



TEST REPORT

EUT Description WLAN and BT, 2x2 PCle M.2 1216 adapter card

Brand Name Intel®

Model Name BE201D2WP

IC ID 1000M-BE201D2P

Date of Test Start/End 2024-06-07 / 2024-06-15

Features 2x2 WiFi - Bluetooth®

(see section 5)

Applicant Intel Corporation SAS

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RSS-247 issue 3, RSS-Gen issue 5 - A1

Reference Standards RSS-248 issue 2 (see section 1)

Test Report identification 240521-02.TR21

Rev. 00

Revision Control This test report revision replaces any previous test report revision

(see section 8)

The test results relate only to the samples tested.

Reference to accreditation shall be used only by full reproduction of test report

Issued by Reviewed by

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Table of Contents

1.	Stan	dards, reference documents and applicable test methods	3
2.	Gene	eral conditions, competences and guarantees	3
		ronmental Conditions	
		samples	
		·	
		Features	
6.	Rem	arks and comments	5
7.	Test	Verdicts summary	6
8.	Docu	ıment Revision History	6
Annex	Α.	Test & System Description	7
A.1	ME	ASUREMENT SYSTEM	7
A.2		ST EQUIPMENT LIST	
A.3		ASUREMENT UNCERTAINTY EVALUATION	
Annex	В.	Test Results	11
B.1	TE	ST CONDITION	11
B.2		DIATED SPURIOUS EMISSION	
В.:	2.1	DTS	12
В.:	2.2	BLE	14
В.:	2.3	BT	
В.:	2.4	U-NII-1	
В.:	2.5	U-NII-2A	20
B.:	2.6	U-NII-2C	22
B.:	2.7	U-NII-3	24
B.:	2.8	U-NII-4	26
B.:	2.9	U-NII-5 to U-NII-8	28
Annex	C.	Photographs	31
C.1	TE:	ST SETUP	31
C 2	TE	ST SAMPLE	32

ISED

1. Standards, reference documents and applicable test methods

1. RSS-Gen Issue 5 Amendment 1 - General Requirements for Compliance of Radio Apparatus.

- RSS-247 Issue 3 Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices.
- 3. RSS-248 Issue 2 Radio Local Area Network (RLAN) Devices Operating in the 5925-7125 MHz Band
- 4. FCC OET KDB 558074 D01 v05r02 Guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules.
- 5. FCC OET KDB 789033 D02 v02r01 General U-NII Test Procedures New Rules Guidelines for compliance testing of Unlicensed National Information Infrastructure (U-NII) Devices (Part 15, Subpart E)
- 6. FCC OET KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
- 7. FCC OET KDB 987594 D01 U-NII 6GHz General Requirements v02r01
- FCC OET KDB 987594 D02 U-NII 6 GHz EMC Measurement v02r01
- 9. FCC OET KDB 987594 D03 U-NII 6 GHz QA v02
- 10. ANSI C63.10-2020 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

2. General conditions, competences and guarantees.

- ✓ Tests performed under ISED standards identified in section 1 are covered by Cofrac accreditation.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an ISO/IEC 17025:2017 testing laboratory accredited by the French Committee for Accreditation (Cofrac) with the certificate number 1-6736.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is a Registered Test Site listed by ISED, with ISED company number 1000Y and CAB identifier FR0005.
- ✓ Intel WRF Lab only provides testing services and is committed to providing reliable, unbiased test results and interpretations.
- ✓ Intel WRF Lab is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.
- ✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.
- ✓ This report is only referred to the item that has undergone the test.
- ✓ This report does not imply an approval of the product by the Certification Bodies or competent Authorities.



3. Environmental Conditions

✓ At the site where the measurements were performed the following limits were not exceeded during the tests:

Temperature	22.1°C ± 1.2°C
Humidity	56.0% ± 4.2%

4. Test samples

Sample	Control #	Description	Model	Serial #	Date of receipt	Note
	240521-02.S05	Wifi 7 Module	BE201D2WP	F8FE5ECDC9B3	2024-05-22	
	220225-03.S07	Microwave Absorber	Eccosorb BSR-1	-	2022-03-14	
	231109-03.S48	Adaptor	PCB00866-00_A	124627	2023-11-24	
	200611-03.S31	Extender	ADEXELEC	-	2020-08-19	
	200504-04.S07	Laptop	Latitude 5401	BVHLK13	2020-06-02	
	220117-04.S18	Antenna 2.4GHz	ANT24-M624-00	-	2022-04-21	
#01	220117-04.S19	Antenna 2.4GHz	ANT24-M624-00	-	2022-04-21	Used for Radiated Spurious Emissions
	220117-04.S22	Antenna 5GHz	ANT24-M855-00	-	2022-04-21	tests
	220117-04.S23	Antenna 5GHz	ANT24-M855-00	-	2022-04-21	
	220117-04.S28	Antenna 6GHz	ANT24-M865-00	-	2022-04-21	
	220117-04.S29	Antenna 6GHz	ANT24-M865-00	-	2022-04-21	
	231120-05.S21	WiFi 7 Module	BE201D2WP	F8FE5CDCA49	2024-02-07	
	180001-01.S21	Socket	1216SD to M.2	-	2021-06-07	
	240521-02.S04	Wifi 7 Module	BE201D2WP	F8FE5ECDCA08	2024-05-22	
	220225-03.S07	Microwave Absorber	Eccosorb BSR-1	-	2022-03-14	
	231109-03.S47	Adaptor	PCB00866-00_A	124727	2023-11-24	
	220915-09.S01	Extender	ADEXELEC	-	2022-04-06	
	200611-03.S30	Laptop	Latitude 5401	6DJLK13	2020-08-19	
	220117-04.S18	Antenna 2.4GHz	ANT24-M624-00	-	2022-04-21	Used for Radiated
#02	220117-04.S19	Antenna 2.4GHz	ANT24-M624-00	-	2022-04-21	Spurious Emissions tests
	220117-04.S22	Antenna 5GHz	ANT24-M855-00	-	2022-04-21	
	220117-04.S23	Antenna 5GHz	ANT24-M855-00	-	2022-04-21	
	220117-04.S28	Antenna 6GHz	ANT24-M865-00	-	2022-04-21	
	220117-04.S29	Antenna 6GHz	ANT24-M865-00	-	2022-04-21	
	231120-05.S20	WiFi 7 Module	BE201D2WP	F8FE5CDCA49	2024-02-07	
	180001-01.S21	Socket	1216SD to M.2	-	2021-06-07	

5. EUT Features

The herein information is provided by the customer.

Intel WRF Lab declines any responsibility for the accuracy of the stated customer provided information, especially if it has any impact on the correctness of test results presented in this report.

Brand Name	Intel®				
Model Name	BE201D2WP				
Software Version	DRTU.05726.99.0.86				
Driver Version	99.0.86.3				
Prototype / Production	Production				
	802.11b/g/n/ax/be	2.4GHz			
	802.11a/n/ac/ax/be	5.2GHz			
Supported Radios	5.6GHz 5.8GHz				
	802.11ax/be 6.0GHz				
	Bluetooth 2.4GHz				
	Transmitter	Chain A (1)	Chain B (2)		
	Manufacturer	Intel	Intel		
	Antenna type	Monopole	Monopole		
Additional information	Part Number	ANT24-M624-00 ANT24-M855-00 ANT24-M865-00	ANT24-M624-00 ANT24-M855-00 ANT24-M865-00		
	Declared Antenna gain (dBi) - 2.4GHz	6.11	6.11		
	Declared Antenna gain (dBi) – 5GHz	7.91	7.91		
	Declared Antenna gain (dBi) – 6 GHz	7.75	7.75		

6. Remarks and comments

- 1. The low, mid, high channels were tested for each RF chain (A, B or A+B), bandwidth, modulation and sub-band. Only the worst case among the low, mid, and high channels per sub-band has been reported.
- 2. At customer request, Radiated tests were carried out at higher Tx Power vs nominal declared power.



7. Test Verdicts summary

The statement of conformity to applicable standards in the table below are based on the measured values, without taking into account the measurement uncertainties.

	RSS part	Test name	Verdict
802.11 b/g/n/ax/be-2.4GHz	RSS-247 Clause 5.5 RSS-Gen A1 Clause 8.9	Spurious Emission (radiated)	Р
BLE	RSS-247 Clause 5.5 RSS-GEN A1 Clause 8.9	Spurious Emission (radiated)	Р
ВТ	RSS-247 Clause 5.5 RSS-GEN A1 Clause 8.9	Spurious Emission (radiated)	Р
802.11 a/n/ac/ax/be – U-NII-1	RSS-247 Clause 6.2.1.2 RSS-GEN A1, Clause 8.9	Spurious Emission (radiated)	Р
802.11 a/n/ac/ax/be - U-NII-2A	RSS-247 Clause 6.2.2.2 RSS-GEN A1, Clause 8.9	Spurious Emission (radiated)	Р
802.11 a/n/ac/ax/be - U-NII-2C	RSS-247 Clause 6.2.3.2 RSS-GEN A1 Clause 8.9	Spurious Emission (radiated)	Р
802.11 a/n/ac/ax/be – U-NII- 3	RSS-247 Clause 6.2.4.2 RSS-GEN A1 Clause 8.9	Spurious Emission (radiated)	Р
802.11 a/n/ac/ax/be – U-NII- 4	RSS-247 Clause 6.2.5.3 RSS-GEN A1 Clause 8.9	Spurious Emission (radiated)	Р
802.11 ax/be – UNII-5 to 8	RSS-248 Clause 4.6.2 RSS-GEN A1 Clause 8.1 RSS-GEN A1 Clause 8.9	Spurious Emission (radiated)	Р

P: Pass F: Fail

NM: Not Measured NA: Not Applicable

8. Document Revision History

Revision #	Modified by	Revision Details
Rev. 00	R.SIMONINI	First Issue

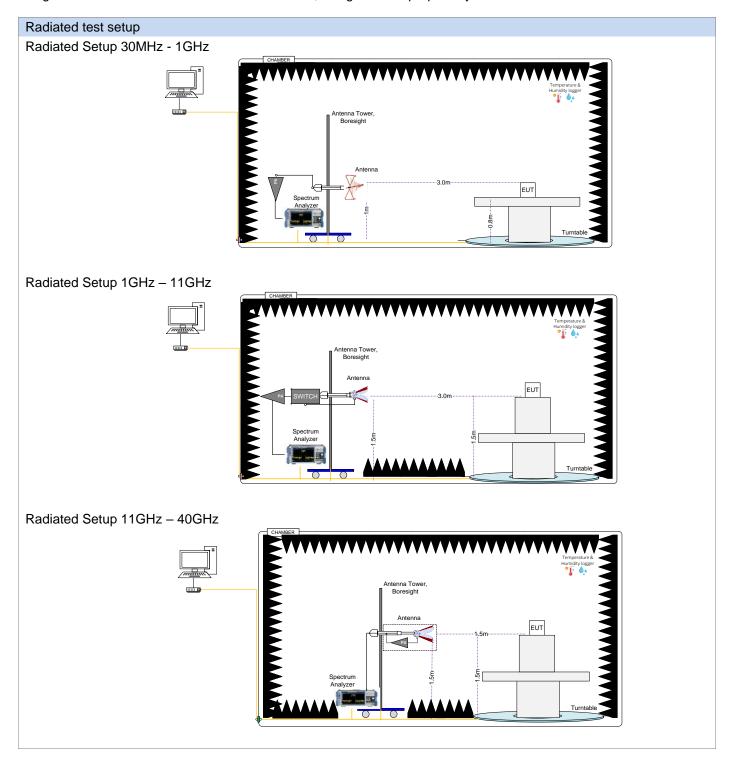


Annex A. Test & System Description

A.1 Measurement System

Measurements were performed using the following setups, made in accordance to the general provisions of FCC KDB 789033 D02 General DTS,UNII,6GHz Test Procedures.

The DUT was installed in a test fixture and this test fixture is connected to a laptop computer and AC/DC power adapter. The laptop computer was used to configure the EUT to continuously transmit at a specified output power using all different modes and modulation schemes, using the Intel proprietary tool DRTU.





Sample Calculation

The spurious received voltage $V(dB\mu V)$ in the spectrum Analyzer is converted to Electric field strength using the transducer factor F corresponding to the Rx path Loss:

F (dB/m)= Rx Antenna Factor (dB/m) + Cable losses (dB) – Amplifiers Gain (dBi)
**E (dB
$$\mu$$
V/m) =** V(dB μ V) + F (dB/m)

For field strength measurements made at other than the distance at which the applicable limit is specified, the field strength of the emission at the distance specified by the limit is deduced as follows:

$$E_{SpecLimit} = E_{Meas} + 20*log(D_{Meas}/D_{SpecLimit})$$

where

ESpecLimit is the field strength of the emission at the distance specified by the limit, in dBμV/m EMeas is the field strength of the emission at the measurement distance, in dBμV/m DMeas is the measurement distance, in m DSpecLimit is the distance specified by the limit, in m

A.2 Test Equipment List

Radiated Setup #1

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
006-000	Anechoic Chamber	FACT3	5720	ETS-Lindgren	2024-01-17	2026-01-17
006-008	Measurement SW, v11.30	EMC32	100623	Rohde & Schwarz	N/A	N/A
259-000	Temp & Humidity Logger	RA12E-TH- RAS	RA12-B9BD70	Avtech	2022-06-27	2024-06-27
006-001	Turn Table	ETS	-	ETS-Lindgren	N/A	N/A
006-011	Boresight antenna mast	BAM 4.0-P	P/278/2890.01	Maturo	N/A	N/A
057-000	Double Horn Ridged antenna	3117	167062	ETS-Lindgren	2022-07-08	2024-07-08
058-000	Double Horn Ridged antenna	3116C	157511	ETS-Lindgren	2022-10-21	2024-10-21
006-061	Bi-Log Periodic antenna	CBL6143A	61382	Teseq	2022-10-24	2024-10-24
147-000	Spectrum analyzer	FSW43	101847	Rohde & Schwarz	2022-11-30	2024-11-30
301-000	Amplifier 9kHz-1300MHz	8447F	3113A07440	HP	2024-03-19	2025-03-19
261-000	Amplifier 1GHz-18GHz	3117-PA	00157993	ETS-Lindgren	2024-03-14	2025-03-14
502-006	Amplifier 0.5GHz-40GHz	DEPA0540-43	2023A05	Diamond Engineering	2024-03-19	2025-03-19
009-007	RF Filter	ZHSS-k11G+	8493 1831830	Mini-Circuits	2024-03-19	2025-03-19
006-068	RF Switch	RC-2SP6T-40	02112090061	Micro-Circuits	2024-03-14	2025-03-14
006-066	Cable 7m – 25MHz to 40GHz	R286304174	20.46.370	Radiall	2024-03-14	2025-03-14
006-063	Cable 30cm – 1GHz to 40GHz	PE371-12	=	Pasternack	2024-03-14	2025-03-14
006-064	Cable 30cm – 1GHz to 40GHz	PE371-12	-	Pasternack	2024-03-14	2025-03-14
006-065	Cable 60cm – 25MHz to 1GHz	PE300-24	-	Pasternack	2024-03-12	2025-03-12

N/A: Not Applicable

Radiated Setup #2

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
007-000	Anechoic chamber	RFD-FA-100	5996	ETS Lindgren	2024-01-18	2026-01-18
127-000	Spectrum Analyzer	FSV40	101358	Rohde & Schwarz	2023-01-27	2025-01-27
007-007	Double Ridge Horn (1- 18GHz)	3117	00152266	ETS Lindgren	2024-03-26	2026-03-26
007-006	Switch & Positioner	EMCenter	00151232	ETS Lindgren	N/A	N/A
059-000	Double Ridge Horn (1- 18GHz)	3117	201542	ETS-Lindgren	2023-09-26	2025-09-26
264-000	Amplifier 1GHz-18GHz	3117-PA	00169546	ETS-Lindgren	2024-03-14	2025-03-14
007-011	RF Cable 1-18GHz - 6.5m	140-8500-11-51	001	Atem	2024-03-15	2025-03-15
007-005	Measurement SW, v11.20.00	EMC32	100401	Rohde & Schwarz	N/A	N/A
007-003	Antenna Tower	2171B-3.0M	00150123	ETS Lindgren	N/A	N/A
007-002	Turntable	-	-	ETS Lindgren	N/A	N/A
007-022	RF Cable 1-18GHz, 1.5m	0501050991200GX	19.23.493	Radiall	2024-03-12	2025-03-12
007-015	RF Cable 1GHz-18GHz 1.5m	-	-	Spirent	2024-03-12	2025-03-12
007-018	RF Cable 1-9.5GHz 1.2m	0500990991200KE	=	Radiall	2024-03-12	2025-03-12
007-020	RF Cable 1-18GHz, 1.2 m	2301761761200PJ	12.22.1104	Radiall	2024-03-15	2025-03-15
349-000	Temp & Humidity Logger	RA12E-TH1-RAS	RA12-D4F8C3	Avtech	2023-11-30	2025-11-30

N/A: Not Applicable

Test Report N° 240521-02.TR21

Shared Radiated Equipment

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
412-000	DRTU Power finder V2.1	-	-	Intel	NA	NA
139-000	Power Sensor	NRP-Z81	104383	Rohde & Schwarz	2023-04-21	2025-04-21
061-000	Power Sensor	NRP-Z81	104386	Rohde & Schwarz	2024-04-09	2026-04-09
140-000	Power Sensor	NRP-Z81	104382	Rohde & Schwarz	2024-04-04	2026-04-04

N/A: Not Applicable

A.3 Measurement Uncertainty Evaluation

The system uncertainty evaluation is shown in the table below with a coverage factor of k = 2 to indicate a 95% level of confidence:

Measurement type	Uncertainty	Unit
Radiated tests <1GHz	±6.23	dB
Radiated tests 1GHz – 40 GHz	±6.40	dB



Annex B. Test Results

B.1 Test Condition

For 802.11b, g and a mode the EUT can transmit at both CHAIN A and CHAIN B RF outputs individually, but not simultaneously.

For 802.11n20 & 802.11ax/be20 (20 MHz channel bandwidth), 802.11n40 & 802.11ax/be40 (40MHz channel bandwidth), 802.11ac80 & 802.11ax/be80 (80MHz channel bandwidth), 802.11ac160 & 802.11ax/be160 (160MHz channel bandwidth) and 802.11be320 (320MHz channel bandwidth) modes the EUT can transmit at both CHAIN A and CHAIN B RF outputs individually, and also simultaneously.

The following data rates were selected based on preliminary testing that identified those rates as the worst cases for the spurious level:

Transmission	Mode	Bandwidth (MHz)	Worst Case Data Rate
	802.11b	20	1Mbps
	802.11g, a	20	6Mbps
	002.445	20	HT0
	802.11n	40	HT0
	000 4400	80	VHT0
SISO	802.11ac	160	VHT0
	802.11ax/be	20	MCS0
		40	MCS0
		80	MCS0
		160	MCS0
	802.11be	320	MCS0
	802.11n	20/40	HT8
MIMO	802.11ac	80/160	VHT0
MIMO	802.11ax/be	20/40/80/160	MCS0
	802.11be	320	MCS0

B.2 Radiated spurious emission

The herein test results were performed by:

Test case measurement	Test Personnel
Radiated spurious emissions	R.Simonini

B.2.1 DTS

Standard references

RSS part	Limits							
	Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):							
	Freq Range	Field Stregth	Field Stregth	Meas. Distance				
	(MHz)	(μV/m)	(dB _µ V/m)	(m)				
	30-88	100	40	3				
	88-216	150	43.5	3				
RSS-247	216-960	200	46	3				
Clause 5.5	Above 960	500	54	3				
RSS-Gen A1 Clause 8.9	employing CISPI 1000 MHz. Rad measurements e For average radi	R quasi-peak defliated emission mploying an ave ated emission mother measuring	tector except for limits in these rage detector. easurements abwith peak detect	re based on mea the frequency ba three bands are ove 1000 MHz. th or function corres	ands above based on here is also			

Test procedure

The radiated setups shown in section A.1 were used to measure the radiated spurious emissions. Depending of the frequency range and bands being tested, different antennas and filters were used. The final measurement is done by varying the antenna height from 1 to 4 meters, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

Radiated spurious - 30 MHz - 1 GHz

Radiated Spurious – All modes

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
30.6	38.4	Quasi-Peak	40.0	1.6	V
50.0	38.1	Quasi-Peak	40.0	1.9	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

1 GHz - 26 GHz, 802.11b, 1Mbps, Chain A

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
5315.2	51.1	Peak	74.0	22.9	Н
5315.7	42.5	Average	54.0	11.5	Н
12058.8	44.8	Peak	74.0	29.2	Н
12058.8	38.1	Average	54.0	15.9	Н
16882.0	36.6	Average	54.0	17.4	Н
16884.8	51.6	Peak	74.0	22.4	Н

B.2.2 BLE

Standards references.

RSS part		Limits							
					defined in §15.20 cified in §15.209(a				
		Freq Range (MHz)	Field Stregth (μV/m)	Field Stregth (dBμV/m)	Meas. Distance (m)				
		30-88	100	40	3				
		88-216	150	43.5	3				
RSS-247	_		216-960	200	46	3			
Clause 5.5 RSS-Gen A1		Above 960	500	54	3				
Clause 8.9	emplo 1000l meas For a a limi	oying CISPR qua MHz. Radiated urements employ verage radiated of t specified when	asi-peak detector emission limits ying an average emission measur	except for the fr in these three detector. ements above 10 peak detector fu	sed on measurer requency bands a bands are base 000 MHz, there is unction, correspo	above ed on			

Test procedure

The radiated setups shown in section A.1 were used to measure the radiated spurious emissions. were used to measure the radiated spurious emissions.

Depending of the frequency range and bands being tested, different antennas and filters were used.

The final measurement is done by varying the antenna height from 1 to 4 meters, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

Radiated spurious - 30 MHz - 1 GHz

Radiated Spurious - All modes

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBμV/m		dBµV/m	dB	
30.6	35.4	Quasi-Peak	40.0	4.6	V
43.8	36.1	Quasi-Peak	40.0	3.9	V
53.6	28.0	Quasi-Peak	40.0	12.0	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

1 GHz - 26 GHz, BLE

Radiated Spurious - 2440 MHz

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
10523.7	59.6	Peak	74.0	14.4	Н
10523.7	48.0	Average	54.0	6.0	V
12294.9	45.9	Peak	74.0	28.1	V
12294.9	35.2	Average	54.0	18.8	V
25982.5	51.6	Peak	74.0	22.4	V
25982.5	39.9	Average	54.0	14.1	V

B.2.3 BT

Standard references

RSS part		Limits						
					defined in §15.2 cified in §15.209(
		Freq Range (MHz)	Field Stregth (μV/m)	Field Stregth (dBμV/m)	Meas. Distance (m)			
		30-88	100	40	3			
RSS-247		88-216	150	43.5	3			
Clause 5.5			216-960	200	46	3		
0.0.00		Above 960	500	54	3			
RSS GEN A1 Clause 8.9	emplo 1000 meas For a a limi	bying CISPR qua MHz. Radiated surements emplo verage radiated it specified when	asi-peak detector emission limits ying an average emission measui	except for the fr in these three detector. rements above 1 peak detector for	sed on measurer requency bands a bands are base 000 MHz, there is unction, correspo	above ed on s also		

Test procedure

The radiated setups shown in section A.1 were used to measure the radiated spurious emissions. Depending on the frequency range and bands being tested, different antennas and filters were used. The final measurement is done by varying the antenna height from 1 m to 4 m, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

Radiated spurious - 30 MHz - 1 GHz

Radiated Spurious – All modes

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
30.6	37.6	Quasi-Peak	40.0	2.4	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

1 GHz – 26 GHz, EDR – $\pi/4$ -DQPSK

Radiated Spurious - CH39 2DH5

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
5312.5	54.6	Peak	74.0	19.4	Н
5312.5	42.7	Average	54.0	11.3	Н
12056.4	46.2	Peak	74.0	27.8	Н
12056.4	35.2	Average	54.0	18.8	V
25996.5	51.8	Peak	74.0	22.2	V
25996.5	39.7	Average	54.0	14.3	V

B.2.4 U-NII-1

Standard references

RSS part		Limits						
RSS-247, Clause 6.2.1.2		For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of –27 dBm/MHz.						
			n fall in the restric ated emission lim	·	•	(a), must		
		Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBµV/m)	Meas. Distance (m)			
		30-88	100	40	3			
		88-216	150	43.5	3			
DOC OFN A4		216-960	200	46	3			
RSS-GEN A1, Clause 8.9		Above 960	500	54	3			
	CISPR of Radiated employin For aver- specified	quasi-peak dete d emission limit ng an average de age radiated emi	ssion measurem g with peak detec	the frequency be bands are beents above 1000	ands above 100 ased on measu MHz, there is als	00 MHz. irements		

Test procedure

The radiated setup shown in section A.1 was used to measure the radiated spurious emissions.

Depending of the frequency range and bands being tested, different antennas and filters were used.

The final measurement is done by varying the antenna height, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

Radiated spurious - 30 MHz - 1 GHz

Radiated Spurious – All modes

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBμV/m		dBµV/m	dB	
30.6	37.5	Quasi-Peak	40.0	2.5	V
50.0	37.5	Quasi-Peak	40.0	2.5	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

802.11ax/be

1 GHz - 40 GHz, 802.11a, 6Mbps, Chain A

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
10966.2	59.0	Peak	74.0	15.0	V
10966.2	48.0	Average	54.0	6.0	Н
23903.1	50.1	Peak	74.0	23.9	Н
23903.1	41.5	Average	54.0	12.5	Н
39974.9	56.0	Peak	74.0	18.0	Н
39974.9	48.0	Average	54.0	6.0	Н

B.2.5 U-NII-2A

Standard references

RSS part		Limits						
RSS-247, Clause 6.2.2.2		For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.						
Radiated emissions which fall in the restricted bands, as defined in §15.209 also comply with the radiated emission limits specified in §15.209(a):								
		Freq Range (MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)	Meas. Distance (m)			
		30-88	100	40	3			
		88-216	150	43.5	3			
		216-960	200	46	3			
RSS-GEN A1,		Above 960	500	54	3			
Clause 8.9	CISPR of Radiated an average For average specified	luasi-peak deted emission limits ir ge detector. age radiated emis	ctor except for in these three ban ession measurem in with peak detec	the frequency bids are based on ents above 1000	measurements e pands above 10 measurements e MHz, there is a esponding to 20	00 MHz. employing		

Test procedure

The radiated setups shown in section A.1 were used to measure the radiated spurious emissions. Depending of the frequency range and bands being tested, different antennas and filters were used. The final measurement is done by varying the antenna height, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

Radiated spurious - 30 MHz - 1 GHz

Radiated Spurious - All modes

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
30.6	37.9	Quasi-Peak	40.0	2.1	V
50.0	37.8	Quasi-Peak	40.0	2.2	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

802.11ax/be

1 GHz - 40 GHz, 802.11a, 6Mbps, Chain B

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
10994.5	48.0	Average	54.0	6.0	V
10994.8	58.0	Peak	74.0	16.0	V
39995.2	55.9	Peak	74.0	18.1	Н
39995.2	47.7	Average	54.0	6.3	Н

B.2.6 U-NII-2C

Standard references

RSS clause		Limits							
RSS-247 Clause 6.2.3 (2)		For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.							
		t also comply wi	th the radiated er	mission limits spe	defined in §15.20 ecified in §15.209	· /·			
		Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dB _µ V/m)	Meas. Distance (m)				
		30-88	100	40	3				
		88-216	150	43.5	3				
DCC CEN A4		216-960	200	46	3				
RSS-GEN A1, Clause 8.9		Above 960	500	54	3				
Clause 6.9	employ 1000 M measu For ave limit sp	ring CISPR quas IHz. Radiated en rements employi erage radiated er ecified when me	i-peak detector e nission limits in th ng an average do nission measure	except for the frecenese three bands etector. ments above 100k detector function	on measurements quency bands abo s are based on 00 MHz, there is a on, corresponding	ove also a			

Test procedure

The radiated setups shown in section A.1 *were* used to measure the radiated spurious emissions. Depending of the frequency range and bands being tested, different antennas and filters were used. The final measurement is done by varying the antenna height from 1 m to 4 m, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

Radiated spurious - 30 MHz - 1 GHz

Radiated Spurious – All modes

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
30.6	38.0	Quasi-Peak	40.0	2.0	V
50.0	38.1	Quasi-Peak	40.0	1.9	V
66.0	35.4	Quasi-Peak	40.0	4.6	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

802.11ax/be

1 GHz - 40 GHz, 802.11ax/be40, MCS0, Chain A+B

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
1455.0	42.7	Average	54.0	11.3	Н
1455.0	54.0	Peak	74.0	20.0	Н
5420.0	59.5	Peak	74.0	14.5	Н
5420.5	51.5	Average	54.0	2.5	Н
8490.2	52.0	Average	54.0	2.0	Н
8490.5	61.8	Peak	74.0	12.2	Н
11319.5	43.8	Average	54.0	10.2	Н
11320.9	51.6	Peak	74.0	22.4	Н
16981.2	54.3	Peak	68.2	13.9	Н
22641.6	47.3	Average	54.0	6.7	V
22642.0	53.0	Peak	74.0	21.0	V
28300.0	54.4	Peak	68.2	13.8	V

B.2.7 U-NII-3

Standard references

RSS part	Limits							
RSS-247 Clause 6.2.4.2	a level of - linearly to 1 or below th below the b	For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.						
			all in the restricte hission limits spe		ned in §15.205(a) (a):	, must also		
		Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Meas. Distance (m)			
		30-88	100	40	3			
		88-216	150	43.5	3			
RSS-GEN A1,		216-960	200	46	3			
Clause 8.9		Above 960	500	54	3			
	CISPR qua emission lindetector. For average specified w	asi-peak detector mits in these thre pe radiated emis	except for the five bands are bas sion measurements with peak detecto	requency bands ed on measurements above 1000	n measurements above 1000 MHz nents employing a MHz, there is a sponding to 20 dE	z. Radiated an average also a limit		

Test procedure

The radiated setups shown in section A.1 were used to measure the radiated spurious emissions.

Depending on the frequency range and bands being tested, different antennas and filters were used.

The final measurement is done by varying the antenna height, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

Radiated spurious - 30 MHz - 1 GHz

Radiated Spurious – All modes

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
30.6	37.0	Quasi-Peak	40.0	3.0	V
50.0	38.1	Quasi-Peak	40.0	1.9	V
67.0	36.3	Quasi-Peak	40.0	3.7	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

802.11ax/be

1 GHz - 40 GHz, 802.11a, 6Mbps, Chain A

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
1540.0	44.7	Peak	74.0	29.3	Н
1540.0	35.4	Average	54.0	18.6	Н
17246.1	49.7	Peak	68.2	18.5	Н

B.2.8 U-NII-4

Standard references

RSS part		Lin	nits					
RSS 247 6.2.5.3	For transmitters operating solely in the 5.850-5.895 GHz band or operating on a channel that spans across 5.725-5.895 GHz: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.							
RSS 247 6.2.5.3	For a client device, all ed dBm/MHz and shall ded							
	Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):							
	Freq Range (MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)	Meas. Distance (m)				
	30-88	100	40	3				
	88-216	150	43.5	3				
RSS-GEN	216-960	200	46	3				
A1, Clause 8.9	Above 960	500	54	3				
	Above 960 500 54 3 The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.							

Test procedure

The radiated setup shown in section A.1 was used to measure the radiated spurious emissions.

Depending of the frequency range and bands being tested, different antennas and filters were used.

The final measurement is done by varying the antenna height, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

Radiated spurious - 30 MHz - 1 GHz

Radiated Spurious – All modes

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
30.6	37.2	Quasi-Peak	40.0	2.8	V
50.0	38.3	Quasi-Peak	40.0	1.7	V
66.4	36.6	Quasi-Peak	40.0	3.4	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

802.11ax/be

1 GHz - 40 GHz, 802.11a, 6Mbps, Chain B

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
1680.3	50.3	Peak	74.0	23.7	Н
1680.3	40.8	Average	54.0	13.2	Н
17655.0	46.8	Peak	88.2	41.4	Н
17655.0	41.1	Average	68.2	27.1	Н

B.2.9 U-NII-5 to U-NII-8

Standard references

ISED Clause	Limits					
RSS-248 Clause 4.6.2	For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of −27 dBm/MHz.					
RSS-Gen Clause 8.1	When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.					
RSS-248 Clause 4.6.2	Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in FCC Part 15.209 and RSS-Gen.					
		emissions which ply with the radia Freq Range (MHz)		·	efined in §15.205 15.209(a): Meas. Distance	i(a), must
		30-88	100	40	3	
		88-216	150	43.5	3	
RSS-Gen		216-960	200	46	3	
Clause 8.9		Above 960	500	54	3	
	The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands above 1000 MHz. Radiated emission limits in this band is based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.					

Test procedure

The radiated setups shown in section A.1 were used to measure the radiated spurious emissions.

Depending of the frequency range and bands being tested, different antennas and filters were used.

- For frequencies less than or equal to 1000 MHz, measurements were made with the CISPR quasi-peak detector with a resolution bandwidth of 120kHz and a video bandwith 3 times of the resolution bandwidth.
- For restricted bands, measurements above 1000 MHz were performed using average and peak detectors with a minimum resolution bandwidth of 1 MHz and a video bandwith 3 times of the resolution bandwidth
- For unrestricted bands, measurements above 1000 MHz were performed using RMS* and peak detectors with a minimum resolution bandwidth of 1 MHz and a video bandwith 3 times of the resolution bandwidth

*RMS detector is required only for FCC. For ISED tests, only average and peak detectors are measured for both restricted and unrestricted bands above 1GHz.

The final measurement is performed by varying the antenna height from 1 m to 4 m, the EUT rotating in azimuth over 360° for both vertical and horizontal polarizations.

30 MHz - 1 GHz, Radiated spurious emissions

Radiated Spurious - All modes

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
30.6	37.4	Quasi-Peak	40.0	2.6	V
51.4	29.5	Quasi-Peak	40.0	10.5	V
66.7	36.5	Quasi-Peak	40.0	3.5	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

UNII 5

1 GHz - 40 GHz, 802.11ax/b20, MCS0, Chain A+B

Radiated Spurious - CH1

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBμV/m		dBµV/m	dB	
10967.6	59.1	Peak	74.0	14.9	V
10967.6	48.0	Average	54.0	6.0	Н
17871.6	50.9	Peak	74.0	23.1	Н
17871.6	43.0	Average	54.0	11.0	Н

UNII 6

1 GHz - 40 GHz, 802.11ax/be20, MCS0, Chain B

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
10989.5	58.6	Peak	74.0	15.4	V
10989.8	48.0	Average	54.0	6.0	Н
13018.4	50.8	Peak	88.2	37.4	Н
13031.0	43.7	RMS	68.2	24.5	Н
19547.3	63.6	Peak	74.0	10.4	Н
19550.2	51.1	Average	54.0	2.9	Н

UNII 7

1 GHz - 40 GHz, 802.11ax/be20, MCS0, Chain A+B

Radiated Spurious - CH181

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
11000.0	58.2	Peak	74.0	15.8	Н
11000.0	48.0	Average	54.0	6.0	V
20559.4	51.6	Peak	74.0	22.4	Н
20564.2	43.1	Average	54.0	10.9	Н

UNII 8

1 GHz - 40 GHz, 802.11ax/be80, MCS0, Chain A+B

Frequency	Level	Detector	Limit	Margin	Polar
MHz	dBµV/m		dBµV/m	dB	
5160.0	59.8	Peak	88.2	28.4	Н
5160.0	55.1	RMS	68.2	13.1	Н
39987.4	55.7	Peak	74.0	18.3	V
39987.4	47.7	Average	54.0	6.3	V