# EL7554IRE-EVAL

Evaluation Board

TB418
Rev.1.00
Nov 14, 2003

## Introduction

The EL7554 is a high efficiency full-featured synchronous 4A step-down regulator. This document lists the completed schematic diagram and BOM, as well as the layout. With components on one side of the PCB, the complete converter occupies less than 0.58in$^2$ of space. Please refer to the datasheet for the application of features. This demo board is preset to 1.8V for $V_O$ and operates at 600kHz switching frequency. The measured crossover frequencies are around 50kHz with the compensation values.

## Circuit Diagram

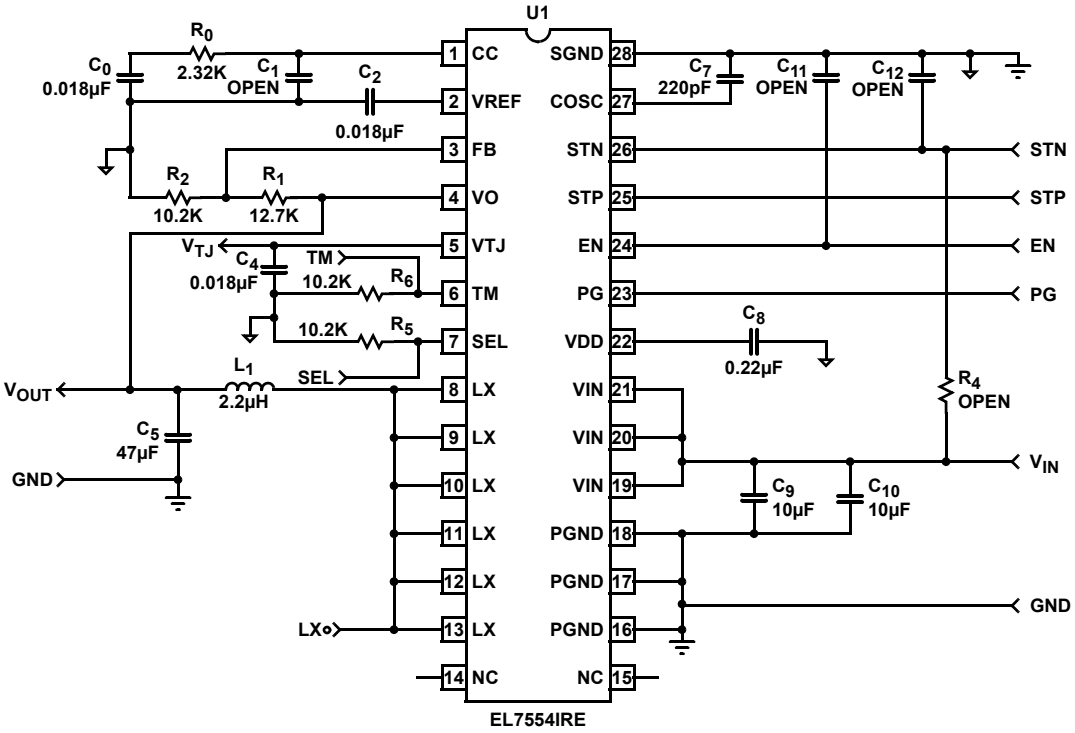


**TABLE 1. DEMO BOARD BILL OF MATERIAL**

| DESIGNATOR | VALUE | PACKAGE | MANUFACTURER | PHONE # | PART NUMBER |
|---|---|---|---|---|---|
| $C_0$, $C_2$, $C_4$ | 0.018µF | 0603 | Any X5R or X7R | | |
| $C_5$ | 47µF | 1210 | TDK | | C3225X5R0J476M |
| $C_7$ | 220pF 5% | 0603 | Any 5% MLCC | | |
| $C_8$ | 0.22µF | 0603 | Any X5R or X7R | | |
| $C_9$, $C_{10}$ | 10µF | 1206 | Any X5R or X7R | | |
| $R_0$ | 2.32K/1% | 0603 | Any | | |
| $R_1$ | 12.7K/1% | 0603 | Any | | |
| $R_2$, $R_5$, $R_6$ | 10.2K/1% | 0603 | Any | | |
| $L_1$ | 2.2µH | | TDK | 847-803-6100 | RLF7030-2R2M5R4 |
| U1 | EL7554IRE | HTSSOP-28 | Intersil | 888-INTERSIL | EL7554IRE |

The output voltage can be as high as the input voltage minus the PMOS and inductor voltage drops. Use $R_1$ and $R_2$ to set the output voltage according to the following formula:

$$V_O = V_{FB} \times \left(1 + \frac{R_1}{R_2}\right)$$

Where $V_{FB}$=0.8V

When the resisters are changed, please change the compensation capacitor $C_0$ and resister $R_0$. For the convenience, standard values of $R_1$ and $R_2$ are listed in Table 2.

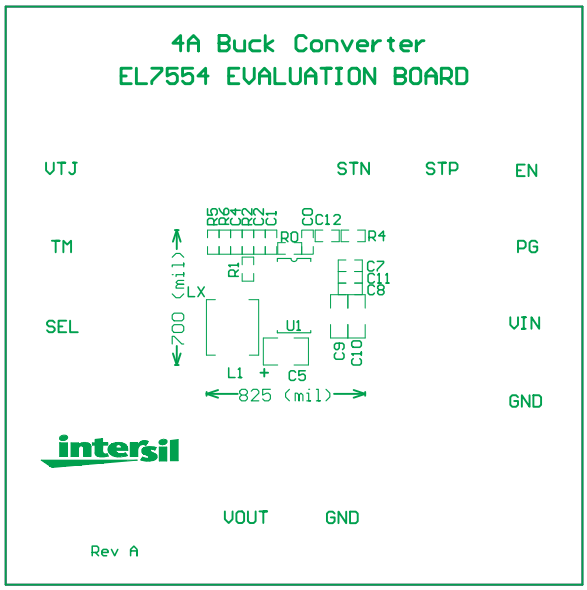
$R_5$ and $R_6$ can be eliminated if voltage margin feature is not used. Connect TM and SEL pins directly to ground.

The layout accommodates 1206, 1210, 1812, and D-size package for C5.

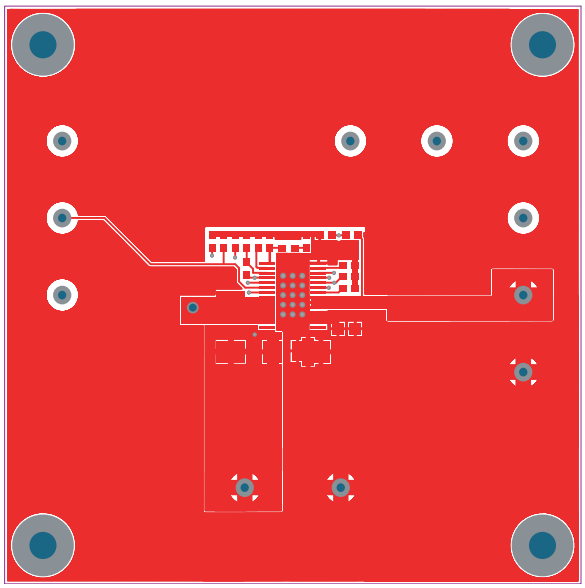
**TABLE 2. FEEDBACK RESISTER AND COMPENSATION VALUES**

| $V_O$ (V) | $C_0$ (pF) | $R_0$ (kΩ) | $R_1$ (kΩ) | $R_2$ (kΩ) |
|---|---|---|---|---|
| 0.8 | 0.018µF | 1.02 | 0 | Open |
| 1 | 0.018µF | 1.27 | 2.49 | 10 |
| 1.2 | 0.018µF | 1.54 | 4.99 | 10 |
| 1.5 | 0.018µF | 1.91 | 10 | 11.5 |
| 1.8 | 0.018µF | 2.32 | 12.7 | 10.2 |
| 2.5 | 0.018µF | 3.24 | 21.5 | 10 |
| 3.3 | 0.018µF | 4.22 | 36 | 11.5 |

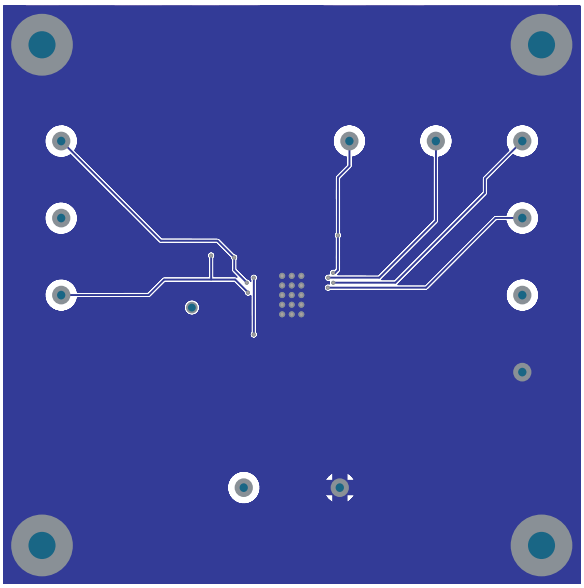
## *Demo Board Layout*




**TOP SILKSCREEN**



**TOP LAYER**



**BOTTOM LAYER**