User's Guide
SNVA100A – February 2005 – Revised April 2013

AN-1350 LM2734 Evaluation Board

1 Introduction

The LM2734 demo board is configured to convert 5V input to 1.8V output at 1A load current using the LM2734X 1.6MHz or the LM2734Y 550kHz step down DC-DC regulator. The tiny low profile thin SOT23 package allows the demo board to be manufactured using less than 1 square inch of a 4-layer printed circuit board.

The circuit is configured with the boost diode connected to V_{IN}, and according to the data sheet, V_{IN} must not exceed the maximum operating limit of 5.5V + V_{fD2} using this configuration. This will ensure that the voltage between the Boost and SW pins, V_{BOOST} - V_{SW}, does not exceed 5.5V for proper operation. Please see the LM2734 data sheet for more information regarding this requirement.

A bill of materials in Table 1 and Table 2 describes the parts used on this demo board. A schematic and layout have also been included in Figure 1 along with measured performance characteristics. The schematics at the end of this document show how to re-configure this demo board for various input and output conditions as discussed in the LM2734 data sheet. Short or leave open the indicated connection as indicated in the schematics. The above restrictions for the input voltage are valid only for the demo board as shipped with the demo board schematic below.

2 Operating Conditions

V_{IN} = 5V

V_O = 1.8V

I_O = 1A

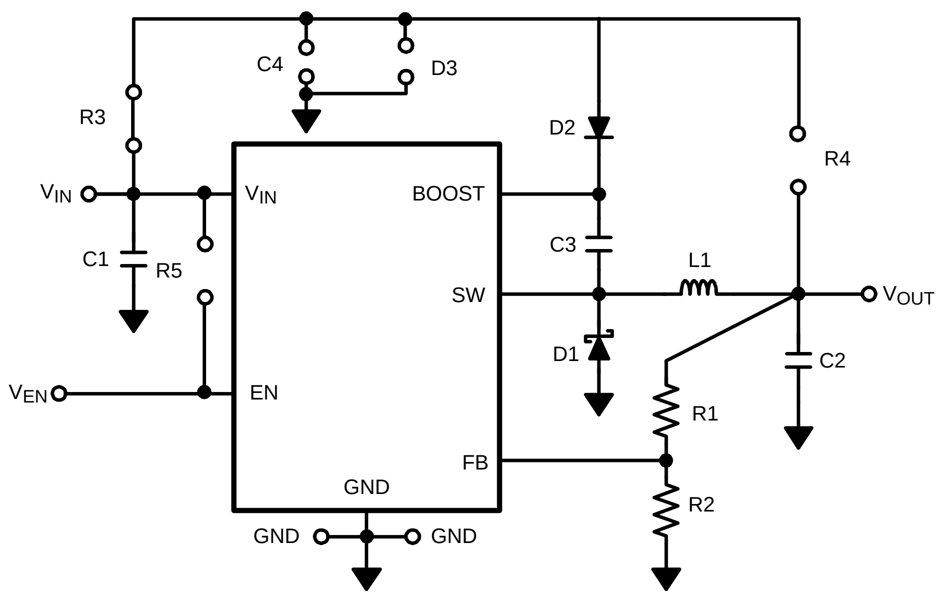

Figure 1. LM2734 Demo Board Schematic

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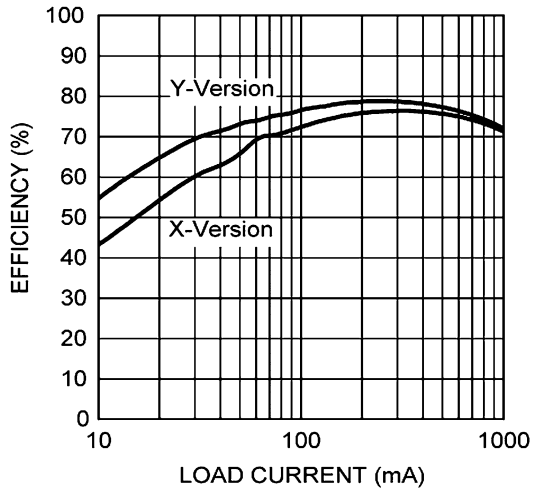

Figure 2. Efficiency vs Load Current

Table 1. Bill of Materials X-Version

Part ID	Part Value	Manufacturer	Part Number	Package Type
C1, Input Cap	4.7µF, 10V, X5R	Murata	GRM42-6X5R475K10	1206
C2, Output Cap	10µF, 6.3V, X5R	Murata	GRM42-6X5R106K6.3	1206
C3, Boost Cap	0.01µF	Vishay	VJ0805Y103KXXA	0805
D2, Boost Diode	1Vf @ 50mA Diode	Diodes, Inc.	1N4148W	SOD-123
R2	10kΩ, 1%	Vishay	CRCW12061002F	1206
U1	1A Buck Regulator	Texas Instruments	LM2734	Thin SOT23-6
D1, Catch Diode	0.34Vf Schottky 1A, 20VR	International Rectifier	MBRA120	SMA
L1	2.7µH, 1.8A, 22mΩ	TDK	SLF6028T-2R7M1R8	6028
R1	12.4kΩ, 1%	Vishay	CRCW12061242F	1206
R3	0Ω	Vishay	CRCW12060R00F	1206
D3, C4, R4, R5	Open			

Table 2. Bill of Materials Y-Version

Part ID	Part Value	Manufacturer	Part Number	Package Type
C1, Input Cap	10µF, 10V, X5R	Murata	GRM42-6X5R106K10	1206
C2, Output Cap	10µF, 6.3V, X5R	Murata	GRM42-6X5R106K6.3	1206
C3, Boost Cap	0.01µF	Vishay	VJ0805Y103KXXA	0805
D2, Boost Diode	1Vf @ 50mA Diode	Diodes, Inc.	1N4148W	SOD-123
R2	10kΩ, 1%	Vishay	CRCW12061002F	1206
U1	1A Buck Regulator	Texas Instruments	LM2734	Thin SOT23-6
D1, Catch Diode	0.34Vf Schottky 1A, 20VR	International Rectifier	MBRA120	SMA
L1	6.8µH, 1.5A, 35mΩ	TDK	SLF6028T-6R8M1R5	6028
R1	12.4kΩ, 1%	Vishay	CRCW12061242F	1206
R3	0Ω	Vishay	CRCW12060R00F	1206
D3, C4, R4, R5	Open			

3 PCB Layout

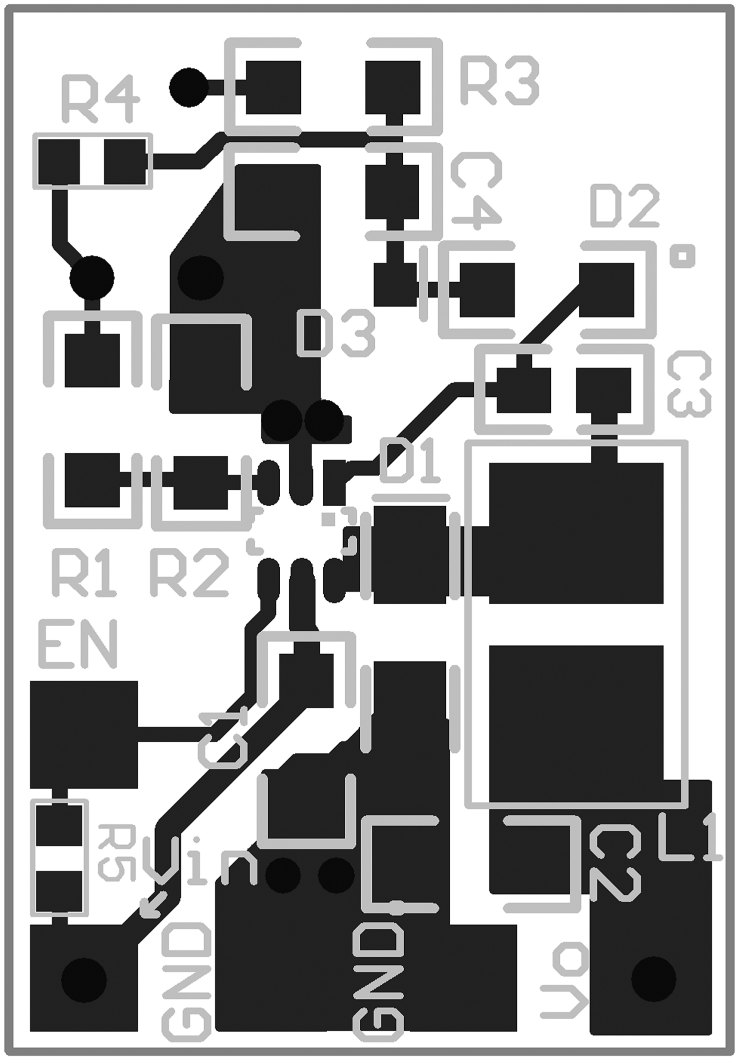

Figure 3. Top Layer

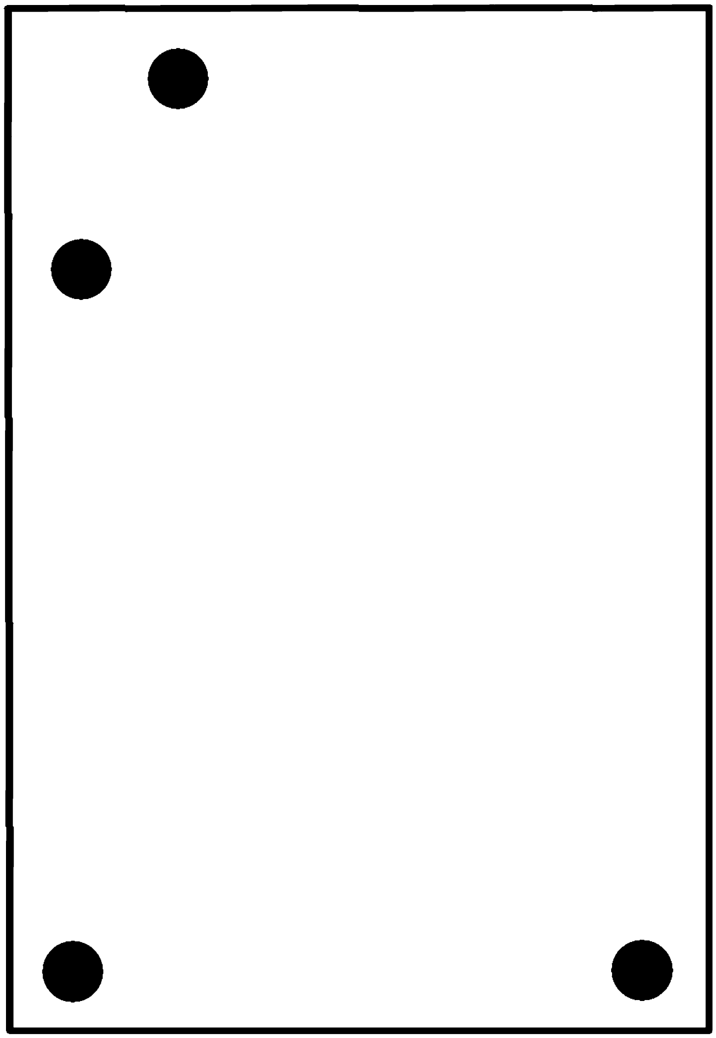

Figure 4. Internal Plane 1 (GND)

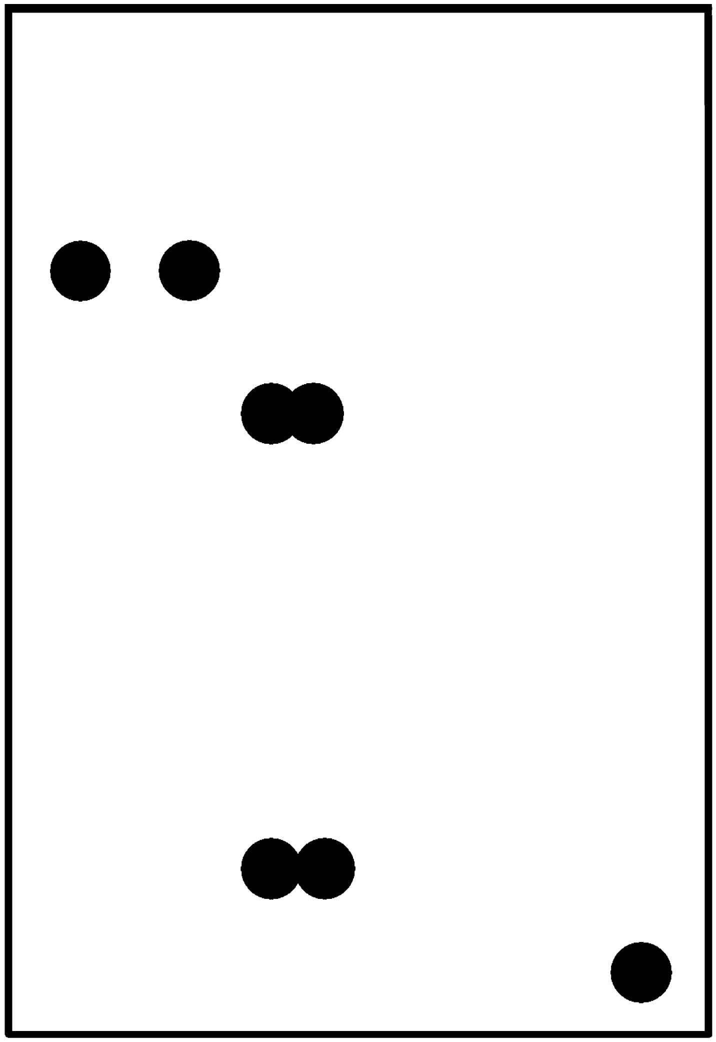

Figure 5. Internal Plane 2 (V_{IN})

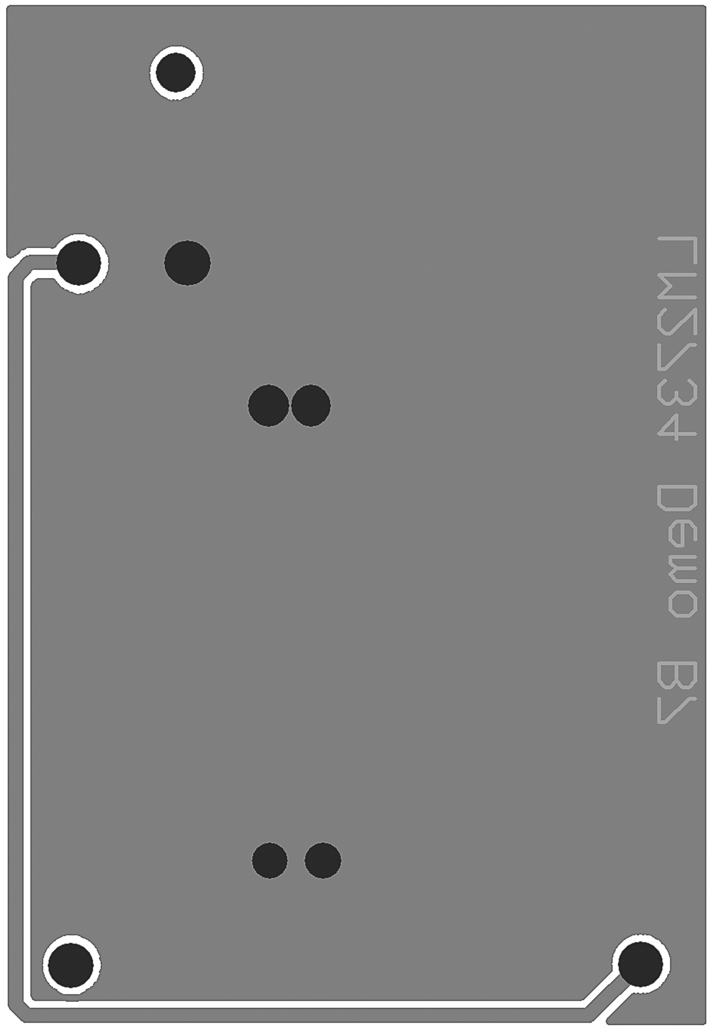

Figure 6. Bottom Layer

4 Additional Circuit Configuration Schematics

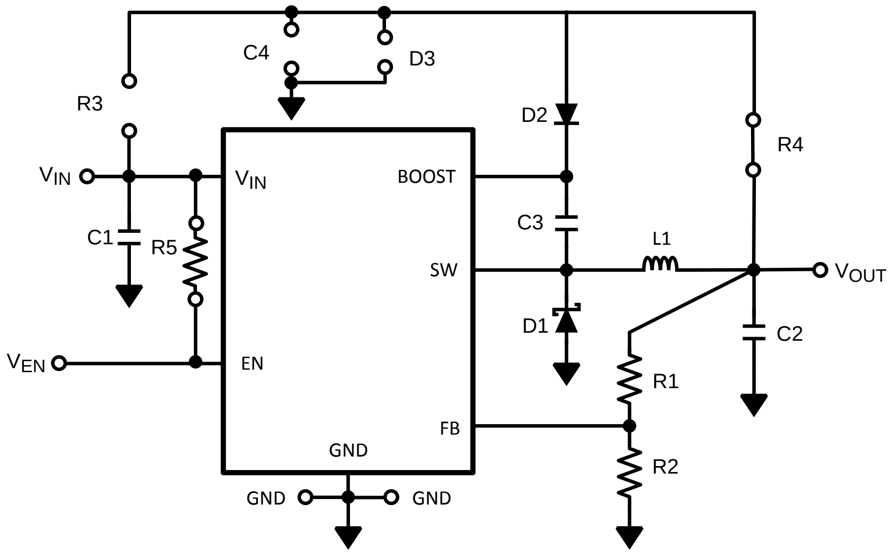

Figure 7. V_{BOOST} Derived from V_{OUT}

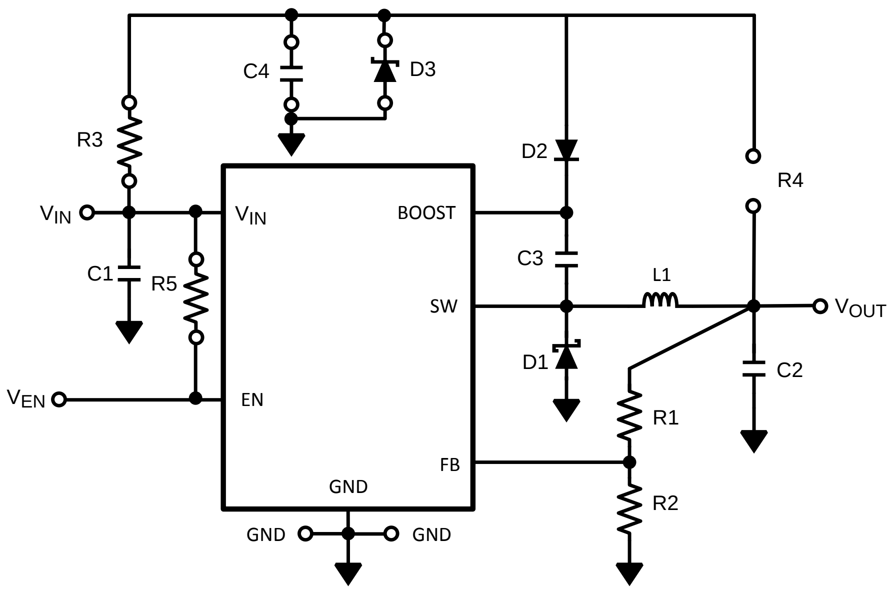

Figure 8. V_{BOOST} Derived from V_{SHUNT}

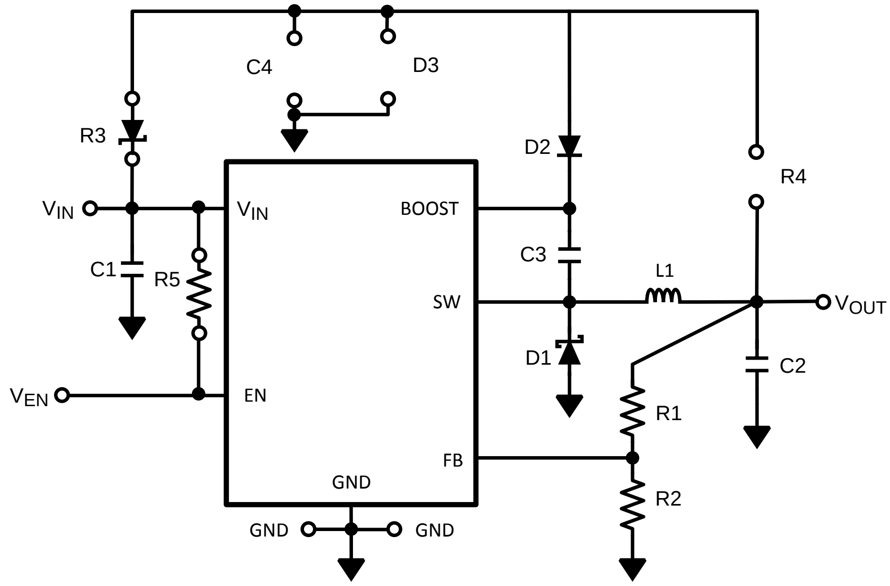

Figure 9. V_{BOOST} Derived from Series Zener Diode (V_{IN})

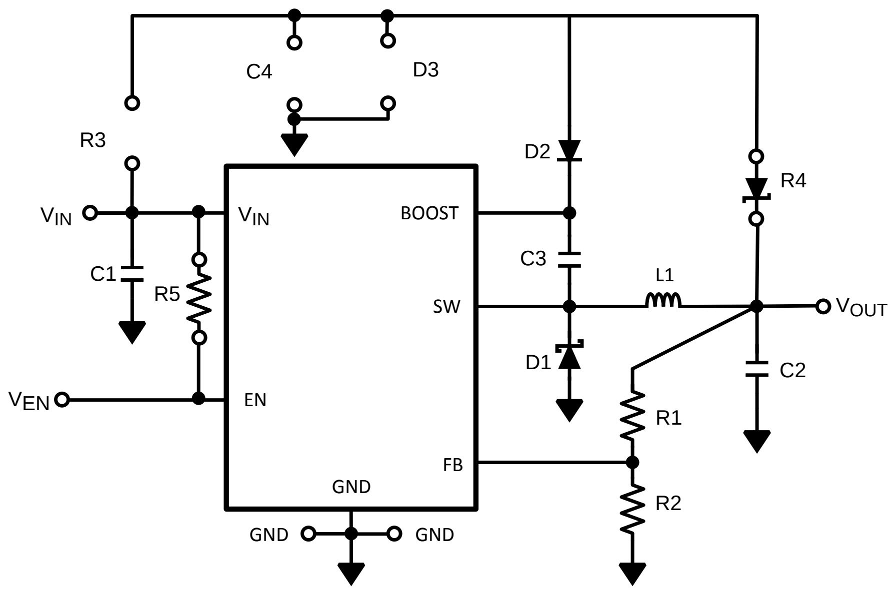

Figure 10. V_{BOOST} Derived from Series Zener Diode (V_{OUT})

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