Additional LED work/update

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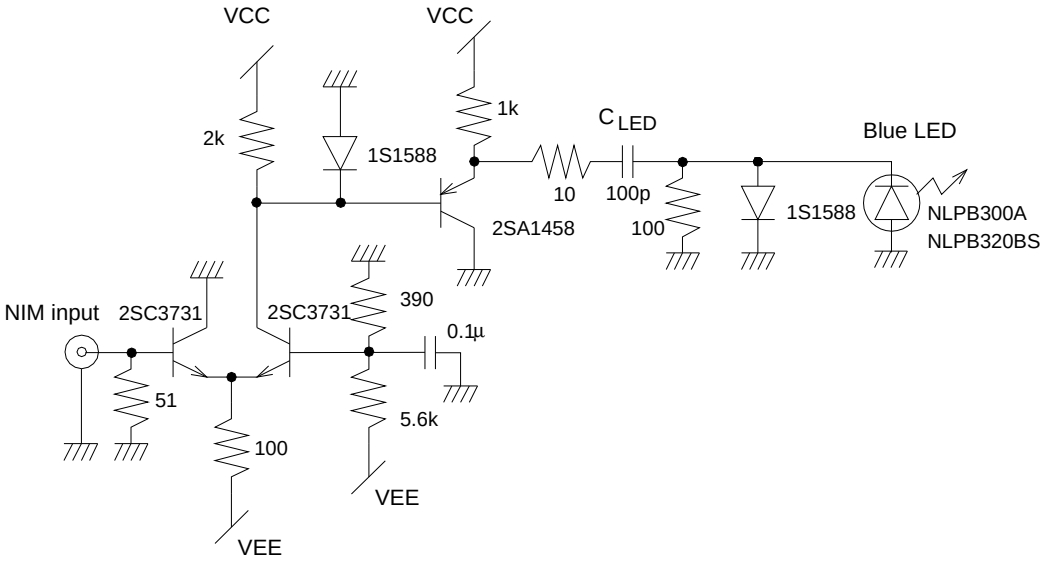
1. Stability in case of larger LED intensity
2. Other possible problems
   (after pulsing, noise picking up, cross talk)

1. Stability in case of larger LED intensity

C_{LED} ... 100 pF $\Rightarrow$ 120 pF
$V_{\rm CC}$ ... constant (9 V)



Dependence on LED's surrounding temperature

sample	LED light yield	
	500–1000K p.e.	4 times larger
(c)	+0.63%/°C	+0.14%/°C
(d)	+0.33%/°C	+0.05%/°C
(e)	+0.51%/°C	+0.12%/°C
"mean"	+0.49%/°C	+0.10%/°C

Driver temperature dependence

LED light yield	
500–1000K p.e.	4 times larger
−1.1%/°C	−0.4%/°C

Driver V_{CC} dependence

LED light yield	
500–1000K p.e.	4 times larger
+0.15%/mV	+0.08%/mV

Expected stability

contrib.		LED light yield		condition
		500–1000K p.e.	4 times larger	
LED	T	$\pm 2.5\%$	$\pm 0.5\%$	$\pm 5^{\circ}$C
driver	T	$\pm 1.1\%$	$\pm 0.4\%$	$\pm 1^{\circ}$C
	$V_{\rm CC}$	$\pm 1.5\%$	$\pm 0.8\%$	± 10 mV
"combined"		$\pm 3.1\%$	$\pm 1.0\%$	

We can construct

very stable system !!

2. Other Possible Problems

(a) After pulsing

There are small amount of after pulses in the region from 600 to 800 ns after main pulse.

of LED or of PMT ?

⇒ Anyway, it is not a problem since physics trigger might be vetoed during a few μsec after LED is flashed.

(b) Noise pick up

PMT picks up small noises from the LED driving wire. (Not from LED itself.)

⇒ Need further study.

(c) Cross talk

Not yet.