	0.5	Pass
High channel 2462MHz	9.120	11.908	0.5	Pass

802.11g modulation Test Result

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (MHz)	Result
Low channel 2412MHz	16.400	18.102	0.5	Pass
Middle channel 2437MHz	16.440	18.102	0.5	Pass
High channel 2462MHz	16.440	18.022	0.5	Pass

802.11n-HT20 modulation Test Result

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (MHz)	Result
Low channel 2412MHz	17.360	18.981	0.5	Pass
Middle channel 2437MHz	17.640	18.981	0.5	Pass
High channel 2462MHz	17.640	18.981	0.5	Pass

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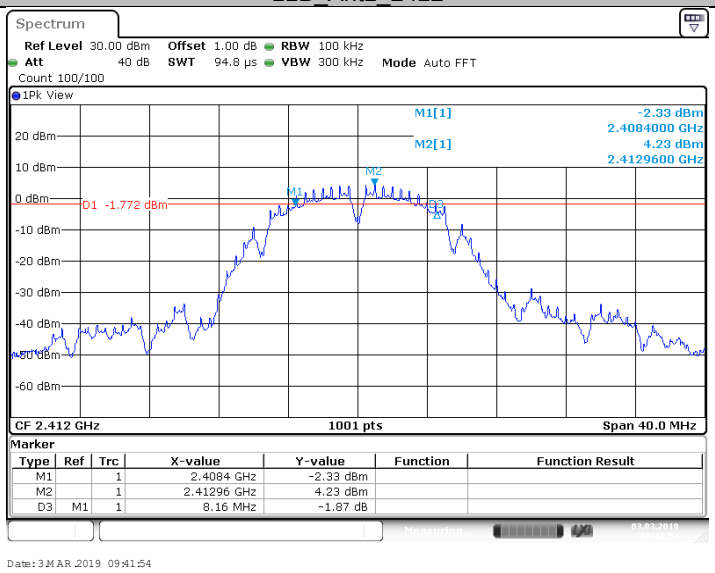
6 dB Bandwidth

11B_Ant1_2412



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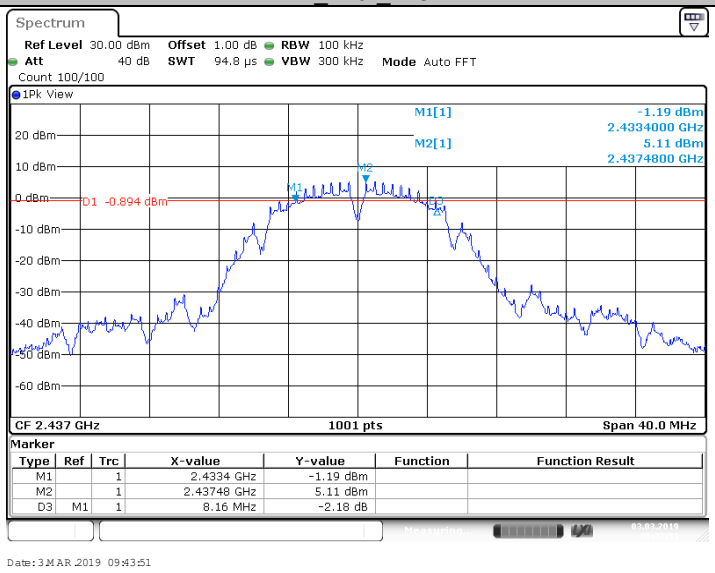

11B_Ant1_2462

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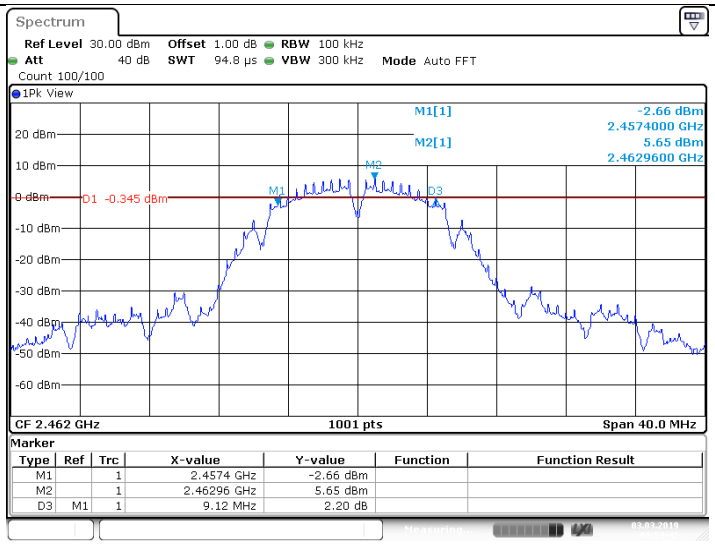

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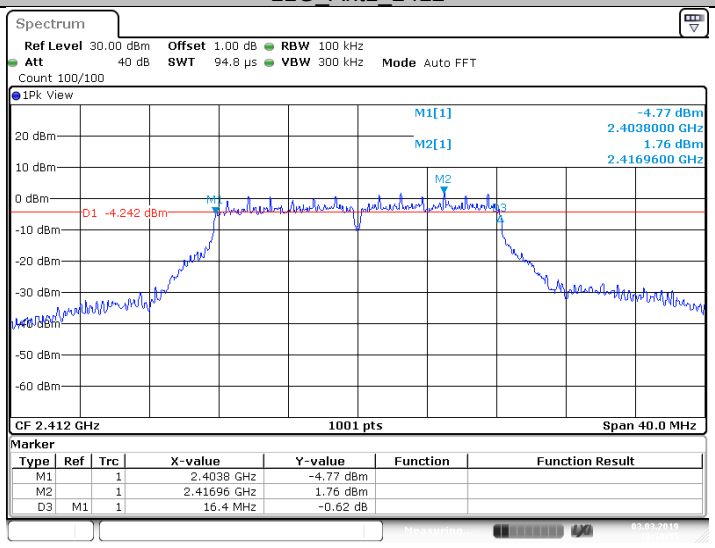

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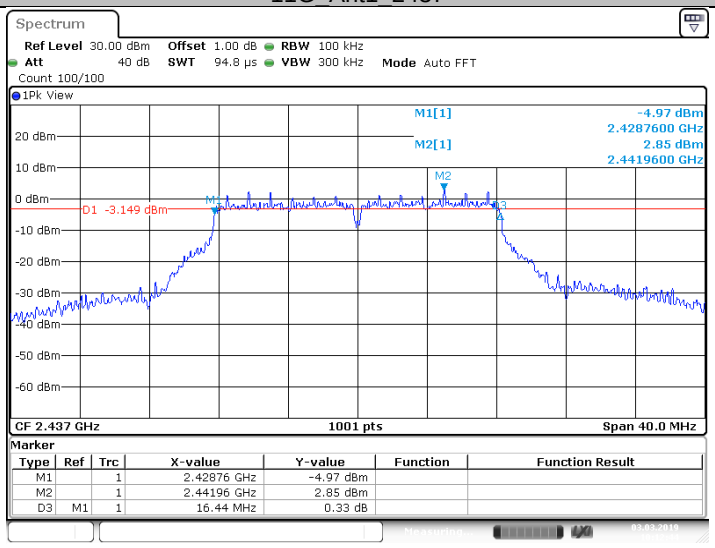

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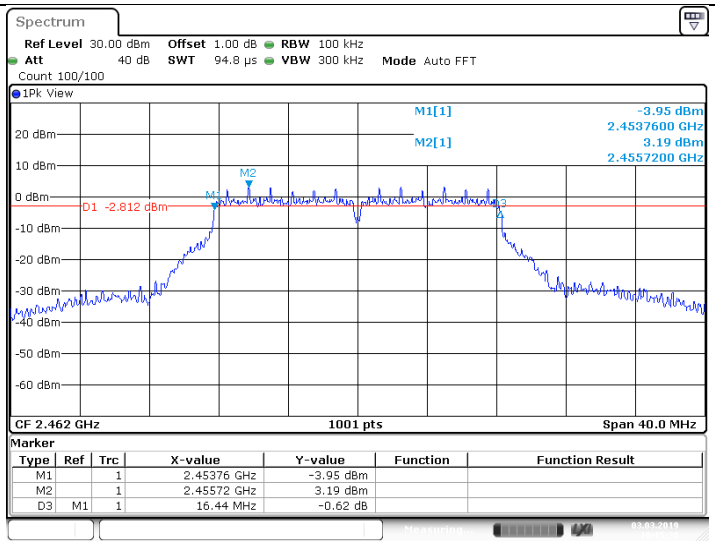

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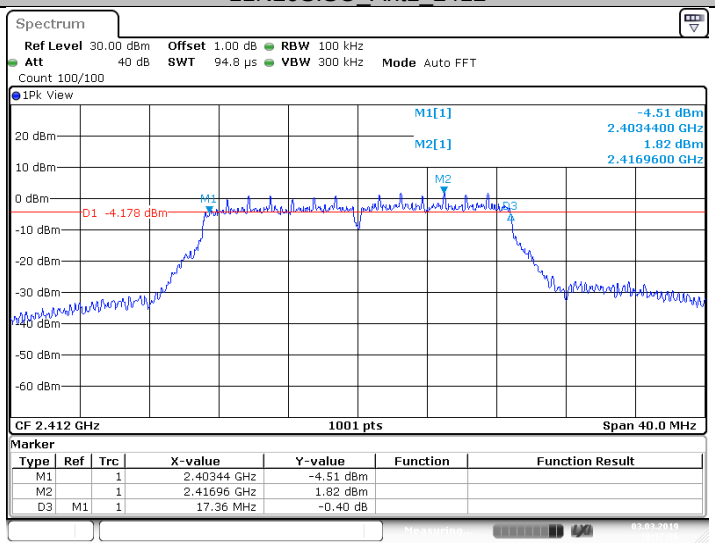

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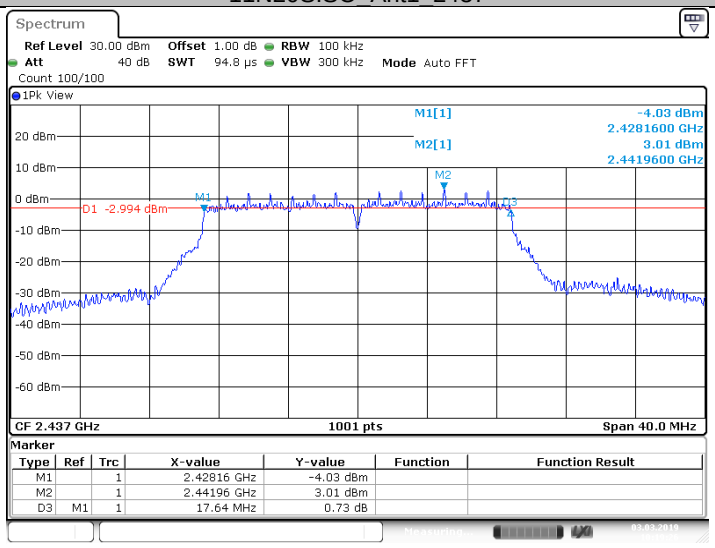

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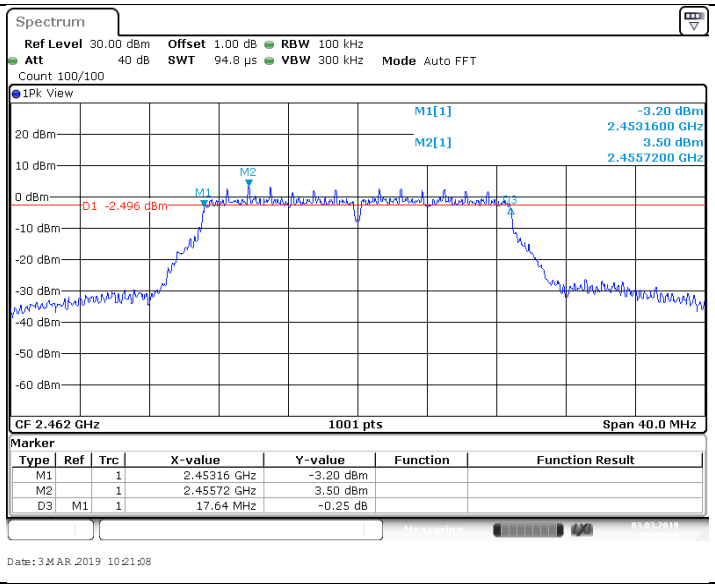

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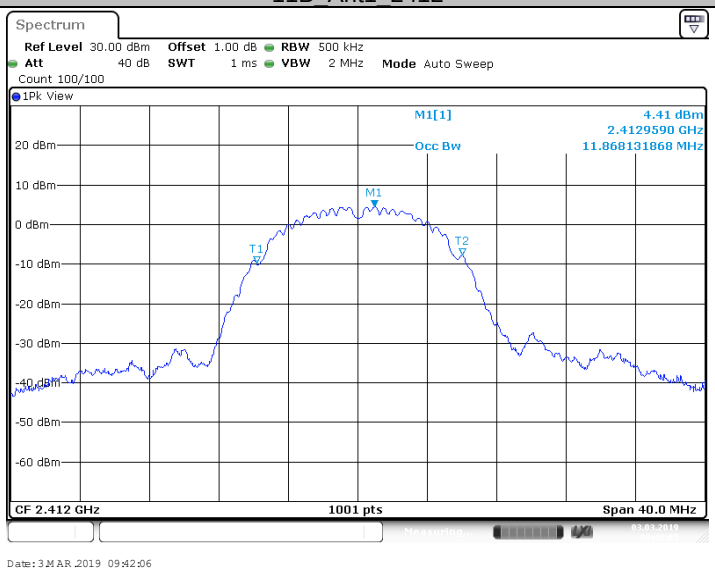
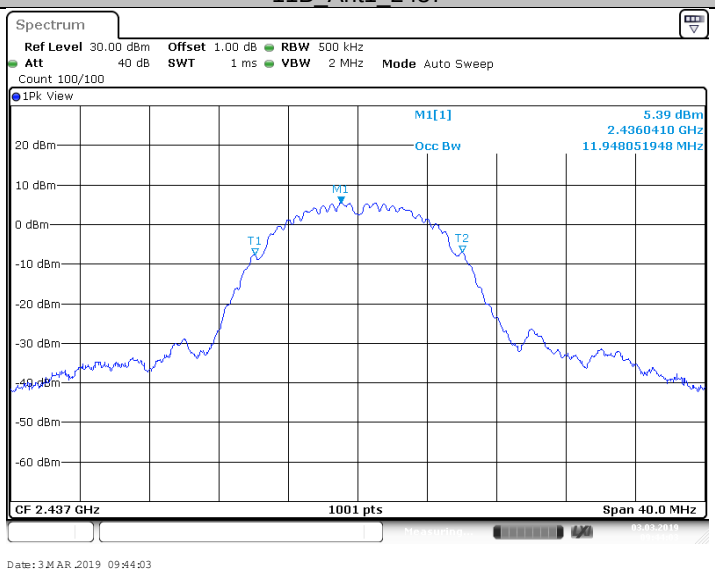
99% Bandwidth

11B_Ant1_2412



11B_Ant1_2437



11B_Ant1_2462

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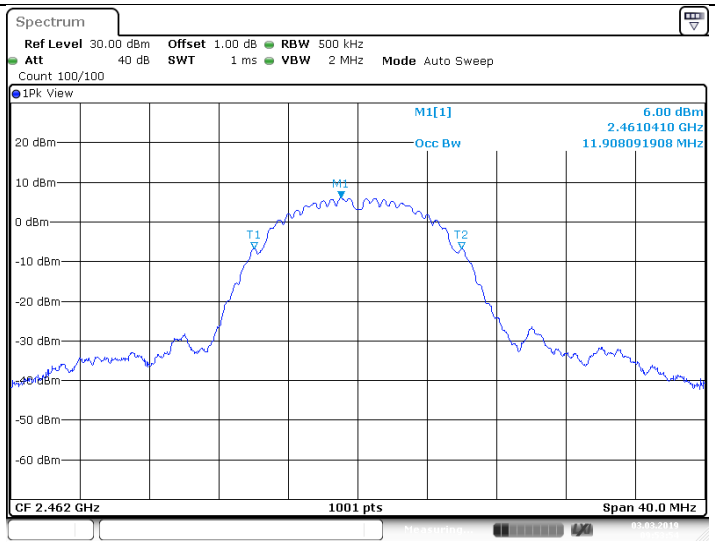
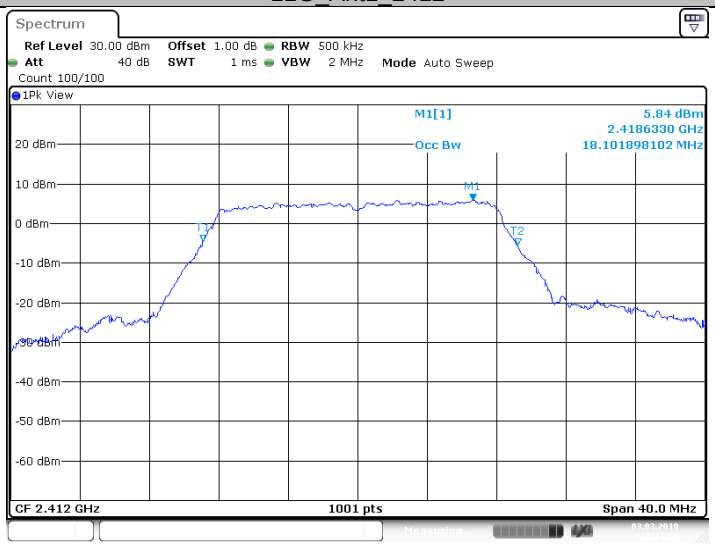
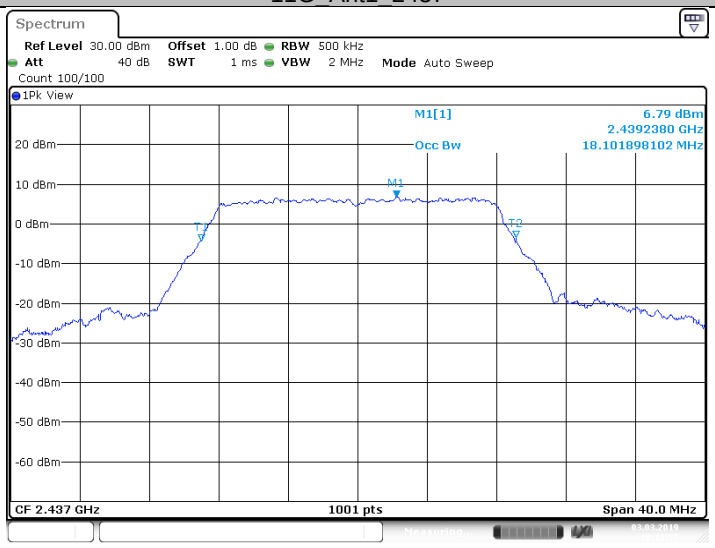


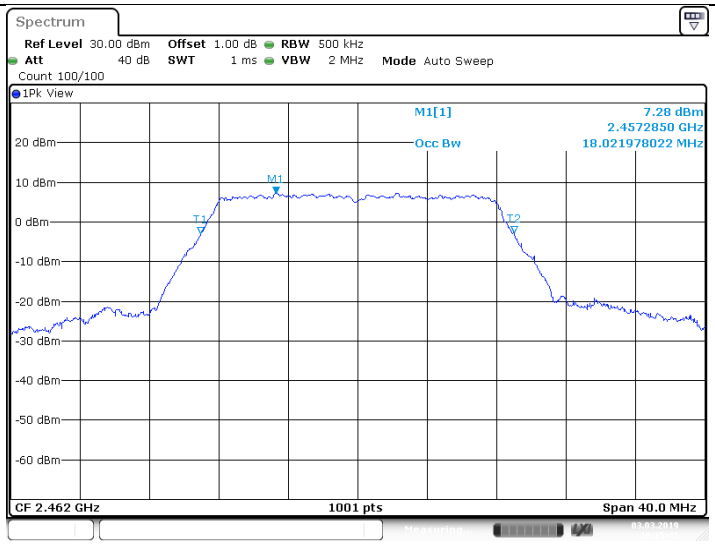
11G_Ant1_2412



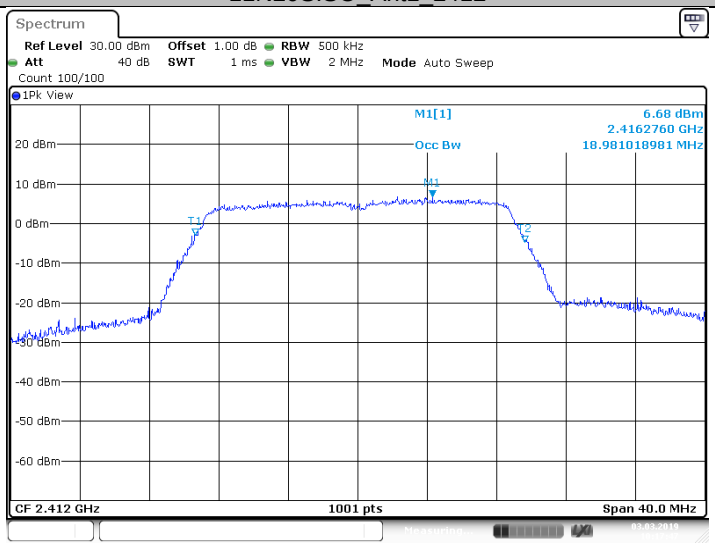
11G_Ant1_2437



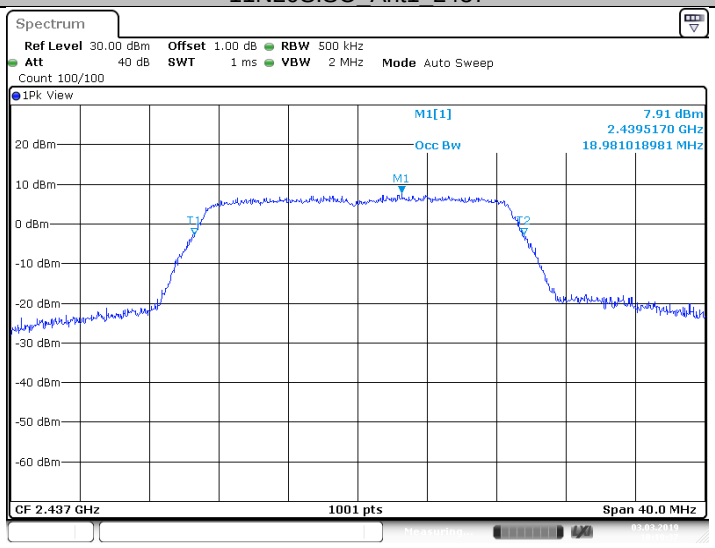
11G_Ant1_2462



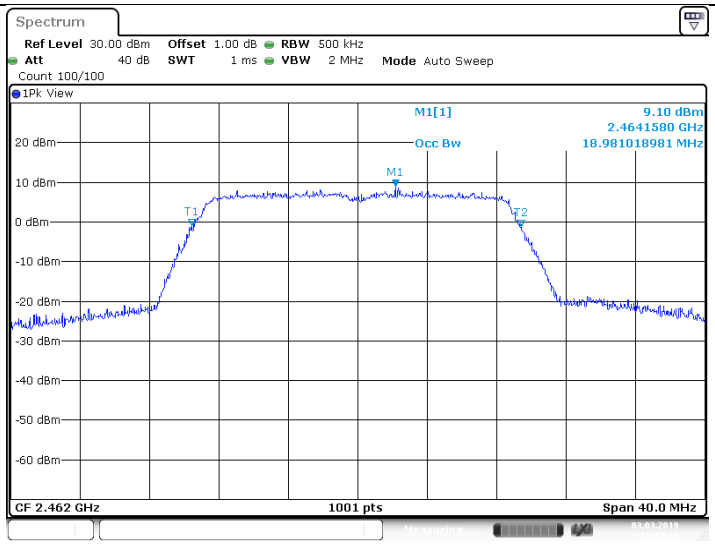
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



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9.4 Power spectral density

Test Method

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

1. The RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.
2. Set analyzer center frequency to DTS channel center frequency. RBW=10kHz, VBW=3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
3. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
4. Repeat above procedures until other frequencies measured were completed.

Limit

Limit [dBm]
≤8

802.11b_SISO modulation Test Result

Frequency (MHz)	Power spectral density (dBm)		Limit (dBm)	Result
	Ant 1	Ant 2		
Low channel 2412MHz	-10.26	-9.14	8	Pass
Middle channel 2437MHz	-8.53	-6.75	8	Pass
High channel 2462MHz	-8.79	-7.98	8	Pass

802.11g_SISO modulation Test Result

Frequency (MHz)	Power spectral density (dBm)		Limit (dBm)	Result
	Ant 1	Ant 2		
Low channel 2412MHz	-13.21	-11.28	8	Pass
Middle channel 2437MHz	-11.71	-10.96	8	Pass
High channel 2462MHz	-11.08	-10.59	8	Pass

802.11n-HT20_MIMO modulation Test Result

Frequency (MHz)	Power spectral density (dBm)	Limit (dBm)	Result
Low channel 2412MHz	-10.11	8	Pass
Middle channel 2437MHz	-7.9	8	Pass
High channel 2462MHz	-7.7	8	Pass

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9.5 Spurious RF conducted emissions

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
3. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
4. The level displayed must comply with the limit specified in this Section. Submit these plots.
5. Repeat above procedures until all frequencies measured were complete.

Limit

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

Note: we test Ant 1 and Ant 2 respectively for 802.11b/g mode and only the worst case recorded in this report.

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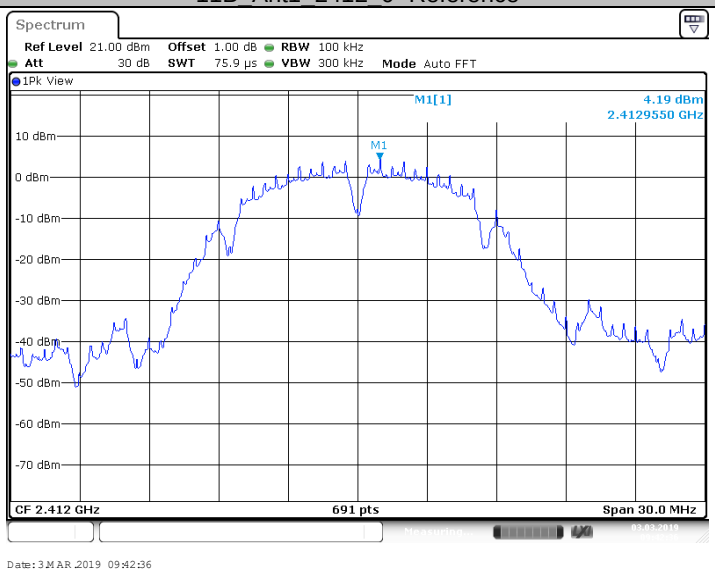
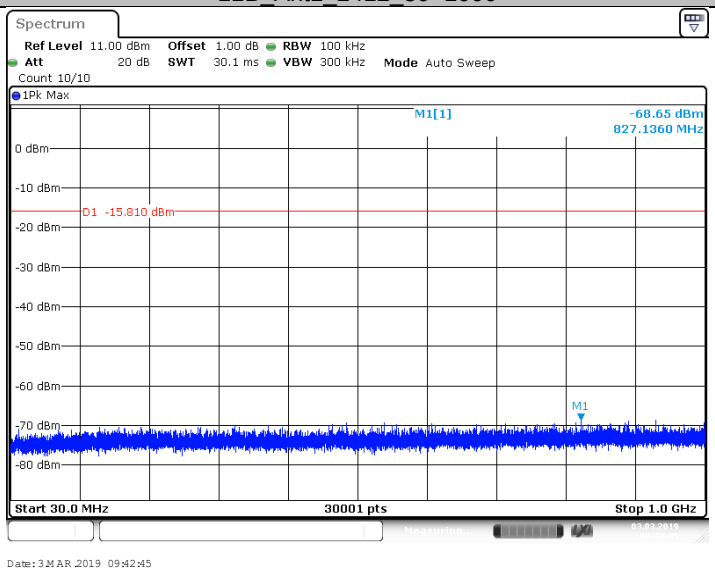
Spurious RF conducted emissions

11B_Ant1_2412_0~Reference



11B_Ant1_2412_30~1000



11B_Ant1_2412_1000~26500

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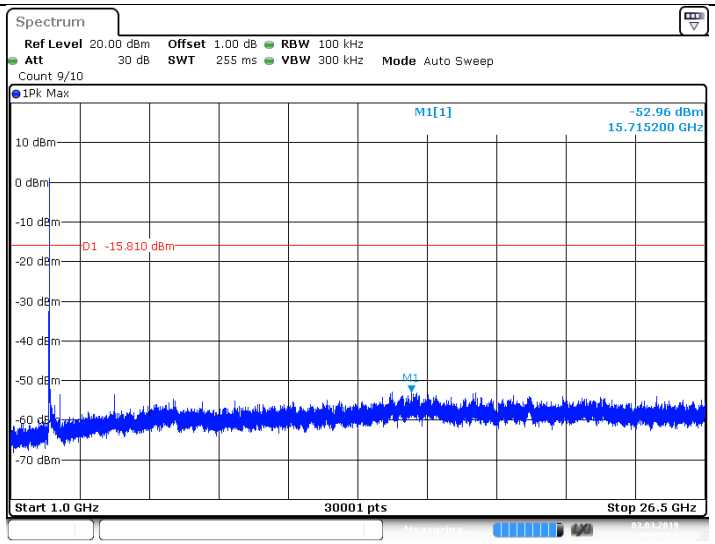
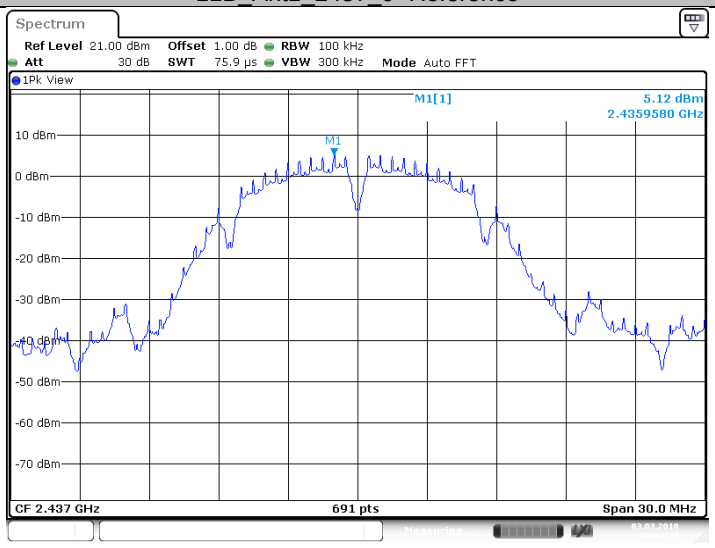
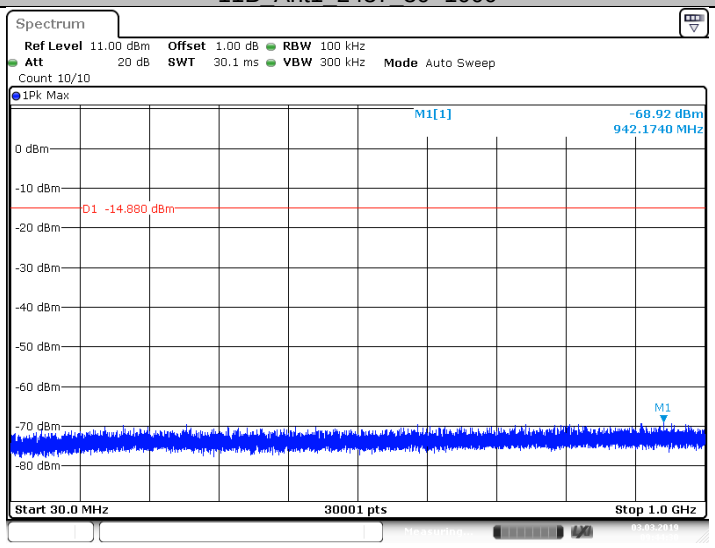


11B_Ant1_2437_0~Reference



11B_Ant1_2437_30~1000



11B_Ant1_2437_1000~26500

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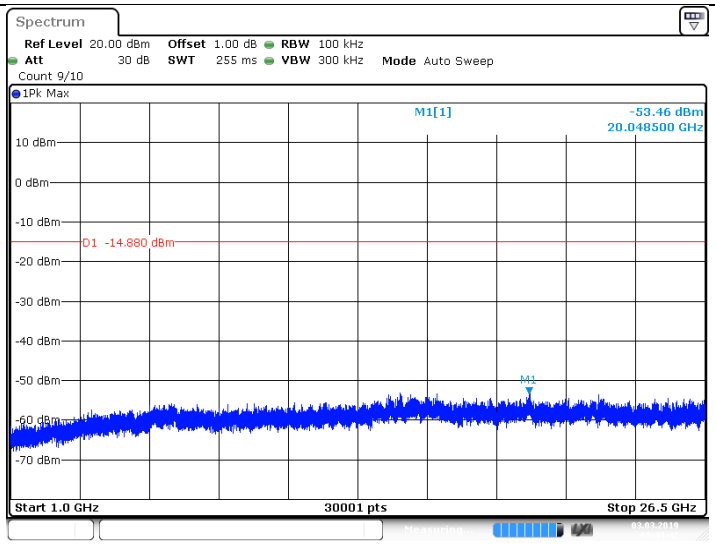
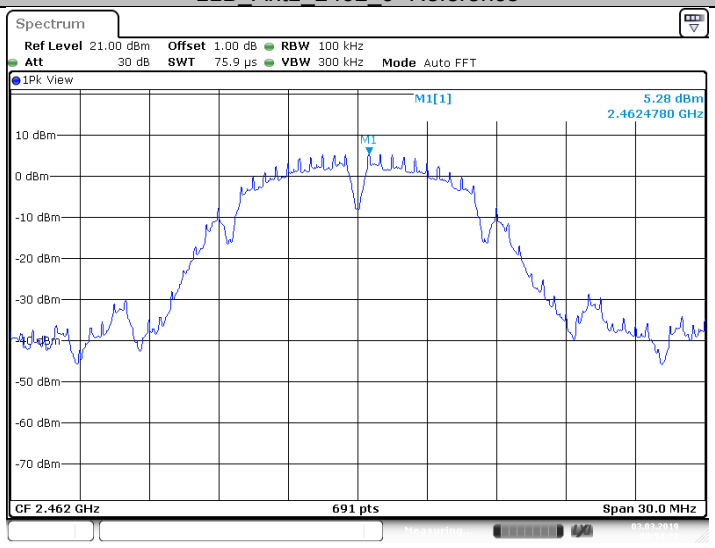
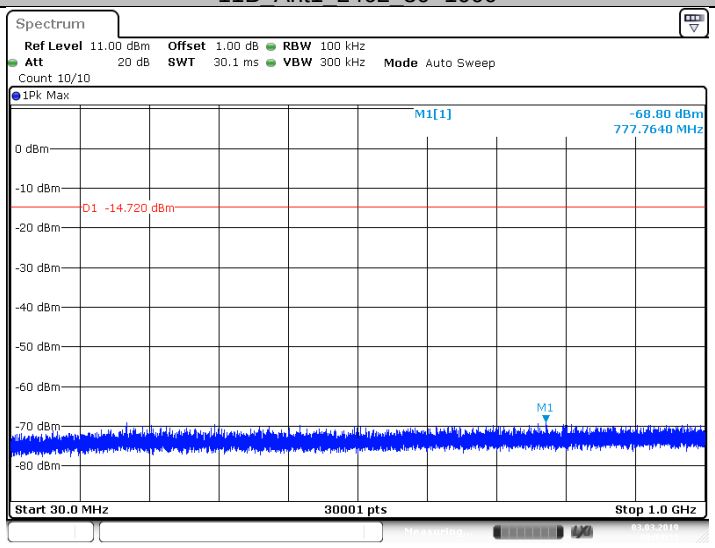


11B_Ant1_2462_0~Reference



11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500

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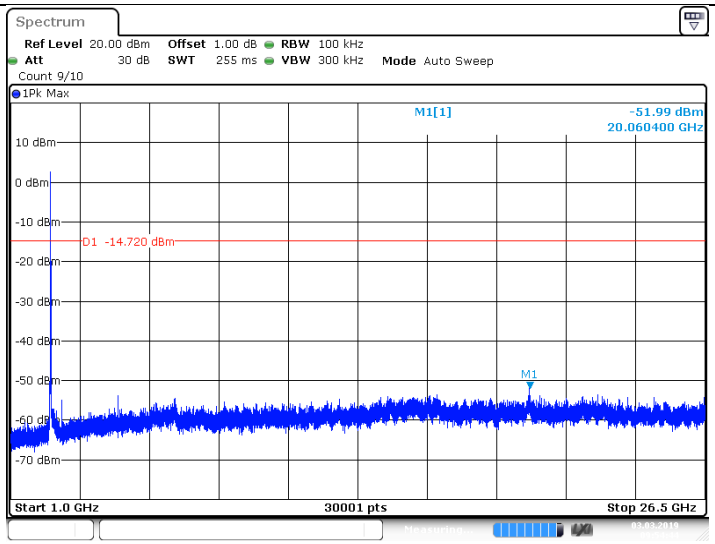
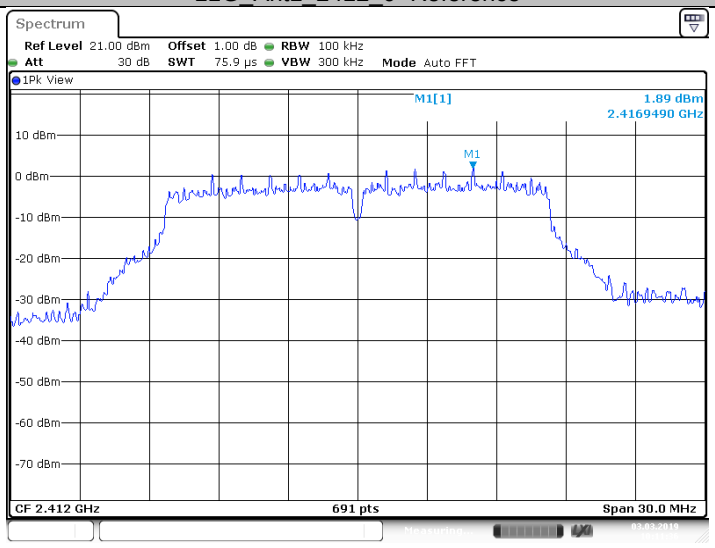
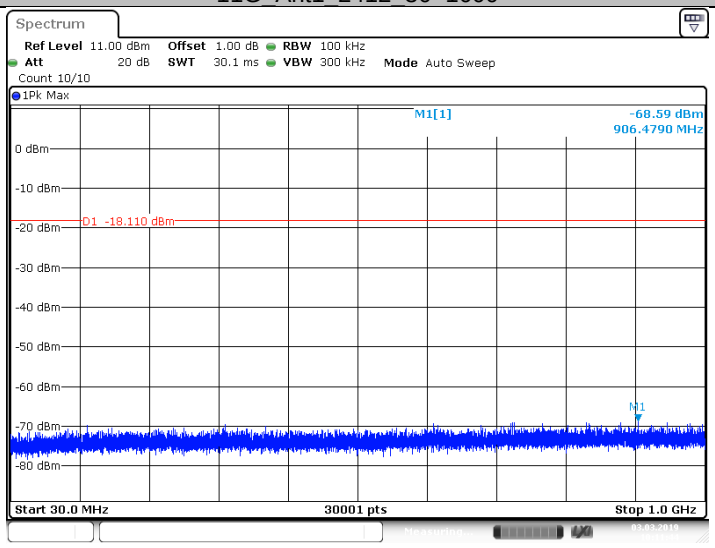


11G_Ant1_2412_0~Reference



11G_Ant1_2412_30~1000



11G_Ant1_2412_1000~26500

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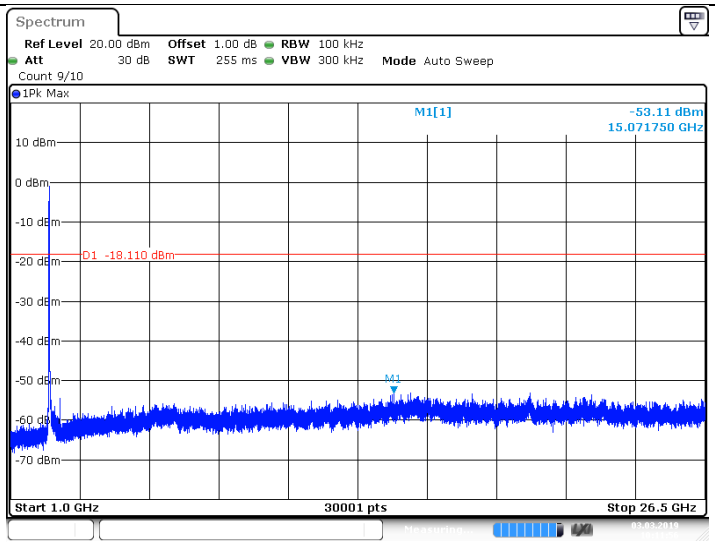
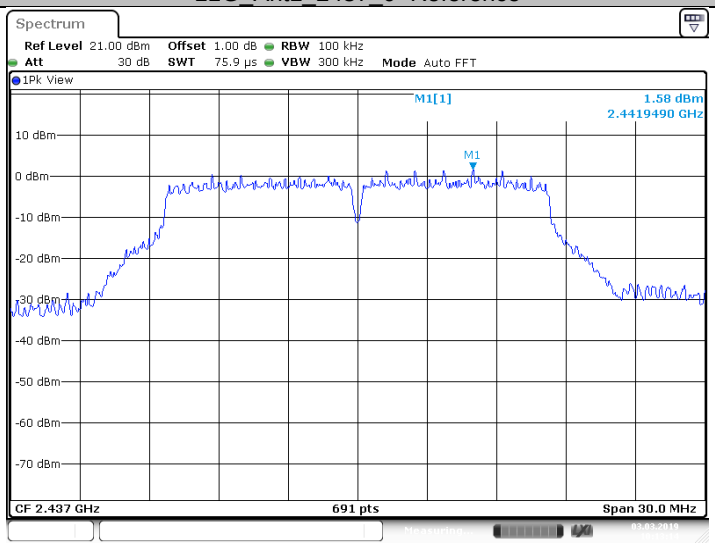
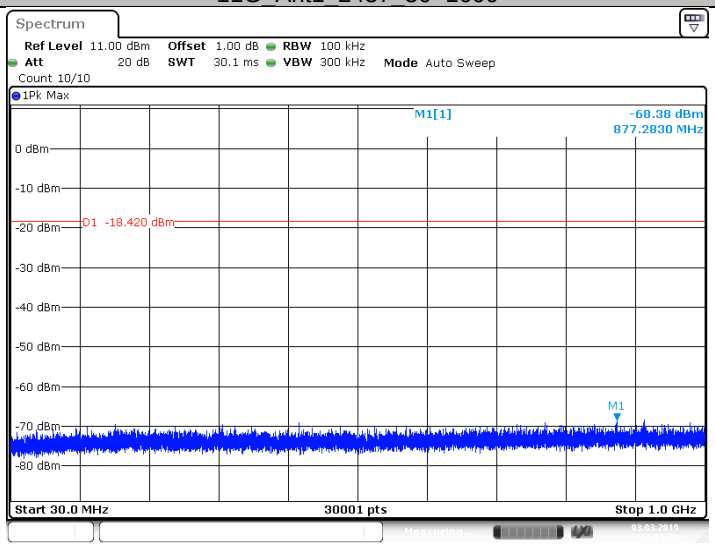


11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000



11G_Ant1_2437_1000~26500

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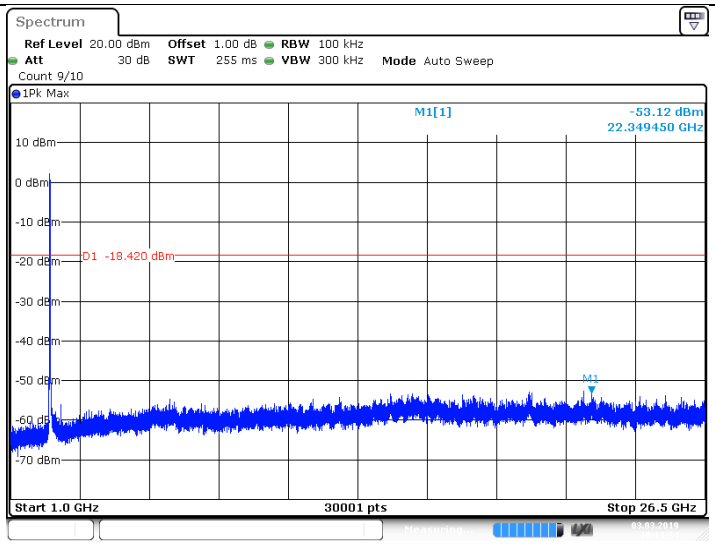
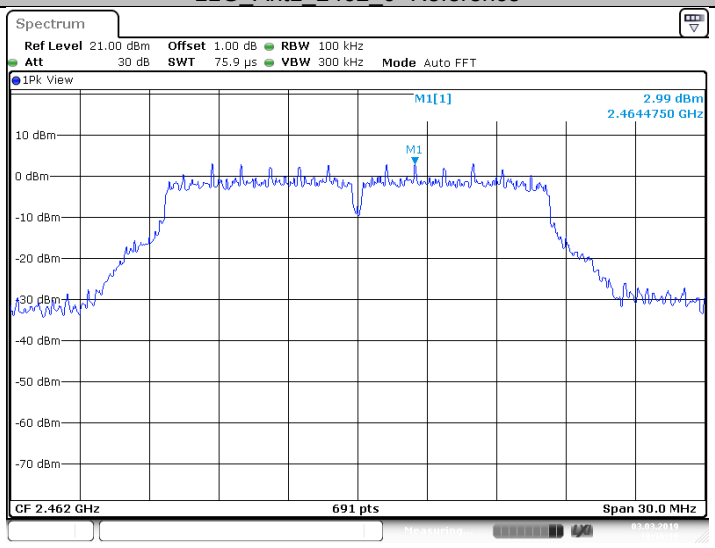
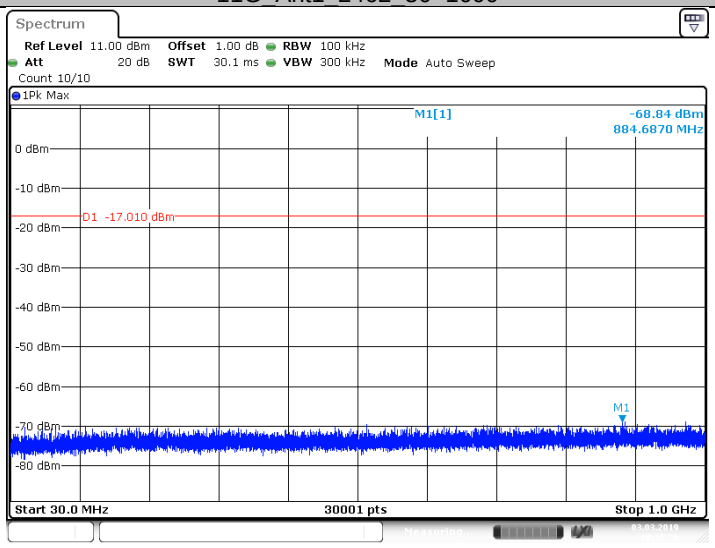


11G_Ant1_2462_0~Reference



11G_Ant1_2462_30~1000



11G_Ant1_2462_1000~26500

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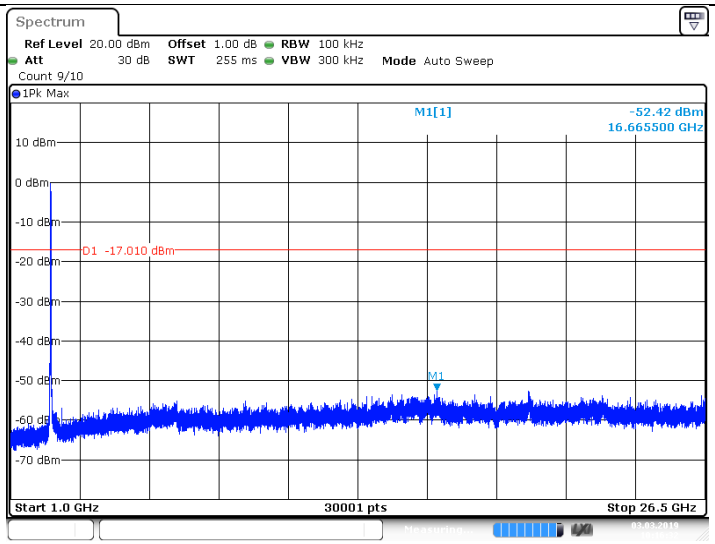
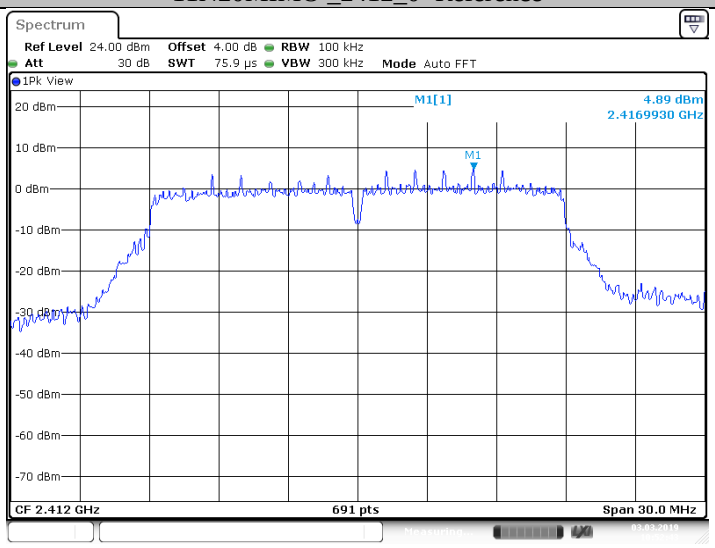
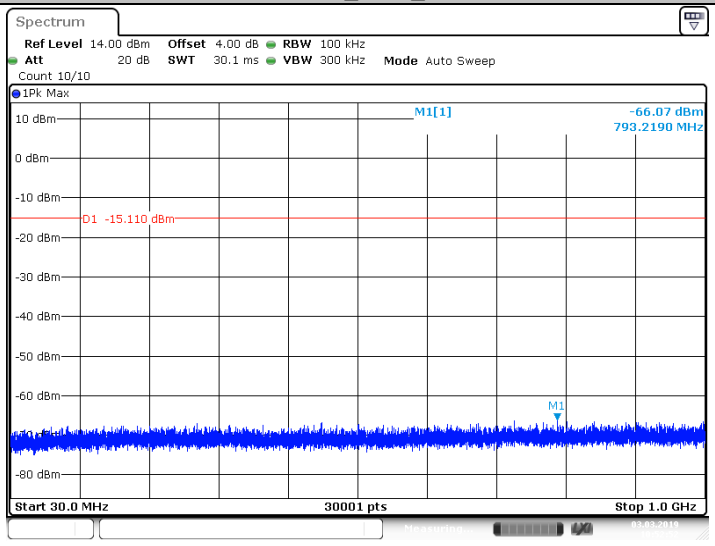


11N20MIMO _2412_0~Reference



11N20MIMO_2412_30~1000



11N20MIMO _2412_1000~26500

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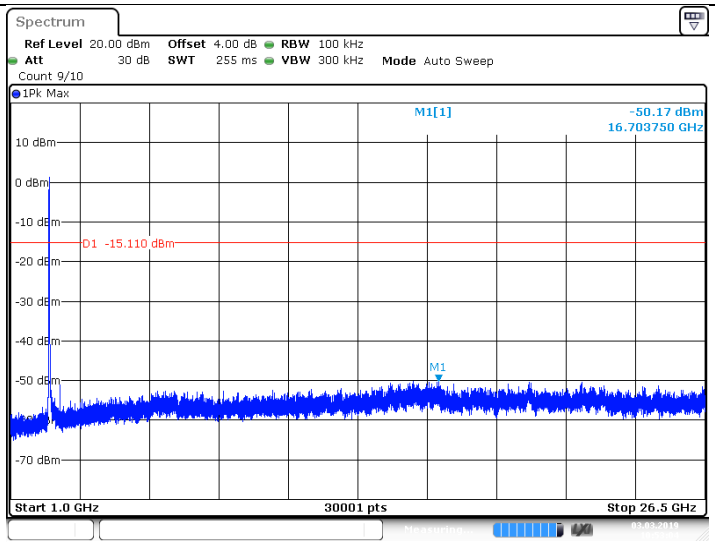
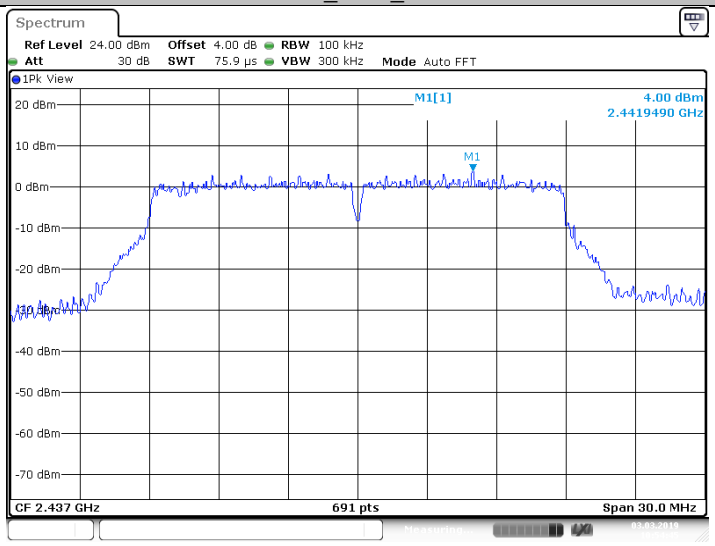
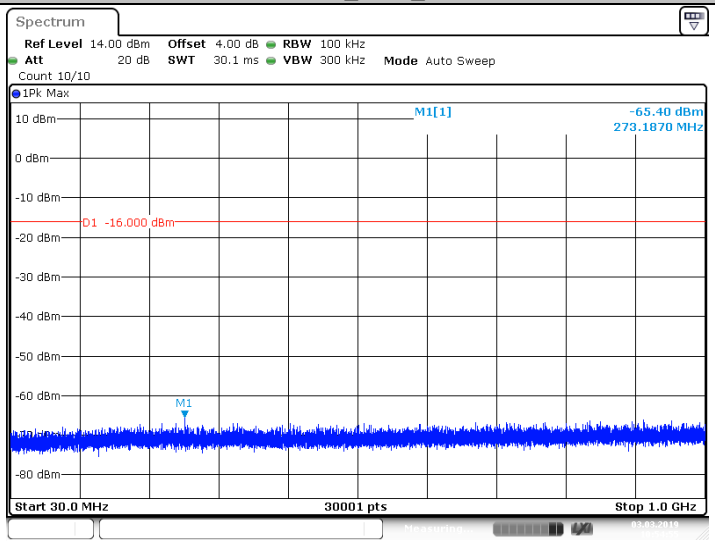


11N20MIMO_2437_0~Reference



11N20MIMO_2437_30~1000



11N20MIMO_2437_1000~26500

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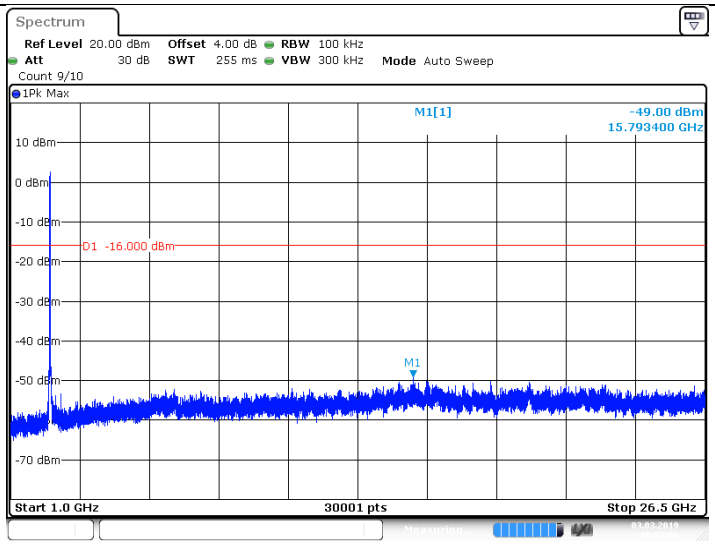

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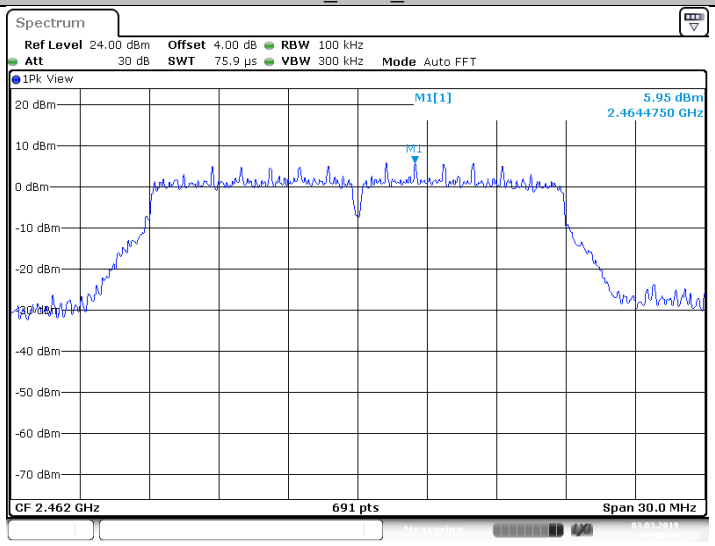
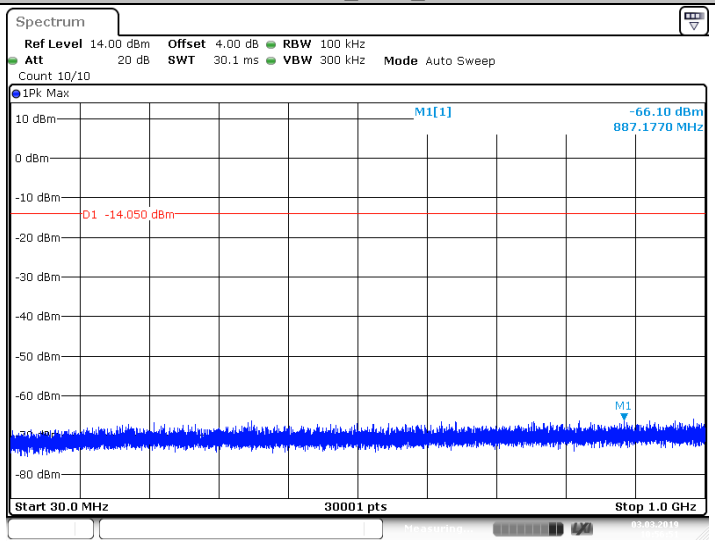


11N20MIMO_2462_30~1000



11N20MIMO_2462_1000~26500

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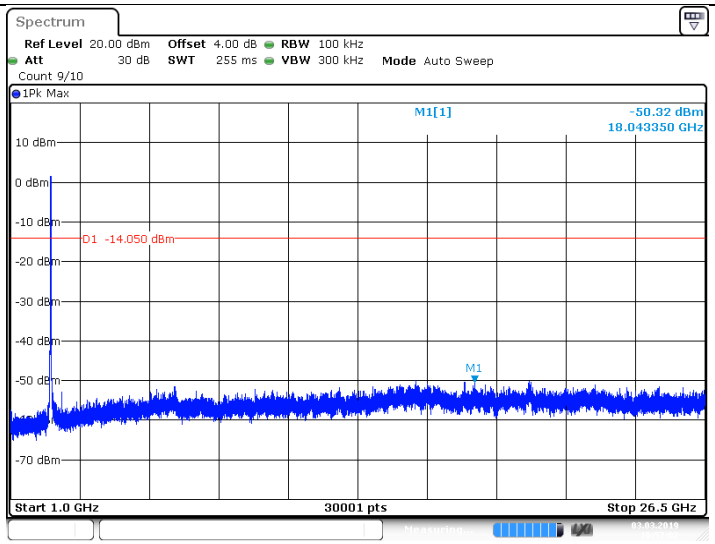

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9.6 Band edge testing

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. 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
3. Allow the trace to stabilize, use the peak and delta measurement to record the result.
4. The level displayed must comply with the limit specified in this Section. .
5. Repeat the test at the hopping off and hopping on mode, submit all the plots.

Limit:

According to §15.247(d) and RSS-247 5.5, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) and RSS-Gen 8.10, must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)) and RSS-Gen.

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

Note: we test Ant 1 and Ant 2 respectively for 802.11b/g mode and only the worst case recorded in this report.

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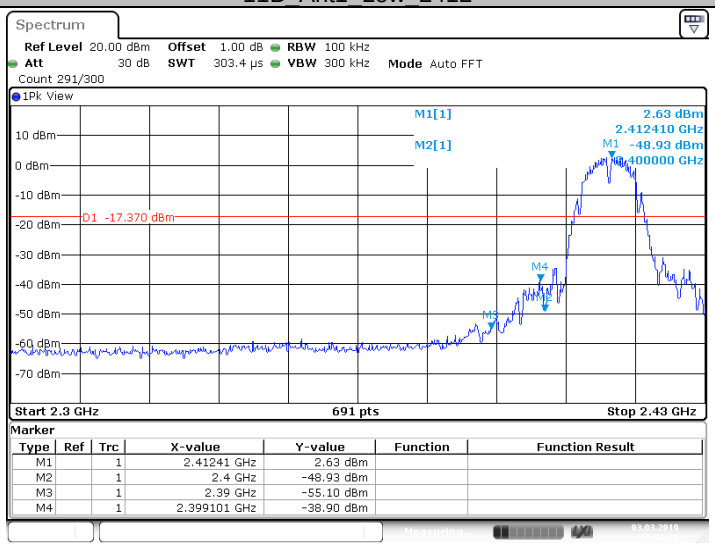
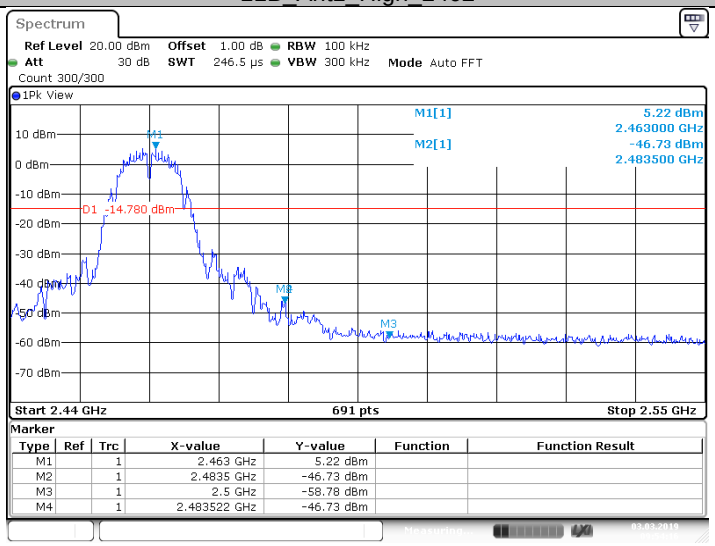
Band edge testing

11B_Ant1_Low_2412



11B_Ant1_High_2462



11G_Ant1_Low_2412

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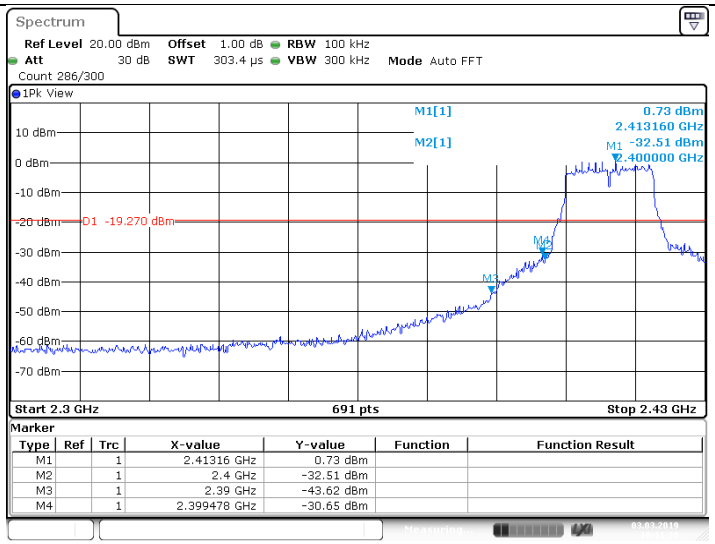
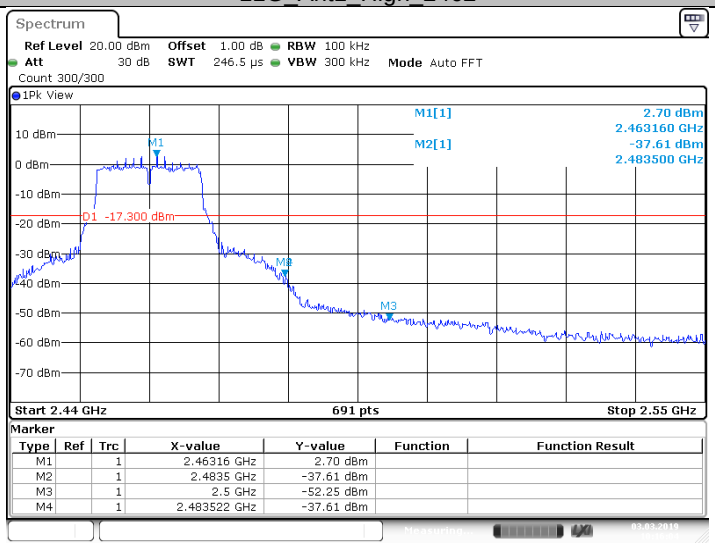
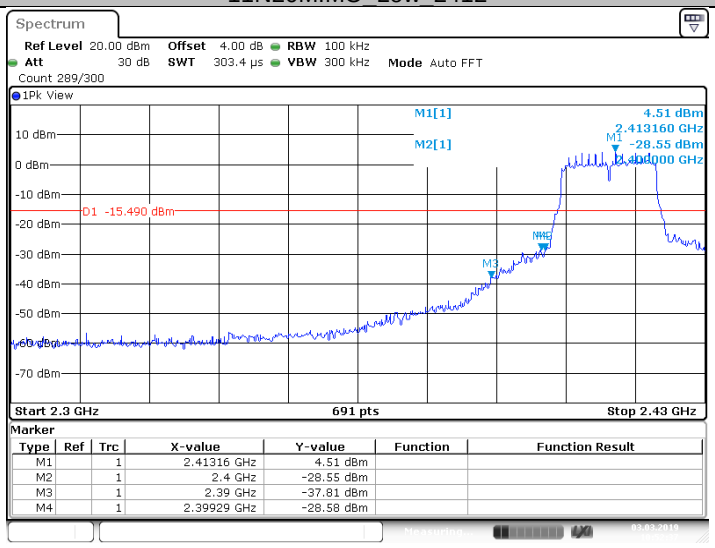


11G_Ant1_High_2462



11N20MIMO_Low_2412



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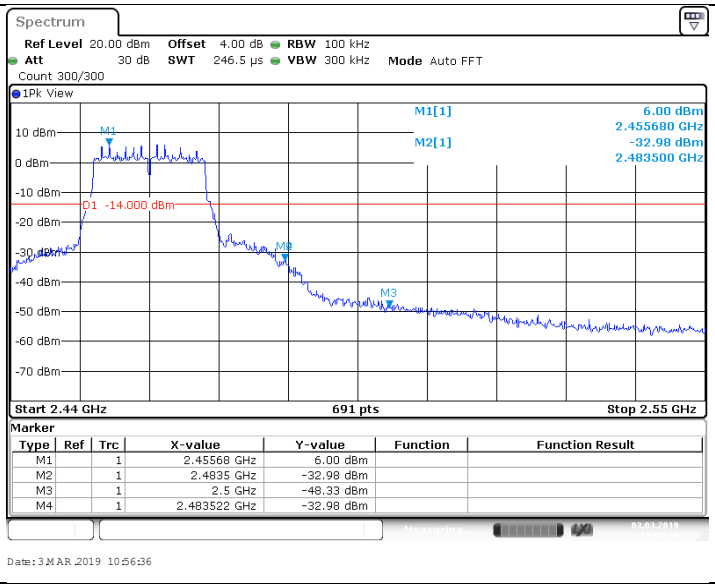

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9.7 Spurious radiated emissions for transmitter

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 3meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
4. 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.
5. 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
6. Use the following spectrum analyzer settings According to C63.10:
   For 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 and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.
   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, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.
7. Repeat above procedures until all frequencies measured were complete.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.

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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 and RSS-GEN 8.10, 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.

The only worse case (802.11B_2412MHz_Ant1 mode) test result is listed in the report.

Transmitting spurious emission test result as below:

802.11B Modulation 2412MHz Test Result

Frequency Band	Frequency	Emission Level	Read level	Polarization	Limit	Detector	Margin	Correct factor	Result
	MHz	dBuV/m	dBuV/m		dBμV/m		dBuV/m	(dB)	
30-1000MHz	335.77	39.60	64.70	H	46	QP	6.40	-25.1	Pass
	480.08	42.73	65.03	H	46	QP	3.27	-22.3	Pass
	528.04	43.64	64.94	H	46	QP	2.36	-21.3	Pass
	Other frequency	---	---	H	---	QP	---	---	Pass
	83.99	32.15	62.95	V	40	QP	7.85	-30.8	Pass
	111.48	31.51	59.41	V	43.5	QP	11.99	-27.9	Pass
	432.07	35.71	59.11	V	46	QP	10.29	-23.4	Pass
	Other frequency	---	---	V	---	QP	---	---	Pass
1000-25000MHz	1224.06	44.52	56.72	H	74	PK	29.48	-12.2	Pass
	2039.69	39.40	48.3	H	74	PK	34.60	-8.9	Pass
	*2856.13	41.88	46.28	H	74	PK	32.12	-4.4	Pass
	*4823.91	40.66	37.86	H	74	PK	33.34	2.8	Pass
	Other Frequency	---	---	H	74	---	---	---	Pass
	1224.06	42.60	54.8	V	74	PK	31.40	-12.2	Pass
	2039.88	39.28	48.18	V	74	PK	34.72	-8.9	Pass
	2412.50	39.88	45.78	V	74	PK	34.12	-5.9	Pass
	*4823.91	43.63	40.83	V	74	PK	30.37	2.8	Pass
	Other Frequency	---	---	V	74	---	---	---	Pass

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 20dB below the permissible limits or the field strength is too small to be measured.

(3) Corrected Amplitude = Read level + Corrector factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss

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10 Test Equipment List

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
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2019-7-6
Test software	Rohde & Schwarz	EMC32	Version9.15.00	N/A

Radiated Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2019-7-6
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2019-6-28
Horn Antenna	Rohde & Schwarz	HF907	102294	2019-6-28
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2019-7-6
Signal Generator	Rohde & Schwarz	SMY01	839369/005	2019-7-6
Attenuator	Agilent	8491A	MY39264334	2019-7-6
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

TS8997 Test System

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2019-7-6
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2019-7-6
Power Splitter	Weinschel	1580	SC319	2019-7-5
Test software	Tonscend	System for BT/WIFI	Version 2.6	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	
Test Items	Extended Uncertainty
Uncertainty for Conducted Emission 150kHz-30MHz (for test using AMN ENV432 or ENV4200)	3.21dB
Uncertainty for Radiated Spurious Emission 25MHz-3000MHz	Horizontal: 4.91dB; Vertical: 4.89dB;
Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.80dB; Vertical: 4.79dB;
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%

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