

Agreement between the Finnish Transport and Communications Agency and the Swedish Post and Telecom Authority concerning the use of the 2.3 GHz (2300-2400 MHz) frequency band for wideband systems capable of providing terrestrial electronic communications services in the border areas of the respective countries

April 2019

1. Principles and definitions

- 1.1 The 2.3 GHz band, as referred to in this agreement, corresponds to the frequency band 2300 -2400 MHz, which is harmonized for mobile/fixed communications networks (MFCN), in accordance with CEPT ECC Decision (14)02.
- 1.2 This agreement is based on the concept of field strength levels on borderlines in accordance with ECC REC (14)04. In the case when LTE systems or 5G NR are used, preferential PCIs as defined in Annex 1 shall be used.
- 1.3 This agreement covers the coordination of TDD (Time Division Duplex) and downlink only base stations. User equipment, or terminals, are allowed to be used on non-interfering basis, in accordance with ITU RR 4.4.
- 1.4 For the purpose of this agreement the Zones F and S referred to in the following paragraphs are defined in Annex 2.

2. Use of frequencies without coordination by administrations

- 2.1 Finland may use the frequency band 2.3 MHz without coordination with Sweden, if the predicted mean field strength produced by a base station does not exceed $30 \text{ dB}(\mu\text{V}/\text{m})/5 \text{ MHz}$, calculated for 50 % of location and 10 % of the time, at a height of 3 m above the ground within Zone S, see Annex 2.
- 2.2 Sweden may use the 2.3 GHz band without coordination with Finland, if the predicted mean field strength produced by a base station does not exceed $30 \text{ dB}(\mu\text{V}/\text{m})/5 \text{ MHz}$, calculated for 50 % of location and 10 % of the time, at a height of 3 m above the ground within Zone F, see Annex 2.
- 2.3 For base stations that are synchronized¹ between Finland and Sweden or deployed as downlink only on both sides of the border, the following applies:
 - 2.3.1 Finland may use the 2.3 GHz band without coordination with Sweden, if the predicted mean field strength produced by a base station does not exceed

¹ Synchronized TDD base stations operate aligned in time, so that there is no overlap between DL and UL transmission.

65 dB(μ V/m)/5 MHz within Zone S and 49 dB(μ V/m)/5 MHz at a distance of 6 km inside Zone S, calculated for 50 % of location and 10 % of the time, at a height of 3 m above the ground, see Annex 2.

2.3.2 Sweden may use the 2.3 GHz band without coordination with Finland, if the predicted mean field strength produced by a base station does not exceed 65 dB(μ V/m)/5 MHz within Zone F and 49 dB(μ V/m)/5 MHz at a distance of 6 km inside Zone F, calculated for 50 % of location and 10 % of the time, at a height of 3 m above the ground, see Annex 2.

2.4 Field strength values are defined within a reference block of 5 MHz in case of other frequency block sizes a value of

$$A = 10 * \log_{10} \left(\frac{\text{frequency block size [MHz]}}{5 \text{ MHz}} \right) [dB]$$

should be added to the field strength values.

3. General

3.1 A complaint in case of harmful interference shall be based on the median values of measurements of field strength, performed at 3 meter of receiving antenna height at least on two different occasions over a range of at least 100 m along the border.

3.2 In the presence of interference, the report of harmful interference shall be presented in accordance with Appendix 10 of the Radio Regulations. The other administration shall take all possible steps in order to eliminate the interference.

3.3 The latest version of Recommendation ITU-R P. 1546 "Method for point-to-area predictions for terrestrial services in the frequency range 30 MHz to 3000 MHz" shall be used for prediction of field strength values.

4. Coordination procedure

4.1 Establishment of agreements between operators shall be encouraged to the extent possible. Subject to agreement between operators other technical characteristics can be used, e.g. other field strength limits or propagation models.

4.2 Any case of interference shall as far as possible be resolved among operators concerned. If not resolved, or in case of unequal access to the spectrum band, assistance might be sought from the administrations.

5. Revision and cancellation

- 5.1 This agreement may be cancelled with a notice of at least twelve months from any of the two parties.
- 5.2 This agreement may be cancelled without notice or revised, if mutual understanding is reached between the administrations.

6. Cancellation of previous Agreement

After entering into force, this Agreement will replace the Agreement between the Finnish Communications Regulatory Authority and the Swedish Post and Telecom Agency concerning the use of the frequency band 2300 - 2400 MHz signed in May 2011.

7. Enter into force

- 7.1 This Agreement shall enter into force when both parties have signed the agreement.

This agreement has been drawn in two identical copies, one for Finland and one for Sweden.

Place

Place

Date

Date

For the Finnish Communications Regulatory Authority

For the Swedish Post and Telecom Authority

ANNEX 1 - PREFERENTIAL PHYSICAL-LAYER CELL IDENTITIES (PCI) FOR LTE and 5G NR

PCI division, according to table below, shall be used in border areas to improve coverage and service when channel centre frequencies are aligned.

The PCIs are divided between the administrations according to the following tables:

Table A1. PCI division for LTE

PCI	Set A 0 to 83	Set B 84 to 167	Set C 168 to 251	Set D 252 to 335	Set E 336 to 419	Set F 420 to 503
Country	Finland	Finland	Finland	Sweden	Sweden	Sweden

Table A2. PCI division for 5G NR²

PCI	Set A 0 to 83 504-587	Set B 84 to 167 588-671	Set C 168 to 251 672-755	Set D 252 to 335 756-839	Set E 336 to 419 840-923	Set F 420 to 503 924-1007
Country	Finland	Finland	Finland	Sweden	Sweden	Sweden

² According to working document for revision of ECC REC (14)04

ANNEX 2 - Definition of protected zones

8. In Finland

Zone F

The land border between Sweden and Finland.

The coastline of Finland.

At Ahvenanmaa/Åland:

- A line between Norrskär (60° 32' 24" N, 20° 12' 30" E), Ådskär (60° 21' 03" N, 19° 31' 17" E), Västerön (60° 14' 17" N, 19° 28' 30" E), Askö (59° 59' 20" N, 19° 59' 19" E) and Kalskär (59° 47' 51" N, 20° 57' 50" E)

At Vaasa/Vasa:

- A line between Mickelsöarna (63° 28' 30" N, 21° 44' 40" E), Lappöarna (63° 22' 03" N, 21° 11' 00" E) and Bergö (62° 58' 41" N, 21° 06' 59" E)

At Oulu/Uleåborg:

- Hailuoto (65° 02' 23" N, 24° 33' 04" E)

9. In Sweden

Zone S

The land border between Finland and Sweden.

The coastline of Sweden.

At the coast of Uppland and Stockholm archipelago:

- A line between Argos grund (60° 37' 42" N, 18° 21' 47" E), Simpnäsklubb (59° 53' 34" N, 19° 04' 46" E), Söderarm (59° 45' 10" N, 19° 24' 21" E), Svenska högarna (59° 26' 38" N, 19° 30' 06" E) and Huvudskär (58° 47' 46" N, 18° 34' 13" E)

Note: Geographical coordinates in WGS 84.



Illustration of Zone S and Zone