Dear Mike,
The prototype PCBA has been done. We simulate the faults test with actual hardware. Our target is when the system is power on can diagnose itself and find whether any led is OPEN or SHORT.
Is it right that D3 could be SHORTED by connecting Pin LED 10 & LED 9 with wire 3 directly? If yes, do you know some reasons why faults register corresponding bit was not set 1?

When I read the datasheet, I'm confused about Phase Shifting.
According to the datasheet page14 figure16 and figure17, I did some calculation about the phase shifting function.

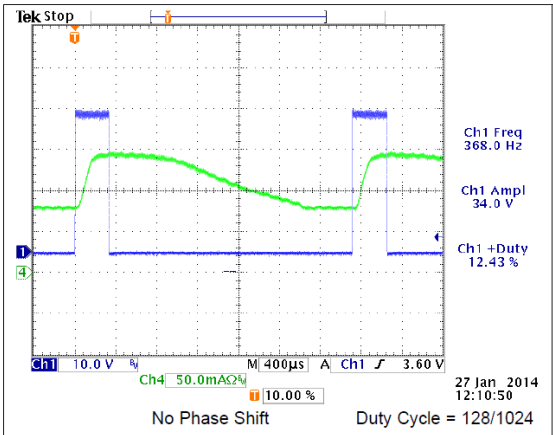

Figure 16. Single Channel,

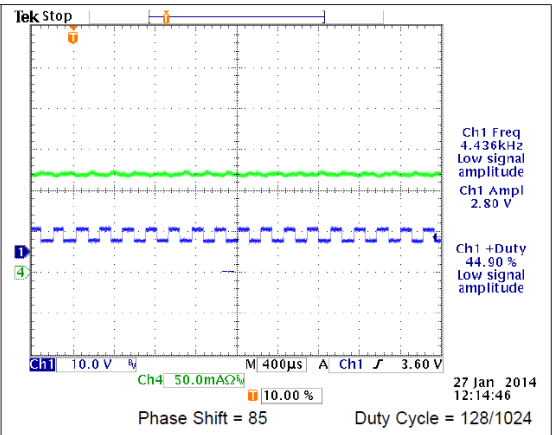

Figure 17. Single Channel

No Phase Shift:
The frequency is 368Hz and the duty is 128/1024 = 12.5%.
So the Period T = 1/368Hz = 2717.4uS
The each LED turn on time t_on = 2717.4uS x 12.5% = 339.675uS
Phase Shift 85:
The frequency is 368Hz x 12 = 4416Hz and the oscillograph displayed 4436Hz was closed to calculation value.
The Period T = 1/4436Hz = 226.45uS
The duty is 44.9%.
So the each LED turn on time t_on = 226.45uS x 44.9% = 101.67uS
Ratio: 101.67uS / 339.675uS = 1/3

Or

No Phase Shift: 34V x 128Counts = 4352
Phase Shift 85: 2.8V x 85Counts x 44.9% x 12Leds = 1282.344
Ratio: 1282.344 / 4352 = 1/3

My question is that compared with no phase shift case, the each LED turn on time of phase shift 85 is only 1/3 of it within whole 2717.4uS. It means the total luminous flux of 12 LEDs also reduced, although minimized the variation in input current.

Do I understand correctly?
If I do, we want to maintain the total luminous flux and minimized the variation in input current at same time. Do you have some ideas for us?

Thanks!