Technical conclusion of the TLC591x

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Meaning | CM | HC | CC0 | CC1 | CC2 | CC3 | CC4 | CC5 |
| Default | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

VG = (1 + HC)×(1 + D/64) / 4

D = CC0×2^5 + CC1×2^4 + CC2×2^3 + CC3×2^2 + CC4×2^1 + CC5×2 0

number with 1-bit exponent HC and 6-bit CC[0:5]. {HC,CC[0:5]} divides the programmable voltage gain VG into 128 steps and two sub-bands:

Low voltage sub-band (HC = 0): VG = 1/4 ~ 127/256, linearly divided into 64 steps

High voltage sub-band (HC = 1): VG = 1/2 ~ 127/128, linearly divided into 64 steps

CM: In addition to determining the ratio IOUT,target/Iref, CM limits the output current range. High Current Multiplier (CM = 1): IOUT,target/Iref = 15, suitable for output current range IOUT = 10 mA to 120 mA.

Low Current Multiplier (CM = 0): IOUT,target/Iref = 5, suitable for output current range IOUT = 3 mA to 40 mA

VG default= 127/128

CM default=1

So that,

Vref=1.26\*127/128=1.25v

Iout=(1.25/Rext)\*15

We can determine the Rext based on the I we need for the LEDs