**TOM SMITH**

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**From:** TI E2E Community - Automated Email [noreply@e2e.ti.com]

**Sent:** Thursday, August 11, 2011 7:34 AM

**To:** TOM SMITH

**Subject:** LED Drivers/LCD Bias Forum: Re: TLC59116 questions, 'ON' resistance, thermal performance, peak current.

Tom Smith replied to Re: TLC59116 questions, 'ON' resistance, thermal performance, peak current. in LED Drivers/LCD Bias Forum.

1. Figure 9 in the data sheet I am looking at is titled TLC59116 40mA Per Channel Typical Application. It's on page 13 of 35 in a document labelled SLDS157C – FEBRUARY 2008 – REVISED JUNE 2010.
Am I looking at the wrong data sheet? What is the title of the figure 9 which you are referencing?

2. This depends on the voltage you are using on the LEDs. If the LED anode voltage is 10V and the string consists of 2 LEDs with a forward voltage of 2V each, the IC has to dissipate 16* 6V * 50mA = 4.8W.

That would be the calculation to use if the driver outputs were like adjustable resistors to ground, programmed to be current sinks. But aren't they actually pulsed FETs to ground? In that case I would be asking what is the 'on' resistance of these FETs when they are 'on'? If the 'on' resistance was zero, for example, the dissipation in the TLC59116 outputs would be zero, even when the average current per channel was 50 mA for each of the 16 channels. Of course a series resistor would be needed to limit the peak current in the LEDs, so I'm thinking that the drivers outputs have a non-zero 'on' resistance. The outputs seem to be pulsed, as implied by the waveforms seen in Fig. 11 titled "Brightness and Group Dimming Signals".

3.Yes, I understand that re the TLC59116F. So, are you saying that the TLC59116 outputs are pulsed to adjust individual LED brightness, and that the current when the brightness is set to max is continuous, or nearly so, with the level being set by the programming resistor?
If that is what you are saying, then I would ask what is the 'on' resistance of the FET outputs of the TLC59116 when the current is set to 50 mA and the brightness is set to max?

4.I meant the peak current per channel, and you say that would be 50 mA when Rext is set to 360 ohms. Does that mean that the outputs can be thought of as pulsed 50 mA current sinks when Rext is 360 ohms?

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