DEMO CIRCUIT 1203
QUICK START GUIDE

LTC4357
Single Positive High Voltage Ideal Diode-OR

FEATURES

- Stuffed for 48V, 5A Applications
- Operates 9-75V Without Modification
- Demo Board Features Two Independent LTC4357 Circuits
- Dual Layout for S-8 or D2Pak MOSFETs
- 0.093-inch Turret Holes Accommodate 12 AWG Wire
- Easily Modified for up to 20A

APPLICATIONS

- Servers, Routers, Switches
- Mass Storage
- Central Office Computing
- Fan Trays
- 12V Power Systems

DESCRIPTION

Demonstration Circuit 1203 showcases two LTC4357s in a 48V, 5A application. The circuits are operational over a range of 9V to 75V and are fully independent, with the exception of a common ground.

Input and output connections are made by 93 mil turrets which if removed, accommodate insertion of up to 12 gauge wire for in-situ testing. Adequate copper is available for use up to 20A, with appropriate MOSFETs.

Design files for this circuit board are available. Call the LTC factory.

PERFORMANCE SUMMARY

Specifications are at TA = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V_{IN}	Input Operating Range		9	48	75	V
	Peak Input Voltage	Clipped by Transient Voltage Suppressor	77		100	V
I_{OUT}	Maximum Load Current	Limited by MOSFET Dissipation	5			A

BOARD LAYOUT

Demonstration Circuit 1203 is built on a 2-layer board. The two ideal diode circuits are entirely independent, sharing only a common ground. Banana jacks are provided for supply and load connections; turrets facilitate connection of voltmeters and scope probes.

MODIFYING FOR MORE CURRENT

Q1 is sized for 5A load current, and can be replaced for higher current applications. Pads are included on the bottom of the board for a D2-Pak MOSFET.

Adequate copper is available to support up to 20A on the circuit board, but it should be borne in mind that banana jacks and test leads are generally limited to currents in the 5-10A range. For higher currents, remove the 93 mil turrets and solder 12AWG wire in their place.

Above 20A remotely locate the MOSFETs using small, short wires between the MOSFETs and the board. High current supply and load connections are then made directly to the MOSFETs, eliminating the constraints of the circuit board. To access the drain, source and gate nodes, simply solder to the D2-Pak pads on the bottom of the board.

LOCALLY GENERATED SPIKES

When bench testing with input short circuits, it is possible to generate high voltage transients in excess of the LTC4357's 100V abs/max rating. For this reason a transient voltage suppressor (D1) has been included on the output of each ideal diode. The minimum TVS clamping voltage is 77V, giving rise to the 75V maximum operating voltage printed on the circuit board silkscreen.

In a real application, it is likely that the output will be bypassed by a large bulk reservoir capacitor. If the connections to this capacitor are short, no TVS is necessary. Pads are provided on the bottom of the board for a surface mounted electrolytic capacitor.

LOW VOLTAGE MODIFICATION

The FDS3672 is specified for 10V gate drive, but in the 9-20V input range the LTC4357 is guaranteed to develop 4.5V minimum gate drive. Somewhere below 20V input the resistance of the FDS3672 will begin creep up, as will the dissipation at 5A. Although adequate for evaluation purposes, this situation should be carefully monitored if attempting to carry a full 5A load at, for example, 12V input for extended periods. In 12V applications use logic level MOSFETs specified for operation at 4.5V gate drive.

BASIC OPERATION

Connect two 48V supplies to the inputs as shown in the figure, and short VOUTA and VOUTB together. Connect a load to the combined output. By adjusting the 48V supplies slightly above and below one another, the diode behavior is evident from observing the flow of current in each supply. The higher of the two supplies will carry the full load current.

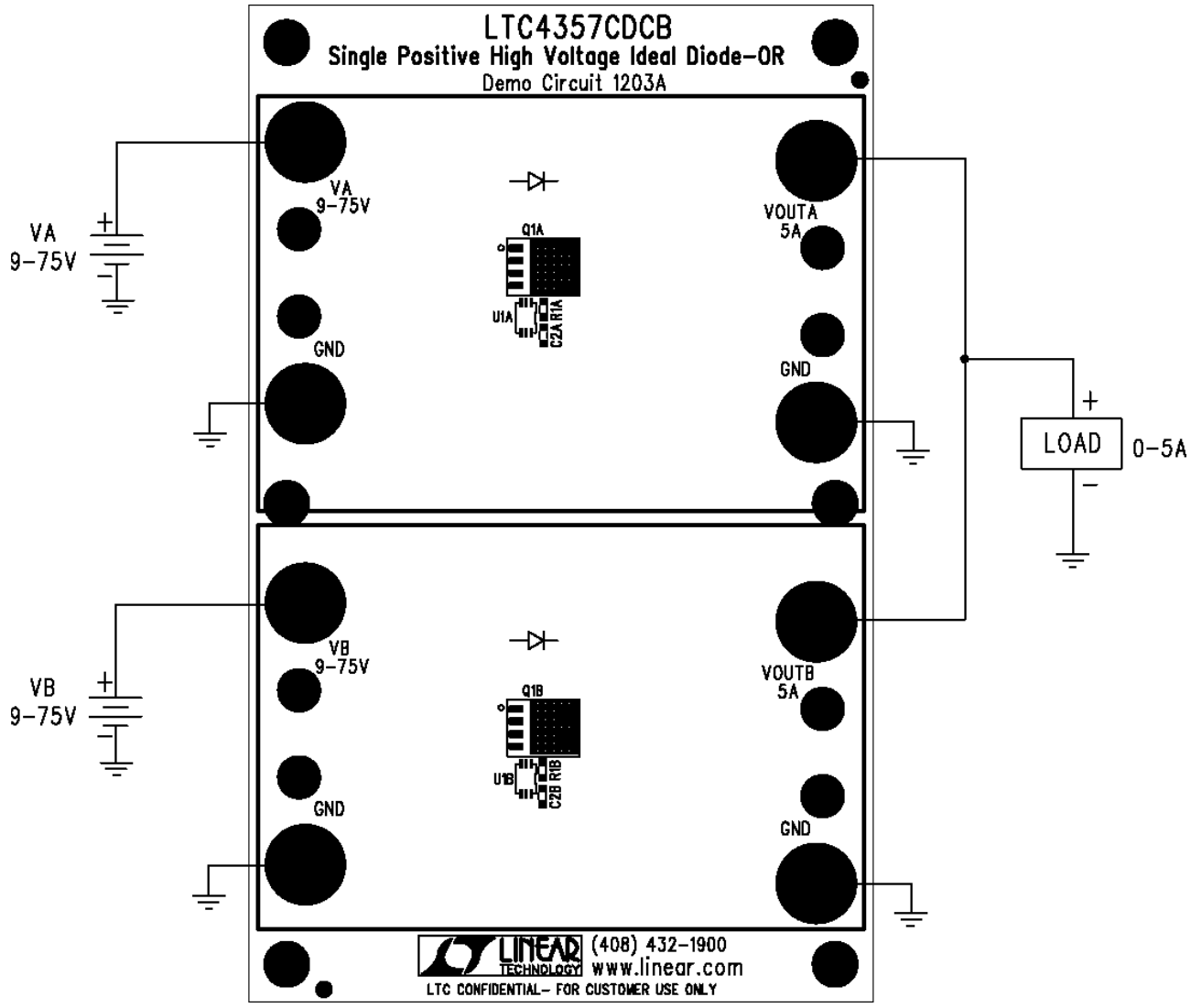

Figure 1. Proper Measurement Equipment Setup