

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

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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.

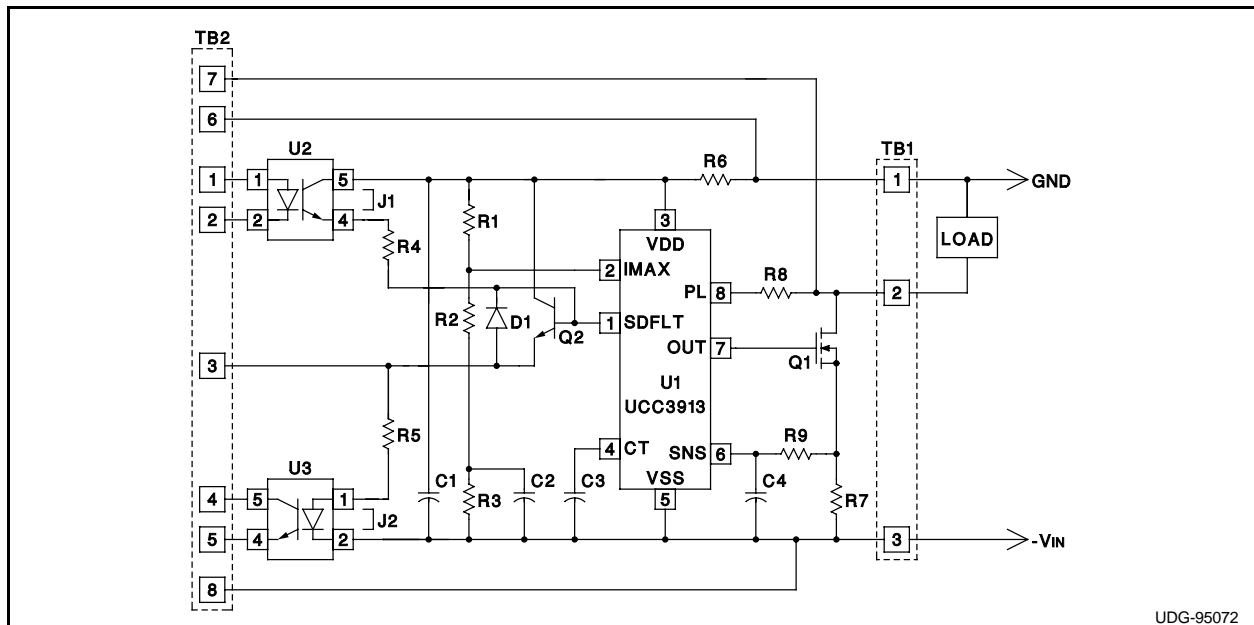


Figure 1. UCC3913 Evaluation Kit Schematic

**List of Materials :**

- C1 1 $\mu$ 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 $\Omega$  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