



## 1.0 Design Specifications

Inputs	Outputs #1
VinMin=12.00 V	Vout1=5.00 V
VinMax=30.00 V	Iout1=1.50 A

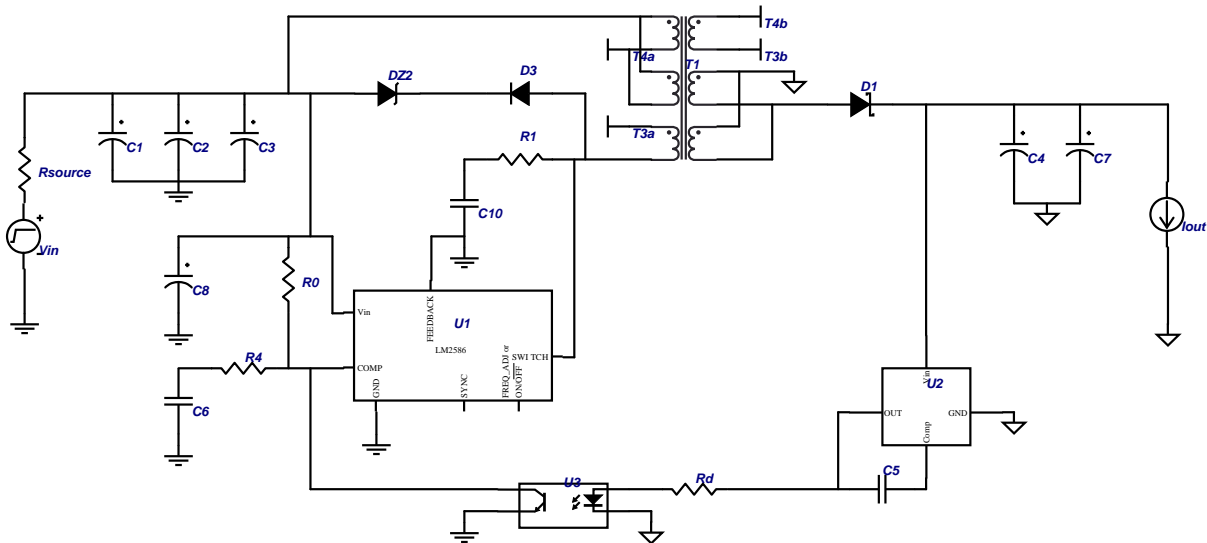
## 2.0 Design Description

The LM2586 and the LM3411-5 are employed here to design a fully isolated, "flyback" power supply where minimizing the parts count and simplicity is important. The LM2586 is a PWM regulator with an internal 3 Amp switch and the LM3411-5 is a precision shunt regulator acting as error amplifier plus reference. An "isolated" architecture is used in applications where the input and output power rails, grounds and feedback paths must not be directly connected but must be connected indirectly through a transformer, T1, and opto-coupler, U3, for safety purposes. Input voltage, Vin, charges up energy in the primary coil of the transformer during the on-time of the regulator switch; then, during the off-time this energy is coupled

to the secondary to Vout through the diode, D1, as part of what is known as a "flyback" action. Note that the transformer here is a very easy to use off-the-shelf part. The circuit formed by DZ2 & D3 creates a switch protection circuit and R4 & C6 are set to compensate the overall control loop for best transient response. Input capacitance, C1 through C3, serve to minimize ripple effects on the input voltage, and output capacitance, C4 & C7, set the output ripple and play a part in the transient response of the power supply.

Notes: Please note that DZ2 in the schematic corresponds to D2 in the PCB layout. C8 (100nF Capacitor) can be included in the board layout.

## 3.0 Schematic



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FIGURE 1. Example Schematic Showing Connection for all Components.

## 4.0 Bill Of Materials

Part	Manufacturer	Part#	Attributes
C1	Sprague	594D156X9050R2T	15u F, 0.35 Ohms
C10	Vishay	VJ1206Y222KXXT	2.2n F
C2	Sprague	594D156X9050R2T	15u F, 0.35 Ohms
C3	Sprague	594D156X9050R2T	15u F, 0.35 Ohms

Part	Manufacturer	Part#	Attributes
C4	Sprague	5940337X9010R2T	330u F, 0.45 Ohms
C5	Vishay	VJ1206Y104KXAAT	0.1u F
C6	Vishay	VJ1206Y223KXBAT	0.022u F
C7	Sprague	5940337X9010R2T	330u F, 0.45 Ohms
C8	Vishay	VJ1206Y104KXAAT	100n F
D1	ONSEMI	MBRS240LT3	0.43 V
D3	ONSEMI	MURS140T3	2 V
DZ2	ONSEMI	1SMB22AT3	5 V
R0	Vishay	CRCW12064701FRT6	4.7k Ohms
R1	Vishay	CRCW120610R0FRT6	10 Ohms
R4	Vishay	CRCW12062700FRT6	270 Ohms
Rd	Vishay	CRCW12062500FRT6	250 Ohms
T1	Coiltronics	VP4-0047	
U1	National Semiconductor	LM2586	
U2	National Semiconductor	LM3411	
U3	Vishay-Semiconductor	CNY17F-3	

## 5.0 Layout

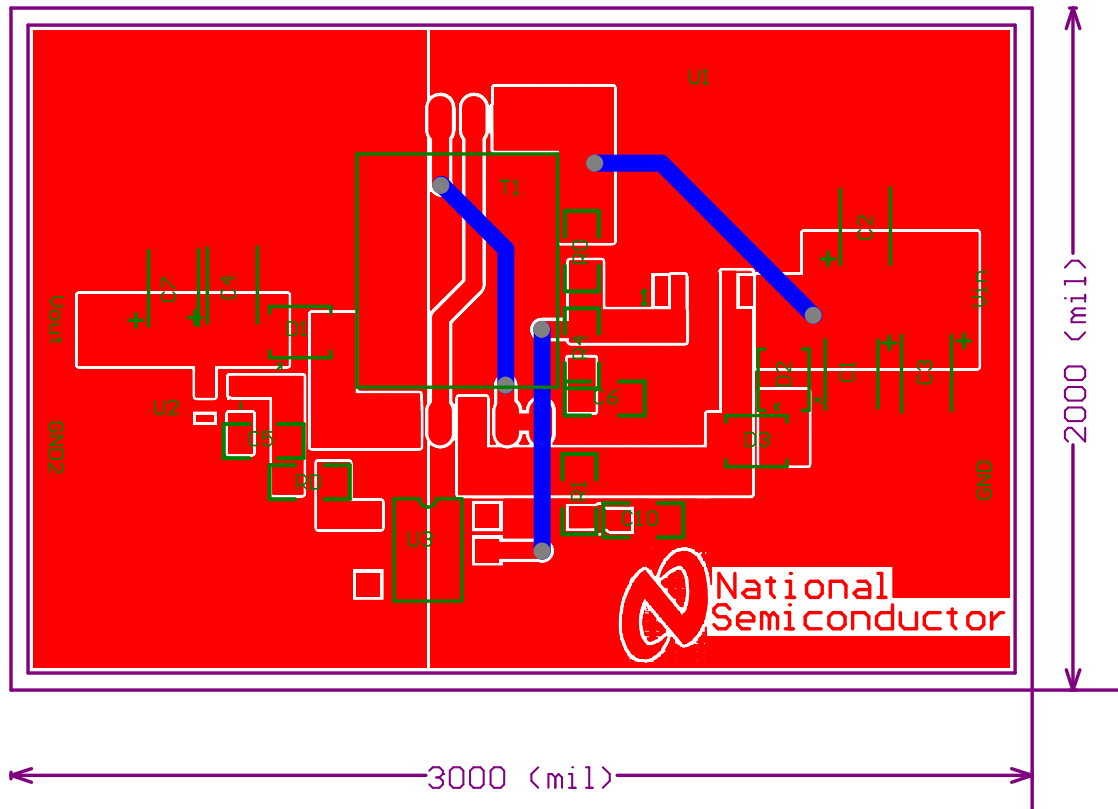
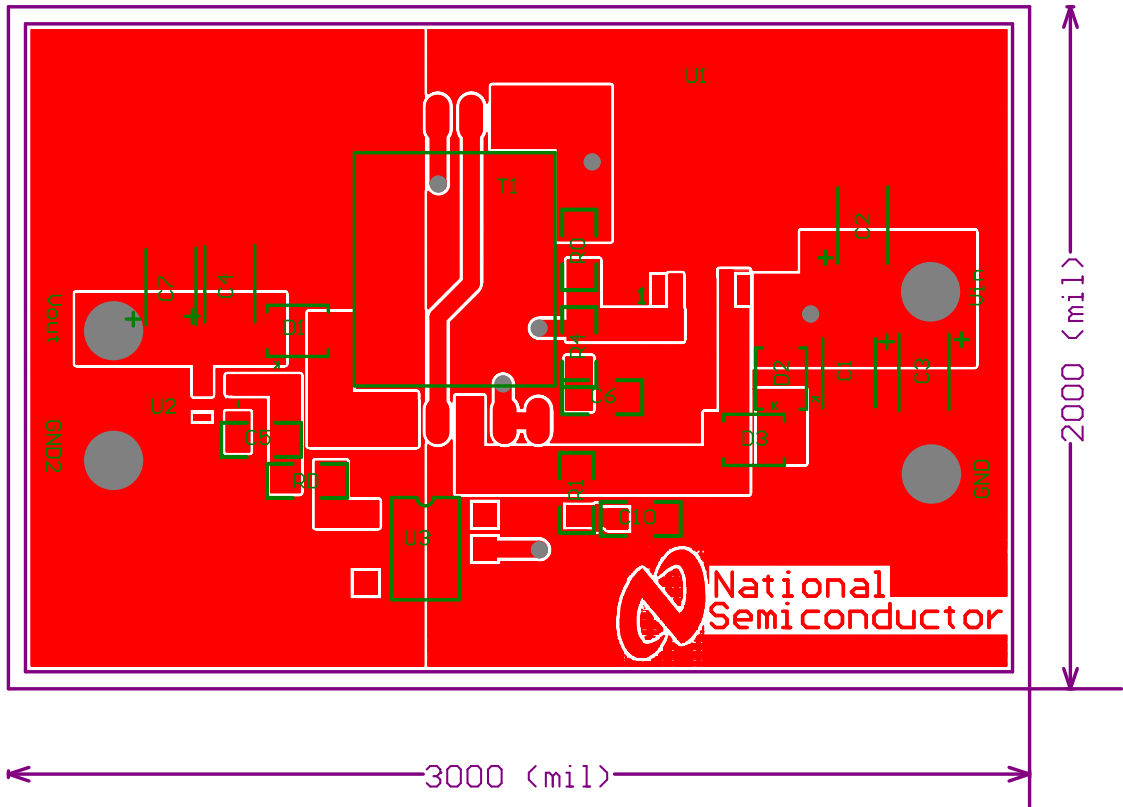


FIGURE 2. Board's Bottom View

PADC\_NSC0020\_lo\_1



PADC\_NSC0020\_io\_2

FIGURE 3. Board's Top View

# Notes

## Notes

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