

FCC TEST REPORT

FCC 47 CFR Part 15C Industry Canada RSS-210

Intentional radiator operating within the bands 902 – 928 MHz, 2400 – 2483.5 MHz and 5725 – 5875 MHz

Report Reference No. G0M-1805-7424-TFC249-V01

Testing Laboratory: Eurofins Product Service GmbH

Address: Storkower Str. 38c

15526 Reichenwalde

Germany

Accreditation:



A2LA Accredited Testing Laboratory, Certificate No.: 1983.01

FCC Filed Test Laboratory, Reg.-No.: 96970 IC OATS Filing assigned code: 3470A-2

Applicant's name: Liftup A/S

Address: Hagensvej 21

DK-9530 Støvring

DENMARK

Test specification:

Standard.....: 47 CFR Part 15C

RSS-210, Issue 9, 2016-08 RSS-Gen, Issue 4, 2014-11

ANSI C63.10, 2013

Test scope....: complete Radio compliance test

Equipment under test (EUT):

Product description Radio module for Liftup A/S products

Model No. MODULE1

Additional Model(s)

Brand Name(s)

Liftup

Hardware version

C

Firmware / Software version 0.14

FCC-ID: 2AK8H-MODULE1 IC: 22516-MODULE1

Test result Passed



Possible test case verdicts:

- required by standard but not appl. to test object: N/A

- required by standard but not tested: N/T

- not required by standard for the test object: N/R

- test object does meet the requirement P (Pass)

- test object does not meet the requirement F (Fail)

Testing:

Test Lab Temperature: 20 – 23 °C

Test Lab Humidity.....: 32 – 38 %

Date of receipt of test item...... 2018-07-02

Compiled by Sebastian Suckow

Tested by (+ signature) Sebastian Suckow

(Responsible for Test)

Approved by (+ signature)......

(Deputy Head of Lab)

Toralf Jahn

Date of issue 2018-08-17

Total number of pages 82

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

Additional comments:



Version History

Version	Issue Date	Remarks	Revised by
01	2018-08-17	Initial Release	



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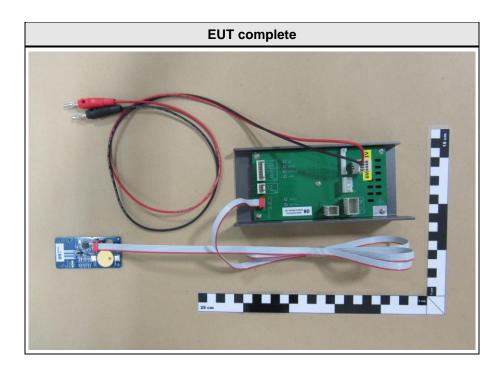


1 Equipment (Test item) Description:

Description	Radio module	for Li	ftup A/S products		
Model	MODULE1				
Additional Model(s)	None	None			
Brand Name(s)	Liftup				
Serial number	None				
Hardware version	С				
Software / Firmware version	0.14				
PMN	MODULE1				
HVIN	MODULE1				
FVIN	N/A				
HMN	N/A				
FCC-ID	2AK8H-MODULI	E1			
IC	22516-MODULE1				
Equipment type	End product				
Radio type	Transceiver				
Radio technology	custom				
Operating frequency range	2410 - 2460 MHz				
Assigned frequency band	2400 - 2483.5 MHz				
	F _{LOW}		2410 MHz		
Frequency range	F _{MID}		2435 MHz		
	F _{HIGH}		2460 MHz		
Spreading	None				
Modulations	GFSK				
Number of channels	3				
Channel spacing	25 MHz				
Number of antennas	1	1			
	Туре		grated		
Antenna	Model	PCE	3		
, and an a	Manufacturer		ıp A/S		
	Gain	0.72	2 dBi		
	Liftup A/S				
Manufacturer	Hagensvej 21				
	DK- 9530 Støvring				
	DENMARK		5.0.700		
Dawer aumah	V _{NOM}		5.6 VDC		
Power supply	V _{MIN}		N/A		
	V _{MIN}		N/A		

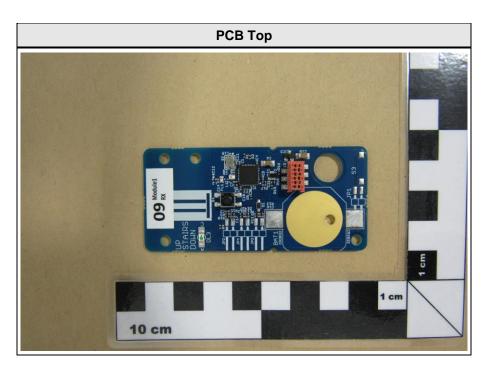


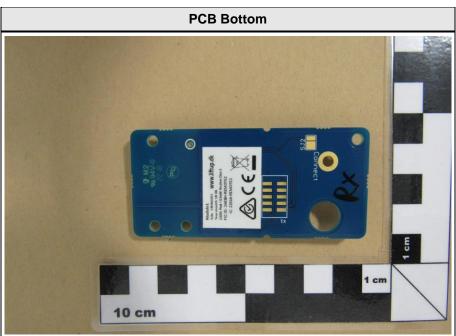
1.1 Photos – Equipment External





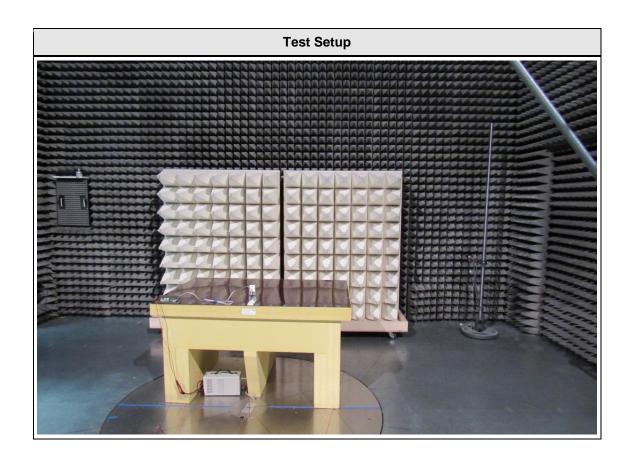
1.2 Photos – Equipment internal







1.3 Photos – Test setup





1.4 Supporting Equipment Used During Testing

Product Type* Device Manufacturer		Model No.	Comments				
None							
*Note: Use	*Note: Use the following abbreviations:						
AE :	AE : Auxiliary/Associated Equipment, or						
SIM : Simulator (Not Subjected to Test)							
CABL:	Connecting cables						



1.5 Test Modes

Mode #	Description		
	General conditions:	Specially prepared test mode with 100% duty cycle.	
Transmit	Radio conditions:	Mode = standalone transmit Modulation = GFSK Power level = Maximum	
	General conditions:	EUT powered by fully charged battery	
Receive	Radio conditions:	Mode = standalone receive Modulation = GFSK	



1.6 Test Equipment Used During Testing

Measurement Software				
Description	Manufacturer	Name	Version	
EMC Test Software	Dare Instruments	Radimation	2015.2.4	

Occupied Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyzer	R&S	FSU 26	EF01003	2017-07	2018-07

		Duty Cy	rcle		
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyzer	R&S	FSU 26	EF01003	2017-07	2018-07

Field strength emissions						
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due	
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-	
MXE EMI Receiver	Keysight Technologies	N9038A- 526/WXP	EF01070	2017-08	2018-08	
Biconical Antenna	R&S	HK 116	EF00203	2018-06	2020-06	
LPD Antenna	R&S	HL 223	EF00187	2016-05	2019-05	
Horn antenna	Schwarzbeck	BBHA 9120D	EF00019	2016-09	2018-09	



1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBµV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

Reading on Analyzer (dB μ V) + A.F. (dB) = Net field strength (dB μ V/m)

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of $dB\mu V/m$). The FCC limits are given in units of $\mu V/m$. The following formula is used to convert the units of $\mu V/m$ to $dB\mu V/m$:

Limit (dB μ V/m) = 20*log (μ V/m)

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF = Net Reading : Net reading - FCC limit = Margin 21.5 dB μ V + 26 dB = 47.5 dB μ V/m : 47.5 dB μ V/m - 57.0 dB μ V/m = -9.5 dB



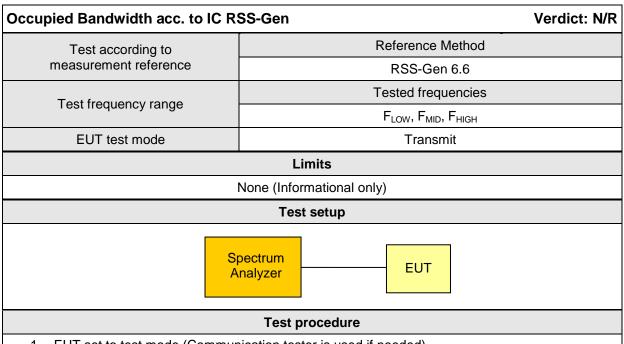
2 Result Summary

S-Gen 6.6 N	N/R Info	Remarks ormational only
		ormational only
SI C63.10 N	J/D Info	
	N/K IIIIC	ormational only
SI C63.10 PA	ASS	
ISI C63.10 PA	ASS	
ISI C63.10 PA	ASS	
SI C63.10 PA	ASS	



3 Test Conditions and Results

3.1 Test Conditions and Results - Occupied Bandwidth



- 1. EUT set to test mode (Communication tester is used if needed)
- 2. Span set to at least twice the emission spectrum
- 3. Resolution bandwidth set to 1 % of span
- 4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function

Test results				
Channel	Frequency [MHz]	Occupied Bandwidth [kHz]		
F _{LOW}	2410	510		
F _{MID}	2435	504		
F _{HIGH}	2460	509		
Comments:				



Occupied Bandwidth - FLOW

Occupied Bandwidth acc. to ISED RSS-Gen 6.6

Project Number: G0M-1805-7423

Applicant: Liftup A/S

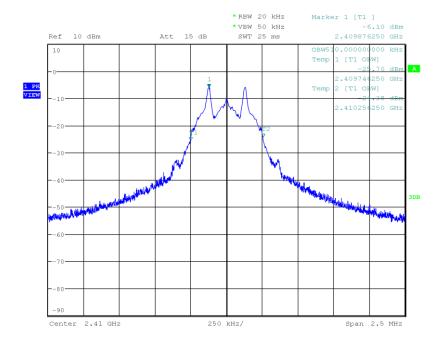
Model Description: Radio module for Liftup A/S products

Model: MODULE1
Test Sample ID: 19142
Operator: S. Suckow

Test Site: Eurofins Product Service GmbH

Test Date: 2018-07-09
Operating Conditions: Tnom/Vnom

Mode: TX 2410 MHz GFSK



Date: 9.JUL.2018 09:52:13



Occupied Bandwidth - F_{MID}

Occupied Bandwidth acc. to ISED RSS-Gen 6.6

Project Number: G0M-1805-7423

Applicant: Liftup A/S

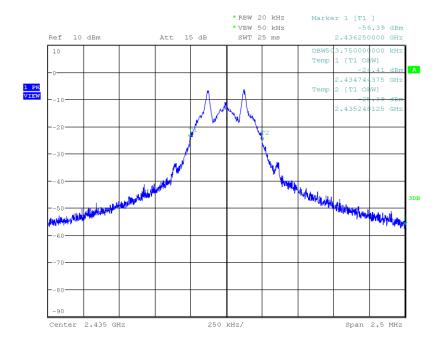
Model Description: Radio module for Liftup A/S products

Model: MODULE1
Test Sample ID: 19142
Operator: S. Suckow

Test Site: Eurofins Product Service GmbH

Test Date: 2018-07-09
Operating Conditions: Tnom/Vnom

Mode: TX 2435 MHz GFSK



Date: 9.JUL.2018 09:55:30



Occupied Bandwidth - FHIGH

Occupied Bandwidth acc. to ISED RSS-Gen 6.6

Project Number: G0M-1805-7423

Applicant: Liftup A/S

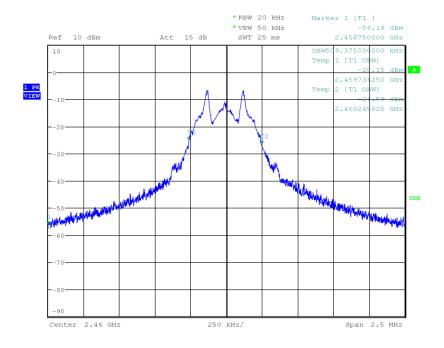
Model Description: Radio module for Liftup A/S products

Model: MODULE1
Test Sample ID: 19142
Operator: S. Suckow

Test Site: Eurofins Product Service GmbH

Test Date: 2018-07-09
Operating Conditions: Tnom/Vnom

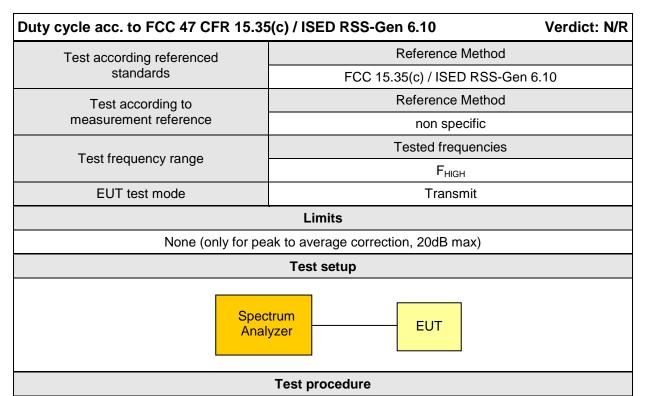
Mode: TX 2460 MHz GFSK



Date: 9.JUL.2018 09:54:12



3.2 Test Conditions and Results - Duty Cycle



- 1. EUT set to test mode
- 2. Center frequency is set to test frequency
- 3. Span it set to zero span
- 4. Resolution bandwidth is set large enough to accurately capture transmission bursts
- 5. Total transmission time is measured

	Test results					
Channel	Frequency [MHz]	Duty Cycle [% @ 100ms]	Duty Cycle correction [dB]			
F _{HIGH}	2460	1	40 -> 20			

Comments: Duty cycle correction is used if pulsed operation is employed and field strength limits are expressed in terms of average value.

Duty Cycle - F_{HIGH}

Duty Cycle

Project Number: G0M-1805-7423

Applicant: Liftup A/S

Model Description: Radio module for Liftup A/S products

Model: MODULE1
Test Sample ID: 16140

Reference Standards: ANSI C63.10:2013

Reference Method: ANSI C63.10:2013, Section 7.5

Operating Frequency: 2460 MHz
Operating Conditions: Tnom/Vnom
Operator: S. Suckow

Test Site: Eurofins Product Service GmbH

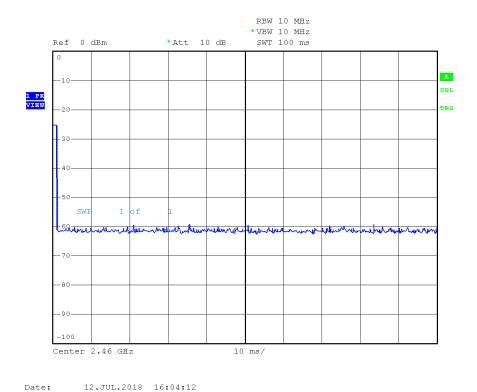
Test Date: 2018-07-12

Duty Cycle Period: 100

Maximum Duty Cycle: 0.01

Maximum Duty Cycle [%]: 1

Duty Cycle Correction [dB]: -40.00



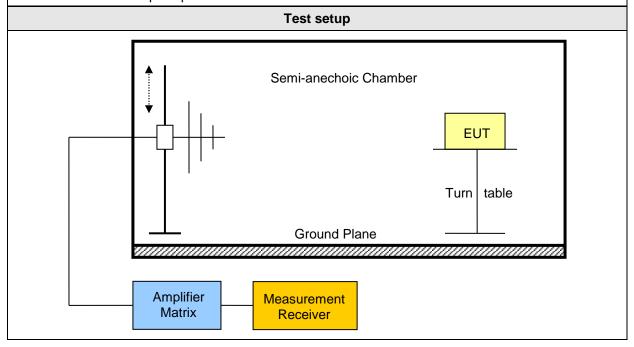


3.3 Test Conditions and Results - Fundamental field strength emissions

Field strength emissions acc. to FCC 47 CFR 15.249 / IC RSS-210 Verdict: N/R							
Test according refe	Reference Method						
standards	FCC 1	5.249(a),(c),(e) / IC	RSS-210 B.10(a)				
Test according	to		Reference Me	ethod			
measurement refe	erence		ANSI C63.	10			
Toot fraguency r	Tested frequencies						
Test frequency ra	ange	F _{LOW} , F _{MID} , F _{HIGH}					
EUT test mod	le	Transmit					
		Limits					
Frequency range [MHz]	Detector	Limit [mV/m] Limit [dBµV/m] Limit Distance [r					
902 – 928	Quasi-Peak	50 94 3					
2400 – 2483.5	Average	50 94 3					
5725 - 5875	Average	50	94	3			

FCC 15.249(e): for frequencies above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Below 1GHz a CISPR quasi-peak detector is used.





Test procedure

- 1. EUT set to test mode
- 2. Span it set according to measurement range
- 3. Below 1 GHz the resolution bandwidth is set according to CISPR 16 to 120 kHz with peak/quasi-peak detector.
- 4. Above 1 GHz the resolution bandwidth is set to 1 MHz with peak/average detector. Pulsed emissions are averaged over 100 ms with duty cycle correction.
- 5. Markers are set to maximum emission levels

Test results pulsed emissions > 1 GHz										
Channel	Frequency [MHz]	Pol.	Peak Level [dBµV/m]	Duty Cycle Correct. [dB]	Average Level [dBµV/m]	Average Limit [dBµV/m]	Limit distance [m]*	Margin [dB]		
F_{LOW}	2410	hor	86.41	20	66.41	94	3	-27.59		
F_{LOW}	2410	ver	98.07	20	78.07	94	3	-15.93		
F _{MID}	2435	hor	90.49	20	70.49	94	3	-23.51		
F _{MID}	2435	ver	96.60	20	76.60	94	3	-17.40		
F _{HIGH}	2460	hor	90.64	20	70.64	94	3	-23.36		
F _{HIGH}	2460	ver	96.32	20	76.32	94	3	-17.68		

Comments: * Physical distance between EUT and measurement antenna.



> 1000

3.4 Test Conditions and Results – Emissions radiated outside the specified frequency band

Radiated out-of-band band emissions acc. to FCC 47 CFR 15.249 / IC RSS-210 Verdict: PASS						
Test according ref	erenced	Reference Method				
standards		FCC 15.249	0(a),(c),(d),(e) / IC R	SS-210 B.10(b)		
Test according	g to		Reference Method	d		
measurement ref	erence		ANSI C63.10			
Toot fraguency			Tested frequencie	S		
Test frequency	range	30 MHz – 10 th harmonic				
EUT test mo	de	Transmit				
	Liı	mits - Harmonics				
The field strength of harm	onic emissions, r	neasured at 3 m, s	hall not exceed 500	μV/m (54 dBμV/m).		
	L	imits - General				
Frequency range [MHz]	Detector	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]		
30 – 88	Quasi-Peak	100	40	3		
88 – 216	Quasi-Peak	150 43.5 3				
216 – 960	Quasi-Peak	200	46	3		
960 – 1000	Quasi-Peak	500	54	3		

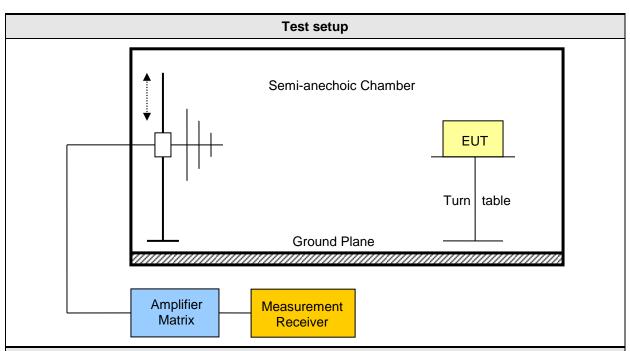
For frequencies above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Average

500

54

Except the higher order harmonics, emission radiated outside the specified frequency band shall be attenuated by at least 50 dB below the level of the fundamental or to the general field strength limits listed in 15.209 / RSS-Gen, whichever is less stringent.



Test procedure

- 1. EUT set to test mode
- 2. Span it set according to measurement range
- 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz
- 4. Markers are set to maximum emission levels

Test results									
Channel	Frequency [MHz]	Emission [MHz]	Level [dBµV/m]	Detector	Pol.	Limit [dBµV/m]	Margin [dB]		
F _{LOW}	2410	4819	41.37	pk	hor	74.00	-32.63		
F _{MID}	2435	4867	41.52	pk	hor	74.00	-32.48		
F _{HIGH}	2460	4919	42.09	pk	hor	74.00	-31.91		

Comments: * Physical distance between EUT and measurement antenna.



3.5 Test Conditions and Results - Receiver radiated emissions

Receiver radiated emissions acc. to IC RSS-210 Verdict: PASS								
Test according referenced			Reference Method					
standards				RSS-Gen 7.1				
	Test according to			Reference Metho	od			
measurement refere	ence			ANSI C63.10				
Test frequency rar	Toot frequency range			Tested frequenci				
rest frequency fai	ige		3	0 MHz – 5 th Harm	onic			
EUT test mode				Receive				
			Limits					
Frequency range [MHz]	Detector	ſ	Limit [µV/m]	Limit [dBµV/m	n] [Limit Distance [m]		
30 – 88	Quasi-Pea	ak	100	40		3		
88 – 216	Quasi-Pea	ak	150	43.5		3		
216 – 960	Quasi-Pe	ak	200	46		3		
960 – 1000	960 – 1000 Quasi-Pea		500	54		3		
> 1000	> 1000 Average		500	54		3		
			Test setup					
			Semi-anechoic Cl	namber EU Turn		_		
Ground Plane								
	plifier atrix	N	Measurement Receiver					



Test procedure

- 1. EUT set to receive mode (Communication tester is used if needed)
- 2. Span it set according to measurement range
- 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz
- 4. Markers are set to peak emission levels

Test results									
Channel	Frequency [MHz]	Emission [MHz]	Level [dBµV/m]	Detector	Pol.	Limit [dBµV/m]	Margin [dB]		
F _{MID}	2435	36.0049	37.30	qpk	ver	40.00	-02.70		

The stated emission level corresponds to ambient noise floor. No real spurious emission has been measured.



3.6 Test Conditions and Results – AC power line conducted emissions

Power line conducted emissions acc. to FCC 47 CFR 15.207 / IC RSS-Gen Verdict: PASS							
Test according referenced			Reference Method				
standards	S			ANSI C63.10			
Fully configured sample	e scanned over		F	requency range			
the following freque	ency range		0.1	5 MHz to 30 MHz			
Points of Appli	cation		Арј	olication Interface			
AC Mains		LISN					
EUT test me	ode	AC-Powerline					
		Limits	and results				
Frequency [MHz]	Quasi-Peak [dBµV]	Result	Average [dBµV]	Result		
0.15 to 5	66 to 56	*	PASS	56 to 46*	PASS		
0.5 to 5	56		PASS	46	PASS		
5 to 30	60		PASS	50	PASS		
Comments: * Limit decreases linearly with the logarithm of the frequency.							



Conducted Emissions

EMI voltage test in the ac-mains according to FCC part 15B

Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

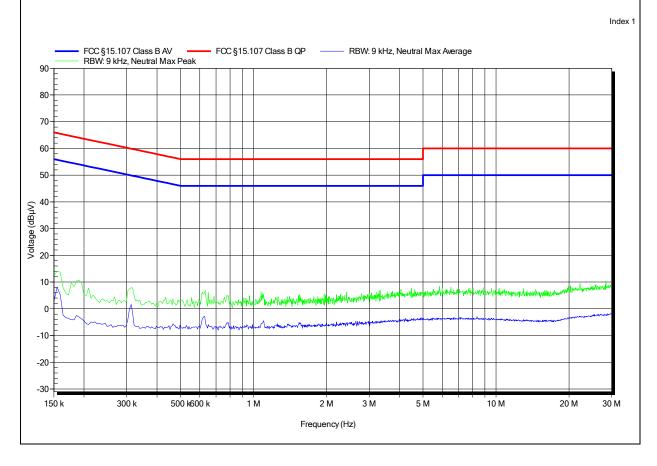
Operator: Mr. Suckow

Test Conditions: Tnom: 24°C, Unom: 5.6 VDC

LISN: ESH2-Z5 N

Mode: TX FHSS 2435 MHz GFSK

Test Date: 2018-07-16 Note: Minus





Conducted Emissions

EMI voltage test in the ac-mains according to FCC part 15B

Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Mr. Suckow

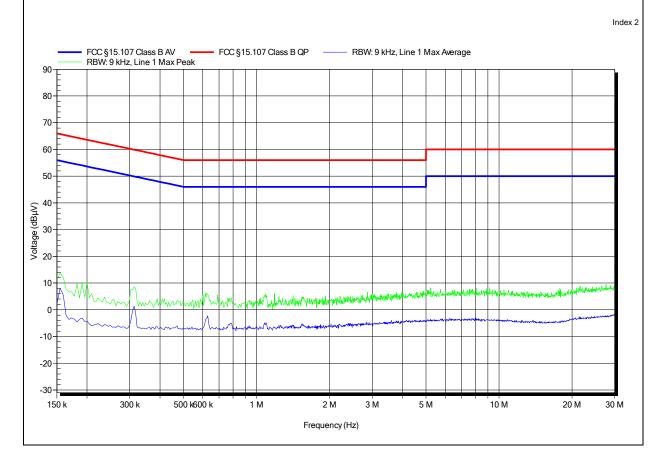
Test Conditions: Tnom: 24°C, Unom: 5.6 VDC

LISN: ESH2-Z5 L

Mode: TX FHSS 2435 MHz GFSK

Test Date: 2018-07-16

Note: Plus





ANNEX A Transmitter radiated spurious emissions

Spurious emissions according to FCC 15.249

Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Mr. Suckow

Test Conditions: Tnom: 24°C, Vnom: 5.6 VDC

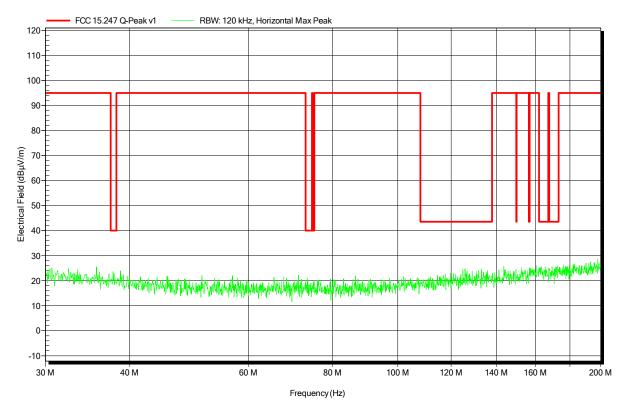
Antenna: Rohde & Schwarz HK 116, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-13

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Mr. Suckow

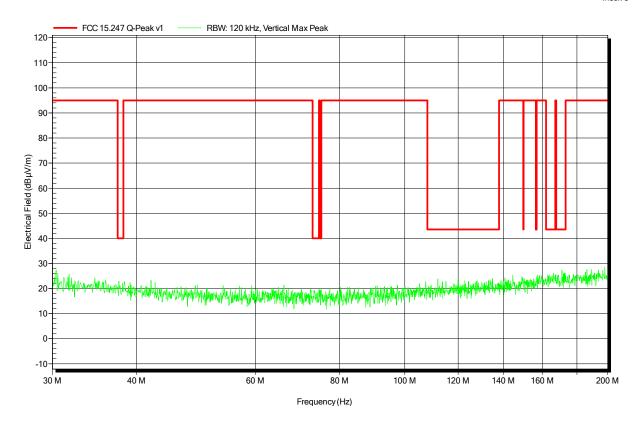
Test Conditions: Tnom: 24°C, Vnom: 5.6 VDC
Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-13

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

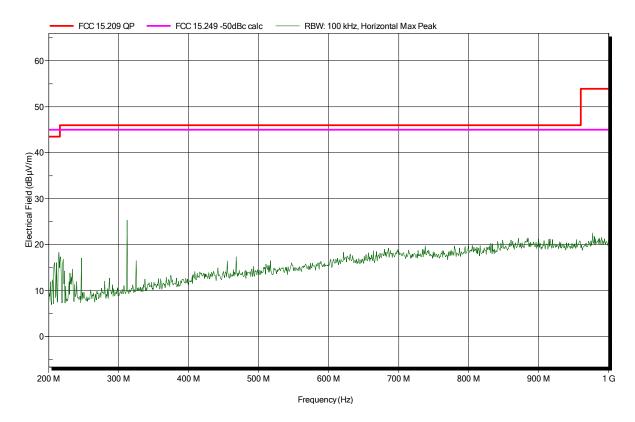
Antenna: Rohde & Schwarz HL 223, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

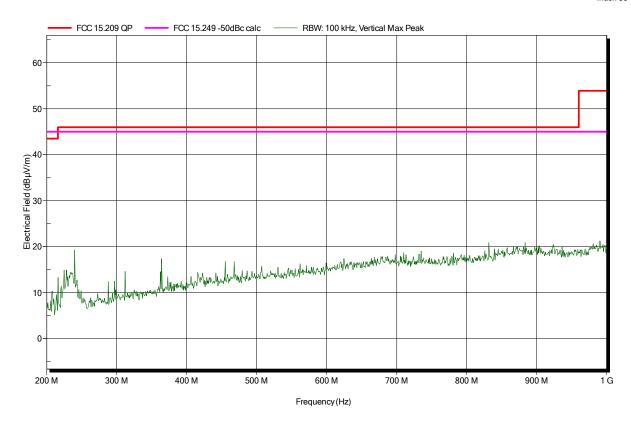
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

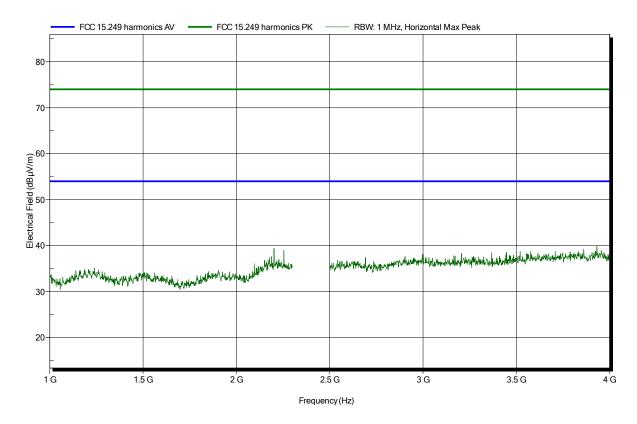
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

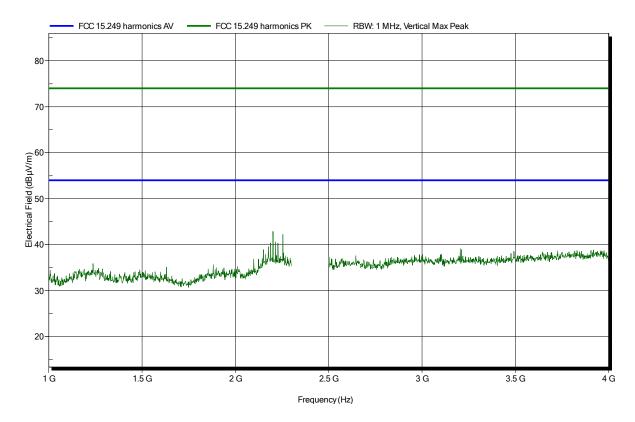
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

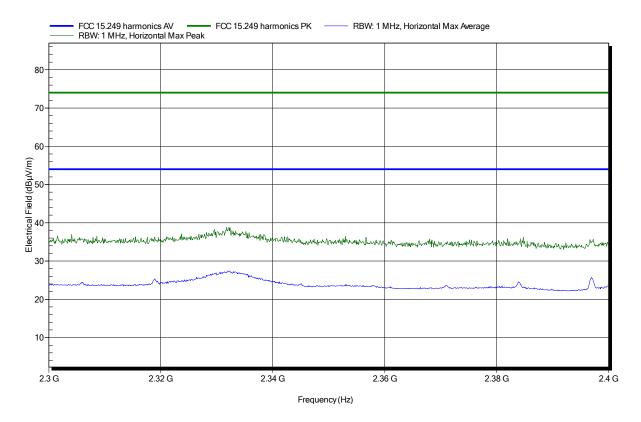
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

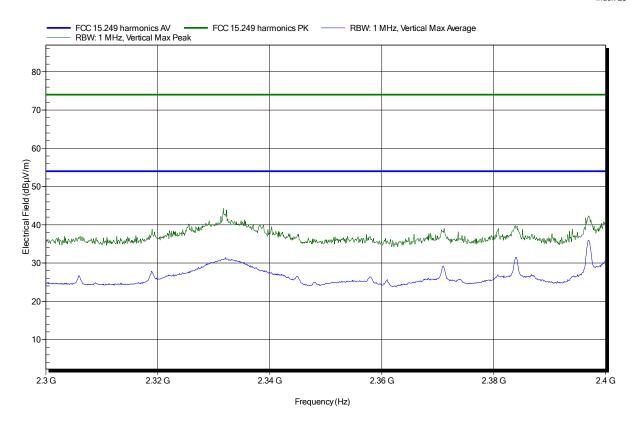
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

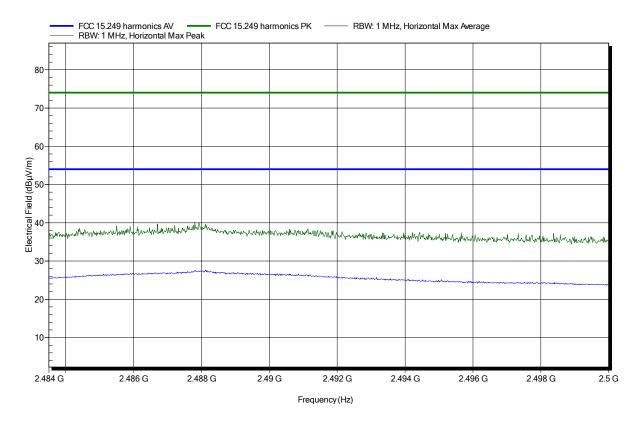
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

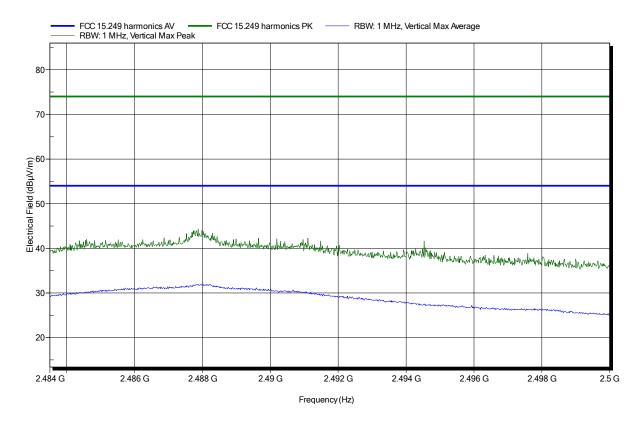
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

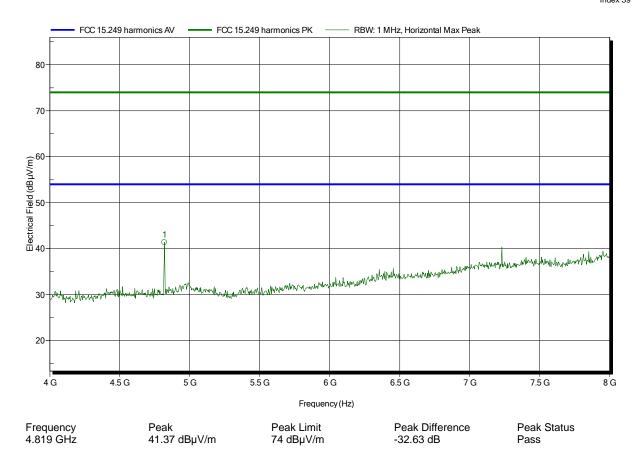
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

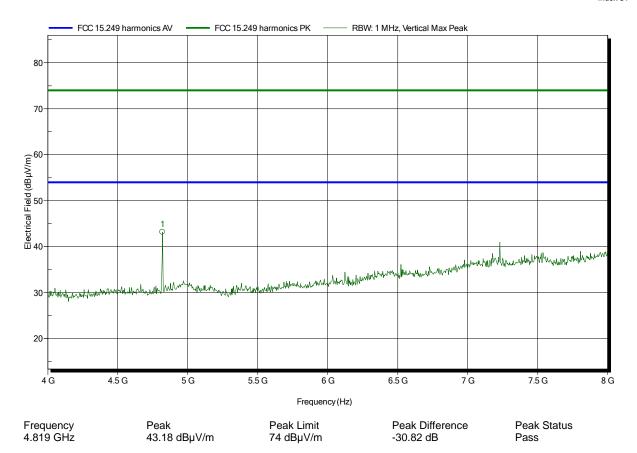
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

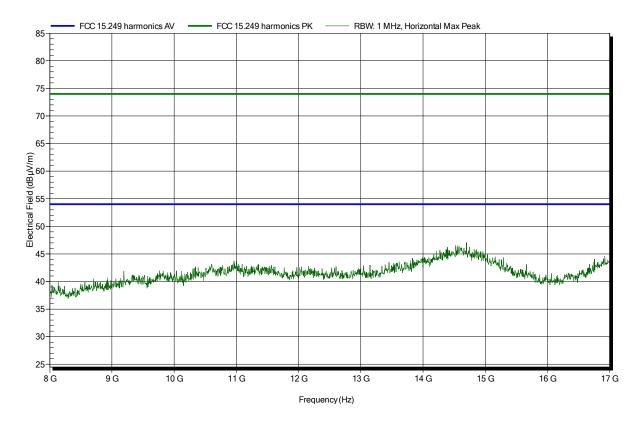
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

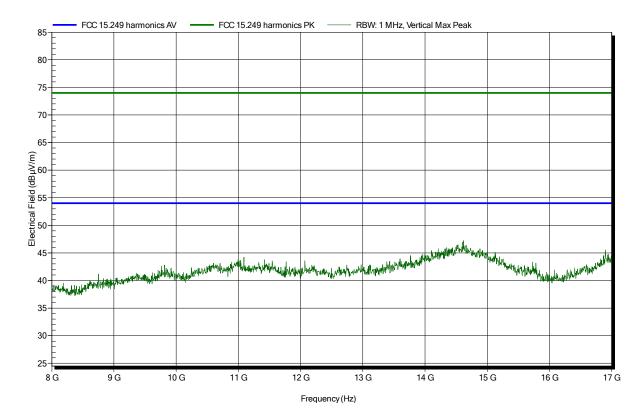
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),

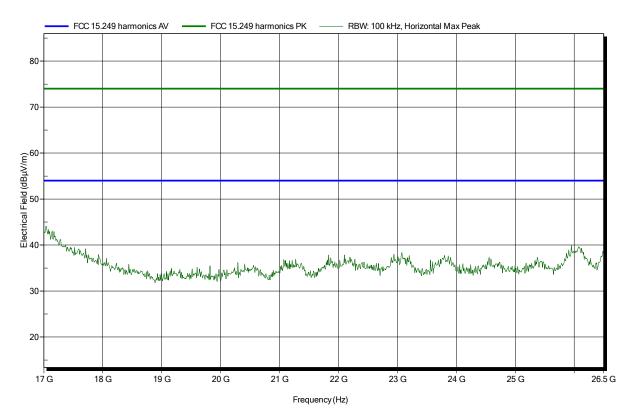
Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2410 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

2018-07-12

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Sebastian Suckow Operator:

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

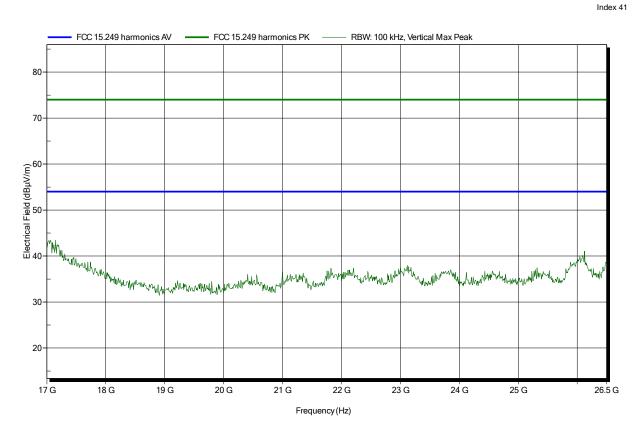
Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),

Vertical

Measurement distance: 1 m converted to 3m

TX; FHSS GFSK 2410 MHz Mode:

Test Date: Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Mr. Suckow

Test Conditions: Tnom: 24°C, Vnom: 5.6 VDC

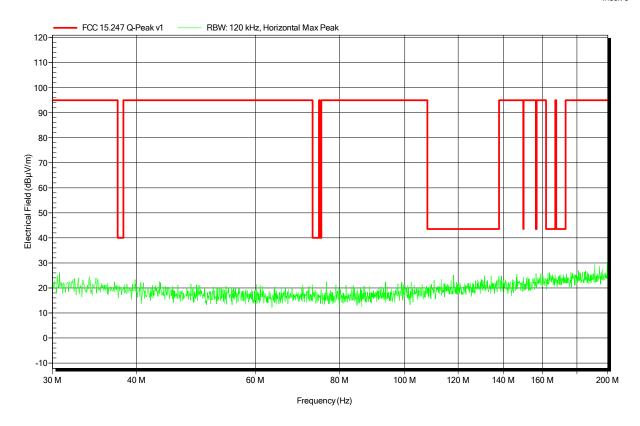
Antenna: Rohde & Schwarz HK 116, Horizontal

Measurement distance: 3 m

Mode: TX; TX, FHSS, 2435 MHz

Test Date: 2018-07-13

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Mr. Suckow

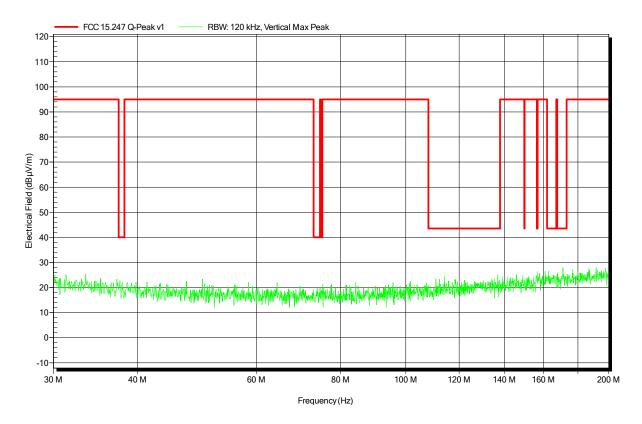
Test Conditions: Tnom: 24°C, Vnom: 5.6 VDC
Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3 m

Mode: TX; TX, FHSS, 2435 MHz

Test Date: 2018-07-13

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

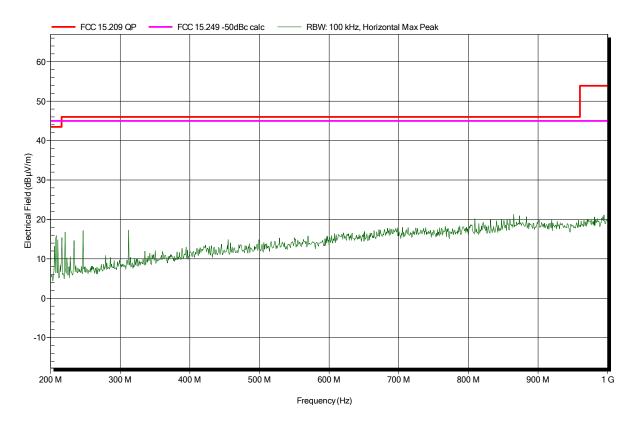
Antenna: Rohde & Schwarz HL 223, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

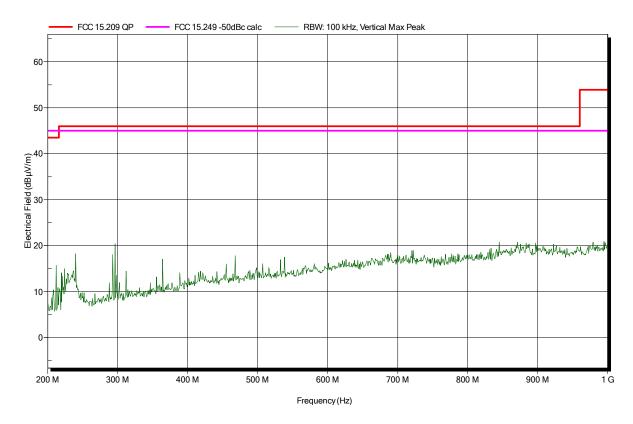
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

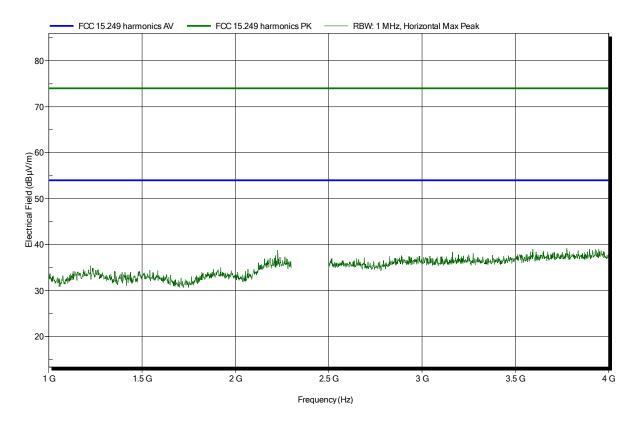
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

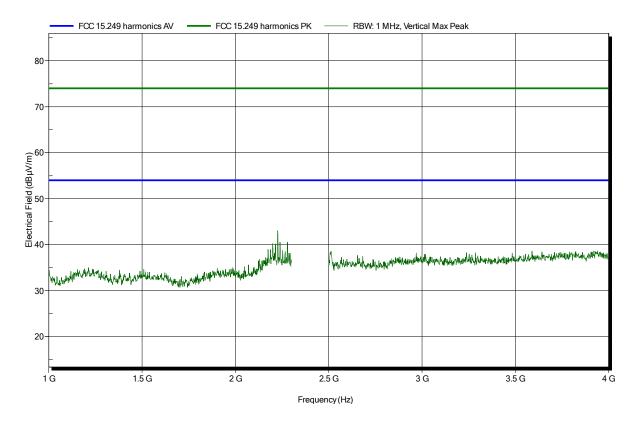
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

Antenna: Schwarzbeck BBHA 9120D, Horizontal

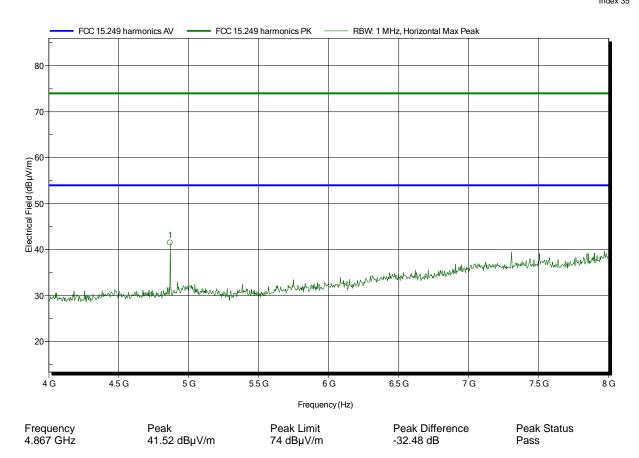
Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:

Index 35



Test Report No.: G0M-1805-7424-TFC249-V01



Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

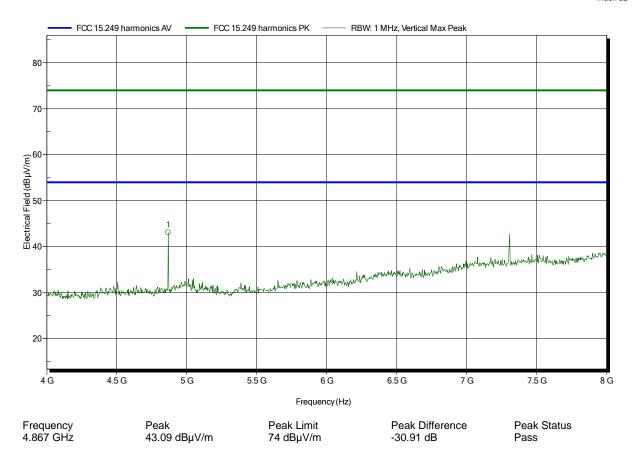
Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:

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Test Report No.: G0M-1805-7424-TFC249-V01



Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

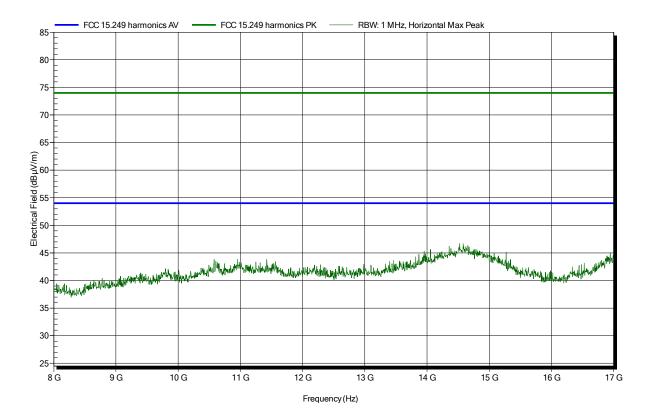
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

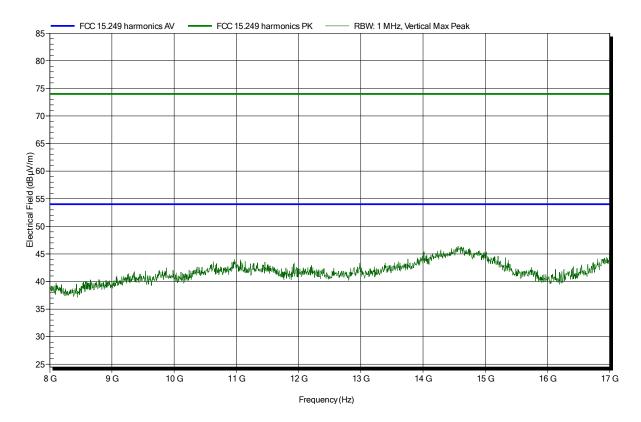
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),

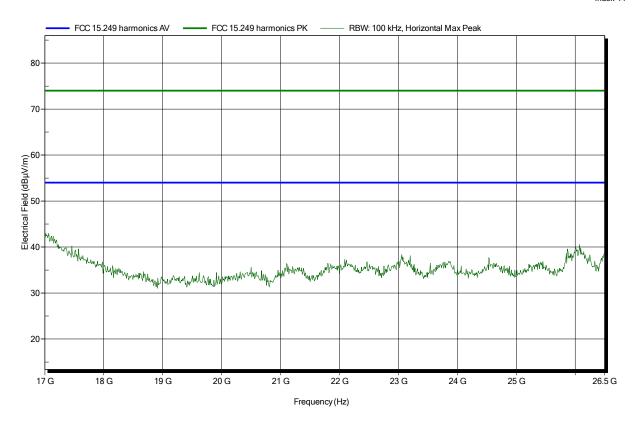
Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),

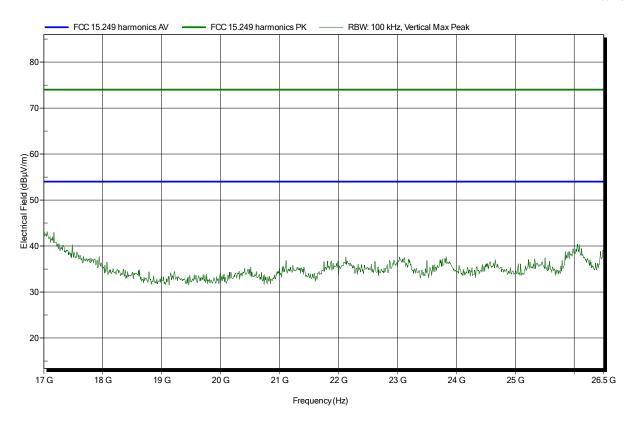
Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Remote Control for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Mr. Suckow

Test Conditions: Tnom: 24°C, Vnom: 5.6 VDC

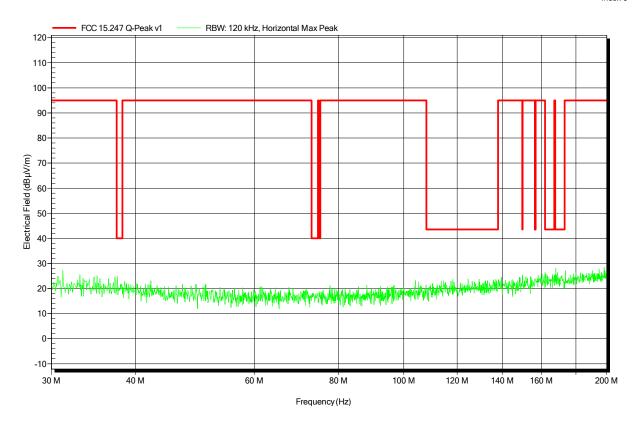
Antenna: Rohde & Schwarz HK 116, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-13

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Remote Control for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Mr. Suckow

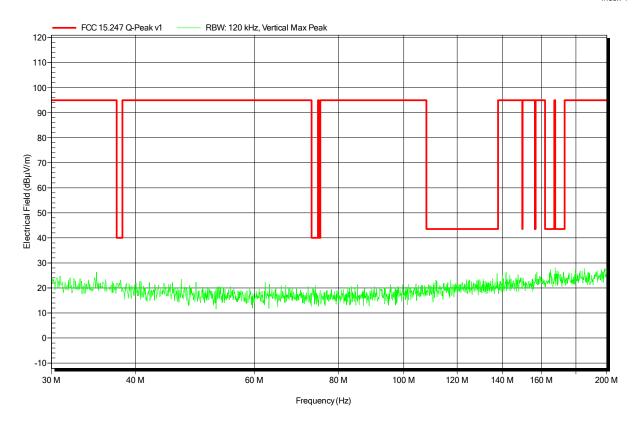
Test Conditions: Tnom: 24°C, Vnom: 5.6 VDC
Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-13

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

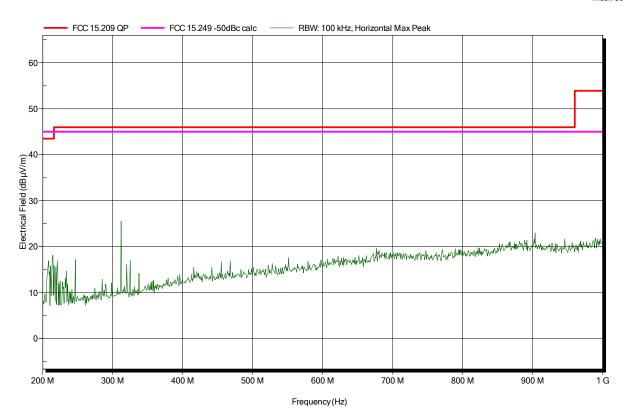
Antenna: Rohde & Schwarz HL 223, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

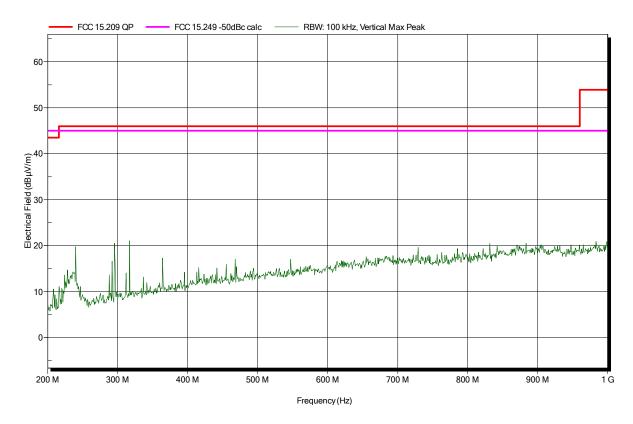
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

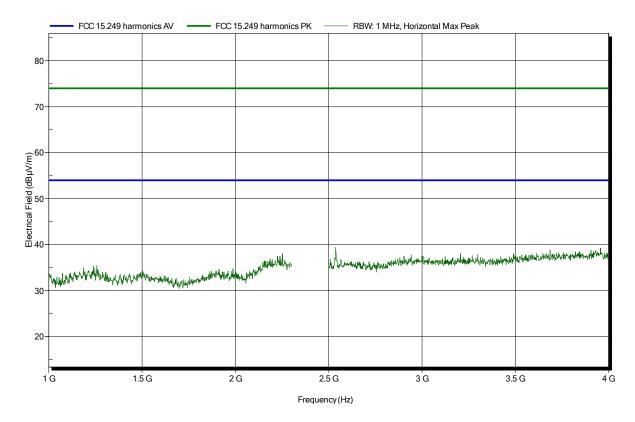
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

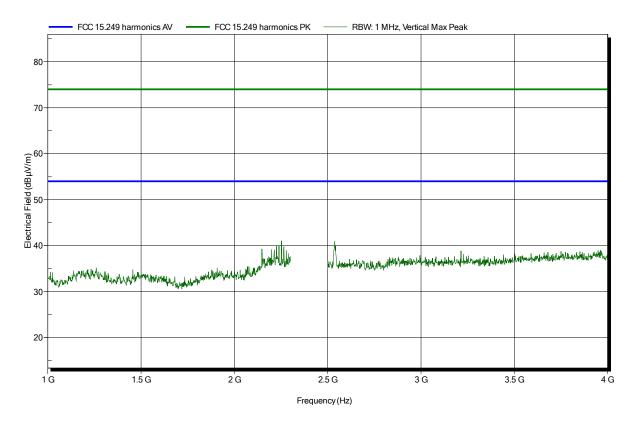
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

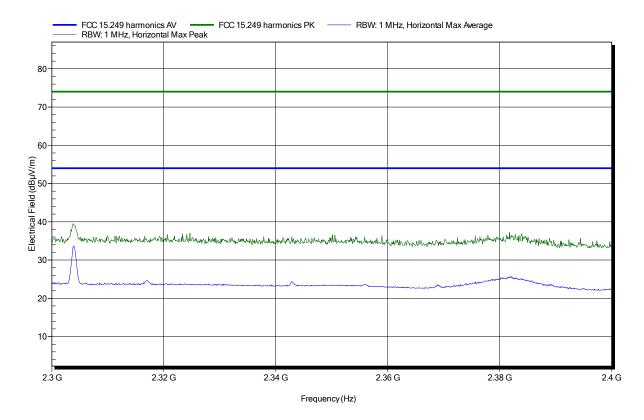
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

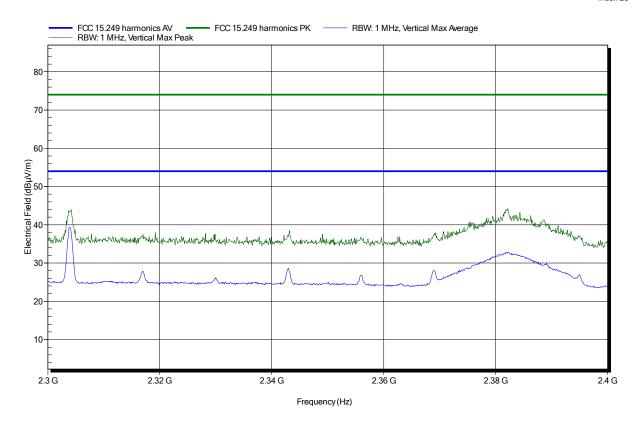
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

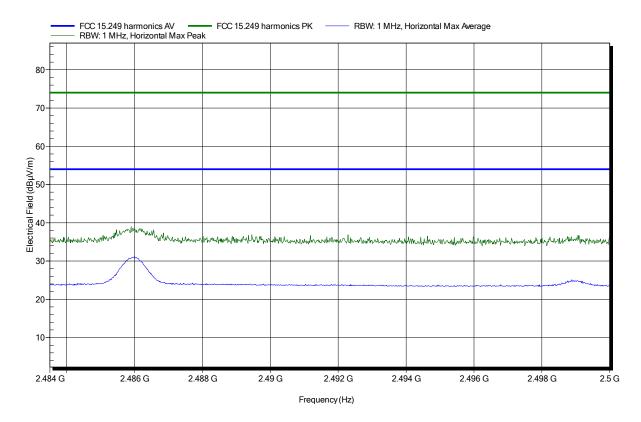
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

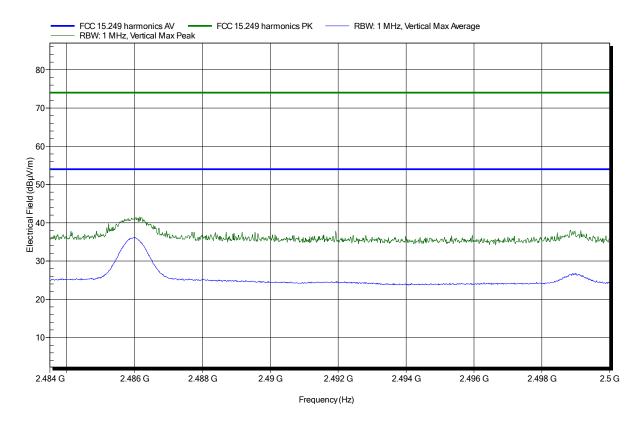
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 3 m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

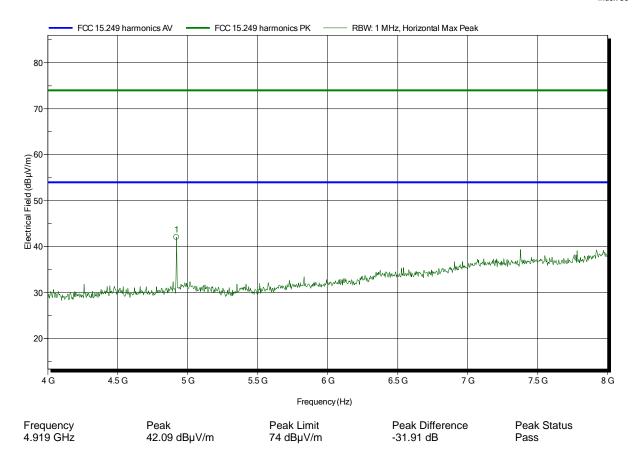
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

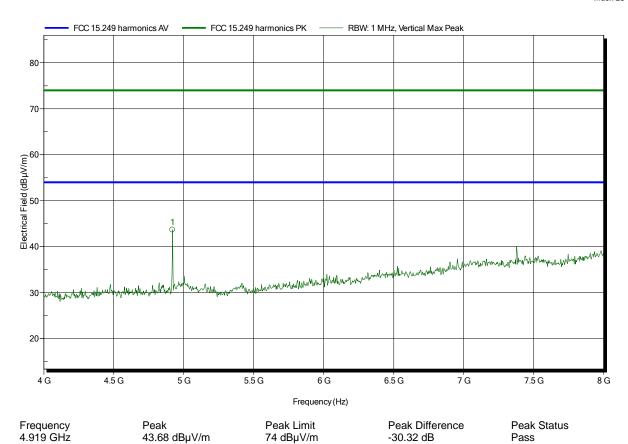
Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:

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Test Report No.: G0M-1805-7424-TFC249-V01



Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

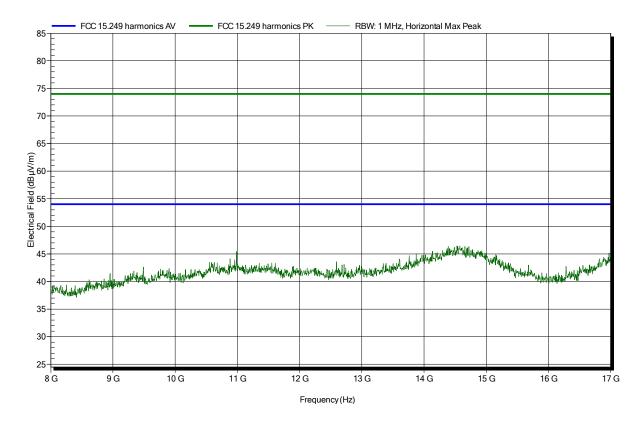
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

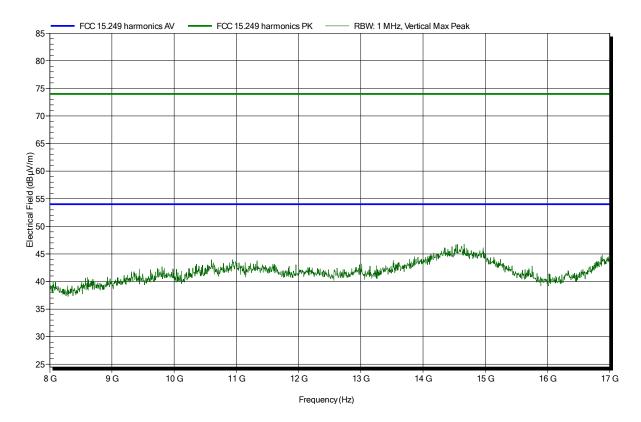
Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),

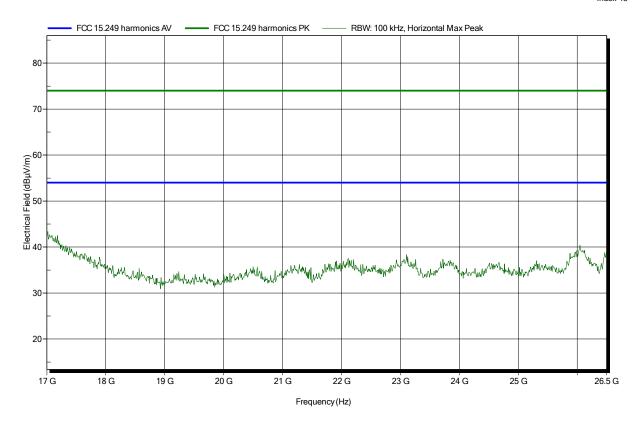
Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7423

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 25°C, Vnom: 5.6 VDC

Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),

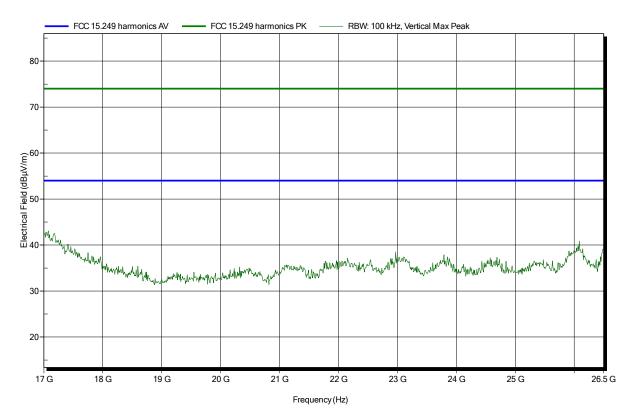
Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; FHSS GFSK 2460 MHz

Test Date: 2018-07-12

Note:





ANNEX B Receiver radiated spurious emissions

Spurious emissions according to RSS-Gen

Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Mr. Suckow

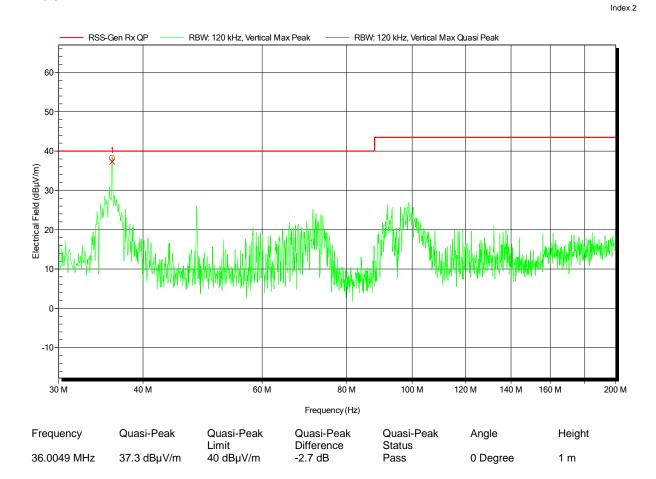
Test Conditions: Tnom: 24°C, Vnom: 5.6 VDC
Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3 m

Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-13

Note:





Spurious emissions according to RSS-Gen

Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Mr. Suckow

Test Conditions: Tnom: 24°C, Vnom: 5.6 VDC

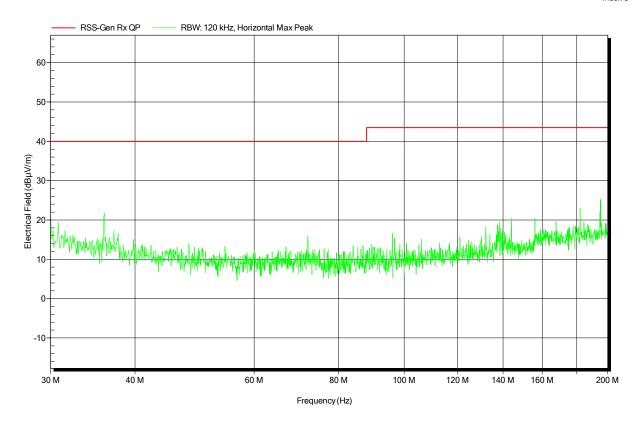
Antenna: Rohde & Schwarz HK 116, Horizontal

Measurement distance: 3 m

Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-13

Note:





Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 26°C, Vnom: 5.6 VDC

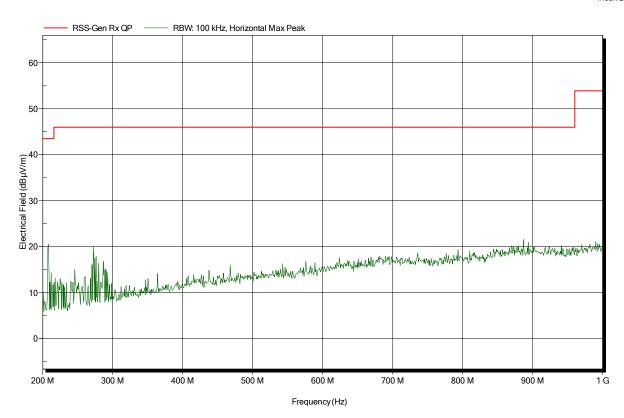
Antenna: Rohde & Schwarz HL 223, Horizontal

Measurement distance: 3 m

Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

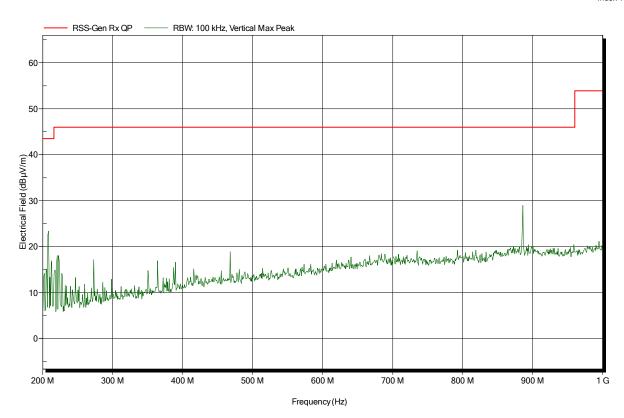
Test Conditions: Tnom: 26°C, Vnom: 5.6 VDC
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3 m

Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 26°C, Vnom: 5.6 VDC

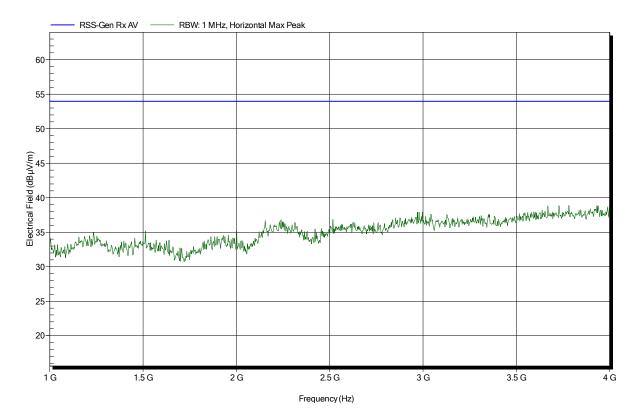
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 3 m

Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 26°C, Vnom: 5.6 VDC

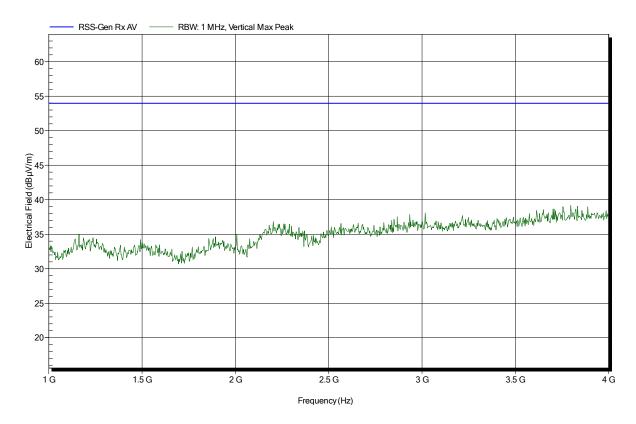
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 3 m

Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 26°C, Vnom: 5.6 VDC

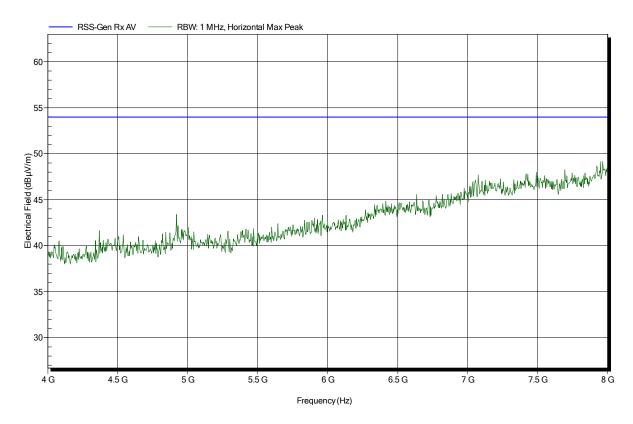
Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 3 m

Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 26°C, Vnom: 5.6 VDC

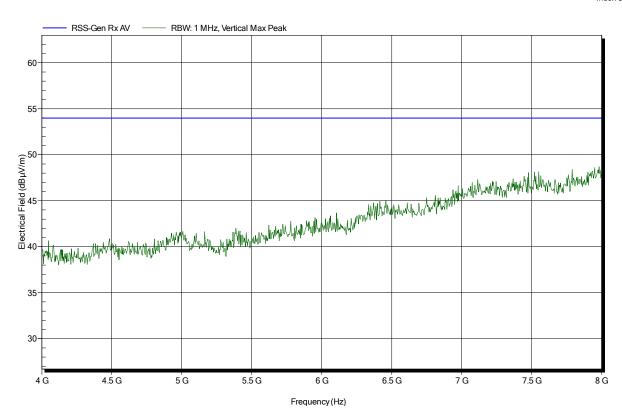
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 3 m

Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

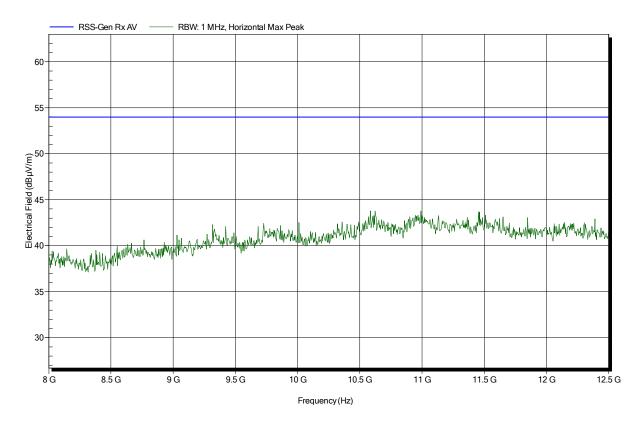
Test Conditions: Tnom: 26°C, Vnom: 5.6 VDC

Antenna: Schwarzbeck BBHA 9120D, Horizontal

Measurement distance: 1 m converted to 3m Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-12

Note:





Project number: G0M-1805-7424

Applicant: Liftup A/S

EUT Name: Radio module for Liftup A/S products

Model: MODULE1

Test Site: Eurofins Product Service GmbH

Operator: Sebastian Suckow

Test Conditions: Tnom: 26°C, Vnom: 5.6 VDC
Antenna: Schwarzbeck BBHA 9120D, Vertical

Measurement distance: 1 m converted to 3m Mode: RX; FHSS, 2435 MHz

Test Date: 2018-07-12

Note:

