

RADIO FREQUENCY ADDENDUM EXPOSURE REPORT TO 95078-19

FOR THE

**Device: 915 MHz Low Power RF Module
Model: SP1ML-915**

Report No.: 95078-19A

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PREPARED FOR:

*STMicroelectronics
Centro Direzionale Colleoni
Palazzo Andromeda 3
Agrate Brianza , 20041
Italy*

PREPARED BY:

*Eddie Wong
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338*

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



**Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.**

Purpose:

To demonstrate compliance with United States RF Exposure requirements for Portable equipment (devices used $\leq 20\text{cm}$ from the body) or Mobile equipment (devices used $>20\text{cm}$ from the body) with power output below exemption levels and Mobile equipment, where Maximum Permissible Exposure (MPE) Calculations apply.

Addendum A: Replaced 3.05 mW/cm^2 with 4.8 mW EIRP on page 4..

United States Compliance Requirements (1.1310):

***RF Exposure Evaluation Limits
Occupational / Controlled Exposure***

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
0.3-3.0	614	1.63	$*(100)$	6
3.0-30	$1842/f$	$4.89/f$	$*(900/f^2)$	6
30-300	61.4	0.163	1	6
300-1500	---	---	$f/300$	6
1500-100,000	---	---	5.0	6

***RF Exposure Evaluation Limits
General Population / Uncontrolled Exposure***

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
0.3-1.34	614	1.63	$*(100)$	30
1.34-30	$824/f$	$2.19/f$	$*(180/f^2)$	30
30-300	27.5	0.073	0.2	30
300-1500	---	---	$f/1500$	30
1500-100,000	---	---	1.0	30

** Plane wave equivalent power density*

Limit is calculated based on the mid-band frequency used in the operating frequency range.

Exemption Level: Power output $< 60/f_{\text{GHz}}$ (mW). For 915MHz = 65.6mW

Device and Antenna Operating Configuration:

Device operating at maximum output power with continuous transmission of modulated data.
EUT is transmitting at its rated maximum output power to an integral antenna.

Test Procedure:

This equipment is evaluated in accordance with the guidelines set forth in OET Guide 65 & ANSI C95.1 for the US.

Other Considerations:

None

MPE Calculations

Applicability:

<i>Limit Used</i>	X	General Population / Uncontrolled Exposure
	X	Occupational / Controlled Exposure
<i>RF Exposure Exemption</i>	Yes	United States

Equipment operational details:

<i>Config #</i>	<i>Operating Frequency (MHz)</i>	<i>Measured Output Power (dBm)</i>	<i>Antenna Gain (dBi)</i>	<i>Antenna Type / Configuration</i>	<i>EIRP (dBm)</i>
1	915	5.2	1.6	integral	6.8
2	903	4	1.6	integral	5.6
3	927	1.8	1.6	integral	3.4

Note: 5.2dBm = 3.3mW, 6.8dBm EIRP = 4.8 mW EIRP

Measurements based from EMC Test Report(s): 95078-11

MPE Calculation:

$$\text{Power Density} = \frac{\text{EIRP}}{4\pi d^2} \quad \text{Given: EIRP in mW or W and } d \text{ in cm or m}$$

<i>Config #</i>	<i>Distance (cm)</i>	<i>US (1.1310)</i>	
		<i>Power Density (mW/cm²)</i>	<i>Limit (mW/cm²)</i>
1	20	Exempt	--
2	20	Exempt	--
3	20	Exempt	--

Summary:*Exemptions:*

In the case the equipment meets compliance requirements by exemption the product is approved for use under mobile or portable conditions without further testing under the condition that any additional collocation or simultaneous transmission requirements (including necessary separation distances) have been met.

MPE Calculation Results:

In the case the equipment meets compliance by MPE Calculations the product is approved for use under mobile conditions without further testing under the condition that any additional collocation or simultaneous transmission requirements (including necessary separation distances) have been met. It is assumed that the manufacturer shall design the equipment such that the minimum separation distance of 20cm (or greater, as listed above) is met or that the manufacturer provides a protection guide (or installation instructions) to the end user such that the antenna(s) may be installed in accordance with the manufacturer's instructions in such a manner to maintain the minimum separation distance.

The Absorption and distribution of Electromagnetic energy in the body is a very complex phenomena that depends on the mass, shape and physiological condition of the body; the orientation of the body with respect to the fields; and, the electrical properties of the body and the environment. Variables that may play a substantial role in possible biological effects are those that characterize the environment (including but not limited to: ambient temperature, air velocity, relative humidity and body insulation); and those that characterize the individual (including but not limited to: age, gender, activity level and existing debilitation or disease). Because innumerable factors may interact to determine specific biological effects of exposure to electromagnetic fields, any protection guide should consider both intended and unintended operational environments and provide guidance for installation and use of the product such that proper separation distances can be maintained. (ANSI C95.1)

References

Federal Communications Commission Knowledge Database (KDB) Publication 447498, "What are the RF exposure requirements and procedures for mobile and portable devices?" As in effect on the issue date of this report.

Federal Communications Commission Bulletin OET 65 Supplement C, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" June 2001

Title 47 Code of Federal Regulations, Part 1.1310, "Radiofrequency radiation exposure limits." As in effect on the issue date of this report.

Title 47 Code of Federal Regulations, Part 2.1091, "Radiofrequency radiation exposure evaluation: mobile devices." As in effect on the issue date of this report.

International Commission on Non-Ionizing Radiation Protection. Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). Health Physics 74 (4): 494-522; 1998.

International Commission on Non-Ionizing Radiation Protection Statement on the "Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz). Health Physics 97(3):257-259; 2009.