EMI – TEST REPORT

- FCC Part 15.225, RSS210 A2.6 -

Type / Model Name	:	RF310R-G2, RF340R-G2, RF350R-G2
Product Description	:	RFID reader 13.56MHz
Applicant	:	Siemens AG
Address	:	Gleiwitzer Str. 555
		90475 Nürnberg
		GERMANY
Manufacturer	:	Siemens AG
Address	:	Östliche Rheinbrückenstr. 50
		76187 Karlsruhe
		GERMANY

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Test Report No. : T40265-00-06JP	04. July 2016 Date of issue

Deutsche Akkreditierungsstelle
D-PL-12030-01-01
D-PL-12030-01-02

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (February, 2016)

FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (February, 2016)

Part 15, Subpart C, Section 15.207	Conducted limits
Part 15, Subpart C, Section 15.209	Radiated emission limits, general requirements
Part 15, Subpart C, Section 15.225	Operation within the band 13.110 - 14.010 MHz

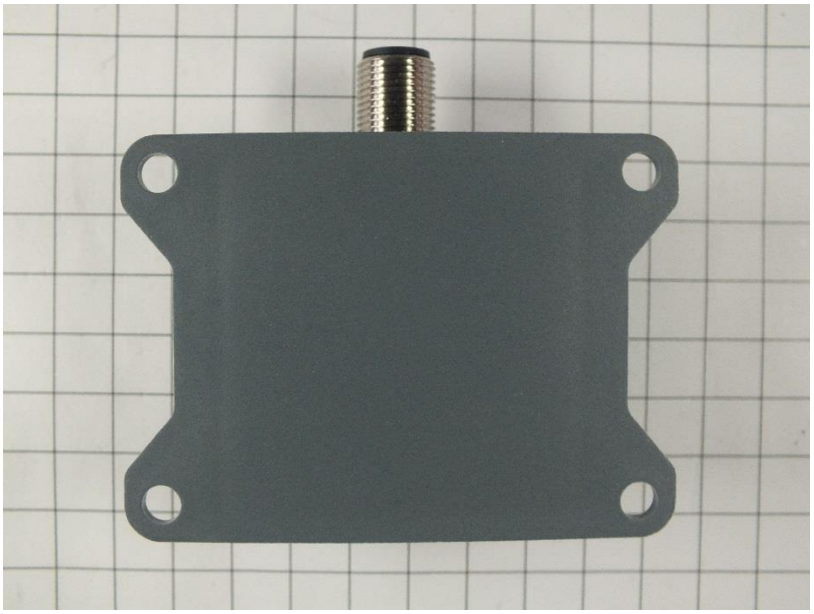
RSS-Gen Issue 4, Nov 2014	General Requirements and Information for the Certification of Radio Apparatus
RSS-210 Issue 8, Dec 2010	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

ANSI C63.10: 2013	Testing Unlicensed Wireless Devices

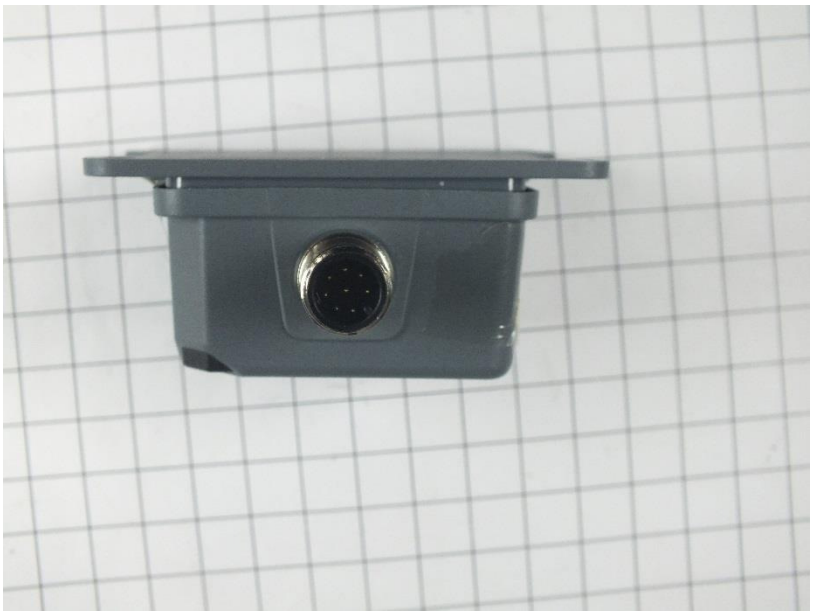
2 EQUIPMENT UNDER TEST

2.1 Photo documentation of the EUT

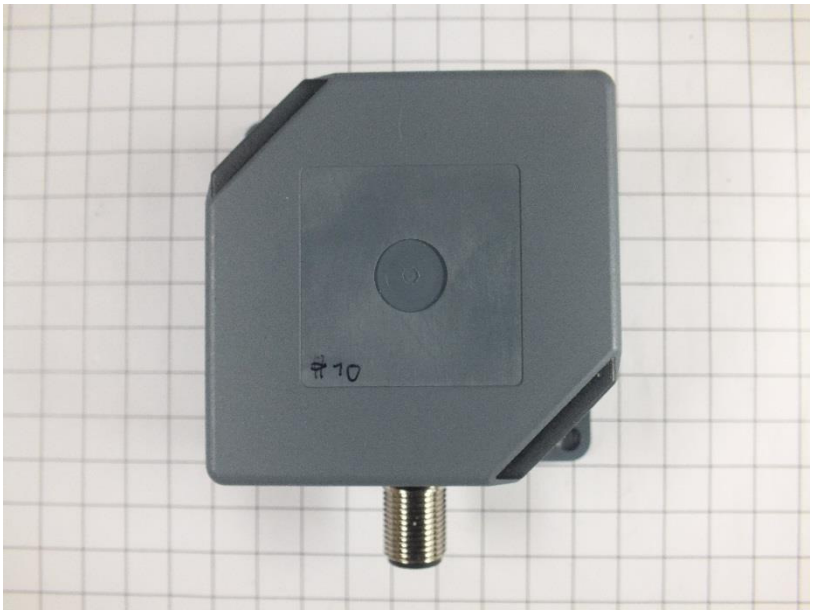
RF310R-G2



RF310R-G2



RF340R-G2




MODEL: SIMATIC RF340R
FCC ID NXW-RF340R
IC 267X-RF340R
Sistema de RFID para uso Industrial
Marca: SIEMENS
Modelo: RF340R/Nr.
IFETEL: XXXXXXXXXX
CMIIT-ID: XXXXXXX
ANATEL
XXXX-XX-XXXX
(01)XXXXXXXXXXXXX

RF340R-G2


SIEMENS
SIMATIC 4F340R
Made in Germany
Sample only,
not for sale


V4
FBG
Nr. 8
Linear

RF350R-G2

RF350R-G2

RF350R-G2

2.2 Equipment category

RFID device; operating frequency 13.56MHz

2.3 Short description of the equipment under test (EUT)

The EuTs are RFID reader using the frequency 13.56MHz. The RF310R-G2 and the RF340R-G2 have an internal antenna. RF350R-G2 has an external antenna connector.

Number of tested samples: 1
Serial number: none

EUT configuration:
(The CDF filled by the applicant can be viewed at the test laboratory.)

2.4 Operation frequency

The operating frequency is 13.56MHz.

2.5 Antenna

RF310R-G2		
Model name	Brand	perfomed tests on EuT/antenna combination
internal	--	field strength of fundamental, spurious emissions, AC power line
RF340R-G2		
Model name	Brand	perfomed tests on EuT/antenna combination
internal	--	field strength of fundamental, spurious emissions, AC power line
RF350R-G2:		
Model name	Brand	perfomed tests on EuT/antenna combination
ANT1	Siemens	full (highest TX power)
ANT3	Siemens	field strength of fundamental, spurious emissions
ANT3s	Siemens	field strength of fundamental, spurious emissions
ANT8	Siemens	field strength of fundamental, spurious emissions
ANT12	Siemens	field strength of fundamental, spurious emissions
ANT18	Siemens	field strength of fundamental, spurious emissions
ANT30	Siemens	field strength of fundamental, spurious emissions

EUT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- continous TAG reading/writing 112 Byte @ 13.56MHz

2.6 Power supply system utilised

Power supply voltage : 24 V / DC

2.7 Peripheral devices and interface cables

The following peripheral devices and interface cables are connected during the measurements:

- Control Unit (PLC) Model : SIMATIC S7-300, Siemens AG

3 SUMMARY

3.1 Test results

FCC Rule Part	RSS Rule Part	Description	Result
15.207	RSS Gen, 8.8	AC power line conducted emissions	passed
15.225	RSS-210, A2.6	Field strength of fundamental	passed
15.209	RSS Gen, 8.9	Spurious emissions	passed
15.225	RSS-210, A2.6	Frequency tolerance	passed
15.215	RSS-Gen, 6.6	Occupied bandwidth	passed
15.225	RSS-210, A2.6	Transmitter spectrum mask	passed

3.2 General Remarks:

The EuT was tested together with Siemens TAG MDS D426 supplied by client.
For RF350R-G2 full testing was performed with ANT1 (higest TX power). For remaining antennas/models partial testing was performed, refer to subclause 2.5 of this report.

3.3 Final assessment

The equipment under test fulfills the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 20 April 2016

Testing concluded on : 16 June 2016

Checked by:

Klaus Gegenfurtner
I confirm the correctness and Integrity of this document
2016.07.05 08:05:59 +02'00'

Klaus Gegenfurtner
Teamleader Radio

Tested by:

Jürgen Pessinger
2016.07.04 16:01:08 +02'00'

Jürgen Pessinger

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

CSA Group Bayern GmbH
Ohmstrasse 1-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor k = 2. The true value is located in the corresponding interval with a probability of 95 % The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 / 11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, CSA Group Bayern GmbH, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Measurement Type	**Range**	**Confidence Level (%)**	**Calculated Uncertainty**
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
20 dB Bandwidth	Center frequency of EuT	95%	± 2.5 x 10^{-7}
99% Occupied Bandwidth	Center frequency of EuT	95%	± 2.5 x 10^{-7}
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	± 3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	± 3.71 dB
Radiated Spurious Emissions	1000 MHz to 10000 MHz	95%	± 2.34 dB
Peak conducted output power	902 MHz to 928 MHz	95%	± 0.35 dB
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	± 2.15 dB

4.4 Measurement protocol for FCC and IC

4.4.1 General information

4.4.1.1 Test methodology

Conducted and radiated disturbance testing is performed according to the procedures set out by the International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

The Open Area test sites are listed Open Sites under the Canadian Test-Sites File-No:

IC 3009A-1 (OATS1) **and IC 3009A-3** (OATS3)

The anechoic chamber site is listed chamber under the Canadian Test-Sites File-No:

IC 3009A-2

In compliance with RSS 210 testing for RSS compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

4.4.1.2 Justification

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.1.3 Details of test procedures

The test methods used comply with CISPR Publication 22, EN 55022 - " Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". In compliance with 47 CFR Part 15 Subpart A, Section 15.38 testing for FCC compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

5 TEST CONDITIONS AND RESULTS

5.1 AC power line conducted emissions

For test instruments and accessories used see section 6 Part **A 4**.

5.1.1 Description of the test location

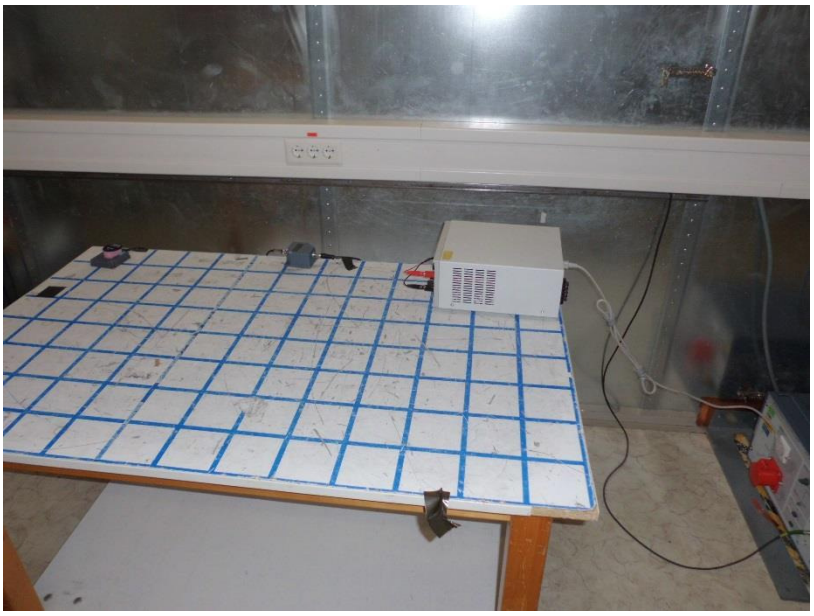
Test location: Shielded Room S2

5.1.2 Photo documentation of the test set-up

RF 310R-G2

RF 340R-G2

RF 350R-G2



5.1.3 Applicable standard

FCC Part 15, Section 15.207 and RSS-Gen 8.8

5.1.4 Test result

Frequency range: 0.15 MHz - 30 MHz
Min. limit margin 2.97 dB at 13.56 MHz

Limit according to FCC Part 15, Section 15.207(a) and RSS-Gen 8.8 Table 3:

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

* Decreases with the logarithm of the frequency

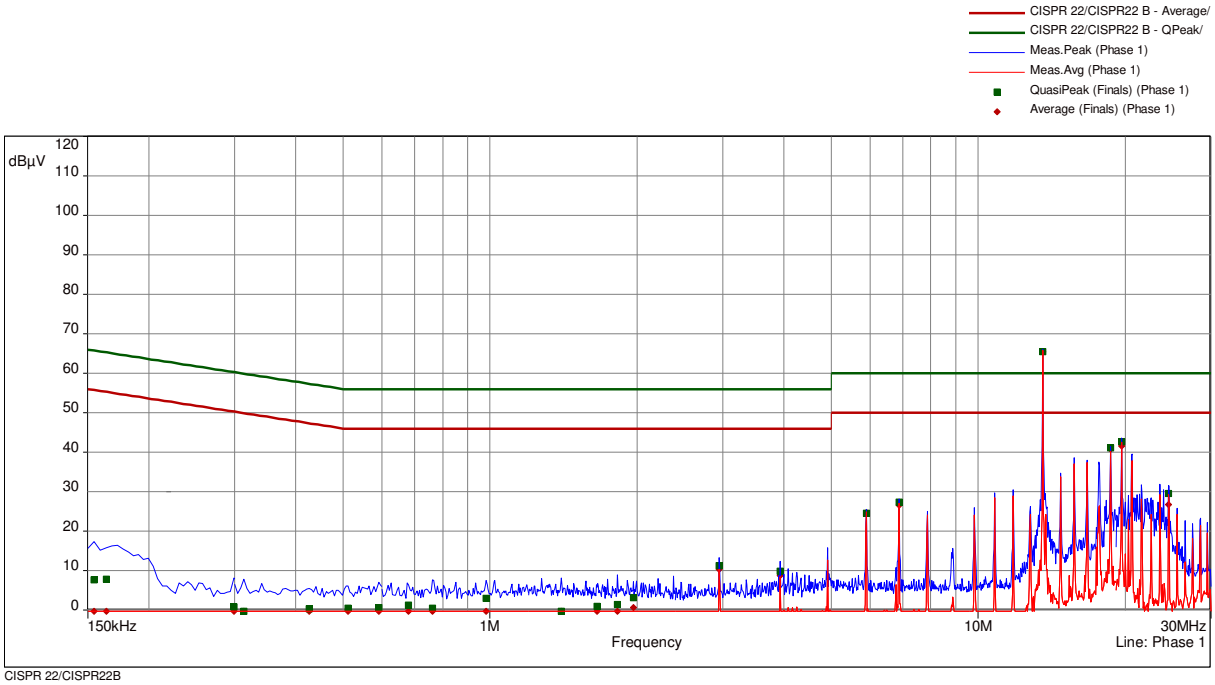
The requirements are **FULFILLED.**

Remarks: Test was performed on the AC input of the used AC/DC power supply (CSA ID: 01-05/50-11-011)

The test was performed with antenna connected. Measurement was repeated with 50Ohm termination of the antenna port for the fundamental frequency (according to KDB 174176D01)

5.1.5 Test protocol

Test point	L1	Result: PASSED
Operation mode:	continous TAG reading/writing 112 Byte @ 13.56MHz	
Remarks:	RF310R-G2, internal antenna connected	

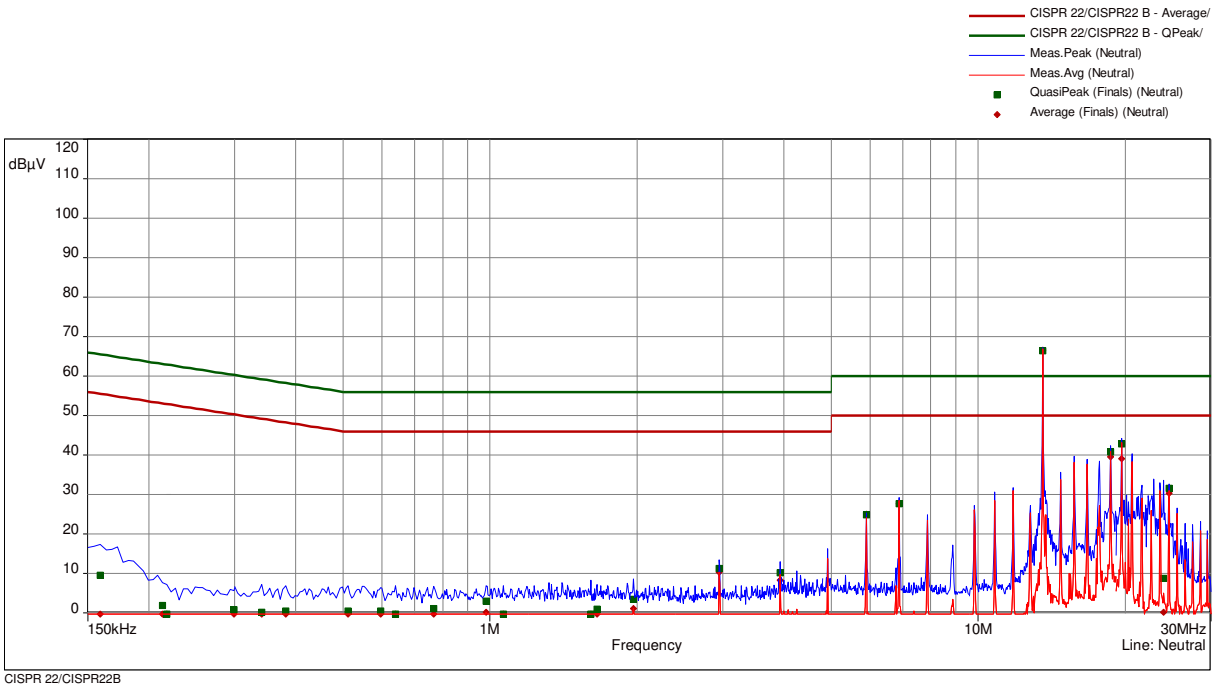


freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.1545	7.70	58.05	65.75	-2.62	58.37	55.75	Phase 1	9.84
0.1635	7.85	57.43	65.28	-2.77	58.06	55.28	Phase 1	9.84
0.2985	0.85	59.43	60.28	-2.57	52.85	50.28	Phase 1	9.82
0.3135	-1.29	61.17	59.88	-4.38	54.26	49.88	Phase 1	9.82
0.426	0.38	56.95	57.33	-2.88	50.21	47.33	Phase 1	9.81
0.5115	0.45	55.55	56.00	-2.77	48.77	46.00	Phase 1	9.82
0.5925	0.65	55.35	56.00	-2.55	48.55	46.00	Phase 1	9.82
0.681	1.23	54.77	56.00	-1.82	47.82	46.00	Phase 1	9.81
0.762	0.50	55.50	56.00	-2.41	48.41	46.00	Phase 1	9.80
0.9825	2.98	53.02	56.00	0.00	46.00	46.00	Phase 1	9.82
1.398	-0.83	56.83	56.00	-3.58	49.58	46.00	Phase 1	9.79
1.659	1.01	54.99	56.00	-1.94	47.94	46.00	Phase 1	9.79
1.8255	1.46	54.54	56.00	-1.61	47.61	46.00	Phase 1	9.80
1.965	3.07	52.93	56.00	0.69	45.31	46.00	Phase 1	9.81
2.949	11.19	44.81	56.00	10.32	35.68	46.00	Phase 1	9.79
3.93	9.84	46.16	56.00	8.70	37.30	46.00	Phase 1	9.81
5.898	24.61	35.39	60.00	24.66	25.34	50.00	Phase 1	9.83
6.8835	27.28	32.72	60.00	26.50	23.50	50.00	Phase 1	9.84
13.56*	65.41	-5.41	60.00	65.51	-15.51	50.00	Phase 1	10.04
18.681	41.15	18.85	60.00	40.73	9.27	50.00	Phase 1	10.27
19.6635	42.73	17.27	60.00	41.55	8.45	50.00	Phase 1	10.32
24.5775	29.57	30.43	60.00	26.67	23.33	50.00	Phase 1	10.35

* fundamental frequency, retested with 50Ohm termination

Test point: N
Operation mode: continous TAG reading/writing 112 Byte @ 13.56MHz
Remarks: RF310R-G2, internal antenna connected

Result: PASSED

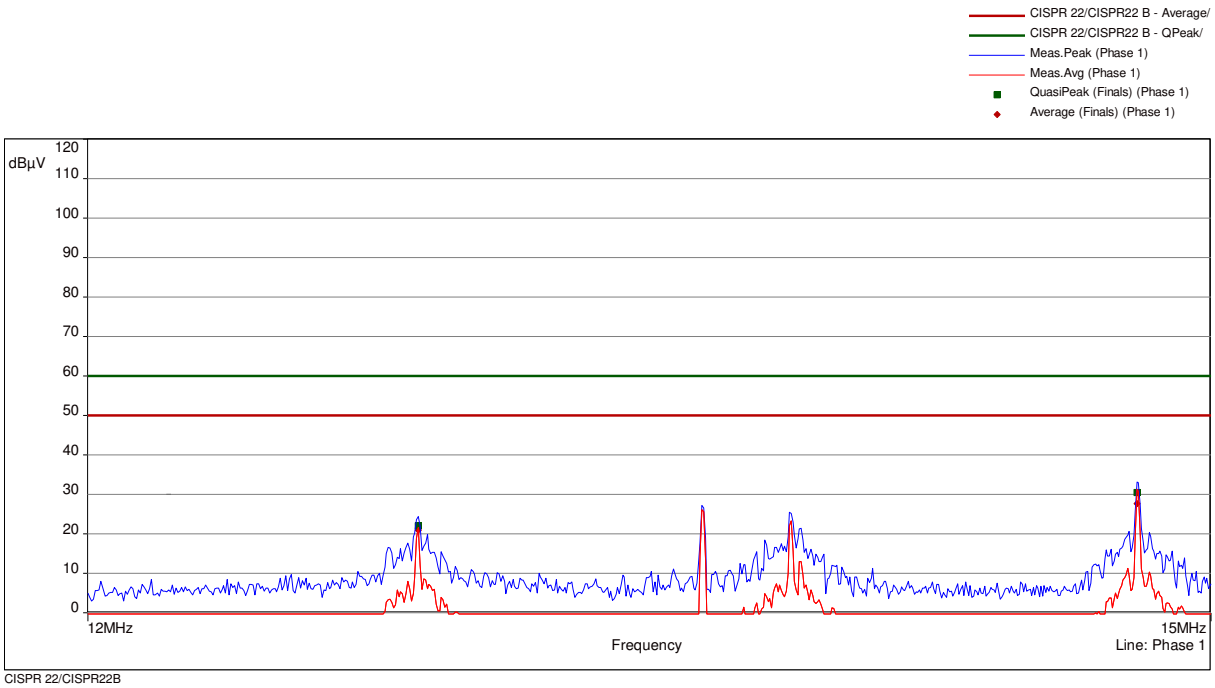


CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.159	9.48	56.04	65.52	-2.25	57.76	55.52	Neutral	9.85
0.213	1.87	61.22	63.09	-2.17	55.26	53.09	Neutral	9.85
0.2175	-0.24	63.15	62.91	-3.62	56.53	52.91	Neutral	9.85
0.2985	0.85	59.43	60.28	-2.54	52.83	50.28	Neutral	9.82
0.3405	0.23	58.96	59.19	-3.26	52.45	49.19	Neutral	9.81
0.381	0.44	57.82	58.26	-2.91	51.16	48.26	Neutral	9.81
0.5115	0.52	55.48	56.00	-2.74	48.74	46.00	Neutral	9.82
0.597	0.52	55.48	56.00	-2.64	48.64	46.00	Neutral	9.82
0.6405	-1.63	57.63	56.00	-4.49	50.49	46.00	Neutral	9.81
0.7665	1.16	54.84	56.00	-1.89	47.89	46.00	Neutral	9.80
0.9825	2.93	53.07	56.00	0.13	45.87	46.00	Neutral	9.82
1.0635	-0.73	56.73	56.00	-4.00	50.00	46.00	Neutral	9.81
1.6095	-1.92	57.92	56.00	-4.82	50.82	46.00	Neutral	9.79
1.659	0.95	55.05	56.00	-1.97	47.97	46.00	Neutral	9.79
1.965	3.42	52.58	56.00	1.10	44.90	46.00	Neutral	9.81
2.949	11.19	44.81	56.00	10.34	35.66	46.00	Neutral	9.79
3.9345	10.10	45.90	56.00	8.27	37.73	46.00	Neutral	9.81
5.898	24.92	35.08	60.00	24.95	25.05	50.00	Neutral	9.81
6.8835	27.73	32.27	60.00	27.62	22.38	50.00	Neutral	9.81
13.56*	66.49	-6.49	60.00	66.62	-16.62	50.00	Neutral	9.89
18.6855	40.85	19.15	60.00	39.50	10.50	50.00	Neutral	10.07
19.6635	42.81	17.19	60.00	39.13	10.87	50.00	Neutral	10.11
24.006	8.70	51.30	60.00	0.18	49.82	50.00	Neutral	9.96
24.5865	31.58	28.42	60.00	30.38	19.62	50.00	Neutral	9.94

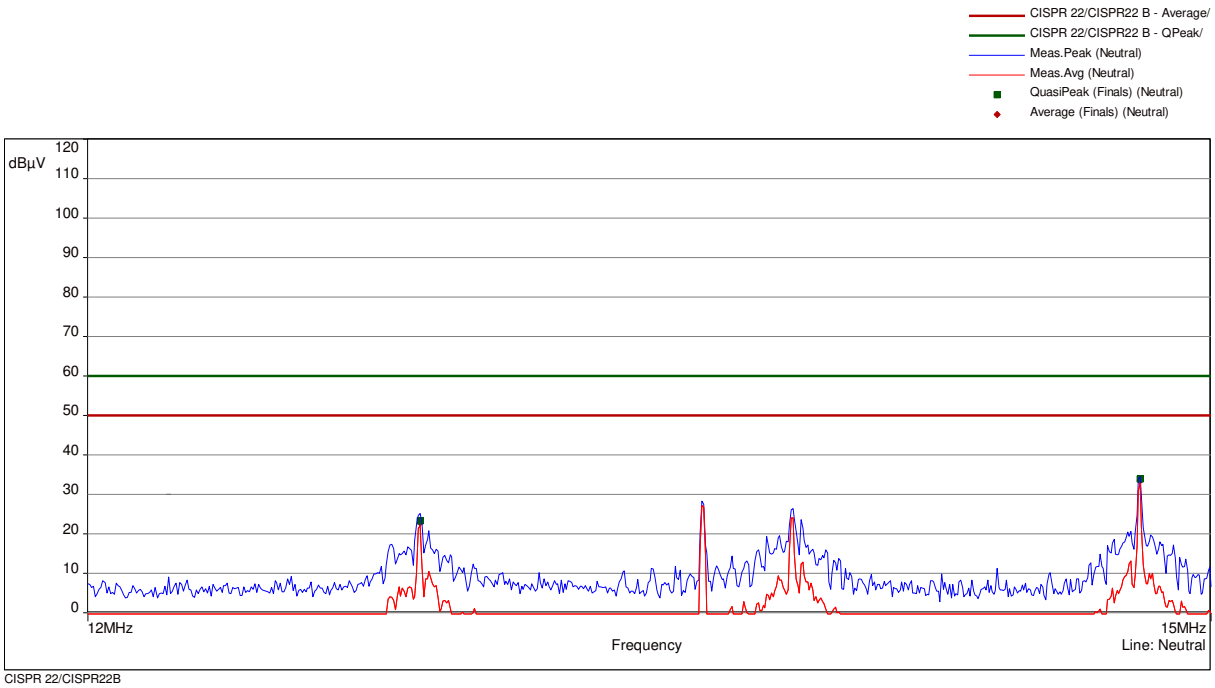
* fundamental frequency, retested with 50Ohm termination

Test point: L1 Result: PASSED
Operation mode: Reader in operational mode, transmitter / receiver powered on. RF-signal terminated into 50 ohms load
Remarks: RF310R-G2, 50Ohm termination of antenna port



freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
13.56	26.61	-33.39	60.00	26.95	-33.05	50.00	Phase 1	10.04

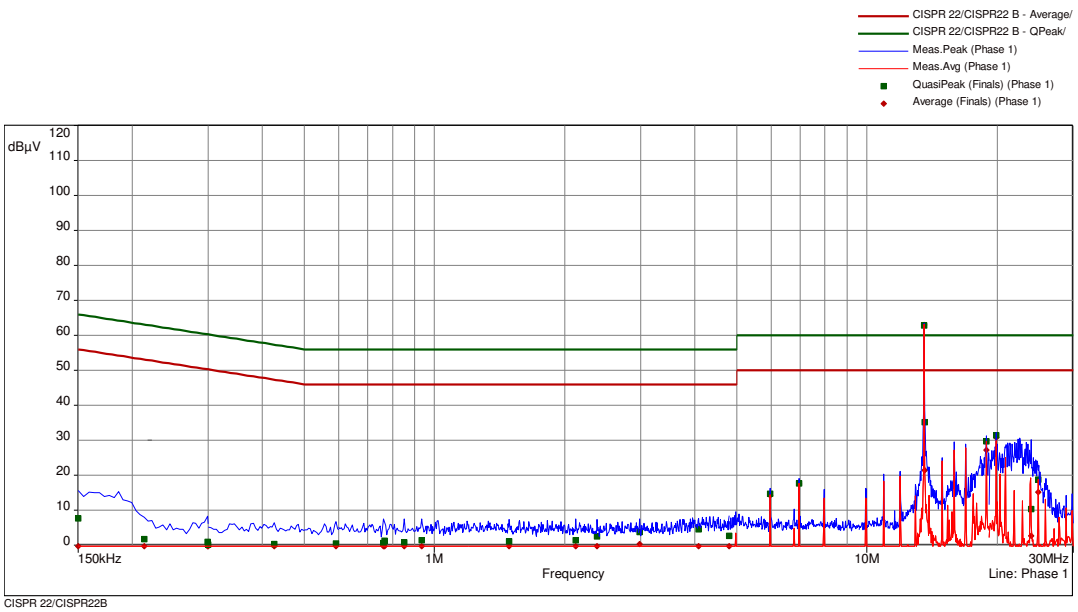
Test point:	N	Result: PASSED
Operation mode:	Reader in operational mode, transmitter / receiver powered on. RF-signal terminated into 50 ohms load	
Remarks:	RF310R-G2, 50Ohm termination of antenna port	



CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
13.56	26.98	-33.02	60.00	27.21	-32.79	50.00	Neutral	9.89

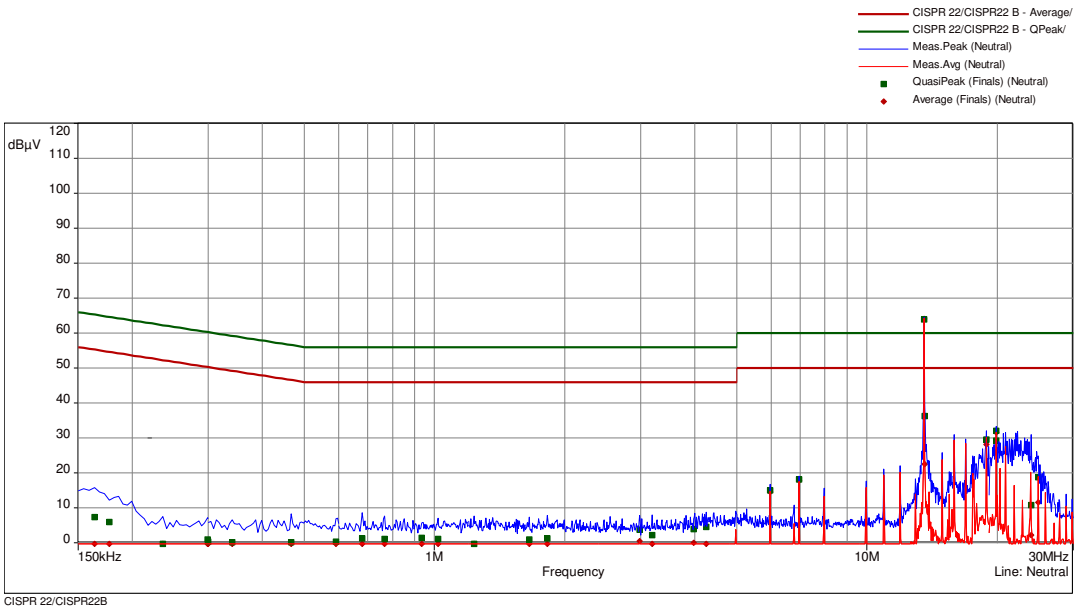
Test point L1 Result: PASSED
Operation mode: continous TAG reading/writing 112 Byte @ 13.56MHz
Remarks: RF340R-G2, internal antenna connected



freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.15	7.68	58.32	66.00	-2.73	58.73	56.00	Phase 1	9.84
0.213	1.73	61.36	63.09	-2.14	55.23	53.09	Phase 1	9.83
0.2985	0.92	59.37	60.28	-2.52	52.80	50.28	Phase 1	9.82
0.3	0.17	60.07	60.24	-3.05	53.29	50.24	Phase 1	9.82
0.426	0.38	56.95	57.33	-3.01	50.34	47.33	Phase 1	9.81
0.5925	0.52	55.48	56.00	-2.57	48.57	46.00	Phase 1	9.82
0.762	0.57	55.43	56.00	-2.42	48.42	46.00	Phase 1	9.80
0.7665	1.22	54.78	56.00	-1.94	47.94	46.00	Phase 1	9.80
0.852	0.77	55.23	56.00	-2.26	48.26	46.00	Phase 1	9.81
0.933	1.35	54.65	56.00	-1.77	47.77	46.00	Phase 1	9.82
1.488	1.14	54.86	56.00	-1.94	47.94	46.00	Phase 1	9.79
2.1225	1.46	54.54	56.00	-3.16	49.16	46.00	Phase 1	9.80
2.379	2.56	53.44	56.00	-1.81	47.81	46.00	Phase 1	9.79
2.985	3.84	52.16	56.00	0.35	45.65	46.00	Phase 1	9.79
4.0785	4.58	51.42	56.00	-0.52	46.52	46.00	Phase 1	9.81
4.8	2.61	53.39	56.00	-1.90	47.90	46.00	Phase 1	9.82
5.97	14.64	45.36	60.00	14.18	35.82	50.00	Phase 1	9.83
6.9645	17.72	42.28	60.00	17.53	32.47	50.00	Phase 1	9.84
13.56*	62.89	-2.89	60.00	62.99	-12.99	50.00	Phase 1	10.04
13.587	35.20	24.80	60.00	21.38	28.62	50.00	Phase 1	10.04
18.906	29.62	30.38	60.00	27.22	22.78	50.00	Phase 1	10.28
19.8975	31.41	28.59	60.00	30.85	19.15	50.00	Phase 1	10.34
24.0105	10.31	49.69	60.00	2.60	47.40	50.00	Phase 1	10.34
24.879	18.79	41.21	60.00	15.15	34.85	50.00	Phase 1	10.35

* fundamental frequency, retested with 50Ohm termination

Test point: N Result: PASSED
Operation mode: continous TAG reading/writing 112 Byte @ 13.56MHz
Remarks: RF340R-G2, internal antenna connected



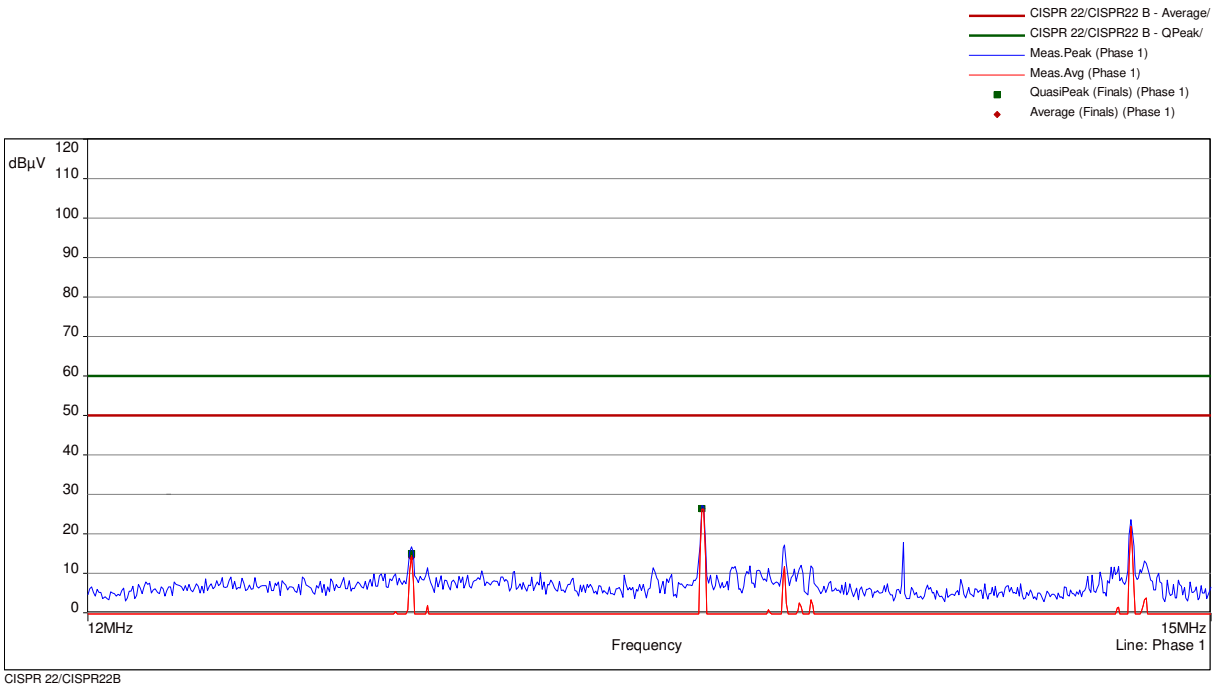
freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.1635	7.31	57.97	65.28	-2.82	58.10	55.28	Neutral	9.85
0.177	5.90	58.73	64.63	-2.84	57.47	54.63	Neutral	9.85
0.2355	-0.24	62.50	62.25	-3.57	55.82	52.25	Neutral	9.84
0.2985	0.92	59.37	60.28	-2.60	52.88	50.28	Neutral	9.82
0.3	0.38	59.86	60.24	-3.09	53.33	50.24	Neutral	9.82
0.3405	0.16	59.03	59.19	-3.33	52.52	49.19	Neutral	9.81
0.4665	0.17	56.41	56.58	-3.30	49.88	46.58	Neutral	9.82
0.5925	0.38	55.62	56.00	-2.67	48.67	46.00	Neutral	9.82
0.681	1.23	54.77	56.00	-1.97	47.97	46.00	Neutral	9.81
0.7665	1.09	54.91	56.00	-1.93	47.93	46.00	Neutral	9.80
0.933	1.35	54.65	56.00	-1.87	47.87	46.00	Neutral	9.82
1.0185	1.17	54.83	56.00	-1.94	47.94	46.00	Neutral	9.81
1.236	-1.14	57.14	56.00	-4.08	50.08	46.00	Neutral	9.80
1.659	0.95	55.05	56.00	-2.24	48.24	46.00	Neutral	9.79
1.8255	1.21	54.79	56.00	-1.92	47.92	46.00	Neutral	9.80
2.985	3.82	52.18	56.00	0.53	45.47	46.00	Neutral	9.79
3.1875	2.22	53.78	56.00	-2.12	48.12	46.00	Neutral	9.80
3.9795	3.85	52.15	56.00	0.08	45.92	46.00	Neutral	9.81
4.2495	4.49	51.51	56.00	-0.84	46.84	46.00	Neutral	9.80
5.97	15.05	44.95	60.00	14.60	35.40	50.00	Neutral	9.81
6.9645	18.07	41.93	60.00	17.83	32.17	50.00	Neutral	9.81
13.56*	63.91	-3.91	60.00	64.04	-14.04	50.00	Neutral	9.89
13.587	36.27	23.73	60.00	22.50	27.50	50.00	Neutral	9.90
18.9105	29.60	30.40	60.00	28.17	21.83	50.00	Neutral	10.08
19.902	32.02	27.98	60.00	31.52	18.48	50.00	Neutral	10.13
19.9065	29.31	30.69	60.00	25.88	24.12	50.00	Neutral	10.13
24.0105	10.80	49.20	60.00	2.21	47.79	50.00	Neutral	9.96
24.8835	18.78	41.22	60.00	11.64	38.36	50.00	Neutral	9.94

* fundamental frequency, retested with 50Ohm termination

Test point: L1 Result: PASSED

Operation mode: Reader in operational mode, transmitter / receiver powered on. RF-signal terminated into 50 ohms load

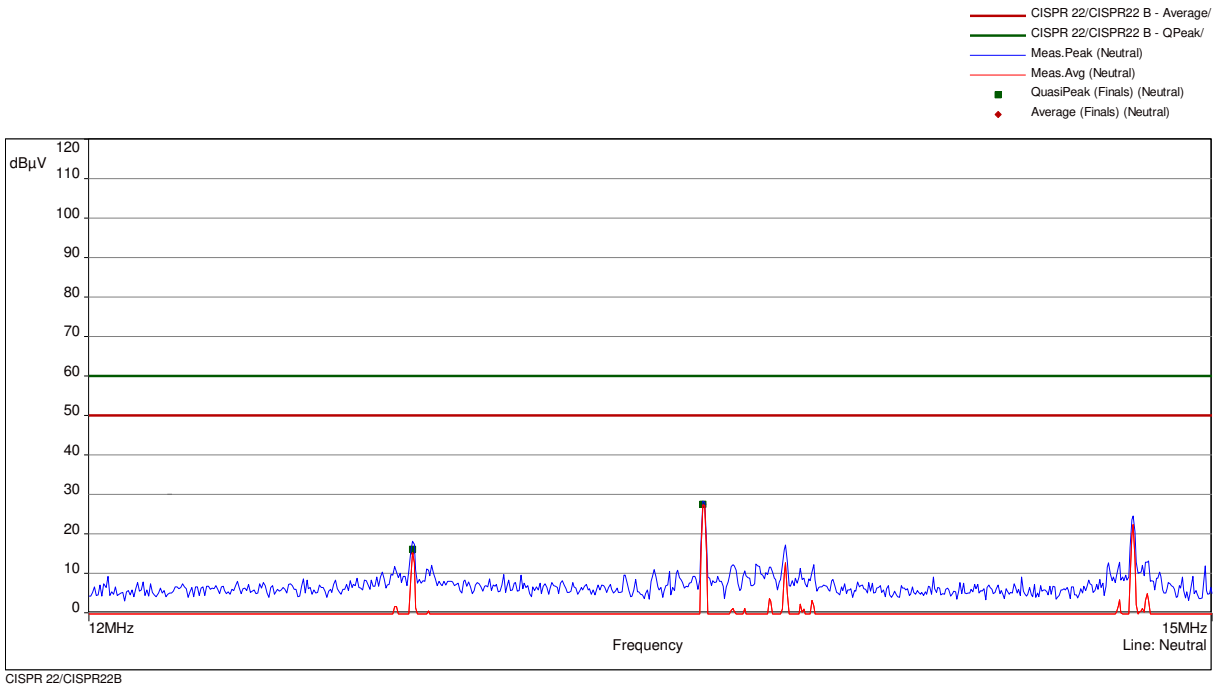
Remarks: RF340R-G2, 50Ohm termination of antenna port



CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
13.56	26.40	33.60	60.00	26.38	23.62	50.00	Phase 1	10.04

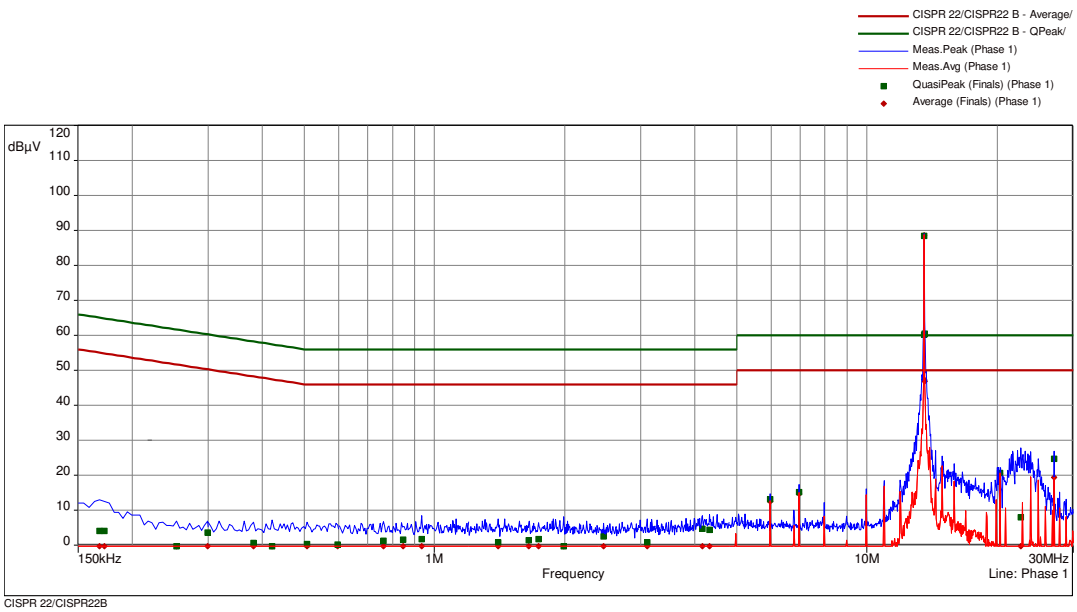
Test point: N Result: PASSED
Operation mode: Reader in operational mode, transmitter / receiver powered on. RF-signal terminated into 50 ohms load
Remarks: RF340R-G2, 50Ohm termination of antenna port



CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
13.56	27.47	32.53	60.00	27.46	22.54	50.00	Neutral	9.89

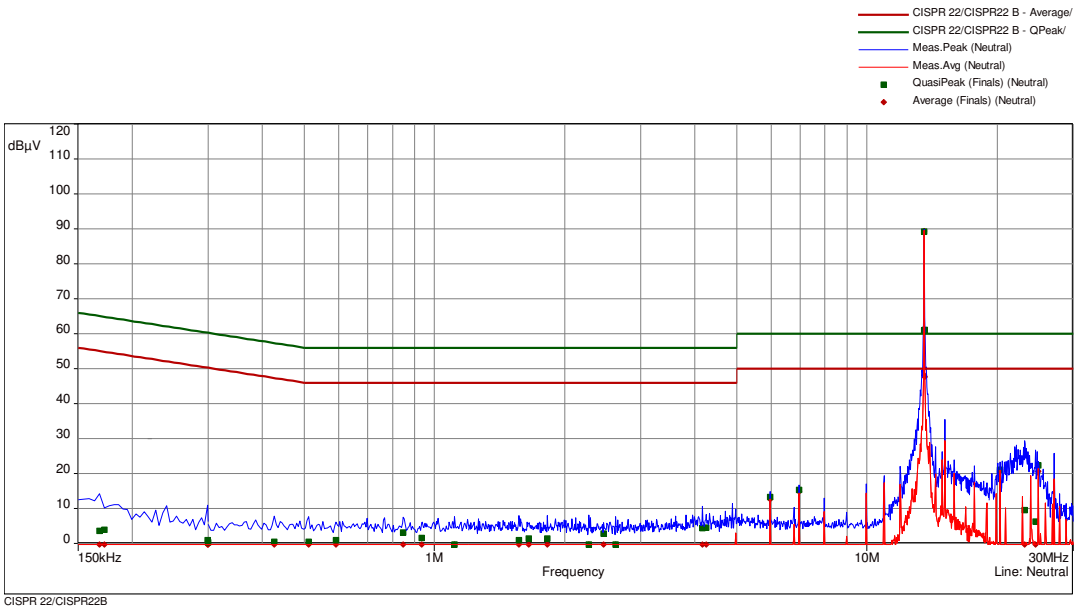
Test point L1 Result: PASSED
Operation mode: continous TAG reading/writing 112 Byte @ 13.56MHz
Remarks: RF350R-G2, extrenal antenna ANT1 connected



freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.168	4.14	60.92	65.06	-2.68	57.74	55.06	Phase 1	9.84
0.1725	4.05	60.79	64.84	-1.25	56.09	54.84	Phase 1	9.84
0.2535	-0.15	61.79	61.64	-3.64	55.29	51.64	Phase 1	9.83
0.2985	3.66	56.62	60.28	-2.46	52.75	50.28	Phase 1	9.82
0.381	0.61	57.64	58.26	-2.76	51.01	48.26	Phase 1	9.81
0.4215	-0.31	57.72	57.42	-3.45	50.87	47.42	Phase 1	9.81
0.507	0.35	55.65	56.00	-2.78	48.78	46.00	Phase 1	9.82
0.597	0.14	55.86	56.00	-2.89	48.89	46.00	Phase 1	9.82
0.762	1.19	54.81	56.00	-1.89	47.89	46.00	Phase 1	9.80
0.8475	1.57	54.43	56.00	-1.49	47.49	46.00	Phase 1	9.81
0.933	1.75	54.25	56.00	-1.41	47.41	46.00	Phase 1	9.82
1.4025	0.79	55.21	56.00	-2.39	48.39	46.00	Phase 1	9.79
1.6545	1.48	54.52	56.00	-1.59	47.59	46.00	Phase 1	9.79
1.74	1.67	54.33	56.00	-1.44	47.44	46.00	Phase 1	9.79
1.992	-0.09	56.09	56.00	-3.25	49.25	46.00	Phase 1	9.81
2.463	2.52	53.48	56.00	-1.83	47.83	46.00	Phase 1	9.79
3.102	0.82	55.18	56.00	-3.57	49.57	46.00	Phase 1	9.80
4.1595	4.66	51.34	56.00	-0.68	46.68	46.00	Phase 1	9.81
4.3305	4.31	51.69	56.00	-1.07	47.07	46.00	Phase 1	9.81
5.9745	13.13	46.87	60.00	12.49	37.51	50.00	Phase 1	9.83
6.969	15.16	44.84	60.00	14.70	35.30	50.00	Phase 1	9.84
13.56*	88.51	-28.51	60.00	88.67	-38.67	50.00	Phase 1	10.04
13.5825*	60.22	-0.22	60.00	47.39	2.61	50.00	Phase 1	10.04
13.587*	60.42	-0.42	60.00	46.96	3.04	50.00	Phase 1	10.04
20.3385	20.63	39.37	60.00	20.43	29.57	50.00	Phase 1	10.34
22.7055	8.03	51.97	60.00	-1.79	51.79	50.00	Phase 1	10.33
27.12	24.71	35.29	60.00	19.34	30.66	50.00	Phase 1	10.34

* fundamental frequency, retested with 50Ohm termination

Test point: N Result: PASSED
Operation mode: continous TAG reading/writing 112 Byte @ 13.56MHz
Remarks: RF350R-G2, extrenal antenna ANT1 connected



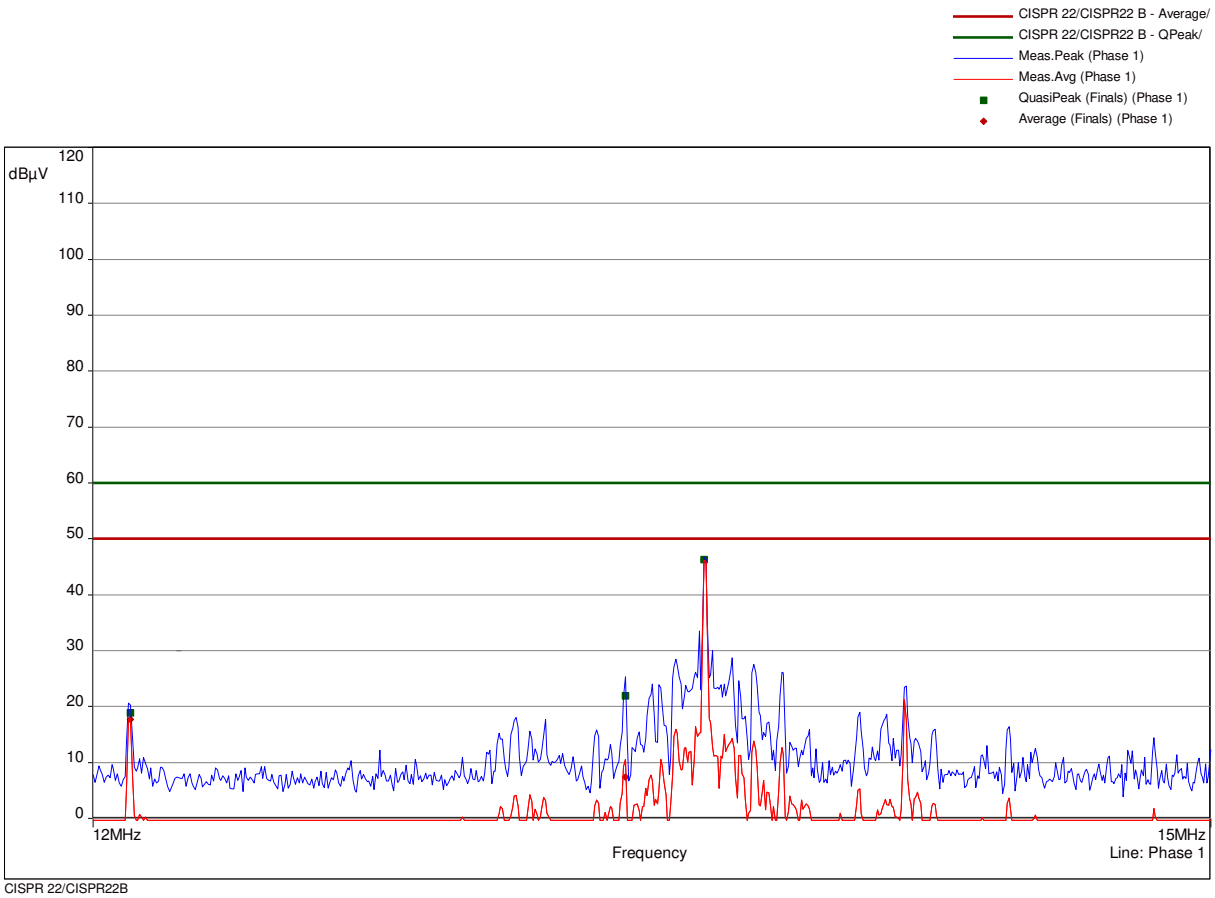
freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.168	3.54	61.52	65.06	-2.58	57.64	55.06	Neutral	9.85
0.1725	3.97	60.87	64.84	-1.12	55.96	54.84	Neutral	9.85
0.2985	0.95	59.33	60.28	-2.48	52.77	50.28	Neutral	9.82
0.3	0.28	59.96	60.24	-2.96	53.21	50.24	Neutral	9.82
0.426	0.41	56.92	57.33	-2.89	50.22	47.33	Neutral	9.81
0.5115	0.55	55.45	56.00	-2.70	48.70	46.00	Neutral	9.82
0.5925	1.02	54.98	56.00	-2.22	48.22	46.00	Neutral	9.82
0.8475	3.21	52.79	56.00	-1.57	47.57	46.00	Neutral	9.81
0.933	1.63	54.37	56.00	-1.55	47.55	46.00	Neutral	9.82
1.113	-0.93	56.93	56.00	-4.73	50.73	46.00	Neutral	9.81
1.569	0.92	55.08	56.00	-2.02	48.02	46.00	Neutral	9.79
1.6545	1.42	54.58	56.00	-1.71	47.71	46.00	Neutral	9.79
1.8255	1.43	54.57	56.00	-1.69	47.69	46.00	Neutral	9.80
2.2755	-0.59	56.59	56.00	-5.31	51.31	46.00	Neutral	9.80
2.463	2.82	53.18	56.00	-1.61	47.61	46.00	Neutral	9.79
2.6205	-0.70	56.70	56.00	-5.34	51.34	46.00	Neutral	9.79
4.1595	4.31	51.69	56.00	-1.13	47.13	46.00	Neutral	9.80
4.245	4.61	51.39	56.00	-0.87	46.87	46.00	Neutral	9.80
5.9745	13.33	46.67	60.00	12.72	37.28	50.00	Neutral	9.81
6.969	15.35	44.65	60.00	14.87	35.13	50.00	Neutral	9.81
13.56*	89.22	-29.22	60.00	89.38	-39.38	50.00	Neutral	9.89
13.5825*	60.98	-0.98	60.00	48.17	1.83	50.00	Neutral	9.90
13.587*	61.18	-1.18	60.00	47.70	2.30	50.00	Neutral	9.90
20.3385	21.17	38.83	60.00	21.04	28.96	50.00	Neutral	10.11
23.16	9.49	50.51	60.00	-1.77	51.77	50.00	Neutral	9.99
24.546	6.31	53.69	60.00	-2.11	52.11	50.00	Neutral	9.95
24.897	22.30	37.70	60.00	20.62	29.38	50.00	Neutral	9.94

* fundamental frequency, retested with 50Ohm termination

Test point: L1 Result: PASSED

Operation mode: Reader in operational mode, transmitter / receiver powered on. RF-signal terminated into 50 ohms load

Remarks: RF350R-G2, 50Ohm termination of antenna port



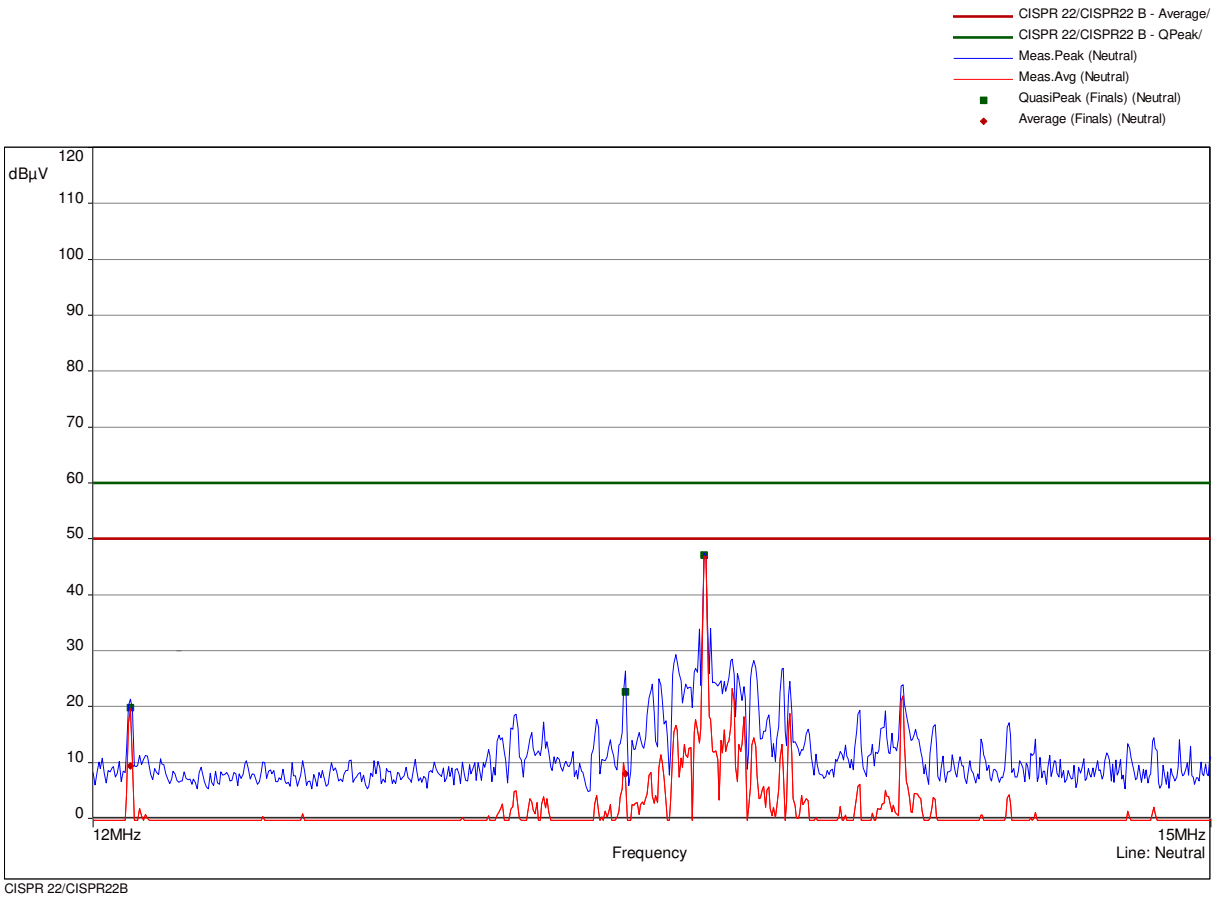
CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
13.56	46.32	13.68	60.00	46.26	3.74	50.00	Phase 1	10.04

Test point: N Result: PASSED

Operation mode: Reader in operational mode, transmitter / receiver powered on. RF-signal terminated into 50 ohms load

Remarks: RF350R-G2, 50Ohm termination of antenna port



CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
13.56	47.06	12.94	60.00	47.03	2.97	50.00	Neutral	9.89

5.2 Field strength of fundamental

For test instruments and accessories used see section 6 Part **CPR 1**.

5.2.1 Description of the test location

Test location: OATS 3
Test distance: 3 m

5.2.2 Photo documentation of the test set-up

RF 310R-G2

RF 340R-G2

RF 350R-G2

5.2.1 Applicable standard

FCC Part 15, Section 15.225 and RSS-210 A2.6

5.2.2 Test result

Measurement result at 3m measurement distance

EuT	Antenna	Frequency (MHz)	Level (dBµV)	Corr. factor (dB)	Corr. Level dB(µV/m)
RF310-G2	internal	13.56	49.7	20.5	70.2
RF340-G2	internal	13.56	55.0	20.5	75.5
RF350-G2	ANT1	13.56	56.1	20.5	76.6
	ANT3	13.56	43.9	20.5	64.4
	ANT3s	13.56	39.3	20.5	59.8
	ANT8	13.56	34.6	20.5	55.1
	ANT12	13.56	43.7	20.5	64.2
	ANT18	13.56	40.6	20.5	61.1
	ANT30	13.56	37.0	20.5	57.5

Extrapolated values to a distance of 30m

EuT	Antenna	Frequency (MHz)	Level (dBµV)	Corr. factor (dB)	Corr. Level dB(µV/m)	Limit dB(µV/m)	Margin (dB)
RF310-G2	internal	13.56	9.7	20.5	30.2	84	53.8
RF340-G2	internal	13.56	15.0	20.5	35.5	84	48.5
RF350-G2	ANT1	13.56	16.1	20.5	36.6	84	47,4
	ANT3	13.56	3.9	20.5	24.4	84	59.6
	ANT3s	13.56	-0.7	20.5	19.8	84	64.2
	ANT8	13.56	-5.4	20.5	15.1	84	68.9
	ANT12	13.56	3.7	20.5	24.2	84	59.8
	ANT18	13.56	0.6	20.5	21.1	84	62.9
	ANT30	13.56	-3.0	20.5	17.5	84	66.5

Limit according to FCC Part 15, Section 15.225(a) and RSS-210 A2.6(a):

Frequency	Field strength of fundamental wave		Measurement distance
(MHz)	(µV/m)	dB(µV/m)	(metres)
13.553 - 13.567	15848	84	30

The requirements are **FULFILLED.**

Remarks: none

5.3 Spurious emissions

For test instruments and accessories used see section 6 Part **SER1, SER 2, SER 3**.

5.3.1 Description of the test location

Test location: OATS3 (RF310R-G2 & RF340R-G2)
OATS1 (RF350R-G2)

Test location: Anechoic chamber 1

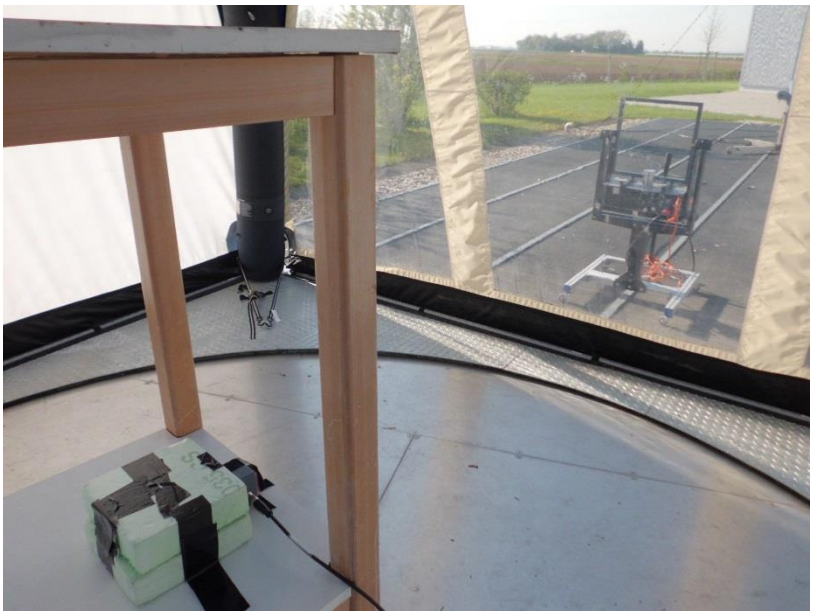
Test distance: 3 m

5.3.2 Photo documentation of the test set-up

Test setup 9 kHz – 30 MHz:

RF310R-G2

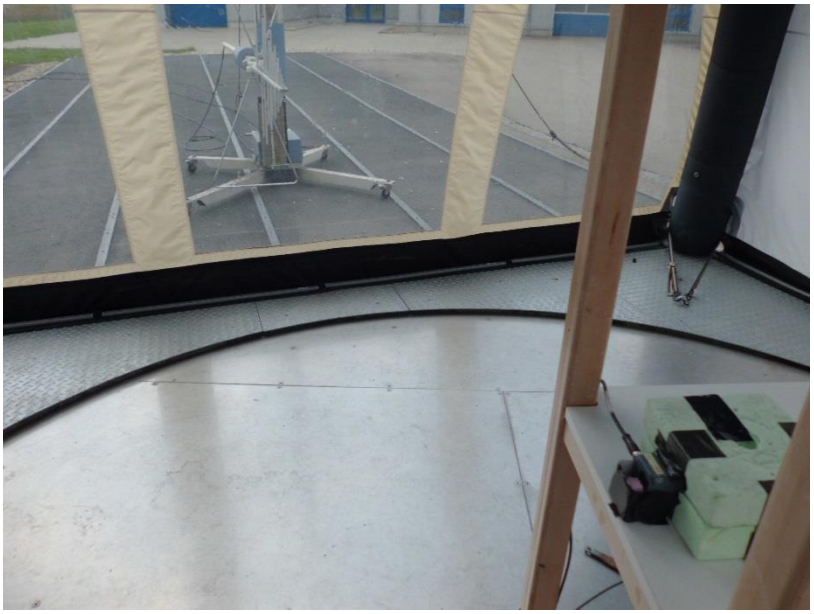
RF340R-G2



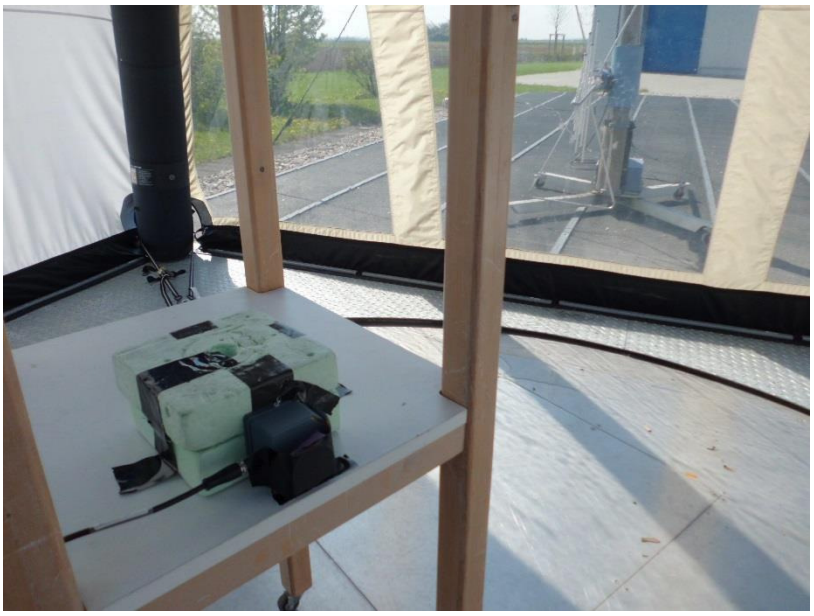
RF350R-G2

Test setup 30 MHz – 1000 MHz:

RF310R-G2



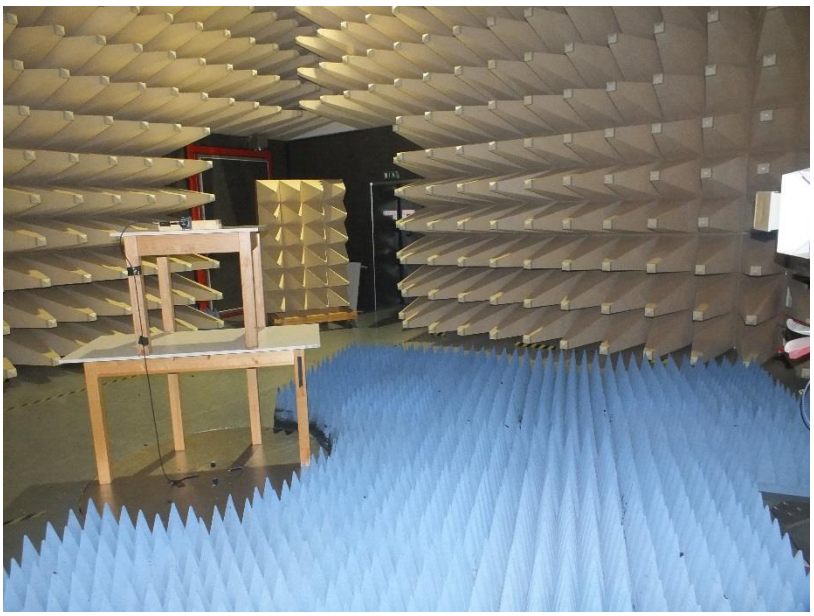
RF340R-G2



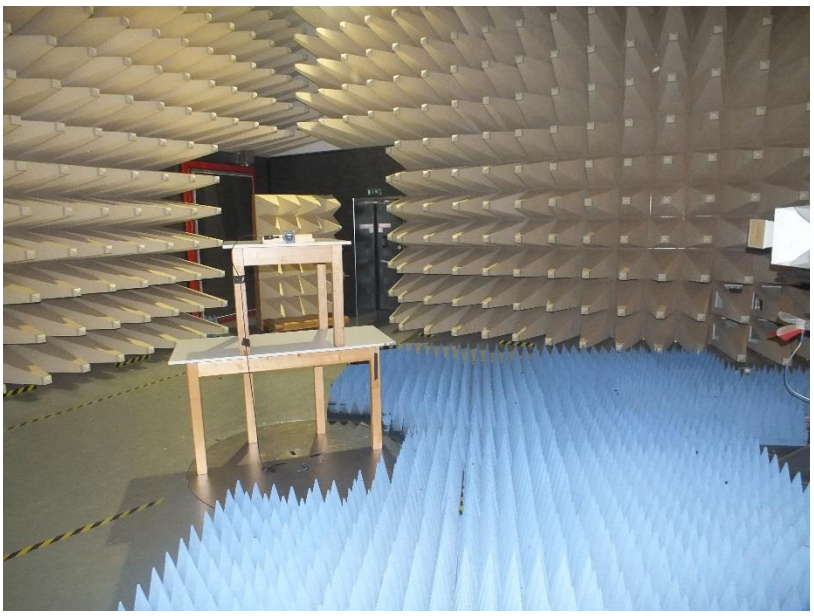
RF350R-G2

Test setup 1 GHz – 4 GHz:

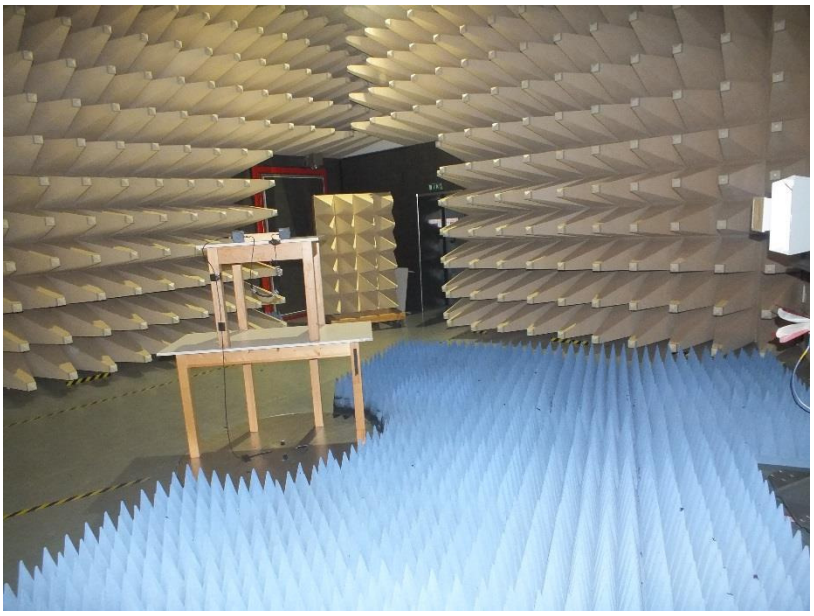
RF310R-G2



RF340R-G2



RF350R-G2



5.3.3 Applicable standard

FCC Part 15, Section 15.209 and RSS-Gen 8.9

Instrument settings:

9 kHz – 150 kHz	RBW:	200 Hz
150 kHz - 30 MHz	RBW:	9 kHz
30 MHz – 1000 MHz:	RBW:	120 kHz
1000 MHz – 4 GHz	RBW:	1 MHz

5.3.1 Test result f < 30 MHz

Note: In the frequency range 9 kHz to 30 MHz the measurement results from 3m distance are extrapolated (D factor) to the specified distance.

RF310R-G2

Frequency (MHz)	Reading level QP (dBµV) @ 3m	D-factor (dB)	Extrapolated level QP (dBµV) @ specified distance	Correction factor (dB/m)	Corrected level QP dB(µV/m)	Limit dB(µV/m)	Margin (dB)
27.12	1.6	40	-38.4	20.5	-17.9	29.5	47.4

RF340R-G2

Frequency (MHz)	Reading level QP (dBµV) @ 3m	D-factor (dB)	Extrapolated level QP (dBµV) @ specified distance	Correction factor (dB/m)	Corrected level QP dB(µV/m)	Limit dB(µV/m)	Margin (dB)
27.12	1.7	40	-38.3	20.5	-17.8	29.5	47.3

RF350R-G2 & ANT1

Frequency (MHz)	Reading level QP (dBµV) @ 3m	D-factor (dB)	Extrapolated level QP (dBµV) @ specified distance	Correction factor (dB/m)	Corrected level QP dB(µV/m)	Limit dB(µV/m)	Margin (dB)
27.12	4.2	40	-35.8	20.5	-15.3	29.5	44.8

RF350R-G2 & ANT3

Frequency (MHz)	Reading level QP (dBµV) @ 3m	D-factor (dB)	Extrapolated level QP (dBµV) @ specified distance	Correction factor (dB/m)	Corrected level QP dB(µV/m)	Limit dB(µV/m)	Margin (dB)
27.12	4.2	40	-35.8	20.5	-15.3	29.5	44.8

RF350R-G2 & ANT3s

Frequency (MHz)	Reading level QP (dBµV) @ 3m	D-factor (dB)	Extrapolated level QP (dBµV) @ specified distance	Correction factor (dB/m)	Corrected level QP dB(µV/m)	Limit dB(µV/m)	Margin (dB)
27.12	5.6	40	-34.4	20.5	-13.9	29.5	43.4

RF350R-G2 & ANT8

Frequency (MHz)	Reading level QP (dBµV) @ 3m	D-factor (dB)	Extrapolated level QP (dBµV) @ specified distance	Correction factor (dB/m)	Corrected level QP dB(µV/m)	Limit dB(µV/m)	Margin (dB)
27.12	5.6	40	-34.4	20.5	-13.9	29.5	43.4

RF350R-G2 & ANT12

Frequency (MHz)	Reading level QP (dBµV) @ 3m	D-factor (dB)	Extrapolated level QP (dBµV) @ specified distance	Correction factor (dB/m)	Corrected level QP dB(µV/m)	Limit dB(µV/m)	Margin (dB)
27.12	6.9	40	-33.1	20.5	-12.6	29.5	42.1

RF350R-G2 & ANT18

Frequency (MHz)	Reading level QP (dBµV) @ 3m	D-factor (dB)	Extrapolated level QP (dBµV) @ specified distance	Correction factor (dB/m)	Corrected level QP dB(µV/m)	Limit dB(µV/m)	Margin (dB)
27.12	3.8	40	-36.2	20.5	-15.7	29.5	45.2

RF350R-G2 & ANT30

Frequency (MHz)	Reading level QP (dBµV) @ 3m	D-factor (dB)	Extrapolated level QP (dBµV) @ specified distance	Correction factor (dB/m)	Corrected level QP dB(µV/m)	Limit dB(µV/m)	Margin (dB)
27.12	3.6	40	-36.4	20.5	-15.9	29.5	45.4

5.3.2 Test result 30 MHz < f < 1 GHz

RF310R-G2

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40,68	23,8	12,8	15,2	15,2	39,0	28,0	40,0	1,0
67,80	16,0	10,9	11,9	11,9	27,9	22,8	40,0	12,1
108,48	17,4	7,2	13,4	13,4	30,8	20,6	43,5	12,7
149,16	13,9	11,6	10,7	10,7	24,6	22,3	43,5	18,9
176,28	17,8	11,3	11,9	11,9	29,7	23,2	43,5	13,8
203,40	15,7	8,4	13,6	13,6	29,3	22,0	43,5	14,2
230,52	16,3	11,6	14,5	14,5	30,8	26,1	46,0	15,2
257,64	10,6	9,2	15,4	15,4	26,0	24,6	46,0	20,0
311,88	15,9	13,2	16,9	16,9	32,8	30,1	46,0	13,2
325,44	14,5	15,3	17,2	17,2	31,7	32,5	46,0	13,5

RF340R-G2

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40,68	23,4	14,6	15,2	15,2	38,6	29,8	40,0	1,4
67,80	17,5	8,5	11,9	11,9	29,4	20,4	40,0	10,6
108,48	17,1	13,3	13,4	13,4	30,5	26,7	43,5	13,0
149,16	15,0	12,2	10,7	10,7	25,7	22,9	43,5	17,8
176,28	17,4	16,8	11,9	11,9	29,3	28,7	43,5	14,2
203,40	19,8	18,0	13,6	13,6	33,4	31,6	43,5	10,1
244,08	17,5	14,5	15,0	15,0	32,5	29,5	46,0	13,5
257,64	15,7	13,5	15,4	15,4	31,1	28,9	46,0	14,9
271,20	11,5	8,4	15,8	15,8	27,3	24,2	46,0	18,7
298,32	11,5	8,6	16,6	16,6	28,1	25,2	46,0	17,9
352,56	14,6	10,8	17,9	17,9	32,5	28,7	46,0	13,5
366,12	13,1	11,0	18,2	18,2	31,3	29,2	46,0	14,7
379,68	21,5	18,3	18,5	18,5	40,0	36,8	46,0	6,0
350,00	10,0	8,3	17,8	17,8	27,8	26,1	46,0	18,2

RF350R-G2 & ANT1

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40,68	22,8	10,5	15,2	15,2	38,0	25,7	40,0	2,0
54,24	14,5	6,4	14,7	14,7	29,2	21,1	40,0	10,8
67,80	26,8	19,7	11,9	11,9	38,7	31,6	40,0	1,3
149,16	14,0	12,3	10,7	10,7	24,7	23,0	43,5	18,8
162,72	13,2	7,6	11,2	11,2	24,4	18,8	43,5	19,1
176,28	20,2	11,6	11,9	11,9	32,1	23,5	43,5	11,4
203,40	22,2	15,7	13,6	13,6	35,8	29,3	43,5	7,7
216,96	22,2	16,0	14,1	14,1	36,3	30,1	46,0	9,7
230,52	19,5	10,4	14,5	14,5	34,0	24,9	46,0	12,0
244,08	13,2	13,0	15,0	15,0	28,2	28,0	46,0	17,8
257,64	16,8	16,4	15,4	15,4	32,2	31,8	46,0	13,8
271,20	17,7	17,1	15,8	15,8	33,5	32,9	46,0	12,5
284,76	16,2	14,8	16,2	16,2	32,4	31,0	46,0	13,6
298,32	20,8	21,7	16,6	16,6	37,4	38,3	46,0	7,7
311,88	14,2	17,7	16,9	16,9	31,1	34,6	46,0	11,4
325,44	24,8	24,7	17,2	17,2	42,0	41,9	46,0	4,0
339,00	12,4	11,2	17,5	17,5	29,9	28,7	46,0	16,1
352,56	24,9	21,4	17,9	17,9	42,8	39,3	46,0	3,2
366,12	12,9	8,0	18,2	18,2	31,1	26,2	46,0	14,9

RF350R-G2 & ANT3

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40,68	23,9	9,4	14,7	13,5	38,6	22,9	40,0	1,4
67,80	18,2	12,7	14,2	13,4	32,4	26,1	40,0	7,6
149,16	20,2	10,6	13,9	14,7	34,1	25,3	43,5	9,4
176,28	15,3	12,1	13,6	14,3	28,9	26,4	43,5	14,6
203,40	10,4	18,5	11,4	12,1	21,8	30,6	43,5	12,9
230,52	10,8	19,9	12,8	13,2	23,6	33,1	46,0	12,9
257,64	22,5	19,9	14,3	14,4	36,8	34,3	46,0	9,2
271,20	18,7	14,8	15,1	15,0	33,8	29,8	46,0	12,2
298,32	14,1	14,4	16,8	16,4	30,9	30,8	46,0	15,1
325,44	18,6	19,7	17,6	17,3	36,2	37,0	46,0	9,0
352,56	15,8	17,8	18,4	18,1	34,2	35,9	46,0	10,1

RF350R-G2 & ANT3s

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40,68	21,3	9,9	14,7	13,5	36,0	23,4	40,0	4,0
67,80	19,7	9,2	14,2	13,4	33,9	22,6	40,0	6,1
149,16	17,6	11,8	13,9	14,7	31,5	26,5	43,5	12,0
176,28	12,9	18,6	13,6	14,3	26,5	32,9	43,5	10,6
203,40	14,5	8,5	11,4	12,1	25,9	20,6	43,5	17,6
230,52	11,6	18,2	12,8	13,2	24,4	31,4	46,0	14,6
257,64	17,0	25,6	14,3	14,4	31,3	40,0	46,0	6,0
271,20	14,6	23,4	15,1	15,0	29,7	38,4	46,0	7,6
298,32	14,5	16,0	16,8	16,4	31,3	32,4	46,0	13,6
325,44	12,7	16,2	17,6	17,3	30,3	33,5	46,0	12,5
352,56	9,9	19,5	18,4	18,1	28,3	37,6	46,0	8,4

RF350R-G2 & ANT8

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40,68	23,1	10,9	14,7	13,5	37,8	24,4	40,0	2,2
67,80	20,4	8,6	14,2	13,4	34,6	22,0	40,0	5,4
149,16	20,1	14,7	13,9	14,7	34,0	29,4	43,5	9,5
176,28	14,6	17,8	13,6	14,3	28,2	32,1	43,5	11,4
203,40	13,4	11,4	11,4	12,1	24,8	23,5	43,5	18,7
230,52	12,9	18,8	12,8	13,2	25,7	32,0	46,0	14,0
257,64	12,6	21,2	14,3	14,4	26,9	35,6	46,0	10,4
271,20	14,8	26,4	15,1	15,0	29,9	41,4	46,0	4,6
298,32	20,3	21,8	16,8	16,4	37,1	38,2	46,0	7,8
325,44	16,5	13,8	17,6	17,3	34,1	31,1	46,0	11,9
352,56	12,9	20,6	18,4	18,1	31,3	38,7	46,0	7,3

RF350R-G2 & ANT12

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40,68	23,7	11,6	14,7	13,5	38,4	25,1	40,0	1,6
67,80	18,2	9,9	14,2	13,4	32,4	23,3	40,0	7,6
149,16	18,3	14,5	13,9	14,7	32,2	29,2	43,5	11,3
176,28	11,6	17,3	13,6	14,3	25,2	31,6	43,5	11,9
203,40	11,7	16,7	11,4	12,1	23,1	28,8	43,5	14,7
230,52	15,9	15,3	12,8	13,2	28,7	28,5	46,0	17,3
257,64	14,6	18,2	14,3	14,4	28,9	32,6	46,0	13,4
271,20	13,0	19,9	15,1	15,0	28,1	34,9	46,0	11,1
298,32	17,6	15,8	16,8	16,4	34,4	32,2	46,0	11,6
325,44	17,8	16,6	17,6	17,3	35,4	33,9	46,0	10,6
352,56	7,8	22,8	18,4	18,1	26,2	40,9	46,0	5,1

RF350R-G2 & ANT18

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40,68	22,9	14,5	14,7	13,5	37,6	28,0	40,0	2,4
54,24	8,6	0,6	15,0	14,0	23,6	14,6	40,0	16,4
67,80	22,6	5,8	14,2	13,4	36,8	19,2	40,0	3,2
81,36	18,8	5,4	10,8	10,6	29,6	16,0	40,0	10,4
108,48	5,3	9,4	10,4	11,3	15,7	20,7	43,5	22,8
122,04	13,5	15,6	12,5	13,0	26,0	28,6	43,5	14,9
135,60	1,1	6,9	13,1	13,9	14,2	20,8	43,5	22,7
149,16	14,7	18,0	13,9	14,7	28,6	32,7	43,5	10,8
162,72	2,5	7,2	14,4	15,2	16,9	22,4	43,5	21,1
176,28	8,5	16,4	13,6	14,3	22,1	30,7	43,5	12,8
203,40	13,2	19,0	11,4	12,1	24,6	31,1	43,5	12,4
216,96	8,2	8,5	12,1	12,6	20,3	21,1	46,0	24,9
230,52	14,6	20,1	12,8	13,2	27,4	33,3	46,0	12,7
244,08	7,6	14,2	13,5	13,7	21,1	27,9	46,0	18,1
257,64	16,1	22,6	14,3	14,4	30,4	37,0	46,0	9,0
271,20	16,9	24,5	15,1	15,0	32,0	39,5	46,0	6,5
284,76	12,8	5,2	15,9	15,7	28,7	20,9	46,0	17,3
298,32	17,8	15,6	16,8	16,4	34,6	32,0	46,0	11,4
311,88	7,3	9,2	17,2	16,8	24,5	26,0	46,0	20,0
325,44	19,8	16,8	17,6	17,3	37,4	34,1	46,0	8,6
339,00	1,8	4,3	18,0	17,7	19,8	22,0	46,0	24,0
352,56	9,8	14,4	18,4	18,1	28,2	32,5	46,0	13,5
366,12	2,1	3,3	18,8	18,5	20,9	21,8	46,0	24,2

RF350R-G2 & ANT30

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40,68	20,0	8,2	14,7	13,5	34,7	21,7	40,0	5,3
54,24	8,1	0,5	15,0	14,0	23,1	14,5	40,0	16,9
67,80	24,6	13,2	14,2	13,4	38,8	26,6	40,0	1,2
81,36	20,4	4,0	10,8	10,6	31,2	14,6	40,0	8,8
108,48	11,2	3,7	10,4	11,3	21,6	15,0	43,5	21,9
122,04	10,9	19,1	12,5	13,0	23,4	32,1	43,5	11,4
135,60	1,2	1,0	13,1	13,9	14,3	14,9	43,5	28,6
149,16	13,0	13,8	13,9	14,7	26,9	28,5	43,5	15,0
162,72	2,3	4,7	14,4	15,2	16,7	19,9	43,5	23,6
176,28	12,7	15,6	13,6	14,3	26,3	29,9	43,5	13,6
203,40	21,9	13,1	11,4	12,1	33,3	25,2	43,5	10,2
216,96	9,4	9,3	12,1	12,6	21,5	21,9	46,0	24,1
230,52	23,2	20,9	12,8	13,2	36,0	34,1	46,0	10,0
244,08	18,9	17,9	13,5	13,7	32,4	31,6	46,0	13,6
257,64	24,6	6,2	14,3	14,4	38,9	20,6	46,0	7,1
271,20	22,7	20,6	15,1	15,0	37,8	35,6	46,0	8,2
284,76	13,8	9,0	15,9	15,7	29,7	24,7	46,0	16,3
298,32	15,7	19,5	16,8	16,4	32,5	35,9	46,0	10,1
311,88	5,9	5,6	17,2	16,8	23,1	22,4	46,0	22,9
325,44	17,8	18,6	17,6	17,3	35,4	35,9	46,0	10,1
339,00	3,2	9,0	18,0	17,7	21,2	26,7	46,0	19,3
352,56	11,2	23,0	18,4	18,1	29,6	41,1	46,0	4,9
366,12	0,8	7,4	18,8	18,5	19,6	25,9	46,0	20,1

5.3.3 Test result f > 1 GHz

RF310R-G2

Frequency (MHz)	Reading PK Vert. (dBµV)	Reading PK Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level PK Vert. (dBµV/m)	Level PK Hor. (dBµV/m)	Limit AV (dBµV/m)	Margin (dB)
1336,00	57,0	--	-19,5	--	37,5	--	54,0	16,5
1324,00	--	54,5	--	-19,5	--	35,0	54,0	19,0
1540,00	--	58,3	--	-20,8	--	37,5	54,0	16,5
2020,00	59,6	--	-15,6	--	44,0	--	54,0	10,0

Note: Peak values are below average limit no duty cycle correction was performed.

RF340R-G2

Frequency (MHz)	Reading PK Vert. (dBµV)	Reading PK Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level PK Vert. (dBµV/m)	Level PK Hor. (dBµV/m)	Limit AV (dBµV/m)	Margin (dB)
1210,00	56,7	--	-19,4	--	37,3	--	54,0	16,7
1324,00	--	57,6		-19,5	--	38,1	54,0	15,9
1474,00	57,5	--	-20,7	--	36,8	--	54,0	17,2
1540,00	--	57,9		-20,8	--	37,1	54,0	16,9

Note: Peak values are below average limit no duty cycle correction was performed.

RF350R-G2 & ANT1

Frequency (MHz)	Reading PK Vert. (dBµV)	Reading PK Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level PK Vert. (dBµV/m)	Level PK Hor. (dBµV/m)	Limit AV (dBµV/m)	Margin (dB)
1216,00	56,0	56,0	-19,2	-19,2	36,8	36,7	54,0	17,2
1492,00	58,0	--	-20,6	--	37,4	--	54,0	16,6
1540,00	--	58,7	--	-20,8	--	37,9	54,0	16,1
1870,00	58,7	--	-16,4	--	42,3	--	54,0	11,7
1912,00	--	56,4	--	-16,0	--	40,4	54,0	13,6

Note: Peak values are below average limit no duty cycle correction was performed.

RF350R-G2 & ANT3

Frequency (MHz)	Reading PK Vert. (dBµV)	Reading PK Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level PK Vert. (dBµV/m)	Level PK Hor. (dBµV/m)	Limit AV (dBµV/m)	Margin (dB)
1330,00	57,8	59,5	-19,6	-19,6	38,2	39,9	54,0	14,1
1420,00	56,5	--	-20,0	--	36,5	--	54,0	17,5
1534,00	--	59,4	--	-20,8	--	38,5	54,0	15,5
1660,00	56,5	--	-20,2	--	36,3	--	54,0	17,7
1672,00	--	58,1	--	-20,1	--	38,0	54,0	16,0

Note: Peak values are below average limit no duty cycle correction was performed.

RF350R-G2 & ANT3s

Frequency (MHz)	Reading PK Vert. (dBµV)	Reading PK Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level PK Vert. (dBµV/m)	Level PK Hor. (dBµV/m)	Limit AV (dBµV/m)	Margin (dB)
1324,00	57,2	--	-19,5	--	37,7	--	54,0	16,3
1330,00	--	61,8	--	-19,6	--	42,1	54,0	11,9
1438,00	--	59,0	--	-20,2	--	38,8	54,0	15,2
1492,00	55,8	--	-20,6	--	35,3	--	54,0	18,7
1990,00	57,1	--	-15,7	--	41,4	--	54,0	12,6
1996,00	--	59,7	--	-15,6	--	44,1	54,0	9,9

Note: Peak values are below average limit no duty cycle correction was performed.

RF350R-G2 & ANT8

Frequency (MHz)	Reading PK Vert. (dBµV)	Reading PK Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level PK Vert. (dBµV/m)	Level PK Hor. (dBµV/m)	Limit AV (dBµV/m)	Margin (dB)
1054,00	56,2	56,9	-21,1	-21,1	35,2	35,9	54,0	18,1
1324,00	59,0	--	-19,5	--	39,5	--	54,0	14,5
1438,00	--	58,8	--	-20,2	--	38,6	54,0	15,4
1996,00	--	58,0	--	-15,6	--	42,3	54,0	11,7
2062,00	56,4	--	-15,8	--	40,7	--	54,0	13,3

Note: Peak values are below average limit no duty cycle correction was performed.

RF350R-G2 & ANT12

Frequency (MHz)	Reading PK Vert. (dBµV)	Reading PK Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level PK Vert. (dBµV/m)	Level PK Hor. (dBµV/m)	Limit AV (dBµV/m)	Margin (dB)
1054,00	56,2	--	-21,1	--	35,1	--	54,0	18,9
1150,00	--	56,8	--	-20,1	--	36,7	54,0	17,3
1324,00	56,5	--	-19,5	--	37,0	--	54,0	17,0
1534,00	--	59,3	--	-20,8	--	38,5	54,0	15,5
1990,00	56,6	--	-15,7	--	40,9	--	54,0	13,1
2050,00	--	59,4	--	-15,6	--	43,9	54,0	10,1

Note: Peak values are below average limit no duty cycle correction was performed.

RF350R-G2 & ANT18

Frequency (MHz)	Reading PK Vert. (dBµV)	Reading PK Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level PK Vert. (dBµV/m)	Level PK Hor. (dBµV/m)	Limit AV (dBµV/m)	Margin (dB)
1054,00	56,5	--	-21,1	--	35,4	--	54,0	18,6
1078,00	--	56,4	--	-21,1	--	35,4	54,0	18,6
1534,00	--	58,3	--	-20,8	--	37,4	54,0	16,6
1666,00	56,8	--	-20,1	--	36,6	--	54,0	17,4
2032,00	--	55,3	--	-15,7	--	39,6	54,0	14,4
2062,00	55,1	--	-15,8	--	39,4	--	54,0	14,6

Note: Peak values are below average limit no duty cycle correction was performed.

RF350R-G2 & ANT30

Frequency (MHz)	Reading PK Vert. (dBµV)	Reading PK Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level PK Vert. (dBµV/m)	Level PK Hor. (dBµV/m)	Limit AV (dBµV/m)	Margin (dB)
1054,00	55,7	56,6	-21,1	-21,1	34,6	35,6	54,0	18,4
1216,00	57,3	--	-19,2	--	38,0	--	54,0	16,0
1438,00	--	57,6	--	-20,2	--	37,4	54,0	16,6
2020,00	--	56,5	--	-15,6	--	40,9	54,0	13,1
2062,00	57,5	--	-15,8	--	41,7	--	54,0	12,3

Note: Peak values are below average limit no duty cycle correction was performed.

Note: The correction factor includes cable loss and antenna factor.

Limit according to FCC Part 15, Section 15.209(a) and RSS-Gen 8.9 Tables 4 and 5:

Frequency	Field strength of spurious emissions		Measurement distance
(MHz)	(µV/m)	dB(µV/m)	(metres)
0.009 - 0.490	2400/F(kHz)	--	300
0.490 - 1.705	24000/F (kHz)	--	30
1.705 - 30.0	30	29.5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

The requirements are **FULFILLED.**

Remarks: The measurement was performed up to 4000 MHz.

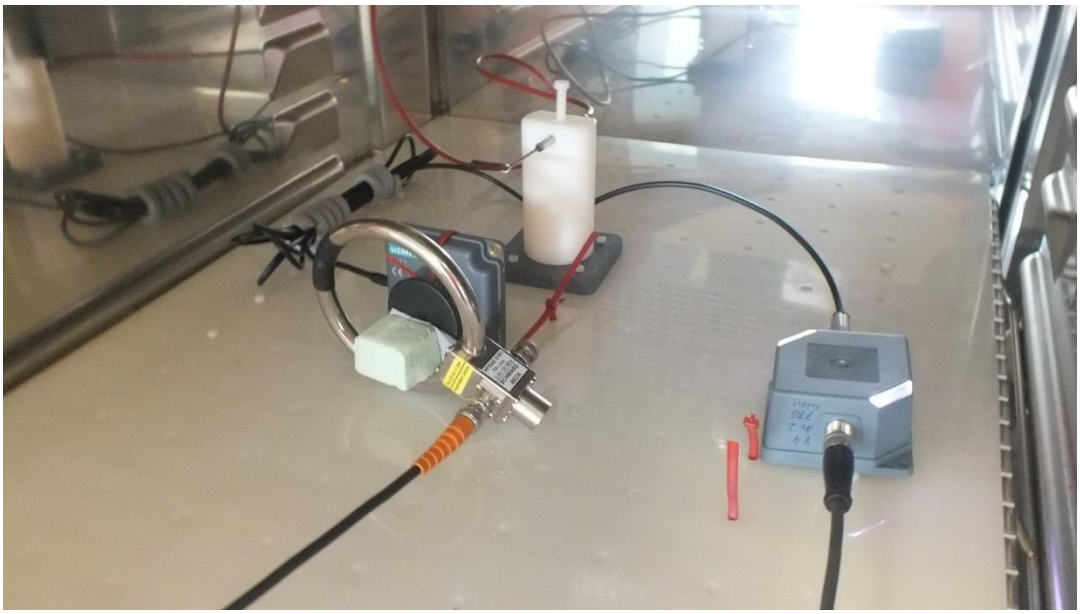
5.4 Frequency tolerance

For test instruments and accessories used see section 6 Part **FE**.

5.4.1 Description of the test location

Test location: AREA4

5.4.2 Photo documentation of the test set-up



5.4.3 Applicable standard

FCC Part 15, Section 15.225 and RSS-210 A2.6

5.4.4 Test result

Test conditions		Test result
		Frequency (MHz)
T_{min} (-20)°C	V_{nom} (24,0 V)	13,55924
T (-10)°C	V_{nom} (24,0 V)	13,55918
T (0)°C	V_{nom} (24,0 V)	13,55914
T (10)°C	V_{nom} (24,0 V)	13,55906
T_{nom} (20)°C	V_{min} (20,4 V)	13,55894
	V_{nom} (24,0 V)	13,55894
	V_{max} (27,6 V)	13,55894
T (30)°C	V_{nom} (24,0 V)	13,55890
T (40)°C	V_{nom} (24,0 V)	13,55880
T_{max} (50)°C	V_{nom} (24,0 V)	13,55876

Carrier frequency: f_c = 13.56 MHz
Max. tolerance: ± 0.01 % of 13.56 MHz = ± 1.356 kHz

Highest frequency: f_h =13,55924 MHz
Lowest frequency: f_l =13,55876 MHz

Negative tolerance: $f_l - f_c$ = -1.24 kHz < - 1.356 kHz
Positive tolerance: $f_h - f_c$ = -0,76 kHz < + 1.356 kHz

Limit according to FCC Part 15, Section 15.225(e) and RSS-210 A2.6
Carrier frequency stability shall be maintained to ±0.01% (±100 ppm).

Remarks: Test was performed on RF350R-G2 & ANT1

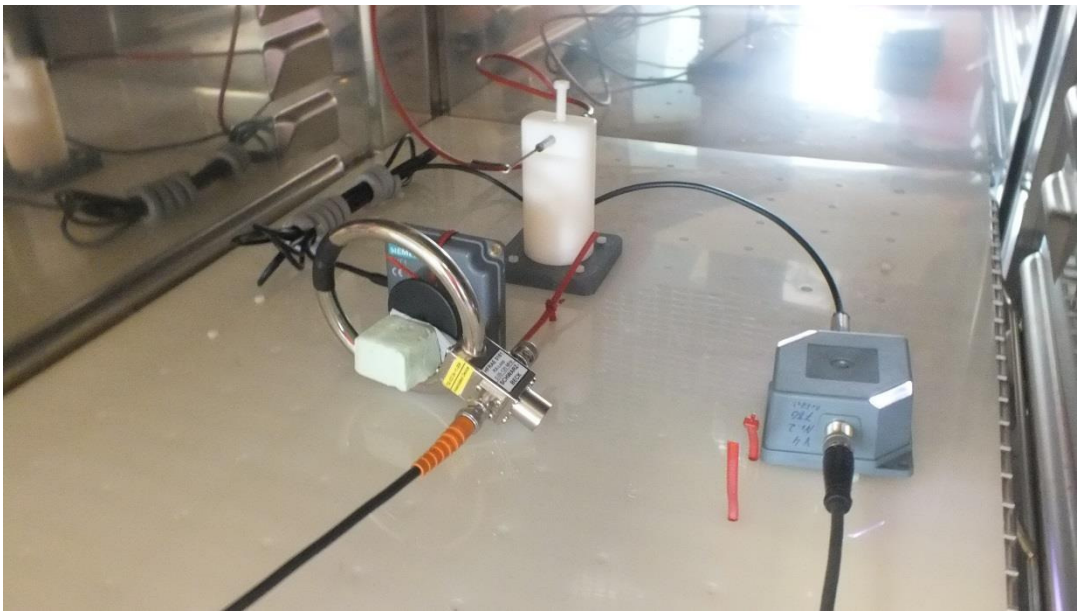
5.5 Occupied Bandwidth

For test instruments and accessories used see section 6 Part **MB**.

5.5.1 Description of the test location

Test location: AREA4

5.5.2 Photo documentation of the test set-up



5.5.3 Applicable standard

FCC Part 15, Section 15.215 and RSS-Gen, 6.6

5.5.4 Test result

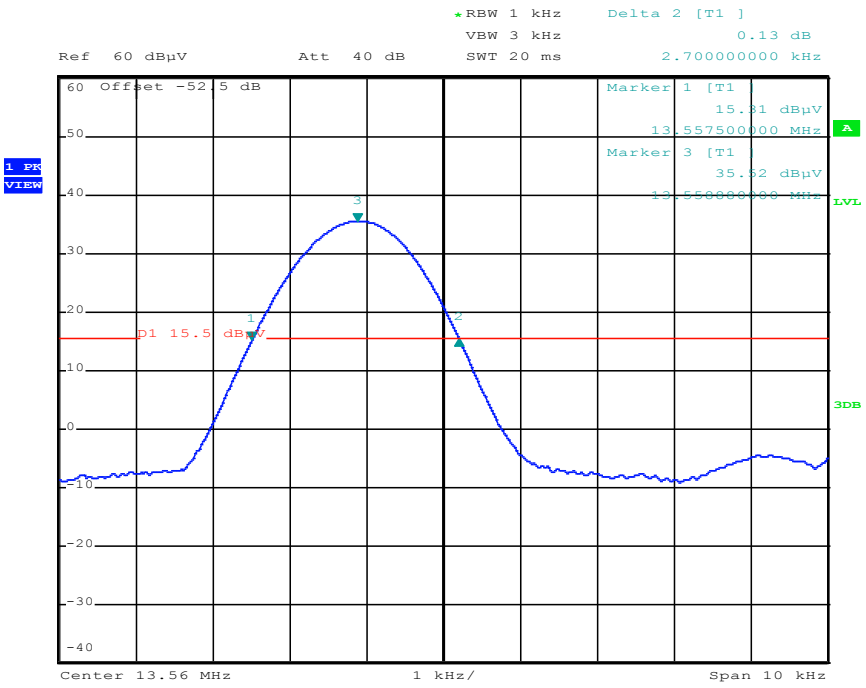
Measured Bandwidth	result (kHz)	Limit (kHz)
20dB	2,70	--
99%	2,28	--

The requirements are **FULFILLED.**

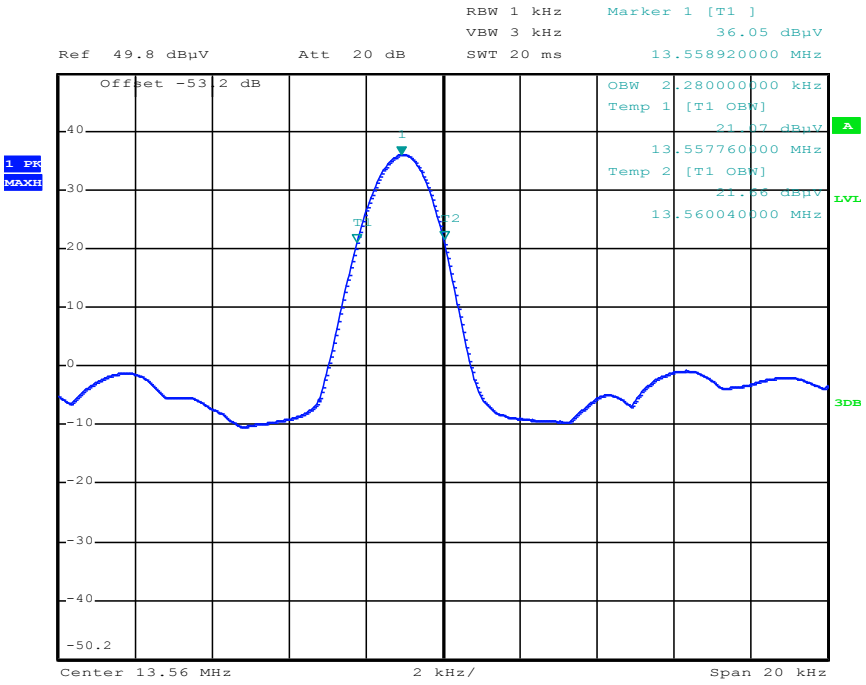
Remarks: Test was performed on RF350R-G2 & ANT1

5.5.5 Test protocols

20 dB bandwidth



OBW 99%



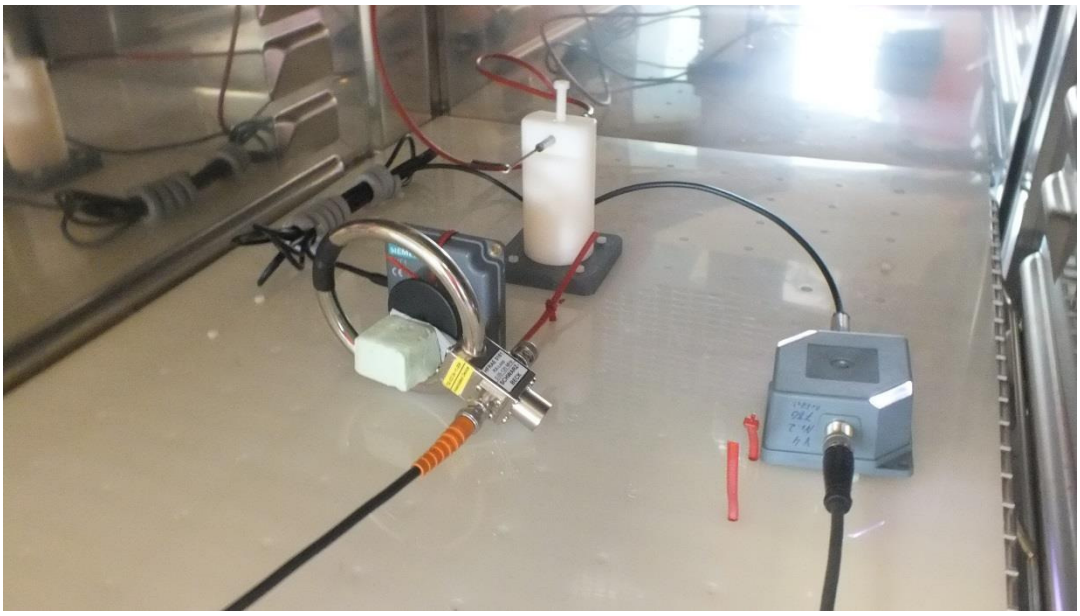
5.6 Transmitter spectrum mask

For test instruments and accessories used see section 6 Part **MB**.

5.6.1 Description of the test location

Test location: AREA4

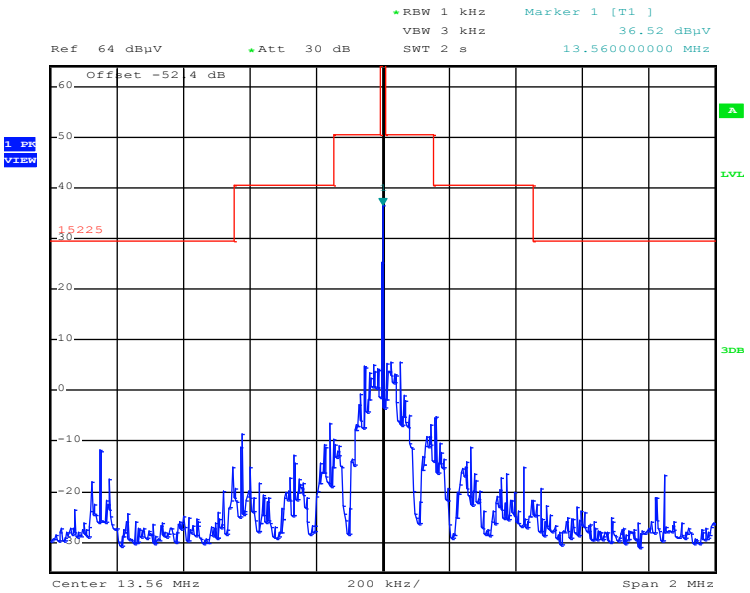
5.6.2 Photo documentation of the test set-up



5.6.3 Applicable standard

FCC Part 15, Section 15.225 and RSS-210 A2.6

5.6.4 Test result



Limit according to FCC Part 15, Section 15.225(a) and RSS-210 A2.6:

Frequency band (MHz)	Emission level limit at 30 m (µV/m)	Emission level limit at 30 m (dBµV/m)
13.110 – 13.410	106	40.5
13.410 - 13.553	334	50.5
13.553 - 13.567	15,848	84.0
13.567 – 13.710	334	50.5
13.710 – 14.010	106	40.5
outside of 13.110 – 14.010	30	29.5

The requirements are **FULFILLED.**

Remarks: Test was performed on RF350R-G2 & ANT1

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	ESCI	02-02/03-05-004	17/09/2016	17/09/2015		
	ESH 2 - Z 5	02-02/20-05-004	26/10/2017	26/10/2015	09/12/2016	09/06/2016
	N-4000-BNC	02-02/50-05-138				
	N-1500-N	02-02/50-05-140				
	ESH 3 - Z 2	02-02/50-05-155	06/11/2016	06/11/2015	21/09/2016	21/03/2016
CPR 1	ESPI 3	01-02/03-03-004	01/10/2016	01/10/2015		
	FMZB 1516	01-02/24-01-018			21/01/2017	21/01/2016
	N-40000-N	01-02/50-05-043				
	N-30000-N	01-02/50-05-044				
FE	FSP 30	02-02/11-05-001	01/10/2016	01/10/2015		
	HFRAE 5161 _ 50 kHz-120	02-02/24-11-004				
	METRAHIT WORLD	02-02/32-15-001	24/11/2016	24/11/2015		
	WK-340/40	02-02/45-05-001	07/07/2016	07/07/2015		
	6543A	02-02/50-05-157				
MB	FSP 30	02-02/11-05-001	01/10/2016	01/10/2015		
	HFRAE 5161 _ 50 kHz-120	02-02/24-11-004				
SER 1	ESPI 3	01-02/03-03-004	01/10/2016	01/10/2015		
	FMZB 1516	01-02/24-01-018			21/01/2017	21/01/2016
	N-40000-N	01-02/50-05-043				
	N-30000-N	01-02/50-05-044				
	ESR 7	02-02/03-13-001	15/06/2017	15/06/2016		
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
SER 2	ESPI 3	01-02/03-03-004	01/10/2016	01/10/2015		
	VULB 9163	01-02/24-01-006	17/11/2017	17/11/2014	13/07/2016	13/01/2016
	N-40000-N	01-02/50-05-043				
	N-30000-N	01-02/50-05-044				
	ESVS 30	02-02/03-05-003	09/07/2016	09/07/2015		
	VULB 9168	02-02/24-05-005	20/04/2017	20/04/2016	20/10/2016	20/04/2016
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
SER 3	FSP 30	02-02/11-05-001	01/10/2016	01/10/2015		
	AFS5-12001800-18-10P-6	02-02/17-06-002				
	AFS4-01000400-10-10P-4	02-02/17-13-002				
	AMF-4F-04001200-15-10P	02-02/17-13-003				
	3117	02-02/24-05-009	24/05/2017	24/05/2016		
	Sucoflex N-2000-SMA	02-02/50-05-075				
	SF104/11N/11N/1500MM	02-02/50-13-015				