



Federal Communications Commission
Washington, D.C. 20554

July 9, 2021

DA 21-813

Brian Huseman
Amazon.com Services LLC
601 New Jersey Avenue, NW, Suite 900
Washington, D.C. 20001

Subject: Request by Amazon.com Services LLC for Waiver of 47 CFR § 15.255(c)(3)
ET Docket No. 21-289

Dear Mr. Huseman:

This is in regard to your Petition for Declaratory Ruling and Request for waiver of Section 15.255 of the Commission's rules filed on behalf of Amazon.com Services LLC (Amazon).

Amazon requests a waiver of Section 15.255(c)(3) of the Commission's rules to permit a grant of equipment authorization for its unlicensed radar device, the Radar Sensor, that would operate in the 57-64 GHz band.¹ Specifically, Amazon requests to operate its Radar Sensor at identical power levels and technical parameters as those granted to Google in a 2018 waiver order.² That waiver permitted Google to deploy a mobile radar in, for example, its Pixel smartphone, to enable touchless control of device functions or features 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 ms interval. In its request, Amazon further stated that it would accept an additional waiver condition intended to promote coexistence among unlicensed users in the band. As discussed below, this condition—which relates to how the radar's duty cycle is calculated—was prompted by comments from 60 GHz unlicensed communications device stakeholders and their discussions with parties interested in operating unlicensed radars under waivers of our rules.³

As with Google, Amazon describes how it plans to use its Radar Sensors to enable touchless control of device features and functions.⁴ It further distinguishes its anticipated devices as being “non-mobile” and only operating when connected to a power source, and states that it plans to use the radar's capability of capturing motion in a three-dimensional space to enable contactless sleep tracing functionalities.⁵

¹ *Amazon.com Services LLC Request for Waiver of Section 15.255(c)(3) of the Commission's Rules for Short Range Interactive Motion Sensing Devices* (filed June 22, 2021) (Amazon Request). Amazon filed its request 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 Amazon Request at 4. *See also, e.g.*, Letter from Alan Norman, Facebook, Inc. *et. al.* to Marlene Dortch, FCC in ET Docket No. 21-48 (filed May 10, 2021).

⁴ Amazon Request at 1.

⁵ *Id.* at 1-2.

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.⁶ Good cause, in turn, may be found and a waiver granted “where particular facts would make strict compliance inconsistent with the public interest.”⁷ 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.⁸ We find that this standard has been met.

As noted in our prior waiver orders, Section 15.255(c)(3) is designed to prevent unlicensed devices from causing harmful interference.⁹ We had previously determined that operation consistent with the Google Waiver would not materially affect the 60 GHz operating environment so as to introduce the risk of harmful interference being caused to licensed and authorized users in the band.¹⁰ Amazon cites the Google Waiver and related filings from Google when it notes that our assessment and concurrence with technical studies in the record showed that 60 GHz unlicensed radars would be able to operate in certain use cases at a higher power level than is permitted under the rules.¹¹

We find that Amazon’s Radar Sensor, when used for the specific types of applications that Amazon has described, is sufficiently analogous to the situations we evaluated for the Google Soli radar for us to reach the same conclusion here.¹² The power level under which the Amazon Radar Sensor will be permitted to operate will be the same as we previously permitted in the Google Waiver. And, as with Google’s devices, Amazon’s radars will be used to capture motion in a discrete space that is characterized by a short distance between the radar and what it is sensing. Moreover, Amazon’s devices will require connection to a power source, which will limit both their mobility and placement. This represents a much narrower setting than that which we authorized in the Google Waiver (i.e., the Google device could be carried by a person and used indoors, outdoors, and onboard commercial aircraft). These characteristics give us added confidence that the analysis we conducted in the Google Waiver is applicable to this situation and that operation of Amazon’s Radar Sensor will not increase the potential for harmful interference to authorized users in the band. For these reasons we conclude that waiver of Section 15.255(c)(3) to Amazon’s Radar Sensors will not undermine the purpose of the rule.

We also find that the second element of the waiver standard has been met; there is a stronger public interest benefit in granting the waiver than in applying the rule. Granting the waiver will provide

⁶ 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).

⁷ *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.

⁸ *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).

⁹ *See, e.g.,* Google Waiver at para. 2.

¹⁰ *Id.* at para 6.

¹¹ Amazon Request (citing Google Waiver at para. 11).

¹² Although Amazon also cites our more recent waiver to six parties that permitted the deployment of radars in automobiles, *Vayyar Imaging Ltd. Request for Waiver of Section 15.255(c)(3) of the Commission’s Rules for Radars used for Interactive Motion Sensing in the frequency band 57-64 GHz*, Order, DA 21-407 (OET 2021) (2021 Waiver Order), that decision permitted a different use case than is envisioned by Amazon and also involved the waiver of an additional rule (section 15.255(a)(2)). The relief we granted there is specific to those parties for their particular applications deployed in passenger automotive vehicles. Amazon’s operation under this waiver must conform to the conditions we set forth herein.

substantial public benefit by, among other things, permitting the deployment of applications that can provide assistance to persons with disabilities and improve personal health and wellness.¹³ We believe that, without the higher power levels associated with the waiver, it is highly likely that Amazon would not be able to produce devices that transmit with large enough bandwidths to provide sufficient resolution to achieve these objectives.¹⁴ In the Google Waiver, we allowed Google to operate its device at a higher power level after it had argued that the power levels in the existing rules were too restrictive to adequately enable its device functions, resulting in missed motions and fewer effective interactions.¹⁵ Absent a waiver, Google likely would not have been able to use interactive motion sensing in the 60 GHz band to successfully aid people with mobility, speech, or tactile impairments. Similar special circumstances exist here. Amazon plans to deploy 60 GHz radars to provide both gesture recognition that can aid persons with disabilities, as well as to provide sleep-related health and wellness applications. In addition, treating Amazon's request in a similar fashion to our grant of the Google Waiver will benefit the American public by fostering added competition and enabling the development of additional 60 GHz radar products and applications.

The waiver conditions we are establishing for Amazon are based on those that we adopted in the Google Waiver.¹⁶ However, as noted above, recent developments prompt us to include an additional condition that 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. Recently, 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.¹⁷ 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."¹⁸ Amazon has indicated that, for purposes of its operations under a waiver, it is prepared to satisfy such a requirement.¹⁹ 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.²⁰ For purposes of this waiver, we will require that any radar off-time between two successive

¹³ Amazon Request at 2.

¹⁴ See, e.g., *id.* at 5.

¹⁵ Google Waiver at para. 3.

¹⁶ Subsequent to the Google Waiver, Federal spectrum stakeholders suggested that we augment the language in our conditions to emphasize the narrow scope of our 60 GHz waivers. This language was included in the 2021 Waiver Order and is reflected here.

¹⁷ 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).

¹⁸ 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.

¹⁹ Amazon Request at 4.

²⁰ *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>

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 Amazon 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 applications that will provide significant benefits to the public 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 the waiver is expressly conditioned on compliance with the Commission’s rules except as waived, which, in this case, is limited to Section 15.255(c)(3) under the conditions we set forth below.²¹ Where rules are modified as a result of any future Commission rulemaking Amazon’s 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 Amazon Radar Sensor under this waiver, as follows:

- The Amazon Radar Sensor 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(c)(3), which are waived to allow the device to operate in the 57-64 GHz band at a maximum +13 dBm EIRP, +10 dBm transmitter conducted output power, and +13 dBm/MHz power spectral density.²²
- The Amazon Radar Sensor device shall operate with a maximum transmit duty cycle of 10% in any 33 milliseconds (ms) intervals (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 between two successive radar pulses that is less than 2 ms shall be considered “on time” for purposes of computing the duty cycle.
- Operations under this waiver may not be used to transmit data.
- Amazon shall inform purchasers of the device that the radar may only be operated on a non-

[band](#), was posted on the Commission’s July Open Meeting webpage. OET opened a new docket, 21-264 to collect comments associated with this item.

²¹ Consistent with the Google Waiver (but unlike the 2021 Waiver Order, which pertained to an unlicensed radar application not at issue here), we are not waiving Section 15.255(a)(2). Accordingly, Amazon must ensure that its radars operate as field disturbance sensors under the limitations of this rule.

²² A copy of this letter shall be provided with the application for certification of the device.

interference basis to other authorized services in the 57-64 GHz frequency band, and operators of the device will be required to mitigate any instances of harmful interference that may occur.

- Users of these 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 Amazon Radar Sensors under the configurations (e.g., operating when connected to a power source) and for the purposes described in its petition and are not to be considered to apply generally to any other 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 in Sections 0.31, 0.241, AND 1.3 of the Commission's rules, 47 CFR §§ 0.21, 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 Request for Waiver filed by Amazon.com Services LLC IS GRANTED, consistent with the terms set forth above. This action is effective immediately.

FEDERAL COMMUNICATIONS COMMISSION

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