

Design Note

UCC3913 or UCC3921 Hot Swap Power Manager for Negative Voltage Applications Evaluation Kit, Schematic, and List of Materials for a -48V/1A Test Circuit

by Bill Andreyckak

Many battery powered and telecommunications power supplies use some form of protection to prevent high currents from flowing during a short circuit or overload condition. This function is often performed by a self-resetting circuit breaker as opposed to a fuse, which would require manual replacement whenever triggered. Circuit breakers can be implemented in a number of different ways, but the most popular approach is use a MOSFET transistor which can be switched on and off as required. Load current is typically sensed with a low value resistor and compared to a reference level to

determine when an overcurrent condition exists. This function can be achieved with discrete circuitry or with a fully integrated solution, such as the UCC3913/21 Negative Voltage Hot Swap Power Manager. This Design Note highlights the UCC3913/21 Evaluation Board in a typical -48VDC, 1A application circuit.

For complete details for programming the various features of the device can be obtained from the UCC3913/21 Datasheet, found in the Unitrode Interface Products Databook.

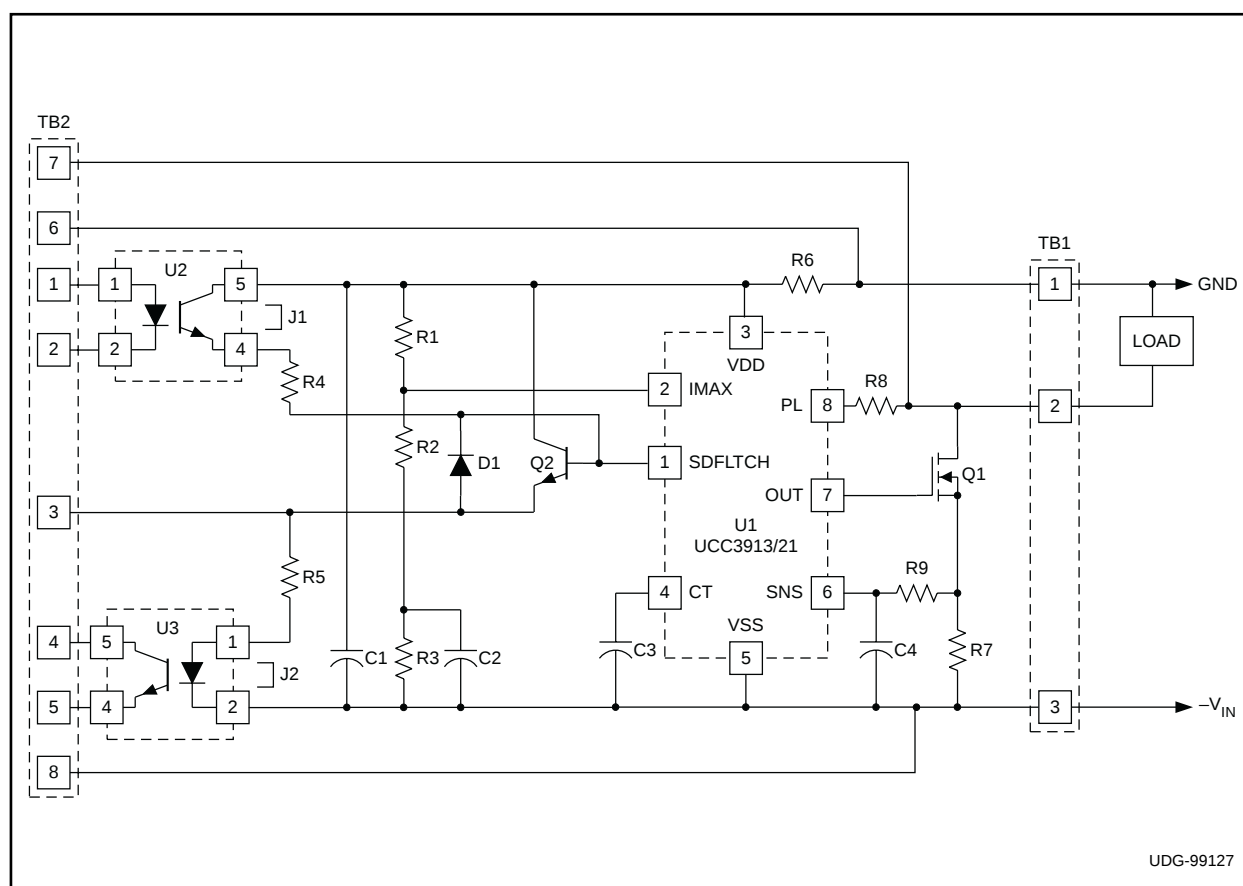


Figure 1. UCC3913/21 evaluation kit schematic.

Table 1. UCC3913 Evaluation Board List of Materials

Designator	Description	Part Value	Manufacturer	Part Number
C1	Ceramic Capacitor	1 μ F/16VDC		
C2	Not Used - Open Circuit			
C3		1.5nF/16VDC		
C4	Not Used - Open Circuit			
D1	Diode			1N4148
Q1	MOSFET	200V/5A		IRF630 or IRF630S
Q2				2N2222 NPN
R1		24k, 1/4W		
R2		510 Ω , 1/4W		
R3	JUMPER - Use AWG 22 Wire			
R4		47k, 1/4W		
R5		1k, 1/4W		
R6	SMD2512 or leaded metal film	3.3k, 5%, 1W		
R7	Shunt	50 m Ω , 1%		
R8		330k, 1/4W		
R9	JUMPER - Use AWG 22 Wire			
U1			Unitrode	UCC3913 or UCC3921 IC
U2,3	Optocoupler		QT Optoelectronics or Toshiba	4N29

Power supply : 48VDC / 1.5ADC
 Programmable electronic load to sink 1.5A
 at 48VDC