

Re: High current LED driver circuit

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electronic.piaf@xxxxxxxxxx wrote:

Hello,

Does anyone have some simple circuit design that will handle 16 high power leds from 220V power source?

The idea would be to control the current from 320 to 700ma for the

key question is – what is capacity of their junction. with this knowledge, you can connect them safely in parallel and use step down DC–DC regulators commonly used for driving small transformers . there are various chips like that avail, i do not want to advertise anything, try querying part databases for 400–600V rated , single chip DC–DC converters or mosfet drivers. you need just a cap and rectifier bridge for them, and instead of transformer winding you just connect your LEDs via small coil. capacitance of LEDs is issue here, like you need to at least basically know it, to choose proper oscillating freq , rising edge time, and coil.

or, you can use bit dangerous but xtremely cheap way and use plain thyristors. there will be significant stroboscopic effect, and your LEDS can be destroyed by voltage spikes in power grid. thyristors should be turned on on falling slope of AC sine wave , when voltage is rated for diodes, or better , but bit less efficient – intermediate voltage can be used, then regulated thyristor rectifier just charges intermediate voltage cap, and current is then limited by plain passive element like small resistor.

minus might be relative complexity, like even it's simple circuit , it is not 'one chip' design like lm or dc–dc chip.

russian designers often use small capacitor in series to device which acts as load as current limiter. it works quite well if AC is 50hz, there are no abrupt spikes and you plan to never use device with i.e. trapezoid AC inverter. calculation for such capacitor might be bit tricky in case of assymetric load (diode), you could though connect half of diodes in one direction, and another half – in opposite. this will equalize current flowing back and forth cap, and thus simplify impedance calculations.

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if you do not mind cost, you could use LC filter, with or without rectifier. it is not very efficient, and calculations might be tricky (you also have to wind quite large coil), but you get decent protection against voltage spikes, totally simple design (rectifier and LC filter, or just one simple coil in series to diodes). minuses – you must use 50hz, as with series cap, otoh trapezoid AC source will not destroy your lamps, but just make them shine dimmer.

i wish you luck

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