# LM3475 Evaluation Board

National Semiconductor
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## Introduction

The LM3475 evaluation board is provided as a tool for developing DC/DC converters based on the LM3475 IC. As shown in *Figure 1*, the evaluation board is configured to provide an output of 2.5V at up to 2A from an input up to 10V. The corresponding bill of material is given in *Table 1*. Typical efficiencies are shown in *Figure 2* and *Figure 3*. *Figure 4* and *Figure 5* show the board layout.

To aid in the design and evaluation of dc/dc buck converters based on the LM3475 controller, the LM3475 Evaluation Board can be easily re-configured for different output voltages.

## Setting Vout

Vout can be set using $R_{FB1}$, as shown in the following equation:

$$V_{OUT} = V_{FB} \times (R_{FB1} + R_{FB2}) / R_{FB2}$$

Where $V_{FB}$ is 0.8V typically.

Refer to the datasheet before changing any component values, since additional design adjustments may be required.

## Optional Components

A feed-forward capacitor $C_{FF}$ is placed on the board, which will increase operating frequency. However, the speed up effect decreases with lower output voltage and is negligible below 1.6V output.

A zero Ohm is used to pull up the EN pin for always on operation. The enable pin can be pulled low at the EN post to shutdown the device. If this resistor is removed, any analog level signal can be used to enable and disable the device.

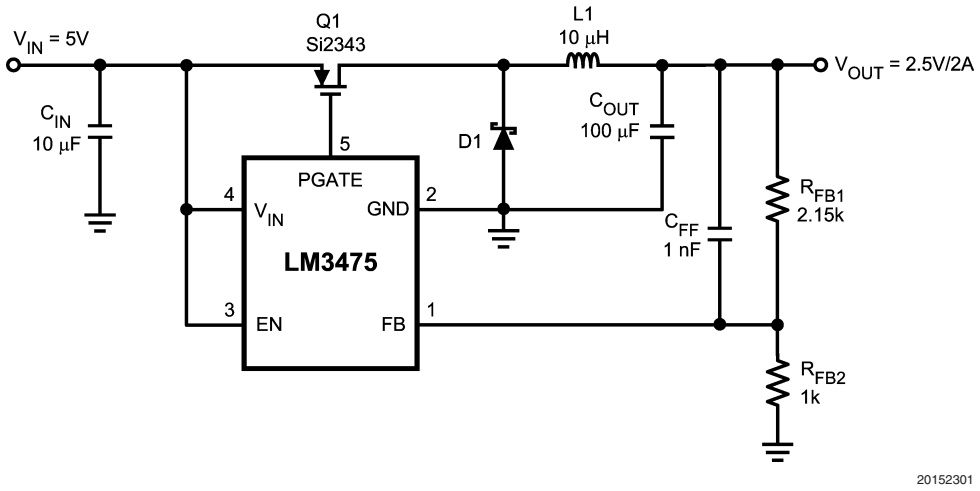


**FIGURE 1. Full Demo Board Schematic**





 

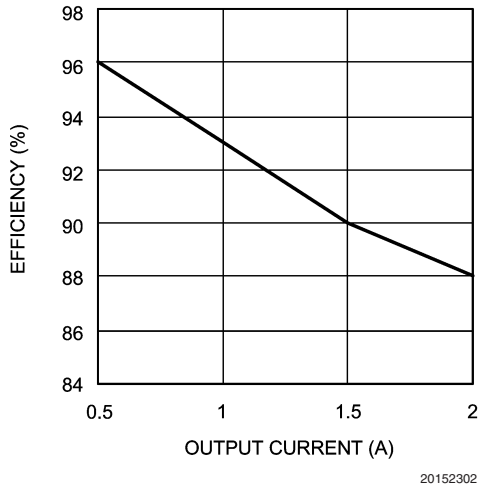


**FIGURE 2. Efficiency vs Output Current (Vin = 5V)**

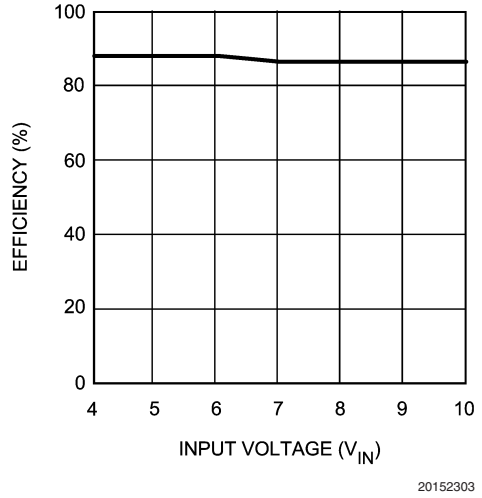


**FIGURE 3. Efficiency vs Input Voltage (Iout = 2A)**

**TABLE 1. Bill of Materials**

| Designator | Part Description | Part Number |
|---|---|---|
| CIN | 10 µF 16V ceramic | Yuden EMK325BJ106MN |
| COUT | 100 µF 6V tantalum | AVX TPSY107M006R0100 |
| CFF | 1 nF 25V ceramic | VJ1206Y102KXXA |
| D1 | Schottky 20V 2A | Central CMSH2-20L |
| L1 | 10 µH 3.1 A | Sumida CDRH103R100 |
| Q1 | Si 2343 30V 2.5A | Vishay Si2343 |
| RFB2 | 1 kΩ | Vishay CRCW08051001F |
| RFB1 | 2.15 kΩ | Vishay CRCW08052151F |
| R2 | 0 Ω | Vishay CRCW08050R00F |

## PCB Layout Diagram(s)

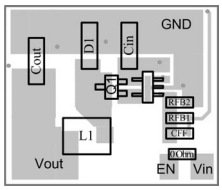


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**FIGURE 4. Top Side Layout**

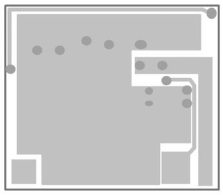

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**FIGURE 5. Bottom Side Layout**



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