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NUD4001 LED Driver Demonstration Boards

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APPLICATION NOTE

General Description

The NUD4001 demo boards are simple circuits which bias the NUD4001 device so that its functionality can easily be observed. Because the NUD4001 device can be used in different ways and applications, two different demo board versions have been developed to cover most of the application cases.

Demo Board A

The purpose of this demo board is to demonstrate the operation of the NUD4001 device for applications where the voltage difference between the input voltage and the LED's voltage is small (i.e. when a 12 V supply voltage is used to power up a LED array composed of three Luxeon 1 devices).

This is the ideal case for the NUD4001 device to operate because the power dissipation on the device is significantly reduced when the LED's array voltage is close to the input

voltage (for further explanations, see design guide on Page 4 of device's data sheet).

The defaults of the demo board A are set to take a 12 V dc or ac input voltage and to provide a LED current of 350 mA. The settings can be changed to meet different application needs. However, the important thing to consider when changing the default settings of the board is not to exceed the NUD4001 device's ratings of voltage, current and power dissipation. Figure 1 illustrates the schematic diagram for the demo board A, and Figure 3 on the following page, shows a picture of a finished board.

The dc or ac input voltage is applied between the two terminals of the board. The connector named Con1 can be used as an alternative way to supply a dc voltage to the board from an IBM ac computer adapter with an output of 16 Vdc and 4.5 A.

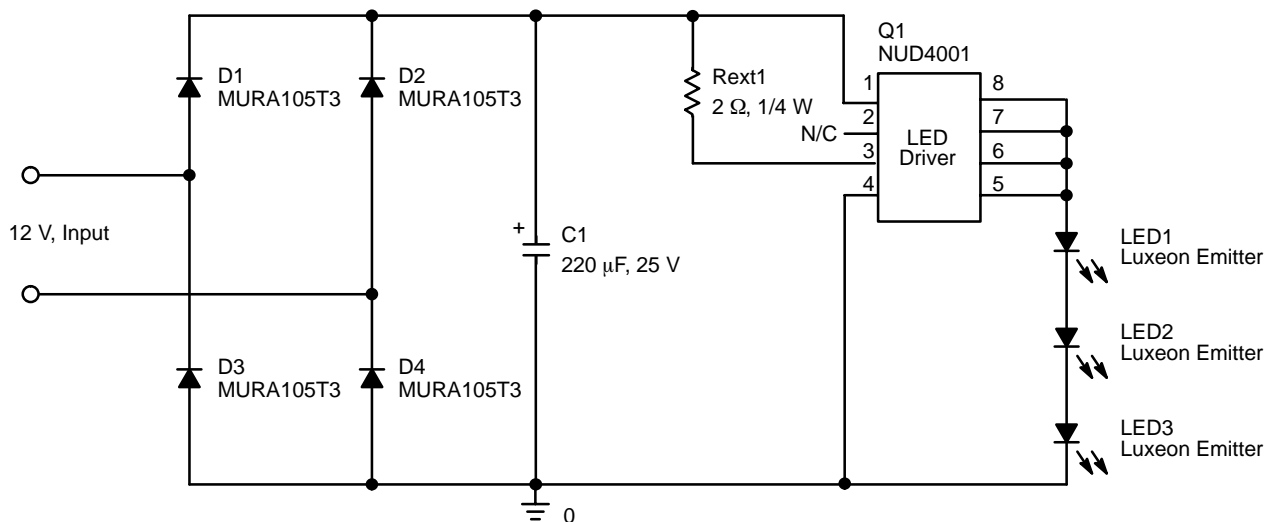


Figure 1. Schematic Diagram for Demo Board A

Demo Board B

The purpose of the demo board B is to illustrate a different circuit concept for applications where the voltage difference between the input voltage and the LED's voltage is large (i.e. when a 12 V supply voltage is used to power up a single LED Luxeon 1).

For this circuit, the NUD4001 device is configured to operate as a controller of an external high power transistor. This way, the high power transistor will drive most of the LED current (around 95%) and only a small portion (around 5%) will be driven by the NUD4001 device.

This type of circuit configuration allows higher power dissipation and higher LED current capability. The heat sink selection for the external transistor depends on the amount of power to be dissipated, which is defined by the conditions of each application circuit.

The defaults of the demo board B are similar than the demo board A. It is set to take a 12 V dc or ac input voltage and to provide a LED current of 350 mA. The settings can be changed to meet different application needs. However, the important thing to consider when changing the default settings of the board is not to exceed the NUD4001 and TIP32 devices' ratings of voltage, current and power dissipation.

Figure 2 illustrates the schematic diagram for the demo board B, and Figure 4 shows a picture of a finished board.

The dc or ac input voltage is applied between the two terminals of the board. The connector named Con1 can be used as an alternative way to supply a dc voltage to the board from an IBM ac computer adapter with an output of 16 Vdc and 4.5 A.

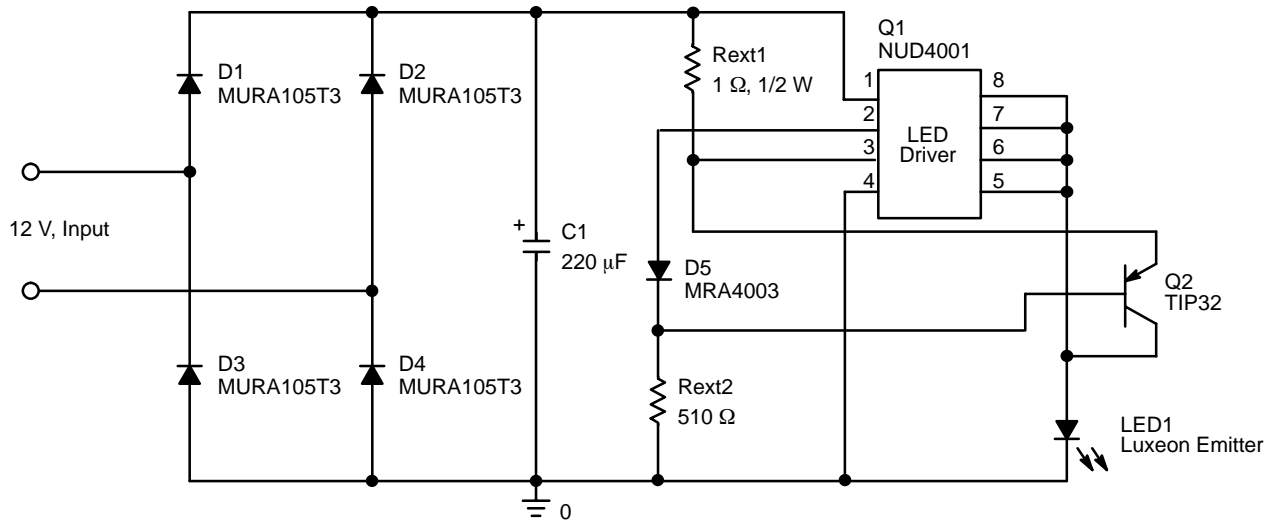


Figure 2. Schematic Diagram for Demo Board B




Figure 3. Picture of Finished Demo Board A



Figure 4. Picture of Finished Demo Board B

Notes

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