eurofins | Product Service

FCC TEST REPORT

FCC 47 CFR Part 15C
Industry Canada RSS-210

Digital transmission systems operating within the 902 – 928MHz band

Report Reference No. ..... :	G0M-1110-1448-TFC247D-V01
Testing Laboratory ..... :	Eurofins Product Service GmbH
Address ..... :	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation ..... :	FCC Filed Test Laboratory, Reg.-No.: 96970 A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 A2LA ACCREDITED TESTING CERT# 1983.01
Applicant's name ..... :	Steute Schaltgeräte GmbH & Co KG
Address ..... :	Brückenstr. 91 32584 Löhne GERMANY
Test specification:	
Standard..... :	47 CFR Part 15C RSS-210, Issue 8, 2010-12 RSS-Gen, Issue 3, 2010-12 ANSI C63.4:2009
Equipment under test (EUT):	
Product description	Transceiver Module
Model No.	RFRX SW 915-4W
Hardware version	E194K02_02
Firmware / Software version	V2.1
	FCC-ID: XK5-RFRXSW915 IC: 5158A-RFRXSW915
Test result	**Passed**

Possible test case verdicts:	
- neither assessed nor tested ..... :	N/N
- 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:

Date of receipt of test item..... :	2011-11-02
Date (s) of performance of tests..... :	2011-11-02 - 2011-11-03
Compiled by..... :	Christian Weber
Tested by (+ signature) ..... :	Wilfried Treffke
Approved by (+ signature)..... :	Jens Zimmermann
Date of issue..... :	2012-04-20
Total number of pages ..... :	49

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.

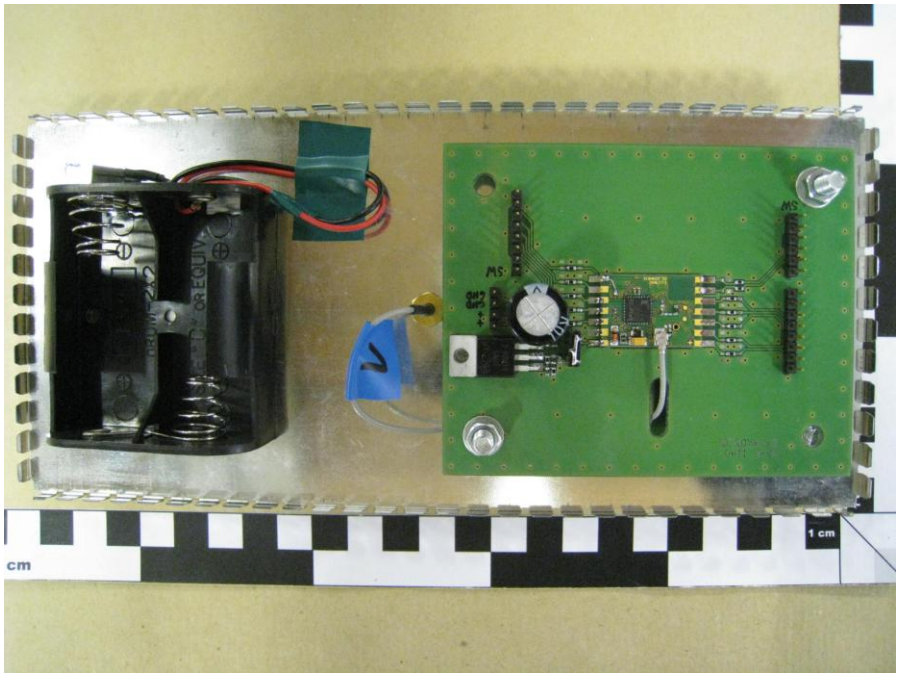
Additional comments:

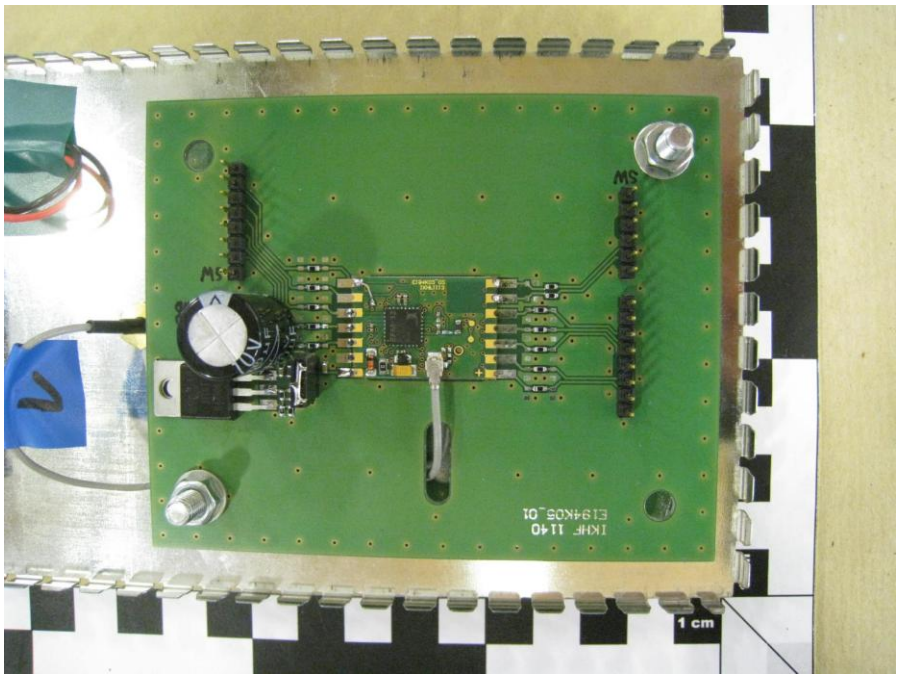
REPORT INDEX

1 Equipment (Test item) Description:

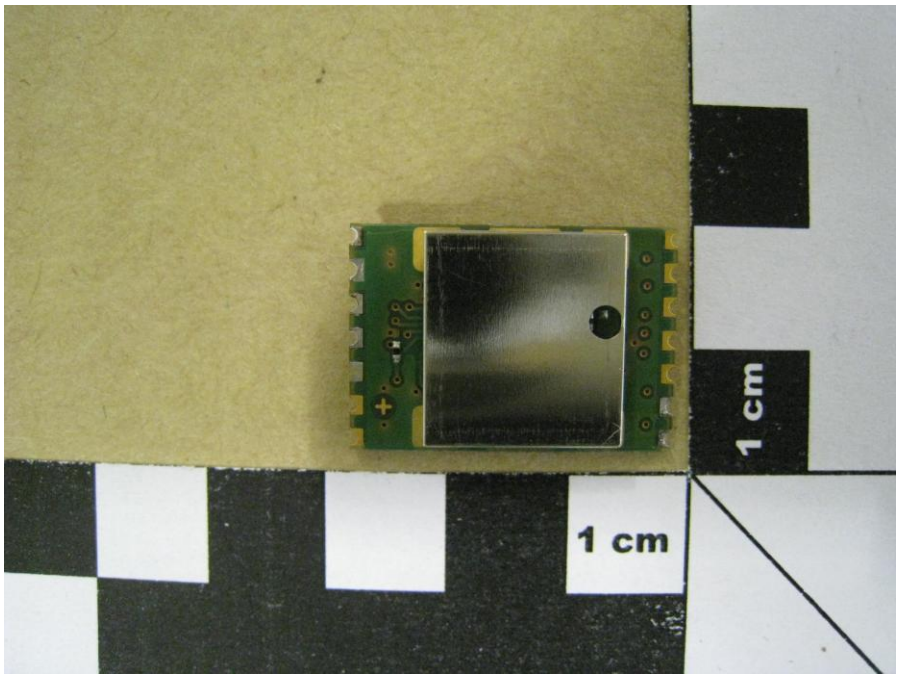
Description	Transceiver Module	
Model	RFRX SW 915-4W	
Serial number	None	
Hardware version	E194K02_02	
Software / Firmware version	V2.1	
FCC-ID	XK5-RFRXSW915	
IC	5158A-RFRXSW915	
Equipment type	Radio module	
Radio type	Transceiver	
Radio technology	custom	
Operating frequency range	915MHz	
Assigned frequency band	902 - 928MHz	
Number of channels	1	
Main test frequencies	F_{MID}	915MHz
Spreading	None	
Modulations	FSK	
Number of channels	1 Channel	
Channel spacing	None	
Number of antennas	1	
Antenna	Type	external dedicated
	Model	FME-f magent foot antenna, MC0114037
	Manufacturer	MC Technologies GmbH
	Gain	+5.0dBi
Manufacturer	IK ELEKTRONIK GmbH Friedrichsgrüner Straße 11-13 08269 Hammerbrücke GERMANY	
Power supply	V_{NOM}	3.3VDC
	V_{MIN}	2.80VDC
	V_{MIN}	3.80VDC
AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A

1.1 Equipment photos

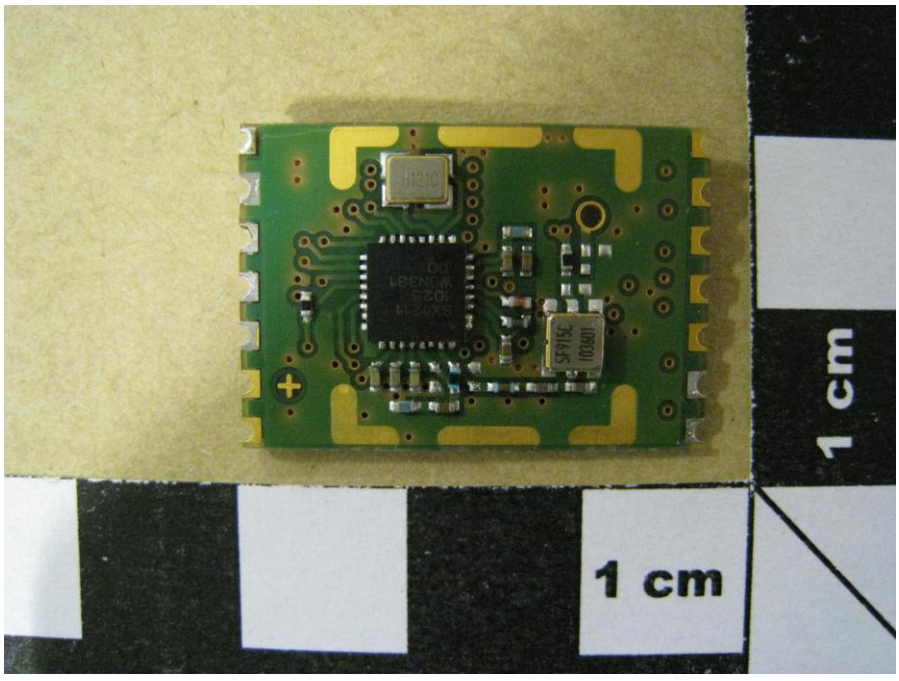
EUT WITH EVALUATION BOARD


EUT EVALUATION BOARD


EUT WITH SHIELDING



EUT WITHOUT SHIELDING



1.2 Supporting Equipment Used During Testing:

Product Type*	Device	Manufacturer	Model No.	Comments
AE	Multi-Mode PSU	Thurlby-Thandar Instruments Ltd.	EX752M	

***Note:** Use the following abbreviations:

AE : Auxiliary/Associated Equipment, or

SIM : Simulator (Not Subjected to Test)

CABL : Connecting cables

1.3 Test Modes:

Mode #	Description	
Single	General conditions:	EUT powered by laboratory power supply
	Radio conditions:	Mode = standalone transmit Spreading = None Modulation = FSK Duty cycle = 10% Power level = Maximum
Receive	General conditions:	EUT powered by laboratory power supply
	Radio conditions:	Mode = standalone receive Spreading = None Modulation = FSK
AC-Powerline	General conditions:	EUT powered by laboratory power supply
	Radio conditions:	Mode = standalone transmit Spreading = None Modulation = FSK Duty cycle = 10% Power level = Maximum

1.4 Test Equipment Used During Testing

Occupied Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	Inv. No. 0496	Aug 10	Aug 12

6dB Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	Inv. No. 0496	Aug 10	Aug 12

Maximum peak conducted power					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	Inv. No. 0496	Aug 10	Aug 12

Power spectral density					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	Inv. No. 0496	Aug 10	Aug 12

Band edge compliance					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	Inv. No. 0496	Aug 10	Aug 12

Conducted spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	Inv. No. 0496	Aug 10	Aug 12

Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 5	Inv. No. 0583		
Spectrum Analyzer	R&S	FSIQ26	Inv. No. 0413	Apr. 11	Apr. 12
Biconical Antenna	R&S	HK 116	Inv. No. 0012	Jan 10	Jan 13
LPD Antenna	R&S	HL 223	Inv. No. 0295	Feb 11	Feb 13
LPD Antenna	R&S	HL 025	Inv. No. 0512	Feb 10	Feb 13

AC powerline conducted emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH2-Z5	Inv. No. 0288	Sep 10	Sep 12
AMN	R&S	ESH3-Z5	Inv. No. 0040	Nov 10	Nov 12
EMI Test Receiver	R&S	ESCS 30	Inv. No. 0474	Jun 11	Jun 12

1.5 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 (dBµV) + A.F. (dB) = Net field strength (dBµV/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 dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Limit (dBµV/m) = 20*log (µV/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:

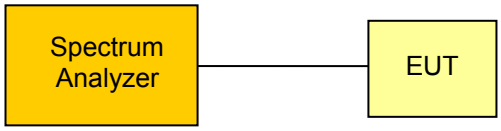
Reading	+	AF	=	Net Reading	:	Net reading - FCC limit	= Margin
21.5 dBµV	+	26 dB	=	47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15C, IC RSS-210				
Product Specific Standard Section	**Requirement – Test**	**Reference Method**	**Result**	**Remarks**
RSS-Gen 4.6.1	Occupied Bandwidth	RSS-Gen 4.6.1	N/A	Informational only
FCC § 15.247(a)(2) IC RSS-210 § A8.2	6dB Bandwidth	KDB Publication No. 558074	PASS	
FCC § 15.247(b)(3) IC RSS-210 § A8.4	Maximum peak conducted power	KDB Publication No. 558074	PASS	
FCC § 15.247(e) IC RSS-210 § A8.2	Power spectral density	KDB Publication No. 558074	PASS	
47 CFR 15.207 RSS-Gen 7.2.4	AC power line conducted emissions	KDB Publication No. 558074 / ANSI C63.4	PASS	
FCC § 15.247(d) IC RSS-210 § A8.5	Band edge compliance	KDB Publication No. 558074	PASS	
FCC § 15.247(d) IC RSS-210 § A8.5	Conducted spurious emissions	KDB Publication No. 558074	PASS	
FCC § 15.247(d) FCC § 15.209 IC RSS-210 A8.5 IC RSS-Gen 4.9 IC RSS-Gen 7.2.5	Transmitter radiated spurious emissions	KDB Publication No. 558074 / ANSI C 63.4	PASS	
IC RSS-Gen 4.10 IC RSS-Gen 6.1	Receiver radiated spurious emissions	ANSI C 63.4	PASS	
Remarks: Testing has been performed with the strongest antenna listed above (antenna 3).				

3 Test Conditions and Results

3.1 Test Conditions and Results – Occupied Bandwidth

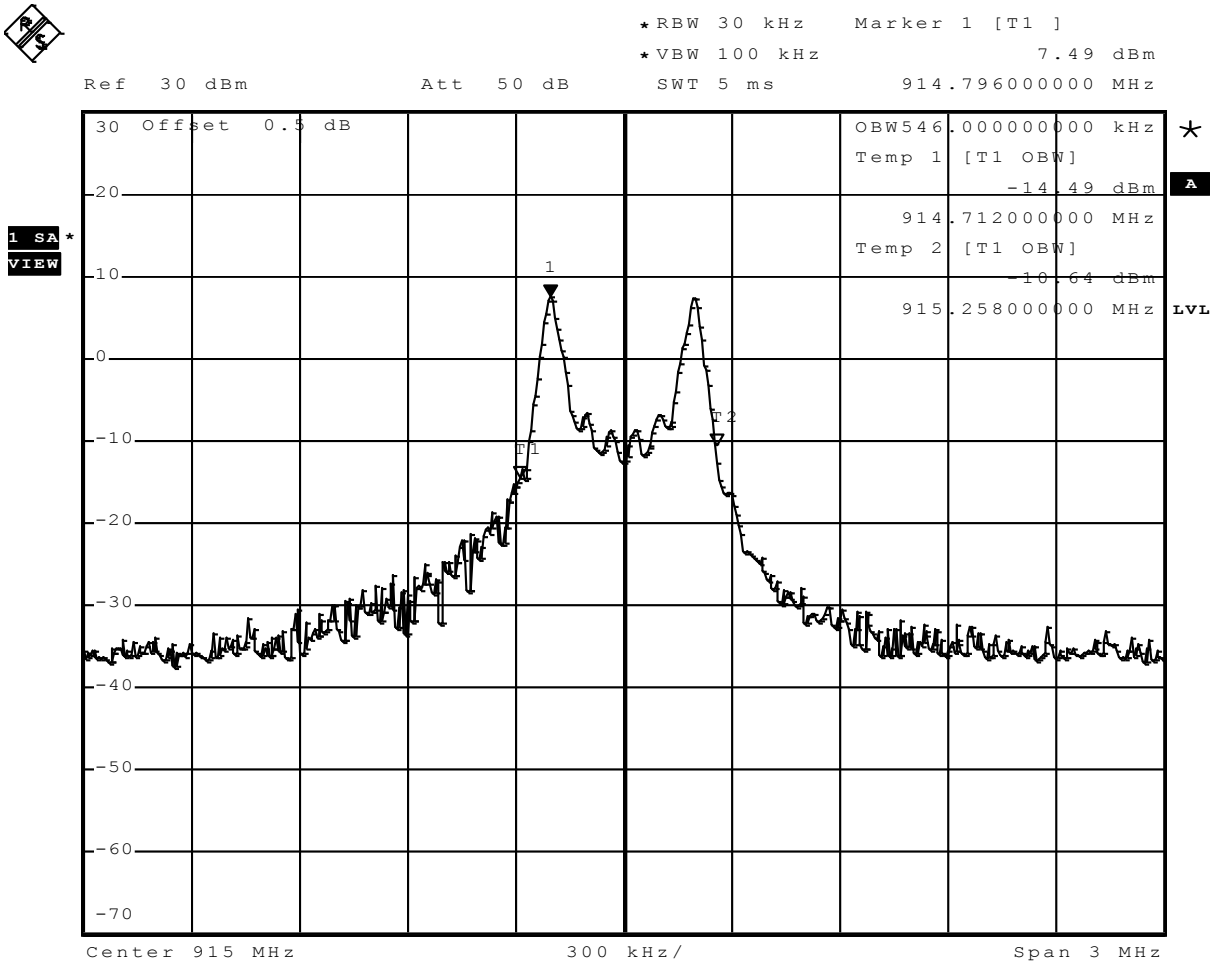
Occupied Bandwidth acc. IC RSS-Gen	**Verdict: PASS**
Test according to measurement reference	Reference Method
	RSS-Gen 4.6.1
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single
Limits	
None (Informational only)	
Test setup	
	
Test procedure	
1. EUT set to test mode (Communication tester 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_{MID}	915	546.796
Comments:		

Occupied Bandwidth - F_{MID}

RSS Gen
Occupied Bandwidth

EUT	Transceiver Module
Model	RFRX SW915-4W
Approval Holder	Steute Schaltgeräte GmbH / Ord.: G0M-1110-1448
Temperature / Voltage	25°C, Vnom
Test Site / Operator	Eurofins Product Service GmbH, Mr. Treffke
Test Specification	4.4.1 Occupied Bandwidth
Comment 1	Channel.: 915 MHz
Comment 2	A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3	pass



Comment: Occupied bandwidth: 546 KHz
Date: 3.NOV.2011 13:30:49

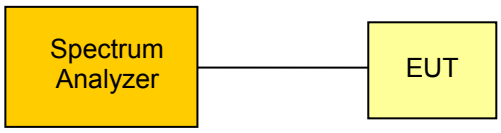
3.2 Test Conditions and Results – 6dB Bandwidth

20dB Bandwidth acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(a)(2) / IC RSS-210 A8.2
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single

Limits

≥ 500kHz

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span set to at least twice the emission spectrum
3. Detector set to peak and max hold
4. Envelope peak value of emission spectrum is selected
5. Marker on envelope of spectrum is set to level of -6dB to the left of the peak
6. Marker on envelope of spectrum is set to level of -6dB to the right of the peak
7. 6dB Bandwidth is determined by marker frequency separation

Test results

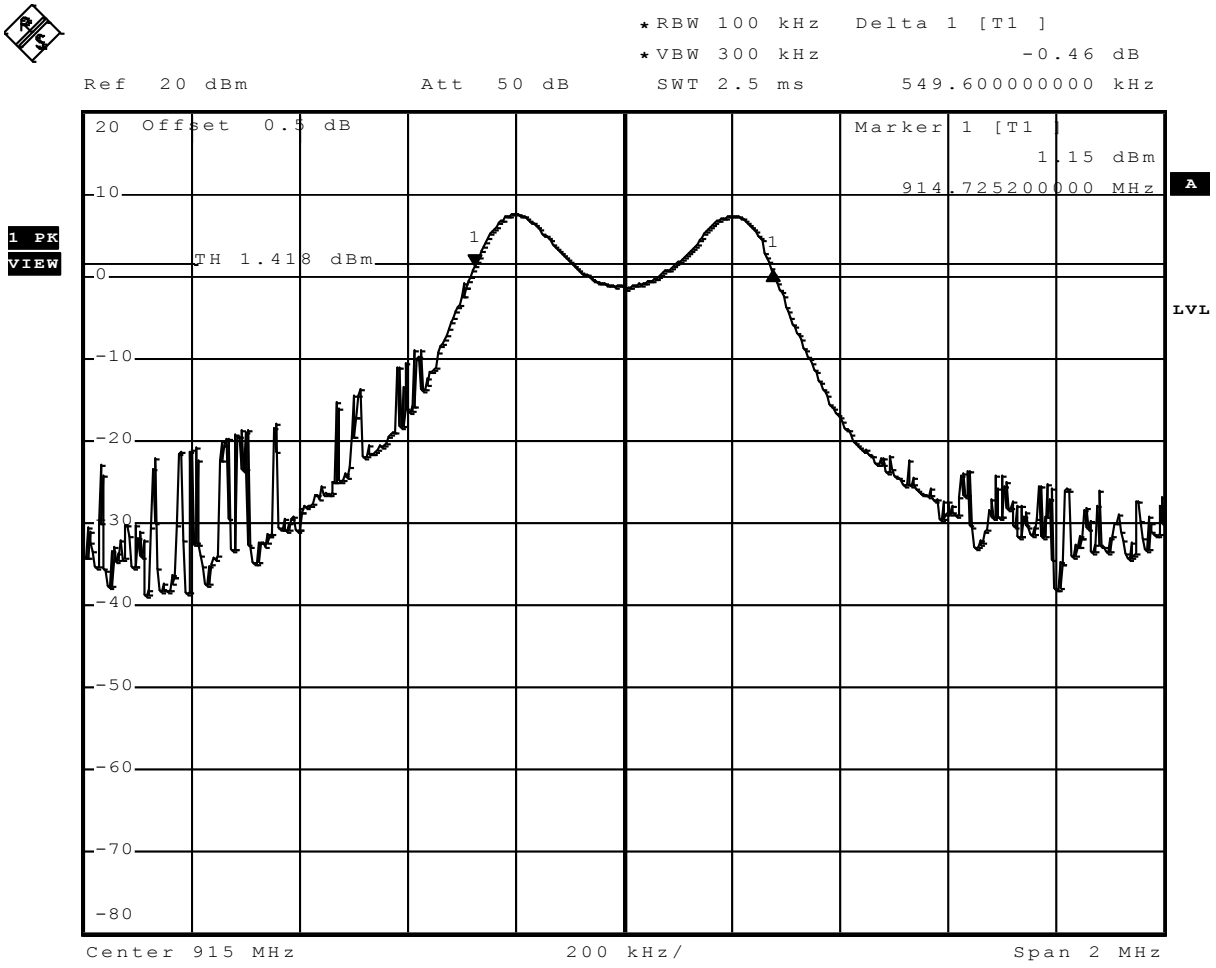
Channel	Frequency [MHz]	6dB Bandwidth [kHz]	Limit [kHz]	Result
F_{MID}	915	549.600	≥ 500	PASS

Comments:

6dB Bandwidth - F_{MID}

FCC part 15.247 (a)(2)
Minimum 6 dB Bandwidth

EUT	Transceiver Module
Model	RFRX SW915-4W
Approval Holder	Steute Schaltgeräte GmbH / Ord.: G0M-1110-1448
Temperature / Voltage	25°C, Vnom
Test Site / Operator	Eurofins Product Service GmbH, Mr. Treffke
Test Specification	FCC part 15.247 (a)(2)
Comment 1	Minimum 6 dB Bandwidth
Comment 2	Channel : 915 MHz
Comment 3	pass



Comment: 6 dB bandwidth: 549.6 KHz > 500 KHz; verdict: PASS
Date: 3.NOV.2011 13:14:52

3.3 Test Conditions and Results – Maximum peak conducted power

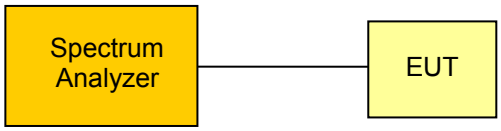
Maximum peak conducted power acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(b)(3) / IC RSS-210 A8.4
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single
Measurement mode	Peak
Maximum antenna gain	5dBi ⇒ Limit correction = 0dB

Limits

1W (30dBm)

The conducted output power limit specified above is based on the use of antennas with directional gains that do not exceed 6dBi. If transmitting antennas of directional gain greater than 6dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in the table, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Center frequency set to test channel center frequency
3. Span is set to be larger than the 6dB bandwidth and RBW is set to be at least the 6dB bandwidth
4. Peak output power is determined from the maximum of the emission envelope

Test results

Channel	Frequency [MHz]	Voltage	Peak power [dbm]	Peak power [W]	Limit [dBm]	Margin [dB]	Result
F_{MID}	915	3.3VDC	8.07	0.006	30	-21.93	PASS
F_{MID}	915	2.80VDC	8.08	0.006	30	-21.92	PASS
F_{MID}	915	3.80VDC	8.07	0.006	30	-21.93	PASS

Comments:

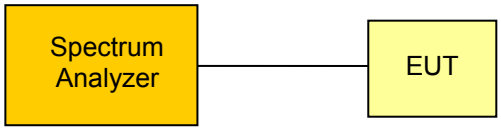
3.4 Test Conditions and Results – Power spectral density

Power spectral density acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(e) / IC RSS-210 A8.2
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single
Measurement mode	Peak

Limits

8dBm/3kHz

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Center frequency set to test channel center frequency
3. Span is set large enough to capture maximum emissions in passband, RBW is set to 3kHz
4. Peak power density is determined from peak emission of envelope

Test results

Channel	Frequency [MHz]	Voltage	Peak frequency [MHz]	Peak power density [dBm]	Limit [dBm/3kHz]	Margin [dB]	Result
F_{MID}	915	3.3VDC	915.132	4.4	8.0	-03.60	PASS

Comments:

3.5 Test Conditions and Results – AC power line conducted emissions

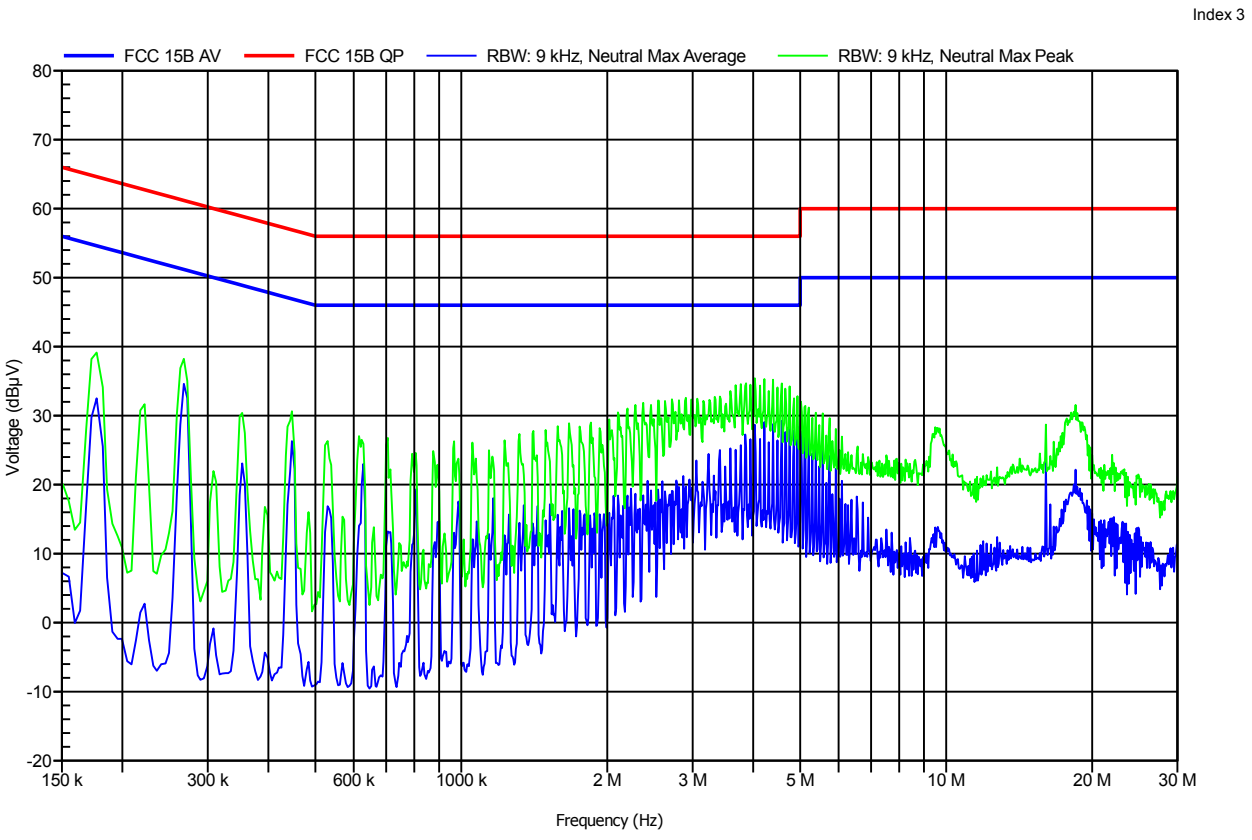
Power line conducted emissions acc. FCC 47 CFR 15.207 / IC RSS-Gen				**Verdict: PASS**
Test according referenced standards	Reference Method			
	ANSI C63.4			
Fully configured sample scanned over the following frequency range	Frequency range			
	0.15MHz to 30MHz			
Points of Application	Application Interface			
AC Mains	LISN			
EUT test mode	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 15B

Order number: G0M-1110-1448

Manufacturer:	Steute Schaltgeräte GmbH & Co. KG
EUT Name:	Tranceiver Module RFRX SW915-4W
Model:	version E194K02_02
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120 VAC power supply output +5 VDC
LISN:	ESH2-Z5 N
Mode:	1
Test Date:	03.11.2011
Note:	

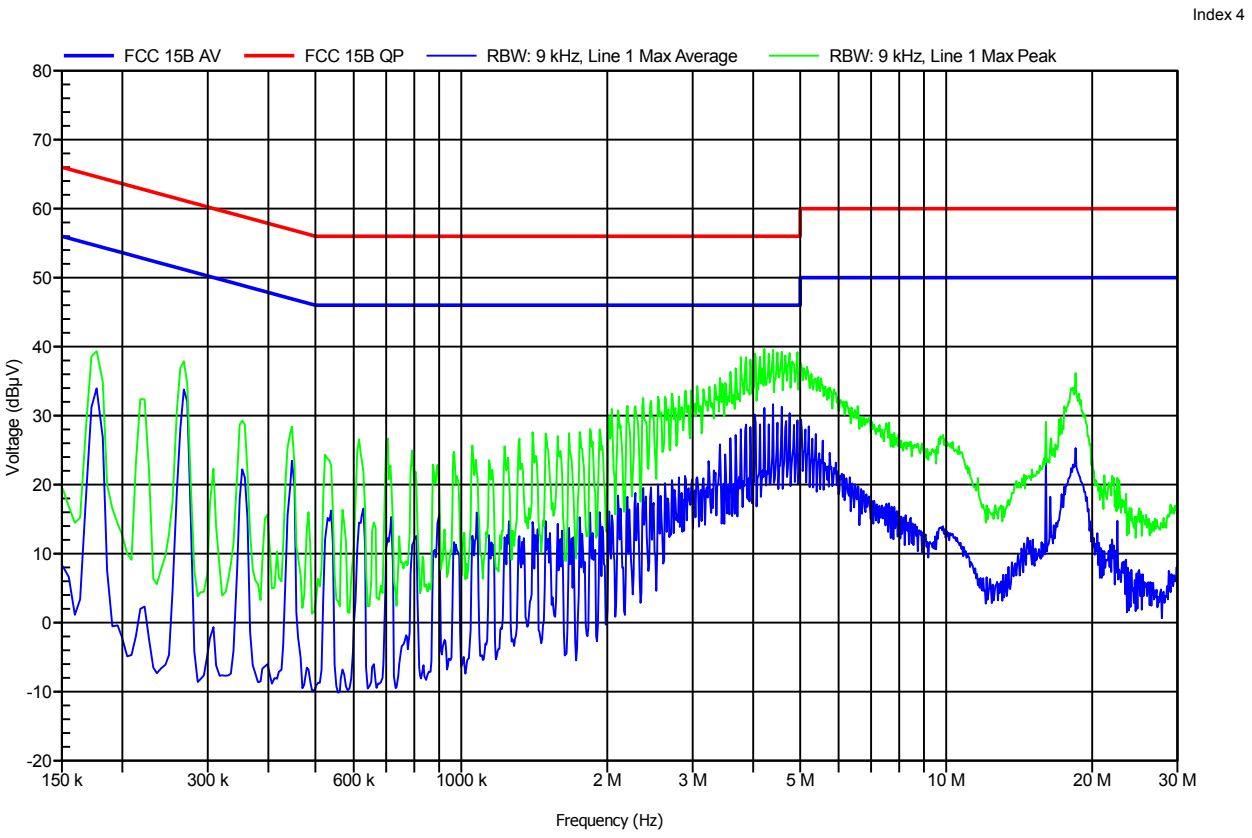


Conducted Emissions

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

Order number: G0M-1110-1448

Manufacturer:	Steute Schaltgeräte GmbH & Co. KG
EUT Name:	Tranceiver Module RFRX SW915-4W
Model:	version E194K02_02
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120 VAC power supply output +5 VDC
LISN:	ESH2-Z5 L
Mode:	2
Test Date:	03.11.2011
Note:	



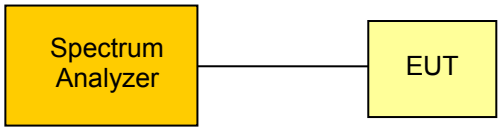
3.6 Test Conditions and Results – Band edge compliance

Band-edge compliance acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(d) / IC RSS-210 A8.5
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single

Limits

Limit	Condition
≤ -20dB/100kHz	Peak power measurement detector = Peak
≤ -30dB/100kHz	Peak power measurement detector = RMS

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is determined from level difference

Test results

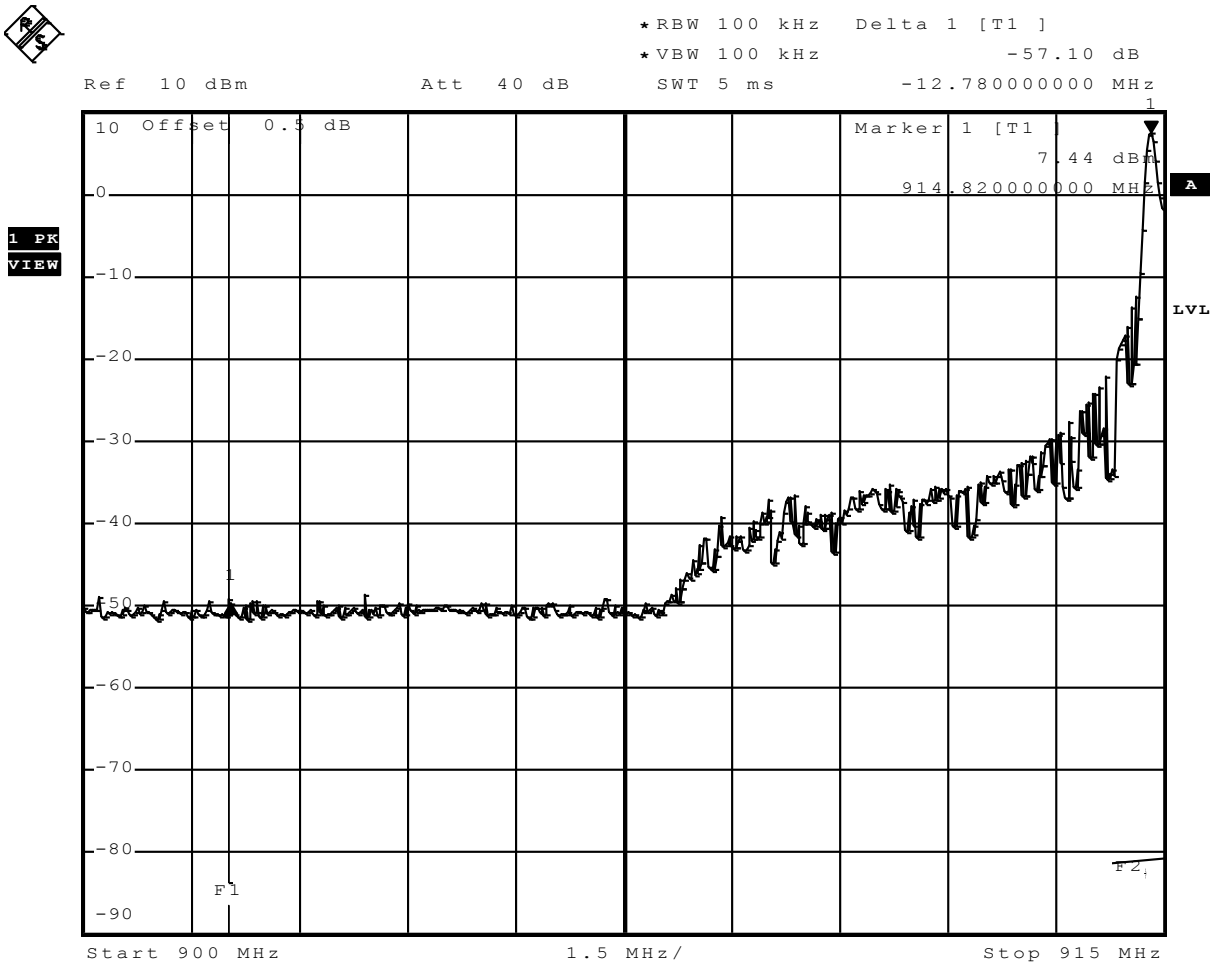
Channel	Frequency [MHz]	Mode	Level [dBc]	Limit [dBc]	Margin [dB]	Result
F_{MID}	915	Single	-57.10	-20	-37.10	PASS
F_{MID}	915	Single	-58.33	-20	-38.33	PASS

Comments:

Band-edge compliance – F_{MID} single – Lower Edge

FCC part 15.247
Band-edge compliance of RF conducted emissions

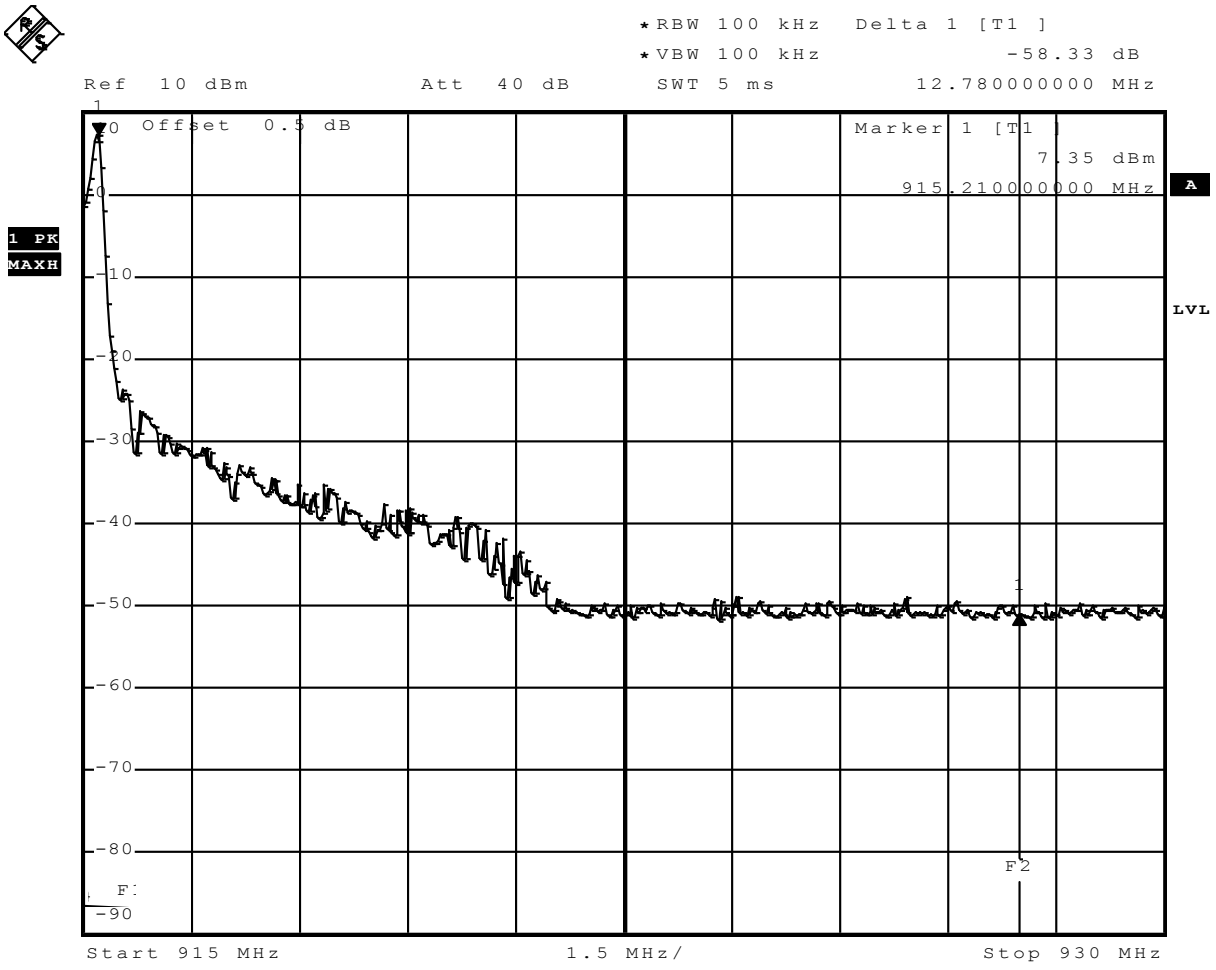
EUT	Transceiver Module
Model	RFRX SW915-4W
Approval Holder	Steute Schaltgeräte GmbH / Ord.: G0M-1110-1448
Temperature / Voltage	25°C, Vnom
Test Site / Operator	Eurofins Product Service GmbH, Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 915 MHz
Comment 3	pass



Band-edge compliance – F_{MID} single – Upper Edge

FCC part 15.247
Band-edge compliance of RF conducted emissions

EUT	Transceiver Module
Model	RFRX SW915-4W
Approval Holder	Steute Schaltgeräte GmbH / Ord.: G0M-1110-1448
Temperature / Voltage	25°C, Vnom
Test Site / Operator	Eurofins Product Service GmbH, Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 915 MHz
Comment 3	pass



Date: 3.NOV.2011 13:44:11

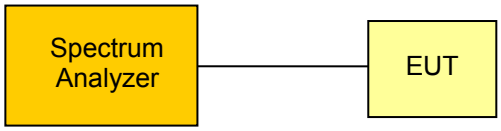
3.7 Test Conditions and Results – Conducted spurious emissions

Conducted spurious emissions acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(d) / IC RSS-210 A8.5
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	10MHz – 10th Harmonic
EUT test mode	Single

Limits

Limit	Condition
≤ -20dB/100kHz	Peak power measurement detector = Peak
≤ -30dB/100kHz	Peak power measurement detector = RMS

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span it set according to measurement range
3. Resolution bandwidth is set to 100kHz and detector to peak and max hold
4. Markers are set to peak emission levels within frequency band
5. Emission level is determined by second marker on emission peak
6. Attenuation is determined from level difference

Test results

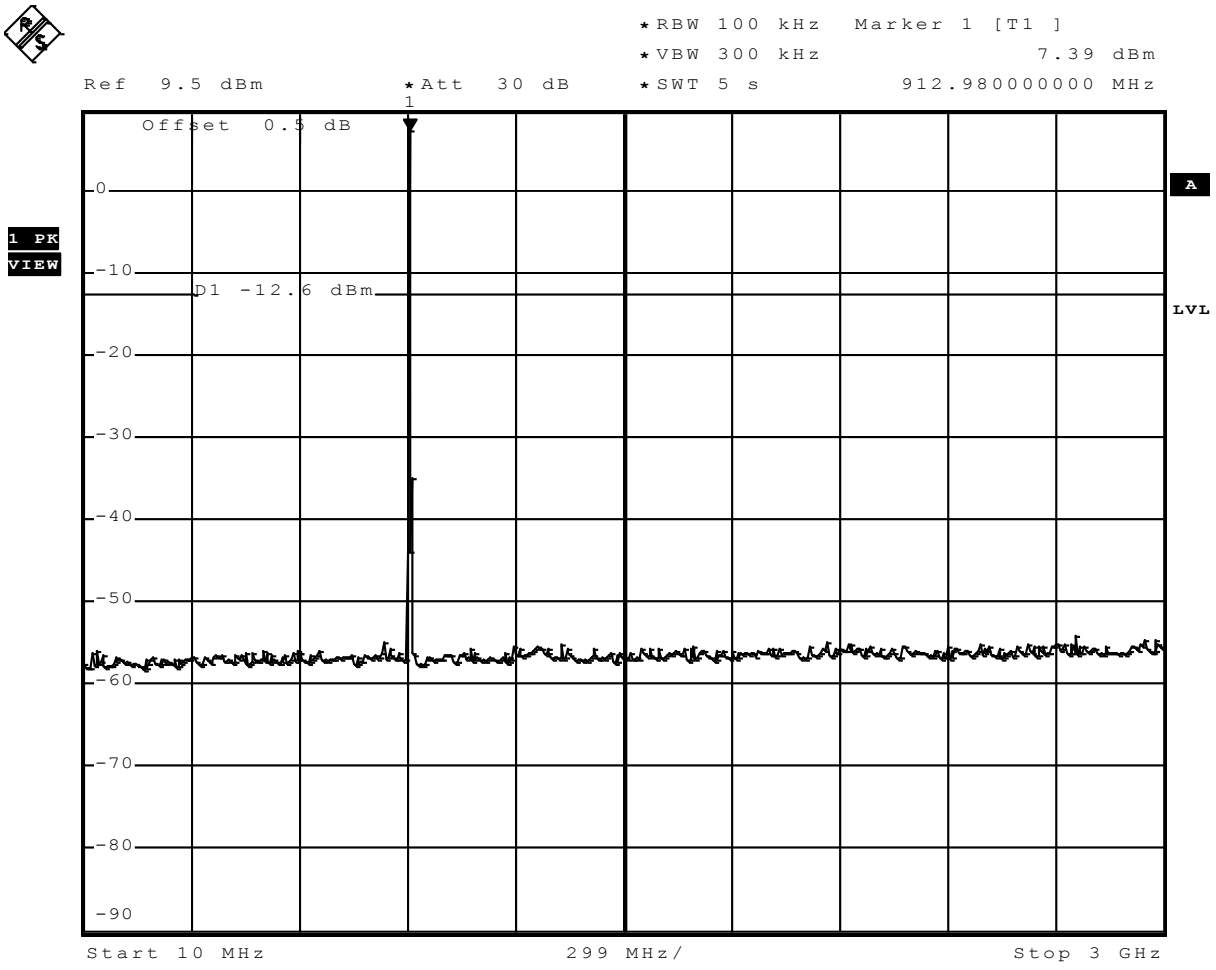
Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dbm]	Peak power [dBm]	Limit [dBm]	Margin [dB]	Result
F_{MID}	902.4	3660	-48.29	7.39	-12.61	-35.68	PASS

Comments:

Conducted spurious emissions – F_{MID}

FCC part 15.247 (d)
Spurious Emissions

EUT	Transceiver Module
Model	RFRX SW915-4W
Approval Holder	Steute Schaltgeräte GmbH / Ord.: G0M-1110-1448
Temperature / Voltage	25°C, Vnom
Test Site / Operator	Eurofins Product Service GmbH, Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 915 MHz
Comment 3	pass

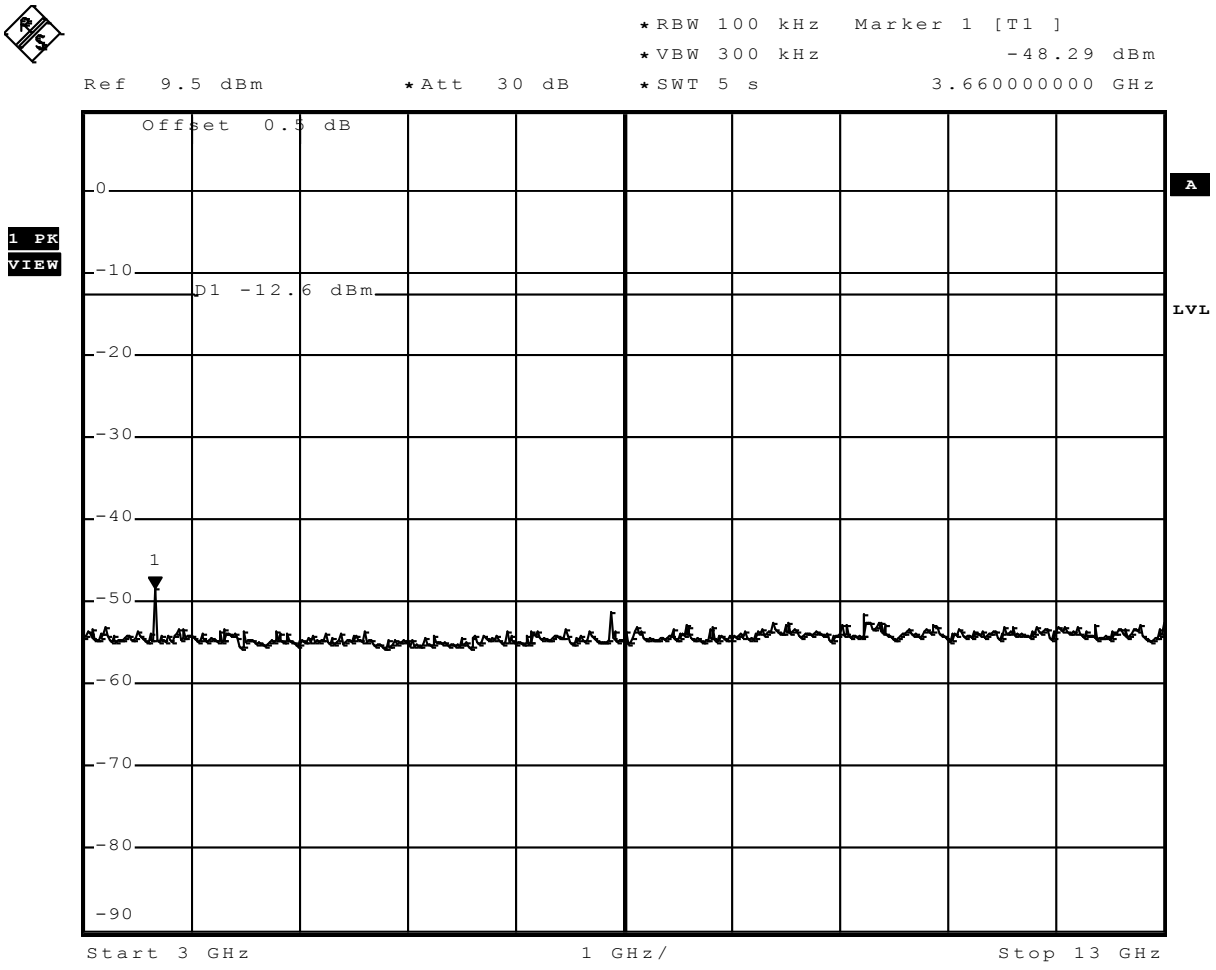


Date: 3.NOV.2011 13:20:43

Conducted spurious emissions – F_{MID}

FCC part 15.247 (d)
Spurious Emissions

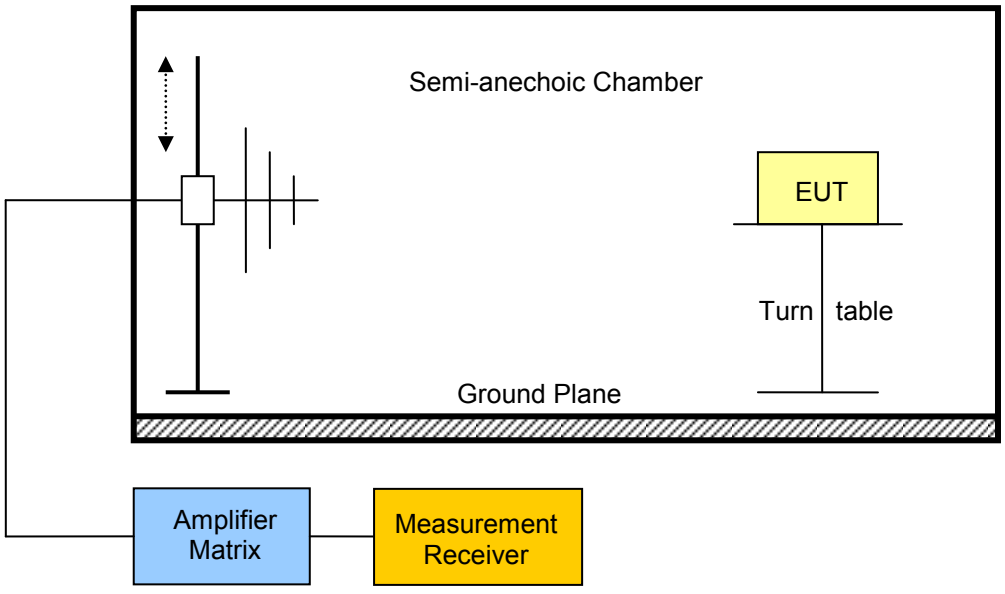
EUT	Transceiver Module
Model	RFRX SW915-4W
Approval Holder	Steute Schaltgeräte GmbH / Ord.: G0M-1110-1448
Temperature / Voltage	25°C, Vnom
Test Site / Operator	Eurofins Product Service GmbH, Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 915 MHz
Comment 3	pass



Date: 3.NOV.2011 13:25:01

3.8 Test Conditions and Results – Transmitter radiated emissions

Transmitter radiated emissions acc. FCC 47 CFR 15.247 / IC RSS-210				**Verdict: PASS**
Test according referenced standards		Reference Method		
		FCC 15.247(d) / IC RSS-210 A8.5		
Test according to measurement reference		Reference Method		
		FCC KDB Publication No. 558074 / ANSI C63.4		
Test frequency range		Tested frequencies		
		30MHz – 10th Harmonic		
EUT test mode		Single		
Limits				
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
> 1000	Average	500	54	3
Radiated emissions which fall in the restricted bands, 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)). When average radiated emission measurements are specified, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.				
Test setup				

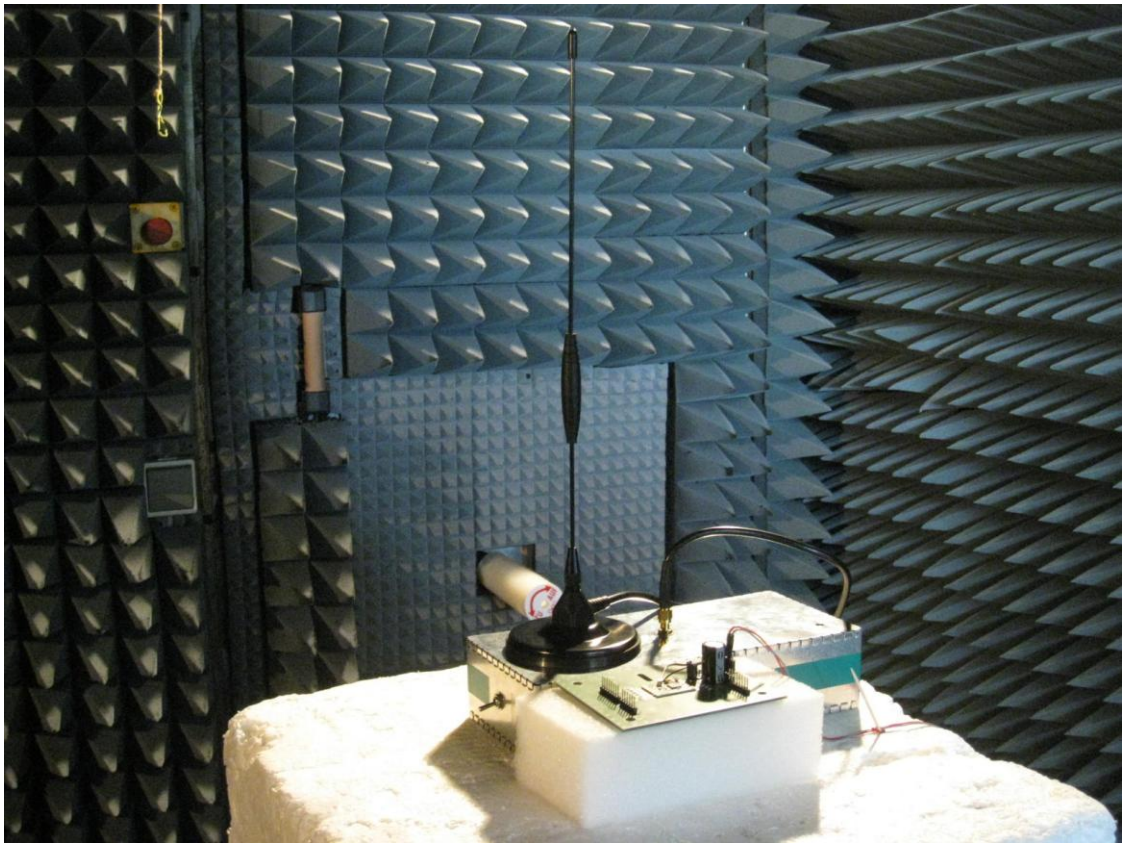


Test procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth below 1GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1MHz with peak/average detector is used above 1GHz 4. Markers are set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

Test results – Internal Antenna

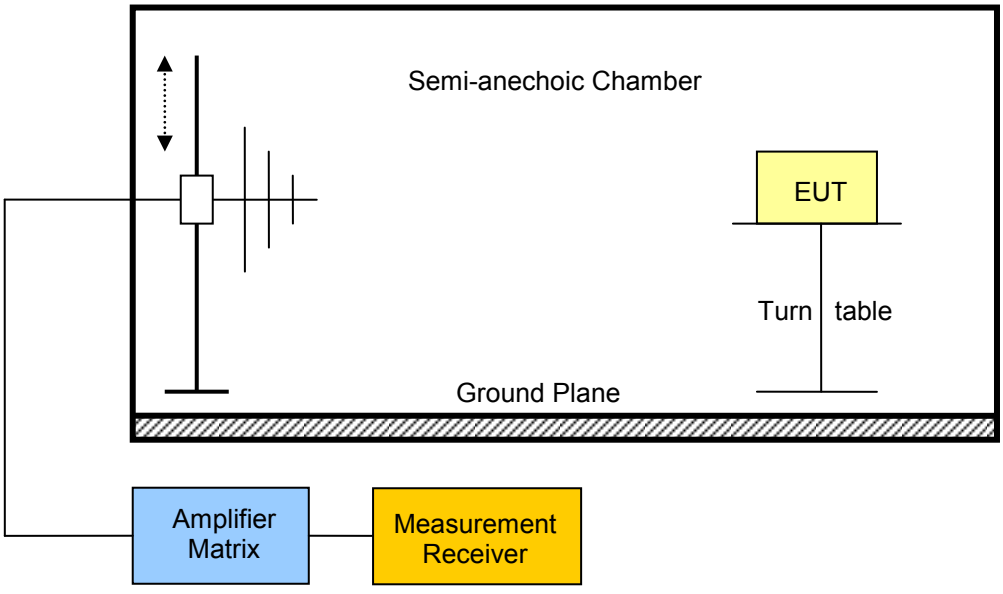
Channel	Frequency [MHz]	Emission [MHz]	Level [dbµV/m]	Detector	Pol.	Limit [dbµV/m]	Limit distance [m]*	Margin [dB]
F_{MID}	915	3663	52.7	pk	ver	74.00	3	-21.30

Comments: * Physical distance between EUT and measurement antenna.

Test setup


3.9 Test Conditions and Results – Receiver radiated emissions

Receiver radiated emissions acc. IC RSS-210				**Verdict: PASS**
Test according referenced standards	Reference Method			
	IC RSS-210 A8.5			
Test according to measurement reference	Reference Method			
	ANSI C63.4			
Test frequency range	Tested frequencies			
	30MHz – 3th Harmonic			
EUT test mode	Receive			
Limits				
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
> 1000	Average	500	54	3
Test setup				



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 1GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1MHz with peak/average detector is used above 1GHz 4. Markers are set to peak emission levels

Test results

Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dbµV/m]	Emission Level [µV/m]	Det.	Limit [µV/m]	Margin [µV/m]
F_{MID}	915MHz	814	27.49	23.686	pk	200.00	-176.31

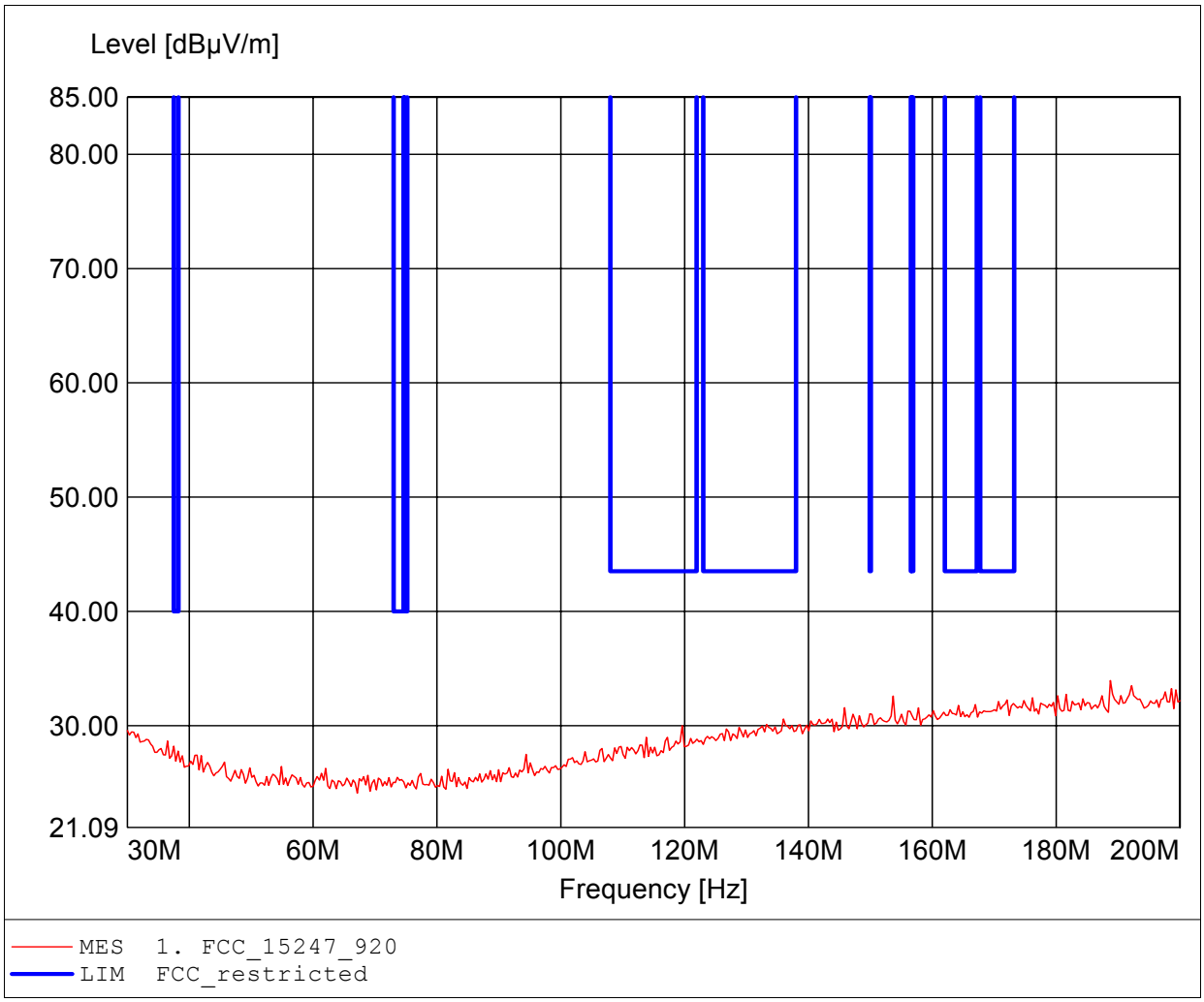
Comments:
* Physical distance between EUT and measurement antenna.

ANNEX A Transmitter radiated spurious emissions

Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

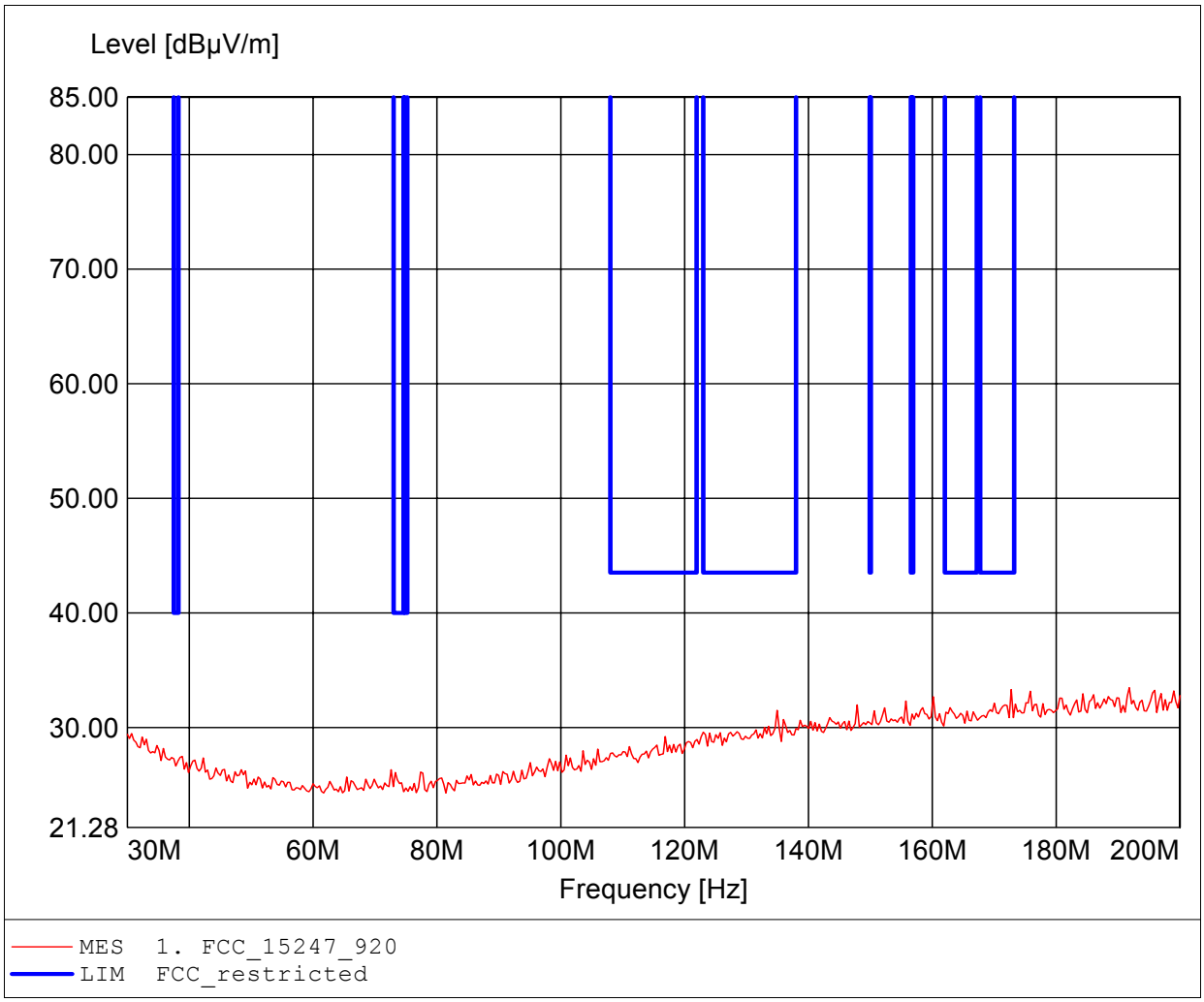
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	according to §15.247
Comment 1:	Dist.: 3m, Ant.: HK 116
Comment 2:	Freq: 188.758MHz, Emax: 33.95dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

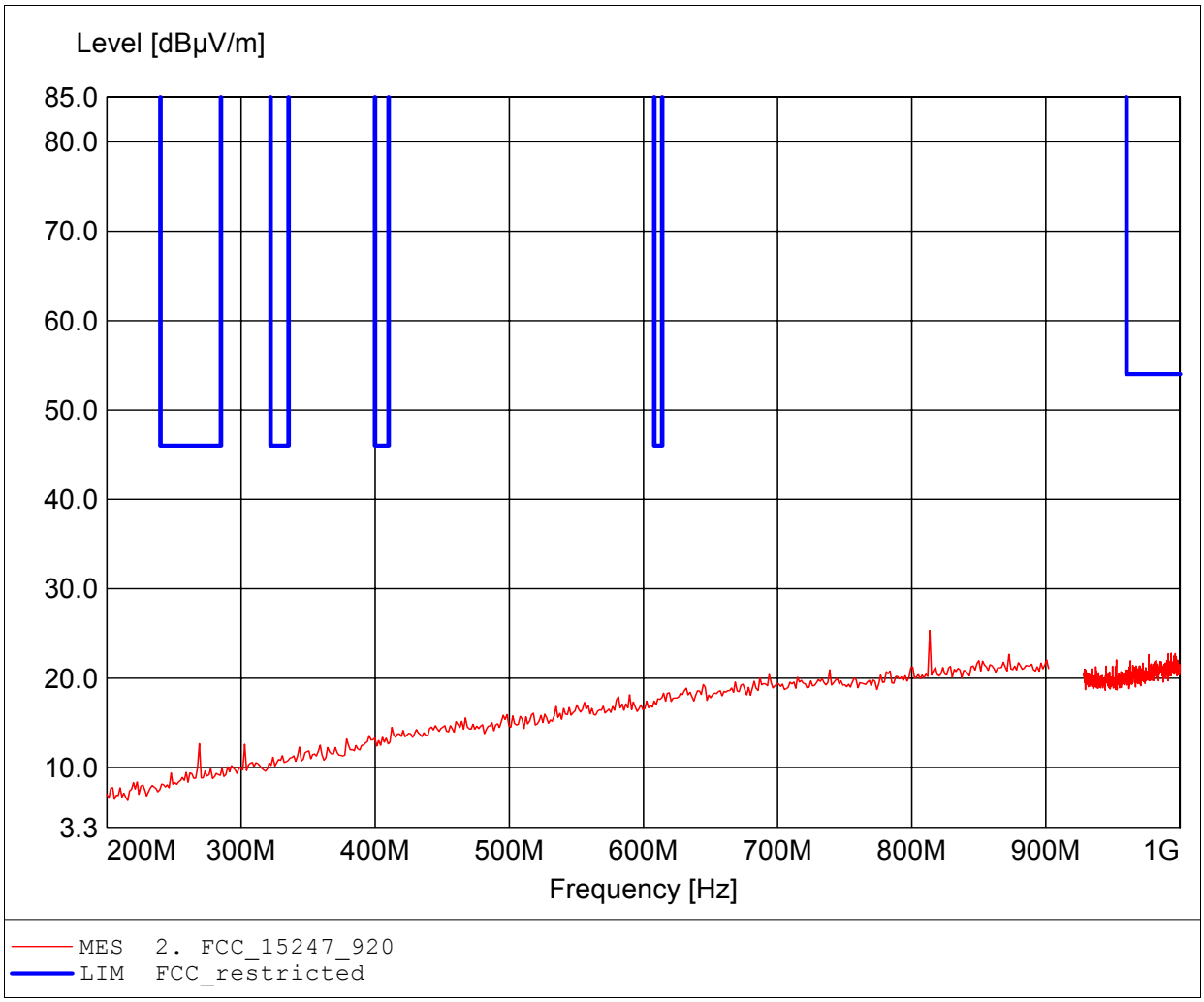
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	according to §15.247
Comment 1:	Dist.: 3m, Ant.: HK 116
Comment 2:	Freq: 191.824MHz, Emax: 33.47dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

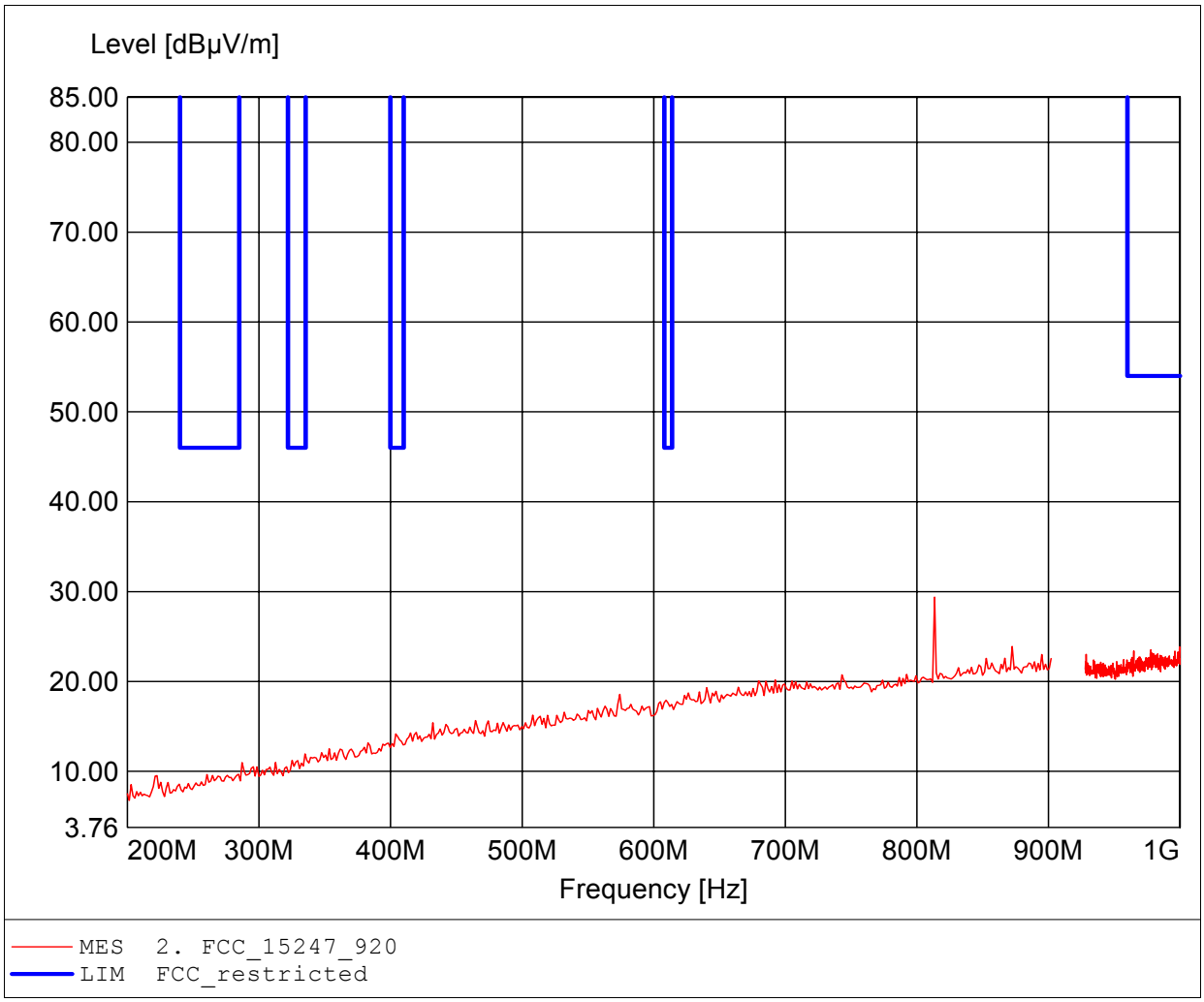
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	according to §15.247
Comment 1:	Dist.: 3m, Ant.: HL 223, amplif.
Comment 2:	Freq: 813.371MHz, Emax: 25.35dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

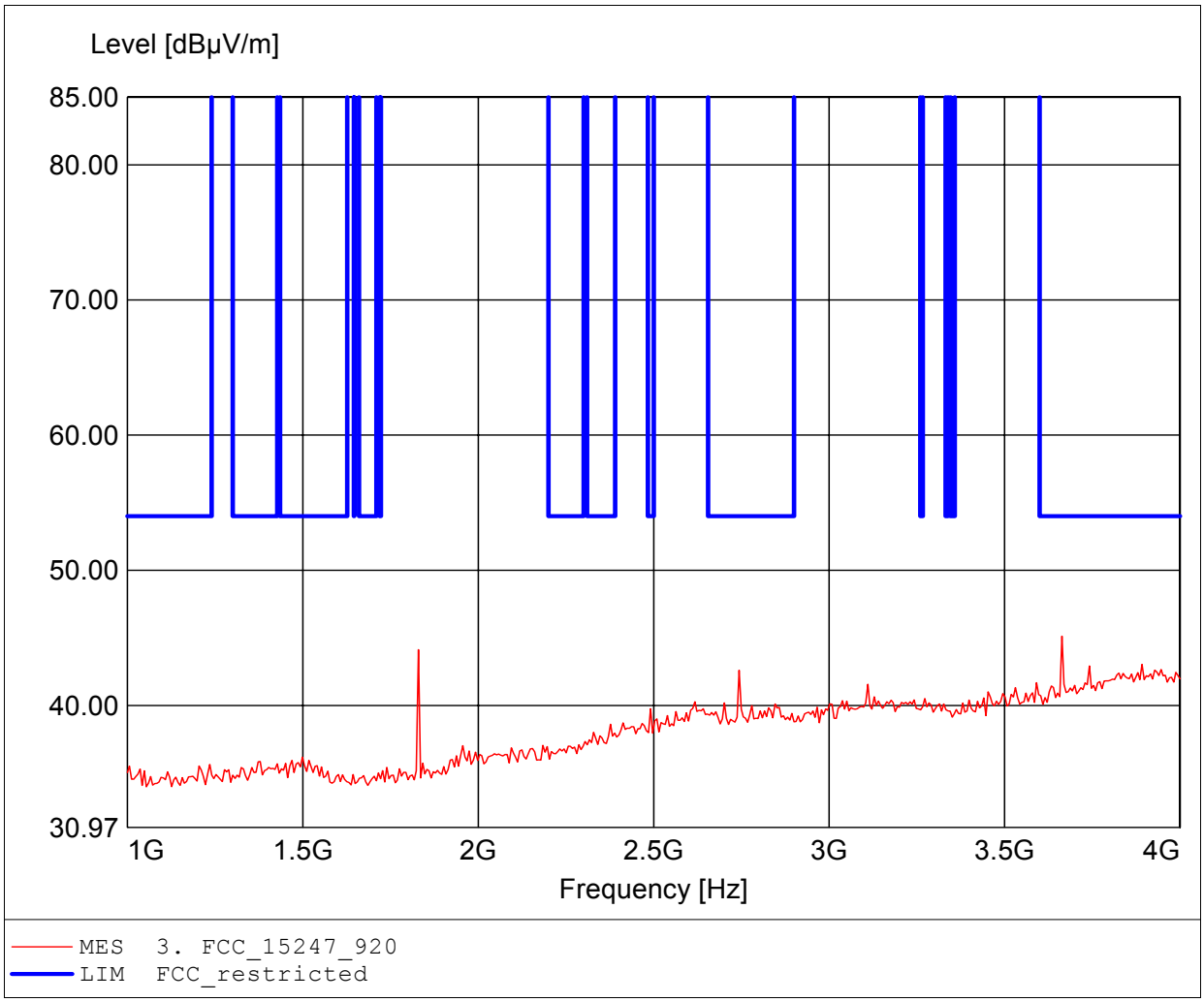
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	according to §15.247
Comment 1:	Dist.: 3m, Ant.: HL 223, amplif.
Comment 2:	Freq: 813.371MHz, Emax: 29.39dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

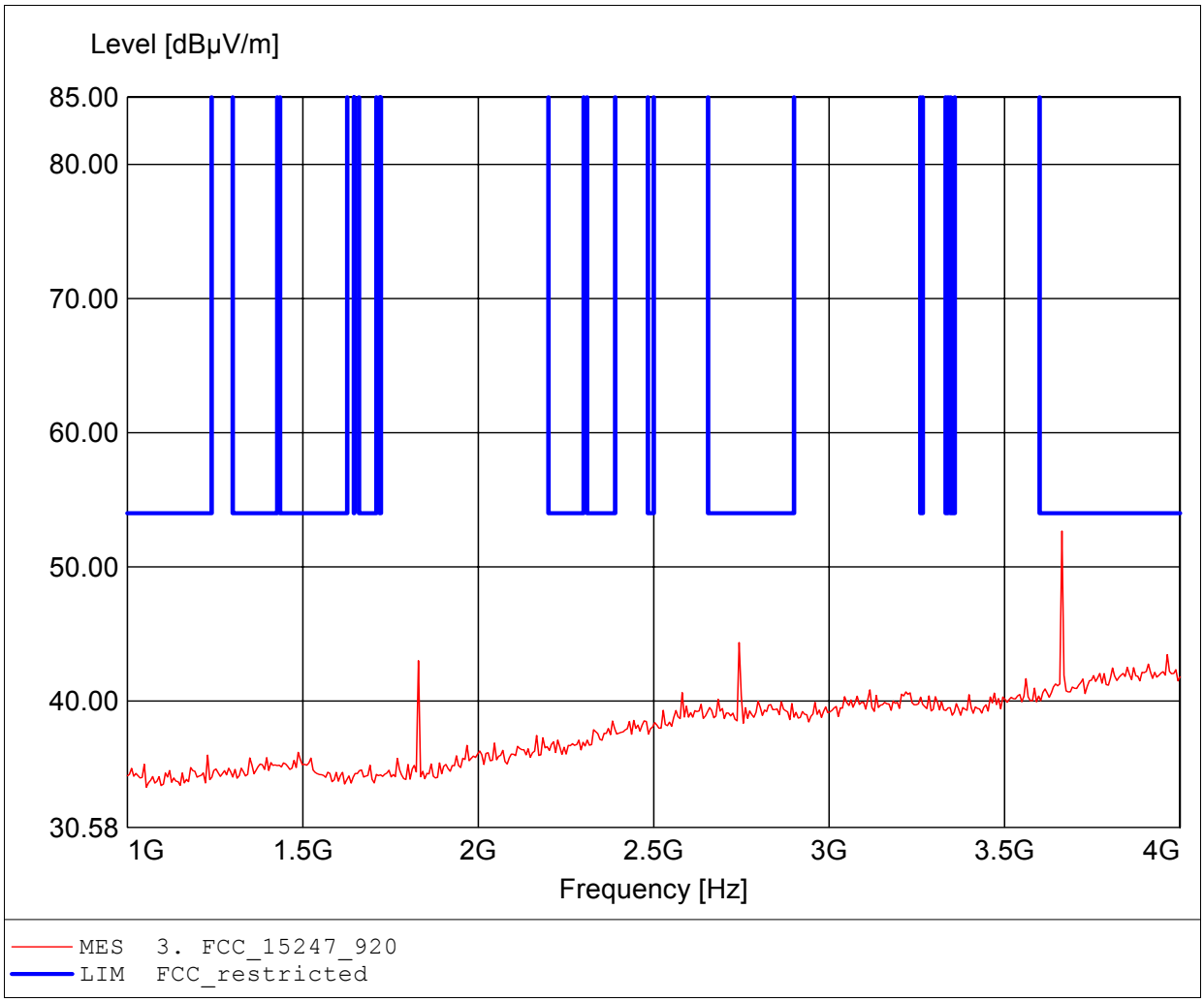
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 3.663GHz, Emax: 45.12dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

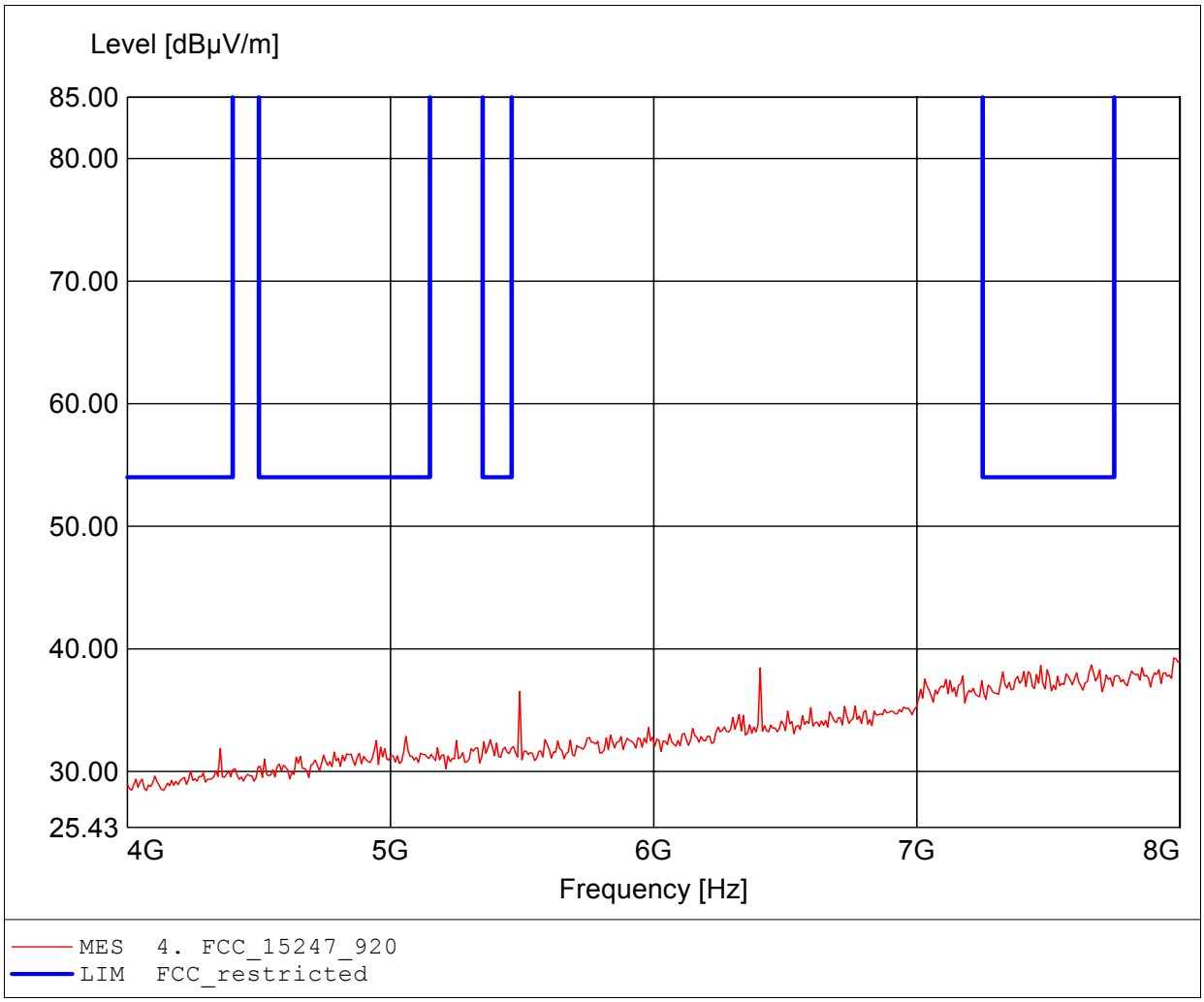
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 3.663GHz, Emax: 52.67dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

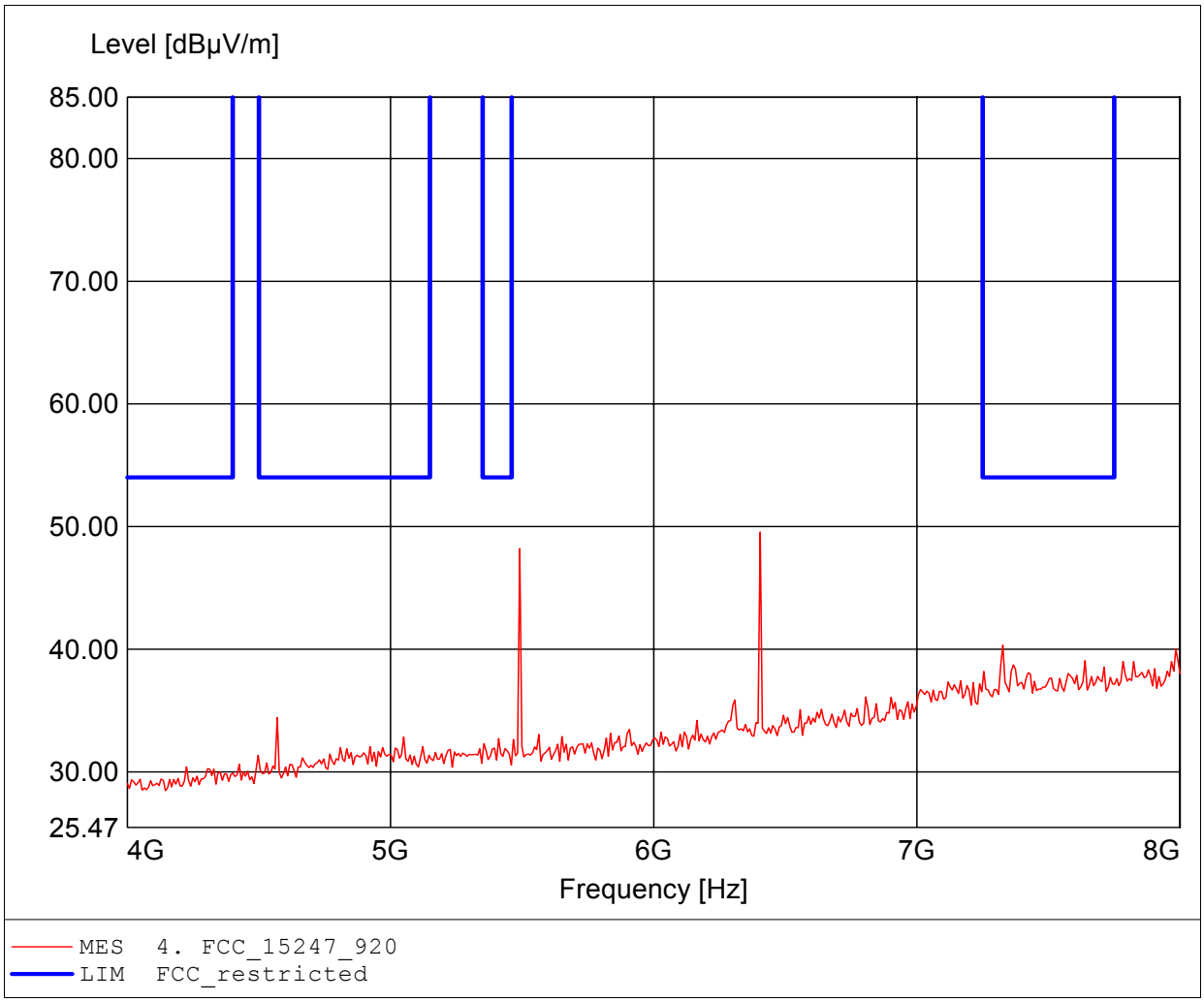
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 7.976GHz, Emax: 39.26dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

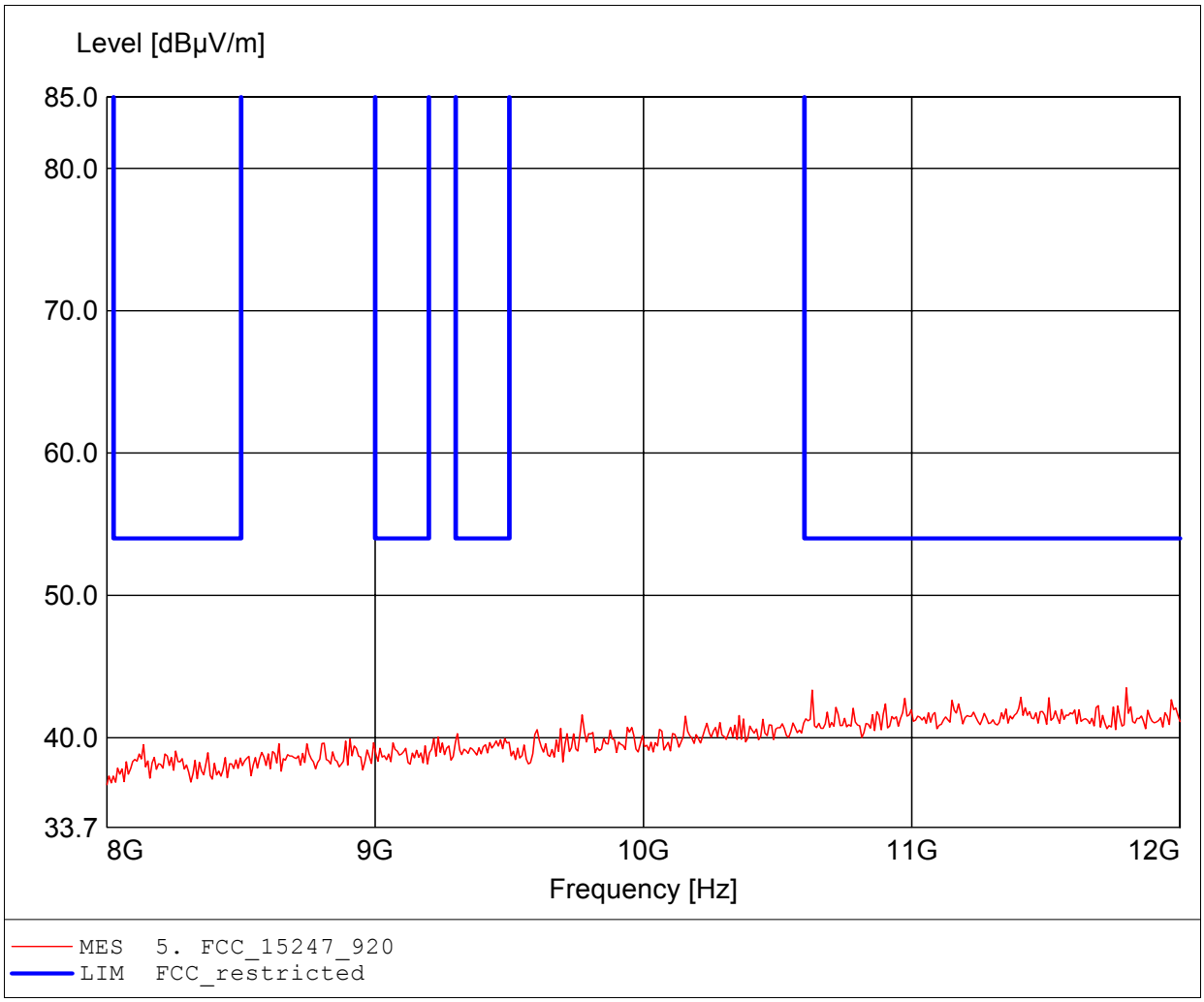
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 6.405GHz, Emax: 49.54dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

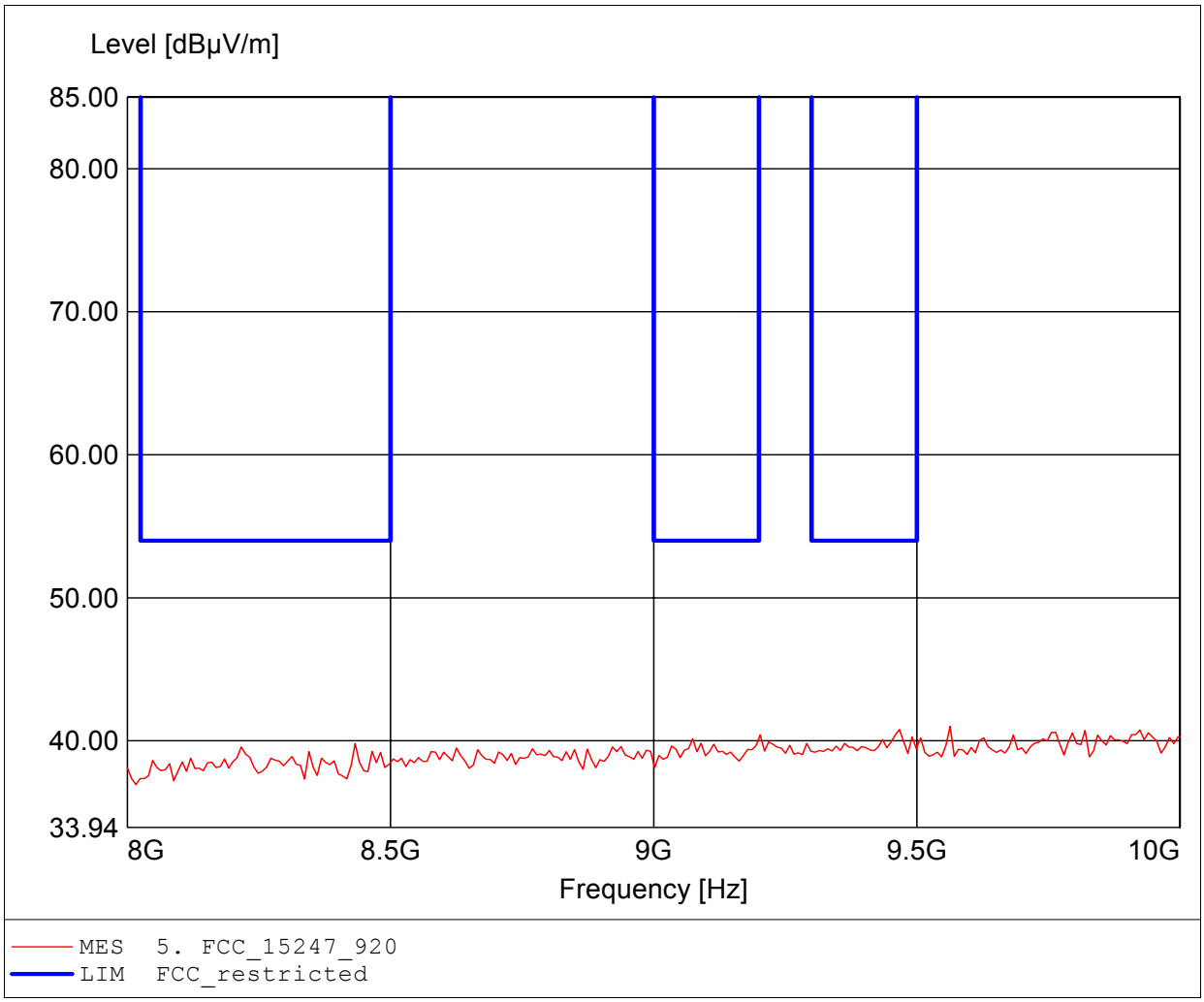
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 11.800GHz, Emax: 43.51dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

```
Approval Holder:       Steute Schaltgeräte GmbH   /   G0M-1110-1448
EUT:                   SRD-Transceiver  Modul
Model:                 RFRX SW915-4W(ext. ant. MC0114037) / setup: Tx,915.0 MHz
Test Site / Operator:  Eurofins Product Service GmbH  /  Mr. Treffke
Test Condition:        Tnom.: 24°C   /   Vnom: 3.3 VDC
Test Specification:    according to §15.247, peak detector
Comment 1:             Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:             Freq: 10.725GHz, Emax: 43.54dBµV/m, RBW: 1MHz
```

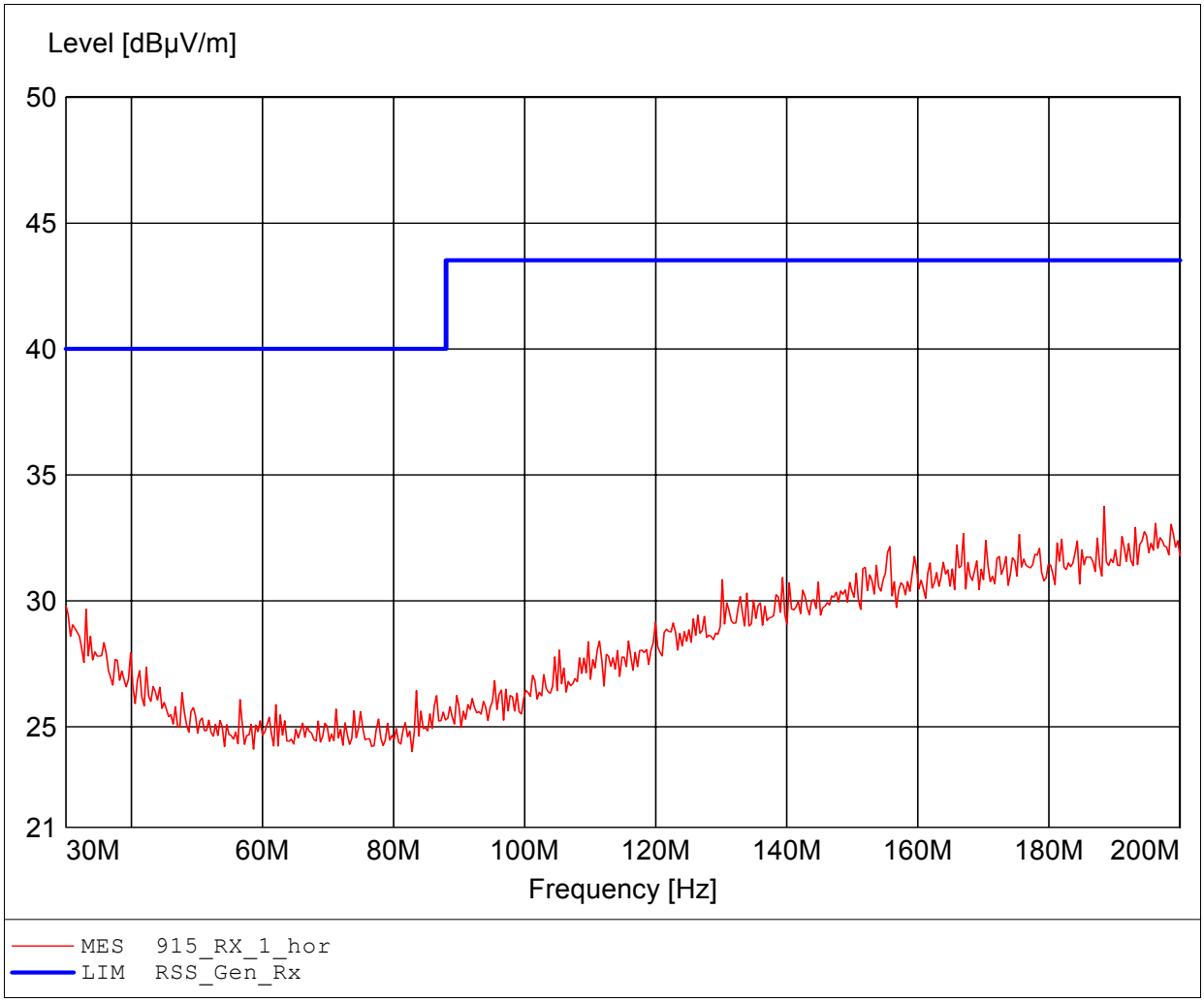


ANNEX B Receiver radiated spurious emissions

Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

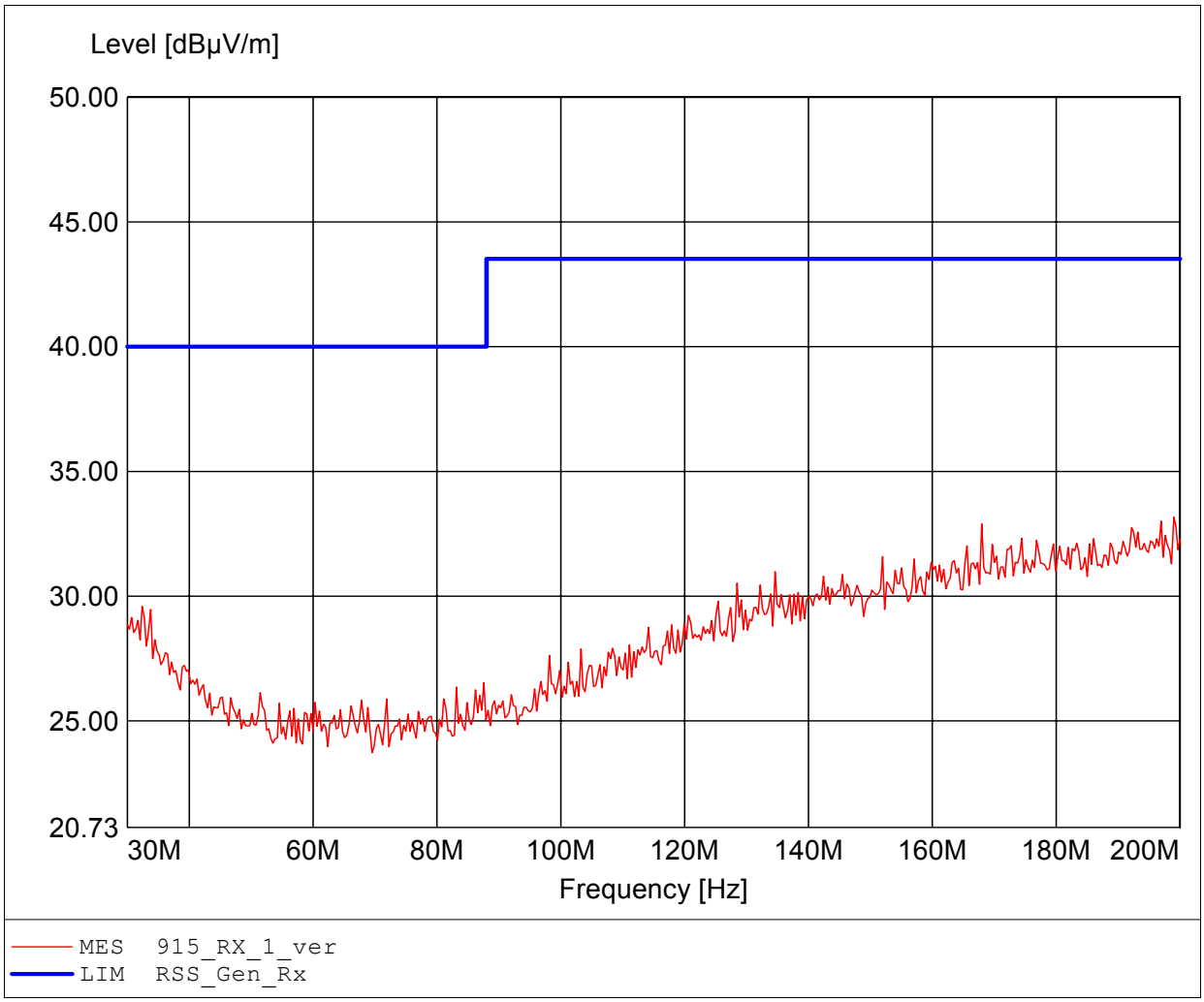
```
Approval Holder:       Steute Schaltgeräte GmbH   /   G0M-1110-1448
EUT:                   SRD-Transceiver  Modul
Model:                 RFRX  SW915-4W(ext. ant. MC0114037) / setup: Rx,915.0 MHz
Test Site / Operator:  Eurofins Product Service GmbH  /  Mr. Treffke
Test Condition:        Tnom.: 24°C   /   Vnom: 3.3 VDC
Test Specification:    Freq. / CH: 915
Comment 1:             Dist.: 3m, Ant.: HK 116
Comment 2:             Freq:188.417MHz Emax:33.74dBµV/m RBW: 100 kHz
```



Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

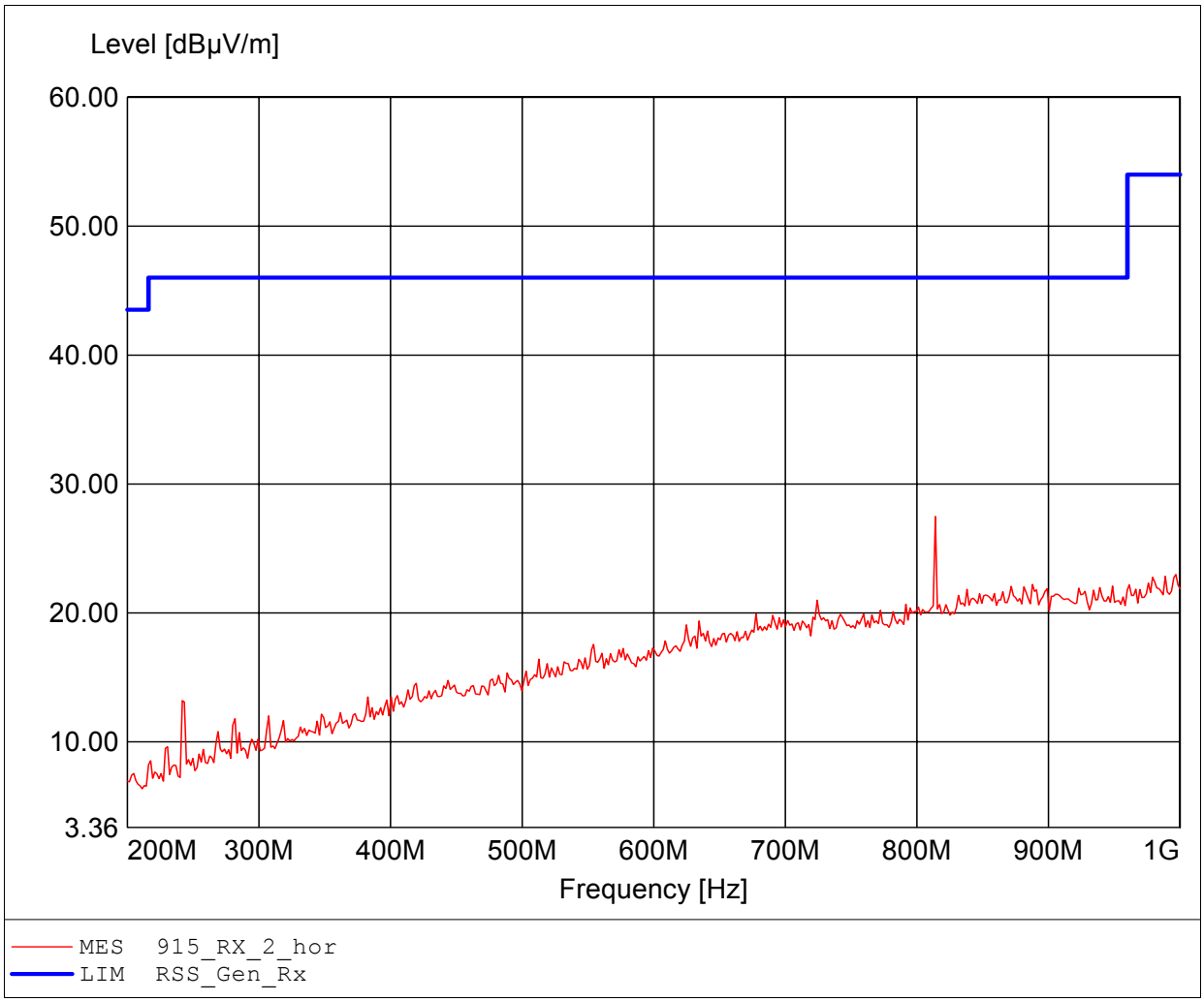
Approval Holder:	Steute Schaltgeräte GmbH / G0M-1110-1448
EUT:	SRD-Transceiver Modul
Model:	RFRX SW915-4W(ext. ant. MC0114037) / setup: Rx,915.0 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom.: 24°C / Vnom: 3.3 VDC
Test Specification:	Freq. / CH: 915
Comment 1:	Dist.: 3m, Ant.: HK 116
Comment 2:	Freq:198.978MHz Emax:33.17dBµV/m RBW: 100 kHz



Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

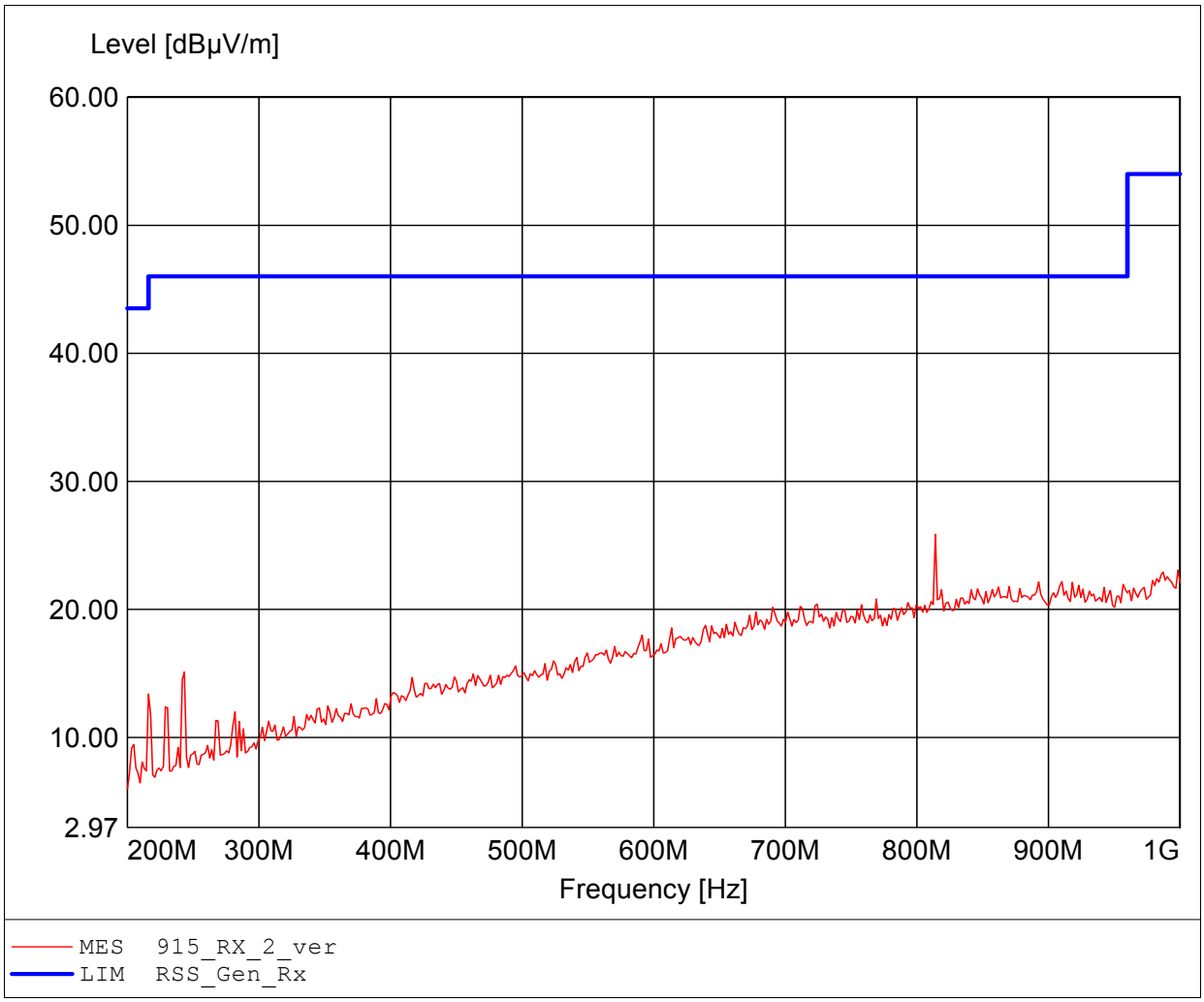
```
Approval Holder:       Steute Schaltgeräte GmbH   /   G0M-1110-1448
EUT:                   SRD-Transceiver  Modul
Model:                 RFRX  SW915-4W(ext. ant. MC0114037) / setup: Rx,915.0 MHz
Test Site / Operator:  Eurofins Product Service GmbH  /  Mr. Treffke
Test Condition:        Tnom.: 24°C   /   Vnom: 3.3 VDC
Test Specification:    Freq. / CH: 915
Comment 1:             Dist.: 3m, Ant.: HL 223, ampl.
Comment 2:             Freq:814.028MHz Emax:27.49dBµV/m RBW: 100 kHz
```



Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

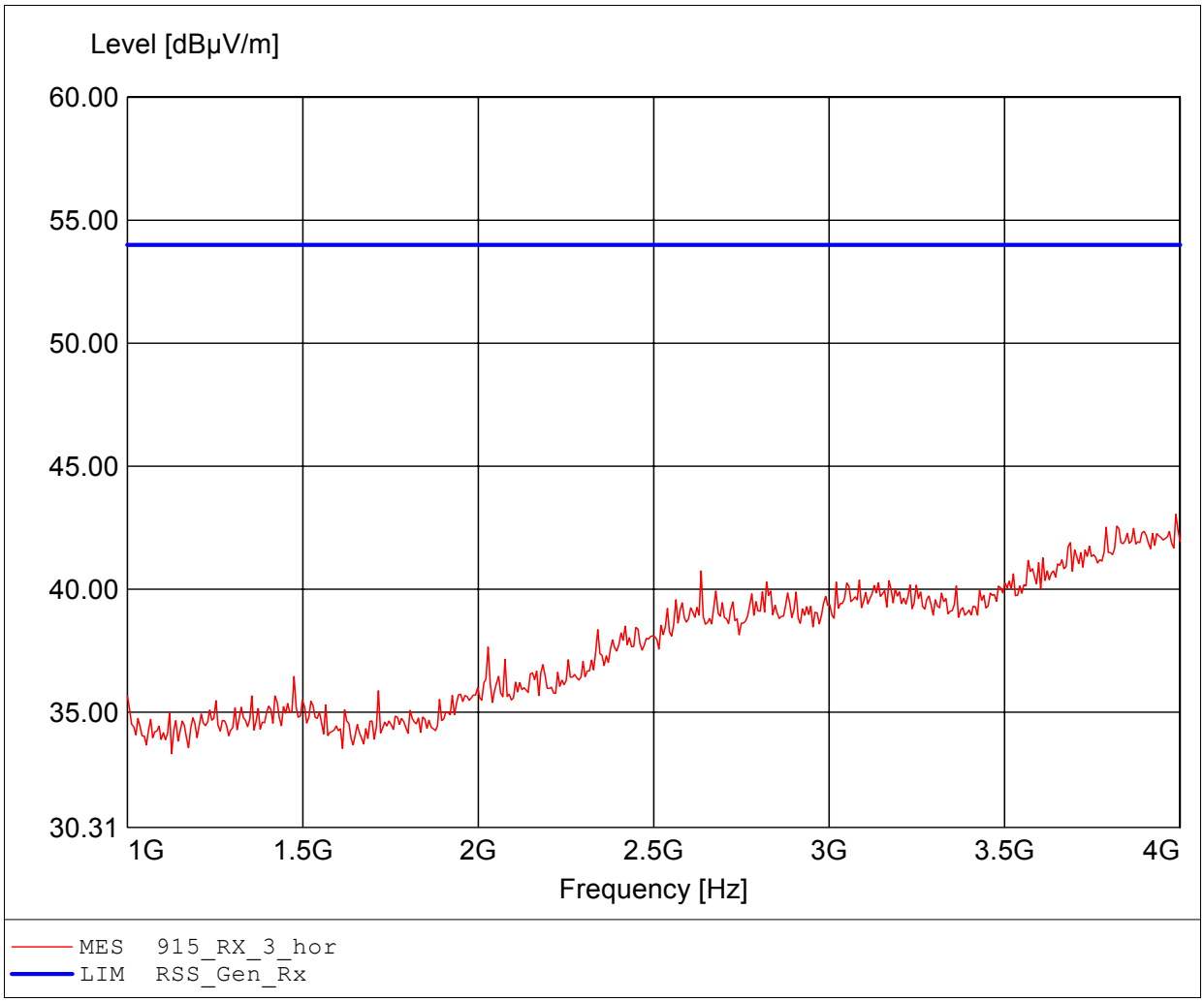
```
Approval Holder:       Steute Schaltgeräte GmbH   /   G0M-1110-1448
EUT:                   SRD-Transceiver  Modul
Model:                 RFRX  SW915-4W(ext. ant. MC0114037) / setup: Rx,915.0 MHz
Test Site / Operator:  Eurofins Product Service GmbH  /  Mr. Treffke
Test Condition:        Tnom.: 24°C   /   Vnom: 3.3 VDC
Test Specification:    Freq. / CH: 915
Comment 1:             Dist.: 3m, Ant.: HL 223, ampl.
Comment 2:             Freq:814.028MHz Emax:25.86dBµV/m RBW: 100 kHz
```



Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

```
Approval Holder:       Steute Schaltgeräte GmbH   /   G0M-1110-1448
EUT:                   SRD-Transceiver  Modul
Model:                 RFRX  SW915-4W(ext. ant. MC0114037) / setup: Rx,915.0 MHz
Test Site / Operator:  Eurofins Product Service GmbH  /  Mr. Treffke
Test Condition:        Tnom.: 24°C   /   Vnom: 3.3 VDC
Test Specification:    Freq. / CH: 915
Comment 1:             Dist.: 3m, Ant.: HL025, ampl.
Comment 2:             Freq:3.988GHz Emax:43.05dBµV/m RBW: 1 MHz
```



Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

```
Approval Holder:       Steute Schaltgeräte GmbH   /   G0M-1110-1448
EUT:                   SRD-Transceiver  Modul
Model:                 RFRX  SW915-4W(ext. ant. MC0114037) / setup: Rx,915.0 MHz
Test Site / Operator:  Eurofins Product Service GmbH  /  Mr. Treffke
Test Condition:        Tnom.: 24°C   /   Vnom: 3.3 VDC
Test Specification:    Freq. / CH: 915
Comment 1:             Dist.: 3m, Ant.: HL025, ampl.
Comment 2:             Freq:3.964GHz Emax:43.22dBµV/m RBW: 1 MHz
```