

Test Report No:
2520368R-RFUSV03S-B

Test Result for Inspection (Class II Permissive Change)

Product Name	C6490
Brand Name	RuggON
Model No.	C6490-U8A
FCC ID	2ABTU-C6490
Applicant's Name / Address	RuggON Corporation 4F, No. 298, Yang Guang St., NeiHu Dist., Taipei City, Taiwan
Manufacturer's Name	RuggON Corporation
Test Method Requested, Standard	FCC CFR Title 47 Part 15 Subpart E Section 15.407 ANSI C63.10-2013
Verdict Summary	IN COMPLIANCE
Documented By Genie Chang	<i>Genie Chang</i>
Tested by Ivan Chuang	<i>Ivan Chuang</i>
Approved by Steven Tsai	<i>Steven Tsai</i>
Date of Receipt	2025/02/14
Date of Issue	2025/05/20
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.

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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	2025/05/20

Permissive Change

Report No.	Version	Description	Issued Date
2520368R-RFUSV03S-B	V1.0	This is to request a Class II permissive change. The major change filed under this application is: Change #1: Addition of a new antenna type. Change #2: Addition of a new platform. (Ruggon / MT7050)	2025/05/20

Summary of Test Result

Report Clause	Test Items	Result (PASS/FAIL)	Remark
3	Maximum Conducted Output Power	PASS	-
4	Transmitter Radiated Spurious Emission	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 Range	5150 ~ 5250 MHz 5250 ~ 5350 MHz 5470 ~ 5725 MHz 5725 ~ 5850 MHz	
Operating Frequency / Channel Number	IEEE 802.11a/n/ac/ax (20 MHz)	5180 ~ 5240 MHz / 4 Channels 5260 ~ 5320 MHz / 4 Channels 5500 ~ 5700 MHz / 11 Channels 5745 ~ 5825 MHz / 5 Channels
	IEEE 802.11n/ac/ax (40 MHz)	5190 ~ 5230 MHz / 2 Channels 5270 ~ 5310 MHz / 2 Channels 5510 ~ 5670 MHz / 5 Channels 5755 ~ 5795 MHz / 2 Channels
	IEEE 802.11ac/ax (80 MHz)	5210 MHz / 1 Channel 5290 MHz / 1 Channel 5530 ~ 5610 MHz / 2 Channels 5775 MHz / 1 Channel
	IEEE 802.11ac/ax (160 MHz)	5250 MHz / 1 Channel 5570 MHz / 1 Channel
Type of Modulation	IEEE 802.11a/n	OFDM-BPSK, QPSK, 16QAM, 64QAM
	IEEE 802.11ac	OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM
	IEEE 802.11ax	OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM

Accessories Information		
No.	Equipment Name	Description
1	Power Cord	Non-shielded, 2.1m

Antenna Information						
Item	Brand Name	Model No.	Type	Antenna Gain (dBi)		
1	AWAN	ALP6Y-100011(Main)	PIFA	U-NII 1	1.95	
				U-NII 2A	1.93	
				U-NII 2C	2.03	
				U-NII 3	2.05	
		ALP6Y-100012(Aux)		U-NII 1	1.98	
				U-NII 2A	1.98	
				U-NII 2C	1.89	
				U-NII 3	1.92	

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/n/ac/ax Mode: (2TX, 2RX)

1.2. EUT Information

EUT Power Type	From Host system (Battery / DC Power)			
Resource Unit of 802.11ax	☐	Full RU	☒	Partial RU

1.3. Testing Location Information

USA	FCC Designation Number: TW0033
Canada	CAB Identifier Number: TW3023 / Company Number: 26930

Site Description	Accredited by TAF
	Accredited Number: 3023

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
	Linkou Laboratory
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 Number	+886-3-275-7255
Fax Number	+886-3-327-8031

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual	Test Date
Radiated Emission	Temperature (°C)	10~40 °C	22.1 °C	2025/03/12~2025/05/07
	Humidity (%RH)	10~90 %	60.7 %	
RF Conducted Emission	Temperature (°C)	10~40 °C	26.8 °C	2025/02/21~2025/05/16
	Humidity (%RH)	10~90 %	50.2 %	

1.4. 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
Maximum Conducted Output Power	Spectrum Analyzer: ± 2.13 dB Power Meter: ± 1.07 dB
Transmitter Radiated Spurious Emission	9 kHz~30 MHz: ± 3.30 dB 30 MHz~1 GHz: ± 4.79 dB 1 GHz~18 GHz: ± 4.17 dB 18 GHz~40 GHz: ± 3.32 dB
Duty Cycle	± 0.51 %

1.5. 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	103466	2024/12/18	2025/12/17
V	Spectrum Analyzer	KEYSIGHT	N9010A	MY53470892	2024/10/30	2025/10/29
V	Peak Power Analyzer	KEYSIGHT	8990B	MY51000539	2025/05/05	2026/05/04
V	Wideband Power Sensor	KEYSIGHT	N1923A	MY59240002	2025/05/07	2026/05/06
V	Wideband Power Sensor	KEYSIGHT	N1923A	MY59240003	2025/05/07	2026/05/06

Note:

1. All equipment is calibrated every year.
2. The test instruments marked with "V" are used to measure the final test results.
3. Test Software Version : DTC_RF_Tool_Release V100

For Radiated Measurements /HY-CB02

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
V	Loop Antenna	TESEQ	HLA6121	49611	2025/02/18	2026/02/17
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0675	2023/08/09	2025/08/08
V	Horn Antenna	RF SPIN	DRH18-E	210503A18ES	2024/02/29	2026/02/28
V	Horn Antenna	Com-Power	AH-840	101101	2023/12/04	2025/12/03
V	Pre-Amplifier	SGH	SGH0301	20230308-1	2025/02/06	2026/02/05
V	Pre-Amplifier	SGH	SGH118-HS	20211102-1	2025/01/10	2026/01/09
V	Pre-Amplifier	EMCI	EMC05820SE	980285	2025/01/10	2026/01/09
	Pre-Amplifier	MICZEN	MZLNA1850GAC40	WB0103001	2025/01/10	2026/01/09
V	Pre-Amplifier	EMCI	EMC184045SE	980369	2025/01/10	2026/01/09
V	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160311	2025/01/10	2026/01/09
V	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242	2025/01/10	2026/01/09
	Filter	MICRO TRONICS	BRM20887	G002	2025/01/05	2026/01/04
V	Filter	MICRO TRONICS	BRM50716	G067	2025/01/05	2026/01/04
	WIFI 6E Filter	Marvelous Microwave Inc.	MFN-5925.7125.S1	C50002N	2025/01/05	2026/01/04
V	EMI Test Receiver	R&S	ESR3	102793	2024/12/06	2025/12/05
V	Spectrum Analyzer	R&S	FSV3044	101113	2025/01/22	2026/01/21
V	Coaxial Cable	SGH	HA800	GD20110223-2	2025/01/10	2026/01/09
V	Coaxial Cable	SGH	HA800	GD20110222-4	2025/01/10	2026/01/09
V	Coaxial Cable	SGH	SGH18	202108-5	2025/01/10	2026/01/09
V	Coaxial Cable	SGH	SGH18	202212-2	2025/01/10	2026/01/09

Note:

1. Bi-Log Antenna and Horn Antenna(AH-840) and RF SPIN 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 12 V by DC power supply

2.2. Test Frequency Mode

Test Software Version	QRCT / Version 4.0.211.0
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Modulation	Frequency (MHz)	Power Setting
802.11a (20 MHz)	5180	15.5
	5200	15.5
	5240	16
	5260	16.5
	5280	16.5
	5320	16
	5500	15
	5580	14.5
	5700	13.5
	5745	12.5
	5785	13
	5825	13
802.11n (20 MHz)	5180	15.5
	5200	13.5
	5240	14
	5260	14.5
	5280	14.5
	5320	14.5
	5500	13
	5580	12.5
	5700	12
	5745	11.5
	5785	11.5
	5825	11.5
802.11n (40 MHz)	5190	14
	5230	14.5
	5270	14.5
	5310	13.5
	5510	13
	5550	13
	5670	12
	5755	11.5
	5795	11.5

802.11ac (20 MHz)	5180	11
	5200	11
	5240	11
	5260	11.5
	5280	11.5
	5320	11
	5500	10
	5580	9.5
	5700	10.5
	5745	10.5
	5785	10.5
	5825	10.5
802.11ac (40 MHz)	5190	12
	5230	13
	5270	13
	5310	13
	5510	12
	5550	12
	5670	11
	5755	11
	5795	11
802.11ac (80 MHz)	5210	13
	5290	13
	5530	12
	5610	11
	5775	11.5
802.11ac (160 MHz)	5250	14
	5570	13.5

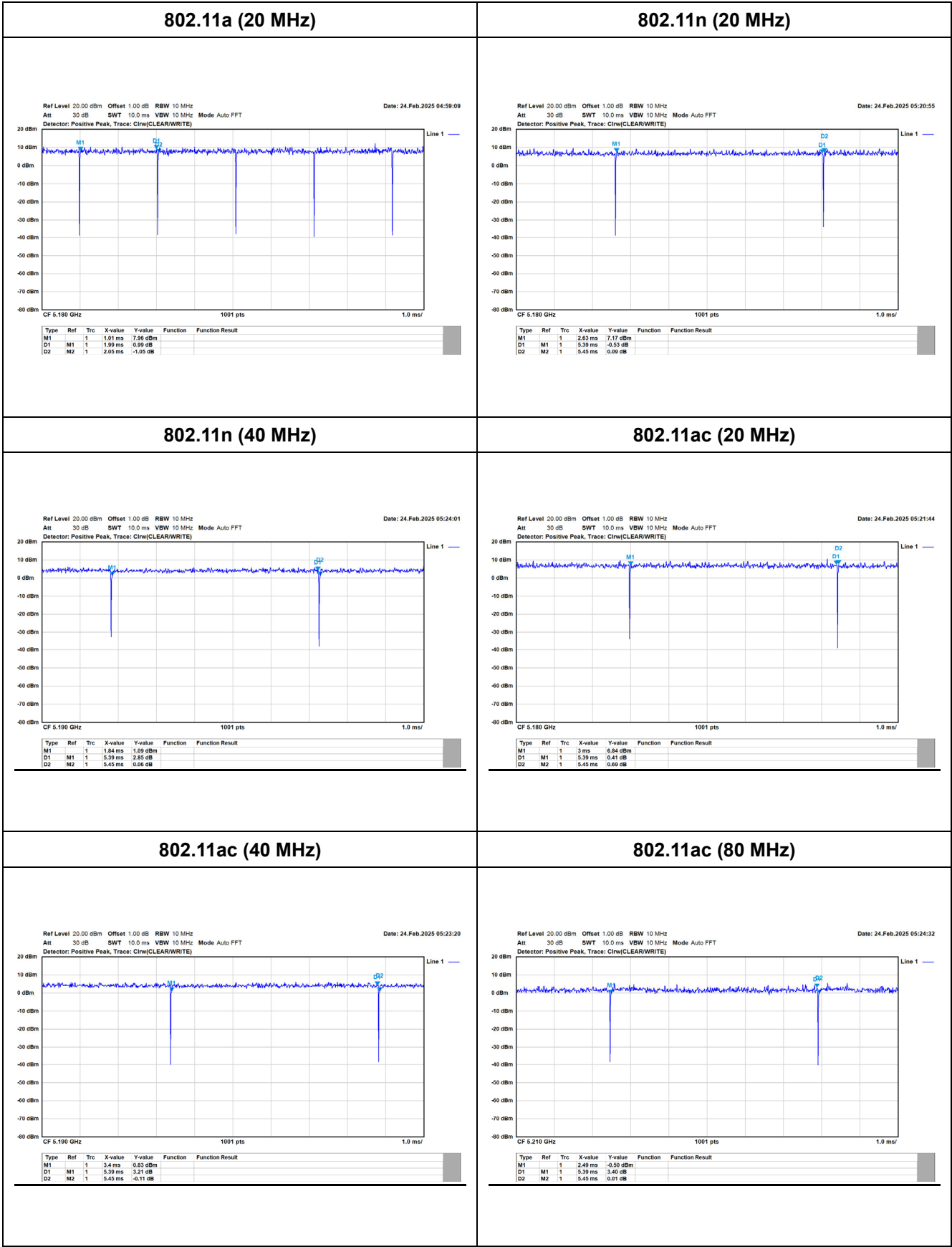
Modulation	Frequency (MHz)	RU Config	Power Setting
802.11ax (20 MHz)	5180	26/0	6.5
		52/37	7.5
		106/53	7
		242/61	11.5
	5200	26/0	7.5
		52/37	7
		106/53	7
		242/61	12
	5240	26/0	7.5
		52/37	7
		106/53	7
		242/61	12
	5260	26/0	7.5
		52/37	8
		106/53	7.5
		242/61	12.5
	5280	26/0	7.5
		52/37	8
		106/53	7
		242/61	12.5
	5320	26/0	7
		52/37	7.5
		106/53	6.5
		242/61	11.5
	5500	26/0	7.5
		52/37	7
		106/53	6.5
		242/61	11.5
	5580	26/0	7
		52/37	6
		106/53	6
		242/61	11
	5700	26/0	7
		52/37	7.5
		106/53	7
		242/61	11
	5745	26/0	7.5
		52/37	7
		106/53	7
		242/61	10.5
	5785	26/0	7.5
		52/37	7.5
		106/53	7
		242/61	11
	5825	26/0	7
		52/37	7.5
		106/53	7.5
		242/61	11

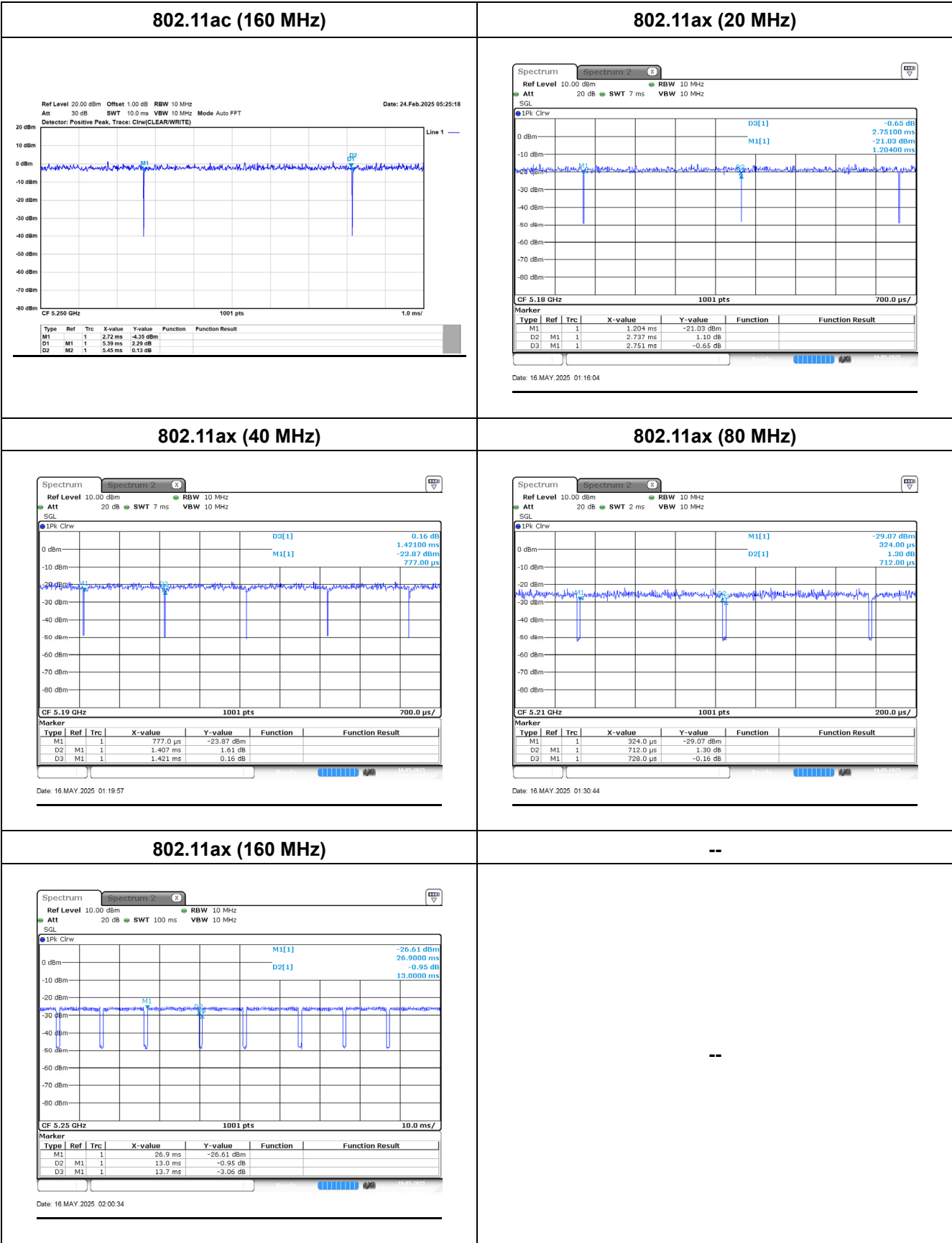
Modulation	Frequency (MHz)	RU Config	Power Setting
802.11ax (40 MHz)	5190	26/0	9
		52/37	8
		106/53	8
		242/61	7.5
		484/65	9
	5230	26/0	8
		52/37	8
		106/53	8
		242/61	8
		484/65	11
	5270	26/0	8
		52/37	8
		106/53	8
		242/61	8
		484/65	11
	5310	26/0	8
		52/37	8
		106/53	8
		242/61	8.5
		484/65	11
	5510	26/0	8
		52/37	8
		106/53	8
		242/61	7.5
		484/65	10
	5550	26/0	8
		52/37	8
		106/53	8
		242/61	8
		484/65	10
	5670	26/0	7.5
		52/37	7.5
		106/53	8
		242/61	8
		484/65	11
	5755	26/0	7.5
		52/37	7.5
		106/53	7.5
		242/61	7.5
		484/65	11
	5795	26/0	8
		52/37	8
		106/53	7.5
		242/61	8
		484/65	11

Modulation	Frequency (MHz)	RU Config	Power Setting
802.11ax (80 MHz)	5210	26/0	9
		52/37	8.5
		106/53	8.5
		242/61	8.5
		484/65	8.5
		996/67	13
	5290	26/0	8
		52/37	8
		106/53	8
		242/61	8
		484/65	8
		996/67	11
	5530	26/0	8
		52/37	8
		106/53	8
		242/61	8
		484/65	8
		996/67	10
	5610	26/0	7
		52/37	7
		106/53	7
		242/61	7
		484/65	7.5
		996/67	10
	5775	26/0	7.5
		52/37	7.5
		106/53	7.5
		242/61	7.5
		484/65	7.5
		996/67	10.5
802.11ax (160 MHz)	5210	26/0	7
		52/37	7
		106/53	7
		242/61	7
		484/65	7.5
		996/67	7.5
		2x996/68	10
	5290	26/0	7
		52/37	7
		106/53	7
		242/61	7
		484/65	8
		996/67	5
		2x996/68	11

2.3. Duty Cycle

Modulation	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (Hz)
802.11a (20 MHz)	1.9900	2.0500	97.07	0.13	1000
802.11n (20 MHz)	5.3900	5.4500	98.90	0.05	10
802.11n (40 MHz)	5.3900	5.4500	98.90	0.05	10
802.11ac (20 MHz)	5.3900	5.4500	98.90	0.05	10
802.11ac (40 MHz)	5.3900	5.4500	98.90	0.05	10
802.11ac (80 MHz)	5.3900	5.4500	98.90	0.05	10
802.11ac (160 MHz)	5.3900	5.4500	98.90	0.05	10
802.11ax (20 MHz)	2.7370	2.7510	99.49	0.02	10
802.11ax (40 MHz)	1.4070	1.4210	99.01	0.04	10
802.11ax (80 MHz)	0.7120	0.7280	97.80	0.10	2000
802.11ax (160 MHz)	13.0000	13.7000	94.89	0.23	100





2.4. Measurement Configuration

Test Mode	Mode 1 (Transmit)	802.11a (20 MHz)
		802.11n (20 MHz)
		802.11n (40 MHz)
		802.11ac (20 MHz)
		802.11ac (40 MHz)
		802.11ac (80 MHz)
		802.11ac (160 MHz)
		802.11ax (20 MHz)_Partial RU
		802.11ax (40 MHz)_Partial RU
		802.11ax (80 MHz)_Partial RU
		802.11ax (160 MHz)_Partial RU

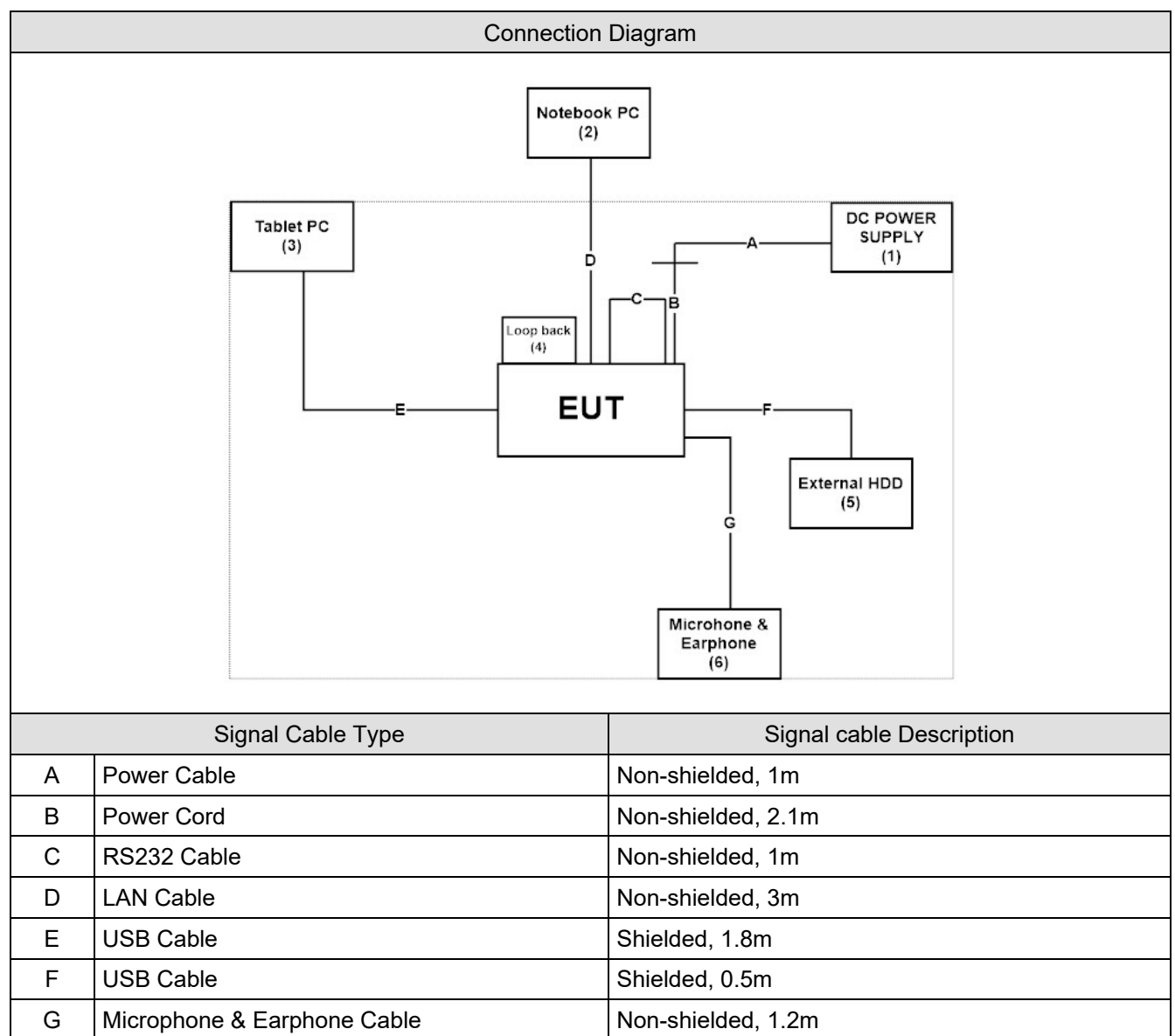
Note:

1. Determining compliance shall be based on the results of the compliance measurement, without taking measurement instrumentation uncertainty into account.
2. For radiated emissions below 1 GHz, all modes of operation were investigated, and the worst-case emissions are reported.
3. The radiation measurements are performed in the X, Y, and Z axis positions. Only the worst case is shown in the report.
4. The lowest data rates are tested in each mode. Only the worst case is shown in the report.
(802.11a is 6 Mbps, 802.11 n is MCS0, 802.11ac is MCS0, 802.11ax is MCS0)

2.5. Tested System Details

No.	Equipment	Brand Name	Model No.	Serial No.	Power Cord
1	DC POWER SUPPLY	KEYSIGHT	E36234A	MY59001234	Non-shielded, 1.8m
2	Notebook PC	Lenovo	TP00067C	PF-0EW0C3	N/A
3	Tablet PC	Lenovo	L13	N/A	N/A
4	Loop back	N/A	N/A	N/A	N/A
5	External HDD	Transcend	TS1TSJ25H3B	F21786-0005	N/A
6	Microphone & Earphone	Verbatim	C09024VB	N/A	N/A

2.6. Configuration of tested System

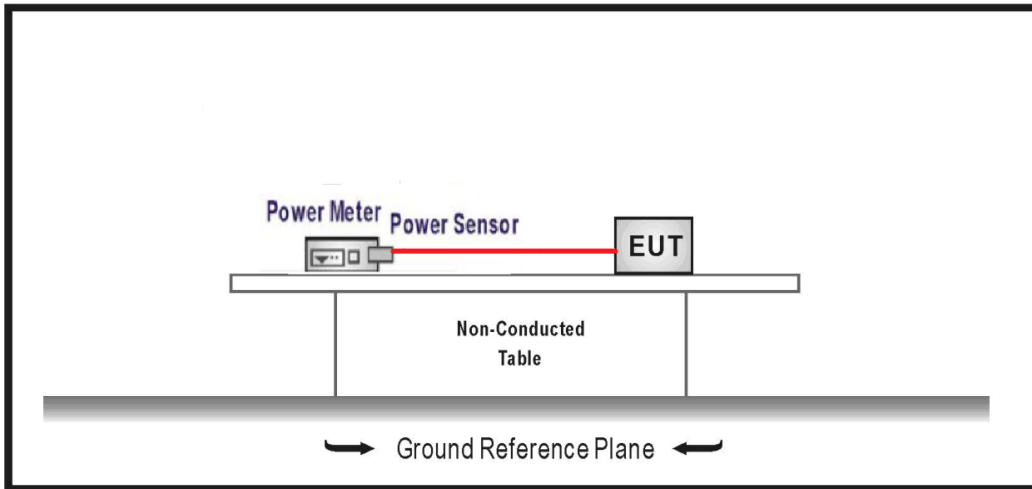


2.7. EUT Operating Procedures

1	Setup the EUT as shown in Section 2.6.
2	Execute software “QRCT / Version 4.0.211.0” on the Tablet PC.
3	Configure the test mode, the test channel, and the data rate.
4	Verify that the EUT works properly.

3. Maximum Conducted Output Power

3.1. Test Setup



3.2. Test Limit

1. For an outdoor access point and an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3. Test Procedure

The EUT was setup to ANSI C63.10: 2013; tested to U-NII test procedure of 789033.

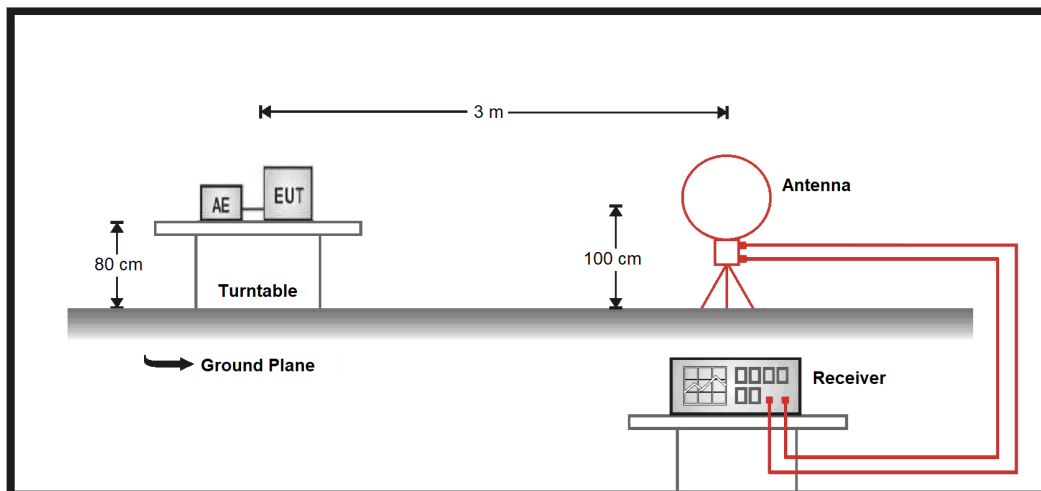
3.4. Test Result of Maximum Conducted Output Power

Refer as Appendix A

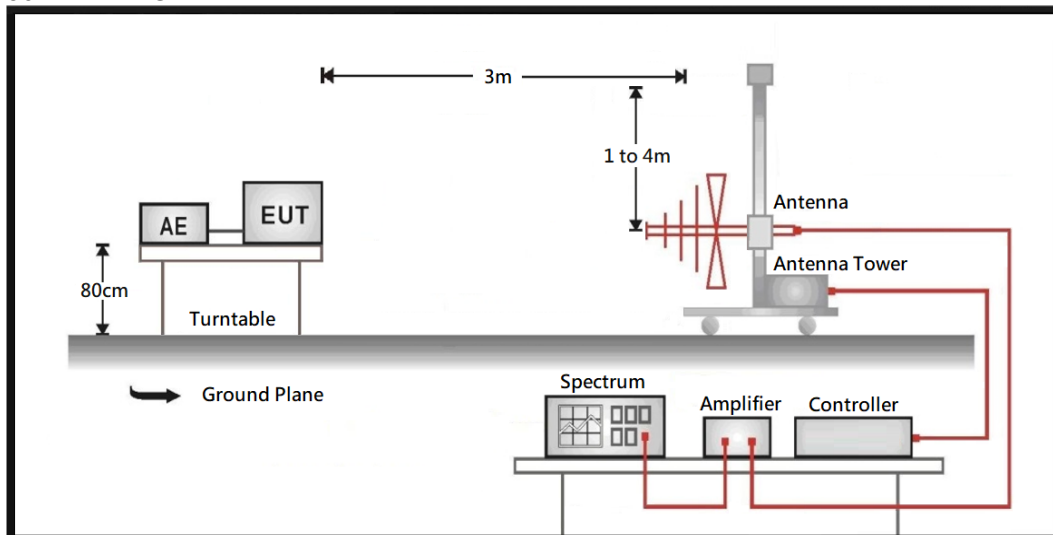
4. Transmitter Radiated Spurious Emission

4.1. Test Setup

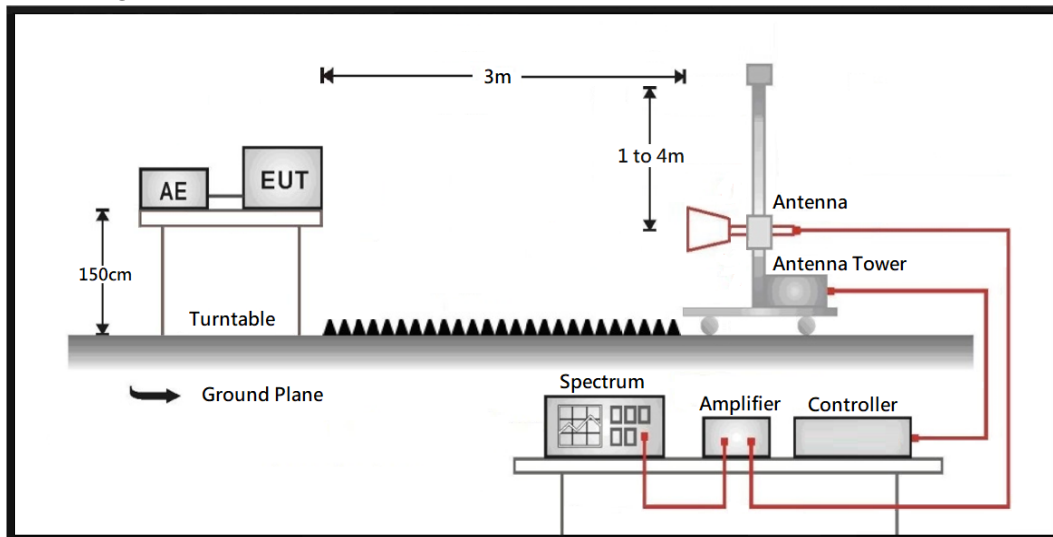
9 kHz ~ 30 MHz



30 MHz ~ 1 GHz



Above 1 GHz



4.2. Test Limit

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/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 (dBμV/m) = 20 log Field strength (μV/m)
2. In the Above Table, the tighter limit applies at the band edges.
2. 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 (dBμV/m@3m)
5150 – 5250	-27	68.2
5250 – 5350	-27	68.2
5470 – 5725	-27	68.2
5725 – 5850	-27 ^{*1}	68.2 ^{*1}
	10 ^{*2}	105.2 ^{*2}
	15.6 ^{*3}	110.8 ^{*3}
	27 ^{*4}	122.2 ^{*4}

^{*1} beyond 75 MHz or more above of the band edge.

^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Remark:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \text{ uV/m, where P is the eirp (Watts).}$$

4.3. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

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: 2013 on radiated measurement.

The additional latch filter below 1 GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

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

The frequency range from 9 kHz to 10th harmonics and included The frequency range from the lowest oscillator frequency generated within the device up to the 10th harmonic was checked is checked.

4.4. Test Result of Transmitter Radiated Spurious Emission

Refer as Appendix B