

Total solder points: 82

Difficulty level:

beginner 1 2 3 4 5 advanced

HIGH-Q
velleman-kit 

Dc to Pulse Width Modulator

K8004

Hardware:

- PWM range: 0 to 100%
- PWM frequency: 100 to 5000Hz adjustable
- Minimum PWM offset: 0 to 20% adjustable
- Adjustable sensitivity: 2.5 to 35VDC
- Short circuit protection
- Overload protection: 6.5A
- Under-Voltage lockout: 7VDC typ.
- Soft start
- Power Supply: 8 to 35VDC unregulated
- Supply current (No load): 35mA typ
- Efficiency: better than 90% at full load
- Dimensions (wxdxh): 85 x 48 x 45mm



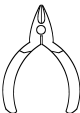
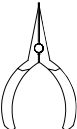


VELLEMAN Components NV
Legen Heirweg 33
9890 Gavere
Belgium Europe
www.velleman.be
www.velleman-kit.com

1. Assembly (Skipping this can lead to troubles !)

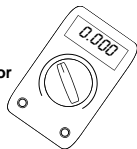
Ok, so we have your attention. These hints will help you to make this project successful. Read them carefully.

1.1 Make sure you have the right tools:

- A good quality soldering iron (25-40W) with a small tip. 
- Wipe it often on a wet sponge or cloth, to keep it clean; then apply solder to the tip, to give it a wet look. This is called 'thinning' and will protect the tip, and enables you to make good connections. When solder rolls off the tip, it needs cleaning.
- Thin rosin-core solder. Do not use any flux or grease. 
- A diagonal cutter to trim excess wires. To avoid injury when cutting excess leads, hold the lead so they cannot fly towards the eyes. 
- Needle nose pliers, for bending leads, or to hold components in place. 
- Small blade and Phillips screwdrivers. A basic range is fine.



For some projects, a basic multi-meter is required, or might be handy

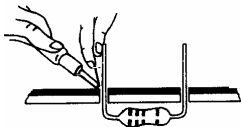
**1.2 Assembly Hints :**

- ⇒ Make sure the skill level matches your experience, to avoid disappointments.
- ⇒ Follow the instructions carefully. Read and understand the entire step before you perform each operation.
- ⇒ Perform the assembly in the correct order as stated in this manual
- ⇒ Position all parts on the PCB (Printed Circuit Board) as shown on the drawings.
- ⇒ Values on the circuit diagram are subject to changes.
- ⇒ Values in this assembly guide are correct*
- ⇒ Use the check-boxes to mark your progress.
- ⇒ Please read the included information on safety and customer service

* Typographical inaccuracies excluded. Always look for possible last minute manual updates, indicated as 'NOTE' on a separate leaflet.

1.3 Soldering Hints :

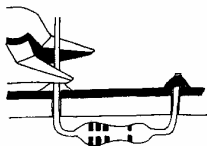
Mount the component against the PCB surface and carefully solder the leads



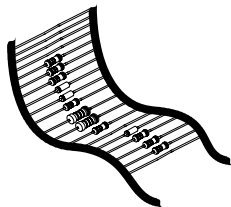
Make sure the solder joints are cone-shaped and shiny



Trim excess leads as close as possible to the solder joint

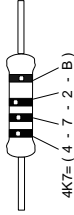


AXIAL COMPONENTS ARE TAPED IN THE CORRECT MOUNTING SEQUENCE !

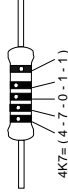


REMOVE THEM FROM THE TAPE
ONE AT A TIME !

5%

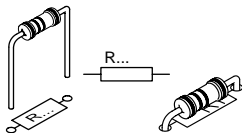


1%



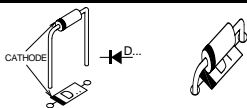
	I	P	E	SF	S	DK	N	D	GB	F	NL	
C	CODICE	CODIGO	CODIGO	VÄRI	FÄRG	FARVE-	FARGE-	FARB	COLOUR	CODIFI-	KLEUR	
O	COLORE	DE CORES	DE COL-	KOODI	SCHEMA	KODE	KODE	KODE	CODE	CATION	KODE	
D			ORES							DES COU-	D	
E										LEURS	E	
0	Nero	Preto	Negro	Musta	Svart	Sort	Sort	Schwarz	Black	Noir	Zwart	0
1	Marrone	Castanho	Marrón	Ruskea	Brun	Brun	Brun	Braun	Brown	Brun	Bruin	1
2	Rosso	Encarnado Rojo		Punainen	Röd	Röd	Röd	Rot	Red	Rouge	Rood	2
3	Aranciato	Laranja	Naranja	Oranssi	Orange	Orange	Orange	Orange	Orange	Orange	Oranje	3
4	Giallo	Amarelo	Amarillo	Keltainen	Gul	Gul	Gul	Gelb	Yellow	Jaune	Geel	4
5	Verde	Verde	Verde	Vihreä	Grön	Grön	Grønn	Grün	Green	Vert	Groen	5
6	Blu	Azul	Azul	Sininen	Blå	Blå	Blå	Blau	Blue	Bleu	Blauw	6
7	Viola	Violeta	Morado	Purppura	Lila	Violet	Violet	Violet	Purple	Violet	Paars	7
8	Grigio	Cinzeno	Grís	Harmaa	Grå	Grå	Grå	Grau	Grey	Gris	Gríjs	8
9	Bianco	Branco	Blanco	Valkoinen	Vit	Hvid	Hvidt	Weiss	White	Blanc	Wit	9
A	Argento	Prateado	Plata	Hopea	Silver	Sølv	Sølv	Silber	Silver	Argent	Zilver	A
B	Oro	Dourado	Oro	Kulta	Guld	Guld	Guld	Gold	Gold	Or	Goud	B

1. Resistors



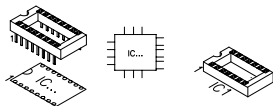
- R1 : 220 (2-2-1-B)
- R2 : 220 (2-2-1-B)
- R3 : 2K2 (2-2-2-B)
- R4 : 2K2 (2-2-2-B)
- R5 : 10K (1-0-3-B)
- R6 : 100K (1-0-4-B)
- R7 : 220K (2-2-4-B)

2. Diodes, check the polarity



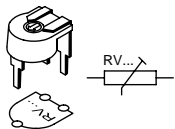
- D1 : 1N4148
- D2 : 1N4148
- D3 : 1N4007

3. IC sockets. Watch the position of the notch!



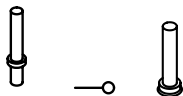
- IC1 : 16p

4. Trim potentiometer



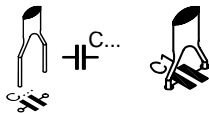
- RV1 : 10K
- RV2 : 10K
- RV3 : 100K

5. PCB pins



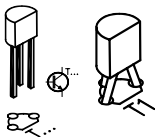
- Vref

6. Ceramic Capacitors



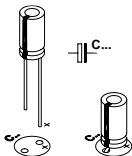
- C1 : 100nF (104)
- C2 : 100nF (104)
- C3 : 100nF (104)
- C4 : 100nF (104)

7. Transistor



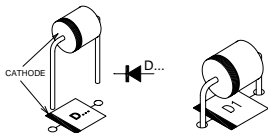
□ T1 : BC547

8. Electrolytic capacitors. Check the polarity !



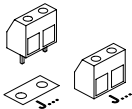
- C5 : 10 μ F
- C6 : 10 μ F
- C7 : 100 μ F (40Vmin)

9. Diodes, check the polarity

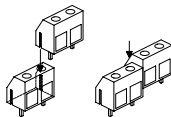


□ D4 : 6A2 / 6A6

10. Screw connectors



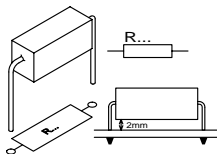
□ J1 : 2p



□ J2 : 2p

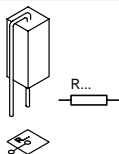
□ J3 : 2p

11. 0,5W Resistors



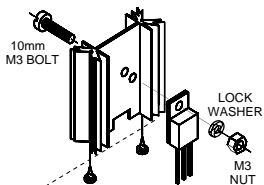
□ R8 : 0,22 (R22)

12. 0,5W Resistors

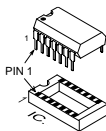


□ R9 : 0,22 (R22)

□ R10 : 0,22 (R22)

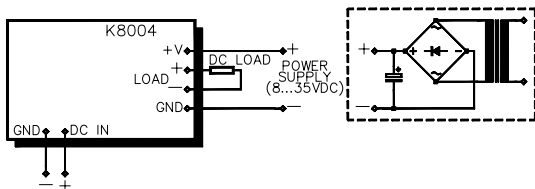
13. Transistor

□ T2 : BUK555-60B or eq.

14. IC. Watch the position of the notch!

□ IC1 : 3525

Fig A



DC CONTROL VOLTAGE (max. 35V)

Fig B

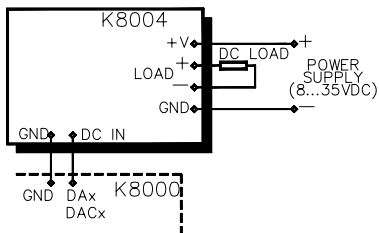
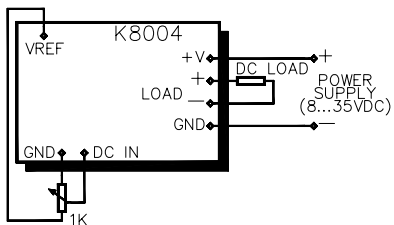
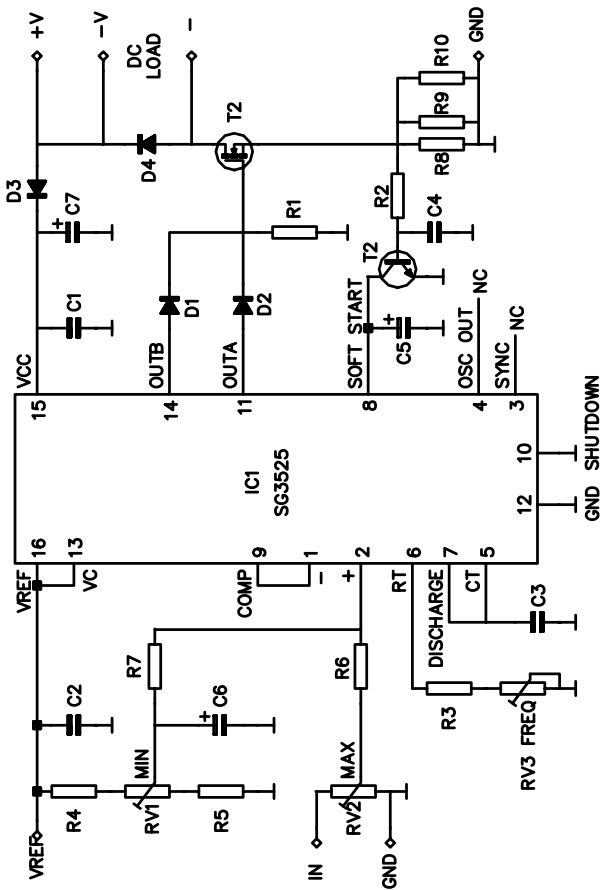


Fig C



16. Schematic diagram.



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