A brief comment of my gamma correction

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1 Explanation

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.

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

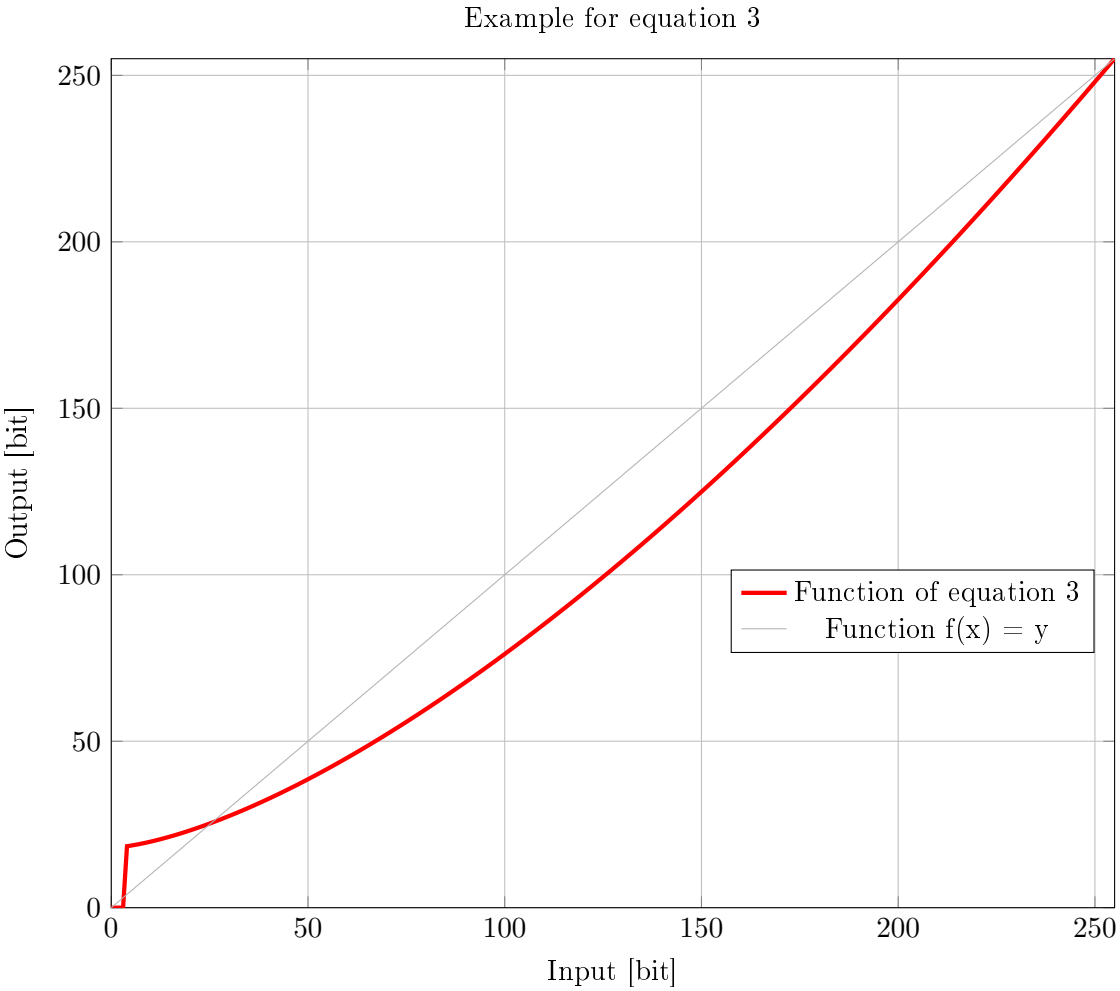
$$bit_{out} = \left(\left(\frac{bit_{in}}{bit_{out,max}}\right)^{gamma} \cdot (bit_{out,max} - bit_{out,threshold})\right) + bit_{out,threshold} \tag{2}$$

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 $bit_{out,threshold} = 18$.

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


Example for equation 3
Output [bit]
Input [bit]
0
50
100
150
200
250
Function of equation 3
Function f(x) = y