DESCRIPTION

Demonstration circuit 886 is an ultra-low input voltage and dropout voltage supply using the LTC3035 linear regulator, which comes in a very small 8-pin DFN package. The DC886 has an input voltage range from 1.7V to 5.5V, an output voltage range between 0.4V and 3.6V, and is capable of delivering 300mA of output current. Due to the 0.4V reference of the LTC3035, the DC886 is capable of supplying power to very low voltage applications, such as a (relatively) high current voltage references. The DC886 comes assembled with small ceramic capacitors – 1uF – to demonstrate the LTC3035 maintaining stability with ceramic output capacitors.

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

Table 1.

Performance Summary (T_A = 25°C)

PARAMETER	CONDITION	VALUE
Minimum Input Voltage		1.7V
Maximum Input Voltage		5.5V
Output Voltage V_{OUT}	V_{IN} = 1.7V to 5.5V, I_{OUT} = 0A to 300mA	1.8V ±3%
Typical Dropout Voltage	V_{IN} = 1.7V, I_{OUT} = 300mA	45mV
Output Regulation	Line	±0.5%
	Load	±0.5%

QUICK START PROCEDURE

The DC886 demonstration board is easy to set up to evaluate the performance of the LTC3035. For proper measurement equipment configuration, set up the circuit according to the diagram in **Figure 1**. Before proceeding to test, insert jumper JP5 shunt into the off (lower) position, connecting the RUN pin to ground (GND), which shuts down the circuit.

NOTE: When measuring the input or output ripple or noise voltage, care must be taken to avoid a long ground lead on the oscilloscope probe. Measure the voltages by touching the probe tip directly across the VIN or VOUT and GND terminals. See Figure 2 for proper scope probe technique.

1. Connect the input power supply and the load to the board. Do not hot-plug VIN or increase VIN over the rated maximum supply voltage of 5.5V, or the part may be damaged. Refer to Figure 1 for the proper measurement equipment setup.
2. Select any of the output voltages by inserting a shunt into that output voltage jumper position.

3. Apply 5V at VIN. Measure VOUT; it should read 0V. If desired, one can measure the shutdown supply current at this point. The supply current will be approximately 1uA in shutdown.
4. Turn on the circuit by inserting the shunt on jumper JP5 into the ON (upper) position. The output voltage should be regulating to +/-2% of its selected value (see the table below).
5. Vary the input voltage from VOUT plus the dropout voltage (45mV typically at 300mA of output current) to 5.5V and adjust the load current from 0 to 300mA. VOUT should read +/-3% of its selected value (see the table below).

When finished, turn off the circuit by inserting the shunt on jumper JP5 into the OFF (lower) position.

	No Load	Max Load or Line Variation	Max Load and Line Variation
	2%	2.5%	3%
VOUT = 1.8V	1.764V – 1.836V	1.755V – 1.845V	1.746V – 1.854V
VOUT = 2.5V	2.45V – 2.55V	2.437V – 2.563V	2.425V – 2.575V
VOUT = 3.3V	3.234V – 3.366V	3.217V – 3.383V	3.201V – 3.399V

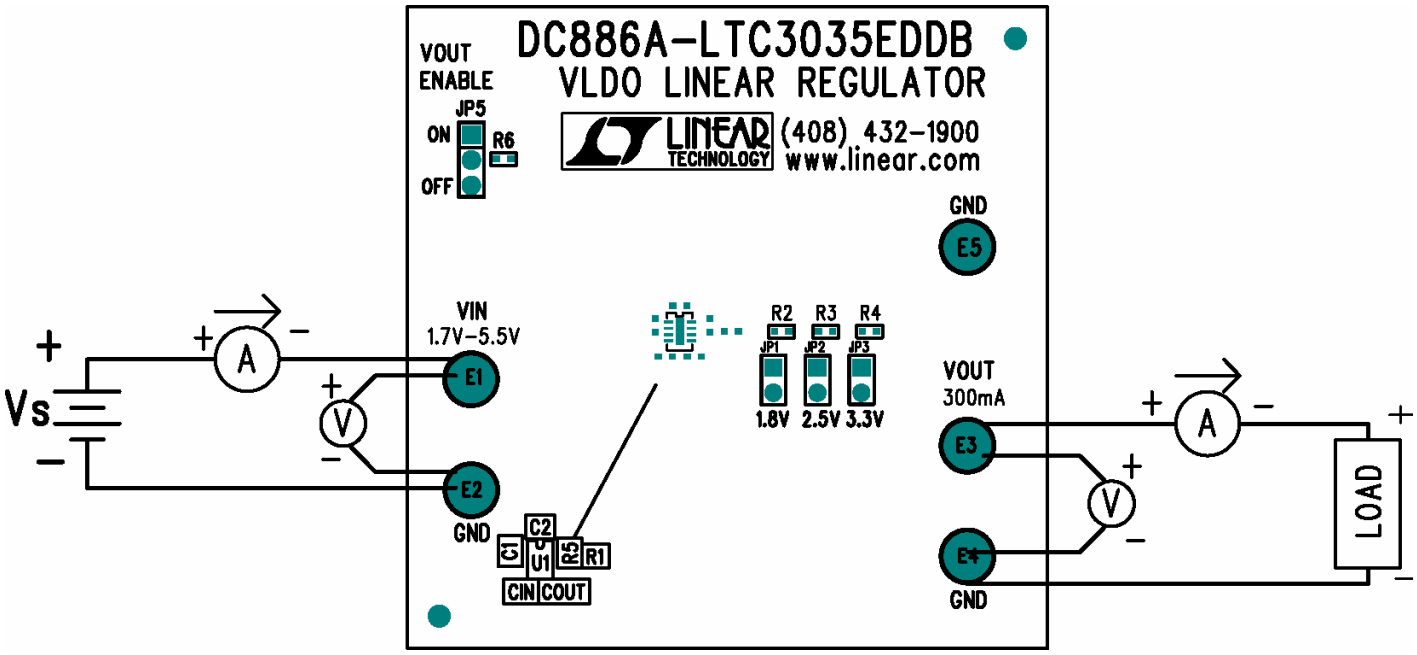


Figure 1. Proper Measurement Equipment Setup

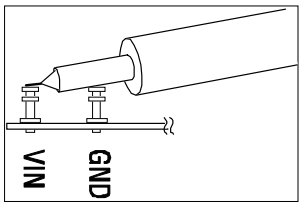
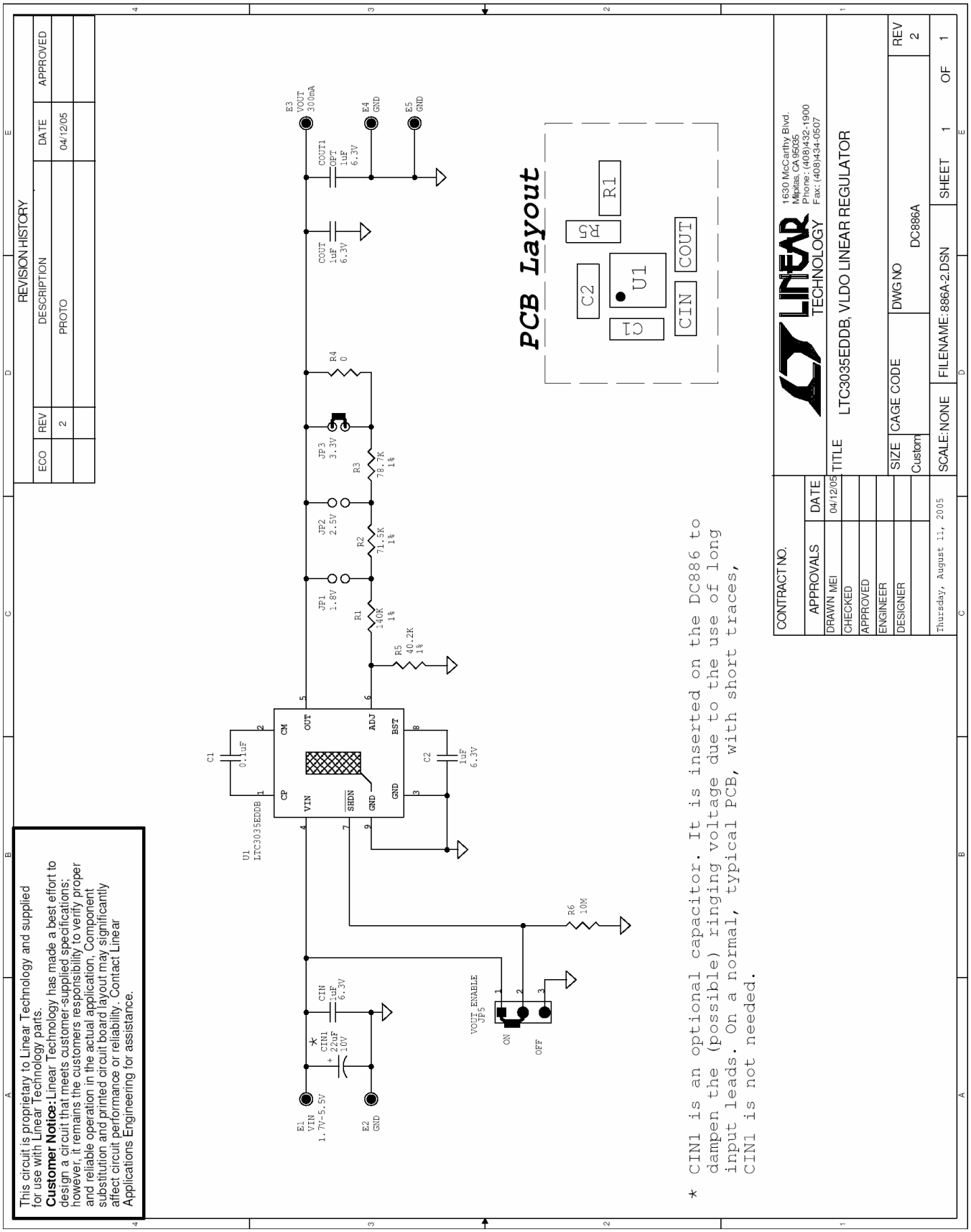


Figure 2. Measuring Input or Output Ripple


REVISION HISTORY
ECO
REV
DESCRIPTION
DATE
APPROVED
2
PROTO
04/12/05
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.
PCB Layout
C2
R1
U1
CIN
COUT
* CIN1 is an optional capacitor. It is inserted on the DC886 to dampen the (possible) ringing voltage due to the use of long input leads. On a normal, typical PCB, with short traces, CIN1 is not needed.
U1 LTC3035EDDB
CP
VIN
SHDN
GND
CM
OUT
ADJ
BST
C1 0.1uF
C2 1uF 6.3V
CIN 1uF 6.3V
CIN1 22uF 10V
COUT 1uF 6.3V
COUT1 OPT 1uF 6.3V
R1 140K 1%
R2 71.5K 1%
R3 78.7K 1%
R4 0
R5 40.2K 1%
R6 10M
JP1 1.8V
JP2 2.5V
JP3 3.3V
VOUT ENABLE JP5
ON
OFF
E1 VIN 1.7V-5.5V
E2 GND
E3 VOUT 300mA
E4 GND
E5 GND
CONTRACT NO.
APPROVALS
DATE
DRAWN MEI 04/12/05
CHECKED
APPROVED
ENGINEER
DESIGNER
TITLE
LTC3035EDDB, VLDO LINEAR REGULATOR
SIZE
Custom
CAGE CODE
DWG NO
DC886A
REV 2
SCALE:NONE
FILENAME:886A-2.DSN
SHEET 1 OF 1
Thursday, August 11, 2005
LINEAR TECHNOLOGY
1630 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408)432-1900
Fax: (408)434-0507

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9