

FEB137-002 / FEB138-002
User Guide
FAN2001 / FAN2002
Evaluation Board

Featured Fairchild Product: FAN2001 / FAN2002

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The following user guide supports the evaluation kit for the FAN2001 and FAN2002. It should be used in conjunction with the device datasheet as well as Fairchild application notes and technical support team. Visit Fairchild's website at www.fairchildsemi.com.

1. Features

- 2.5 to 5.5V Input Range
- Up to 1A Output Current
- Adjustable Output from 0.8V to V_{IN}
- Thermal Shutdown, Short-Circuit Protection, Soft Start, Output Over-Voltage Protection
- 1.3MHz Fixed-Frequency PWM Operation at Heavy Load and Burst Operation at Light Load
- Up to 96% Efficiency, Synchronous Operation
- Pb-Free, 6-lead 3x3mm MLP Package

2. Description

The FAN2001/2 Evaluation Board is a compact circuit including either the FAN2001 MPX or the FAN2002 MPX in a 3x3mm MLP package. Both models feature an external resistor divider for varying output voltage and differ only in pin out. The FAN2001/2 demo board, a completely assembled and tested surface mount board, provides easy probe access points to all inputs and outputs so that electrical characteristics and waveforms can be easily measured.

3. Operation

1. Connect V_{IN} (2.5 to 5.5V) and GND (0V).
2. Use a jumper to toggle the circuit between "ON" and "OFF" modes.
3. Observe that, for varying input levels, if $V_{IN} > V_{OUT} + 0.6V$ and $I_{LOAD} < 1A$, V_{OUT} remains constant.
4. The output voltage level is $V_{OUT} = V_{REF} (1 + (R1/R2))$ where $V_{REF} = 0.8V$ (typical) and $R2 = 10K$. For $V_{OUT} = 1.2V$, $R1$ is preset to 5K and for $V_{OUT} = 3.3V$, $R1$ is preset to 31.25K.
Note: $R2$ and $R1$ values are reversed for FAN2002MPX.
5. To verify supply current in "ON" and "OFF" modes; observe that, in shutdown mode, supply current drops below $1\mu A$ and in "ON" mode, $I_Q < 50\mu A$.
6. If quiescent current is a key design parameter, a higher value feedback resistor $R2$ can be used, along with a small bypass capacitor C_F (e.g. $R2 = 100K$ and $C_F = 10pF$).

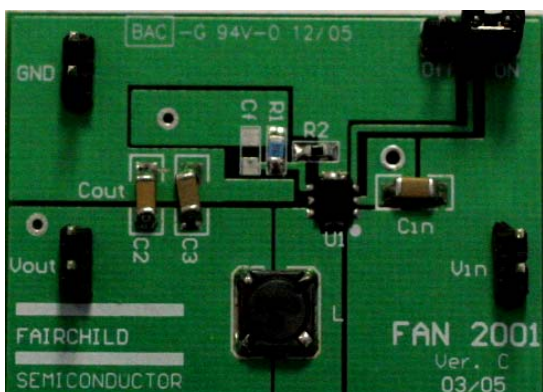


Figure 1. FAN2001MPX Board

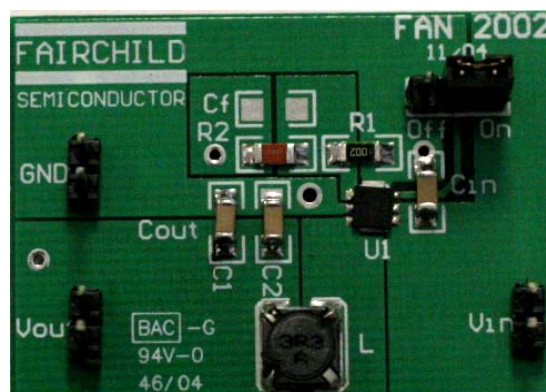


Figure 2. FAN2002MPX Board

4. PCB Layout

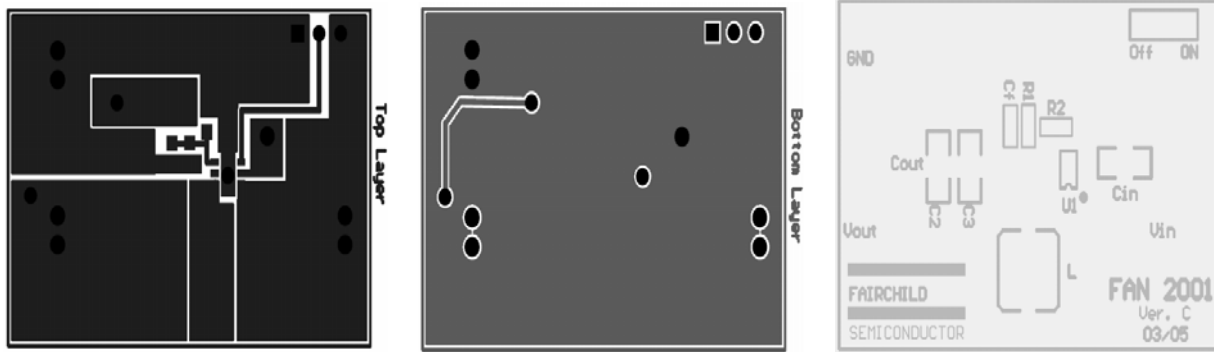


Figure 3. FAN2001MPX PCB Layout

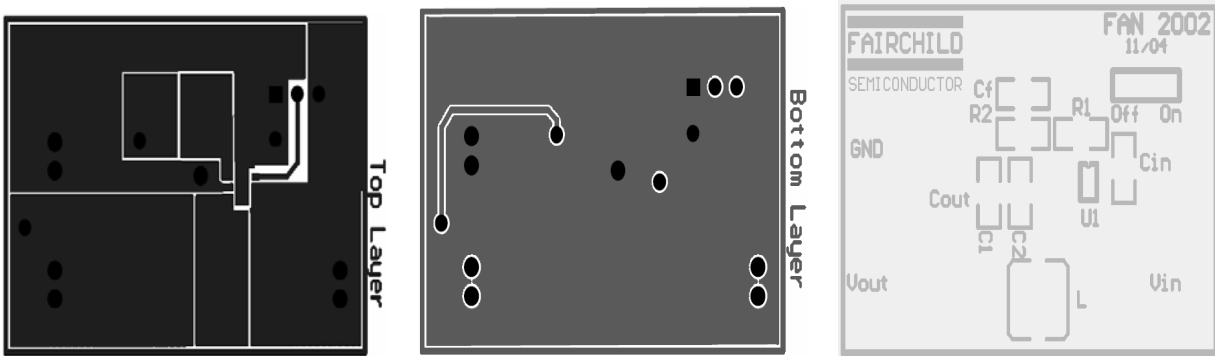


Figure 4. FAN2002MPX PCB Layout

5. Waveforms

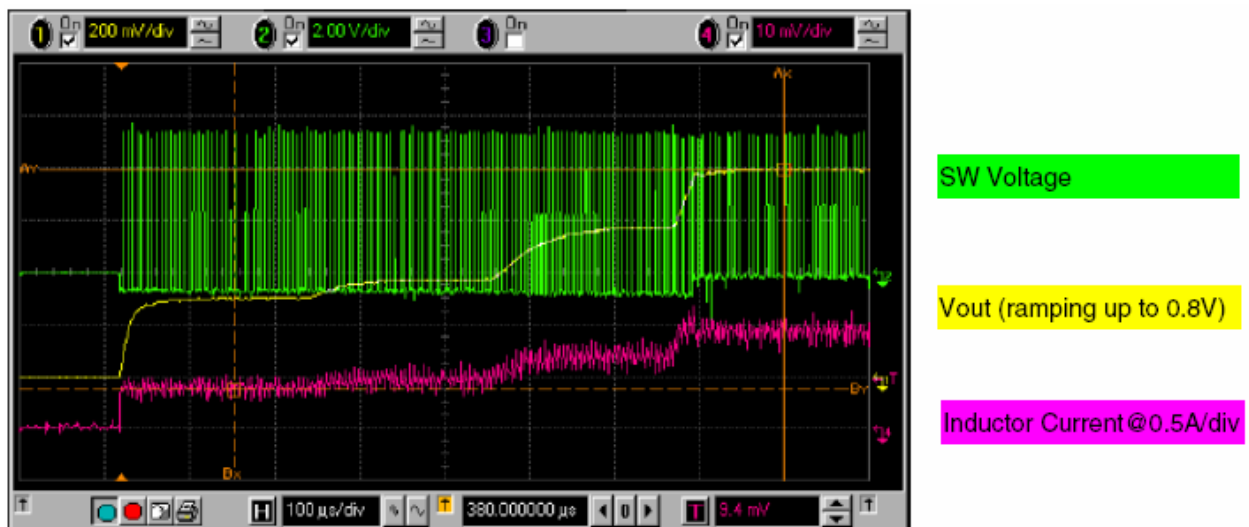


Figure 5. Start-Up Waveform in Full Load ($V_{IN}=5.5V$)

6. Schematics

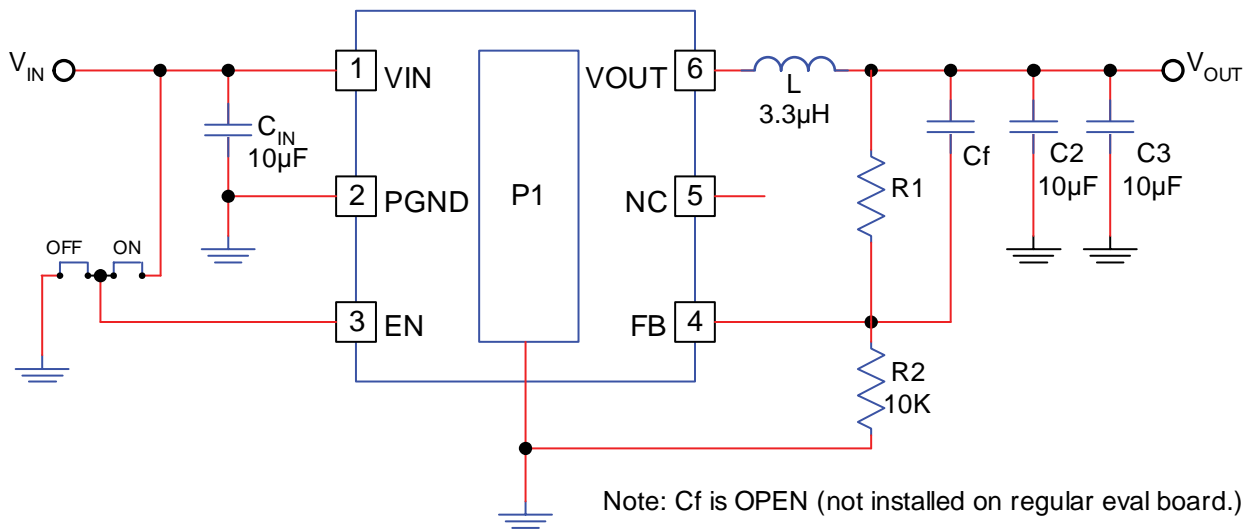


Figure 6. FAN2001MPX Schematic (R1 = 5K for $V_{OUT} = 1.2V$ and R1 = 31.25K for $V_{OUT} = 3.3V$)

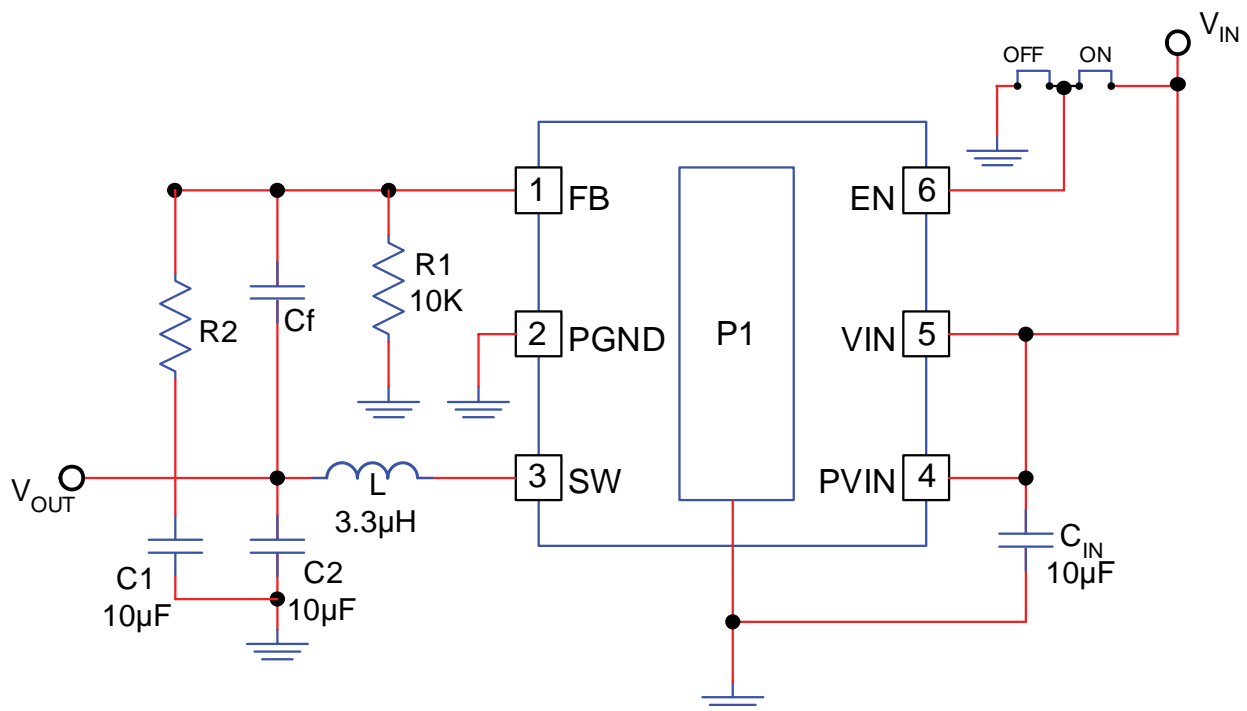


Figure 7. FAN2002MPX Schematic (R1 = 5K for $V_{OUT} = 1.2V$ and R1 = 31.25K for $V_{OUT} = 3.3V$)

7. Materials Lists

Table 1. FAN2001MPX List of Materials

| Description | Qty. | Ref. | Vendor | Part Number |
|---|------|---------------------------------------|----------------------------|----------------|
| Inductor 3.3 μ H, $I_{sat} = 0.5A$ | 1 | L | Any | |
| Capacitor 10 μ F, 10%, 6.3V, X5R, 1206 | 3 | C2, C3, C_{IN} | MURATA | GRM31CR70J106K |
| | | | Panasonic | ECJ-3YB0J106K |
| Resistor 10Kohm, 1%, 1206 | 1 | R2 | Any | |
| Resistor 31.25Kohm, 1%, 0805 (for option V_{OUT} set 3.3V) | 1 | R1 | Any | |
| Resistor 4.99Kohm, 1%, 0805 (for option V_{OUT} set 1.2V) | 1 | R1 | Any | |
| Hardware Connector Header . 1 SINGLE STR 36POS | 9 | V_{IN} , V_{OUT} , GND, ON/OFF | Digi-Key | S1011-36-ND |
| IC DC/DC Regulator, 6-lead MLP 3x3mm, FSID: FAN2001MPX | 1 | U1 | Fairchild Semiconductor | FAN2001MPX |
| Hardware, SHUNT, PHBR 15AU | 1 | ON/OFF | DIGI-KEY | A26227-ND |

Table 2. FAN2002 MPX List of Materials


| Description | Qty. | Ref. | Vendor | Part Number |
|---|------|---------------------------------------|----------------------------|----------------|
| Inductor 3.3 μ H, $I_{sat} = 0.5A$ | 1 | L | Any | |
| Capacitor 10 μ F, 10%, 6.3V, X5R, 1206 | 3 | C1, C2, C_{IN} | MURATA | GRM31CR70J106K |
| | | | Panasonic | ECJ-3YB0J106K |
| Resistor 10Kohm, 1%, 1206 | 1 | R1 | Any | |
| Resistor 31.25Kohm, 1%, 1206 (for option V_{OUT} set 3.3V) | 1 | R2 | Any | |
| Resistor 4.99Kohm, 1%, 1206 (for option V_{OUT} set 1.2V) | 1 | R2 | Any | |
| Hardware Connector Header .1 SINGLE STR 36POS | 9 | V_{IN} , V_{OUT} , GND, ON/OFF | Digi-Key | S1011-36-ND |
| IC DC/DC Regulator, 6-lead MLP 3x3mm, FSID: FAN2002MPX | 1 | U1 | Fairchild Semiconductor | FAN2002MPX |
| Hardware, SHUNT, PHBR 15AU | 1 | ON/OFF | DIGI-KEY | A26227-ND |

Table 3. Ordering Information

| Product Number | Package Type | Order Code |
|----------------|---|------------|
| FAN2001 | Pb-Free, 6-Lead 3x3mm Molded Leadless Package (MLP) | FAN2001MPX |
| FAN2002 | Pb-Free, 6-Lead 3x3mm Molded Leadless Package (MLP) | FAN2002MPX |

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