MPE Report
For
NovAtel Inc
SMART-MR10

FCC ID: UTU01018518
IC: 129A-01018518

Project Code CG-1418

(Report CG-1418-RA-2-1)
Revision: 1

May 25, 2010

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Accreditation Numbers:	0214.22 Electrical 0214.23 Mechanical Accredited by A2LA The American Association for Laboratory Accreditation CLIENTS SERVED: All interested parties FIELDS OF TESTING: Electrical/Electronic, Mechanical/Physical ACCREDITATION DATE:: May 14, 2009 VALID TO: December 31, 2011
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Register of revisions

Revision	Date	Description of Revisions
1	May 25, 2010	Initial release

1.0 INTRODUCTION

1.1 PURPOSE

This Maximum Permissive Exposure report demonstrates compliance with FCC CFR 47 1.1310, 2.1091 and RSS-102 Issue 4, RF Exposure evaluation for Model SMART-MR10 which is categorized as mobile.

1.2 ANTENNA SPECIFICATIONS

The Model SMART-MR10 has the following antenna gain specification
Bluetooth 3 dBi Surface Mount Integral Antenna (D-PUCK -SMT 2.45 & 5.51 GHz part# MAF94192)

2.0 RF EXPOSURE LIMITS AND EQUATIONS

In compliance with FCC CFR 47 1.1310, the criteria listed in the table below shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1303 (b).

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mw/cm2)	Average Time (minutes)
(A) Limits for Occupational/Control Exposures (f=frequency)				
30-300	61.4	0.2	1.0	6.0
300-1500	-	-	f/300	6.0
1500-100,000	-	-	5.0	6.0
(B) Limits for General Population/Uncontrolled Exposure (f=frequency)				
30-300	27.5	0.1	0.2	30.0
300-1500	-	-	f/1500	30.0
1500-100,000	-	-	1.0	30.0

Friis Transmission Formula:

$Pd = (Pout * G) / (4\pi R^2)$
Where,
Pd = power density (mW/cm^2)
Pout = output power to antenna (mW)
G = gain of antenna in linear scale
R = distance between observation point and center of the radiator (cm)

The resulted power density at a distance of 20cm can be calculated as follows:
$Power\ Density = (EIRP * Duty\ cycle) / (4\pi R^2)$

3.0 MPE FIGURE

For the purposes of this report worst case MPE value is provided for highest conducted power output and antenna peak gain.

3.1 OPERATING MODE: 2.4 GHZ

Maximum EIRP = Conducted power + Antenna gain = 0.01 + 3.0 = 3.01 dBm or 2 mW

Result

Compliant.

4.0 RSS-102 ISSUE 4, RF EXPOSURE EVALUATION

2.5.1 Exemption from Routine Evaluation Limits – SAR Evaluation

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:

- above 2.2 GHz and up to 3 GHz inclusively, and with output power (i.e. the higher of the conducted 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;

The unit is exempt from routine evaluation
Maximum EIRP = Conducted power + Antenna gain = 0.01 + 3.0 = 3.01 dBm or 2 mW which is smaller than 20 mW

2.5.2 Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:
At or above 1.5 GHz and the maximum e.i.r.p. of the device is equal to or less than 5 W.

The peak power output of the device is 0.01 dBm at 2480 MHz
The maximum antenna gain is 3 dBi
The calculated maximum radiated e.i.r.p. is 3.01 dBm (0.002 W) which is less than 5 W

Therefore the unit is exempt from RSS-102 Issue 4, routine evaluation limits

END OF DOCUMENT