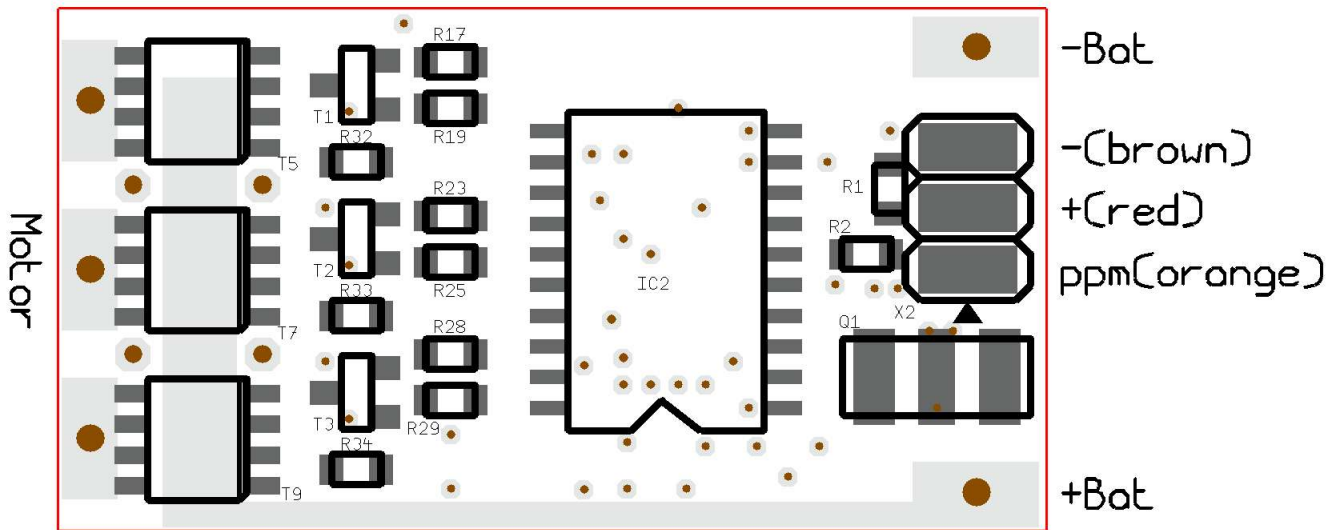
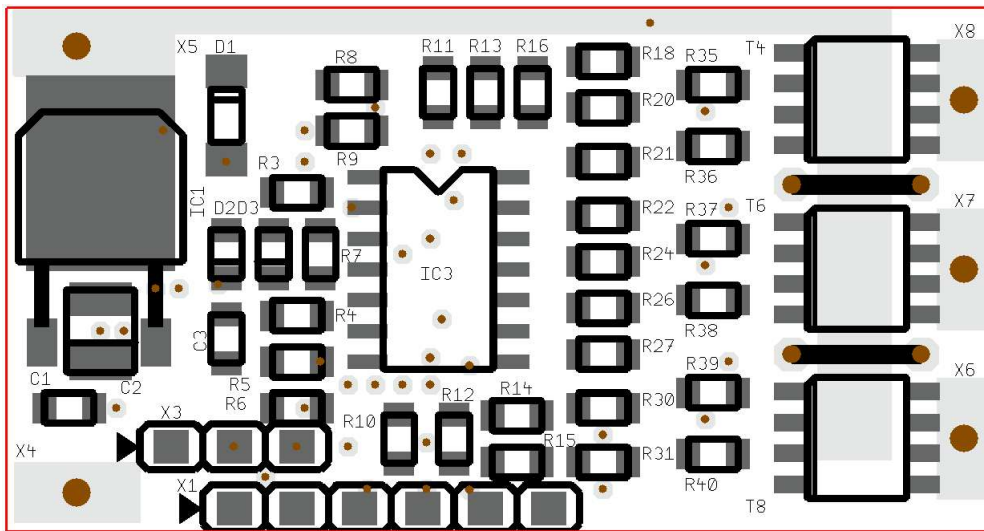


Maßstab	84,00%	Datei	BRUSHLESS2	Zeichner	BM	Blatt	01/01
Anderung	07.07.04		11:02	Titel Brushless Sensorless R/C Motor Controller			
Ausgabe	06.12.04		14:58				
Firma	B. Konze / teba			Projekt Eigen 06/04			



No	Name	Value	Casing	Additional notes
1	C4	47...470 μ		16V, low ESR, to be soldered externally to the (+) and (-) battery terminals of the BLMC
2	IC2	AT90S2313-SO20	SO20	To be flashed with the chosen firmware
3	Q1	8MHz	QARTZ-SMD	SMD ceramic resonator with integrated ballast capacitors
4	R01	47k	805	
5	R02	10k	805	
6	R17	47k	805	
7	R19	10k	805	
8	R23	47k	805	
9	R25	10k	805	
10	R28	47k	805	
11	R29	10k	805	
12	R32	680R	805	
13	R33	680R	805	
14	R34	680R	805	
15	T1	BC847C	SOT-23	Or similar general purpose NPN transistor in SOT-23 casing
16	T2	BC847C	SOT-23	
17	T3	BC847C	SOT-23	
18	T5	SI4425P	SO8	Or any other suitable logic level P-channel MOSFET with SO8 casing
19	T7	SI4425P	SO8	
20	T9	SI4425P	SO8	
21	X2	K1X3	1X03	Solder receiver interconnection cable to these pads



No	Name	Value	Casing	Additional notes
22	C1	100n	805	
23	C2	10 μ	SMD-B	
24	C3	100n	805	
25	D1	LL4148	SOD80	Or any other general purpose Si PN diode
26	D2	LHR974	805	or any other 805 size red SMD LED
27	D3	LGR971	805	or any other 805 size green SMD LED
28	IC1	L4941 BDT	D-PAK	
29	IC3	LM339D	SO14	
30	R03	2.2k	805	
31	R04	10k	805	
32	R05	20k	805	
33	R06	10k	805	
34	R07	2.2k	805	
35	R08	10k	805	
36	R09	2.2k	805	
37	R10	2.2k	805	
38	R11	10k	805	
39	R12	2.2k	805	
40	R13	2.2k	805	
41	R14	2.2k	805	
42	R15	2.2k	805	
43	R16	2.2k	805	
44	R18	10k	805	
45	R20	20k	805	
46	R21	20k	805	
47	R22	20k	805	
48	R24	10k	805	
49	R26	20k	805	
50	R27	20k	805	
51	R30	20k	805	

No	Name	Value	Casing	Additional notes
52	R31	10k	805	
53	R35	47k	805	
54	R36	100R	805	
55	R37	47k	805	
56	R38	100R	805	
57	R39	47k	805	
58	R40	100R	805	
59	T4	SI4420N	SO8	Or any other suitable logic level N-channel MOSFET with SO8 casing
60	T6	SI4420N	SO8	
61	T8	SI4420N	SO8	
62	X1	K1X6	1X06	Serial programming interface for AT90S2313
63	X3	K1X3	1X03	Asynchronous serial interface for extension/debugging
64	X4	K1X1	1X01	Connect (+) of battery to this pad
65	X5	K1X1	1X01	Connect (-) of battery to this pad
66	X6	K1X1	1X01	Connect three phases of brushless motor to these pads
67	X7	K1X1	1X01	
68	X8	K1X1	1X01	

Pinout of X1 (AT90S2313 serial programming interface)	
Pad	Function
1 (▶)	Vcc
2	Reset
3	SCLK
4	MISO
5	MOSI
6	GND

Pinout of X3 (asynchronous serial interface)	
Pad	Function
1 (▶)	GND
2	TxD
3	RxD

Some additional notes concerning assembly of the BLMC:

- Don't forget to solder the two jumpers between the MOSFETs.
- Both (+) and (-) PCB tracks from the battery connection pads (X4, X5) to the output stage (MOSFETs) need to be reinforced with a length of copper wire.
- All resistors should be 1% accurate, this is especially important for the 20k, 10k and 2.2k located in the EMF feedback network. If you use less accurate resistors in these places, motor startup may be difficult.
- Mount C2 before IC1 since if you try it the other way round, the (-) terminal of the electrolytic won't be accessible anymore. Some vias beneath C2 are very closely spaced to one of its pads. Please make sure that there are no shorts immediately after soldering C2 in place.

Happy BLMC'ing!