

| Inverter Controller Assembly BOM WG39Rev7B Issue 120225 | | | | | | | |
|---|------------------------|---------------------|---------------------------|----------|-----------|-------------|---|
| Designator | Comment | Description | Footprint | Quantity | From | Price ea | Comments |
| Blank PCB | | WG39Rev7B | | 1 | | | |
| C1, 2 | 22n | Film capacitor | 2.54mm (0.2") | 2 | | | 50/63V |
| C3 | 22n | Ceramic | 2.54mm (0.2") | 1 | | | 50/63V |
| C4 | 1u | Monolithic or Film | 2.54mm (0.2") | 1 | | | 50/63V |
| C5, 6 | 220n | Monolithic | 2.54mm (0.2") | 2 | | | 50/63V |
| C7, 9, C10 - C13, 15, C19, 21, 22, 26, 28 | 100n | Monolithic | 2.54mm (0.2") | 12 | | | 50/63V |
| C8 | 10u | Tantalum | 0.2" or 0.1" | 1 | | | From 6 - 35V ok |
| C16, 20 | 4u7 | Tantalum | 0.2" or 0.1" | 2 | | | From 6 - 35V ok |
| C14, 23 | 10n | Ceramic | 2.54mm (0.2") | 2 | | | 50/63V |
| C17, 18 | 1u | Monolithic | 2.54mm (0.2") | 2 | | | 50/63V 220/330/470n/1u ok |
| C24 | 220u 63V | Electrolytic | RBV/10_0/5_0 | 1 | | | Any value from 100u up is OK |
| C25, 27 | 100u 16V | Electrolytic | RBV/6_3/2_5 | 2 | | | Any value from 47u up is OK |
| D1, 2, 3, 5, 6, 12, 13 | 1N4148 | Diode | DO-35 (0.3" pitch) | 7 | | | |
| D4 (5V Reg. Mod.) | 8V2 0.5W | Zener Diode | DO-35 (0.4" pitch) | 1 | | | Fit on spare pads with KR78U05 |
| D8 | 16V 1W | Zener Diode | DO-41 (0.4" pitch) | 1 | | | Optional 12V Rail protect |
| D9 | 5V6 1W | Zener Diode | DO-41 (0.4" pitch) | 1 | | | Optional 5V Rail protect |
| D10, 11, 14, 15 | 1N4004 | Diode | DO-41 (0.4" pitch) | 4 | | | |
| J1 | 4 Pin Vert. PCB | PCB Header 4 Way | 5.08mm Pitch | 1 | Digikey | 88c/1 | 4176384 |
| (J1) | 4 Pin Pluggable | Terminal block | 5.08mm Pitch | 1 | Digikey | 1.44/1 | 249364401 |
| J2, 4 | 2 Way Vert. PCB | PCB Header 2 Way | 5.08mm Pitch | 2 | Digikey | 2.86/10 | 3770486 |
| (J2, 4) | 2 Way Pluggable | Terminal Block | 5.08mm Pitch | 2 | Digikey | 7.35/10 | 102-6390-ND |
| J3 | 6 Way Pin Strip | Header strip | 2.54mm/0.1" | 1 | | | Front Panel LEDs & O/C Reset SW. |
| J5, 6 | 8 Way Pin Strip | Header strip | 2.54mm/0.1" | 2 | | | |
| J7 | 6 Pin Vert. PCB | PCB Header 6 Way | 5.08mm Pitch | 1 | Element14 | \$7.60/10 | 3810266 |
| (J7) | 6 Pin Pluggable | Terminal block | 5.08mm Pitch | 1 | Element14 | \$8.49 | 4352909 |
| (J7) Alternate | 6 Pin Pluggable | Terminal block | 5.08mm Pitch | 1 | Digikey | \$2.39 | 102-6394-ND |
| J8 - J11 **(J10) | 3 Way Pin Strip | Header strip | 2.54mm/0.1" | 3 | | | ** DNL J10 No Sync code yet |
| LD1 | GRN LED | 5mm | LED/5V | 1 | | | Clear lens 3 or 5 mm |
| LD2 | RED LED | 5mm | LED/5V | 1 | | | Clear lens 3 or 5 mm |
| PS1 | 12V Regulator | K78U12-500 | 75Vin to 12V 0.5A | 1 | Element14 | \$7.99 | Omit if using external 12V supply? |
| PS1 Alternative | 12V Regulator | LMW78_12-0.5R | 75Vin to 12V 0.5A | 1 | Digikey | \$5.97 | Omit if using external 12V supply? |
| PS2 (+ mini heatsink) | KA78R05 5V Reg | Linear With Enable | 4 Pin (0.1" pitch) | 1 | | NOTE | 7805 or Linear Reg KA78R05 best |
| Q1 | 2N3906 or equiv. | PNP Transistor | TO92/100/CBE | 1 | | | Gen. Purp. PNP but Check pinout |
| Q2 | 2N3904 or equiv. | NPN Transistor | TO92/100/CBE | 1 | | | Gen. Purp. NPN but Check pinout |
| Q3, 4, 6, 10, 11 | BS170 or equiv. | NCH | TO92/100/DGS | 5 | Digi/E14 | | Substitute FETs ok Check pinout |
| Q5, 7, 8, 9 | WGP30N10V | NCH 100V 30A | TO-220FETV | 4 | LCSC | 90c/5 | Any min60V Fet @ min5A is ok |
| Q5, 7, 8, 9 Alternate | NCE6020AI | NCH 60V 20A | TO-220FETV | 4 | LCSC | 68c/5 | Any min60V Fet @ min5A is ok |
| R1, 2 | 100K Vertical | 0.4 - 1W Axial | 5.08mm (0.2" pitch) | 2 | | | Lead size>0.68mm |
| R3 | 270R | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| R4, 5, R48 - R51 | 10K | 0.25-0.4W Axial | 10mm (0.4" pitch) | 6 | | | |
| R6 | 15K | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| R7 | 150K | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| R8, 57 | 56K | 0.25-0.4W Axial | 10mm (0.4" pitch) | 2 | | | |
| R9 | 9K1 | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| R10, 12, 22, 23, 36, R44, 53 | 100K | 0.25-0.4W Axial | 10mm (0.4" pitch) | 7 | | | |
| R11 | 47K | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
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|--|-------------------|---------------------|------------------------|----|-----------|--------------------|---|
| R13 | 33R | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| R14 | 180R | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| R15, 30-32, 43, 46, 47 | 1K | 0.25-0.4W Axial | 10mm (0.4" pitch) | 7 | | | |
| R16 | 100R | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| R17 | 470R | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| R18 - R21, 24, 25, 28, R33, 37, 38 | 4K7 | 0.25-0.4W Axial | 10mm (0.4" pitch) | 10 | | | |
| R26, 29, 35, 45, 52, 56 | 2K2 | 0.25-0.4W Axial | 10mm (0.4" pitch) | 5 | | | DNL R52 No Sync code yet |
| R27 | 27K | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| R34, 54, 55, 58, 59 | 220R | 0.25-0.4W Axial | 10mm (0.4" pitch) | 5 | | | |
| R39 - R42 | DNL? *** | 0.25-0.4W Axial | 10mm (0.4" pitch) | 4 | | | Only Fit if U7,U8 not used AND if U6 = 74ACS86 |
| R60 | 220K | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| RV1 | 10K (top adjust) | Trimpot Multi turn | 3296Y | 1 | | | Or single turn trimmer 3306P OK |
| RV2 | 5K (top adjust) | Trimpot Multi turn | 3296Y | 1 | Digikey ! | \$3.87 | Get 10 at Ali for less! |
| RV3, 4 | 20K | Trimpot Single turn | 3306P | 2 | | | Multiturn pot is best for RV3 setting |
| T1 | ZMPT107-1 | 2mA - 2mA 1KV | TV31D | 1 | LCSC | 56c | |
| U1, 2, 5 | MCP6002 | Dual Op Amp | 8 Pin DIP | 3 | Digikey | 90c | or MCP602 or MCP617 |
| U3 | 15P Sip Sockets | Nano Module | 2 x SIP15 (0.1" Pitch) | 1 | Ali | | |
| (U3) | NANO PCB | Nano Module | DIP30/600 | 1 | Ali | | |
| U6 | SN74AC86N | Quad 2-Input XOR | DIP14/300 | 1 | Digikey | 95c | 74HC86 or HCT86 OK if U8&9 fitted |
| U7 | FOD817D | 4-Pin Optocoupler | DIP4/300 | 0 | Digikey | 65c | DNL U7 No Sync code yet |
| U8, 9 | TC4424 | Dual Gate Drive | DIP4/300 | 2 | LCSC | \$5.80/10 | Can also Use UCC27424 ex Digikey |
| U8, 9 Alternate | HX4424/HX4427 | Dual Gate Drive | DIP4/300 | 2 | LCSC | 31c | LCSC HX4424P or HX4427P or eq. |
| U4 | +5V Rail Monitor | S-80838CNY-B2-U | TO92 | 1 | Digikey | \$1.19 or 0.59c ea | or = SMD Part, cheaper & more fiddly to fit. APX803L20-42SA-7 |
| Note: PS2 on PCB has footprints for 3 switchmode and 2 linear regulator options, suggest you use the KA78R05 supplied linear regs | | | | | | | |
| Suggest all ICs use machined pin IC sockets from digikey or Element 14 no Asian cheapies!! They fail! | | | | | | | |
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| WG44R3 LCD Assembly | | | | | | | |
| Blank PCB | | WG44Rev2 | | 1 | | | |
| LCD | 2004 | Green ? | ~ 98 x 60mm | 1 | Ali | ~\$4 +Del. | 20 Character 4 line LCD |
| U1 | NANO PCB KIT | | 30Pin Nano Module | 1 | Ali | | |
| U2 | +5V Rail Monitor | S-80838CNY-B2-U | TO92 | 1 | Digikey | \$1.19 or 0.59c ea | or = SMD Part, cheaper & more fiddly to fit. APX803L20-42SA-7 |
| R1 | 10 - 100K | single turn trimpot | 3306P or similar | 1 | Digikey | ~78c | |
| C1 | 100n | | 2.54mm (0.2") | | | | Optional, fit if display not stable |
| 3P - 3P | 2 x 3 pin females | wired connector | F - F, 3 x 0.1" | | Ali | | L=300mm, 10 for \$4.25 |
| The 2 x 15 pin strip connectors supplied with the Nano kit will all be used for the assembly 6 + 6 + 3 & 6 + 4 + 3 + 2 = 30 pins | | | | | | | |
| Note J1 can be soldered vertically or horizontally | | | | | | | |
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| WG48R1 Front Panel Assembly | | | | | | | |
| Blank PCB | | WG48Rev1 | | 1 | | | |
| S1 | PCB Switch | Push-Button Switch | | 1 | | | |
| S2 | | Toggle Switch | | 1 | | | |
| LED 1, 4, 5 | | Green LED | 2.54mm (0.2") | 3 | | | 3mm or 5mm LED water clear lens? |
| LED 2, 3 | | Red LED | 2.54mm (0.2") | 2 | | | 3mm or 5mm LED water clear lens? |
| R1 | 2K2 | 0.25-0.4W Axial | 10mm (0.4" pitch) | 1 | | | |
| J1 | 6 Way Pin Strip | Header strip | 2.54mm/0.1" | 1 | | | Front Panel LEDs & O/C Reset SW. |
| J2 | 4 Way Pin Strip | Header strip | 2.54mm/0.1" | 1 | | | Stage 2 LED & Manual/Auto Switch |