




# RADIO TEST REPORT

**FCC ID** : LDK603102338  
**Equipment** : Cisco Board Pro 55 G2  
**Brand Name** : Cisco  
**Model Name** : TTC60-35  
**Applicant** : Cisco Systems Inc  
125 West Tasman Drive, San Jose, CA 95134-1706 · USA  
**Manufacturer** : Cisco Systems Norway AS  
Philip Pedersens vei 1, 1366 Lysaker, Norway  
**Standard** : 47 CFR FCC Part 15 Subpart C § 15.249

The product was received on Oct. 17, 2023, and testing was started from Oct. 26, 2023 and completed on Nov. 29, 2023. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

**Sporton International Inc. Hsinchu Laboratory**  
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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## Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2.1	15.207	AC Power Line Conducted Emissions	PASS	-
2.2	15.249(a)	Field Strength of Fundamental Emissions	PASS	-
2.3	15.215(c)	20dB Spectrum Bandwidth	PASS	-
2.4	15.249(a)/(d)	Radiated Emissions	PASS	-
2.5	15.203	Antenna Requirements	PASS	-

**Conformity Assessment Condition:**

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

**Disclaimer:**

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

**Reviewed by: Sam Chen**

**Report Producer: Sophia Shiung**



# 1 General Information

## 1.1 Product Details

Items	Description
Power Type	From AC power
Modulation	FMCW
Frequency Range	24000 ~ 24250 MHz
Operation Frequency Range	24060 ~ 24240 MHz
Testing Frequency	24150 MHz
Channel Bandwidth (99%)	180.174 MHz
Max. Field Strength	86.33 dBuV/m at 3m(Average) / 95.87 dBuV/m at 1m (Average) 92.00 dBuV/m at 3m(Peak) / 101.54 dBuV/m at 1m (Peak)
Accessories	N/A

Note: The above information was declared by manufacturer.

## 1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Integrated Antenna	N/A	2

Note: The above information was declared by manufacturer.



### 1.3 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR122660.

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
<p>Implemented the Board device with the Product Name Cisco Webex Board Pro 55 with Model Name TTC60-31, with the following changes, creating a new Product Name Cisco Board Pro 55 G2 with Model Name TTC60-35.</p> <p>1. The list below describes the implementations done to the new Board device.</p> <p>a) Added two I/O Ports: One HDMI Output Port, and one Ethernet Port.</p> <p>b) Upgraded the Camera.</p>	<p>1. Radiated Emissions below 1GHz</p> <p>2. AC Power Line Conducted Emissions</p>
<p>2. Applied the second source component to the 24 GHz Radio Radar PCB with the following changes without causing any function or performance differences.</p> <p>a) Alternate second source of crystal from Diodes.</p> <p>b) Increased the PCB space paths to accommodate the following second source components: Resistor R16, R17, and C28 capacitor location. The R16 and R17 resistors are zero-ohm jumpers used for debugging. The C28 capacitor serves as a decoupling capacitor.</p>	<p>1. 99% Bandwidth</p> <p>2. Field Strength of Fundamental Emissions</p>

### 1.4 Table for Test Modes

The following table is a list of the test modes shown in this test report.

Test Items	Mode
AC Power Line Conducted Emissions Test Voltage: 120Vac / 60Hz	CTX
Field Strength of Fundamental Emissions	CTX
20dB Spectrum Bandwidth	CTX
Radiated Emissions 30MHz~1GHz	CTX

Note: CTX=continuously transmitting

After evaluating, the worst case was found at the X axis. Thus, the measurement followed the same configuration.



### 1.5 Applicable Standards

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

- ◆ ANSI C63.10-2013
- ◆ 47 CFR FCC Part 15 Subpart C § 15.249

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

- ◆ FCC KDB 414788 D01 v01r01

### 1.6 Table for Testing Locations

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu      ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)	
(TAF: 3787)    TEL: 886-3-656-9065                      FAX: 886-3-656-9085	
Test site Designation No. TW3787 with FCC.	
Conformity Assessment Body Identifier (CABID) TW3787 with ISED.	

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	10CH01-CB	Richard Pai	22.4~23.5 / 55~58	Nov. 03, 2023~ Nov. 29, 2023
AC Conduction	CO01-CB	Tim Chen	23~24 / 62~64	Oct. 26, 2023



### 1.7 Table for Supporting Units

For AC Power Line Conducted Emissions:

No.	Support Unit	Brand	Model	FCC ID
A	Notebook	DELL	E4300	N/A

For other test items:

No.	Support Unit	Brand	Model	FCC ID
A	Flash disk3.0	Transcend	JetFlash-700	N/A
B	Earphone	SHYARO CHI	MIC-04	N/A
C	Table microphone	Cisco Systems Inc	CS-MIC-TABLE-J	N/A
D	Table microphone	Cisco Systems Inc	CS-MIC-TABLE-J	N/A

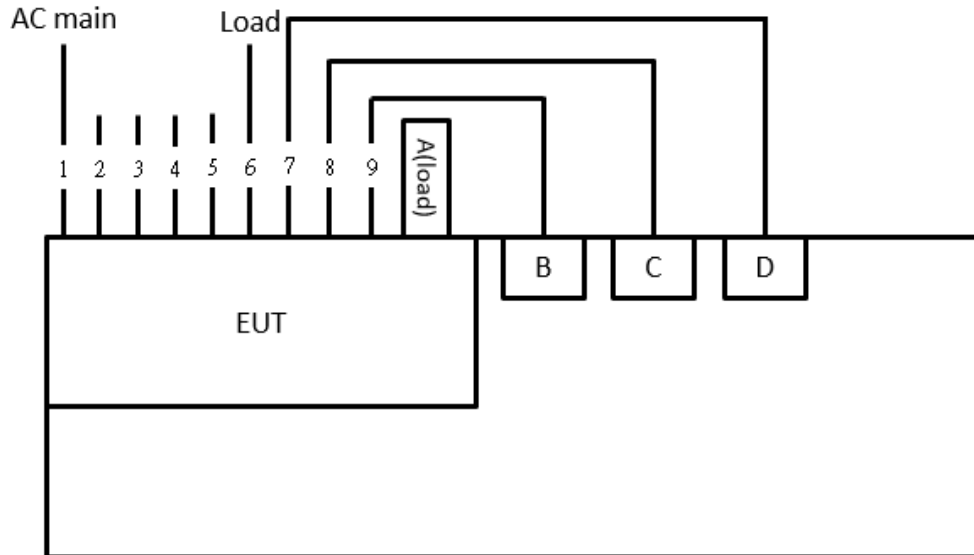
### 1.8 Table for Parameters of Test Software Setting

Test Software Version	Ttermpro version (4.75)
Frequency	24150 MHz
Software Setting	Default



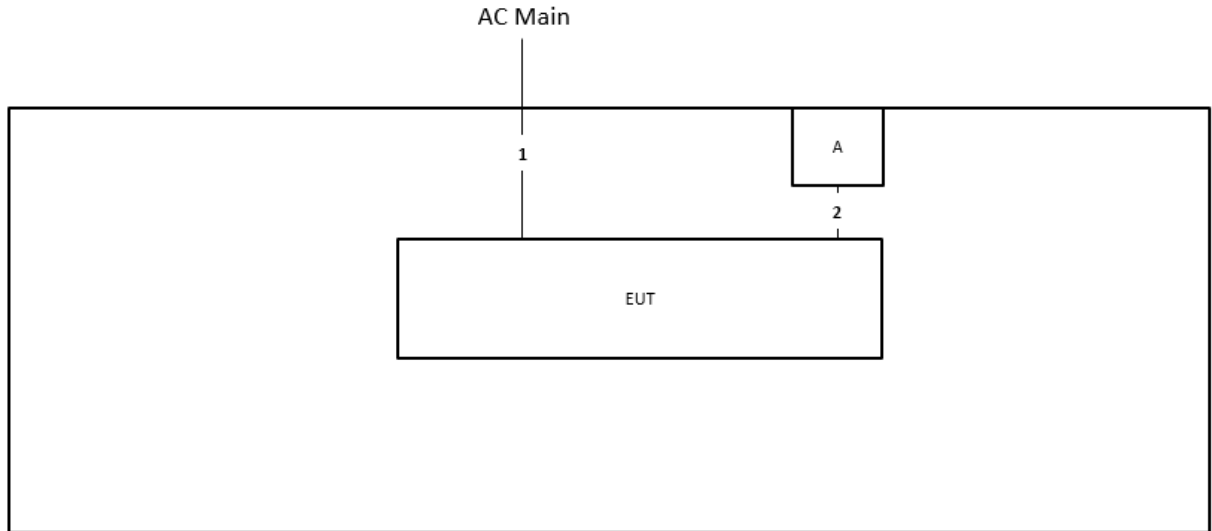
## 1.9 Test Configurations

### 1.9.1 AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	5m
2	HDMI cable	Yes	1.8m
3	HDMI cable*2	Yes	8m
4	Micro USB cable	Yes	1.8m
5	TypeC USB cable	Yes	9m
6	RJ-45 cable*3	No	5m
7	Table microphone cable	Yes	7.5m
8	Table microphone cable	Yes	7.5m
9	Audio cable	No	1.2m

**1.9.2 Radiation Emissions Test Configuration**



Item	Connection	Shielded	Length
1	Power cable	No	5m
2	USB to Micro cable	Yes	1m



## 2 Test Result

### 2.1 AC Power Line Conducted Emissions Measurement

#### 2.1.1 Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

#### 2.1.2 Measuring Instruments and Setting

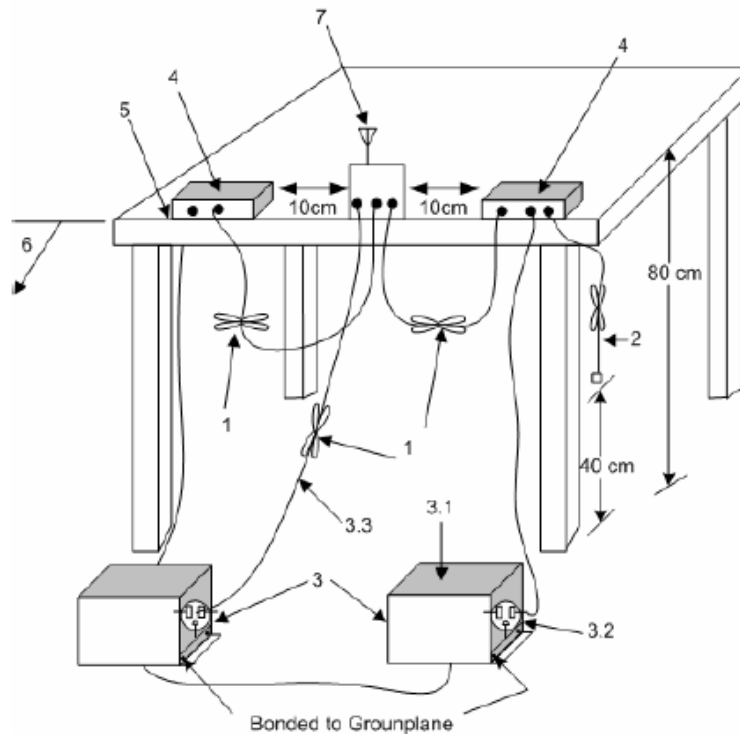
Refer a test equipment and calibration data table in this test report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

#### 2.1.3 Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

**2.1.4 Test Setup Layout**



- 1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
- 2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- 3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
- 3.1—All other equipment powered from additional LISN(s).
- 3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
- 3.3—LISN at least 80 cm from nearest part of EUT chassis.
- 4—Non-EUT components of EUT system being tested.
- 5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
- 6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
- 7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

**2.1.5 Test Deviation**

There is no deviation with the original standard.

**2.1.6 EUT Operation during Test**

The EUT was placed on the test table and programmed in normal function.

**2.1.7 Measurement Results Calculation**

The measured Level is calculated using:

- a. Corrected Reading: LISN Factor (LISN) + Attenuator (AT/AUX) + Cable Loss (CL) + Read Level (Raw) = Level
- b. Margin = -Limit + Level

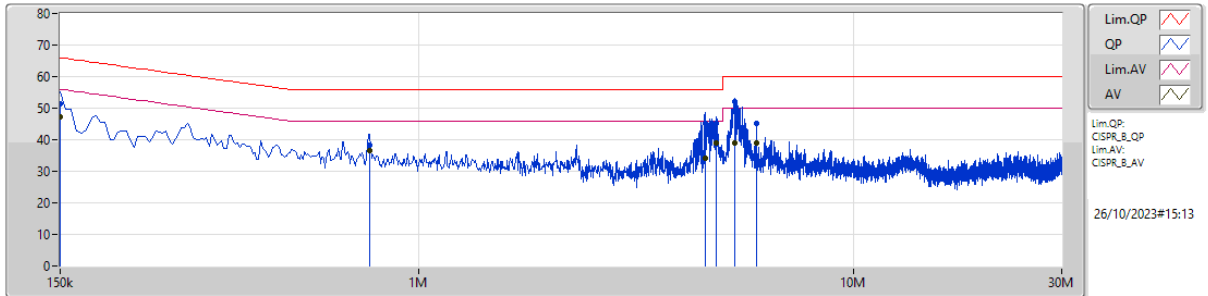


**2.1.8 Results of AC Power Line Conducted Emissions Measurement**

<b>Configuration</b>	CTX
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**Line**

**Mode 1**



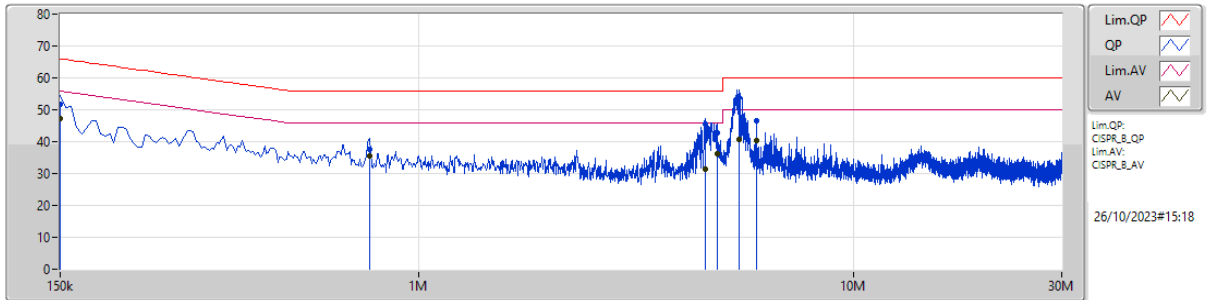
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Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	150k	51.32	66.00	-14.68	9.98	Line	-	41.34	0.09	0.02	9.87
AV	150k	47.11	56.00	-8.89	9.98	Line	-	37.13	0.09	0.02	9.87
QP	771k	38.39	56.00	-17.61	10.01	Line	-	28.38	0.10	0.01	9.90
AV	771k	36.66	46.00	-9.34	10.01	Line	-	26.65	0.10	0.01	9.90
QP	4.547M	45.12	56.00	-10.88	10.23	Line	-	34.89	0.18	0.14	9.91
AV	4.547M	34.06	46.00	-11.94	10.23	Line	-	23.83	0.18	0.14	9.91
QP	4.835M	45.34	56.00	-10.66	10.25	Line	-	35.09	0.19	0.14	9.92
AV	4.835M	38.91	46.00	-7.09	10.25	Line	"Worst"	28.66	0.19	0.14	9.92
QP	5.307M	51.97	60.00	-8.03	10.25	Line	-	41.72	0.19	0.14	9.92
AV	5.307M	38.87	50.00	-11.13	10.25	Line	-	28.62	0.19	0.14	9.92
QP	5.973M	45.18	60.00	-14.82	10.26	Line	-	34.92	0.20	0.14	9.92
AV	5.973M	38.87	50.00	-11.13	10.26	Line	-	28.61	0.20	0.14	9.92



**Neutral**

**Mode 1**



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	150k	51.61	66.00	-14.39	9.96	Neutral	-	41.65	0.07	0.02	9.87
AV	150k	47.21	56.00	-8.79	9.96	Neutral	-	37.25	0.07	0.02	9.87
QP	771k	37.46	56.00	-18.54	9.99	Neutral	-	27.47	0.08	0.01	9.90
AV	771k	35.42	46.00	-10.58	9.99	Neutral	-	25.43	0.08	0.01	9.90
QP	4.542M	45.41	56.00	-10.59	10.19	Neutral	-	35.22	0.14	0.14	9.91
AV	4.542M	31.34	46.00	-14.66	10.19	Neutral	-	21.15	0.14	0.14	9.91
QP	4.839M	42.61	56.00	-13.39	10.21	Neutral	-	32.40	0.15	0.14	9.92
AV	4.839M	36.22	46.00	-9.78	10.21	Neutral	-	26.01	0.15	0.14	9.92
QP	5.46M	53.86	60.00	-6.14	10.22	Neutral	"Worst"	43.64	0.16	0.14	9.92
AV	5.46M	40.65	50.00	-9.35	10.22	Neutral	-	30.43	0.16	0.14	9.92
QP	5.973M	46.49	60.00	-13.51	10.23	Neutral	-	36.26	0.17	0.14	9.92
AV	5.973M	40.27	50.00	-9.73	10.23	Neutral	-	30.04	0.17	0.14	9.92



## 2.2 Field Strength of Fundamental Emissions Measurement

### 2.2.1 Limit

The field strength of fundamental emissions within these bands specified at a distance of 3 meters (measurement instrumentation employing an average detector) shall comply with the following table.

Frequency Band	Fundamental Emissions Limit Average/Peak (dBuV/m) at 3m
24000 ~ 24250 MHz	107.96/127.96

Note 1: 107.96 dBuV/m rounding to 108dBuV/m and 127.96 dBuV/m rounding to 128dBuV/m

Note 2: Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor =  $20 \log(\text{specific distance [3m]} / \text{test distance [1m]})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

Average limit = 108dBuV/m + distance extrapolation factor (9.54 dB) =117.54dBuV/m.

Peak limit = 128dBuV/m + distance extrapolation factor (9.54 dB) =137.54dBuV/m.

### 2.2.2 Measuring Instruments and Setting

Refer a test equipment and calibration data table in this test report. The following table is the setting of the spectrum analyzer.

Power Meter Parameter	Setting
RBW	1 MHz
VBW	3 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

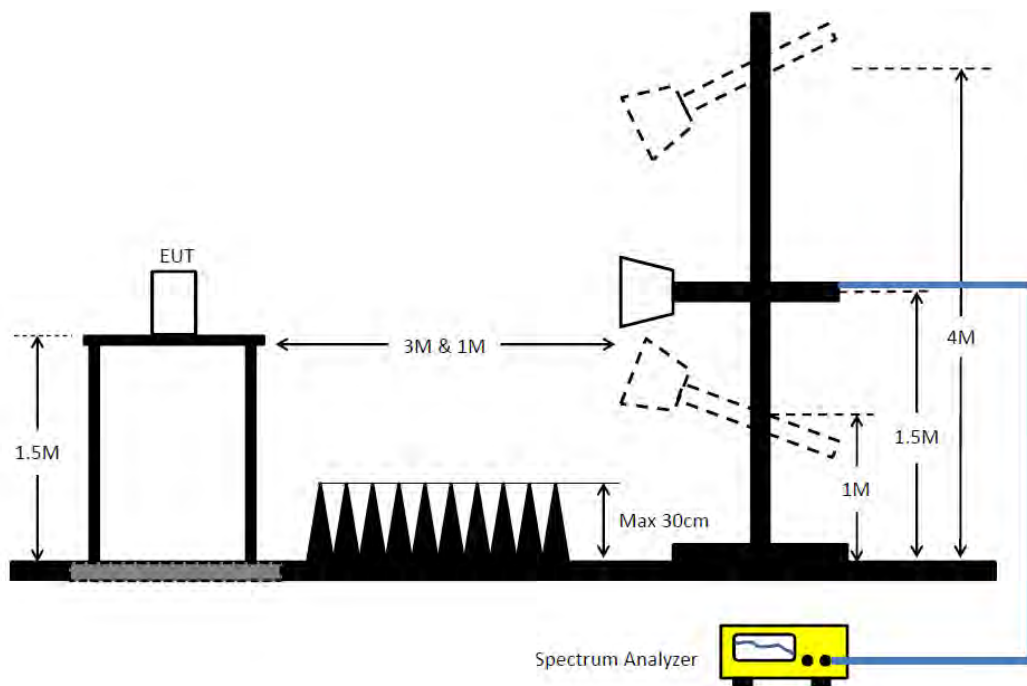
### 2.2.3 Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. For Fundamental emissions, use 1MHz RBW and 3MHz VBW for peak reading. The average is used

peak level + correction factor.

6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

**2.2.4 Test Setup Layout**



**2.2.5 Test Deviation**

There is no deviation with the original standard.

**2.2.6 EUT Operation during Test**

The EUT was programmed to be in continuously transmitting mode.

**2.2.7 Measurement Results Calculation**

The measured Level is calculated using:

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

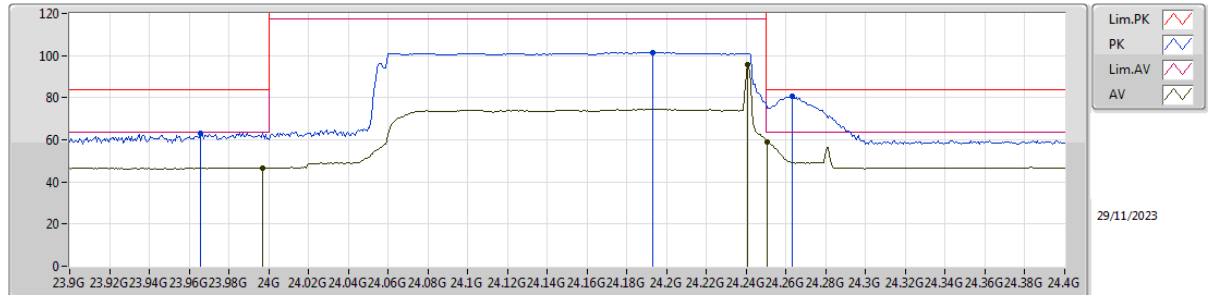




**2.2.8 Test Result of Field Strength of Fundamental Emissions**

**Horizontal**

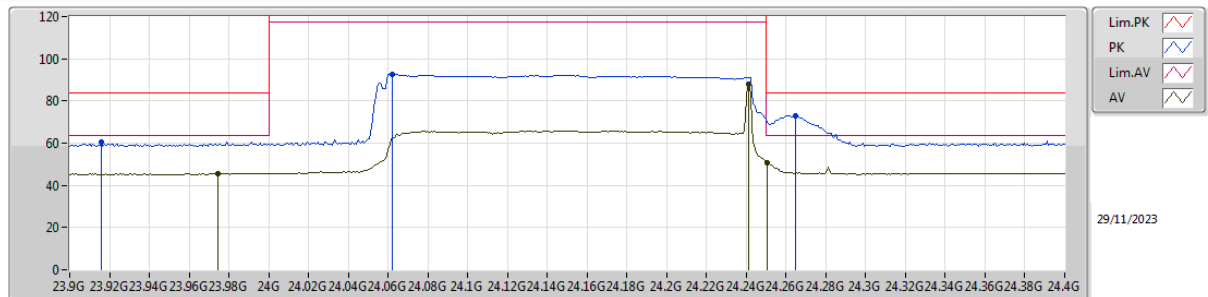
**Mode 1**



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	23.96594G	63.25	83.54	-20.29	12.66	1	Horizontal	0	1.00	-	50.59	38.96	20.91	47.21
AV	23.9971G	46.70	63.54	-16.84	12.83	1	Horizontal	0	1.00	-	33.87	39.09	20.93	47.19
PK	24.19275G	101.54	137.54	-36.00	13.05	1	Horizontal	0	1.00	-	88.49	39.10	21.02	47.07
AV	24.24058G	95.87	117.54	-21.67	13.02	1	Horizontal	0	1.00	-	82.85	39.02	21.04	47.04
PK	24.26304G	80.44	83.54	-3.10	13.06	1	Horizontal	0	1.00	-	67.38	39.03	21.05	47.02
AV	24.25073G	59.22	63.54	-4.32	13.02	1	Horizontal	0	1.00	-	46.20	39.00	21.05	47.03

**Vertical**

**Mode 1**



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	23.91594G	60.73	83.54	-22.81	12.48	1	Vertical	360	1.00	-	48.25	38.83	20.88	47.23
AV	23.97464G	45.67	63.54	-17.87	12.71	1	Vertical	360	1.00	-	32.96	39.00	20.91	47.20
PK	24.06232G	92.53	137.54	-45.01	12.71	1	Vertical	360	1.00	-	79.82	38.90	20.96	47.15
AV	24.2413G	87.84	117.54	-29.70	13.02	1	Vertical	360	1.00	-	74.82	39.02	21.04	47.04
PK	24.26449G	73.18	83.54	-10.36	13.07	1	Vertical	360	1.00	-	60.11	39.03	21.06	47.02
AV	24.25073G	50.60	63.54	-12.94	13.02	1	Vertical	360	1.00	-	37.58	39.00	21.05	47.03

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).



### 2.3 20dB Spectrum Bandwidth Measurement

#### 2.3.1 Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (24000 ~ 24250 MHz).

#### 2.3.2 Measuring Instruments and Setting

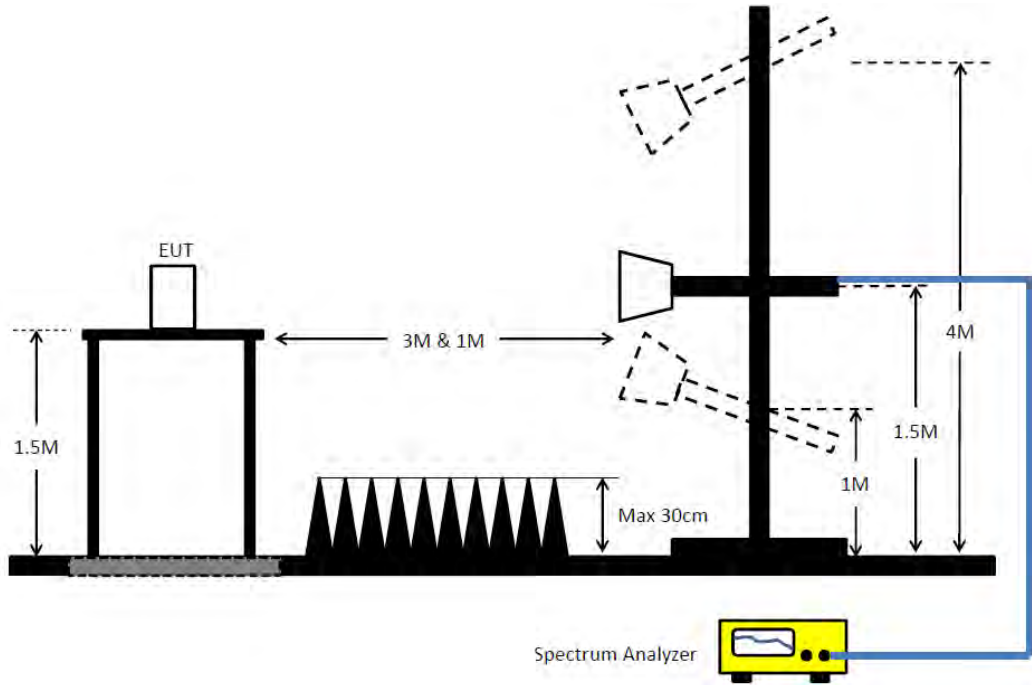
Refer a test equipment and calibration data table in this test report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 20dB Bandwidth
RBW	20 dB Bandwidth 1%~5%
VBW	3 time RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 2.3.3 Test Procedures

1. The test procedure is the same as section 2.4.3.
2. The resolution bandwidth (20 dB Bandwidth 1%~5%) and the video bandwidth (3 time RBW) were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

**2.3.4 Test Setup Layout**



**2.3.5 Test Deviation**

There is no deviation with the original standard.

**2.3.6 EUT Operation during Test**

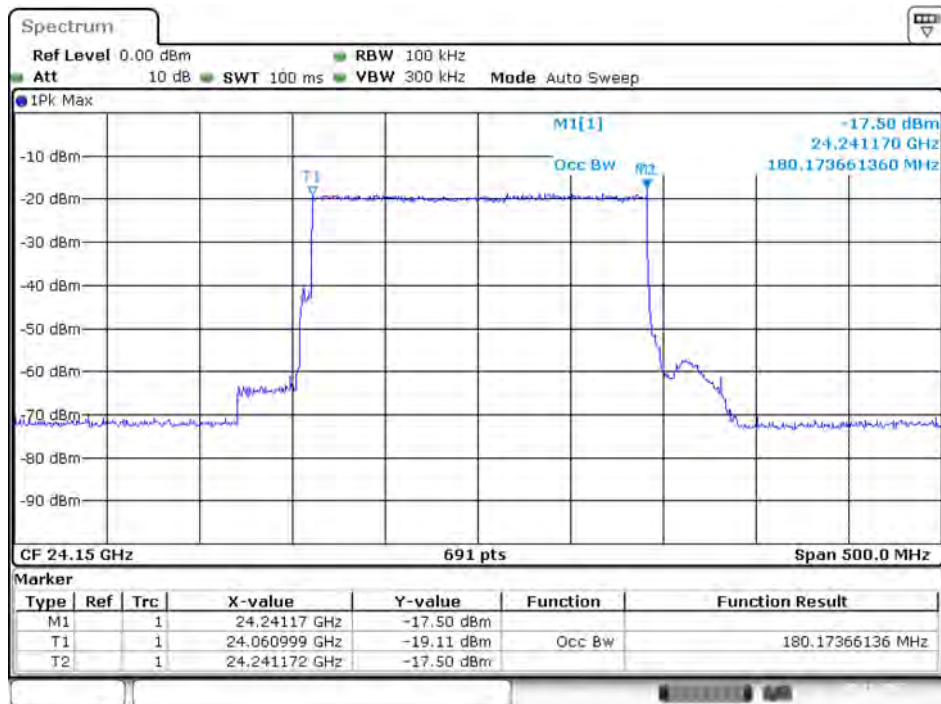
The EUT was programmed to be in continuously transmitting mode.



**2.3.7 Test Result of 20dB Spectrum Bandwidth**

Frequency	99% OBW (MHz)	Frequency range (MHz) $f_L > 24000\text{MHz}$	Frequency range (MHz) $f_H < 24250\text{MHz}$	Test Result
24150 MHz	180.174	24060.999	24241.172	<b>PASS</b>

**99% Bandwidth Plot on 24150 MHz**



Date: 28 NOV.2023 21:29:49



## 2.4 Radiated Emissions Measurement

### 2.4.1 Limit

For 9kHz~40GHz

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

For 40GHz~100GHz

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 47 CFR Part 15.249, whichever is the lesser attenuation.

Operating Frequencies	Harmonics Strength (micorvolts/meter)	Harmonics Strength (dBuV/m) at 3m
24000 ~ 24250 MHz	2500 at 3m	68 (Average)
24000 ~ 24250 MHz	2500 at 3m	88 (Peak)



**2.4.2 Measuring Instruments and Setting**

Refer a test equipment and calibration data table in this test report. The following table is the setting of the spectrum analyzer and receiver.

<b>Spectrum Parameter</b>	<b>Setting</b>
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW	1MHz / 3MHz for Peak

<b>Receiver Parameter</b>	<b>Setting</b>
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

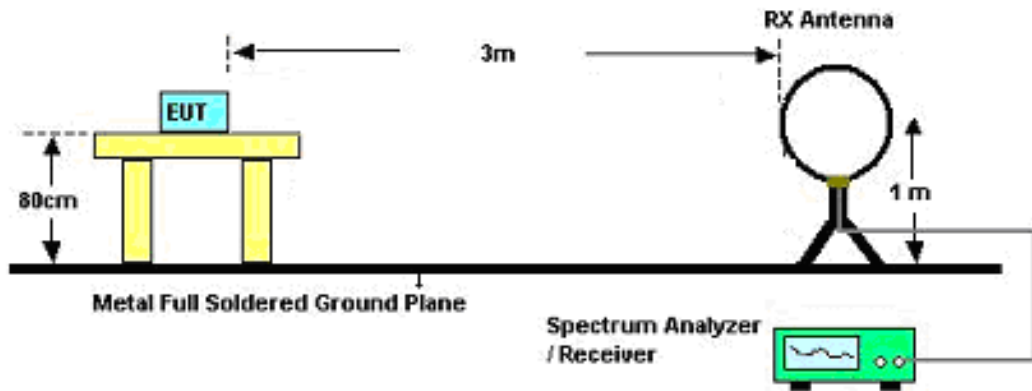


### 2.4.3 Test Procedures

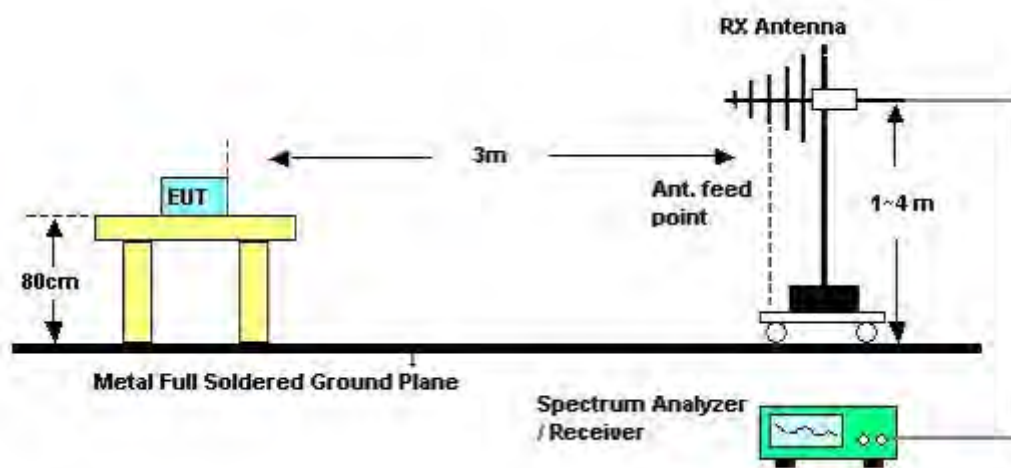
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. The average is used peak level + correction factor.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

**2.4.4 Test Setup Layout**

For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



**2.4.5 Test Deviation**

There is no deviation with the original standard.

**2.4.6 EUT Operation during Test**

The EUT was programmed to be in continuously transmitting mode.





**2.4.7 Measurement Results Calculation**

The measured Level is calculated using:

For below 40GHz

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

For above 40GHz

$$EIRP = \text{Meas. Level} - \text{RX Antenna Gain} + 20 \cdot \log(4 \cdot \text{Pi} \cdot (3.14159)^2 \cdot D^2 / (300 / (\text{Frequency} \cdot 1000)))$$

**2.4.8 Results of Radiated Emissions (9kHz~30MHz)**

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

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

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

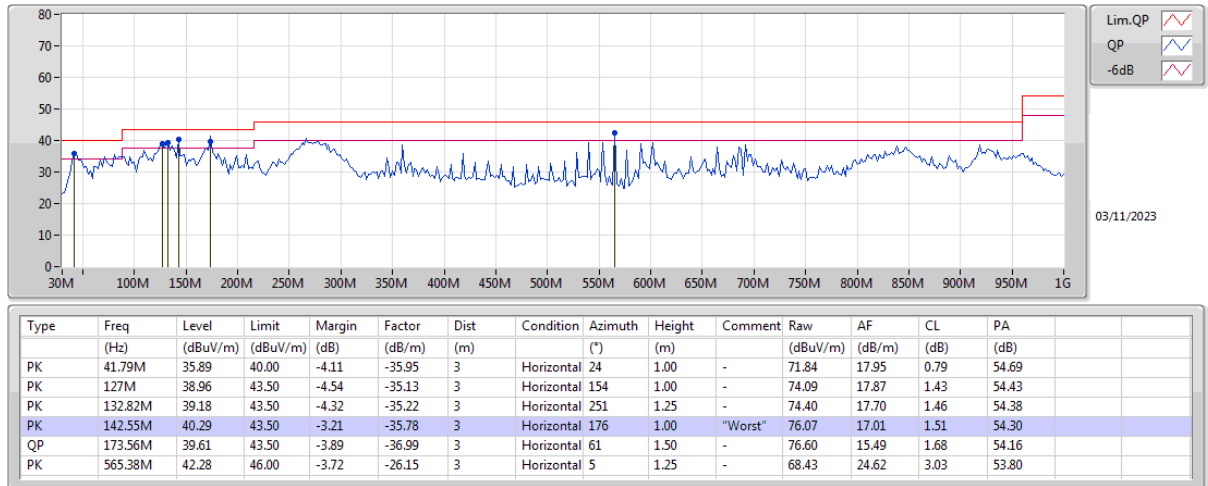
Limit line = specific limits (dBuV) + distance extrapolation factor.



**2.4.9 Results of Radiated Emissions (30MHz~1GHz)**

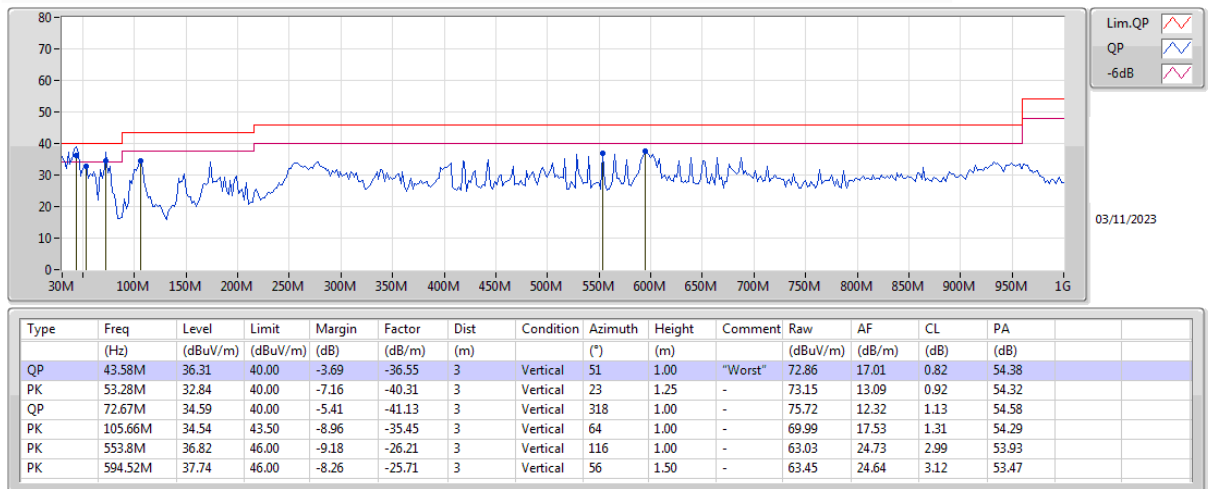
**Horizontal**

**Mode 1**



**Vertical**

**Mode 1**



**Note:**

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

Emission level (dBuV/m) = 20 log Emission level (uV/m).



## **2.5 Antenna Requirements**

### **2.5.1 Limit**

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

### **2.5.2 Antenna Connector Construction**

The antenna connector complied with the requirements.



### 3 List of Measuring Equipments

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.4GHz	Feb. 20, 2023	Feb. 19, 2024	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Feb. 16, 2023	Feb. 15, 2024	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Apr. 27, 2023	Apr. 26, 2024	Conduction (CO01-CB)
Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Feb. 09, 2023	Feb. 08, 2024	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	Oct. 17, 2023	Oct. 16, 2024	Conduction (CO01-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
10m Semi Anechoic Chamber NSA	TDK	SAC-10M	10CH01-CB	30MHz~1GHz 10m,3m	Jan. 18, 2023	Jan. 17, 2024	Radiation (10CH01-CB)
10m Semi Anechoic Chamber VSWR	TDK	SAC-10M	10CH01-CB	1GHz ~18GHz 3m	Feb. 24, 2023	Feb. 23, 2024	Radiation (10CH01-CB)
Amplifier	Agilent	8447D	2944A10783	9kHz ~ 1.3GHz	Mar. 10, 2023	Mar. 09, 2024	Radiation (10CH01-CB)
Amplifier	Agilent	8447D	2944A10784	9kHz ~ 1.3GHz	Mar. 10, 2023	Mar. 09, 2024	Radiation (10CH01-CB)
Low Cable	Woken	SUCOFLEX 104	low cable-01	25MHz ~ 1GHz	Oct. 17, 2023	Oct. 16, 2024	Radiation (10CH01-CB)
Low Cable	Woken	SUCOFLEX 104	low cable-02	25MHz ~ 1GHz	Oct. 17, 2023	Oct. 16, 2024	Radiation (10CH01-CB)
EMI Test Receiver	Rohde&Schwarz	ESCI	100186	9kHz ~ 3GHz	Jul. 11, 2023	Jul. 10, 2024	Radiation (10CH01-CB)
Spectrum Analyzer	Rohde&Schwarz	FSV30	101026	9kHz ~ 30GHz	Apr. 19, 2023	Apr. 18, 2024	Radiation (10CH01-CB)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1370	1GHz~18GHz	Jun. 30, 2023	Jun. 29, 2024	Radiation (10CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Sep. 04, 2023	Sep. 03, 2024	Radiation (10CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02660	1GHz ~ 26.5GHz	May 18, 2023	May 17, 2024	Radiation (10CH01-CB)
Pre-Amplifier	SGH	SGH184	20230109-3	18~40GHz	Jan. 13, 2023	Jan. 12, 2024	Radiation (10CH01-CB)
High Cable	TITAN	T318E	high cable-02	1GHz ~ 18GHz	Oct. 17, 2023	Oct. 16, 2024	Radiation (10CH01-CB)
Bilog Antenna with 6dB Attenuator	Chase & EMCI	CBL6111A &N-6-06	1543 &AT-N0609	30MHz ~ 1GHz	Jun. 24, 2023	Jun. 23, 2024	Radiation (10CH01-CB)
Amplifier	EM	EM101	060703	10MHz ~ 1GHz	Oct. 18, 2023	Oct. 17, 2024	Radiation (10CH01-CB)
Low Cable	TITAN	T318E	low cable-03	30MHz ~ 1GHz	Oct. 17, 2023	Oct. 16, 2024	Radiation (10CH01-CB)
Loop Antenna	Teseq	HLA 6120	31244	9kHz - 30 MHz	Mar. 23, 2023	Mar. 22, 2024	Radiation (10CH01-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40 GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (10CH01-CB)



Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40 GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (10CH01-CB)
High Cable	Woken	WCA0929M	40G#6	1GHz ~ 40 GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (10CH01-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (10CH01-CB)

Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.



## 4 Measurement Uncertainty

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.4 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.1 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.1 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.2 dB	Confidence levels of 95%