



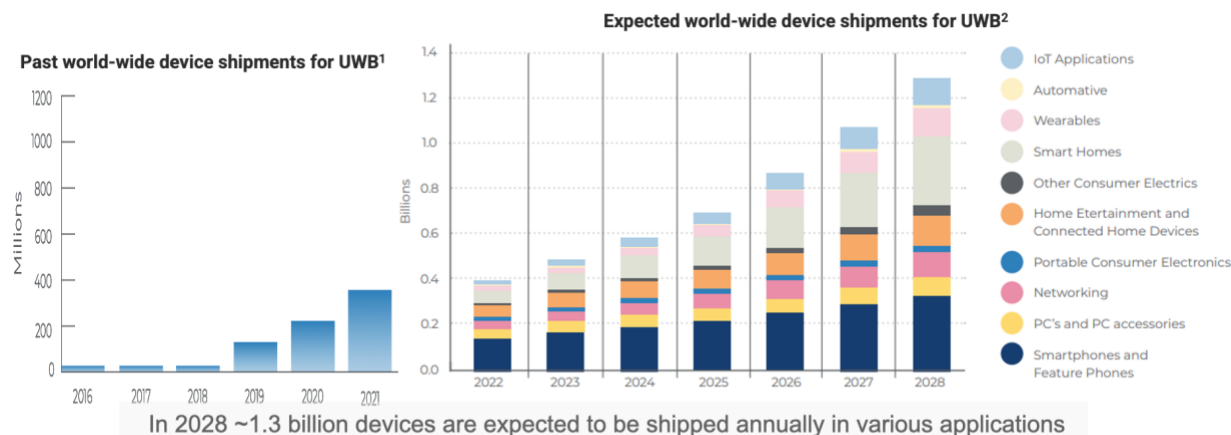
FiRa Responses to questions directed to the stakeholders providing incumbent services in the upper 6 GHz band for the case of UWB (Ultra-Wideband)

FiRa® Consortium would like to thank RSPG for the opportunity to comment on the future plans for upper 6 GHz 6425 – 7125 MHz. Please find our answers below.

1) Explain impact of possible future usage of the upper 6GHz for MFCN and/or WAS/RLAN on existing services:

a) What are your current and future spectrum needs (before and beyond 2030) in the upper 6GHz band?

UWB is a successful ecosystem with significant device growth expected over the coming years. Below figure demonstrates this growth and shows expected worldwide UWB shipments likely to exceed 1 billion devices shipped globally per year by 2027.



Source: 1) FiRa 2021 annual report based on ABI Research
2) FiRa 2023 annual report based on ABI Research

Those devices mainly use UWB Channel 5 (6.2 – 6.8 GHz) and UWB Channel 9 (7.7 – 8.3 GHz) as well as some use of UWB Channel 6 (6.7-7.3 GHz). All the lower parts ,i.e. below 7.5 GHz, will be impacted by a change in use of the spectrum.

The frequency band available without severe mitigation techniques for use cases relevant to FiRa¹ is limited to 6 – 8.5 GHz. So adding, in particular MFCN to the upper 6 GHz will lead to a loss of UWB Channel 5 and Channel 6 that is the available UWB spectrum today. So at a point where the ecosystem shows rapid growth, a large part of the spectrum is likely to become significantly degraded and likely un-usable for FiRa UWB use cases.

¹ <https://www.firaconsortium.org/discover/use-cases>



Furthermore, even though the questionnaire relates to the Upper 6 GHz, the bigger picture regarding UWB is that channel 9, the “last remaining band”, is also threatened by a potential IMT identification in WRC-27 AI 1.7. Also see the figure below.

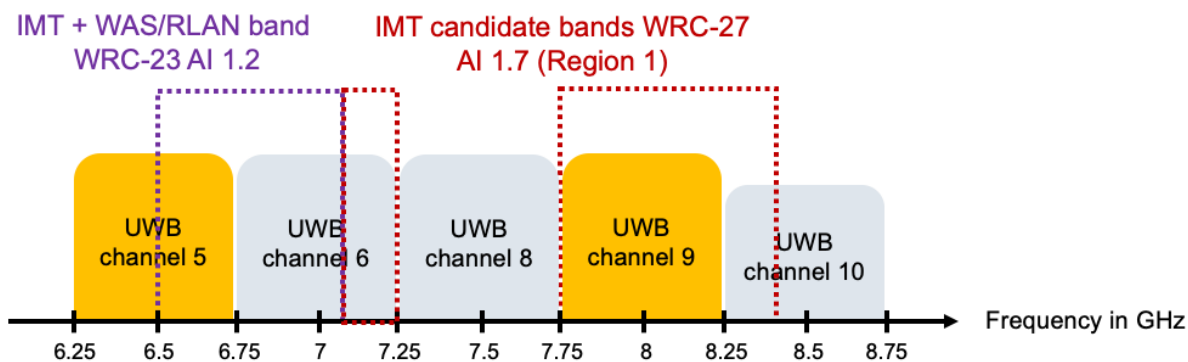
This means that with a foreseen scenario of MFCN in the Upper 6 GHz and later in 8 GHz, there will be no safe-haven spectrum for UWB to operate reliably.

2) What impact on your service do you expect from the introduction of MFCN and/or WAS/RLAN in the upper 6GHz band?

While the introduction of WAS/RLAN has a noticeable impact to UWB performance, MFCN introduction at high power of 68 dBm (6.3 kW) or 83 dBm (0.2 MW) would eradicate any UWB experience once deployment has occurred.²

The introduction of MFCN in the upper 6 GHz frequency range would not allow the reliable implementation of UWB any longer in UWB Channel 5. This puts even more pressure to ensure that the sharing/coexistence conditions for UWB in the remaining part of the spectrum are kept. On top it is expected that more and more applications will rely on UWB based location information on a large scale, including safety related applications (e.g. indoor navigation for mobility impaired people) which makes the challenge even harder to rely on a limited band.

Therefore, FiRa strongly recommends preserving UWB channel 9 as a safe-haven for UWB, especially from a perspective of a potential IMT identification of the 7/8 GHz at WRC-27 under AI 1.7 which is illustrated in the figure below.



² https://api.cept.org/documents/cpg23-pta/77231/pta-23-071-annex-1_fira-analysis-of-imt-into-uwv



3) What measures could improve compatibility from your perspective?

FiRa recognizes the regulatory status of UWB against those services or applications that are currently present. However, FiRa notes the economic impact of such a technology to European citizens, e.g. secured and high accuracy ranging peer-to-peer applications between smartphones and various (consumer) devices.

A fundamental change in the spectrum environment has severe consequences for most of the UWB applications. There are some UWB applications outside the FiRa use cases that would remain usable, despite an introduction of MFCN but limited to controlled environments (like industrial indoor use). For end-user application, only those parts of the UWB band will be usable (i.e. 7500 - 8500 MHz) which can be protected through filtering from very high power MFCN signals.