

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT DC1400A 8A HIGH DENSITY POWER MODULE

LTM4608AEV

DESCRIPTION

Demonstration circuit DC1400A features the LTM[®]4608AEV, the high efficiency, high density switch mode step-down power module. The input voltage range is from 2.5V to 5.5V. The output voltage is jumper selectable from 0.596V to 3.3V; refer to step down ratio curve in the LTM4608A datasheet. The rated load current is 8A, 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 bulk input and output capacitors are needed externally. The LTM4608A 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. Margining function is provided for user who wants to stress their systems by varying supply voltages during testing; refer to datasheet for functional diagram.

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		2.5V
Maximum Input Voltage		5.5V
Output Voltage V_{OUT}	Jumper selectable (open for 0.596V)	1.2V, 1.5V, 1.8V, 2.5V, 3.3V; $\pm 2\%$
Maximum Continuous Output Current	De-rating is necessary for certain V_{IN} , V_{OUT} , and thermal conditions	$8A_{DC}$
Default Operating Frequency		1.5 MHz
Efficiency	$V_{IN}=5V$, $V_{OUT}=2.5V$, $I_{OUT}=8A$	84.5%, See Figure 3 for more information
Load Transient	$V_{IN}=3.3V$, $V_{OUT}=1.2V$	See Figure 4 for details

QUICK START PROCEDURE

Demonstration circuit DC1400A is easy to set up to evaluate the performance of the LTM4608AEV. 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 1.2V_{OUT} application:

Vout Select	RUN	TRACK	MARGINING
1.2V	ON	DISABLE	NO

2. With power off, connect the input power supply, load and meters as shown in Figure 1.

Preset the load to 0A and V_{in} supply to be less than 5.5V.

3. Turn on the power at the input. The output voltage should be $1.2V \pm 2\%$.
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

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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 monitored at BNC connector J6.

7. In applications when the VOUT is close to VIN (drop out mode), to disable margining, the MARGINING pin should be tied to a voltage rail that is in the range from 0.7V to $SVIN-0.7V$.

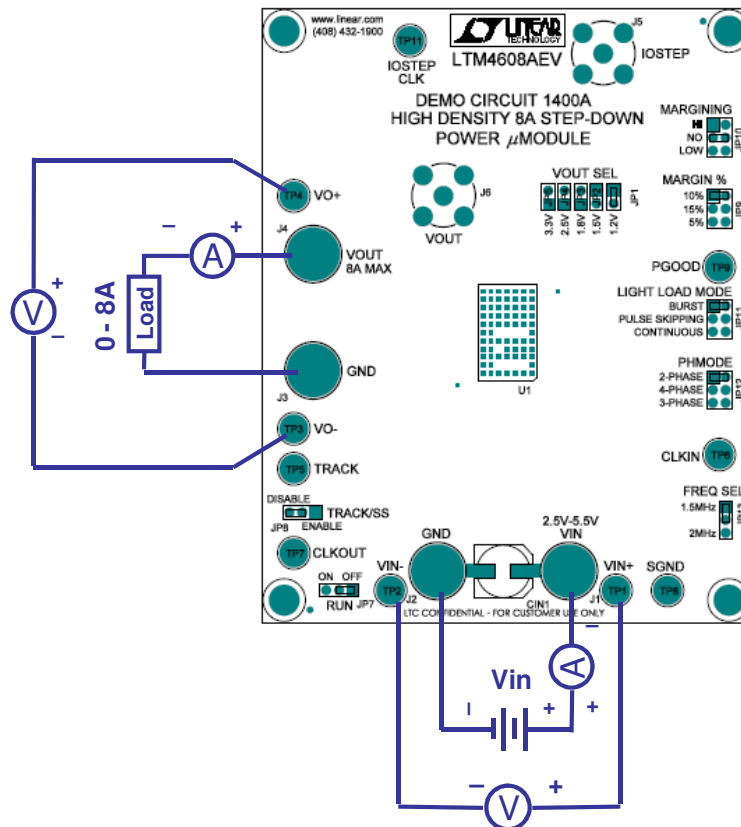
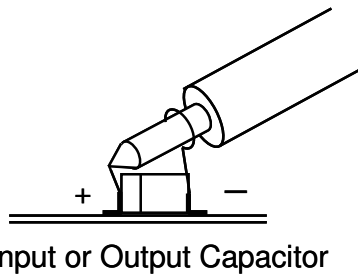


Figure 1. Test Setup of DC1400A



Input or Output Capacitor

Figure 2. Proper Scope Probe Placement for Measuring Input or Output Ripple.

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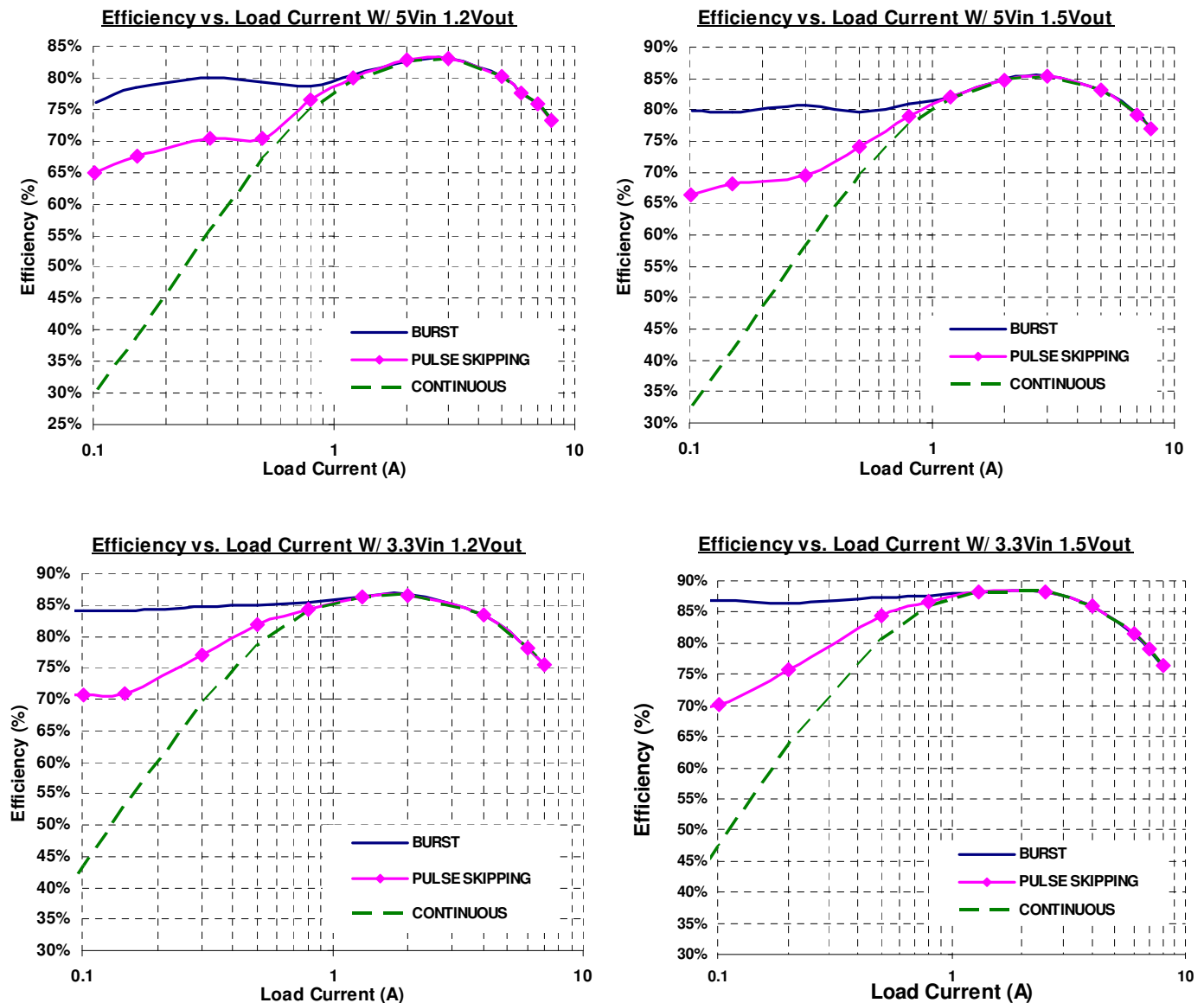


Figure 3. Measured Supply Efficiency with Different V_{IN} and V_{OUT}

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$V_{in} = 3.3V$

$V_{out} = 1.2V$

2A to 6A LOAD STEP

$C_{out} = 1 \times 22\mu F$ ceramic (1206, X5R, 6.3V), $2 \times 100\mu F$ ceramic (1812, X5R, 6.3V)

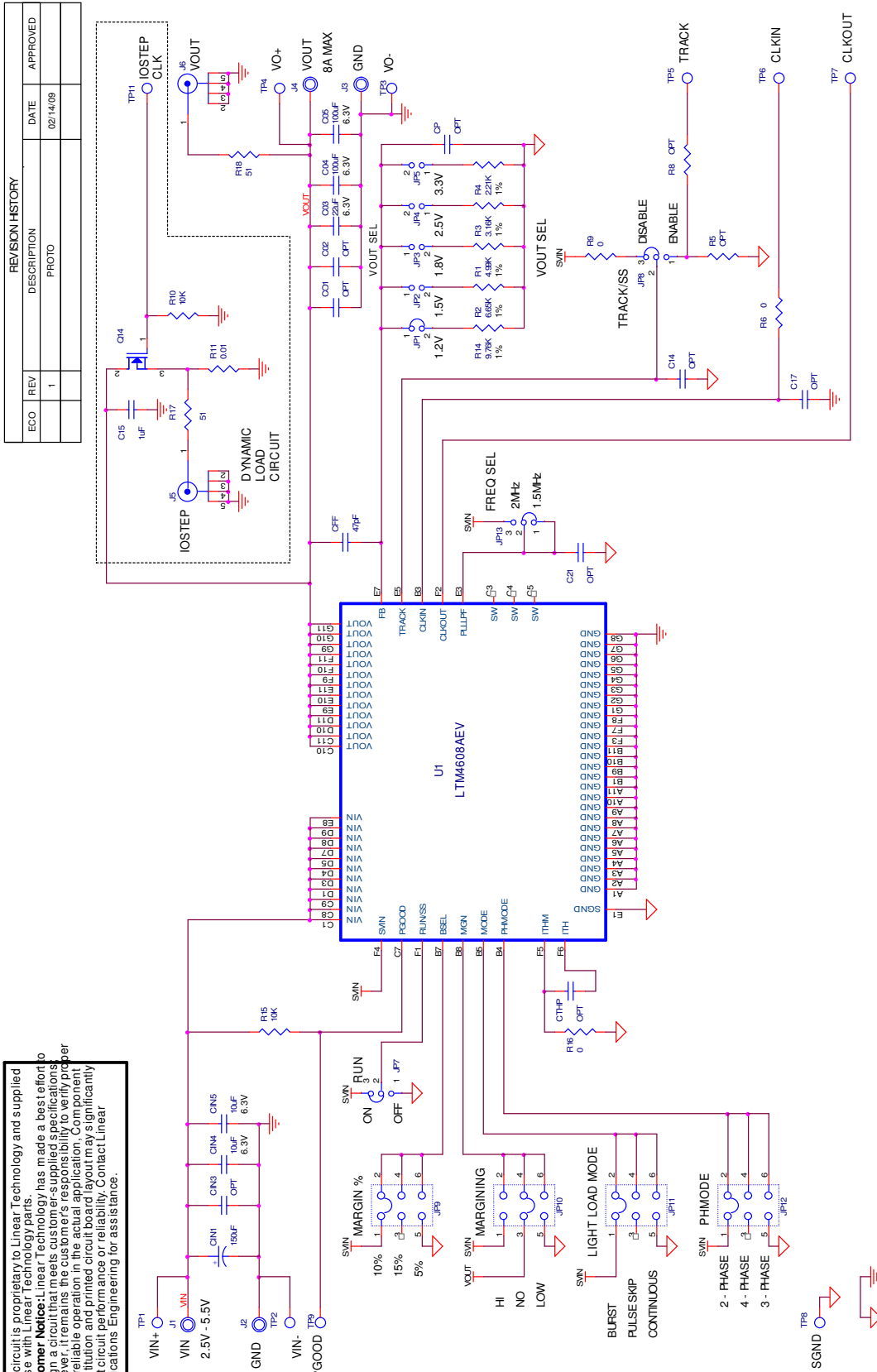
$CFF = 47pF$

Figure 4. Measured Load Transient Response (4A Step, 25% to 75%)

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This circuit is proprietary to Linear Technology and is 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, but does not warrant the circuit for any application. Component substitution and printed circuit board layout may significantly affect circuit performance or reliability. Contact Linear Applications Engineering for assistance.



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