

November 12, 2017

**Before the  
Federal Communications Commission  
Washington, DC 20554**

In the Matter of	)	
	)	
Expanding Flexible Use in Mid-Band Spectrum	)	GN Docket No. 17-183
Between 3.7 and 24 GHz	)	

**COMMENTS OF 3DB ACCESS (“3DB”)**

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## **I. INTRODUCTION**

3db Access (“3DB”) provides below its comments on the “Expanding Flexible Use in Mid-Band Spectrum between 3.7 and 24 GHz Notice of Inquiry” adopted by Federal Communications Commission (FCC) on August 3, 2017.

3DB is a Swiss semiconductor company with headquarters in Thalwil, Switzerland. 3DB commercializes a highly integrated low-power transceiver for accurate and secure distance measurement and 1D/2D/3D centimeter precise indoor localization using spectrum allocations under wideband and ultra-wide band rules in US, Europe and Japan.

3DB customers typically certify their systems under FCC Part 15.250, EN 302 065 Part 1 and Part 3 and in Japan under ARIB STD T-91.

## **II. Band 5.925 – 7125 GHz**

Since several years 3DB is doing spectrum engineering as part of ETSI Task Group UWB and Working Group Spectrum Engineering (WG SE) in Europe. An essential part of this work consists of 1) understanding protection requirements for licensed services in the 3.1 – 4.8 GHz and 6 – 8.5 GHz (ECC Decision (06)04 in Europe) and 2) perform compatibility studies to ensure that wideband systems (>50 MHz) protect incumbent licensees under the strict protection criteria established by ITU.

For example, studies conducted within the WG SE evaluated the impact of UWB on Fixed Wireless Services (FWS) in the band 6-8.5 GHz. These bands are extensively used for long-range links to provide high data rates over distances up to 50 km, and will still be used in the future due to the difficulty caused by propagation effects to reach the same performance above 10 GHz (see Report ITU-R F.2323-0 on future trends on FS use). Incumbent radio-frequency band used by FWS are listed in Report ITU-R F.2108.

Guidelines for defining parameters establishing interference protection levels of FWS are described in Recommendation ITU-R F.758. Considerations are mainly given on how to properly design performance and availability degradations due to interference according to generic Recommendation ITU-R F.1094. This document prescribes that interference from a secondary service should not exceed 1% of the total Error Performance Objective (EPO). Based on this generic protection criterion, degradation on the FWS communication link caused by a UWB devices are quantified in terms of a ratio of errored seconds (ES) and severely errored seconds (SES) and are defined in Rec. ITU-R F.1668-1. More particularly, these documents are specifying:

- 1) A long term protection criterion with interference to noise levels (I/N) of -20...-13 dB that should not be exceeded more than 20% of time;

- 2) A short term protection criterion, e.g. a value of I/N that should not exceed for more than X% of the time, where  $X \ll 1\%$ , for instance 0.01% or 0.001%. The values of I/N should be derived depending on the requirements of the victim service.

Similar protection criteria apply for all licensed services in Mid-Band including Radio Astronomy in 6.65 – 6.6752 GHz, Fixed Satellite Services and Microwave link in the C-band (4-8 GHz).

The outcome of these studies and also previous extensive compatibility studies performed for wideband devices ( $> 50$  MHz) over the past years (see Report ITU-R SM.2057 compiling several studies on the impact of UWB) is showing that wideband systems can only safely co-exist with licensed services (safety critical or not), if and only if they follow very low emission power spectral densities and, in many cases, are further constrained to Low Duty Cycle provisions which limit their  $T_{on}$  time and also activity per second.

In spectrum management, the allocation of very wide band ( $> 50$  MHz) interference to any licensed or non-license based incumbent services have always been the main concern. In the recent case of the allocation of the UWB band with bandwidths of 500 MHz, the underlay approach has been used. This approach allows transmission only under the condition that transmitted power densities in the incumbent service are not degrading the existing services.

Last but not least, it is important to mention that even with the strict wideband rules and low transmit power of -41 dBm/MHz Mid-Bands up to 7.25 GHz are not allowed in many countries including Japan and Korea.

### **III. CONCLUSION**

Given the current usage of the band 5.925 – 7.125 GHz together with the stringent protection criteria required to protect licensees, using U-NII systems with power spectral density levels higher than -41.3 dBm/MHz will not be able to ensure protection of licensed (safety critical or other) and also currently allowed unlicensed users.

Allowing high power and high data rate systems will make a concentration of thousands of devices occupying large bandwidths simultaneously and on a non duty-cycled basis. This will lead to disastrous interference with Fixed Services, Radio Astronomy, Mobile Services, Maritime Microwave links and any other licensed services.

In addition, such allocation will fully disable currently operating unlicensed wideband devices ( $> 50$  MHz) complying with Part 15.250 and ultra-wide band devices working according to the “underlay” principle and complying with Part 15.501.

Given all previous studies already performed on this topic, 3DB requests that the Commission to take no action on any further allocations in the 5.925 - 7.125 GHz bands for unlicensed devices.