Smart ByPass

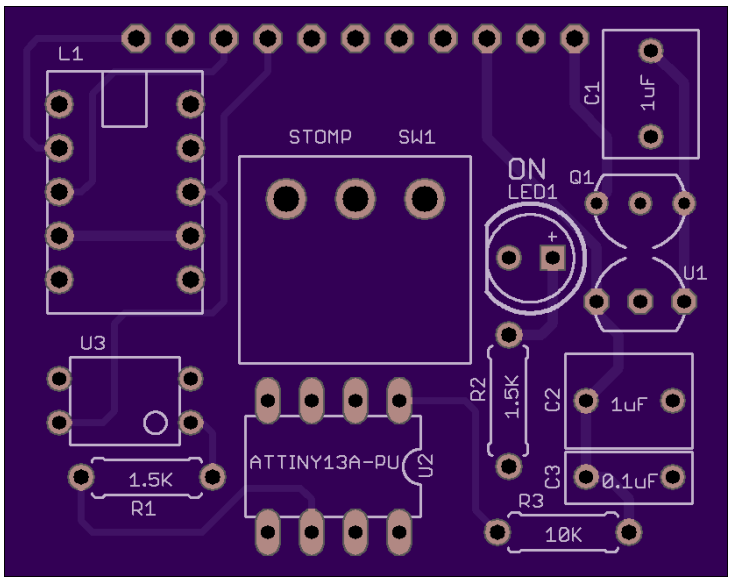
Designed By Erik Vincent

A reliable and professional bypass solution; The Smart ByPass has been designed with a “smart” preprogrammed ATTINY chip at its core and covers almost everything you could want in a bypass solution. This kit comes with all the parts you need (see BOM below) to build the Smart ByPass, including a preprogrammed chip, making its construction for you simply a matter of soldering. Just some of the many features built into the Smart ByPass include:

- Reliable, ‘soft touch’ non-latching SPDT stomp E-Switch (rated at 30,000 cycles)
- Reliability of a relay bypass solution (analogue latching relay)
- Regulated (power filtered) 5v output
- Smarter reverse polarity protection for your pedals using PFETs instead of diodes
- Kit includes Preprogrammed attiny13a and all parts for easy assembly including the footswitch!
- The state of the relay is held for ~1/2 a second if power is disconnected. This is to prevent slight power interruptions that would otherwise cause the Smart Bypass relay to switch to bypassed mode.

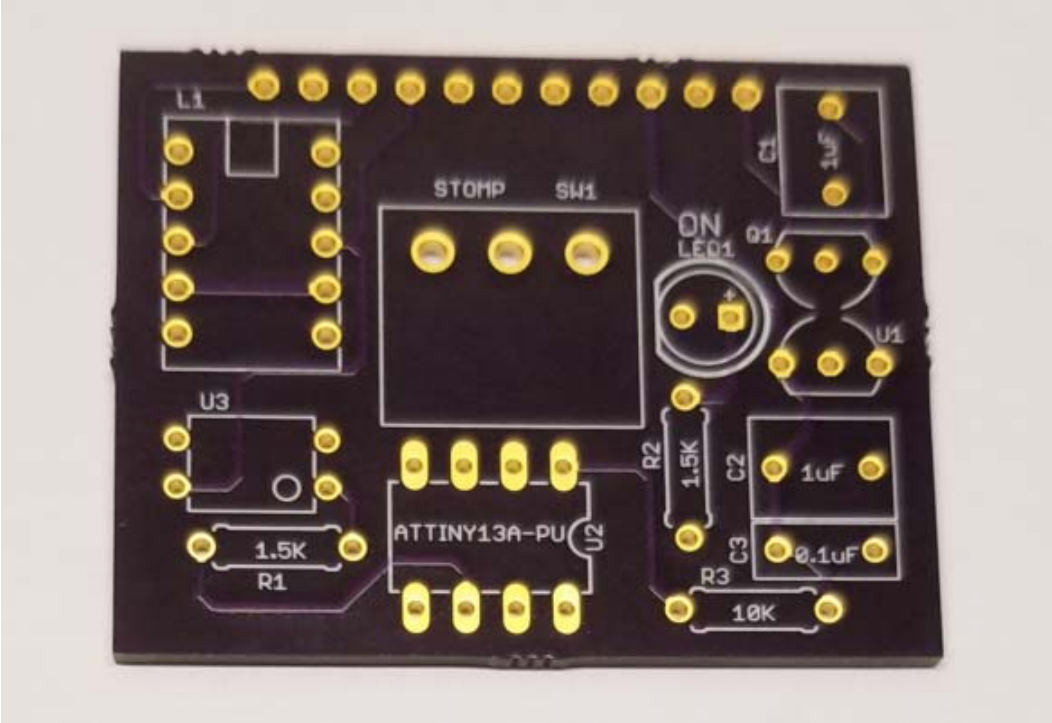
Bill of materials

Relay		Capacitor	
L1	TQ2-L-5V	C1	1uf (film)
		C2	1uf (film)
Stomp Switch		C3	100nf (film)
Mini Non-Latching SPDT Stomp Switch			
IC		**Transistor**	
U1	LP2950-50LPRE3 *(68MR7CE)*	**Q1**	VP2106N3-G
U2	ATTINY13A-PU		
U3	G3VM-351A	**Resistor**	
		R1	1k5
LED		**R2**	1k5 (LED CLR)
LED1	5mm Status LED	**R3**	10k

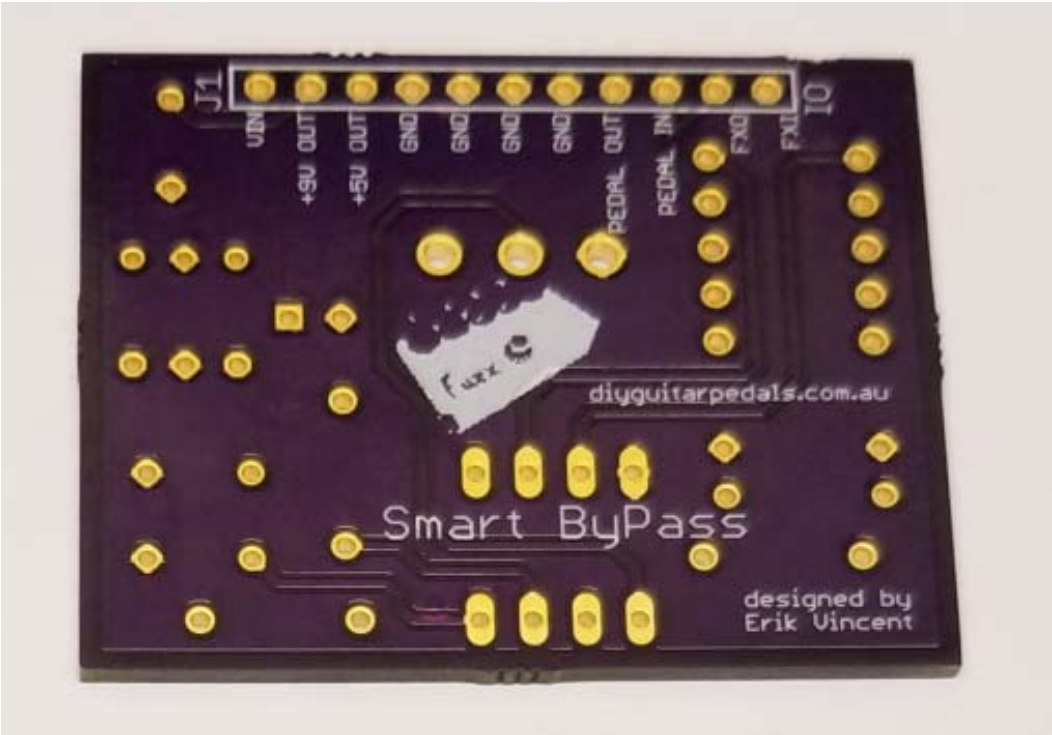


Assembly / Soldering

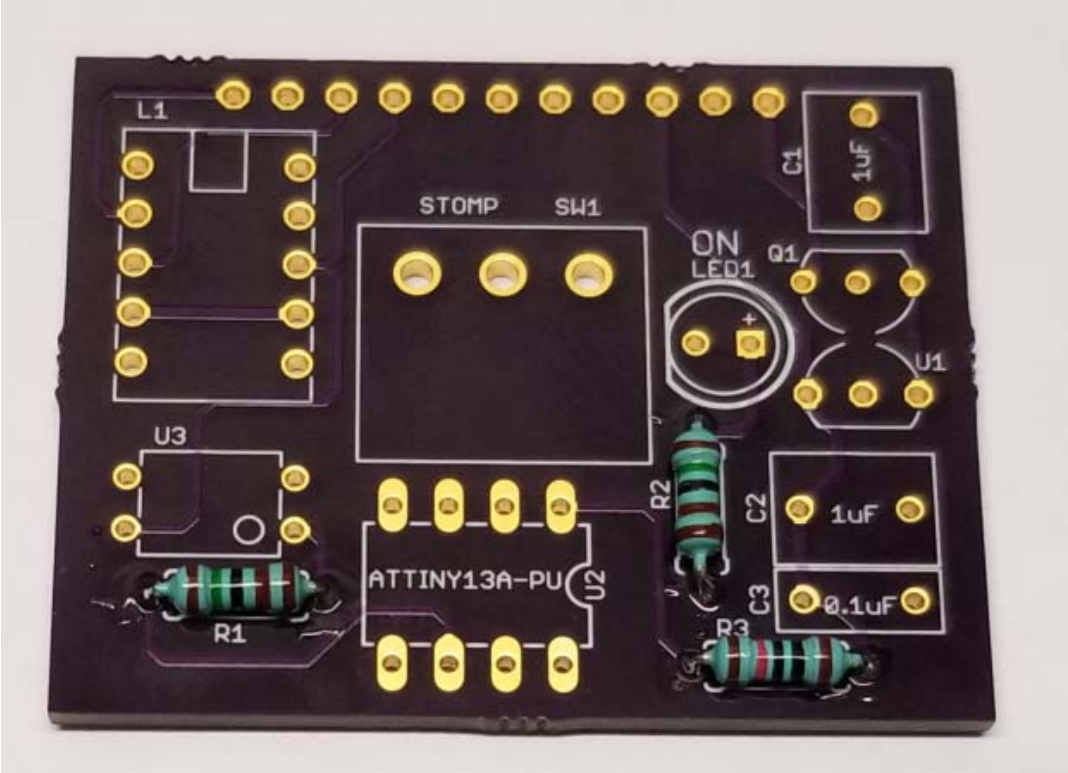
1. This is the top of the Smart ByPass PCB.



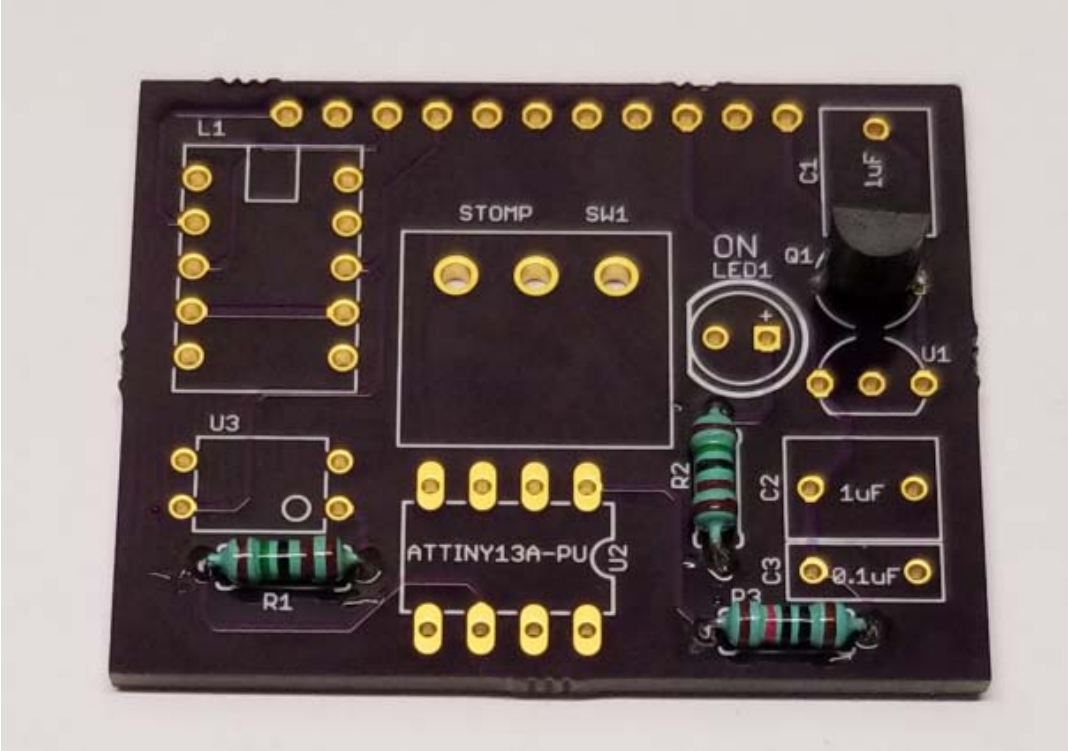
2. This is the bottom of the PCB. Note the J1 Header



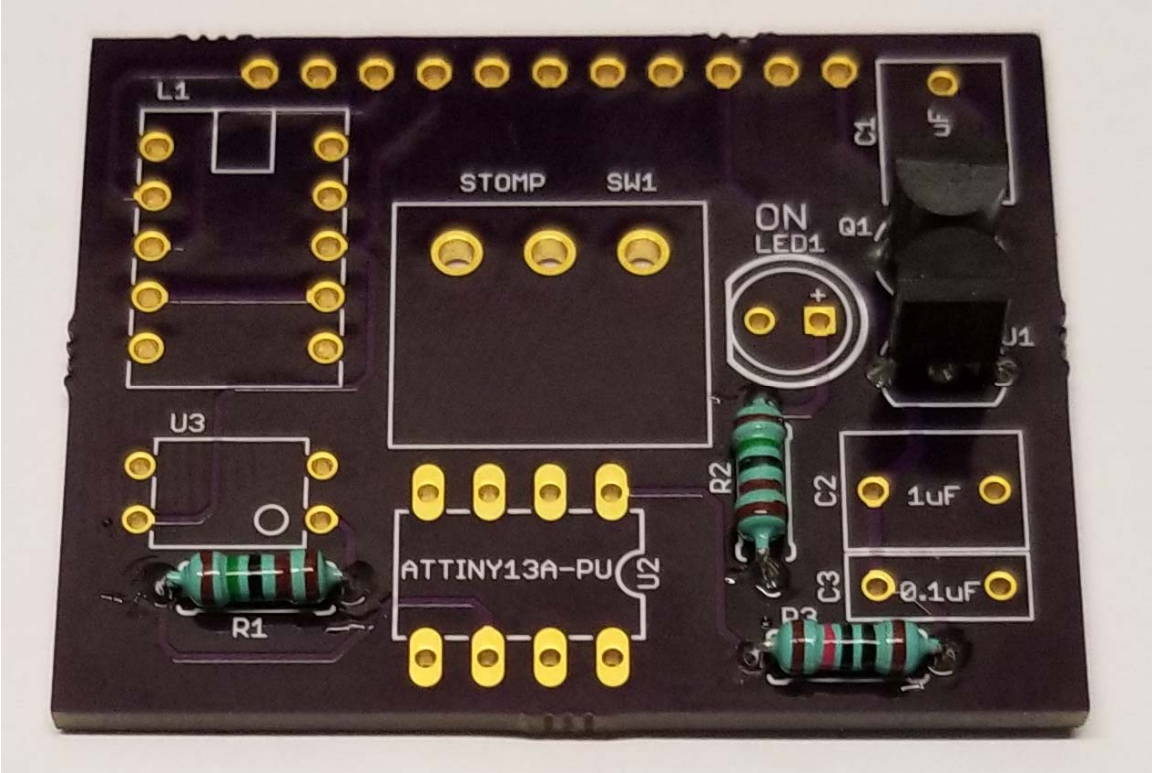
3. First, solder the 1/4W resistors. The values for R1 and R2 are 1.5K. The value or R3 is 10K.



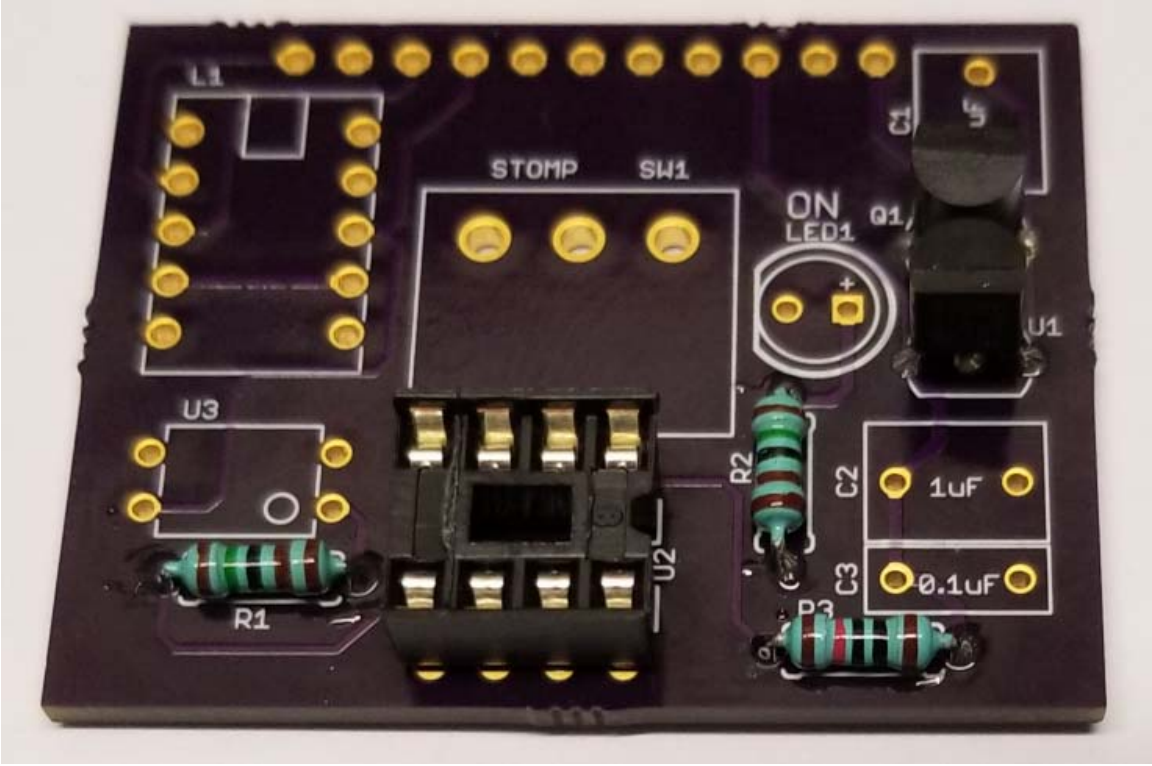
4. Next, solder the P-Channel MOSFET, Q1.



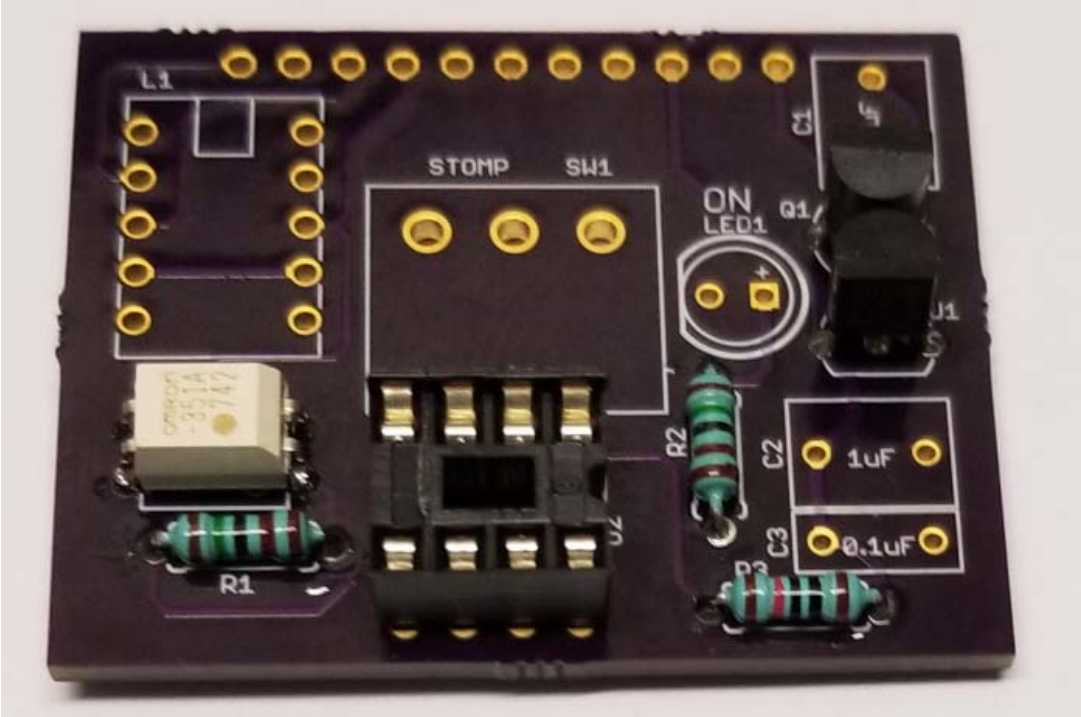
5. Next, solder the 5V Regulator, U1.



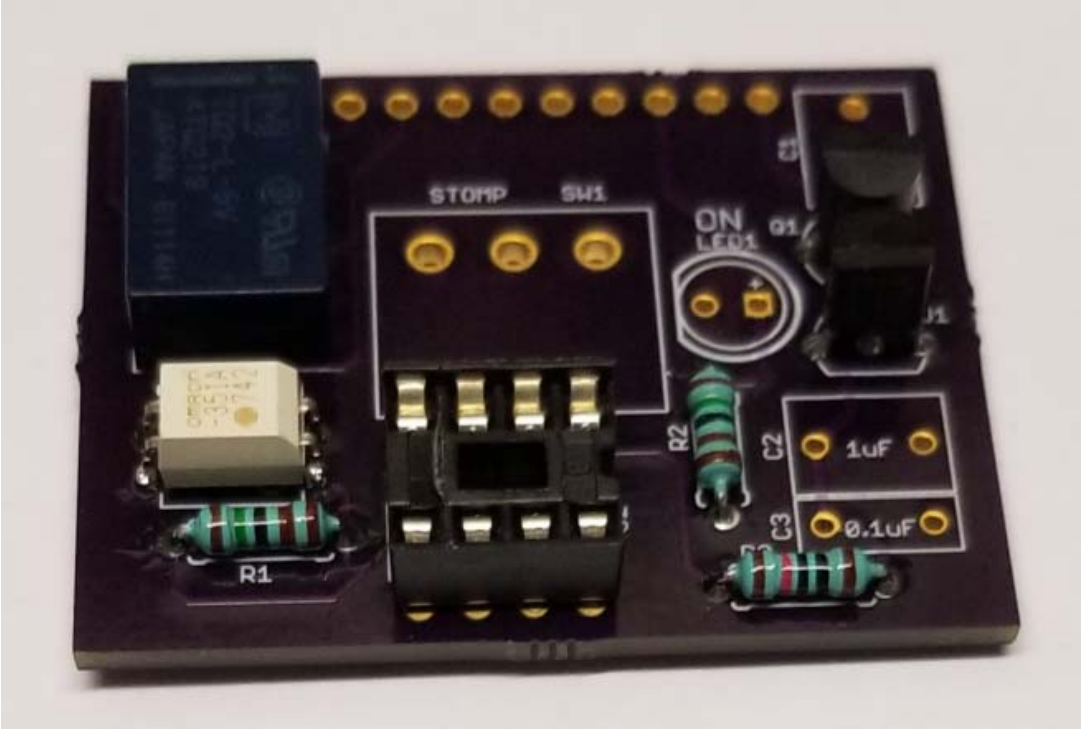
6. Next, solder the 8-Pin socket onto U2. Let Bono and the Edge know.



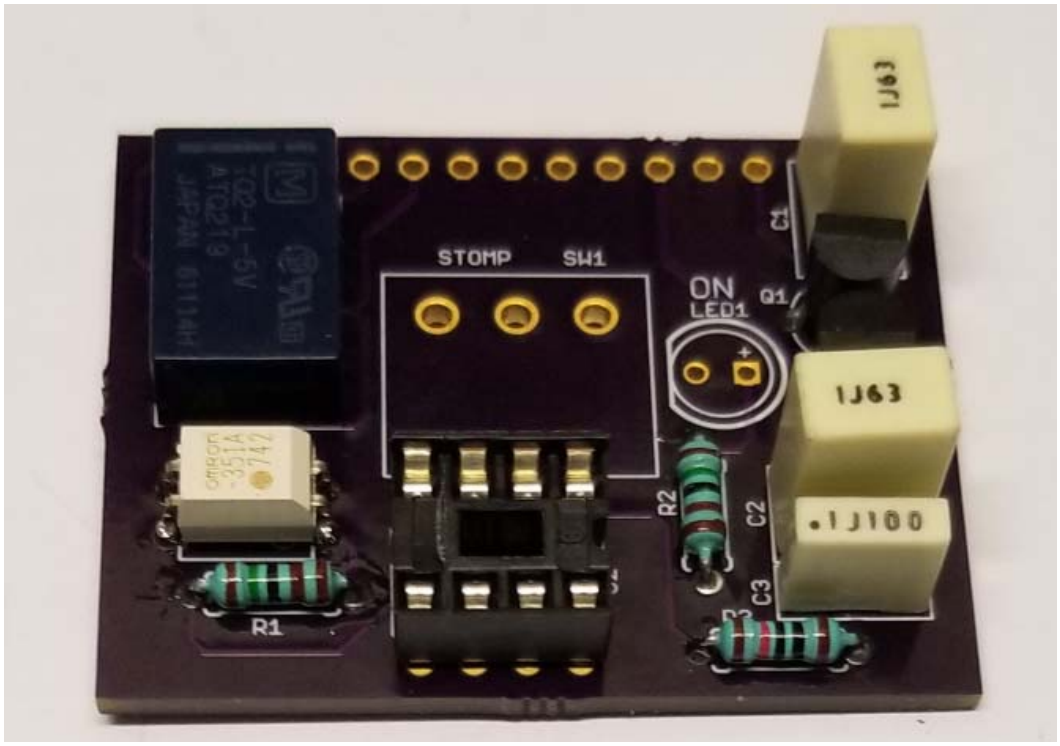
7. Next, solder the solid-state relay, U3



8. Next, solder the small current latching relay, L1

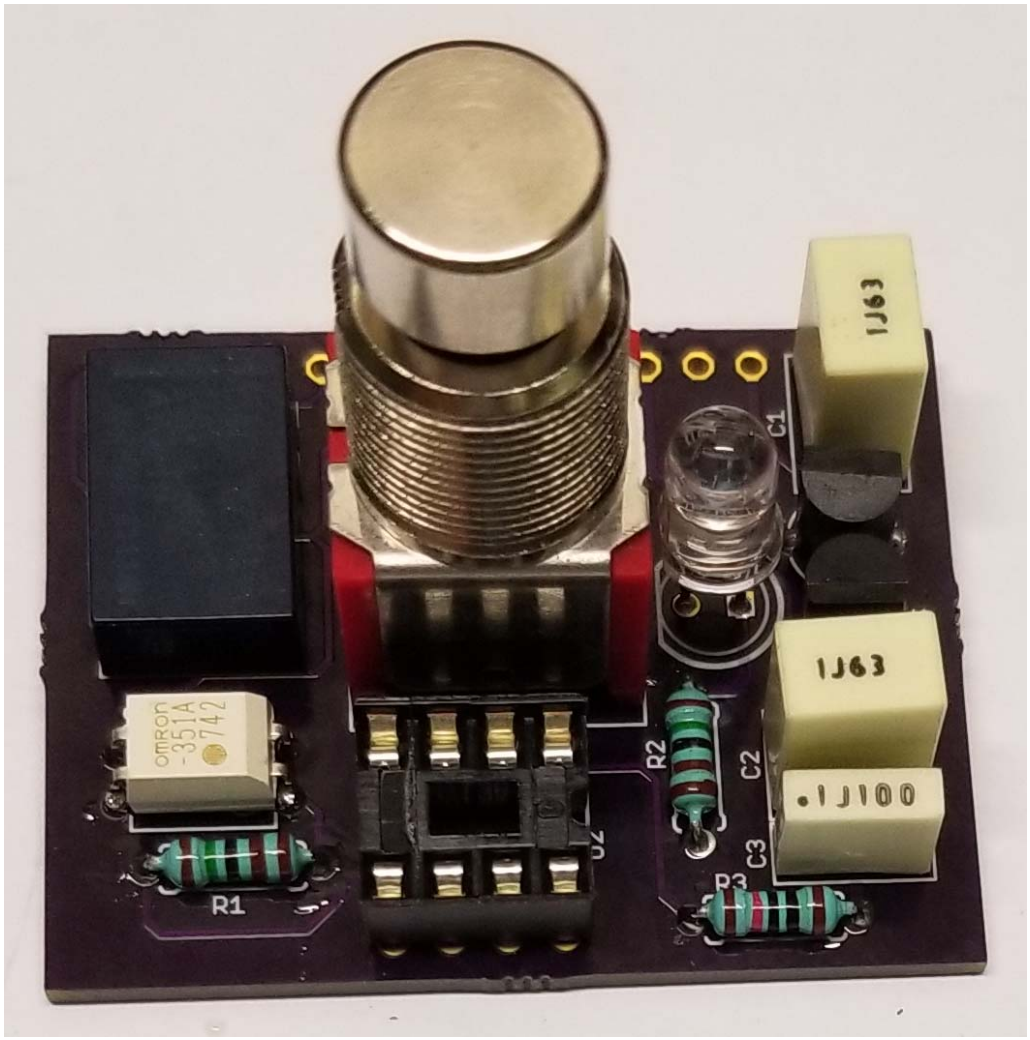


9. Next, solder the film capacitors, first with C3, then C1 and C2. The values of C1 and C2 are 1uF. The value of C3 is 0.1uF

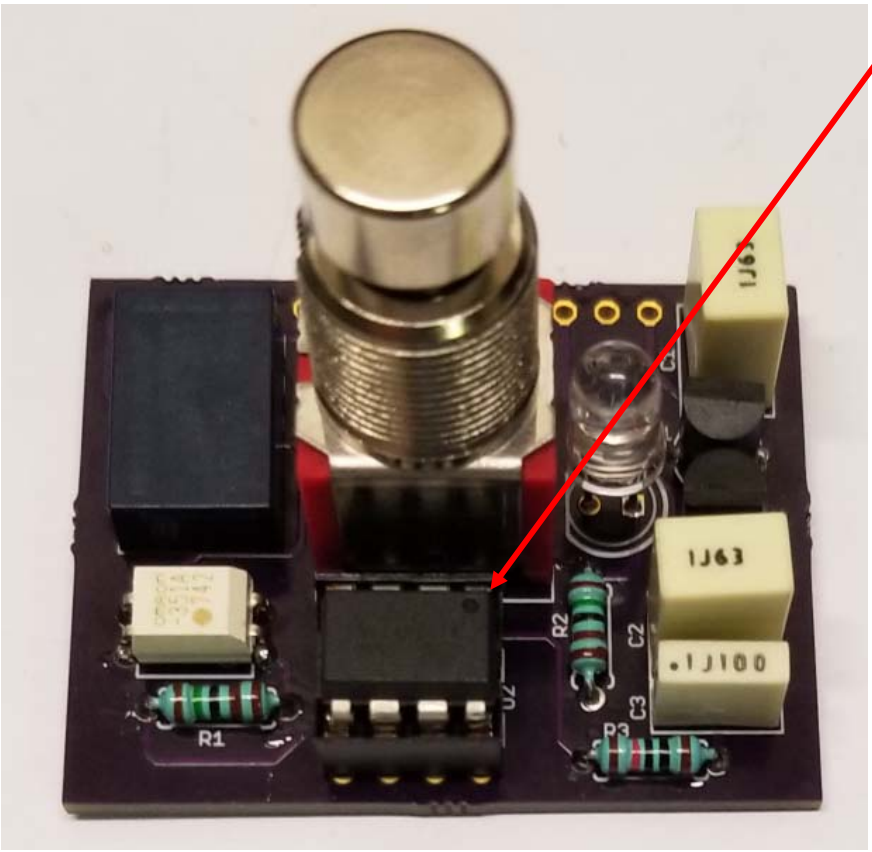


10. Next, solder up the stomp switch to SW1

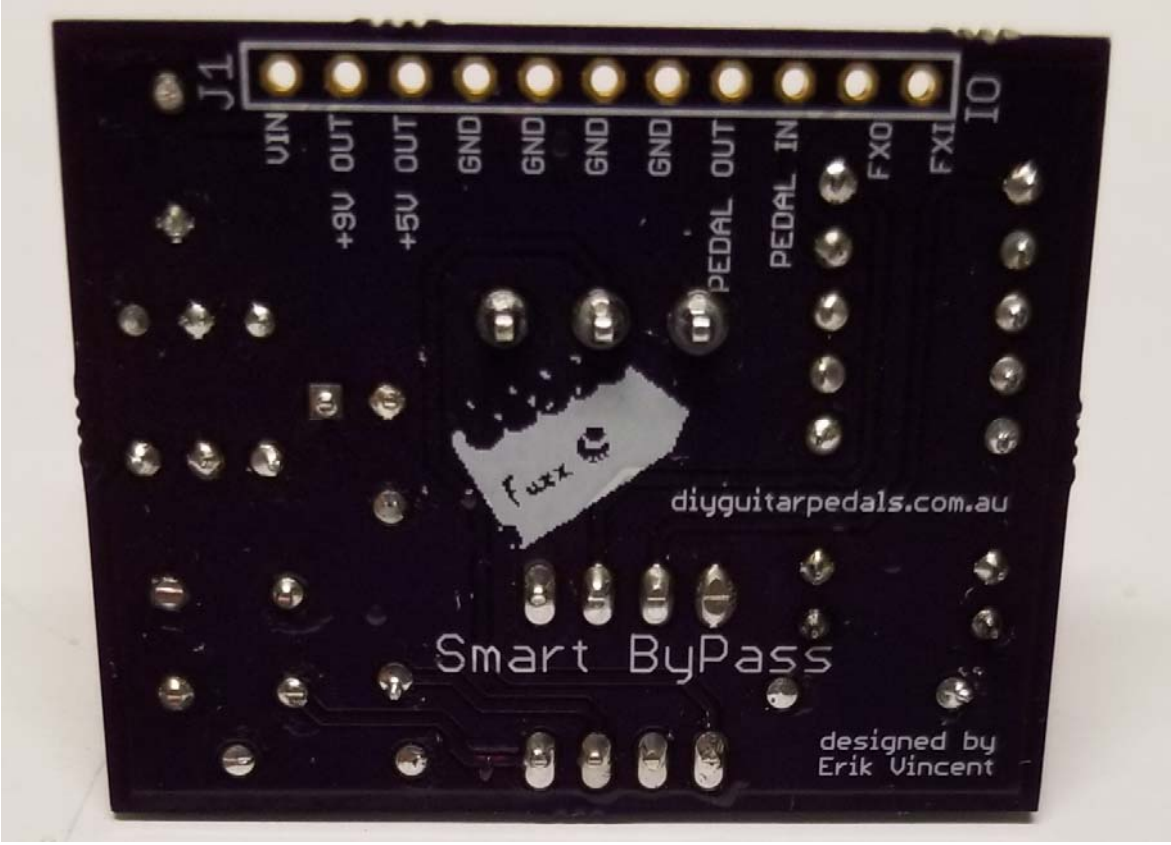
11. Next, solder the LED to LED1. It should stand off a little bit as to get it closer to where the stomp switch will be flush-mounted to the box of the pedal. Note the close proximity of the LED, you may need to adjust the position of the led if you are using a 14mm washer.



12. Next, insert the programmed microcontroller. Make sure the markings are correct.

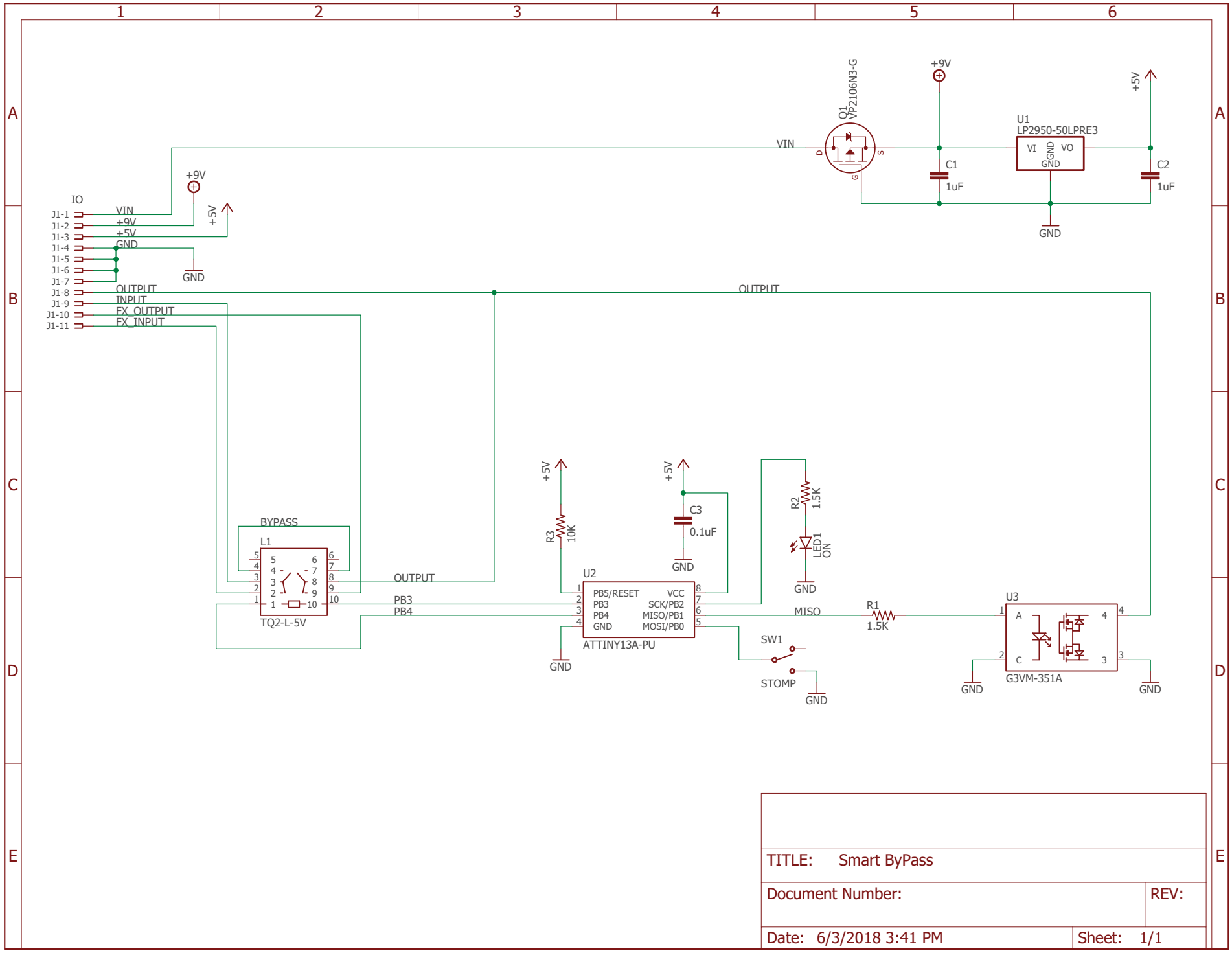


13. Flip over to the bottom and note J1 and its labels.



J1 – Header connections

VIN – 9V coming in from battery or wall power
+9V OUT – protected 9V power. This connects to your effect board to provide it 9V power
+5V OUT – protected 5V power up to 100mA. This goes to your effect board if it needs 5V power
GND – this is for common ground components such as power ground, input/output jack ground, and effect board ground. Note, not all grounds may be utilized.
PEDAL OUT – this connects to the output jack's output signal wire
PEDAL IN – this connects to the input jack's input signal wire
FXO – this connects to the effect board's output
FXI – this connects to the effect board's input


1
2
3
4
5
6
A
B
C
D
E
Q1
VP2106N3-G
VIN
+9V
U1
LP2950-50LPRE3
VI
GND
VO
+5V
C1
1uF
C2
1uF
GND
IO
J1-1
J1-2
J1-3
J1-4
J1-5
J1-6
J1-7
J1-8
J1-9
J1-10
J1-11
VIN
+9V
+5V
GND
OUTPUT
INPUT
FX_OUTPUT
FX_INPUT
BYPASS
L1
TQ2-L-5V
R3
10K
C3
0.1uF
R2
1.5K
LED1
ON
U2
PB5/RESET
PB3
PB4
GND
VCC
SCK/PB2
MISO/PB1
MOSI/PB0
ATTINY13A-PU
PB3
PB4
MISO
R1
1.5K
SW1
STOMP
U3
G3VM-351A
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