eurofins | Product Service

RF-EXPOSURE ASSESSMENT REPORT

FCC 47 CFR Part 2.1093
Industry Canada RSS-102

RF-Exposure evaluation of portable equipment

Report Reference No. ..... :	G0M-1202-1765-TFC093M-V01
Testing Laboratory ..... :	Eurofins Product Service GmbH
Address ..... :	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation ..... :	A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Filed Test Laboratory, Reg.-No.: 96970 IC OATS Filing assigned code: 3470A
Applicant's name ..... :	Orderman GmbH
Address ..... :	Bachstrasse 59 5023 Salzburg AUSTRIA
Test specification:	
Standard..... :	47 CFR 1.1310 / 47 CFR 2.1091 / 47 CFR 2.1093 OET Bulletin 65:1997 KDB 447498:2009 RSS-102, Issue 4:2010 Safety Code 6:2009
Equipment under test (EUT):	
Product description	Sol+/Sol+ MSR Handheld terminal
Model No.	Sol+ 09021 , Sol+ MSR 09031
Hardware version	1.xx
Firmware / Software version	None
	FCC-ID: A9CSOL090X IC: 10102A-SOL0903
Contains (WT12 Bluetooth module)	FCC-ID: QOQWT12 IC: 5123A-BGTWT12A
Test result	**Passed**

Possible test case verdicts:	
- not applicable to test object ..... :	N/A
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)

Testing:

Date of receipt of test item ..... :	2012-03-01	
Date (s) of assessment ..... :	2012-03-12	
Compiled by ..... :	Christian Weber	
Assessed by (+ signature) ..... : (Testing Manager)	Christian Weber	C. Weber .....
Approved by (+ signature) ..... : (Test Lab Manager)	Jens Zimmermann	.....
Date of issue ..... :	2012-03-12	
Total number of pages ..... :	12	

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

Additional comments:

REPORT INDEX

1 Equipment (Test item) Description

Description	Sol+/Sol+ MSR Handheld terminal
Model	Sol+ 09021 , Sol+ MSR 09031
Serial number	None
Hardware version	1.xx
Software / Firmware version	None
FCC-ID	A9CSOL090X
IC	10102A-SOL0903
Contains FCC-ID	QOQWT12 (WT12 Bluetooth module)
Contains IC	5123A-BGTWT12A (WT12 Bluetooth module)
Equipment type	End product

1.1 Reference Documents

Document type	Document No.	Issued by	Date
FCC 15.249 Radio Report	G0M-1202-1765-TFC249D-V01	Eurofins Product Service GmbH	2012-03-12
FCC 15.247 Radio Report	EF/2005/C0012	SGS Taiwan Ltd.	2006-01-10

1.2 Radiation Sources

Mode #	Description	
SRD 902MHz	Frequency range [MHz]	902.2 – 905.5
	Channels	61
	Modulations	unspecified
	Maximum conducted power [dBm]	9.77
	Antenna gain [dBi]	-14
	Maximum radiadted field strength [dBµV/m]	91.00
	Maximum radiated power [dBm e.i.r.p.]	-4.23
	Maximum transmission duty cycle [%]	100%
Bluetooth	Frequency range [MHz]	2402 – 2480
	Channels	79
	Transmission modes	Bluetooth Basic / Bluetooth EDR
	Modulations	GFSK / π/4-DQPSK / 8-DPSK
	Maximum peak power [dBm]	3.46
	Antenna gain [dBi]	0.5 (integrated chip antenna)
	Maximum radiated power [dBm e.i.r.p.]	3.96
	Maximum transmission duty cycle [%]	100%

2 Result Summary

FCC 47 CFR Part 2.1093, KDB447498, IC RSS-102			
Product Specific Standard Section	**Requirement**	**Result**	**Remarks**
47 CFR 2.1093 KDB447498	SAR evaluation exemption : Bluetooth	PASS	
47 CFR 2.1093 KDB447498	SAR evaluation exemption : SRD 902MHz	PASS	
RSS-102 2.5.1	SAR evaluation exemption : Bluetooth	PASS	
RSS-102 2.5.1	SAR evaluation exemption : SRD 902MHz	PASS	
Remarks:			

3 RF-Exposure Classifications

Device Types	
Fixed	A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located.
Mobile	A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. (47 CFR 2.1091)
Portable	A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. (47 CFR 2.1093)

Exposure Categories	
Occupational / Controlled	Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
General population / uncontrolled	Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

4 Assessment

4.1 SAR Exemption Assessment –FCC KDB447498 / RSS-102

MPE Assessment acc. to FCC KDB447498 / IC RSS-102		**Verdict: PASS**
Assessment according to reference	Reference Method	
	KDB447498 & 2.1093 / RSS-102 & Safety Code 6	
Device type	portable	
Exposure category	General population	
FCC/IC SAR Limits		
Region	Occupational SAR values [W/kg]	General public SAR values [W/kg]
Whole-body SAR averaging mass = entire body	0.4	0.08
Partial-body SAR averaging mass = 1g	8.0	1.6
Hands, Wrists, Feet and Ankles SAR averaging mass = 10g	20	4
FCC SAR evaluation exemptions		

Excerpt from KDB 447498:

Unlicensed intentional radiators and licensed devices can be approved as either a transmitter or a module for use in stand-alone portable exposure conditions that do not allow simultaneous transmission. Based on the SAR or output power level, the following three conditions may be applied;

A device may be used in portable exposure conditions with no restrictions on host plat forms when either the source-based time-averaged output power is ≤ 60/*f*(GHz) mW or all measured 1-g SAR are < 0.4 W/kg. When SAR evaluation is required, the most conservative exposure conditions for all expected operating configurations must be tested.

A device may be approved for use in multiple host platforms, each with similar family attrib utes, for example, PDA, laptop/notebook/netbook computers, and tablet computers, when each host platform is tested in the most conservative exposure conditions and the 1-g SAR is < 0.8 W/kg for all configurations.

A device may be approved for use in a single platform when all hosts within the same platform have the same operating configurations and exposure conditions, with only minor configure tion and construction differences. The most conservative exposure conditions among all host configurations within the platform must be fully tested using the procedures in item 2) b) according to the required platform test configurations, such as those in item 4); the remaining less restrictive exposure conditions and host configurations may apply. The 1-g SAR must be < 1.2 W/kg for all configurations.

IC SAR evaluation exemptions
Excerpt from RSS-102 Issue 4: **SAR evaluation is required** if the separation distance between the user and the radiating element of the **device is less than or equal to 20 cm, except** when the device operates as follows: from **3 kHz up to 1 GHz** inclusively, and with **output power** (i.e. the higher of the conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power) that is **less than or equal to 200 mW for general public use** and **1000 mW for controlled use**; **above 1 GHz and up to 2.2 GHz** inclusively, and with **output power** (i.e. the higher of the con ducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is **less than or equal to 100 mW for general public use** and **500 mW for controlled use**; **above 2.2 GHz and up to 3 GHz** inclusively, and with **output power** (i.e. the higher of the con ducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is **less than or equal to 20 mW for general public use** and **100 mW for controlled use**; **above 3 GHz and up to 6 GHz** inclusively, and with **output power** (i.e. the higher of the con ducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is **less than or equal to 10 mW for general public use** and **50 mW for controlled use**.
Assessment procedure
For the radiation source included into the device the output power is taken from a corresponding RF test report. If needed the output power is converted to source based, time-averaged output power. Finally the output power is compared to the FCC and IC low power SAR evaluation exemption level.

Assessment results – SRD 902MHz	
Transmission mode	
Operating mode frequency range [MHz]	902.2-905.5
Assessment frequency [MHz]	905.5
Transmission duty cycle [%]	100%
Peak conducted power [dBm]	9.77
Source-based, time averaged power	
Duty cycle correction [dB]	0.0
Averaged peak power [dBm]	9.77
Averaged radiated power	
Antenna gain [dBi]	-14
Averaged radiated power [dBm e.i.r.p.]	-4.23
SAR evaluation exemption power levels	
FCC 60/f(GHz)	60/0.9055 = 66.26mW (18.21dBm)
IC	200mW (23.0dBm)
Verdict	
The source-based, time-averaged output power of the EUT fulfills the SAR evaluation exemption requirements according to FCC KDB447498 and IC RSS-102	
Comments:	

Assessment results – Bluetooth	
Transmission mode	
Operating mode frequency range [MHz]	2402-2480
Assessment frequency [MHz]	2480
Transmission duty cycle [%]	100%
Peak conducted power [dBm]	3.46
Source-based, time averaged power	
Duty cycle correction [dB]	0.0
Averaged peak power [dBm]	3.46
Averaged radiated power	
Antenna gain [dBi]	0.5
Averaged radiated power [dBm e.i.r.p.]	3.96
SAR evaluation exemption power levels	
FCC 60/f(GHz)	60/2.480 = 24.19mW (13.84dBm)
IC	20mW (13.0dBm)
Verdict	
The source-based, time-averaged output power of the EUT fulfills the SAR evaluation exemption requirements according to FCC KDB447498 and IC RSS-102	
Comments:	