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## **ELECTRO-MAGNETIC INTERFERENCE FILTER FOR ULTRASOUND SCANNER**

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**Abstract:** Ultrasound technology has reformed various fields, from medical diagnostics to a huge range of industrial applications. However, the sensitive electronic components in ultrasound equipment are highly vulnerable to electromagnetic interference (EMI), which can reduce the quality of performance or cause malfunctions threatening patient safety. An Ultrasound EMI filter is an essential component which can be used to mitigate electromagnetic interferences generated by external sources or within the system itself. The main objective of this study is to design and implementation of an EMI filter specifically tailored for ultrasound scanners. The proposed EMI filter aims to mitigate interference by attenuating unwanted high- frequency signals while ensuring the reliability of the ultrasound signals. The newly designed filter consists of a combination of inductors, capacitors, and resistors, which have been optimized for the frequency range associated with ultrasound medical diagnosing devices. Comprehensive testing was conducted in both controlled environments and real-world medical set-ups. The results demonstrated a significant reduction in EMI, leading to improved clarity and reliability of ultrasound images. These improvements enriches diagnostic capabilities and ensures that ultrasound scanners operate within required safety margins and optimal parameters. The implementation of this EMI filter is very much important for maintaining high standards in medical imaging, especially in environments with numerous electronic devices connected. The research findings suggest that the widespread adoption of these EMI filters could be beneficial for other sensitive medical devices, contributing to better healthcare applications.

**Keywords:** Electro-Magnetic Interference, Ultrasound, Reliability