

### General Description

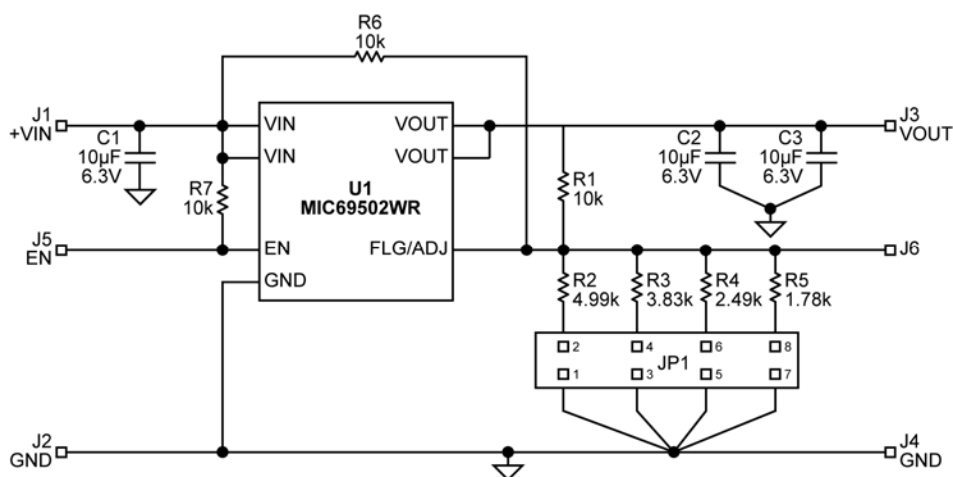
The MIC69502 is a 5A, low dropout linear regulator that provides low voltage, high current outputs with a minimum of external components. They offer high precision and ultra low dropout of 500mV under worst case conditions.

The MIC69502 operate from an input of 1.65V to 5.5V. They are designed to drive digital circuits requiring low voltage at high currents (i.e. PLDs, DSP, microcontroller, etc.). They are available in fixed and adjustable output voltages.

### Features

- Main Input voltage range: 1.65V to 5.5V
- Maximum load current: 5.0A
- Adjustable output voltage down to 0.5V
- Stable with 10uF ceramic capacitor
- Power S-Pak package

### Evaluation Board Schematic



### Pin Description

| Pin Number | Pin Name | Pin Function   |
|------------|----------|--|
| J1         | VIN      | Input voltage which supplies current to the output power device                    |
| J2, J4     | GND      | Ground (TAB is connected to ground on S-Pak)                                       |
| J3         | VOUT     | Regulator Output   |
| J5         | Enable   | Enable (Input): CMOS compatible input. (logic high = enable, logic low = shutdown) |
| J6         | ADJ      | Adjustable regulator feedback input. Connect to resistor voltage divider.          |

## Enable

The MIC69502 features an active high enable input (EN) that allows on-off control of the regulator. Current drain reduces to “zero” when the device is in shutdown, with only microamperes of leakage current. The EN input has TTL/CMOS compatible thresholds for simple logic interfacing. EN may be directly tied to  $V_{IN}$  and pulled up to the maximum supply voltage.

### Adjustable Regulator Design

The MIC69502 allows the output voltage to be set between 0.5V and 5.5V. The ADJ pin voltage is 0.5V. Once a suitable  $V_{OUT}$  voltage is determined values for R1 and R2 can be calculated. The only requirement is that R1 should not exceed 10k $\Omega$ .

$$R1 = R2 \times (V_{out}/0.5 - 1)$$

Target voltage for the MIC69500 is controlled via JP1. Jumper settings are:

1. Pins 1&2 – 1.5V

2. Pins 3&4 – 1.8V

3. Pins 5&6 – 2.5V

4. Pins 7&8 – 3.3V

### GND

TAB is also used for ground

### VIN

VIN provides the high current to the collector of the pass transistor of the regulator. The minimum input voltage for the MIC69300 is 1.65V. The suggested bypass capacitor value for VIN on the demo board is a 10uF ceramic capacitor.

### VOUT

The MIC69502 requires a minimum 10mA load to maintain output voltage regulation. The suggested bypass capacitor value for VOUT on the demo board is a 10uF ceramic capacitor. An output capacitance is required on the MIC69502 to maintain stability.

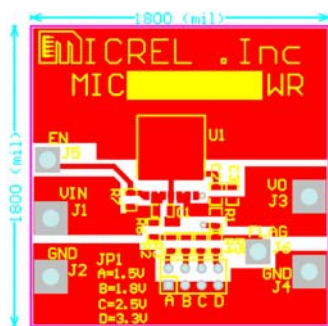
## Bill of Materials

| Item       | Part Number        | Manufacturer | Description                      | Qty. |
|------------|--------------------|--------------|----------------------------------|------|
| C1, C2, C3 | 0805D106MAT2A      | AVX          | 10uF, 6.3V X5R Ceramic Capacitor | 1    |
|            | VJ0805Y106KXYAT    | Vishay       |                                  |      |
|            | C2012X5R0J106K     | TDK          |                                  |      |
|            | GRM21CR70J106KA01B | muRATA       |                                  |      |
| R1, R6, R7 | CRCW08051002FRT1   | Vishay       | 1k, 1%, 1/10W, 0805              | 3    |
| R2         | CRCW08054991FRT1   | Vishay       | 4.99k, 1%, 1/10W, 0805           | 1    |
| R3         | CRCW08053831FRT1   | Vishay       | 3.83k, 1%, 1/10W, 0805           | 1    |
| R4         | CRCW08052491FRT1   | Vishay       | 2.49k, 1%, 1/10W, 0805           | 1    |
| R5         | CRCW08051781FRT1   | Vishay       | 1.78k, 1%, 1/10W, 0805           | 1    |
| U1         | MIC69502WR         | MICREL       | SPAK – 7 Pins                    | 1    |

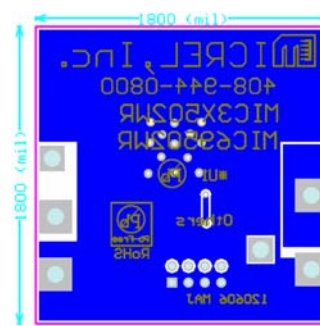
### Notes:

1. AVX: [www.avx.com](http://www.avx.com)
2. Murata: [www.murata.com](http://www.murata.com)
3. TDK: [www.tdk.com](http://www.tdk.com)
4. Vishay: [www.vishay.com](http://www.vishay.com)
5. Micrel Semiconductor: [www.micrel.com](http://www.micrel.com)

### PCB Layout



Top



Bottom

### Ordering Information

| Part Number   | Description   |
|---------------|---|
| MIC69502WR EV | Evaluation board with MIC69502WR adjustable device. |

NOTE: For additional voltage options, contact Micrel Marketing.

**MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA**  
 TEL +1 (408) 944-0800 FAX +1 (408) 474-1000 WEB <http://www.micrel.com>

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