



Device and Method for Reducing the Electromagnetic Interference (EMI) Generated by Power Converters

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a hybrid filter device that more effectively reduces EMI produced by switching power converters.

Overview

As a byproduct of normal operation, electrical circuits can induce unwanted signals, or noise, in other circuits, thereby degrading performance. This problem, known as electromagnetic interference (EMI), is especially severe in equipment that includes switching power converters because of the high frequencies and short time intervals involved. Switching power converters—which carry out operations such as converting AC to DC power and vice versa—are found in increasing numbers of military, industrial and residential devices, including computers, telephones and heavy machinery. As a result, there is growing concern about EMI within and between various types of machines.

The Invention

UW-Madison researchers have developed a hybrid filter device that more effectively reduces EMI produced by switching power converters, especially those involving high power densities, high switching frequencies and short transition intervals. The device consists of an active filter that works in conjunction with a passive filter. It targets EMI, resulting from the parasitic capacitive coupling paths that high frequency signals often find through various circuit elements, particularly in the common mode, or ground, paths.

Applications

- A wide range of power converters, including those found in aerospace, automotive, industrial and household applications

Key Benefits

- More effectively reduces EMI generated by switching power converters, especially those involving high power densities, high switching frequencies and short transition intervals
- Avoids the limitations of conventional hybrid filters, whose operation is difficult to model and thus not easy to predict or guarantee

Stage of Development

In trials, the hybrid filter effectively attenuated the resonance that occurs between Y-capacitance (the capacitance between ground and line) and common mode inductance, thereby limiting EMI.

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For More Information About the Inventors

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Tech Fields

- [Engineering : Power electronics & control systems](#)

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867

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