

Master Thesis

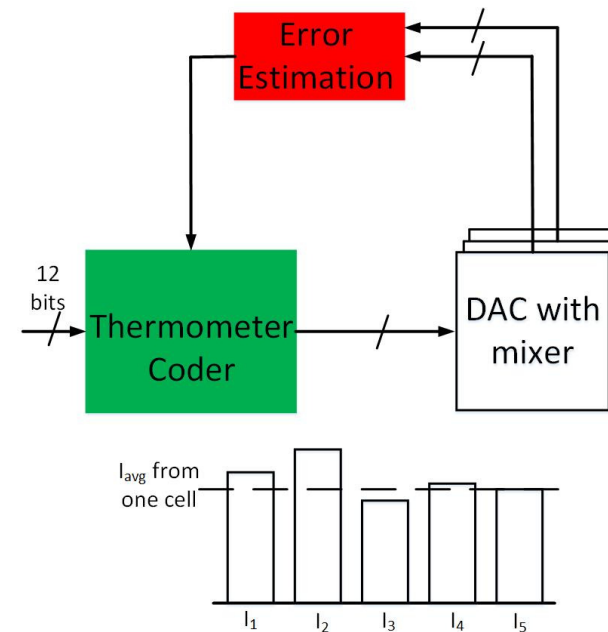
Calibration technique for RF-DAC based Transmitter in 65nm CMOS

Background:

Unlike conventional transmitter, mixer and digital-to-analog (DAC) parts are combined into the one block so called RF-DAC. These DAC cells can be designed in segmented or binary-weighted fashion depends on the topology. Segmented cells have advantages over the binary ones in terms of linearity of the system which has direct impact on the demodulation in the receiver part. Thus, this linearity issue is one of the most important criteria in the design. Each segmented cell has to give equal current to achieve fine linearity. However in reality this is not the case. As shown in the figure, there is always mismatch between cells which degrades the linearity and so overall performance. That's why some kind of calibration method is needed to measure the error between cells and based on this measurement, thermometer coder can be redicted which changes its state so that opposite error sources can be combined. This will increase both static and dynamic performance significantly.

Tasks:

- Literature survey about different calibration techniques.
- New calibration technique which includes error measurement block and new thermometer coder will be investigated and designed.
- The complete schematic and layout will be done in Cadence with 65 nm CMOS technology.



General block diagram of RFDAC with calibration technique by using error measurement

Further information on this and other topics could be delivered by email, telephone or discussion.

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