



**FCC Part 1 Subpart I  
FCC Part 2 Subpart J**

**RF EXPOSURE REPORT**

**FOR**

**850/900/1800/1900MHZ GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA MINI-PCIE  
WIRELESS WAN CARD**

**MODEL NUMBER: F3307**

**FCC ID: VV7-MBMF33071-T**

**REPORT NUMBER: 10U13160-2**

**ISSUE DATE: APRIL 20, 2010**

*Prepared for*

**ERICSSON AB  
BUSINESS UNIT NETWORK  
LINDHOLMSPIREN 11  
GOT SE-41756, SWEDEN**

*Prepared by*

**COMPLIANCE CERTIFICATION SERVICES  
47173 BENICIA STREET  
FREMONT, CA 94538, U.S.A.  
TEL: (510) 771-1000  
FAX: (510) 661-0888**



**NVLAP LAB CODE 200065-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	04/20/10	Initial Issue	T. Chan

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS.....</b>	<b>4</b>
<b>2. METHODOLOGY .....</b>	<b>5</b>
<b>3. REFERENCES .....</b>	<b>5</b>
<b>4. FACILITIES AND ACCREDITATION.....</b>	<b>5</b>
<b>5. EUT DESCRIPTION .....</b>	<b>5</b>
5.1. DESCRIPTION OF EUT.....	5
5.2. DESCRIPTION OF EUT MODULES.....	5
<b>6. REQUIREMENTS - LIMITATION OF EXPOSURE .....</b>	<b>6</b>
6.1. LIMITS.....	6
6.1.1. FCC RULES .....	6
6.1.2. LIMITS APPLICABLE TO THE EUT.....	6
6.2. EQUATIONS .....	7
6.3. RESULTS.....	8

## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** ERICSSON AB  
BUSINESS UNIT NETWORK  
LINDHOLMSPIREN 11, GOT, SE-417 56, SWEDEN

**EUT DESCRIPTION:** 850/900/1800/1900MHz GSM/ GPRS/ EDGE/ WCDMA/ HSDPA/  
HSUPA Mini-PCle Wireless WAN Card

**MODEL:** F3307

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 1 SUBPART I & PART 2 SUBPART J	Pass

Compliance Certification Services, Inc. (CCS) calculated the RF Exposure of the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation, as described by the referenced documents. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By:



THU CHAN  
EMC MANAGER  
COMPLIANCE CERTIFICATION SERVICES

Calculated By:



CHIN PANG  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. METHODOLOGY

All calculations were made in accordance with FCC OET Bulletin 65 Edition 97-01.

## 3. REFERENCES

Worst-case power, antenna gain and duty cycle data is excerpted from the AT4 Wireless S.A. report 28940RET.001 FCC ID: VV7-MBMF3607GW1 for the WWAN module operating in the 850 and 1900 MHz bands.

Worst-case power and antenna gain data is excerpted from Taiwan CCS report number 81029005 for the WLAN module operating in the 2.4 GHz band.

## 4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

## 5. EUT DESCRIPTION

### 5.1. DESCRIPTION OF EUT

The EUT is a multi-band wireless modem that installed inside Toshiba Mini-Notebook Computer with Hitachi PIFA antennas. The device radio module, model F3307 (FCC ID: VV7-MBMF33071-T)

### 5.2. DESCRIPTION OF EUT MODULES

The EUT will be co-located with a WLAN radio module, model number: PA3722U-1MPC, FCC ID: CJ6UPA3722WL and model number PA3758U-1MPC, FCCID: CJ6UPA3758WL operating in the 2.4 GHz band.

The EUT is a fixed or mobile device, thus a separation distance of at least 20 cm from all persons is applicable.

Other details regarding the EUT are documented in the applicable test reports and product documentation.

## 6. REQUIREMENTS - LIMITATION OF EXPOSURE

### 6.1. LIMITS

#### 6.1.1. FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

f = frequency in MHz

\* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: 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.

NOTE 2 TO TABLE 1: 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 can not exercise control over their exposure.

#### 6.1.2. LIMITS APPLICABLE TO THE EUT

For mobile radio equipment operating in the cellular phone band, the lowest power density limit is calculated using the lowest frequency, as  $824 \text{ MHz} / 1500 = 0.55 \text{ mW/cm}^2$  (FCC).

For operation in the PCS band and the 2.4 GHz band, from FCC §1.1310 Table 1 (B), the maximum value of  $S = 1.0 \text{ mW/cm}^2$ .

## 6.2. EQUATIONS

Power density is given by:

$$S = \text{EIRP} / (4 * \pi * D^2)$$

where

S = Power density in W/m<sup>2</sup>

EIRP = Equivalent Isotropic Radiated Power in W

D = Separation distance in m

Where applicable (for example, multi-slot cell phone applications) a duty cycle factor may be applied.

$$\text{Source-based time-averaged EIRP} = (\text{DC} / 100) * \text{EIRP}$$

where

DC = Duty Cycle in %, as applicable

EIRP = Equivalent Isotropic Radiated Power in W

For multiple colocated transmitters operating simultaneously in frequency bands where the limit is identical, the total power density is calculated using the total EIRP obtained by summing the Power \* Gain product (in linear units) of each transmitter.

$$\text{Total EIRP} = (P_1 * G_1) + (P_2 * G_2) + \dots + (P_n * G_n)$$

where

P<sub>x</sub> = Power of transmitter x

G<sub>x</sub> = Numeric gain of antenna x

For multiple colocated transmitters operating simultaneously in frequency bands where different limits apply, either the lowest limit applicable to the co-located transmitters can be applied or a fraction of the exposure limit is established for each band, such that the sum of the fractions is less than or equal to one.

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

### 6.3. RESULTS

#### EUT with WLAN module, model: PA3722U-1MPC

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	FCC Power Density (mW/cm <sup>2</sup> )
800 MHz	GSM	0.20	33.51	-0.60	100	0.389
1900 MHz	GSM	0.20	30.11	-1.60	100	0.141
2.4 GHz	WLAN	0.20	25.28	-1.50	100	0.048

#### EUT with WLAN module, model: PA3758U-1MPC

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	FCC Power Density (mW/cm <sup>2</sup> )
800 MHz	GSM	0.20	33.51	-0.60	100	0.389
1900 MHz	GSM	0.20	30.11	-1.60	100	0.141
2.4 GHz	WLAN	0.20	18.24	-1.50	100	0.009

#### CO-LOCATED RESULTS FOR SIMULTANEOUS OPERATION IN THE CELLULAR BAND AND 2.4 GHz BAND: model: PA3722U-1MPC

The co-located Power Density is less than .55 W/m<sup>2</sup>, which is the most stringent of the limits for each separate transmitter (.55 W/m<sup>2</sup> and 1 W/m<sup>2</sup> for the WWAN and WLAN respectively).

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	FCC Power Density (mW/cm <sup>2</sup> )
850 MHz	WWAN		33.51	-0.60	100	
2.4 GHz	WLAN		25.28	-1.50	100	
Combined		0.20				0.436



**CO-LOCATED RESULTS FOR SIMULTANEOUS OPERATION IN THE PCS BAND AND 2.4 GHz band  
model number PA3722U-1MPC**

The co-located Power Density is less than 1 W/m<sup>2</sup>, which is the limit for each separate transmitter.

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	FCC Power Density (mW/cm <sup>2</sup> )
1900 MHz	WWAN		30.11	-1.60	100	
2.4 GHz	WLAN		25.28	-1.50	100	
Combined		0.20				0.189

**CO-LOCATED RESULTS FOR SIMULTANEOUS OPERATION IN THE CELLULAR BAND AND 2.4  
GHz BAND: model: PA3758U-1MPC**

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	FCC Power Density (mW/cm <sup>2</sup> )
850 MHz	WWAN		33.51	-0.60	100	
2.4 GHz	WLAN		18.24	-1.50	100	
Combined		0.20				0.398

**CO-LOCATED RESULTS FOR SIMULTANEOUS OPERATION IN THE PCS BAND AND 2.4 GHz band  
model number PA3758U-1MPC**

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	FCC Power Density (mW/cm <sup>2</sup> )
1900 MHz	WWAN		30.11	-1.60	100	
2.4 GHz	WLAN		18.24	-1.50	100	
Combined		0.20				0.151

## END OF REPORT