Report on the FCC and IC Testing of the KATHREIN SE FlexRET. Model: FlexRET 86010165 In accordance with FCC 47 CFR Part 15C and Industry Canada RSS-210 and Industry Canada RSS-GEN

Product Service

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Prepared for: KATHREIN SE
Anton-Kathrein Straße 1-3
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Germany

FCC ID: SP3–86010165
IC: 5530A-86010165

COMMERCIAL-IN-CONFIDENCE

Date: 2019-05-15
Document Number: TR-73710-47575-01 | Issue: 03

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Alex Fink	2019-05-15	
Authorised Signatory	Matthias Stumpe	2019-05-15	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT
The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C and Industry Canada RSS-210 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Alex Fink	2019-05-15	

Laboratory Accreditation	Laboratory recognition	Industry Canada test site registration
DAkkS Reg. No. D-PL-11321-11-02	Registration No. BNetzA-CAB-16/21-15	3050A-2

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN:2016, Issue 09 (08-2016) and Issue 04 (11-2014).

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Product Service

Contents

Product Service

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	2019-02-07
2	Manufacturer name changed from KATHREIN-Werke KG to KATHREIN SE	2019-02-21
3	FCC Part 15B removed to a separate test report	2019-05-15

Table 1

1.2 Introduction

Applicant	KATHREIN SE
Manufacturer	KATHREIN SE
Model Number(s)	FlexRET 86010165
Serial Number(s)	E4L2863493
Hardware Version(s)	---
Software Version(s)	---
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN:2016, Issue 09 (08-2016) and Issue 04 (11-2014)
Test Plan/Issue/Date	---
Order Number Date	7500005394 2017-11-07
Date of Receipt of EUT	2019-01-04
Start of Test	2019-01-08
Finish of Test	2019-02-01
Name of Engineer(s)	Alex Fink, Martin Steindl
Related Document(s)	ANSI C63.10 (2013)

Product Service

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C and Industry Canada RSS-210 and Industry Canada RSS-GEN is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: Standby Mode - RFID Active				
2.1	15.207, N/A and 8.8	AC Power Line Conducted Emissions	Pass	ANSI C63.10 (2013)
2.2	15.215 (c), N/A and 6.6	20 dB Bandwidth	Pass	ANSI C63.10 (2013)
2.3	15.225 (a)(b)(c)(d), B.1 to B.9, 6.4 and 6.5.	Field Strength of any Emission	Pass	ANSI C63.10 (2013)
2.4	15.225 (e), B.1 to B.9 and 6.11.	Frequency Tolerance Under Temperature Variations	Pass	ANSI C63.10 (2013)
2.5	1.1307	Exposure of Humans to RF Fields	Pass	ANSI C63.4: 2014

Table 2

Product Service

1.4 Application Form

1.5 Product Information

1.5.1 Technical Description

Positioning tool for antennas

1.6 Deviations from the Standard

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.
The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.8 Test Location

TÜV SÜD Product Service conducted the following tests at our Straubing Test Laboratory.

Test Name	Name of Engineer(s)
Configuration and Mode: Standby Mode - RFID Active	
AC Power Line Conducted Emissions	Alex Fink
20 dB Bandwidth	Alex Fink
Field Strength of any Emission	Alex Fink
Frequency Tolerance Under Temperature Variations	Martin Steindl

Table 4

Office Address:

Äußere Frühlingstraße 45
94315 Straubing
Germany

Product Service

2 Test Details

2.1 AC Power Line Conducted Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN, Clause 15.207, N/A and 8.8

2.1.2 Equipment Under Test and Modification State

FlexRET 86010165, S/N: E4L2863493 - Modification State 0

2.1.3 Date of Test

2019-01-24

2.1.4 Environmental Conditions

Ambient Temperature	22.0 °C
Relative Humidity	24.0 %

Product Service

2.1.5 Test Results

Standby Mode - RFID Active

Applied supply Voltage: 60 Hz
Applied supply frequency: 120 Vac

Frequency *MHz*	*QuasiPeak* *dBµV*	*CAverage* *dBµV*	*Limit* *dBµV*	*Margin* *dB*	*Meas. Time* *ms*	*Bandwidth* *kHz*	*Line*	*PE*	*Corr.* *dB*
1.57400	---	43.17	46.00	2.83	1000.0	9.000	N	GND	0.1
1.64000	---	42.25	46.00	3.75	1000.0	9.000	N	GND	0.1
2.29000	---	41.91	46.00	4.09	1000.0	9.000	N	GND	0.1
2.71800	---	42.77	46.00	3.23	1000.0	9.000	N	GND	0.1
2.86200	---	42.59	46.00	3.41	1000.0	9.000	N	GND	0.1
4.79400	---	40.03	46.00	5.97	1000.0	9.000	L1	GND	0.2

Table 5 - Emissions Results

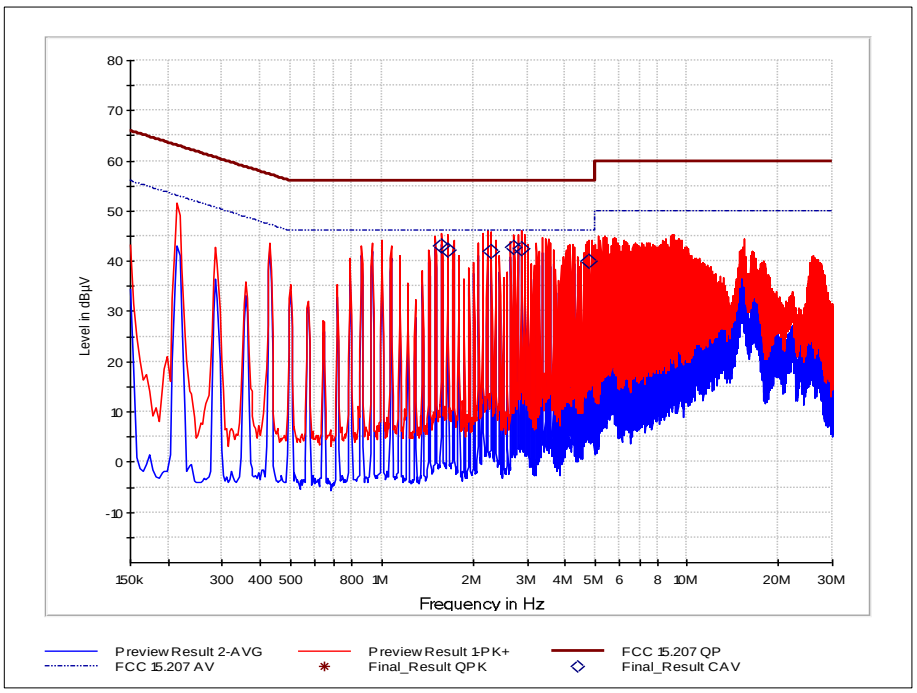

Figure 1 – Emissions Results - 150 kHz to 30 MHz

FCC 47 CFR Part 15, Limit Clause 15.207 and Industry Canada RSS-GEN, Limit Clause 8.8

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

Table 6

*Decreases with the logarithm of the frequency.

2.1.6 Test Location and Test Equipment Used

This test was carried out in Shielded room - cabin no. 4.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMC32-MEB	Rohde & Schwarz	100281	20090	---	---
EMI test receiver	Rohde & Schwarz	100008	19730	18	2019-04-30
V-network	Rohde & Schwarz	894785/005	18919	36	2019-10-31

Table 7

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.2 20 dB Bandwidth

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN, Clause 15.215 (c), N/A and 6.6

2.2.2 Equipment Under Test and Modification State

FlexRET 86010165, S/N: E4L2863493 - Modification State 0

2.2.3 Date of Test

2019-01-28

2.2.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.9.1.

2.2.5 Environmental Conditions

Ambient Temperature	24.0 °C
Relative Humidity	26.0 %

2.2.6 Test Results

Standby Mode - RFID Active

Frequency (MHz)	20 dB Bandwidth (Hz)	99% Occupied Bandwidth (Hz)	F_{LOWER} (MHz)	F_{UPPER} (MHz)
13.56	308	244	13.559832	13.560140

Table 8

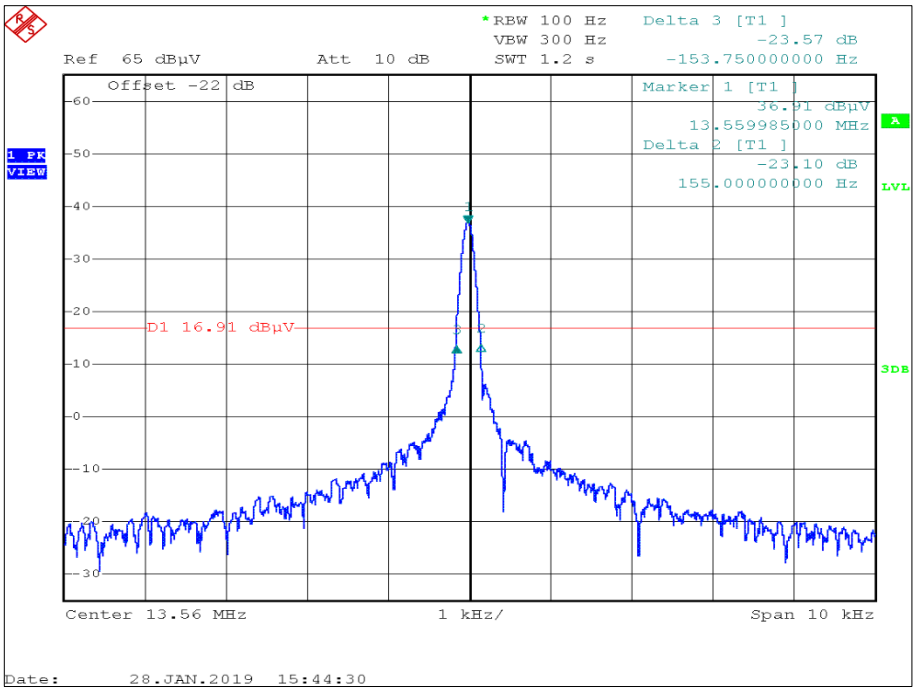

Figure 2 - 20 dB Bandwidth

Product Service

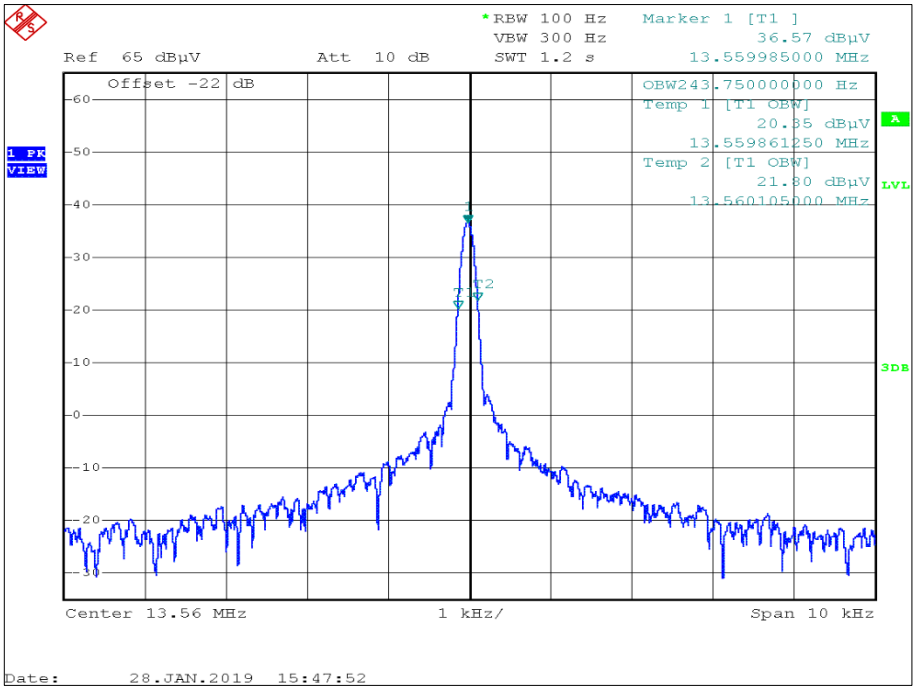

Figure 3 - 99% Occupied Bandwidth

FCC 47 CFR Part 15, Limit Clause 15.215 (c)

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.

Industry Canada RSS 210 and Industry Canada RSS GEN, Limit Clause

None specified.

2.2.7 Test Location and Test Equipment Used

This test was carried out in Non shielded room.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI test receiver	Rohde & Schwarz	100008	19730	18	2019-04-30

Table 9

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.3 Field Strength of any Emission

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN, Clause 15.225 (a)(b)(c)(d), B.1 to B.9, 6.4 and 6.5.

2.3.2 Equipment Under Test and Modification State

FlexRET 86010165, S/N: E4L2863493 - Modification State 0

2.3.3 Date of Test

2019-01-22

2.3.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.3, 6.4 and 6.5.

Measurements were made at a distance of 3 m. The limit lines shown on the plot were extrapolated from either 300 m or 30 m to the measurement distance of 3 m in accordance with ANSI C63.10 Clause 6.4.4.2.

2.3.5 Environmental Conditions

Ambient Temperature	24.0 °C
Relative Humidity	26.0 %

Product Service

2.3.6 Test Results

Standby Mode - RFID Active, Carrier Results

Frequency MHz	Quasi-Peak Level (dBµV/m) at 3 m	Quasi-Peak Level (dBµV/m) at 30 m	Quasi-Peak Level (µV/m) at 3 m	Quasi-Peak Level (µV/m) at 30 m
13.562	33.61	-6.4	47.9	0.479

Table 10 - Emissions Results - 9 kHz to 30 MHz

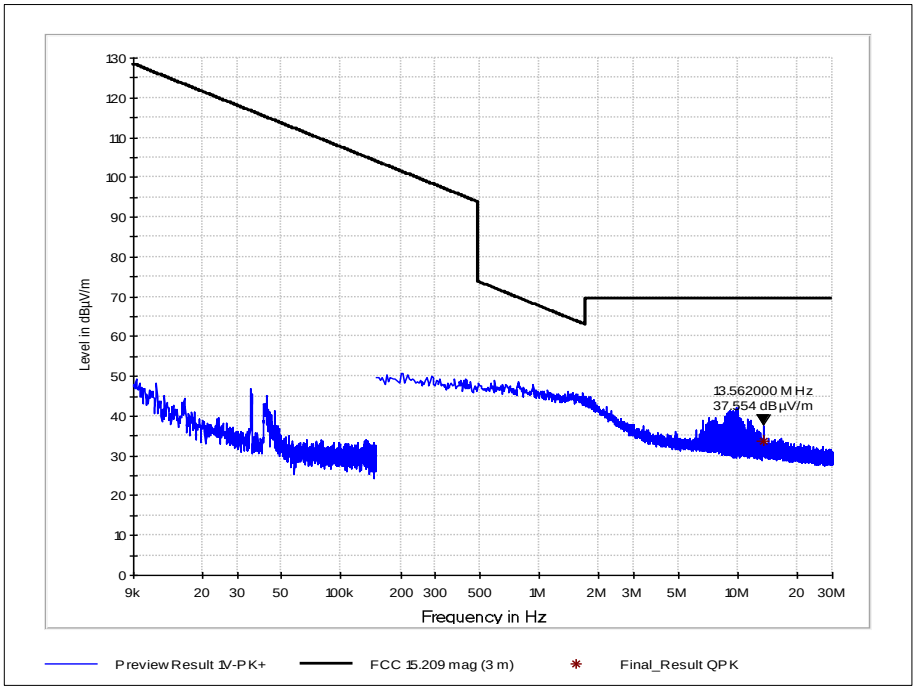

Figure 4 - *9 kHz to 30 MHz*

Frequency MHz	MaxPeak dBµV/m	Limit dBµV/m	Margin dB	Meas. Time ms	Bandwidth kHz	Pol	Azimuth deg	Corr. dB/m
319.254000	38.94	46.00	7.06	2.5	100.000	V	297.0	-18

Table 11 - Emissions Results – 30 MHz to 1 GHz

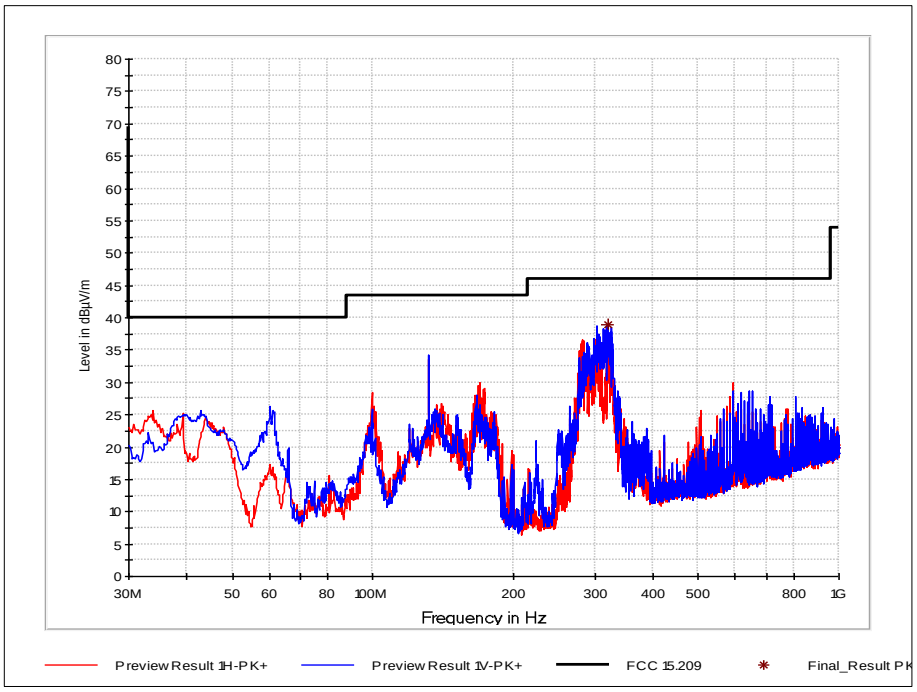

Figure 5 - *30 MHz to 1 GHz*

Product Service

FCC 47 CFR Part 15, Limit Clause 15.225 (a)(b)(c)(d)

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 m.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 m.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 m.

(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
0.009 to 0.490	2400/F (kHz)	300
0.490 to 1.705	24000/F (kHz)	30
1705 to 30	30	30
30 to 88	100**	3
88 to 216	150**	3
216 to 960	200**	3
Above 960	500	5

Table 12 - FCC Radiated Emission Limit

Industry Canada RSS-210, Limit Clause B.6

The field strength of any emission shall not exceed the following limits:

(a) 15.848 mW/m (84 dBµV/m) at 30 m, within the band 13.553 – 13.567 MHz.

(b) 334 µV/m (50.5 dBµV/m) at 30 m, withing the bands 13.410 – 13.553 MHz and 13.567 – 13.710 MHz.

(c) 106 µV/m (40.5 dBµV/m) at 30 m, within the bands 13.110 – 13.410 MHz and 13.710 – 14.010 MHz.

(d) RSS-GEN general field strength limits for frequencies outside the band 13.110 – 14.010 MHz.

Industry Canada RSS-GEN, Limit Clause

Frequency	Electric Field Strength (µV/m)	Magnetic Field Strength (H-Field) (µA/m)	Measurement Distance (m)
9 - 490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	300
490 - 1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1,705 kHz - 30 MHz	30	N/A	30

Table 13 - Industry Canada Radiated Emission Limit - Less than 30 MHz

Frequency (MHz)	Field Strength (µV/m at 3 m)
30 - 88	100
88 - 216	150
216 - 960	200
> 960	500

Table 14 - Industry Canada Radiated Emission Limit - 30 MHz to 1 GHz

2.3.7 Test Location and Test Equipment Used

This test was carried out in Semi anechoic room - cabin no. 8.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMC32-ME+	Rohde & Schwarz	100016	19719	---	---
TRILOG Antenna	Schwarzbeck	VULB 9163	19691	24	2020-12-31
EMI test receiver	Rohde & Schwarz	ESW26	28268	12	2019-05-31
Loop antenna	Rohde & Schwarz	HFH2-Z2	18876	36	2019-07-31

Table 15

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.4 Frequency Tolerance Under Temperature Variations

2.4.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN, Clause 15.225 (e), B.1 to B.9 and 6.11.

2.4.2 Equipment Under Test and Modification State

FlexRET 86010165, S/N: E4L2863493 - Modification State 0

2.4.3 Date of Test

2019-01-08

2.4.4 Environmental Conditions

Ambient Temperature	23.0 °C
Relative Humidity	30.0 %

2.4.5 Test Results

Standby Mode - RFID Active

Temperature	Voltage	Measured Frequency (MHz)	Frequency Deviation (%)	Frequency Error (ppm)
-20.0 °C	120 V AC	13.560032	0.0003687	3.687
-10.0 °C	120 V AC	13.560044	0.0004572	4.572
0.0 °C	120 V AC	13.560034	0.0003835	3.835
+10.0 °C	120 V AC	13.560011	0.0002139	2.139
+20.0 °C	120 V AC	13.559982	±0.00	±0.00
+30.0 °C	120 V AC	13.559954	-0.0002065	-2.065
+40.0 °C	120 V AC	13.559935	-0.0003466	-3.466
+50.0 °C	120 V AC	13.559933	-0.0003614	-3.614

Table 16 - Frequency Tolerance Under Temperature Variation

Temperature	Voltage	Measured Frequency (MHz)	Frequency Deviation (%)	Frequency Error (ppm)
+20.0 °C	138 V AC	13.559983	0.0000074	0.074
+20.0 °C	120 V AC	13.559982	±0.00	±0.00
+20.0 °C	102 V AC	13.559982	±0.00	±0.00

Table 17 - Frequency Tolerance Under Voltage Variation

Product Service

FCC 47 CFR Part 15, Limit Clause 15.225 (e)

The frequency tolerance of the carrier signal shall be maintained within ± 0.01 % of the operating frequency.

Industry Canada RSS-210, Limit Clause B.6

Carrier frequency stability shall be maintained to ±0.01% (±100 ppm)

2.4.6 Test Location and Test Equipment Used

This test was carried out in Non shielded room.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI test receiver	Rohde & Schwarz	100008	19730	18	2019-04-30
Climatic test chamber	ESPEC	PL-2J	18843	36	2020-03-31

Table 18

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

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2.5 Exposure of Humans to RF Fields

2.5.1 Specification Reference

IC RSS-Gen Issue 4, section 3.2

2.5.2 Guide

IC RSS-102 Issue 5, section 2.5

2.5.3 Equipment Under Test and Modification State

FlexRET 86010165, S/N: E4L2863493 - Modification State 0

2.5.4 Date of Test

2019-01-22

2.5.5 Test Results

Detailed results are shown below.

Exposure of Humans to RF Fields	Applicable	Declared by applicant	Measured	Exemption
The antenna is				
☐ detachable				
The conducted output power (CP in watts) is measured at the antenna connector: CP = **..... W**			☐	
The effective isotropic radiated power (EIRP in watts) is calculated using				
☐ the numerical antenna gain: G = **.....** $EIRP = G \cdot CP \Rightarrow EIRP$ = **..... W**		☐		
☐ the field strength[1] in V/m: FS = **..... V/m**			☐	
$EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ = **..... W**				
with: Distance between the antennas in m: D = **..... m**			☐	
☒ not detachable				
A field strength measurement is used to determine the effective isotropic radiated power (EIRP in watts) given by:				

[1] The conversion formula is valid only for properly matched antennas. In other cases the transmitter output power may have to be measured by a terminated measurement when applying the exemption clauses.
If an open area test site is used for field strength measurement, the effect due to the metal ground reflecting plane should be subtracted from the maximum field strength value in order to reference it to free space, before calculating TP.

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$EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ = **143.7 µW** with: Field strength in V/m: FS **= 47.9 µV/m** Distance between the two antennas in m: D = **3 m**			☒ ☒	
Selection of output power				
The output power TP is the higher of the conducted or effective isotropic radiated power (e.i.r.p.): TP = **143.7 µW**				

Exposure of Humans to RF Fields (continued)	Applicable	Declared by applicant	Measured	Exemption
Separation distance between the user and the transmitting device is				
☒ less than or equal to 20 cm ☐ greater than 20 cm		☐		
Transmitting device is				
☐ in the vicinity of the human head ☐ body-worn		☐		

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SAR evaluation														
SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in the table. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in the table are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in the table are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in the table, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required. For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.														
Frequency (MHz)	Exemption limits (mW)[2] at separation distance of													
	≤5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	≥50 mm				
≤300 [3]	71	101	132	162	193	223	254	284	315	345				
450	52	70	88	106	123	141	159	177	195	213				
835	17	30	42	55	67	80	92	105	117	130				
1900	7	10	18	34	60	99	153	225	316	431				
2450	4	7	15	30	52	83	123	173	235	309				
3500	2	6	16	32	55	86	124	170	225	290				
5800	1	6	15	27	41	56	71	85	97	106				

[2] The exemption limit in the table are based on measurements and simulations on half-wave dipole antennas at separaton distances of 5 mm to 25 mm from a flat phantom, providing a SAR value of approximately 0.4 W/kg for 1 g of tissue. For low frequencies (300 MHz to 835 MHz), the exemption limits are derived from alinear fit. For high frequencies (1900 MHz and above), the exemption limits are derived from athird order polynomial fit.

[3] Transmitters operating between 3 kHz and 10 MHz, meeting the exemption from routine SAR evaluation, shall demonstrate compliance to the instantaneous limits in IC RSS-102, issue 5, section 4.

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Carrier frequency:	*f*	=	**13.56 MHz**			
Distance:	*d*	=	**5 mm**			
Transmitter output power:	*TP*	=	**143.7 µW**			
Limit:	TP_{limit}	=	**71 mW**			☒
☐ SAR evaluation is documented in test report no. …						

2.5.6 Test Location and Test Equipment Used

This test was carried out in Semi anechoic room - cabin no. 8.

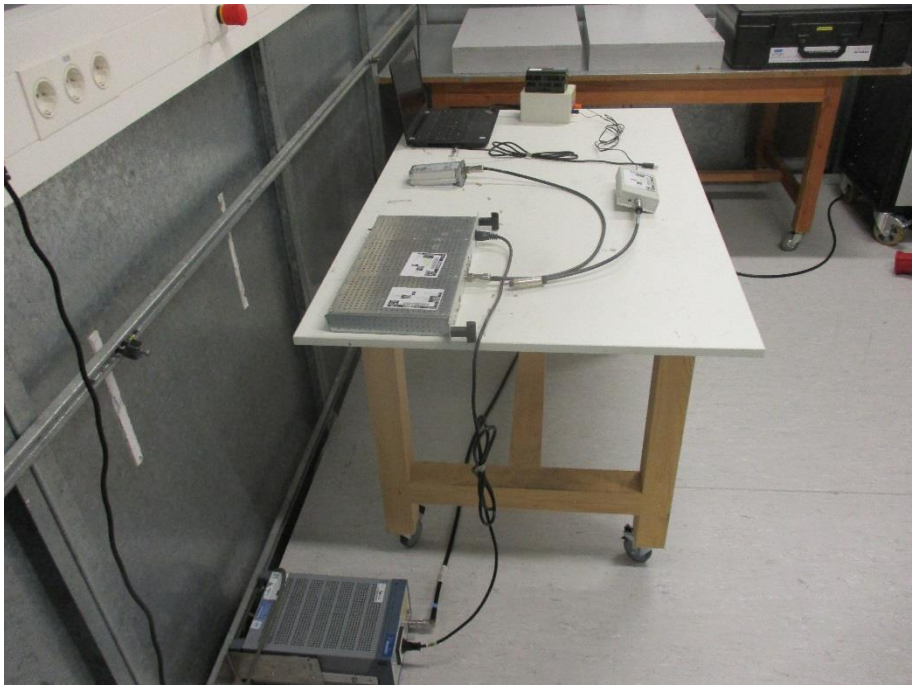
Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMC32-ME+	Rohde & Schwarz	100016	19719	---	---
TRILOG Antenna	Schwarzbeck	VULB 9163	19691	24	2020-12-31
EMI test receiver	Rohde & Schwarz	ESW26	28268	12	2019-05-31
Loop antenna	Rohde & Schwarz	HFH2-Z2	18876	36	2019-07-31

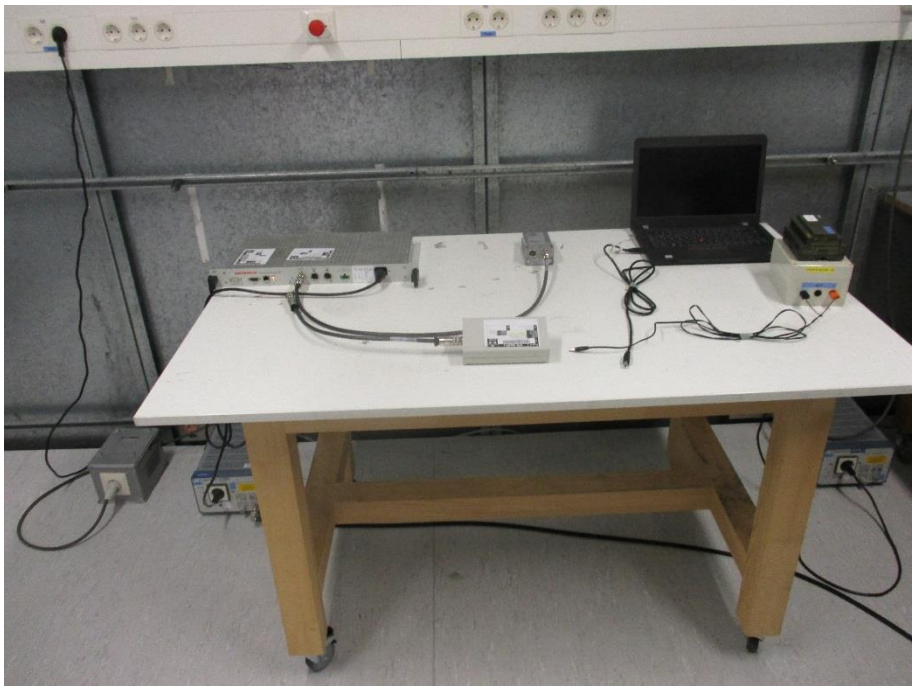
Table 19

Product Service

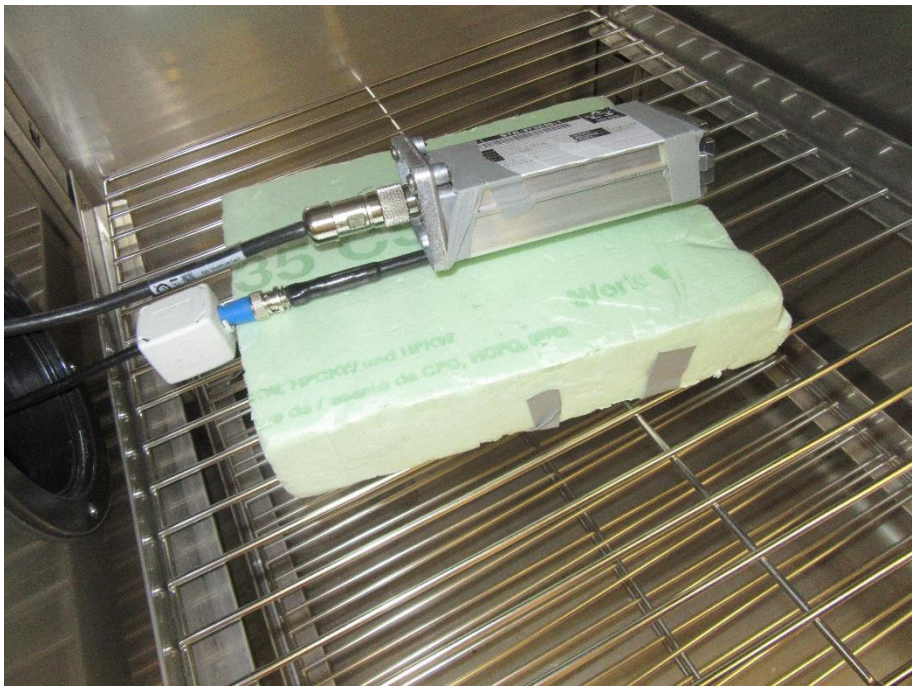
3 Photographs

3.1 Equipment Under Test (EUT)

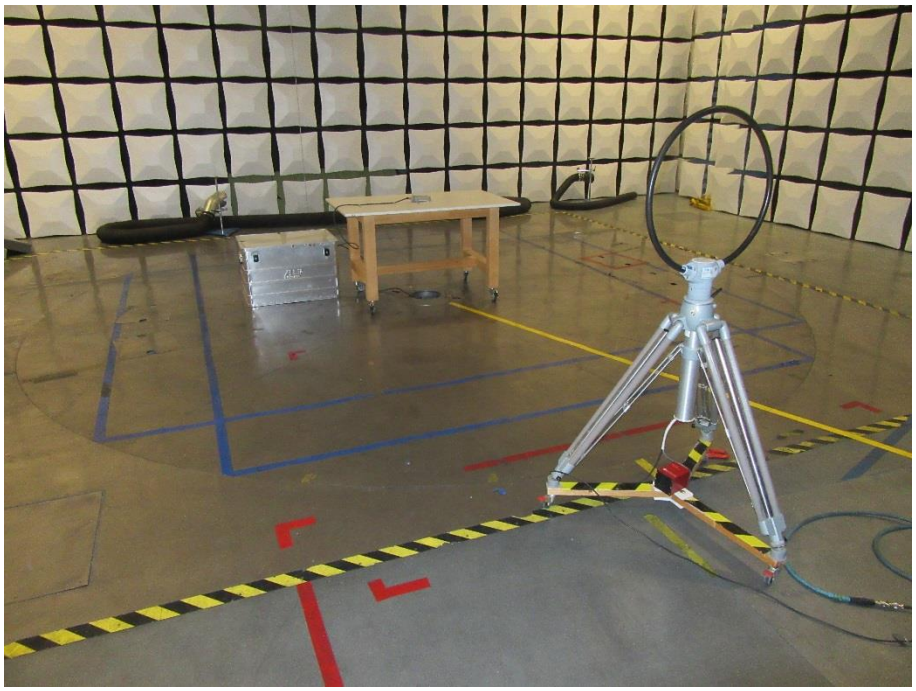




Product Service



Product Service



Product Service

4 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Radio Testing			
Test Name	kp	Expanded Uncertainty	Note
Occupied Bandwidth	2.0	±1.14 %	2
RF-Frequency error	1.96	±1 · 10-7	7
RF-Power, conducted carrier	2	±0.079 dB	2
RF-Power uncertainty for given BER	1.96	+0.94 dB / -1.05	7
RF power, conducted, spurious emissions	1.96	+1.4 dB / -1.6 dB	7
RF power, radiated			
25 MHz – 4 GHz	1.96	+3.6 dB / -5.2 dB	8
1 GHz – 18 GHz	1.96	+3.8 dB / -5.6 dB	8
18 GHz – 26.5 GHz	1.96	+3.4 dB / -4.5 dB	8
40 GHz – 170 GHz	1.96	+4.2 dB / -7.1 dB	8
Spectral Power Density, conducted	2.0	±0.53 dB	2
Maximum frequency deviation			
300 Hz – 6 kHz	2	±2,89 %	2
6 kHz – 25 kHz	2	±0.2 dB	2
Maximum frequency deviation for FM	2	±2,89 %	2
Adjacent channel power 25 MHz – 1 GHz	2	±2.31 %	2
Temperature	2	±0.39 K	4
(Relative) Humidity	2	±2.28 %	2
DC- and low frequency AC voltage			
DC voltage	2	±0.01 %	2
AC voltage up to 1 kHz	2	±1.2 %	2
Time	2	±0.6 %	2

Table 20

Product Service

Radio Interference Emission Testing			
Test Name	kp	Expanded Uncertainty	Note
Conducted Voltage Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
100 kHz to 200 MHz (50Ω/5µH AMN)	2	± 3.6 dB	1
Discontinuous Conducted Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
Conducted Current Emission			
9 kHz to 200 MHz	2	± 3.5 dB	1
Magnetic Fieldstrength			
9 kHz to 30 MHz (with loop antenna)	2	± 3.9 dB	1
9 kHz to 30 MHz (large-loop antenna 2 m)	2	± 3.5 dB	1
Radiated Emission			
Test distance 1 m (ALSE)			
9 kHz to 150 kHz	2	± 4.6 dB	1
150 kHz to 30 MHz	2	± 4.1 dB	1
30 MHz to 200 MHz	2	± 5.2 dB	1
200 MHz to 2 GHz	2	± 4.4 dB	1
2 GHz to 3 GHz	2	± 4.6 dB	1
Test distance 3 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 5.0 dB	1
1 GHz to 6 GHz	2	± 4.6 dB	1
Test distance 10 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 4.9 dB	1
Radio Interference Power			
30 MHz to 300 MHz	2	± 3.5 dB	1
Harmonic Current Emissions			4
Voltage Changes, Voltage Fluctuations and Flicker			4

Table 21

Product Service

Immunity Testing			
Test Name	kp	Expanded Uncertainty	Note
Electrostatic Discharges			4
Radiated RF-Field			
Pre-calibrated field level	2	+32.2 / -24.3 %	5
Dynamic feedback field level	2.05	+21.2 / -17.5 %	3
Electrical Fast Transients (EFT) / Bursts			4
Surges			4
Conducted Disturbances, induced by RF-Fields			
via CDN	2	+15.1 / -13.1 %	6
via EM clamp	2	+42.6 / -29.9 %	6
via current clamp	2	+43.9 / -30.5 %	6
Power Frequency Magnetic Field	2	+20.7 / -17.1 %	2
Pulse Magnetic Field			4
Voltage Dips, Short Interruptions and Voltage Variations			4
Oscillatory Waves			4
Conducted Low Frequency Disturbances			
Voltage setting	2	± 0.9 %	2
Frequency setting	2	± 0.1 %	2
Electrical Transient Transmission in Road Vehicles			4

Table 22

Note 1:
The expanded uncertainty reported according to CISPR 16-4-2:2003-11 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 2:
The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 3:
The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2.05, providing a level of confidence of p = 95.45%
Note 4:
It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95%confidence.
Note 5:
The expanded uncertainty reported according to IEC 61000-4-3 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 6:
The expanded uncertainty reported according to IEC 61000-4-6 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 7:
The expanded uncertainty reported according ETSI TR 100 028 V1.4.1 (all parts) to is based on a standard uncertainty multiplied by a coverage factor of kp = 1.96, providing a level of confidence of p = 95.45%
Note 8:
The expanded uncertainty reported according to ETSI TR 102 273 V1.2.1 (all parts) is based on a standard uncertainty multiplied by a coverage factor of kp = 1.96, providing a level of confidence of p = 95.45%