

LTM4608AEV: 8A Step-Down Power μModule® Regulator

DESCRIPTION

Demonstration circuit DC1400A features the LTM®4608AEV, the high efficiency, high density switch mode step-down power module. The input voltage range is 2.5V to 5.5V. The output voltage is jumper selectable from 0.6V to 3.3V. The rated load current is 8A although derating is necessary for certain V_{IN} , V_{OUT} and thermal conditions. LTM4608A offers a novel phase-shift clock output to support current sharing with other regulators. The TRACK/SS pin allows the user to program output voltage ramp-up and ramp-down slew rate. The same pin also allows the output to

coincidentally or ratiometrically track another voltage rail. The margining function is provided for users who wish to stress their systems by varying supply voltages during testing. The LTM4608A data sheet must be read in conjunction with this demo manual prior to working on or modifying the DC1400A

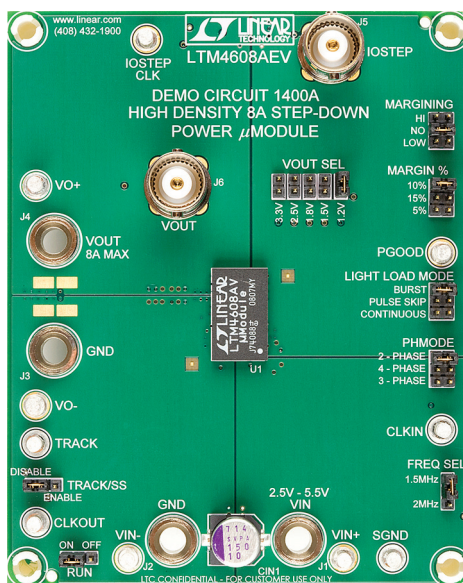
Design files for this circuit board are available at
<http://www.linear.com/demo>

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PERFORMANCE SUMMARY (T_A = 25°C)

PARAMETER	CONDITION	VALUE
Input Voltage Range		2.5V to 5.5V
Output Voltage Range	Jumper Selectable (Open for 0.6V)	1.2V, 1.5V, 1.8V, 2.5V, 3.3V; $\pm 2\%$
Maximum Continuous Output Current	Derating is Necessary for Certain V_{IN} , V_{OUT} and Thermal Conditions	8A DC
Default Operating Frequency		1.5MHz
Efficiency	$V_{IN} = 5V$, $V_{OUT} = 2.5V$, $I_{OUT} = 8A$	84.5%, See Figure 3 for More Information

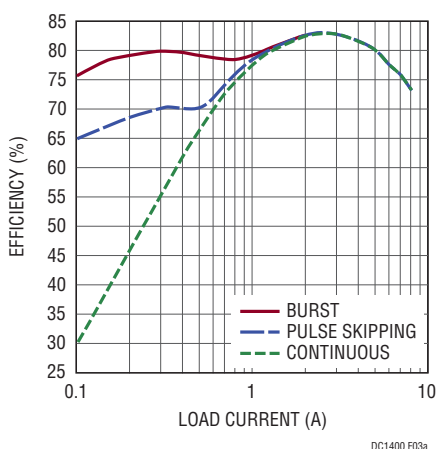
BOARD PHOTO



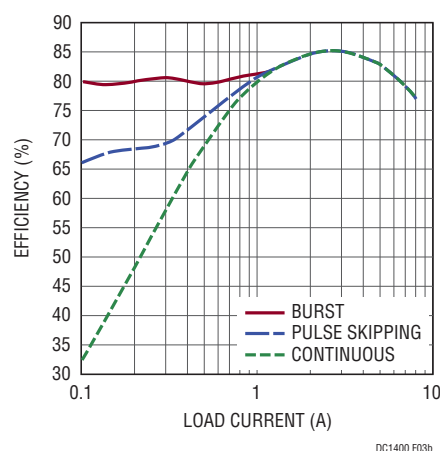
dc1400af

QUICK START PROCEDURE

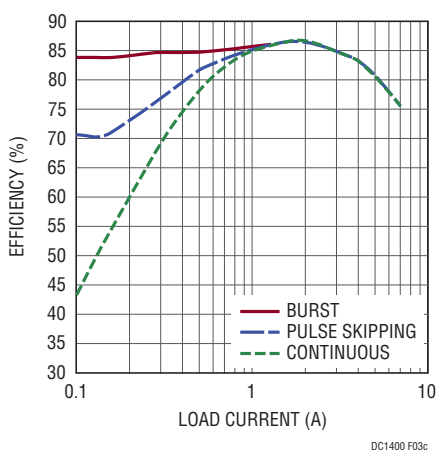
Efficiency vs Load Current with $5V_{IN}$, $1.2V_{OUT}$



Efficiency vs Load Current with $5V_{IN}$, $1.5V_{OUT}$



Efficiency vs Load Current with $3.3V_{IN}$, $1.2V_{OUT}$



Efficiency vs Load Current with $3.3V_{IN}$, $1.5V_{OUT}$

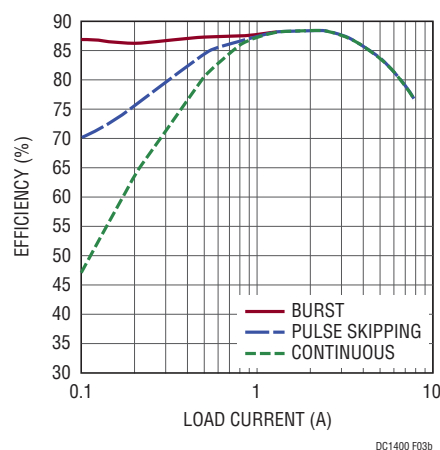


Figure 3. Measured Supply Efficiency with Different V_{IN} and V_{OUT}

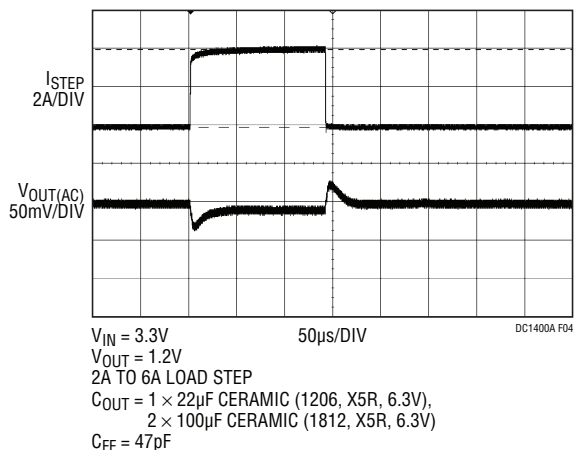


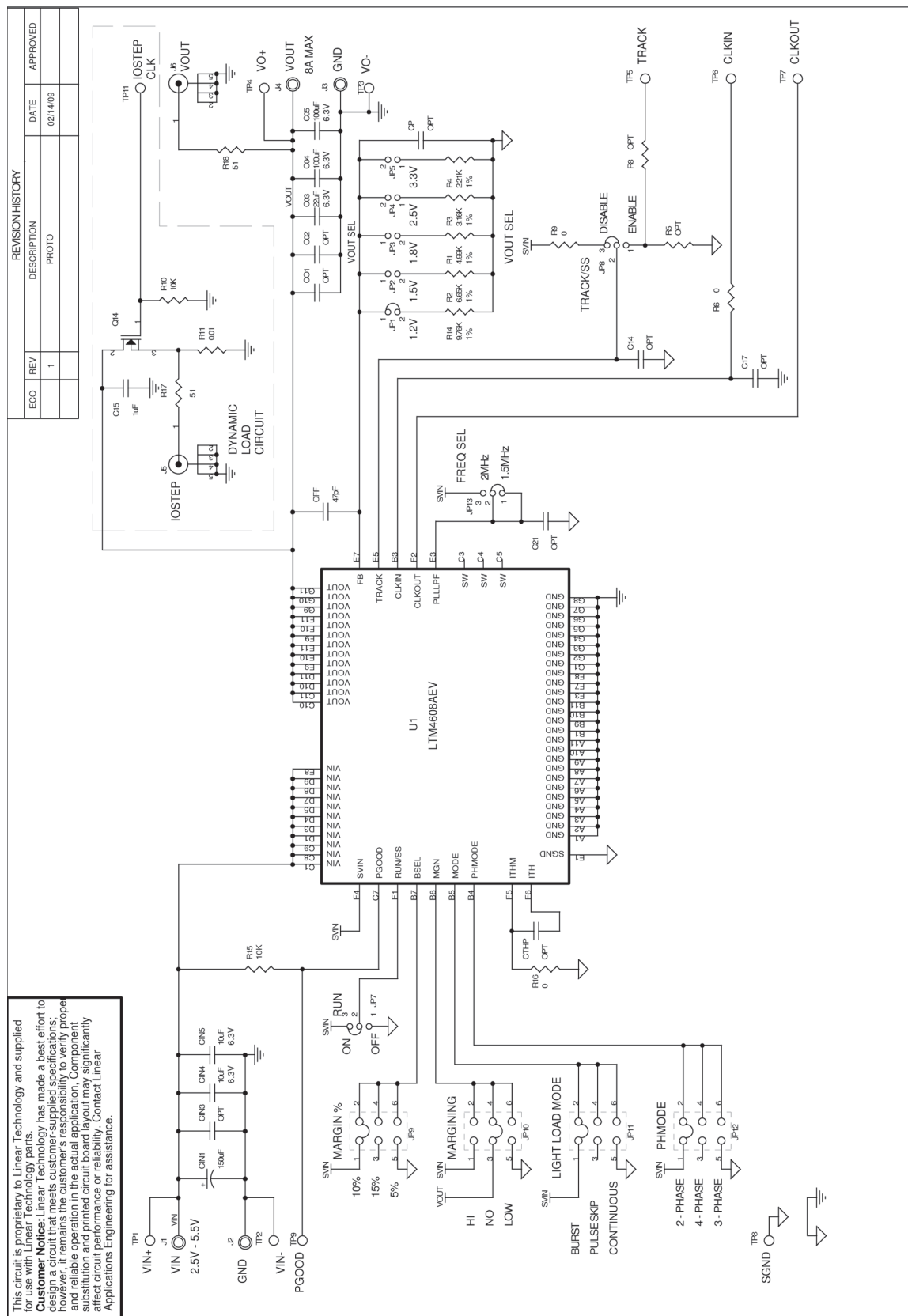
Figure 4. Measured Load Transient Response (4A Step, 25% to 75%)

DEMO MANUAL DC1400A

PARTS LIST

ITEM	QTY	REFERENCE	DESCRIPTION	MANUFACTURER'S PART NUMBER
Required Circuit Components				
1	1	CFF	CAP, 0603 47pF 10% 25V NPO	AVX 06033A470KAT
2	1	CIN1	CAP, 150μF 20% 10V ELEC	SANYO 10SVPA150MAA
3	2	CIN5, CIN4	CAP, 0805 10μF 10% 6.3V X5R	AVX 08056D106KAT2A
4	1	C03	CAP, 1206 22μF 20% 6.3V X5R	AVX 12066D266MAT2A
5	2	C05, C04	CAP, 1812 100μF 20% 6.3V X5R	TDK C4532X5R0J107MZ
6	1	R14	RES, 0603 9.76k 1% 1/10W	VISHAY CRCW06039K76FKEA
7	1	U1	IC, LOW VOLTAGE POWER MODULE	LINEAR TECH. LTM4608AEV
Additional Demo Board Circuit Components				
1	0	C02, CIN3	CAP, 1812 100μF 20% 6.3V X5R OPTION	TDK C4532X5R0J107MZ OPTION
2	0	C01	CAP, 1812 OPTION	TAIYO YUDEN JMK432BJ107MU-T OPTION
3	0	C14, C21, CTHP, CP	CAP, 0603 OPTION	OPTION
4	1	C15	CAP, 0603 1μF 20% 10V X5R	TAIYO YUDEN LMK107BJ105MA-T
5	0	C17	CAP, 0603 1μF 20% 16V X5R OPTION	TDK C1608X7R1C105M OPTION
6	1	Q14	XSTR, MOSFET	VISHAY SUD50N03-09CP-E3
7	1	R1	RES, 0603 4.99k 1% 1/10W	VISHAY CRCW06034K99FKEA
8	1	R2	RES, 0603 6.65k 1% 1/10W	VISHAY CRCW06036K65FKEA
9	1	R3	RES, 0603 3.16k 1% 1/10W	VISHAY CRCW06033K16FKEA
10	1	R4	RES, 0603 2.21k 1% 1/10W	VISHAY CRCW06032K21FKEA
11	0	R8, R5	RES, 0603 OPTION	OPTION
12	3	R6, R9, R16	RES, 0603 0Ω JUMPER	VISHAY CRCW06030000Z0EA
13	2	R10, R15	RES, 0603 10k 5% 1/10W	VISHAY CRCW060310K0JNEA
14	1	R11	RES, 2512 0.01Ω 1% 1W	PANASONIC ERJ-M1WSF10MU
15	2	R18, R17	RES, 0603 51Ω 5% 1/10W	VISHAY CRCW060351R0JNEA
Hardware				
1	5	JP1, JP2, JP3, JP4, JP5	HEADER, 2-PIN, 2mm	SAMTEC TMM 102-02-L-S
2	3	JP7, JP8, JP13	HEADER, 3-PIN, 2mm	SAMTEC TMM-103-02-L-S
3	4	JP9, JP10, JP11, JP12	HEADER, 3 × 2 2mm	SAMTEC TMM-103-02-L-D
4	4	J1, J2, J3, J4	JACK, BANANA	KEYSTONE 575-4
5	2	J5, J6	CONN, BNC, 5 PINS	CONNEX 112404
6	10	TP1-TP9, TP11	TURRET	MILL MAX 2501-2-00-80-00-00-07-0
7	8	JP1, JP7-JP13	SHUNT, 2mm	SAMTEC 2SN-BK-G
8	4		STANDOFF, SNAP ON	KEYSTONE_8834

SCHEMATIC DIAGRAM



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES 2 PLACES ... 3 PLACES ... TOLERANCE ON ANGLE ... PER ASME Y14.5M, 1994 THIRD ANGLE PROJECTION		CONTRACT NO.			 LINEAR TECHNOLOGY 10301 McConkey Blvd Milpitas, CA 95035 Tel: (408)944-0070 Fax: (408)944-0507	TITLE SCH. LTM4608AEV, HIGH DENSITY 8A STEP-DOWN POWER μ MODULE	SIZE	CAGE CODE	DWG NO	REV	
		APPROVALS	DATE								
		DRAWN MEL	02/14/09								
		CHECKED									
		APPROVED									
ENGINEER											
DESIGNER											
DO NOT SCALE DRAWING		Tuesday, May 13, 2008		SCALE: NONE		FILE NAME: 1400A-1.DSN		SHEET 1 OF 1			

DEMO MANUAL DC1400A

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Mailing Address:

Linear Technology
1630 McCarthy Blvd.
Milpitas, CA 95035

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dc1400af

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9