# Effect Of Bit-Threshold Errors On The Harmonic And Intermodulationperformance Of Successive Approximation A/D Converters

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## Summary

A simple approach is described for predicting the harmonic and intermodulation performance of a real successive approximation analog-to-digital converter (ADC) with bit-threshold errors. The real ADC characteristic is split into an ideal staircase characteristic, representing the ideal ADC characteristic, minus a train of pulses, representing the bit-threshold errors. Series expressions are obtained for the output spectra of the real ADC excited by a multicarrier input signal with arbitrary amplitudes. The special case of two equal-amplitude carriers is considered in detail, and analytical expressions are obtained for the amplitudes of the harmonic and intermodulation products in terms of the individual bit-threshold errors. The feasibility of minimizing the amplitudes of the intermodulation products is explored