

Spectrum Of A Nonlinearly Quantised Equal-Amplitude Dual-Tonesignal

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Summary

Nonlinear quantisation of an equal-amplitude dual-tone signal is analysed using a simple, general approach. The actual transfer characteristic of the quantiser is split into two nonlinear characteristics; the first represents the nonlinearity error, and the second represents the quantisation error sawtooth. Whereas the nonlinearity error characteristic is modelled by a third-order polynomial, the quantisation error sawtooth is modelled by a Fourier series. This strategy yields exact infinite-series expressions for all the intermodulation and distortion components produced by the nonlinear quantisation of an equal-amplitude dual-tone signal. Special cases are considered where the infinite-series expressions can be reduced to convenient. Approximate analytical expressions. The effects of the parameters of the nonlinearity error characteristic are studied, and the feasibility of minimising the intermodulation performance of the quantiser is explored

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