

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Request to Modify April 24, 2023 Waiver Order) ET Docket No. 19-138
of the 5.9 GHz Band Rules to Permit Initial)
Deployment of Cellular Vehicle-to-Everything)
Technology)

ORDER

Adopted: July 5, 2023

Released: July 5, 2023

By the Chiefs, Public Safety and Homeland Security Bureau, Office of Engineering and Technology, and Wireless Telecommunications Bureau:

I. Introduction

1. In this Order, the Public Safety and Homeland Security Bureau, the Office of Engineering and Technology, and the Wireless Telecommunications Bureau (collectively, the Bureaus) address the Request for Modified Waiver¹ by Audi of America, Inc., Ford Motor Company, Jaguar Land Rover, the Utah Department of Transportation, AAEON Technology Inc., Advantech Co., Ltd., Applied Information, Inc., Cohda Wireless Pty Ltd., Commsignia, Inc., Danlaw Inc., HARMAN International Industries, Inc., Kapsch TrafficCom USA Inc., and Panasonic Corporation of North America (collectively, the Joint Waiver Parties or Petitioners)² to modify the Bureaus' April 24, 2023 Joint Waiver Order.³ Specifically, the Joint Waiver Parties request that the Bureaus remove the "20 dBm Transmitter Output Power" limit for OBUs from the technical parameters and restrictions the Bureaus imposed on the waiver order which granted authorization to the named Petitioners to deploy Cellular Vehicle-to-Everything (C-V2X) technology in the 5.9 GHz band.⁴ For the reasons stated below, the Bureaus grant the Joint Waiver Parties' request to remove the 20 dBm Transmitter Output Power limit for OBUs from the conditions imposed on the Joint Waiver Order.

II. Background

2. *Joint Waiver Request.* On December 13, 2021, the Joint Waiver Parties asked the Commission to permit C-V2X-based operations that meet the technical parameters set forth in Appendix 1 of their filing on the upper 20-megahertz portion (5905-5925 MHz) of the 5.9 GHz band, pending adoption of final C-V2X-based rules.⁵ Petitioners requested the waiver to allow (1) the named

¹ See Letter from the C-V2X Joint Waiver Parties to Marlene H. Dortch, Secretary, FCC, ET Docket No. 19-138 (filed Jun. 8, 2023) (*Request for Modified Waiver*), <https://www.fcc.gov/ecfs/document/1060816922821/1>.

² The Virginia Department of Transportation (VDOT), although a signatory on the December 13, 2021 Joint Waiver Request, is not a signatory on the instant waiver request.

³ See *Request for Waiver of 5.9 GHz Band to Permit Initial Deployment of Cellular Vehicle-to-Everything Technology*, Order, ET Docket No. 19-138, DA 23-343 (PSHSB/OET/WTB rel. Apr. 24, 2023) ("Joint Waiver Order").

⁴ See *Request for Modified Waiver* at 1.

⁵ Request for Waiver of 5.9 GHz Band Rules to Permit Initial Deployments of Cellular Vehicle-to-Everything Technology, Ford Motor Company, et al., ET Docket No. 19-138, at Appendix 1 at 10-11 (filed Dec. 13, 2021)

automakers to deploy C-V2X-based On-Board Units (OBUs) in their cars sold in the United States; (2) the named state departments of transportation to deploy C-V2X operations, including Roadside Units (RSUs) and OBUs, throughout their respective state borders; and (3) identified equipment manufacturers to obtain the necessary equipment certifications for their C-V2X equipment.⁶

3. *Joint Waiver Order.* On April 24, 2023, the Bureaus waived the current Dedicated Short-Range Communication (DSRC) based rules applicable to intelligent transportation systems (ITS) operations to allow Petitioners to use C-V2X-based technology in the upper 30 megahertz (5.895-5.925 GHz) portion of the 5.850-5.925 GHz Band (5.9 GHz band) prior to adoption of final C-V2X-based rules.⁷ Also, the Bureaus determined that C-V2X equipment subject to the Joint Waiver Order will operate in the 5905-5925 MHz portion of the 5.9 GHz band using a 20-megahertz channel.⁸

4. As a condition to the waiver grant, the Joint Waiver Order required that “[a]ll RSUs and OBUs authorized under [the] Order must operate using the technical characteristics and operating parameters, including power, height, and out-of-band emission limits, specified [in the following table], in order to ensure compliance with all existing technical rules applicable to ITS operations other than the requirement to use DSRC-based technology”:⁹

C-V2X OBU and RSU Operations

Frequency Range	Channel Bandwidth	OBU Limits	RSU EIRP Limit
5905-5925 MHz	20 MHz	20 dBm Transmitter Output Power 33 dBm EIRP*; 27dBm EIRP within 5 degrees of horizontal	33 dBm EIRP

*EIRP (equivalent isotropically radiated power)

5. *Request for Modified Waiver.* On June 8, 2023, the C-V2X Joint Waiver Parties submitted the instant request for a modified waiver to remove the “20 dBm Transmitter Output Power” limit for OBUs from the technical parameters of the waiver grant.¹⁰

III. DISCUSSION

6. The C-V2X Joint Waiver Parties are seeking to modify the April 24, 2023 waiver grant pursuant to section 1.925 of the Commission’s rules.¹¹ Section 1.925 states that the agency may grant a waiver if it is shown that the underlying purpose of the rule at issue would not be served or would be frustrated by application to the instant case, and a grant would be in the public interest, or where, “in view of unique or unusual factual circumstances,” application of the rule would be inequitable, unduly

(*Joint Waiver Request*), https://www.fcc.gov/ecfs/file/download/DOC-5f6d7d2ef3400000-A.pdf?file_name=C-V2X%20Waiver%20Request%2012%2013%202021.pdf; Letter from the C-V2X Joint Waiver Parties to Marlene H. Dortch, Secretary, FCC, ET Docket No. 19-138, at 3 (filed Apr. 20, 2022) (*Joint Waiver Request Supplement*), <https://www.fcc.gov/ecfs/document/104201266008794/1>; C-V2X Joint Waiver Parties Aug. 29, 2022 Reply Comments at 11 (correcting power spectral density bandwidth units used in Out-of-band emission (“OOBE”) limits table in *Joint Waiver Request* Appendix 1 at 11 from MHz to kHz).

⁶ *Joint Waiver Request* at 4-5.

⁷ The Bureaus waived sections 90.375, 90.377, 90.379, 95.3163, 95.3167, and 95.3189 of the Commission’s rules, 47 CFR §§ 90.375, 90.377, 90.379, 95.3163, 95.3167, and 95.3189. *See* Joint Waiver Order at 10-11.

⁸ *See Id.* at 9.

⁹ Joint Waiver Order at 9-10.

¹⁰ *Request for Modified Waiver* at 1.

¹¹ 47 CFR § 1.925.

burdensome or contrary to the public interest, or the applicant has no reasonable alternative.¹² In addition, section 1.3 provides that the Commission may waive any provision of its rules on its own motion for good cause.¹³

7. We find that removal of the 20 dBm Transmitter Output Power limit for OBUs is warranted under section 1.925. In the Joint Waiver Order, the Bureaus imposed a set of conditions and technical restrictions, including the OBU Transmitter Output Power limit requirement, to ensure that federal radiolocation services and DSRC incumbents in the band would be protected from potentially harmful interference from C-V2X operations.¹⁴ Petitioners contend that the 20 dBm Transmitter Output Power limit “is unnecessary from an interference protection standpoint” and “forces the use of specific antenna designs to achieve the maximum permitted EIRP levels and restricts our ability to use higher conducted power limits while still complying with the EIRP levels in the Joint Waiver Order.”¹⁵ Petitioners further argue that by restricting “design flexibility,” the limit creates an “unnecessary burden for waiver grantees.”¹⁶

8. Petitioners correctly point out that the National Telecommunications and Information Administration recommended limits it deemed sufficient to protect federal systems from potential interference from C-V2X operations, in terms of EIRP, during the waiver period, and did not require a Transmitter Output Power limit.¹⁷ The waiver grant, on the other hand, was conditioned on both a Transmitter Output Power limit representing the signal level entering the antenna and an EIRP limit representing the signal level transmitted from the antenna.¹⁸ We agree with Petitioners that the EIRP limit is appropriate and sufficient to ensure coexistence with other users of the band, including federal radar systems and DSRC operations, and that the removal of the Transmitter Output Power limit would not change the interference dynamics among these systems sharing the band. We also note that the Commission has moved away from defining the transmitter output power limit and antenna gain requirement in recent rulemakings in order to provide product design flexibility to manufacturers.¹⁹

9. The conditions the Bureaus imposed on the Joint Waiver Order are not intended to add unnecessary burden or constraint on the deployment of C-V2X-based technology. Rather, the Bureaus intended by their Joint Waiver Order “to encourag[e] widespread deployment of ITS operations using V2X technology” and to “serve the public interest by advancing vehicular safety and promoting

¹² 47 CFR § 1.925(b)(3)(i)-(ii).

¹³ 47 CFR § 1.3 (“Any provision of the rules may be waived by the Commission on its own motion or on petition if good cause therefor is shown.”); *see also* *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

¹⁴ *See* Joint Waiver Order at 8-11.

¹⁵ *Request for Modified Waiver* at 1.

¹⁶ *Id.* at 2.

¹⁷ *See id.* at 1; *see also* Letter from Charles Cooper, Associate Administrator, Office of Spectrum Management, National Telecommunications and Information Administration, to Ronald T. Repasi, Acting Chief, FCC Office of Engineering and Technology, ET Docket No. 19-138 (filed April 14, 2023) at 3, <https://www.fcc.gov/ecfs/document/1041481775855/1>.

¹⁸ *See* Joint Waiver Order at 9.

¹⁹ *See Unlicensed Use of the 6 GHz Band*, ET Docket No. 18-295, *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, GN Docket No. 17-183, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852, 3860 paras. 17-19, Table 3: Expanded Unlicensed Use of the 6 Gigahertz Band, 3919-3924, paras. 181-194 (2020); 47 CFR §§ 15.407(a)(4)-(8). *See also Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, 35 FCC Rcd 2343, 2468-70 paras. 335-342 (2020); 47 CFR §§ 27.50(j)(1)-(5).

interoperability.”²⁰ To deny the request for a modified waiver and retain the requirement at issue would be contrary to the public interest, and contrary to the Commission’s stated intention in the *5.9 GHz First R&O*,²¹ as it would preclude rapid deployment of C-V2X technology in the 5.9 GHz band. Accordingly, the underlying purpose of the Commission’s rules governing ITS operations would be frustrated by insisting on application of the 20 dBm OBU Transmitter Output Power limit.²² We therefore grant the request for a modified waiver to the extent necessary and amend the conditions on the April 24, 2023 waiver grant provided in the C-V2X OBU and RSU Operations table in paragraph 24 to read as follows:

C-V2X OBU and RSU Operations

Frequency Range	Channel Bandwidth	OBU Limits	RSU EIRP Limit
5905-5925 MHz	20 MHz	33 dBm EIRP*; 27dBm EIRP within 5 degrees of horizontal	33 dBm EIRP

*EIRP (equivalent isotropically radiated power)

IV. ORDERING CLAUSES

10. Accordingly, IT IS ORDERED that, pursuant to section 4(i) of the Communications Act, as amended, 47 U.S.C. § 154(i), and section 1.925 of the Commission’s rules, 47 CFR § 1.925, the request to modify the Bureaus’ April 24, 2023 Joint Waiver Order to remove the 20 dBm Transmitter Output Power limit for OBUs as a condition of the waiver, is HEREBY GRANTED.

11. This action is taken under delegated authority pursuant to sections 0.31, 0.131, 0.191, 0.241, 0.331 and 0.392 of the Commission’s rules, 47 CFR §§ 0.31, 0.131, 0.191, 0.241, 0.331, and 0.392 and the *5.9 GHz First R&O*.²³

²⁰ Joint Waiver Order at 5.

²¹ See *Use of the 5.850-5.925 GHz Band*, ET Docket No. 19-138, First Report and Order, Further Notice of Proposed Rulemaking, and Order of Proposed Modification, 35 FCC Rcd 13440, 13465 para. 56 (2020), *petitions for review denied sub nom. Intelligent Transp. Soc’y of America v. FCC*, 45 F.4th 406 (D.C. Cir. 2022) (*5.9 GHz First R&O*).

²² See 47 CFR § 1.925(b)(3)(i).

²³ *5.9 GHz First R&O* at 13464-65, paras. 55-56.

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