

## ABSTRACT

- This paper introduces, miniaturized antenna solution optimized for wearable devices operating in the 5.8 GHz ISM band.
- The proposed design features a circular patch structure excited via probe feeding and built on a cost-effective FR4 substrate. Emphasis is placed on achieving compactness, mechanical robustness, and safety for on-body use.
- Simulation results show strong performance metrics, including wide bandwidth, moderate gain, and low return loss. Specific Absorption Rate (SAR) analysis confirms the antenna's compliance with international exposure standards, making it suitable for prolonged skin contact.
- The combination of affordability, practical design, and reliable performance positions this antenna as a viable candidate for integration into modern wearable platforms such as smartwatches, health monitors, and fitness devices.