ENCs module

Encoders illuminated with WS2812 LEDs

Schematic

Power input is +5V via a 3-pin 100mil connector (or Molex) and a Schottky diode. The value of electrolytic capacitor C1 is not critical.

The pLED chain enters via J2:pin 6 and resistor R1. The resistor should be replaced with a wire link for each additional module (i.e. only the first in the chain gets a resistor, the remainder stuffed with wire links). The serial chain then follows a snake pattern to J3, where additional pLED modules may be connected. The LED ID matches the capacitor name. The RC (R2, C18) end termination shouldn't be necessary, but can be trialled should problems with signal reflection arise.

Encoders are arranged in columns with outputs on J4–7. The top encoder (EN1/5/9/13 uses pins 10/9, the second (EN2/6/10/14) 8/7 etc. Note that the direction of these encoders is opposite to that of ALPS STEC-12. This needs to be accounted for in an MB_NG config file.

BOM v1.1

Type	Qty	Value	Package	Parts	Notes
resistors					
	1	220-470R	0204/7	R1	replace with wire link for each additional module
capacitors					
	16	100n	1206	C2-17	
	1	100-1000u	electrolytic 3,5-6	C1	
diodes					
	1	1N5187	DO41-7.6	D1	
	16	WS2812B	5050	programmable LEDs	
encoders					
	16	clear shaft 12mm encoders		EN1–16	
headers					
	6		2*5 (shrouded) THT	J2-5	can use DIL 100mil breakaway header strips
	1		1X03_SMALL	J1	can use Molex 22-23-2031
misc					
	16		spacer pieces		optional

Versions

v1.0: errata: J4–7 have no connection to ground. J1-3 do carry ground, so it isn't a problem if the DIN modules share the same power rail.

Assembly

1206 caps should go down first, followed by LEDs. The LEDs should be oriented with the notch aligned with the silkscreen mark. The headers are best soldered before the encoders.

The encoders should be installed so they can turn freely. If they are tight against the LEDs, the shafts will not turn properly. A spacer piece can be placed around the LED to raise it up. It's then best to straighten the two mounting pins (either side of the three contact pins) forming part of the metal body (otherwise there's not enough purchase to get the encoder solidly mounted). A 2mm spacer piece would probably be better than the 3mm one I've distributed.

Interconnections

- J1 is a power header with +5V as marked, middle pin 0V.
- J2 normally connects to Core J4B (I2C)
- J3 carries the WS2812B chain for additional modules
- J4-7 connect to DINX4 headers

License

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