July 2005

# FAN5607 Evaluation Board User Manual

- 2.4 to 5.5V Input Range
- Up to 120mA Output Current (4x30mA)
- Adaptive $V_{out}$ Adjustment to the Highest Diode Voltage
- External Resistor to Set Maximum LED Current
- Enable Input Can have PWM LED Brightness Control
- Short Circuit Protection, Shutdown Mode and Soft Start
- 1MHz Operating Frequency
- Up to 93% Efficiency
- Small 16-lead 4x4mm MLP Package

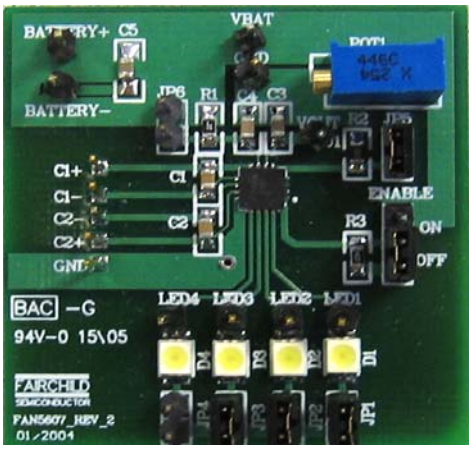


**Figure 1: FAN5607 HMPX**

## Description:

The **FAN5607 Evaluation Board** is a compact circuit including the FAN5607 HMPX in a 4x4 MLP package and two 4.7uF capacitors which can provide stable input/output current for up to four of Fairchild's super bright white LEDs. Two 1uF bucket capacitors maintain constant current through the LEDs in different pump regulator modes. The FAN5607 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.

## Where To Begin:

**1:** Connect Battery (2.4 to 5.5V) and Gnd (0V).

**2:** Jumper JP5 presets the LED current to 20mA. Use the adjustable resistor POT1 to decrease the current. (**Note:** It is not advised to increase current beyond 20mA due to LED limitations)

**3:** Each LED current can be measured by removing jumpers JP1 through JP4 respectfully and applying a current meter. Observe that the LED current is constant regardless of Battery input voltage and that current is not affected by varying numbers of LEDs. Observe that the supply current changes in steps when the battery voltage reaches the threshold of mode changes. (**Note:** Replacing the provided LEDs with other types can affect the input voltage threshold values where transition modes occur)

**4:** Adding resistor R1 by removing jumper JP6 reduces battery voltage ripple.

**5:** To verify supply current in "ON" and "OFF" modes, observe that in shutdown mode, supply current will drop below 1uA at Battery input.

**6:** To verify PWM dimming, remove ENABLE jumper and apply a PWM signal of 100Hz to ON (pin 2). Observe that the average LED current is directly proportional to the duty cycle.

**7:** To measure clock frequency, connect scope probe to bucket capacitors C1+, C1-, C2+ and C2-

**8:** Observe that the circuit is protected from open load conditions by verifying the output voltage Vout < 6V.

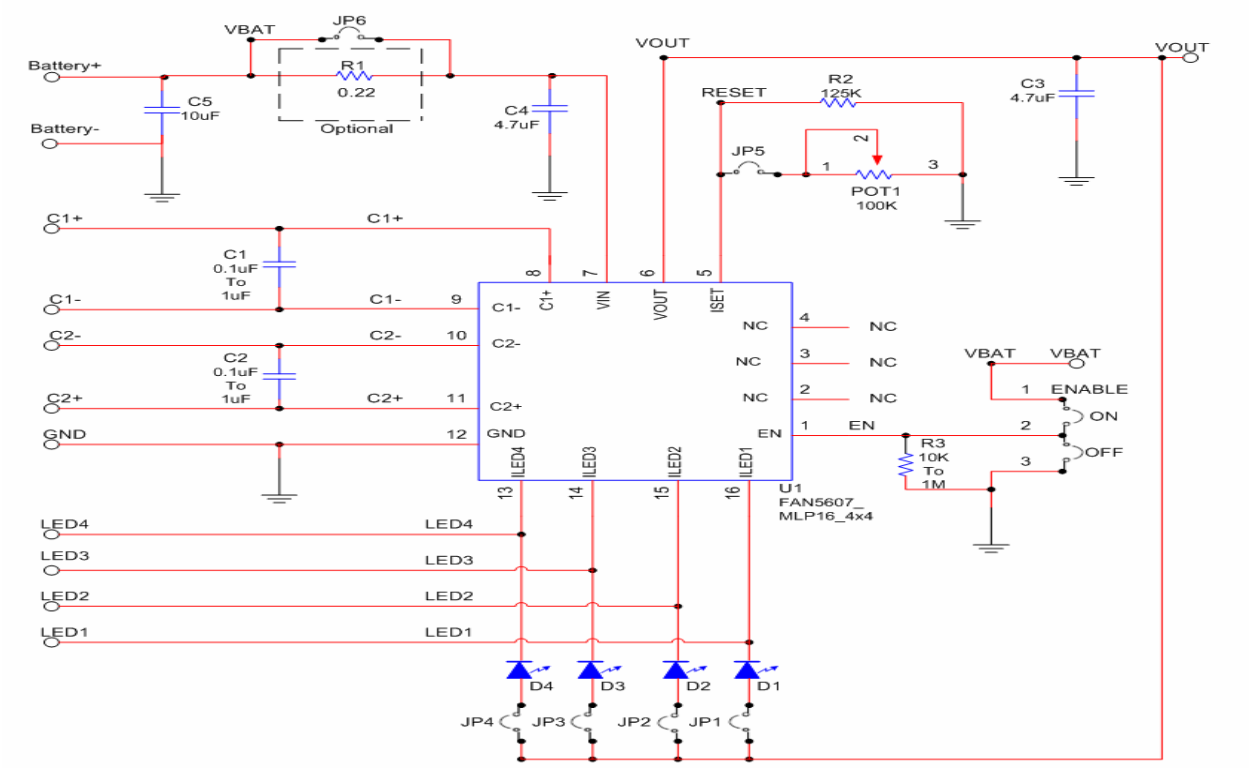


**Figure 2: Schematic Diagram**

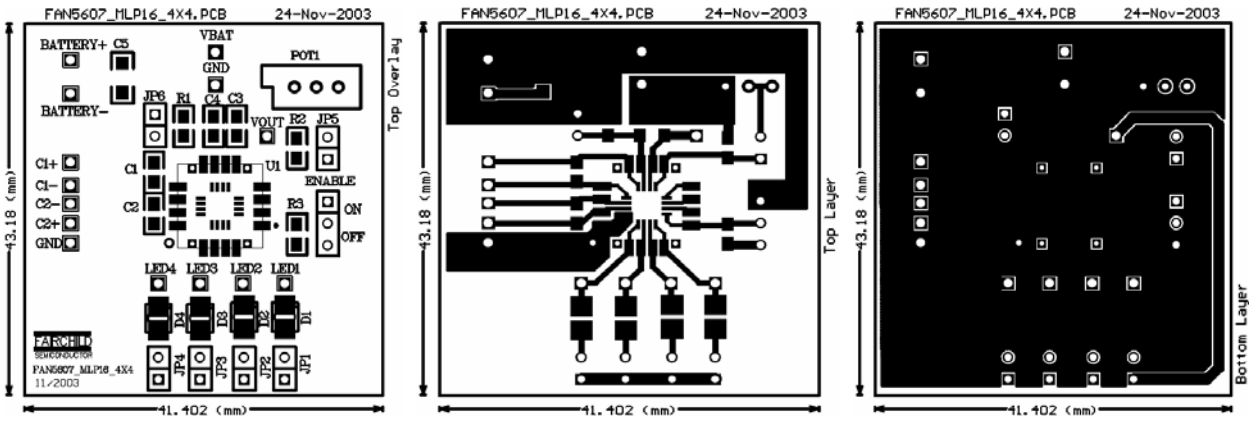


**Figure 3: PCB Layout**

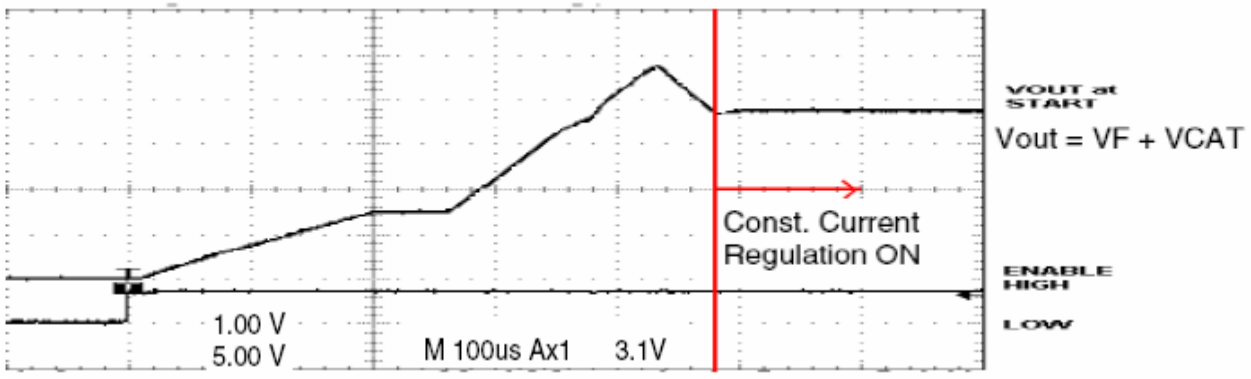


**Figure 4: Start-Up Waveform**

## Table 1: FAN5607 List of Materials

| Description | Qty | Ref. | Vendor | Part Number |
|---|---|---|---|---|
| Capacitor 1uF, 10%, 10VDC, X7R, 0805 | 2 | C1,C2 | Kemet<br>Panasonic<br>Murata | C0805C105K8RACTU<br>ECJ-2YB1A105K<br>GRM21BR71A105K |
| Capacitor 4.7uF, 20%, 6.3VDC, X5R, 0805 | 2 | C3,C4 | Panasonic<br>Taiyo Yuden<br>TDK | ECJ-2FBOJ475M<br>JMK212BJ475MG<br>C2012X5R0J475M |
| Capacitor 10uF, 10%, 6.3V, X5R, 1206 | 1 | C5 | Rubycon<br>Panasonic | 16MBZ1500M10x20<br>ECJ-3YB0J106K |
| LED Super Bright QTLP670C-IW | 4 | LED1 to 4 | Fairchild | QTLP620C-IW |
| Hardware Connector Header .1 SINGLE STR 36POS | 29 | JP,TP | Digi-Key | S1011-36-ND |
| IC System Regulator, MLP16 4x4, FSID: FAN5607 HMPX | 1 | U1 | Fairchild | FAN5607 HMPX |
| Resistor 125 Kohm, 1%, 0805 | 1 | R2 | Any | |
| Potentiometer 100K | 1 | P1 | Any | |
| Resistor 10K to 1MOhm | 1 | R3 | Any | |

## Table 2: Ordering Information

| Product Number | Package Type | Order Code |
|---|---|---|
| FAN5607 | 16-Lead 4x4mm MLP | FAN5607HMPX |

## WARNING AND DISCLAIMER

Replace components on the Evaluation Board only with those parts shown on the parts list in the User's Guide. Contact an authorized Fairchild representative with any questions.

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| DOME™ | GTO™ | MicroPak™ | QFET® | SuperSOT™-8 |
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