TEST REPORT

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Report No.:
CTK-2025-00416

1. Applicant

◦ Name : Sound Plus Limited

◦ Address : B-1, 38, Ogeum-ro 53-gil, Songpa-gu, Seoul, 05735, Republic of Korea

◦ Date of Receipt : 2024-11-08

2. Manufacturer

◦ Name : Sound Plus Limited

◦ Address : B-1, 38, Ogeum-ro 53-gil, Songpa-gu, Seoul, 05735, Republic of Korea

3. Use of Report : For FCC Certification

4. Test Sample / Model: Musical Instruments Microphone / SaxMic-14BR

5. Date of Test : 2024-12-07 to 2025-01-14

6. Test Standard(method) used : FCC 47 CFR part 15 subpart C 15.249

7. Testing Environment: refer to 8 page

8. Test Results : Compliance

9. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

(Address : 5, Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea)

Approval	Tested by Bong-seok Kim: (Signature)	Technical Manager Young-taek Lee: (Signature)

2025-02-14

CTK Co., Ltd.

REPORT REVISION HISTORY

Date	Revision	Page No
2025-02-14	Issued (CTK-2025-00416)	all

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1. General Product Description

1.1 Client Information

Company	Sound Plus Limited
Contact Point	B-1, 38, Ogeum-ro 53-gil, Songpa-gu, Seoul, 05735, Republic of Korea
Contact Person	Name : Ju Seoung Chul E-mail : jsc@soundplus.com

1.2 Product Information

Product Description	Musical Instruments Microphone
Model name	SaxMic-14BR
Variant Model name	SXM-14BR, CLM-9BR, AGM-14BR, HMM-14BR, TPM-14BR, TBM-14BR, HRM-14BR, TUM-14BR (No technical differences with basic model except for the model name for marketing purposes) ClarinetMic, FluteMic, HarmonicaMic, GuitarMic, EGM (There are differences in appearance from the basic model, but no differences in circuitry.)
FCC ID	2BNM9-CURTIS0816
Operating Frequency	902.6 MHz ~ 927.3 MHz
RF Output Power	Below 94 dBuV/m @ 3 m
Antenna Specification	Antenna type : λ/4 Mono Pole antenna Antenna gain : -2 dBi
Number of channels	8 Channels Channel 1 – 902.60 MHz; Channel 2 – 903.35 MHz; Channel 3 – 910.10 MHz; Channel 4 – 913.85 MHz; Channel 5 – 917.60 MHz; Channel 6 – 920.93 MHz; Channel 7 – 924.26 MHz; Channel 8 – 927.30 MHz
Type of Modulation	FM Modulation
Power Source	DC 1.5 V (Battery)

1.3 Antenna Information

☒		Integral antenna (antenna permanently attached)
	☒	Temporary RF connector provided
	☐	No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
☐		External antenna (dedicated antennas)

1.4 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
-	-	-	-

2. Accreditations

2.1 Laboratory Accreditations and Listings

Country	Agency	Registration Number
USA	FCC	805871
CANADA	ISED	CN : 8737A CAB ID : KR0025
KOREA	NRRA	KR0025

2.2 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

3. Test Specifications

3.1 Standards

FCC Part Section(s)	Requirement(s)	Status (Note 1)	Report Clause
15.203	Antenna Requirement	C	1.3
15.215(C)	Emission Bandwidth	C	4.1
15.249(a)	Field Strength	C	4.3
15.249(d)	Emissions radiated outside of the specified frequency bands	C	4.2
15.209	Radiated Emissions	C	4.3
15.207	AC Conducted Emission	NA(Note 3)	-
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable			
Note 2: The data in this test report are traceable to the national or international standards.			
Note 3: The equipment is operated on battery power only.			
Note 4: The sample was tested according to the following specification: FCC Part 15.249, ANSI C63.10-2013			

3.2 Mode of operation during the test

The EUT is operated in a manner representative of the typical of the equipments.
The results are only attached worst cases.

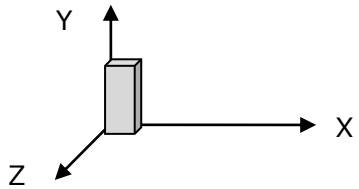
Test Channel/Frequency

Lowest channel	Middle channel	Highest channel
902.6 MHz	917.6 MHz	927.3 MHz

Type of test signal

TX mode	Duty cycle
Continuous	100 %

The Worst Case Measurement Configuration

Tests Item	Radiated Emissions
Condition	Radiated measurement
User Position	☐ EUT will be placed in fixed position.
	☒ EUT will be placed in mobile position and operating multiple positions.
	☐ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.
EUT antenna faces identified relative to view from receiving antenna	

3.3 Measurement Uncertainty

The value of the measurement uncertainty for the measurement of each parameter.
Coverage factor k = 2, Confidence levels of 95 %

Description	Uncertainty
Radiated Emissions (f ≤ 1 GHz)	3.8 dB (C.L.: Approx. 95 %, k=2)
Radiated Emissions (f > 1 GHz)	4.5 dB (C.L.: Approx. 95 %, k=2)

3.4 Test Software

Radiated Test	EP5RE Ver. 6.0.10, ES10 Ver. 2022.04.000

3.5 Testing Environment

Test Item	Test Date	Temperature (℃)	Relative Humidity (%)
20 dB Bandwidth	2025-01-02	25	47
Radiated emission (9 kHz ~ 30 MHz)	2024-12-07	18	24
Radiated emission (30 MHz ~ 1 GHz)	2024-12-16	20	28
Radiated emission (1 GHz ~ 10 GHz)	2025-01-14		

4. Technical Characteristic Test

4.1 Emission Bandwidth

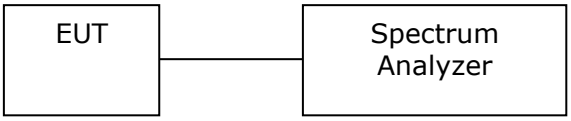
Requirement

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedures

For the emission bandwidth refer ANSI C63.10-2013, clause 6.9(Occupied bandwidth).

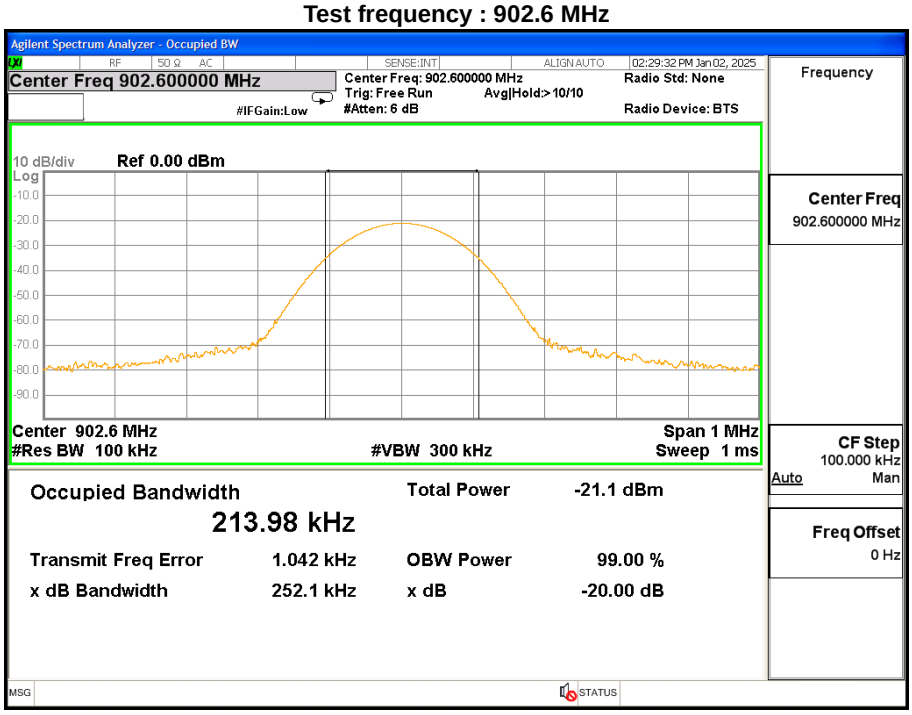
Test Setup



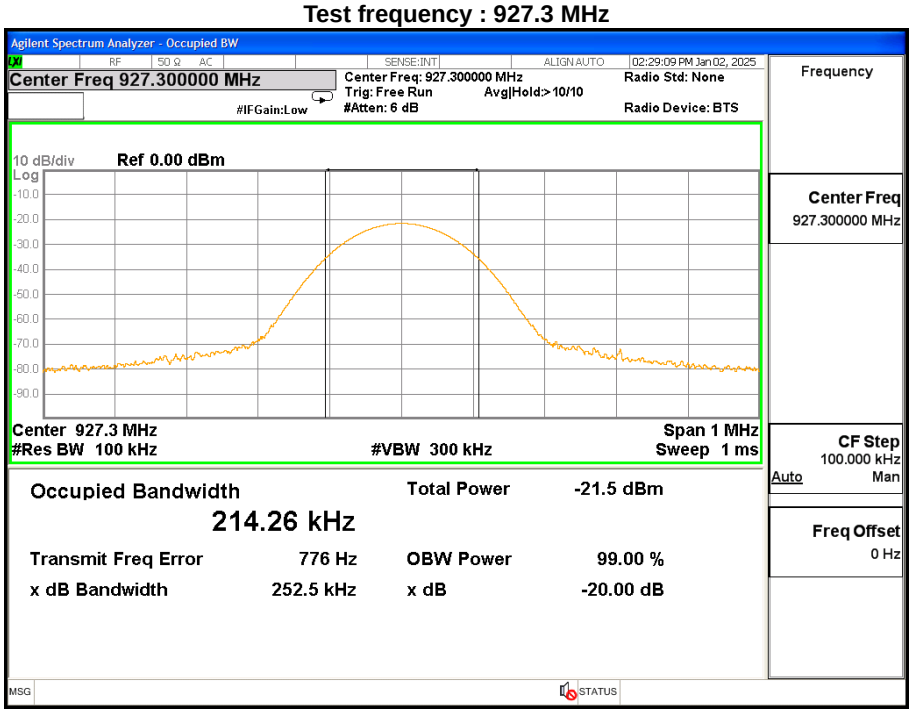
Test results

Test frequency (MHz)	20 dB Bandwidth (kHz)	Limit
902.6	252.1	N/A
927.3	252.5	

Test frequency : 902.6 MHz



Test frequency : 927.3 MHz



4.2 Band Edge

Requirement

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 §15.209, whichever is the lesser attenuation.

Test Procedures(ANSI C63.10-2013 6.10)

a) Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described in step e) (be sure to enter all losses between the unlicensed wireless device output and the spectrum analyzer).
b) Set the EUT to the lowest frequency channel (for the hopping on test, the hopping sequence shall include the lowest frequency channel).
c) Set the EUT to operate at maximum output power and 100% duty cycle, or equivalent "normal mode of operation".
d) Perform the test as follows:

1) Span : Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation.
2) RBW : 100 kHz
3) VBW : 300 kHz
4) Detector : Peak
5) Sweep time = Coupled
6) Trace : Max hold
7) Attenuation : Auto(at least 10 dB preferred)
8) Allow trace to fully stabilize

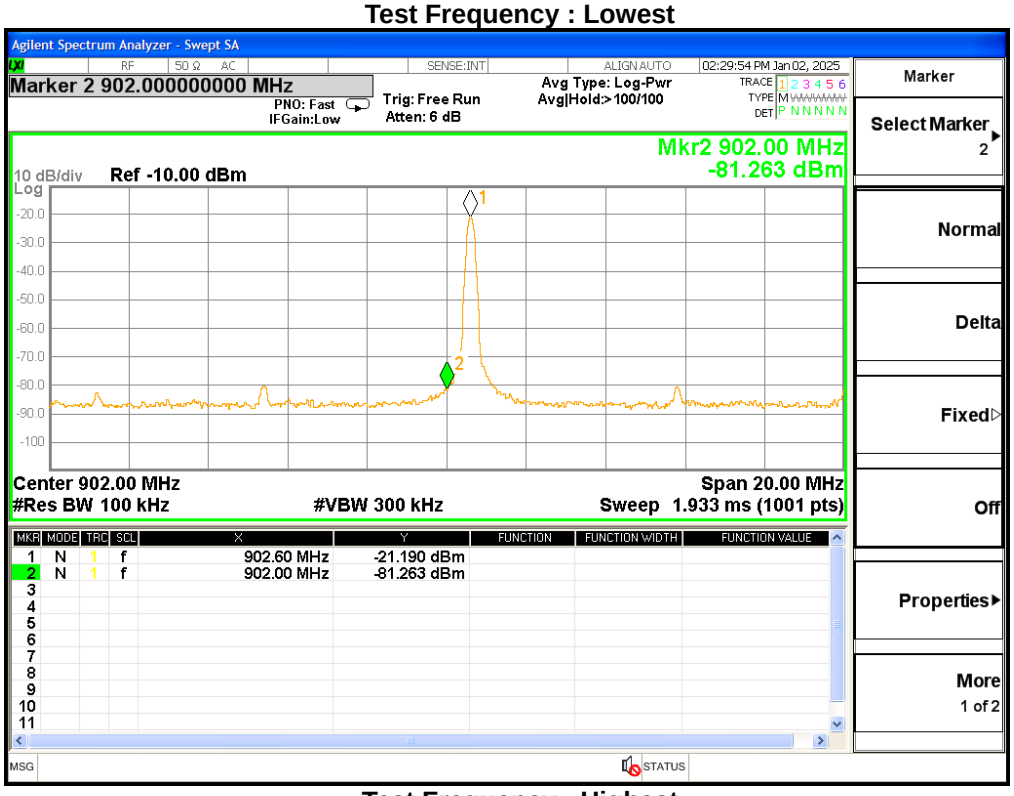
e) Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge. Enable the marker-delta function, and then use the marker-to-peak function to move the marker to the peak of the in-band emission.
f) Set the EUT to the highest frequency channel (for the hopping on test, the hopping sequence shall include the highest frequency channel) and repeat step c) through step d).
g) The band-edge measurement shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

Test results: Complies

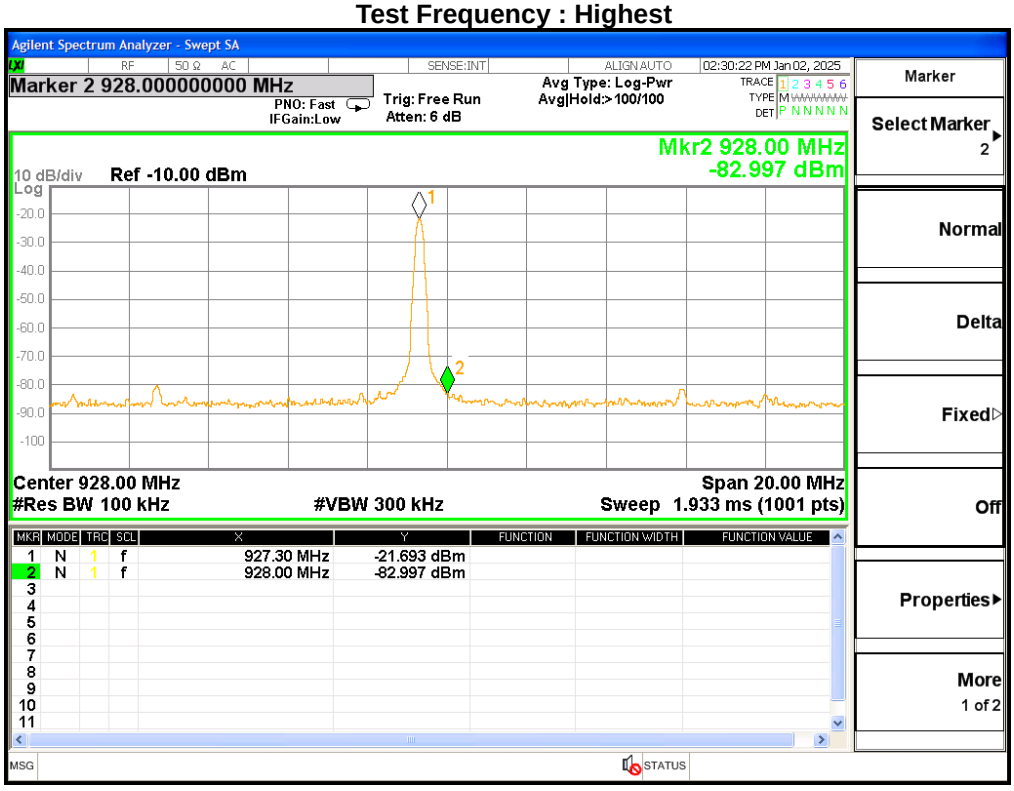
See next pages for actual measured spectrum plots.

Band–edge

Test Frequency : Lowest



Test Frequency : Highest



4.3 Field strength

Test Location

☒ 10 m SAC (test distance : ☐ 10 m, ☒ 3 m)
☒ 3 m FAC (test distance : 3 m)

Test Procedures

1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
2) In the frequency rage above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

Test Settings:

Frequency Range = 9 kHz ~ 10 GHz (10^{th} harmonic)

a) RBW = 1 MHz for f ≥ 1 GHz, 120 kHz for f < 1 GHz, 9 kHz for f < 30 MHz

b) VBW ≥ RBW

c) Sweep time = auto couple

Requirement :

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Standards	Field strength of fundamental	Field strength of harmonics
902-928 MHz	FCC Part 15.249 (a)	50 mV/m (94 dBuV/m)	500 uV/m (54 dBuV/m)

Field strength limits are specified at a distance of 3 meters.

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 §15.209, whichever is the lesser attenuation.

FCC Part 15 § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (uV/m)	Field Strength (uA/m)	Field Strength (dBuV/m)	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	6.37/F (F in kHz)	48.5 - 13.8	300
0.490-1.705	24000/F(kHz)	63.7/F (F in kHz)	33.8 - 23	30
1.705-30	30	0.08	29.5	30
30-88	100**	-	40	3
88-216	150**	-	43.5	3
216-960	200**	-	46	3
Above 960	500	-	54	3

** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

Note :
1) For above 1 GHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
2) For above 1 GHz, limit field strength of harmonics : 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK)

FCC Part 15 § 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	MHz	GHz
0.09-0.11	8.37626-8.38675	73-74.6	399.9-410	2690-2900	10.6-12.7
[1]0.495-0.505	8.41425-8.41475	74.8-75.2	608-614	3260-3267	13.25-13.4
2.1735-2.1905	12.29-12.293	108-121.94	960-1240	3332-3339	14.47-14.5
4.125-4.128	12.51975-12.52025	123-138	1300-1427	3345.8-3358	15.35-16.2
4.17725-4.17775	12.57675-12.57725	149.9-150.05	1435-1626.5	3600-4400	17.7-21.4
4.20725-4.20775	13.36-13.41	156.52475-156.52525	1645.5-1646.5	4500-5150	22.01-23.12
6.215-6.218	16.42-16.423	156.7-156.9	1660-1710	5350-5460	23.6-24
6.26775-6.26825	16.69475-16.69525	162.0125-167.17	1718.8-1722.2	7250-7750	31.2-31.8
6.31175-6.31225	16.80425-16.80475	167.72-173.2	2200-2300	8025-8500	36.43-36.5
8.291-8.294	25.5-25.67	240-285	2310-2390	9000-9200	[2]Above 38.6
8.362-8.366	37.5-38.25	322-335.4	2483.5-2500	9300-9500	

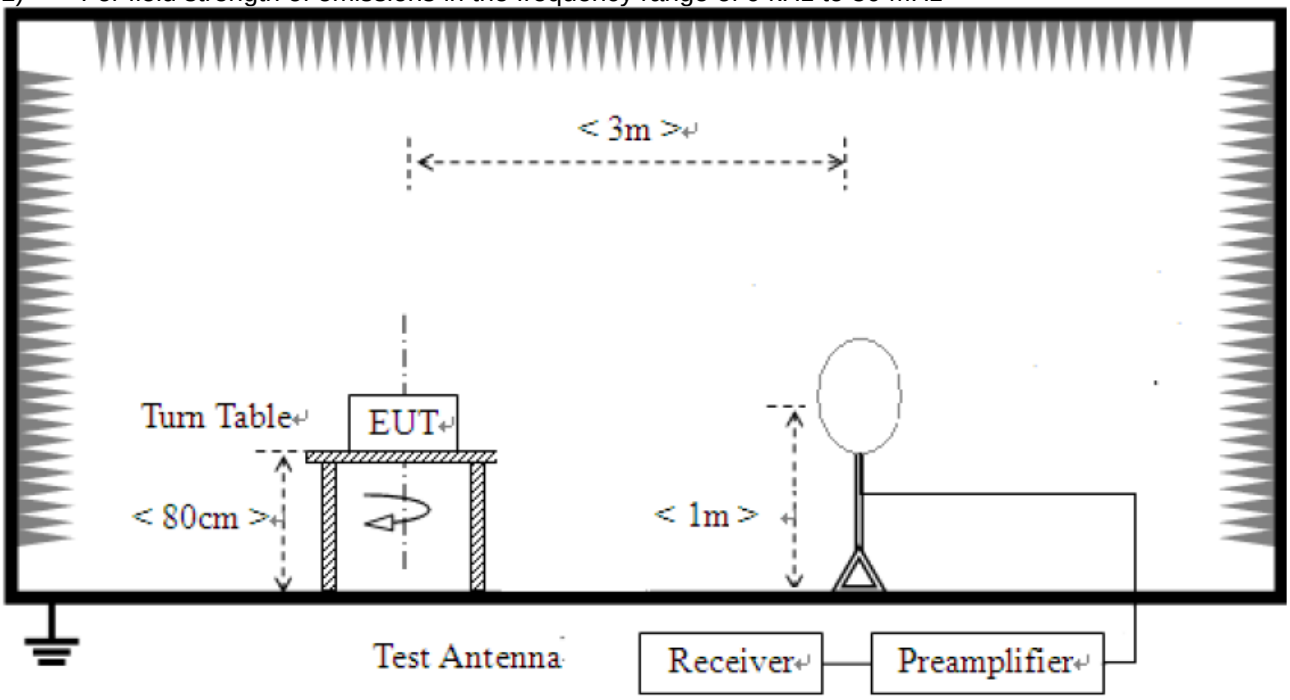
[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

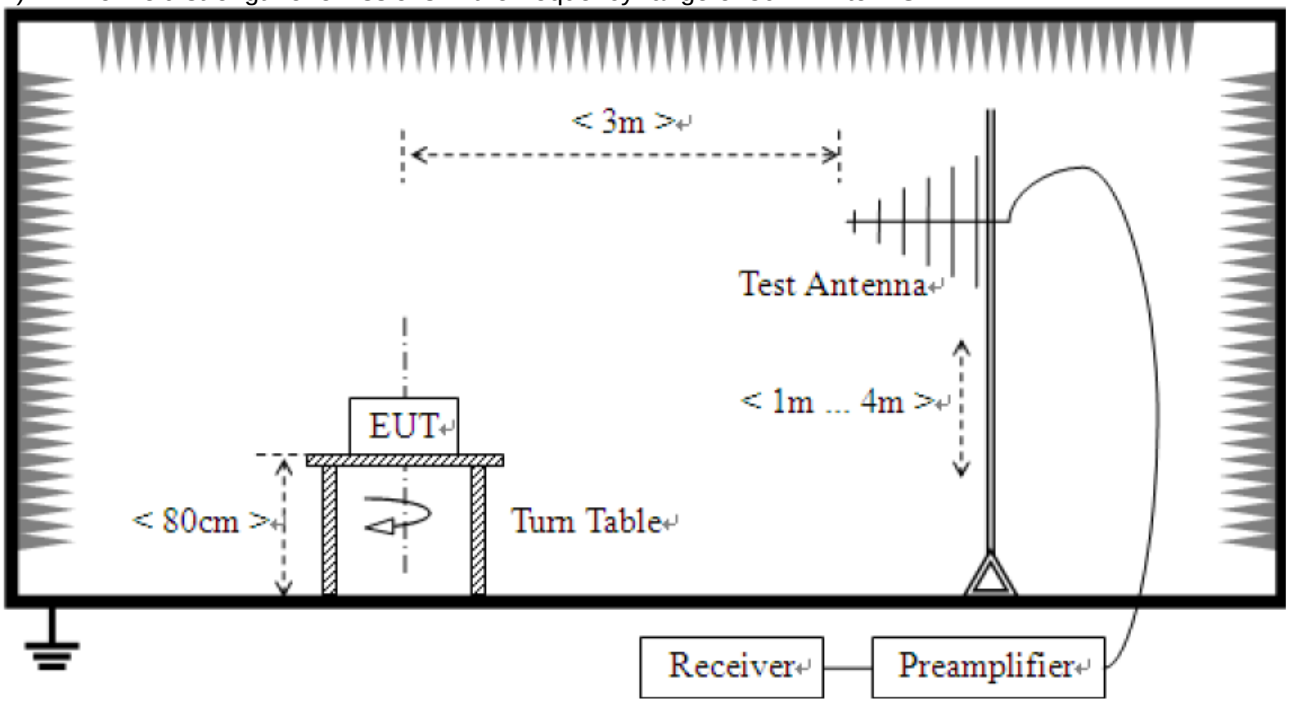
§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

Test Setup:

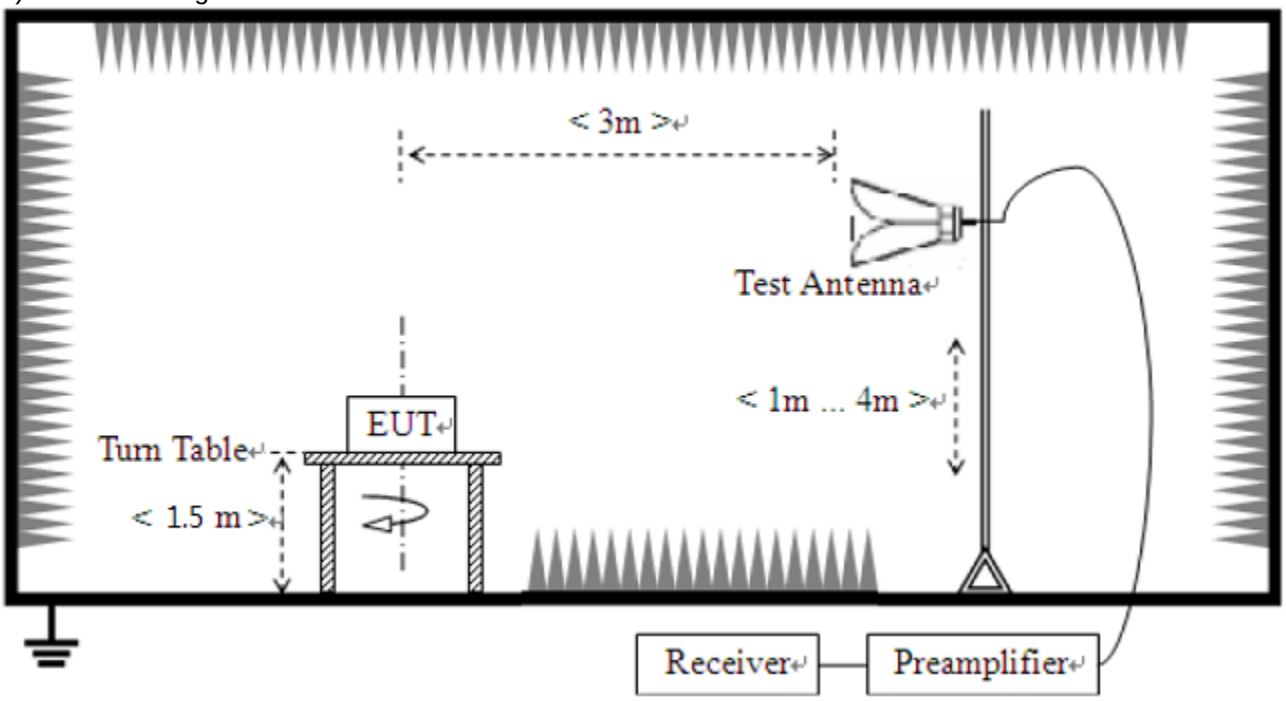
1) For field strength of emissions in the frequency range of 9 kHz to 30 MHz



2) For field strength of emissions in the frequency range of 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz



Test Data :

1) Field strength of fundamental

The requirements are:
☒ Complies

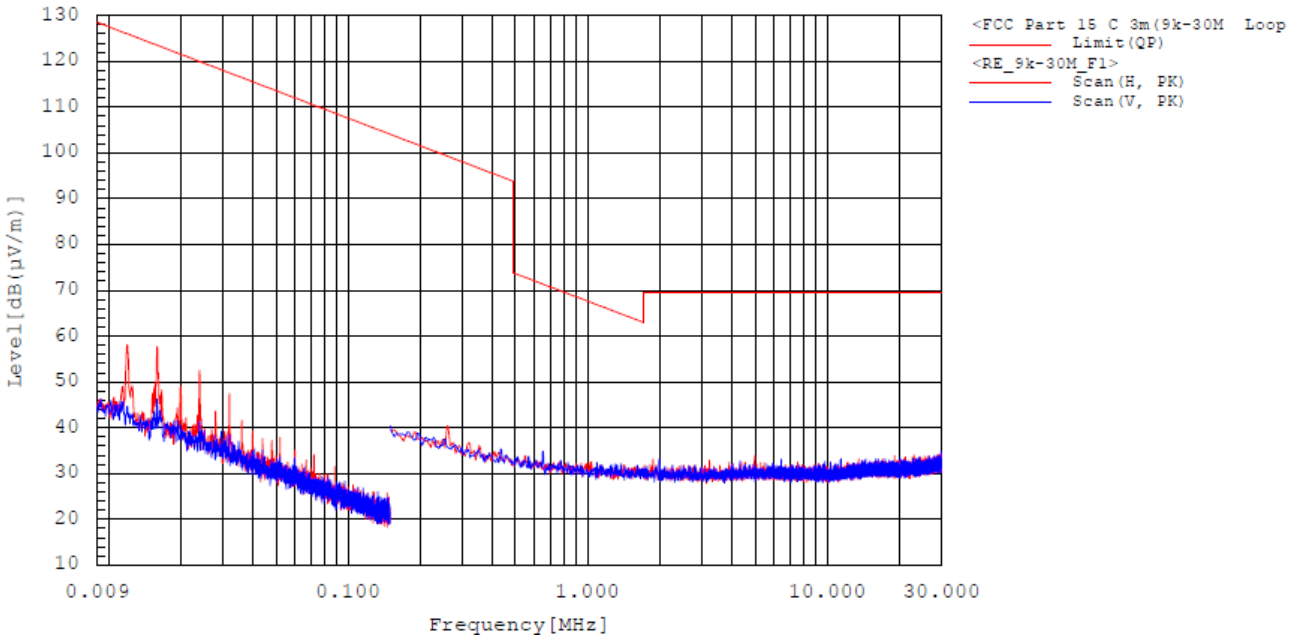
Frequency [MHz]	Ant. Pol. (V/H)	Reading [dBuV/m]	C.F [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
902.6	Hor.	84.1	3.1	87.2	94	6.8
	Ver.	73.4	3.1	76.5	94	17.5
917.6	Hor.	82.6	3.6	86.2	94	7.8
	Ver.	71.9	3.6	75.5	94	18.5
927.3	Hor.	82.0	3.8	85.8	94	8.2
	Ver.	72.2	3.8	76.0	94	18.0

Remark :
1. Result(Peak) = Reading + c.f(Correction factor)
2. Correction factor = Antenna factor + Cable loss + 6 dB attenuator – Amp. Gain
3. The test result in peak detector is less than limit.

2) Field strength of outside of the specified frequency bands – 9 kHz to 30 MHz

The requirements are:
☒ Complies

Test Channel : Lowest Channel(Worst case)



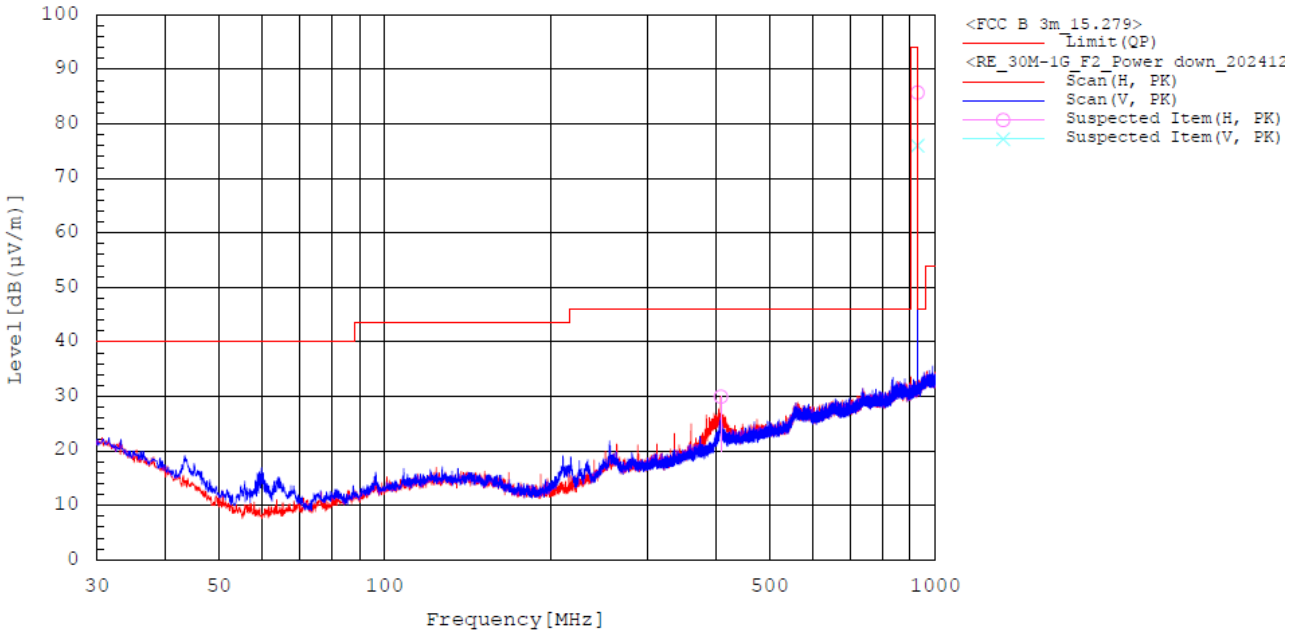
Result : Emissions more than 20 dB below the limit don't need to be reported.

Remark :
1. Result = Reading + c.f(correction factor)
2. Correction factor = Antenna factor + Cable loss + 6 dB attenuator
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)

3) Field strength of outside of the specified frequency bands – 30 MHz to 1 GHz

The requirements are:
☒ Complies

Test channel : Highest channel(Worst case)



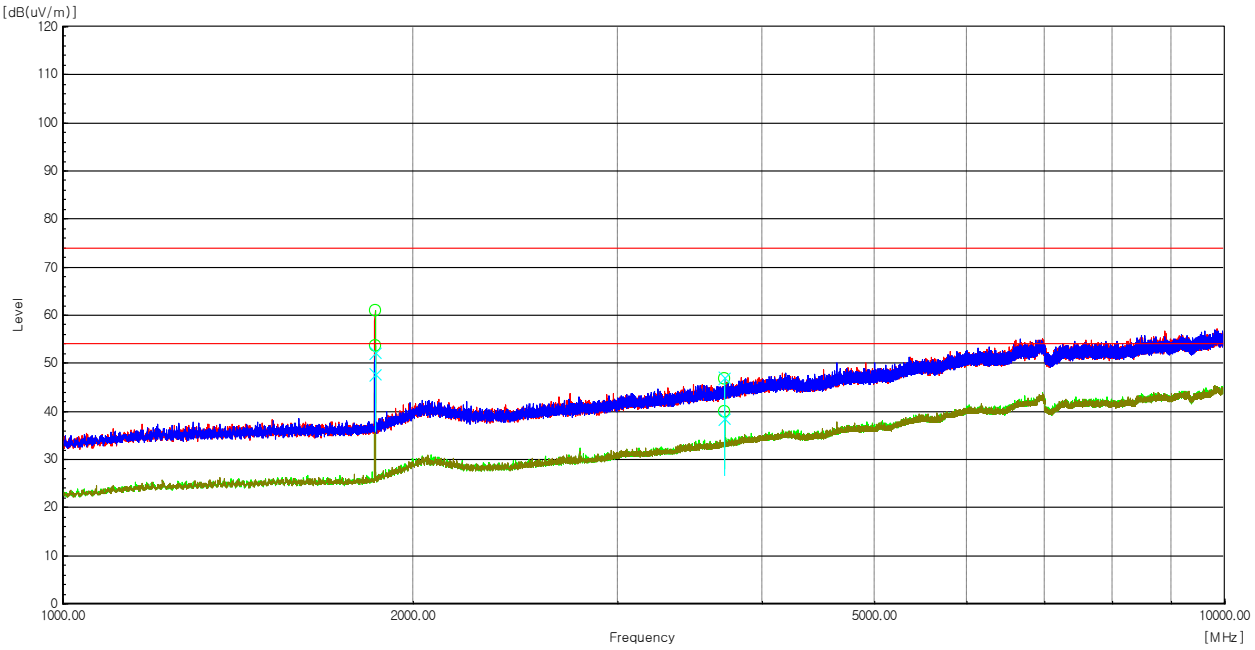
No.	Frequency [MHz]	Antenna Polarization	Reading [dBuV]	c.f [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Magin[dB]	Remark
1	408.0	Hor.	36.7	-6.8	29.9	46	16.1	
2	927.3	Hor.	82.0	3.8	85.8	-	-	Fundamental
3	927.3	Ver.	72.2	3.8	76.0	-	-	Fundamental

Remark :
1. Result = Reading + c.f(Correction factor)
2. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain
3. The test result in peak detector is less than quasi-peak limit.

4) Field strength of outside of the specified frequency bands – 1 GHz to 10 GHz

The requirements are:
☒ Complies

Test channel : Highest channel(Worst case)



Frequency [MHz]	Ant. Pol. (V/H)	Reading [dBuV/m]	c.f [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1 856	H	69.4	-8.4	61.0	74	13.0	Peak
1 856	H	61.9	-8.4	53.5	54	0.5	Average
1 856	V	60.6	-8.4	52.2	74	21.8	Peak
1 856	V	56.0	-8.4	47.6	54	6.4	Average
3 712	H	47.3	-0.5	46.8	74	27.2	Peak
3 711	H	40.5	-0.5	40.0	54	14.0	Average
3 711	V	47.4	-0.5	46.9	74	27.1	Peak
3 711	V	39.1	-0.5	38.6	54	15.4	Average

Remarks
1. Result = Reading + c.f(correction factor)
2. Correction factor = Antenna factor + Cable loss - Amp Gain

APPENDIX A – Test Equipment Used For Tests

No.	Name of Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Signal Analyzer	Agilent	N9020A	MY50200512	2024-03-21	2025-03-21
2	Signal Generator	Rohde & Schwarz	SMB100A	175528	2024-03-21	2025-03-21
3	EMI TEST RECEIVER	Rohde & Schwarz	ESW44	102039	2024-04-29	2025-04-29
4	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-125	2024-04-15	2026-04-15
5	Bilog Antenna	TESEQ	CBL6111D	60654	2023-08-21	2025-08-21
6	AMPLIFIER	SONOMA INSTRUMENT	310N	411011	2024-07-31	2025-07-31
7	ATTENUATOR	PASTERNACK	PE7AP006-06	L20210504000023	2024-07-31	2025-07-31
8	ATTENUATOR	NONE	6dB	190557	2024-09-19	2025-09-19
9	Preamplifier	Agilent	8449B	3008A00620	2024-04-11	2025-04-11
10	Double Ridged Guide Antenna	ETS-Lindgren	3115	00078895	2024-04-16	2025-04-16
11	Spectrum Analyzer	Rohde & Schwarz	FSV40	101574	2025-01-10	2026-01-10

-END-