

42117

**NEGATIVE HIGH TEMPERATURE  
FIXED VOLTAGE REGULATOR**  
Designed to use in high temperature environments

**Mii**  
MICROCIRCUITS DIVISION

**Features:**

- Operating temperature +200°C
- Output current to 1.0 A
- Output voltage to -30 V
- Internal short circuit protection, foldback and current limiting
- Isolated TO-258 package

**Applications:**

- Down hole
- Harsh environment application

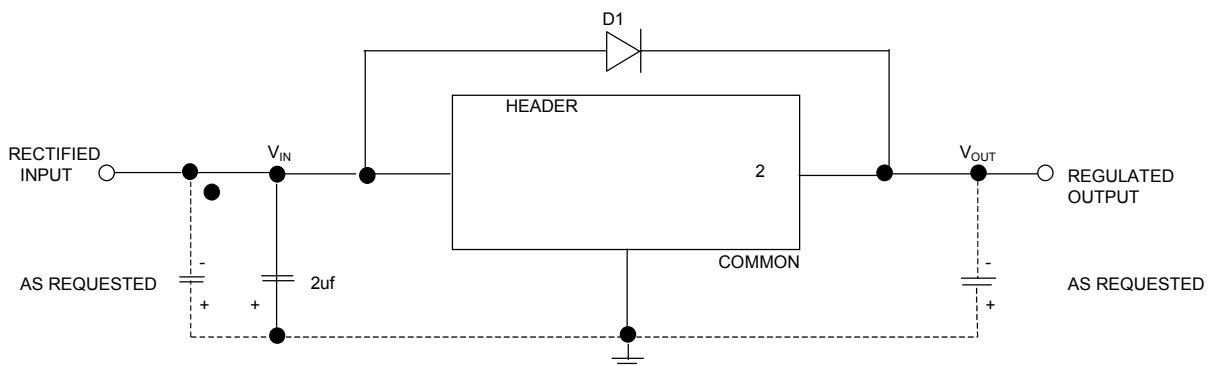
**DESCRIPTION**

The 42117 series of fixed voltage regulators covers the output voltage range from -5 VDC through -30 VDC. These voltage regulators are fabricated using hybrid techniques and will operate at case temperatures up to +200°C. These devices are complete with internal short circuit protection which includes voltage shutdown and current foldback. The 42117 series voltage regulators normally do not require any additional components. However, for good design practice, an external filter cap of 2µF should be installed at the input, as close to the case as possible.

**ABSOLUTE MAXIMUM RATINGS AT 200°C CASE TEMPERATURE**

|  |         |
|--|---------|
| Output Current ( $I_{OUT}$ ) .....     | 1.0 A   |
| Input Voltage ( $V_{IN}$ ) .....       | -38 VDC |
| Storage Temperature ( $T_{STG}$ )..... | +250°C  |
| Power Dissipation $P_d$ .....          | 8 W     |

**Typical Connection Diagram**



Note: D1 should be installed for input safety

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## ELECTRICAL CHARACTERISTICS

| PARAMETER   | TEST CONDITIONS   | TEMPERATURE     | TYPICAL   |
|---|---|-----------------|---|
| *Output Voltage Note 1                                      | $I_{OUT} = 1.0 \text{ A}$<br>$V_{IN} = V_{OUT} + 3 \text{ VDC}$               | +25°C to +200°C | $V_{OUT} \pm 1.0\%$                                 |
| *Line Regulation Note 2                                     | $V_{IN} = V_{OUT} - 3 \text{ V}_{DC}$ to -38 VDC<br>$I_{OUT} = 50 \text{ mA}$ | +25°C to +200°C | $V_{OUT} \pm 0.5\%$                                 |
| Load Regulation   | $V_{IN} = V_{OUT} - 5 \text{ VDC}$<br>$I_{OUT} = 0.05$ to 1.0A                | +25°C to +200°C | $V_{OUT} \pm 0.5\%$ at 25°C<br>$\pm 1.0\%$ at 200°C |
| Ripple Rejection at 120 Hz                                  | $V_{IN} = V_{OUT} - 5 \text{ VDC}$<br>$I_L = 300 \text{ mA}$                  | +25°C           | -50 dB  |
| Standby Current   | $V_{IN} = V_{OUT} - 5 \text{ VDC}$<br>$I_{OUT} = 0$                           | +25°C           | 30 mA   |
| Short Circuit Current                                       | $V_{IN} = V_{OUT} - 5 \text{ VDC}$  | +25°C           | 400 mA  |
| Short Circuit Current                                       | $V_{IN} = V_{OUT} - 5 \text{ VDC}$  | +200°C          | 200 mA  |
| Foldback Current (knee)                                     | $V_{IN} = V_{OUT} - 5 \text{ VDC}$  | +25°C           | 2 A   |
| Foldback Current (knee)                                     | $V_{IN} = V_{OUT} - 5 \text{ VDC}$  | +200°C          | 1.5 A   |
| Noise Output  | $V_{IN} = V_{OUT} - 5 \text{ VDC}$<br>$I_{OUT} = 300 \text{ mA}$              | +25°C           | 2 mVRMS   |
| Differential Voltage *<br>( $\Delta V = V_{IN} - V_{OUT}$ ) | $I_{OUT} = 300 \text{ mA}$  | +25°C to +200°C | 3 VDC MIN   |

Note 1.  $V_{OUT}$  for 5 volt  $\pm 2\%$

Note 2. Line regulation for 5 volt devices  $\pm 1\%$

\* $V_{IN} = -10 \text{ V Min}$

TABLE 1 (see note)

| TYPE      | $V_{OUT}$ vdc | MAX $I_{OUT}$ A | TYP $I_{KNEE}$<br>(A at 25°C) |
|-----------|---------------|-----------------|-------------------------------|
| 42117-005 | -5            | 1.0             | 2.0                           |
| 42117-012 | -12           | 1.0             | 2.0                           |
| 42117-015 | -15           | 1.0             | 2.0                           |
| 42117-018 | -18           | 1.0             | 2.0                           |
| 42117-024 | -24           | 1.0             | 2.0                           |
| 42117-030 | -30           | 1.0             | 2.0                           |

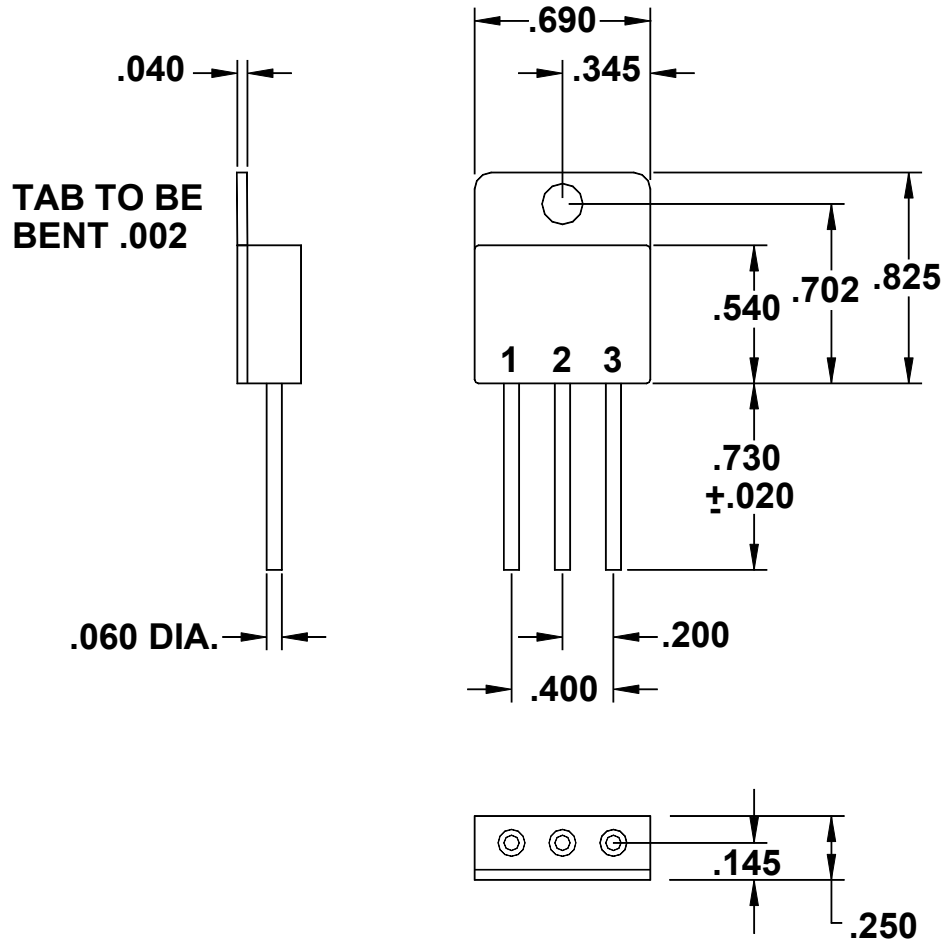
NOTE: Under condition  $(V_{IN} - V_{OUT}) \times I_{OUT} \leq 8$  watts at 200°C

Option: 1) Other output voltage available

2) MIL-STD-883 type screening available

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Mechanical Configuration



| Pin | Function         |
|-----|------------------|
| 1   | V <sub>OUT</sub> |
| 2   | Common           |
| 3   | V <sub>IN</sub>  |

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