



FCC Test Report

APPLICANT : TCL Communication Ltd.
EQUIPMENT : Vodafone USB Connect LPWA v2
BRAND NAME : Vodafone
MODEL NAME : IKM1GL
FCC ID : 2ACCJSCD007
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification
TEST DATE(S) : Jul. 05, 2025 ~ Aug. 07, 2025

We, Sporton International Inc. (ShenZhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

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

Fly Liang



Approved by: Fly Liang

Sportun International Inc. (ShenZhen)

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People's Republic of China



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REVISION HISTORY



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 12.01 dB at 0.160 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 8.85 dB at 398.600 MHz

Conformity Assessment Condition:

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. Please refer to each test results in the section "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.



1. General Description

1.1. Applicant

TCL Communication Ltd.

5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong

1.2. Manufacturer

Vodafone Procurement Company S.à.r.l.

15 rue Edward Steichen, L-2540 Luxembourg, Grand-Duché de Luxembourg

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Vodafone USB Connect LPWA v2
Brand Name	Vodafone
Model Name	IKM1GL
FCC ID	2ACCJSCD007
EUT supports Radios application	LTE Category M1 / NB-IOT
IMEI Code	Conduction/Radiation: 35934565000026
HW Version	V3.0
SW Version	IKM1GL_ZZ_01.00_01
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Category M1 / NB-IOT: Band 2 : 1850 MHz ~ 1910 MHz Band 4 : 1710 MHz ~ 1755 MHz Band 5 : 824 MHz ~ 849 MHz Band 12 : 699 MHz ~ 716 MHz Band 13 : 777 MHz ~ 787 MHz
Rx Frequency	LTE Category M1 / NB-IOT: Band 2 : 1930 MHz ~ 1990 MHz Band 4 : 2110 MHz ~ 2155 MHz Band 5 : 869 MHz ~ 894 MHz Band 12 : 729 MHz ~ 746 MHz Band 13 : 746 MHz ~ 756 MHz
Antenna Type	WWAN: FPC Antenna
Type of Modulation	LTE Category M1: QPSK / 16QAM NB-IOT: BPSK, QPSK



1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Test Location

Sportun International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sportun International Inc. (Shenzhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sportun Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO02-SZ ; 03CH05-SZ	CN1256	421272

1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH05-SZ	AUDIX	E3	6.2009-8-24
2.	CO02-SZ	AUDIX	E3	6.120613b

1.8. Applicable Standards

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

- 47 CFR Part 15 Subpart B
- ANSI C63.4-2014

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.



2. Test Configuration of Equipment Under Test

2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

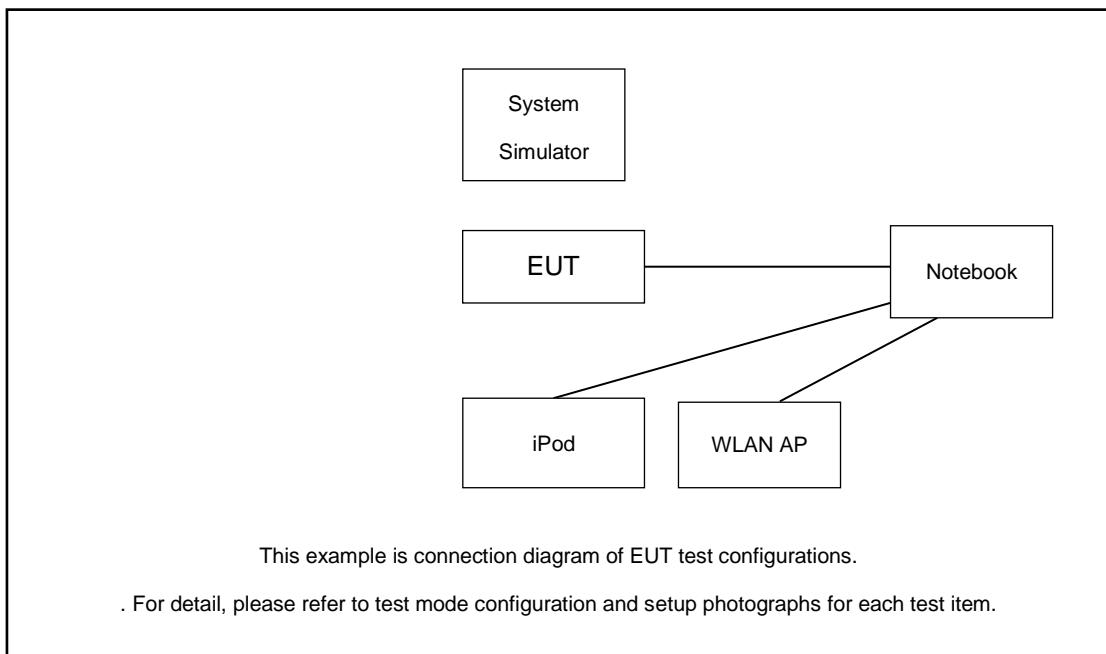
Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: NB-IOT Band 5 Idle(Low CH) + Charging from Notebook Mode 2: LTE Cat-M1 Band 12 Idle(High CH) + Charging from Notebook Mode 3: LTE Cat-M1 Band 13 Idle(Middle CH) + Charging from Notebook Mode 4: NB-IOT Band 5 Idle(Low CH) + USB Cable Charging from Adapter
Radiated Emissions	Mode 1: NB-IOT Band 5 Idle(Low CH) + Charging from Notebook Mode 2: LTE Cat-M1 Band 12 Idle(High CH) + Charging from Notebook Mode 3: LTE Cat-M1 Band 13 Idle(Middle CH) + Charging from Notebook Mode 4: LTE Cat-M1 Band 13 Idle(Middle CH) + USB Cable Charging from Adapter

Remark:

1. The worst case of AC is mode 1; only the test data of this mode is reported.
2. The worst case of RE is mode 3; only the test data of this mode is reported.
3. Pre-scanned Low/Middle/High channel, the worst channel was recorded in this report.

2.2. Connection Diagram of Test System



The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application

2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station	Anritsu	CWM500	N/A	N/A	Unshielded,1.8m
2.	Notebook	DELL	Latitude 3400	N/A	N/A	Unshielded,1.8m
3.	Ipod	apple	MC69029/A	N/A	N/A	N/A
4.	WLAN AP	Dlink	DIR-820L	N/A	N/A	Unshielded,1.8m

2.4. EUT Operation Test Setup

The EUT was in LTE idle mode during the testing.



3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (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 the limits in the following table.

<Class B Limit>

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

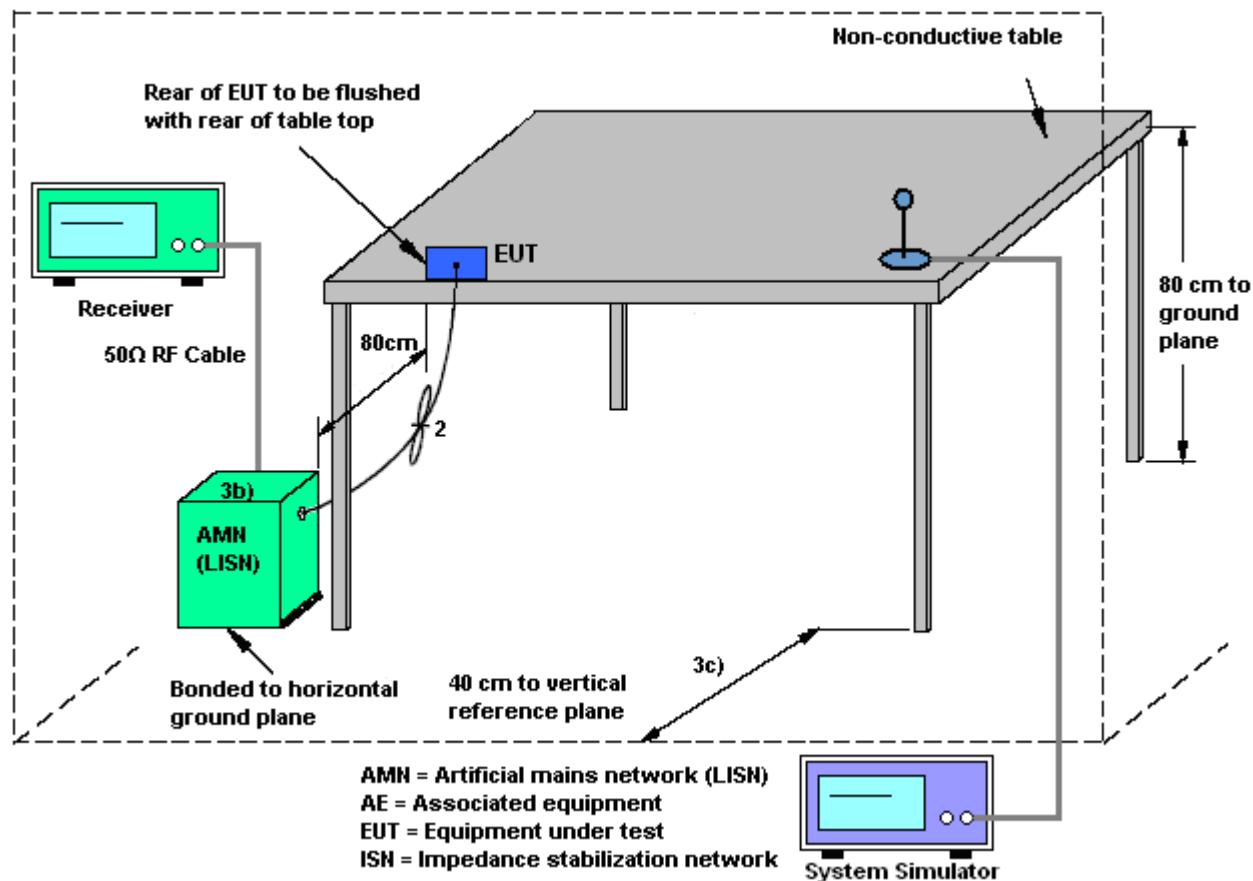
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

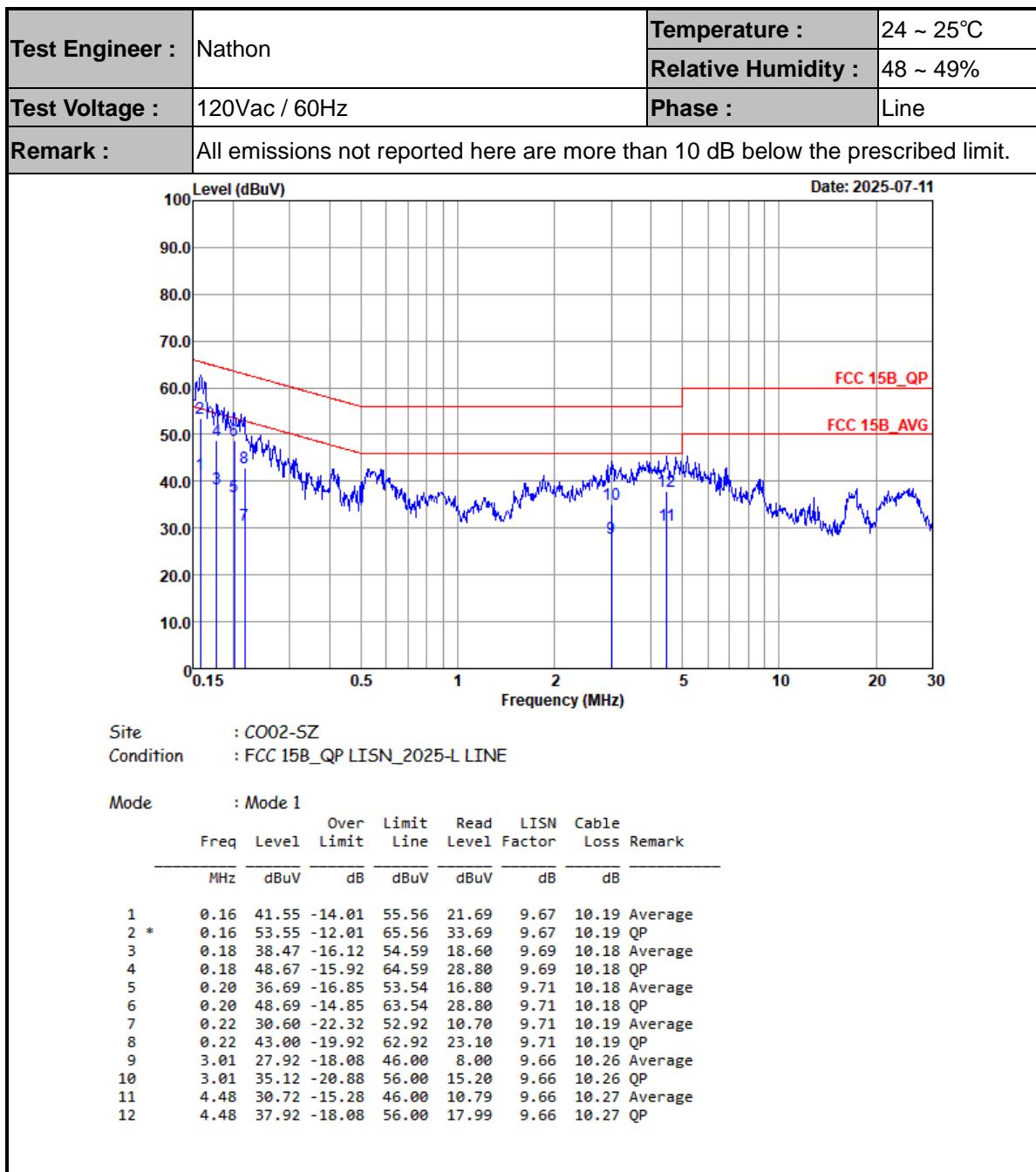
3.1.3 Test Procedure

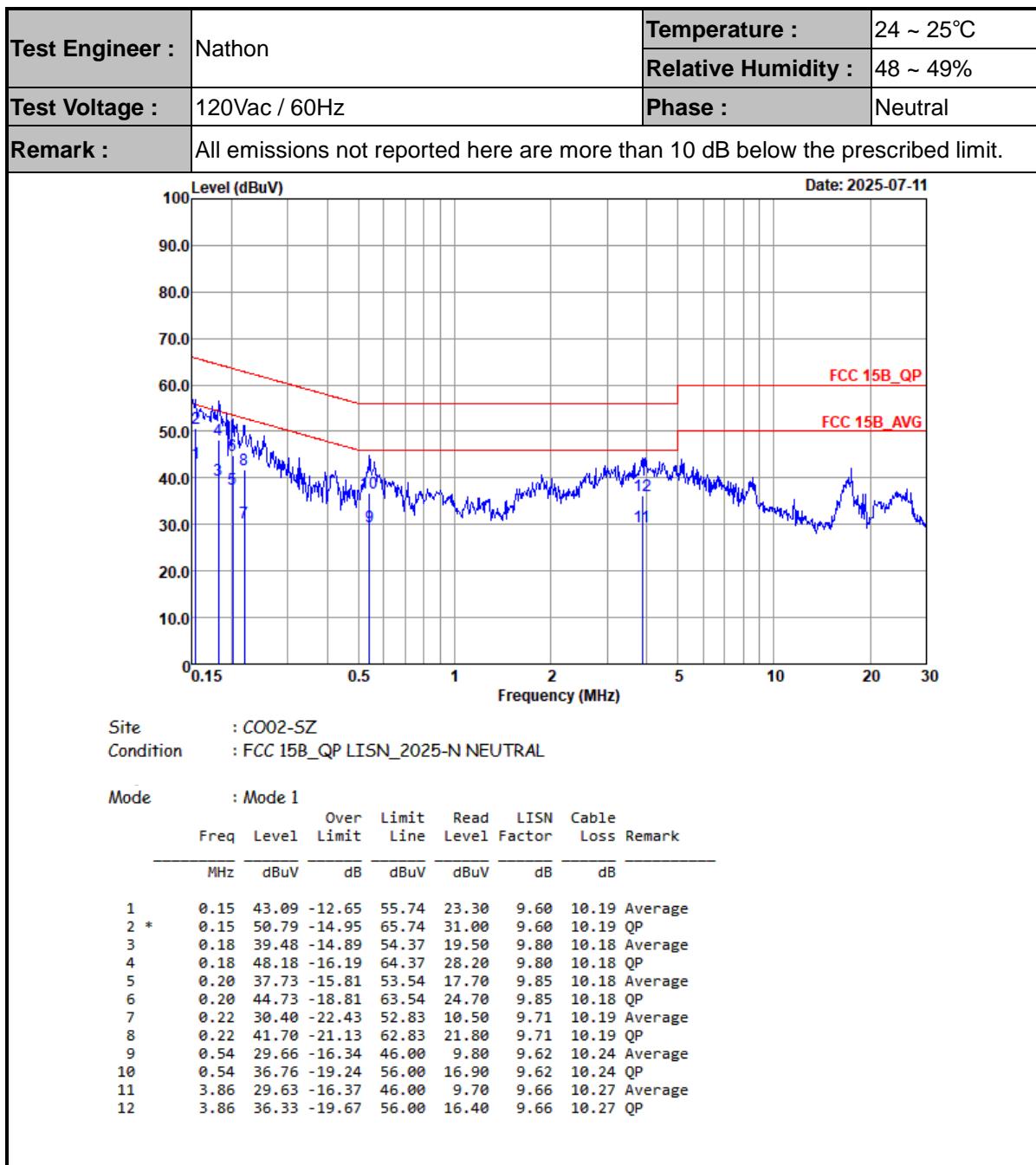
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.1.4 Test Setup



3.1.5 Test Result of AC Conducted Emission





Note:

1. Level(dB μ V) = Read Level(dB μ V) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dB μ V) – Limit Line(dB μ V)



3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

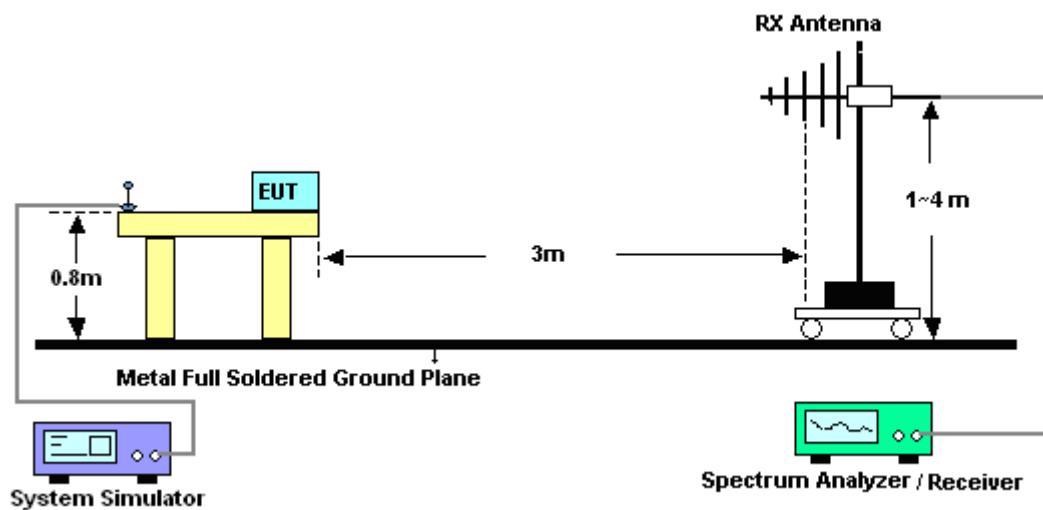
3.2.3. Test Procedures

1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiation.
5. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
6. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
7. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
8. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.

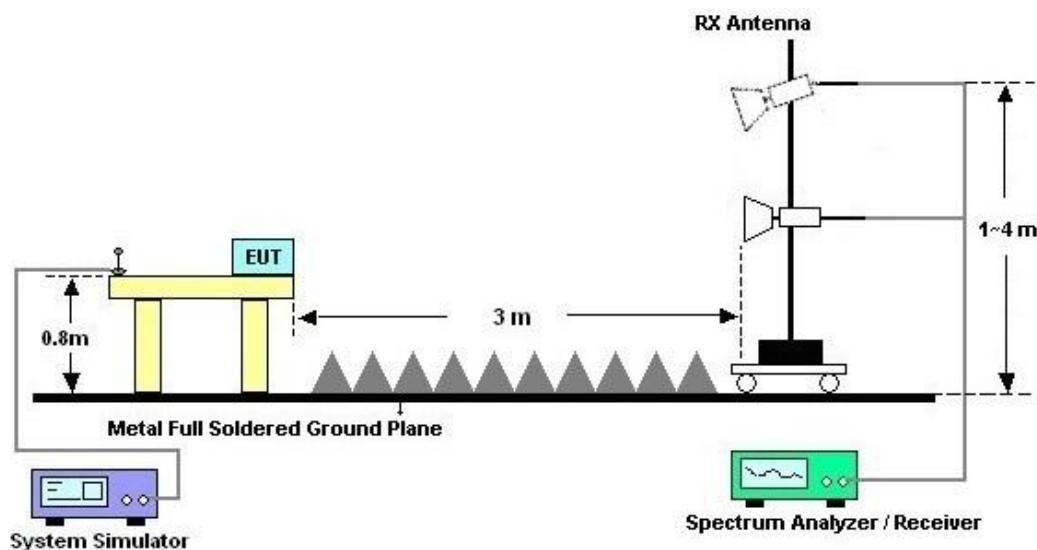
9. Emission level ($\text{dB}\mu\text{V/m}$) = $20 \log \text{Emission level } (\mu\text{V/m})$
10. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
11. Exploratory radiated emissions testing of handheld and/or body-worn devices shall include rotation of the EUT through three orthogonal axes (X/Y/Z Plane) to determine the orientation (attitude) that maximizes the emissions.

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Engineer :	TaoZhang	Temperature :	24 ~ 25°C						
		Relative Humidity :	48 ~ 49%						
Test Distance :	3m	Polarization :	Horizontal						
Remark :	#6 is system simulator signal which can be ignored.								
			Date: 2025-07-05						
Site	: 03CH05-SZ								
Condition	: FCC CLASS-B 3m VULB9168-01001 HORIZONTAL								
Plane	: Y								
	Freq	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	A/Pos Factor	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm deg
1	63.95	19.32	-20.68	40.00	34.03	18.45	1.80	34.96	---
2	166.77	19.87	-23.63	43.50	34.22	18.13	2.42	34.90	---
3	256.01	28.45	-17.55	46.00	42.26	17.95	3.03	34.79	---
4	398.60	33.50	-12.50	46.00	43.29	21.60	3.31	34.70	---
5	659.53	29.65	-16.35	46.00	33.75	26.62	3.68	34.40	---
6 *	751.00	44.20		46.59	28.07	3.74	34.20	---	---
7	798.24	32.68	-13.32	46.00	33.47	28.94	4.37	34.10	---
8	1984.00	41.54	-32.46	74.00	56.20	31.58	6.87	53.11	---
9	4336.00	44.66	-29.34	74.00	53.56	34.63	9.60	53.13	---
10	8888.00	45.98	-28.02	74.00	48.30	36.98	12.26	51.56	---
11	9540.00	45.51	-28.49	74.00	46.22	37.80	13.03	51.54	---
12	13437.00	45.34	-28.66	74.00	43.32	39.64	14.33	51.95	---
13	16317.00	46.23	-27.77	74.00	41.74	41.50	15.46	52.47	---



Test Engineer :	TaoZhang	Temperature :	24 ~ 25°C							
		Relative Humidity :	48 ~ 49%							
Test Distance :	3m	Polarization :	Vertical							
Remark :	#6 is system simulator signal which can be ignored.									
Site : 03CH05-SZ Condition : FCC CLASS-B 3m VULB9168-01001 VERTICAL										
Plane	: Y									
	Freq	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	30.97	20.47	-19.53	40.00	35.62	18.23	1.23	34.61	---	--- Peak
2	193.93	20.00	-23.50	43.50	35.94	16.29	2.67	34.90	---	--- Peak
3	257.95	29.12	-16.88	46.00	42.84	18.02	3.04	34.78	---	--- Peak
4	398.60	37.15	-8.85	46.00	46.94	21.60	3.31	34.70	---	--- Peak
5	572.23	26.90	-19.10	46.00	32.65	25.17	3.54	34.46	---	--- Peak
6 *	751.00	43.73		46.12	28.07	3.74	34.20	---	---	--- Peak
7	800.18	34.82	-11.18	46.00	35.56	28.97	4.39	34.10	---	--- Peak
8	1984.00	43.01	-30.99	74.00	57.67	31.58	6.87	53.11	---	--- Peak
9	4384.00	44.87	-29.13	74.00	53.83	34.60	9.59	53.15	---	--- Peak
10	8896.00	46.00	-28.00	74.00	48.30	36.99	12.26	51.55	---	--- Peak
11	9603.00	46.12	-27.88	74.00	46.65	37.91	13.16	51.60	---	--- Peak
12	13869.00	46.25	-27.75	74.00	44.01	39.70	14.51	51.97	---	--- Peak
13	16605.00	46.25	-27.75	74.00	41.76	41.71	15.37	52.59	---	--- Peak

Note:

1. Level(dB μ V/m) = Read Level(dB μ V) + Antenna Factor(dB/m) + Cable Loss(dB) - Preamp Factor(dB)
2. Over Limit(dB) = Level(dB μ V/m) - Limit Line(dB μ V/m)



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	102261	9kHz~7GHz	Apr. 02, 2025	Jul. 05, 2025~Aug. 07, 2025	Apr. 01, 2026	Radiation (03CH05-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071191	10Hz~44GHz	Apr. 02, 2025	Jul. 05, 2025~Aug. 07, 2025	Apr. 01, 2026	Radiation (03CH05-SZ)
Log-periodic Antenna	SCHWARZBECK	VULB 9168	01001	20MHz~1.5GHz	Jul. 09, 2024	Jul. 05, 2025~Aug. 07, 2025	Jul. 08, 2025	Radiation (03CH05-SZ)
Log-periodic Antenna	SCHWARZBECK	VULB 9168	01001	20MHz~1.5GHz	Jul. 08, 2025		Jul. 07, 2026	Radiation (03CH05-SZ)
Amplifier	EM Electronics	EM330	060756	0.01Hz ~3000MHz	Apr. 02, 2025	Jul. 05, 2025~Aug. 07, 2025	Apr. 01, 2026	Radiation (03CH05-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Jul. 04, 2025	Jul. 05, 2025~Aug. 07, 2025	Jul. 03, 2026	Radiation (03CH05-SZ)
HF Amplifier	EM Electronics	EM01G18GA	060779	1GHz~18GHz	Dec. 25, 2024	Jul. 05, 2025~Aug. 07, 2025	Dec. 24, 2025	Radiation (03CH05-SZ)
HF Amplifier	EM Electronics	EM18G40G	060778	18GHz~40GHz	Apr. 03, 2025	Jul. 05, 2025~Aug. 07, 2025	Apr. 02, 2026	Radiation (03CH05-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	00983	15GHz~40GHz	Apr. 03, 2025	Jul. 05, 2025~Aug. 07, 2025	Apr. 02, 2027	Radiation (03CH05-SZ)
AC Power Source	APC	AFV-S-600	F119050013	N/A	Oct. 14, 2024	Jul. 05, 2025~Aug. 07, 2025	Oct. 13, 2025	Radiation (03CH05-SZ)
Turn Table	EMEC	T-200-S-1	060925-T	0~360 degree	NCR	Jul. 05, 2025~Aug. 07, 2025	NCR	Radiation (03CH05-SZ)
Antenna Mast	EMEC	MBS-400-1	060927	1 m~4 m	NCR	Jul. 05, 2025~Aug. 07, 2025	NCR	Radiation (03CH05-SZ)
EMI Receiver	R&S	ESR7	102297	9kHz~7GHz;	Jul. 02, 2025	Jul. 11, 2025~Aug. 05, 2025	Jul. 01, 2026	Conduction (CO02-SZ)
AC LISN	R&S	ENV216	101499	9kHz~30MHz	Jul. 02, 2025	Jul. 11, 2025~Aug. 05, 2025	Jul. 01, 2026	Conduction (CO02-SZ)
AC Power Source	CHROMA	61601	616010002470	100Vac~250Vac	Dec. 25, 2024	Jul. 11, 2025~Aug. 05, 2025	Dec. 24, 2025	Conduction (CO02-SZ)

NCR: No Calibration Required



5. Measurement Uncertainty

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_{C(y)}$)	2.5 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_{C(y)}$)	4.2 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_{C(y)}$)	5.1 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_{C(y)}$)	4.1 dB
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