

## Calculation of UCD3138 Slope Compensation for PCM

Step 1. Take CLAO output which is voltage loop output every half switching cycle;

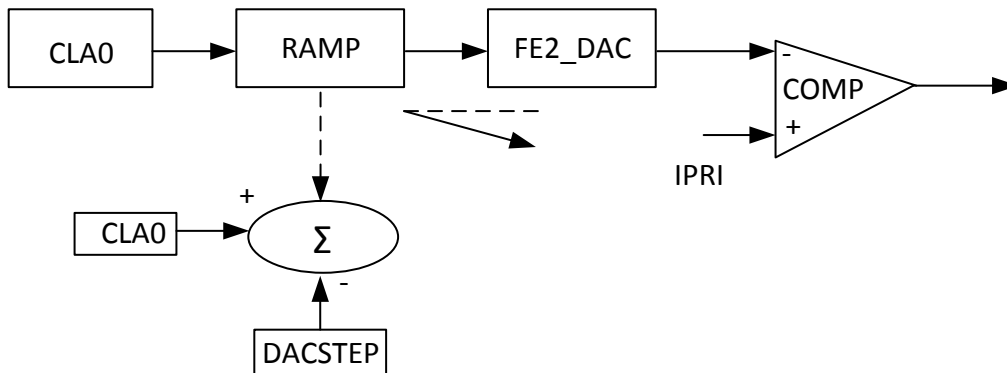
Step2: CLAO is the starting point of the slope ramp, every 32ns, CLAO is reduced by the DAC\_STEP;

Step3: The subtraction is fed into FE2\_DAC;

Step4: The DAC output is a analog voltage, which is compared with input current signal;

The below is blocking diagram to explain the sequence.

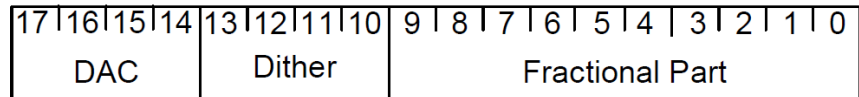
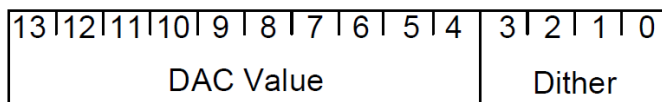
Diagram of Slope Compensation



For example: how to calculate the slope rate in 1us for DAC\_STEP = 48000:

$$((1000\text{ns}/32\text{ns}) * 48000 / 1024 * 0.0976\text{mV} = 142\text{mv/us})$$

DAC\_VALUE



DAC\_STEP

Where 1024 is fractional part of DAC\_STEP, and 0.0976mv is DAC LSB

Use inverse equation, DAC\_STEP can be calculated for a given slope compensation.

For example, calculate the DAC\_STEP for SLOPE = 100mV/us

$$(100(\text{mv})/0.097(\text{mv})) * 1024 / (1000\text{ns}/32\text{ns}) = 33781$$