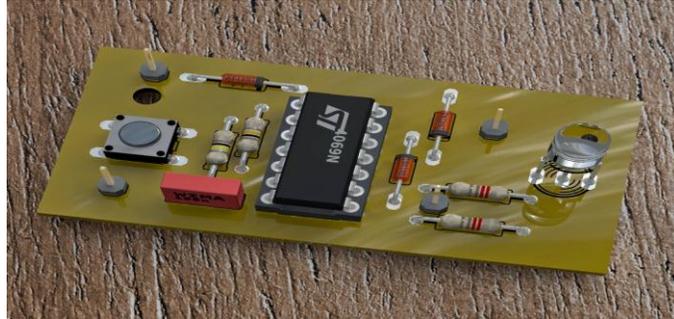


# COMPUTER PSU START CIRCUIT WITH BICOLOR LED



There are a lot of tutorials on the internet on how to turn a computer PSU into a bench top power supply. Most of them involve adding a load on the 5V line and turning the PSU on by grounding the PS\_ON wire via a switch.

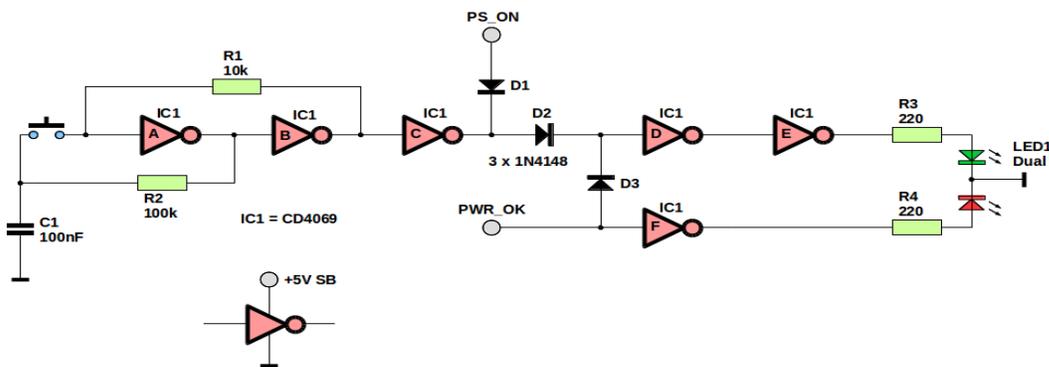
ATX PSUs work well under rather constant loads. So if you power up the PSU with a small load of a few tens miliamps and then connect a greater load, for example a car light bulb which may require 3-4 A, the PSU may shut down. The same happens in case of an accidental short circuit. You may believe that the PSU got broken or its fuse got blown. That's not true. The PSU automatically shut itself off.

To know the current state of the PSU, three signals should be monitored:

- +5V SB - the standby voltage - if it is present, then the PSU is connected to the mains.
- PS\_ON - if it is held low, the PSU should be on and the required voltages should be present at the outputs

- PWR\_OK - matters only when PS\_ON is held low. A high level (5 V) on PWR\_OK means the PSU is working. A low voltage signals that the PSU is in an error state and a power cycle should be made.

The following circuit displays the state of a PSU using only one LED (a bicolor one). More than that, it allows you to switch on and off the PSU by means of a simple push button.



Schematic of the ATX PSU start circuit

The circuit is simple. Inverters A and B form together an alternating ON/OFF switch (as seen on Tony van Roon's webpage). At power-up inverter B output is low. So inverter C output is high, thus not holding PS\_ON low. PWR\_OK is low as the PSU is in standby mode. Inverters D and E are there to drive the LED. Inverter F input is low (PWR\_OK) so the LED is on. The other LED is on too, so it will appear as yellow/orange light. This is in standby. When the button is pressed, inverter B output is toggled to high, thus starting PSU and turning of the green half of the LED.

If everything is OK, PWR\_OK should become high, turning off the red LED and turning on the green one. If PWR\_OK goes low, both inverter D and F inputs go low, thus turning on the red LED and off the green one, indicating an error.

The circuit connects to:

- GND - any black wire
- PS\_ON - usually the green wire
- PWR\_OK - usually the gray wire
- +5V\_SB - the purple wire

For more information on ATX connector pinout see [pinouts.ru](http://pinouts.ru).

The LED color means:

- yellow - PSU is in standby
- green - PSU is on and working
- red - PSU is turned on, but the operating voltages are not (all) present at the output. A power cycle is required (even a mains power cycle if the button can't get it back on).

Don't forget the load resistor (10...22 ohms at 10 W) on the 5V line; otherwise the PSU may not start at all.

Source: <http://onetransistor.blogspot.in/2014/09/computer-psu-start-circuit-with-bicolor.html>