

PicProtection2ch smd – mounting instructions

Thanks for buying this PicProtection pcb or kit! Now the fun of mounting starts. Make sure you read the complete instructions before you start mounting. Read also the information on:

<http://www.djoke.nl/en/projects/1-power-amplifiers/22-pic-based-speaker-protection>

Assembling can be done by an experienced hobbyist in about one hour.

List of components

Please check if all is complete. The kit should have the following components, if you bought the pcb, these components are suggested (but you can of course adapt it to your needs).

SMD components

The following SMD components are pre-mounted for convenience

Qty	Value	Device	Parts
3	100n	C-1206	C1, C8, C10
2	33p	C-1206	C9, C11
11	1N4148	D-1206	D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12
7	100k	R-1206	R1, R2, R9, R11, R13, R16, R17
3	10k	R-1206	R3, R15, R10
2	1k	R-1206	R5, R6
3	22k	R-1206	R4, R8, R14
1	3k3	R-1206	R7
1	PIC12F675	SOIC-8	IC2
5	BC850	SOT-23	Q2, Q3, Q4, Q5, Q7
2	BSS138	SOT-23	Q6, Q8
1	12V	D-1206	ZD1

Through-hole components

Qty	Value	Device	Parts
2	10uF	C-Bipolar2.5/5	C6, C7
1	47uF	C-Elec2.5-6	C4
1	1uF	C-Elec2.5-6	C5
1	22uF	C-Elec2.5-6	C3
1	100uF/63V	C-Elec3.5-10	C2
1	2-pin	Con-AK500	SUPPLY
2	5-pin	Con-KK	CH1, CH2
1	LSP10	Con-pin	AC
1	2x6	Con-pinheader	ISP
2		Jumper	J1, J2 (use resistor spare wire)
2	red/green	LED3MM	POWER, PROTECT
1	100	R-2W	R12
1	MCP9700/1	T-sensor	TEMP
1	MJE3055	Transistor-NPN	Q1
1	7805	V-reg	IC1

Tools

- ✓ Soldering iron and solder
- ✓ Multi-meter (voltage and resistance)
- ✓ Side-cutting pliers

Supply

This circuit can be supplied directly from the positive supply rail (25-60VDC) of the power amplifier, in which case the cascade brings down the input voltage to the regulator to about 12V.

If a lower voltage is available (10-25V), the cascade with Q1 can be omitted and R12 can be bridged directly to the input of the voltage regulator.

The AC pin should be connected to one of the secondary windings of the power amplifier transformer (10-40VAC), so that loss of AC is detected immediately (before the capacitor bank discharges)

Mounting

The easiest way of mounting is by starting with the components with the lowest height and build up the PCB in steps, where components of the same height are fitted and soldered in each step. So, solder in this order: connectors, transistors, regulators,

electrolytic capacitors.

Hints:

- The LEDs can be wired to a front panel to provide visual feedback
- Using J1/J2, the positive supply for the relays can be selected (internal 12V or external supply voltage on CH#-2)

Always double check all components before you solder them (especially the ones that are polarity dependent: electrolytic capacitors, etc), as it is difficult to remove them after soldering, much more time consuming and may break components or PCB.

Testing

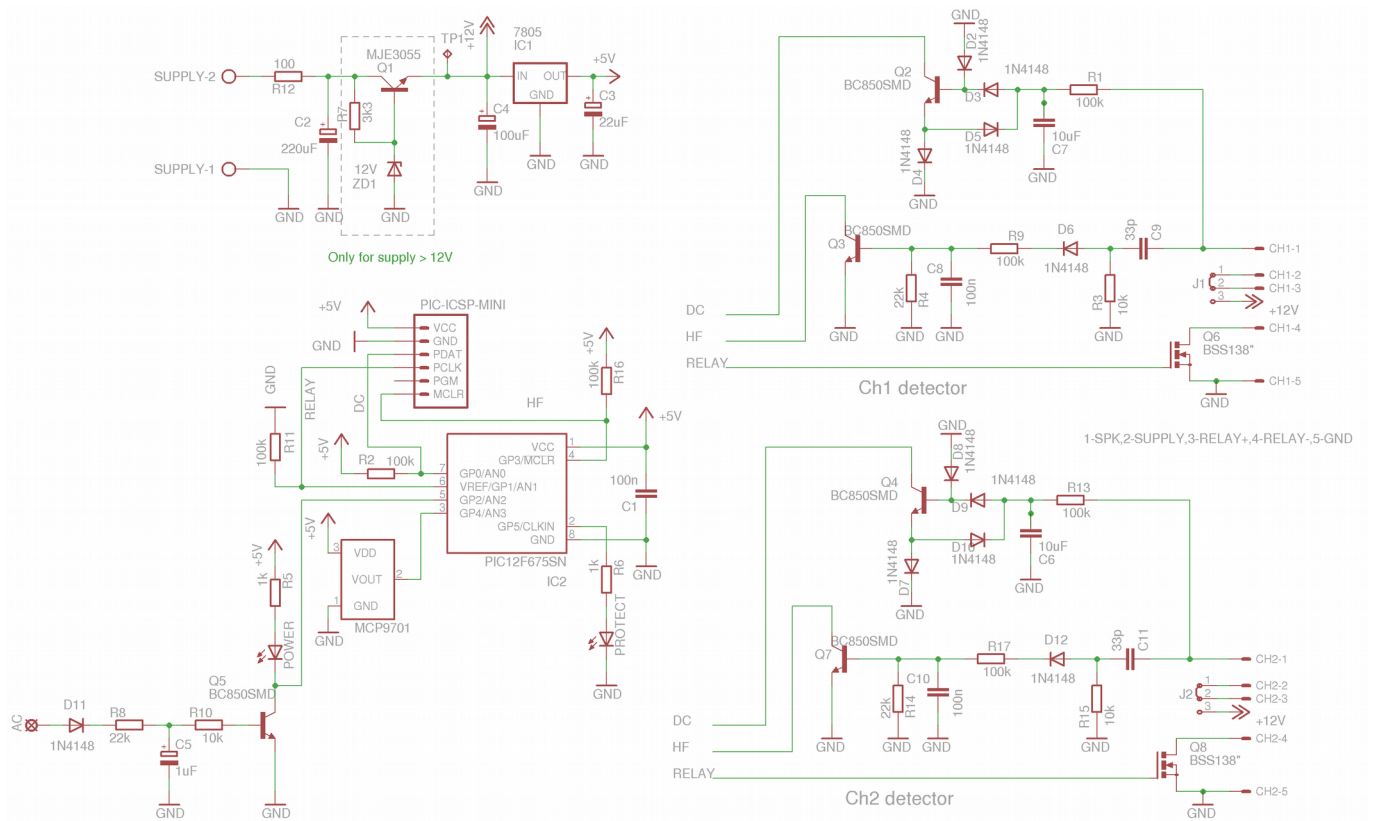
Connect a bench supply set at 12V. Check if the +12V connection (at TP1) is somewhere between 10-12V. Check that the regulated 5V supply is between 4.9-5.1V. Gradually increase the supply voltage and check that the +12V connection remains near 12V. If that is all ok, connect your final supply.

Very carefully (double)check the connections between CH1/CH2 and your power amplifier as high voltages are present, referring to the schematic for the correct connections in your setup:

- CH#-1 connected to the speaker output
- CH#-2 connected to the positive rail supply (or leave open if the internal 12V is used)
- CH#-3 connected to the positive side of the relay (connected to the positive rail of CH#-2 or internal 12V)
- CH#-4 connected to the negative side of the relay (which will be switched via the fet to GND)
- CH#-5 connected to GND

After poweron, both leds stay off, until AC is present. When AC is detected, the POWER led switches on and after about 4s the relays are activated. The PROTECT led should only light up in case of a DC, Instability, Overtemperature error or Temperature warning.

Schematic



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