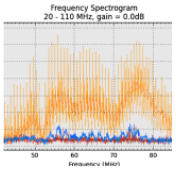
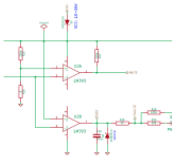
ELECTRONIC 6



TPA3132D2 vs. MAX9709 measurements EMI / EMV



TPA3132D2 - delay and scram (anti-POP) - also for TPA3116 / TPA3118

SigmaDSP programmieren (Sigma Studio ADAU1701/1401A EEPROM Standalone Self-Boot)

DSP-Board SigmaDSP ADAU1701/1401A

10/30/50 / 100W LED Driver Application (UC3843A)

BY 360CUSTOMS · 19. MAY 2014

The operation of power LEDs Calls constant current sources of higher performance. (≫ = 1A).
As an example here is the operation of a 30W LED on a modified step-up converter (boost) are shown.

SRC4382 PCM5102A

KiCAD Eagle3D POV-Ray

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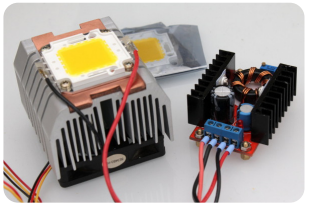
To use them is a 30W High Power Led with the following parameters:

- Power: 30W
- Color temperature: 3000-3500k
- Operating voltage: 30-38V
- Operating current: 1A
- Luminous flux: 2600-2800 lumens
- Lifespan: & gt; 50,000 hours



At the laboratory power supply it will return to operating current of 1A at 38V approx.

Is not a constant current source available, the LED with undervoltage can be operated at

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low light power losses. Here, a voltage is selected, in which the current 10% below the operating current (900mA). It must be ensured that the current caused by thermal drift, the specified by the manufacturer, current does not exceed.

Using a step-up converter (boost) can these LEDs also operate voltage sources whose output voltage & lt; = the operating voltage. (For example, Batteries, Power Supplies)

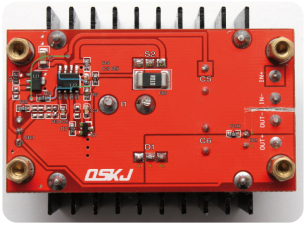
Cost (currently 3.50 € | 5/19/2014) are available 150W Step-Up-ModuleBased on the PWM

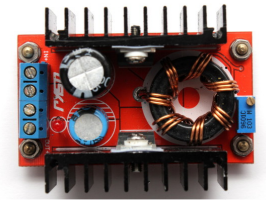
controller UC3843A with the following parameters:

- Input voltage: 10-32V
- Output voltage: 12-35V
- Input current: 10A (16A max with time growing cooling.)
- Output Power: 100W (150W max with time growing cooling.)
- Efficiency: 94% (input 16V, output 19V 2.5A)
- Ausgangsspannungsripple: 2% max
- Load regulation: -0.5%
- Voltage Regulation: -0.5%
- No short-circuit and

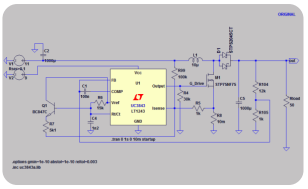
reverse polarity protection

As the power switch is a STP75NF75 use (75V 80A NMOS), power diode STPS2045C (45V Schottky 30Arms). Without replacing the breaker are thus output voltages of up to 75V possible.



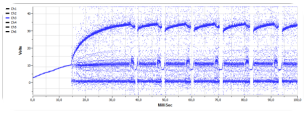


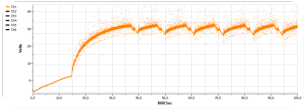
The original circuit is as shown:



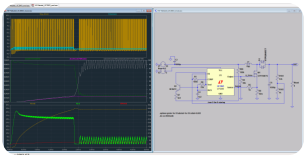
This has the disadvantage of being unstable in higher load ranges

and / or translation ratio. In Uin = 12V4, Vout = 32V and Rload = 15R2 (Iout = 2A, Pout = 67W) measurement shows the unmodified circuit following behavior (Vout = Orange, Blue = VInduktor):

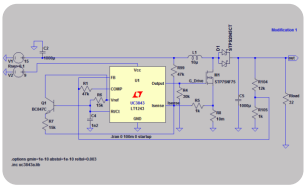




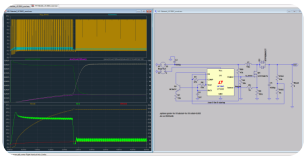
For subsequent simulation (Original) C1 through a resistor (100k) is replaced. At 20V input voltage, output voltage 32V (4A / 120W) shows the instability of the arrangement:



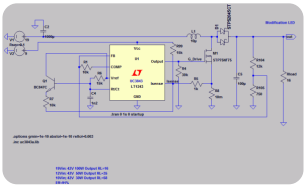
In order to further stabilization in the R1 and R99 changed in value (Modification 1).



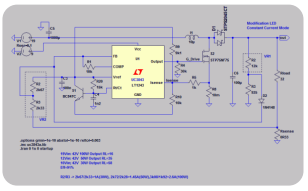
The simulation example at 20V input voltage, output voltage 32V (5A / 160W) shows:



For use as a purely voltage-limited LED driver, the circuit as shown below, further modified. R1 / R7 / R99 be changed in value, the connection of R99 is now at 9V (7809). Note the minimum input voltage for various output powers.

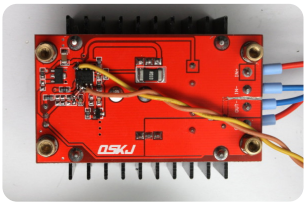


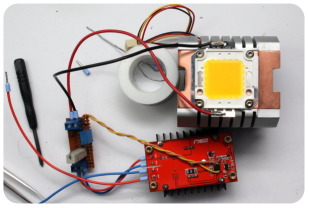
For constant current operation, a modification according to the following picture is necessary.



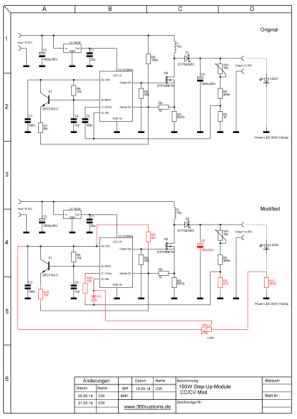
R2 / R3 represent in the simulation, the (newly added) Potentiometers, Rload the LED. The open circuit voltage is set using the existing potentiometer, it must be less than the voltage value of the output capacitor. For proper operation, it is essential that the output voltage (respectively the forward voltage of the LED) when set to the rated current is greater

than the input voltage of the step-up transformer. The test set-up is shown below. For higher currents, the value of the shunt is scaled down in order to keep voltage drop and power loss low. The structure shown here has at 1A rated current (LED), an efficiency of ~ 86%.

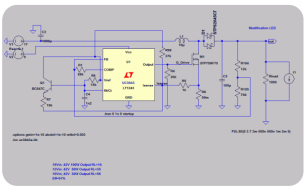


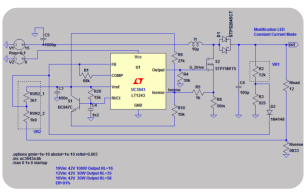


The conversion circuit in the summary:



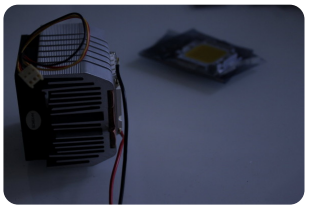
Since the circuit with R8 (Shunt 10mOhm) a "hot box", it makes sense to replace it with 50mOhm. This results in a higher-loop stability, also, the feedback (compensation) high impedance be interpreted. Below shown the changes for constant voltage / constant current:

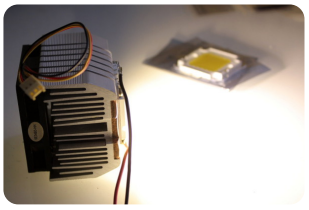




Finally some pictures to color

impression at each firm White Balance (Daylight) / aperture / exposure time (separately for both subjects):





If you want to learn more, looking in D-Amp-Forum over.

LTSpice Simulation:

Download (Zip)

Tags: Boost CCCV

Constand Current Konstantstromquelle LED Step-Up UC3842 UC3843 UC3843A

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30 NOV, 2014

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Mike

24. March 2015 at 19:14

Hello,

Thank you for this interesting

comments, they provide a wonderful base for other projects!
However, I noticed a small discrepancy:
Looking at the Spice circuits for constant current and the summary was highlighted in color in, then diode D2 / D3 is wired differently. Spice it lies just behind the voltage divider VR1 / R3 and directly affects both FB, COMP R1 and VR2. In contrast, the diode colorized plan is right on FB, before that comes in VR2, and * behind * is R1 (R20) to COMP.
Of these, probably because it is present the typical voltage drop across the diode vote only one version, I suppose.
Is it correct to assume the Spice version here?
Best regards!
Mike

Reply

360customs

6. April 2015 at 17:49

Hi Mike,

thanks for the comments. Both circuits are equivalent to the circuit of R1 to COMP. Both will work - the SPICE circuit is preferable. (Conceptually push the diode to the voltage divider, it can be seen)

Greeting Christian

Reply

Thiago

22. November 2014 at 21:13

Hello , congratulations on your posting.
I have convert identical. I want to use in electric motor 18 VDC x 8A through the 12 volt battery.
What change in this circuit that could help me.

Return wait .
Thank you/

Reply

360customs

25. November 2014 at 11:55

18VDC*8A = 144VA – way to much for the converter. You'd better got for a 600W converter that can be found on Ebay at ~$14.

Regards, Christian

Reply

Max 17. July 2014 at 1:48

Get them here:
http://www.ebay.de/itm/310523503559

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