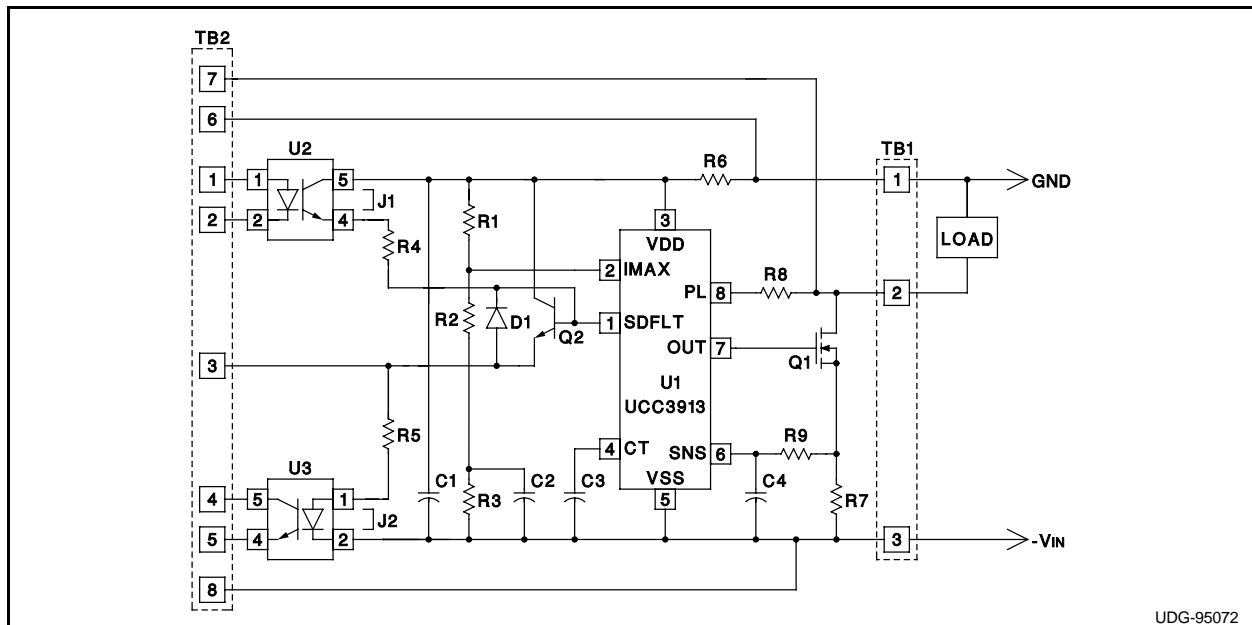


Design Note
**UCC3913 Electronic Circuit Breaker for Negative Voltage Applications
Evaluation Kit List of Materials for a -48V/1A Test Circuit**
by Bill Andreycak

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 Negative Voltage Circuit Breaker. This Design Note highlights the UCC3913 Evaluation Board in a typical -48VDC, 1A application circuit. Complete details for programming the various features of the device can be obtained from the UCC3913 Datasheet, found in the Unitrode Product and Applications Handbook.


Figure 1. UCC3913 Evaluation Kit Schematic
List of Materials :

C1	1 μ F/16VDC Ceramic
C2	not used - open circuit
C3	1.5nF/16VDC
C4	not used - open circuit
D1	1N4148 Diode
Q1	IRF630 200V/5A MOSFET
Q2	2N2222 NPN
R1	24k, 1/4W
R2	510 ohms, 1/4W
R3	JUMPER - use AWG 22 wire
R4	47k, 1/4W

R5	1k, 1/4W
R6	3.3k, 1/4W or Qty (4) 13k Ω 1/8W SMT resistors in parallel
R7	50 milliohm shunt
R8	510k, 1/4W
R9	JUMPER - use AWG 22 wire
U1	UCC3913 IC
U2,3	4N29 Optocoupler

Test Equipment :

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