

Filter for the Measurement of Supraharmonics in Distribution Networks

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Abstract : Due to rapidly developing power electronics devices and technologies such as power line communication or self-commutating converters, voltage and current distortion, as well as interferences, have increased in the frequency range of 2 kHz to 150 kHz; there is an urgent need for regulation of electromagnetic compatibility (EMC) standards in this frequency range. Measuring or testing compliance with emission and immunity limitations necessitates the use of precise, repeatable measuring methods. Appropriate filters to minimize the fundamental component and its harmonics below 2 kHz in the measuring signal would improve the measurement accuracy in this frequency range leading to better analysis. This paper discusses filter suggestions in the current measurement standard and proposes an infinite impulse response (IIR) filter design that is optimized for a low number of poles, strong fundamental damping, and high accuracy above 2 kHz. The new filter's transfer function is delivered as a result. An analog implementation is derived from the overall design.

Keywords : supraharmonics, 2 kHz, 150 kHz, filter, analog filter

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