DEMO CIRCUIT 1586A
QUICK START GUIDE

LTC3855EUJ

HIGH EFFICIENCY, HIHG DENSITY, DUAL-OUPUT (3.3V/5A and 2.5V/5A) REGULATOR

DESCRIPTION

Demonstration circuit 1586A is a high efficiency, dual-output (3.3V and 2.5V), synchronous buck converter with 4.5V to 25V input range. It can supply 5A maximum load current at 3.3V and 2.5V outputs. The demo board uses the LTC®3855EUJ controller. The LTC3855 is a feature-rich dual-output dual-phase synchronous buck controller with on-chip drivers, remote output voltage sensing (Vout2) and inductor DCR temperature compensation. It is suitable for input from 4.5V to 38V and output up to 12.5V. The LTC3855 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 40-pin 6mm × 6mm QFN and 38-pin TSSOP packages.

The RUN pins (JP1 and JP4) provides enable feature. To shut down the converter, one simple way is to force the RUN pins below 1.2V (JP1: OFF; JP4: OFF). Use JP2 jumper to select burst mode, pulse skipping mode or forced continuous mode operation. The phase of CLKOUT is set by JP3. Switching frequency is pre-set at about 500KHz, and it can be easily modified from 250KHz to 770KHz. Please see LTC3855 datasheet for detailed information.

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		4.5V to 25V
Output Voltage, V_{OUT1}	V_{IN} = 4.5-25V, I_{OUT1} = 0A to 5A	3.3V ±2%
Output Voltage, V_{OUT2}	V_{IN} = 4.5-25V, I_{OUT2} = 0A to 5A	2.5V ±2%
Maximum Output Current, I_{OUT1}	V_{IN} = 4.5-25V, V_{OUT1} = 3.3V	5A
Maximum Output Current, I_{OUT2}	V_{IN} = 4.5-25V, V_{OUT2} = 3.3V	5A
Typical Efficiency for V_{OUT1}	V_{IN} = 12V, V_{OUT1} = 3.3V, I_{OUT1} = 5A	92.1%
Typical Efficiency for V_{OUT2}	V_{IN} = 12V, V_{OUT2} = 2.5V, I_{OUT2} = 5A	90.3%
Typical Switching Frequency		500kHz

QUICK START PROCEDURE

Demonstration circuit 1586A is easy to set up to evaluate the performance of the LTC3855EUJ. 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 (4.5V-25V) and GND (input return).
2. Connect the 3.3V output load between Vout1 and GND (Initial load: no load).
3. Connect the 2.5V output load between Vout2 and GND (Initial load: no load).
4. Connect the DVMs to the input and outputs.
5. Turn on the input power supply and check for the proper output voltages. Vout1 should be 3.3V+/-2%. Vout2 should be 2.5V+/-2%.
6. 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.

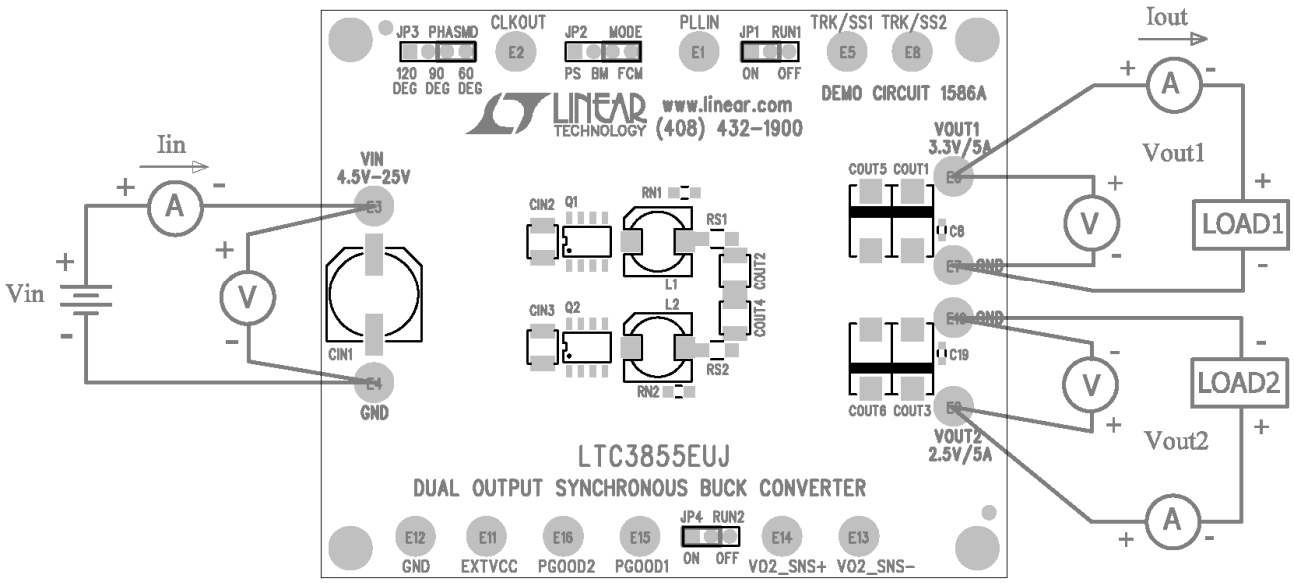


Figure 1. Proper Measurement Equipment Setup

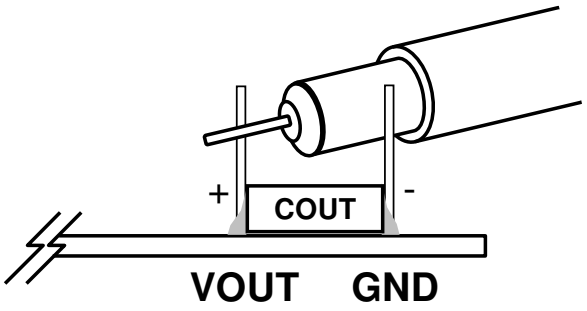


Figure 2. Measuring Output Voltage Ripple

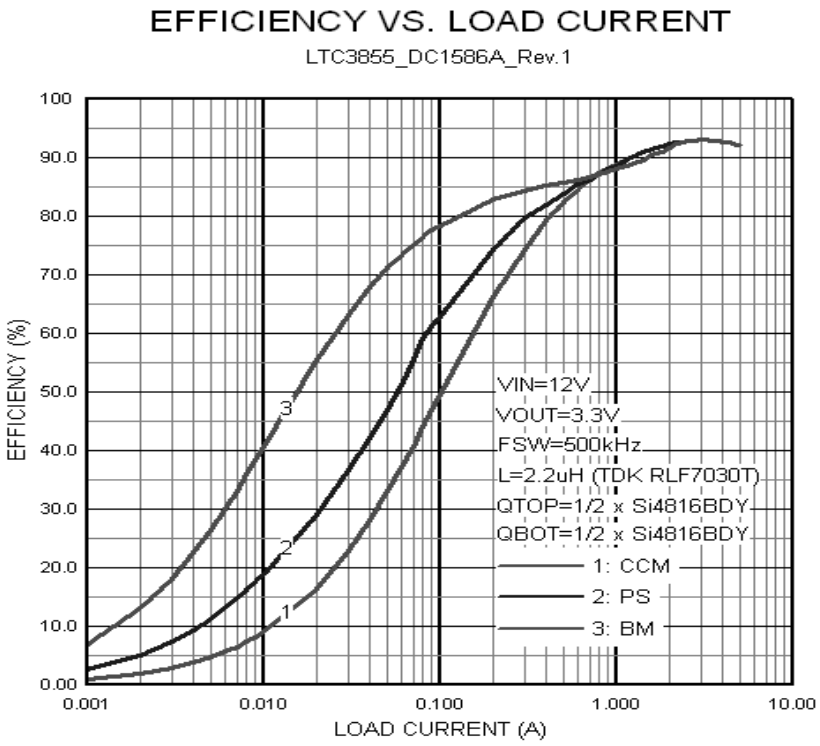


Figure 3. Efficiency vs load current For Vout1

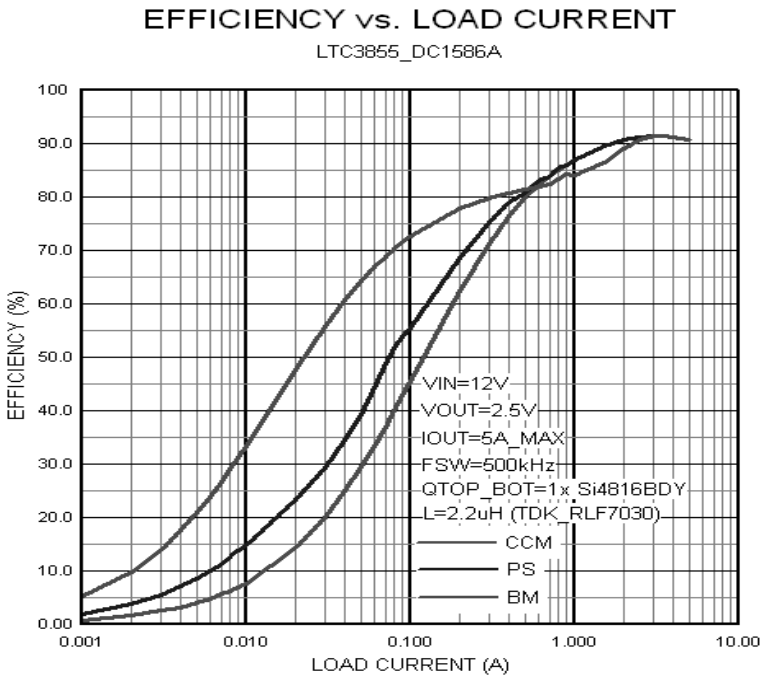
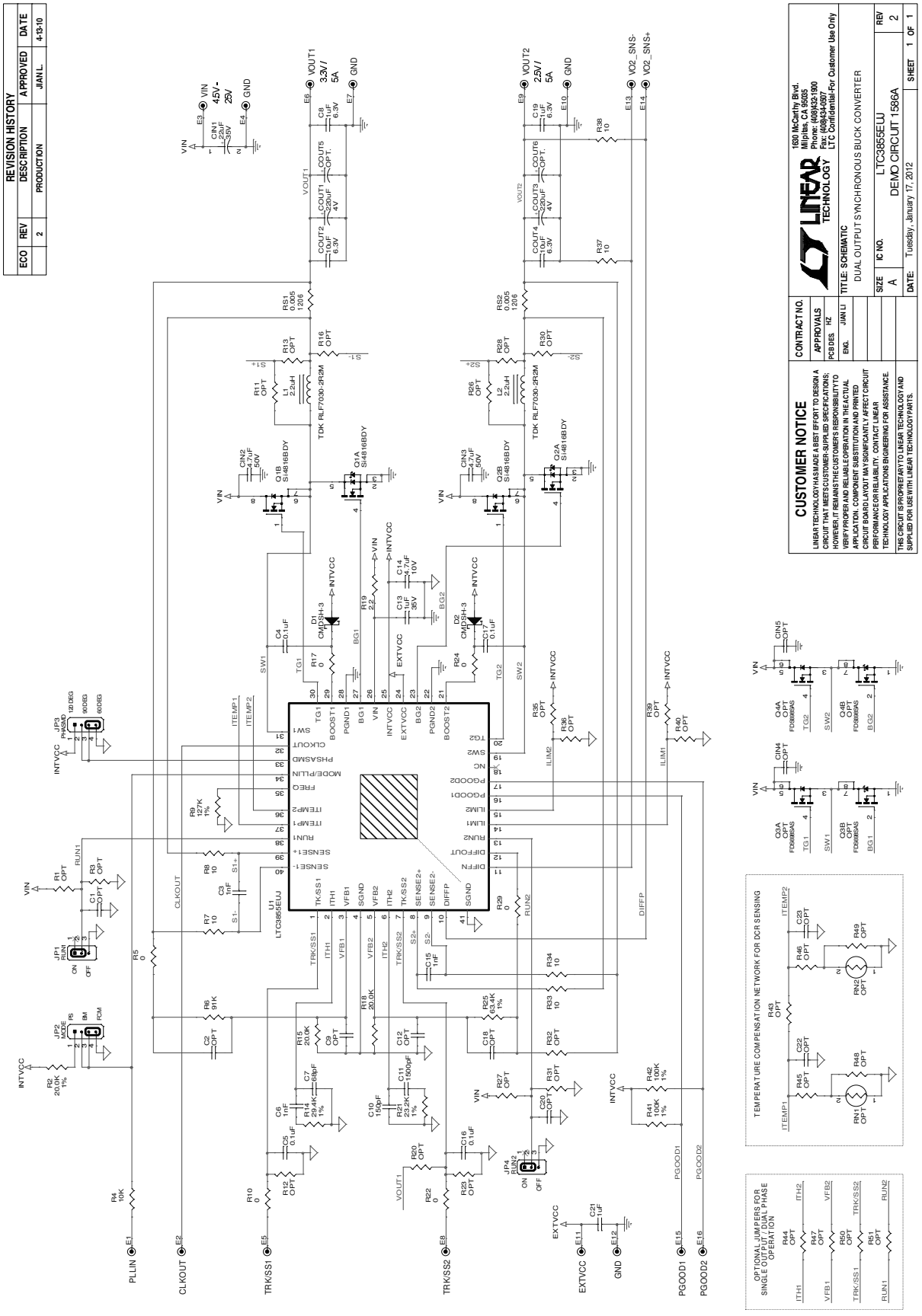


Figure 4. Efficiency vs load current For Vout2


REVISION HISTORY
ECO REV DESCRIPTION APPROVED DATE
2 PRODUCTION JIAN L. 4-15-10
CUSTOMER NOTICE
LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS; HOWEVER, IT REMAINS THE CUSTOMER'S 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 TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE.
THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.
CONTRACT NO.
APPROVALS
PCB DES. HZ
ENG. JIAN LI
1630 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408)432-1900
Fax: (408)434-0507
LTC Confidential-For Customer Use Only
TITLE: SCHEMATIC
DUAL OUTPUT SYNCHRONOUS BUCK CONVERTER
SIZE A
IC NO. LTC3855EUJ
DEMO CIRCUIT 1586A
REV 2
DATE: Tuesday, January 17, 2012
SHEET 1 OF 1
U1 LTC3855EUJ
Q1A Si4816BDY
Q1B Si4816BDY
Q2A Si4816BDY
Q2B Si4816BDY
L1 2.2uH TDK RLF7030-2R2M
L2 2.2uH TDK RLF7030-2R2M
D1 CMDSH-3
D2 CMDSH-3
Q3A Q3B Q4A Q4B FDS6898AS
TEMPERATURE COMPENSATION NETWORK FOR DCR SENSING
OPTIONAL JUMPERS FOR SINGLE OUTPUT / DUAL PHASE OPERATION
PLLIN CLKOUT TRK/SS1 TRK/SS2 EXTVCC GND PGOOD1 PGOOD2
VIN 4.5V - 25V
VOUT1 3.3V / 5A
VOUT2 2.5V / 5A
VO2_SNS- VO2_SNS+