

Re: LED backlight driver

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- *From:* ehsjr <ehsjr@xxxxxxxxxxxxxxxxxxxx>
 - *Date:* Wed, 09 Jan 2008 16:47:41 GMT
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ehsjr wrote:

Jim Yanik wrote:

ehsjr <ehsjr@xxxxxxxxxxxxxxxxxxxx> wrote in
[zaPgj.5002\\$O97.4020@trndny01](mailto:zaPgj.5002$O97.4020@trndny01):>news:zaPgj.5002\$O97.4020@trndny01:

news@xxxxxxxxxxxxxxxxxxxx wrote:

Hi,

A new product I'm designing uses a TFT display with an LED backlight. The LEDs are arranged as 5 series strings of (I think) 9 white LEDs. Each string is spec'd at $V_f = 30V @ 20 \text{ mA}$. They also recommend that the currents in each string are matched to within 5% for good brightness uniformity.

The power supply is a wall-wart with battery backup, giving a supply rail of 6 to 9VDC. The brightness needs to be adjustable down to 2 mA per string.

There are several schemes I can think of to drive this, none of them particularly elegant:

1. Five boost converters (LT3461 or similar), one driving each LED string, feedback pin connected to current-sensing resistor.

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2. One boost converter to provide a regulated 35V rail, then a linear current regulator (op-amp + npn or MOSFET) in the negative end of each string.

3. Connect all 5 strings in series and drive from a 150V boost converter. This would probably need a transformer rather than an inductor, so we'd be looking at a custom-wound part.

This isn't a particularly cost-sensitive application, but none of the options above look particularly great.

There was a fourth option, similar to (2) but with the strings connected in parallel, then a single current-sense resistor connected to the SMPS feedback pin. I don't physically have the LCD panel yet, but I tried a few strings of Nichia NSPW300's in parallel, with 10R current-sharing resistors, and couldn't get them to balance even within 50%.

Anyone got any better ideas?

Thanks

Rhydian.

Not sure ... you could use the 35 V and put a current mirror in there if you need to adjust all the strings simultaneously for you 2 to 20 ma requirement. If you need individual control, an LM317 with a 62 ohm R and 500 ohm pot in series between Vout and Adj will give you about 2.2 to 20.2 ma from the adj pin.

Ed

the question is;will his LEDs output the same brightness with identical

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currents? I suspect there will be a significant variation between LEDs.

That's why the individual control circuit might be preferable. OTOH, he could put a series trimming

^^^^^^
parallel

resistor in each string driven by the mirror.

Or are you referring to different brightness in individual LEDs within a series string of 9 LEDs? Individually controlling 45 LEDs can be done, of course, but it may be impractical for the op.

Ed

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