TEST REPORT

Report Reference No......:	**HK2512116489-6ER**
Compiled by (position+printed name+signature)..:	Testing engineer Len Liao
Supervised by (position+printed name+signature)..:	Technique principal Sliver Wan
Approved by (position+printed name+signature)..:	Manager Jason Zhou
Date of issue.....:	2026/03/25
Representative Laboratory Name.....:	Shenzhen HUAK Testing Technology Co., Ltd.
Address.....:	1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Applicant's name.....:	EDA Technology Shanghai Co.,Ltd
Address.....:	Building 29, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC
Test specification ..... **:**	
Standard .....:	**ETSI EN 300 440 V2.2.1 (2018-07)**
TRF Originator.....:	Shenzhen HUAK Testing Technology Co., Ltd.
Master TRF.....:	Dated 2018-12

Product Name ..... :	ED-HMI3010
Trade Mark .....:	EDATEC
Product Model.....:	ED-HMI3010-215CA
Series Model .....:	ED-HMI3010-116C, ED-HMI3010-116CA, ED-HMI3010-133C, ED-HMI3010-133CA, ED-HMI3010-156C, ED-HMI3010-156CA, ED-HMI3010-185C, ED-HMI3010-185CA, ED-HMI3010-215C
Hardware version.....:	V2.0
Software version .....:	V1.0
Operation Frequency.....:	From 5745MHz-5825MHz
Ratings.....:	DC 12V From Adapter
Result.....:	**PASS**

TEST REPORT

Test Report No. :	HK2512116489-6ER	2026/03/25 Date of issue

Product Name	:	ED-HMI3010
Product Model	:	ED-HMI3010-215CA
Series Model	:	ED-HMI3010-116C, ED-HMI3010-116CA, ED-HMI3010-133C, ED-HMI3010-133CA, ED-HMI3010-156C, ED-HMI3010-156CA, ED-HMI3010-185C, ED-HMI3010-185CA, ED-HMI3010-215C
Applicant	:	EDA Technology Shanghai Co.,Ltd
Address	:	Building 29, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC
Manufacturer	:	EDA Technology Shanghai Co.,Ltd
Address	:	Building 29, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC

Test Result:	**PASS**

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

** Issued history **

Revision	Description	Issued Date	Remark
Revision 1.0	Initial Test Report Release	2026/03/25	Jason Zhou

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

ETSI EN 300 440 V2.2.1 (2018-07) : Short Range Devices (SRD);Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	2025/12/11
Testing commenced on	:	2025/12/11
Testing concluded on	:	2026/03/25

2.2. Product Description

Product Name	ED-HMI3010
Product Model	ED-HMI3010-215CA
Series Model	ED-HMI3010-116C, ED-HMI3010-116CA, ED-HMI3010-133C, ED-HMI3010-133CA, ED-HMI3010-156C, ED-HMI3010-156CA, ED-HMI3010-185C, ED-HMI3010-185CA, ED-HMI3010-215C
Difference descrption	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: ED-HMI3010-215CA.
Power supply:	DC 12V From Adapter
Adapter information:	Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 12V/4.0A, 48.0W Model: KSA-50W-120400D5
Antenna Type	External Antenna
Antenna Gain	1dBi
WLAN	Supported 802.11a/802.11n HT20/802.11n HT40/802.11ac HT20/802.11ac HT40/802.11ac HT80
Operation frequency	IEEE 802.11a/ IEEE 802.11n HT20/802.11ac HT20:5745MHz-5825MHz IEEE 802.11n HT40/ IEEE 802.11ac HT40:5755-5795MHz IEEE 802.11ac HT80:5775MHz
Modulation Type	IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac HT20: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac HT40: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac HT80: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Receiver category	Receiver category 2
Remark: The products are identical in interior structure, electrical circuits and components, just model names are different.	
Note:Antenna gain Refer to the antenna specifications. The cable loss data is obtained from the supplier. The test results in the report only apply to the tested sample.	

2.3. Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	○	120V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 12V From Adapter

Description of the test mode

Channel	Frequency (MHz)
149	5745
151	5755
153	5765
155	5775
157	5785
159	5795
161	5805
165	5825

2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

○	/	M/N:	/
		Manufacturer:	/

2.5. Test summary

ETSI EN 300 440 Requirements		
Equivalent isotropic radiated power(Radiated)	ETSI EN 300 440 Sub-clause 4.2.2	Pass
Permitted range of operating frequencies	ETSI EN 300 440 Sub-clause 4.2.3	Pass
Spurious emissions	ETSI EN 300 440 Sub-clause 4.2.4	Pass
Duty cycle	ETSI EN 300 440 Sub-clause 4.2.5	N/A
Additional requirements for FHSS equipment	ETSI EN 300 440 Sub-clause 4.2.6	N/A Note 1
Adjacent channel selectivity	ETSI EN 300 440 Sub-clause 4.3.3	Pass
Blocking or desensitization	ETSI EN 300 440 Sub-clause 4.3.4	Pass
Receiver Spurious emissions	ETSI EN 300 440 Sub-clause 4.3.5	Pass
Spectrum access techniques	ETSI EN 300 440 Sub-clause 4.4	Pass Note 2

Note 1: Which only applicable to FHSS system device.
Note 2: The manufacturer declares compliance with Section 4.4(Spectrum access techniques)

2.6. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Information of the Test Laboratory

Shenzhen HUAK Testing Technology Co., Ltd.
1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature: 25 °C
High Temperature: 40 °C
Low Temperature: -10 °C
Normal Voltage: DC 12V
High Voltage: DC 13.2V
Low Voltage: DC 10.8V
Relative Humidity: 55 %
Air Pressure: 989 hPa

3.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen HUAK Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen HUAK Testing Technology Co., Ltd is reported:

Test Items	Measurement Uncertainty	Notes
Conducted spurious emission	1.60 dB	(1)
Radiated spurious emission	2.20 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.4. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Type No.	Serial No.	Calibration Date	Cal. Due
1	Spectrum analyzer	Agilent	N9020A	HKE-025	2026.02.06	2027.02.05
2	Receiver	R&S	ESR-7	HKE -010	2026.02.06	2027.02.05
3	Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	2026.02.06	2028.02.05
4	Spectrum analyzer	R&S	FSV3044	HKE-126	2026.02.06	2027.02.05
5	Horn antenna	Schwarzbeck	9120D	HKE-013	2026.02.06	2028.02.05
6	Preamplifier	Schwarzbeck	EMC051845SE	HKE-006	2026.02.06	2027.02.05
7	Preamplifier	Agilent	83051A	HKE-016	2026.02.04	2027.02.03
8	Wireless Communication Test Set	R&S	CMW500	HKE-027	2026.02.06	2027.02.05
9	Signal generator	Agilent	N5182A	HKE-029	2026.02.04	2027.02.03
10	High pass filter unit	Tonscend	JS0806-F	HKE-055	2026.02.06	2027.02.05
11	RF automatic control unit	Tonscend	JS0806-2	HKE-060	2026.02.06	2027.02.05
12	Signal generator	KEYSIGHT	N5182B	HKE-124	2026.02.04	2027.02.03
13	Power meter	KEYSIGHT	E4419B	HKE-144	2026.02.06	2027.02.05
14	RF test software	Tonscend	V3.5.39	HKE-083	/	/
15	RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE -184	/	/

4. TEST CONDITIONS AND RESULTS

4.1. 6dB Bandwidth

Limit

N/A

Test Procedure

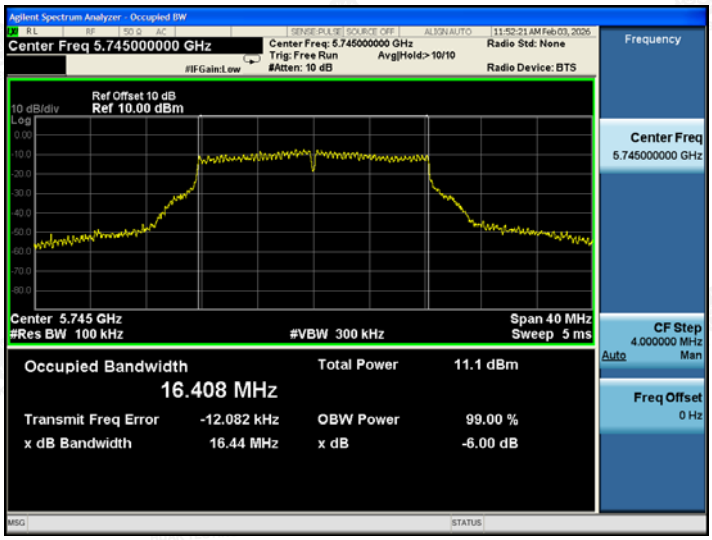
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

Test Configuration

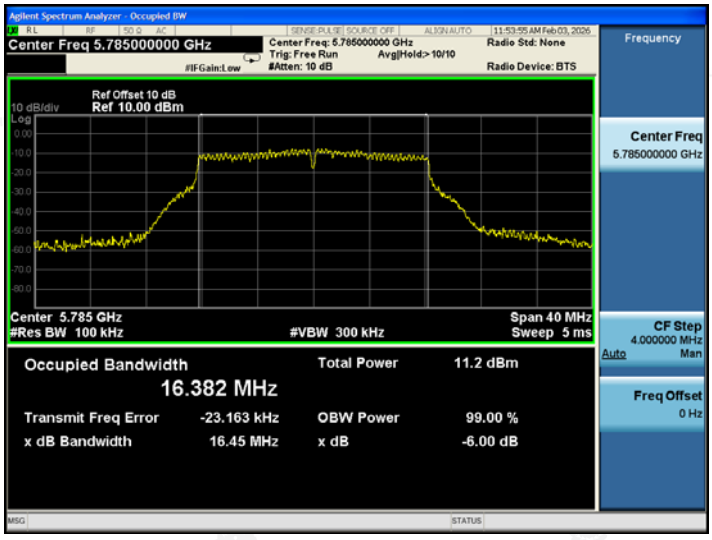
Test Results

Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11a	149	16.408	N/A	N/A
	157	16.382		
	165	16.392		
802.11 n HT 20	149	17.637	N/A	N/A
	157	17.625		
	165	17.645		
802.11 n HT 40	151	36.156	N/A	N/A
	159	36.149		
802.11 ac HT 20	149	17.601	N/A	N/A
	157	17.605		
	165	17.632		
802.11 ac HT 40	151	36.116	N/A	N/A
	159	36.165		
802.11 ac HT 80	155	75.420	N/A	N/A

802.11a-5745



802.11a-5785



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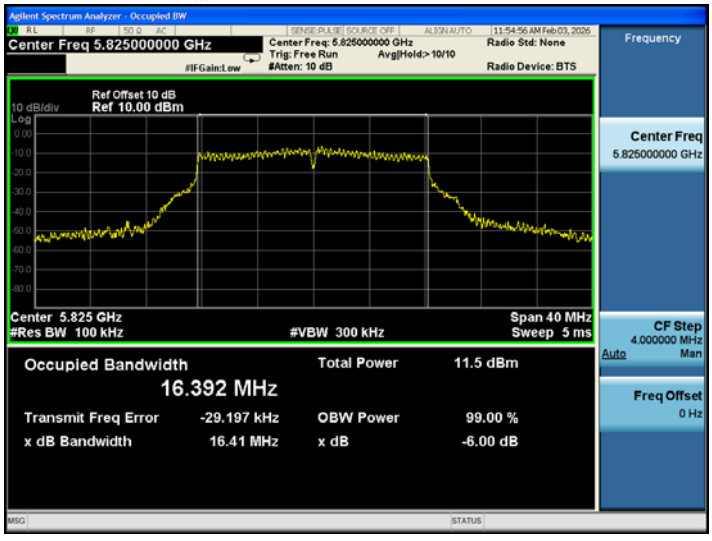
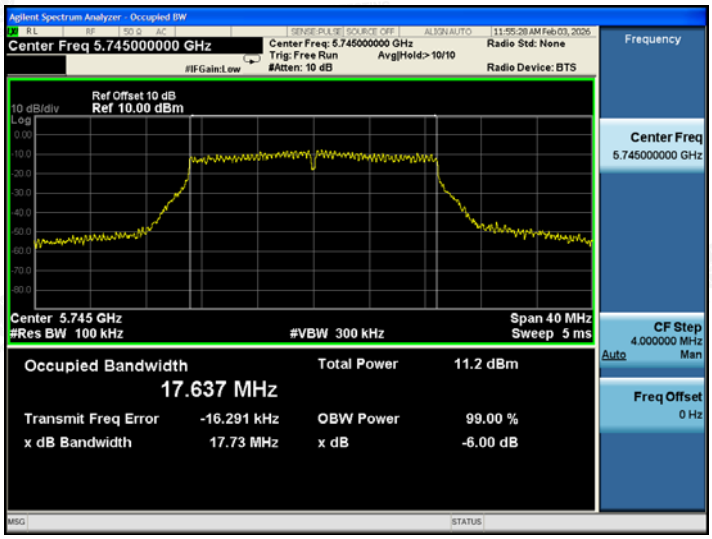


802.11n HT20-5745



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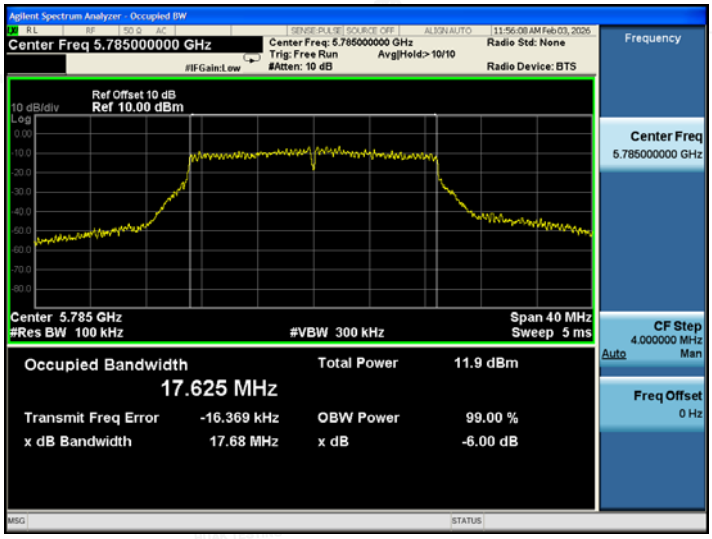

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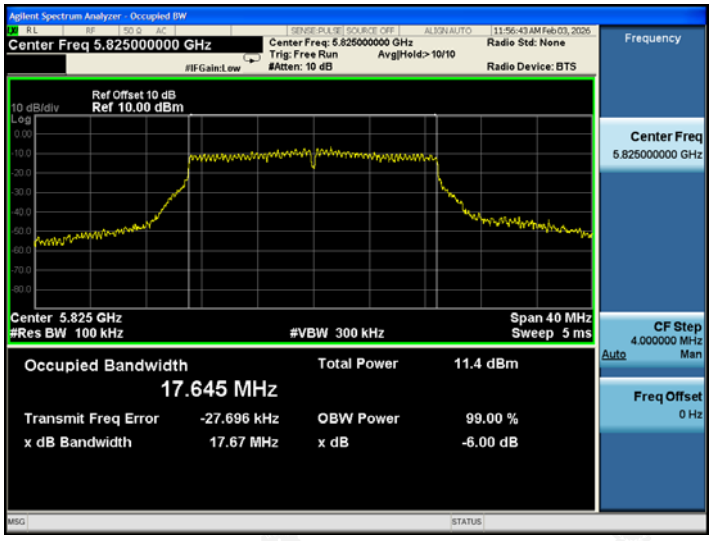

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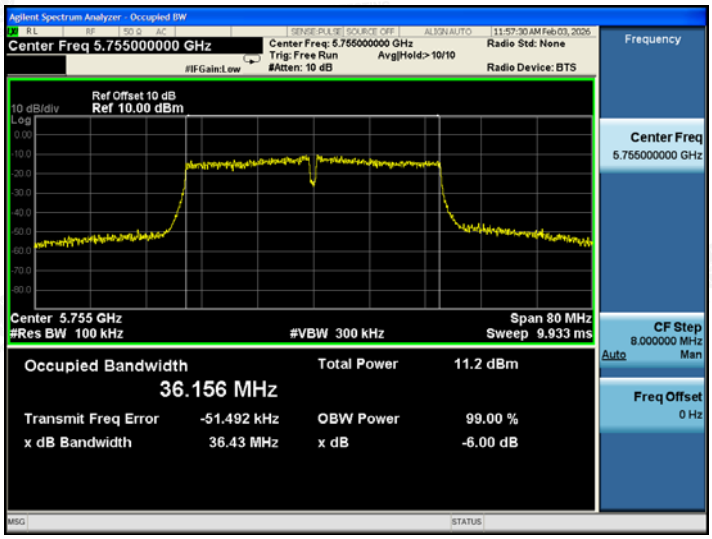

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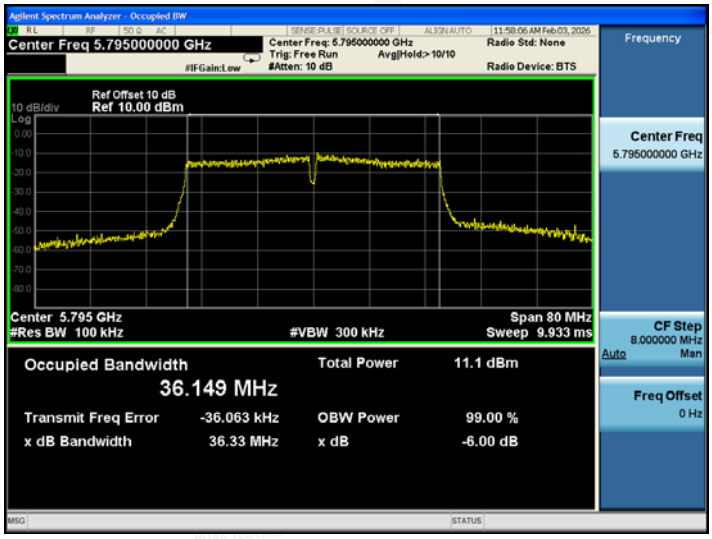
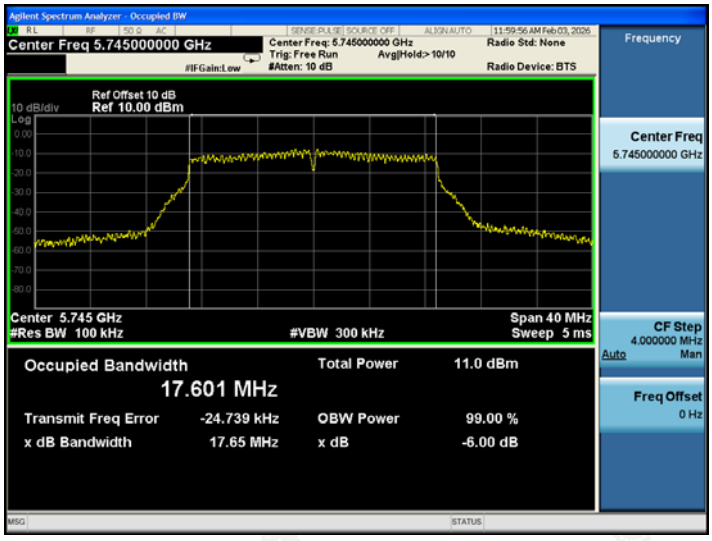


802.11ac HT20-5745



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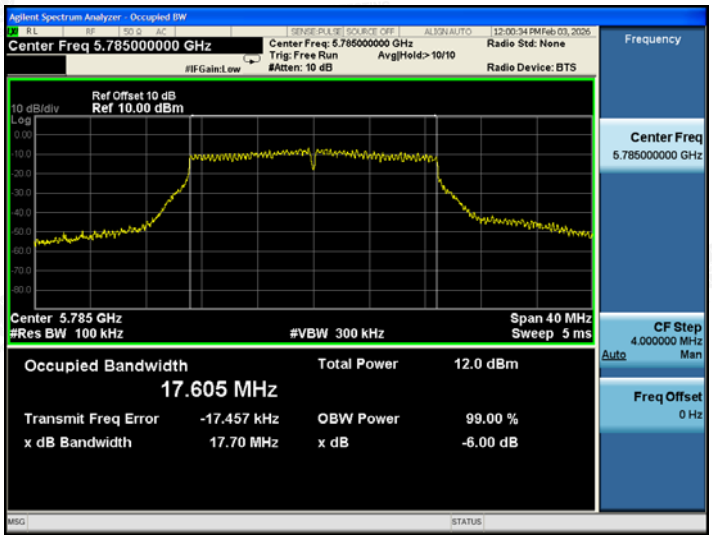

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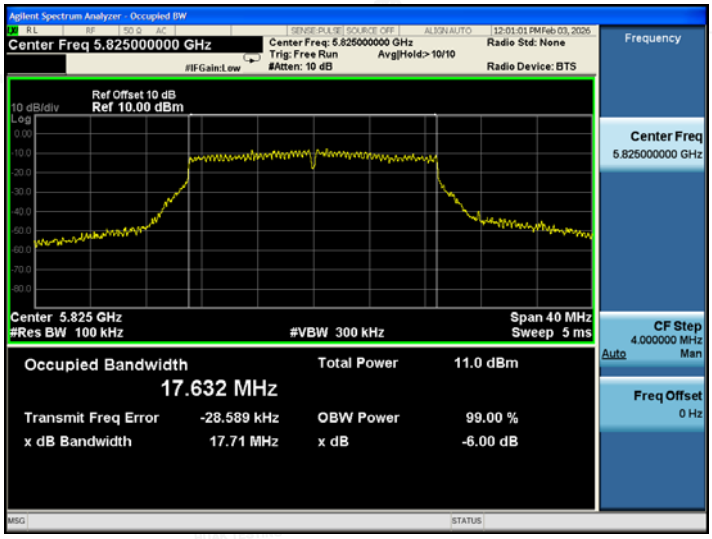

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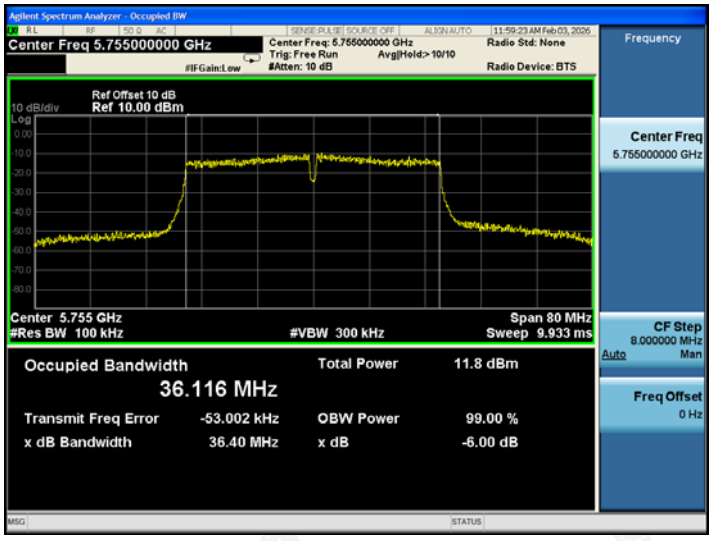

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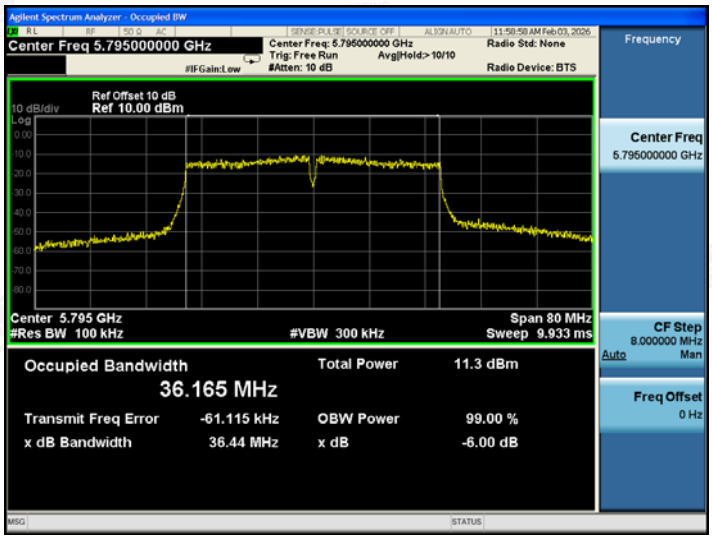
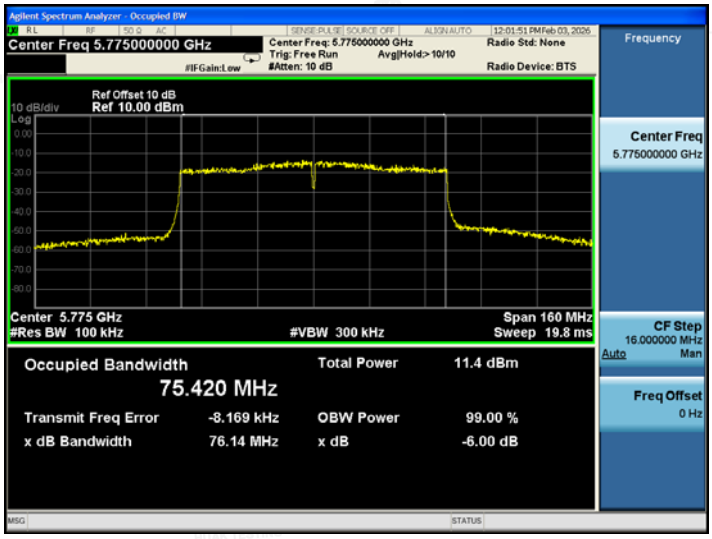


802.11ac HT80-5775



4.2. Equivalent Isotropically Radiated Power (e.i.r.p)

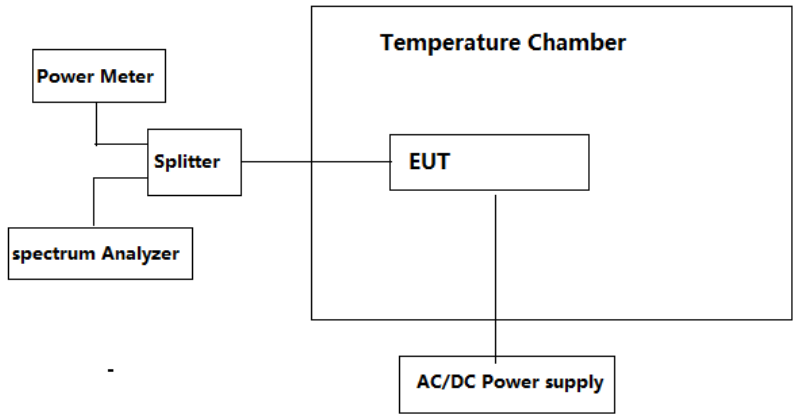
LIMIT

The transmitter maximum e.i.r.p. under normal and extreme test conditions is provided in table 2.

Table 2: Maximum radiated power (e.i.r.p.)

Entry	Frequency Bands	Power	Application	Notes
1	2 400 MHz to 2 483,5 MHz	10 mW e.i.r.p.	Non-specific short range devices	
2	2 400 MHz to 2 483,5 MHz	25 mW e.i.r.p.	Radiodetermination devices	
3	(a) 2 446 MHz to 2 454 MHz	500 mW e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and Annex G
4	(b) 2 446 MHz to 2 454 MHz	4 W e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and Annex G
5	5 725 MHz to 5 875 MHz	25 mW e.i.r.p.	Non-specific short range devices	
6	9 200 MHz to 9 500 MHz	25 mW e.i.r.p.	Radiodetermination devices	
7	9 500 MHz to 9 975 MHz	25 mW e.i.r.p.	Radiodetermination devices	
8	10,5 GHz to 10,6 GHz	500 mW e.i.r.p.	Radiodetermination devices	
9	13,4 GHz to 14,0 GHz	25 mW e.i.r.p.	Radiodetermination devices	
10	17,1 GHz to 17,3 GHz	400 mW e.i.r.p.	Radiodetermination devices	See Annex H
11	24,00 GHz to 24,25 GHz	100 mW e.i.r.p.	Non-specific short range devices and radiodetermination devices	
NOTE: The spectrum ranges in some entries are not harmonised throughout all EU territory, specifically entries 4, 9, and 11 have been identified as such. Implementers are cautioned to refer to CEPT/ERC Recommendation 70-03 [i.2] as well as current National Radio plans to verify acceptance within intended regions of use.				

TEST CONFIGURATION



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TEST PROCEDURE

Non spread spectrum transmitters with a -6 dB bandwidth of up to 20 MHz and spread spectrum transmitters with channel bandwidth of up to 1 MHz

The measurement shall be performed preferably in the absence of modulation.
When it is not possible to measure it in the absence of modulation, this fact shall be stated in test reports.
The transmitter shall be set in continuous transmission mode. If this is not possible, the measurements shall be carried out in a period shorter than the duration of the transmitted burst. It may be necessary to extend the duration of the burst.

The transmitter shall be connected to an artificial antenna (see clause 5.8.2) and the power delivered to this artificial antenna shall be measured.
The equivalent isotropically radiated power is then calculated from the measured value, the known antenna gain, relative to an isotropic antenna, and if applicable, any losses due to cables and connectors in the measurement system.

Equipment measured as non-constant envelope modulation equipment

The measurement shall be performed with test signals D-M2 or D-M3 as appropriate.
The transmitter shall be preferably set in continuous transmission mode. If this is not possible, the measurement can be performed in discontinuous mode.
The transmitter shall be connected to an artificial antenna (see clause 5.8.2) and the power delivered to this artificial antenna shall be measured. The measuring instrument shall have a measurement bandwidth not less than sixteen times the channel bandwidth.
The equivalent isotropically radiated power is then calculated from the measured value, the known antenna gain, relative to an isotropic antenna, and if applicable, any losses due to cables and connectors in the measurement system.

Transmitters other than those defined

This method of measurement shall be used for:
a) equipment with a -6 dB bandwidth greater than 20 MHz, and equipment with a duty cycle below 50 %; or for
b) spread spectrum equipment with a channel bandwidth above 1 MHz.
The equivalent isotropically radiated power shall be determined and recorded.
In case of radiated measurements on smart antenna systems using symmetrical power distribution across the available transmit chains, the EUT should, where possible, be configured so that only one transmit chain (antenna) is activated while the other transmit chains are disabled. Where this is not possible, the method used shall be documented in the test report. If only one transmit chain was tested, the result for the active transmit chain shall be corrected to be valid for the whole system (all transmit chains).
NOTE: The power (in mW) for one transmit chain needs to be multiplied with the number of transmit chains to obtain the total power for the system.
The measurement shall be performed using normal operation of the equipment with the test modulation applied (see clause 5.8.1).
The test procedure shall be as follows:
Step 1:
• using a suitable means, the output of the transmitter shall be coupled to a matched diode detector;
• the output of the diode detector shall be connected to the vertical channel of an oscilloscope;
• the combination of the diode detector and the oscilloscope shall be capable of faithfully reproducing the envelope peaks and the duty cycle of the transmitter output signal;
• the observed duty cycle of the transmitter (Tx on/(Tx on + Tx off)) shall be noted as x, ($0 < x < 1$) and recorded.
Step 2:
• the average output power of the transmitter shall be determined using a wideband, calibrated RF power meter with a matched thermocouple detector or an equivalent thereof and, where applicable, with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be recorded as "A" (in dBm);
• the e.i.r.p. shall be calculated from the above measured power output A, the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:
- $P = A + G + 10 \log (1/x)$;
- P shall not exceed the value specified in clause 4.2.2.4.
The measurement shall be repeated at the lowest, the middle, and the highest frequency of the stated frequency range.
These frequencies shall be recorded. FHSS equipment shall be made to hop continuously to each of these three frequencies separately.

TEST RESULTS

802.11a							
Test conditions		**Channel/ Frequency**	**Measured power (dBm)**	**Antenna Gain (dBi)**	**e.i.r.p (dBm)**	**Limit (dBm)**	**Result**
Temperature (℃)	**Voltage (V)**						
+25℃	12.0V	149/5745	11.33	1.0	12.33	13.98	PASS
-10℃	13.2V		11.14	1.0	12.14		
	10.8V		10.62	1.0	11.62		
+40℃	13.2V		11.30	1.0	12.30		
	10.8V		10.05	1.0	11.05		
+25℃	12.0V	157/5785	11.66	1.0	12.66		
-10℃	13.2V		9.92	1.0	10.92		
	10.8V		10.13	1.0	11.13		
+40℃	13.2V		10.57	1.0	11.57		
	10.8V		10.90	1.0	11.90		
+25℃	12.0V	165/5825	11.12	1.0	12.12		
-10℃	13.2V		9.70	1.0	10.70		
	10.8V		11.19	1.0	12.19		
+40℃	13.2V		10.05	1.0	11.05		
	10.8V		10.59	1.0	11.59		

802.11n HT 20							
Test conditions		**Channel/ Frequency**	**Measured power (dBm)**	**Antenna Gain (dBi)**	**e.i.r.p (dBm)**	**Limit (dBm)**	**Result**
Temperature (℃)	**Voltage (V)**						
+25℃	12.0V	149/5745	11.41	1.0	12.41	13.98	PASS
-10℃	13.2V		10.65	1.0	11.65		
	10.8V		9.43	1.0	10.43		
+40℃	13.2V		9.53	1.0	10.53		
	10.8V		9.59	1.0	10.59		
+25℃	12.0V	157/5785	11.34	1.0	12.34		
-10℃	13.2V		9.86	1.0	10.86		
	10.8V		11.07	1.0	12.07		
+40℃	13.2V		9.98	1.0	10.98		
	10.8V		9.49	1.0	10.49		
+25℃	12.0V	165/5825	10.92	1.0	11.92		
-10℃	13.2V		10.14	1.0	11.14		
	10.8V		9.49	1.0	10.49		
+40℃	13.2V		9.86	1.0	10.86		
	10.8V		9.71	1.0	10.71		

802.11n HT 40							
Test conditions		**Channel/ Frequency**	**Measured power (dBm)**	**Antenna Gain (dBi)**	**e.i.r.p (dBm)**	**Limit (dBm)**	**Result**
Temperature (℃)	**Voltage (V)**						
+25℃	12.0V	151/5755	10.67	1.0	11.67	13.98	PASS
-10℃	13.2V		9.70	1.0	10.70		
	10.8V		9.97	1.0	10.97		
+40℃	13.2V		10.10	1.0	11.10		
	10.8V		8.56	1.0	9.56		
+25℃	12.0V	159/5795	10.09	1.0	11.09		
-10℃	13.2V		9.47	1.0	10.47		
	10.8V		9.96	1.0	10.96		
+40℃	13.2V		9.25	1.0	10.25		
	10.8V		8.64	1.0	9.64		

802.11ac HT 20							
Test conditions		**Channel/ Frequency**	**Measured power (dBm)**	**Antenna Gain (dBi)**	**e.i.r.p (dBm)**	**Limit (dBm)**	**Result**
Temperature (℃)	**Voltage (V)**						
+25℃	12.0V	149/5745	10.64	1.0	11.64	13.98	PASS
-10℃	13.2V		9.87	1.0	10.87		
	10.8V		9.86	1.0	10.86		
+40℃	13.2V		8.23	1.0	9.23		
	10.8V		8.11	1.0	9.11		
+25℃	12.0V	157/5785	9.88	1.0	10.88		
-10℃	13.2V		8.80	1.0	9.80		
	10.8V		6.95	1.0	7.95		
+40℃	13.2V		8.75	1.0	9.75		
	10.8V		7.51	1.0	8.51		
+25℃	12.0V	165/5825	9.37	1.0	10.37		
-10℃	13.2V		8.71	1.0	9.71		
	10.8V		8.78	1.0	9.78		
+40℃	13.2V		8.42	1.0	9.42		
	10.8V		8.74	1.0	9.74		

802.11ac HT 40							
Test conditions		**Channel/ Frequency**	**Measured power (dBm)**	**Antenna Gain (dBi)**	**e.i.r.p (dBm)**	**Limit (dBm)**	**Result**
Temperature (℃)	**Voltage (V)**						
+25℃	12.0V	151/5755	9.55	1.0	10.55	13.98	PASS
-10℃	13.2V		8.94	1.0	9.94		
	10.8V		8.65	1.0	9.65		
+40℃	13.2V		8.35	1.0	9.35		
	10.8V		8.03	1.0	9.03		
+25℃	12.0V	159/5795	9.21	1.0	10.21		
-10℃	13.2V		7.78	1.0	8.78		
	10.8V		8.91	1.0	9.91		
+40℃	13.2V		8.02	1.0	9.02		
	10.8V		7.15	1.0	8.15		

802.11ac HT 80							
Test conditions		**Channel/ Frequency**	**Measured power (dBm)**	**Antenna Gain (dBi)**	**e.i.r.p (dBm)**	**Limit (dBm)**	**Result**
Temperature (℃)	**Voltage (V)**						
+25℃	12.0V	155/5775	8.31	1.0	9.31	13.98	PASS
-10℃	13.2V		7.51	1.0	8.51		
	10.8V		7.50	1.0	8.50		
+40℃	13.2V		6.81	1.0	7.81		
	10.8V		6.97	1.0	7.97		

4.3. Permitted Range of Operating Frequencies

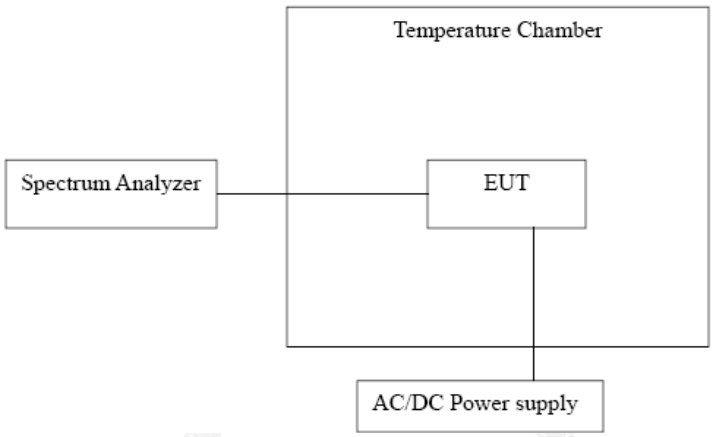
LIMIT

The width of the power spectrum envelope is fH -fL for a given operating frequency. In equipment that allows adjustment or selection of different operating frequencies, the power envelope takes up different positions in the allowed band. The frequency range is determined by the lowest value of fL and the highest value of fH resulting from the adjustment of the equipment to the lowest and highest operating frequencies.
The occupied bandwidth (i.e. the bandwidth in which 99 % of the wanted emission is contained) of the transmitter shall fall within the assigned frequency band.
For all equipment the frequency range shall lie within the frequency band given by clause 4.2.2.4, table 2. For non-harmonized frequency bands the available frequency range may differ between national administrations

Table 2: Maximum radiated power (e.i.r.p.)

Entry	Frequency Bands	Power	Application	Notes
1	2 400 MHz to 2 483,5 MHz	10 mW e.i.r.p.	Non-specific short range devices	
2	2 400 MHz to 2 483,5 MHz	25 mW e.i.r.p.	Radiodetermination devices	
3	(a) 2 446 MHz to 2 454 MHz	500 mW e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and Annex G
4	(b) 2 446 MHz to 2 454 MHz	4 W e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and Annex G
5	5 725 MHz to 5 875 MHz	25 mW e.i.r.p.	Non-specific short range devices	
6	9 200 MHz to 9 500 MHz	25 mW e.i.r.p.	Radiodetermination devices	
7	9 500 MHz to 9 975 MHz	25 mW e.i.r.p.	Radiodetermination devices	
8	10,5 GHz to 10,6 GHz	500 mW e.i.r.p.	Radiodetermination devices	
9	13,4 GHz to 14,0 GHz	25 mW e.i.r.p.	Radiodetermination devices	
10	17,1 GHz to 17,3 GHz	400 mW e.i.r.p.	Radiodetermination devices	See Annex H
11	24,00 GHz to 24,25 GHz	100 mW e.i.r.p.	Non-specific short range devices and radiodetermination devices	
NOTE: The spectrum ranges in some entries are not harmonised throughout all EU territory, specifically entries 4, 9, and 11 have been identified as such. Implementers are cautioned to refer to CEPT/ERC Recommendation 70-03 [i.2] as well as current National Radio plans to verify acceptance within intended regions of use.				

TEST CONFIGURATION



TEST PROCEDURE

The method of measurement for equipment employing FHSS and stepped frequency modulation is given in clause 4.2.3.4.
Using applicable conducted measurement procedures, as described in Annex E, the frequency range(s) shall be measured and recorded in the test report.
Where applicable, during these measurements the test data sequence as specified in clauses 5.8.1 and 5.8.1.1 shall be used. The transmitter power level shall be set to the rated power level. During the test, the transmitter shall be set in continuous transmission mode. If this is not possible, the measurements shall be carried out in a period shorter than the duration of the transmitted burst. It may be necessary to extend the duration of the burst.
These measurements shall be performed under both normal and extreme operating conditions except for the occupied bandwidth assessment for which measurement at normal operating conditions is sufficient.
The measurement procedure shall be as follows:
a) put the spectrum analyser in video averaging mode with a minimum of 50 sweeps selected;
b) select the lowest operating frequency of the equipment under test and activate the transmitter with modulation applied. The RF emission of the equipment shall be displayed on the spectrum analyser;
c) using the marker of the spectrum analyser, find the lowest frequency below the operating frequency at which the spectral power density drops below the level given in clause 4.2.3.2. This frequency shall be recorded in the test report;
d) select the highest operating frequency of the equipment under test and find the highest frequency at which the spectral power density drops below the value given in clause 4.2.3.2. This frequency shall be recorded in the test report;
e) the difference between the frequencies measured in steps c) and d) is the operating frequency range. It shall be recorded in the test report.
This measurement shall be repeated for each frequency range declared by the manufacturer.
4.2.3.4 Method of measurement for equipment using FHSS modulation
Using an applicable conducted measurement procedure as described in Annex E the frequency range of the equipment shall be measured and recorded in the test report.
During these measurements the test data sequence, as specified in clause 5.8.1, shall be used. During the test, the transmitter shall be set in continuous transmission mode. If this is not possible, the measurements shall be carried out in a period shorter than the duration of the transmitted burst. It may be necessary to extend the duration of the burst.
The transmitter power level shall be set to the maximum power level if controllable.
These measurements shall be performed under both normal and extreme operating conditions.

The measurement procedure shall be as follows:
a) put the spectrum analyser in video averaging mode with a minimum of 50 sweeps selected;
b) select the lowest hop frequency of the equipment under test and activate the transmitter with modulation applied;
c) find the lowest frequency below the operating frequency at which the spectral power density drops below the level given in clause 4.2.3.2. This frequency shall be recorded in the test report;
d) select the highest hop frequency of the equipment under test and find the highest frequency at which the spectral power density drops below the level given in clause 4.2.3.2. This frequency shall be recorded in the test report;
e) the difference between the frequencies measured in steps c) and d) is the frequency range. It shall be recorded in the test report.
This measurement shall be repeated for each operating frequency range declared by the manufacturer.

TEST RESULTS

802.11a					
Test Condition		f_L (MHz)	f_H (MHz)	Limit	Result
Temperature (℃)	Voltage (V)				
+25℃	12.0V	5735.88	5833.84	$f_L \geqq 5725$MHz and $f_H \leqq 5875$MHzGHz	Pass
-10℃	13.2V	5735.56	5833.47		
	10.8V	5735.52	5833.53		
+40℃	13.2V	5735.49	5833.39		
	10.8V	5735.27	5833.35		

802.11n HT20					
Test Condition		f_L (MHz)	f_H (MHz)	Limit	Result
Temperature (℃)	Voltage (V)				
+25℃	12.0V	5735.28	5834.40	$f_L \geqq 5725$MHz and $f_H \leqq 5875$MHzGHz	Pass
-10℃	13.2V	5735.11	5834.42		
	10.8V	5735.29	5834.55		
+40℃	13.2V	5735.28	5834.61		
	10.8V	5735.16	5834.73		

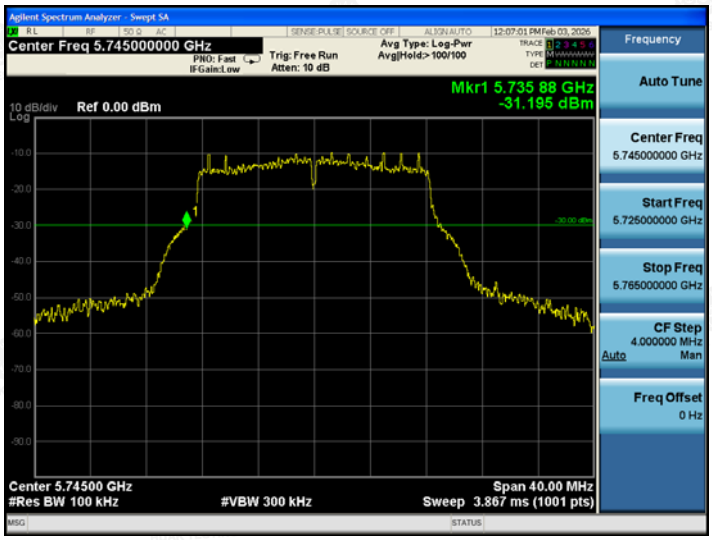
802.11n HT40					
Test Condition		f_L (MHz)	f_H (MHz)	Limit	Result
Temperature (℃)	Voltage (V)				
+25℃	12.0V	5736.20	5813.56	$f_L \geqq 5725$MHz and $f_H \leqq 5875$MHzGHz	Pass
-10℃	13.2V	5736.99	5813.78		
	10.8V	5736.82	5813.97		
+40℃	13.2V	5736.70	5813.71		
	10.8V	5736.81	5813.68		

802.11ac HT20					
Test Condition		f_L (MHz)	f_H (MHz)	Limit	Result
Temperature (℃)	Voltage (V)				
+25℃	12.0V	5735.20	5834.24	$f_L \geqq 5725$MHz and $f_H \leqq 5875$MHzGHz	Pass
-10℃	13.2V	5735.19	5834.82		
	10.8V	5735.27	5834.94		
+40℃	13.2V	5735.36	5834.76		
	10.8V	5735.25	5834.67		

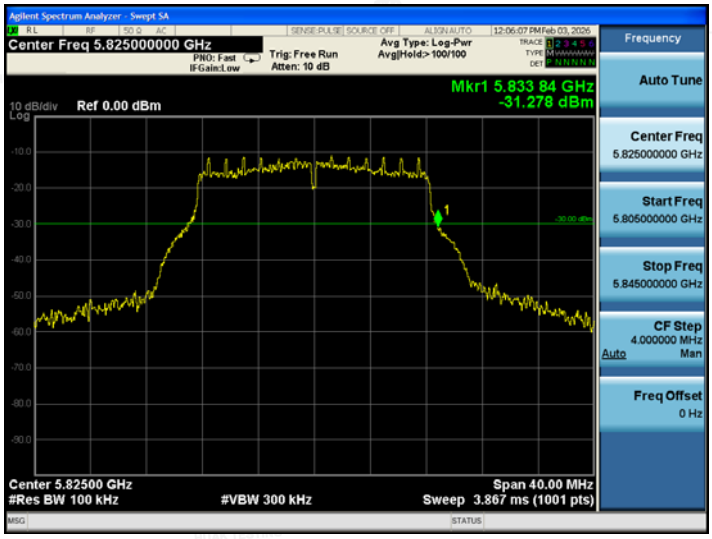
802.11ac HT40					
Test Condition		f_L (MHz)	f_H (MHz)	Limit	Result
Temperature (℃)	Voltage (V)				
+25℃	12.0V	5736.36	5813.56	$f_L \geqq 5725$MHz and $f_H \leqq 5875$MHzGHz	Pass
-10℃	13.2V	5736.15	5813.87		
	10.8V	5736.23	5813.77		
+40℃	13.2V	5736.24	5813.65		
	10.8V	5736.16	5813.61		

802.11ac HT80					
Test Condition		f_L (MHz)	f_H (MHz)	Limit	Result
Temperature (℃)	Voltage (V)				
+25℃	12.0V	5736.44	5813.40	$f_L \geqq 5725$MHz and $f_H \leqq 5875$MHzGHz	Pass
-10℃	13.2V	5736.20	5813.52		
	10.8V	5736.25	5813.63		
+40℃	13.2V	5736.39	5813.42		
	10.8V	5736.11	5813.41		

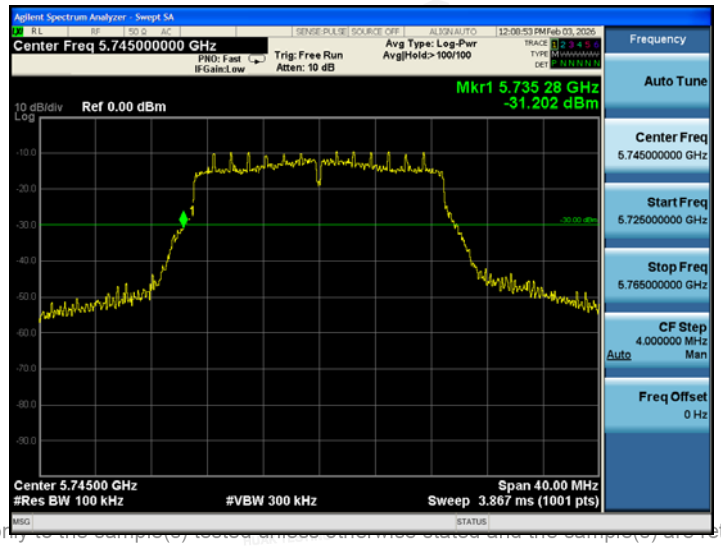
802.11a 5745



802.11a 5825



802.11n HT20 5745



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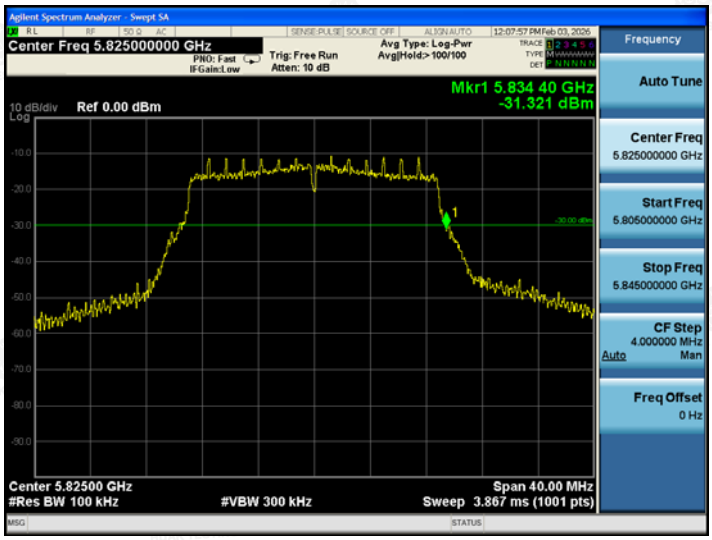
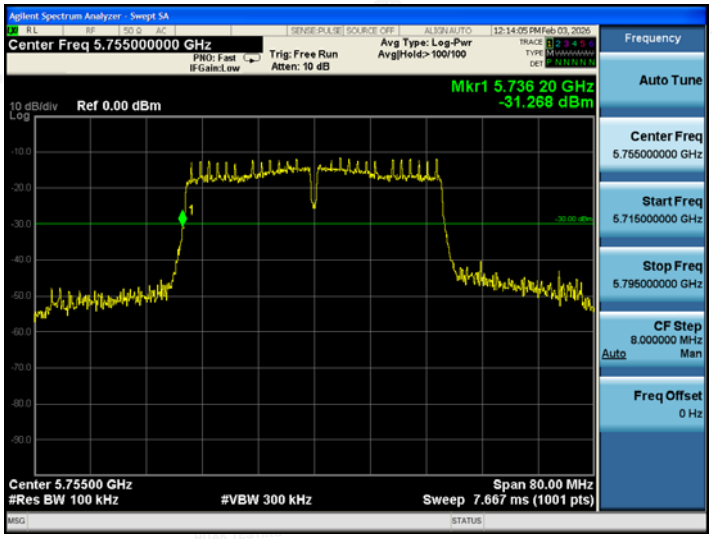


802.11n HT40 5755



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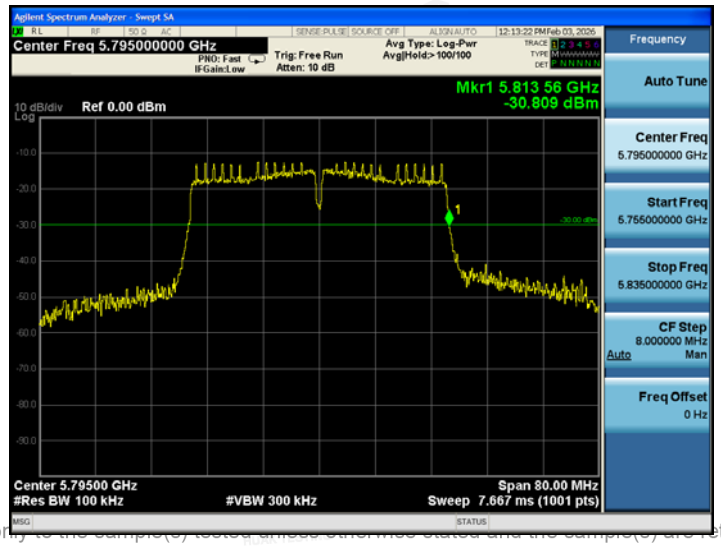
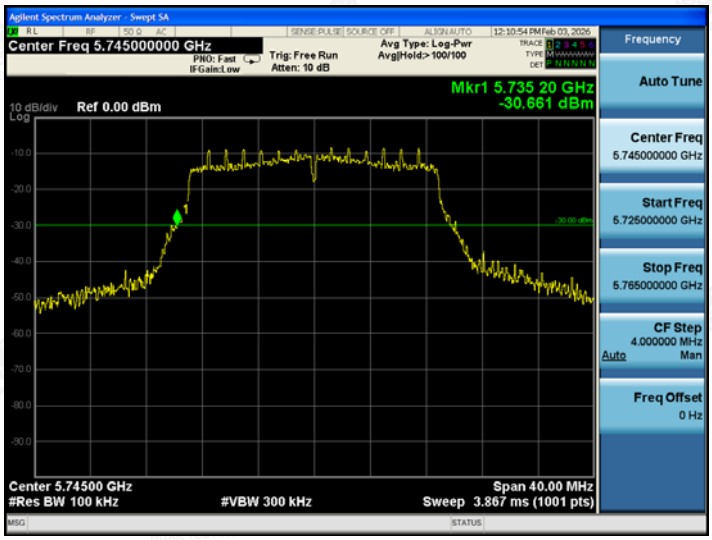
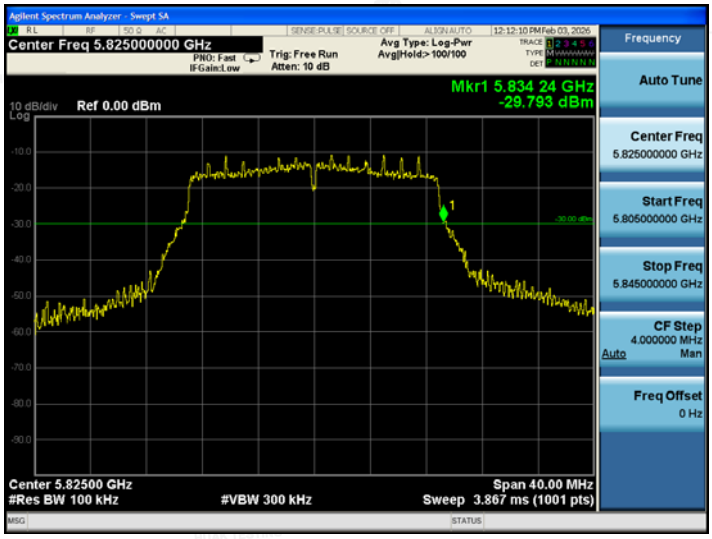


802.11ac HT20 5745



802.11ac HT20 5825



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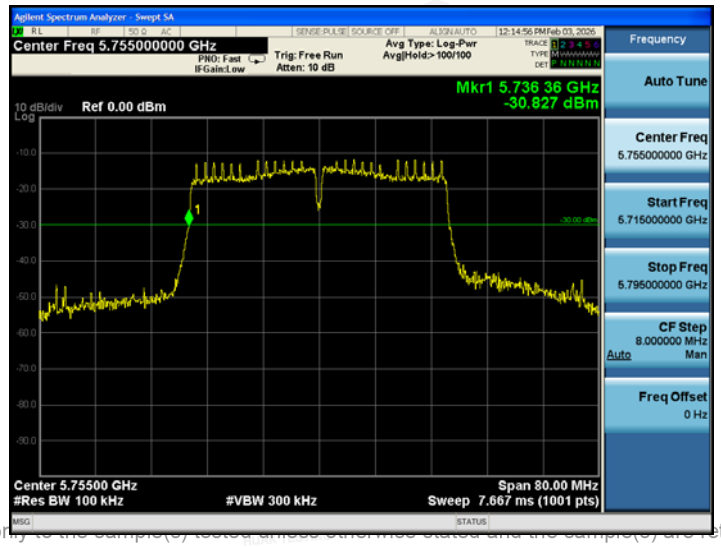
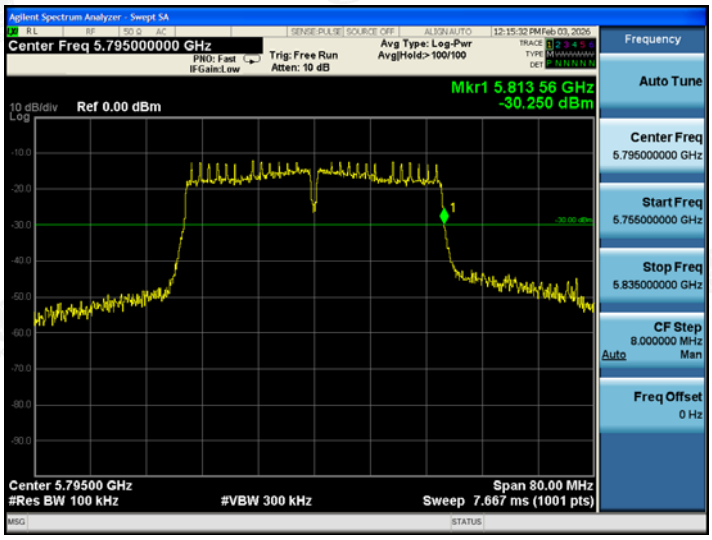
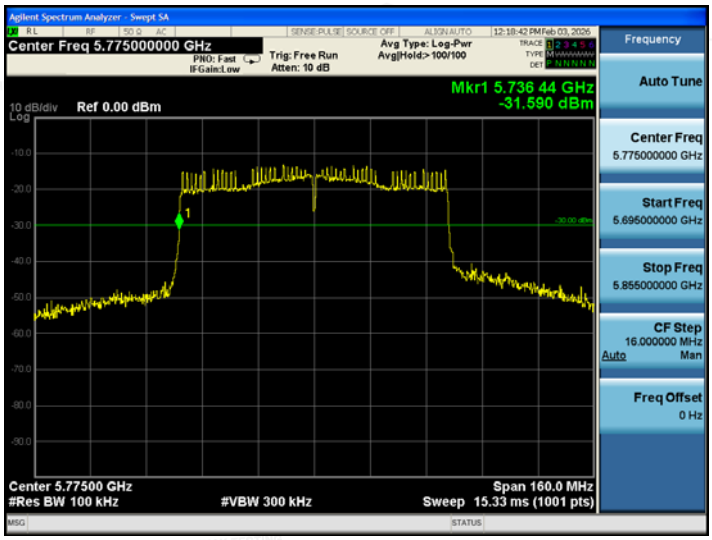
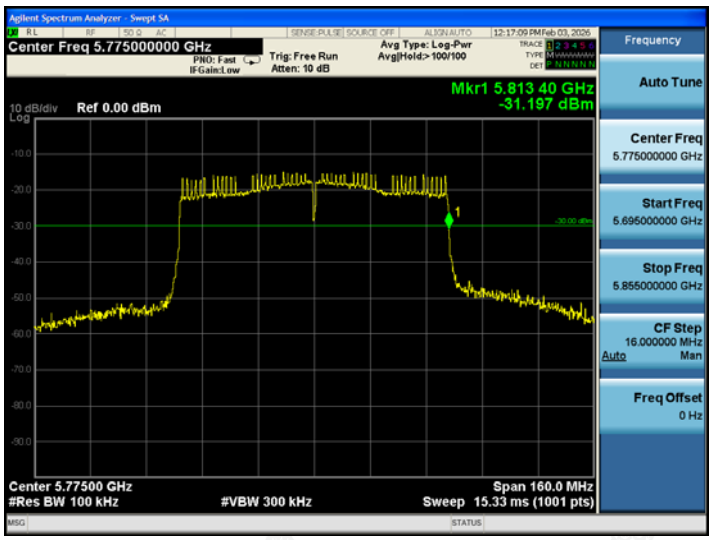


802.11ac HT40 5795



802.11ac HT80 5775





4.4. Spurious emissions and cabinet

LIMIT

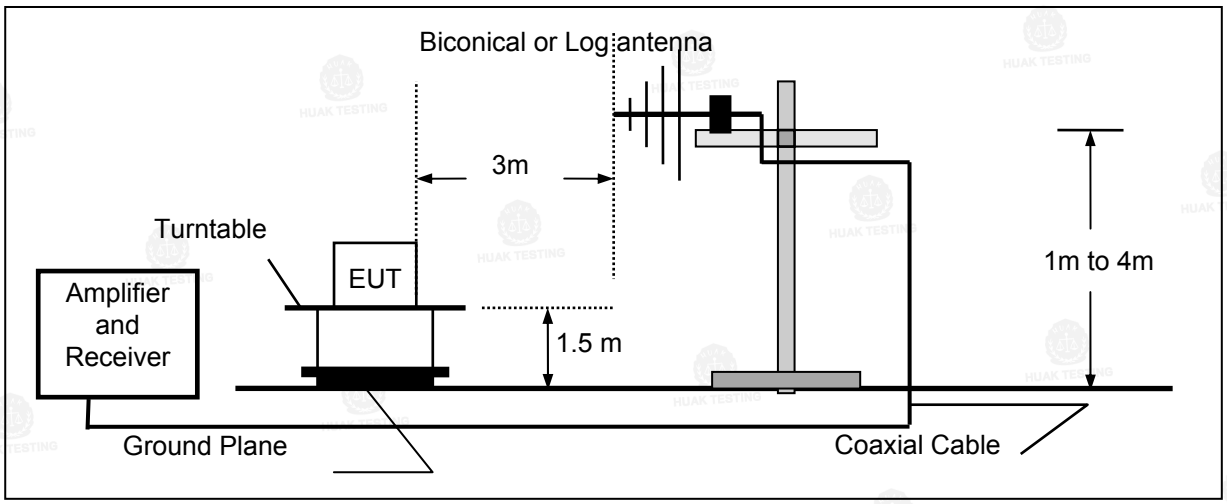
The maximum power limits of any unwanted emissions in the spurious domain are given in table 3.

Table 3: Spurious emissions

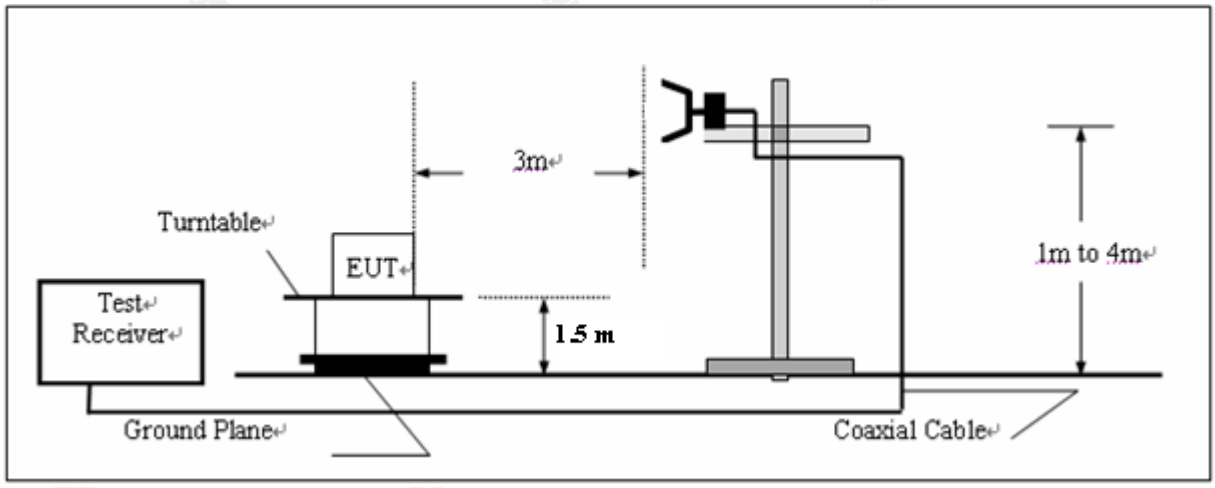
Frequency ranges / State	47 MHz to 74 MHz 87,5 MHz to 108 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤ 1 000 MHz	Frequencies > 1 000 MHz
Operating	4 nW	250 nW	1 µW
Standby	2 nW	2 nW	20 nW

TEST CONFIGURATION

Below 1GHz



Above 1GHz



TEST PROCEDURE

Conducted spurious emission

This method of measurement applies to transmitters having a permanent antenna connector.
Additional requirements for equipment employing FHSS modulation are given in clause 4.2.4.3.4:
a) The transmitter shall be connected to a measuring receiver through a test load, 50 Ω power attenuator, and if necessary, an appropriate filter to avoid overload of the measuring receiver. The bandwidth of the measuring receiver shall be adjusted until the sensitivity of the measuring receiver is at least 6 dB below the spurious emission limit given in table 3, see clause 4.2.4.4. This bandwidth shall be recorded in the test report.
For the measurement of spurious emissions below the second harmonic of the carrier frequency, the filter used shall be a high "Q" (notch) filter centred on the transmitter carrier frequency, which attenuates this signal by at least 30 dB.
For the measurement of spurious emissions at and above the second harmonic of the carrier frequency the filter used shall be a high pass filter with a stop band rejection exceeding 40 dB. The cut-off frequency of the high pass filter shall be approximately 1,5 times the transmitter carrier frequency.
Precautions may be required to ensure that the test load does not generate or that the high pass filter does not attenuate, the harmonics of the carrier.
b) The transmitter shall be unmodulated and operating at the maximum limit of its specified power range. If modulation cannot be inhibited then the test shall be carried out with modulation (see clause 5.8.1) and this fact shall be recorded in the test report.
c) For carrier frequencies in the range 1 GHz to 20 GHz the frequency of the measuring receiver shall be adjusted over the frequency range 25 MHz to 10 times the carrier frequency, not exceeding 40 GHz. For carrier frequencies above 20 GHz the measuring receiver shall be tuned over the range 25 MHz up to twice the carrier frequency, not exceeding 66 GHz. The frequency and level of every spurious emission found shall be noted.
The emissions within the channel occupied by the transmitter carrier and, for channelized systems its adjacent channels, shall not be recorded.
d) If the measuring receiver has not been calibrated in terms of power level at the transmitter output, the level of any detected components shall be determined by replacing the transmitter by the signal generator and adjusting it to reproduce the frequency and level of every spurious emission noted in step c). The absolute power level of each of the emissions shall be noted.
e) The frequency and level of each spurious emission measured and the bandwidth of the measuring receiver shall be recorded in the test report.
f) If a user accessible power adjustment is provided then the tests in steps c) to e) shall be repeated at the lowest power setting available.
g) The measurement in steps c) to f) shall be repeated with the transmitter in the standby condition if this option is available.

Method of measurement - cabinet spurious radiation

This method of measurement applies to transmitters having a permanent antenna connector. For equipment without a permanent antenna connector see clause 4.2.4.3.3
Additional requirements for equipment employing FHSS modulation are given in clause 4.2.4.3.4:
a) A test site selected from Annex E which fulfils the requirements of the specified frequency range of this measurement shall be used. The test antenna shall be oriented initially for vertical polarization and connected to a measuring receiver. The bandwidth of the measuring receiver shall be adjusted until the sensitivity of the measuring receiver, after allowing for the coupling loss, is at least 6 dB below the spurious emission limit given in table 3, see clause 4.2.4.4. This bandwidth shall be recorded in the test report.
The transmitter under test shall be placed on the support in its standard position, connected to an artificial antenna (see clause 5.8.2) and switched on without modulation. If modulation cannot be inhibited then the test shall be carried out with modulation, (see clause 5.8.1), and this fact shall be recorded in the test report.
b) For carrier frequencies in the range 1 GHz to 20 GHz the frequency of the measuring receiver shall be adjusted over the frequency range 25 MHz to 10 times the carrier frequency, not exceeding 40 GHz. For carrier frequencies above 20 GHz the measuring receiver shall be tuned over the range 25 MHz up to twice the carrier frequency, not exceeding 66 GHz, except for the channel on which the transmitter is intended to operate and for channelized systems, its adjacent channels. The frequency of each spurious emission detected shall be noted. If the test site is disturbed by interference coming from outside the site, this qualitative search may be performed in a screened room, with a reduced distance between the transmitter and the test antenna.

c) At each frequency at which an emission has been detected, the measuring receiver shall be tuned and the test antenna shall be raised or lowered through the specified height range until the maximum signal level is detected on the measuring receiver.
d) The transmitter shall be rotated through 360° about a vertical axis, to maximize the received signal.
e) The test antenna shall be raised or lowered again through the specified height range until a maximum is obtained. This level shall be noted.
f) The substitution antenna (see clause E.3.2) shall replace the transmitter antenna in the same position and in vertical polarization. It shall be connected to the signal generator.
g) At each frequency at which an emission has been detected, the signal generator, substitution antenna, and measuring receiver shall be tuned. The test antenna shall be raised or lowered through the specified height range until the maximum signal level is detected on the measuring receiver. The level of the signal generator giving the same signal level on the measuring receiver as in item e) shall be noted. After corrections due to the gain of the substitution antenna and the cable loss between the signal generator and the substitution antenna, is the radiated spurious emission at this frequency.
h) The frequency and level of each spurious emission measured and the bandwidth of the measuring receiver shall be recorded in the test report.
i) Steps c) to h) shall be repeated with the test antenna oriented in horizontal polarization.
j) If a user accessible power adjustment is provided then the tests in steps c) to h) shall be repeated at the lowest power setting available.
k) Steps c) to i) shall be repeated with the transmitter in the standby condition if this option is available.

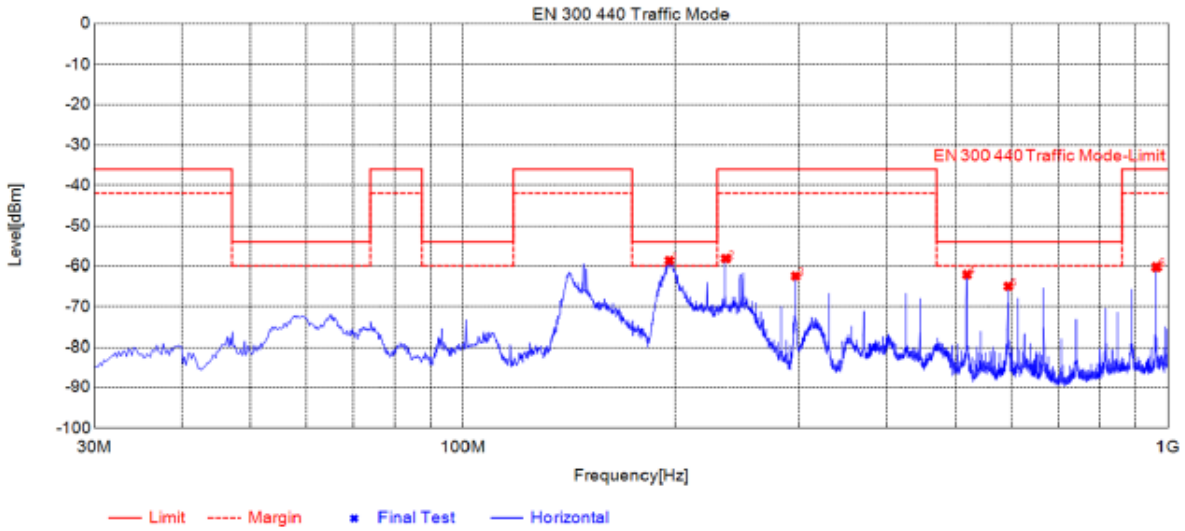
Method of measurement - radiated spurious emission
a) A test site selected from Annex E which fulfils the requirements of the specified frequency range of this measurement shall be used. The test antenna shall be oriented initially for vertical polarization and connected to a measuring receiver, through a suitable filter to avoid overloading of the measuring receiver if required.
The bandwidth of the measuring receiver shall be adjusted until the sensitivity of the measuring receiver, after allowing for the coupling loss, is at least 6 dB below the spurious emission limit given in table 3, see clause 4.2.4.4. This bandwidth shall be recorded in the test report.
For the measurement of spurious emissions below the second harmonic of the carrier frequency the optional filter used shall be a high "Q" (notch) filter centred on the transmitter carrier frequency and attenuating this signal by at least 30 dB.
For the measurement of spurious emissions at and above the second harmonic of the carrier frequency the optional filter used shall be a high pass filter with a stop band rejection exceeding 40 dB. The cut-off frequency of the high pass filter shall be approximately 1,5 times the transmitter carrier frequency.
The transmitter under test shall be placed on the support in its standard position and shall be switched on without modulation. If modulation cannot be inhibited then the test shall be carried out with modulation (see clause 5.8.1) and this fact shall be recorded in the test report.
b) The same method of measurement as steps b) and k) of clause 4.2.4.3.2 shall be used.

TEST RESULTS

Note:We tested at 802.11a/802.11n HT20/802.11n HT40/802.11ac HT20/802.11ac HT40/802.11ac HT80 mode at the antenna single transmitting mode and the Mimo
mode, and recorded the worst case 802.11n HT 20 mode at the Mimo mode. The measurement frequency range is from 25MHz to the 10th harmonic of the fundamental frequency, not exceeding 40GHz.18GHz-40GHz not recorded for no spurious point have a margin of less than 6 dB with respect to the limits.

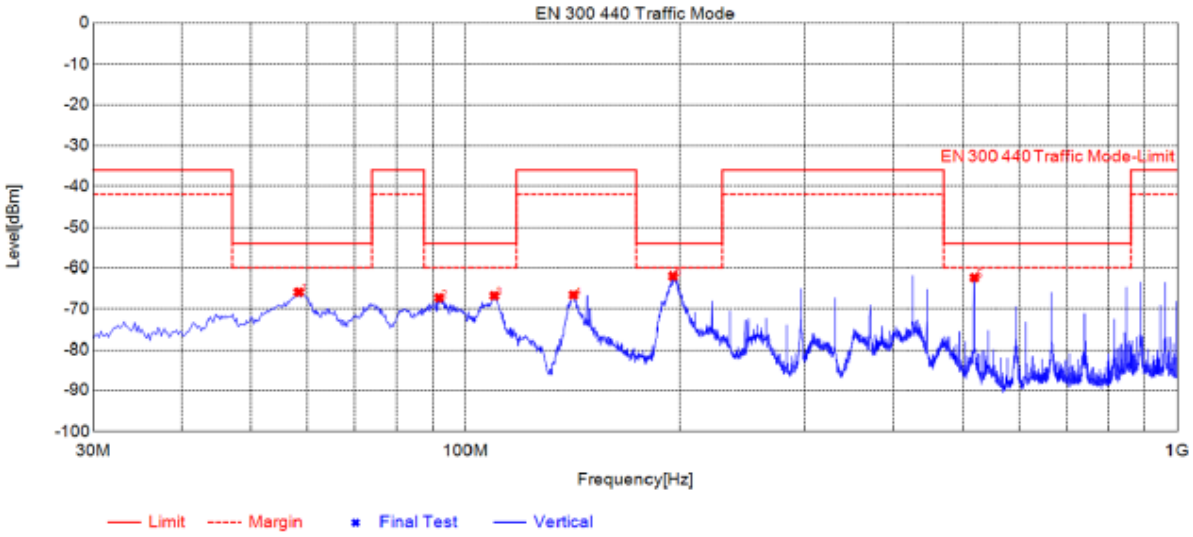
802.11n HT 20, CH 149, Horizontal/Vertical

Below 1GHz:



Suspected List

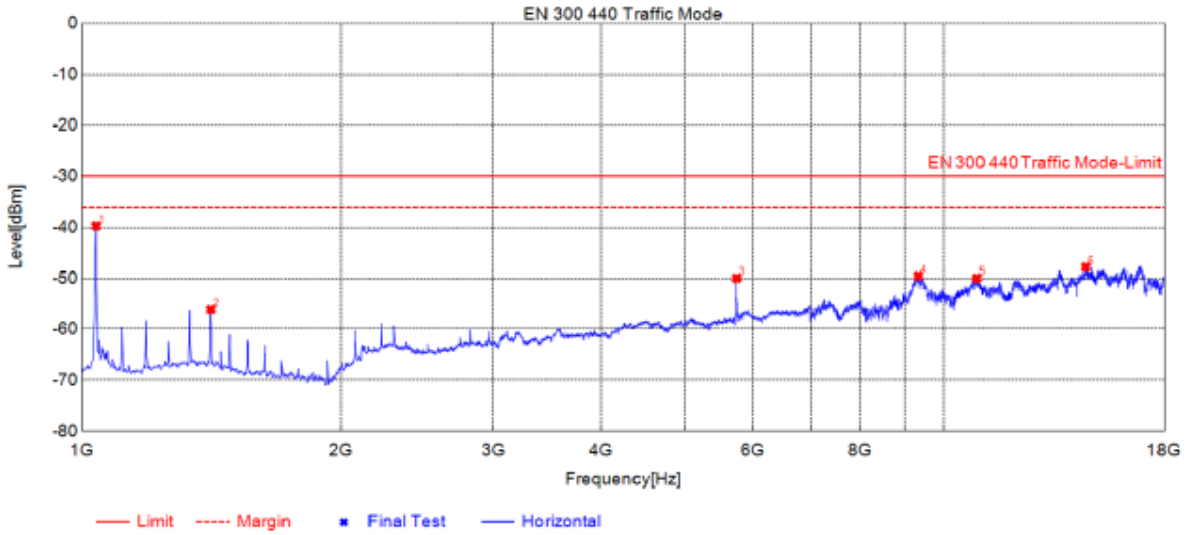
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	196.291	-58.93	-58.67	-54.00	4.67	0.26	Horizontal
2	236.263	-61.95	-58.17	-36.00	22.17	3.78	Horizontal
3	296.997	-64.94	-62.34	-36.00	26.34	2.60	Horizontal
4	519.754	-65.93	-61.99	-54.00	7.99	3.94	Horizontal
5	593.876	-71.38	-64.90	-54.00	10.90	6.48	Horizontal
6	965.267	-70.28	-60.22	-36.00	24.22	10.06	Horizontal



Suspected List

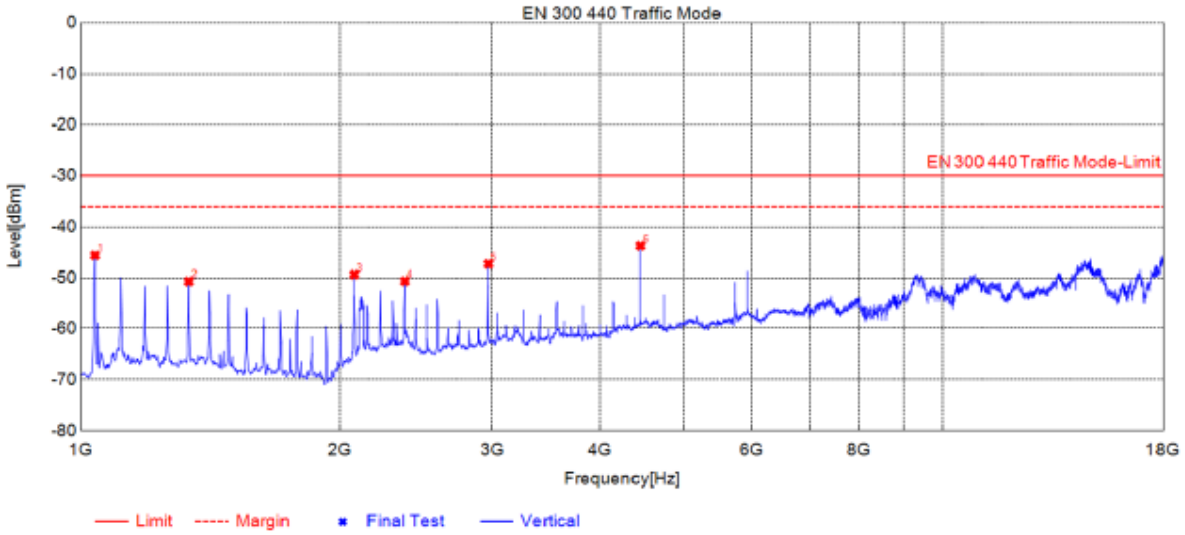
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	58.3297	-60.85	-65.84	-54.00	11.84	-4.99	Vertical
2	91.8984	-69.28	-67.25	-54.00	13.25	2.03	Vertical
3	109.75	-79.18	-66.72	-54.00	12.72	12.46	Vertical
4	141.766	-65.83	-66.55	-36.00	30.55	-0.72	Vertical
5	195.709	-60.55	-61.91	-54.00	7.91	-1.36	Vertical
6	519.754	-65.54	-62.26	-54.00	8.26	3.28	Vertical

Above 1GHz:



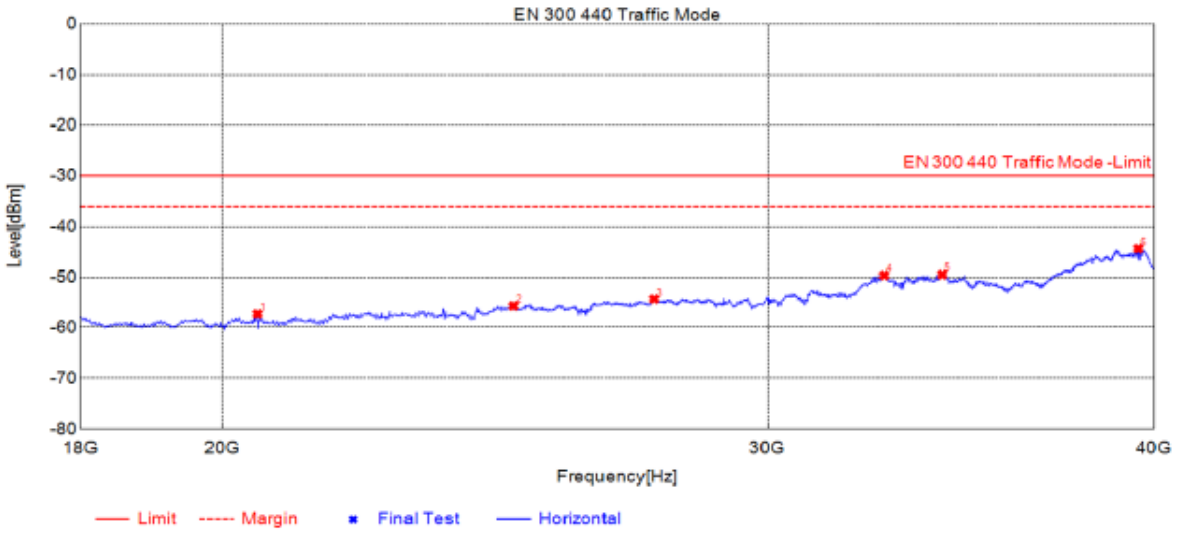
Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1040.01	-33.54	-39.69	-30.00	9.69	-6.15	Horizontal
2	1410.13	-52.34	-56.16	-30.00	26.16	-3.82	Horizontal
3	5743.58	-57.80	-49.97	-30.00	19.97	7.83	Horizontal
4	9332.46	-64.35	-49.55	-30.00	19.55	14.80	Horizontal
5	10927.7	-66.11	-50.00	-30.00	20.00	16.11	Horizontal
6	14595.9	-68.90	-47.82	-30.00	17.82	21.08	Horizontal



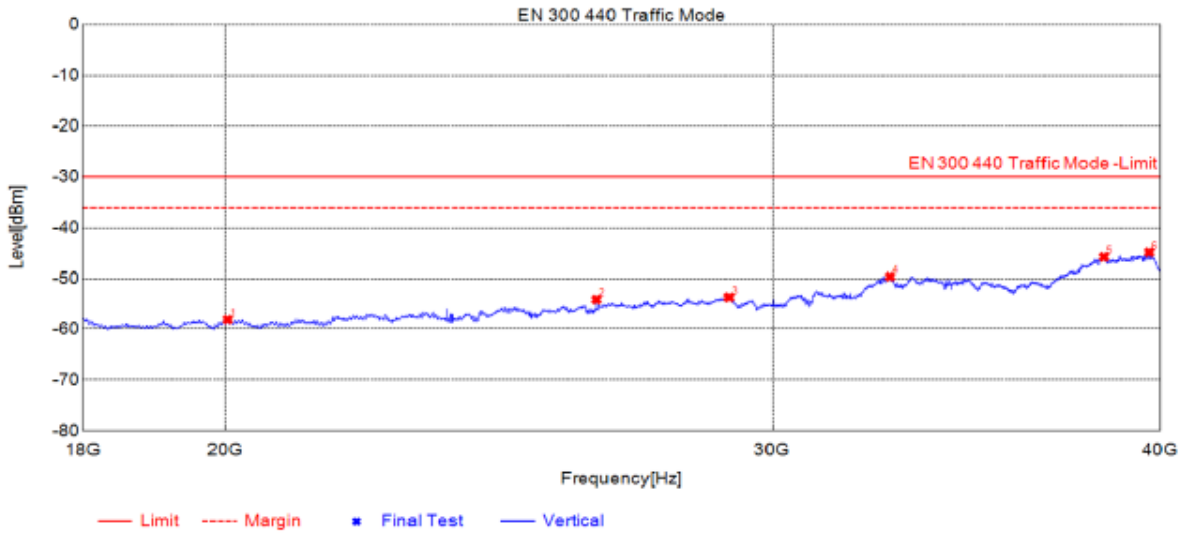
Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1040.01	-39.16	-45.64	-30.00	15.64	-6.48	Vertical
2	1336.11	-46.89	-50.69	-30.00	20.69	-3.80	Vertical
3	2078.35	-47.59	-49.38	-30.00	19.38	-1.79	Vertical
4	2376.45	-50.35	-50.64	-30.00	20.64	-0.29	Vertical
5	2970.65	-48.18	-47.33	-30.00	17.33	0.85	Vertical
6	4455.15	-49.02	-43.75	-30.00	13.75	5.27	Vertical



Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	20530.8	-63.26	-57.31	-30.00	27.31	5.95	Horizontal
2	24844.2	-61.93	-55.72	-30.00	25.72	6.21	Horizontal
3	27573.1	-62.59	-54.34	-30.00	24.34	8.25	Horizontal
4	32715.5	-60.21	-49.63	-30.00	19.63	10.58	Horizontal
5	34168.0	-60.10	-49.50	-30.00	19.50	10.60	Horizontal
6	39530.5	-55.75	-44.41	-30.00	14.41	11.34	Horizontal

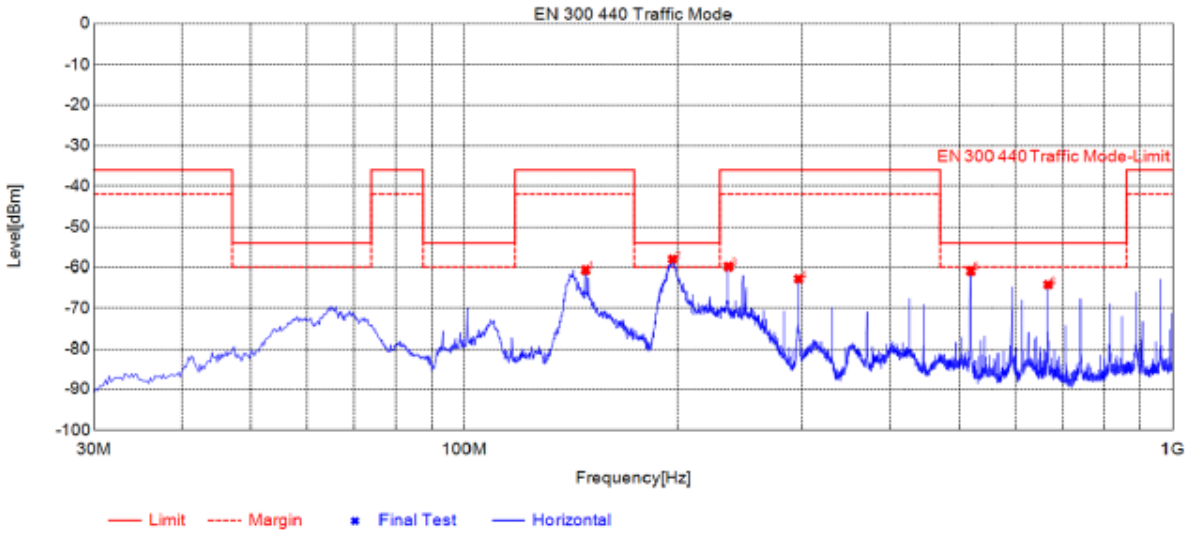


Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	20039.3	-64.32	-58.14	-30.00	28.14	6.18	Vertical
2	26340.7	-61.09	-54.15	-30.00	24.15	6.94	Vertical
3	29055.0	-62.73	-53.71	-30.00	23.71	9.02	Vertical
4	32730.2	-60.20	-49.61	-30.00	19.61	10.59	Vertical
5	38364.1	-56.17	-45.80	-30.00	15.80	10.37	Vertical
6	39677.2	-56.20	-44.87	-30.00	14.87	11.33	Vertical

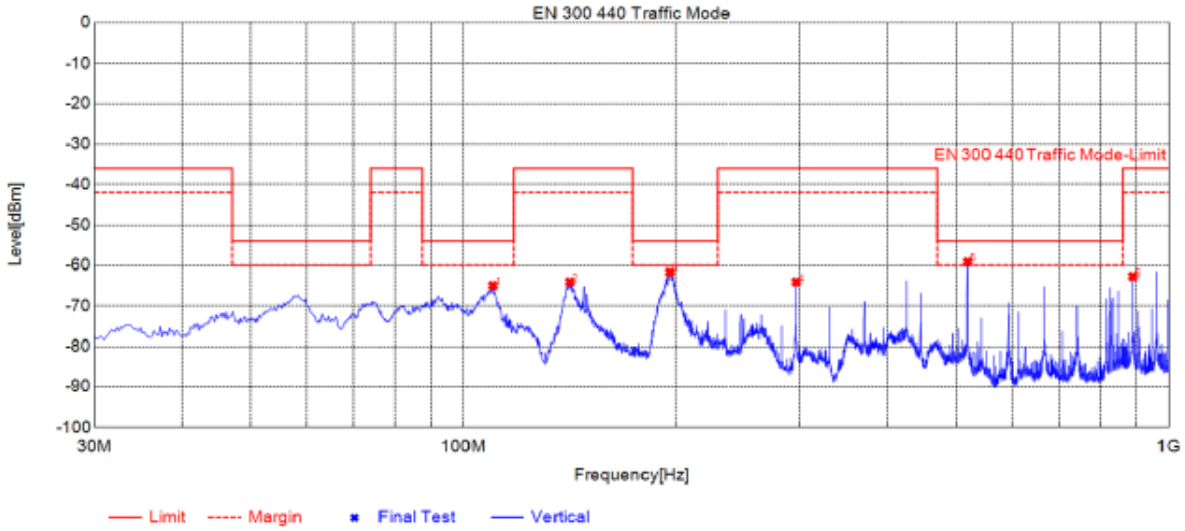
802.11n HT 20, CH 165, Horizontal/Vertical

Below 1GHz:



Suspected List

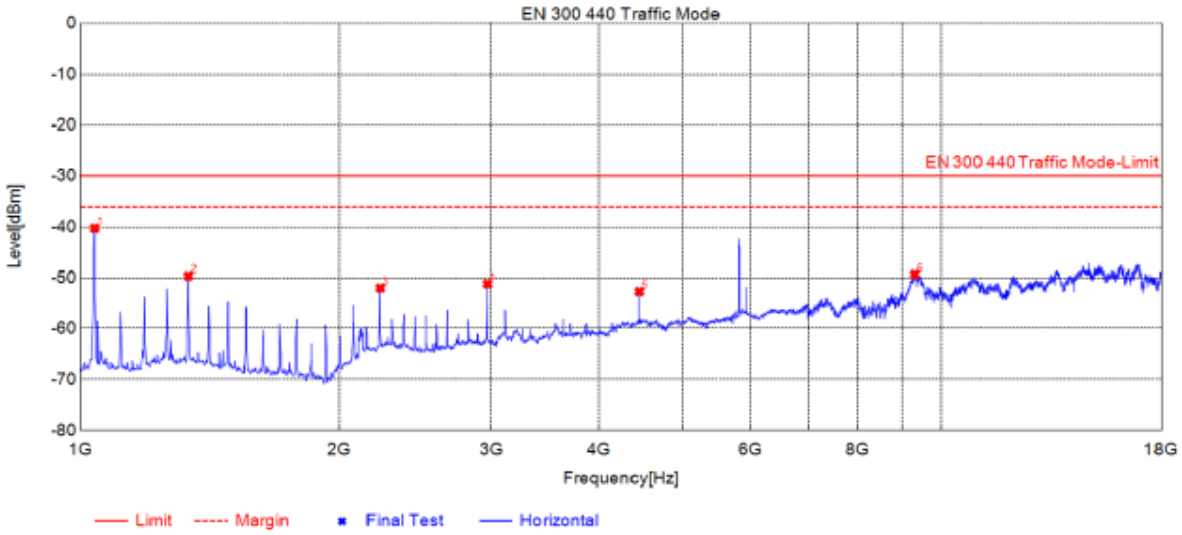
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	148.363	-62.76	-60.64	-36.00	24.64	2.12	Horizontal
2	196.873	-58.44	-58.03	-54.00	4.03	0.41	Horizontal
3	236.263	-63.59	-59.81	-36.00	23.81	3.78	Horizontal
4	296.997	-65.32	-62.72	-36.00	26.72	2.60	Horizontal
5	519.754	-64.81	-60.87	-54.00	6.87	3.94	Horizontal
6	668.193	-71.40	-64.16	-54.00	10.16	7.24	Horizontal



Suspected List

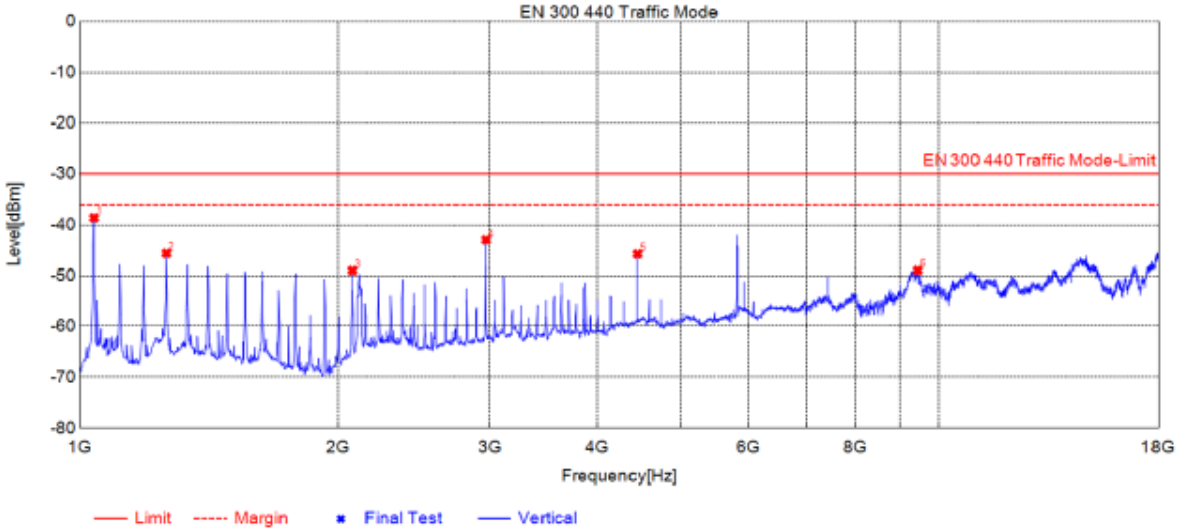
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	110.138	-77.46	-64.95	-54.00	10.95	12.51	Vertical
2	141.572	-63.34	-64.05	-36.00	28.05	-0.71	Vertical
3	196.291	-60.35	-61.65	-54.00	7.65	-1.30	Vertical
4	296.997	-64.59	-64.05	-36.00	28.05	0.54	Vertical
5	519.754	-62.45	-59.17	-54.00	5.17	3.28	Vertical
6	890.950	-71.96	-62.69	-36.00	26.69	9.27	Vertical

Above 1GHz:



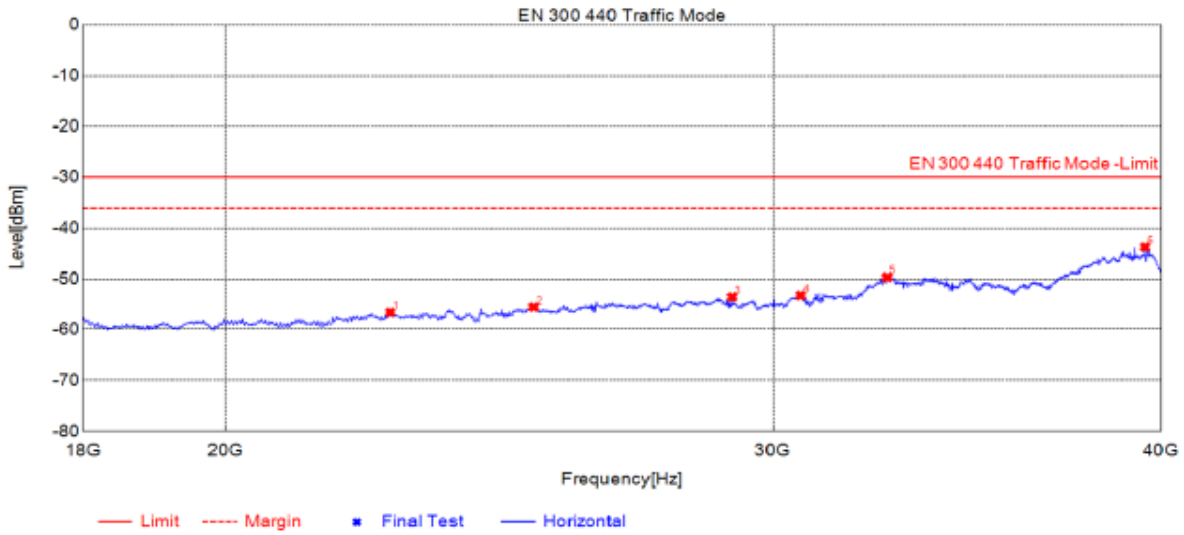
Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1040.01	-34.09	-40.24	-30.00	10.24	-6.15	Horizontal
2	1336.11	-46.09	-49.64	-30.00	19.64	-3.55	Horizontal
3	2228.40	-52.02	-52.01	-30.00	22.01	0.01	Horizontal
4	2970.65	-52.05	-51.16	-30.00	21.16	0.89	Horizontal
5	4455.15	-58.28	-52.69	-30.00	22.69	5.59	Horizontal
6	9308.26	-64.09	-49.33	-30.00	19.33	14.76	Horizontal



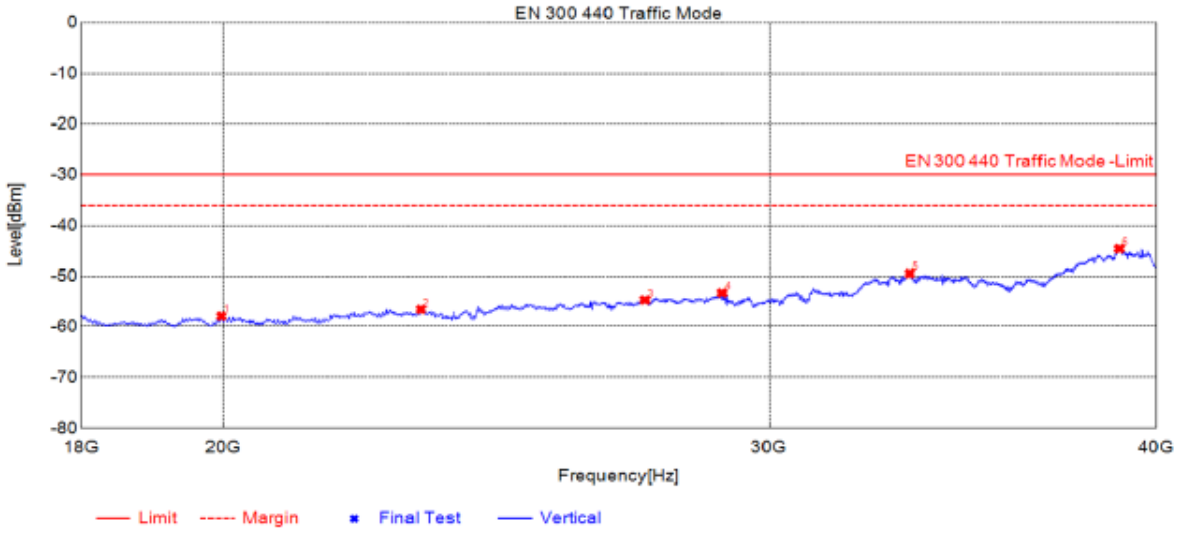
Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1040.01	-32.11	-38.59	-30.00	8.59	-6.48	Vertical
2	1262.08	-41.19	-45.64	-30.00	15.64	-4.45	Vertical
3	2078.35	-47.22	-49.01	-30.00	19.01	-1.79	Vertical
4	2970.65	-43.82	-42.97	-30.00	12.97	0.85	Vertical
5	4455.15	-51.05	-45.78	-30.00	15.78	5.27	Vertical
6	9446.88	-64.27	-48.98	-30.00	18.98	15.29	Vertical



Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	22599.5	-62.22	-56.62	-30.00	26.62	5.60	Horizontal
2	25130.3	-61.90	-55.55	-30.00	25.55	6.35	Horizontal
3	29106.3	-62.57	-53.56	-30.00	23.56	9.01	Horizontal
4	30632.2	-62.91	-53.25	-30.00	23.25	9.66	Horizontal
5	32649.5	-60.21	-49.67	-30.00	19.67	10.54	Horizontal
6	39523.1	-55.10	-43.75	-30.00	13.75	11.35	Horizontal



Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	19973.3	-64.13	-57.93	-30.00	27.93	6.20	Vertical
2	23164.3	-62.21	-56.59	-30.00	26.59	5.62	Vertical
3	27360.4	-62.64	-54.73	-30.00	24.73	7.91	Vertical
4	28974.3	-62.32	-53.30	-30.00	23.30	9.02	Vertical
5	33309.7	-60.43	-49.49	-30.00	19.49	10.94	Vertical
6	38914.3	-55.87	-44.62	-30.00	14.62	11.25	Vertical

4.5. Duty cycle

LIMIT

Table 4 defines the maximum duty cycle within a 1 hour period.

Table 4: Duty cycle limits

Frequency Band	Duty cycle	Application	Notes
2 400 MHz to 2 483,5 MHz	No Restriction	Generic use	
2 400 MHz to 2 483,5 MHz	No Restriction	Radiodetermination	
(a) 2 446 MHz to 2 454 MHz	No Restriction	RFID	Limits shown in Annex G shall apply
(b) 2 446 MHz to 2 454 MHz	≤ 15 %	RFID	Limits shown in Annex G shall apply
5 725 MHz to 5 875 MHz	No Restriction	Generic use	
9 200 MHz to 9 500 MHz	No Restriction	Radiodetermination	
9 500 MHz to 9 975 MHz	No Restriction	Radiodetermination	
10,5 GHz to 10,6 GHz	No Restriction	Radiodetermination	
13,4 GHz to 14,0 GHz	No Restriction	Radiodetermination	
17,1 GHz to 17,3 GHz	DAA or equivalent techniques	Radiodetermination, limited to GBSAR detecting and movement and alert applications	Limits shown in Annex I shall apply
24,00 GHz to 24,25 GHz	No Restriction	Generic use and for radiodetermination	
NOTE: The spectrum ranges in some entries are not harmonised throughout all EU territory, specifically entries 4, 9, and 11 have been identified as such. Implementers are cautioned to refer to CEPT/ERC Recommendation 70-03 [i.2] as well as current National Radio plans to verify acceptance within intended regions of use.			

For devices with a 100 % duty cycle transmitting an unmodulated carrier most of the time, a time-out shut-off facility shall be implemented in order to improve the efficient use of spectrum.

TEST RESULTS

For device working in frequency band 5725MHz to 5875MHz, no duty cycle restricted.

4.6. Adjacent channel selectivity

LIMIT

The adjacent channel selectivity of the equipment under specified conditions shall not be less than -30 dBm + k.
The correction factor, k, is as follows:
Where:

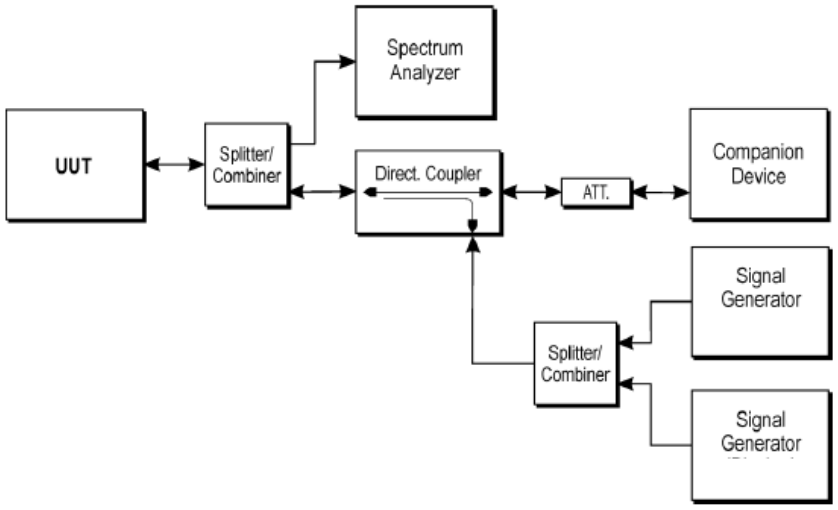
$$k = -20\log f - 10\log BW$$

- f is the frequency in GHz;
- BW is the channel bandwidth in MHz.

The factor k is limited within the following:
- -40 dB < k < 0 dB.

The measured adjacent channel selectivity shall be stated in the test report

TEST PROCEDURE



TEST CONFIGURATION

This measurement shall be conducted under normal conditions.
Two signal generators A and B shall be connected to the receiver via a combining network to the receiver, either:
a) via a test fixture or a test antenna to the receiver integrated, dedicated or test antenna; or
b) directly to the receiver permanent or temporary antenna connector.
The method of coupling to the receiver shall be stated in the test report.
Signal generator A shall be at the nominal frequency of the receiver, with normal modulation of the wanted signal.
Signal generator B shall be unmodulated and shall be adjusted to the adjacent channel centre frequency immediately above that of the wanted signal.
Initially signal generator B shall be switched off and using signal generator A the level that still gives sufficient response shall be established. The output level of generator A shall then be increased by 3 dB.
Signal generator B is then switched on and adjusted until the wanted criteria are met. This level shall be recorded.
The measurements shall be repeated with signal generator B unmodulated and adjusted to the adjacent channel centre immediately below the wanted signal.
The adjacent channel selectivity shall be recorded for the upper and lower adjacent channels as the level in dBm of the unwanted signal.
For tagging systems (e.g. RF identification, anti-theft, access control, location and similar systems) signal generator A may be replaced by a physical tag positioned at 70 % of the measured system range in metres.
In this case, the adjacent selectivity shall be recorded as the level in dBm of lowest level of the unwanted signal (generator B) resulting in a non-read of the tag.

TEST RESULTS

802.11a

Test Channel	BW(MHz)	Unwanted Signal Frequency(MHz)	Adjacent Frequency Signal Power Level (dBm)	Limit (dBm)	Result
153	20	5745	-41.61	-58.20	PASS
	20	5785	-45.88	-58.26	PASS
161	20	5785	-43.20	-58.26	PASS
	20	5825	-41.36	-58.32	PASS

802.11 n HT 20

Test Channel	BW(MHz)	Unwanted Signal Frequency(MHz)	Adjacent Frequency Signal Power Level (dBm)	Limit (dBm)	Result
153	20	5745	-45.52	-58.20	PASS
	20	5785	-43.74	-58.26	PASS
161	20	5785	-41.19	-58.26	PASS
	20	5825	-45.62	-58.32	PASS

802.11 n HT 40

Test Channel	BW(MHz)	Unwanted Signal Frequency(MHz)	Adjacent Frequency Signal Power Level (dBm)	Limit (dBm)	Result
155	40	5755	-43.39	-61.22	PASS
	40	5795	-44.26	-61.28	PASS

802.11 ac HT 20

Test Channel	BW(MHz)	Unwanted Signal Frequency(MHz)	Adjacent Frequency Signal Power Level (dBm)	Limit (dBm)	Result
153	20	5745	-46.63	-58.20	PASS
	20	5785	-39.72	-58.26	PASS
161	20	5785	-46.93	-58.26	PASS
	20	5825	-45.37	-58.32	PASS

802.11 ac HT 40

Test Channel	BW(MHz)	Unwanted Signal Frequency(MHz)	Adjacent Frequency Signal Power Level (dBm)	Limit (dBm)	Result
155	40	5755	-46.25	-61.22	PASS
	40	5795	-44.16	-61.28	PASS

802.11 ac HT 80

Test Channel	BW(MHz)	Unwanted Signal Frequency(MHz)	Adjacent Frequency Signal Power Level (dBm)	Limit (dBm)	Result
155	80	5775	-46.62	-64.26	PASS

4.7. Blocking or desensitization

LIMIT

The blocking level, for any frequency within the specified ranges, shall not be less than the values given in table 6, except at frequencies on which spurious responses are found.

Table 6: Limits for blocking or desensitization

Receiver category	Limit
1	-30 dBm + k
2	-45 dBm + k
3	-60 dBm + k

The correction factor, k, is as follows:

$$K=-20\log f-10\log BW$$

Where:

- f is the frequency in GHz;

- BW is the occupied bandwidth in MHz.

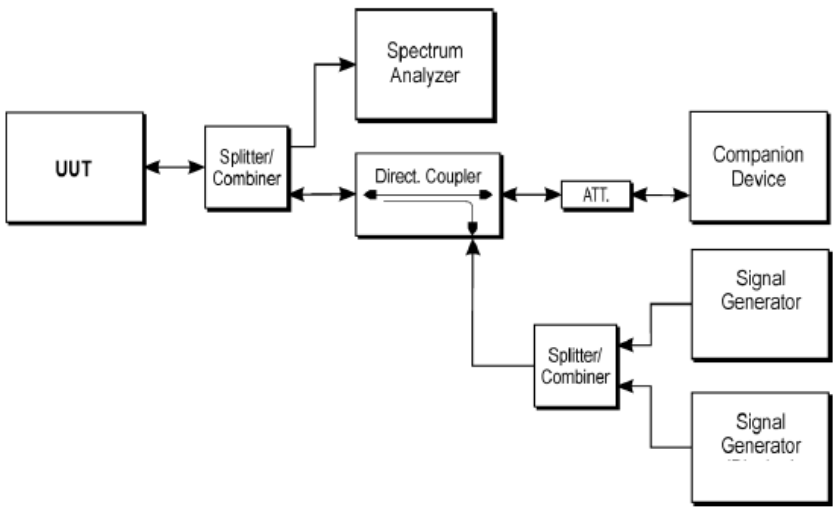
The factor k is limited within the following:

- -40 dB < k < 0 dB.

The measured blocking level shall be stated in the test report

The manufacturer declare the BW is 20MHz,K=-20logf(Blocking Signal Frequency)-13.01.

TEST PROCEDURE



TEST CONFIGURATION

This measurement shall be conducted under normal conditions.
Two signal generators A and B shall be connected to the receiver via a combining network to the receiver, either:
a) via a test fixture or a test antenna to the receiver integrated, dedicated or test antenna; or
b) directly to the receiver permanent or temporary antenna connector.

The method of coupling to the receiver shall be stated in the test report.
Signal generator A shall be at the nominal frequency of the receiver, with normal modulation of the wanted signal.
Signal generator B shall be unmodulated and shall be adjusted to a test frequency at approximately 10 times, 20 times and 50 times of the occupied bandwidth above upper band edge of occupied bandwidth.
Initially signal generator B shall be switched off and using signal generator A the level which still gives sufficient response shall be established. The output level of generator A shall then be increased by 3 dB.
Signal generator B is then switched on and adjusted until the wanted criteria are met. This level shall be recorded.
The measurement shall be repeated with the test frequency for signal generator B at 10 times, 20 times and 50 times of the occupied bandwidth below the lower band edge of the occupied bandwidth.
The blocking or desensitization shall be recorded as the level in dBm of lowest level of the unwanted signal (generator B).
For tagging systems (e.g. RF identification, anti-theft, access control, location and similar systems) signal generator A may be replaced by a physical tag positioned at 70 % of the measured system range in metres. In this case, the blocking or desensitization shall be recorded as the ratio in dB of lowest level of the unwanted signal (generator B) resulting in a non-read of the tag. to the declared sensitivity of the receiver +3 dB.

TEST RESULTS

802.11a

Test Channel	BW(MHz)	Blocking Signal Frequency(MHz)	Blocking Signal Power Level (dBm)	Limit (dBm)	Result
149	20	5545(10 time channel bandwidth frequency offset)	-48.36	-72.88	PASS
		5345(20 time channel bandwidth frequency offset)	-49.15	-72.56	PASS
		4745(50 time channel bandwidth frequency offset)	-42.21	-71.53	PASS
165	20	6025(10 time channel bandwidth frequency offset)	-47.74	-73.60	PASS
		6225(20 time channel bandwidth frequency offset)	-46.52	-73.89	PASS
		6825(50 time channel bandwidth frequency offset)	-46.91	-74.69	PASS

802.11 n HT 20

Test Channel	BW(MHz)	Blocking Signal Frequency(MHz)	Blocking Signal Power Level (dBm)	Limit (dBm)	Result
149	20	5545(10 time channel bandwidth frequency offset)	-51.92	-72.88	PASS
		5345(20 time channel bandwidth frequency offset)	-44.68	-72.56	PASS
		4745(50 time channel bandwidth frequency offset)	-48.70	-71.53	PASS
165	20	6025(10 time channel bandwidth frequency offset)	-51.11	-73.60	PASS
		6225(20 time channel bandwidth frequency offset)	-49.08	-73.89	PASS
		6825(50 time channel bandwidth frequency offset)	-42.99	-74.69	PASS

802.11 n HT 40

Test Channel	BW(MHz)	Blocking Signal Frequency(MHz)	Blocking Signal Power Level (dBm)	Limit (dBm)	Result
151	40	5355(10 time channel bandwidth frequency offset)	-47.95	-75.59	PASS
		4955(20 time channel bandwidth frequency offset)	-50.30	-74.92	PASS
		3755(50 time channel bandwidth frequency offset)	-47.55	-73.51	PASS
159	40	6195(10 time channel bandwidth frequency offset)	-45.19	-76.86	PASS
		6595(20 time channel bandwidth frequency offset)	-48.31	-77.40	PASS
		7795(50 time channel bandwidth frequency offset)	-53.79	-77.66	PASS

802.11 ac HT 20

Test Channel	BW(MHz)	Blocking Signal Frequency(MHz)	Blocking Signal Power Level (dBm)	Limit (dBm)	Result
149	20	5545(10 time channel bandwidth frequency offset)	-46.35	-72.88	PASS
		5345(20 time channel bandwidth frequency offset)	-50.06	-72.56	PASS
		4745(50 time channel bandwidth frequency offset)	-51.07	-71.53	PASS
165	20	6025(10 time channel bandwidth frequency offset)	-48.23	-73.60	PASS
		6225(20 time channel bandwidth frequency offset)	-49.69	-73.89	PASS
		6825(50 time channel bandwidth frequency offset)	-51.52	-74.69	PASS

802.11 ac HT 40

Test Channel	BW(MHz)	Blocking Signal Frequency(MHz)	Blocking Signal Power Level (dBm)	Limit (dBm)	Result
151	40	5355(10 time channel bandwidth frequency offset)	-51.31	-75.59	PASS
		4955(20 time channel bandwidth frequency offset)	-50.93	-74.92	PASS
		3755(50 time channel bandwidth frequency offset)	-47.09	-72.51	PASS
159	40	6195(10 time channel bandwidth frequency offset)	-49.76	-76.86	PASS
		6595(20 time channel bandwidth frequency offset)	-43.19	-77.40	PASS
		7795(50 time channel bandwidth frequency offset)	-46.52	-77.66	PASS

802.11 ac HT 80

Test Channel	BW(MHz)	Blocking Signal Frequency(MHz)	Blocking Signal Power Level (dBm)	Limit (dBm)	Result
155	80	4975(10 time channel bandwidth frequency offset)	-51.98	-72.88	PASS
		3175(20 time channel bandwidth frequency offset)	-48.00	-72.56	PASS
		1775(50 time channel bandwidth frequency offset)	-43.89	-71.53	PASS
		6575(10 time channel bandwidth frequency offset)	-54.23	-73.60	PASS
		7375(20 time channel bandwidth frequency offset)	-49.91	-73.89	PASS
		9775(50 time channel bandwidth frequency offset)	-48.34	-74.69	PASS

4.8. Receiver Emissions

LIMIT

The power of any spurious emission shall not exceed 2 nW in the range 25 MHz to 1 GHz and shall not exceed 20 nW on frequencies above 1 GHz.

TEST CONFIGURATION

The same as described in section 4.4

TEST PROCEDURE

Method of measurement conducted spurious components

This requirement applies to all receivers. Spurious emission levels from a transmitter and receiver of full duplex equipment using a common port are measured simultaneously and the test only needs to be conducted once (see clause 4.2.4)."A test load, 50 Ω power attenuator, may be used to protect the measuring receiver (see clause 5.8.5) against damage when testing a receiver combined in one unit with a transmitter.
The measuring receiver used shall have sufficient dynamic range and sensitivity to achieve the required measurement accuracy at the specified limit. The bandwidth of the measuring receiver shall be adjusted until the sensitivity of the measuring receiver is at least 6 dB below the spurious emission limit given in clause 4.3.5.4. This bandwidth shall be recorded in the test report:
a) The receiver input terminals shall be connected to a measuring receiver having an input impedance of 50 Ω and the receiver is switched on.
b) For carrier frequencies in the range 1 GHz to 20 GHz the frequency of the measuring receiver shall be adjusted over the frequency range 25 MHz to 10 times the carrier frequency, not exceeding 40 GHz. For carrier frequencies above 20 GHz the measuring receiver shall be tuned over the range 25 MHz up to twice the carrier frequency not exceeding 66 GHz. The frequency and the absolute power level of each of the spurious components found shall be noted.
c) If the detecting device is not calibrated in terms of power input, the level of any detected components shall be determined by replacing the receiver by the signal generator and adjusting it to reproduce the frequency and level of every spurious component noted in step b). The absolute power level of each spurious component shall be noted.
d) The frequency and level of each spurious emission measured and the bandwidth of the measuring receiver shall be recorded in the test report.

Method of measurement cabinet radiation

This method of measurement applies to receivers having a permanent antenna connector:
a) A test site selected from Annex E which fulfils the requirements of the specified frequency range of this measurement shall be used. The test antenna shall be oriented initially for vertical polarization and connected to a measuring receiver. The bandwidth of the measuring receiver shall be adjusted until the sensitivity of the measuring receiver is at least 6 dB below the spurious emission limit given in clause 4.3.5.4. This bandwidth shall be recorded in the test report.
The receiver under test shall be placed on the support in its standard position and connected to an artificial antenna, see clause 5.8.2.
b) For carrier frequencies in the range 1 GHz to 20 GHz the frequency of the measuring receiver shall be adjusted over the frequency range 25 MHz to 10 times the carrier frequency, not exceeding 40 GHz. For carrier frequencies above 20 GHz the measuring receiver shall be tuned over the range 25 MHz up to twice the carrier frequency not exceeding 66 GHz. The frequency of each spurious component shall be noted. If the test site is disturbed by radiation coming from outside the site, this qualitative search may be performed in a screened room with reduced distance between the transmitter and the test antenna.
c) At each frequency at which a component has been detected, the measuring receiver shall be tuned and the test antenna shall be raised or lowered through the specified height range until the maximum signal level is detected on the measuring receiver.

d) The receiver shall be rotated up to 360° about a vertical axis, to maximize the received signal.
e) The test antenna shall be raised or lowered again through the specified height range until a maximum is obtained. This level shall be noted.
f) The substitution antenna (see clause E.3.2) shall replace the receiver antenna in the same position and in vertical polarization. It shall be connected to the signal generator.
g) At each frequency at which a component has been detected, the signal generator, substitution antenna and measuring receiver shall be tuned. The test antenna shall be raised or lowered through the specified height range until the maximum signal level is detected on the measuring receiver. The level of the signal generator giving the same signal level on the measuring receiver as in step e) shall be noted. This level, after correction due to the gain of the substitution antenna and the cable loss, is the radiated spurious component at this frequency.
h) The frequency and level of each spurious emission measured and the bandwidth of the measuring receiver shall be recorded in the test report.
i) Measurements b) to h) shall be repeated with the test antenna oriented in horizontal polarization.

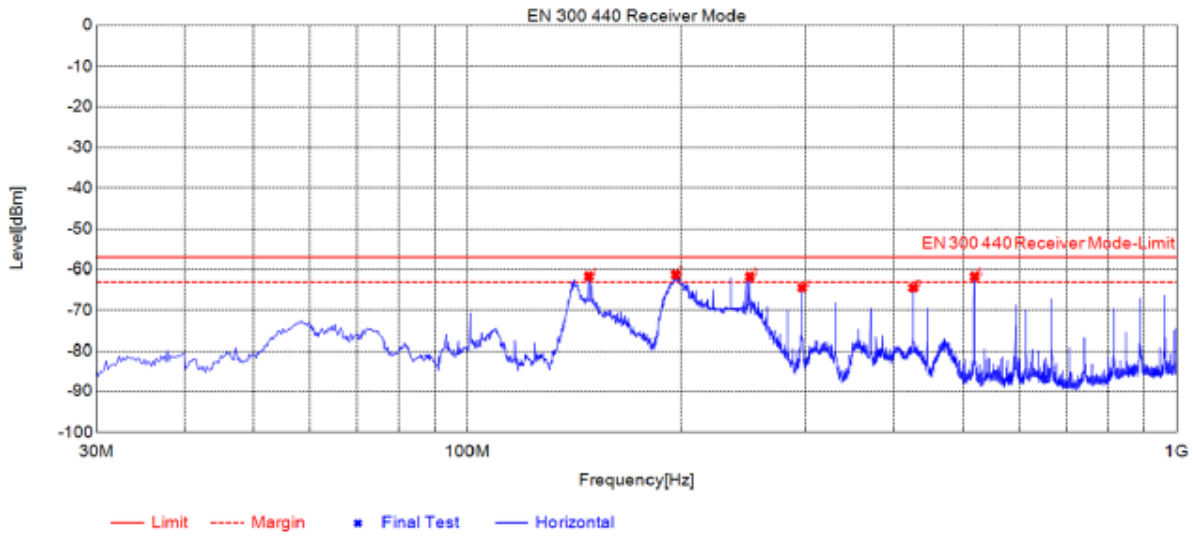
Method of measurement radiated spurious components
This method of measurement applies to receivers having an integral antenna.
a) A test site selected from Annex E which fulfils the requirements of the specified frequency range of this measurement shall be used. The test antenna shall be oriented initially for vertical polarization and connected to a measuring receiver. The bandwidth of the measuring receiver shall be adjusted until the sensitivity of the measuring receiver is at least 6 dB below the spurious emission limit given in clause 4.3.5.4. This bandwidth shall be recorded in the test report.
The receiver under test shall be placed on the support in its standard position.
b) The same method of measurement as items b) to i) of clause 4.3.5.3.2 shall apply.

TEST RESULTS

Remark: We tested at 802.11a/802.11n HT20/802.11n HT40/802.11ac HT20/802.11ac HT40 mode at the antenna single receiver mode and the Mimo mode, and recorded the worst case 802.11n HT 20 mode at the Mimo mode. The measurement frequency range is from 25MHz to the 10th harmonic of the fundamental frequency, not exceeding 40GHz.18GHz-40GHz not recorded for no spurious point have a margin of less than 6 dB with respect to the limits.

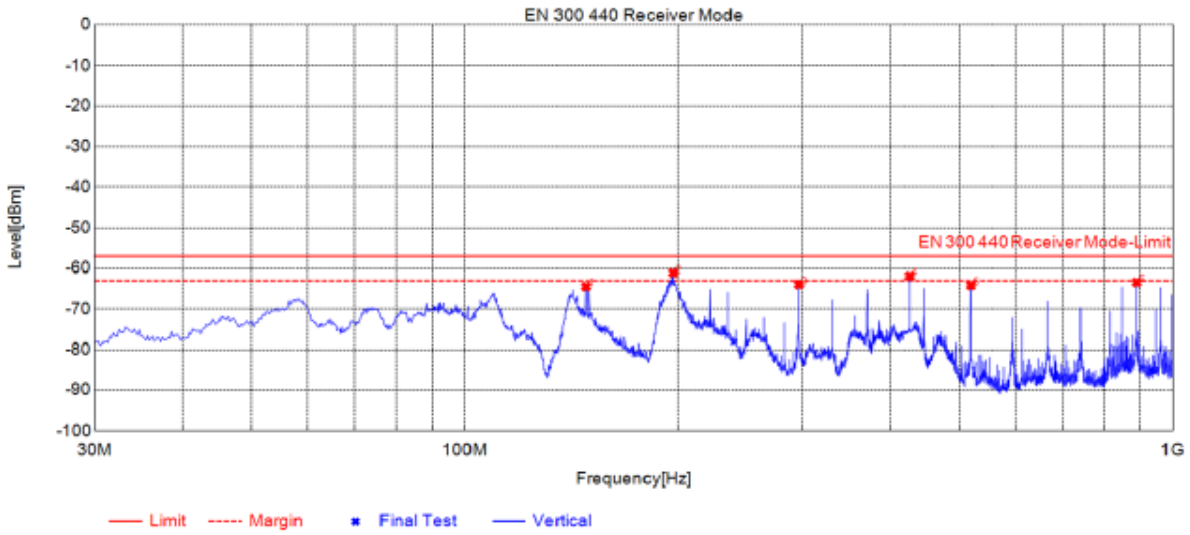
802.11n HT 20, CH 149, Horizontal/Vertical

Below 1GHz:



Suspected List

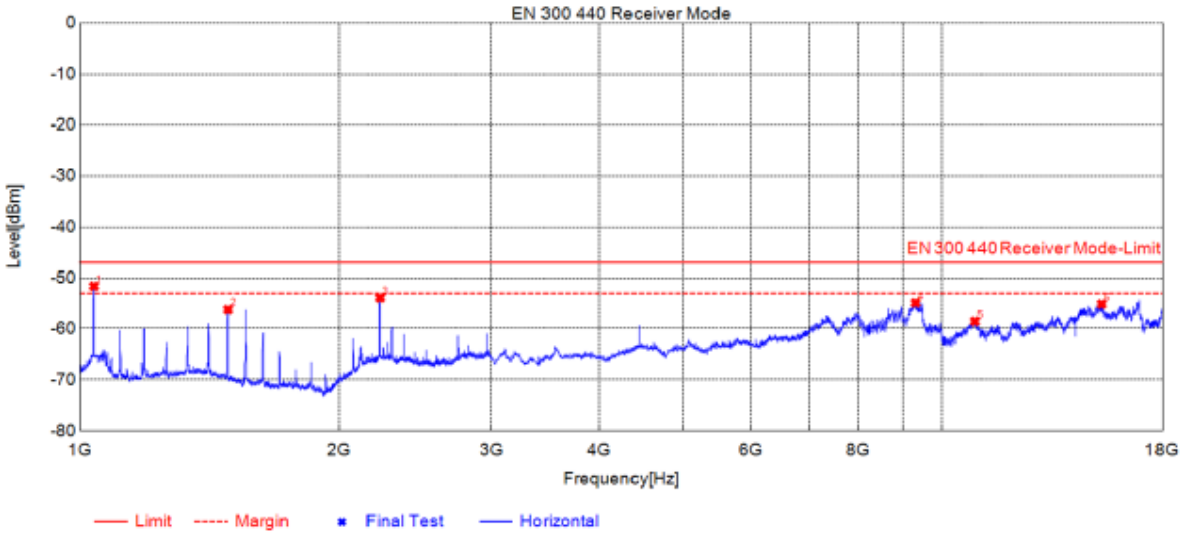
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	148.363	-63.77	-61.65	-57.00	4.65	2.12	Horizontal
2	196.679	-61.63	-61.26	-57.00	4.26	0.37	Horizontal
3	250.04	-67.91	-61.72	-57.00	4.72	6.19	Horizontal
4	296.997	-67.01	-64.41	-57.00	7.41	2.60	Horizontal
5	425.257	-68.32	-64.45	-57.00	7.45	3.87	Horizontal
6	519.754	-65.64	-61.70	-57.00	4.70	3.94	Horizontal



Suspected List

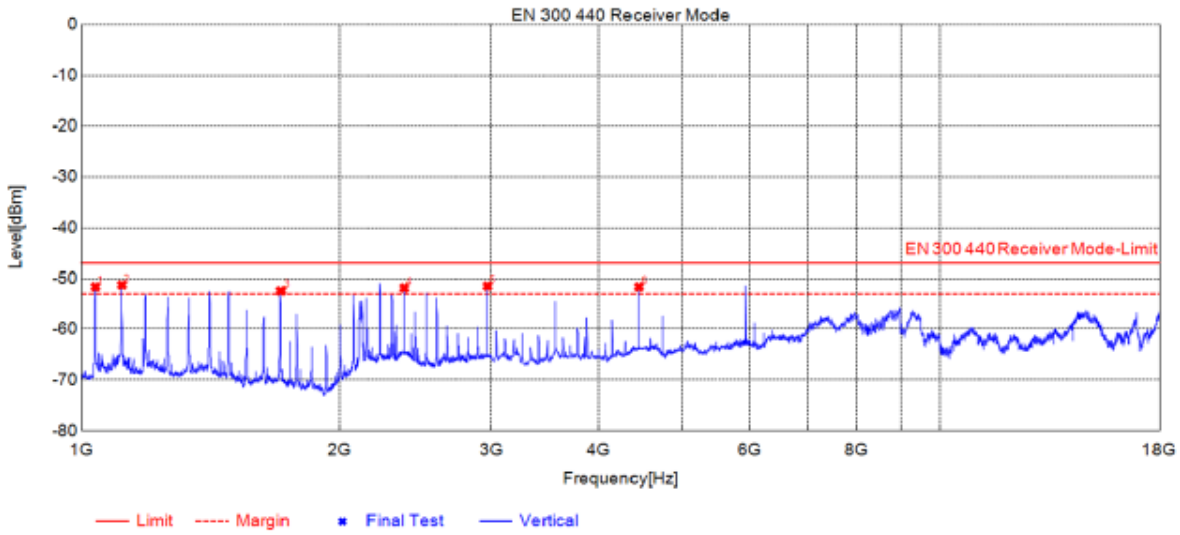
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	148.363	-63.47	-64.47	-57.00	7.47	-1.00	Vertical
2	197.067	-59.93	-61.14	-57.00	4.14	-1.21	Vertical
3	296.997	-64.50	-63.96	-57.00	6.96	0.54	Vertical
4	425.257	-64.53	-61.91	-57.00	4.91	2.62	Vertical
5	519.754	-67.45	-64.17	-57.00	7.17	3.28	Vertical
6	890.950	-72.71	-63.44	-57.00	6.44	9.27	Vertical

Above 1GHz:



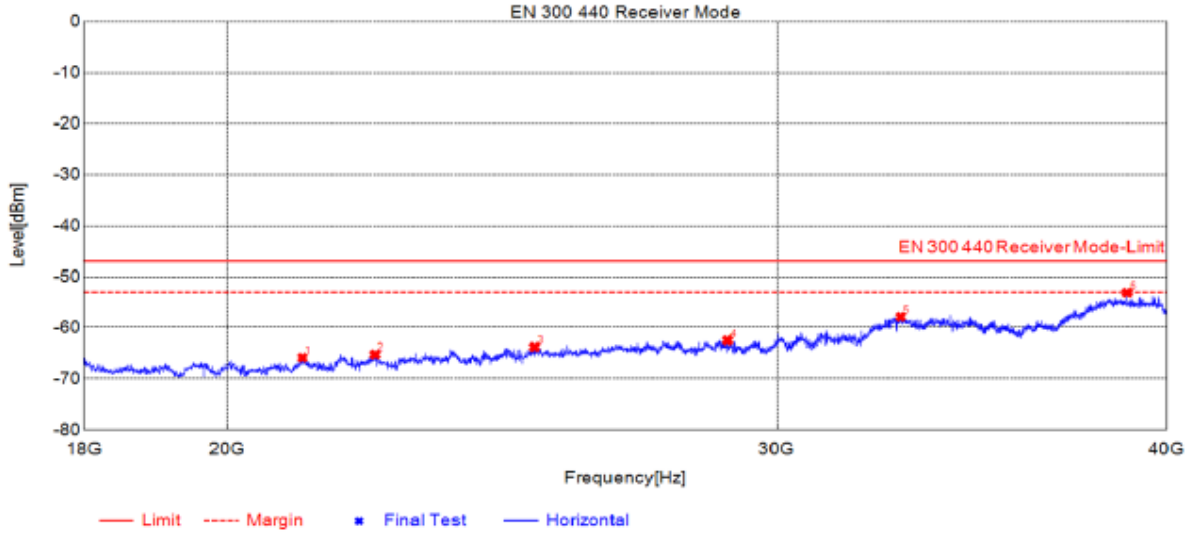
Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1039.20	-47.24	-51.59	-47.00	4.59	-4.35	Horizontal
2	1484.89	-51.98	-56.23	-47.00	9.23	-4.25	Horizontal
3	2227.44	-53.87	-53.92	-47.00	6.92	-0.05	Horizontal
4	9313.26	-69.23	-54.87	-47.00	7.87	14.36	Horizontal
5	10927.5	-74.94	-58.57	-47.00	11.57	16.37	Horizontal
6	15314.4	-76.69	-55.13	-47.00	8.13	21.56	Horizontal



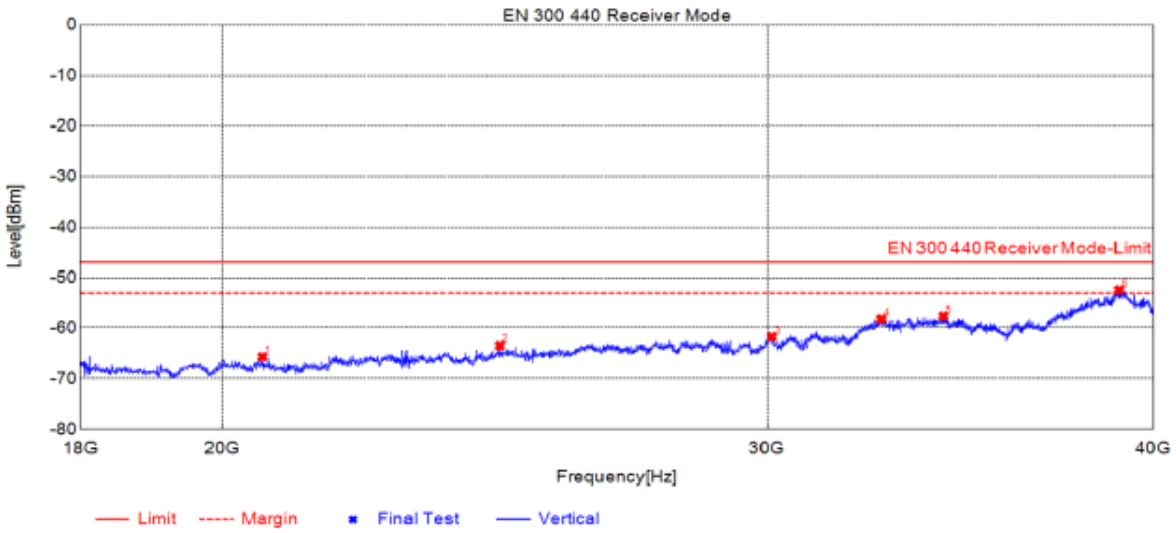
Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1039.20	-46.93	-51.62	-47.00	4.62	-4.69	Vertical
2	1113.62	-46.97	-51.26	-47.00	4.26	-4.29	Vertical
3	1707.34	-47.00	-52.43	-47.00	5.43	-5.43	Vertical
4	2375.87	-51.42	-51.82	-47.00	4.82	-0.40	Vertical
5	2969.99	-51.98	-51.46	-47.00	4.46	0.52	Vertical
6	4455.29	-54.50	-51.63	-47.00	4.63	2.87	Vertical



Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	21142.2	-71.14	-65.83	-47.00	18.83	5.31	Horizontal
2	22308.4	-70.94	-65.22	-47.00	18.22	5.72	Horizontal
3	25094.2	-70.15	-63.79	-47.00	16.79	6.36	Horizontal
4	28931.7	-71.47	-62.48	-47.00	15.48	8.99	Horizontal
5	32866.1	-68.66	-57.89	-47.00	10.89	10.77	Horizontal
6	38846.9	-64.25	-53.11	-47.00	6.11	11.14	Horizontal

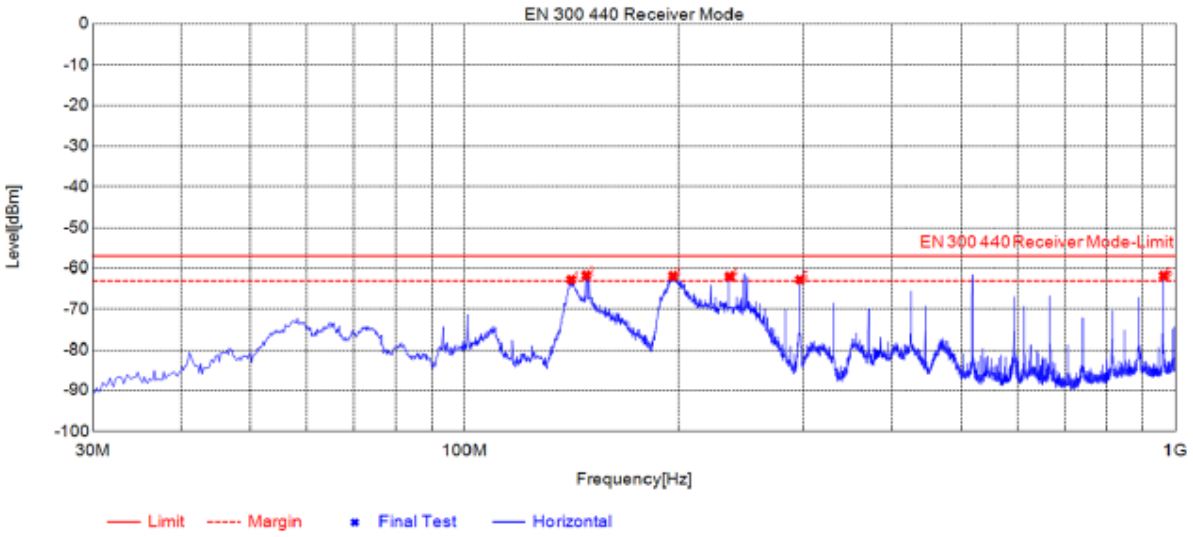


Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	20609.7	-71.51	-65.64	-47.00	18.64	5.87	Vertical
2	24592.5	-69.35	-63.49	-47.00	16.49	5.86	Vertical
3	30106.8	-70.80	-61.78	-47.00	14.78	9.02	Vertical
4	32668.1	-68.79	-58.23	-47.00	11.23	10.56	Vertical
5	34212.8	-68.16	-57.66	-47.00	10.66	10.50	Vertical
6	38992.1	-63.81	-52.42	-47.00	5.42	11.39	Vertical

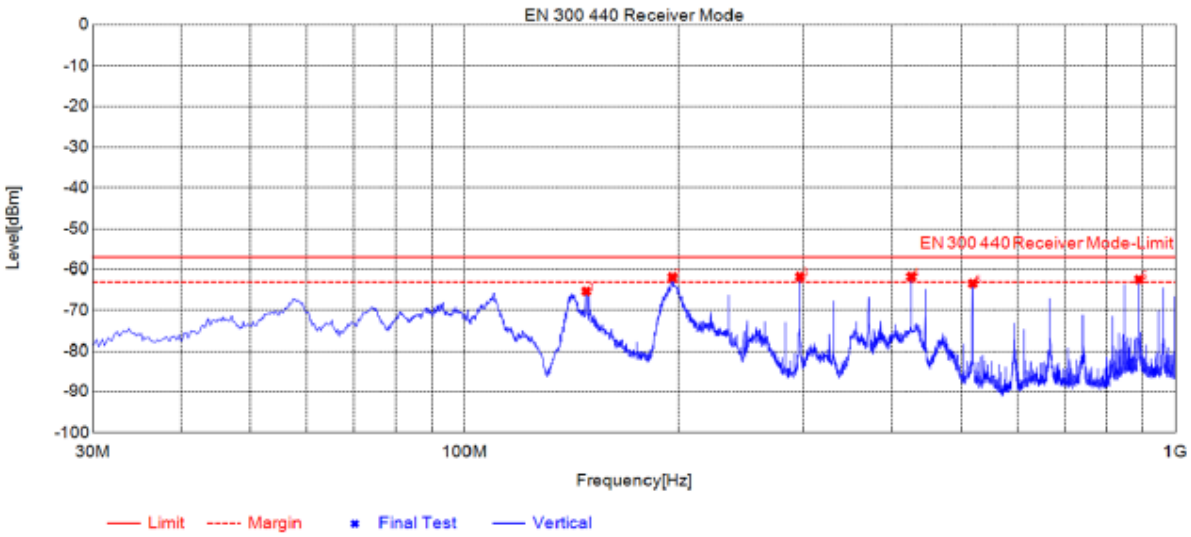
802.11n HT 20, CH 165, Horizontal/Vertical

Below 1GHz:



Suspected List

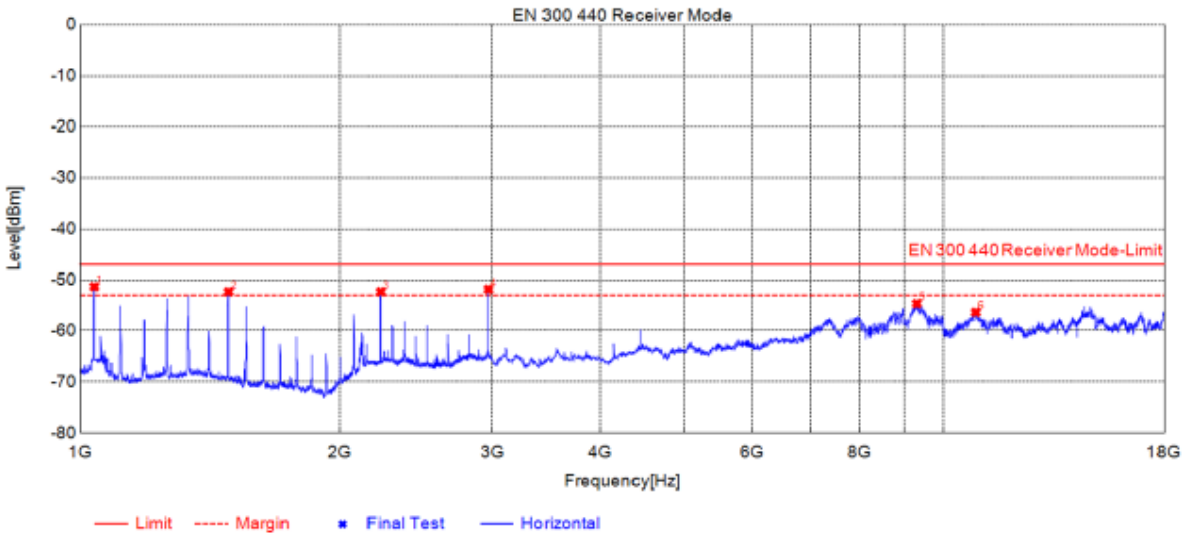
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	141.184	-63.08	-62.69	-57.00	5.69	0.39	Horizontal
2	148.363	-63.83	-61.71	-57.00	4.71	2.12	Horizontal
3	196.485	-62.16	-61.84	-57.00	4.84	0.32	Horizontal
4	236.263	-65.74	-61.96	-57.00	4.96	3.78	Horizontal
5	296.997	-65.32	-62.72	-57.00	5.72	2.60	Horizontal
6	965.267	-71.84	-61.78	-57.00	4.78	10.06	Horizontal



Suspected List

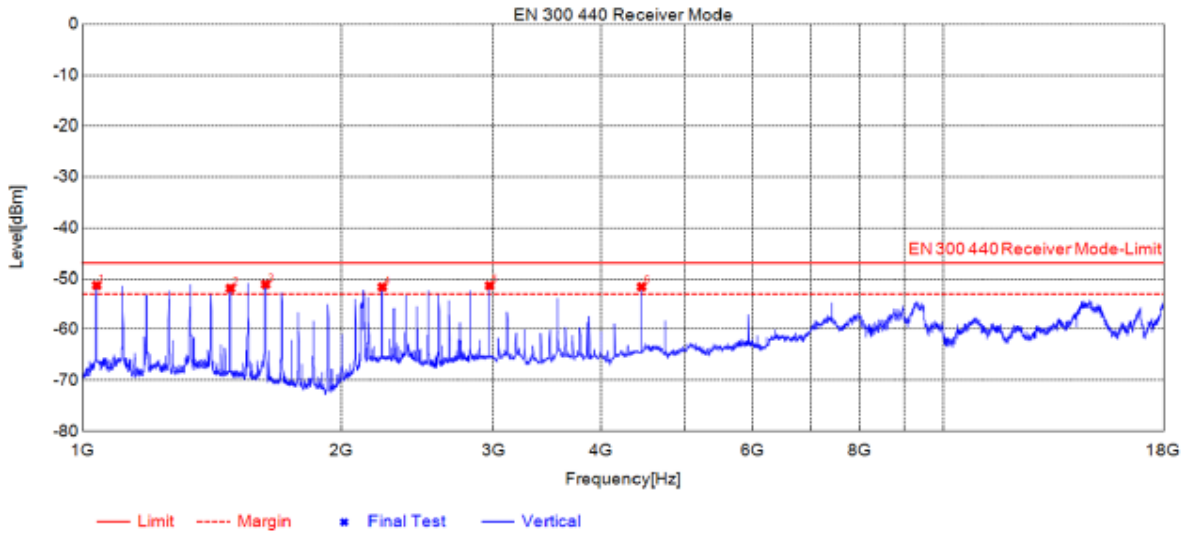
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	148.363	-64.29	-65.29	-57.00	8.29	-1.00	Vertical
2	196.097	-60.53	-61.85	-57.00	4.85	-1.32	Vertical
3	296.997	-62.30	-61.76	-57.00	4.76	0.54	Vertical
4	425.257	-64.37	-61.75	-57.00	4.75	2.62	Vertical
5	519.754	-66.62	-63.34	-57.00	6.34	3.28	Vertical
6	890.950	-71.64	-62.37	-57.00	5.37	9.27	Vertical

Above 1GHz:



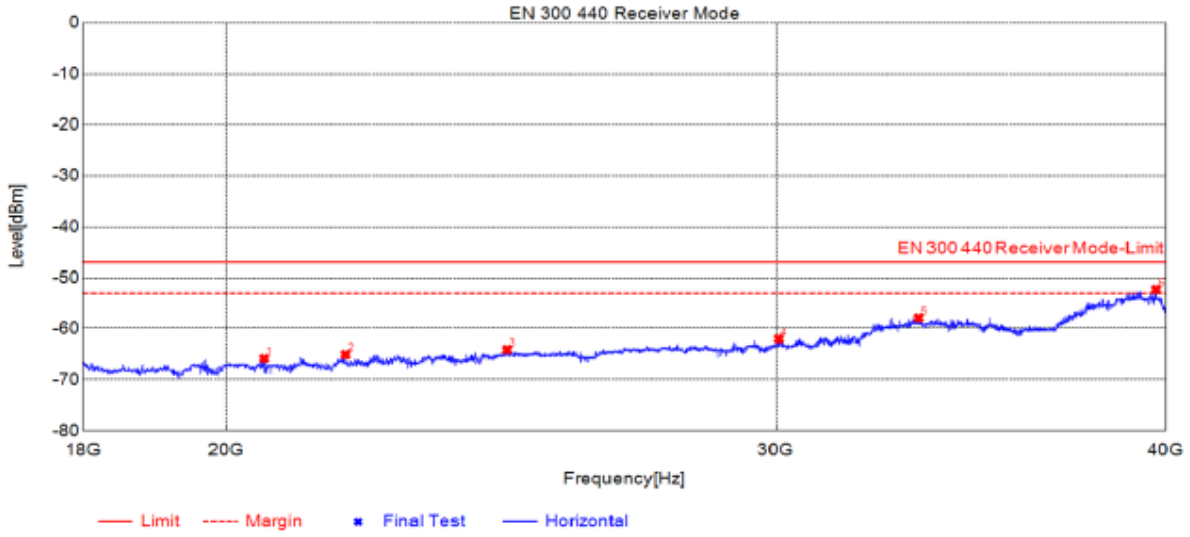
Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1039.20	-46.96	-51.31	-47.00	4.31	-4.35	Horizontal
2	1484.89	-48.06	-52.31	-47.00	5.31	-4.25	Horizontal
3	2227.44	-52.25	-52.30	-47.00	5.30	-0.05	Horizontal
4	2969.99	-52.37	-51.81	-47.00	4.81	0.56	Horizontal
5	9307.26	-69.03	-54.66	-47.00	7.66	14.37	Horizontal
6	10909.5	-72.78	-56.36	-47.00	9.36	16.42	Horizontal



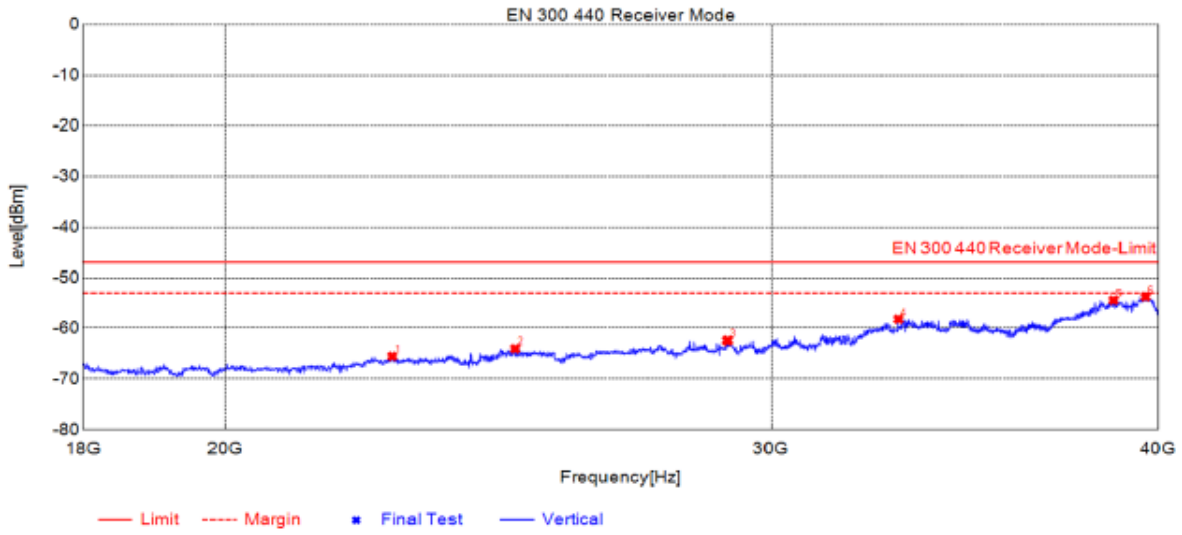
Suspected List

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1039.60	-46.59	-51.28	-47.00	4.28	-4.69	Vertical
2	1484.89	-47.13	-51.85	-47.00	4.85	-4.72	Vertical
3	1633.32	-45.89	-51.08	-47.00	4.08	-5.19	Vertical
4	2227.44	-51.47	-51.61	-47.00	4.61	-0.14	Vertical
5	2969.99	-51.85	-51.33	-47.00	4.33	0.52	Vertical
6	4455.29	-54.44	-51.57	-47.00	4.57	2.87	Vertical



Suspected List

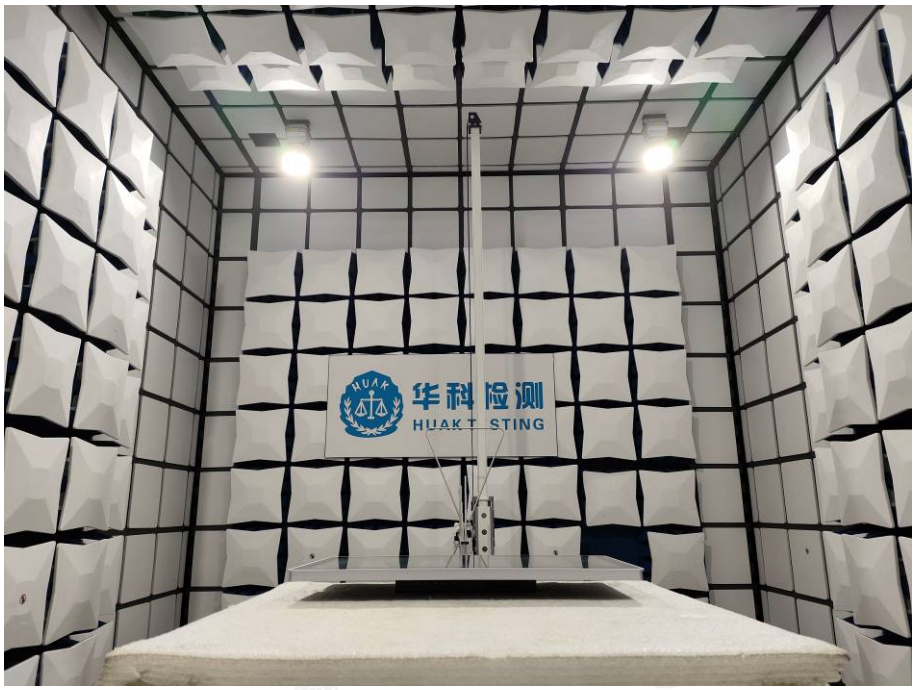
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	20570.1	-71.72	-65.82	-47.00	18.82	5.90	Horizontal
2	21841.9	-70.63	-65.03	-47.00	18.03	5.60	Horizontal
3	24605.7	-69.93	-64.06	-47.00	17.06	5.87	Horizontal
4	30062.8	-70.99	-62.02	-47.00	15.02	8.97	Horizontal
5	33337.0	-68.87	-57.94	-47.00	10.94	10.93	Horizontal
6	39718.3	-63.59	-52.26	-47.00	5.26	11.33	Horizontal

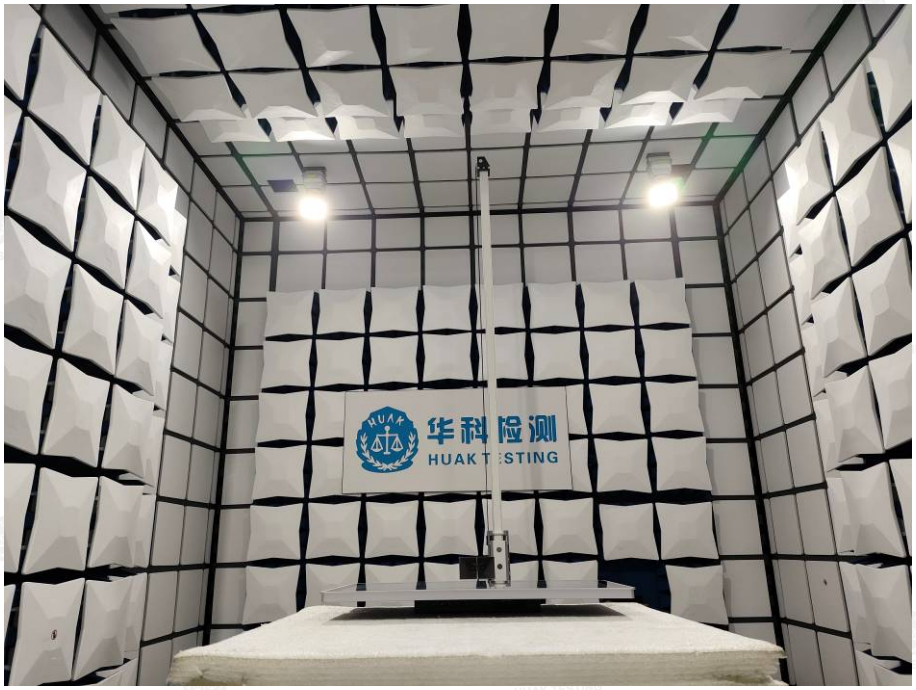


Suspected List

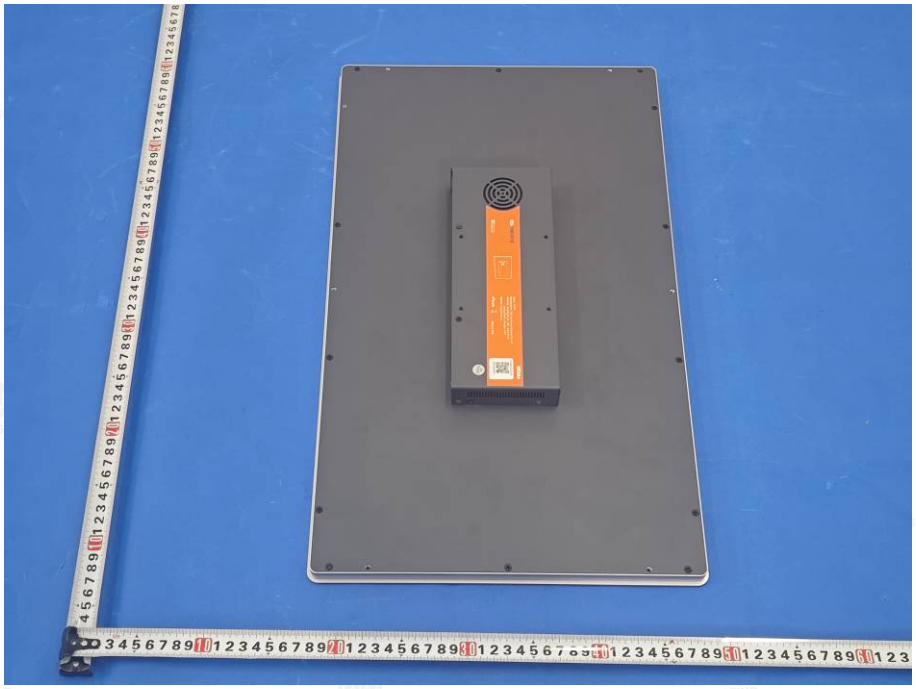
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	22647.3	-71.07	-65.49	-47.00	18.49	5.58	Vertical
2	24812.5	-70.14	-63.98	-47.00	16.98	6.16	Vertical
3	29046.2	-71.45	-62.43	-47.00	15.43	9.02	Vertical
4	32976.1	-69.16	-58.23	-47.00	11.23	10.93	Vertical
5	38697.3	-65.33	-54.44	-47.00	7.44	10.89	Vertical
6	39625.9	-65.09	-53.75	-47.00	6.75	11.34	Vertical

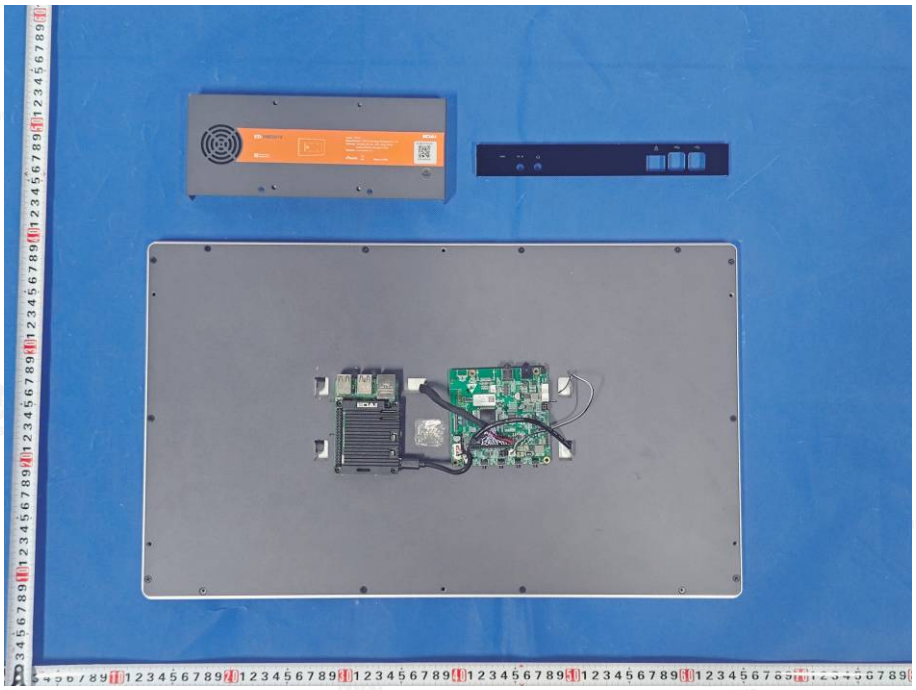
5. Test Setup Photos of the EUT

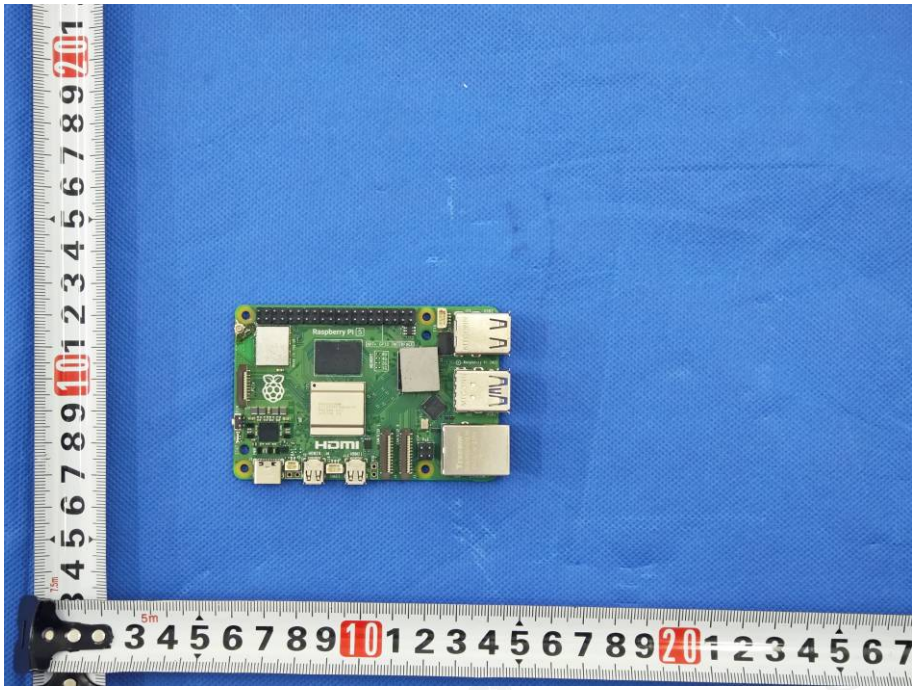


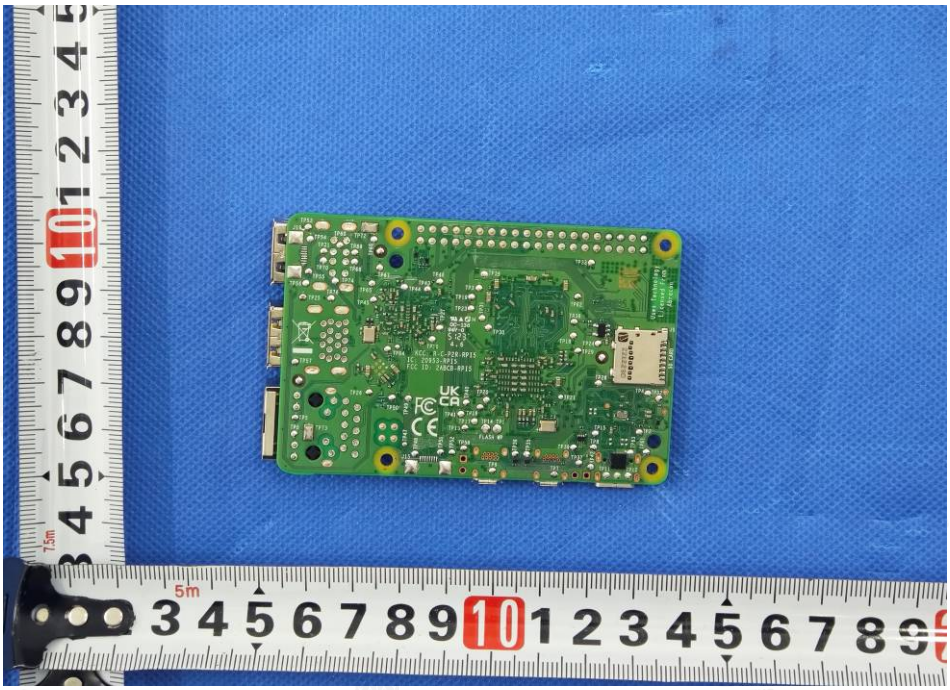


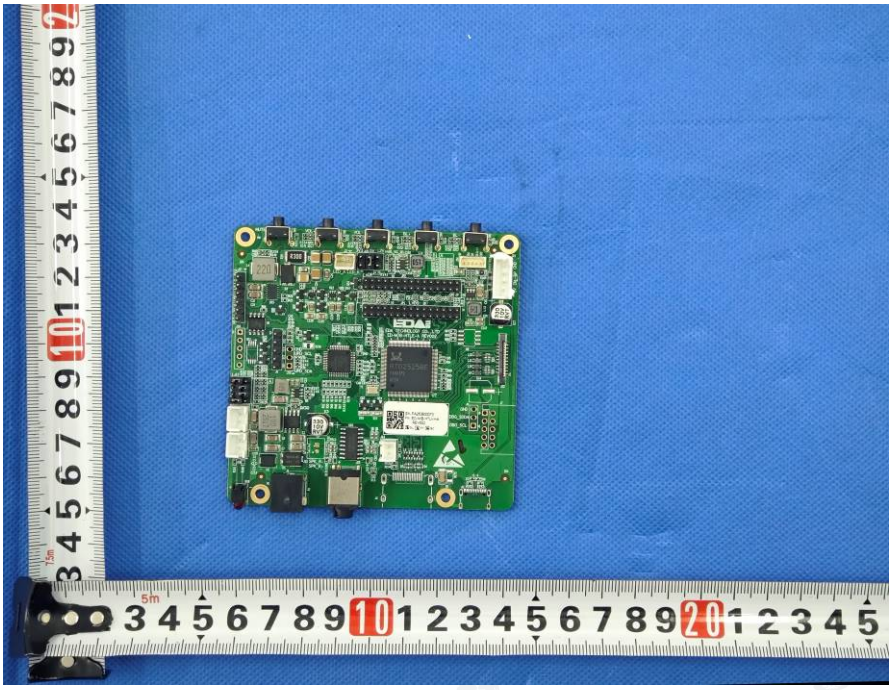
6. External and Internal Photos of the EUT

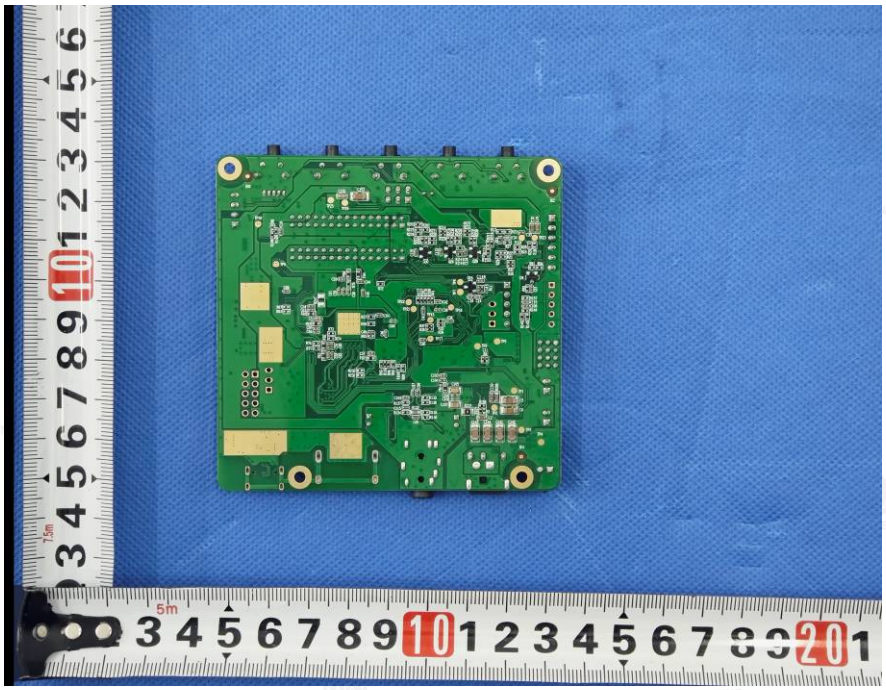












.....End of Report.....