



Accredited testing-laboratory

DAR registration number: DAT-P-176/94-D1

**Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97**

Recognized by the Federal Communications Commission

Anechoic chamber registration no.: 90462 (FCC)

Anechoic chamber registration no.: 3463A-1 (IC)

Certification ID: DE 0001

Accreditation ID: DE 0002

Accredited Bluetooth® Test Facility (BQTF)

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Test report no. : 4-2629-01-04/07
Type identification : Globe Surfer 2
Applicant : Option N.V.
FCC ID : NCMOGS0201
IC Certification No : 2734A-GS0201
Test standards : FCC 2.1091 RF-Exposure

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1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

Test laboratory manager:

2007-08-29

Manfred Paschwitz



Date

Name

Signature

Technical responsibility for area of testing:

2007-08-29

Harro Ames



Date

Name

Signature

1.2 Testing laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10
66117 Saarbrücken
Germany

Phone: + 49 681 5 98 - 0

Fax: + 49 681 5 98 - 9075

e-mail: info@ICT.cetecom.de

Internet: <http://www.cetecom-ict.de>

State of accreditation: The test laboratory (area of testing) is accredited according to
DIN EN ISO/IEC 17025
DAR registration number: DAT-P-176/94-D1

Accredited by: Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97

Testing location, if different from CETECOM ICT Services GmbH:

Name :
Street :
Town :
Country :
Phone :
Fax :

1.3 Details of applicant

Name:	Option N.V.
Street:	Gaston Geenslaan 14
Town:	3001 Leuven
Country:	Belgium
Telephone:	+32-16-317411
Fax:	
Contact:	Joeri Boeckx
E-mail:	J.Boeckx@option.com
Telephone:	+32 16 317 411

1.4 Application details

Date of receipt of order:	2007-06-28
Date of receipt of test item:	2007-06-27
Date of start test:	2007-08-03
Date of end test	2007-08-16
Persons(s) who have been present during the test:	

Technical tests

2.1 Details of manufacturer

Name:	Option N.V.
Street:	Gaston Geenslaan 14
Town:	3001 Leuven
Country:	Belgium

2.1.1 Test item

Kind of test item :	Globe Surfer 2
Type identification :	Globe Surfer 2
S/N serial number :	-
HW hardware status :	GS 2 HW 3.0
SW software status :	
Frequency Band [MHz] :	ISM 2400 – 2483.5, GSM 850, GSM 1900, (EDGE, WCDMA, HSDPA)
Antenna :	Integrated pcb antennas / External antenna (CAF-6540FMXX / Joymax Electronics co., LTD.)
Power Supply :	115 V AC
Temperature Range :	-20°C to 55°C

FCC ID: **NCMOGS0201**
 IC: **2734A-GS0201**

2.1.2 EUT operating modes

EUT operating mode no. *)	Description of operating modes	Additional information
Op. 0	Normal mode	Normal temperature and power source conditions
Op. 1		low temperature, low power source conditions
Op. 2		low temperature, high power source conditions
Op. 3		high temperature, low power source conditions
Op. 4		high temperature, high power source conditions

*) EUT operating mode no. is used to simplify the test plan

2.1.3 Conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature	T _{nom}	°C	23
Nominal Humidity	H _{nom}	%	48
Nominal Power Source	V _{nom}	V	115

Type of power source: **AC**

Deviations from these values are reported in chapter 2

3 Summary of Measurement Results and list of all performed test cases

- No deviations from the technical specifications were ascertained
- There were deviations from the technical specifications ascertained

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC Part 2.1091	PASS	2007-08-29	

Test Specification Clause	Test Case	Pass	Fail	Not applicable	Not performed
None	Antenna Gain	Yes			
§2.1091	RF-Exposure	Yes			
§1.1310	RF-Exposure limits	Yes			

4 RF measurement testing

4.1 Description of test set-up

4.1.1 Radiated measurements

The radiated measurements are performed in an anechoic chamber. The EUT is positioned on a non-conductive support with a height of 0.80 m above a non-conductive ground plane.

The measuring equipment is positioned at 20 cm distance.

The sample is rotated to find maximum emissions.

Test configurations:

Configuration 1: Internal WLAN-antenna colocated with internal WWAN-antenna

Configuration 2: Internal WLAN-antenna colocated with external WWAN-antenna.

The external WWAN-antenna (CAF-6540FMXX) is equipped with a cable length of 1500mm (Type RG174/U)

4.2 Referenced Documents

None

4.3 Additional comments

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4.4 Internal Antenna gain WLAN part

Reference (see Cetecom ICT Report Nr.: 4-2629-01-02_07_v2)

4.5 Internal Antenna gain WWAN part

Reference (Option Report Nr.: 20070116_TycoMainAnt()+PulseDA()+GS2)

Gain [dBi]	low channel	mid channel	high channel
850 MHz	1.39	1.26	1.12
1900 MHz	-0.10	0.02	0.14

4.6 External Antenna gain WWAN part

Reference (Datasheet antenna)

Gain [dBi]	low channel	mid channel	high channel
850 MHz	0.17	0.13	0.09
1900 MHz	1.25	1.38	1.57

Antenna gain is corrected with the cable attenuation.

4.7 Output power complete

The results for WWAN conducted power are taken from 7Layer Report Nr.: MDE_Opti_0611_FCCh und MDE_Opti_0611_FCCi

GSM 850	Conducted power (dBm)	Radiated power (dBm) Internal antenna	Radiated power (dBm) External antenna
128 / 824.2 MHz	31.9	33.3	32.1
190 / 836.6 MHz	31.8	33.1	32.0
251 / 848.8 MHz	31.8	32.9	31.9
GSM 1900			
512 / 1850.2 MHz	28.6	28.5	29.9
661 / 1880.0 MHz	28.9	28.9	30.3
810 / 1909.8 MHz	29.3	29.4	30.9
GSM EDGE 850			
128 / 824.2 MHz	27.0	28.4	27.2
190 / 836.6 MHz	27.2	28.5	27.3
251 / 848.8 MHz	27.4	28.5	27.5
GSM EDGE 1900			
512 / 1850.2 MHz	26.8	26.7	28.1
661 / 1880.0 MHz	27.0	27.0	28.4
810 / 1909.8 MHz	27.2	27.3	28.8
WCDMA 850			
4132 / 826.4 MHz	26.0	27.4	26.2
4183 / 836.6 MHz	25.6	26.9	25.7
4233 / 846.6 MHz	25.7	26.8	25.8
WCDMA 1900			
9262 / 1852.4 MHz	24.1	24.0	25.4
9400 / 1880.0 MHz	23.6	23.6	25.0
9538 / 1907.6 MHz	23.2	23.3	24.8
WLAN b-mode			
01 / 2412 MHz	24.26	26.02	-
06 / 2437 MHz	24.68	24.29	-
11 / 2462 MHz	23.67	23.44	-
WLAN g-mode			
01 / 2412 MHz	25.82	27.83	-
06 / 2437 MHz	26.63	26.38	-
11 / 2462 MHz	25.41	26.01	-

4.8 Worst case RF-exposure

Regarding the results of the list above following channels have been used for configuration 1 and 2: GSM 850 (Channel 128) colocated with WLAN g-mode (Channel 1)

The measurements have been performed with a calibrated wideband RF-probe from PMM (PMM8053).

The sample was controlled by a CMU for GSM850 and used by a Windows network via WLAN g-mode. This was defined as worst case regarding output power.

Measurement procedure:

- 1) The probe was positioned on the turntable at a separation distance of 20 cm from the radiating antenna and at a starting height of 5 cm to the center of the probe.
- 2) The turntable was positioned in a way that the initial start angle was 0 degrees.
- 3) The EUT was powered on and allowed sufficient time to stabilize. The EUT was operated at full power on the desired frequencies.
- 4) The Field probe was set for maximum hold, and set on the appropriate power range.
- 5) The turntable was rotated 360 degrees and the maximum reading was obtained for that elevation.
- 6) The EUT was then turned off and the probe raised by 5 cm. This process was repeated to a sufficient distance past the tip of the antenna or where the maximum radiation was reduced by a significant factor to warrant no further measurement.

Result for configuration 1: The maximum field strength was 0.48 mW/cm² at 20cm distance.

Result for configuration 2: The maximum field strength was 0.53 mW/cm² at 20cm distance.

Limit:

The limit is 0.567 mW/ cm² for 850 Mhz and 1 mW/ cm² for 2437 MHz. for uncontrolled exposure.

Final verdict: Pass

5 Test equipment and ancillaries used for tests

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

Anechoic chamber C:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Anechoic chamber	MWB	87400/02	300000996	Monthly verification		
2	System-Rack 85900	HP I.V.	*	300000222	n.a.		
3	Measurement System 1						
4	Spektrum Analyzer 8566B	HP	2747A05306	300001000	05.10.2006	24	05.10.2008
5	Spektrum Analyzer Display 85662A	HP	2816A16541	300002297	05.10.2006	24	05.10.2008
6	Quasi-Peak-Adapter 85650A	HP	2811A01131	300000999	05.10.2006	24	05.10.2008
7	RF-Preselector 85685A	HP	2837A00779	300000218	08.11.2006	24	08.11.2008
8	PC Vectra VL	HP		300001688	n.a.		
9	Software EMI	HP		300000983	n.a.		
10	Measurement System 2						
11	FSP 30	R&S	100623	ICT 300003464	26.10.2006	12	26.10.2007
12	PC	F+W			n.a.		
13	TILE	TILE			n.a.		
14	Biconical antenna	EMCO	S/N: 860 942/003		Monthly verification (System cal.)		
15	Log. Period. Antenna 3146	EMCO	2130	300001603	Monthly verification (System cal.)		
16	Double Ridged Antenna HP 3115P	EMCO	3088	300001032	Monthly verification (System cal.)		
17	Active Loop Antenna 6502	EMCO	2210	300001015	Monthly verification (System cal.)		
18	Power Supply 6032A	HP	2818A03450	300001040	12.05.2007	36	12.05.2010
19	Busisolator	Kontron		300001056	n.a.		
20	Leitungsteiler 11850C	HP		300000997	Monthly verification (System cal.)		
21	Power attenuator 8325	Byrd	1530	300001595	Monthly verification (System cal.)		
22	Band reject filter WRCG1855/1910	Wainwright	7	300003350	Monthly verification (System cal.)		
23	Band reject filter WRCG2400/2483	Wainwright	11	300003351	Monthly verification (System cal.)		
24	Portable field meter 8053	PMM	0220J10945	300002888	19.04.2007	24	19.04.2009
25	Electric field probe EP330	PMM	1010J10627	300002888a	19.04.2007	24	19.04.2009

Bluetooth Rack:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	FSP 30	R&S		300003575	02.04.2007	24	02.04.2009
2	CBT	R&S	100313	300003516	24.10.2006	24	24.10.2008
3	Switch Matrix	HP		300000929	n.a.		
4	Power Supply	HP	3041A00544	300002270	13.05.2007	36	13.05.2010
5	Signal Generator	R&S	836206/0092	300002680	30.05.2007	36	30.05.2010

Signaling Units:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	CBT	R&S	100313	300003516	24.10.2006	24	24.10.2008
2	CBT	R&S	100185	300003416	21.02.2006	24	21.02.2008
3	CMU-200	R&S	103992	300003231	27.04.2007	12	27.04.2008
4	CMU-200	R&S	106240	300003321	02.05.2006	24	02.05.2008

SRD Laboratory Room 005:

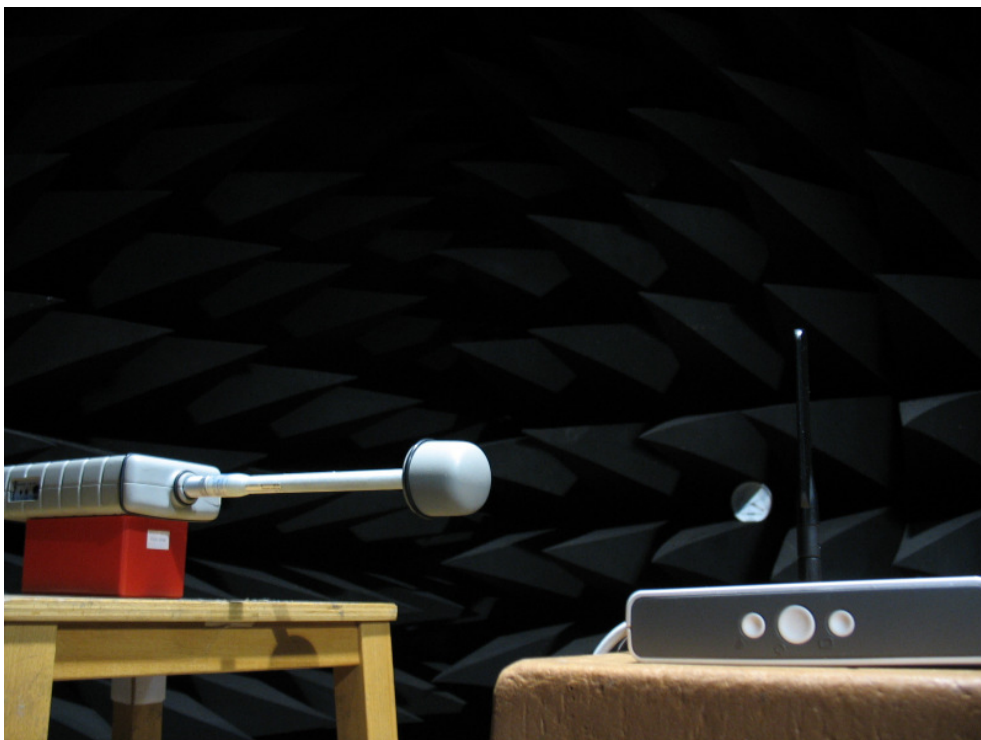
No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Spektrum Analyzer 8566B	HP	2747A05275	300000219	08.11.2006	24	08.11.2008
2	Spektrum Analyzer Display 85662A	HP	2816A16497	300001690	08.11.2006	24	08.11.2008
3	Quasi-Peak-Adapter 85650A	HP	2811A01135	300000216	08.11.2006	24	08.11.2008
4	Power Supply	Heiden	003202	300001187	12.05.2007	36	12.05.2010
5	Power Supply	Heiden	1701	300001392	12.05.2007	36	12.05.2010

6 Photographs of the Test Set-up

Photo 1: Radiated (Configuration 1)



Photo 2: Radiated (Configuration 2)



7 RF Technical Brief Cover Sheet acc. To RSS-102

1. COMPANY NUMBER: 2734A
2. MODEL NUMBER: Globe Surfer 2
3. MANUFACTURER: Option N.V.
4. TYPE OF EVALUATION:

RF Evaluation

- Evaluated against exposure limits: General Public Use Controlled Use
- Duty cycle used in evaluation: 100 %
- Standard used for evaluation: RSS-102 Issue 2 (2005-11)
- Measurement distance: 0.20 m
- RF value: 5.3 V/m A/m W/m²

Measured Computed Calculated

Declaration of RF Exposure Compliance

ATTESTATION: I attest that the information provided in this test report is correct; that a Technical Brief was prepared and the information it contains is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed and that the device meets the SAR and/or RF exposure limits of RSS-102.

Name: Stefan Bös
Title: Dipl.Ing. (FH)
Company: CETECOM ICT Services GmbH