

Design Note

UCC3941 One Volt Boost Converter Demonstration Kit - Schematic and List of Materials

The UCC3941-3/-5/-ADJ Demonstration Kit allows the designer to evaluate the performance of the UCC3941-3/-5/-ADJ One Volt Boost Converter in a typical application circuit. Figure 1 shows a schematic for the UCC3941-3/-5/-ADJ Demonstration Kit. The UCC3941 control chip is available in three output voltage configurations (VOUT = 3.3V, 5V, or adjustable). The kit can be populated to evaluate any of these three versions.

For the fixed output voltages, R1 is not populated and R2 is a 0Ω jumper, connecting pin 6 to ground. With the adjustable version, pin 6 is connected to

are printed on the circuit board next to the associated components.

Alternate components can be substituted, however a few words of caution are in order.

High quality low ESL, low ESR, capacitors should be used in order to keep the output ripple voltage low and minimize noise that could effect circuit performance. Sprague 594D/595D series, AVX TPS series, or Sanyo OS-CON series are good choices.

A 22μH inductor is recommended for most applications. An inductor value of less than 10μH should

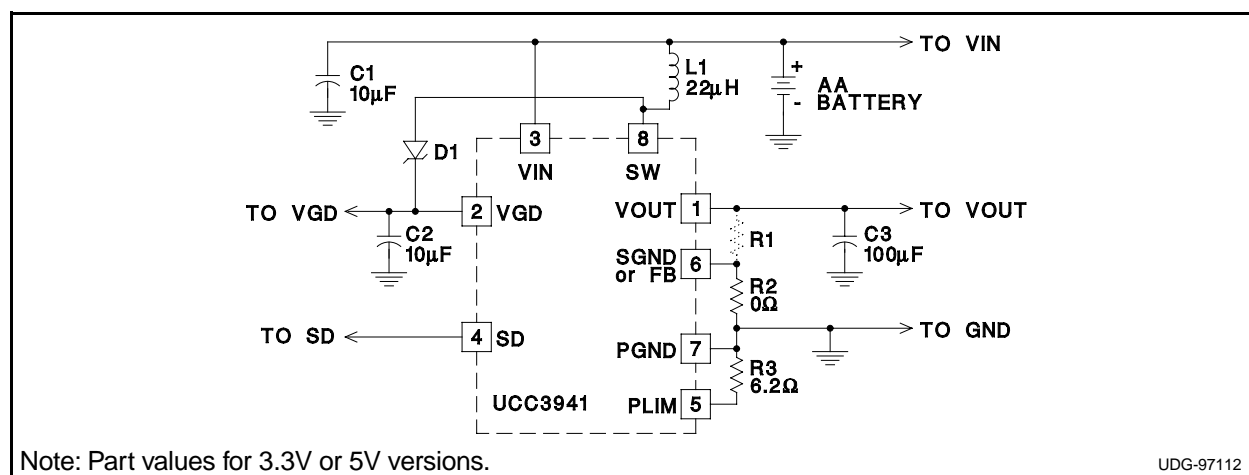


Figure 1. Demonstration Kit Schematic

the inverting input of a comparator whose non-inverting input is internally connected to 1.25V. R1 and R2 are used to program the output voltage, where

$$V_{OUT} = 1.25 \cdot \left(1 + \frac{R1}{R2} \right)$$

SD needs to be grounded, or set to a logic level low, in order for the chip to operate. If SD is floating, or set to a logic level high, the UCC3941 enters a low power shutdown state. R3 sets the power limit of the device (see the UCC3941-3/-5/-ADJ Data Sheet). A value of 6.2Ω will limit the output power to 500mW.

Table 1 contains a parts list for the demonstration kit (fixed output versions). Reference designers

not be used since the rise and fall times will begin to approach internal timing limits of the IC. Larger values of inductors will typically result in larger ripple voltages on the outputs, due to the residual energy stored in the inductor. (Note: Data Sheet equations for the power limit and peak current assume a 22μH inductor). Inductors exist as standard part numbers from vendors such as Coilcraft, Coiltronics and Sumida.

A zener diode is used for D1 in order to guarantee that VGD does not rise above 10V during unloaded conditions.

For further information, contact a local Unitrode Representative or Field Applications Engineer at (603) 424-2410.

Reference Designator	Part Description	Part Value	Part Manufacturer	Part Number
C1	Tantalum Capacitor	10 μ F, 16V	Sprague	595D106X0016B2T
C2	Tantalum Capacitor	10 μ F, 16V	Sprague	595D106X0016B2T
C3	Tantalum Capacitor	100 μ F, 6.3V	Sprague	595D107X06R3C2T
D1	Zener Diode	10V	Motorola	1SMB5925BT3
L1	Inductor	22 μ H	Coilcraft	DT3316P-223
R1	Not Populated			
R2	Jumper	0 Ω	Panasonic	ERJ-3GSY0R00
R3	SMT Resistor	6.2 Ω	IRC	WCR0805-6R2
U1	Control Chip		Unitrode	UCC3941-3, 5, ADJ
	AA Battery Holder		Digi-Key	BHAA-ND
	5-Pin Connector		Molex	22-12-2054

Table 1. Demonstration Kit Parts List