

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1392A 4A HIGH DENSITY POWER MODULE

LTM4604AEV

DESCRIPTION

Demonstration circuit 1392A features the LTM[®]4604AEV, the high efficiency, high density switch mode step-down power module with 0.635mm LGA pads and 1.27mm pitch. The input voltage range is from 2.375V to 5.5V. The output voltage is jumper selectable from 0.8V to 3.3V; refer to step down ratio curve in the LTM4604A datasheet. The rated load current is 4A, 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 ex-

ternally. The LTM4604A 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.

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		2.375V
Maximum Input Voltage		5.5V
Output Voltage V_{OUT}	Jumper selectable (open for 0.8V)	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	$4A_{DC}$
Default Operating Frequency		1.25 MHz
Efficiency	$V_{IN}=5V$, $V_{OUT}=3.3V$, $I_{OUT}=4A$	88% typical, See Figure 3

QUICK START PROCEDURE

Demonstration circuit 1392A is easy to set up to evaluate the performance of the LTM4604AEV. 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
1.2V	ON	OFF

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 duty cycle (<5%) to limit the thermal stress on the transient load circuit. The output transient current can be monitored at BNC connector J1

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(10mV/A), the output voltage can be monitor at BNC connector J2.

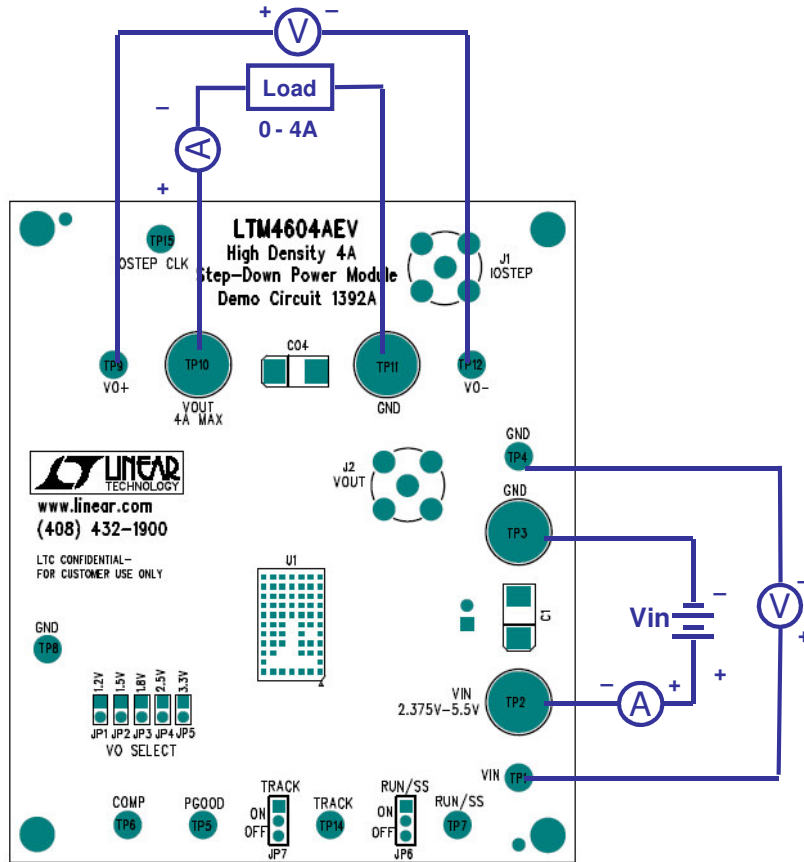


Figure 1 Test Setup of DC1392A

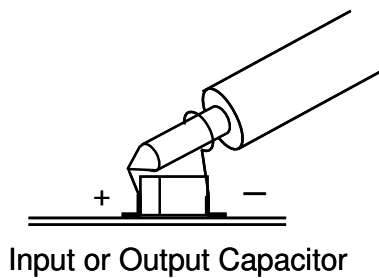


Figure 2. Scope Probe Placements for Measuring Input or Output Ripple.

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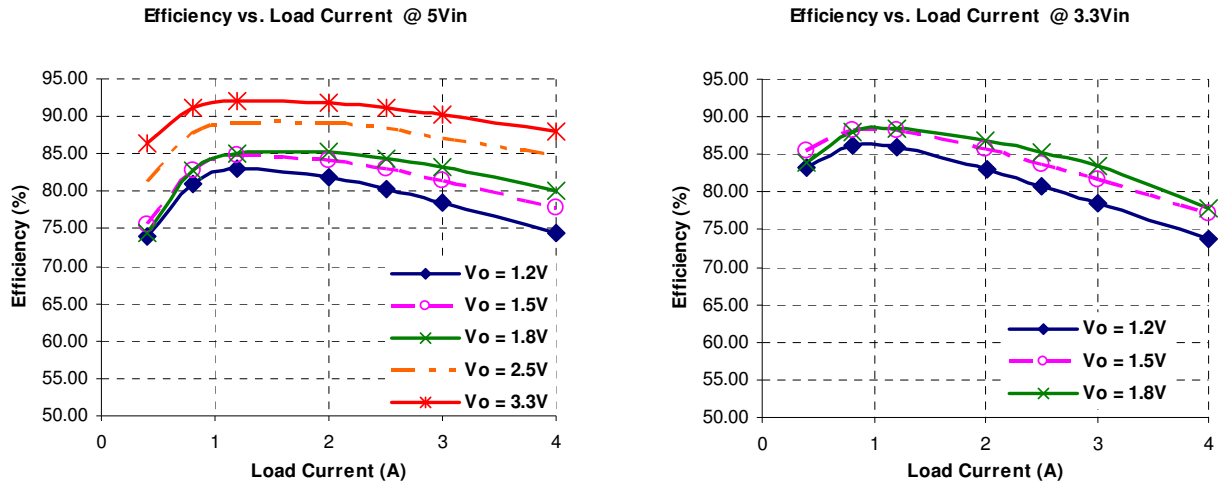
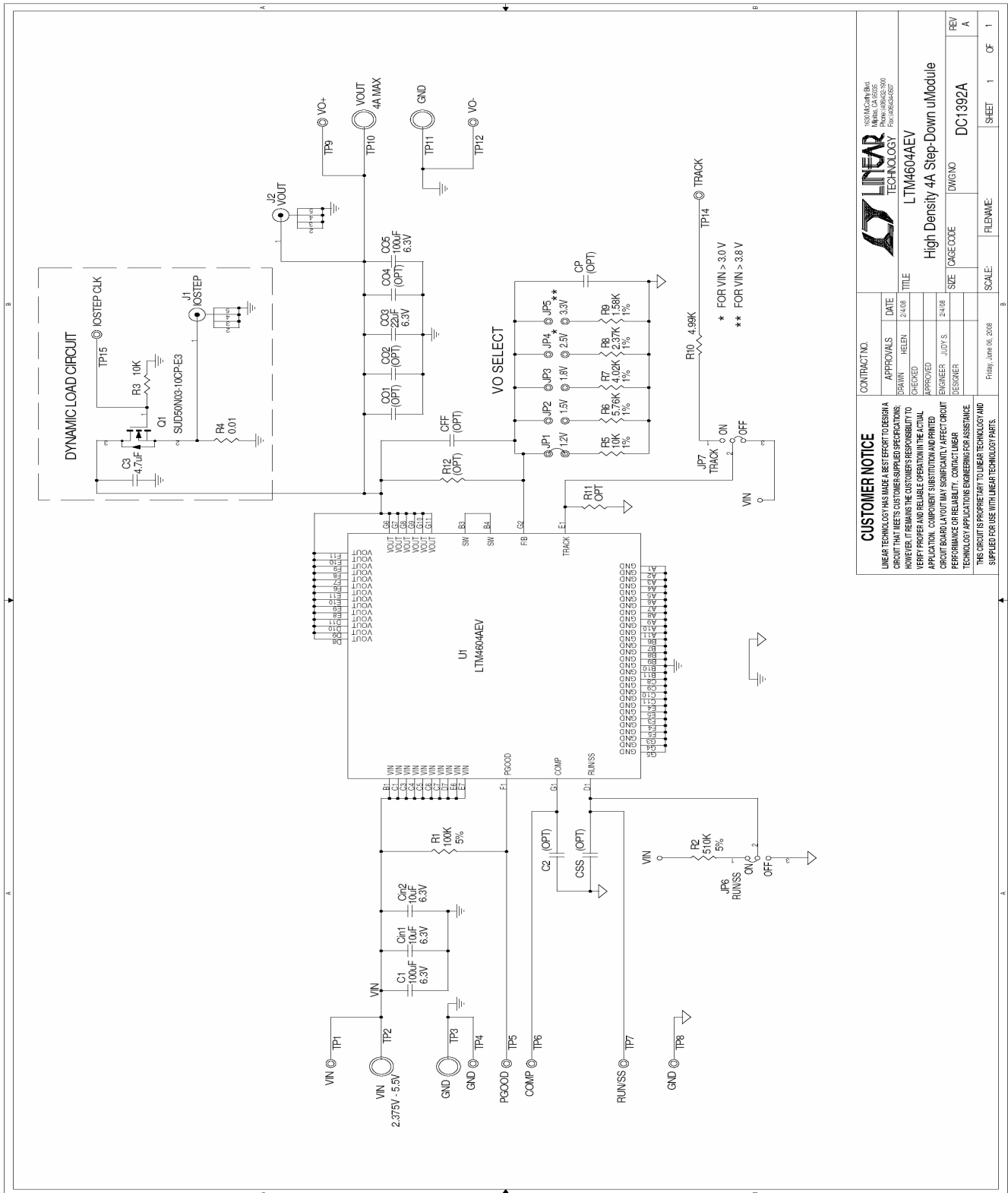


Figure 3. Measured Supply Efficiency with Different V_{IN} and V_{OUT}

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CONTRACT NO.		APPROVALS		DATE		TITLE	
		DRAWN	HELEN	2-4-08		LTM4604AEV	
		CHECKED				High Density 4A Step-Down uModule	
		APPROVED				SIZE	
		ENGINEER	JUDY S	2-4-08		DWGNO	
		DESIGNER				DC1392A	
						REV	
						A	
						SHEET	
						1 OF 1	
						SCALE:	
						FILENAME:	
						DATE:	
						REV	
						A	

CUSTOMER NOTICE

LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER 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 APPLICATION ENGINEERING FOR ASSISTANCE. THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.