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LT3070
5A, Low Noise, Programmable Output,
85mV Dropout Linear Regulator

DESCRIPTION

Demonstration circuit 1433 is an adjustable 5A linear regulator featuring LT3070. LT3070 is a low dropout voltage, UltraFast™ transient response linear regulator. The device supplies up to 5A of output current with a typical dropout voltage of 85mV. A 0.01µF reference bypass capacitor decreases output voltage noise to $25\mu V_{RMS}$. The LT3070's high bandwidth permits the use of low ESR ceramic capacitors.

Output voltage is digitally selectable in 50mV increments over a 0.8V to 1.8V range. A margining function allows the user to tolerance system output voltage in increments of ±1%, ±3% or ±5%. To maintain proper performance and regulation, the BIAS supply voltage must be higher than the IN supply voltage. For a given V_{OUT}, the BIAS voltage must satisfy the following conditions:

$2.2 \leq V_{BIAS} \leq 3.6V$ and $V_{BIAS} \geq (1.25 \cdot V_{OUT}+1V)$.

For $V_{OUT} \leq 0.95V$, the minimum bias voltage is limited to 2.2V.

The IC incorporates a unique tracking function to control buck regulator powering the LT3070's input. This tracking function drives the buck regulator to maintain the LT3070's input voltage to V_{OUT} + 300mV, minimizing power dissipation. It has internal protection includes UVLO, reverse-current protection, precision current limiting with power foldback and thermal shutdown.

The LT3070 regulator is available in a thermally enhanced 28-lead, 4mm×5mm QFN package.

The LT3070 datasheet gives a complete description of the part, operation and application information. The datasheet must be read in conjunction with this quick start guide for demo circuit 1433.

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

Performance Summary ($T_A = 25^O$C)

PARAMETER	CONDITION	VALUE
Minimum Input Voltage	V_{OUT}=1.2V, I_{OUT} = 5A	1.32V
Maximum Input Voltage		3V
Minimum Bias Voltage	V_{OUT}=1.2V	2.5V
Maximum Bias Voltage		3.6V
Output Voltage V_{OUT}	JP1=LOW, JP2=HIGH, JP3=HIGH JP4=LOW, JP6=FLOAT	1.2V ±1%
Maximum Output Current	V_{IN} -V_{out} < 0.5V	5A

QUICK START PROCEDURE

Demonstration circuit 1433 is easy to set up to evaluate the performance of the LT3070. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place JP5 on the ON position.

2. Use JP1, JP2, JP3, JP4 and JP6 to set the desired output voltage.

3. With power off, connect the input power supply to Vin and GND.

4. Connect the bias voltage to Vbias and GND.

5. Turn on the power at the input and the bias pin.

NOTE. Make sure that the input voltage does not exceed 3V and the bias voltage is within its limit.

6. Check for the proper output voltage.

NOTE. If there is no output, temporarily disconnect the load to make sure that the load is not set too high.

7. Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, efficiency and other parameters.

NOTE. Make sure that the power dissipation is limited below the thermal limit.
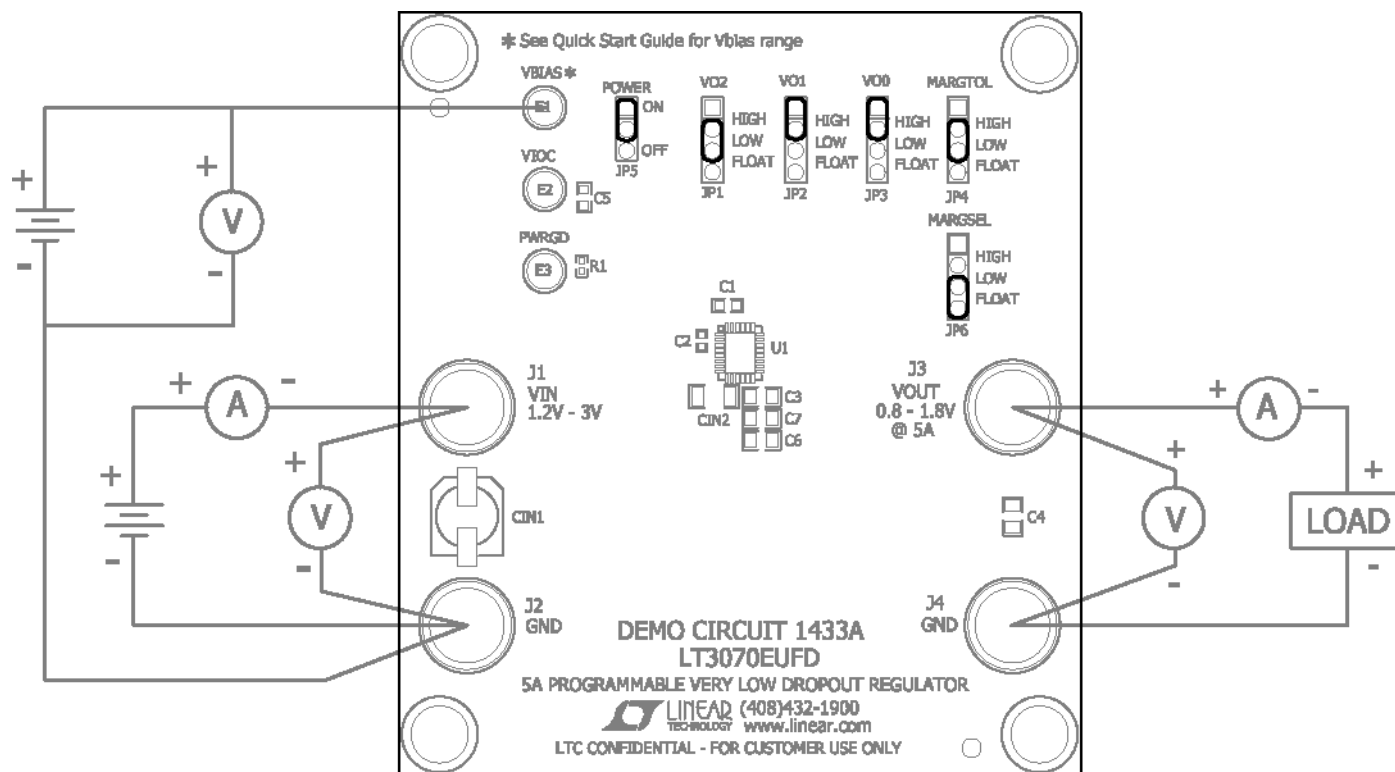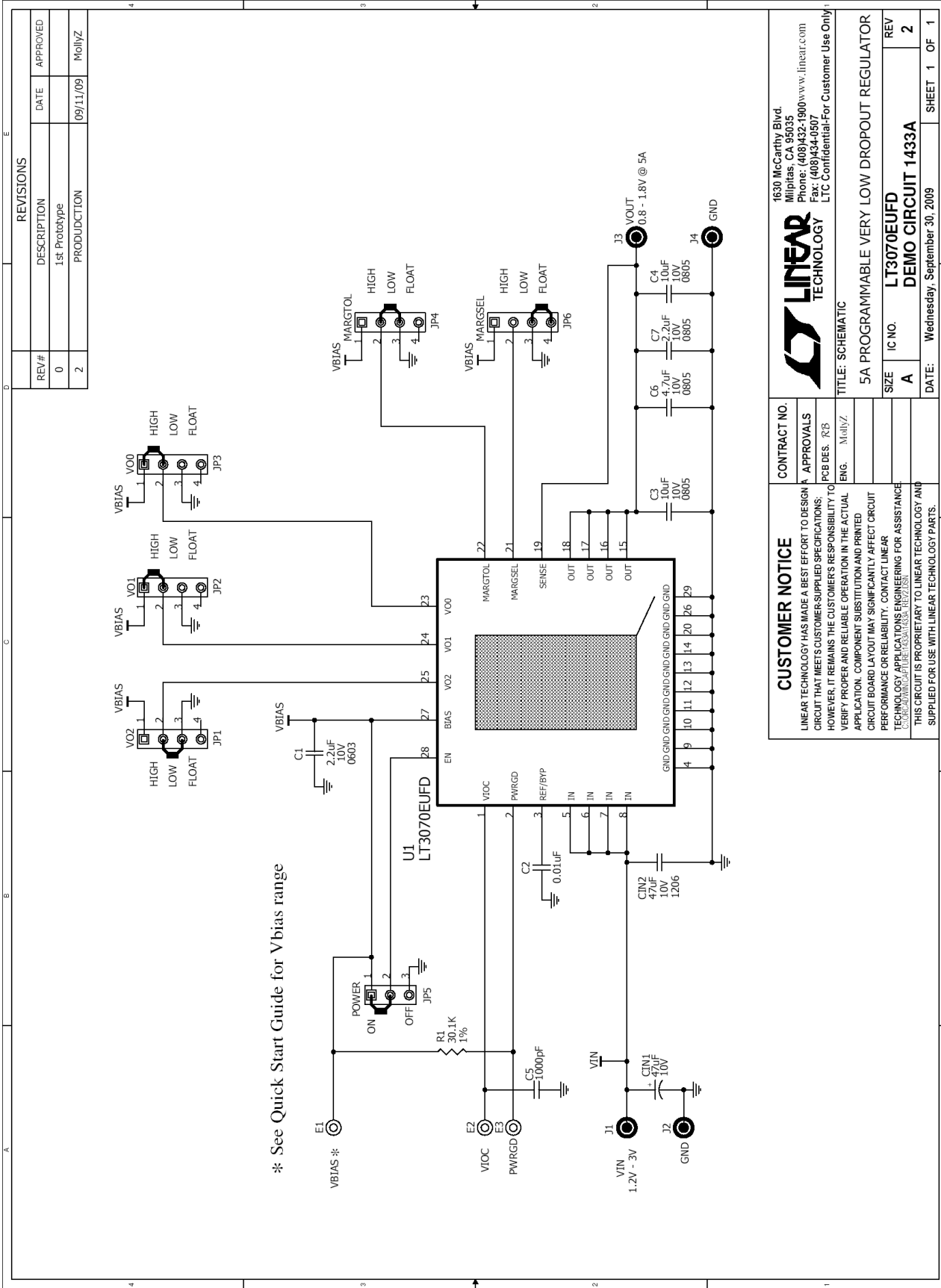

Figure 1. Proper Measurement Equipment Setup

* See Quick Start Guide for Vbias range

U1
LT3070EUFD

REVISIONS

REV#	DESCRIPTION	DATE	APPROVED
0	1st Prototype		
2	PRODUCTION	09/11/09	MollyZ

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APPROVALS

| PCB DES. | RB |
| ENG. | MollyZ |

1630 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408)432-1900 www.linear.com
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LINEAR
TECHNOLOGY

TITLE: SCHEMATIC

5A PROGRAMMABLE VERY LOW DROPOUT REGULATOR

SIZE	IC NO.		REV
A	LT3070EUFD		2
	DEMO CIRCUIT 1433A		

DATE: Wednesday, September 30, 2009   SHEET 1 OF 1