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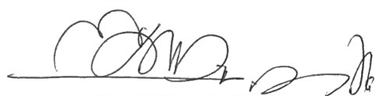
30 May 2025

**RE: Public Consultation on Draft Regulations on Dynamic Spectrum Access and Opportunistic Spectrum Management in the Innovation Spectrum 3800-4200 MHz and 5925-6425 MHz**

Please find attached Qualcomm’s comments on the Public Consultation on Draft Regulations on Dynamic Spectrum Access and Opportunistic Spectrum Management in the Innovation Spectrum 3800-4200 MHz and 5925-6425 MHz issued by the Independent Communications Authority of South Africa.

Please feel free to contact me should you have any questions.

Kind regards,



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Qualcomm Inc. (Qualcomm) welcomes the opportunity to provide input to the Independent Communications Authority of South Africa (ICASA) on the Draft Regulations on Dynamic Spectrum Access and Opportunistic Spectrum Management in the Innovation Spectrum 3800-4200 MHz and 5925-6425 MHz (the Draft Regulations).

Qualcomm is the world’s leading wireless technology innovator and the driving force behind the development, launch, and expansion of 5G. When we connected the phone to the internet, the mobile revolution was born. Today, our technologies serve as the foundation of the mobile ecosystem and are found in every 3G, 4G, and 5G smartphone. We are bringing the benefits of mobile to new industries, including automotive, the internet of things (IoT), and compute, and are creating a world where everything and everyone communicates and interacts seamlessly. Qualcomm’s Wi-Fi solutions build on our world-class engineering capabilities to provide highly reliable multi-gigabit connectivity to users and devices in homes, businesses, libraries, and on school campuses. Today, we are laser-focused on advancing 5G, developing 6G, and continuing to improve Wi-Fi connectivity.

The remainder of this submission presents information on Qualcomm’s views on the Draft Regulations.

# General comments

Qualcomm supports ICASA’s development and planned publication of regulations intended to facilitate the use of innovation spectrum in the 3.8-4.2 GHz range (C band) and the 5925-6425 MHz range (lower 6 GHz band) by secondary users while also mitigating against harmful interference between incumbents and secondary users. Enabling access to unused spectrum in the C band and to the lower 6 GHz band for outdoor applications will provide additional capacity for expanding access to broadband connectivity and for new wireless technology use cases and innovation.

In particular, Qualcomm supports policies and regulatory frameworks that enable the deployment of Wi-Fi devices in the lower 6 GHz band and IMT-enabled services in the C band. Specifically, we support the implementation of a regulatory framework that enables dynamic access to unused spectrum, leveraging technological solutions to enable interference-free operation.

# Comments on specific frequency ranges

## Lower 6 GHz band (5925-6425 MHz)

The 5925-6425 MHz band, also known as Innovation Spectrum Frequency Range 2 (ISFR2) or the lower 6 GHz band, is particularly important due to growing demand for wireless internet access, the need to facilitate the deployment of new networks, and promoting the efficient use of internet access technologies. Global demand for connectivity continues to grow, especially driven by the rapid rise in the number of users working, learning, and consuming entertainment from home. Qualcomm continues to support policies and regulations that enable and promote the use of the 6 GHz band by technologies such as Wi-Fi, noting that the availability of wide and contiguous mid-band spectrum is critical to meet demands for license-exempt wireless access systems (WAS)/radio local area network (RLAN) technologies, including Wi-Fi 6E.

South Africa has taken an important step in helping to meet the rising demand in connectivity by proposing the amendment of the Radio Frequency Spectrum Regulations, 2015 to make the lower 6 GHz band available for WAS/RLAN technologies, including low power indoor (LPI) and very low power (VLP) devices, on a license-exempt basis. Implementing the proposed regulation to allow the use of standard power devices outdoors is a key step toward making the most intensive and efficient use possible of the lower 6 GHz range by enabling the deployment of additional use cases for advanced Wi-Fi 6E and Wi-Fi 7 networks.

The Draft Regulations, if adopted, would enable the use of unlicensed devices in urban and rural outdoor settings, further expanding connectivity options. ICASA’s proposed approach, employing dynamic spectrum access enabled by a Unified Spectrum Switch (USS), will enable the deployment of standard-power RLAN deployments, which might enable cost-effective options for expanding access to broadband connectivity.

Standard-power RLAN deployments can enable a higher-performance and longer-range version of 6 GHz operation and unlock the full potential of Wi-Fi 6E and Wi-Fi 7. The benefits of standard-power RLANs include:

* **Improved Connectivity Experience**: With the ability to transmit stronger signals, standard-power access points (APs) can provide longer-range coverage. This means that users can enjoy reliable Wi-Fi connectivity in larger areas, including areas with obstacles like walls or floors, providing a more consistent and stable connection throughout the premises. Simultaneously, this higher power transmission also boosts the throughputs achievable at a given range. The combination of increased data rates and extended range results in an improved connectivity experience for users. They can enjoy faster data speeds, reduced latency, and a more stable connection, even in challenging environments.
* **Outdoor operation**: With dynamic spectrum access, such as would be enabled by the Draft Regulations, standard-power APs would gain the capability to operate outdoors within the 6 GHz band. This significant advancement opens opportunities for deploying Wi-Fi networks in various outdoor settings, including wireless internet service providers (WISPs), campus environments, outdoor event venues, stadiums, and municipal networks.
* **New use cases**: The inclusion of outdoor operation, weatherized enclosures, and connectorized antennas greatly broadens the range of enterprise use cases and deployment options that were previously unavailable for 6 GHz devices. This expansion encompasses the deployment of standard-power APs in diverse environments such as manufacturing facilities, warehouses, industrial settings, and other deployments that demand ruggedized enclosures, unlocking new possibilities for connectivity and improved productivity.

Qualcomm continues to support dynamic spectrum access and coordination approaches such as the automated frequency coordination (AFC) technology incorporated into the 6 GHz regulatory regimes in countries including Canada and the United States. In 2023, Innovation, Science, and Economic Development Canada (ISED) designated Qualcomm as an approved dynamic spectrum access administrator, marking the world’s first such approval.[[1]](#footnote-2) Similarly Qualcomm has been approved as an AFC operator in the United States along with 6 other entities. Qualcomm has been providing standard power devices with its AFC system and providing channel availability both in the US and Canada for the past two years.

The Qualcomm AFC system protects licensed fixed services in the 6 GHz band by ensuring no single unlicensed interference source increases the noise at the fixed receiver to a level of harmful interference, which will be determined using information each licensee is required to provide to applicable regulator in its license applications and is made publicly available in a database. The AFC system will use the information associated with each fixed service receiver in the database in conjunction with a robust propagation model — which effectively protects all potentially affected fixed receivers — to ensure that no unlicensed operations are activated that exceed a specified interference threshold at any incumbent licensee’s receiver. The interference protection determination by the AFC system can be and should be simple and flexible and does not require any unlicensed system registration, database coordination, or any aggregate interference calculation because none of that is needed to protect incumbent links.

A flexible AFC or similar framework will support simple unlicensed deployment models and allow for multiple AFC architectures and operators, providing for low-cost unlicensed deployments.

Qualcomm encourages ICASA to adopt a framework, such as that included in the Draft Regulations, that enables the deployment of standard-power RLANs in the lower 6 GHz band using a dynamic spectrum access system. In the appendix of this document, we have provided our recommendations on the draft regulation. In addition, Qualcomm would be pleased to offer its expertise and information regarding the operation and management of the AFC systems in Canada and the United States.

## C band (3800-4200 MHz)

The adoption of a dynamic spectrum access system in the C band, as proposed in the Draft Regulations, will also enable both the expansion of public mobile network availability and the deployment of new and innovative wireless technology use cases – in this case leveraging IMT infrastructure and devices. The proposed framework’s flexibility allows for the use of C-band innovation spectrum (Innovation Spectrum Frequency Range 1, or ISFR1) for multiple purposes.

One potential use of ISFR1 is to enable mobile network operators – including both large and small operators – to leverage the capacity and coverage of the C band to expand 5G services in targeted geographic areas with underutilized spectrum. This approach provides additional options for operators seeking to offer service in remote and rural areas that may be underserved. The availability of additional C-band spectrum also allows providers to leverage a mature device ecosystem. According to the Global Suppliers Association (GSA), the largest ecosystems of announced 5G devices are in 3GPP bands n78 (3300-3800 MHz), n41 (2496-2690 MHz), n1 (2100 MHz), and n77 (3300-4200 MHz), in that order respectively.[[2]](#footnote-3) In addition, dynamic access to unused C-band spectrum on a local basis and in a manner that prevents interference with incumbent operators could enable the deployment of private networks.

Another potential use case for ISFR1 is 5G private networks, which can be used in a variety of use cases across different industrial verticals. Around the world, operators and companies alike have deployed industrial applications, including robotics, over private networks. The ultra-high capacity and low latency offered by private 5G networks can help enable numerous industrial sensors, actuators, and controllers in standard and safety control applications. Industrial private 5G is an enabler of digital transformation in smart manufacturing to help deliver business outcomes, such as sustainability and agility, by supporting key application use cases, as noted below:

* Connected worker applications increase visibility and intelligence through mobile digital tools, such as analytics, digital twins, and augmented reality (AR).
* Mobile asset applications increase agility and efficiency with autonomous vehicles, such as automated guided vehicles (AGVs) and autonomous mobile robots (AMRs).
* Untethered fixed industrial asset applications improve sustainability by reducing the need for wired infrastructure to connect static equipment, static equipment with rotating parts, and nomadic equipment. Untethered fixed industrial assets also increase agility by reducing the time to retool industrial operations to respond to changing market conditions.

Private networks are intended to support automation and the digital transformation activities of industrial processes. However, private network development is not always the main economic objective of the company that deploys them (either by itself or in partnership with a mobile operator). To facilitate the network’s viability, it is key that companies have access to spectrum in the bands with the most developed device and equipment ecosystems to keep deployment costs reasonable. While other bands may be available for private network use, if the state of development of the ecosystem is incipient, the implementation costs increase significantly. In practice, this limits the number of private and industrial network deployments in a country.

As noted above, the C-band device ecosystem is already mature. By implementing a dynamic spectrum access regime for ISFR1, ICASA would enable stakeholders interested in deploying private or public networks to access a well-developed device ecosystem, potentially resulting in lower costs for enterprises and users in rural areas as well as expanded deployments.

One important aspect to highlight is the importance of defining conditions to avoid the fragmentation of spectrum assignments to the maximum extent. We recommend developing a set of guidelines for the USS operators to make sure that the assignments are being coordinated and organized in a way that leaves enough room for the growth of the networks, but at the same time looks for making sure that other parts of the band can be available for new entrants.

# Additional comments on lower 6 GHz technical characteristics and licensing regime

Drawing on Qualcomm’s experience and expertise with 6 GHz RLAN technologies and AFC systems, we would also like to highlight certain technical matters for further consideration by ICASA. Qualcomm would be pleased to engage directly with ICASA to further discuss these points and other technical matters. In particular, we recommend:

* aligning the Draft Regulations with comparable frameworks, requirements, and protocols adopted in other countries;
* providing information on the process for designating USSPs;
* reducing administrative overhead by streamlining licensing and registration requirements;
* removing requirements related to professional ISD installation and antenna height;
* considering the need for active connections between a USS and ISDs as described in Sections 7.13 and 7.14, particularly taking into account similar capabilities already present in AFC systems;
* considering the need for aggregate interference calculation as described in Sections 7.11 and 11.7 through 11.10; and
* allowing channel bandwidths to be determined by implementation, as long as the USS determines that spectrum is available, and devices follow defined operating parameters.

Qualcomm believes that further consideration of these matters would allow for both an implementation of dynamic spectrum access that would align South Africa with global practices and allow for minor simplification of the proposed regulations. Additional information is provided in the appendix to this submission.

# Conclusion

Qualcomm welcomes the opportunity to convey our views to ICASA regarding the Draft Regulations and look forward to continuing engagement with ICASA on the issues raised in this and future consultations.

Should you have any questions or comments on this submission, please do not hesitate to contact me at +27 82 616 3604 or [emigwall@qualcomm.com](http://?).

# Appendix: Lower 6 GHz Technical Comments

## Aligning USS Regulation with Automated Frequency Coordination Rules

Wi-Fi devices can operate in the 6 GHz band under Standard Power rules in multiple countries, including Canada and the United States.[[3]](#footnote-4) To harmonize South Africa’s approach with global developments, it would be beneficial to align the Unified Spectrum Switch (USS) regulation with comparable frameworks adopted in countries around the world.

## Rules Governing USS/AFC Operator Application

Qualcomm recommends that the Draft Regulations provide further guidance regarding the designation of USSPs. We recommend that multiple USSPs be allowed to operate in South Africa, fostering economies of scale and enabling market-driven solutions.

## Professional Installation Requirements

Qualcomm recommends removing the professional ISD installation requirement in Section 11.3. Automated geolocation methods such as GPS and Qualcomm’s geolocation solution allow cost-effective device deployments and ensure accurate and secure device geolocation without requiring professional installation.[[4]](#footnote-5)

## Maximum Antenna Height Restriction

Considering that ISDs could be installed in high-rise buildings, Qualcomm recommends the removal of Section 10.3’s antenna height limits. Instead, USSs can make use of the antenna height (and associated uncertainty) of ISDs to ensure the protection of incumbent services. We also suggest revising the Draft Regulations to allow both AMSL and AGL units.

## Maximum Power Limit

To make 6 GHz spectrum attractive for ISD/SP operations, and to align South Africa’s rules with international developments, Qualcomm recommends increasing the maximum power limit in Section 10.3 of the Draft Regulations to 36 dBm in urban areas.

## Propagation Model

Qualcomm suggests allowing the Irregular Terrain Model (ITM) in place or in addition to the P.452 Model included in Section 14.4. The ITM model has been well tested and implemented in other countries. Including the model in South Africa’s framework would contribute to more widespread global alignment of propagation models and protection criteria.

## Licensing Requirements

In the interest of reducing administrative burdens on operators and ICASA, Qualcomm suggests eliminating the registration/licensing requirement included in Sections 4.2 and 6 of the Draft Regulation. The USSP’s access to operator contact information and device locations eliminates the need for an additional operator registration or licensing requirement.

## Kill-Switch Requirement

Drawing upon Qualcomm’s AFC experience, we note that existing systems provide functionality to deactivate ISDs under certain conditions, such as changes in operating conditions. Given the existing functionality, Qualcomm believes the Draft Regulations could be streamlined by eliminating provisions in Sections 7.13, 7.14, and 11.17 that prescribe specific timelines in which a USS must have the ability to instruct ISDs to cease operation.

## Channel Bandwidth Requirements

Qualcomm suggests revising Section 4.1.b of the Draft Regulations to provide greater flexibility regarding allowed bandwidths, noting that Wi-Fi 7 already supports 320 MHz operation. We recommend avoiding the inclusion of static bandwidths defined for operation in the 6 GHz band and instead allow devices to operate in any bandwidth as long as the spectrum is determined to be available by the USS and devices follow power spectral density and total power limits (operating parameters) provided by the USS.

## Protocol for Accessing USS

In order to maximize harmonization and economies of scale, Qualcomm suggests revising Section 7.1 of the Draft Regulations to allow industry partnerships (e.g., between device manufacturers and USS operators) to determine the ideal protocol choice. This approach would allow the use of the CPAUSS protocol developed in South Africa as well as, for example, the Wi-Fi Alliance protocol that has been broadly adopted by existing AFC operators.[[5]](#footnote-6)

## Requirement to coordinate among unlicensed devices

Qualcomm notes that existing USS/AFC systems do not require aggregate interference calculation and have been operational without any aggregate interference reports up to this time. Based on this data, we recommend the elimination of the requirement in Section 7.11 for ISDs to communicate their usage of IS channel(s) back to the USS and the ISD interference coordination requirements detailed in Sections 11.7 through 11.10.

## Out of Block Emission Limits

In the interest of increasing global harmonization, Qualcomm suggests revising the table in Section 11.6 of the Draft Regulations to align the stated out-of-block emission limits with IEEE or FCC 6 GHz limits.

1. ISED, List of designated Dynamic Spectrum Access System Administrators (DSASAs), [https://ised-isde.canada.ca/site/certification-engineering-bureau/en/list-of-designated-dynamic-spectrum-access-system-administrators](http://?); Qualcomm, Qualcomm Designated as World's First Approved Automated Frequency Coordination System Administrator for Superior Wi-Fi Experiences, August 22, 2023, [https://www.qualcomm.com/news/releases/2023/08/qualcomm-designated-as-world-s-first-approved-automated-frequenc](http://?). [↑](#footnote-ref-2)
2. GSA, Mid-Band Spectrum, December 2024, [https://gsacom.com/download.php?id=18910](http://?). [↑](#footnote-ref-3)
3. Available at [https://www.ecfr.gov/current/title-47/part-15/section-15.407#p-15.407(k)](http://?) and [https://ised-isde.canada.ca/site/spectrum-management-telecommunications/sites/default/files/attachments/2022/DBS-06-i1-2022-12EN.pdf](http://?). [↑](#footnote-ref-4)
4. More details can be found in [https://www.qualcomm.com/products/internet-of-things/networking/wi-fi-networks/automated-frequency-coordination](http://?) [↑](#footnote-ref-5)
5. Available: [https://www.wi-fi.org/discover-wi-fi/6-ghz-afc-resources](http://?) [↑](#footnote-ref-6)