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

In the Matter of
Amendment of the Commission’s Rules with
Regard to Commercial Operations in the 3550-
3650 MHz Band

GN Docket No. 12-354

To: The Commission

COMMENTS OF INTERDIGITAL, INC.

Robert Stien
Vice President, Government Relations and
Regulatory Affairs

InterDigital
200 Bellevue Parkway, Suite 300
Wilmington, DE 19809

Telephone: (202) 372-6333
Email: rob.stien@interdigital.com
In the Matter of Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band

COMMENTS OF INTERDIGITAL, INC.

InterDigital, Inc. ("InterDigital") hereby submits its comments in the above-captioned docket in response to the Commission’s Second Further Notice of Proposed Rulemaking FNPRM 15-47, regarding commercial operations in the 3550 – 3650 MHz band.

InterDigital, a US company, with headquarters in DE, and R&D offices in NY, PA, CA, as well as in Montreal, Canada, London, UK and Seoul, Korea, is an industry leader in exploring and developing technologies for shared and dynamic spectrum use. Since its founding in 1972, the company has been a wireless pioneer that has designed and developed a wide range of technologies used in digital cellular and wireless products and networks, including 2G, 3G, 4G and now 5G, as well as IEEE 802-related products and networks. The company actively participates in and contributes to the standards bodies that drive the design and function of each generation of wireless technologies. These bodies include IETF, ETSI, 3GPP, SAE, IEEE 802, ATIS, TIA and WFA among others.

Some of InterDigital’s recent contributions to the worldwide standards have been in areas involving multi-carrier technology, heterogeneous deployments, interference management,
dynamic spectrum management and use, small cell support, relays, machine-type communications, security and video over wireless.

InterDigital is also actively working on building and promoting so called 5G technologies globally, is involved in 4 major EU Horizon 2020 5G projects, and participates as member in the European 5G Public Private Partnership (5G PPP), in the 5G Forum in South Korea, and other 5G organizations.

InterDigital will continue to work across the ecosystem to drive market adoption of spectrum sharing, 5G technologies in both spectrum below and above 6 GHz.

**Introduction**

In these comments, InterDigital provides its views on defining “use” of PAL frequencies, specifically on the engineering definition of spectrum use (paragraphs 419-423 in the 2nd FNPRM), and complements its earlier comments submitted in response to the Commission’s Notice of Proposed Rulemaking and Order regarding commercial operations in the 3550 – 3650 MHz band [FCC_1]-[FCC_4], [IDCC_1]-[IDCC_3].

InterDigital welcomes the Commission’s new rules on the 3.5 GHz Band, where new methods of spectrum sharing are explored and up to 150 MHz of spectrum may be used in a three-tiered sharing framework. As we previously stated, we do believe that the proposed sharing model can be applied also in other bands in the future, thereby providing a means of improving the frequency spectrum availability and use.

We commend the progress made by the Commission, working with the NTIA, to achieve a significant reduction in the size of the exclusion zone as compared to the original values
reported in NTIA’s fast track report [NTIA_1], [NTIA_2]. At the same time, we believe that in order for the technology to gain market traction, a timely transition to Phase 2 is highly desirable, so that under the control of the SAS and the ESC, the Exclusion zones can be converted to Protection zones. This way the CBRS band becomes truly nationwide.

**Engineering Definition of Spectrum Use**

InterDigital believes than an engineering definition of spectrum use is feasible within the CBRS framework, and it is a preferred way to determine the spectrum use.

As we suggested in our previous submissions ([IDCC_2], [IDCC_3]), the CBSDs (or the Proxy/Network Manager entity) should provide measurement reports to the SAS. Examples of such measurements may include: average over-the-air data rate (or the average throughput), peak data rates, channel occupancy, as well as duty factors averaged over various time intervals. In case a PA licensee deploys multiple CBSDs across the area of a census tract, the Proxy/Network Manager entity performing the reporting should report average use values for each CBSD.

Additionally, as the Commission ruled in 96.39(d), the “CBSD must report to an SAS regarding received signal strength in its occupied frequencies and adjacent frequencies, received packet error rates or other common standard metrics of interference for itself and associated End User Devices as directed by an SAS,” this information should be used to determine if the spectrum is in use. It is assumed that as the CBSDs need to be certified by the Commission to operate in the band, they will meet the requirements for measurements and reporting. Compliance with these requirements, as well as with policy constraints, can ensure that false reporting (or over reporting) of the traffic cannot be used as a means to artificially keep the channel occupied.
Jointly, the measurements listed above can provide an SAS with enough data to assess if a channel is being used. The measurement reporting frequency should be chosen such that it is effective in preventing “gaming the system”, while at the same time it does not significantly increase the overhead.

Reporting measurements for each CBSD (potentially just a sub-set of the data, to reduce reporting overhead) may help address the Commission’s concern “that it might be possible for Priority Access licensees to deploy low-cost CBSDs whose main purpose is to trigger SAS protections” ([FCC-4] at 423).

We further believe that the specific method to derive the occupancy status needs to be agreed upon by the stakeholders, so that it is implemented consistently across different SAS providers.

Lastly, we believe that vacating channels to serve as guard bands for PA licensees will not result in efficient use of spectrum, and will potentially lead to areas where the channels may lay fallow. Moreover, given the maximum conducted power (24 dBm/10 MHz), the maximum EIRP (30 dBm/10 MHz), as well as the maximum HAAT of 6 m, guard channels are not needed for Category-A CBSD. For rural deployments using Category-B CBSD, guard channels are also not needed, since the deployments would likely use directive antennas, thus limiting the interference. Use of non-rural Category B CBSD on a channel should not preclude low power and/or indoor use on the adjacent channel.

Conclusion
InterDigital welcomes the Commission’s new rules for Part 96, specific for the new Citizens Broadband Radio Service in the 3.5 GHz Band. We support the engineering definition of spectrum use, and believe that use of vacant channels to serve as guard bands is not necessary.

InterDigital will be pleased to continue to work together with the Commission to ensure that there will be a possibility to employ advanced and efficient spectrum management technologies in the future.

References


