

NXP Comments Consultation Paper on Assignment of the Microwave Spectrum in 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, 21 GHz Bands, E-Band, and V-Band

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Introduction.

Scope

This document provides comments on TRAI Consultation Paper No 05/ 2025 “Consultation Paper on Assignment of the Microwave Spectrum in 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, 21 GHz Bands, E-Band, and V-Band” as issued by the Telecom Regulatory Authority of India, 28.05.2025 from NXP India. The questions in the above consultation paper are addressed in sequence.

NXP comments relate to unlicensed use in the 57-71 GHz band (V-band) for wireless interface, and therefore only address relevant questions in the consultation paper.

NXP

NXP Semiconductors N.V. (NASDAQ: NXPI), an S&P500 company, enables a smarter, safer, and more sustainable world through innovation. As the world leader in secure connectivity solutions for embedded applications, NXP is pushing boundaries in the automotive, industrial & IoT, mobile, and communication infrastructure markets. Built on more than 60 years of combined experience and expertise, the company has ~31,000 employees including 11,000 engineers in R&D who created 9,500 patent families in more than 30 countries and posted revenue of \$12.61 billion in 2024.

Based on the expertise in the field of high-performance mixed signal NXP drives innovation in the automotive, identification, and mobile electronics industries as well as in the fields of vehicle communication and automated driving. Core areas of the portfolio are sensors, microprocessors, (cyber-)security technology as well as wired and wireless communication. As a world leader in automotive semiconductors, NXP offers advanced solutions for vehicle sensor systems and driver assistance systems and short-range high-speed data communication solutions.

NXP India

NXP's presence in India goes back more than 50 years and is one of NXP's largest design centers. Our Center of Excellence functions from four sites across India with more than 3000 engineers and over 800 patents, and is focused on innovations for the Automotive, IoT, Industrial and Mobile markets.

Noida is one of NXP's largest sites. It is a Center of Excellence for hardware and software design, validation and enablement specifically around edge processing and automotive processing. NXP Bengaluru is a hub of innovation for NXP's connectivity, security, advanced analog and radio frequency products with the automotive and IoT markets as key drivers. The Pune site focuses on end-to-end solutions for Wireless LAN, and Bluetooth® connectivity. Established in 2007, it becomes part of NXP through the acquisition of Marvell's wireless business in 2019. Our design center in Hyderabad is focused on NXP's edge processing and advanced analog businesses.

Wireless interface applications

Wireless Interface (Wi-INT) is a new innovative communication technology aiming to transmit 11 Gbit/s in the 60 GHz spectrum for near field communication. As the communication technology is intended for short distances (< 5 cm distance), the transmission power is very low and the radiation levels get confined to space between the transmitter and receiver (near field).

Wireless Interface technology brings significant benefits for customers, enabling new and more flexible use cases. Wi-INT has a wide range of applications, ranging from Consumer applications such as Smartphones, Computing devices, Smart Watches and Wireless docking stations (to name a few), to Industrial/Automotive applications such as connector replacement for factory automation, robotic articulations communication and medical applications.

NXP expects a large ecosystem to be created around this technology in combination with Smartphones OEMs, Computing OEMs, system integrators and partners, creating a large business potential. NXP estimate a sizable /substantial market size by 2030.

Sustainability is at the core of the Wi-INT technology as the technology is intended to replace connectors, reducing the carbon footprint and ultimately, reducing the amount of e-waste generated when the solution/device reaches the end of its life.

NXP is working on Wi-INT technology development with a global team (America, Europe and Asia). NXP India is at the core of this new and exciting technology with more than 50 engineers working on architectural definition and implementation.

NXP offer to provide further background

NXP would be glad to provide additional information on the potential of these Wi-INT applications to provide a deeper understanding of unlicensed use of the 57-66 GHz band (V-band) for wireless interface, and, if necessary, to engage in compatibility studies to ensure broad deployment of Wi-INT technology in India.

Answers to questions in as far NXP can provide relevant input

Q9. As the 7125-8400 MHz range in the 7 GHz band and the 14.8-15.35 GHz range in the 15 GHz band are being considered for IMT in WRC-27, whether there is a need to review the usage of 7 GHz and 15 GHz microwave backhaul bands at this stage itself, or should the review be undertaken after considering the outcome of WRC-27? Kindly provide a detailed response with justifications.

Various important regions are currently developing their position on Agenda Item 1.7 of WRC'27. There are significant hesitations in USA, Europe and China regarding allocation of IMT in the 7.4-8.4GHz band. Allocation of IMT to the 7.4-8.4GHz band is uncertain.

NXP is providing Ultra-wideband technology (UWB) using low power spectral densities (-41.3 dBm/MHz). This technology is standardized in [IEEE 802.15.4z](#). Interoperable UWB applications have been standardized in [Car Connectivity Consortium](#) and [FiRa-Consortium](#). Both CCC and FiRa use 7.6-8.4 GHz as the central communication and ranging band. Coexistence with fixed links has been established in various countries. UWB will experience significant interference from IMT in the same band due to the omnipresent high signal levels required for IMT networks. NXP respectfully suggests considering existing unlicensed applications when taking position on IMT allocation.

Q19. What is the level of demand of the spectrum in the V-band (57-64/ 66 GHz) for each of the service/ usage viz. Backhaul, Access and IAB? Kindly provide a detailed response in respect of each service/ usage with justification including availability of technical standards and ecosystem.

So far industry development of V-band for backhaul applications has not evolved, as is demonstrated by the Ericsson data in clause 1.16 and 3.10 of the consultation document. This should also be understood in the light of the successful deployments in the E-Band. Due to high spatial reuse E-band spectrum could be sufficient for all telecom applications. On top of this increasing deployment of fiber will further limit the need for radio links.

Q24. What frequency range (57-64 GHz, or 57-66 GHz) in the V-band should be adopted for radio backhaul purposes? In case you are of the opinion that the 57-66 GHz range should be adopted for radio backhaul purposes, considering that the 66-71 GHz range is already identified for IMT, whether there is a need for provisioning a guard band between the 57-66 GHz range (for the backhaul purposes) and the 66-71 GHz range (for IMT)? If yes, what should be the guard band? Kindly provide a detailed response with justifications.

NXP's consideration is for unlicensed Short Range Devices (SRD) applications like Wi-INT. Wi-INT uses the V-band because of the availability of a wide bandwidth of at least 7 GHz. For this reason and the natural break in band allocation 57-66 GHz seems to be the more natural choice.

Q29. Whether it is feasible to allow low power indoor consumer device-to-consumer device usages on a license-exempt basis in the V-band in parallel to the use of the spectrum by telecom service providers for the establishment of terrestrial networks in a part or full V-band? Kindly provide a detailed response with justification and international scenario.

The parallel operation of fixed links and unlicensed and SRD application in the V-band has been demonstrated in many countries as documented in the TRAI consultation. Also Europe provides for SRDs in the V-band in accordance with [ECC REC 70.03](#), annex 1, table 1, line n1. It should also be noted that no country constrains these applications to indoor. [ECC Report 176](#) provides a study demonstrating compatibility between fixed links and low power SRDs for outdoor scenarios. Wi-INT operates at an even lower power level than EU SRDs.

Q30. In case it is decided to allow low power indoor consumer device-to-device usages on a license-exempt basis in the V-band (57-64/66 GHz),

(a) Should it be permitted in the entire V-band or only in a portion of the V-band? If it should be permitted only in a portion of the V-band, please specify the frequency range.

NXP's Wi-INT application will require the full band from 57-64 GHz.

(b) In case it is decided to permit low power indoor consumer device-to-device usages on a license-exempt basis in the entire V-band, whether the 57-64 GHz range, or the 57-66 GHz range should be considered for such usages?

The full band from 57-66 GHz is preferred since this will alleviate any cross-band interference concerns, permits future higher bandwidth operation of Wi-INT and is consistent with breaks in the allocation table.

(c) What should be the carrier size/ channel bandwidth?

For SRD applications, especially very wide band SRDs, there is no need for a specific bandwidth and channel allocation. Wi-INT requires 7 GHz bandwidth and a centre frequency of 60.48 GHz. There is no need to fix such channelization since reuse of frequencies, which is the purpose of channelization, is in the spatial domain in case of Wi-INT, not in the frequency domain.

(d) What should be the definition of indoor usages?

There is no need to put forced limits on SRDs to indoor operation. No such constraints were deemed necessary in many countries.

(e) What technical parameters should be prescribed, including EIRP limits for low power indoor consumer device-to-device usages?

[ECC REC 70.03](#), annex 1, table 1, line n1 provides a reference basis. The basic requirements are: $EIRP \leq 20\text{dBm}$, output power¹ $\leq 10\text{dBm}$. In practice only the EIRP limit should be sufficient, since there will be few applications with a very low antenna gain. It should be noted that these limits are

¹ Note that measurement of conducted power is not realistic for small transceivers with integrated antennas. I.e. a measurement of Total Radiated Power (TRP) should be performed which is complex.

equal to the Australian limits and below the limits of USA, UK, New Zealand and Singapore. NXPs Wi-INT application requires a maximum EIRP of 10 dBm.

Q31. Whether there is a need for permitting “outdoor” usages of V-band on a license-exempt basis? Kindly provide a detailed response with justification and international scenario.

See answer Q32.

Q32. If the response to the Q31 is in the affirmative, whether it is feasible to allow outdoor usages on a license-exempt basis in the V-band in parallel to the use of the spectrum by telecom service providers for the establishment of terrestrial networks in a part or full V-band? Kindly provide a detailed response with justification and international scenario.

Typical Wi-INT deployment will be indoor. Also vehicular in-cabin application should be considered indoor due to the entry-loss of the vehicle chassis. But it should be noted that Wi-INT applications can have a partially mobile nature. Given the evidence of all regulatory regimes in the consultation, including Europe's, which has considered interference to fixed links (see [ECC Report 176](#)), the relatively infrequent outdoor deployment of Wi-INT should not present any risk of interference.

Q33. In case it is decided to allow outdoor usages on a license-exempt basis in the V-band (57-64/ 66 GHz), -

(a) Should it be permitted in the entire V-band or only in a portion of the V-band? If it should be permitted only in a portion of the V-band, please specify the frequency range.

There should be no problem to permit outdoor use in the whole band for SRDs with an EIRP ≤ 20 dBm, see Q32. Wi-INT applications will require an EIRP ≤ 10 dBm.

(b) In case it is decided to permit outdoor usages on a license-exempt basis in the entire V-band, whether the 57-64 GHz range, or the 57-66 GHz range should be considered for such usages?

57-66 GHz seems most appropriate. See answer to Q30b.

(c) What should be the carrier size/ channel bandwidth?

SRDs do not require a carrier size or channel bandwidth restriction other than the band limits. Wi-INT requires 7 GHz of bandwidth.

(d) What technical parameters should be prescribed, including EIRP limits for low power indoor consumer device-to-device usages?

EIRP limit of 10 dBm is sufficient for Wi-INT applications as per the answer to Q30e.