Nemko Test Report:	144336-1TRFWL
Applicant:	Pika Technologies 535 Legget Drive, Suite 400 Ottawa, ON Canada K2K 3B8
Apparatus:	SIM340 GSM/GPRS Module
IC Registration Number:	8460A-20100224007
In Accordance With:	RSS-132, Issue 2 Cellular Telephones Employing New Technologies Operating in the Bands 824–849 MHz and 869–894 MHz and RSS-133, Issue 5 2 GHz Personal Communications Services – Fundamental and spurious emissions
Authorized By:	Andrey Adelberg, Senior Wireless/EMC Specialist
Date:	April 8, 2010
Total Number of Pages:	22

Nemko Canada Inc.
303 River Road,
Ottawa, Ontario
K1V 1H2
T 1 613 737 9680 **F** 1 613 737 9691**TF** 1 800 563 6336
Email Canada@nemko.com
Web www.nemko.com

SCC Accredited LAB
LAB Accrédité CCN

TABLE OF CONTENTS

Section 1 : Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Industry Canada RSS-132 and RSS-133. Radiated tests were conducted in accordance with ANSI C63.4-2003.

The assessment summary is as follows:

Apparatus Assessed:	SIM340 GSM/GPRS Module
Specification:	RSS-132, Issue 2 and RSS-133, Issue 5
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release
Test Location:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
IC Test Site Reference No.:	2040A-4
Tests Performed By:	Kevin Ma, Wireless/EMC Specialist
Test Dates:	February 2010

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Section 2 : Equipment Under Test

2.1 Identification of Equipment Under Test (EUT)

The following information identifies the EUT under test:

Type of Equipment:	GSM/GPRS Module
Brand Name:	SIMCOM
Model Number:	SIM340Z
Serial Number:	MP0608360019606
Nemko Sample Number:	1
IC Registration Number:	8460A-20100224007
Date of Receipt:	February 17, 2010

2.2 Accessories

Description:	Switching power supply
Brand Name:	CUI INC
Model Name or Number:	3A-251DN12
Serial Number:	N/A
Nemko Sample Number:	2
Connection Port:	DC port

Description:	WARP Appliance with GSM daughter card (Host Unit)
Brand Name:	PIKA
Model Name or Number:	PIK-99-00910 with PIK-99-00916
Nemko Sample Number:	1
Connection Port:	60 pin board-to-board connector on PIK-99-00916

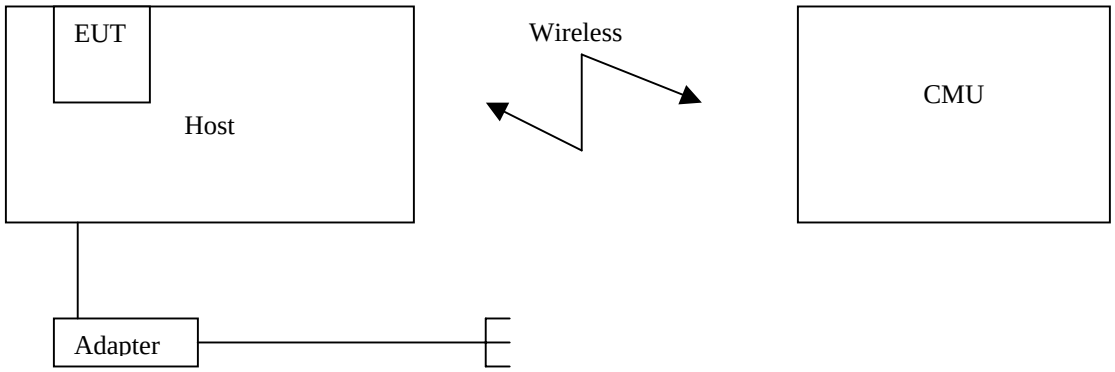
2.3 EUT Description

The EUT is a Quad-band GSM/GPRS Module and does not support data transmission.

2.4 Technical Specifications of the EUT

Operating Band:	GSM-850: 824–849 MHz (RSS-132) PCS-1900: 1850–1910 MHz (RSS-133)
Operating Frequencies:	824.2–848.8 MHz 1850.2–1909.8 MHz
Modulation:	GMSK
Antenna Data:	2.15 dBi external antenna
Power Supply Requirements:	120 VAC, 60 Hz

2.5 EUT Setup diagram



2.6 Operation of the EUT during testing

A communication link was set up between EUT and a base station simulator (CMU 200). The EUT output power level and traffic channels were controlled by the CMU 200.

2.7 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

Section 3 : Test Conditions

3.1 Specifications

The apparatus was assessed against the following specifications:

IC RSS-132, Issue 2, September 2005
IC RSS-133, Issue 5, February 2009

3.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15–30 °C
Humidity range	:	20–75 %
Pressure range	:	86–106 kPa
Power supply range	:	±5 % of rated voltages

3.4 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95 % and can be found in Nemko Canada document MU-003.

3.5 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Cal. Date	Next Cal.
3 m EMI Test Chamber	TDK	SAC-3	FA002047	May 06/09	May 06/10
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 26	FA002043	Nov. 30/09	Nov. 30/10
Bilog	Sunol	JB3	FA002108	Jan. 18/10	Jan. 18/11
Horn Antenna #2	EMCO	3115	FA000825	Jan. 21/10	Jan. 21/11
1 – 18 GHz Amplifier	JCA	JCA118-503	FA002091	Oct 7/09	Oct 7/10
Spectrum Analyzer	Rohde & Schwarz	FSU46	FA001877	Sep 29/09	Sep 29/10
Horn 18 – 26.5 GHz	Electro-Metrics	SH-50/60-1	FA000479	COU	COU
18.0 – 26.0 GHz Amplifier	NARDA	BBS-1826N612	FA001550	COU	COU
Highpass Filter	Trilithic Inc.	6HC1000/10000	FA002232	COU	COU
Highpass Filter	Trilithic Inc.	6HC3000/18000	FA002231	COU	COU
Power Divider	Mini-circuits	ZA3PD-4	FA001156	COU	COU

COU – Calibrate on Use
NCR – No Calibration Required

Section 4 : Results Summary

This section contains the following:

IC RSS-132, Issue 2 : Test Results
IC RSS-133, Issue 5 : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No : not applicable / not relevant.

Y Yes : Mandatory i.e. the apparatus shall conform to these tests.

N/T Not Tested, mandatory but not assessed. (See Report Summary)

4.1 IC RSS-132, Issue 2 : Test Results

RSS-132	Test Description	Required	Result
4.4	Transmitter Output Power	Y	PASS
4.5	Transmitter Unwanted Emissions	—	—
4.5.1	Out-of-block Emissions	Y	PASS
4.6	Receiver Spurious Emissions	Y	PASS

4.2 IC RSS-133, Issue 5 : Test Results

RSS-133	Test Description	Required	Result
6.4	Transmitter Output Power	Y	PASS
6.5	Transmitter Unwanted Emissions	—	—
6.5.2	Out-of-Sub-band Emissions	Y	PASS
6.6	Receiver Spurious Emissions	Y	PASS

Note: Only partial tests were performed based on the original modular approval certification.

Appendix A : Test Results

RSS-132, Clause 4.4 Transmitter Output Power

The transmitter output power shall not exceed the limits given in SRSP-503:
SRSP-503, Clause 5.1.3 The maximum EIRP shall be 11.5 W for mobile stations.

Test Results: Pass

Additional Observations:

The EUT, spectrum analyzer and CMU 200 were connected through a power divider, the EUT operated at maximum output power (level 5) controlled by CMU200.

The test was performed using a spectrum analyzer with peak detector set to 1 MHz/1 MHz RBW/VBW.

Channel	Frequency MHz	Output power dBm	Antenna gain dBd	ERP dBm	Limit dBm	Margin dB
128	824.2	32.14	0	32.14	38.45	6.31
190	836.6	32.23	0	32.23	38.45	6.22
251	848.8	32.45	0	32.45	38.45	6.00

RSS-132, Clause 4.5.1 Out-of-block emissions

Mobile and base station equipment with emission bandwidth less than or equal to 4 MHz shall comply with 4.5.1.1.
Mobile station equipment with emission bandwidth greater than 4 MHz shall comply with 4.5.1.2.
Base station equipment with emission bandwidth greater than 4 MHz shall comply with either 4.5.1.2 or 4.5.1.3.
4.5.1.1 In the first 1.0 MHz band immediately outside and adjacent to the licensee's frequency block, the power of emissions per any 1 % of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least $43 + 10 \log_{10}(P)$, dB. After the first 1.0 MHz, the power of emissions shall be attenuated below the transmitter output power by at least $43 + 10 \log_{10}(P)$, dB, in any 100 kHz bandwidth.
4.5.1.2 In the first 1.0 MHz band immediately outside and adjacent to the licensee's frequency block, the power of emissions per any 1 % of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least $43 + 10 \log_{10}(P)$, dB. After the first 1.0 MHz, the power of emissions shall be attenuated below the transmitter output power by at least $43 + 10 \log_{10}(P)$, dB, in any 1 MHz bandwidth.

Test Results: Pass

Additional Observations:

The spectrum was searched from 30 MHz to 10th harmonic of the highest fundamental frequency.

The air link was set up between EUT and CMU 200, and EUT was operated at maximum output power controlled by CMU 200.

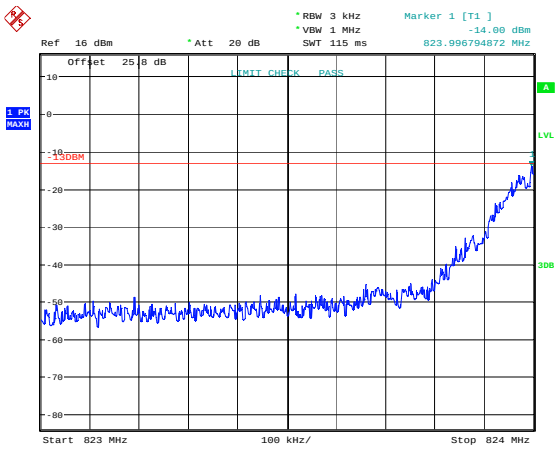
The EUT was tested radiated at the distance of 3 m.

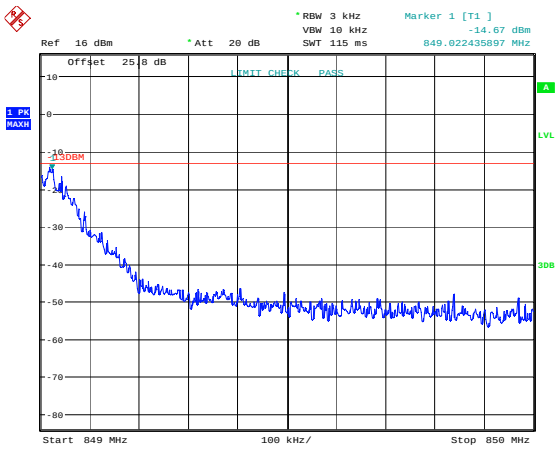
Within 1 MHz adjacent to authorized operating band RBW was set to 3 kHz (>1 % of emission bandwidth)
After the first 1 MHz the test was performed using a spectrum analyzer with peak detector set to 1 MHz/3 MHz RBW/VBW.

Only the worst case is presented in the report.

Channel	Frequency MHz	Pol.	RCVD dBµV	ERP dBm	Limit dBm	Margin dB
128	1648.5016	H	32.11	-38.23	-13.00	25.23
	1648.4134	V	35.32	-35.05	-13.00	22.05
	2472.3157	H	38.41	-28.95	-13.00	15.95
	2472.6121	V	45.22	-20.05	-13.00	7.05
190	1673.2932	H	35.14	-34.92	-13.00	21.92
	1673.0128	V	38.18	-31.83	-13.00	18.83
	2509.4310	H	42.37	-24.78	-13.00	11.78
	2509.4952	V	45.80	-19.25	-13.00	6.25
251	1697.3958	H	36.95	-32.91	-13.00	19.91
	1697.7203	V	39.23	-30.52	-13.00	17.52
	2546.3865	H	43.16	-23.78	-13.00	10.78
	2546.6025	V	46.12	-18.89	-13.00	5.89

Band edge measurement:





RSS-132, Clause 4.6 Receiver Spurious Emissions

Receiver spurious emissions shall comply with the limits specified in RSS-Gen.

RSS-GEN Clause 7.2.3.1 Receiver Spurious Emissions (Antenna Conducted)
If the device has a detachable antenna of known antenna impedance, then the antenna conducted method is permitted in lieu of a radiated measurement.

Note: Audit testing by the Department to check compliance will use the radiated method. If the radiated limit is exceeded or, as a result of an interference complaint, it is determined that the device's spurious emissions cause harmful interference to other authorized users of the spectrum, the Department may require that the party responsible for compliance take corrective action. Therefore, the radiated method should be employed.

Receiver spurious emissions at any discrete frequency shall not exceed 2 nanowatts in the band 30–1000 MHz, or 5 nanowatts above 1 GHz.

RSS-GEN Clause 7.2.3.2 Receiver Spurious Emissions (Radiated)
All spurious emissions shall comply with the limits of Table 1 (see Section 6).

Table 1 - Spurious Emission Limits for Receivers Spurious

Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30–88	100
88–216	150
216–960	200
Above 960	500

Test Results: Pass

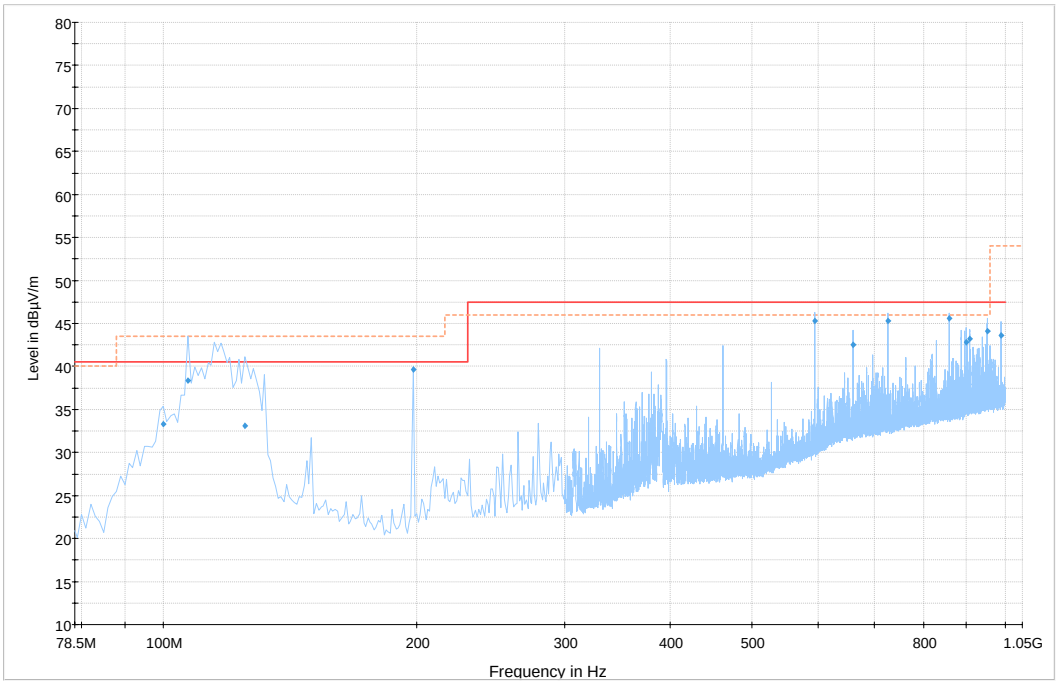
Additional Observations:

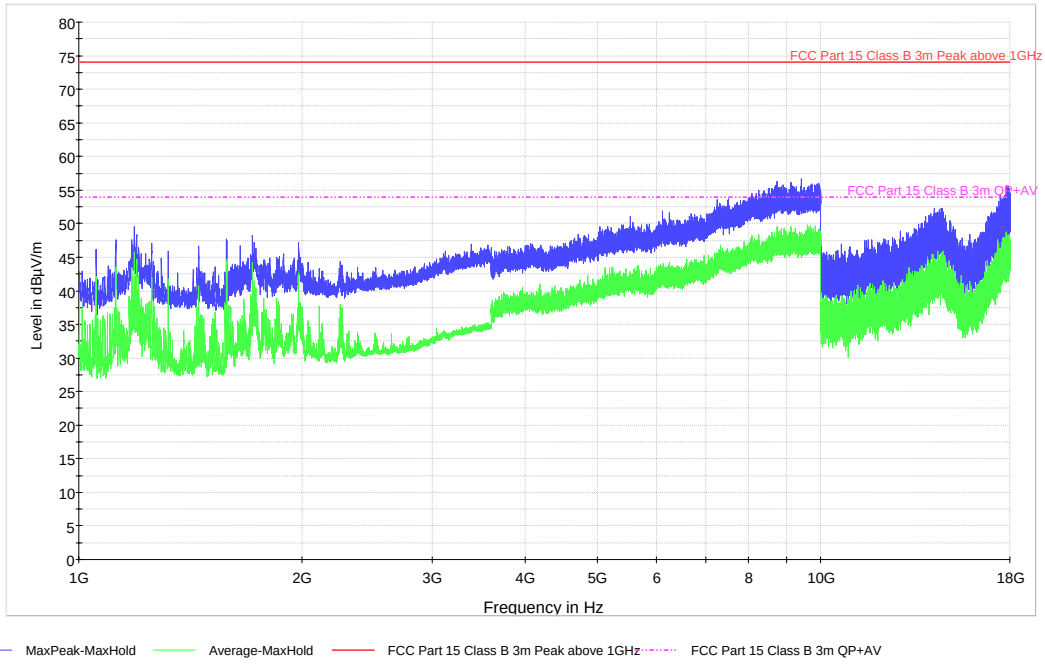
The Spectrum was searched from 30 MHz to the 10th harmonics.

All measurements were performed using a quasi-peak detector with 120 kHz/300 kHz RBW/VBW below 1 GHz, and using peak detector with 1 MHz/3 MHz RBW/VBW for peak results, average detector with 1 MHz/3 MHz RBW/VBW for average results above 1 GHz at a distance of 3 m.

Only the worst case is presented in the report.

Spectral plots:





Tabular data

Frequency (MHz)	Q-Peak Field Strength (dBµV/m)	Bandwidth (kHz)	Pol.	Correction (dB)	Margin (dB)	Limit (dBµV/m)
100.0000	33.3	120.000	V	11.6	10.2	43.5
107.0000	38.4	120.000	V	13.3	5.1	43.5
125.0000	33.1	120.000	V	15.4	10.4	43.5
198.0000	39.7	120.000	H	13.5	3.8	43.5
593.9700	45.2	120.000	H	21.4	0.8	46.0
659.9700	42.5	120.000	H	22.6	3.5	46.0
726.0300	45.3	120.000	H	23.4	0.7	46.0
857.9400	45.6	120.000	H	24.9	0.4	46.0
899.5500	42.8	120.000	H	25.3	3.2	46.0
908.1000	43.2	120.000	H	25.5	2.8	46.0
952.0500	44.1	120.000	H	26.1	1.9	46.0
989.9400	43.6	120.000	V	26.0	10.4	54.0

RSS-133, Clause 6.4 Transmitter Output Power

The average equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510:
5.1.2 Mobile Stations
Mobile stations and hand-held portables are limited to 2 W maximum e.i.r.p. The equipment shall employ means to limit the power to the minimum necessary for successful communication.

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

Test Results: Pass

Additional Observations:

The EUT, spectrum analyzer and CMU 200 were connected through a power divider, the EUT operated at maximum output power (level 5) controlled by CMU200.

The test was performed using a spectrum analyzer with peak detector set to 1 MHz/1 MHz RBW/VBW.

Channel	Frequency MHz	Output power dBm	Antenna gain dBi	EIRP dBm	Limit dBm	Margin dB
512	1850.2	28.83	2.15	30.98	33.00	2.02
661	1980.0	28.99	2.15	31.14	33.00	1.86
810	1909.8	29.04	2.15	31.19	33.00	1.81

RSS-133, Clause 6.5.2 Transmitter Unwanted Emissions Out-of-Sub-band Emissions

Outside the sub-bands 1850–1915 MHz and 1930–1995 MHz, the attenuation shall be equal to or greater than the out-of-block emission limits in Section 6.5.1:

6.5.1 Out-of-Block Emissions (Mobile and Base Stations)

a. Mobile stations shall comply with subsection (i) below.

i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1 % of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least 43 + 10 log10(P), dB.

b. After the first 1.0 MHz (for equipment that complies with (a)(i) of this subsection), the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in watts) by at least 43 + 10 log10 (P), dB. (**Note:** If the test result using 1 % of the emission bandwidth is used, power integration over 1.0 MHz is required; alternatively, the spectrum analyzer resolution and video bandwidths can be increased to 1.0 MHz for this measurement).

Test Results: Pass

Additional Observations:

The spectrum was searched from 30 MHz to 10th harmonic of the highest fundamental frequency.

The air link was set up between EUT and CMU 200, and EUT was operated at maximum output power controlled by CMU 200.

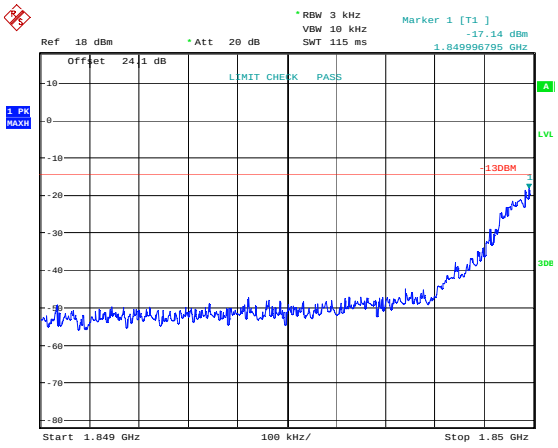
The EUT was tested radiated at the distance of 3 m.

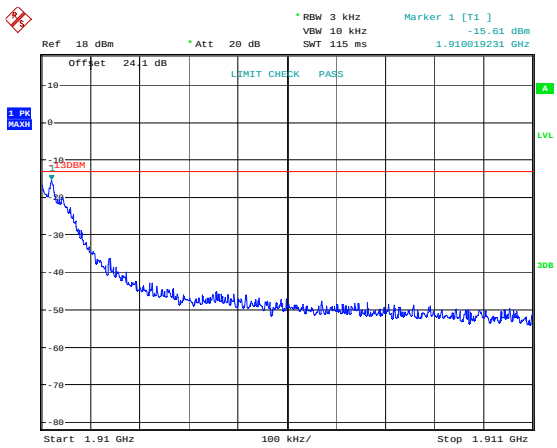
Within 1 MHz adjacent to authorized operating band RBW was set to 3 kHz (>1 % of emission bandwidth)
After the first 1 MHz the test was performed using a spectrum analyzer with peak detector set to 1 MHz/3 MHz RBW/VBW.

Only the worst case is presented in the report.

Channel	Frequency (MHz)	Pol.	RCVD (dBµV)	ERP dBm	Limit dBm	Margin dB
512	3700.2115	H	16.25	-45.77	-13.00	32.77
	3700.2019	V	19.50	-41.67	-13.00	28.67
661	3760.1153	H	15.77	-45.86	-13.00	32.86
	3759.8365	V	19.08	-42.11	-13.00	29.11
810	3819.4983	H	14.08	-47.41	-13.00	34.41
	3819.4455	V	17.52	-43.68	-13.00	30.68

Band edge measurement:





RSS-133, Clause 6.6 Receiver Spurious Emissions

Receiver spurious emissions shall comply with the limits specified in RSS-Gen.

RSS-GEN Clause 7.2.3.1 Receiver Spurious Emissions (Antenna Conducted)
If the device has a detachable antenna of known antenna impedance, then the antenna conducted method is permitted in lieu of a radiated measurement.

Note: Audit testing by the Department to check compliance will use the radiated method. If the radiated limit is exceeded or, as a result of an interference complaint, it is determined that the device's spurious emissions cause harmful interference to other authorized users of the spectrum, the Department may require that the party responsible for compliance take corrective action. Therefore, the radiated method should be employed.

Receiver spurious emissions at any discrete frequency shall not exceed 2 nanowatts in the band 30-1000 MHz, or 5 nanowatts above 1 GHz.

RSS-GEN Clause 7.2.3.2 Receiver Spurious Emissions (Radiated)
All spurious emissions shall comply with the limits of Table 1 (see Section 6).

Table 1 - Spurious Emission Limits for Receivers Spurious

Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30–88	100
88–216	150
216–960	200
Above 960	500

Test Results: Pass

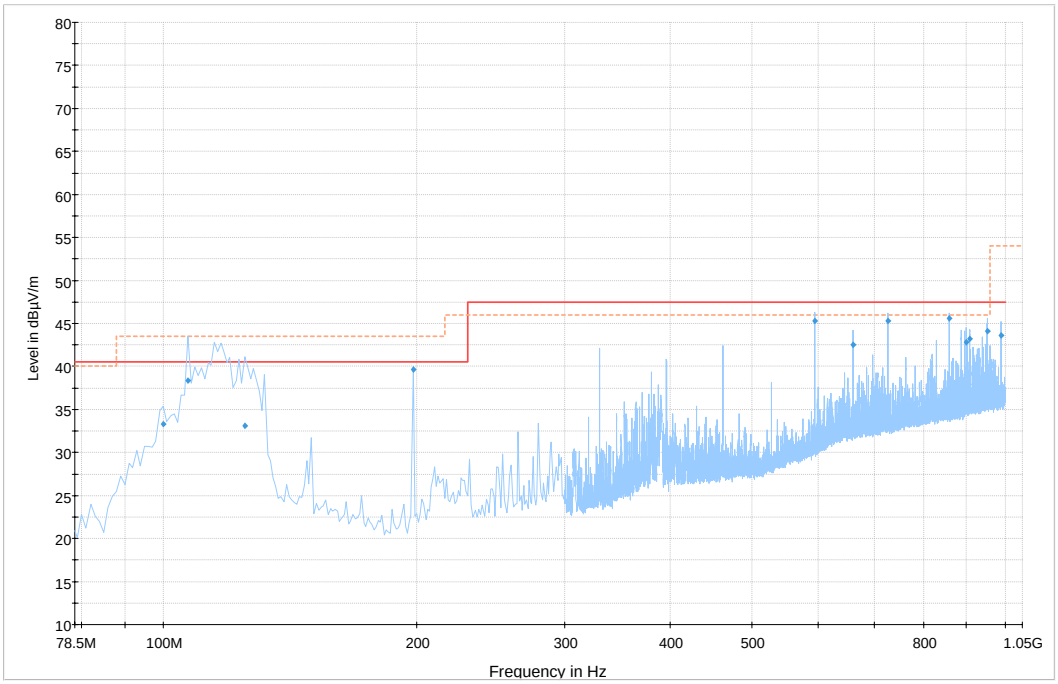
Additional Observations:

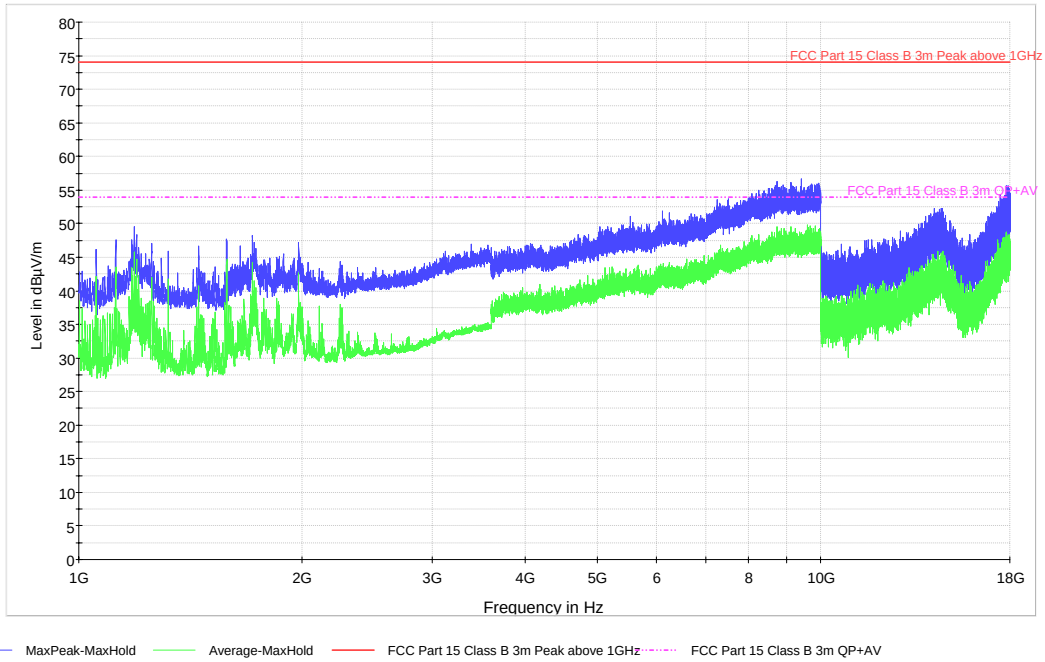
The Spectrum was searched from 30 MHz to the 10th harmonics.

All measurements were performed using a quasi-peak detector with 120 kHz/300 kHz RBW/VBW below 1 GHz, and using peak detector with 1 MHz/3 MHz RBW/VBW for peak results, average detector with 1 MHz/3 MHz RBW/VBW for average results above 1 GHz at a distance of 3 m.

Only the worst case is presented in the report.

Spectral plots:



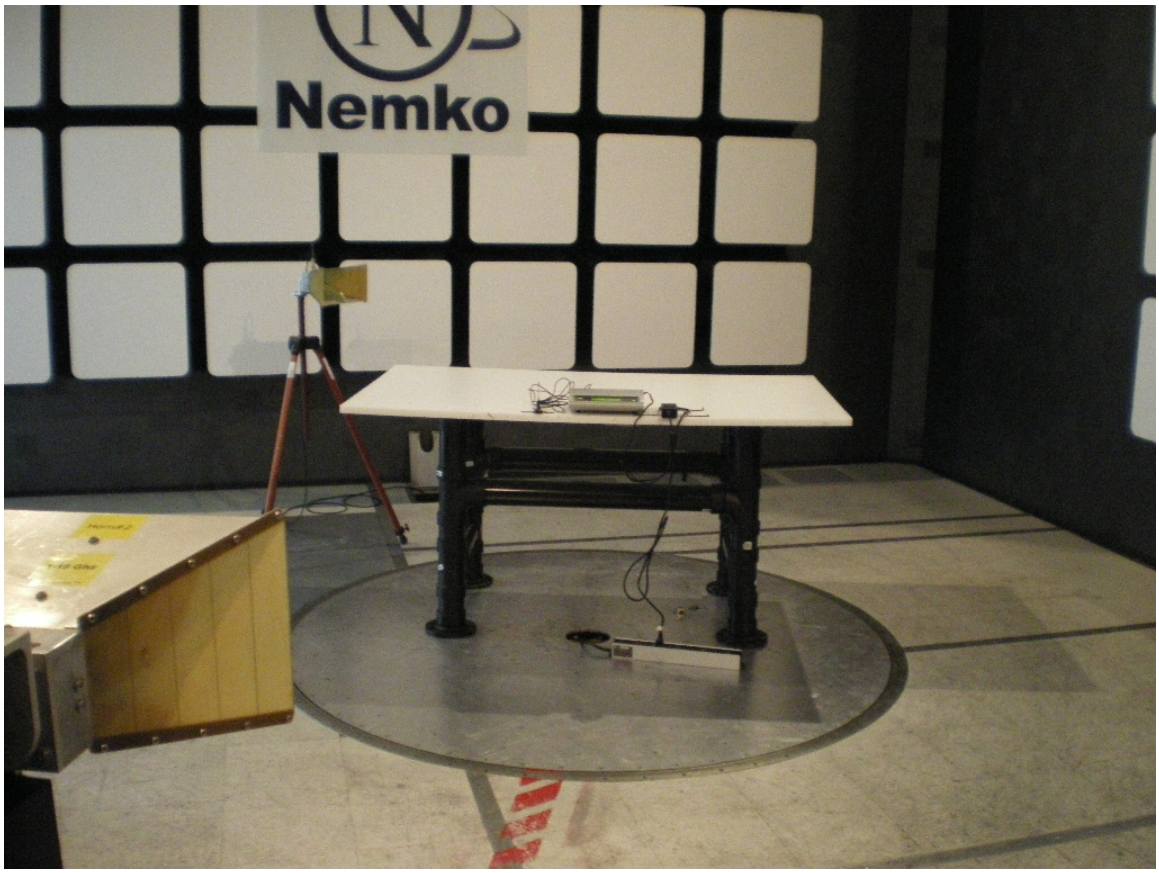


Tabular data

Frequency (MHz)	Q-Peak Field Strength (dBµV/m)	Bandwidth (kHz)	Pol.	Correction (dB)	Margin (dB)	Limit (dBµV/m)
100.0000	33.3	120.000	V	11.6	10.2	43.5
107.0000	38.4	120.000	V	13.3	5.1	43.5
125.0000	33.1	120.000	V	15.4	10.4	43.5
198.0000	39.7	120.000	H	13.5	3.8	43.5
593.9700	45.2	120.000	H	21.4	0.8	46.0
659.9700	42.5	120.000	H	22.6	3.5	46.0
726.0300	45.3	120.000	H	23.4	0.7	46.0
857.9400	45.6	120.000	H	24.9	0.4	46.0
899.5500	42.8	120.000	H	25.3	3.2	46.0
908.1000	43.2	120.000	H	25.5	2.8	46.0
952.0500	44.1	120.000	H	26.1	1.9	46.0
989.9400	43.6	120.000	V	26.0	10.4	54.0

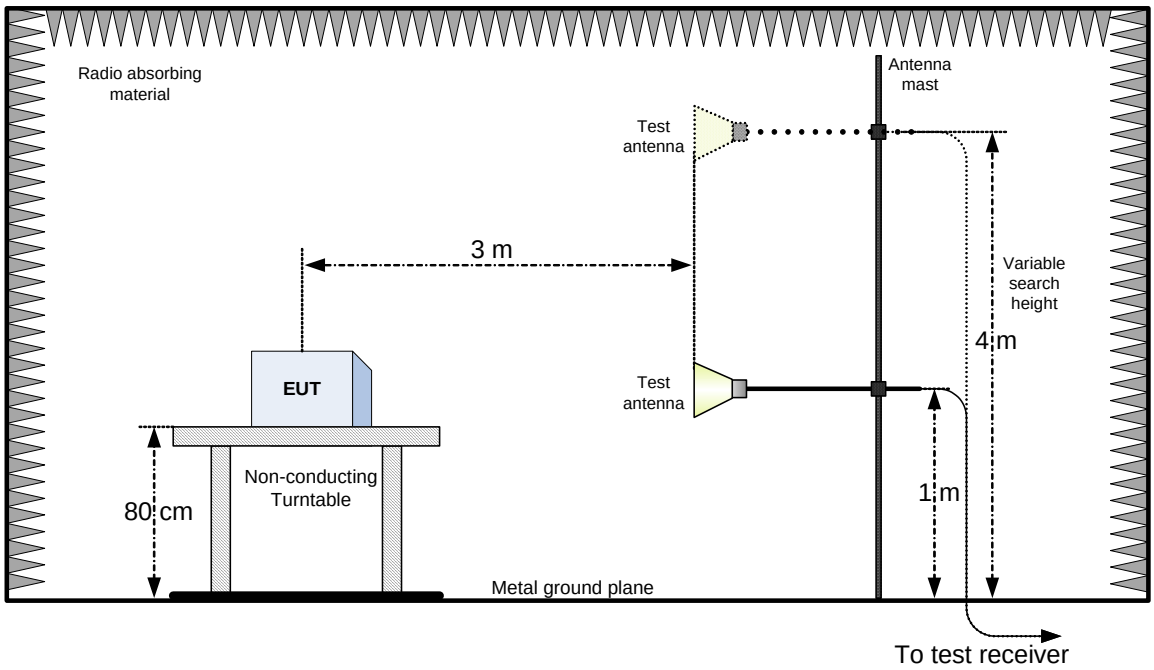
Appendix B : Setup Photographs

Spurious Emissions Setup:



Appendix C : Block Diagram of Test Setups

Radiated Emissions above 30 MHz Test Site



Conducted output power