

Test Report No:  
2520368R-RFUSV01S-A

## 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 C Section 15.247 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

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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

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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-RFUSV01S-A	V1.0	<p>This is to request a Class II permissive change. The major change filed under this application is:</p> <p>Change #1: Addition of a new antenna type.</p> <p>Change #2: Addition of a new platform.</p> <p>(Ruggon / MT7050)</p>	2025/05/20

## Summary of Test Result

Report Clause	Test Items	Result (PASS/FAIL)	Remark
3	Maximum Peak Conducted Output Power	PASS	-
4	Radiated 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	2400 ~ 2483.5 MHz
Operating Frequency / Channel Number	2402 ~ 2480 MHz / 79 Channels
Mode	Bluetooth BR / EDR
Type of Modulation	Bluetooth BR uses a GFSK (1 Mbps)
	Bluetooth EDR uses a combination of $\pi/4$ DQPSK (2 Mbps) and 8DPSK (3 Mbps)

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

Antenna Information				
Item.	Brand Name	Part No.	Type	Gain (dBi)
1	AWAN	ALP6Y-100011(Main)	PIFA	2.39
		ALP6Y-100012(Aux)		1.90

Note:

1. Only the higher gain antenna was tested and recorded in this report.
2. The antenna of EUT conforms to FCC 15.203.

## 1.2. EUT Information

EUT Power Type	From Host system (Battery / DC Power)
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## 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	21.7 °C	2025/03/12~2025/04/15
	Humidity (%RH)	10~90 %	62.1 %	
RF Conducted Emission	Temperature (°C)	10~40 °C	23.1 °C	2025/02/21~2025/02/25
	Humidity (%RH)	10~90 %	55.7 %	

## 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 Peak Conducted Output Power	Spectrum Analyzer: $\pm 2.13$ dB Power Meter: $\pm 1.07$ dB
Radiated Emission	9 kHz~30 MHz: $\pm 3.30$ dB 30 MHz~1 GHz: $\pm 4.79$ dB 1 GHz~18 GHz: $\pm 4.17$ dB 18 GHz~40 GHz: $\pm 3.32$ dB
Duty Cycle	$\pm 0.51$ %

## 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
V	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
V	Filter	MICRO TRONICS	BRM20887	G002	2025/01/05	2026/01/04
	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

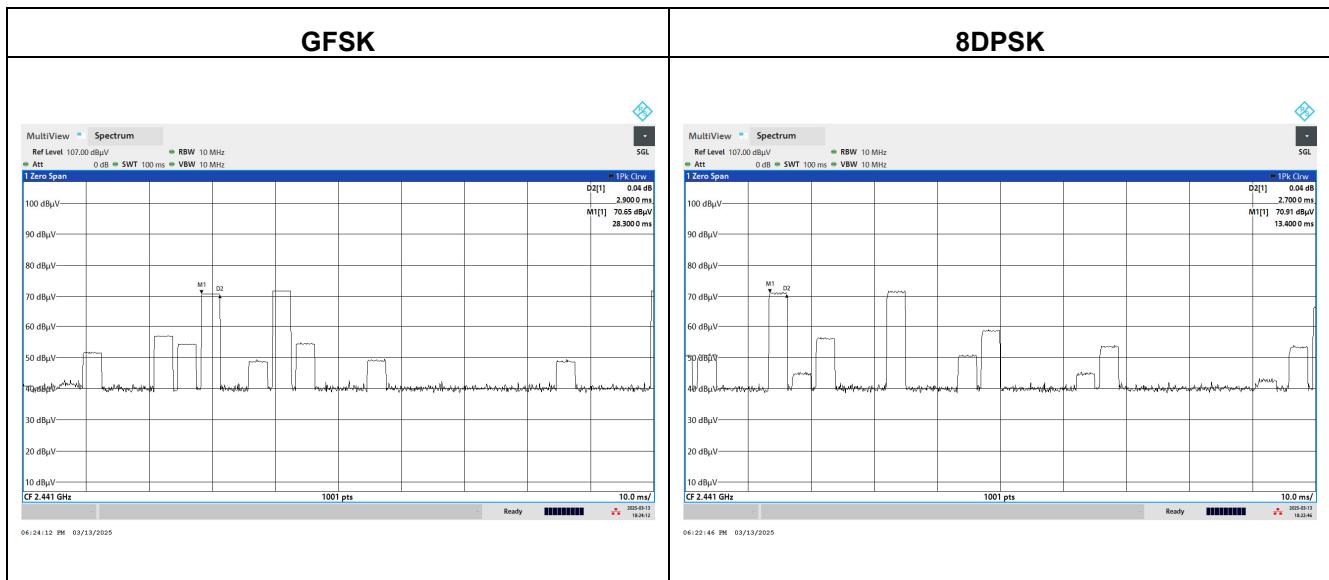
Test Software Version	QRCT / Version 4.0.211.0
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Modulation	Frequency (MHz)	Power Setting
GFSK	2402	8
	2441	8
	2480	7
$\pi/4$ DQPSK	2402	8
	2441	8
	2480	7
8DPSK	2402	8
	2441	8
	2480	7

### 2.3. Duty Cycle

Modulation	Time on of 100 ms (ms)	Duty Cycle (Ton/100 ms)	Duty Cycle Correction factor (dB)
GFSK	5.80	0.058	-24.731
8DPSK	5.40	0.054	-25.352

Note: Duty Cycle correction factor = 20 LOG(Duty Cycle).



## 2.4. Measurement Configuration

Test Mode	Mode 1 (Transmit)	GFSK
		$\pi/4$ DQPSK
		8DPSK

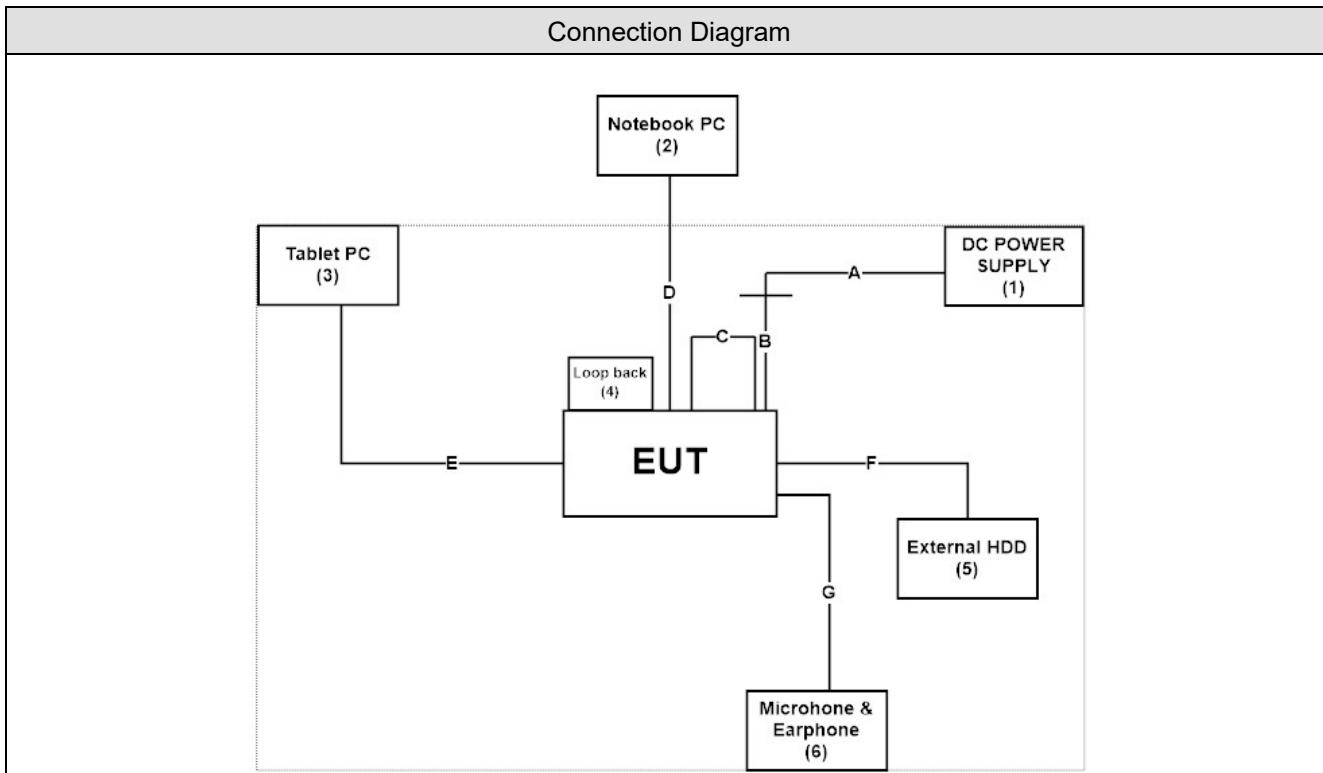
Note:

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 test mode is based on Bluetooth technology. While testing 1 Mbps, 2 Mbps, and 3 Mbps, the worst cases are 1 Mbps and 3 Mbps. Only the worst-case data is recorded in this report.
4. The radiation measurements are performed in the X, Y, and Z axis positions. Only the worst case is shown in the report.

## 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



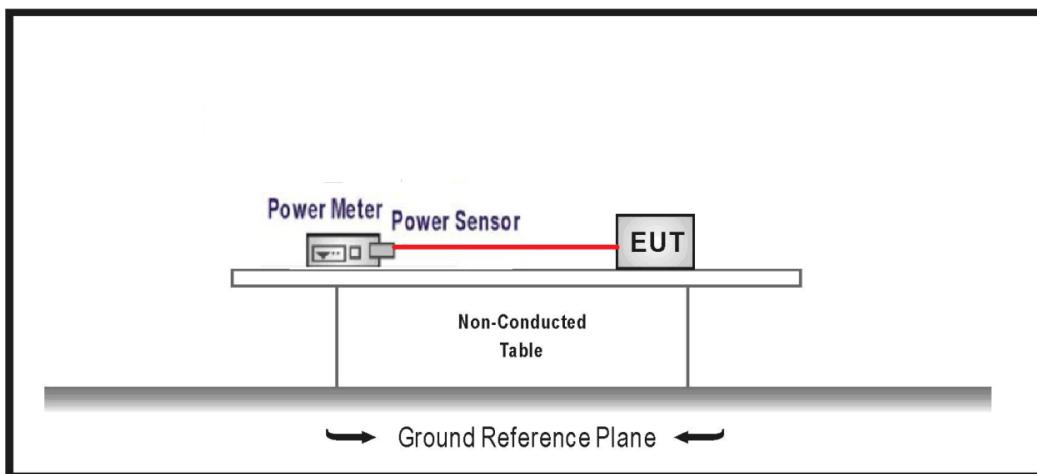
Signal Cable Type		Signal cable Description
A	Power Cable	Non-shielded, 1m
B	Power Cord	Non-shielded, 2.1m
C	RS232 Cable	Non-shielded, 1m
D	LAN Cable	Non-shielded, 3m
E	USB Cable	Shielded, 1.8m
F	USB Cable	Shielded, 0.5m
G	Microphone & Earphone Cable	Non-shielded, 1.2m

## 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 Peak Conducted Output Power

#### 3.1. Test Setup



#### 3.2. Test Limit

For frequency hopping systems operating in the 902 ~ 928 MHz band:

1. Number of Hopping Frequencies  $\geq 50$ : 1 watt (30dBm)
2.  $50 >$  Number of Hopping Frequencies  $\geq 25$ : 0.25 watt (23.98dBm)

For frequency hopping systems operating in the 2400 ~ 2483.5 MHz band:

1. Number of Hopping Frequencies  $\geq 75$ : 1 watt (30dBm)
2.  $75 >$  Number of Hopping Frequencies  $\geq 15$ : 0.125 watts (20.97dBm)

For frequency hopping systems operating in the 5725 ~ 5850 MHz band:

Number of Hopping Frequencies  $\geq 75$ : 1 watt (30dBm)

#### 3.3. Test Procedures

The EUT was setup according to ANSI C63.10: 2013 and tested according to FHSS test procedure of KDB 558074.

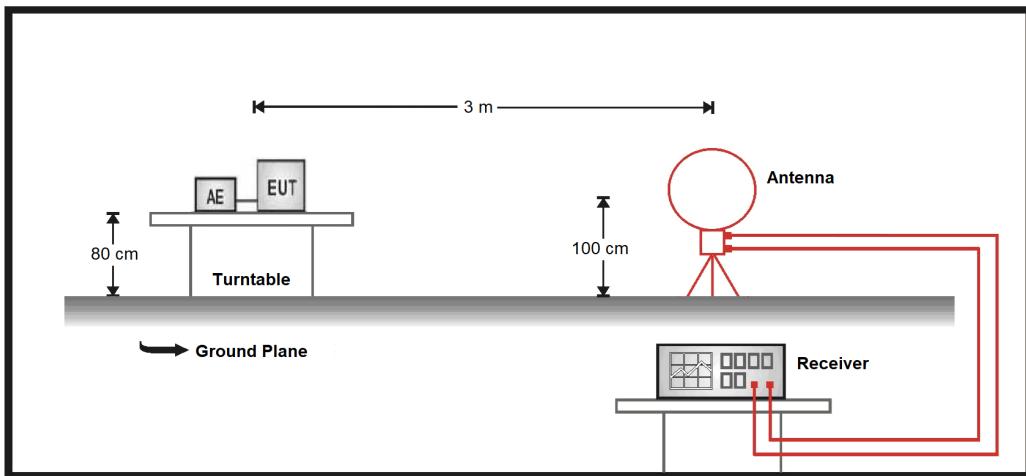
#### 3.4. Test Result of Maximum Peak Conducted Output Power

Refer as Appendix A

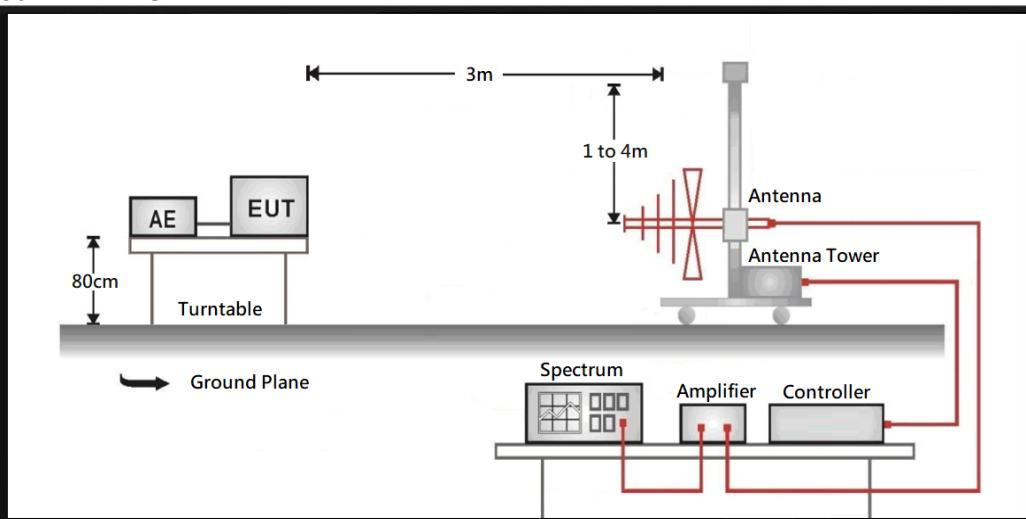
## 4. Radiated Emission

### 4.1. Test Setup

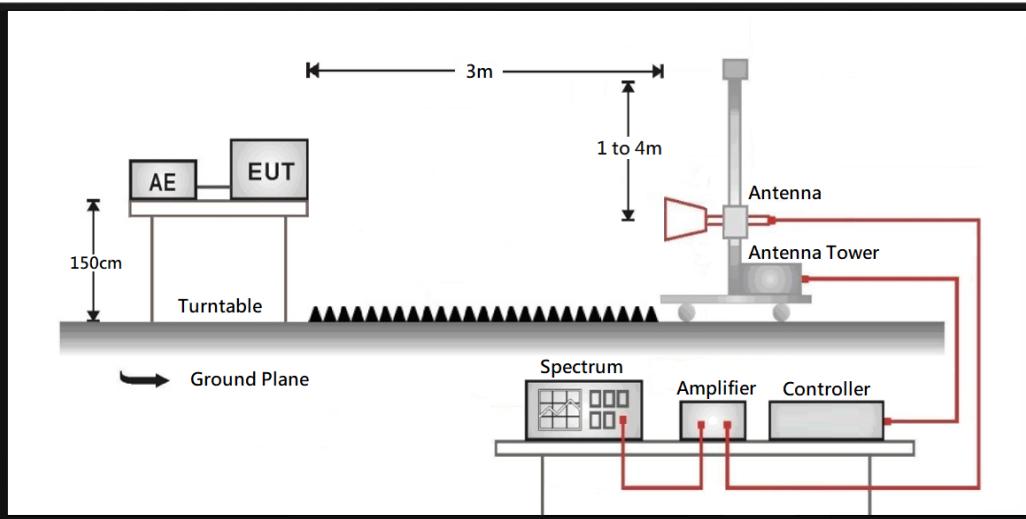
9 kHz ~ 30 MHz



30 MHz ~ 1 GHz



Above 1 GHz



#### 4.2. Test Limit

Frequency (MHz)	Field strength ( $\mu$ V/m)	Field strength ( $\text{dB}\mu\text{V}/\text{m}$ )	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 ( $\text{dB}\mu\text{V}/\text{m}$ ) = 20 log Field strength ( $\mu\text{V}/\text{m}$ )
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.

#### 4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to FHSS test procedure of KDB 558074.

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 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.

On any frequency or frequencies from 9 kHz (including 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.

#### 4.4. Test Result of Radiated Emission

Refer as Appendix B