

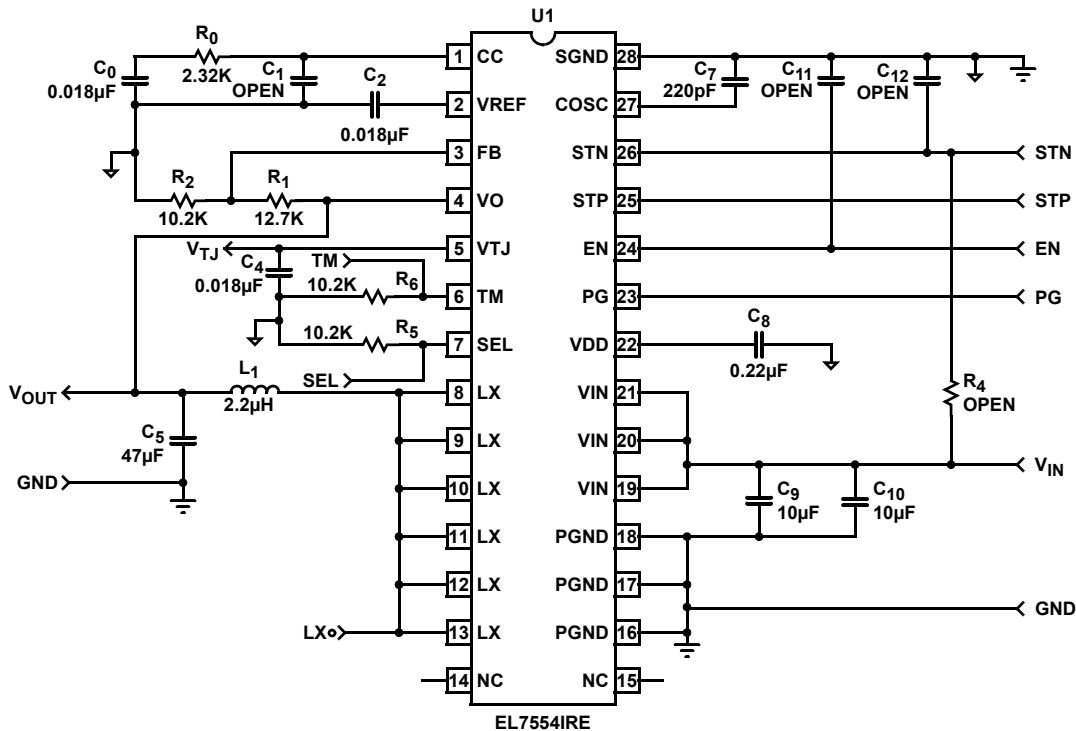
**Introduction**



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<sup>2</sup> of space.

Please refer to the datasheet for the application of features. This demo board is preset to 1.8V for V<sub>O</sub> and operates at 600kHz switching frequency. The measured crossover frequencies are around 50kHz with the compensation values.

**Circuit Diagram**



## Technical Brief 418

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

DESIGNATOR	VALUE	PACKAGE	MANUFACTURER	PHONE #	PART NUMBER
C <sub>0</sub> , C <sub>2</sub> , C <sub>4</sub>	0.018μF	0603	Any X5R or X7R		
C <sub>5</sub>	47μF	1210	TDK		C3225X5R0J476M
C <sub>7</sub>	220pF 5%	0603	Any 5% MLCC		
C <sub>8</sub>	0.22μF	0603	Any X5R or X7R		
C <sub>9</sub> , C <sub>10</sub>	10μF	1206	Any X5R or X7R		
R <sub>0</sub>	2.32K/1%	0603	Any		
R <sub>1</sub>	12.7K/1%	0603	Any		
R <sub>2</sub> , R <sub>5</sub> , R <sub>6</sub>	10.2K/1%	0603	Any		
L <sub>1</sub>	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<sub>1</sub> and R<sub>2</sub> 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<sub>FB</sub>=0.8V

When the resistors are changed, please change the compensation capacitor C<sub>0</sub> and resistor R<sub>0</sub>. For the convenience, standard values of R<sub>1</sub> and R<sub>2</sub> are listed in Table 2.

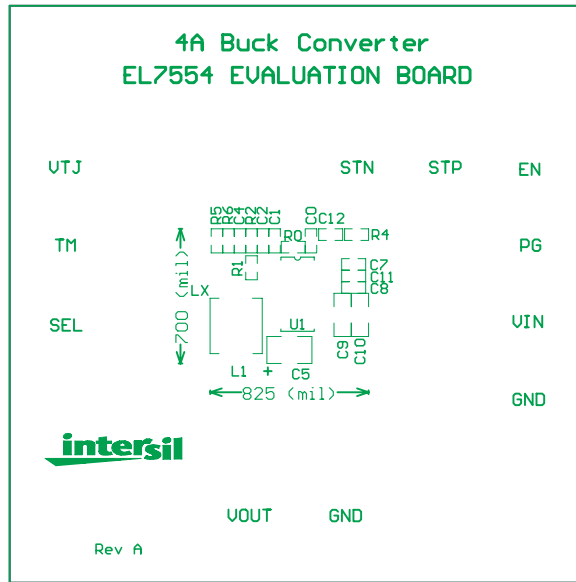
R<sub>5</sub> and R<sub>6</sub> can be eliminated if voltage margin feature is not used. Connect TM and SEL pins directly to ground.

The layout accommodates 1206, 1210, 1812, and D-size package for C<sub>5</sub>.

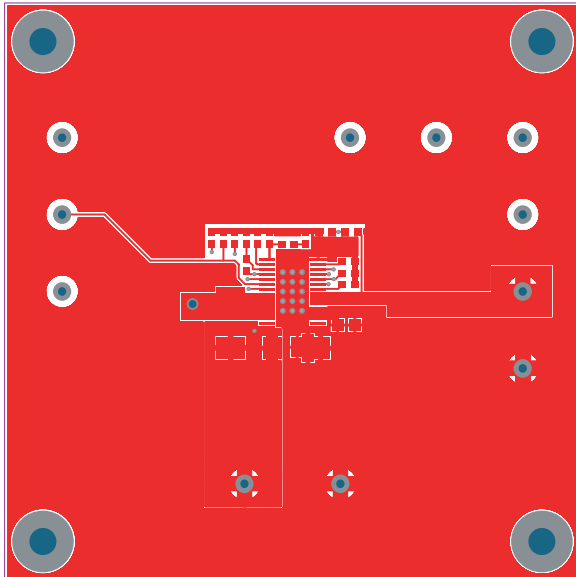
**TABLE 2. FEEDBACK RESISTER AND COMPENSATION VALUES**

V <sub>O</sub> (V)	C <sub>0</sub> (pF)	R <sub>0</sub> (kΩ)	R <sub>1</sub> (kΩ)	R <sub>2</sub> (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

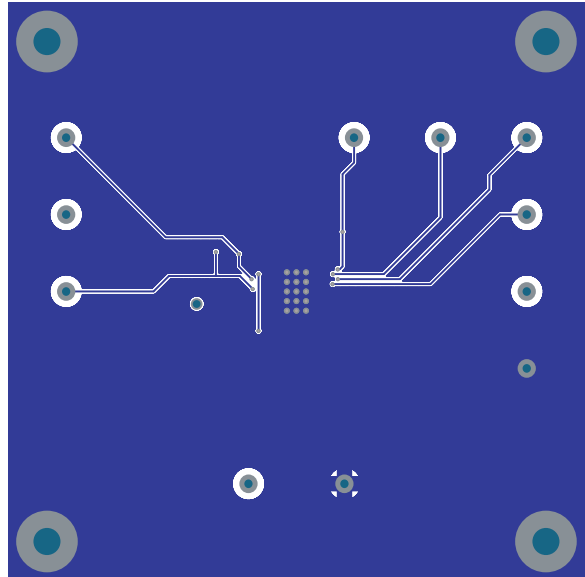
Demo Board Layout



TOP SILKSCREEN



TOP LAYER



BOTTOM LAYER

All Intersil U.S. products are manufactured, assembled and tested utilizing ISO9000 quality systems. Intersil Corporation's quality certifications can be viewed at [www.intersil.com/design/quality](http://www.intersil.com/design/quality)

*Intersil products are sold by description only. Intersil Corporation reserves the right to make changes in circuit design, software and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that data sheets are current before placing orders. Information furnished by Intersil is believed to be accurate and reliable. However, no responsibility is assumed by Intersil or its subsidiaries for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Intersil or its subsidiaries.*

For information regarding Intersil Corporation and its products, see [www.intersil.com](http://www.intersil.com)