DEMO CIRCUIT 1531
QUICK START GUIDE

LT3092EDD
Two-Terminal Current Source

DESCRIPTION

Demonstration circuit 1531A is a two-terminal current source featuring LT®3092. It requires only two resistors to set an output current between 0.5mA and 200mA. It is stable without input and output capacitors, offering high DC and AC impedance. It can be used in many applications such as 2-terminal floating current source, GND referred current source, variable current source, in-line limiter and intrinsic safety circuits.

A key feature of the LT3092 is the capability to supply a wide output current range. By using two external resistors, the output current can be programmed to any level between 0.5mA and 200mA, while the input-to-output difference voltage is limited to 40V and the power dissipation is limited below the thermal limit.

Internal protection circuitry includes reverse-battery and reverse-current protection, current limiting and thermal limiting.

LT3092 regulator is offered in the thermally enhanced 8-lead TSOT-23, 3-lead SOT-223 and 8-lead 3mm× 3mm DFN packages.

The LT3092 datasheet gives a complete description of the part, operation and application information. The datasheet should be read in conjunction with this quick start guide for working on or modifying the demo circuit 1531A.

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

Table 1. Performance Summary (T_A = 25°C)

PARAMETER	CONDITION	VALUE
Minimum Vin-Vout Voltage	I_{OUT}=1mA	1.2V
Maximum Vin-Vout Voltage		40V
Output Current	JP1, I_{OUT}=200mA	200mA ±3%
	JP1, I_{OUT}=100mA	100mA ±3%
	JP1, I_{OUT}=50mA	50mA ±3%
	JP1, I_{OUT}=ADJ	0.5mA~110mA

QUICK START PROCEDURE

The DC1531A is easy to set up to evaluate the performance of the LT3092. Refer to Figure 1. for proper measurement equipment setup and following the procedures below:

1. Before proceeding to test, use jumper JP1 for the desired output current (200mA, 100mA or 50mA). If the output current is different from the above values, use the ADJ option.
2. Assume 200mA is the desired output. Apply 2V across VIN (to VOUT). The measured I_{OUT} should be 200mA ± 3% (195mA to 207mA).
3. Vary Vin-Vout from 2V to 40V. I_{OUT} should measure 200mA ± 3% (195mA to 207mA).

Note: Minimum Vin-Vout depends on I_{OUT}. See datasheet for dropout curves.

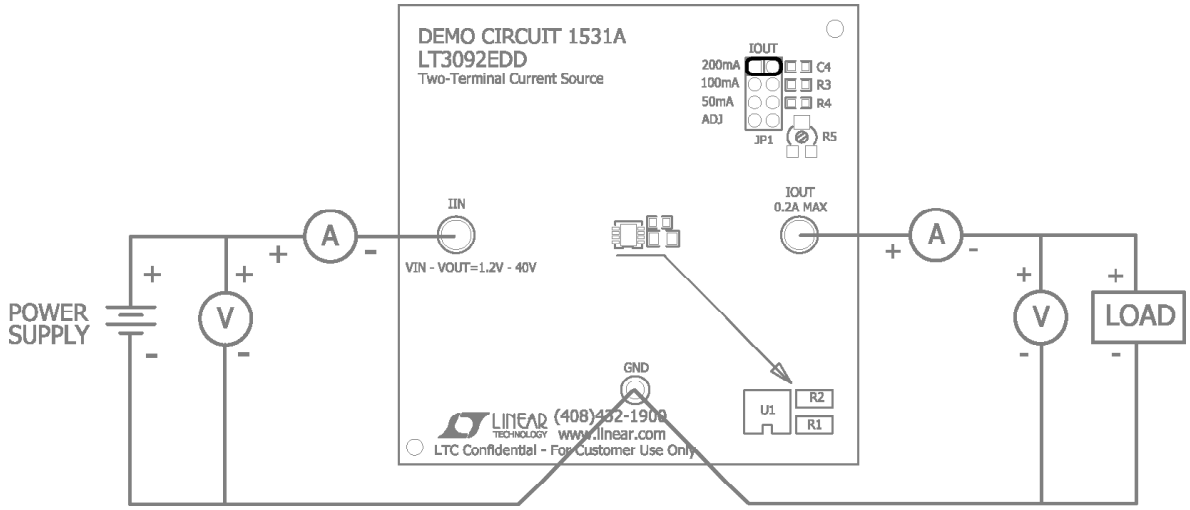
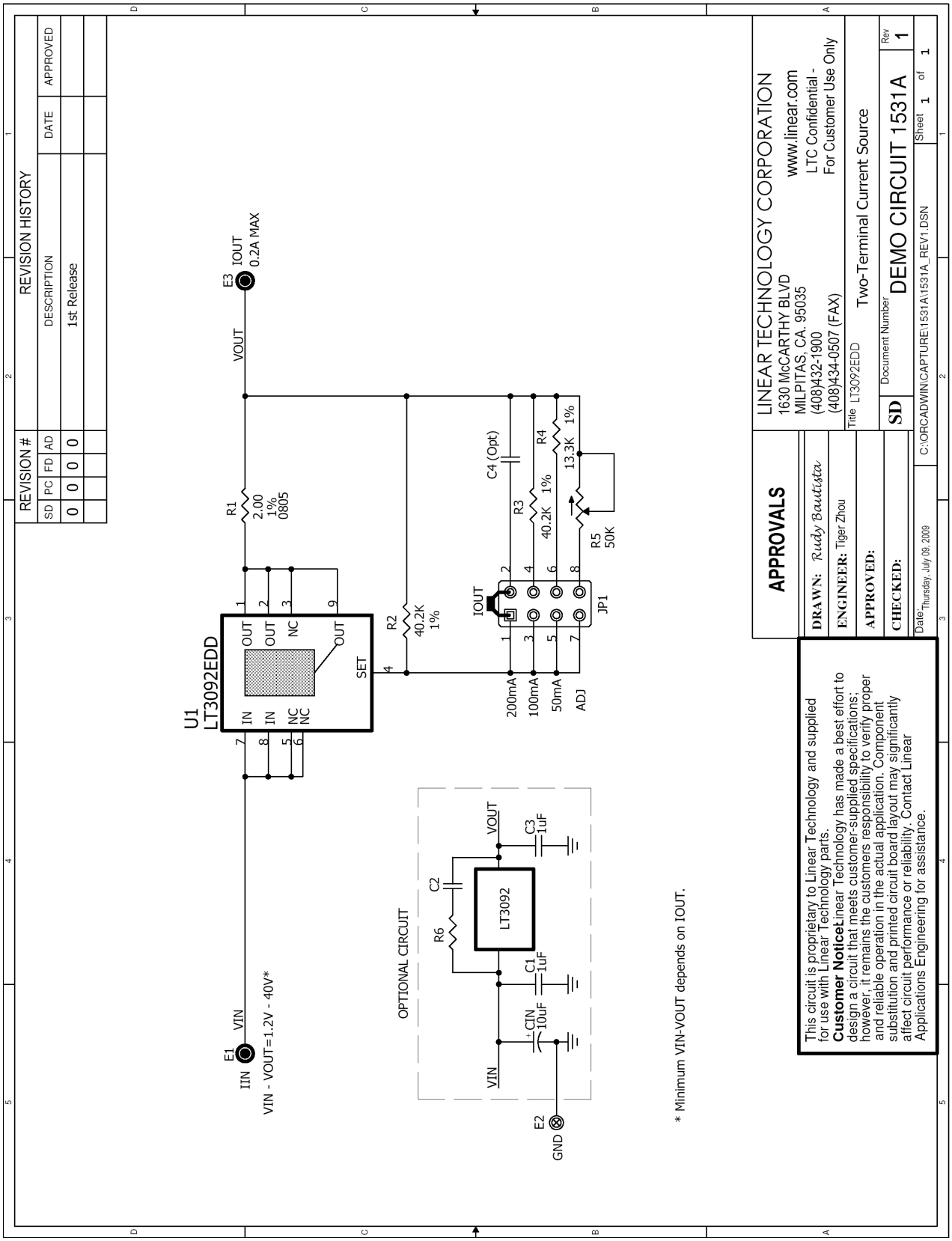


Figure 1. Proper Measurement Equipment Setup

ADDITIONAL NOTE

Although the LT3092's design strives to be stable without any capacitors over a wide variety of operating conditions, it is not possible to test for all possible combinations of input and output impedances that the LT3092 will encounter. These impedances may include resistive, capacitive and inductive components and may be complex distributed networks. In addition, the current source's value will differ between applications and its connection may be GND referenced, power supply referenced or floating in a signal line path. **Linear Technology strongly recommends that stability be tested in circuits for any LT3092 application.**

When operating with a capacitor across the SET pin resistor, external compensation is usually required to maintain stability and compensate for the introduced pole. Optional input capacitor, output capacitor or RC compensation can be installed on the back side of the DC1531A if necessary. See datasheet for details.


REVISION HISTORY
REVISION #
SD PC FD AD
0 0 0 0
DESCRIPTION
1st Release
DATE
APPROVED
E3 IOUT 0.2A MAX
VOUT
R1 2.00 1% 0805
U1 LT3092EDD
IN IN NC NC
OUT OUT NC OUT
SET
R2 40.2K 1%
C4 (Opt)
R3 40.2K 1%
R4 13.3K 1%
R5 50K
JP1
IOUT
200mA 100mA 50mA ADJ
E1 VIN
IIN
VIN - VOUT=1.2V - 40V*
OPTIONAL CIRCUIT
C2
R6
LT3092
C1 1uF
CIN 10uF
C3 1uF
VOUT
VIN
E2 GND
* Minimum VIN-VOUT depends on IOUT.
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SD
Document Number
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Rev 1
Date: Thursday, July 09, 2009
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Sheet 1 of 1
This circuit is proprietary to Linear Technology and supplied for use with Linear Technology parts.
Customer Notice: Linear Technology has made a best effort to design a circuit that meets customer-supplied specifications; however, it remains the customers responsibility to verify proper and reliable operation in the actual application. Component substitution and printed circuit board layout may significantly affect circuit performance or reliability. Contact Linear Applications Engineering for assistance.