



Bill of Material

Document:	BOM CIR-BMBP-12V-4
Revision:	2
Revision Date:	June 4, 2010

Name:		CIR-BMBP-12V-4	Version: 1	Battery Protector, full model, 12VDC, overvoltage, charge, relay outputs		Notes
Line #	PCB Part Label	Qty.	Digi-key Part #	Description	Notes	
1	R1	1	27KEBK-ND	Resistor, 27k Ohms, 1/8W 5% carbon film		
2	R2	1	10MEBK-ND	Resistor, 1.0M Ohms, 1/8W 5% carbon film	Shutoff reset+ VR3. 1M:13.9V, 1.2M:13.2V, 1.8M:12.8V	
3	R3,R5,R9,R10,R15,R19,R23	7	100KEBK-ND	Resistor, 100k Ohms, 1/8W 5% carbon film		
4	R4, R11, R12, R22	3	330KEBK-ND	Resistor, 330k Ohms, 1/8W 5% carbon film		
5	R6, R14	2	47KEBK-ND	Resistor, 47k Ohms, 1/8W 5% carbon film		
6	R7	1	10KEBK-ND	Resistor, 10k Ohms, 1/8W 5% carbon film		
7	R8	1	10MEBK-ND	Resistor, 1.0M Ohms, 1/8W 5% carbon film		
8	R13, R21	1	2.2KEBK-ND	Resistor, 2.2k Ohms, 1/8W 5% carbon film		
9	R15	1	1N4148MSCT-ND	Diode, 1N4148, signal diode, 500mW	D+ @R15(pin 2) : D- @R7(pin 1), require insulation	
10	R16	1	47KEBK-ND	Resistor, 47k Ohms, 1/8W 5% carbon film	R16 @ C8+ : R16 @R16(pin 2)	
11	R17	1		Resistor, bare jumper wire	bare wire	
12	D	1	1N4148MSCT-ND	Diode, 1N4148, signal diode, 500mW	D+ @R16(pin 1) : D- @Q1(output), insulated, bottom PCB	
13	C1, C3	2	P5164-ND	Capacitor, 35V 47uF, electrolytic, 0.1" spacing	C1-Vsense delay, Alt: P5165-ND (35V, 100uF)	
14	C2	1	P5194-ND	Capacitor, 25V 10uF, electrolytic, 0.1" spacing	Alt: P5161-ND (35V, 10uF)	
15	C4, C5	2	478-2476-ND	Capacitor, 50V 0.1uF (10A), ceramic 20%, 0.1"		
16	D1, D5, D7	3	1N5234BDO35MSCT-ND	Diode, 1N5234, 6.2V zener, 500mW		
17	D2	1	1N4148MSCT-ND	Diode, 1N4148, signal diode, 500mW	D2+ @VR3 (pin 1) : D2- @D2-	
18	D3, D6	2	1N4148MSCT-ND	Diode, 1N4148, signal diode, 500mW		
19	D4	1	1N4002GCT-ND	Diode, 1N4002, general Si diode, 100V 1A		
20	IC1, IC2	2	LM258NOS-ND	IC, LM258 dual op-amp		
21	VR1	1	3362U-504LF-ND	Resistor, 500k variable, 3362U, top adjust, inline		
22	VR2	1	3362U-104LF-ND	Resistor, 100k variable, 3362U, top adjust, inline		
23	VR3	1	3362U-105LF-ND	Resistor, 1M variable, 3362U, top adjust, inline	pin 1 @D2(+): pin 2 @ hole D2 (+): pin 3 @ R2 (pin 1)	
24	VR4	1	3362U-104LF-ND	Resistor, 100k variable, 3362U, top adjust, inline	pin 1 @C7-: pin 2 @C7+: pin 3 @ R of C9	
24	Q1	1	IRFZ44VPBF-ND	Discrete, IRFZ44V, N HEXFET, 60V, TO-220	use low power N-CH for relay control option.	
25	Q2	1	2N3904	Discrete, 2N3904 NPN transistor, TO-92	generic transistor, any type	
25	LED1	1	160-1057-ND	Display, red/green LED, 5mm, 29mcd diffused	LED+ @D8+ : LED- @D10+	
26	LED2	1	160-1057-ND	Display, LED, yellow 5mm 19mcd diffused		
26	PCB	1		PCB, Battery Protector, V1, PCB-BMBP-001		
27	JPM2	0.025		Wire, 24AWG, red	2.5cm, D8- : D10-	
28	D9	1	10MEBK-ND	Resistor, 1.0M Ohms, 1/8W 5% carbon film		
29	C9	1	100KEBK-ND	Resistor, 100k Ohms, 1/8W 5% carbon film	R @C9+ : R @VR4(pin 3)	
30	C6	1	P5164-ND	Capacitor, 35V 10uF, electrolytic, 0.1" spacing		
31	R20	1	P5194-ND	Capacitor, 50V 1uF, electrolytic, 0.1" spacing	C+ @D9- : C- @R20(pin 1)	
32	WIRE1	0.3		Wire, 22AWG, red	30cm, +12V IN	
33	WIRE2	0.3		Wire, 22AWG, black	30cm, pwr negative in	
34	WIRE3	0.04		Wire, 24AWG, blue	4cm, negative power to power relay	
35	WIRE4	0.04		Wire, 24AWG, white	4cm, D10-, positive power to power relay	
36	WIRE5	0.04		Wire, 24AWG, yellow	4cm, D8+, positive power to small relay	
37	WIRE6	0.04		Wire, 24AWG, black	4cm, D8+, negative power to small relay	
38	WIRE6	0.3		Wire, 22AWG, orange	small relay COM	
39	WIRE7	0.3		Wire, 22AWG, brown	small relay NO	
40	WIRE8	0.3		Wire, 22AWG, blue	small relay NC	
41	WIRE9	0.3		Wire, 18AWG, orange	power relay COM	
42	WIRE10	0.3		Wire, 18AWG, brown	power relay NO	
43	WIRE11	0.3		Wire, 18AWG, blue	power relay NC	
44	D	1	1N4148MSCT-ND	Diode, 1N4148, signal diode, 500mW	clamping for small relay	
45	D	1	1N4002GCT-ND	Diode, 1N4002, general Si diode, 100V 1A	clamping for power relay	
46	REL1	1		Relay, SPDT, 12V 10A	power output relay	
47	REL2	1		Relay, SPDT, 12V 1A, miniature	charging indicator relay	

Note: CIR-BMBP-12V-3 is similar to CIR-BMBP-12V-4 without the relay components.