

Maximum LED strip is 5m@14.4W/m  
Input is 12Vdc±10%, maximum 8A.

Ensure 2.5mm<sup>2</sup> hole sizes  
for CONN1 and CONN2.

Keep high current traces to  
minimal lengths on PCB – route  
off-board with discrete wires,  
direct to connectors.

Ensure 2.5mm<sup>2</sup> hole sizes  
for CONN1a and CONN2a.

Pin 2 of CONN2 provides  
flexibility in routing  
ground return currents.

Connect pin 2 direct to pin 2 on CONN1  
to prevent high DC return currents  
flowing on PCB signal ground.

Pins 2 and 3 provide flexibility  
in routing ground return currents  
for the fast LEDx edges whilst  
avoiding potentially large DC return.

Ensure 1.5mm<sup>2</sup> hole sizes.

High-Voltage Programming not supported.  
Transient protection limits bandwidth  
so keep ICSP clock at 1MHz or less.

ZCABLE ~40Ω  
ZPIC termination has been  
simulated using IBIS models.  
Each output will need damping  
with discrete components at the LED strip.

If cable length requires it then place  
a further 4.7kΩ (externally) in parallel  
with R22 and R23 to increase the I2C  
drive strength to about its maximum. A  
compromise between meeting I2C VIL  
and circuit simplicity has been made for  
ESD protection of these pins. Violation  
of the PIC's I<sub>k</sub> clamping current (20mA)  
may occur.

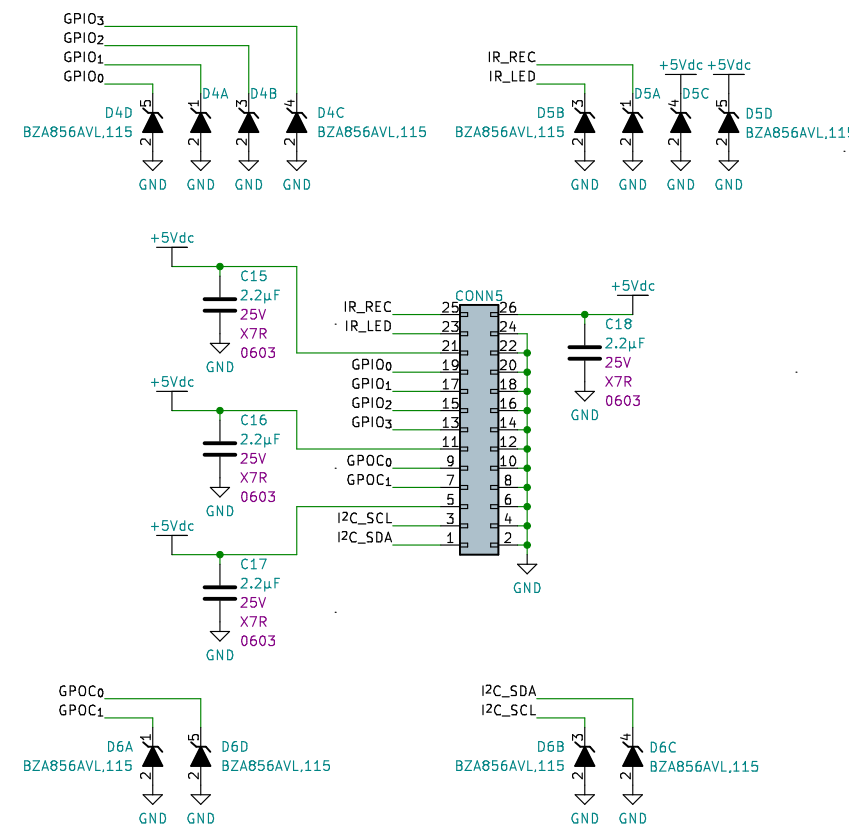
Current source for roughly 87mA;  
75mA–96mA over temperature

PCB Stackup:  
L1 – Signal / Power  
L2 – Ground  
L3 – Ground  
L4 – Signal / Power

JLC Stackup JLC04081H-7628:  
Z<sub>0</sub>=40Ω, w=20.46mil, L1–L2  
Z<sub>0</sub>=76.5Ω, w=5mil, L1–L2  
Z<sub>0</sub>=85.25Ω, w=3.50mil, L1–L2

2) JLC04161H-7628 Stackup

Layer	Material Type	Thickness	
Layer	Copper	0.035mm	
Prepreg	7628*1	0.2104mm	
inner Layer	Copper	0.0152mm	1.1mm (with copper core)
Core>	Core	1.065mm	
inner Layer	Copper	0.0152mm	
Prepreg	7628*1	0.2104mm	
Layer	Copper	0.035mm	



Unless otherwise specified:  
All resistors are thick-film ±1% ±100ppm  
All 0402 resistors are 0.0625W, 0603 are 0.1W and 0805 are 0.25W  
All unpolarised capacitors are MLCC ±10% with X7R tempo

Drives two strips of 60 LEDs/m at 14.4W/m; max 5m (8A) total

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**Title: Kitchen WS2812B RGB LED Strip Controller**

Size: A3 Date: Aug 2023

Rev: 1.0

KiCad E.D.A. kicad 6.0.11-3.fc37

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