

A brief comment of my gamma correction

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1 Explanation

The basic idea: https://en.wikipedia.org/wiki/Gamma_correction

The equation 1 shows how the basic calculation of bit_{out} . The logarithmic function can be vertical adjust with the bit $bit_{out,threshold}$ (equation 2). Therefor threshold parameters in LED drivers can be compensated.

$$bit_{out} = \left(\frac{bit_{in}}{bit_{out,max}} \right)^{gamma} \cdot bit_{out,max} \quad (1)$$

$$bit_{out} = \left(\left(\frac{bit_{in}}{bit_{out,max}} \right)^{gamma} \cdot (bit_{out,max} - bit_{out,threshold}) \right) + bit_{out,threshold} \quad (2)$$

bit_{out} : Output value (e.g. PWM output to driver)

$bit_{out,max}$: Output maximum value (e.g. 8-bit MCU = 255)

bit_{in} : Input value, $bit_{in,max} = bit_{out,max}$

$gamma$: Gamma factor (1,5 to 3)

$bit_{out,threshold}$: Value to adjust the output offset

1.1 Example

An example for a 8-bit MCU, $gamma = 1.5$ and $bit_{out,threshold} = 18$.

$$bit_{out} = \left(\left(\frac{bit_{in}}{255} \right)^{1,5} \cdot (255 - 18) \right) + 18 \quad (3)$$

Example for equation 3

