

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of

Expanding Flexible Use of the 3.7 to 4.2 GHz Band

GN Docket No. 18-122

Petition for Rulemaking to Amend and Modernize
Parts 25 and 101 of the Commission’s Rules to
Authorize and Facilitate the Deployment of
Licensed Point-to-Multipoint Fixed Wireless
Broadband Service in the 3.7-4.2 GHz Band

RM-11791

Fixed Wireless Communications Coalition, Inc.,
Request for Modified Coordination Procedures in
Band Shared Between the Fixed Service and the
Fixed Satellite Service

RM-11778

REPLY COMMENTS OF QUALCOMM INCORPORATED

Qualcomm files these reply comments on the FCC *NPRM* that proposes to allocate up to 500 MHz of much-needed exclusively licensed mid-band spectrum for mobile services in the 3.7 to 4.2 GHz band.¹ As the entire mobile wireless industry explains in their opening comments, timely action by the FCC and satellite industry incumbents to open this entire band for flexible use is essential so it can be incorporated into America’s 5G mobile broadband networks and 5G-based devices to be sold to U.S. consumers as soon as possible.²

¹ See Expanding Flexible Use of the 3.7 to 4.2 GHz Band, *Order and Notice of Proposed Rulemaking*, FCC 18-91, GN Docket No. 18-122 (July 13, 2018) (“*NPRM*”).

² See, e.g., CTIA Comments, AT&T Comments, T-Mobile Comments, Verizon Comments (filed Oct. 29, 2018); see also Nokia Comments, Ericsson Comments, and Qualcomm Comments (filed Oct. 29, 2018).

The Commission's *NPRM* correctly acknowledges the explosive growth in wireless communications services and the concomitant need to make additional mid-band mobile spectrum available.³ The use of 3.7 to 4.2 GHz mid-band licensed spectrum in conjunction with other mid-band spectrum, such as Citizens Broadband Radio Service ("CBRS") band at 3.55-3.7 GHz and potentially 3.45 to 3.55 GHz, along with both low-band (sub-1 GHz) and high-band (millimeter wave) spectrum is crucial for enabling 5G services. The FCC should continue to examine all means of opening up the full 500 MHz-wide band for flexible use because there is no other comparable block of mid-band spectrum available in the U.S. Indeed, our country is at a disadvantage in the sheer amount of licensed sub-6 GHz spectrum for 5G when compared to other countries and regions.

In these reply comments, Qualcomm explains that the Commission must reject the out-of-band emissions ("OOBE") limits the C-Band Alliance seeks to place on mobile devices using the 3.7 to 4.2 GHz band because those limits would require massive reductions in mobile transmit power levels and thus cripple U.S. deployment of 5G technology in this band. The only alternative to this massive power reduction would be for manufacturers to attempt to produce new, U.S.-only filters for this band, which would require extraordinarily sharp attenuation, far greater than what is supported by typical filters for other 5G or 4G frequency bands. Forcing the use of U.S.-only filters would destroy any economies of scale and any worldwide harmonization for devices that use this band.

The C-Band Alliance offers highly questionable technical support for its attempt to impose these extremely low emissions levels for mobile devices — which are orders of magnitude lower than the spurious emissions levels currently allowed under FCC rules from

³ See *NPRM* at ¶¶ 1-8.

millions and millions of intentional and unintentional emitters. In addition, the C-Band Alliance completely ignores the negative implications for global harmonization. The C-Band Alliance also fails to explain why the OOB levels that apply to emissions outside the 3.5 GHz Band to protect satellite receivers are insufficient to protect those same receivers if and when they are confined to the upper portion of the 3.7 to 4.2 GHz band. The Commission must reject these proposals.

I. The OOB Limits The C-Band Alliance Wants To Impose On 3.7 GHz Mobile Licensees Would Cripple 5G Deployments In This New Flexible Use Band

The Commission must not adopt the unprecedented and extreme OOB levels the C-Band Alliance has proposed to apply to new flexible use licensees to protect any remaining satellite incumbents above the new 3.7 GHz licensed flexible use band. The C-Band Alliance proposes these levels based upon dubious technical support: -28 dBm/MHz at the band edge; -55 dBm/MHz between 20 and 40 MHz from the band edge; and -65 dBm/MHz beyond 40 MHz from the band edge.⁴ These limits are orders of magnitude lower than the Part 15 general radiated (*i.e.*, spurious) emissions limit of -41.3 dBm/MHz that applies to spurious emissions from countless unintentional radiators, such as computers, printers, and RF receivers, as well as intentional radiators, such as keyless remote entry systems, Wi-Fi equipment, and satellite ground station transmitters.⁵

Complying with the C-Band Alliance's proposed OOB would force 5G mobile devices operating in the new 3.7 GHz flexible use band to reduce in-band transmit power by more than

⁴ See C-Band Alliance Comments, Technical Annex at 10.

⁵ See 47 C.F.R. §§ 15.019 & 15.209. Compliance with these Part 15 limits above 1 GHz typically is premised on use of an average detector function and a measurement instrument with a minimum resolution bandwidth of 1 MHz and a 20 dB peak-to-average limit. See 47 C.F.R. § 15.35(b).

15 dB, thus crippling a carrier's ability to use this spectrum to serve geographic areas comparable to those that can be served by other licensed mobile bands without such unnecessary restrictions.

The C-Band Alliance does not explain why the levels the FCC imposed on mobile devices operating in the 3.5 GHz CBRS band, *i.e.*, -25 dBm/MHz above 3710 MHz and -40 dBm/MHz above 3720 MHz,⁶ will not provide sufficient protection. In fact, NCTA – The Internet & Television Association, whose members rely heavily upon satellite operations in the 3.7 to 4.2 GHz band, recommends that the FCC adopt limits no tighter than the limits that apply to 3.5 GHz CBRS band emissions at the boundary separating new flexible use operations and remaining satellite incumbents.⁷ Qualcomm remains hopeful that the entire 500 MHz-wide band from 3.7 to 4.2 GHz will be cleared of satellite incumbents and thus eliminate the need to provide any special OOB protection levels for satellite receivers like those that apply above the 3.5 GHz CBRS band.

Finally, as Qualcomm explains in its opening comments, when the FCC authorizes flexible use licenses in the 3.7 to 4.2 GHz band, it should remove the stringent OOB emissions that apply above the 3.7 GHz band edge of the CBRS band.⁸ The satellite receivers these limits were put in place to protect will no longer occupy the lower portion of the 3.7 to 4.2 GHz band,

⁶ See 47 C.F.R. § 96.41(e)(1)&(2); see also *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Report and Order, FCC 18-149 (rel. Oct. 24, 2018), Appendix A, new Rule Section 96.41(e), 3.5 GHz Emissions and Interference Limits.

⁷ See NCTA – The Internet & Television Association *ex parte* letter at 4 (filed July 2, 2018) (“Commission should propose the more stringent 3.5 GHz band OOB limits, and seek comment on whether different characteristics could enable relaxation of those limits.”).

⁸ See *NPRM* at ¶ 169.

so the -25 dBm/MHz and -40 dBm/MHz limits that apply at 3710 MHz and 3720 MHz, respectively, would no longer serve any purpose and should be removed.

CONCLUSION

Qualcomm encourages the FCC to move forward to open the 3.7 to 4.2 GHz band for flexible licensed wireless services in accordance with our Comments and these Reply Comments. There is no question that 5G networks will require additional licensed mid-band spectrum resources to support next generation enhanced mobile broadband, massive IoT, and mission critical services, and this band offers a key component of such spectrum resources. The FCC and industry should proceed quickly to explore all options to open as much of this band as possible within the quickest timeframe.

Respectfully submitted,

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