

# Project Documentation

## Illuminated Commodore Logo

Project number: 135

Revision: 0

Date: 25.10.2019



# Illuminated Commodore Logo Rev. 0

## Module description

The Commodore Logo is a sort of fan art and the purpose is the use in hobby projects. A transparent 3D printed body is illuminated with two LEDs and masked with a face plate, that is designed to the measures defined in a document about the Commodore C= logo.

The PCB contains two 5mm LEDs, which are sufficient to illuminate the logo. These LEDs require a current limiting resistor each, which is also contained on the PCB.

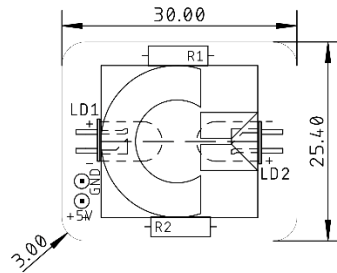


Figure 1: Dimensions of the PCB

For 5V supply voltage and a standard red, green or yellow LED, a value of  $330\Omega$  is sufficient. For other LEDs, like a blue or white LED, or other supply voltages or currents, the resistor value has to be calculated.

$$R_{LED} = \frac{U_{supply} - U_{f,LED}}{I_{f,LED}}$$

$R_{LED}$ : current limiting resistor for the LED

$U_{supply}$ : Supply voltage

$U_{f,LED}$ : Forward voltage of the LED

$I_{f,LED}$ : Forward current of the LED

The forward voltage and current can be found in the data sheet of the LED. That is the voltage drop over the LED, when it is conducting and the current should be below the maximum rating. A typical value for a standard LED is  $U_{f,LED}$  is 1.8V and for the current  $I_{f,LED}$  is 10mA. This results in

$$R_{LED} = \frac{5V - 1.8V}{0.010A} = 320\Omega \approx 330\Omega$$

The available resistor value closest to  $320\Omega$  is  $330\Omega$ . The resistors do not require a very accurate value, so it is no problem to use what is available. A range of  $\pm 10\%$  is ok for this purpose.

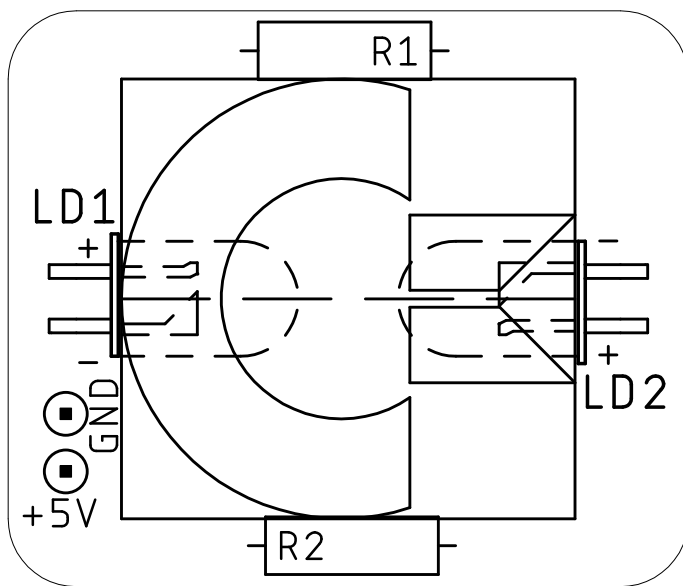
A blue LED with a forward voltage of 3.2V and a forward current of 20mA will require a forward resistor, that is

$$R_{LED} = \frac{5V - 3.2V}{0.020A} = 90\Omega \approx 91\Omega$$

A  $91\Omega$  resistor is sufficient. Notice: The forward voltages of blue LEDs are varying and it is required to look it up for the specific LED. The same applies for white LEDs.


A	B	C	D	E	F	G	H	K															
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Sven Petersen 2019	Doc.-No.: 135-2-01-00	
	Cu: 35µm	Cu-Layers: 2
C-logo		
25.10.2019 09:54		Rev.: 0
placement component side		



Sven Petersen 2019	Doc.-No.: 135-2-01-00	
	Cu: 35µm	Cu-Layers: 2
C-logo		
08.08.2020 17:15		Rev.: 0
placement solder tabs		

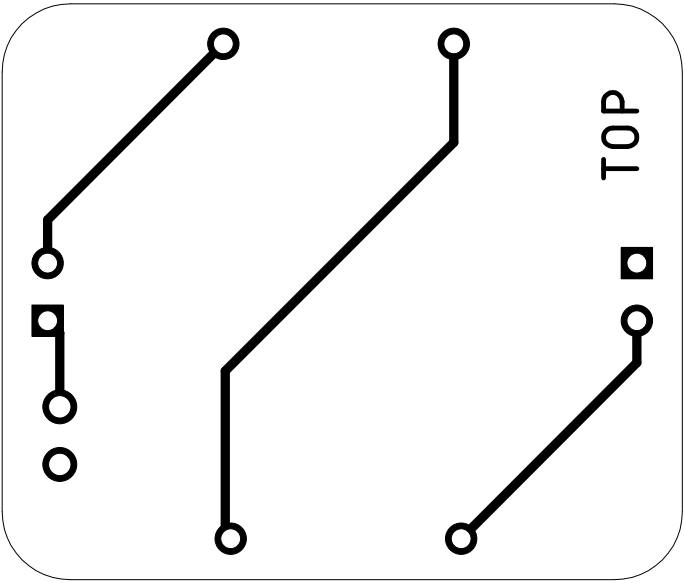
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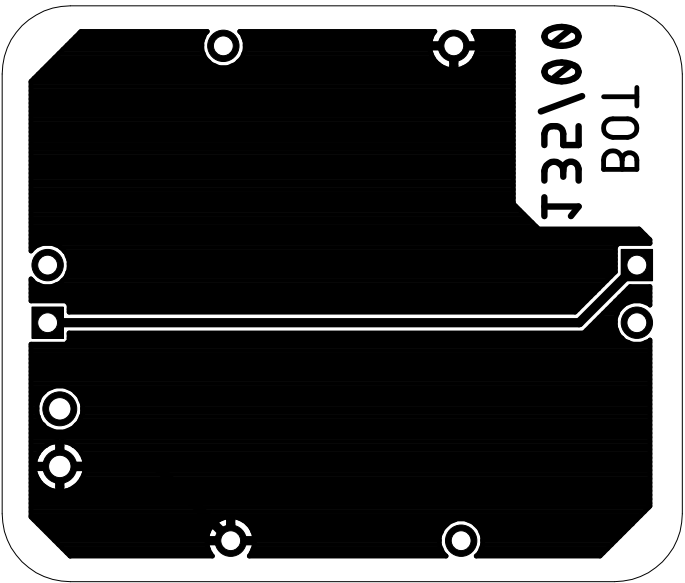
<http://www.svenpetersen1982.com>

GND  
+5V

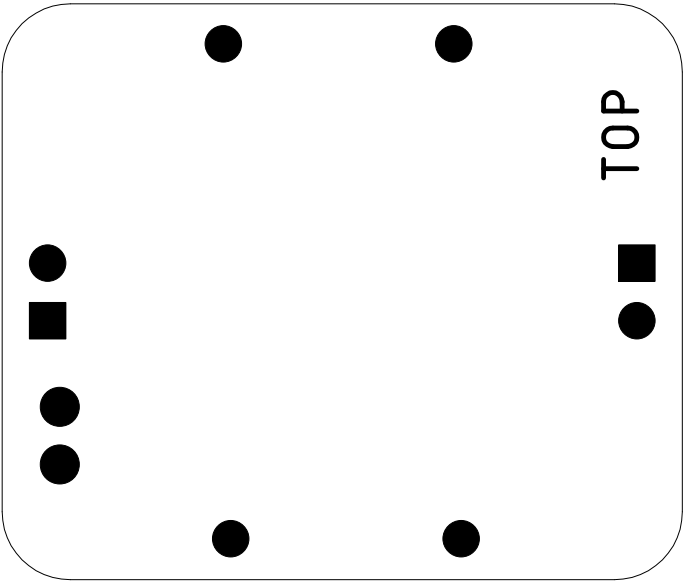
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top		



Sven Petersen 2019	Doc.-No.: 135-2-01-00	
	Cu: 35µm	Cu-Layers: 2
C-logo		
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bottom		

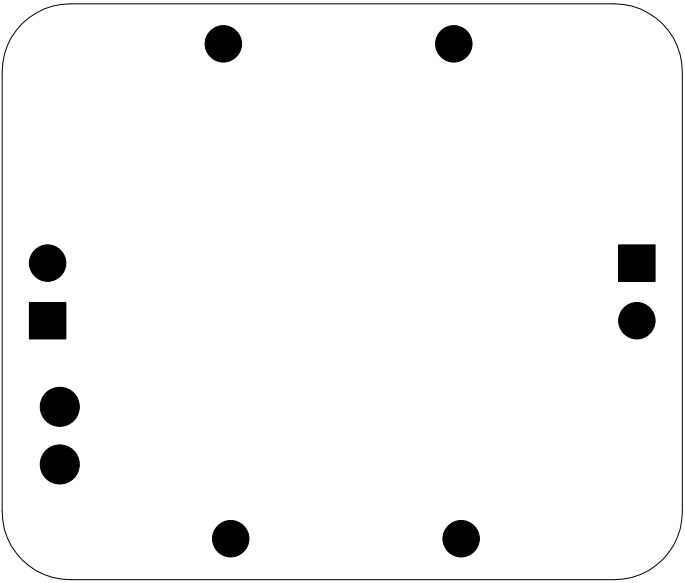


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stopmask component side		





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stopmask solder side		



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C-logo		
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placement component side		measures

