

Test Report No:
2630895R-RFUSV03S-B

TEST REPORT

FCC Rules & Regulations

Product Name	Telematics
Model No.	QICSFDNX5US, QICSFWNX5RW, QICSFWNX5NC
FCC ID	HFS-QICSFDNX5US
Applicant's Name / Address	Quanta Computer Inc. No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City, 33377, Taiwan
Manufacturer's Name	Quanta Computer Inc.
Test Method Requested, Standard	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Verdict Summary	IN COMPLIANCE
Documented By Genie Chang	<i>Genie Chang</i>
Approved By Steven Tsai	<i>Steven Tsai</i>
Date of Receipt	2026/03/31
Date of Issue	2026/09/18
Report Version	V1.0

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Competences and Guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA 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.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

General Conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	2026/09/18

Summary of Test Result

Report Clause	Test Items	Result (PASS/FAIL)	Remark
3	AC Power Line Conducted Emission	PASS	-
4	Emission Bandwidth	PASS	-
5	Maximum E.I.R.P. Power	PASS	-
6	Maximum E.I.R.P. Power Spectral Density	PASS	-
7	Radiated Emission	PASS	-
8	In-Band Emission (Mask)	PASS	-
9	Contention Based Protocol	PASS	-

Comments and Explanations

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1. General Information

1.1. EUT Description

Frequency Band	5925 ~ 7125 MHz	
Operating Frequency / Channel Number	IEEE 802.11a/ax (20 MHz)	5955 ~ 7115 MHz / 59 Channels
	IEEE 802.11ax (40 MHz)	5965 ~ 7085 MHz / 29 Channels
	IEEE 802.11ax (80 MHz)	5985 ~ 7025 MHz / 14 Channels
	IEEE 802.11ax (160 MHz)	6205 ~ 6985 MHz / 7 Channels
Type of Modulation	IEEE 802.11a	OFDM-BPSK, QPSK, 16QAM, 64QAM
	IEEE 802.11ax	OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Contain WWAN Module	M/N: QV28NUS / FCC ID: HFS-QV28NUS	
	M/N: QV28NRW / FCC ID: HFS-QV28NRW	

The difference for each model is shown as below:

NAD Variant	NAD Module	Model Name	GNSS	V2X	WiFi / BT	Audio Function	Backup Battery
US	QV28NUS	QICSFDNX5US	O	X	O	O	O
ROW	QV28NRW	QICSFWNX5RW	O	X	O	O	O
NC	-	QICSFWNX5NC	O	X	O	X	X

From the above models, model: QICSFDNX5US was selected as the worst-case representative model for the test, and its data was recorded in this report.

Antenna Information					
Item.	Brand Name	Model No.	Type	Antenna Gain (dBi)	
1	molex	5A7F527	PIFA (WiFi 1)	U-NII 5	9.04
				U-NII 6	8.80
				U-NII 7	10.04
				U-NII 8	8.42
			PIFA (WiFi 2)	U-NII 5	9.01
				U-NII 6	8.60
				U-NII 7	9.34
				U-NII 8	8.22
2	molex	5A7F528	PIFA (WiFi 1)	U-NII 5	8.83
				U-NII 6	9.73
				U-NII 7	10.71
				U-NII 8	8.90
			PIFA (WiFi 2)	U-NII 5	9.67
				U-NII 6	9.47
				U-NII 7	9.22
				U-NII 8	9.06
3	molex	5A7F529	PIFA (WiFi 1)	U-NII 5	8.13
				U-NII 6	9.08
				U-NII 7	10.25
				U-NII 8	8.33
			PIFA (WiFi 2)	U-NII 5	8.99
				U-NII 6	8.88
				U-NII 7	8.84
				U-NII 8	7.00
4	AMO	BMW ICON SF	PIFA (WiFi 3)	U-NII 5	2.24
				U-NII 6	1.65
				U-NII 7	1.65
				U-NII 8	1.65

Note:

1. Only the higher gain antenna was tested and recorded in this report.
2. The antenna of EUT conforms to FCC 15.203.
3. For IEEE 802.11a/ax Mode: (2TX, 2RX)

Directional Gain (dBi)			
U-NII 5	U-NII 6	U-NII 7	U-NII 8
12.27	12.61	13.01	11.99

Mode		
SISO	MIMO	
WiFi 3	WiFi 1 + WiFi 2	WiFi 1 + WiFi 3

From the above mode, MIMO was selected as representative model for the test and its data was recorded in this report.

1.2. EUT Information

EUT Power Type	From Battery			
Product Type	☐	Low-power Indoor Access Point	☐	Indoor Subordinate
	☐	Low-power Indoor Client	☐	Standard Power Access Point
	☐	Dual Client	☐	Standard Client
	☐	Fixed Client	☒	Very Low Power
Beamforming Function	☐	With beamforming	☒	Without beamforming
Resource Unit of 802.11ax	☒	Full RU	☒	Partial RU
Channel Puncturing Function	☐	With Channel Puncturing	☒	Without Channel Puncturing

1.3. Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC CFR Title 47 Part 15 Subpart E Section 15.407
- ♦ ANSI C63.10-2020
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01
- ♦ FCC KDB 987594 D01 U-NII 6GHz General Requirements v03r01
- ♦ FCC KDB 987594 D02 U-NII 6 GHz EMC Measurement v03

The following reference test guidance is not within the scope of accreditation of TAF:

- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01

1.4. Testing Location Information

Testing Location Information		
Test Laboratory : DEKRA Testing and Certification Co., Ltd.		
V	Address	No. 85, Wenlin St., Linkou Dist., New Taipei City 244017, Taiwan, R.O.C.
	Performed Location	No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.
	Phone/Fax Number	TEL: +886-3-275-7255 FAX: +886-3-327-8031
	USA	FCC Designation Number: TW0033 / FCC Registration Number: 647365
	Canada	CAB Identifier Number: TW3023 / Company Number: 26930
	Site Description	Accredited by TAF
		Accredited Number: 3023
	Address/ Performed Location	No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
	Phone/Fax Number	TEL: +886-3-582-8001 FAX: +886-3-582-8958
	USA	Test site Designation No. TW3024 with FCC.
	Canada	CAB Identifier Number: TW3024 / Company Number: 22397
	Site Description	Accredited by TAF
		Accredited Number: 3024
	Address/ Performed Location	No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
	Phone/Fax Number	TEL: +886-3-582-8001 FAX: +886-3-582-8958
	USA	Test site Designation No. TW3024 with FCC.
	Canada	CAB Identifier Number: TW3024 / Company Number: 22397
	Site Description	Accredited by TAF
		Accredited Number: 3024

1.5. Ambient Conditions In The Laboratory

Performed Item	Items	Required	Actual	Test Date	Tested By
RF Conducted Emission	Temperature (°C)	10~40 °C	23.4~26.8 °C	2026/06/30 ~	Neko Chen
	Humidity (%RH)	10~90 %	51.1~66.1 %	2026/08/24	Jimmy Chang
Radiated Emission	Temperature (°C)	10~40 °C	23.7~24.4 °C	2026/07/17 ~	Rock Liang
	Humidity (%RH)	10~90 %	62.4~65.7 %	2026/07/27	Ashton Chiu

1.6. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty
AC Power Line Conducted Emission	± 3.73 dB
Emission Bandwidth	± 1580.61 Hz
Maximum E.I.R.P. Power	Spectrum Analyzer: ± 2.13 dB Power Meter: ± 1.06 dB
Maximum E.I.R.P. Power Spectral Density	± 2.13 dB
Radiated Emission	9 kHz~30 MHz: ± 3.30 dB 30 MHz~1 GHz: ± 5.39 dB 1 GHz~18 GHz: ± 4.24 dB 18 GHz~40 GHz: ± 3.62 dB
In-Band Emission (Mask)	± 2.13 dB
Contention Based Protocol	± 1.06 dB
Duty Cycle	± 0.65 %

1.7. List of Test Equipment

For Conducted Measurements / HY-SR02

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Spectrum Analyzer	R&S	FSV30	103467	2026/04/24	2027/04/23
V	Peak Power Analyzer	KEYSIGHT	8990B	MY51000539	2026/04/30	2027/04/29
V	Wideband Power Sensor	KEYSIGHT	N1923A	MY59240002	2026/05/06	2027/05/05
V	Wideband Power Sensor	KEYSIGHT	N1923A	MY59240003	2026/05/06	2027/05/05

Note:

1. All equipment is calibrated every year.
2. The test instruments marked with "V" are used to measure the final test results.
4. Test Software Version : DTC_RF_Tool_Release V2.0.37

For Radiated Measurements /HY-CB03

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Loop Antenna	TESEQ	HLA6121	49611	2026/02/04	2027/02/03
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0675	2025/08/14	2027/08/13
V	Horn Antenna	Com-Power	AH-840	101100	2025/10/07	2027/10/06
V	Horn Antenna	RF SPIN	DRH18-E	210507A18ES	2026/04/24	2028/04/23
V	Pre-Amplifier	SGH	SGH0301-9	20211007-11	2026/01/10	2027/01/09
V	Pre-Amplifier	SGH	PRAMP118	20200701	2026/01/10	2027/01/09
V	Pre-Amplifier	EMCI	EMC05820SE	980310	2026/01/10	2027/01/09
V	Pre-Amplifier	EMCI	EMC184045SE	980369	2026/01/10	2027/01/09
V	Coaxial Cable	EMCI	EMC102-KM-KM-600	160311	2026/01/10	2027/01/09
V	Coaxial Cable	SGH	HC360-2.92M/2.92M-7.0M	202108-1	2026/01/10	2027/01/09
	Filter	MICRO TRONICS	BRM20887	G003	2026/01/05	2027/01/04
	Filter	MICRO TRONICS	BRM50716	G196	2026/01/05	2027/01/04
V	WIFI 6E Filter	Marvelous Microwave Inc.	MFN-5925.7125.S1	C50003N	2026/01/05	2027/01/04
V	EMI Test Receiver	R&S	ESR3	102793	2025/12/01	2026/11/30
V	Spectrum Analyzer	R&S	FSV3044	101114	2026/04/08	2027/04/07
V	Coaxial Cable	SGH	HA800	202602-3	2026/07/17	2027/07/16
V	Coaxial Cable	SGH	SGH18	2021005-1	2026/01/10	2027/01/09
V	Coaxial Cable	SGH	SGH18	202108-4	2026/01/10	2027/01/09
V	Coaxial Cable	SGH	HA800	GD20110223-1	2026/01/10	2027/01/09
V	Coaxial Cable	SGH	HA800	GD20110222-8	2026/01/10	2027/01/09
V	Radio communication test station	Anritsu	MT8000A	6262134961	2026/05/04	2027/05/03
V	Radio communication test station	Anritsu	8820C	6201169086	2026/04/07	2027/04/06

Note:

1. Bi-Log Antenna and Horn Antenna are calibrated every two years, the other equipment is calibrated every year.
2. The test instruments marked with "V" are used to measure the final test results.
3. Test Software Version: e3 230303 dekra V9.

2. Test Configuration of EUT

2.1. Test Condition

EUT Operational Condition	
Testing Voltage	DC 12V

2.2. Test Frequency Mode

Test Software Version	CMD / Version 10.0.19045.5965
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Modulation	Frequency (MHz)	Power Setting	
		SISO	MIMO
802.11a (20 MHz)	5935	-0.5	-6
	6175	1	-6.5
	6415	5.5	-7.5
	6435	7	-7.5
	6475	5	-7.5
	6515	6	-6.5
	6535	4	-6.5
	6695	12	-5
	6855	8	-4.5
	6875	10	-4
	6995	9.5	-7
	7115	9.5	-7
802.11ax (20 MHz)	5935	-0.5	-7
	6175	1	-7
	6415	5.5	-7.5
	6435	7	-7.5
	6475	5	-8
	6515	6	-6.5
	6535	4	-6.5
	6695	12	-4.5
	6855	8	-4
	6875	10	-4
	6995	9.5	-6.5
	7115	9.5	-6.5

Modulation	Frequency (MHz)	Power Setting	
		SISO	MIMO
802.11ax (40 MHz)	5965	5.5	-3.5
	6165	5	-5
	6405	8	-4.5
	6445	9	-4
	6485	7	-4.5
	6525	7	-3.5
	6565	9.5	-3
	6685	13	-5.5
	6885	12	-1
	7005	12	-4.5
	7085	12	-3.5
802.11ax (80 MHz)	5985	8.5	0
	6145	8	-2.5
	6385	11	-1
	6465	10.5	-1.5
	6545	10.5	0
	6625	12.5	1.5
	6705	15	5
	6785	13	2.5
	6865	13	1.5
	6945	13	1.5
	7025	12	0
802.11ax (160 MHz)	6025	4	-4.5
	6185	12	4
	6345	9.5	1.5
	6505	9.5	2
	6665	12	4.5
	6825	13.5	5.5
	6985	10.5	3.5

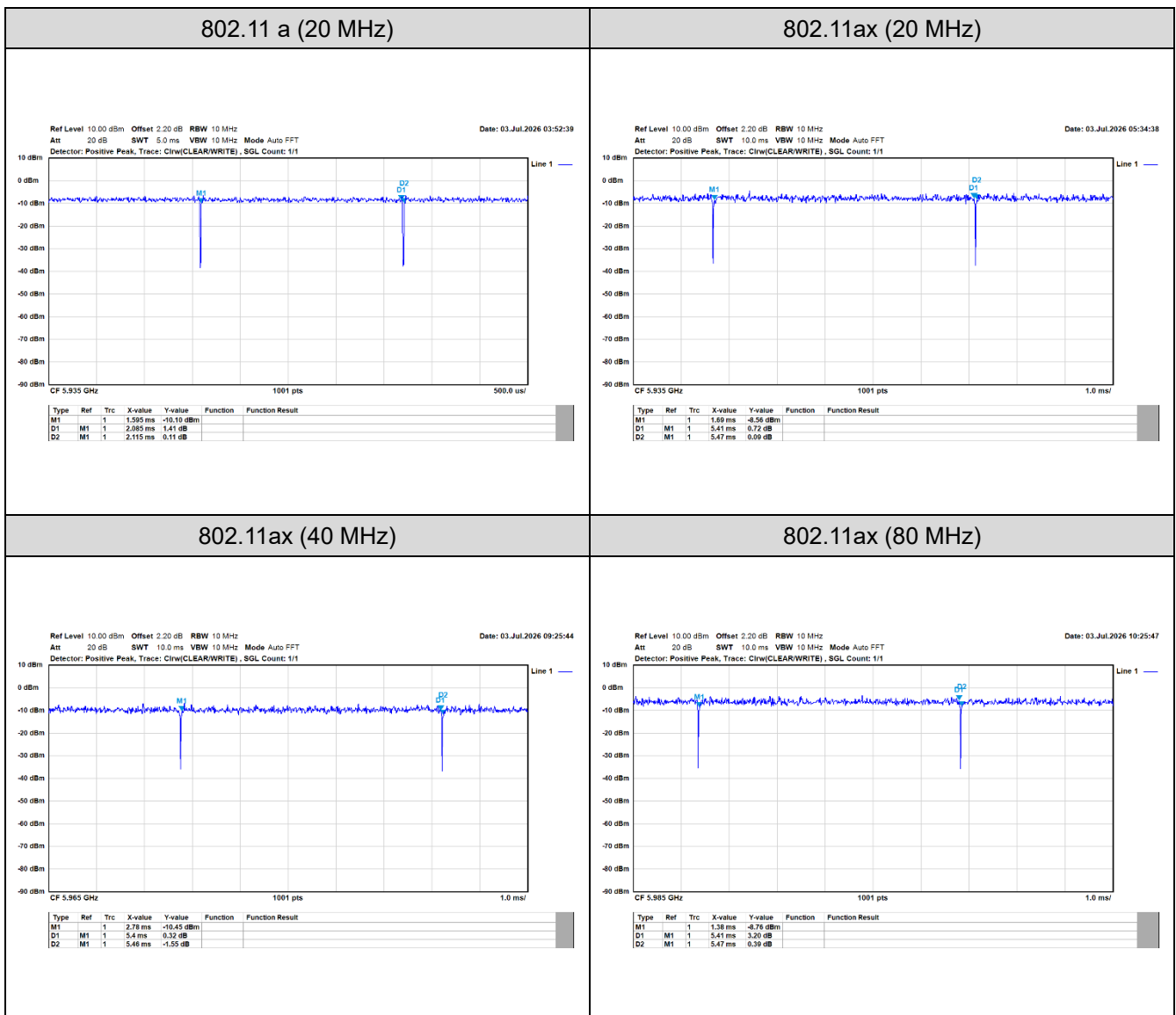
Partial RU

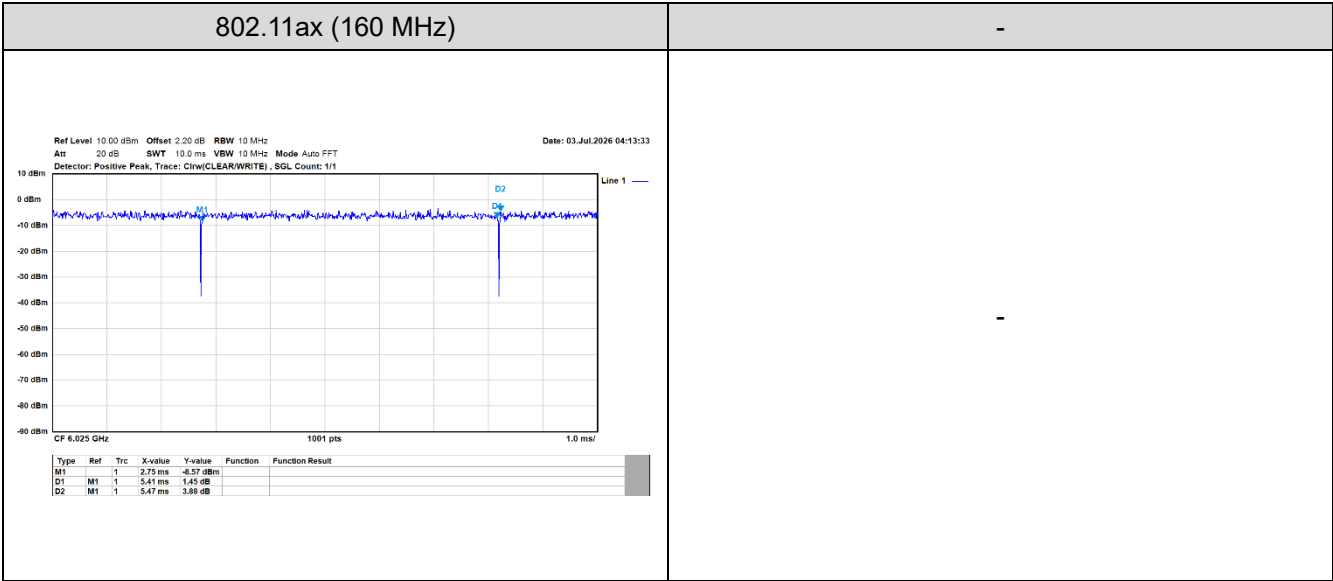
Modulation	Frequency (MHz)	RU Config	Power Setting	
			SISO	MIMO
802.11ax (20 MHz)	5935	26-0	-6	-15
		26-8	-5.5	-18
		52-37	-3.5	-11.5
		52-40	-3	-10
		106-53	-2	-8
		106-54	-1.5	-7
	7115	26-0	-5.5	-20
		26-8	-5	-18
		52-37	-3.5	-11.5
		52-40	-3	-11.5
		106-53	-1	-8
		106-54	-1	-7.5

2.3. Duty Cycle

WiFi 1 + WiFi 2 Antenna

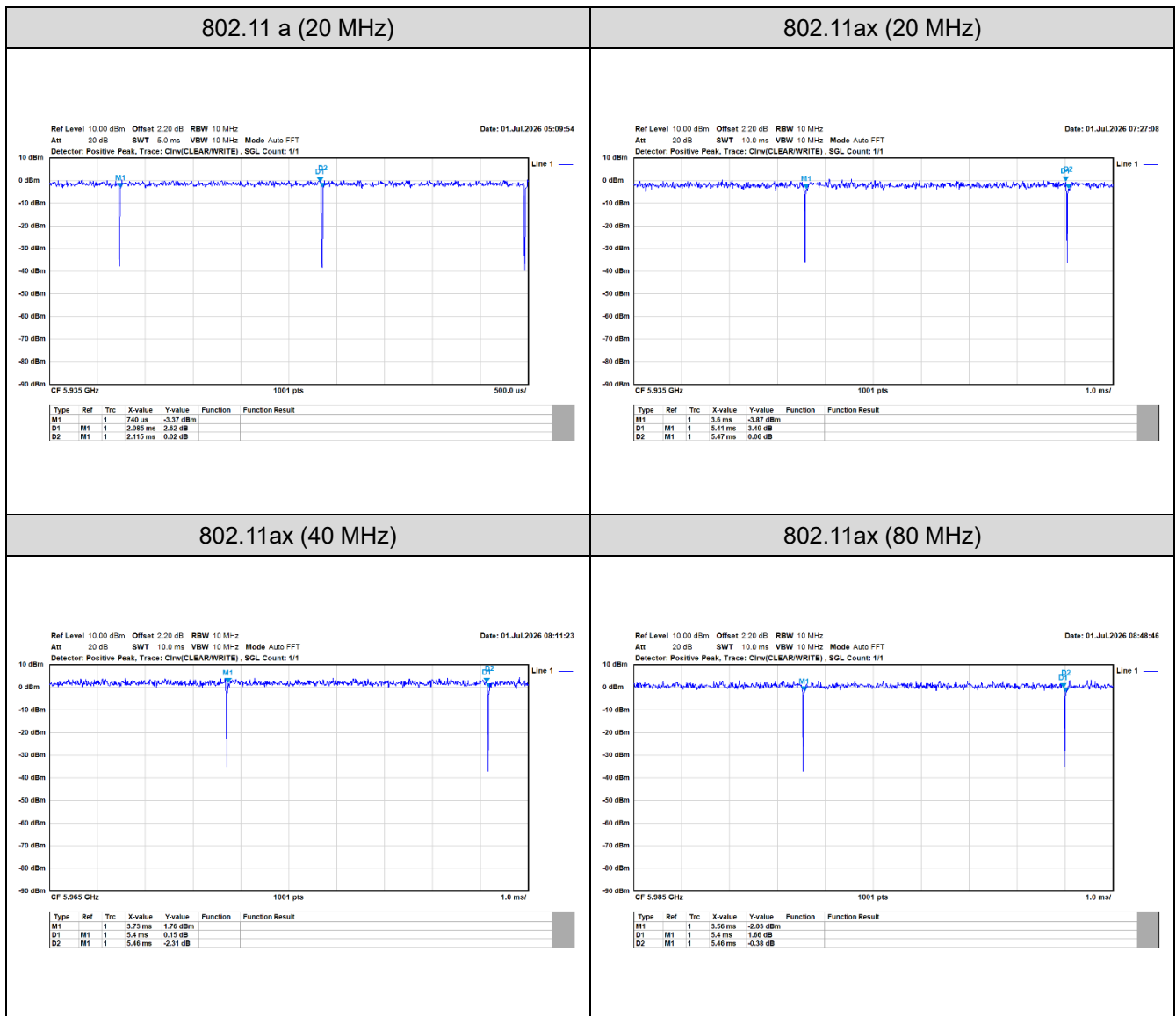
Modulation	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11 a (20 MHz)	2.0850	2.1150	98.58	0.06	10
802.11ax (20 MHz)	5.4100	5.4700	98.90	0.05	10
802.11ax (40 MHz)	5.4000	5.4600	98.90	0.05	10
802.11ax (80 MHz)	5.4100	5.4700	98.90	0.05	10
802.11ax (160 MHz)	5.4100	5.4700	98.90	0.05	10

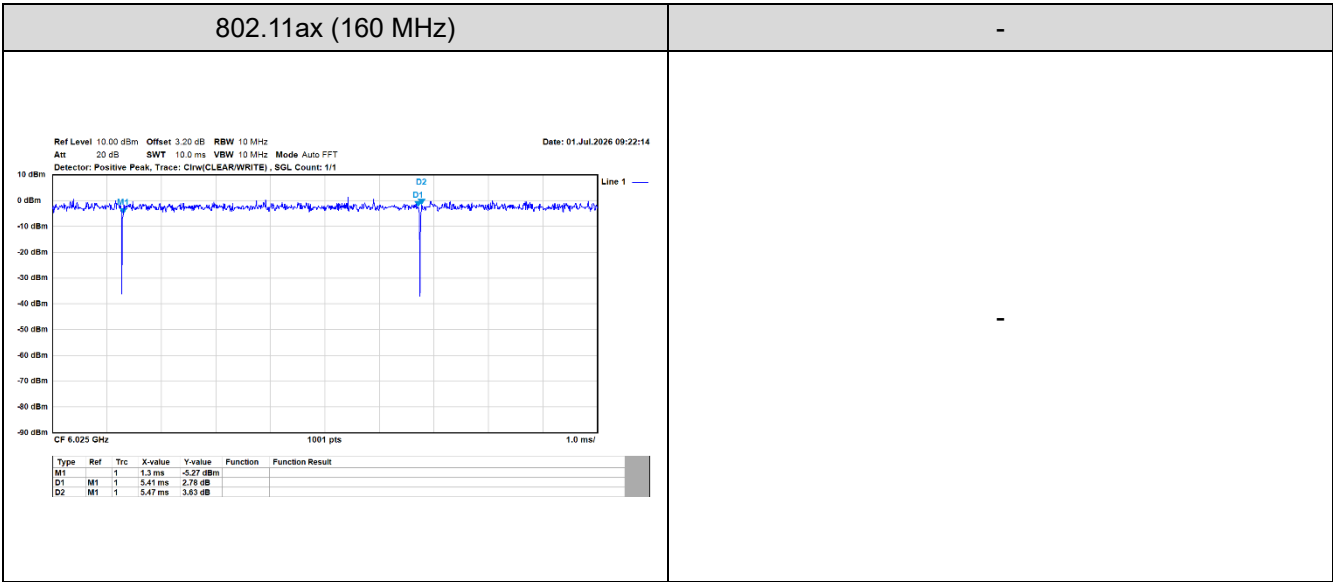




WiFi 3 Antenna

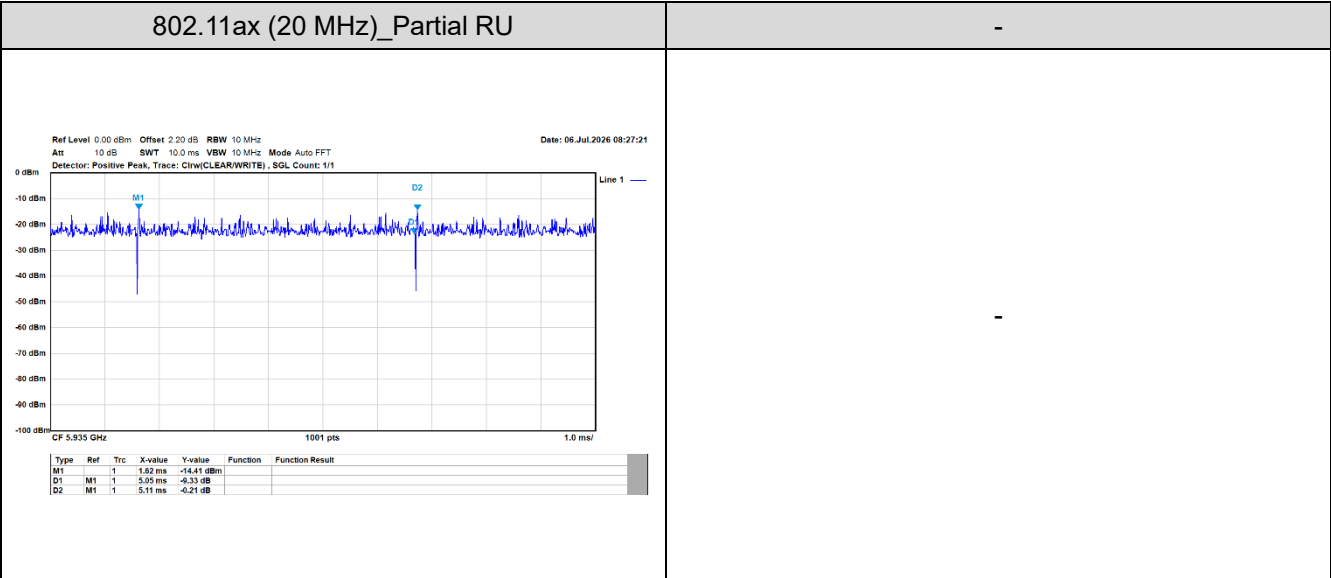
Modulation	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11 a (20 MHz)	2.0850	2.1150	98.58	0.06	10
802.11ax (20 MHz)	5.4100	5.4700	98.90	0.05	10
802.11ax (40 MHz)	5.4000	5.4600	98.90	0.05	10
802.11ax (80 MHz)	5.4000	5.4600	98.90	0.05	10
802.11ax (160 MHz)	5.4100	5.4700	98.90	0.05	10





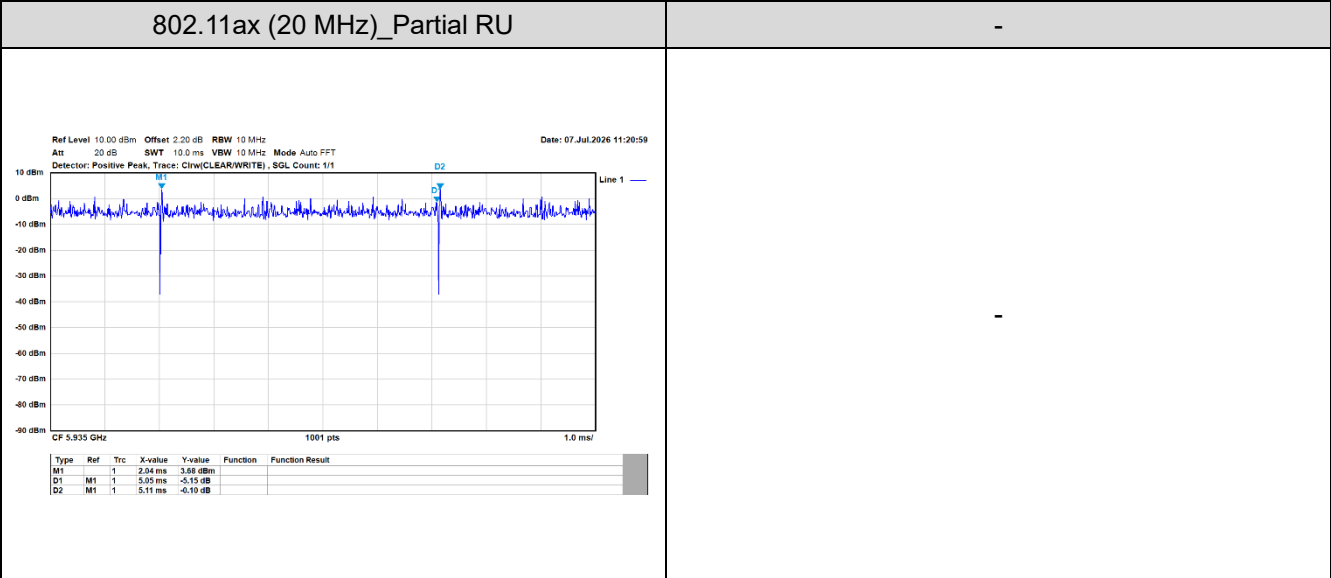
WiFi 1 + WiFi 2 Antenna (Partial RU)

Modulation	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ax (20 MHz)_Partial RU	5.0500	5.1100	98.83	0.05	10



WiFi 3 Antenna (Partial RU)

Modulation	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ax (20 MHz)_Partial RU	5.0500	5.1100	98.83	0.05	10



2.4. Measurement Configuration

Tests Item	Emission Bandwidth Maximum E.I.R.P. Power Maximum E.I.R.P. Power Spectral Density In-Band Emission (Mask) Contention Based Protocol
Test Condition	Conducted measurement at transmit chains
Operating Mode	Transmit

Tests Item	Maximum E.I.R.P. Power Maximum E.I.R.P. Power Spectral Density Radiated Emission
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	Transmit
Operating Mode > 1GHz	Transmit

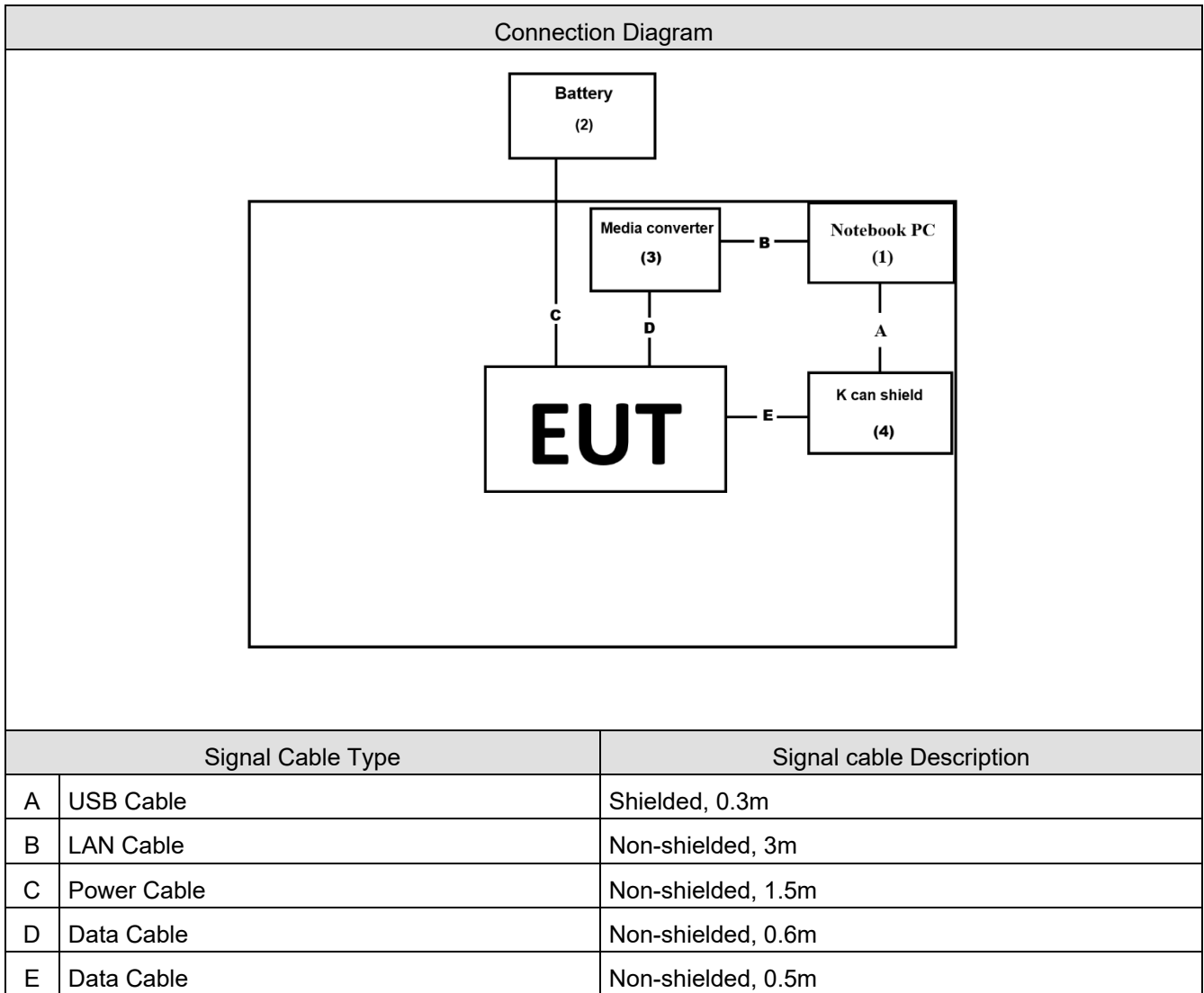
Note:

1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
3. For radiated emission below 1 GHz have performed all modes of operation were investigated and the worst-case emissions are reported.
4. The lowest data rates are tested in each mode. Only the worst case is shown in the report.
(802.11a is 6 Mbps, 802.11ax is MCS0)

2.5. Tested System Details

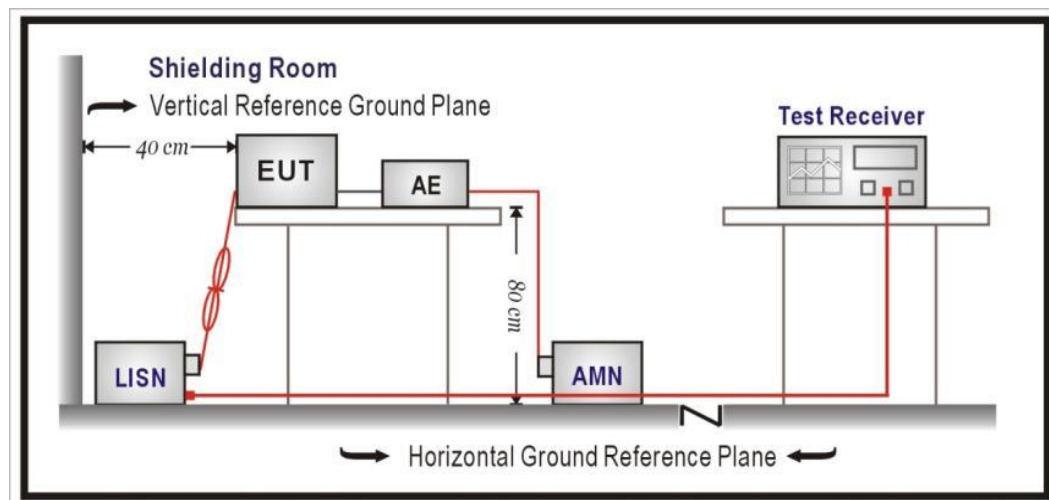
No.	Equipment	Brand Name	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	P75G	7CTHQF2	N/A
2	Battery	BOSCH	60044	N/A	N/A
3	Media converter	N/A	N/A	N/A	N/A
4	K can shield	N/A	N/A	N/A	N/A

2.6. Configuration of Tested System



3. AC Power Line Conducted Emission

3.1. Test Setup



3.2. Test Limit

Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

3.3. Test Procedure

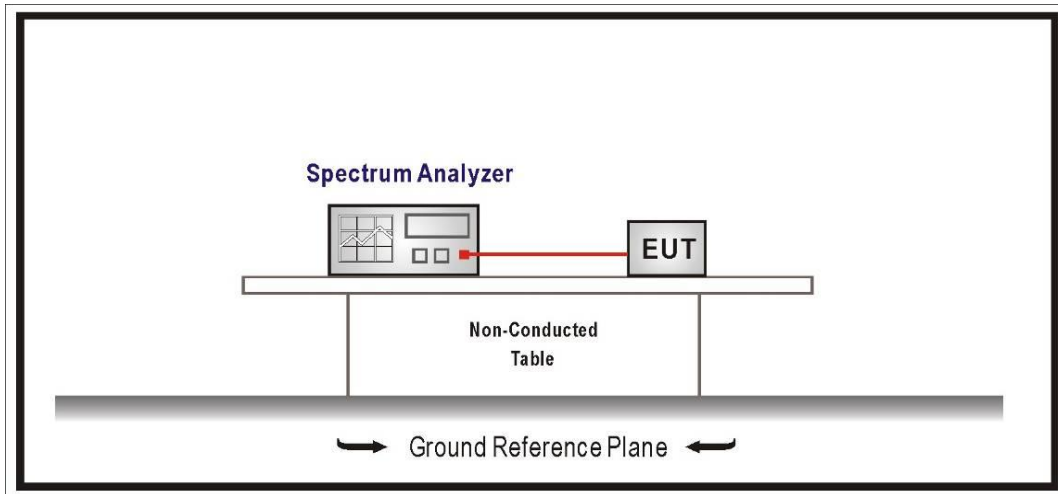
The EUT was setup according to ANSI C63.10-2020 for AC Power Line Conducted Emissions.

3.4. Test Result of AC Power Line Conducted Emission

Refer as Appendix A

4. Emission Bandwidth

4.1. Test Setup



4.2. Test Limit

26dB Bandwidth & 99% Occupied Bandwidth : 320MHz.

4.3. Test Procedure

The EUT was setup to ANSI C63.10-2020; tested to U-NII test procedure of KDB 789033.

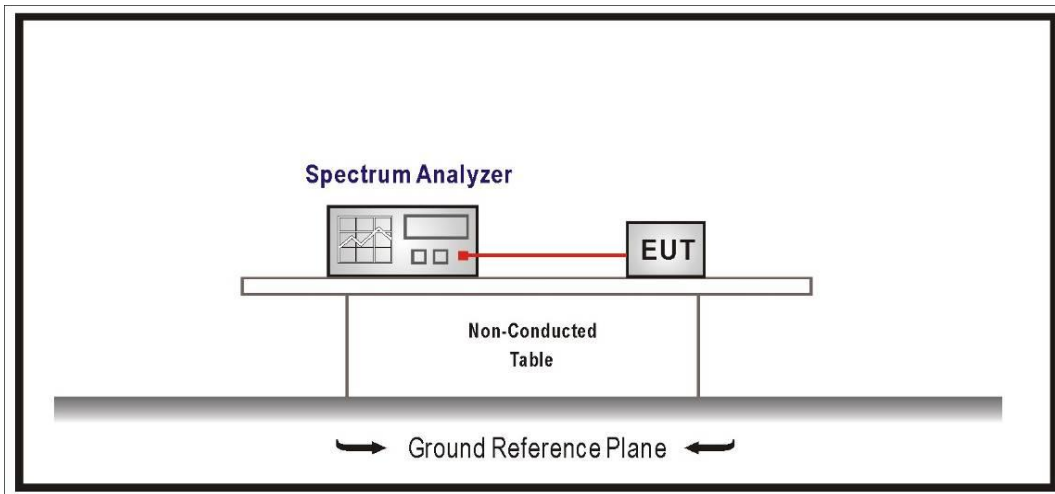
4.4. Test Result of Emission Bandwidth

Refer as Appendix B

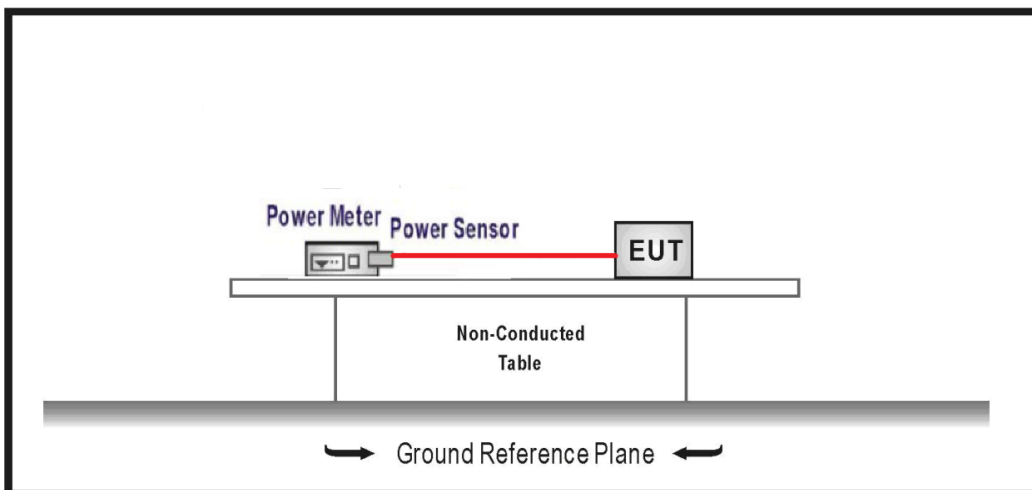
5. Maximum E.I.R.P. Power

5.1. Test Setup

For straddle channels:



For othes channels:



5.2. Test Limit

1. 5.925 ~ 6.425 GHz frequency band:
For standard power access point and fixed client device : e.i.r.p < 36 dBm , For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees not exceed 125 mW (21 dBm).
For indoor access point : e.i.r.p < 30 dBm.
For subordinate device control of an indoor access point : e.i.r.p < 30 dBm.
For client device control of a standard power access point : e.i.r.p < 30 dBm.
For client device control of an indoor access point : e.i.r.p < 24 dBm.
For very low power devices: e.i.r.p < 14 dBm.
2. 6.425 ~ 6.525 GHz frequency band:
For indoor access point : e.i.r.p < 30 dBm.
For client device control of an indoor access point : e.i.r.p < 24 dBm.
For very low power devices: e.i.r.p < 14 dBm.
3. 6.525 ~ 6.875 GHz frequency band:
For standard power access point and fixed client device : e.i.r.p < 36 dBm , For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees not exceed 125 mW (21 dBm).
For indoor access point : e.i.r.p < 30 dBm.
For subordinate device control of an indoor access point : e.i.r.p < 30 dBm.
For client device control of a standard power access point : e.i.r.p < 30 dBm.
For client device control of an indoor access point : e.i.r.p < 24 dBm.
For very low power devices: e.i.r.p < 14 dBm.
4. 6.87 ~ 7.125 GHz frequency band:
For indoor access point : e.i.r.p < 30 dBm.
For client device control of an indoor access point : e.i.r.p < 24 dBm.
For very low power devices: e.i.r.p < 14 dBm.

5.3. Test Procedure

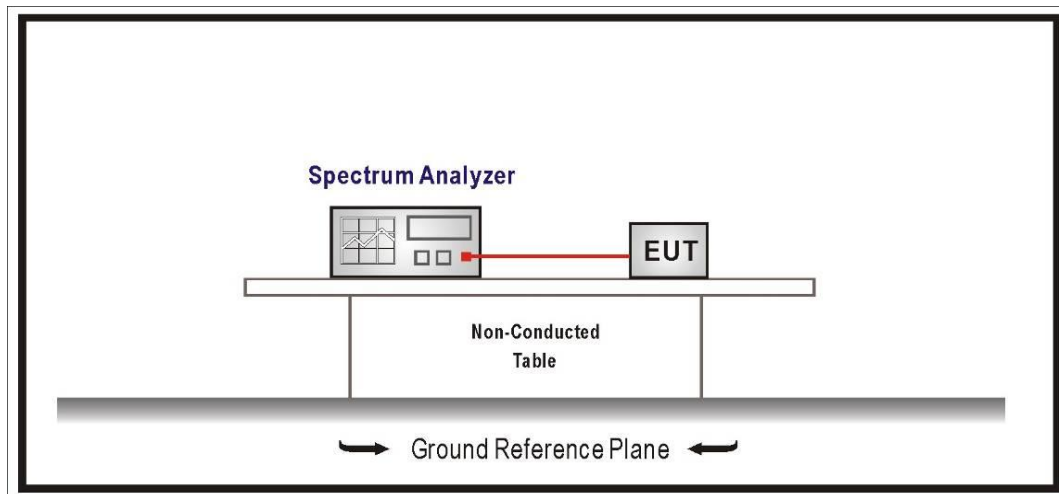
The EUT was setup to ANSI C63.10-2020; tested to U-NII test procedure of KDB 789033.

5.4. Test Result of Maximum E.I.R.P. Power

Refer as Appendix C

6. Maximum E.I.R.P. Power Spectral Density

6.1. Test Setup



6.2. Test Limit

1. 5.925 ~ 6.425 GHz frequency band:
 - For standard power access point and fixed client device : e.i.r.p PSD < 23 dBm/MHz.
 - For indoor access point : e.i.r.p PSD < 5 dBm/MHz.
 - For subordinate device control of an indoor access point : e.i.r.p PSD < 5 dBm/MHz.
 - For client device control of a standard power access point : e.i.r.p PSD < 17 dBm/MHz.
 - For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.
 - For very low power devices : e.i.r.p PSD < -5 dBm/MHz.
2. 6.425 ~ 6.525 GHz frequency band:
 - For indoor access point : e.i.r.p PSD < 5 dBm/MHz.
 - For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.
 - For very low power devices : e.i.r.p PSD < -5 dBm/MHz.
3. 6.525 ~ 6.875 GHz frequency band:
 - For standard power access point and fixed client device : e.i.r.p PSD < 23 dBm/MHz.
 - For indoor access point : e.i.r.p PSD < 5 dBm/MHz.
 - For subordinate device control of an indoor access point : e.i.r.p PSD < 5 dBm/MHz.
 - For client device control of a standard power access point : e.i.r.p PSD < 17 dBm/MHz.
 - For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.
 - For very low power devices : e.i.r.p PSD < -5 dBm/MHz.
4. 6.875 ~ 7.125 GHz frequency band:
 - For indoor access point : e.i.r.p PSD < 5 dBm/MHz.
 - For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.
 - For very low power devices : e.i.r.p PSD < -5 dBm/MHz.

6.3. Test Procedure

The EUT was setup to ANSI C63.10-2020; tested to U-NII test procedure of KDB 789033.

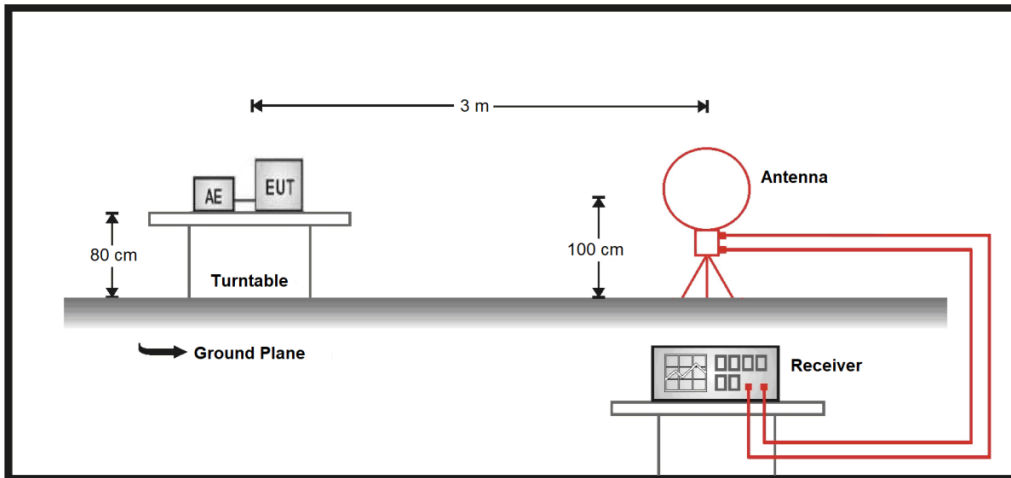
6.4. Test Result of Maximum E.I.R.P. Power Spectral Density

Refer as Appendix D

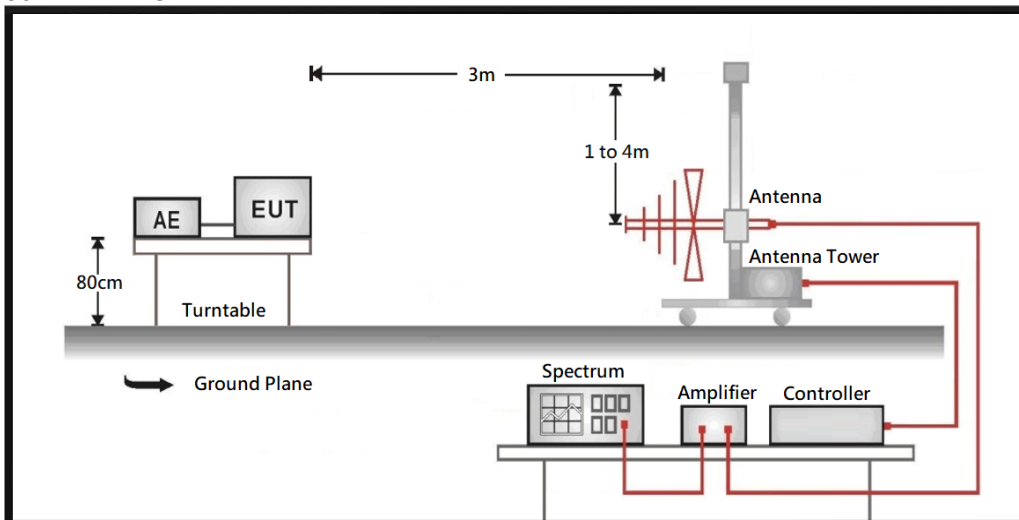
7. Radiated Emission

7.1. Test Setup

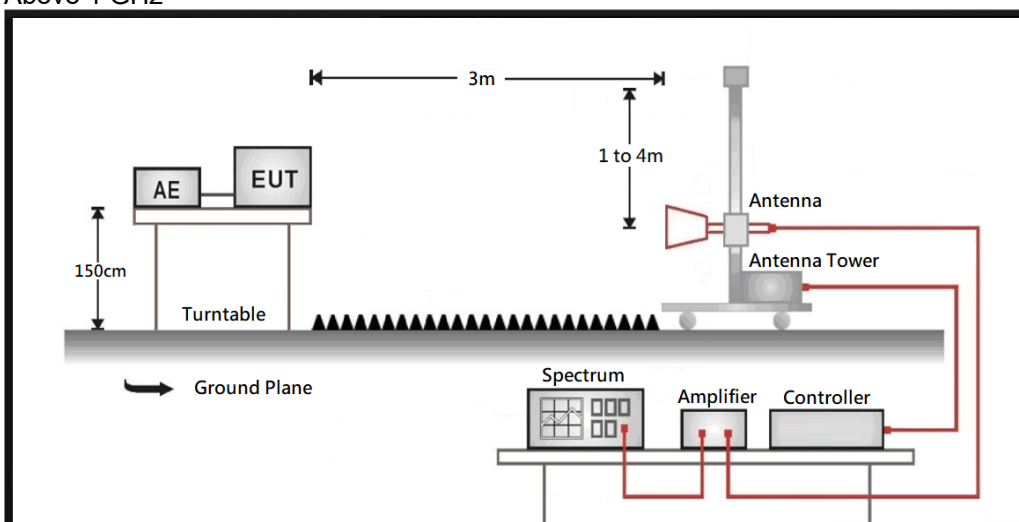
9 kHz ~ 30 MHz



30 MHz ~ 1 GHz



Above 1 GHz



7.2. Test Limit

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Field strength (dB $\mu\text{V/m}$)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	20 log (2400/F(kHz))	300
0.490 – 1.705	24000/F(kHz)	20 log (24000/F(kHz))	30
1.705 - 30	30	29.5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Remarks:

1. Field strength (dB $\mu\text{V/m}$) = 20 log Field strength ($\mu\text{V/m}$)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Unwanted Emission out of the restricted bands Test Limit

Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength (dB $\mu\text{V/m}$ @3m)
5925 MHz - 7125 MHz	Peak: -7	88.2
	Average: -27	68.2

Remarks: Based on ANSI C63.10-2020 provides the conversion formula between field strength and EIRP, if distance is 3m, -27dBm/MHz is equivalent to 68.2dB $\mu\text{V/m}$.

7.3. Test Procedure

The EUT and all the supporting units are placed on a turn table which is 0.8 or 1.5 meters above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10-2020 on radiated measurement.

On any frequency or frequencies from 9 kHz (include the lowest oscillator frequency generated within the device up to the 10th harmonic) to 1000 MHz, the limit shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limit shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

The bandwidth below 1 GHz setting on the field strength meter is 120 kHz and above 1 GHz is 1 MHz.

7.4. Test Result of Radiated Emission (Below 30 MHz)

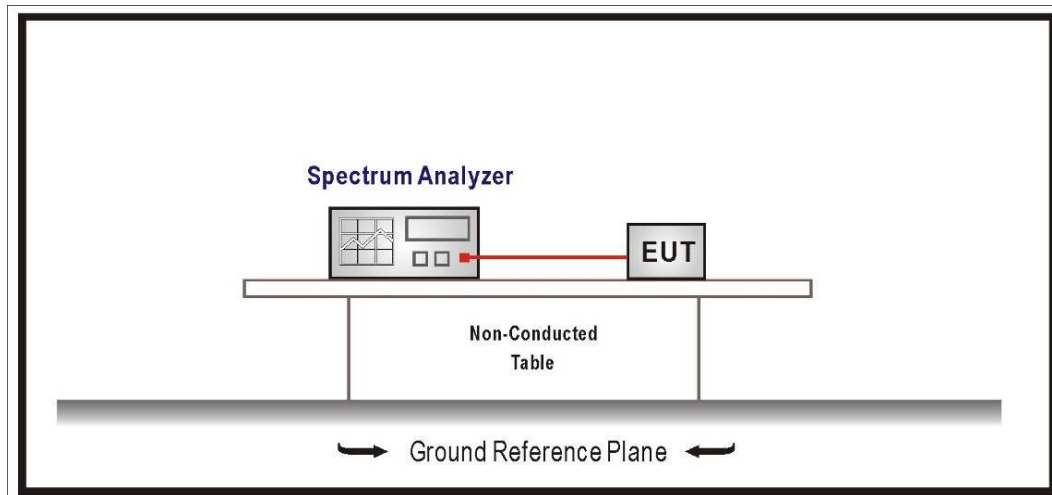
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

7.5. Test Result of Radiated Emission

Refer as Appendix E

8. In-Band Emission (Mask)

8.1. Test Setup



8.2. Test Limit

Test Items	Frequencies (MHz)	(X) dBc*1
Emission Mask	At 1MHz outside of channel edge	20
	At one channel bandwidth from the channel center*2	28
	At one- and one-half times the channel bandwidth away from channel center*3	40
	From the channel center by more than one- and one-half times the channel bandwidth	40

Remark:

1. The power spectral density must be suppressed by "x" dB.
2. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limit must be linearly interpolated between 20 dB and 28 dB suppression.
3. At frequencies between one and one- and one-half times an unlicensed device's channel bandwidth, the limit must be linearly interpolated between 28 dB and 40 dB suppression.

8.3. Test Procedure

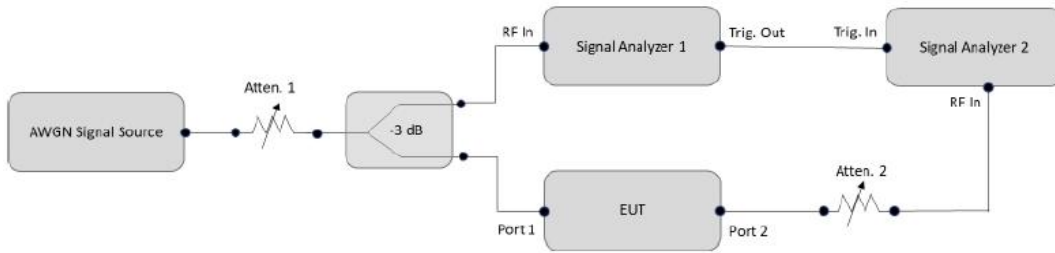
1. Connect output of the antenna port to a spectrum analyzer and adjust appropriate attenuation.
2. Measure the 26 dB EBW using the test procedure 12.4.1 of ANSI C63.10-2020. (Determine the channel edge.)
3. Measure the power spectral density (for emissions mask reference) using the following procedure:
 - (1) Set the span to encompass the entire 26 dB EBW of the signal.
 - (2) Set RBW = same RBW used for 26 dB EBW measurement.
 - (3) Set VBW $\geq 3 \times$ RBW
 - (4) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$.
 - (5) Sweep time = auto.
 - (6) Detector = RMS (i.e., power averaging)
 - (7) Trace average at least 100 traces in power averaging (rms) mode.
 - (8) Use the peak search function on the instrument to find the peak of the spectrum.
4. To develop the emission mask, the channel bandwidth is defined as 26 dB Equivalent Bandwidth (EBW) or 99% of the occupied bandwidth.
5. Using the measuring equipment limit line function, develop the emissions mask based on the following requirements. The emissions power spectral density must be reduced below the peak power spectral density (in dB) as follows:
 - (1) Suppressed by 20 dB at 1 MHz outside of the channel edge. (The channel edge is defined as the 26-dB point on either side of the carrier center frequency.)
 - (2) Suppressed by 28 dB at one channel bandwidth from the channel center.
 - (3) Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.
6. Adjust the span to encompass the entire mask as necessary and clear trace.
7. Trace average at least 100 traces in power averaging (rms) mode.
8. Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask

8.4. Test Result of In-Band Emission (Mask)

Refer as Appendix F

9. Contention Based Protocol

9.1. Test Setup



9.2. Test Limit

Unlicensed devices must detect co-channel radio frequency power that is at least -62 dBm (The threshold is referenced to a 0dBi antenna gain.) or lower. Additionally, these devices must detect co-channel energy with 90% or greater certainty.

9.3. Test Procedure

1. Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
2. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters.
3. Determine number of times detection threshold test as following table,

Test Items	Number of Tests	Placement of Incumbent Transmission
$BW_{EUT} \leq BW_{Inc}$	Once	Same as EUT transmission
$BW_{Inc} < BW_{EUT} \leq 2x BW_{Inc}$	Once	Contained within BWEUT
$2x BW_{Inc} < BW_{EUT} \leq 4x BW_{Inc}$	Twice. (Incumbent transmission is contained within BWEUT)	Closely to the lower edge and upper edge of the EUT Channel
$BW_{EUT} > 4x BW_{Inc}$	Three times	Closely to the lower edge ,in the middle and upper edge of the EUT Channel

4. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal.
5. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT.
6. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.
7. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
8. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
9. Refer to step 3 table to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 1, choose a different center frequency for the AWGN signal and repeat the process.

9.4. Test Result of Contention Based Protocol

Refer as Appendix G