

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1292

NO RSENSE STEP-DOWN DC/DC CONVERTER

LTC3878EGN

DESCRIPTION

Demonstration circuit 1292 is a NO RSENSE STEP-DOWN DC/DC CONVERTER featuring the LTC3878EGN. Its output supplies 1.2V @ 18A and its input voltage range is 4.5V to 14V. The demo board uses a high density, two sided drop-in layout. The power components, excluding the bulk output capacitors and bulk input capacitors, fit within a 0.94" x 0.63" area on the top layer. The control circuit on the bottom layer has a footprint of 0.63" x 0.40".

The fixed on-time valley current mode architecture of the LTC3878EGN provides a very fast load step response. Other features of the board include a RUN/SS pin, a PGOOD pin and jumper to select either CCM or DCM operation at light load.

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

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Table 1. Performance Summary ($T_A = 25^\circ\text{C}$)

PARAMETER	CONDITION	VALUE
Minimum Input Voltage		4.5V
Maximum Input Voltage		14V
Output Voltage	$V_{IN} = 4.5\text{V to } 14\text{V}$, $I_{OUT} = 0\text{A to } 18\text{A}$	1.2V $\pm 2\%$
Maximum Output Current		18A
Typical Output Voltage Ripple	$V_{IN} = 12\text{V}$, $I_{OUT} = 18\text{A}$ (20MHz BW)	17mVp-p
Nominal Switching Frequency	100% load, $V_{IN} = 12\text{V}$, $I_{OUT} = 18\text{A}$	340kHz
Efficiency (see Figure 3 for efficiency curves)	$V_{IN} = 12\text{V}$, 100% load	88.4% Typical

QUICK START PROCEDURE

Demonstration circuit 1292 is easy to set up to evaluate the performance of the LTC3878EGN. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

NOTE: When measuring the input or output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. See Figure 2 for proper scope probe technique. Short, stiff leads should be soldered to the (+) and (-) terminals of an output capacitor. The probe's ground ring needs to touch the (-) lead and the probe tip needs to touch the (+) lead.

1. Place jumpers in the following positions:
JP1 RUN ON
JP2 MODE CCM
2. With power off, connect the input power supply to V_{in} and GND.
3. Turn on the power at the input.
4. Check for the proper output voltages.
 $V_{out} = 1.176\text{V to } 1.224\text{V}$
5. Once the proper output voltages are established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

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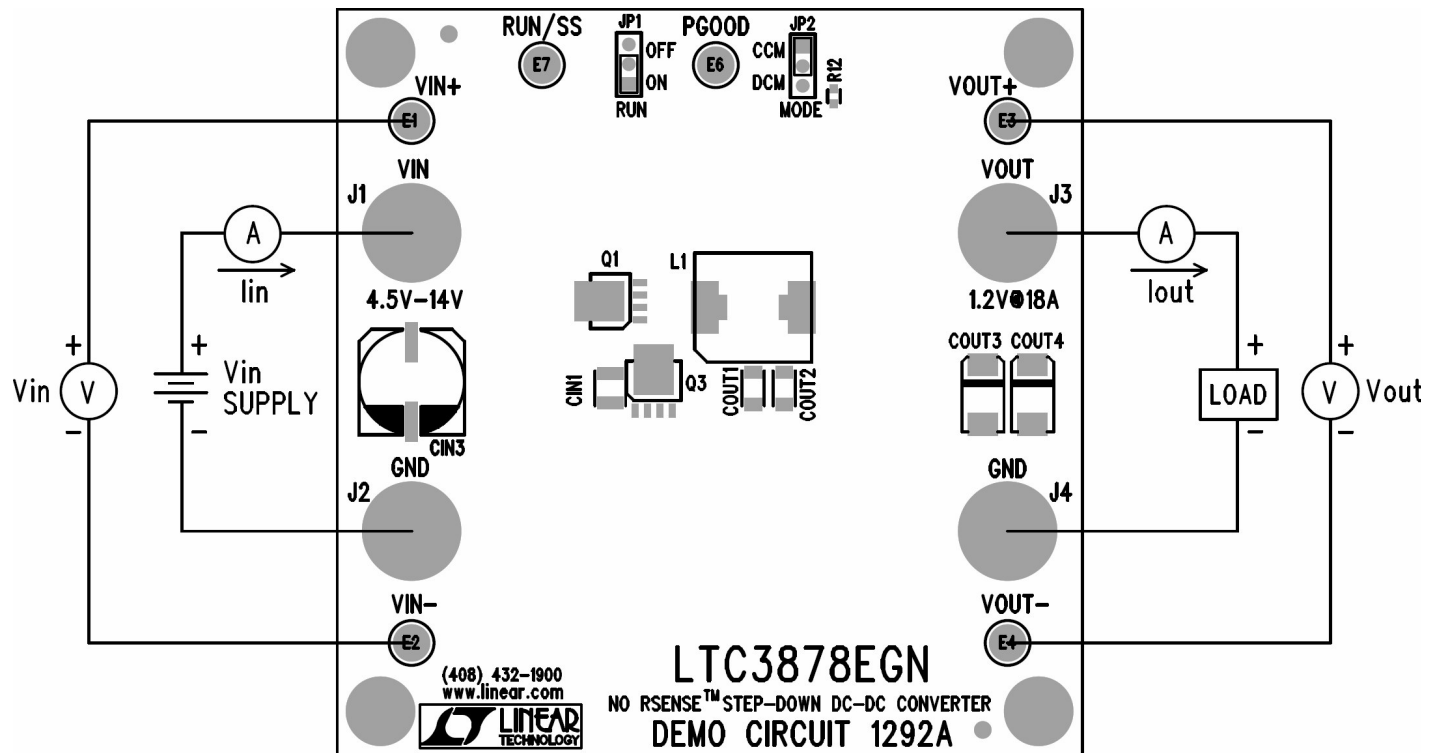


Figure 1. Proper Measurement Equipment Setup

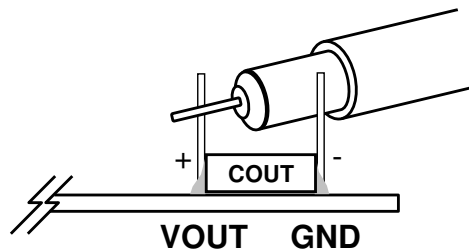


Figure 2. Measuring Output Voltage Ripple

Fsw = 340kHz, mode = CCM

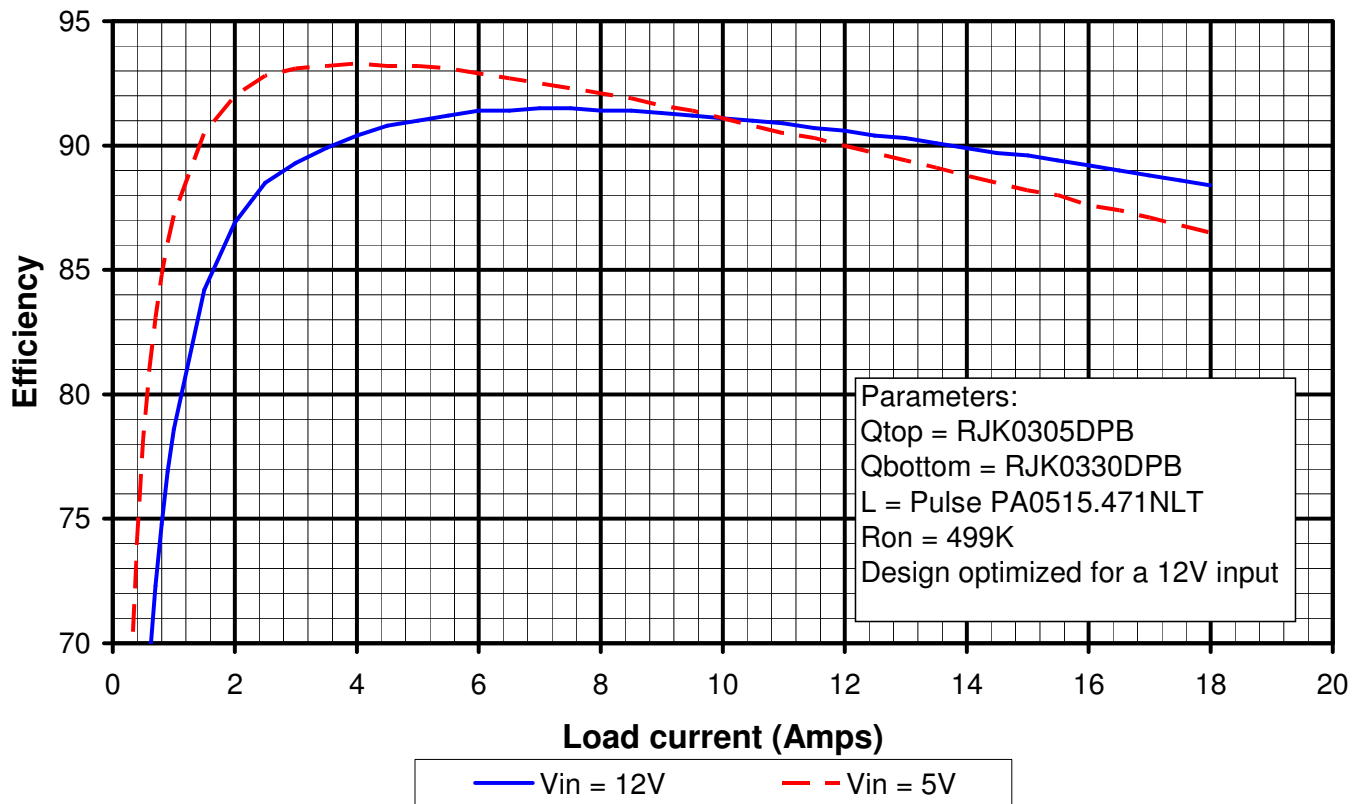
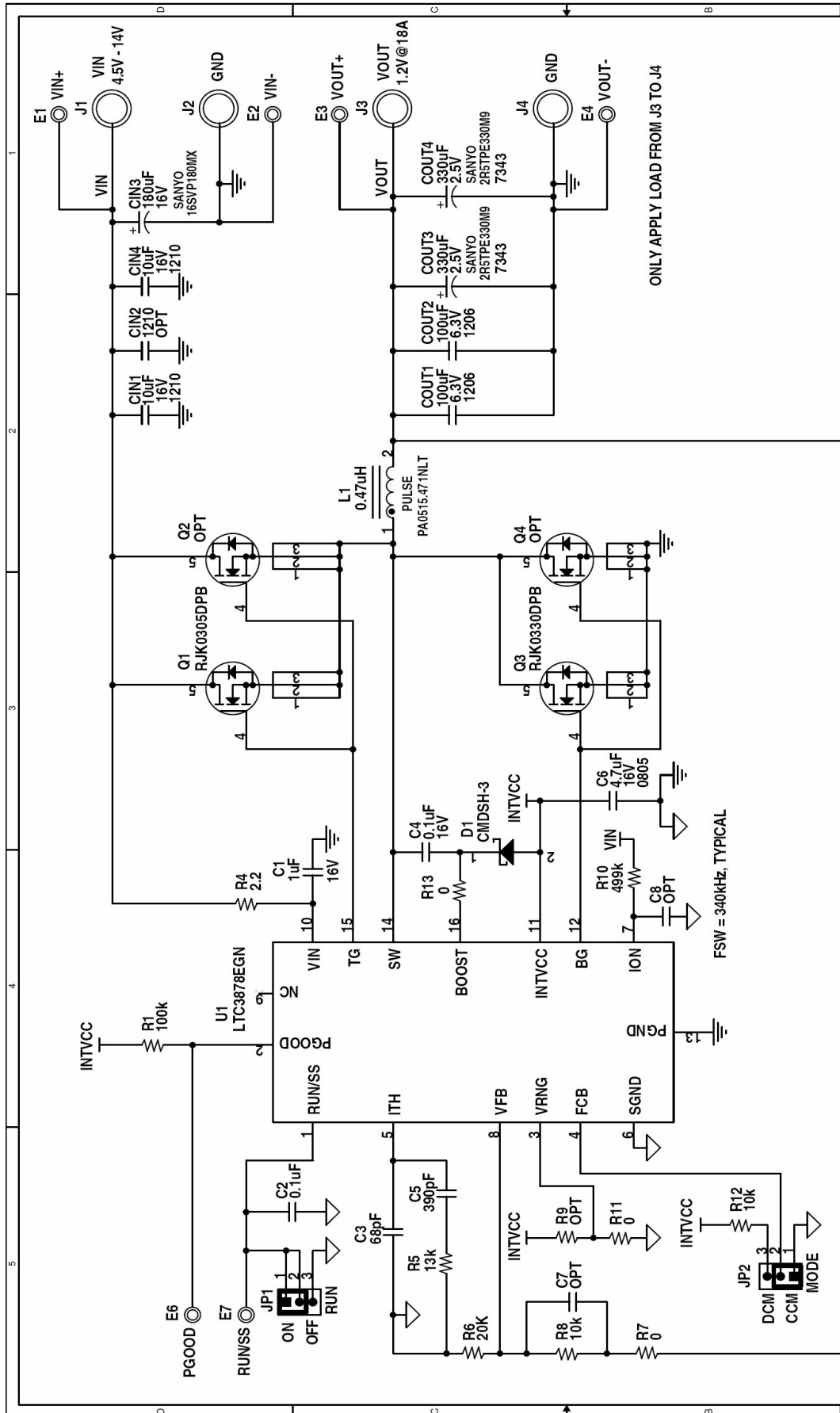


Figure 3. Typical efficiency curves

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THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.

CONTRACT NO.

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TITLE: SCHEMATIC

NO RSENSE™ STEP-DOWN DC-DC CONVERTER

SIZE DWG NO.

DC1292A-1 * LTC3878EGN

REV

A-1

DATE: Wednesday, January 07, 2009

SHEET 1 OF 1

NOTE: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE IN OHMS, 0603.
ALL CAPACITORS ARE IN MICROFARADS, 0603.