Waveform Design Engineering

An important concept in the design of power amplifiers is that of instantaneous power, defined as the product of voltage times current. For a 1 ohm resistive load, this is given by the (instantaneous) value of the waveforms magnitude squared.

In this problem we consider some aspects of waveform design. The power in the harmonics of a periodic waveform, depend on the waveform’s shape. Sharpe changes in a waveform’s amplitude tend to increase the power in its higher harmonics. You want to design a periodic waveform with an average power of 1 watt that minimizes the power in the 5th harmonic with the restrictions that the average voltage is zero. Compare your result to the the third harmonic power of a square wave with a zero average voltage.