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To: To Whom It May Concern

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From: Product Approvals Team

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Date: 14 / Apr / 2013

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cc:

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Subject: Electromagnetic environment of 9764 MCO V1.0 B2 W-CDMA 1W – Compliance assessment wrt NAR regulations

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Reference: ALU/PA/13001/V3.0

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## 1. Introduction

This memo provides inputs with regard to the assessments of human exposure to the Electromagnetic Environment of the 9764 MCO V1.0 B2 W-CDMA 1W and its compliance to related regulations in North America Region and in countries using the similar references to IEEE exposure limits.

## 2. Reference regulations

RF exposure USA – General Public & Workers	USA: FCC 47CFR 1.1310 Radiofrequency radiation exposure limits.
US FCC OET Bulletin 65 (incl. supplements)	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields and its supplements
RF exposure Canada – General Public & Workers	Safety Code 6 - Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz.
Canada RSS 102	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

Note: These standards are aligned with IEEE C95.1 from the Institute of Electrical & Electronics Engineers (IEEE). The recommendations provided below may also be extended to other IEEE or FCC based regulations.

## 3. Main relevant parameters of the equipment

The Alcatel-Lucent 9764 lightRadio™ Metro Cell Outdoor V1.0 B2 W-CDMA 1W is basically a radio transmitter and receiver. When it's turned on, it receives and transmits radio frequency (RF) signals.

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The system controls the transmitted power level within a range up to 1 W. The transmit frequency band is 1930 – 1990 MHz. The equipment includes a 8 dBi built-in antenna with 2 radiating elements

## 4. EME compliance assessment

### 4.1.Short description of the method

The EME compliance assessment is performed with the "EMF Visual" software in its release 3. The EMFVisual model of the antenna is defined such that its transmitting characteristics match the measured characteristics of the equipment within 20%.

Then, the EMF Visual model is used to assess the power density at 20 cm from the equipment. The spatial averaging technique is derived from the "9 sampling point" method defined in IEC 62232. For general public exposure, the exposed person is on the ground and exposed to the equipment installed 3 m above ground. For workers exposure, the exposed worker is in the main lobe of the antenna.

### 4.2.Results

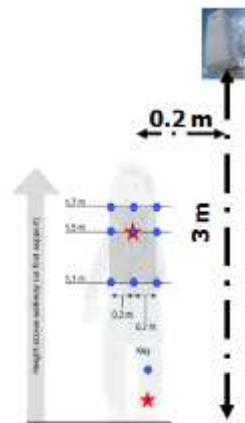
#### a) Model validation

Parameter	Specification	Model	Delta (%)
	LR MCO 2100	WCDMA_H84_V41_9dBi	
Frequency range (MHz)	1920 – 2170	2100	9
Gain (dBi)	8	10,5	11
Horizontal Beamwidth (HBW °)	75 - 88	83,5	10
Vertical Beamwidth (VBW °)	35 - 45	41°	15
First Upper Side Lobe (dB)	14 - 16	14,7	8
Front to back ratio (dB)	> 20	20	0
Dimensions of radiating elements (x,y,z) in mm	100 x 200 x 21.5	90 x 190 x z	na
Distance between the radiating elements (mm)	na	95	na

#### b) General public exposure assessment

General public limit = 10 W/m<sup>2</sup>

Result: Savg < 0.2 W/m<sup>2</sup>

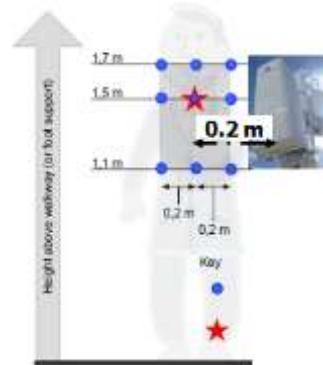


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## c) Workers exposure assessment

Workers limit =  $50 \text{ W/m}^2$

Result:  $S_{avg} < 3 \text{ W/m}^2$



## 5. Conclusion

The product complies with FCC 47CFR1.1310 (US) and Safety Code 6 (Canada) RF exposure limits for uncontrolled (general public) environments. The equipment must be installed and operated with a minimum separation distance of 20 cm (8 inches) between the radiator and user (see: USA – FCC OET Bulletin 65 and supplements and Canada – RSS 102).

Installation for the Alcatel-Lucent 9764 lightRadio™ Metro Cell Outdoor V1.0 B1 WCDMA1W equipment shall be performed in accordance with all applicable manufacturer's recommendations, and national laws and regulations. In particular:

- Workers that are required to work in close proximity to the equipment, for example maintenance personnel, should strictly follow instructions provided by their employer.
- Workers equipped with personal medical electronic devices, such as pacemakers and hearing aids, shall consult the manufacturer's instructions and consult their occupational health practitioner.

More information about "RF exposure" can be found in the Product Description Document (PDD), in the Site Preparation Procedure (SPP), in the HW Installation and in the Maintenance & Troubleshooting documents.

Products Approvals Team  
ALCATEL-LUCENT