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RO-IR UWB-07

TECHNICAL REGULATION

for the radio interface

concerning radio equipment based on ultra-wide band (UWB) technology

(installed in motor and railway vehicles)

1. Basic considerations

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 was implemented in national legislation by Government Decision No 740/2016 on making available on the market of radio equipment with subsequent amendments and completions.

This technical regulation contains the requirements for the use of license exempt of the radio spectrum by radio equipment based on ultra-wide band technology (UWB) (installed in motor and railway vehicles) in the specified frequency bands and considers, especially, compliance with the provisions of Article 3 Paragraph 2, and Articles 6-8 of Directive 2014/53/EU.

Nothing in this technical regulation shall preclude the obligation for radio equipment placed on the market or made available on the market in Romania to comply with Directive 2014/53/EU.

The obligations arising from Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 on the procedure for the provision of information in the field of technical regulations and of rules on Information Society services are met in this regulation (OJ L 241, 17.9.2015, p. 1-15).

All Romanian technical regulations for the radio interfaces notified under Directive 2015/1535 (EU) shall be published and made available on National Authority for Management and Regulation in Communications of Romania (ANCOM) web-site at: http://www.ancom.ro/reglementari-interfete_2723.

2. Radio Interface Specifications

UWB equipment (installed in motor and railway vehicles)

Frequency band
f ≤ 1.6 GHz
1.6 < f ≤ 2.7 GHz
2.7 < f ≤ 3.1 GHz
3.1 < f ≤ 3.4 GHz
3.4 < f ≤ 3.8 GHz
3.8 < f ≤ 4.8 GHz
4.8 < f ≤ 6 GHz
6 < f ≤ 8.5 GHz
8.5 < f ≤ 9 GHz
9 < f ≤ 10.6 GHz
f > 10.6 GHz

For the purposes of this technical regulation, *equipment using ultra-wideband technology (UWB)* means equipment incorporating, as an integral part or as an accessory, technology for short-range radio communication, involving the intentional generation and transmission of radio-frequency energy that spreads over a frequency range wider than 50 MHz, which may overlap several frequency bands allocated to radio communication services.

For the purposes of this technical regulation, *e.i.r.p.* means *equivalent isotropically radiated power*, which is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain).

Maximum mean power spectral density means the average power per unit bandwidth (centred on that frequency) radiated in the direction of the maximum level under the specified conditions of measurement and which is specified as e.i.r.p. of the radio device under test at a particular frequency.

Peak power means the power contained within a 50 MHz bandwidth at the frequency at which the highest mean radiated power occurs, radiated in the direction of the maximum level under the specified conditions of measurement and which is specified as e.i.r.p.

For the purposes of this technical regulation, *non-interference and non-protected basis* means that no harmful interference may be caused to any radio communication service and that no claim may be made for protection of these devices against interference originating from radio communication services.

The usage of radio spectrum by the radio equipment based on ultra-wide band (UWB) is permitted without interference and protection only provided that such equipment meets the conditions set out in the Annex below and is used indoors. *Indoors* means inside buildings or places in which the shielding will typically provide the necessary attenuation to protect radio communication services against harmful interference. If this radio equipment is used outdoors, it is not attached to a fixed installation, a fixed infrastructure or a fixed outdoor antenna.

3. Document history:

Edition	Changes
Edition 1/2015	Notification number according to Directive 98/34/EC: 2015/142/RO.
Edition 2/2018 (10.08.2018)	Update of the legal framework according to Point 1 – „Basic considerations" and reference documents (row 13); Formal changes according to TCAM-RSC pattern of November 2017.
Edition 3/2021 (04.10.2021)	Changes according to Commission Implementing Decision (EU) 2019/785 of 14 May 2019 on the harmonization of radio spectrum for equipment using ultra-wideband technology in the Union and repealing Decision 2007/131/EC; Changes of titles according to Decision No 248/2021 amending and completing National Authority for Management and Regulation in Communications of Romania (ANCOM) President's Decision No 311/2016 on radio frequencies or frequency bands exempted from the licensing regime; Update of the legal framework according to Point 1 – „Basic considerations" and reference documents (row 13).

<table>
<tr><th></th><th>No</th><th>Parameter</th><th>Description</th><th>Comments</th></tr>
<tr><td rowspan="8">Normative part</td><td>1</td><td>Radio communication Service</td><td>Mobile</td><td></td></tr>
<tr><td>2</td><td>Application</td><td>Radio equipment based on UWB technology</td><td>Radio equipment installed in motor and railway vehicles</td></tr>
<tr><td>3</td><td>Frequency band</td><td>See the frequency bands shown in row (7)</td><td>Harmonized radio spectrum for equipment using ultra-wide band technology (Commission Implementing Decision (EU) 2019/785 of 14 May 2019 on the harmonization of radio spectrum for equipment using ultra-wide band technology in the Union and repealing Decision 2007/131/EC)</td></tr>
<tr><td>4</td><td>Channeling (channel distribution)</td><td>-</td><td></td></tr>
<tr><td>5</td><td>Modulation/Occupied bandwidth</td><td>-</td><td></td></tr>
<tr><td>6</td><td>Direction/Separation</td><td>-</td><td></td></tr>
<tr><td>7</td><td>Transmit power / Power density</td><td>
<table>
<tr><th>Frequency band</th><th>Maximum mean power spectral density (e.i.r.p.)</th><th>Maximum peak power (e.i.r.p.) (within a 50 MHz bandwidth)</th></tr>
<tr><td>f ≤ 1.6 GHz</td><td>– 90 dBm/MHz</td><td>– 50 dBm</td></tr>
<tr><td>1.6 < f ≤ 2.7 GHz</td><td>– 85 dBm/MHz</td><td>– 45 dBm</td></tr>
<tr><td>2.7 < f ≤ 3.1 GHz</td><td>– 70 dBm/MHz</td><td>– 36 dBm</td></tr>
<tr><td>3.1 < f ≤ 3.4 GHz</td><td>– 70 dBm/MHz
or
– 41.3 dBm/MHz using LDC (1) + e.l. (4)
or
– 41.3 dBm/MHz using TPC (3) +
+ DAA (2) + e.l. (4)</td><td>– 36 dBm
or
≤ 0 dBm
or
≤ 0 dBm</td></tr>
<tr><td>3.4 < f ≤ 3.8 GHz</td><td>– 80 dBm/MHz
or
– 41.3 dBm/MHz using LDC (1) + e.l. (4)
or
– 41.3 dBm/MHz using TPC (3) +
+ DAA (2) + e.l. (4)</td><td>– 40 dBm
or
≤ 0 dBm
or
≤ 0 dBm</td></tr>
<tr><td>3.8 < f ≤ 4.8 GHz</td><td>– 70 dBm/MHz
or
– 41.3 dBm/MHz using LDC (1) + e.l. (4)
or
– 41.3 dBm/MHz using TPC (3) +
+ DAA (2) + e.l. (4)</td><td>– 30 dBm
or
≤ 0 dBm
or
≤ 0 dBm</td></tr>
</table>
</td><td>(1) The Low Duty Cycle (LDC) mitigation technique and its limits are defined in clauses 4.5.3.1, 4.5.3.2 and 4.5.3.3 of ETSI Standard EN 302 065-3 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of Directive 2014/53/EU and respect the technical requirements of Commission Implementing Decision (EU) 2019/785.
(2) The Detect and Avoid (DAA) mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-3 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of Directive 2014/53/EU and respect the technical requirements of Commission Implementing Decision (EU) 2019/785.
(3) The Transmit Power Control (TPC) mitigation technique and its limits are defined in clauses 4.7.1.1, 4.7.1.2 and 4.7.1.3 of ETSI Standard EN 302 065-3 V2.1.1. Alternative mitigation</td></tr>
</table>

			<table><tr><td>4.8 < f ≤ 6 GHz</td><td>– 70 dBm/MHz</td><td>– 30 dBm</td></tr><tr><td>6 < f ≤ 8.5 GHz</td><td>– 53.3 dBm/MHz or – 41.3 dBm/MHz using LDC ([1]) + e.l.([4]) or – 41.3 dBm/MHz using TPC ([3]) + e.l.([4])</td><td>– 13.3 dBm or ≤ 0 dBm or ≤ 0 dBm</td></tr><tr><td>8.5 < f ≤ 9 GHz</td><td>– 65 dBm/MHz or – 41.3 dBm/MHz using TPC ([3]) + + DAA ([2]) + e.l. ([4])</td><td>– 25 dBm or ≤ 0 dBm</td></tr><tr><td>9 < f ≤ 10.6 GHz</td><td>– 65 dBm/MHz</td><td>– 25 dBm</td></tr><tr><td>f > 10.6 GHz</td><td>– 85 dBm/MHz</td><td>– 45 dBm</td></tr></table> Technical requirements to be used within the bands 3.8-4.2 GHz and 6-8.5 GHz for vehicular access systems using trigger-before-transmit are defined in the following table. <table><tr><td colspan="3">Technical requirements</td></tr><tr><td>Frequency band</td><td>Maximum mean power spectral density (e.i.r.p.)</td><td>Maximum peak power (e.i.r.p.) (within a 50 MHz bandwidth)</td></tr><tr><td>3.8 < f ≤ 4.2 GHz</td><td>– 41.3 dBm/MHz using „trigger-before-transmit” and LDC ≤ 0.5 % (in 1h)</td><td>0 dBm</td></tr><tr><td>6 < f ≤ 8.5 GHz</td><td>– 41.3 dBm/MHz using „trigger-before-transmit” and LDC ≤ 0.5 % (in 1h) or TPC</td><td>0 dBm</td></tr></table> Trigger-before-transmit mitigation is defined as a UWB transmission that is only initiated when necessary, specifically where the system indicates that UWB devices are nearby. The communication is either triggered by a user or by the vehicle. The subsequent communication can be considered as 'triggered communication'. The existing LDC mitigation applies (or alternatively TPC in the 6 GHz to 8.5 GHz range). An exterior limit requirement must not be applied when using the trigger-before-transmit mitigation technique for vehicular access systems. Trigger-before-transmit mitigation techniques that provide an appropriate level of performance in order to comply with the essential requirements of Directive 2014/53/EU shall be used for vehicular access systems. If relevant techniques are described in harmonized standards or parts thereof the references of which have been published in the Official Journal of the European Union under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured. These techniques shall respect the technical requirements of Commission Implementing Decision (EU) 2019/785.	*techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of Directive 2014/53/EU and respect the technical requirements of Commission Implementing Decision (EU) 2019/785.* ([4]) *The exterior limit (e.l.) ≤ – 53.3 dBm/MHz is required. The exterior limit is defined in clauses 4.3.4.1, 4.3.4.2 and 4.3.4.3 of ETSI Standard EN 302 065-3 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of Directive 2014/53/EU and respect the technical requirements of Commission Implementing Decision (EU) 2019/785.*
	8	**Channel occupation and access rules**	-	
	9	**Authorization regime**	License exemption	

	10	**Additional essential requirements (According to Article 3 Paragraph 3 of 2014/53/EU Directive)**	-	
	11	**Assumptions on spectrum planning**	-	
Informative Part	**12**	**Planned changes**	-	
	13	**Reference**	Commission Implementing Decision (EU) 2019/785 repealing Decision 2007/131/EC; EN 302 065-3 V2.1.1	
	14	**Notification number**		
	15	**Remarks**		

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