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ASSESSMENT REPORT

Report No.: 33376IDT.001

REPORT ON: RF EXPOSURE ASSESSMENT OF THE F5321 ERICSSON MOBILE BROADBAND MODULE INSTALLED IN GENERIC HOST PLATFORMS COVERING 7 DIFFERENT COLLOCATION SCENARIOS.

Product	:	Ericsson Mobile Broadband Module
Trade Mark	:	Ericsson
Model	:	F5321
FCC ID / IC:	:	VV7-MBMF5321 / 287AG-MBMF5321
Manufacturer	:	Ericsson AB
Requested by	:	Ericsson AB
Host Platform	:	Generic host platforms covering 7 different collocation scenarios
Standard(s)	:	OET Bulletin 65 Edition 97-01 August 1997 FCC 47 CFR § 1.1307 FCC 47 CFR § 1.1310 RSS-102 Issue 4 - March 2010 EN 62311:2008 1999/519/EC Council Recommendation Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2003 ARPANSA RPS No. 3 AS 2772.2-1998:Radiofrequency radiation – Part 2 Vodafone requirements [1999/519/EC]

This report includes 2 annexes and therefore, the total number of pages is 36.

INDEX

1. COMPETENCE AND GUARANTEES

AT4 wireless is a testing laboratory competent to carry out the evaluation described in this report.

AT4 wireless guarantees the reliability of the data presented in this report, which is based on the information available at AT4 wireless at the time of performance of the evaluation.

AT4 wireless is liable to the client for the maintenance of the confidentiality of all information related to the item under review and the results of such evaluation

2. GENERAL CONDITIONS

1. This report refers only to the item that has undergone the evaluation as described in Annex A of this report according to the information provided by the applicant.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of AT4 wireless.
4. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of AT4 wireless and the Accreditation Bodies.

3. CHARACTERISTICS OF THE EVALUATION

3.1. SERVICES REQUESTED

RF exposure assessment of the F5321 Ericsson Mobile Broadband Module installed in generic host platforms covering 7 different collocation scenarios according to:

Requirements	Frequency bands
OET Bulletin 65 Edition 97-01 August 1997 - Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields FCC 47 CFR § 1.1307 - Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared. FCC 47 CFR § 1.1310 - Radiofrequency radiation exposure limits. RSS-102 Issue 4 - March 2010	GSM 850, FDD V, PCS 1900, FDD II
EN 62311:2008 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) 1999/519/EC Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)	E-GSM 900, FDD VIII, DCS 1800, FDD I

Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2003 ARPANSA RPS No. 3 – Maximum Exposure Levels to Radiofrequency Fields (3 kHz to 300 GHz) AS 2772.2-1998: Radiofrequency radiation - Part 2: Principles and methods of measurement - 300 kHz to 100 GHz	FDD V, E-GSM 900, DCS 1800, FDD I
Vodafone requirements [1999/519/EC]	GSM 850, FDD V, FDD VI, E-GSM 900, FDD VIII, DCS 1800, PCS 1900, FDD II, FDD I

3.2. REQUIREMENTS AND METHOD

The evaluation has been carried out according to the following documents and standards:

Requirements	Frequency bands
OET Bulletin 65 Edition 97-01 August 1997 - Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields FCC 47 CFR § 1.1307 - Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared. FCC 47 CFR § 1.1310 - Radiofrequency radiation exposure limits. RSS-102 Issue 4 - March 2010	GSM 850, FDD V, PCS 1900, FDD II
EN 62311:2008 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) 1999/519/EC Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)	E-GSM 900, FDD VIII, DCS 1800, FDD I
Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2003 ARPANSA RPS No. 3 – Maximum Exposure Levels to Radiofrequency Fields (3 kHz to 300 GHz) AS 2772.2-1998: Radiofrequency radiation - Part 2: Principles and methods of measurement - 300 kHz to 100 GHz	FDD V, E-GSM 900, DCS 1800, FDD I
Vodafone requirements [1999/519/EC]	GSM 850, FDD V, FDD VI, E-GSM 900, FDD VIII, DCS 1800, PCS 1900, FDD II, FDD I

4. IDENTIFICATION DATA SUPPLIED BY THE APPLICANT

Identification data included in this section has been supplied by the client.

4.1. APPLICANT

Name / Company: Ericsson AB

V.A.T. Registration number: SE 556056625801

Address: Lindholmspiren 11, SE-417 56 Goteborg

Country: Sweden

Telephone: +46 10 712 0000 **Fax:** +46 10 712 6033

4.2. REPRESENTATIVE

Name: Fredrik Claesson

Address: Lindholmspiren 11, SE-417 56 Goteborg

Country: Sweden

Telephone: +46 10 712 7856 **Fax:** +46 10 712 6033

4.3. IDENTIFICATION OF ITEM/ITEMS EVALUATED

Product: Ericsson Mobile Broadband Module

Trade mark: Ericsson **Model:** F5321

FCC ID: VV7-MBMF5321 **IC:** 287AG-MBMF5321

Manufacturer: Ericsson AB

Country of manufacture: China

Host platform: Generic host platforms covering 7 different collocation scenarios

Description: QUAD BAND 850/900/1800/1900 GSM/GPRS/EGPRS class 10, WCDMA Bands I/II/V/VI/VIII HSDPA Cat. 14 HSUPA Cat. 6 miniPCI Full Size Wireless WAN module installed in generic host platforms covering 7 different collocation scenarios.

5. EVALUATION RESULTS

Abbreviations used in the VERDICT column of the following tables are:

C	Compliant with requirements
NC	Not Compliant with requirements
NA	Not Applicable
NE	Not Evaluated

5.1. RESULTS FOR ITEM EVALUATED TRANSMITTING ALONE

DOCUMENT/STANDARD	VERDICT			
	NA	C	NC	NE
OET Bulletin 65 Edition 97-01 August 1997 - Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields FCC 47 CFR § 1.1307 - Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared. FCC 47 CFR § 1.1310 - Radiofrequency radiation exposure limits. RSS-102 Issue 4 - March 2010		C		
EN 62311:2008 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) 1999/519/EC Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)		C		
Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2003 ARPANSA RPS No. 3 – Maximum Exposure Levels to Radiofrequency Fields (3 kHz to 300 GHz) AS 2772.2-1998: Radiofrequency radiation - Part 2: Principles and methods of measurement - 300 kHz to 100 GHz		C		
Vodafone requirements [1999/519/EC]		C		

5.2. RESULTS FOR ITEM EVALUATED TRANSMITTING SIMULTANEOUSLY WITH OTHER COLLOCATED TRANSMITTERS

DOCUMENT/STANDARD	VERDICT			
	NA	C	NC	NE
OET Bulletin 65 Edition 97-01 August 1997 - Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields FCC 47 CFR § 1.1307 - Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared. FCC 47 CFR § 1.1310 - Radiofrequency radiation exposure limits. RSS-102 Issue 4 - March 2010		C		
EN 62311:2008 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) 1999/519/EC Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)		C		
Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2003 ARPANSA RPS No. 3 – Maximum Exposure Levels to Radiofrequency Fields (3 kHz to 300 GHz) AS 2772.2-1998: Radiofrequency radiation - Part 2: Principles and methods of measurement - 300 kHz to 100 GHz		C		

Vodafone requirements [1999/519/EC]	C

6. REMARKS AND COMMENTS

GSM and GPRS modes have been evaluated together because both modes share the same power class and modulation scheme in the uplink.

WCDMA and HSDPA modes have been evaluated together because HSDPA is an improved mode of operation only for Downlink (equipment reception), but using the normal WCDMA mode for the Uplink (equipment transmission).

7. SUMMARY

Considering the results of the performed analysis and evaluation, stated in annexes A and B, the item under evaluation is **IN COMPLIANCE** with the specifications listed in section 3.1 "SERVICES REQUESTED".

NOTE: The results presented in this report apply only to the particular item under evaluation established in section "4.3. IDENTIFICATION OF ITEM/ITEMS EVALUATED" of this document, as presented for evaluation by the applicant.

ANNEX A

HOST PLATFORMS ANALYSIS

Report No: 33376IDT.001

A.1. SCENARIO 1

Scenario 1 covers a host device where the F5321 Ericsson Mobile Broadband Module is in mobile exposure conditions (antenna-to-user distance > 20 cm) and it is collocated with a Bluetooth transmitter (F5321 antenna-to-Bluetooth antenna distance < 20 cm) which is also in mobile exposure conditions. Other transmitters may be installed in the same host platform but they are not collocated with F5321 Ericsson Mobile Broadband Module.

MAIN/PRIMARY TRANSMITTER:

WWAN transmitter:

Type of equipment : Ericsson Mobile Broadband Module
Trade mark : Ericsson
Model : F5321
FCC ID / IC : VV7-MBMF5321 / 287AG-MBMF5321
Maximum antenna gain : Low bands: 2.91 dBi // High bands: 2.34 dBi
Output power : See table below

Frequency Band	Mode	Frequency range (MHz)	Maximum conducted output power (dBm)	Maximum conducted output power (mW)	Duty Cycle	Equivalent conducted output power (mW)	Maximum antenna gain (dBi)	Maximum antenna gain (numerical)	EIRP (mW)
GSM 850	GSM/GPRS	824,2 - 848,8	33,27	2123,24	25%	530,81	2,91	1,95	1037,39
	EDGE	824,2 - 848,8	31,01	1261,83	25%	315,46	2,91	1,95	616,51
FDD V	WCDMA/HSDPA	826,4 - 846,6	27,95	623,73	100%	623,73	2,91	1,95	1218,99
	HSUPA	826,4 - 846,6	27,23	528,45	100%	528,45	2,91	1,95	1032,76
FDD VI	WCDMA/HSDPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
	HSUPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
E-GSM 900	GSM/GPRS	880,2 - 914,8	32,80	1905,46	25%	476,37	2,91	1,95	930,98
	EDGE	880,2 - 914,8	27,20	524,81	25%	131,20	2,91	1,95	256,41
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	23,29	213,16	100%	213,16	2,91	1,95	416,58
	HSUPA	882,4 - 912,6	24,27	267,18	100%	267,18	2,91	1,95	522,16
DCS 1800	GSM/GPRS	1710,2 - 1784,8	29,80	954,99	25%	238,75	2,34	1,71	409,20
	EDGE	1710,2 - 1784,8	26,00	398,11	25%	99,53	2,34	1,71	170,58
PCS 1900	GSM/GPRS	1850,2 - 1909,8	30,67	1166,81	25%	291,70	2,34	1,71	499,97
	EDGE	1850,2 - 1909,8	30,09	1020,94	25%	255,23	2,34	1,71	437,46
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	26,08	405,51	100%	405,51	2,34	1,71	695,02
	HSUPA	1852,4 - 1907,6	25,48	353,18	100%	353,18	2,34	1,71	605,34
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	22,60	181,76	100%	181,76	2,34	1,71	311,53
	HSUPA	1922,4 - 1977,6	22,61	182,31	100%	182,31	2,34	1,71	312,46

ADDITIONAL/SECONDARY TRANSMITTERS:

Bluetooth transmitter:

Type of equipment : Bluetooth [1]
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

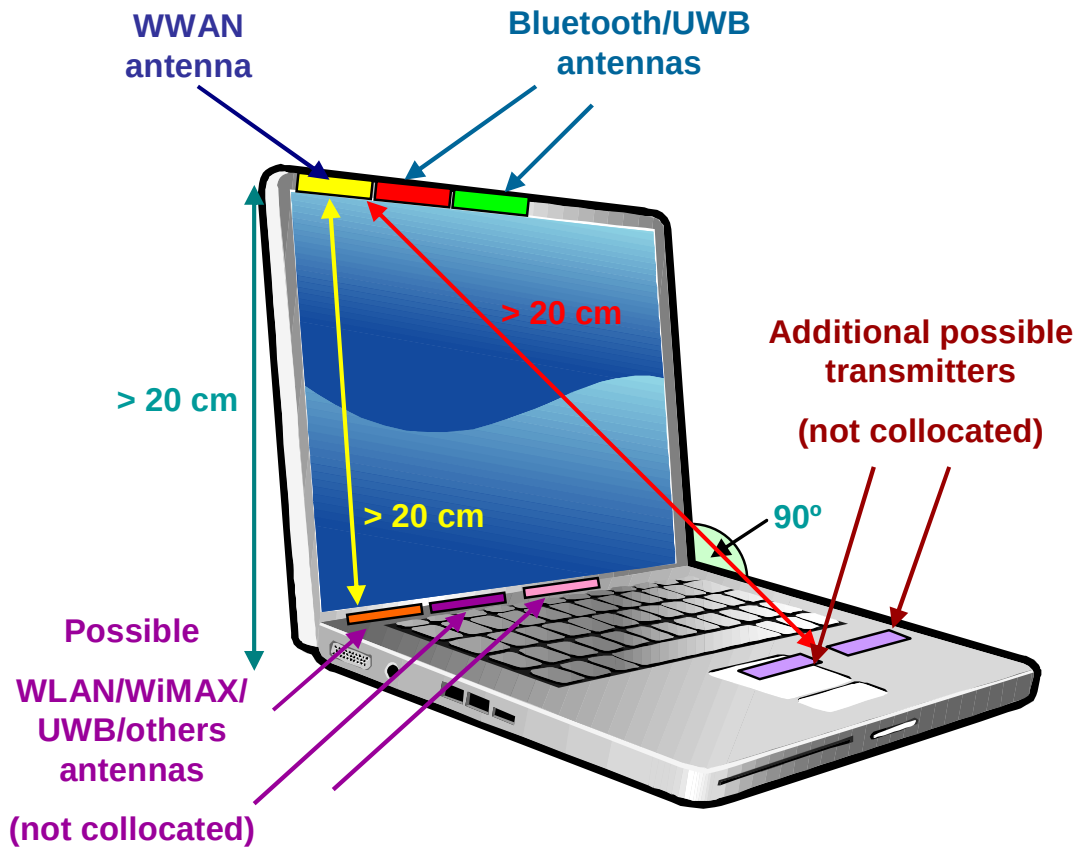
Scenario 1			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
Bluetooth	100	76%	76,43

[1] It could be also Bluetooth + UWB transmitter.
UWB contribution does not need to be considered.

WORST CASE CONSIDERATIONS:

- Antenna-to-user distance: 20 cm.
    - Any antenna-to-user distance > 20 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- F5321 antenna gains: Low bands: 2.91 dBi // High bands: 2.34 dBi
    - Any antenna gains below the specified would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Bluetooth EIRP: 100 mW
    - Any Bluetooth (or Bluetooth + UWB) transmitter with EIRP below 100 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Antenna-to-antenna distances: 0 cm
    - Any antenna-to-antenna distance > 0 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.

SAMPLE CONFIGURATION:



A.2. SCENARIO 2

Scenario 2 covers a host device where the F5321 Ericsson Mobile Broadband Module is in mobile exposure conditions (antenna-to-user distance > 20 cm) and it is collocated with a WLAN transmitter (F5321 antenna-to-WLAN antenna distance < 20 cm) which is also in mobile exposure conditions.

WLAN transmitter may have other antennas in portable exposure conditions but they are not collocated with F5321 Ericsson Mobile Broadband Module antenna.

Other transmitters may be installed in the same host platform but they are not collocated with F5321 Ericsson Mobile Broadband Module.

MAIN/PRIMARY TRANSMITTER:

WWAN transmitter:

Type of equipment : Ericsson Mobile Broadband Module
Trade mark : Ericsson
Model : F5321
FCC ID / IC : VV7-MBMF5321 / 287AG-MBMF5321
Maximum antenna gain : Low bands: 2.91 dBi // High bands: 2.34 dBi
Output power : See table below

Frequency Band	Mode	Frequency range (MHz)	Maximum conducted output power (dBm)	Maximum conducted output power (mW)	Duty Cycle	Equivalent conducted output power (mW)	Maximum antenna gain (dBi)	Maximum antenna gain (numerical)	EIRP (mW)
GSM 850	GSM/GPRS	824,2 - 848,8	33,27	2123,24	25%	530,81	2,91	1,95	1037,39
	EDGE	824,2 - 848,8	31,01	1261,83	25%	315,46	2,91	1,95	616,51
FDD V	WCDMA/HSDPA	826,4 - 846,6	27,95	623,73	100%	623,73	2,91	1,95	1218,99
	HSUPA	826,4 - 846,6	27,23	528,45	100%	528,45	2,91	1,95	1032,76
FDD VI	WCDMA/HSDPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
	HSUPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
E-GSM 900	GSM/GPRS	880,2 - 914,8	32,80	1905,46	25%	476,37	2,91	1,95	930,98
	EDGE	880,2 - 914,8	27,20	524,81	25%	131,20	2,91	1,95	256,41
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	23,29	213,16	100%	213,16	2,91	1,95	416,58
	HSUPA	882,4 - 912,6	24,27	267,18	100%	267,18	2,91	1,95	522,16
DCS 1800	GSM/GPRS	1710,2 - 1784,8	29,80	954,99	25%	238,75	2,34	1,71	409,20
	EDGE	1710,2 - 1784,8	26,00	398,11	25%	99,53	2,34	1,71	170,58
PCS 1900	GSM/GPRS	1850,2 - 1909,8	30,67	1166,81	25%	291,70	2,34	1,71	499,97
	EDGE	1850,2 - 1909,8	30,09	1020,94	25%	255,23	2,34	1,71	437,46
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	26,08	405,51	100%	405,51	2,34	1,71	695,02
	HSUPA	1852,4 - 1907,6	25,48	353,18	100%	353,18	2,34	1,71	605,34
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	22,60	181,76	100%	181,76	2,34	1,71	311,53
	HSUPA	1922,4 - 1977,6	22,61	182,31	100%	182,31	2,34	1,71	312,46

ADDITIONAL/SECONDARY TRANSMITTERS:

WLAN transmitter:

Type of equipment : WLAN [2]
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

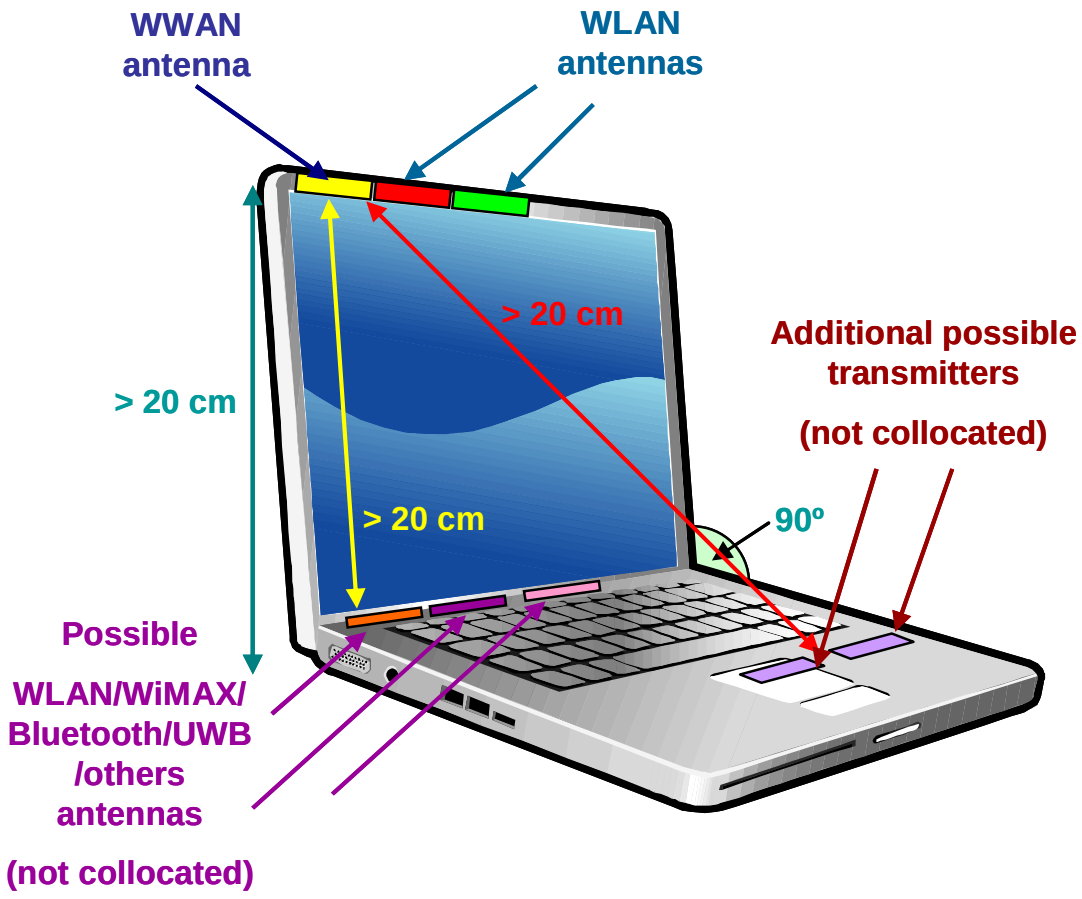
Scenario 3			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
WLAN	2000	100%	2000,00

[2] It could be also WLAN/WiMAX combo transmitter where WLAN and WiMAX transmitters do not transmit simultaneously.

WORST CASE CONSIDERATIONS:

- Antenna-to-user distance: 20 cm.
  - Any antenna-to-user distance > 20 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- F5321 antenna gains: Low bands: 2.91 dBi // High bands: 2.34 dBi
  - Any antenna gains below the specified would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- WLAN EIRP: 2000 mW
  - Any WLAN transmitter with EIRP below 2000 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Antenna-to-antenna distances: 0 cm
  - Any antenna-to-antenna distance > 0 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.

SAMPLE CONFIGURATION:



A.3. SCENARIO 3

Scenario 3 covers a host device where the F5321 Ericsson Mobile Broadband Module is in mobile exposure conditions (antenna-to-user distance > 20 cm) and it is collocated with a WLAN transmitter and a Bluetooth transmitter (F5321 antenna-to-WLAN/Bluetooth antenna distance < 20 cm) which are also in mobile exposure conditions.

WLAN transmitter may have other antennas in portable exposure conditions but they are not collocated with F5321 Ericsson Mobile Broadband Module antenna.

Other transmitters may be installed in the same host platform but they are not collocated with F5321 Ericsson Mobile Broadband Module.

MAIN/PRIMARY TRANSMITTER:

WWAN transmitter:

Type of equipment : Ericsson Mobile Broadband Module
Trade mark : Ericsson
Model : F5321
FCC ID / IC : VV7-MBMF5321 / 287AG-MBMF5321
Maximum antenna gain : Low bands: 2.91 dBi // High bands: 2.34 dBi
Output power : See table below

Frequency Band	Mode	Frequency range (MHz)	Maximum conducted output power (dBm)	Maximum conducted output power (mW)	Duty Cycle	Equivalent conducted output power (mW)	Maximum antenna gain (dBi)	Maximum antenna gain (numerical)	EIRP (mW)
GSM 850	GSM/GPRS	824,2 - 848,8	33,27	2123,24	25%	530,81	2,91	1,95	1037,39
	EDGE	824,2 - 848,8	31,01	1261,83	25%	315,46	2,91	1,95	616,51
FDD V	WCDMA/HSDPA	826,4 - 846,6	27,95	623,73	100%	623,73	2,91	1,95	1218,99
	HSUPA	826,4 - 846,6	27,23	528,45	100%	528,45	2,91	1,95	1032,76
FDD VI	WCDMA/HSDPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
	HSUPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
E-GSM 900	GSM/GPRS	880,2 - 914,8	32,80	1905,46	25%	476,37	2,91	1,95	930,98
	EDGE	880,2 - 914,8	27,20	524,81	25%	131,20	2,91	1,95	256,41
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	23,29	213,16	100%	213,16	2,91	1,95	416,58
	HSUPA	882,4 - 912,6	24,27	267,18	100%	267,18	2,91	1,95	522,16
DCS 1800	GSM/GPRS	1710,2 - 1784,8	29,80	954,99	25%	238,75	2,34	1,71	409,20
	EDGE	1710,2 - 1784,8	26,00	398,11	25%	99,53	2,34	1,71	170,58
PCS 1900	GSM/GPRS	1850,2 - 1909,8	30,67	1166,81	25%	291,70	2,34	1,71	499,97
	EDGE	1850,2 - 1909,8	30,09	1020,94	25%	255,23	2,34	1,71	437,46
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	26,08	405,51	100%	405,51	2,34	1,71	695,02
	HSUPA	1852,4 - 1907,6	25,48	353,18	100%	353,18	2,34	1,71	605,34
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	22,60	181,76	100%	181,76	2,34	1,71	311,53
	HSUPA	1922,4 - 1977,6	22,61	182,31	100%	182,31	2,34	1,71	312,46

ADDITIONAL/SECONDARY TRANSMITTERS:

WLAN transmitter:

Type of equipment : WLAN [3]
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

Scenario 3			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
WLAN	2000	100%	2000,00

[3] It could be also WLAN/WiMAX combo transmitter where WLAN and WiMAX transmitters do not transmit simultaneously.

Bluetooth transmitter:

Type of equipment : Bluetooth [4]
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

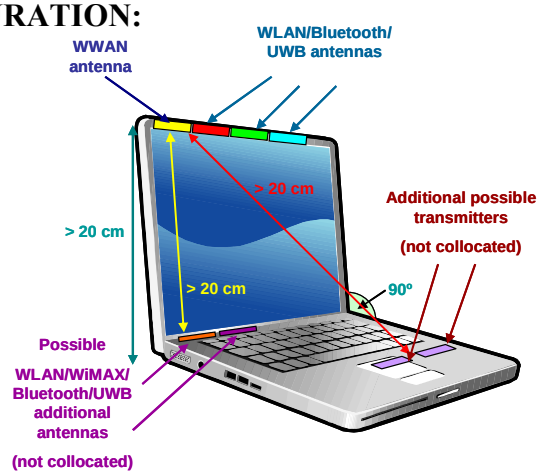
Scenario 3			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
Bluetooth	100	76%	76,43

[4] It could be also Bluetooth + UWB transmitter.
UWB contribution does not need to be considered.

WORST CASE CONSIDERATIONS:

- Antenna-to-user distance: 20 cm.
  - Any antenna-to-user distance > 20 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- F5321 antenna gains: Low bands: 2.91 dBi // High bands: 2.34 dBi
  - Any antenna gains below the specified would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- WLAN EIRP: 2000 mW
  - Any WLAN transmitter with EIRP below 2000 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Bluetooth EIRP: 100 mW
  - Any Bluetooth (or Bluetooth + UWB) transmitter with EIRP below 100 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Antenna-to-antenna distances: 0 cm
  - Any antenna-to-antenna distance > 0 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.

SAMPLE CONFIGURATION:



A.4. SCENARIO 4

Scenario 4 covers a host device where the F5321 Ericsson Mobile Broadband Module is in mobile exposure conditions (antenna-to-user distance > 20 cm) and it is collocated with a WiMAX transmitter (F5321 antenna-to-WiMAX antenna distance < 20 cm) which is also in mobile exposure conditions.

WiMAX transmitter may have other antennas in portable exposure conditions but they are not collocated with F5321 Ericsson Mobile Broadband Module antenna.

Other transmitters may be installed in the same host platform but they are not collocated with F5321 Ericsson Mobile Broadband Module.

MAIN/PRIMARY TRANSMITTER:

Type of equipment : Ericsson Mobile Broadband Module
Trade mark : Ericsson
Model : F5321
FCC ID / IC : VV7-MBMF5321 / 287AG-MBMF5321
Maximum antenna gain : Low bands: 2.91 dBi // High bands: 2.34 dBi
Output power : See table below

Frequency Band	Mode	Frequency range (MHz)	Maximum conducted output power (dBm)	Maximum conducted output power (mW)	Duty Cycle	Equivalent conducted output power (mW)	Maximum antenna gain (dBi)	Maximum antenna gain (numerical)	EIRP (mW)
GSM 850	GSM/GPRS	824,2 - 848,8	33,27	2123,24	25%	530,81	2,91	1,95	1037,39
	EDGE	824,2 - 848,8	31,01	1261,83	25%	315,46	2,91	1,95	616,51
FDD V	WCDMA/HSDPA	826,4 - 846,6	27,95	623,73	100%	623,73	2,91	1,95	1218,99
	HSUPA	826,4 - 846,6	27,23	528,45	100%	528,45	2,91	1,95	1032,76
FDD VI	WCDMA/HSDPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
	HSUPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
E-GSM 900	GSM/GPRS	880,2 - 914,8	32,80	1905,46	25%	476,37	2,91	1,95	930,98
	EDGE	880,2 - 914,8	27,20	524,81	25%	131,20	2,91	1,95	256,41
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	23,29	213,16	100%	213,16	2,91	1,95	416,58
	HSUPA	882,4 - 912,6	24,27	267,18	100%	267,18	2,91	1,95	522,16
DCS 1800	GSM/GPRS	1710,2 - 1784,8	29,80	954,99	25%	238,75	2,34	1,71	409,20
	EDGE	1710,2 - 1784,8	26,00	398,11	25%	99,53	2,34	1,71	170,58
PCS 1900	GSM/GPRS	1850,2 - 1909,8	30,67	1166,81	25%	291,70	2,34	1,71	499,97
	EDGE	1850,2 - 1909,8	30,09	1020,94	25%	255,23	2,34	1,71	437,46
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	26,08	405,51	100%	405,51	2,34	1,71	695,02
	HSUPA	1852,4 - 1907,6	25,48	353,18	100%	353,18	2,34	1,71	605,34
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	22,60	181,76	100%	181,76	2,34	1,71	311,53
	HSUPA	1922,4 - 1977,6	22,61	182,31	100%	182,31	2,34	1,71	312,46

ADDITIONAL/SECONDARY TRANSMITTERS:

WiMAX transmitter:

Type of equipment : WiMAX [5]
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

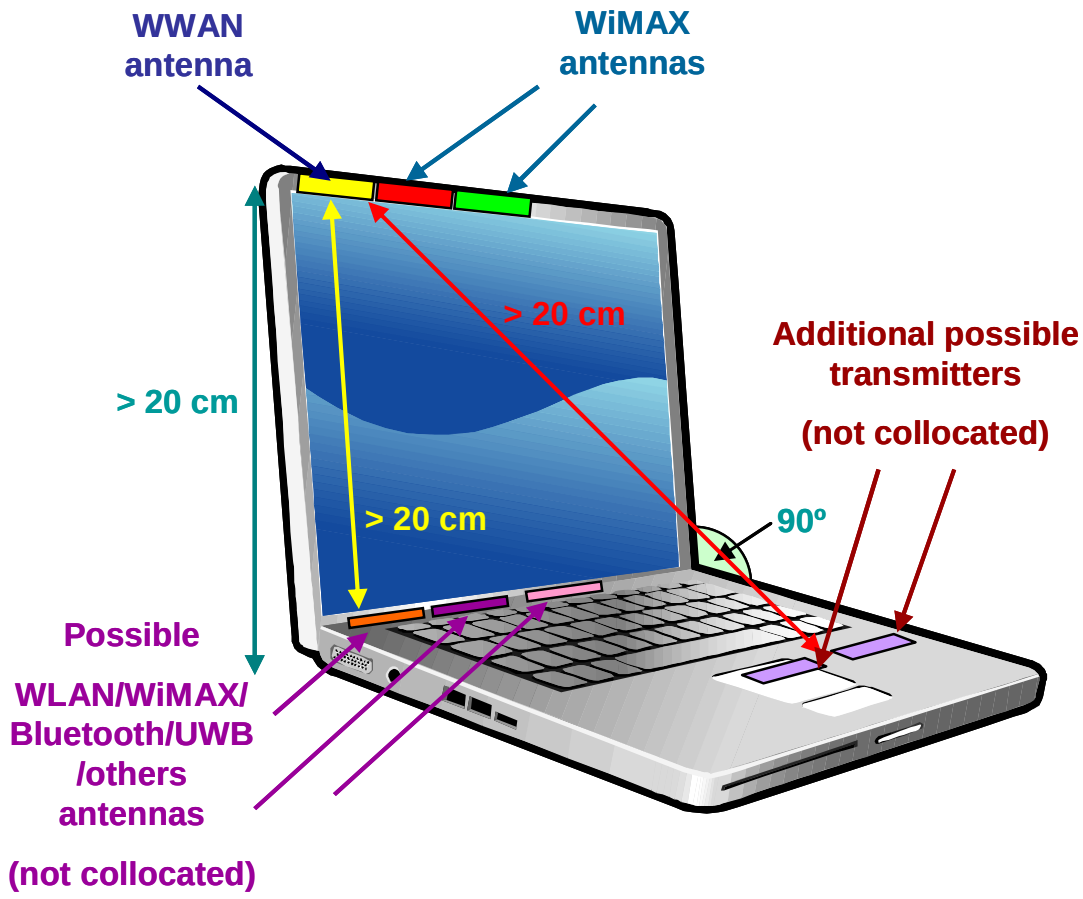
Scenario 4			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
WiMAX	2000	100%	2000,00

[5] It could be also WLAN/WiMAX combo transmitter where WLAN and WiMAX transmitters do not transmit simultaneously.

WORST CASE CONSIDERATIONS:

- Antenna-to-user distance: 20 cm.
    - Any antenna-to-user distance > 20 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- F5321 antenna gains: Low bands: 2.91 dBi // High bands: 2.34 dBi
    - Any antenna gains below the specified would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- WiMAX EIRP: 2000 mW
    - Any WiMAX transmitter with EIRP below 2000 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Antenna-to-antenna distances: 0 cm
    - Any antenna-to-antenna distance > 0 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.

SAMPLE CONFIGURATION:



A.5. SCENARIO 5

Scenario 5 covers a host device where the F5321 Ericsson Mobile Broadband Module is in mobile exposure conditions (antenna-to-user distance > 20 cm) and it is collocated with a WiMAX transmitter and a Bluetooth transmitter (F5321 antenna-to-WiMAX/Bluetooth antenna distance < 20 cm) which are also in mobile exposure conditions.

WiMAX transmitter may have other antennas in portable exposure conditions but they are not collocated with F5321 Ericsson Mobile Broadband Module antenna.

Other transmitters may be installed in the same host platform but they are not collocated with F5321 Ericsson Mobile Broadband Module.

MAIN/PRIMARY TRANSMITTER:

WWAN transmitter:

Type of equipment : Ericsson Mobile Broadband Module
Trade mark : Ericsson
Model : F5321
FCC ID / IC : VV7-MBMF5321 / 287AG-MBMF5321
Maximum antenna gain : Low bands: 2.91 dBi // High bands: 2.34 dBi
Output power : See table below

Frequency Band	Mode	Frequency range (MHz)	Maximum conducted output power (dBm)	Maximum conducted output power (mW)	Duty Cycle	Equivalent conducted output power (mW)	Maximum antenna gain (dBi)	Maximum antenna gain (numerical)	EIRP (mW)
GSM 850	GSM/GPRS	824,2 - 848,8	33,27	2123,24	25%	530,81	2,91	1,95	1037,39
	EDGE	824,2 - 848,8	31,01	1261,83	25%	315,46	2,91	1,95	616,51
FDD V	WCDMA/HSDPA	826,4 - 846,6	27,95	623,73	100%	623,73	2,91	1,95	1218,99
	HSUPA	826,4 - 846,6	27,23	528,45	100%	528,45	2,91	1,95	1032,76
FDD VI	WCDMA/HSDPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
	HSUPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
E-GSM 900	GSM/GPRS	880,2 - 914,8	32,80	1905,46	25%	476,37	2,91	1,95	930,98
	EDGE	880,2 - 914,8	27,20	524,81	25%	131,20	2,91	1,95	256,41
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	23,29	213,16	100%	213,16	2,91	1,95	416,58
	HSUPA	882,4 - 912,6	24,27	267,18	100%	267,18	2,91	1,95	522,16
DCS 1800	GSM/GPRS	1710,2 - 1784,8	29,80	954,99	25%	238,75	2,34	1,71	409,20
	EDGE	1710,2 - 1784,8	26,00	398,11	25%	99,53	2,34	1,71	170,58
PCS 1900	GSM/GPRS	1850,2 - 1909,8	30,67	1166,81	25%	291,70	2,34	1,71	499,97
	EDGE	1850,2 - 1909,8	30,09	1020,94	25%	255,23	2,34	1,71	437,46
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	26,08	405,51	100%	405,51	2,34	1,71	695,02
	HSUPA	1852,4 - 1907,6	25,48	353,18	100%	353,18	2,34	1,71	605,34
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	22,60	181,76	100%	181,76	2,34	1,71	311,53
	HSUPA	1922,4 - 1977,6	22,61	182,31	100%	182,31	2,34	1,71	312,46

ADDITIONAL/SECONDARY TRANSMITTERS:

WiMAX transmitter:

Type of equipment : WiMAX [6]
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

Scenario 5			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
WiMAX	2000	100%	2000,00

[6] It could be also WLAN/WiMAX combo transmitter where WLAN and WiMAX transmitters do not transmit simultaneously.

Bluetooth transmitter:

Type of equipment : Bluetooth [7]
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

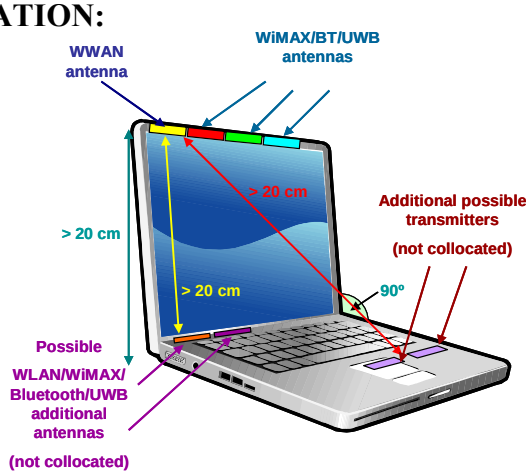
Scenario 5			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
Bluetooth	100	76%	76,43

[7] It could be also Bluetooth + UWB transmitter.
UWB contribution does not need to be considered.

WORST CASE CONSIDERATIONS:

- Antenna-to-user distance: 20 cm.
  - Any antenna-to-user distance > 20 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- F5321 antenna gains: Low bands: 2.91 dBi // High bands: 2.34 dBi
  - Any antenna gains below the specified would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- WiMAX EIRP: 2000 mW
  - Any WiMAX transmitter with EIRP below 2000 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Bluetooth EIRP: 100 mW
  - Any Bluetooth (or Bluetooth + UWB) transmitter with EIRP below 100 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Antenna-to-antenna distances: 0 cm
  - Any antenna-to-antenna distance > 0 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.

SAMPLE CONFIGURATION:



A.6. SCENARIO 6

Scenario 6 covers a host device where the F5321 Ericsson Mobile Broadband Module is in mobile exposure conditions (antenna-to-user distance > 20 cm) and it is collocated with a WLAN transmitter and a WiMAX transmitter (F5321 antenna-to-WLAN/WiMAX antenna distance < 20 cm) which are also in mobile exposure conditions.

WLAN/WiMAX transmitters may have other antennas in portable exposure conditions but they are not collocated with F5321 Ericsson Mobile Broadband Module antenna.

Other transmitters may be installed in the same host platform but they are not collocated with F5321 Ericsson Mobile Broadband Module.

MAIN/PRIMARY TRANSMITTER:

WWAN transmitter:

Type of equipment : Ericsson Mobile Broadband Module
Trade mark : Ericsson
Model : F5321
FCC ID / IC : VV7-MBMF5321 / 287AG-MBMF5321
Maximum antenna gain : Low bands: 2.91 dBi // High bands: 2.34 dBi
Output power : See table below

Frequency Band	Mode	Frequency range (MHz)	Maximum conducted output power (dBm)	Maximum conducted output power (mW)	Duty Cycle	Equivalent conducted output power (mW)	Maximum antenna gain (dBi)	Maximum antenna gain (numerical)	EIRP (mW)
GSM 850	GSM/GPRS	824,2 - 848,8	33,27	2123,24	25%	530,81	2,91	1,95	1037,39
	EDGE	824,2 - 848,8	31,01	1261,83	25%	315,46	2,91	1,95	616,51
FDD V	WCDMA/HSDPA	826,4 - 846,6	27,95	623,73	100%	623,73	2,91	1,95	1218,99
	HSUPA	826,4 - 846,6	27,23	528,45	100%	528,45	2,91	1,95	1032,76
FDD VI	WCDMA/HSDPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
	HSUPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
E-GSM 900	GSM/GPRS	880,2 - 914,8	32,80	1905,46	25%	476,37	2,91	1,95	930,98
	EDGE	880,2 - 914,8	27,20	524,81	25%	131,20	2,91	1,95	256,41
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	23,29	213,16	100%	213,16	2,91	1,95	416,58
	HSUPA	882,4 - 912,6	24,27	267,18	100%	267,18	2,91	1,95	522,16
DCS 1800	GSM/GPRS	1710,2 - 1784,8	29,80	954,99	25%	238,75	2,34	1,71	409,20
	EDGE	1710,2 - 1784,8	26,00	398,11	25%	99,53	2,34	1,71	170,58
PCS 1900	GSM/GPRS	1850,2 - 1909,8	30,67	1166,81	25%	291,70	2,34	1,71	499,97
	EDGE	1850,2 - 1909,8	30,09	1020,94	25%	255,23	2,34	1,71	437,46
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	26,08	405,51	100%	405,51	2,34	1,71	695,02
	HSUPA	1852,4 - 1907,6	25,48	353,18	100%	353,18	2,34	1,71	605,34
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	22,60	181,76	100%	181,76	2,34	1,71	311,53
	HSUPA	1922,4 - 1977,6	22,61	182,31	100%	182,31	2,34	1,71	312,46

ADDITIONAL/SECONDARY TRANSMITTERS:

WLAN/WiMAX transmitter:

Type of equipment : WLAN / WiMAX
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

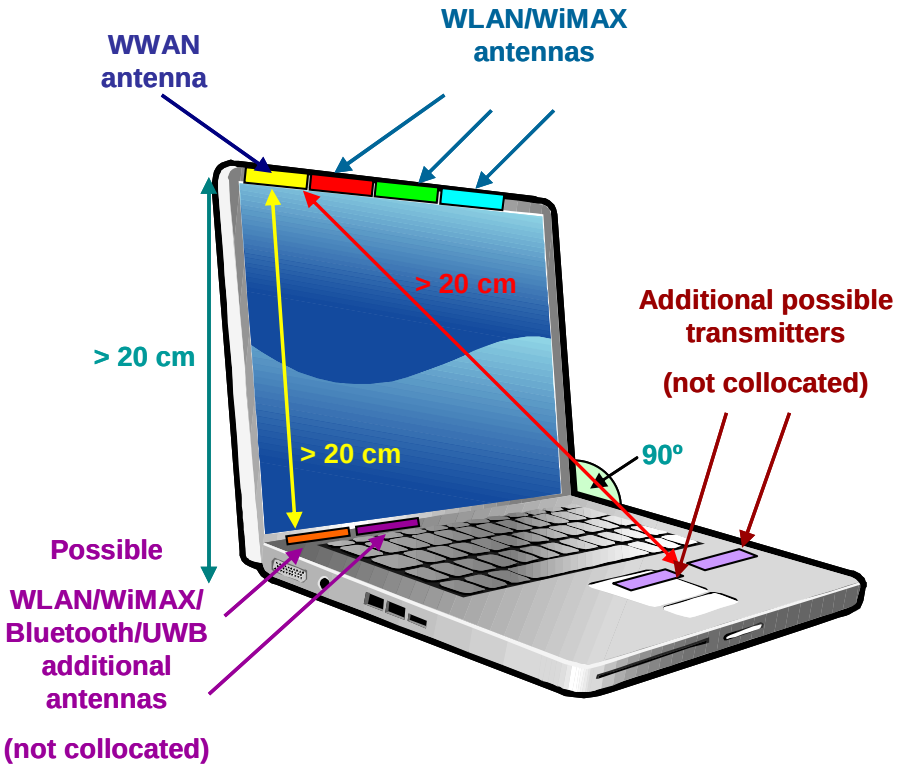
Scenario 6			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
WLAN / WiMAX	2000 [8]	100%	2000,00

[8] Aggregated EIRP of WLAN and WiMAX transmitters

WORST CASE CONSIDERATIONS:

- Antenna-to-user distance: 20 cm.
  - Any antenna-to-user distance > 20 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- F5321 antenna gains: Low bands: 2.91 dBi // High bands: 2.34 dBi
  - Any antenna gains below the specified would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- WLAN EIRP + WiMAX EIRP: 2000 mW
  - Any WLAN transmitter and WiMAX transmitters with aggregated EIRP below 2000 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Antenna-to-antenna distances: 0 cm
  - Any antenna-to-antenna distance > 0 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.

SAMPLE CONFIGURATION:



A.7. SCENARIO 7

Scenario 6 covers a host device where the F5321 Ericsson Mobile Broadband Module is in mobile exposure conditions (antenna-to-user distance > 20 cm) and it is collocated with a WLAN transmitter a WiMAX transmitter and a Bluetooth transmitter (F5321 antenna-to-WLAN/WiMAX/Bluetooth antenna distance < 20 cm) which are also in mobile exposure conditions.

WLAN/WiMAX transmitters may have other antennas in portable exposure conditions but they are not collocated with F5321 Ericsson Mobile Broadband Module antenna.

Other transmitters may be installed in the same host platform but they are not collocated with F5321 Ericsson Mobile Broadband Module.

MAIN/PRIMARY TRANSMITTER:

WWAN transmitter:

Type of equipment : Ericsson Mobile Broadband Module
Trade mark : Ericsson
Model : F5321
FCC ID / IC : VV7-MBMF5321 / 287AG-MBMF5321
Maximum antenna gain : Low bands: 2.91 dBi // High bands: 2.34 dBi
Output power : See table below

Frequency Band	Mode	Frequency range (MHz)	Maximum conducted output power (dBm)	Maximum conducted output power (mW)	Duty Cycle	Equivalent conducted output power (mW)	Maximum antenna gain (dBi)	Maximum antenna gain (numerical)	EIRP (mW)
GSM 850	GSM/GPRS	824,2 - 848,8	33,27	2123,24	25%	530,81	2,91	1,95	1037,39
	EDGE	824,2 - 848,8	31,01	1261,83	25%	315,46	2,91	1,95	616,51
FDD V	WCDMA/HSDPA	826,4 - 846,6	27,95	623,73	100%	623,73	2,91	1,95	1218,99
	HSUPA	826,4 - 846,6	27,23	528,45	100%	528,45	2,91	1,95	1032,76
FDD VI	WCDMA/HSDPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
	HSUPA	832,4 - 837,6	23,47	222,18	100%	222,18	2,91	1,95	434,21
E-GSM 900	GSM/GPRS	880,2 - 914,8	32,80	1905,46	25%	476,37	2,91	1,95	930,98
	EDGE	880,2 - 914,8	27,20	524,81	25%	131,20	2,91	1,95	256,41
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	23,29	213,16	100%	213,16	2,91	1,95	416,58
	HSUPA	882,4 - 912,6	24,27	267,18	100%	267,18	2,91	1,95	522,16
DCS 1800	GSM/GPRS	1710,2 - 1784,8	29,80	954,99	25%	238,75	2,34	1,71	409,20
	EDGE	1710,2 - 1784,8	26,00	398,11	25%	99,53	2,34	1,71	170,58
PCS 1900	GSM/GPRS	1850,2 - 1909,8	30,67	1166,81	25%	291,70	2,34	1,71	499,97
	EDGE	1850,2 - 1909,8	30,09	1020,94	25%	255,23	2,34	1,71	437,46
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	26,08	405,51	100%	405,51	2,34	1,71	695,02
	HSUPA	1852,4 - 1907,6	25,48	353,18	100%	353,18	2,34	1,71	605,34
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	22,60	181,76	100%	181,76	2,34	1,71	311,53
	HSUPA	1922,4 - 1977,6	22,61	182,31	100%	182,31	2,34	1,71	312,46

WLAN/WiMAX transmitter:

Type of equipment : WLAN / WiMAX
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

Scenario 6			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
WLAN / WiMAX	2000 [9]	100%	2000,00

[9] Aggregated EIRP of WLAN and WiMAX transmitters

Bluetooth transmitter:

Type of equipment : Bluetooth [10]
Trade mark : Any
Model : Any
FCC ID / IC : Any
Output power : See table below

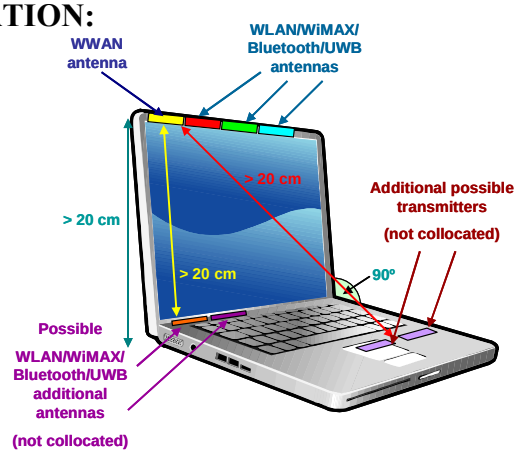
Scenario 5			
Type of transmitter	**Maximum EIRP (mW)**	**Duty Cycle**	**EIRP (mW)**
Bluetooth	100	76%	76,43

[10] It could be also Bluetooth + UWB transmitter.
UWB contribution does not need to be considered.

WORST CASE CONSIDERATIONS:

- Antenna-to-user distance: 20 cm.
  - Any antenna-to-user distance > 20 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- F5321 antenna gains: Low bands: 2.91 dBi // High bands: 2.34 dBi
  - Any antenna gains below the specified would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- WLAN EIRP + WiMAX EIRP: 2000 mW
  - Any WLAN transmitter and WiMAX transmitters with aggregated EIRP below 2000 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Bluetooth EIRP: 100 mW
  - Any Bluetooth (or Bluetooth + UWB) transmitter with EIRP below 100 mW would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Antenna-to-antenna distances: 0 cm
  - Any antenna-to-antenna distance > 0 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.

SAMPLE CONFIGURATION:



ANNEX B

RF EXPOSURE ASSESSMENT

Report No: 33376IDT.001

B.1. MAXIMUM PERMISSIBLE EXPOSURE (MPE) LIMITS

B.1.1. FCC / IC LIMITS

Normative documents:

- OET Bulletin 65 Edition 97-01 August 1997 - Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
- FCC 47 CFR § 1.1307 - Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.
- FCC 47 CFR § 1.1310 - Radiofrequency radiation exposure limits.1999/519/EC Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)
- RSS-102 Issue 4 - March 2010

Reference levels:

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Power density ($\frac{mW}{cm^2}$)	Averaging time (minutes)
300 – 1500	$\frac{f(MHz)}{1500}$	30
1500 – 100.000	1.0	30

The table below is excerpted from item 4.2 of RSS-102 Issue 4, titled RF Field Strength Limits for Devices Used by the General Public:

Frequency Range (MHz)	Power density ($\frac{W}{m^2}$)	Averaging time (minutes)
300 – 1500	*f (MHz) /150*	6
1500 – 100.000	10	6

MPE limits:

- Main/Primary transmitter (F5321 Ericsson Mobile Broadband Module):

Frequency Band	Mode	Frequency Range (MHz)	Reference frequency (MHz)	MPE limit (S_{eq}) ($\frac{mW}{cm^2}$)
GSM 850	GSM/GPRS	824,2 - 848,8	824,20	0,5494667
	EDGE	824,2 - 848,8	824,20	0,5494667
FDD V	WCDMA/HSDPA	826,4 - 846,6	826,40	0,5509333
	HSUPA	826,4 - 846,6	826,40	0,5509333
PCS 1900	GSM/GPRS	1850,2 - 1909,8	1850,20	1,0000000
	EDGE	1850,2 - 1909,8	1850,20	1,0000000
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	1852,40	1,0000000
	HSUPA	1852,4 - 1907,6	1852,40	1,0000000

- Additional/Secondary transmitters: All the transmission frequencies for collocated transmitter modules are above 1.5 GHz, so that the MPE limit is 1 mW/cm^2 .

B.1.2. EUROPEAN UNION MPE LIMITS

Normative document:

- EN 62311:2008 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)
- 1999/519/EC Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)

Reference levels:

The table below is excerpted from Table 2 of 1999/519/EC, titled "Reference levels for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz, unperturbed rms values)":

Frequency range	E-field strength $(\frac{V}{m})$	H-field strength $(\frac{A}{m})$	B-field (µT)	Equivalent plane wave power density S_{eq} $(\frac{W}{m^2})$
400 - 2000 MHz	$1{,}375 \cdot f(MHz)^{1/2}$	$0{,}0037 \cdot f(MHz)^{1/2}$	$0{,}0046 \cdot f(MHz)^{1/2}$	$\frac{f(MHz)}{200}$
2 - 300 GHz	61	0,16	0,2	10

MPE limits:

- Main/Primary transmitter (F5321 Ericsson Mobile Broadband Module):

Frequency Band	Mode	Frequency Range (MHz)	Reference frequency (MHz)	MPE limit (S_{eq}) $(\frac{mW}{cm^2})$
E-GSM 900	GSM/GPRS	880,2 - 914,8	880,20	0,4401000
	EDGE	880,2 - 914,8	880,20	0,4401000
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	882,40	0,4412000
	HSUPA	882,4 - 912,6	882,40	0,4412000
DCS 1800	GSM/GPRS	1710,2 - 1784,8	1710,20	0,8551000
	EDGE	1710,2 - 1784,8	1710,20	0,8551000
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	1922,40	0,9612000
	HSUPA	1922,4 - 1977,6	1922,40	0,9612000

- Additional/Secondary transmitters: All the transmission frequencies for collocated transmitter modules are above 2 GHz, so that the MPE limit is 1 mW/cm^2 .

B.1.3. AUSTRALIA MPE LIMITS

Normative documents:

- Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2003

- ARPANSA RPS No. 3 – Maximum Exposure Levels to Radiofrequency Fields (3 kHz to 300 GHz)
- AS 2772.2-1998: Radiofrequency radiation - Part 2: Principles and methods of measurement - 300 kHz to 100 GHz

Reference levels:

The table below is excerpted from Table 7 of ARPANSA RPS No. 3, titled "Reference levels for time averaged exposure to RMS electric and magnetic fields (unperturbed rms values)":

Exposure category	**Frequency range**	**E-field strength** $(\frac{V}{m}$ **rms)**	**H-field strength** $(\frac{A}{m}$ **rms)**	**Equivalent plane wave power density** S_{eq} $(\frac{W}{m^2})$	**Equivalent plane wave power density** S_{eq} $(\frac{mW}{cm^2})$
General public	400 MHz - 2 GHz	$1{,}37 \cdot f(MHz)^{1/2}$	$0{,}00364 \cdot f(MHz)^{1/2}$	$\frac{f(MHz)}{200}$	$\frac{f(MHz)}{2000}$
General public	2 - 300 GHz	61	0,16	10	1

MPE limits:

- Main/Primary transmitter (F5321 Ericsson Mobile Broadband Module):

Frequency Band	**Mode**	**Frequency Range (MHz)**	**Reference frequency (MHz)**	**MPE limit** (S_{eq}) $(\frac{mW}{cm^2})$
FDD V	WCDMA/HSDPA	826,4 - 846,6	826,40	0,4132000
	HSUPA	826,4 - 846,6	826,40	0,4132000
E-GSM 900	GSM/GPRS	880,2 - 914,8	880,20	0,4401000
	EDGE	880,2 - 914,8	880,20	0,4401000
DCS 1800	GSM/GPRS	1710,2 - 1784,8	1710,20	0,8551000
	EDGE	1710,2 - 1784,8	1710,20	0,8551000
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	1922,40	0,9612000
	HSUPA	1922,4 - 1977,6	1922,40	0,9612000

- Additional/Secondary transmitters: All the transmission frequencies for collocated transmitter modules are above 2 GHz, so that the MPE limit is 1 mW/cm^2 .

B.1.4. VODAFONE MPE LIMITS

Normative document:

- 1999/519/EC Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)

Reference levels:

The table below is excerpted from Table 2 of 1999/519/EC, titled "Reference levels for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz, unperturbed rms values)":

Exposure category	Frequency range	E-field strength ($\frac{V}{m}$ rms)	H-field strength ($\frac{A}{m}$ rms)	Equivalent plane wave power density S_{eq} ($\frac{W}{m^2}$)	Equivalent plane wave power density S_{eq} ($\frac{mW}{cm^2}$)
General public	400 MHz - 2 GHz	$1{,}37 \cdot f(MHz)^{1/2}$	$0{,}00364 \cdot f(MHz)^{1/2}$	$\frac{f(MHz)}{200}$	$\frac{f(MHz)}{2000}$
General public	2 - 300 GHz	61	0,16	10	1

MPE limits:

- Main/Primary transmitter (F5321 Ericsson Mobile Broadband Module):

Frequency Band	Mode	Frequency Range (MHz)	Reference frequency (MHz)	MPE limit (S_{Lim}) ($\frac{mW}{cm^2}$)
GSM 850	GSM/GPRS	824,2 - 848,8	824,20	0,4121000
	EDGE	824,2 - 848,8	824,20	0,4121000
FDD V	WCDMA/HSDPA	826,4 - 846,6	826,40	0,4132000
	HSUPA	826,4 - 846,6	826,40	0,4132000
FDD VI	WCDMA/HSDPA	832,4 - 837,6	832,40	0,4162000
	HSUPA	832,4 - 837,6	832,40	0,4162000
E-GSM 900	GSM/GPRS	880,2 - 914,8	880,20	0,4401000
	EDGE	880,2 - 914,8	880,20	0,4401000
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	882,40	0,4412000
	HSUPA	882,4 - 912,6	882,40	0,4412000
DCS 1800	GSM/GPRS	1710,2 - 1784,8	1710,20	0,8551000
	EDGE	1710,2 - 1784,8	1710,20	0,8551000
PCS 1900	GSM/GPRS	1850,2 - 1909,8	1850,20	0,9251000
	EDGE	1850,2 - 1909,8	1850,20	0,9251000
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	1852,40	0,9262000
	HSUPA	1852,4 - 1907,6	1852,40	0,9262000
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	1922,40	0,9612000
	HSUPA	1922,4 - 1977,6	1922,40	0,9612000

- Additional/Secondary transmitters: All the transmission frequencies for WLAN and Bluetooth modules are above 2 GHz, so that the MPE limit is 1 mW/cm^2 .

B.2. RF EXPOSURE ASSESSMENT – INDIVIDUAL TRANSMITTERS

B.2.1. INTRODUCTION

Calculations to predict power density levels in the far-field of the antenna are made by use of the following equation:

$$S = \frac{P \cdot G}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

B.2.2. RF EXPOSURE ASSESSMENT FOR F5321 ERICSSON MOBILE BROADBAND MODULE INSTALLED IN GENERIC HOST PLATFORMS

FCC / IC REQUIREMENTS

Frequency Band	Mode	Frequency Range (MHz)	EIRP (mW)	Evaluation distance (R) (cm)	Power Density (S_{eq}) $S = \frac{P \cdot G}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$ $\left(\frac{mW}{cm^2}\right)$	MPE limit (S_{Lim}) $(\frac{mW}{cm^2})$	COMPLIANCE ($S_{eq} < S_{Lim}$) $(\frac{mW}{cm^2})$
GSM 850	GSM/GPRS	824,2 - 848,8	1044,58	20,00	0,2063812	0,5494667	**COMPLIANT**
	EDGE	824,2 - 848,8	1044,58	20,00	0,1226507	0,5494667	**COMPLIANT**
FDD V	WCDMA/HSDPA	826,4 - 846,6	1218,99	20,00	0,2425103	0,5509333	**COMPLIANT**
	HSUPA	826,4 - 846,6	1169,50	20,00	0,2054614	0,5509333	**COMPLIANT**
PCS 1900	GSM/GPRS	1850,2 - 1909,8	499,97	20,00	0,0994650	1,0000000	**COMPLIANT**
	EDGE	1850,2 - 1909,8	497,67	20,00	0,0870302	1,0000000	**COMPLIANT**
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	1258,93	20,00	0,1382707	1,0000000	**COMPLIANT**
	HSUPA	1852,4 - 1907,6	1318,26	20,00	0,1204287	1,0000000	**COMPLIANT**

EUROPEAN UNION REQUIREMENTS

Frequency Band	Mode	Frequency Range (MHz)	EIRP (mW)	Evaluation distance (R) (cm)	Power Density (S_{eq}) $S = \frac{P \cdot G}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$ $\left(\frac{mW}{cm^2}\right)$	MPE limit (S_{Lim}) $(\frac{mW}{cm^2})$	COMPLIANCE ($S_{eq} < S_{Lim}$) $(\frac{mW}{cm^2})$
E-GSM 900	GSM/GPRS	880,2 - 914,8	930,98	20,00	0,1852124	0,4401000	**COMPLIANT**
	EDGE	880,2 - 914,8	256,41	20,00	0,0510117	0,4401000	**COMPLIANT**
FDD VIII	GSM/GPRS	882,4 - 912,6	416,58	20,00	0,0828763	0,4412000	**COMPLIANT**
	EDGE	882,4 - 912,6	522,16	20,00	0,1038796	0,4412000	**COMPLIANT**
DCS 1800	GSM/GPRS	1710,2 - 1784,8	409,20	20,00	0,0814086	0,8551000	**COMPLIANT**
	EDGE	1710,2 - 1784,8	170,58	20,00	0,0339367	0,8551000	**COMPLIANT**
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	311,53	20,00	0,0619769	0,9612000	**COMPLIANT**
	HSUPA	1922,4 - 1977,6	312,46	20,00	0,0621627	0,9612000	**COMPLIANT**

AUSTRALIA REQUIREMENTS

Frequency Band	Mode	Frequency Range (MHz)	EIRP (mW)	Evaluation distance (R) (cm)	Power Density (S_{eq}) $S=\frac{P\cdot G}{4\pi R^2}=\frac{EIRP}{4\pi R^2}$ $\left(\frac{mW}{cm^2}\right)$	MPE limit (S_{Lim}) $(\frac{mW}{cm^2})$	COMPLIANCE ($S_{eq} < S_{Lim}$) $(\frac{mW}{cm^2})$
FDD V	WCDMA/HSDPA	826,4 - 846,6	1218,99	20,00	0,2425103	0,4132000	**COMPLIANT**
	HSUPA	826,4 - 846,6	1032,76	20,00	0,2054614	0,4132000	**COMPLIANT**
E-GSM 900	GSM/GPRS	880,2 - 914,8	930,98	20,00	0,1852124	0,4401000	**COMPLIANT**
	EDGE	880,2 - 914,8	256,41	20,00	0,0510117	0,4401000	**COMPLIANT**
DCS 1800	GSM/GPRS	1710,2 - 1784,8	409,20	20,00	0,0814086	0,8551000	**COMPLIANT**
	EDGE	1710,2 - 1784,8	170,58	20,00	0,0339367	0,8551000	**COMPLIANT**
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	311,53	20,00	0,0619769	0,9612000	**COMPLIANT**
	HSUPA	1922,4 - 1977,6	312,46	20,00	0,0621627	0,9612000	**COMPLIANT**

VODAFONE REQUIREMENTS

Frequency Band	Mode	Frequency Range (MHz)	EIRP (mW)	Evaluation distance (R) (cm)	Power Density (S_{eq}) $S=\frac{P\cdot G}{4\pi R^2}=\frac{EIRP}{4\pi R^2}$ $\left(\frac{mW}{cm^2}\right)$	MPE limit (S_{Lim}) $(\frac{mW}{cm^2})$	COMPLIANCE ($S_{eq} < S_{Lim}$) $(\frac{mW}{cm^2})$
GSM 850	GSM/GPRS	824,2 - 848,8	1037,39	20	0,2063812	0,4121000	**COMPLIANT**
	EDGE	824,2 - 848,8	616,51	20	0,1226507	0,4121000	**COMPLIANT**
FDD V	WCDMA/HSDPA	826,4 - 846,6	1218,99	20	0,2425103	0,4132000	**COMPLIANT**
	HSUPA	826,4 - 846,6	1032,76	20	0,2054614	0,4132000	**COMPLIANT**
FDD VI	WCDMA/HSDPA	832,4 - 837,6	434,21	20	0,0863834	0,4162000	**COMPLIANT**
	HSUPA	832,4 - 837,6	434,21	20	0,0863834	0,4162000	**COMPLIANT**
E-GSM 900	GSM/GPRS	880,2 - 914,8	930,98	20	0,1852124	0,4401000	**COMPLIANT**
	EDGE	880,2 - 914,8	256,41	20	0,0510117	0,4401000	**COMPLIANT**
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	416,58	20	0,0828763	0,4412000	**COMPLIANT**
	HSUPA	882,4 - 912,6	522,16	20	0,1038796	0,4412000	**COMPLIANT**
DCS 1800	GSM/GPRS	1710,2 - 1784,8	409,20	20	0,0814086	0,8551000	**COMPLIANT**
	EDGE	1710,2 - 1784,8	170,58	20	0,0339367	0,8551000	**COMPLIANT**
PCS 1900	GSM/GPRS	1850,2 - 1909,8	499,97	20	0,0994650	0,9251000	**COMPLIANT**
	EDGE	1850,2 - 1909,8	437,46	20	0,0870302	0,9251000	**COMPLIANT**
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	695,02	20	0,1382707	0,9262000	**COMPLIANT**
	HSUPA	1852,4 - 1907,6	605,34	20	0,1204287	0,9262000	**COMPLIANT**
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	311,53	20	0,0619769	0,9612000	**COMPLIANT**
	HSUPA	1922,4 - 1977,6	312,46	20	0,0621627	0,9612000	**COMPLIANT**

B.2.3. RF EXPOSURE ASSESSMENT FOR SECONDARY TRANSMITTERS INSTALLED IN GENERIC HOST PLATFORMS

Model name	FCC ID	EIRP (mW)	Evaluation distance (cm)	Power Density (S_{eq}) $S = \frac{P \cdot G}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$ $\left(\frac{mW}{cm^2}\right)$	MPE limit (S_{Lim}) $(\frac{mW}{cm^2})$	COMPLIANCE ($S_{eq} < S_{Lim}$)
Scenario 1	Bluetooth	76,43	20,00	0,0152046	1,0000000	**COMPLIANT**
Scenario 2	WLAN	2000,00	20,00	0,3978874	1,0000000	**COMPLIANT**
Scenario 3	WLAN	2000,00	20,00	0,3978874	1,0000000	**COMPLIANT**
	Bluetooth	76,43	20,00	0,0152046	1,0000000	**COMPLIANT**
Scenario 4	WiMAX	2000,00	20,00	0,3978874	1,0000000	**COMPLIANT**
Scenario 5	WiMAX	2000,00	20,00	0,3978874	1,0000000	**COMPLIANT**
	Bluetooth	76,43	20,00	0,0152046	1,0000000	**COMPLIANT**
Scenario 6	WLAN	2000,00	20,00	0,3978874	1,0000000	**COMPLIANT**
	WiMAX		20,00	0,0081	1,0000000	**COMPLIANT**
Scenario 7	WLAN	2000,00	20,00	0,3978874	1,0000000	**COMPLIANT**
	WiMAX		20,00	0,0112	1,0000000	**COMPLIANT**
	Bluetooth	76,43	20,00	0,0152046	1,0000000	**COMPLIANT**

B.3. RF EXPOSURE ASSESSMENT – COLLOCATION CONSIDERATIONS

B.3.1. INTRODUCTION

In situations where simultaneous exposure to fields of different equipment and frequencies occurs, the possibility that these exposures will be additive in their effects must be considered. Calculations based on this additivity are performed by the sum of relative exposure for each equipment according to the following compliance criteria:

$$\sum_{1}^{N} \frac{S_{eqn}}{S_{Limn}} = \frac{S_{eq1}}{S_{Lim1}} + \frac{S_{eq2}}{S_{Lim2}} + \ldots + \frac{S_{eqN}}{S_{LimN}} \leq 1$$

where:

S_{eq} is the power density of the electromagnetic field caused, at a given distance (evaluation distance), by a specific equipment transmitting at a defined frequency.

S_{Lim} is the MPE limit for the evaluated transmission frequency.

B.3.2. FCC / IC REQUIREMENTS

RELATIVE EXPOSURE FOR F5321 ERICSSON BROADBAND MODULE

Frequency Band	Mode	Frequency Range (MHz)	S_{eq}	S_{Lim}	$\frac{S_{eq}}{S_{Lim}}$
GSM 850	GSM/GPRS	824,2 - 848,8	0,2063812	0,5494667	0,3756028
	EDGE	824,2 - 848,8	0,1226507	0,5494667	0,2232178

FDD V	WCDMA/HSDPA	826,4 - 846,6	0,2425103	0,5509333	**0,4401808**
	HSUPA	826,4 - 846,6	0,2054614	0,5509333	0,3729332
PCS 1900	GSM/GPRS	1850,2 - 1909,8	0,0994650	1,0000000	0,0994650
	EDGE	1850,2 - 1909,8	0,0870302	1,0000000	0,0870302
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	0,1382707	1,0000000	0,1382707
	HSUPA	1852,4 - 1907,6	0,1204287	1,0000000	0,1204287

RELATIVE EXPOSURE FOR SECONDARY TRANSMITTERS

SCENARIO	Type of transmitter	S_{eq}	S_{Lim}	$\frac{S_{eq}}{S_{Lim}}$
Scenario 1	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 2	WLAN	0,3978874	1,0000000	**0,3978874**
Scenario 3	WLAN	0,3978874	1,0000000	**0,3978874**
	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 4	WiMAX	0,3978874	1,0000000	**0,3978874**
Scenario 5	WiMAX	0,3978874	1,0000000	**0,3978874**
	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 6	WLAN	0,3978874	1,0000000	**0,3978874**
	WiMAX			
Scenario 7	WLAN	0,3978874	1,0000000	**0,3978874**
	WiMAX			
	Bluetooth	0,0152046	1,0000000	0,0152046

SIMULTANEOUS EXPOSURE

SCENARIO	Equipment		Maximum $\frac{S_{eq}}{S_{Lim}}$	Maximum $\frac{S_{Pri}}{S_{Lim\_Pri}} + \sum \frac{S_{Sec}}{S_{Lim\_Sec}}$	COMPLIANCE $\frac{S_{Pri}}{S_{Lim\_Pri}} + \sum \frac{S_{Sec}}{S_{Lim\_Sec}} < 1$
Scenario 1	Primary transmitter	Ericsson F5321	0,4401808	0,4553854	**COMPLIANT**
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 2	Primary transmitter	Ericsson F5321	0,4401808	0,8380682	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
Scenario 3	Primary transmitter	Ericsson F5321	0,4401808	**0,8532728**	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 4	Primary transmitter	Ericsson F5321	0,4401808	0,8380682	**COMPLIANT**
	Secundary transmitter	WiMAX	0,3978874		

Scenario 5	Primary transmitter	Ericsson F5321	0,4401808	**0,8532728**	**COMPLIANT**
	Secundary transmitter	WiMAX	0,3978874		
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 6	Primary transmitter	Ericsson F5321	0,4401808	0,8380682	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	WiMAX			
Scenario 7	Primary transmitter	Ericsson F5321	0,4401808	**0,8532728**	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	WiMAX			
	Secundary transmitter	Bluetooth	0,0152046		

B.3.3. EUROPEAN UNION REQUIREMENTS

RELATIVE EXPOSURE FOR F5321 ERICSSON BROADBAND MODULE

Frequency Band	Mode	Frequency Range (MHz)	S_{eq}	S_{Lim}	$\frac{S_{eq}}{S_{Lim}}$
E-GSM 900	GSM/GPRS	880,2 - 914,8	0,1852124	0,4401000	**0,4208417**
	EDGE	880,2 - 914,8	0,0510117	0,4401000	0,1159094
FDD VIII	GSM/GPRS	882,4 - 912,6	0,0828763	0,4412000	0,1878428
	EDGE	882,4 - 912,6	0,1038796	0,4412000	0,2354478
DCS 1800	GSM/GPRS	1710,2 - 1784,8	0,0814086	0,8551000	0,0952036
	EDGE	1710,2 - 1784,8	0,0339367	0,8551000	0,0396875
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	0,0619769	0,9612000	0,0644787
	HSUPA	1922,4 - 1977,6	0,0621627	0,9612000	0,0646720

RELATIVE EXPOSURE FOR SECONDARY TRANSMITTERS

SCENARIO	Type of transmitter	S_{eq}	S_{Lim}	$\frac{S_{eq}}{S_{Lim}}$
Scenario 1	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 2	WLAN	0,3978874	1,0000000	**0,3978874**
Scenario 3	WLAN	0,3978874	1,0000000	**0,3978874**
	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 4	WiMAX	0,3978874	1,0000000	**0,3978874**
Scenario 5	WiMAX	0,3978874	1,0000000	**0,3978874**
	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 6	WLAN	0,3978874	1,0000000	**0,3978874**
	WiMAX			
Scenario 7	WLAN	0,3978874	1,0000000	**0,3978874**
	WiMAX			
	Bluetooth	0,0152046	1,0000000	0,0152046

SIMULTANEOUS EXPOSURE

SCENARIO	Equipment		Maximum $\frac{S_{eq}}{S_{Lim}}$	Maximum $\frac{S_{Pri}}{S_{Lim\_Pri}} + \sum \frac{S_{Sec}}{S_{Lim\_Sec}}$	COMPLIANCE $\frac{S_{Pri}}{S_{Lim\_Pri}} + \sum \frac{S_{Sec}}{S_{Lim\_Sec}} < 1$
Scenario 1	Primary transmitter	Ericsson F5321	0,4208417	0,4360463	**COMPLIANT**
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 2	Primary transmitter	Ericsson F5321	0,4208417	0,8187291	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
Scenario 3	Primary transmitter	Ericsson F5321	0,4208417	**0,8339337**	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 4	Primary transmitter	Ericsson F5321	0,4208417	0,8187291	**COMPLIANT**
	Secundary transmitter	WiMAX	0,3978874		
Scenario 5	Primary transmitter	Ericsson F5321	0,4208417	**0,8339337**	**COMPLIANT**
	Secundary transmitter	WiMAX	0,3978874		
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 6	Primary transmitter	Ericsson F5321	0,4208417	0,8187291	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	WiMAX			
Scenario 7	Primary transmitter	Ericsson F5321	0,4208417	**0,8339337**	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	WiMAX			
	Secundary transmitter	Bluetooth	0,0152046		

B.3.4. AUSTRALIA REQUIREMENTS

RELATIVE EXPOSURE FOR F5321 ERICSSON BROADBAND MODULE

Manufacturer	Model name	Frequency range (MHz)	S_{eq}	S_{Lim}	$\frac{S_{eq}}{S_{Lim}}$
FDD V	WCDMA/HSDPA	826,4 - 846,6	0,2425103	0,4132000	**0,5869077**
	HSUPA	826,4 - 846,6	0,2054614	0,4132000	0,4972443
E-GSM 900	GSM/GPRS	880,2 - 914,8	0,1852124	0,4401000	0,4208417
	EDGE	880,2 - 914,8	0,0510117	0,4401000	0,1159094
DCS 1800	GSM/GPRS	1710,2 - 1784,8	0,0814086	0,8551000	0,0952036
	EDGE	1710,2 - 1784,8	0,0339367	0,8551000	0,0396875
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	0,0619769	0,9612000	0,0644787
	HSUPA	1922,4 - 1977,6	0,0621627	0,9612000	0,0646720

RELATIVE EXPOSURE FOR SECONDARY TRANSMITTERS

SCENARIO	Type of transmitter	S_{eq}	S_{Lim}	$\frac{S_{eq}}{S_{Lim}}$
Scenario 1	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 2	WLAN	0,3978874	1,0000000	**0,3978874**
Scenario 3	WLAN	0,3978874	1,0000000	**0,3978874**
	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 4	WiMAX	0,3978874	1,0000000	**0,3978874**
Scenario 5	WiMAX	0,3978874	1,0000000	**0,3978874**
	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 6	WLAN	0,3978874	1,0000000	**0,3978874**
	WiMAX			
Scenario 7	WLAN	0,3978874	1,0000000	**0,3978874**
	WiMAX			
	Bluetooth	0,0152046	1,0000000	0,0152046

SIMULTANEOUS EXPOSURE

SCENARIO	Equipment		Maximum $\frac{S_{eq}}{S_{Lim}}$	Maximum $\frac{S_{Pri}}{S_{Lim\_Pri}} + \sum \frac{S_{Sec}}{S_{Lim\_Sec}}$	COMPLIANCE $\frac{S_{Pri}}{S_{Lim\_Pri}} + \sum \frac{S_{Sec}}{S_{Lim\_Sec}} < 1$
Scenario 1	Primary transmitter	Ericsson F5321	0,5869077	0,6021123	**COMPLIANT**
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 2	Primary transmitter	Ericsson F5321	0,5869077	0,9847951	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
Scenario 3	Primary transmitter	Ericsson F5321	0,5869077	**0,9999997**	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 4	Primary transmitter	Ericsson F5321	0,5869077	0,9847951	**COMPLIANT**
	Secundary transmitter	WiMAX	0,3978874		
Scenario 5	Primary transmitter	Ericsson F5321	0,5869077	**0,9999997**	**COMPLIANT**
	Secundary transmitter	WiMAX	0,3978874		
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 6	Primary transmitter	Ericsson F5321	0,5869077	0,9847951	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	WiMAX			

Scenario 7	Primary transmitter	Ericsson F5321	0,5869077	**0,9999997**	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	WiMAX			
	Secundary transmitter	Bluetooth	0,0152046		

B.3.5. VODAFONE REQUIREMENTS

RELATIVE EXPOSURE FOR F5321 ERICSSON BROADBAND MODULE

Manufacturer	Model name	Frequency range (MHz)	S_{eq}	S_{Lim}	$\frac{S_{eq}}{S_{Lim}}$
GSM 850	GSM/GPRS	824,2 - 848,8	0,2063812	0,4121000	0,5008037
	EDGE	824,2 - 848,8	0,1226507	0,4121000	0,2976237
FDD V	WCDMA/HSDPA	826,4 - 846,6	0,2425103	0,4132000	**0,5869077**
	HSUPA	826,4 - 846,6	0,2054614	0,4132000	0,4972443
FDD VI	WCDMA/HSDPA	832,4 - 837,6	0,0863834	0,4162000	0,2075525
	HSUPA	832,4 - 837,6	0,0863834	0,4162000	0,2075525
E-GSM 900	GSM/GPRS	880,2 - 914,8	0,1852124	0,4401000	0,4208417
	EDGE	880,2 - 914,8	0,0510117	0,4401000	0,1159094
FDD VIII	WCDMA/HSDPA	882,4 - 912,6	0,0828763	0,4412000	0,1878428
	HSUPA	882,4 - 912,6	0,1038796	0,4412000	0,2354478
DCS 1800	GSM/GPRS	1710,2 - 1784,8	0,0814086	0,8551000	0,0952036
	EDGE	1710,2 - 1784,8	0,0339367	0,8551000	0,0396875
PCS 1900	GSM/GPRS	1850,2 - 1909,8	0,0994650	0,9251000	0,1075181
	EDGE	1850,2 - 1909,8	0,0870302	0,9251000	0,0940766
FDD II	WCDMA/HSDPA	1852,4 - 1907,6	0,1382707	0,9262000	0,1492882
	HSUPA	1852,4 - 1907,6	0,1204287	0,9262000	0,1300246
FDD I	WCDMA/HSDPA	1922,4 - 1977,6	0,0619769	0,9612000	0,0644787
	HSUPA	1922,4 - 1977,6	0,0621627	0,9612000	0,0646720

RELATIVE EXPOSURE FOR SECONDARY TRANSMITTERS

SCENARIO	Type of transmitter	S_{eq}	S_{Lim}	$\frac{S_{eq}}{S_{Lim}}$
Scenario 1	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 2	WLAN	0,3978874	1,0000000	**0,3978874**
Scenario 3	WLAN	0,3978874	1,0000000	**0,3978874**
	Bluetooth	0,0152046	1,0000000	0,0152046
Scenario 4	WiMAX	0,3978874	1,0000000	**0,3978874**
Scenario 5	WiMAX	0,3978874	1,0000000	**0,3978874**
	Bluetooth	0,0152046	1,0000000	0,0152046

Scenario 6	WLAN	0,3978874	1,0000000	**0,3978874**
	WiMAX			
Scenario 7	WLAN	0,3978874	1,0000000	**0,3978874**
	WiMAX			
	Bluetooth	0,0152046	1,0000000	0,0152046

SIMULTANEOUS EXPOSURE

SCENARIO	Equipment		Maximum $\frac{S_{eq}}{S_{Lim}}$	Maximum $\frac{S_{Pri}}{S_{Lim\_Pri}} + \sum \frac{S_{Sec}}{S_{Lim\_Sec}}$	COMPLIANCE $\frac{S_{Pri}}{S_{Lim\_Pri}} + \sum \frac{S_{Sec}}{S_{Lim\_Sec}} < 1$
Scenario 1	Primary transmitter	Ericsson F5321	0,5869077	0,6021123	**COMPLIANT**
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 2	Primary transmitter	Ericsson F5321	0,5869077	0,9847951	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
Scenario 3	Primary transmitter	Ericsson F5321	0,5869077	**0,9999997**	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 4	Primary transmitter	Ericsson F5321	0,5869077	0,9847951	**COMPLIANT**
	Secundary transmitter	WiMAX	0,3978874		
Scenario 5	Primary transmitter	Ericsson F5321	0,5869077	**0,9999997**	**COMPLIANT**
	Secundary transmitter	WiMAX	0,3978874		
	Secundary transmitter	Bluetooth	0,0152046		
Scenario 6	Primary transmitter	Ericsson F5321	0,5869077	0,9847951	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	WiMAX			
Scenario 7	Primary transmitter	Ericsson F5321	0,5869077	**0,9999997**	**COMPLIANT**
	Secundary transmitter	WLAN	0,3978874		
	Secundary transmitter	WiMAX			
	Secundary transmitter	Bluetooth	0,0152046		