DESCRIPTION

Demonstration circuit DC1295A features the LTM®4606EV, the low noise, high efficiency, high density switch mode step-down power module. The input voltage range is from 5V to 28V. The output voltage is programmable from 0.6V to 5V: please refer to step down ratio curve in the LTM4606 datasheet. The rated load current is 6A, while de-rating is necessary for certain V_{IN}, V_{OUT}, and thermal conditions. Integrated input and output filters enable a simple PCB layout. Only input and output capacitors are needed externally. The LTM4606 allows the user to program output ramp-up and ramp-down through the TRACK/SS pin. The output can be set to coincidentally or ratiometrically track to another voltage rail. Output voltage margining can also be realized through jumper position selections.

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		5V
Maximum Input Voltage		28V
Output Voltage V_{OUT}	Jumper selectable (open for 0.6V)	1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5V; ± 2%
Maximum Continuous Output Current	De-rating is necessary for certain V_{IN}, V_{OUT}, and thermal conditions	$6A_{DC}$
Default Operating Frequency		800 KHz
Efficiency	V_{IN}=12V, V_{OUT} =3.3V, I_{OUT} =6A	89.6%, See Figure 3
Load Transient	V_{IN}=12V, V_{OUT} =1.5V	See Figure 4 for detail

QUICK START PROCEDURE

Demonstration circuit DC1295A is easy to set up to evaluate the performance of the LTM4606EV. Please refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place jumpers in the following positions for a typical $1.5V_{OUT}$ application:

Vout Select	RUN	FCB	MARG1	MARG0
1.5V	ON	CCM	LO	LO

2. With power off, connect the input power supply, load and meters as shown in Figure 1. Preset the load to 0A and Vin supply to be 12V.
3. Turn on the power at the input. The output voltage should be 1.5V ± 2% (1.47V~1.53V).
4. Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters
5. To measure input and output ripple, please refer to Figure 2 for proper setup.
6. For optional load transient test, apply adjustable pulse signal between

IOSTEP_CLK and GND pins. Pulse amplitude sets the current step. The pulse signal should have very small duty cycle (<5%) to limit the thermal stress on the transient load circuit. The output transient current can be monitored at BNC connector J5 (10mV/A), the output voltage can be monitor at BNC connector J6.

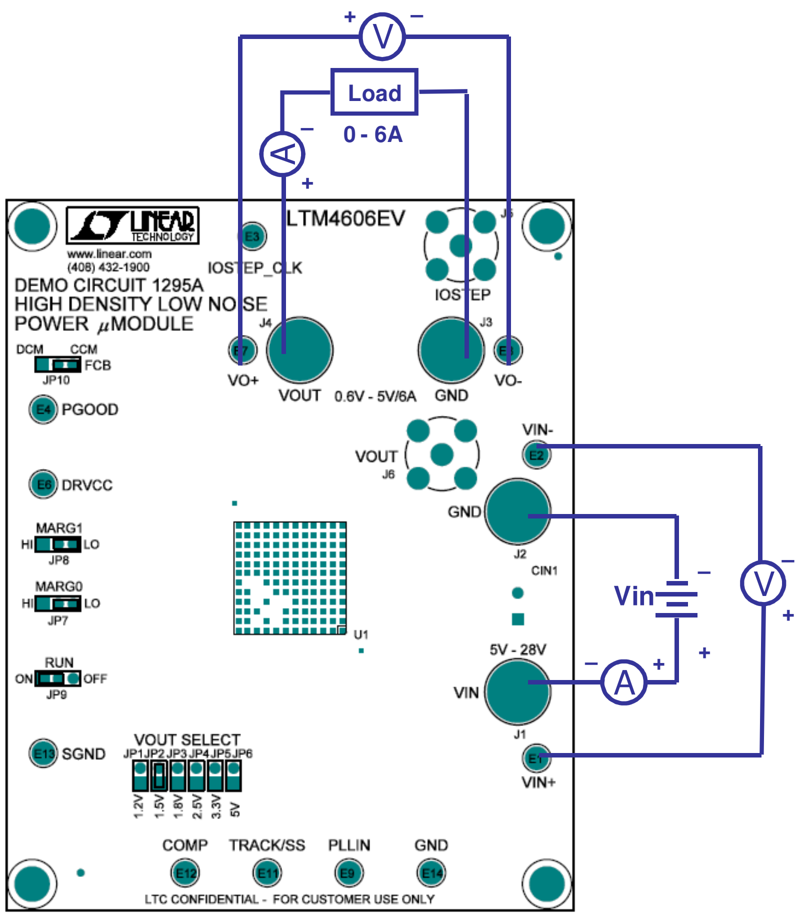
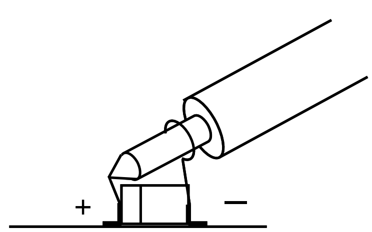


Figure 1. Test Setup of DC1295A.



Input or Output Capacitor

Figure 2. Scope Probe Placements for Measuring Input or Output Ripple.

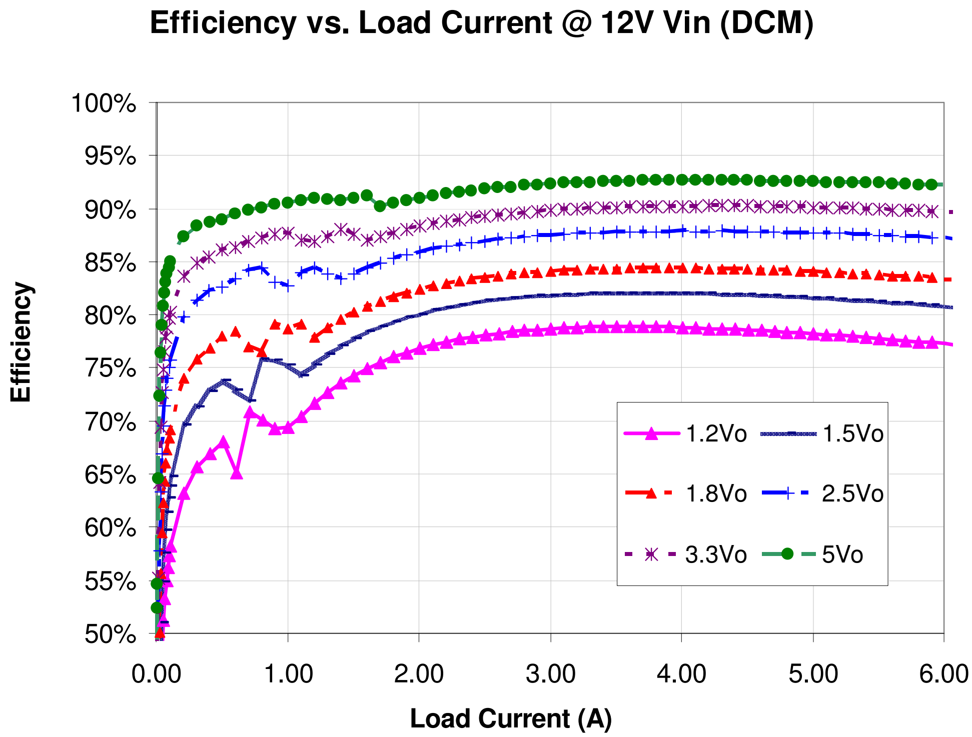
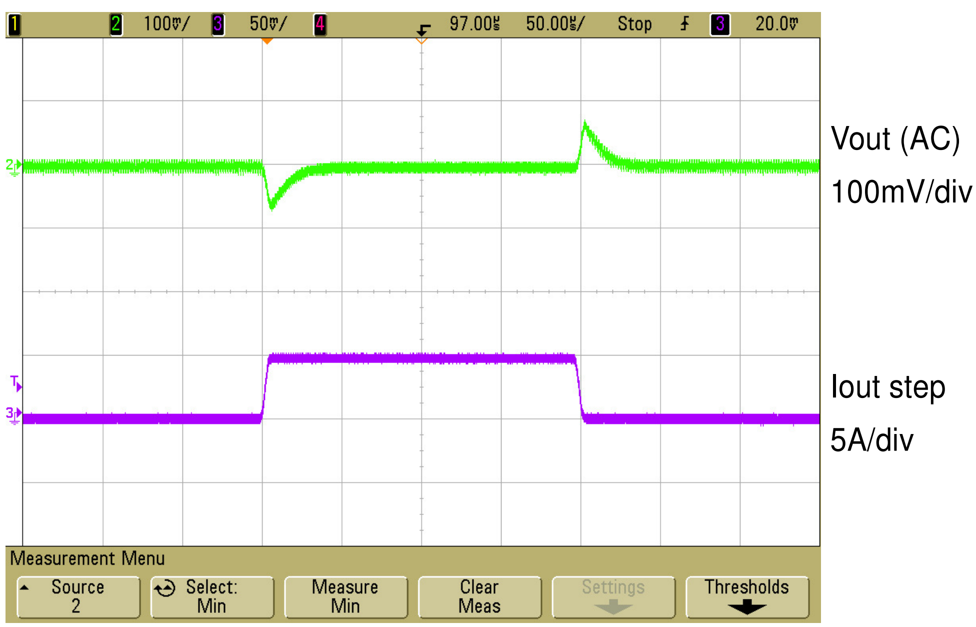


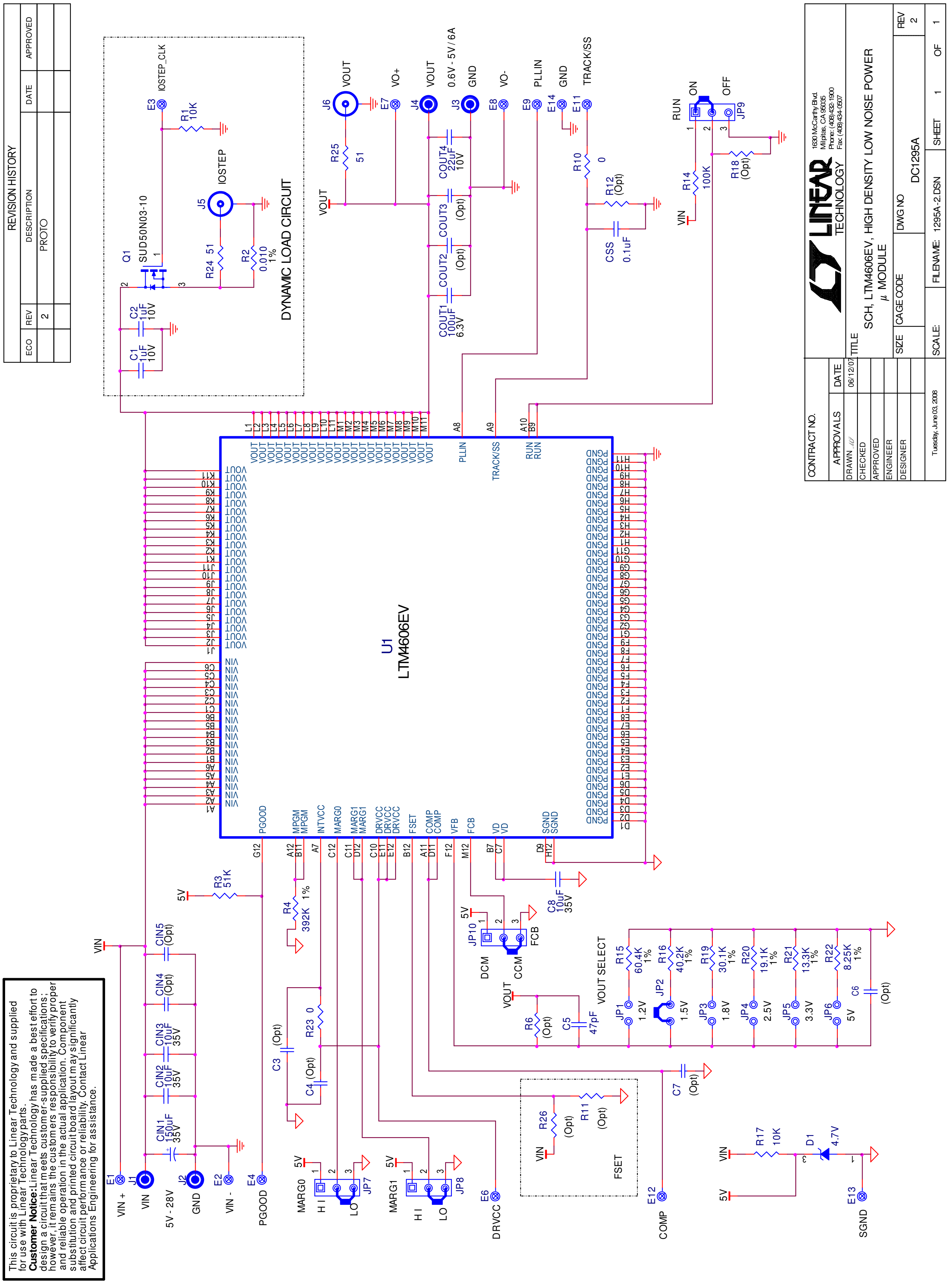
Figure 3. Measured Supply Efficiency @ 12V V_{IN} with Different V_{OUT}



V_{IN}=12V, V_{OUT}=1.5V, 0 to 5A load step (CCM)

C_{OUT}=100uF/6.3V/X5R+22uF/10V/X5R ceramic capacitors

Figure 4. Measured Load Transient Response


REVISION HISTORY
ECO
REV
DESCRIPTION
DATE
APPROVED
2
PROTO
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.
DYNAMIC LOAD CIRCUIT
Q1 SUD50N03-10
IOSTEP
IOSTEP_CLK
U1
LTM4606EV
VOUT SELECT
FSET
CONTRACT NO.
APPROVALS
DATE
DRAWN
CHECKED
APPROVED
ENGINEER
DESIGNER
06/12/07
TITLE
SCH, LTM4606EV, HIGH DENSITY LOW NOISE POWER µ MODULE
TECHNOLOGY
1630 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408)432-1900
Fax: (408)434-0507
SIZE
CAGE CODE
DWG NO
DC1295A
REV
2
SCALE:
FILENAME: 1295A-2.DSN
SHEET 1 OF 1
Tuesday, June 03, 2008