DEMO CIRCUIT 1530A
QUICK START GUIDE

LTC3829EUHF
HIGH EFFICIENCY, 3-PHASE, SINGLE OUTPUT, SYNCHRONOUS BUCK CONVERTER

DESCRIPTION

Demonstration circuit 1530A is a high efficiency, 3-phase, synchronous buck converter with 7V to 14V input range. It can supply 60A maximum load current at 1.5V output. The demo board uses the LTC®3829EUHF controller. The LTC3829 is a feature-rich single-output 3-phase synchronous buck controller with on-chip drivers, remote output voltage sensing, inductor DCR temperature compensation, phase shedding, nonlinear control and adaptive voltage positioning (AVP). It is suitable for input from 4.5V to 38V and output up to 5V. The LTC3856 can provide high efficiency, high power density and versatile power solutions for telecom and datacom systems, industrial and medical instruments, DC power distribution systems and computer systems. The controller is available in 38-pin 5mm × 7mm QFN and 38-pin TSSOP packages.

The RUN pin (JP1) provides enable feature. To shut down the converter, one simple way is to force the RUN pin below 1.2V (JP1: OFF). Use JP4 jumper to select burst mode, stage shedding mode or forced continuous mode operation. The nonlinear control function is set by JP11. Switching frequency is preset at about 400KHz, and it can be easily modified from 250KHz to 770KHz. On-board dynamic circuit is also available for transient test.

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

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

PARAMETER	CONDITION	VALUE
Input Voltage Range		7V to 14V
Output Voltage, V_{OUT}	V_{IN} = 7-14V, I_{OUT} = 0A to 60A	1.5V ±2%
Maximum Output Current, I_{OUT}	V_{IN} = 7-14V, V_{OUT} = 1.5V	60A
Typical Efficiency	V_{IN} = 12V, V_{OUT} = 1.5V, I_{OUT} = 60A	86.4%
Typical Switching Frequency		400kHz

QUICK START PROCEDURE

Demonstration circuit 1530A is easy to set up to evaluate the performance of the LTC3829EUHF. Refer to Figure 1 for the proper measurement equipment setup and follow the procedure below:

1. With power off, connect the input power supply to Vin (7V-14V) and GND (input return).
2. Connect the 1.5V output load between Vout and GND (Initial load: no load).
3. Connect the DVMs to the input and outputs.
4. Turn on the input power supply and check for the proper output voltages. Vout should be 1.5V+/-2%.
5. Once the proper output voltages are established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage and other parameters.

Note: When measuring the output or input voltage ripple, do not use the long ground lead on the oscilloscope probe. See Figure 2 for the proper scope probe technique. Short, stiff leads need to 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.

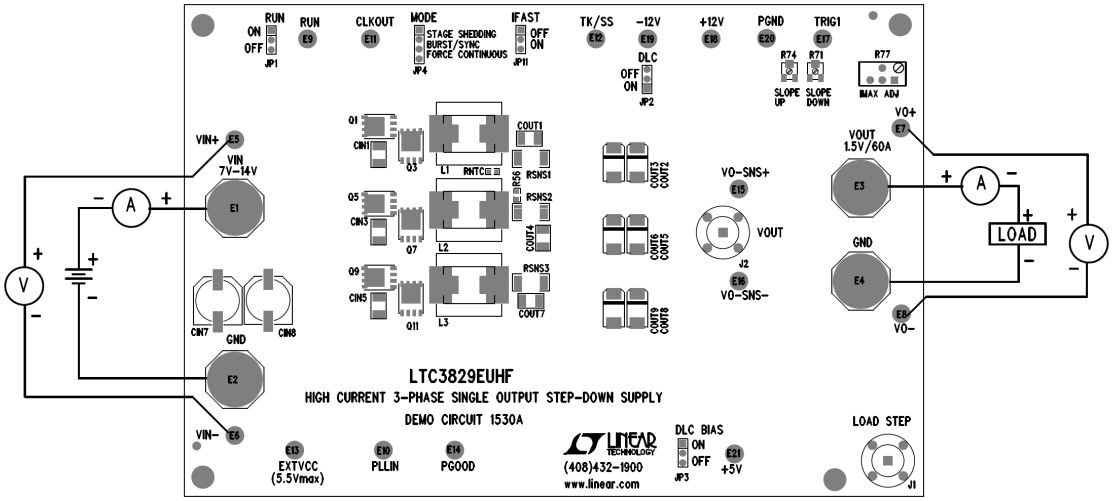


Figure 1. Proper Measurement Equipment Setup

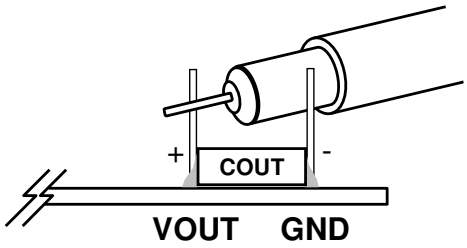


Figure 2. Measuring Output Voltage Ripple

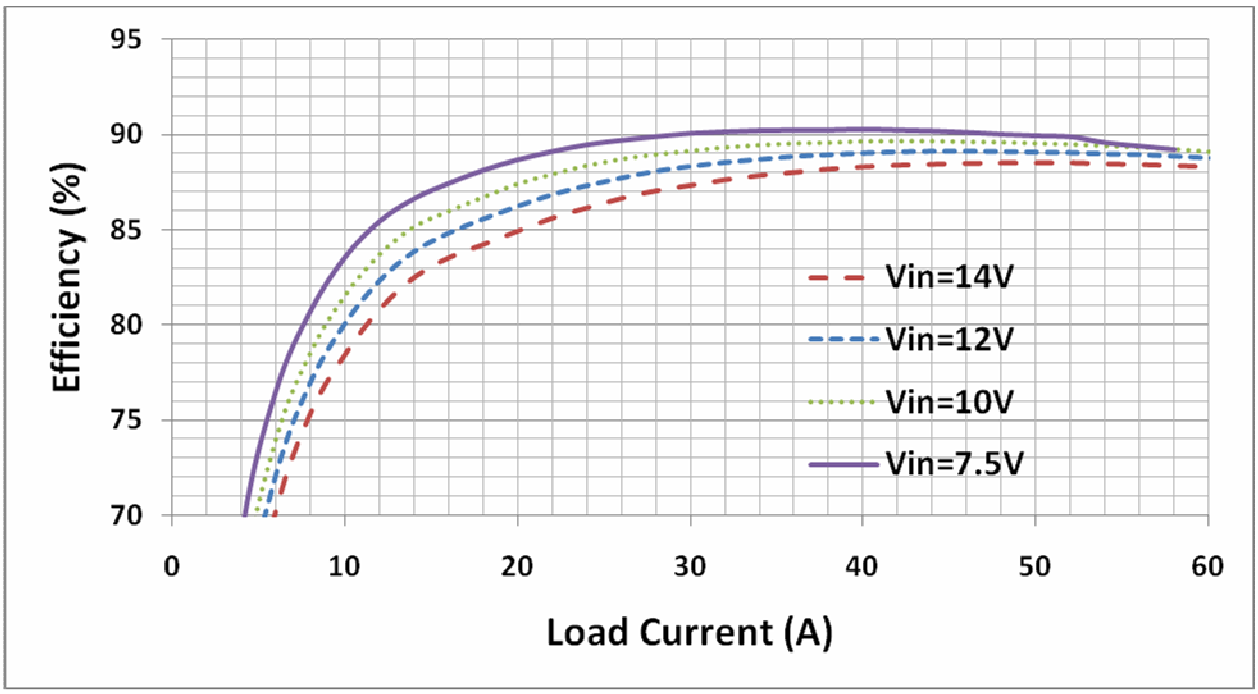
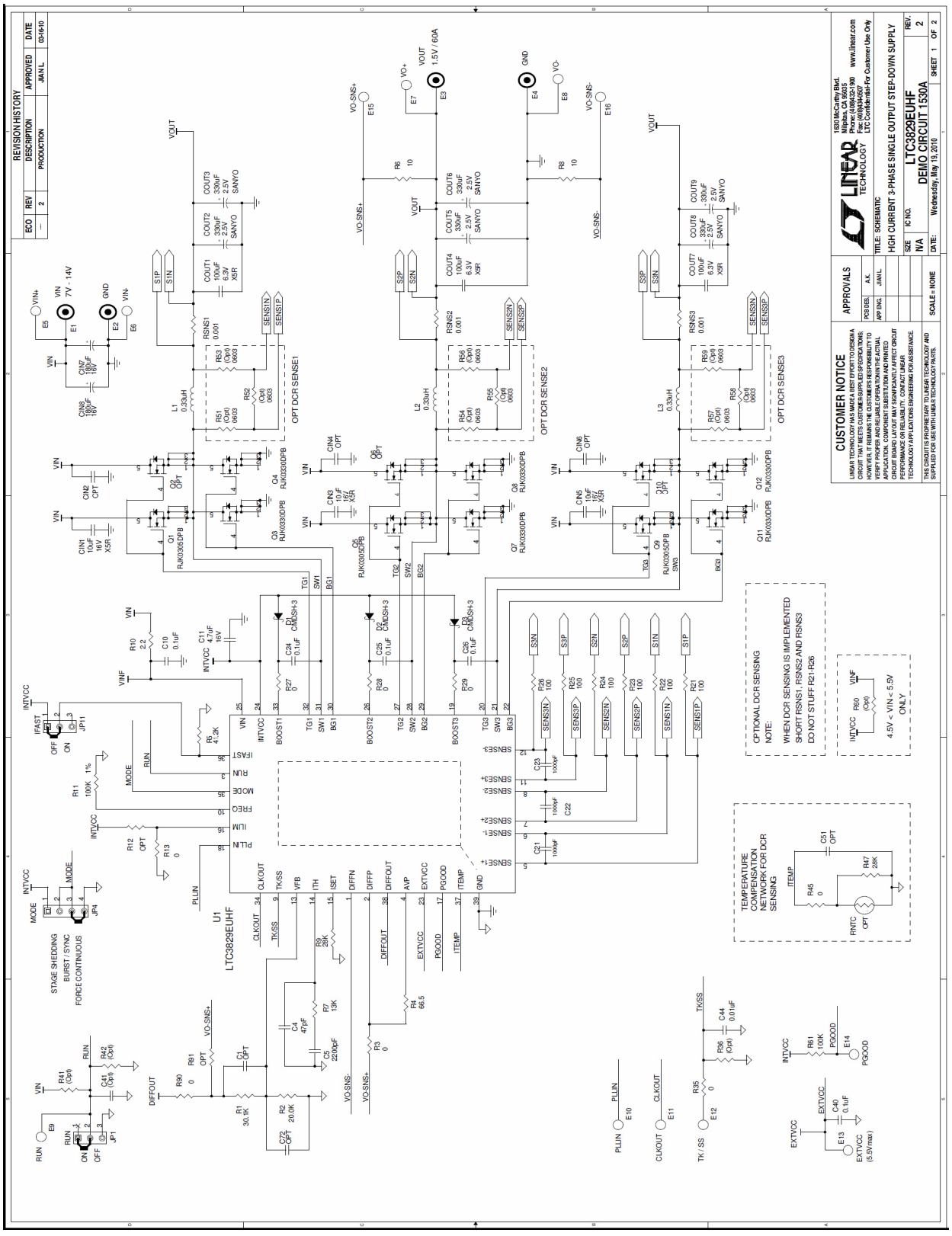


Figure 3. Efficiency vs load current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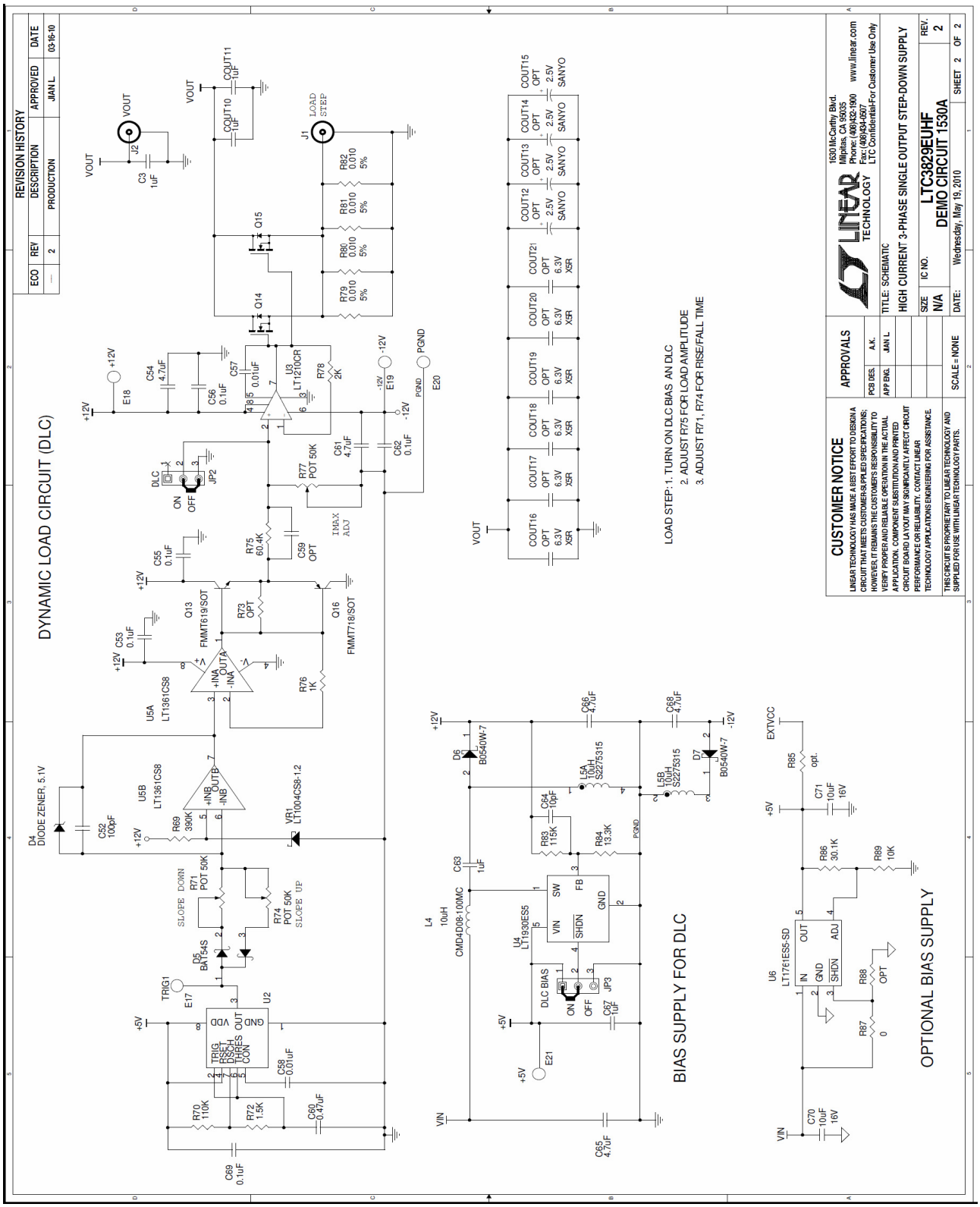
TITLE: SCHEMATIC
HIGH CURRENT 3-PHASE SINGLE OUTPUT STEP-DOWN SUPPLY
SIZE
N/A
IC NO.
LTC3829EUHF
DEMO CIRCUIT 1530A
REV.
2
DATE:
Wednesday, May 19, 2010
SHEET 1 OF 2
SCALE = NONE
U1
LTC3829EUHF
OPT DCR SENSE1
OPT DCR SENSE2
OPT DCR SENSE3
CPTIONAL DCR SENSING
NOTE:
WHEN DCR SENSING IS IMPLEMENTED
SHORT RSNS1, RSNS2 AND RSNS3
DO NOT STUFF R21-R26
TEMPERATURE
COMPENSATION
NETWORK FOR DCR
SENSING
4.5V < VIN < 5.5V
ONLY
VIN
VOUT
1.5V / 60A
INTVCC
EXTVCC
PGOOD
RUN
MODE
PLLIN
CLKOUT
TK/SS
DIFFOUT
STAGE SHEDDING
BURST / SYNC
FORCE CONTINUOUS


DYNAMIC LOAD CIRCUIT (DLC)
BIAS SUPPLY FOR DLC
OPTIONAL BIAS SUPPLY
REVISION HISTORY
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TITLE: SCHEMATIC
HIGH CURRENT 3-PHASE SINGLE OUTPUT STEP-DOWN SUPPLY
SIZE N/A
IC NO.
LTC3829EUHF
DEMO CIRCUIT 1530A
REV. 2
DATE: Wednesday, May 19, 2010
SHEET 2 OF 2
SCALE = NONE
LOAD STEP: 1. TURN ON DLC BIAS AN DLC
2. ADJUST R75 FOR LOAD AMPLITUDE
3. ADJUST R71, R74 FOR RISE/FALL TIME