

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

In the Matter of	)	
	)	
WTB & OET Seek Comment on Samsung Waiver	)	WT Docket No. 23-93
of Sections 96.41 and 2.947	)	
	)	
Ericsson Petition for Waiver of Sections 96.41 and	)	WT Docket No. 25-159
2.947	)	

ORDER

Adopted: May 2, 2025**Released: May 2, 2025**

By the Acting Chief, Wireless Telecommunications Bureau and the Acting Chief, Office of Engineering and Technology:

I. INTRODUCTION

1. By this Order, the Wireless Telecommunications Bureau and the Office of Engineering and Technology conditionally grant Samsung Electronics America, Inc. (Samsung)¹ and Ericsson² waivers of sections 96.41(e) and 2.947(f) of the Commission's rules.³ Samsung and Ericsson requested waivers to allow them to manufacture, market, and sell multiband devices capable of operating in both the Citizens Broadband Radio Service and the 3.7 GHz Service.⁴ For the reasons discussed below, we find that permitting these multiband devices to be marketed and deployed will serve the public interest and, accordingly, we conditionally waive sections 96.41(e) and 2.947(f) to the extent necessary to effectuate this result.⁵

¹ Petition of Samsung Electronics America, Inc. for Waiver, WT Docket No. 23-93 (filed Aug. 23, 2022), https://www.fcc.gov/ecfs/document/10_823066036951/1 (*Samsung Petition*); Letter from John Godfrey, Senior Vice President, Public Policy, Samsung Electronics America, Inc., to Marlene H. Dortch, Secretary, FCC, Docket No. 23-93 (filed Mar. 1, 2023) (redacted for public inspection) (*Samsung Petition Supplemental Letter*).

² Petition of Ericsson for Waiver (filed Mar. 16, 2023), <https://www.fcc.gov/ecfs/document/10316596125517/1> (*Ericsson 3.5 GHz/3.7 GHz Petition*); Letter from Mark Racek, Sr. Director, Spectrum Policy, Ericsson, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed Dec. 5, 2023) (*Ericsson December 2023 Ex Parte*); Amendment to Ericsson Petition for Waiver (filed Jan. 7, 2025), <https://www.fcc.gov/ecfs/document/1010705569567/1> (*Ericsson Amendment*).

³ 47 CFR §§ 2.947(f), 96.41(e).

⁴ See *Samsung Petition* at 1; see *Ericsson Amendment* at 1 (amending the frequency range of the waiver request to the 3.72-4.0 GHz frequency range).

⁵ Within this Order, we address petitions requesting similar relief from Samsung and Ericsson in the interest of administrative efficiency, and in light of the substantial record generated in the Samsung proceeding and the similarity of the issues raised. See *Ericsson Amendment* at 2-4 (arguing for a combined order and noting the similarity of the devices for which relief is requested, the opportunities for public comment in the Samsung waiver proceeding and the *Promoting Investment in the 3550-3700 MHz Band* Notice of Proposed Rulemaking, the fact that the Commission's waiver rules do not require a new public notice proceeding to consider the requests separately, and requesting expeditious relief).

II. BACKGROUND

2. Over the past decade, the Commission has made 530 megahertz of critical mid-band spectrum available in the 3.0-4.0 GHz frequency range for next generation wireless services, including 5G.⁶ This mid-band spectrum includes the 3.45 GHz Service in the 3.45-3.55 GHz band, the Citizens Broadband Radio Service in the 3.55-3.7 GHz band (3.5 GHz band), and the 3.7 GHz Service in the 3.7-3.98 GHz band (3.7 GHz band).⁷ To ensure effective coexistence within and across these bands, the Commission adopted base station out-of-band emissions (OOBE) limits that reflect the unique operational environment in each band.⁸ For all three bands, the Commission required base stations to limit their conducted transmission power to no greater than -13 dBm/MHz outside of their authorized channel(s).⁹ In the 3.5 GHz band, base stations are further required to limit their OOBE to -25 dBm/MHz beyond 10 megahertz from the edge of their authorized channel(s) and to -40 dBm/MHz below 3.53 GHz and above 3.72 GHz.¹⁰

3. In its *Petition*, Samsung seeks a waiver of the -40 dBm/MHz OOBE requirement in section 96.41(e)(2) for emissions from operations in the 3.5 GHz band to exceed -40 dBm/MHz above 3.72 GHz, as well as a conforming waiver of section 2.947(f) to permit equipment authorization in accordance with a higher emission limit than allowed by the rule.¹¹ Samsung explains that there is market demand for multiband radios that can transmit concurrently in the adjacent 3.5 GHz band and 3.7 GHz Service, and that combining radios for both bands in one device would reduce energy consumption and facilitate rapid network deployment.¹² Samsung states that its proposed wideband radio will be capable of operation “(i) as a standalone 3.7 GHz radio, or (ii) in a combined 3.7 GHz/CBRS mode when operators are using channels in the CBRS band in addition to the 3.7 GHz band.”¹³ Samsung explains that it

⁶ See *Facilitating Shared Use in the 3100-3550 MHz Band*, WT Docket No. 19-348, Second Report and Order, Order on Reconsideration, and Order of Proposed Modification, 36 FCC Rcd 5987, 5994 at para. 12 (2021) (3.45 GHz *Second R&O*); *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 (2020) (3.7 GHz *R&O*) (establishing the 3.7 GHz Service in the 3.7-4.2 GHz band); *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) (3.5 GHz *R&O*) (establishing the Citizens Broadband Radio Service in the 3.55-3.7 GHz band).

⁷ By 3.7 GHz band, we refer to the 3.7-4.2 GHz frequency range. The 3.7 GHz Service is limited to the 3.7-3.98 GHz frequency range. See 47 CFR §§ 27.4, 27.5(m). Samsung’s waiver request identifies the 3.7-3.98 GHz frequency range as the 3.7 GHz band, though it identifies the frequencies for which it requests an OOBE rule waiver as 3.72-4.0 GHz. See *Samsung Petition* at 1.

⁸ 3.45 GHz *Second R&O* at 6016-19, paras. 79-87.

⁹ *Id.* at 6016-17, paras. 79-83; 47 CFR § 27.53(n)(1); 3.5 GHz *R&O* at 4017, para. 184; 47 CFR § 96.41(e)(1); 3.7 GHz *R&O* at 2470, para. 343; 47 CFR § 27.53(l)(1).

¹⁰ 3.5 GHz *R&O* at 4017, para. 184; 47 CFR §§ 96.41(e)(1)-(2). The Commission also adopted an additional limitation for base station emissions in the 3.45 GHz Service. See 47 CFR § 27.53(n)(1). In the 3.7 GHz Service, base stations have a flat OOBE limit of -13 dBm/MHz outside the licensee’s authorized bandwidth. See 47 CFR § 27.53(l)(1).

¹¹ *Samsung Petition* at 1, 5; see also 47 CFR §§ 2.947(f), 96.41(e)(2). Section 2.947 of the Commission’s rules describes the measurement procedures for equipment authorization testing. With respect to composite devices, subsection (f) prescribes, among other things, that “[i]f the individual devices in a composite system are subject to different technical standards, each such device must comply with its specific standards. In no event may the measured emissions of the composite system exceed the highest level permitted for an individual component.” 47 CFR § 2.947(f).

¹² *Id.* at 4.

¹³ *Samsung Petition* at 5.

intends to seek approval of the device under parts 96 and 27,¹⁴ and that the radio will not be capable of standalone operation in the 3.5 GHz band other than in a special configuration for equipment authorization compliance testing.¹⁵

4. According to Samsung, its proposed multiband radio will utilize a single power amplifier across the two adjacent bands, which precludes the typical filtering that would allow the radio to comply with the -40 dBm/MHz OOB limit above 3.72 GHz from the Citizens Broadband Radio Service.¹⁶ Thus, the “testing pursuant to the Commission’s composite rule [section 2.947(f)], which requires ‘individual device’ testing, will show transmissions in the 3.7 GHz band as signals necessarily pass through the filter that would allow for 3.7 GHz transmissions in the commercial operation modes, even when the device is in its testing-only CBRS mode.”¹⁷ Samsung’s design would use a conventional filter for the frequencies above and below the combined passband.¹⁸ Samsung further states that “[i]n commercial standalone 3.7 GHz or composite 3.7 GHz/CBRS operations, the radio will comply with the emissions permitted by the composite device rule. Samsung’s radio will be no more capable of causing interference than a standalone 3.7 GHz radio permitted under the Commission’s rules.”¹⁹

5. On March 10, 2023, the Wireless Telecommunications Bureau and Office of Engineering and Technology sought comment on the Samsung Petition.²⁰ Verizon and Ericsson filed comments in support of the Samsung Petition.²¹ Samsung submitted reply comments reiterating its request for a waiver, and Charter Communications, Inc. (Charter) also submitted reply comments.²² Charter asked the Commission to defer acting on Samsung’s waiver petition until interested stakeholders could evaluate the multiband radio’s compliance with the standards governing emissions into the 3.5 GHz band in each mode of operation.²³ Samsung later provided supplemental technical information to Commission staff about the OOB measurements of the composite device in various operational modes.²⁴ Samsung also indicated that it had engaged with Charter regarding the proposed radio’s emissions into the 3.5 GHz band.²⁵

¹⁴ See *id.* at 5 (explaining that Samsung plans to seek approval of the device as a Category B Citizens Broadband Radio Service Device (Maximum EIRP below 47 dBm/10MHz) under part 96 and as a fixed station under part 27).

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.* at 6.

¹⁹ *Samsung Petition Supplemental Letter* at 1.

²⁰ *Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment on Samsung’s Waiver Request to Enable Multiband Radios for the 3.5 GHz and 3.7 GHz Bands*, WT Docket No. 23-93, Public Notice, DA 23-195 (WTB/OET Mar. 10, 2023).

²¹ See Comments of Verizon (*Verizon Comments*); Comments of Ericsson (*Ericsson Comments*).

²² See Reply Comments of Samsung Electronics America, Inc. (*Samsung Reply Comments*); Reply Comments of Charter Communications, Inc. (*Charter Reply Comments*).

²³ See *Charter Reply Comments* at 1. In the alternative, Charter asked the Commission to “condition any [waiver] grant on Samsung immediately ceasing operations if the base station causes harmful interference to CBRS operations.” *Id.*

²⁴ See Letter from John Godfrey, Senior Vice President, Public Policy, Samsung Electronics America, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed June 9, 2023) (*Samsung June 9, 2023, Ex Parte Letter*), Letter from John Godfrey, Senior Vice President, Public Policy, Samsung Electronics America, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed June 15, 2023) (redacted for public inspection).

²⁵ See *Samsung June 9, 2023, Ex Parte Letter* at 1, n.2.

6. The proceeding generated a significant and varied record after the comment deadline closed. NCTA and WISPA submitted filings expressing concerns with aspects of Samsung's waiver request, including potential harmful interference with Citizens Broadband Radio Service operations and concerns about Samsung's interpretation of section 2.947(f) of the Commission's rules.²⁶ In its response to WISPA's and NCTA's filings, Samsung argues that the waiver would confer numerous public interest benefits, including "lower deployment costs and faster deployment; energy savings stemming from significantly increased energy efficiency; and smaller size and weight resulting in a smaller footprint and wind load on towers" and improved aesthetics.²⁷ Samsung also submitted additional materials on the real-world emissions profile of its device and discussed the underpinnings of its interpretation of section 2.947(f).²⁸ Verizon, Ericsson, and CTIA submitted filings in support of Samsung's Petition, arguing that a grant would be in the public interest.²⁹

7. The record also included multiple technical submissions that addressed the potential impact of Samsung's multiband device on the interference environment in the 3.5 GHz band. Notably, NCTA submitted a summary of an analysis that it had performed using a CableLabs simulator that it argued showed that deployment of Samsung's proposed base station, in combination with deployment of similar dual-band 3.45 GHz/3.5 GHz base stations, could increase noise in the 3.5 GHz band, reducing capacity and increasing network costs for Citizens Broadband Radio Service users.³⁰ Samsung, Ericsson, Qualcomm, and Verizon filed a joint response reiterating that "Samsung's proposed 3.5/3.7 GHz multiband radio will have substantially the same radiofrequency profile as a standalone 3.7 GHz radio collocated with a standalone 3.5 GHz radio."³¹ They also questioned the assumptions underlying NCTA's analysis, arguing that those assumptions were inconsistent with the data that Samsung had

²⁶ See Letter from Traci Biswese, Vice President and Associate General Counsel, NCTA – The Internet and Television Association to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed Oct. 2, 2023) (*NCTA Oct. 2, 2023 Ex Parte Letter*) and Letter from Traci Biswese, Vice President and Associate General Counsel, NCTA – The Internet and Television Association to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed Nov. 30, 2023) (*NCTA Nov. 30, 2023 Ex Parte Letter*); Letter from Louis Peraertz, Vice President of Policy, WISPA-Broadband Without Boundaries to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed Sept. 12, 2023) (*WISPA Sept. 12, 2023, Ex Parte Letter*).

²⁷ See Letter from John Godfrey, Senior Vice President, Public Policy, Samsung Electronics America, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed Nov. 2, 2023) (*Samsung Nov. 2, 2023, Ex Parte Letter*) at 2.

²⁸ See *Samsung Nov. 2, 2023, Ex Parte Letter*; See Letter from John Godfrey, Senior Vice President, Public Policy, Samsung Electronics America, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (Dec. 7, 2023) (*Samsung Dec. 7, 2023, Ex Parte Letter*) at 2-3.

²⁹ See Letter from Patrick T. Welsh, Vice President, Federal Regulatory & Legal Affairs, Verizon, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (Oct. 31, 2023) (*Verizon Ex Parte Letter*); Letter from Mark Racek, Senior Director Spectrum Policy, Ericsson, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (Dec. 5, 2023); Letter from John Godfrey, Senior Vice President, Public Policy, Samsung Electronics America, Inc., Mark Racek, Senior Director Spectrum Policy, Ericsson, John W. Kuzin, Vice President, Spectrum Policy and Regulatory Counsel, Qualcomm, and Patrick Welsh, Vice President, Federal Regulatory and Legal Affairs, Verizon, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (Jan. 4, 2024) (*Joint Jan. 4, 2024, Ex Parte Letter*); Letter from Michael Mullinix, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (Jan. 19, 2024).

³⁰ See Letter from Traci Biswese, Vice President and Associate General Counsel, NCTA, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed Mar. 6, 2024) (*NCTA March 6, 2024, Ex Parte Letter*); "Simulations on Multi-Band BS Waiver Impacts to CBRs" presentation (*NCTA March 4, 2024, Presentation*) at 23-31.

³¹ See Letter from John Godfrey, Senior Vice President, Public Policy, Samsung Electronics America, Inc., Mark Racek, Senior Director Spectrum Policy, Ericsson, John W. Kuzin, Vice President, Spectrum Policy and Regulatory Counsel, Qualcomm, and Patrick Welsh, Vice President, Federal Regulatory and Legal Affairs, Verizon, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed Mar. 29, 2024) (*Joint Mar. 29, 2024 Ex Parte Letter*).

provided.³² NCTA also submitted the results of lab testing by its member Charter Communications, which, it claims, used commercially available equipment in a controlled environment to measure the interference effects within the 3.5 GHz band of higher emissions arising either from a relaxation of emissions limits for 3.5 GHz devices or from dual-band 3.5 GHz/3.7 GHz band devices with higher composite emissions.³³ Samsung and Ericsson submitted a joint response in which they challenged the methodology and results of NCTA's study.³⁴

8. Ericsson also submitted a petition for waiver to allow for the manufacture and marketing of a mid-band multiband radio across the 3.5 GHz and 3.7 GHz Services.³⁵ Ericsson initially framed its waiver request as seeking "a limited waiver of the CBRS out-of-band-emissions (OOBE) rule, Section 96.41(e)(2), from 3.55 GHz to 4.0 GHz,"³⁶ but submitted an amended waiver request in January 2025 clarifying that it sought similar relief to that sought by Samsung—i.e., a waiver of section 96.41(e) for the -40 dBm/MHz step-down limit for emissions into the 3.72 GHz to 4.0 GHz.³⁷ Ericsson argues that a separate public notice and comment period is not necessary under the circumstances.³⁸

III. DISCUSSION

9. Section 1.925(b)(3) of the Commission's rules states that the Commission may grant a waiver when the Commission finds that either (i) "[t]he underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and that a grant of the requested waiver would be in the public interest," or (ii) "[i]n view of unique or unusual factual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative."³⁹ After consideration of the Samsung and Ericsson Petitions and supplemental materials, and the record in this proceeding, we find that both parties have satisfied the requirements of section 1.925(b)(3) and, accordingly, we waive sections 2.947(f) and 96.41(e)(2) of the Commission's rules to the extent necessary to grant Samsung's and Ericsson's requests for relief, subject to the conditions set forth below.⁴⁰

10. First, we find that the purposes of sections 2.947(f) and 96.41(e)(2) would not be served by strict application in this case.⁴¹ Section 96.41(e)(2) establishes OOBE parameters for Citizens

³² See *id.* at 4-5.

³³ See Letter from Traci Biswese, Vice President and Associate General Counsel, NCTA, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 and WT Docket No. 23-93 (filed Mar. 5, 2025) (*NCTA Mar. 5, 2025 Ex Parte Letter*)

³⁴ See Letter from Robert Kubik, Samsung Electronics America, Inc., Jeffery Marks, Ericsson, Noman Alam, Ericsson to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (filed March 27, 2025) (*Joint Mar. 27, 2025 Ex Parte Letter*)

³⁵ *Ericsson 3.5 GHz/3.7 GHz Petition*.

³⁶ *Id.* at 1.

³⁷ *Ericsson Amendment* at 2.

³⁸ *Id.* at 3.

³⁹ 47 CFR § 1.925(b)(3).

⁴⁰ As Ericsson's waiver request seeks substantially similar relief as that sought by Samsung to allow for the manufacture and marketing of a dual-band device covering the same bands (3.5 GHz and 3.7 GHz Services), we find that a separate comment period is unnecessary and that it is in the public interest to combine the two requests. As such, we rely on our analysis of the record generated in response to Samsung's waiver request in granting Ericsson's request.

⁴¹ See 47 CFR § 1.925(b)(3)(i) (authorizing waiver if the underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and if waiver is in the public interest).

Broadband Radio Service radios to avoid causing harmful interference to operations in adjacent bands.⁴² Section 2.947(f) requires that where “the individual devices in a composite system are subject to different technical standards, each such device must comply with its specific standards,” and accordingly, the Commission requires each component to be tested separately.⁴³ Taken together, these rules are designed to prevent harmful interference to adjacent band operations and ensure that composite devices do not cause harmful interference to services within or adjacent to their operational frequencies.

11. Samsung states that its device, when in dual-band operation in real-world conditions, creates comparable emissions to that of two co-located devices operating independently in the 3.5 GHz band and the 3.7 GHz band.⁴⁴ Samsung asserts that this is largely due to the fact that for the Commission already allows base stations in the 3.7 GHz Service—which are operated at significantly higher power than 3.5 GHz band Citizens Broadband Radio Service Devices (CBSDs)—to meet a more permissive OOB limit of -13 dBm/MHz, including below the 3.7 GHz band edge.⁴⁵ We note that no party objected to Samsung’s requested waiver of the -40 dBm/MHz OOB limit above the 3.72 GHz band edge when its multiband device is operated in testing mode.⁴⁶ Rather, the debate in the record centers on putative adverse impacts on the interference environment in the 3.5 GHz band when the multiband radios are deployed.

12. WISPA and NCTA raise general concerns about the possibility of additional noise in the Citizens Broadband Radio Service from Samsung’s proposed device and about potential impacts to the Environmental Sensing Capability (ESC) sensors used to protect federal operations in the band.⁴⁷ Similarly, NCTA analyzed a simulated deployment of Samsung’s proposed base station, in combination with simulated deployment of dual band 3.45 GHz/3.5 GHz base stations, that purports to show an increase in the noise floor in the 3.5 GHz band and reduced throughput and coverage for CBSDs in the band.⁴⁸ NCTA also performed lab tests that purport to show that Samsung’s proposed multiband device would harm existing and planned CBRS operations.⁴⁹ However, as Samsung, Ericsson, and Verizon correctly noted, NCTA’s simulation went beyond the instant waiver by assuming the addition of dual band base stations operating in the 3.45 GHz and 3.5 GHz bands.⁵⁰ Similarly, Samsung and Ericsson identified assumptions used in NCTA’s lab testing that may undercut the applicability of NCTA’s findings to real world deployments.⁵¹ Most importantly, no commenters presented information or data to

⁴² See *Amendment of the Commission’s Rules With Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Order on Reconsideration, GN Docket No. 12-354, 31 FCC Rcd 5011 (2016) at para. 91. Further, as noted in Samsung’s petition, at the time that the 3.5 GHz OOB rules were established, they provided protection for fixed satellite services then operating above the band. See *Samsung Petition* at 12, n. 27 (citing *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Report and Order, 33 FCC Rcd 10598, 10665 para.134 (2018)). Because the fixed satellite services were subsequently relocated, this concern no longer applies. See *id.*

⁴³ See 47 CFR § 2.947(f).

⁴⁴ See *Samsung Petition* at 12, n.25; *Samsung Sept. 27, 2023, Ex Parte Letter* at 3; *Samsung Nov. 2, 2023, Ex Parte Letter*, attach. at 11; *Joint Jan. 4, 2024, Ex Parte Letter* at 1; *Samsung Jan. 5, 2024, Ex Parte Letter* at 1.

⁴⁵ 47 CFR § 27.53(l)(1).

⁴⁶ We note that this waiver grant has no bearing on the voluntary commitments made by 3.7 GHz Service licensees concerning operations in the C-band.

⁴⁷ *WISPA Ex Parte Letter* at 1; *NCTA Oct. 2, 2023 Ex Parte Letter* at 2; *NCTA Nov. 30, 2023 Ex Parte Letter* at 2.

⁴⁸ *NCTA March 6, 2024, Ex Parte Letter* at 1; See *NCTA March 4, 2024, Presentation* at 23-31.

⁴⁹ *NCTA Mar. 5, 2025 Ex Parte Letter* at 1 and Attachment.

⁵⁰ See *Joint Mar. 29, 2024 Ex Parte Letter* at 5-6.

⁵¹ *Id.* at 1-2.

challenge Samsung's fundamental assertion that its multiband radio would produce emissions that are comparable to two co-located base station radios operating independently in the 3.5 GHz band and 3.7 GHz band.⁵² Since such co-located operations are already permitted under the Commission's rules, we find that Samsung's multiband device is unlikely to negatively affect operations in the Citizens Broadband Radio Service (including by increasing the noise floor) in a manner that the Commission did not anticipate or intend. Accordingly, we conclude that strict application of sections 2.947(f) and 96.41(e)(2) would not serve the underlying purposes of the rules.

13. We also find that granting Samsung and Ericsson a conditional waiver will serve the public interest by helping to facilitate the deployment of multiband devices capable of operating across multiple wireless services. In its filings, Samsung asserts that granting its waiver request would speed 5G deployment and that the public interest benefits of granting its waiver request "will not be countermanded by any negative effects or countervailing public interest harms."⁵³ Specifically, Samsung claims that its multiband device would be approximately 30-45% more energy efficient than two standalone units.⁵⁴ Samsung and Verizon also note that a combined radio makes siting easier, as carriers will be able to leverage investment and put the same infrastructure to use on two adjacent bands.⁵⁵ As Verizon states, "[u]se of a single radio rather than two separate radios significantly reduces deployment costs of radio, cabling, and antenna equipment."⁵⁶ We agree that faster and more energy-efficient 5G deployment in mid-band spectrum is in the public interest and that Samsung's composite device may further these goals. Accordingly, since the composite device is likely to confer significant public interest benefits and is unlikely to cause additional interference to operators in the 3.5 GHz band and 3.7 GHz Service, we believe that the public interest will be served by the conditional grant of this waiver.

14. We note that the record in this proceeding includes numerous assertions of the appropriate application and interpretation of section 2.947(f) of the Commission's rules regarding "composite devices."⁵⁷ Notably, Samsung seeks a narrow waiver of section 2.947(f) "to allow the OOB within 3720-4000 MHz to be -25 dBm/MHz when measured for regulatory compliance in a standalone configuration."⁵⁸ Samsung asserts that its multiband device is otherwise fully compliant with section

⁵² *Id.* at 6-7.

⁵³ See, e.g., *Samsung Petition* at 10-11; *Samsung Nov. 2, 2023 Ex Parte Letter*, attach. at 4.

⁵⁴ *Samsung Petition* at 11; *Verizon Comments* at 2.

⁵⁵ *Samsung Petition* at 11-12; *Verizon Comments* at 1-2.

⁵⁶ *Verizon Ex Parte Letter* at 1. Verizon also notes that it is "the largest holder of both 3.7 GHz band and CBRS Priority Access Licenses ('PALs') band spectrum" with a "vested interest in the continuing success of both bands, as well as ensuring that any operations remain free from interference." *Id.*

⁵⁷ See e.g., *Samsung Nov. 2, 2023, Ex Parte Letter*; *Samsung Dec. 7, 2023, Ex Parte Letter* at 2-3; *Joint Mar. 29, 2024 Ex Parte Letter* at 3 (citing *Amendment of Parts 0, 1, 2, 15 and 18 of the Commission's Rules regarding Authorization of Radiofrequency Equipment*, ET Docket No. 15-170; First Report and Order, 32 FCC Rcd 8746, 8777, para. 76 (2017); FCC, OET, KDB Publication No. 968740 (Mar. 26, 2007) ("KDB 968740"); FCC, OET, Laboratory Div., Supplier's Declaration of Conformity Frequently Asked Questions, KDB Publication No. 896810 D02, at 4 (July 2, 2018); *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, ET Docket No. 13-49, Notice of Proposed Rulemaking, 28 FCC Rcd 1769, 1802, para. 113 (2013); FCC, OET, Laboratory Div., Modular Transmitter Integration Guide Guidance for Host Product Manufacturers, KDB Publication No. 996369 D04, at 3 n.4 (Oct. 13, 2020)). *NCTA March 6, 2024, Ex Parte Letter* at 2-4; Letter from Traci Biswese, Vice President and Associate General Counsel, NCTA, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 23-93 (April 8, 2024) (arguing that Samsung's proposed multiband device should not be considered a composite device); Letter from Michael Calabrese, Director, Wireless Future, New America's Open Technology Institute to Marlene H. Dortch, Secretary, FCC at 4-5, Docket Nos. WT 20-443, GN 23-171, GN 14-177, WT 23-158, ET 24-40, and WT 23-93 (April 12, 2024).

⁵⁸ *Samsung Petition* at 6.

2.947(f).⁵⁹ NCTA disagrees and, instead, contends that Samsung’s multiband device is not a “composite device” within the scope of the rule and, further, that Samsung’s interpretation of section 2.947(f) would undermine the Commission’s rules by allowing multiband devices to ignore more restrictive OOB limits in some spectrum bands.⁶⁰ Under either interpretation, we would be required to waive section 2.947(f) to permit Samsung to certify its device. As discussed above, Samsung and Ericsson have satisfied the waiver conditions set forth in section 1.925 of the Commission’s rules,⁶¹ and thus we need not address any interpretation of section 2.947(f) in this context.

15. For the reasons discussed above, we grant Samsung and Ericsson’s waiver requests subject to the following conditions, which are consistent with the operations described in the parties’ requests:⁶²

- (1) each radio, when operated in 3.5 GHz band-only mode for equipment authorization testing, must comply with section 96.41(e)(2) in its entirety, except the radio’s OOB may be limited to a conducted power level of no greater than -25 dBm/MHz for frequencies between 3.72 and 4.0 GHz;
- (2) except when testing for equipment authorization purposes, the subject radio may not operate in a standalone 3.5 GHz band mode, and must be configured such that the operator does not have access to controls that could result in such operation;
- (3) this waiver and any related technical approvals of the multiband device are subject to future Commission rulemaking actions and the subject device must comply with all future Commission rules in their entirety.

Prior to marketing the multiband device described in its waiver request, Samsung and Ericsson must submit their respective base stations for equipment authorization testing and certification—and each base station must demonstrate compliance with the conditions of this waiver order during the testing and certification process—in accordance with part 2 of the Commission’s rules.⁶³

16. For these reasons, we find it is in the public interest to conditionally waive sections 2.947(f) and 96.41(e)(2) subject to the conditions described herein.

⁵⁹ See *id.* at 12; *Joint Mar. 29, 2024 Ex Parte Letter* at 1-6.

⁶⁰ See *NCTA Oct. 2, 2023 Ex Parte Letter* at 1 (arguing that Samsung’s interpretation of section 2.947(f) would “allow its dual-band radio—when operating in composite 3.7/CBRS mode—to use the less restrictive C-band OOB limits of -13 dBm/MHz across the full CBRS band” instead of the CBRS’s -25 dBm/MHz limit for frequencies within CBRS more than 10 megahertz from the operating channel); *NCTA March 6, 2024, Ex Parte Letter*.

⁶¹ These conditional waiver grants apply only to the specific circumstances addressed in this order. Nothing herein shall be read to affect the Commission’s existing equipment approval processes.

⁶² See *Samsung Petition* at 5-10; *Samsung June 9, 2023 Ex Parte Letter* at 1; *Ericsson Amendment* at 1-2, 6-7.

⁶³ See generally 47 CFR Part 2.

IV. ORDERING CLAUSES

17. Accordingly, IT IS ORDERED, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and section 1.925 of the Commission's rules, 47 CFR § 1.925, that the requests filed by Samsung and Ericsson for waiver of sections 2.947(f) and 96.41(e)(2) of the Commission's rules, 47 CFR §§ 2.947(f) and 96.41(e)(2), are GRANTED to the extent described, and with the conditions specified herein.

18. This action is taken under delegated authority pursuant to sections 0.131, 0.31, 0.241, and 0.331 of the Commission's rules, 47 CFR §§ 0.131, 0.31, 0.241, and 0.331.

FEDERAL COMMUNICATIONS COMMISSION

Joel Taubenblatt
Acting Chief, Wireless Telecommunications Bureau

Ira Keltz
Acting Chief, Office of Engineering and Technology