PERASO | WIRELESS UNLEASHED™


**Tactical Communications**

**Introduction**

The utilization of mmWave spectrum for Defense applications using COTS technology is of great interest for many military organizations worldwide. The 60 GHz frequency band is advantageous for defense applications for several reasons:

- **High Data Rates**: The 60 GHz band offers very high bandwidth, which allows for high data rates. This is beneficial for transmitting large amounts of data quickly, such as high-definition video, sensor data, and other mission critical information
- **Low Interference**: The 60 GHz band is less crowded compared to lower frequency bands, resulting in less interference from other devices. This is crucial in defense applications where reliable communication is essential
- **Security**: mmWaves at 60 GHz have shorter wavelengths, which means they are less likely to penetrate walls and other obstacles. This reduces the risk of detection and makes communications more secure
- **Ultra-low SWAP**: Size, Weight and Power. The higher frequency allows for smaller antennas, which can be beneficial for compact and portable defense systems
- **High Precision**: The shorter wavelength at 60 GHz allows for more precise targeting and location tracking, which is important for applications like radar and guidance systems
- **Atmospheric Absorption**: The 60 GHz band is subject to higher atmospheric absorption, especially by oxygen. While this can limit the range, it also means that signals are less likely to travel long distances, reducing the risk of interception and interference from distant sources
- **Line-of-Sight Communication**: The 60 GHz band is ideal for line-of-sight communication, which is often the case in many defense scenarios, such as between ground stations and unmanned aerial vehicles (UAVs)

- **Spectrum Availability**: There is massive 14GHz of unlicensed spectrum available in the 60 GHz band, reducing the risk of congestion

Peraso's 60 GHz modules provide integrated USB 3.0-to-RF solutions incorporating Peraso's IEEE 802.11ad baseband, 60GHz phased array RFICs and on-board antennas. The modules are based on the IEEE 802.11ad wave form which is an inherently stealthy protocol with low probability of interception (LPI), low probability of detection (LPD) and are anti-jamming (AJ). The operation of these products is in the unlicensed frequency band 57 – 71 GHz, enabling stealthy wireless communications for a variety of tactical applications such as last-mile, V2V, V2X communications both on-the-move and at-the-halt.

Self-aligning and self-configuring, the modules enable fast and easy to set up, with minimal operator intervention required. Adaptive beam-forming and ultra-narrow pencil beams, coupled with over-the-air, real-time encryption (128- and 256-bit AES encryption together with rolling key based on GCMP) provide additional layers of security.

The 60 GHz band was originally allocated as unlicensed due to the undesirable impact of oxygen absorption in the 57-66 GHz range. The oxygen absorption, in conjunction with the direction beam pattern provided by beamforming antenna technology, can be exploited to reduce the ESM detection range. Recent updates to regulations (FCC and EU domains) allow use of high gain antennas and additional spectrum up to 71 GHz, which is not impacted by oxygen. These changes have enabled practical point-to-point radio links for backhaul up to 20 km, and point-to-multipoint access networks with 8km range when the tactical application requirements are aligned.

**Conclusion**

Overall, the 60 GHz band offers a combination of high data rates, security, and precision that makes it well-suited for a variety of defense applications with Peraso's 60GHz solutions being ideally suited for these tactical, standalone military applications.

**About Peraso**

Peraso Inc. (NASDAQ: PRSO) is a pioneer in high-performance 60 GHz unlicensed wireless technology, offering chipsets, antenna modules, software and IP. Peraso supports a variety of applications, including tactical communications, fixed wireless access, immersive video and factory automation. For additional information, please visit www.perasoinc.com.