

RRA-EMIESS24F385SKF-01Av0

Certification Radio test report

According to the standard:

CFR 47 FCC PART 15

RSS GEN – Issue 5

RSS 247 – Issue 3

Equipment under test:

Enlight Collect IMx-1

FCC ID: 2AJ99-CMWA-6100-EX

IC NUMBER: 26053-CMWA6100EX

Company:

SKF FRANCE

Distribution: Mr LIGNEE

(Company: SKF FRANCE)

Number of pages: 33 with 3 annexes

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			Name and Function	Visa
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Information in italics are declared by the manufacturer/customer and are under his responsibility

DESIGNATION OF PRODUCT: *Enlight Collect IMx-1*

Serial number (S/N): **Sample 1 (BLE):** *C4BD6A01B99A*
Sample 2 (MIRA): *0441A9D25C7480*

Reference: **Sample 1 (BLE):** *SK-2831 B*
Sample 2 (MIRA): *SK-2816 F*

HVIN: *26053-HW01*

Model (P/N): *CMWA 6100*

Software version: **Sample 1 (BLE):** *LX_CMWA_6100_B_02 5*
Sample 2 (MIRA): *radio_test-mkw41z-mesh*

MANUFACTURER: *SKF FRANCE*

COMPANY SUBMITTING THE PRODUCT:

Company: SKF FRANCE

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Responsible: Mr LIGNEE

Person(s) present during the tests: /

DATES OF TEST: From 26-Mar-25 to 27-Mar-25

TESTING LOCATION: EMITECH ANGERS laboratory at BEAUCOUZE (49) FRANCE

FCC Accredited under US-EU MRA Designation Number: FR0009
Test Firm Registration Number: 873677

ISED Accredited under CANADA-EU MRA Designation Number: FR0001
Industry Canada Registration Number: 4452A

TESTED BY: B. VOVARD

VISA:

WRITTEN BY: B. VOVARD

A handwritten signature in blue ink, appearing to read "B. Vovard", with a horizontal line extending to the right.

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REVISIONS HISTORY

Revision	Date	Modified pages	Modifications
0	15-Jul-25	/	Creation

1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: **Enlight Collect IMx-1**, in accordance with normative reference.

The equipment under test integrates:

- BLE transceiver radio part function declared already certified,
- MIRA transceiver radio part function declared already certified (802.15.4).

This equipment is already certified (FCC ID: 2AJ99-CMWA-6100-EX) and (IC ID: 26053-CMWA6100EX).

This report concerns the two functions. Only partial tests were carried out to validate the minor modifications of the equipment (RF parts is not concerned by theses modifications).

This radio test report concerns the followings configurations:

Class 2 Permissive Change: Measure of output power and harmonics of BLE and MIRA

2. PRODUCT DESCRIPTION

Category of equipment (ISED): I

Class: B

Utilization: Industrial

Antenna type and gain: Integrated antenna (Maximum gain: -1.95 dBi)

Operating frequency range: From 2400 MHz to 2483.5 MHz

Sample 1: BLE

Number of channel which it can operate: 40
Channel separation: 2 MHz
Nominal Channel bandwidth: 2 MHz
Modulation: GFSK

Power setting: 15

Nominal Operating Frequencies:

Sample N°= 1 ⇒ 2402 MHz (Advertising mode)
Sample N°= 1 ⇒ 2426 MHz (Advertising mode)
Sample N°= 1 ⇒ 2480 MHz (Advertising mode)

Sample 2: MIRA

Number of channel which it can operate: 16
Channel separation: 5 MHz
Nominal Channel bandwidth: 2 MHz
Modulation: GFSK

Power setting: 0

Nominal Operating Frequencies:

Sample N°= 2 ⇒ 2402 MHz
Sample N°= 2 ⇒ 2440 MHz
Sample N°= 2 ⇒ 2480 MHz

Power source: 3.6 Vdc by battery (not rechargeable)

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

3. NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below.

They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

CFR 47 FCC Part 15 (2025) Radio Frequency Devices

ANSI C63.10 2020 + Corrigendum (2023) + Amendment 1 (2024)
Procedures for Compliance Testing of Unlicensed Wireless Devices.

558074 D01 15.247 Meas Guidance v05r02
Guidance for compliance measurements on digital transmission system,
frequency hopping spread spectrum system, and hybrid system devices
operating under section 15.247 of the FCC rules.

RSP-100 Issue 12, August 2019
Certification of Radio Apparatus and Broadcasting equipment

RSS-Gen Issue 5, April 2018
General Requirements for Compliance of Radio Apparatus

RSS-247 Issue 3, August 2023
Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs)
and Licence-Exempt Local Area Network (LE-LAN) Devices

4. TEST METHODOLOGY

Radio performance tests procedures given in CFR 47 part 15:

Subpart C – Intentional Radiators

- Paragraph 203: Antenna requirement
- Paragraph 205: Restricted bands of operation
- Paragraph 207: Conducted limits
- Paragraph 209: Radiated emission limits; general requirements
- Paragraph 212: Modular transmitter
- Paragraph 215: Additional provisions to the general radiated emission limitations
- Paragraph 247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz

Radio performance tests procedures given in RSS-Gen:

- Paragraph 2 - General
- Paragraph 3 - Normative publications and related documents
- Paragraph 4 - Labelling requirements
- Paragraph 6 - General administrative and technical requirements
- Paragraph 8 - Licence-exempt Radio Apparatus

Radio performance tests procedures given in RSS-247:

- Paragraph 3 - Certification requirements
- Paragraph 4 - Measurement method
- Paragraph 5 - Standard specifications for frequency hopping systems and digital transmission systems operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz

5. TEST EQUIPMENT CALIBRATION DATES

Emitech Number	Model	Type	Last calibration (DD/MM/YYYY)	Calibration interval (years)	Next calibration due (DD/MM/YYYY)
0000	BAT-EMC V3.18.0.26	Software	/	/	/
1406	EMCO 6502	Loop antenna	04/04/2024	1	04/04/2025
1469	FEM Aéro N-13m	cable	09/10/2023	2	08/10/2025
1766	Mini-circuit ZFL-1000LN	Low-noise amplifier	22/04/2024	1	22/04/2025
2736	N-10m	cable	26/02/2024	2	25/02/2026
4087	Filtek LP03/1000-7GH	Low Pass Filter	07/02/2023	3	06/02/2026
4088	R&S FSP40	Spectrum Analyzer	10/06/2024	2	10/06/2026
7124	A.H. Systems SAS-572	Antenna	23/05/2022	3	22/05/2025
7171	R&S HL223	Antenna	19/05/2022	3	18/05/2025
7299	Microtronics BRM50702	Reject band filter	16/08/2022	3	15/08/2025
7566	Testo 608-H1	Meteo station	17/12/2024	2	17/12/2026
8528	Schwarzbeck VHA 9103	Biconical antenna	19/05/2022	3	18/05/2025
8548	Midwest Microwave 10dB	Attenuator	08/02/2023	3	07/02/2026
8855	EMITECH	Turntable and mat controller	/	/	/
8896	ACQUISYS GPS8	Satellite synchronized frequency standard	/	/	/
8974	STORM MICROWAE k-20cm	cable	29/01/2024	2	28/01/2026
10771	EMCO 3117	Antenna	30/11/2022	3	30/11/2025
10789	MATURO	Turntable and mat controller NCD	/	/	/
12590	LUCIX Corp S005180M3201	Low-noise amplifier	29/05/2024	1	29/05/2025
14903	Fluke 177	Multimeter	22/12/2023	2	21/12/2025
16109	C&C HPF180400	High pass filter	11/08/2022	3	10/08/2025
17296	Huber + Suhner	Cable	25/09/2024	2	25/09/2026
17377	Comtest SAC	Semi Anechoic Chamber	/	/	/
18418	MechANC - Type K - 1m	Cable	02/09/2024	2	02/09/2026

Emitech Number	Model	Type	Last calibration (DD/MM/YYYY)	Calibration interval (years)	Next calibration due (DD/MM/YYYY)
19154	QOTANA DBLNA317202120S	Low-noise amplifier 18-26GHz	23/09/2024	1	23/09/2025
19263	Radiall R412706124 - 6dB	Attenuator	06/12/2023	3	05/12/2026
19264	Radiall R412706124 - 6dB	Attenuator	06/12/2023	3	05/12/2026
19462	R&S ESW44	Test receiver	25/04/2024	1	25/04/2025
19877	HYTEM - N - 5m	Cable	30/08/2024	2	30/08/2026
19887	HYTEM - N - 1m	Cable	30/08/2024	2	30/08/2026
19898	HYTEM - N - 2.5m	Cable	30/08/2024	2	30/08/2026
19907	HYTEM - N - 5.8m	Cable	30/08/2024	2	30/08/2026
20040	COMTEST FAR-2	Anechoic chamber	/	/	/

6. TESTS RESULTS SUMMARY

6.1 CFR 47 part 15 requirements

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.203	ANTENNA REQUIREMENT	X				Note 1
FCC Part 15.205	RESTRICTED BANDS OF OPERATION	X				
FCC Part 15.207	CONDUCTED LIMITS			X		Supplied by battery
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				Note 2
FCC Part 15.212	MODULAR TRANSMITTERS			X		
FCC part 15.215	ADDITIONAL PROVISIONS TO THE GENERAL RADIATED EMISSION LIMITATIONS					
	(a) Alternative to general radiated emission limits				X	Note 3
	(b) Unwanted emissions outside of §15.247 frequency bands	X				Note 4
	(c) 20 dB bandwidth and band-edge compliance				X	Note 3

NAp: Not Applicable

NAs: Not Asked

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAP	NAs	
FCC Part 15.247	OPERATION WITHIN THE BANDS 902-928 MHZ, 2400-2483.5 MHz and 5725-5850 MHz					
	(a) (1) Hopping systems			X		
	(a) (2) Digital modulation techniques	X				
	(b) Maximum peak output power	X				Note 5
	(c) Operation with directional antenna gains > 6 dBi			X		
	(d) Intentional radiator	X				
	(e) Peak power spectral density				X	Note 3
	(f) Hybrid system			X		
	(g) Frequency hopping requirements			X		
	(h) Frequency hopping intelligence			X		
	(i) RF exposure compliance	X				Note 3

NAP: Not Applicable

NAs: Not Asked

Note 1: Integral antenna without standard connector.

Note 2: See FCC part 15.247 (d).

Note 3: Only power and harmonics measurements are realized on these products (C2PC). No increase of power was detected by comparison with the initial product.

Note 4: See FCC part 15.209. Unwanted emissions levels are all below the fundamental emission field strength level.

Note 5: Conducted measurement is not possible (integral antenna), so we used the radiated method in open field.

6.2 RSS-Gen requirements

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
Paragraph 8	Licence-exempt radio apparatus					
§ 8.1	Measurement Bandwidths and Detector Functions	X				
§ 8.2	Pulsed operation	X				
§ 8.3	Prohibition of amplifiers	X				
§ 8.4	User manual notice	X				see certification documents
§ 8.5	Measurement of licence-exempt devices on-site (in-situ)			X		
§ 8.6	Operating frequency range of devices in master/slave networks	X				
§ 8.7	Radio frequency identification (RFID) devices			X		
§ 8.8	AC power line conducted emissions limits			X		Supplied by battery
§ 8.9	Transmitter emission limits	X				Permissive change report
§ 8.10	Restricted frequency bands	X				
§ 8.11	Frequency stability			X		

NAp: Not Applicable

NAs: Not Asked

6.3 RSS-247 requirements

Test Procedure RSS-247	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
Paragraph 5	Standard specifications for frequency hopping system and digital transmission systems operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz					
5.1	Frequency hopping systems (FHSS)			X		
5.2	Digital transmission systems	X				Permissive change report Note 1
5.3	Hybrid systems			X		
5.4	Transmitter output power and equivalent isotropically radiated power (e.i.r.p.) requirements	X				
5.5	Unwanted emissions	X				

NAp: Not Applicable

NAs: Not Asked

Note 1: Only power and harmonics measurements are realized on these products (C2PC). No increase of power was detected by comparison with the initial product.

7. MEASUREMENT UNCERTAINTY

To declare, or not, the compliance with the specifications, it was not explicitly taken into account of uncertainty associated with the result(s)

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for normal distribution corresponds to a coverage probability of approximately 95%.

Parameter	Emitech Uncertainty
RF power, conducted	$\pm 0.8\text{dB}$
Radiated emission valid to 26 GHz	
9kHz – 30MHz	$\pm 4.3\text{ dB}$
30MHz – 1GHz	$\pm 5.9\text{ dB}$
1GHz – 18GHz	$\pm 4.8\text{ dB}$
18GHz – 40GHz	$\pm 5.9\text{ dB}$
AC Power Lines conducted emissions	$\pm 3.7\text{ dB}$
Temperature	$\pm 0.95\text{ }^{\circ}\text{C}$
Humidity	$\pm 4.6\text{ \%}$

8. PEAK CONDUCTED OUTPUT POWER**Temperature (°C) :** 22 and 28**Humidity (%HR):** 43 and 44**Date :** March 26, 2025 and June 30, 2025**Technician :** B. VOVARD**Standard:** FCC Part 15
RSS-247**Test procedure:**

For FCC Part 15: paragraph 15.247 (b)

For RSS-247: paragraph 5.4

DTS:

RBW ≥ DTS bandwidth method of paragraph 11.9.1.1 of ANSI C63.10

Test set up: (Refer Appendix 3)

First an exploratory radiated measurement was performed. During this phase the product is oriented in these two normal positions.

Then the final measurement is realized with the product on the most critical orientation.

The system is tested in anechoic chamber, the EUT is placed on a rotating table, 1.5 m from a ground plane.

Zero degree azimuths correspond to the front of the device under test.

See test setup in appendix 3

Distance of antenna: 3 meters (in anechoic room)**Antenna height:** 1 to 2.5 meters or 0.5 m above the top of the EUT, whichever is higher (in anechoic room)**Antenna polarization:** vertical and horizontal (only the highest level is recorded)

The measurement of the radiated electro-magnetic field is realized with an analyser and peak detector. The resolution bandwidth is adjusted at 1 MHz and video bandwidth at 3 MHz. (11.9.1.1 of ANSI C63.10)

Finally the radiated electro-magnetic field is converted in dBm with the following formula:

$EIRP(dBm) = E(dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance in meters and antenna Gain = 0.35 dBi.

Equipment under test operating condition:

BLE: The equipment under test is blocked in discontinuous modulated transmission in advertising mode, with the power setting set at 15.

MIRA: The equipment under test is blocked in discontinuous modulated transmission mode, with the power setting set at 0.

Power source: 3.6 Vdc by battery

Percentage of voltage variation during the test (%): ± 1

Results:

Sample N° 1 Low Channel (F = 2402 MHz)

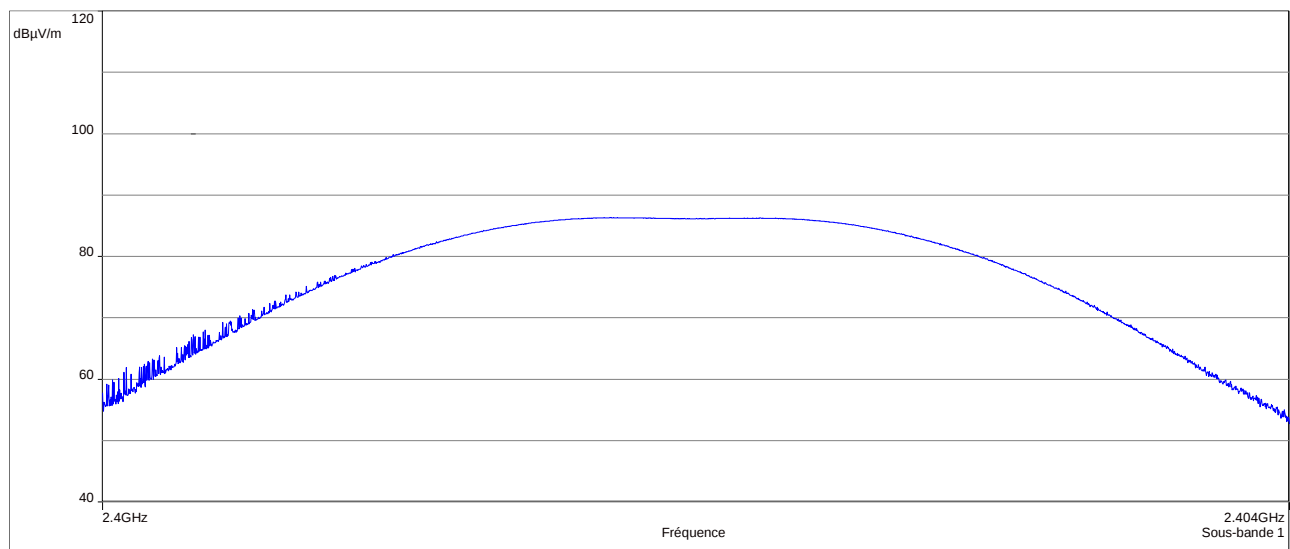
	Electro-magnetic field at 3 (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	86.25	-7.06	0.000197	1

Polarization of test antenna: horizontal

(height: 162 cm)

Position of equipment: Position 2 (flat)

(azimuth: 60 degrees)



(1) Maximum Peak conducted output power:

$EIRP(dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance in meters and antenna Gain = -1.95 dBi.

Sample N° 1 Central Channel (F = 2426 MHz)

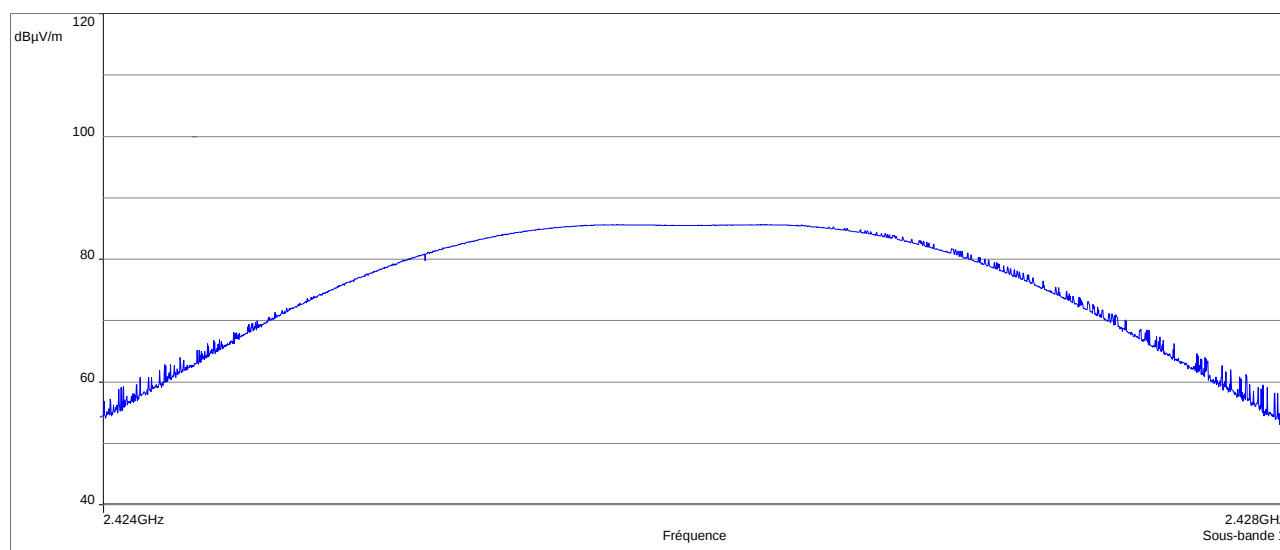
	Electro-magnetic field at 3 (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	85.56	-7.30	0.000186	1

Polarization of test antenna: horizontal

(height: 137 cm)

Position of equipment: Position 2 (flat)

(azimuth: 64 degrees)



(1) Maximum Peak conducted output power:

$EIRP(dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance in meters and antenna Gain = -2.40 dBi.

Sample N° 1 High Channel (F = 2480 MHz)

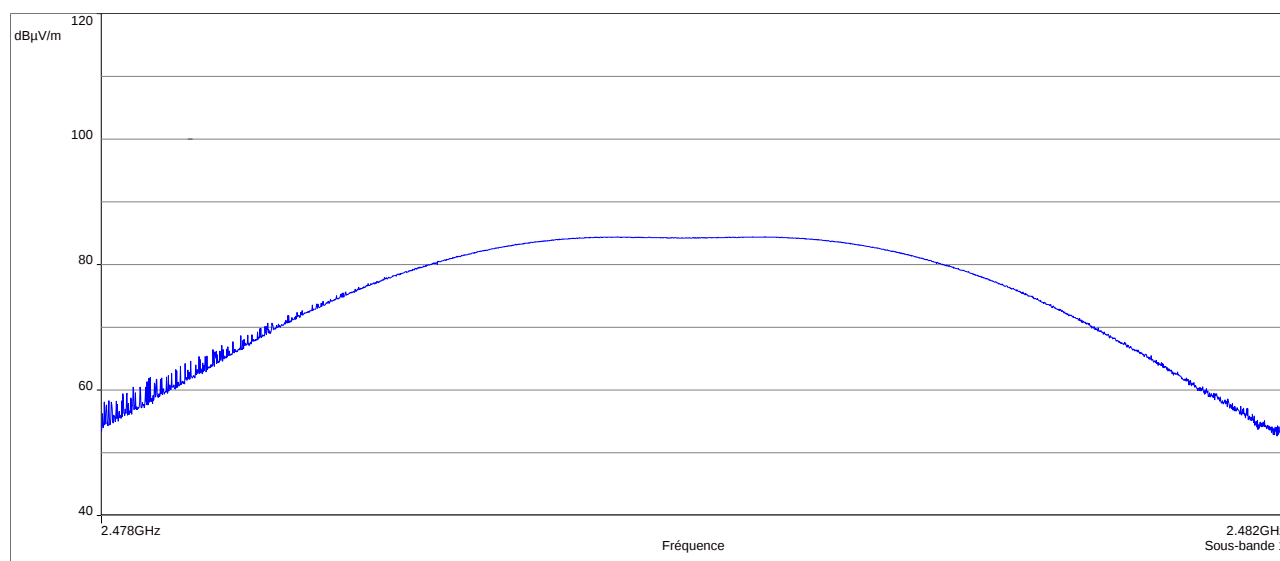
	Electro-magnetic field at 3 (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	84.42	-7.38	0.000183	1

Polarization of test antenna: horizontal

(height: 128 cm)

Position of equipment: Position 2 (flat)

(azimuth: 65 degrees)



(1) Maximum Peak conducted output power:

$EIRP(dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance in meters and antenna Gain = -3.46 dBi.

Results:

Sample N° 2 Low Channel (F = 2402 MHz)

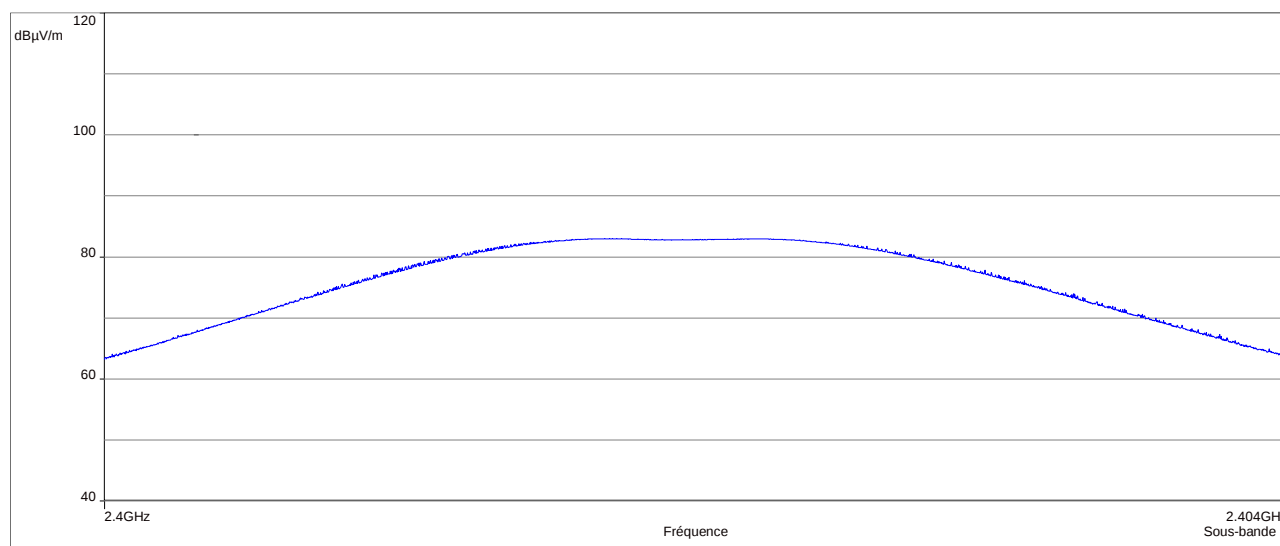
	Electro-magnetic field at 3 (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	82.93	-10.38	0.000092	1

Polarization of test antenna: horizontal

(height: 186 cm)

Position of equipment: Position 2 (flat)

(azimuth: 252 degrees)



(1) Maximum Peak conducted output power:

$EIRP(dBm) = E (dBμV/m) + 20\log(D) - 104.8$; where D is the measurement distance in meters and antenna Gain = -1.95 dBi.

Sample N° 2 Central Channel (F = 2440 MHz)

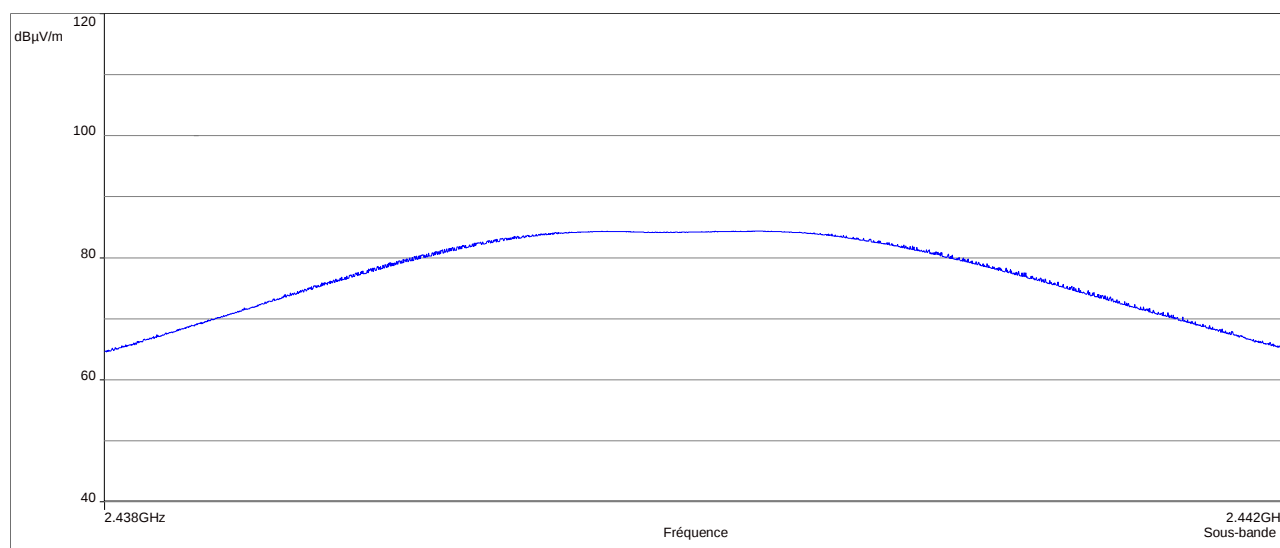
	Electro-magnetic field at 3 (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	84.32	-8.79	0.000132	1

Polarization of test antenna: horizontal

(height: 104 cm)

Position of equipment: Position 2 (flat)

(azimuth: 207 degrees)



(1) Maximum Peak conducted output power:

$EIRP(dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance in meters and antenna Gain = -2.15 dBi.

Sample N° 2 High Channel (F = 2480 MHz)

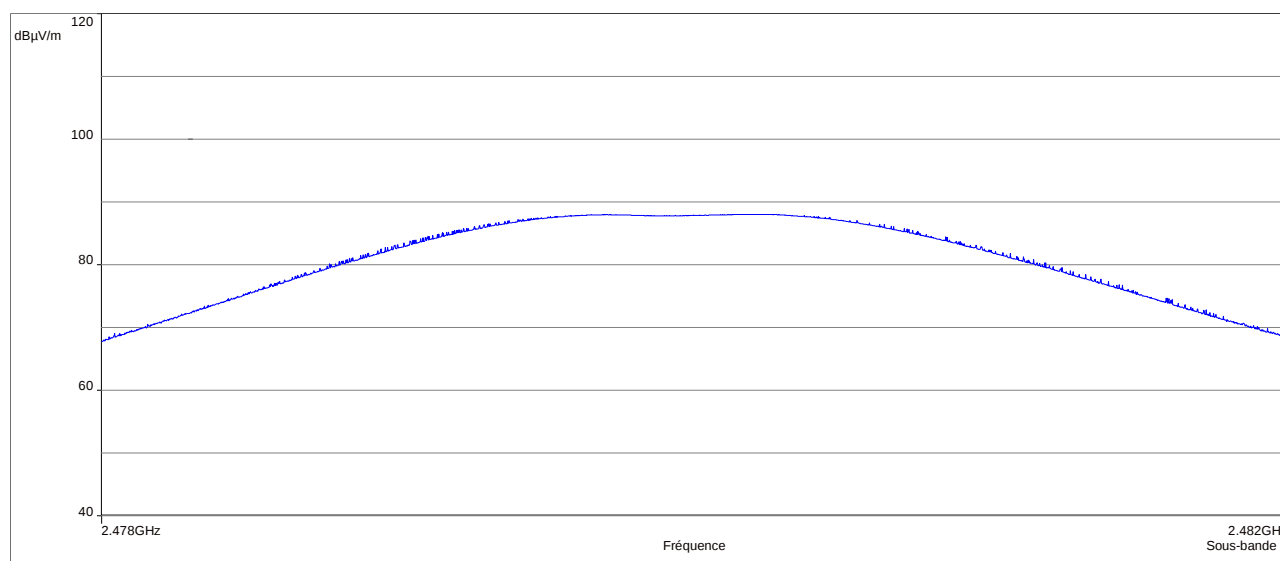
	Electro-magnetic field at 3 (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	86.72	-5.07	0.000311	1

Polarization of test antenna: horizontal

(height: 150 cm)

Position of equipment: Position 2 (flat)

(azimuth: 255 degrees)



(1) Maximum Peak conducted output power:

$EIRP(dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance in meters and antenna Gain = -3.46 dBi.

Test conclusion:

RESPECTED STANDARD

9. RADIATED SPURIOUS EMISSIONS**Temperature (°C) :** 25 and 28**Humidity (%HR):** 34 and 44**Date :** March 27, 2025 and June 30, 2025**Technician :** B. VOVARD**Standard:** FCC Part 15
RSS-247**Test procedure:**

For FCC Part 15: paragraph 15.205, paragraph 15.209, paragraph 15.247 (d)

For RSS-247: paragraph 5.5

DTS:

Emissions in non-restricted frequency bands method of paragraph 11.11 of ANSI C63.10

Emissions in restricted frequency bands method of paragraph 11.12 of ANSI C63.10

Test set up: (Refer Appendix 3)

First an exploratory radiated measurement was performed. During this phase the product is oriented in these two normal positions.

Then the final measurement is realized with the product on the most critical orientation.

The measure is realized on semi anechoic room under 1 GHz and in anechoic chamber above 1 GHz.

When the system is tested in semi anechoic room , the EUT is placed on a rotating table, 0.8m from a ground plane.

When the system is tested in anechoic chamber, the EUT is placed on a rotating table, 1.5 m from a ground plane.

Zero degree azimuths correspond to the front of the device under test.

See test setup in appendix 3

Frequency range: From 9 kHz to 10th harmonic of the highest fundamental frequency (2480 MHz)**Detection mode:** Quasi-peak (F < 1 GHz)

Peak / Average (F > 1 GHz)

Bandwidth: 200Hz (9 kHz < F < 150kHz)
9 kHz (150 kHz < F < 30MHz)
120 kHz (30 MHz < F < 1 GHz)
100 kHz / 1 MHz (F > 1 GHz)**Distance of antenna:** 3 meters (in semi anechoic room) / 3 meters (in anechoic room)**Antenna height:** 1 to 4 meters (in semi anechoic room) / 1 to 2.5 meters or 0.5 m above the top of the EUT, whichever is higher (in anechoic room)**Antenna polarization:** vertical and horizontal (only the highest level is recorded)

Equipment under test operating condition:

BLE: The equipment under test is blocked in discontinuous modulated transmission in advertising mode, with the power setting set at 15.

MIRA: The equipment under test is blocked in discontinuous modulated transmission mode, with the power setting set at 0.

Power source: 3.6 Vdc by battery

Percentage of voltage variation during the test (%): ± 1

Results:

Sample N° 1 Low Channel (F = 2402 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Azimuth (degree)	RBW (kHz)	Position	Polarization H: Horizontal V: Vertical	Field strength Measured at 3m (dB μ V/m)	Limits at 3m (dB μ V/m)	Margin (dB)
4804 (1)	P	145	200	1000	1	H	52.79 (2)	74	21.21
7206	P	107	115	1000	1	H	49.91	65.5	15.59
9608	P	250	178	1000	2	V	50.54	65.5	14.96

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Sample N° 1 Central Channel (F = 2426 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Azimuth (degree)	RBW (kHz)	Position	Polarization H: Horizontal V: Vertical	Field strength Measured at 3m (dB μ V/m)	Limits at 3m (dB μ V/m)	Margin (dB)
4852 (1)	P	145	200	1000	1	H	52.92 (2)	74	21.08
7278 (1)	P	107	115	1000	1	H	50.12 (2)	74	23.88
9704	P	250	178	1000	2	V	50.07	65.5	14.80

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Sample N° 1 High Channel (F = 2480 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Azimuth (degree)	RBW (kHz)	Position	Polarization H: Horizontal V: Vertical	Field strength Measured at 3m (dB μ V/m)	Limits at 3m (dB μ V/m)	Margin (dB)
4960 (1)	P	145	200	1000	1	H	52.08 (2)	74	21.92
7440 (1)	P	107	115	1000	1	H	47.81 (2)	74	26.19
9920	P	250	178	1000	2	V	52.20	65.5	13.30

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Applicable limits: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

The highest level recorded in a 100 kHz bandwidth is 85.5 dB μ V/m on lowest channel.
So the applicable limit is 65.5 dB μ V/m.

In addition, radiated emissions which fall in the restricted band, as defined in section 15.205 (a), must also comply with the radiated emission limits specified in section 15.209 (a) (see section 15.205 (c)).

In addition, radiated emissions which fall in the restricted band, as defined in Table 6 of RSS-Gen, must also comply with the radiated emission limits specified in Table 4 and Table 5 of RSS-Gen.

Results:

Sample N° 2 Low Channel (F = 2402 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Azimuth (degree)	RBW (kHz)	Position	Polarization H: Horizontal V: Vertical	Field strength Measured at 3m (dBμV/m)	Limits at 3m (dBμV/m)	Margin (dB)
4804 (1)	P	145	124	1000	1	H	59.66	74	14.34
4804 (1)	Av	145	124	1000	1	H	53.22 (2)	54	0.78
7206	P	150	323	1000	2	H	52.22	67.99	15.77
9608	P	150	0	1000	2	V	53.12	67.99	14.87

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) Duty-Cycle Included

Sample N° 2 Central Channel (F = 2440 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Azimuth (degree)	RBW (kHz)	Position	Polarization H: Horizontal V: Vertical	Field strength Measured at 3m (dBμV/m)	Limits at 3m (dBμV/m)	Margin (dB)
4880 (1)	P	116	126	1000	1	H	59.32	74	14.68
4880 (1)	Av	116	126	1000	1	H	53.15 (2)	54	0.85
7320 (1)	P	227	123	1000	2	V	52.20 (3)	74	21.80
9760	P	198	40	1000	2	H	53.88	67.99	14.11

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) Duty-Cycle Included

(3) The peak level is lower than the average limit (54 dBμV/m)

Sample N° 2 High Channel (F = 2480 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Azimuth (degree)	RBW (kHz)	Position	Polarization H: Horizontal V: Vertical	Field strength Measured at 3m (dB μ V/m)	Limits at 3m (dB μ V/m)	Margin (dB)
4960 (1)	P	133	44	1000	1	V	58.90	74	15.10
4960 (1)	Av	133	44	1000	1	V	52.98 (2)	54	1.02
7440 (1)	P	150	130	1000	2	V	52.39 (3)	74	21.61
9920	P	150	5	1000	2	V	52.98	67.99	15.01

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) Duty-Cycle Included

(3) The peak level is lower than the average limit (54 dB μ V/m)

Applicable limits: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

The highest level recorded in a 100 kHz bandwidth is 87.99 dB μ V/m on highest channel.
So the applicable limit is 67.99 dB μ V/m.

In addition, radiated emissions which fall in the restricted band, as defined in section 15.205 (a), must also comply with the radiated emission limits specified in section 15.209 (a) (see section 15.205 (c)).

In addition, radiated emissions which fall in the restricted band, as defined in Table 6 of RSS-Gen, must also comply with the radiated emission limits specified in Table 4 and Table 5 of RSS-Gen.

Note: any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

Test conclusion:

RESPECTED STANDARD

□□□ End of report, 3 appendixes to be forwarded □□□

APPENDIX 1: Calculation example for radiated spurious emission

Frequencies (MHz)	Level (dBμV/m) (1)	Margin (dB) (2)	Limit (dBμV/m)	Read level (dBμV)	Antenna Factor (dBm)	Cable Loss (dB)	Preamp Factor (dB)
2390 (Peak)	57.63	16.37	74	64.3	32.7	3.27	42.64
2390 (Av)	46.43	7.57	54	53.1	32.7	3.27	42.64

(1) Level (dBμV/m) = Antenna Factor (dBm) + Cable loss (dB) + Read level (dBμV) – Preamp Factor (dB)

(2) Margin (dB) = Limit (dBμV/m) - Level (dBμV/m)

For Peak Limit @ 2390MHz:

(1) Level (dBμV/m)

= Antenna Factor (dBm) + Cable loss (dB) + Read level (dBμV) – Preamp Factor (dB)

= 32.7 (dBm) + 3.27 (dB) + 64.3 (dBμV) - 42.64 (dB)

= 57.63 (dBμV/m)

(2) Margin (dB)

= Limit (dBμV/m) - Level (dBμV/m)

= 74 (dBμV/m) - 57.63 (dBμV/m)

= 16.37 (dB)

For Average Limit @ 2390MHz:

(1) Level (dBμV/m)

= Antenna Factor (dBm) + Cable loss (dB) + Read level (dBμV) – Preamp Factor (dB)

= 32.7 (dBm) + 3.27 (dB) + 53.1 (dBμV) - 42.64 (dB)

= 46.43 (dBμV/m)

(2) Margin (dB)

= Limit (dBμV/m) - Level (dBμV/m)

= 54 (dBμV/m) – 46.43 (dBμV/m)

= 7.57 (dB)

APPENDIX 2: Test equipment list

Peak radiated output power

TYPE	MANUFACTURER	EMITECH NUMBER
Full anechoic chamber 2	EMITECH	20040
Turntable and mat controller NCD	MATURO	10789
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Antenna 3117	ETS-Lindgren	10771
Low-noise amplifier S005180M3201	LUCIX Corp.	12590
N-1M Cable	HYTEM	19887
N-2.5M Cable	HYTEM	19898
N-5M Cable	HYTEM	19877
N-5.8M Cable	HYTEM	19907
Attenuator 10dB	Midwest Microwave	8548
Multimeter 177	Fluke	14903
Meteo station 608-H1	Testo	7566
Software	BAT-EMC V3.18.0.26	0000

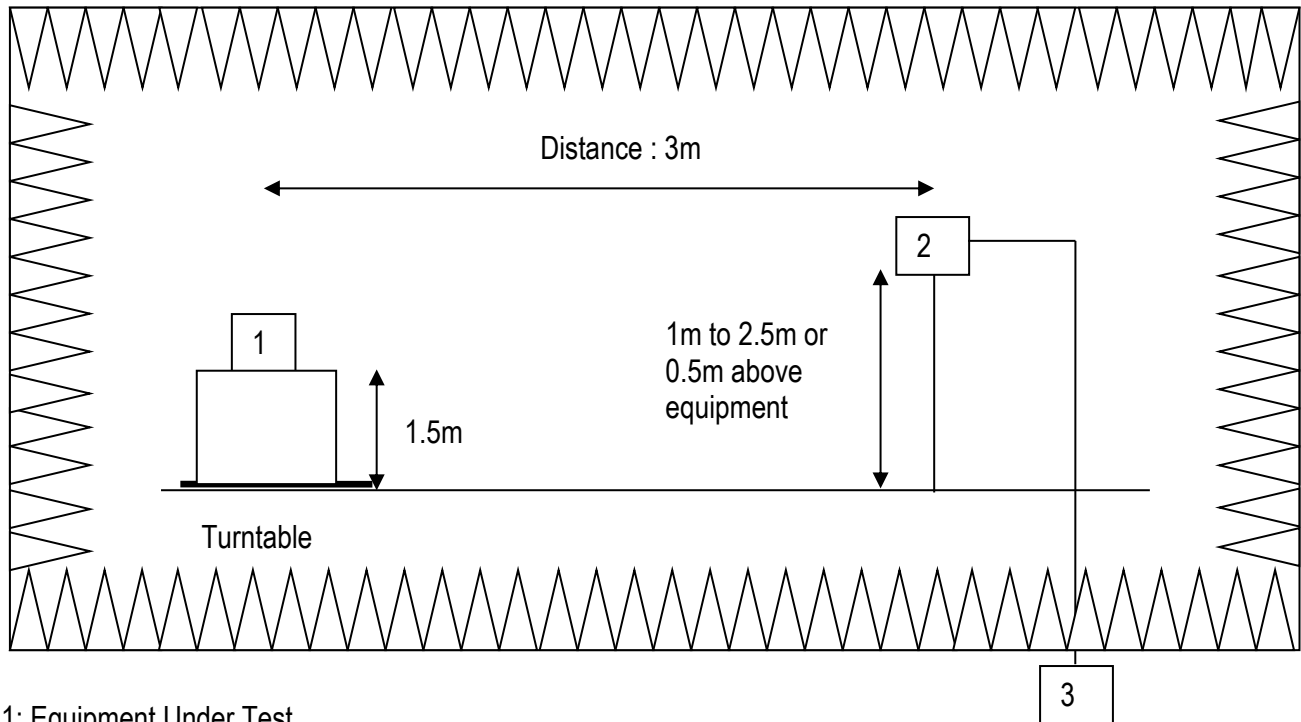
Radiated spurious emissions

TYPE	MANUFACTURER	EMITECH NUMBER
Semi anechoic room	EMITECH	17377
Turntable and mat controller	EMITECH	8855
Full anechoic chamber 2	EMITECH	20040
Turntable and mat controller NCD	MATURO	10789
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESW44	Rohde & Schwarz	19462
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Loop antenna 6502	EMCO	1406
Biconical antenna VHA 9103	Schwarzbeck	8528
Log periodic antenna HL223	Rohde & Schwarz	7171
Antenna 3117	ETS-Lindgren	10771
Antenna SAS-572	A.H Systems	7124
Low-noise amplifier S005180M3201	LUCIX Corp.	12590
Low-noise amplifier ZFL-1000LN	Mini-circuit	1766
Low-noise amplifier DBLNA317202120S	QOTANA	19154
Attenuator 6dB	Radiall	19263
Attenuator 6dB	Radiall	19264
N-1M Cable	HYTEM	19887
N-2.5M Cable	HYTEM	19898
N-5M Cable	HYTEM	19877
N-5.8M Cable	HYTEM	19907
N-13M Cable	FEM Aero	1469
N-5M Cable	Huber + Suhner	17296
N-10M Cable	EMITECH	2736
Cable k-20cm	STORM MICROWAE	8974
Cable k-100cm	MecHANC	18418
Low pass filter LP03/1000-7GH	Filtek	4087
Attenuator 10dB	Midwest Microwave	8548
Reject band filter BRM50702	Microtronics	7299
High pass filter HPF180400	C&C	16109
Multimeter 177	Fluke	14903
Meteo station 608-H1	Testo	7566
Software	BAT-EMC V3.18.0.26	0000

APPENDIX 3: Radiated Test Setup

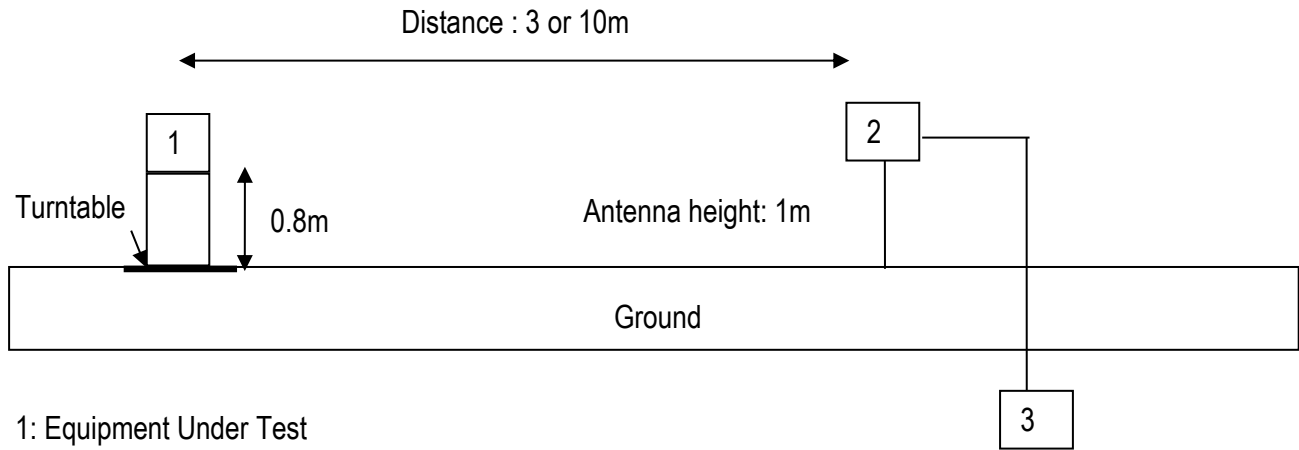
Anechoic chamber setup

Above 1 GHz



- 1: Equipment Under Test
- 2: Measurement antenna with tilt for variation from 1 to 2.5m or 0.5m above top of equipment
- 3: Measurement equipment

Open area setup

Below 30 MHz

- 1: Equipment Under Test
- 2: Measurement antenna
- 3: Measurement equipment

Semi anechoic chamber setup

Between 30 MHz and 1 GHz

