CEPT ECC
Electronic Communications Committee

ECC Decision (15)01

Harmonised technical conditions for mobile/fixed communications networks (MFCN) in the band 694-791 MHz including a paired frequency arrangement (Frequency Division Duplex 2x30 MHz) and an optional unpaired frequency arrangement (Supplemental Downlink)[1]

approved 6 March 2015

latest amended 30 October 2026

[1] Comparable technical specifications to those given in this ECC Decision are given in EC Implementing Decision (EU) 2016/687. EU Member States and, if so approved by the EEA Joint Committee, Iceland, Liechtenstein and Norway are obliged to implement the EC Decision.

EXPLANATORY MEMORANDUM

1 INTRODUCTION

WRC-12 decided to allocate the frequency band 694-790 MHz in Region 1 to the mobile, except aeronautical mobile, service on a primary basis and identified this band for IMT. The allocation has been effective since WRC-15.

This Decision on harmonised technical conditions for mobile/fixed communications networks (MFCN) in the 700 MHz band has been developed, on the basis of the CEPT Report 53 [2]. CEPT Report 53 was produced in response to a mandate from the European Commission, and includes the MFCN frequency arrangement and technical conditions for this band.

2 BACKGROUND

The CEPT recognised the importance of a harmonised frequency arrangement for MFCN and the need of common and minimal least restrictive technical conditions (LRTC) for MFCN in the band 694-791 MHz.

The following principles have been considered to define the MFCN frequency arrangement:

- Facilitation of roaming and border coordination to achieve global economies of scale for equipment;
- Use of a 5 MHz block approach which is in line with the foreseen mobile systems to be used in the 700 MHz;
- Protection of broadcasting below 694 MHz: an unwanted emission limit for terminal equipment of -42 dBm/8 MHz (assuming an MFCN channel of 10 MHz or less and a 9 MHz guard band) has been defined;
- Spectrum efficiency and high level of flexibility in order to adapt to national circumstances as well as to meet the changing need and demand for capacity in time and geography;
- No Digital Terrestrial Television (DTT) usage was assumed in the 694-790 MHz frequency band.

The harmonisation of the CEPT frequency arrangement for the 694-791 MHz will provide economies of scale.

In consequence, CEPT has identified a channelling arrangement for MFCN including FDD (2x30 MHz, uplink in 703-733 MHz and downlink in 758-788 MHz). In addition, the channelling arrangement allows flexibility to administrations to choose different options for the use of the duplex gap and the guard bands to respond to various national demands. An approach of “zero or up to four block(s) of 5 MHz” Supplemental Downlink (SDL) in 738-758 MHz leaves flexibility to administrations for the use of the duplex gap and the guard bands to respond to various national demands.

When defining LRTC, the block edge mask (BEM) concept has been developed by CEPT to facilitate implementation of spectrum rights of use which are as technology neutral as possible.

Moreover careful consideration has been given to the protection of broadcasting service in the 470-694 MHz band.

CEPT took into account the need of unwanted emission limit to be respected by terminal equipment that would satisfy the following criteria:

- manage the risk of interference between mobile use and the broadcasting service below 694 MHz;
- be technically feasible for practical implementation of IMT terminals;
- achieve global harmonisation of mobile terminals.

Based on results of studies and taking into account the above criteria, CEPT agreed on an unwanted emission limit. CEPT noted that manufacturers have indicated that they are able to develop and manufacture terminals for the agreed CEPT unwanted emission limit in a common implementation with current 3GPP band 28. This unwanted emission limit has already been included in technical specifications for mobile terminals (ETSI TS 136 101).

The implementation of the 700 MHz frequency arrangement by national administrations will require coordination with any other administration whose broadcasting service and/or other primary terrestrial services are considered to be affected. For broadcasting, the coordination procedure will take into account the framework of the GE-06 agreement.

3 REQUIREMENT FOR AN ECC DECISION

CEPT believes that the continued development of MFCN services will be facilitated by the introduction of harmonised frequency arrangements across CEPT countries wishing to implement MFCN in the band 694 - 791 MHz. However, CEPT also recognises that administrations need flexibility to adapt their use of the band 694-791 MHz to national circumstances and to other usages.

CEPT recognises that implementation of MFCN in the band 694-791 MHz (FDD 2x30 MHz and SDL on optional basis) based on LRTC and on common frequency arrangements will reduce capital expenditure for operators and cost of manufacturing equipment and will secure future investments by providing economies of scale that promote opportunities and benefits for end users. Access to the 694-791 MHz band will enable mobile broadband operators to improve coverage, capacity and performance, especially in rural areas and for indoor use.

In consequence, this Decision provides administrations with the harmonised channelling arrangement and LRTC for the use of the 700 MHz band by MFCN.

ECC DECISION OF 06 MARCH 2015 ON HARMONISED TECHNICAL CONDITIONS FOR MOBILE/FIXED COMMUNICATIONS NETWORKS (MFCN) IN THE BAND 694-791 MHz INCLUDING A PAIRED FREQUENCY ARRANGEMENT (FREQUENCY DIVISION DUPLEX 2X30 MHZ) AND AN OPTIONAL UNPAIRED FREQUENCY ARRANGEMENT (SUPPLEMENTAL DOWNLINK) (ECC DECISION (15)01), AMENDED 30 OCTOBER 2026

"The European Conference of Postal and Telecommunications Administrations,

considering

a) that WRC-12 allocated the frequency band 694-790 MHz in Region 1 to the mobile, except aeronautical mobile, service on a primary basis and identified the band for IMT and that this allocation has been effective since WRC-15;

b) that the frequency band 694-790 MHz is also allocated in Region 1 to the broadcasting service on a primary basis and that the GE-06 agreement applies for this band and the bands above and below;

c) that in accordance with RR 5.312 the band 645-862 MHz is also allocated to the aeronautical radionavigation service on a primary basis in some CEPT countries;

d) that MFCN for the purpose of this Decision includes IMT and other mobile and fixed communications networks;

e) that harmonised technical conditions (incl. a harmonised frequency arrangement) will support the implementation of MFCN in this band within CEPT and facilitate global roaming;

f) that Recommendation ITU-R M.1036 contains the 2x30 MHz frequency arrangement (703-733 / 758-788 MHz) as channelling arrangement A7;

g) that ECC Decision (16)02 [4] provides the PPDR frequency arrangement and technical conditions for PPDR in the 700 MHz band;

h) that ERC Recommendation 70-03, annex 10 [3], contains frequency arrangements and technical conditions for radio microphones (e.g. for PMSE) in the 694-703 MHz and 733-757.5 MHz bands;

i) that harmonisation of the CEPT frequency arrangements in accordance with the lower duplexer[2] of the A5 band plan in Recommendation ITU-R M.1036 will achieve maximum inter-regional harmonisation;

j) that coexistence with the 800 MHz band plan (using a reversed duplex arrangement) is achieved by placing the 700 MHz downlink band (using a conventional duplex arrangement) adjacent to the 800 MHz downlink band;

k) that CEPT Report 53 [2] contains the MFCN frequency arrangement and common and minimal LRTC for the 694-790 MHz band;

l) that the use of MFCN in parts of the band 694-791 MHz would not prevent administrations from using also parts of the band for other terrestrial applications to adapt to national circumstances and furthermore some administrations may not make available all the frequencies in the 694-791 MHz band for MFCN because they have already been allocated to other services and applications;

m) that as an alternative to the optional unpaired frequency arrangement (SDL) administrations could choose other options such as Programme Making and Special Events (PMSE), Public Protection and Disaster Relief (PPDR), Machine to Machine (M2M) that could respond to additional demands by using all or part of the duplex gap of the paired band plan (733-758 MHz) and, if appropriate, the guard bands;

n) that the block edge mask (BEM) concept has been developed by CEPT to facilitate implementation of spectrum rights of use which are as technology neutral as possible;

[2] Frequency arrangement A5 is technically implemented using two partly overlapping duplexers of 30 MHz bandwidth each.

o) that the protection of the broadcasting service below 694 MHz from MFCN implies a guard band of 9 MHz above 694 MHz;

p) that the protection of the broadcasting service from MFCN terminals also requires the implementation of unwanted emission limits below 694 MHz;

q) that for the protection of the broadcasting service below 694 MHz additional measures may need to be applied by administrations at the national level to manage possible interference as a result of nearby MFCN base stations;

r) that interference from broadcasting transmitters to MFCN BS receivers either due to transmitter in band power or unwanted emissions may arise, and that in such cases, appropriate mitigation techniques can be applied by mobile operators on a case-by-case basis at national level;

s) that administrations wishing to deploy MFCN will have to fulfil cross-border coordination obligations, taking into account the GE-06 agreement;

t) that this ECC Decision should retain flexibility to administrations to determine at a national level the use of this frequency band;

u) that a preferred block size of 5 MHz does not preclude the option of smaller channel bandwidths within a block;

v) that in EU/EFTA countries the radio equipment that is under the scope of this Decision shall comply with the RE Directive [6]. Conformity with the essential requirements of the RE Directive may be demonstrated by compliance with the applicable harmonised European standard(s), cited in the Official Journal (OJ) of the European Union, or by using the other conformity assessment procedures set out in the RE Directive.

DECIDES

1. that administrations wishing to introduce Mobile Fixed Communication Networks (MFCN) in the band 694-791 MHz shall apply the frequency arrangement and technical conditions according to decides 2 to 4;

2. that, as part of the harmonised technical conditions, the MFCN frequency arrangement in the band 694-791 MHz includes a paired frequency arrangement (FDD 2x30 MHz) and an optional unpaired frequency arrangement (SDL) as provided in Annex 1;

3. that, in order to address national needs:
   a) the MFCN frequency arrangement contains an optional element to allow administrations to implement zero or up to four block(s) of 5 MHz for SDL;
   b) the optional element within the MFCN frequency arrangement provides flexibility for administrations to choose between different options, including ‘non MFCN’ options such as PPDR, PMSE, M2M, for the use of the duplex gap of the MFCN FDD 2x30 MHz;

4. that the LRTC to be applied to the MFCN frequency arrangement are specified in Annex 2;

5. that this Decision does not preclude the use of the band by other services to which the band is allocated;

6. that this Decision **enters into force** on 6 March 2015;

7. that CEPT administrations shall communicate the **national measures** implementing this Decision to the ECC Chair and the European Communications Office when the Decision is nationally implemented.”

Note:

Please check the ECO Documentation Database https://docdb.cept.org for the up to date position on the implementation of this and other ECC Decisions.

ANNEX 1: HARMONISED FREQUENCY ARRANGEMENT FOR MFCN (FDD AND OPTION FOR SDL)

The frequency arrangement shall be as follows:

- The block sizes shall be in multiples of 5 MHz, which does not preclude smaller channel bandwidths within a block;
- A paired frequency arrangement (FDD);
  - terminal station transmitter: 703-733 MHz;
  - base station transmitter: 758-788 MHz;
- An unpaired frequency arrangement (SDL) on optional basis;
  - SDL using 'zero or up to four' of the following frequency blocks: 738-743 MHz, 743-748 MHz, 748-753 MHz and 753-758 MHz. The decision on the number of contiguous blocks would be taken at national level. This approach ensures flexibility for combination with other options identified by CEPT in considering m).

694-703	703-708	708-713	713-718	718-723	723-728	728-733	733-738	738-743	743-748	748-753	753-758	758-763	763-768	768-773	773-778	778-783	783-788	788-791
Guard band	Uplink						Gap	SDL (A)				Downlink						Guard band
9 MHz	30 MHz (6 blocks of 5 MHz)						5 MHz	20 MHz (zero up to 4 blocks of 5 MHz)				30 MHz (6 blocks of 5 MHz)						3 MHz

(A) SDL Option: "The zero or up to 4 blocks of 5 MHz approach" provides flexibility for combination with other options being considered in CEPT (see considering m).

ANNEX 2: LEAST RESTRICTIVE TECHNICAL CONDITIONS (LRTC) FOR THE MFCN FREQUENCY ARRANGEMENT

The technical conditions presented in this annex are in the form of block-edge masks (BEMs). BEMs are related to spectrum licensing and the avoidance of interference between users of spectrum.

A BEM is an emission mask that is defined, as a function of frequency, relative to the edge of a block of spectrum that is licensed to an operator. It consists of in-block and out-of-block components which specify the permitted emission levels over frequencies inside and outside the licensed block of spectrum respectively. The out-of-block component of the BEM itself consists of a baseline level and, where applicable, intermediate (transition) levels which describe the transition from the in-block level to the baseline level as a function of frequency.

The technical conditions derived below for the frequency range 694-791 MHz are optimised for, but not limited to, fixed/mobile communications networks. Therefore, they are derived both for base stations (BS) and terminal stations (TS). The BEMs have been developed to ensure coexistence with other MFCN blocks (including the option for SDL), as well as other services and applications in the band and in adjacent bands. Additional measures may be required at a national level to achieve coexistence with other services and applications using the guard bands or the duplex gap.

In the derivation of the BEM elements for protection of PPDR and M2M frequency blocks, it has been assumed that the same protection requirements as for MFCN should be applied. These requirements are applicable when PPDR and M2M options are implemented in the guard bands or the duplex gap at a national level. BEM requirements for TSs and BSs to protect broadcasting below 694 MHz are also sufficient for the protection of PMSE operating below 694 MHz.

A2.1 BASE STATION

The MFCN Base Station (BS) BEM consists of several elements. The in-block power limit is applied to a block licensed to an operator. The out-of-block elements consist of a baseline level, designed to protect the spectrum of other MFCN operators as well as adjacent services, and transitional levels enabling filter roll-off from in-block to baseline levels. Additionally, elements are provided for guard bands between MFCN and other services and between the MFCN uplink (UL) and downlink (DL). The BEM is based on minimum coupling loss (MCL) analysis and simulations.

Table 1 contains the different elements of the BS BEM, and Tables 2 to 5 contain the power limits for the different BEM elements.

Operators of mobile/fixed communications networks (MFCN) in the 694-791 MHz band may agree, on a bilateral or multilateral basis, less stringent technical parameters provided that they continue to comply with the technical conditions applicable for the protection of other services, applications or networks and with their cross-border obligations. Administrations should ensure that these less stringent technical parameters can be used, if agreed among all affected parties.

Table 1: MFCN BS BEM elements

In-block	Block for which the BEM is derived
Baseline	Spectrum used for MFCN UL and DL (including SDL, if applicable), for DTT, for MFCN above 790 MHz (DL) for PPDR UL and DL or M2M UL and DL
Transitional region	The transitional region applies from 0 to 10 MHz below and above the block assigned to the operator, except from in the uplink region of MFCN (703-733 MHz), PPDR or M2M

Table 3: MFCN BS in-block power limit

Frequency range	Maximum mean e.i.r.p.	Measurement Bandwidth
Block assigned to the operator	Not mandatory. In case an upper bound is desired by an administration, a value of 64 dBm/5 MHz per antenna may be applied.	5 MHz

Table 4: MFCN BS baseline requirements for protection of uplink frequencies

Frequency range	Maximum mean e.i.r.p.	Measurement bandwidth
Uplink frequencies in the range 698-733 MHz	-50 dBm per cell	5 MHz
Uplink frequencies in the range 733-736 MHz	-52 dBm per cell	3 MHz
Note: In a multi sector site "cell" refers to one of the sectors. Note: Administrations may select a measurement bandwidth of 200 kHz, and scale the maximum mean e.i.r.p. accordingly, depending on national options implemented.		

Table 5: MFCN BS transitional and baseline requirements

BEM element	Frequency range	Maximum mean e.i.r.p.	Measurement bandwidth
Transitional	–10 to –5 MHz from lower block edge	18 dBm per antenna	5 MHz
	–5 to 0 MHz from lower block edge	22 dBm per antenna	5 MHz
	0 to +5 MHz from upper block edge	22 dBm per antenna	5 MHz
	+5 to +10 MHz from upper block edge	18 dBm per antenna	5 MHz
Baseline	Other frequencies in the range 738-821 MHz	16 dBm per antenna	5 MHz

The spurious domain in this Decision for a base station starts 10 MHz from the band edge and the corresponding spurious emission limits are defined in ERC Recommendation 74-01 [5]. For MFCN base stations capable of multi-band operation, where multiple bands are mapped on the same antenna connector, the spurious emission requirement does not apply in the frequency range(s) between 10 MHz below the lower band edge and 10 MHz above the upper band edge of each supported band by the base station (see Figure below).

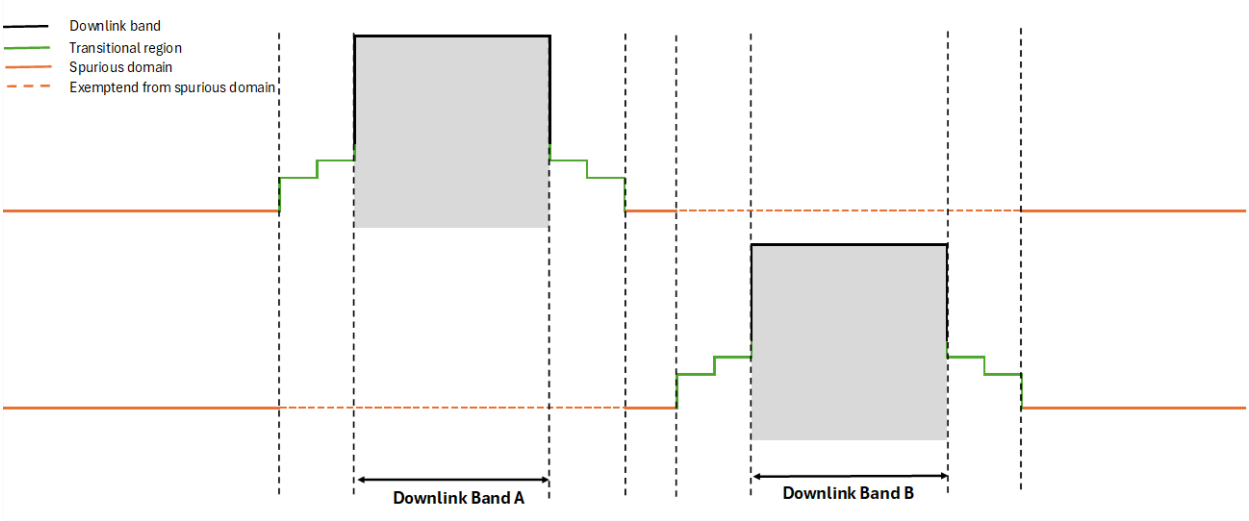


Figure 1: Scenario where multiple bands are mapped on the same antenna connector

Table 6: MFCN BS Baseline requirements for DTT spectrum

Frequency range	Maximum mean e.i.r.p.	Measurement bandwidth
For DTT frequencies below 694 MHz where broadcasting is protected	-23 dBm per cell (Note 1)	8 MHz
Note 1: In a multi sector site "cell" refers to one of the sectors.		

A2.2 TERMINAL STATION

The terminal station (TS) BEM consists of an in-block level, and a baseline level for DTT spectrum, see Table 6 through Table 7. Further requirements will have to be taken into account by ETSI in the harmonised standards, which may require close cooperation between ETSI, CEPT and Standard Developing Organisations.

The power limits are specified as e.i.r.p. for terminal stations designed to be fixed or installed and as total radiated power (TRP) for terminal stations designed to be mobile or nomadic[3].

Administrations may relax the in-block power limit in certain situations, for example fixed TS in rural areas, provided that protection of other services, networks and applications is not compromised and cross-border obligations are fulfilled.

Table 7: TS in-block emission limit

Maximum mean in-block power
23 dBm
Note: It is recognised that this value is subject to a tolerance of up to +2 dB, to take account of operation under extreme environmental conditions and production spread.

[3] TRP is a measure of how much power the antenna actually radiates. The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere. For an isotropic antenna radiation pattern, e.i.r.p. and TRP are equivalent. For a directional antenna radiation pattern, e.i.r.p. in the direction of the main beam is (by definition) greater than the TRP.

Table 8: Unwanted emissions requirements for TS over frequencies occupied by broadcasting

Frequency range of unwanted emissions	Maximum mean unwanted emission power (see Notes)	Measurement Bandwidth
470-694 MHz	-42 dBm	8 MHz
Note 1: Unwanted emission limit was based on broadcasting using DVB-T2 and derived for an MFCN system with a bandwidth of 10 MHz for a DTT-MFCN centre frequency separation of 18 MHz (assuming an 8 MHz TV channel, 9 MHz guard band and a 10 MHz MFCN bandwidth). If administrations wish to allow the deployment of MFCN on a national basis with a bandwidth greater than 10 MHz and in case an out-of-band power higher than -42 dBm/8 MHz is generated in the band below 694 MHz, they should consider: either implementing the greater MFCN bandwidth starting at a frequency higher than 703 MHz so that the required limit of out-of-band power is still met; and/or applying mitigation techniques (see Note 3). Note 2: This value has been derived with regard to fixed DTT reception. Administrations who wish to consider portable-indoor DTT reception may need, on a case-by-case basis, to implement further measures at a national/local level (see Note 3). Note 3: Examples of potential mitigation techniques which may be considered by administrations include using additional DTT filtering, reducing the in-block power of the TS, reducing the bandwidth of the TS transmissions, or using techniques contained in the non-exhaustive list of potential mitigation techniques given in CEPT Report 30 [1].		

ANNEX 3: LIST OF REFERENCES

[1] CEPT Report 30: The identification of common and minimal (least restrictive) technical conditions for 790 - 862 MHz for the digital dividend in the European Union, approved October 2009

[2] CEPT Report 53: to develop harmonised technical conditions for the 694 -790 MHz ('700 MHz') frequency band in the EU for the provision of wireless broadband and other uses in support of EU spectrum policy objectives, approved November 2014

[3] ERC Recommendation 70-03: “Relating to the use of Short Range Devices (SRD)”, approved October 1997, latest amended June 2026

[4] ECC Decision (16)02: “Harmonised technical conditions and frequency bands for the implementation of Broadband Public Protection and Disaster Relief (BB-PPDR) systems”, approved June 2016, latest amended March 2019

[5] ERC Recommendation 74-01: ”Unwanted emissions in the spurious domain”, approved 1998,corrected May 2022

[6] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC