



Federal Communications Commission
Washington, D.C. 20554

July 9, 2021

DA 21-816

Mr. Seung Hoon Choe
Hyundai Mobis Co., Ltd.
203, Teheran-ro Gangnam-gu
Seoul, South Korea

Subject: Request by Hyundai Mobis Co., Ltd. for Waiver of 47 CFR §§ 15.255(a)(2) & (c)(3)
ET Docket No. 21-287

Dear Mr. Seung:

This is in regard to your Request for waiver of Sections 15.255 of the Commission's rules filed on behalf of Hyundai Mobis Co., Ltd. (Hyundai Mobis).

Hyundai Mobis requests a waiver of Sections 15.255(a)(2) and (c)(3) of the Commission's rules to permit a grant of equipment authorization for a radar that would operate within the 60-64 GHz band at higher power than specified in the rule.¹ The petition seeks the ability to operate unlicensed radars under the same maximum power level and technical parameters that we granted to Google in 2018² and for installation in passenger motor vehicles consistent with waivers we granted to six parties in April 2021.³

In the 2018 waiver, we permitted Google to deploy a mobile radar at +10 dBm peak transmitter conducted output power, +13 dBm peak EIRP level, and +13 dBm/MHz peak power spectral density, with a 10% duty cycle in any 33 milliseconds (ms) interval.⁴ Pursuant to that waiver, Google has deployed mobile radars under its Soli brand name to enable touchless control of device functions or features in devices such as its Pixel smartphone. In April 2021, we granted waivers to six parties to permit the use of radars operating at the higher power levels associated with the Google Waiver when installed in passenger motor vehicles for the primary purpose of supporting public safety in-cabin passenger monitoring functions (*e.g.*, detecting children inadvertently left unattended on a rear seat). We now consider whether a similar waiver should also be granted to Hyundai Mobis.

We are authorized to grant a waiver under Section 1.3 of the Commission's rules if the petitioner demonstrates good cause for such action.⁵ Good cause, in turn, may be found and a waiver granted

¹ Request by Hyundai Mobis for Waiver of 47 CFR §§ 15.255(a)(2) & (c)(3) rules (filed May 3, 2021); this request was filed in INBOX-PART 15 in the Commission's Electronic Comment Filing System.

² Google LLC Request for Waiver of Section 15.255(c)(3) of the Commission's Rules Applicable to Radars used for Short-Range Interactive Motion Sensing in the 57-64 GHz Frequency Band, ET Docket No. 18-70, Order, 33 FCC Rcd 12542 (OET 2018) (Google Waiver).

³ Waiver of Section 15.255 of the Commission's rules, ET Docket Nos. 20-15, 20-121, 20-263, 20-264, 20-434, 20-435, DA 21-407, Order (OET 2021) (2021 Waiver Order).

⁴ Google Waiver.

⁵ 47 CFR § 1.3; *see also* *ICO Global Communications (Holdings) Limited v. FCC*, 428 F.3d 264 (D.C. Cir. 2005); *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

“where particular facts would make strict compliance inconsistent with the public interest.”⁶ To satisfy this public interest requirement, the waiver cannot undermine the purposes of the rule, and there must be a stronger public interest benefit in granting the waiver than in applying the rule.⁷ We find that this standard has been met.

In the 2021 Waiver Order, we waived compliance with two portions of the rules: Section 15.255(a)(2) to allow radar installations within the cabin of passenger motor vehicles; and Section 15.255(c)(3) to allow such radars to operate at higher power levels than permitted in the rule. As we discussed in that order, the operational policies and technical parameters associated with Section 15.255 were designed to ensure that users of devices operating under that rule part (including mobile users engaged in short-range interactive motion sensing) do not cause harmful interference to other authorized users in the band.⁸ We found that allowing radar operation limited to passenger motor vehicles at the same power levels and duty cycle granted to Google would not materially affect the 60 GHz operating environment. Because it would not increase the potential for harmful interference to authorized users in the band, we found that a waiver of the power levels of Section 15.255(c)(3) will not undermine the purpose of the rule. Similarly, we found that the specific type of mobile operation permitted under the terms of the waiver — radar operation in the 57-64 GHz band in passenger motor vehicles where a child may be inadvertently left unattended on a rear seat — would not undermine the purpose of Section 15.255(a)(2) by causing harmful interference to other authorized users in the band.⁹ Furthermore, we found that the narrow relief provided to permit radar applications while installed inside passenger motor vehicles will foster innovative radar systems to save lives without posing interference threats to authorized users in the band; thus, the public interest element of the waiver standard was also met.¹⁰ No party has objected to the grant of these waivers.

Here, we find that the subject radar’s vehicular use cases are the same as those already considered, and granted, in the 2021 Waiver Order. When installed inside the cabin of a passenger motor vehicle and complying with the specific waiver conditions below, Hyundai Mobis’ radars can be expected to create a spectrum use “footprint” that mirrors that of the radars subject to the 2021 Waiver Order. In other words, because these parties are essentially identical in their spectrum use, the prior analysis from that decision and the thorough harmful interference analysis that accompanied it applies here. We have confidence that the Hyundai Mobis’ radar will not cause harmful interference to authorized users of the 60-64 GHz band, and that they therefore would not undermine the purpose of the rules.

We also find that the interest in detecting unattended children inside vehicles in hot weather remains as compelling an interest as it was when we adopted the 2021 Waiver Order and that Hyundai Mobis’ radars are intended to further this objective. The same special circumstances that supported our decision in the 2021 Waiver Order apply here. There, we recognized that the automotive industry, consumer interest groups, and an expert Federal government agency had all identified the prevention of pediatric hot car deaths as a significant priority. Waiving our rules was necessary for 60 GHz radars to be used to meet this objective; specifically, the waiver permitted the radars to be operated in mobile vehicles

⁶ *Northeast Cellular*, 897 F.2d at 1166; *see also ICO Global Communications*, 428 F.3d at 269 (quoting *Northeast Cellular*); *WAIT Radio*, 418 F.2d at 1157-59.

⁷ *See, e.g., WAIT Radio*, 418 F.2d at 1157 (stating that even though the overall objectives of a general rule have been adjudged to be in the public interest, it is possible that application of the rule to a specific case may not serve the public interest if an applicant’s proposal does not undermine the public interest policy served by the rule); *Northeast Cellular*, 897 F.2d at 1166 (stating that in granting a waiver, an agency must explain why deviation from the general rule better serves the public interest than would strict adherence to the rule.)

⁸ 2021 Waiver Order at para. 39.

⁹ *Id.* at para. 40.

¹⁰ *Id.* at para. 50.

and at a power level that gives sufficient resolution to detect an infant’s respiration. Furthermore, we find that granting an additional waiver consistent with the decision and terms of the 2021 Waiver Order will promote competition in the vehicular radar space, which further supports our finding that there is a stronger public interest in granting the waiver than in applying the rule. The benefits of providing additional narrowly tailored waiver relief at this time can add additional competition in the marketplace which in turn can help lower prices and spread the benefits of preventing hot child deaths to even more Americans. Accordingly, the subject radar easily satisfies both elements of the waiver standard. Consistent with our prior analysis, we limit radar use under this waiver to deployment in passenger motor vehicles as we defined that term in the 2021 Waiver Order.¹¹

Recent developments prompt us to include an additional waiver condition that was not part of the Google Waiver or the 2021 Waiver Order: requiring a minimum amount of time that a device must not be transmitting when calculating the duty cycle. This additional condition is intended to facilitate coexistence between different unlicensed device users operating in the 60 GHz band in the short term, while not precluding a more thorough consideration of this matter in the context of a rulemaking proceeding or other Commission process. As background, parties representing unlicensed communications device users have advised the Commission that they have been working with companies seeking to operate unlicensed radars to find ways to allow different unlicensed users to effectively share use of the spectrum resource. Although these parties continue their discussions, representatives for unlicensed communication device users have expressed concern that the duty cycle conditions that we have included in the waivers to date will unacceptably raise the risk of inhibiting communications applications if they continue to be applied to a larger set of radar devices by way of subsequent waivers.¹² To address this concern, these unlicensed communication device parties have suggested modifying the duty cycle restriction adopted in any future waivers to read that “any radar off-time period between two successive radar pulses that is less than 2 ms shall be considered ‘on time’ for purposes of computing the duty cycle.”¹³ We note that a draft Notice of Proposed Rulemaking that considers unlicensed radar use under Section 15.255 and that has been circulated for the Commissioners’ consideration and potential adoption at the FCC’s July 2021 Open Meeting asks questions about how duty cycle should be regulated for 60 GHz radars.¹⁴ In light of these facts and for purposes of this waiver, we opt to limit Hyundai Mobis’ operations under the waiver to account for the concerns raised by the unlicensed communications device parties. Specifically, we will require, as part of this waiver, that any radar off-time between two

¹¹ 2021 Waiver Order at para. 1, n.2 (defining “passenger motor vehicle” to mean a “passenger car” (a motor vehicle with motive power, except a low-speed vehicle, multipurpose passenger vehicle, motorcycle, or trailer, designed for carrying 10 persons or less) or a “multipurpose passenger vehicle” (a motor vehicle with motive power, except a low-speed vehicle or trailer, designed to carry 10 persons or less which is constructed either on a truck chassis or with special features for occasional off-road operation) that has more than one row of seats, as those terms are used by the National Highway Traffic Safety Administration at 49 CFR § 571.3).

¹² Letter from Alan Norman, Director, Public Policy, Facebook, *et. al.* to Marlene Dortch, Secretary, FCC, filed May 10, 2021 in ET Docket 20-15 at 2-3 (asserting that the duty cycle limitation that we included as a condition on previous waivers introduced a ‘loophole’ that we should close). The duty cycle language we have been using was based on a record of extensive consultation between Google and Facebook and other stakeholders and a mutual agreement as to what would be appropriate for the FCC to include in the waiver that was ultimately granted to Google in 2018. *See* Letter from Megan Anne Stull, Google LLC, and Pankaj Venugopal, Facebook, Inc., to Marlene Dortch, FCC, ET Docket No. 18-70 (filed Sept. 7, 2018).

¹³ Letter from Alan Norman, Director, Public Policy, Facebook, *et. al.* to Marlene Dortch, Secretary, FCC, filed May 10, 2021 in ET Docket 20-15 at 3.

¹⁴ *FCC Announces Tentative Agenda for July Open Meeting*, News Release, rel. June 22, 2021. Further information about the draft document, <https://www.fcc.gov/document/enabling-state-art-radar-sensing-technologies-60-ghz-band>, was posted on the Commission’s July Open Meeting webpage. A new docket, 21-264, has been opened to collect comments associated with this item.

successive radar pulses that is less than 2 ms shall be considered “on time” for purposes of computing the duty cycle. The condition is intended to prevent unlicensed radar devices from operating with such a small period of time between transmissions that they effectively preclude the ability of unlicensed communication device users to access the band. This could happen if the radars are perceived by these other unlicensed users as engaging in a singular continuous transmission. This waiver condition is not intended to predetermine the outcome of any ongoing or future rulemaking. On the contrary, by adopting these conservative operating conditions, this order is intended to enable Hyundai Mobis to enter the marketplace, increasing competition and innovation in 60 GHz radar, while preserving the question of a permanent framework for a future Commission action. By imposing this waiver condition, we recognize the recently expressed concerns and are able to promote a full and open discussion of these matters as part of any associated rulemaking proceeding that the Commission may conduct.

The draft Notice of Proposed Rulemaking discussed above addresses unlicensed radar use under Section 15.255. As with the prior waiver grants, we recognize that there are strong benefits in acting on the waiver request at this time regardless of any potential rulemaking activity. Here, the narrow relief we are providing will permit the deployment of innovative radar applications to provide potentially life-saving applications — in this case, radars deployed in passenger motor vehicles to detect children left unattended in hot cars — without posing interference threats to authorized users in the band. We condition the grant of this waiver on the outcome of any changes to our rules that may be adopted in a future rulemaking proceeding. We intend to revisit this waiver, as well as other 60 GHz band waivers that have been granted to date, if and when the Commission might revise its rules. We further emphasize that grant of this waiver and the conditions we associate with it are not intended to predetermine the outcome of this or any potential future rulemaking.

Operation pursuant to this waiver is expressly conditioned on compliance with the Commission’s rules except as waived, and where rules are modified as a result of any future Commission rulemaking these operations will be subject to those modified rules. To ensure that harmful interference to authorized operations and other spectrum users will not occur, we impose explicit conditions on the installation, operation, and certification of the Hyundai Mobis radars under this waiver, as follows:

- The radar shall be certified for compliance with all the technical specifications applicable to operation under 47 CFR Part 15, with the exception of the following provisions in 47 CFR §§ 15.255(a)(2) and (c)(3), which are waived to allow the device to operate as a radar on new passenger motor vehicles in the 60-64 GHz band at a maximum +13 dBm EIRP, +10 dBm transmitter conducted output power, and +13 dBm/MHz power spectral density.¹⁵
- Each individual radar device shall not exceed a maximum transmit duty cycle of 10% in any 33 milliseconds (ms) interval (i.e., the device will not transmit longer than a total of 3.3 ms in any 33 ms time period).
- Any radar off-time period between two successive radar pulses that is less than 2 ms shall be considered “on time” for purposes of computing the duty cycle.
- The radar shall be restricted to factory installation in the interior of new passenger motor vehicles for the primary purpose of in-cabin monitoring functions and shall not be marketed in after-market add-on products. The grantee shall include clear and complete installation instructions that explain this restriction and a copy of these instructions shall be submitted along with the application for equipment authorization. If the radar is installed such that it is not visible (e.g., behind the headliner), then the required equipment labeling in accordance with the provisions of 47 CFR §§ 2.925 and 15.19 shall be provided in the vehicle’s Owner’s

¹⁵ A copy of this letter shall be provided with the application for certification of the device.

Manual. The certification grant shall specify these restrictions.

- Operations under this waiver may not be used to transmit data.
- Users of the radars must be made aware through a disclosure in the vehicle Owner's Manual or an equivalent means that the operation is subject to the conditions that no harmful interference is caused and that any interference must be accepted.
- This waiver and its conditions shall apply only to radars intended for installation in passenger motor vehicles as described herein and are not to be considered to apply generally to any other radars or field disturbance sensors that will operate in different environments where further analysis would be necessary to assess the potential for impact to other authorized users.
- The waiver conditions granted herein are not transferable to any third party via §2.933 or any other means of technology transfer.
- The waiver is explicitly conditioned on any changes to our rules that may be adopted in a future rulemaking proceeding in accordance with the terms of this order.

Accordingly, pursuant to authority delegated in Sections 0.31 and 0.241 AND 1.3 of the Commission's rules, 47 C.F.R §§ 0.31, 0.241, and 1.3, and Sections 4(i), 302, 303(e), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C §§ 154(i), 302, 303(e), and 303(r), IT IS ORDERED that the Requests for Waiver filed by Hyundai Mobis Co., Ltd. IS GRANTED, consistent with the terms of this Order, effective upon release of this Order.

FEDERAL COMMUNICATIONS COMMISSION

Ronald T. Repasi
Acting Chief,
Office of Engineering and Technology