TEST REPORT

According to FCC, CFR 47 Part 15
And Industry Canada
According to RSS 210 Issue 7

SE600

N°256106-CC-1-b

GYL technologies
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This report concerns :	**Original grant** ✓ **Class II change** ☐
Equipment tested :	**SE600**
Equipment FCC ID :	**UAE-SI00**
Designed by :	**RSI Alarm** **6, rue de Rungis** **67200 Strasbourg**
Manufactured by :	**RSI Alarm** **6, rue de Rungis** **67200 Strasbourg**

Deferred grant requested per 47 CFR 0.457 (d)(1)(ii) **YES** ☐ **NO** ✓

if yes, defer until :

Company Named agrees to notify the Commission by :

of the intended date of announcement of the product so that the grant can be issued on the date

Transition rules requested per 15.37? **YES** ☐ **NO** ✓

If no, assumed Part 15, Subpart B for intentional or unintentional radiator

The new 47 CFR [10-1-96 edition] provision

Company number: **6534A**

Product name: **SE600 INDOOR SIREN**

Model number: **SE600**

Manufacturer: **RSI Alarm**
6, rue de Rungis
67200 STRASBOURG

Tested to radio standards specification (RSS) No: RSS210 Issue 7

Open Area test site Industry Canada number: IC4452

Frequency range: 904.378 – 926.220 MHz

R.F. Power in Watts: P = 0.039 W

Antenna Gain: 0 dBi

Field strength: max level measured at 3 m is 111.2 dBµV/m

Occupied bandwidth: 417 kHz.

Type of modulation: GFSK

Emission designator: 417KF1D

Transmitter and Receiver spurious (worst case): 2,745.998 MHz, 43.36 dBµV/m avg at 3m
71.81 dBµV/m peak at 3 m

ATTESTATION

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned departmental standards, and that the radio equipment identified in this application has been subject to all the applicable test conditions specified in the departmental standards and all of the requirements of the standards have been met.

Signature:

Date: 4 April 2008

ROY Olivier, technical manager.

Summary

1 Reference and record of revisions of the test report:

Test report number :	Revision :	Number of pages	Modification reasons :
256106-CC-1-a	a	15	Creation
256106-CC-1-b	b	18	Fusion with Canadian test report
Redactor : O.ROY			**Date of writing** : April 4, 2008
Technical control: O. ROY 			**Quality Control: F.NOURRY** 

2 Interpretation and remarks:

2.1 RESULTS:

This equipment complies with the rules of the FCC section 15.247 and related sections.

This equipment complies with the rules of the IC RSS-210 Appendix 8 and related sections.

3 GENERAL INFORMATION:

3.1 APPLICANT:

RSI Alarm
6, rue de Rungis
67200 STRASBOURG

3.2 MANUFACTURER:

RSI Alarm
6, rue de Rungis
67200 STRASBOURG

3.3 TEST DATE:

3 to 11 May 2006

3.4 TEST SITE:

GYL Technologies
Parc d'activités de Lanserre
49610 Juigné sur Loire – France
FCC registration Number: 90469

4 INTRODUCTION:

The following test report for alarm system (915 MHz radio link) is written in accordance with Part 15 of the Federal Communications Commissions and RSS-210 and ICES-003 of the Industry Canada.
The Equipment Under Test (EUT) was the siren of an alarm system. The test results reported in this document relate only to the item that was tested.

The model number SE600 can bear several references. For sample other products referenced SE600G was not tested but as only a difference in the software concerning reduced user functions. See Exhibit 1 for details.

Tests have been performed in 2006, but results are still applicable to current devices and standards.

All measurements contained in this Application were conducted in accordance with ANSI C63.4 Methods of Measurement of Radio Noise Emissions of 2003. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Some accessories are used to increase sensitivity and prevent overloading of the measuring instrument. These are explained in this report. Calibration checks are performed regularly on the instruments, and all accessories including the high pass filter, preamplifier and cables.

All radiated and conducted emissions measurements were performed manually at GYL TECHNOLOGIES. The radiated emissions measurements required by the rules were performed on the three to ten meters, open field, test site maintained by GYL Technologies Parc d'activités de Lanserre, 49610 Juigné sur Loire , France. Complete description and site attenuation measurement data have been placed on file with the Federal Communications Commission.

5 MEASUREMENT EQUIPMENT LIST:

PART TYPE	MANUFACTURER	MODEL	GYL TECHNOLOGIES NUMBER	CALIBRATION DATE
RECEIVERS				
Receiver	Rohde & Schwarz	ESI 7	M02020	May-06
Spectrum analyzer	Rohde & Schwarz	FSEM 30	M02021	April-06
ANTENNAS				
Bilog (30-2000MHz)	CHASE	CBL-6112	M02031	Aug-05
Bilog (30-2000MHz)	CHASE	CBL-6112	M02032	Aug-05
Horn antenna	EMCO	3115	M02045	Mar-06

CONFIGURATION OF TESTED SYSTEM:

For all tests, the device under test was tested alone.

It doesn't need any other equipment.

6 EXERCISING TEST CONDITIONS:

Measurements are done in hopping mode in all channels with modulation (a permanent emission of H'55' at full speed).

For measurements that need to be done in one channel, the channel used was activated with the transmission of a 0 (to have the lower part of the spectrum) or a 1 (to have the higher part of the spectrum).

The equipment uses a FSK modulation on each channel.

7 CONFORMANCE STATEMENT:

7.1 STANDARDS REFERENCED FOR THIS REPORT:

PART 2: 2004	Frequency allocations and Radio Treaty Matters General Rules and Regulations
PART 15: 2004	Radio frequency devices
ANSI C63.4-2003	Standard format measurements/technical report personal computer and peripherals
ICES-003 Issue 4 : 2004	Digital apparatus
RSS210 Issue 7 : 2007	Low Power Licence-Exempt Radiocommunication Device
RSS-GEN Issue 2 : 2007	General Requirements and Information for the Certification of Radiocommunication Equipment

7.2 JUSTIFICATION:

As mentioned in paragraph 5 of this report, the equipment is a part of an alarm system. It can be installed in residential commercial or light industry areas the following sub clause of the standard mentioned above are:

- Part 15.209 for radiated emission for intentional radiator.
- Part 15.247 for intentional radiator in ISM band 902-928 MHz.
- ICES-003 for radiated emission for intentional radiator in restricted band
- RSS-210 Issue 7 Appendix 8 for intentional radiator in ISM band 902-928 MHz

8 TEST ACCORDING TO CFR 47 Part 15, RSS-210 and ICES-003

Tests performed by Olivier ROY at GYL Technologies laboratories from 3 to 11 May of 2006.

8.1 REFERENCE DOCUMENTATION:

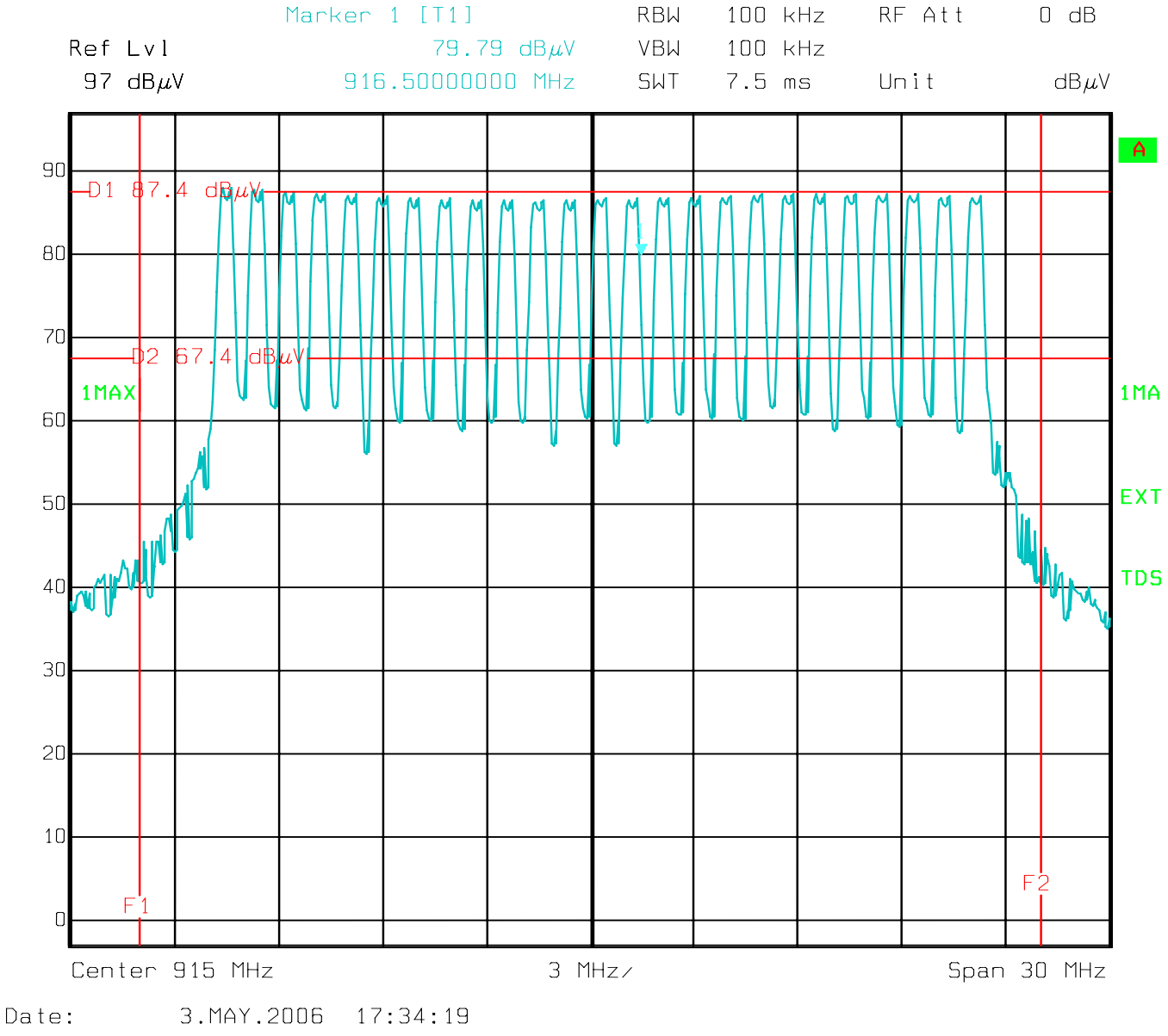
FCC part 15 (Sub part B) 15.209 and 15.247 of 2005
RSS-210 Issue 7 and ICES-003 class B

8.2 Intentional radiator operation within the band 902 – 928 MHz §15.247 and RSS-210 A8:

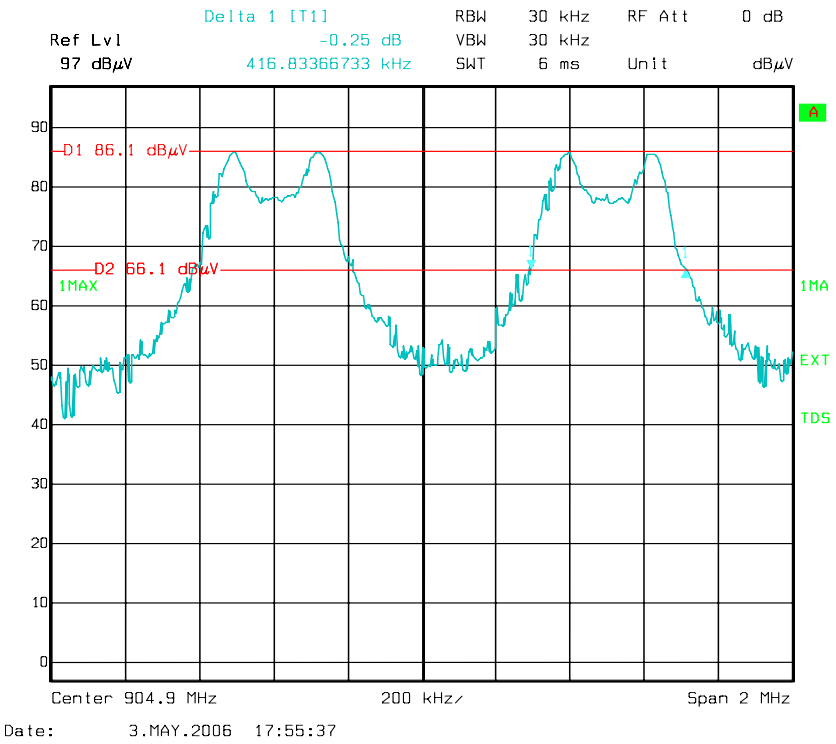
The system uses **25 channels** numbered from 1 to 25

For details of frequency hopping technology used see Exhibit 7 frequency hopping description.

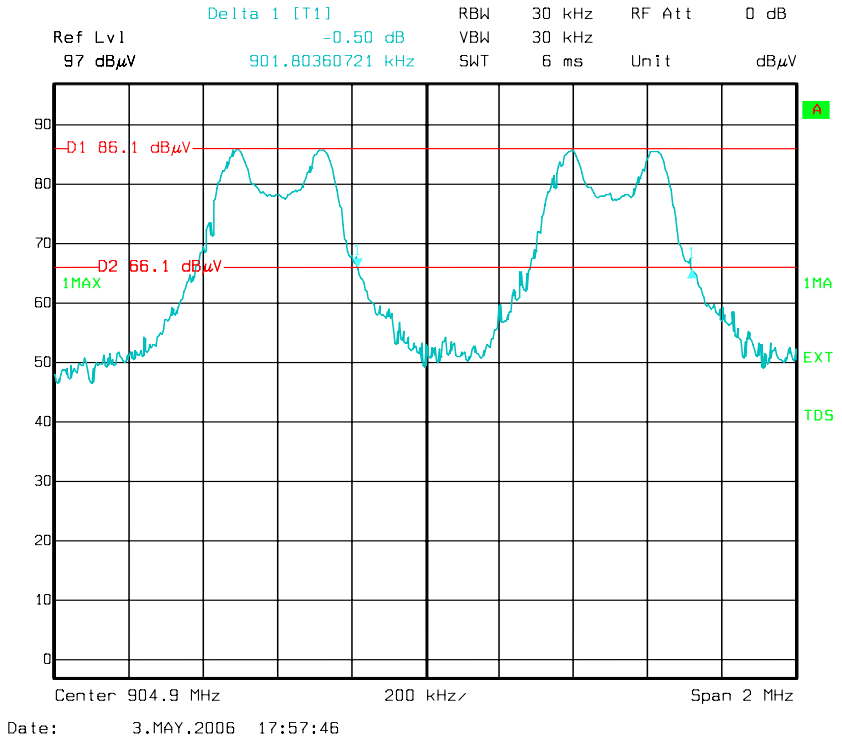
All products used in the alarm system have the same radio component with the same usage.
Measurements before §8.2.2 have been done on the V 6000 (test report 256101-CC-1-a).



8.2.1 Frequency hopping channel separation (15.247 (a) (1))

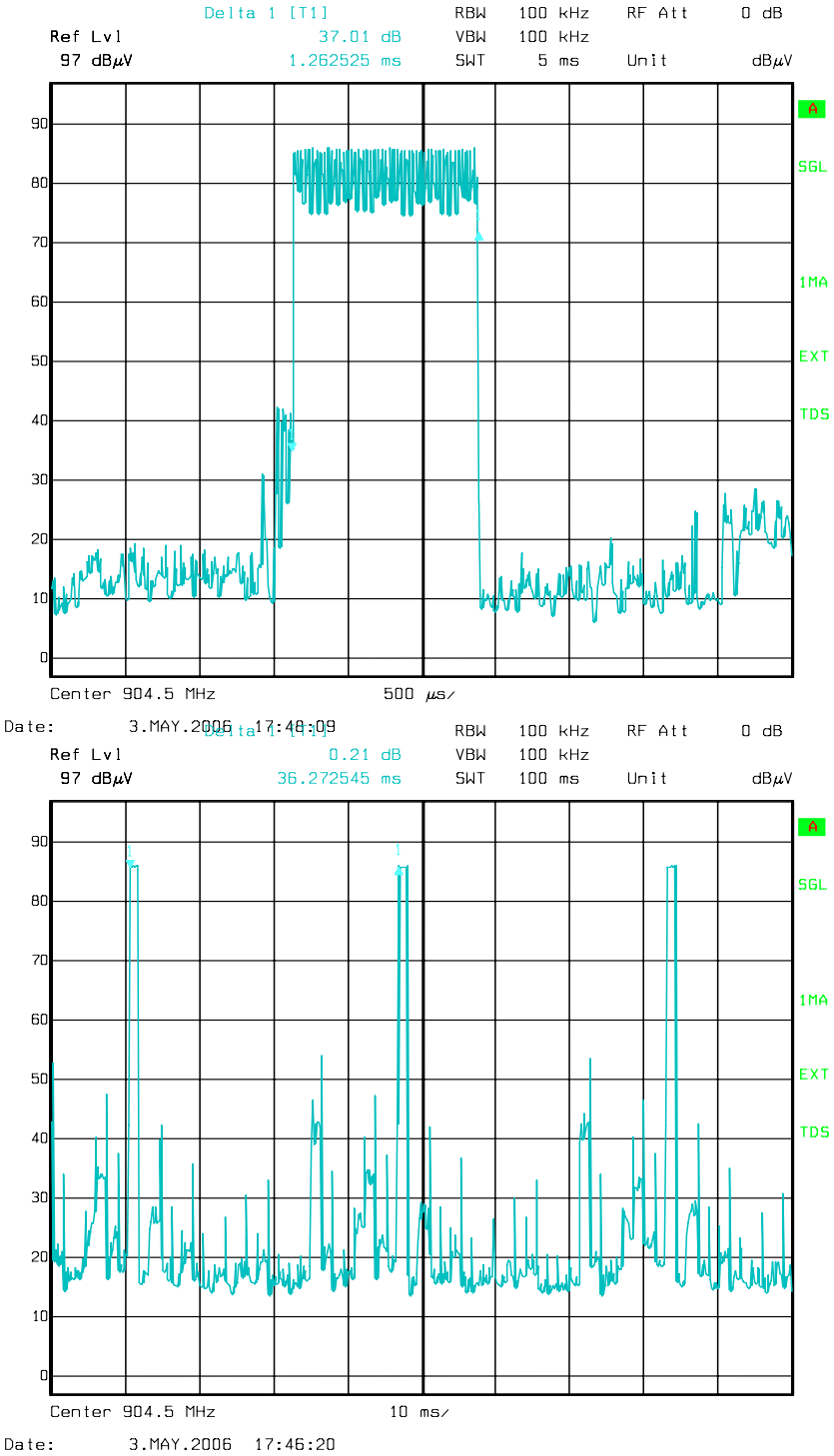


The 20dB bandwidth of each hopping channel is **417 kHz** (greater than 250 kHz and less than 500kHz)



The channel separation is almost **902 kHz** which is greater than the 20dB bandwidth.

The measurement during a long transmission gives **1263 µs every 36.27 ms** on each channel so the average time within a period of 10 seconds is **348.6 ms** which is less than the 400 ms limit.



That gives a maximum of 3 transmissions in a period of 100 ms so the duel time correction factor for spurious measurement is 20Log(3x1.26/100) = **-28.45 dB**.

8.2.2 Maximum peak output power

The maximum peak conducted power can't be measured in this product (internal antenna without connector).

According to DA 00-705, the alternative test procedure is used to calculate the conducted peak power.

$$P = \frac{(E*d)^2}{30G}$$

For calculation, G is taken to be 1 (isotropic antenna, worst case).

The conducted limit is 0.25W.

Measurements are done on OATS at 3 m distance.

Results	Frequency (MHz)	3 m dBµV/m	Power (W)
Channel 1	904.391	110.85	0.036
Channel 13	915.406	111.19	**0.039**
Channel 25	926.207	108.41	0.021

8.2.3 Spurious emissions (15.247 § (d))

In any 100 kHz bandwidth outside the frequency band, the level is at least 20 dB below that in the 100kHz bandwidth within the band contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

SPURIOUS EMISSIONS MEASUREMENTS:

Spurious emissions measurement results from 30MHz to 1GHz:

Before final measurements of radiated emissions were made on the open-field three/ten meter range; the EUT was pre-scanned in the semi anechoic at one meter distance. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to insure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a conductive turntable on isolated support, table, 0.8 meter above the ground plane. At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters in order to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations. The spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode when needed. No video filter less than 10 times the resolution bandwidth was used. The range of the frequency spectrum to be investigated is specified in FCC Part 15. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Summary of settings for measurements in restricted bands

ESI 7 EMI TEST RECEIVER IN RECEIVER MODE	
Peak measurement time	5 ms
step size	40 kHz
Preamplifier	ON
Preselector	ON
Resolution, Band Width	120 kHz
Final Quasi Peak measurement time	1 s minimum
Final average measurement time	1 s minimum

Spurious emissions measurement results from 1GHz to 10GHz:

A pre-scan measurement is done very close to the product (less than 10cm) with 100 kHz RBW and a max peak detector Then measurements are performed at 1 m with 1MHz RBW and a video averaging (10Hz) for spurious measurement with normal hopping emission.

Harmonics are peak measured with 1MHz RBW and an averaging due to the duty cycle correction factor.

8.2.3.1 Spurious RESULTS:

Spurious emissions are made twice: with a permanent modulation and hopping active and with single channel with a permanent emission of a 1 or a 0.

The following data table lists the most significant emission frequencies, measured level, correction factor (includes cable and antenna corrections), corrected reading and the limit.

During the prescan, no spurious emission has been found in restricted bands over the noise floor (more than 20 dB below the class B limit).

3 m open area test site final measurements results

Frequency (MHz)	Peak (dBµV/m)	Quasi peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Polar.	Height (cm)	Angle (°)	Factor Corr. (dB)
902.002	53.55	48.98	91.2	>20dB	H	145	348	25.55
904.391	110.85				H	238	8	25.17
915.406	111.19				H	238	7	25.44
926.207	108.41				H	242	7	25.70
928.000	61.40	59.51	91.2	>20dB	H	142	266	26.41

Over 1 GHz, no spurious has been found outside the harmonics.

Average limit in restricted bands §15.205 and table 1 of RSS-210 at 3 m is 54 dBµV/m. Otherwise, the limit is only 20 dB under the emission level (91.2 dBµV/m at 3m) without averaging with duty cycle factor.

Max spurious for channel 1

Frequency (GHz)	Peak (dBµV/m) 1m	Corr Peak (dBµV/m 3 m	Limit (dBµV/m) Pk Or Pk/avg	Averaging (duty cycle correction factor of -28.45) (dBµV/m)	Lowest Margin (dB)	Polar.	Angle (°)
1,809072	71.54	61.54	91.2	Not used	20.91	V	0
2,713572	80.94	70.94	74/54	42.49	3.06	V	90
3,618072	72.66	62.66	74/54	34.21	11.33	V	0
4,522572	69.77	59.77	74/54	31.32	14.23	H	45
5,427072	70.64	60.64	74/54	32.19	13.36	V	25
6,331059	58.97	48.97	91.2		33.48	V	0
7,235400	NF		91.2				
8,140505	60.55	50.55	74/54		23.45	H	0
9,045000	62.52	52.52	74/54		21.48	H	0

Max spurious for channel 13

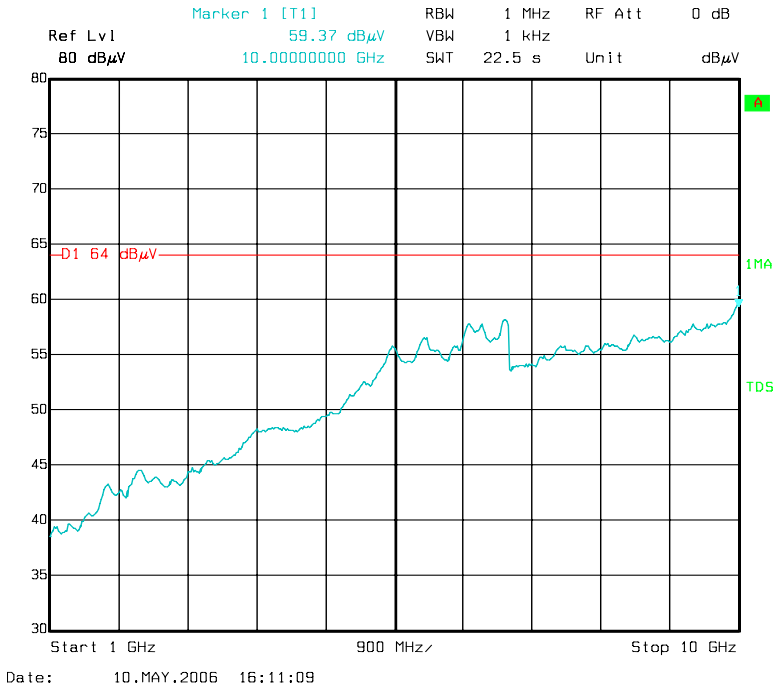
Frequency (GHz)	Peak (dBµV/m) 1m	Corr Peak (dBµV/m 3 m	Limit (dBµV/m) Pk Or Pk/avg	Averaging (duty cycle correction factor of -28.45) (dBµV/m)	Lowest Margin (dB)	Polar.	Angle (°)
1,830688	74.16	64.16	91.2	Not used	18.29	V	180
2,745998	81.81	71.81	74/54	43.36	2.19	V	90
3,661288	72.28	62.28	74/54	33.83	11.72	V	0
4,576540	69.12	59.12	74/54	30.67	14.88	V	100
5,491872	66.51	56.51	74/54	28.06	17.49	V	0
6,407188	57.13	47.13	91.2		35.32	V	90
7,322400	NF		74/54				
8,237700	NF		74/54		23.45		
9,153000	NF		74/54		21.48		

Max spurious for channel 25

Frequency (GHz)	Peak (dBµV/m) 1m	Corr Peak (dBµV/m 3 m	Limit (dBµV/m) Pk Or Pk/avg	Averaging (duty cycle correction factor of -28.45) (dBµV/m)	Lowest Margin (dB)	Polar.	Angle (°)
1,852272	74.78	64.78	91.2	Not used	17.67	V	180
2,778372	81.08	71.08	74/54	42.63	2.92	V	100
3,704504	71.85	61.85	74/54	33.4	12.15	V	0
4,630556	71.97	61.97	74/54	33.52	12.03	H	270
5,556559	67.91	57.91	74/54	29.46	16.09	V	20
6,482634	66.67	56.67	91.2		25.78	V	20
7,408600	56.98	46.98	74/54		27.02	H	0
8,334900	60.67	50.67	74/54		23.33	H	0
9,261000	60.67	50.67	74/54		23.33	H	0

* NF means Noise Floor

Noise Floor


Marker 1 [T1]
Ref Lvl
80 dBµV
59.37 dBµV
10.00000000 GHz
RBW 1 MHz
VBW 1 kHz
SWT 22.5 s
RF Att 0 dB
Unit dBµV
D1 64 dBµV
1MA
TDS
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 10.MAY.2006 16:11:09

8.2.4 Exposition of public to radio frequency energy.

In the frequency range of this product, the limit of S is 1mW/cm^2.

With the formula given in OET 65 and the measurement of EIRP, we can compute that the minimum distance between a body and the antenna is:

For
R = square root (EIRP/(4*Pi*1))
R = square root (0.039/(4*Pi*1))
R = 5.5 cm

If we consider the averaging possibility, the safe distance if far lower.

The normal use of this product is with the antenna at a distance greater than 20 cm from a body.

In accordance with bulletin OET 65 C, there is no need to make SAR evaluation for such device.
In accordance with RSS-102 issue 2 section 2.5.2, there is no need to make SAR evaluation for such device.

8.3 Antenna requirements

Not applicable because the antenna is located inside the equipment and is not replaceable without modifying the product.

8.4 Measurement of frequency stability

The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Measurements were conducted according to the operating temperature range given in the installation guide

Frequencies (MHz)

Temperature	0°C		20°C		40°C	
Power Supply	**5.1 V**	**6 V**	**5.1 V**	**6 V**	**5.1 V**	**6 V**
Channel 1	904.396	904.396	904.391	904.391	904.385	904.385
Channel 13	915.421	915.421	915.416	915.416	915.409	915.409
Channel 25	926.222	926.222	926.217	926.217	926.211	926.211

Neither voltage nor temperature variations affect the frequency stability that is better than ±10 ppm.