

Test report No:
NIE: 64670REM.002A1

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 6 (Updated 2019-04)

(*) Identification of item tested	Smart Cooking Sensor
(*) Trademark	Safera
(*) Model and /or type reference	Sense PRO (Model code: IFU10B-PRO)
Other identification of the product	HW Version: B SW Version: 1.0.25 FCC ID: 2AT88-2000021194
(*) Features	Bluetooth LE, 802.15.4 (ZigBee-type), Wi-Fi 802.11 b/g/n (HT20)
Manufacturer	SAFERA OY Tekniikantie 4 B, FI-02150 Espoo, Finland.
Test method requested, standard	FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 6 (Updated 2019-04)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager
Date of issue	2022-06-10
Report template No	FDT08_24 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is a FCC recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report, FCC designation number ES0004.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification internal document PODT000.

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is $l = \pm 4,9$ dB for quasi-peak measurements, $l = \pm 4,6$ dB for peak measurements ($k= 2$).

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 1000 MHz to 12.75 GHz is $l = \pm 2,6$ dB for peaks and average measurements ($k = 2$).

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested")
2. Safera Sense is a Smart Cooking Sensor with the following main features:
 - Sensors for monitoring the stove area and detecting cooking processes, as well as estimating indoor air quality.
 - Processor and algorithms for detecting stove overheating, which will result in an audible alarm.

Support for Bluetooth communication to smartphones and iOS / Android application in order to visualize data. Support for proprietary 802.15.4 based radio protocol for controlling some Safera Accessories (for example Power Control Unit for Stove). Support for Wi-Fi for connection to Safera Cloud or other Internet of Things - services.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples under test have been selected by: The client.

Sample **S/01** is composed by the following elements:

Control N°	Description	Model	Serial N°	Date of reception
64670/004	Smart Cooking Sensor	Sense PRO (Model code: IFU10B-PRO)	---	2020-04-17

Auxiliary element used with the sample S/01:

Control N°	Description	Model	Serial N°	Date of reception
64670/007	Accessories bag	---	---	2020-04-17

Test sample description

Ports..... :	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded		
	N/A			<input type="checkbox"/>	<input type="checkbox"/>		
Supplementary information to the ports..... :							
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		DC: For the final product: 3 x AA Alkaline batteries as power supply. Operational voltage from 3.0 V to 5.0 V. <input checked="" type="checkbox"/> For testing purposes, power is wired externally to some sample units. This is done to make it possible to use an external power supply. When using an external power supply, allowed voltages are 3.0 VDC to 5.0 VDC.					
Rated Power	Normal operating mode: approx. 0.1 mA average Max. short term current consumption 150 mA Max. very short peak current consumption approx. 400 mA (ms level)						
Clock frequencies..... :	64 MHz main processor clock (nRF52840) 80-160 MHz auxiliary network processor clock (ESP8285) 32.768 kHz RTC auxiliary clock						
Other parameters	Not provided data						
Software version	1.0.25						
Hardware version	B						
Dimensions in mm (L x W x D)..... :	Not provided data						
Mounting position	<input type="checkbox"/>	Table top equipment					
	<input checked="" type="checkbox"/>	Wall/Ceiling mounted equipment (Receiver)					
	<input type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					
	<input type="checkbox"/>	Other:					
Modules/parts..... :	Module/parts of test item		Type		Manufacturer		
	Sensor Unit				Safera		
Accessories (not part of the test item)	Description		Type		Manufacturer		
	Power supply						
	Batteries						
Documents as provided by the applicant	Description		File name		Issue date		
	User Manual						

Identification of the client

SAFERA OY
Tekniikantie 4 B, FI-02150 Espoo, Finland.

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-07-21
Date (finish)	2020-07-21

Document history

Report number	Date	Description
64670REM.002	2020-11-11	First release
64670REM.002A1	2022-06-10	Second release.Updating equipment settings. This modification test reports cancels and replaces the test report 64670RRF.002s.

List of equipment used during the test

Control Number	Description	Model	Manufacturer	Next Calibration
2942	EMI TEST RECEIVER 20Hz-40GHz	ESU40	ROHDE AND SCHWARZ	2021-09-17
4523	EMI TEST RECEIVER 20Hz-26.5GHz	ESU26	ROHDE AND SCHWARZ	2022-05-27
4612	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2022-06-14
5641	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2021-07-31
6064	SEMIANECHOIC ABSORBER LINED CHAMBER	SAC-3	FRANKONIA	---
6126	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2022-04-17
6132	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2022-04-20
6195	PRE-AMPLIFIER G>55dB 1-18GHz	AMF-7D-01001800-22-10P	NARDA	2022-05-19
6329	SHIELDED ROOM	---	FRANKONIA	---

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The test have been performed by the technical personnel: Daniel Mejías.

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

Emission Test		
Requirement – Test case	Verdict	Remark
Radiated emission. Electromagnetic field measure (30 MHz – 1000 MHz)	P	---
Radiated emission. Electromagnetic field measure (1 GHz – 12.75 GHz)	P	---
Radiated emission. Electromagnetic field measure (12.75 GHz – 40 GHz)	N/A	(1)
Continuous conducted emission (150 KHz – 30 MHz)	N/A	(2)
<u>Supplementary information and remarks:</u>		
(1) Range: $f > 12.75$ GHz. Test required only if the 5 th harmonics of the maximum internal work frequency EUT is higher than 12.75GHz.		
(2) This test is not applicable according to standard. Equipment powered by DC internal battery.		

Appendix A: Test results

Appendix A Content

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DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. The operation modes used by the samples to which the present report refers, are shown in the following table:

OPERATION MODE	DESCRIPTION
OM#01	EUT ON. Bluetooth 5.0 in RX mode. ZigBee 2.4 GHz in RX mode. WLAN 802.11 in RX mode. Power Supply 4.5Vdc: (3xAA Batteries).

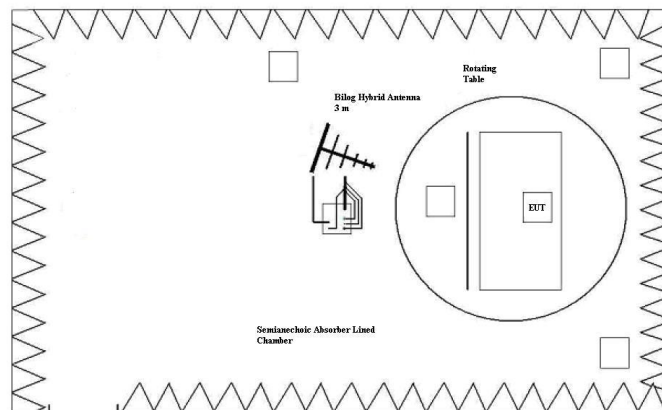
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 6 (Updated 2019-04)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 6 (Updated 2019-04)

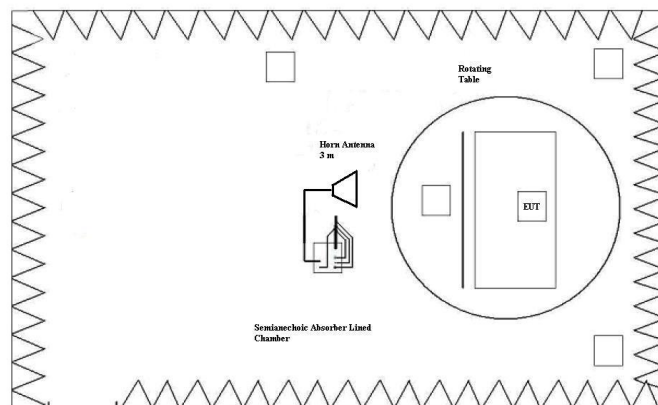
Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 6 (Updated 04-2019)

Frequency of emission (MHz)	Field strength (microvolt/meter)
30-88	100
88-216	150
21-960	200
Above 960	500



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

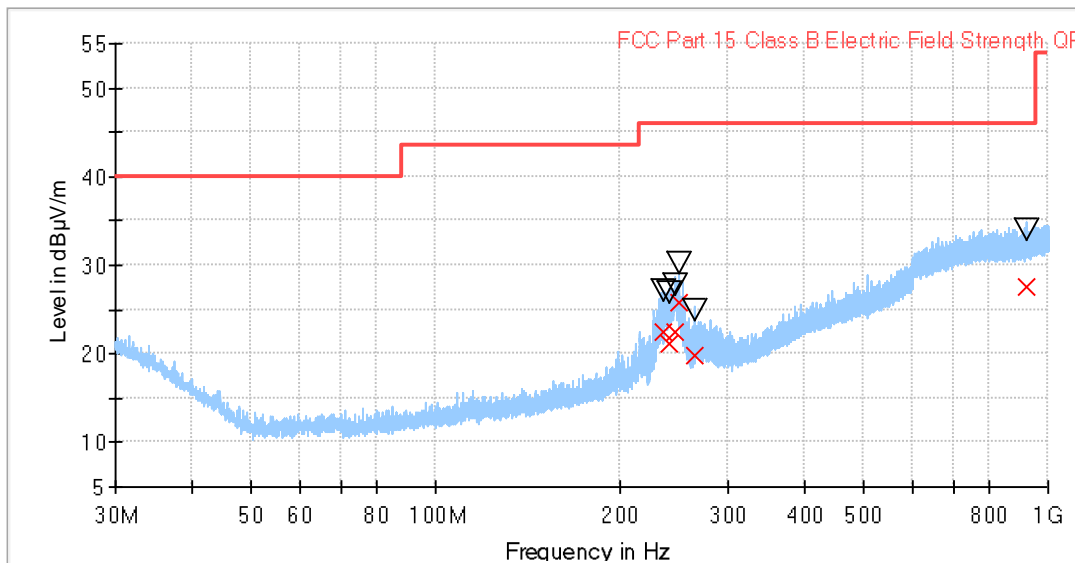
TESTED SAMPLE:	S/01
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization.

CRmmnnRRPP	Description	Result
CR0101LR	Range: 30 MHz - 1000 MHz.	P
CR0101HR_HP	Range: 1 GHz – 12.75 GHz. Horizontal polarization.	P
CR0101HR_VP	Range: 1 GHz – 12.75 GHz. Vertical polarization.	P

Radiated Emission. CR0101LR

Project: 64670REM.002
 Company: Safera Oy
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Bluetooth 5.0 in RX mode. ZigBee 2.4 GHz in RX mode. WLAN 802.11 in RX mode. Power Supply 4.5Vdc: (3xAA Batteries). Vertical and Horizontal polarization.

Full Spectrum



— Preview Scan
x QuasiPeak
— FCC Part 15 Class B Electric Field Strength C
▽ MaxPeak

Maximizations

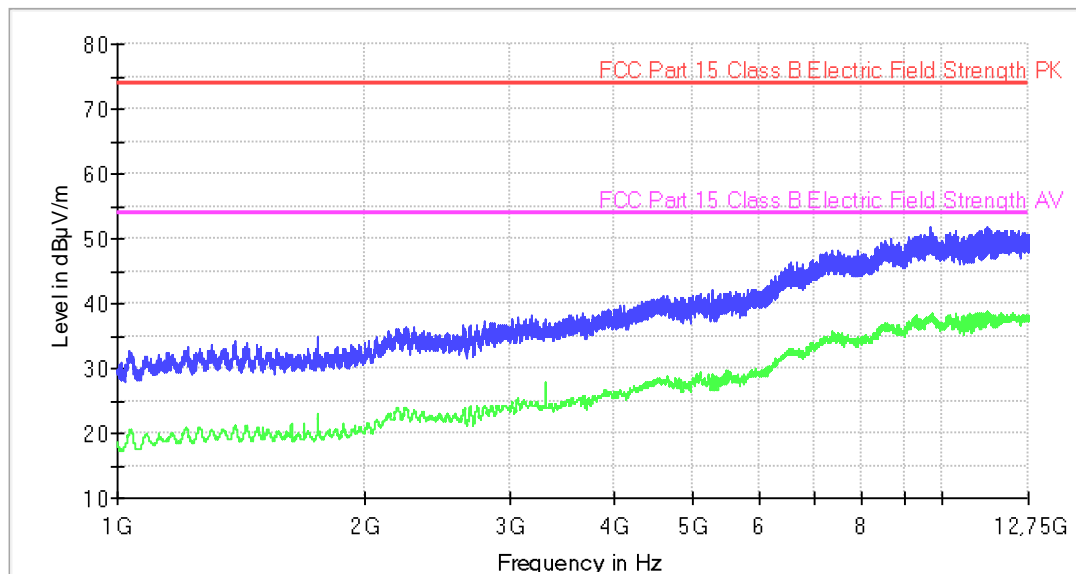
Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Pol	Azimuth (deg)
234.534000	22.56	27.10	H	177.0
240.277000	21.15	26.81	H	-174.0
246.374000	22.58	27.79	H	166.0
249.846000	25.75	30.25	H	0.0
265.010000	19.87	25.00	H	177.0
922.058000	27.60	34.00	V	-19.0

Subrange 30 MHz - 1 GHz **Step Size** 40 kHz **Detectors** PK+ **IF BW** 120 kHz **Meas. Time** 0,01 s

Radiated Emission. CR0101HR_HP

Project: 64670REM.002
 Company: Safera OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Bluetooth 5.0 in RX mode. ZigBee 2.4 GHz in RX mode. WLAN 802.11 in RX mode. Power Supply 4.5Vdc: (3xAA Batteries).Horizontal polarization.

RE FCC Part 15 ClassB 1-12,75 GHz



— Average Scan — Peak Scan
 — FCC Part 15 Class B Electric Field Strength PK — FCC Part 15 Class B Electric Field Strength A

Subrange Maxima

Frequency (MHz)	PK+ CLRWR (dBµV/m)	AVG CLRWR (dBµV/m)	Pol
2132.800000	35.6	22.8	H
3183.200000	38.2	24.6	H
4459.200000	40.7	27.5	H
5262.000000	42.2	29.1	H
6665.200000	46.3	32.6	H
7496.800000	48.2	35.5	H
9148.800000	50.3	36.9	H
9673.200000	51.7	37.7	H
11390.800000	52.0	38.8	H
11773.200000	51.3	37.7	H

Subrange **Step Size** **Detectors** **IF BW** **Meas. Time**
 1 GHz – 12.75 GHz 400 kHz PK+ ; AVG 1 MHz 0,01 s

