

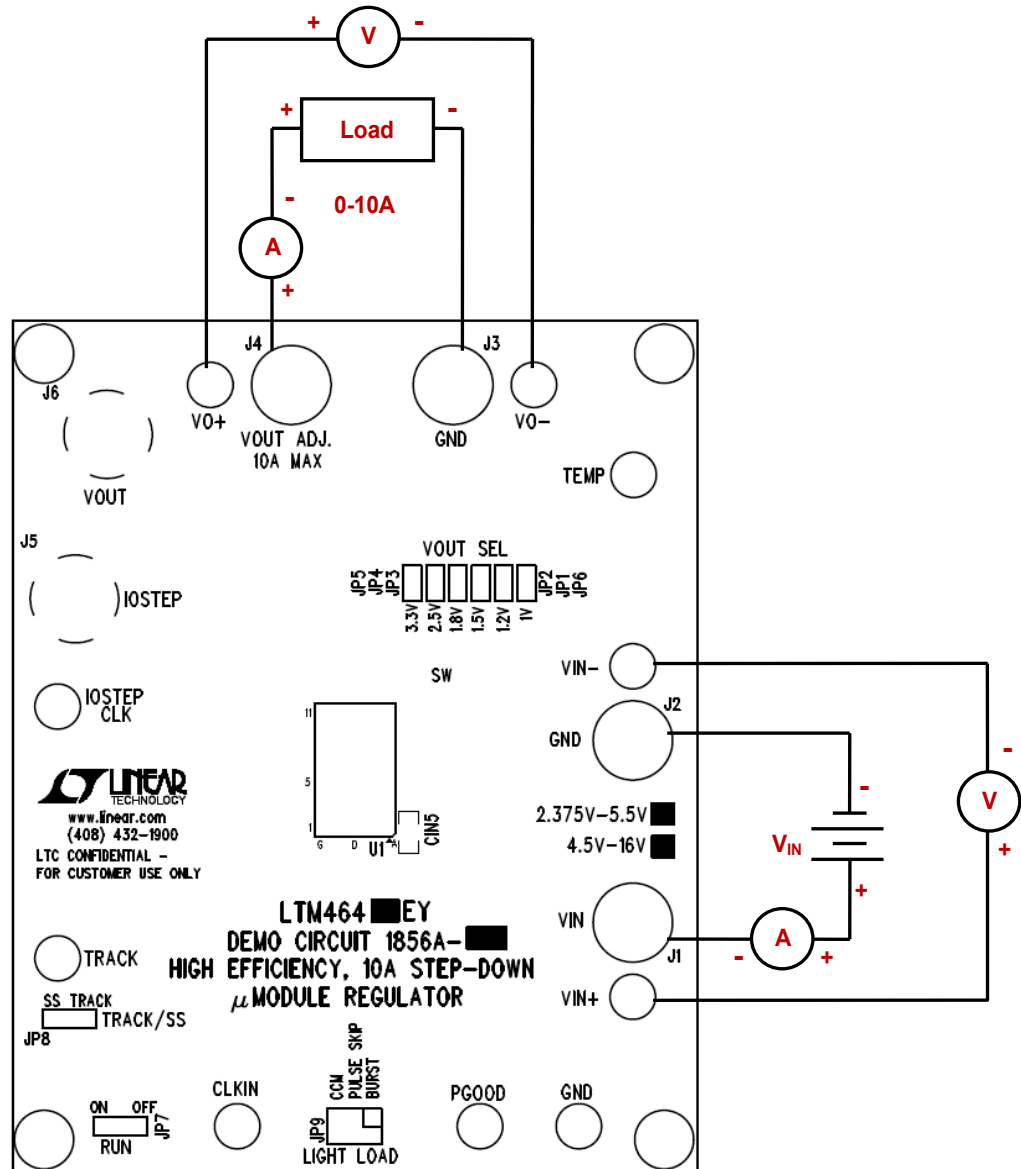
QUICK START PROCEDURE

Demonstration circuit 1856A-A is an easy way to evaluate the performance of the LTM4648EY. Please refer to Figure 1 for test setup connections and follow the procedure below.

1. With power off, place the jumpers in the following positions for a typical 1.8V_{out} application:

<i>JP8</i>	<i>JP7</i>	<i>JP9</i>	<i>JP2</i>
TRACK/SS	RUN	MODE	V_{OUT} Select
SS	ON	CCM	1.8V

2. Before connecting input supply, load and meters, pre-set the input voltage supply to be between 2.375V to 5.5V. Pre-set the load current to 0A.
3. With power off, connect the load, input voltage supply and meters as shown in Figure 1.
4. Turn on input power supply. The output voltage meter should display the selected output voltage $\pm 2\%$.
5. Once the proper output voltage is established, adjust the load current within the 0-10A range and observe the load regulation, efficiency, and other parameters. Output voltage ripple should be measured at J6 with a BNC cable and oscilloscope.
6. To observe increased light load efficiency place the Mode pin jumper (JP9) in the Burst Mode position. To observe increased light load efficiency with a reduced output ripple as compared to Burst Mode[®] place the Mode pin jumper in the Pulse skip position.
7. For optional load transient testing apply an adjustable positive pulse signal between IOSTEP CLK and GND pins. The pulse amplitude sets the load step current amplitude. The pulse width should be short ($< 1\text{ms}$) and pulse duty cycle should be low ($< 15\%$) to limit the thermal stress on the load transient circuit. The load step current can be monitored with a BNC connected to J5 (10mV/A).



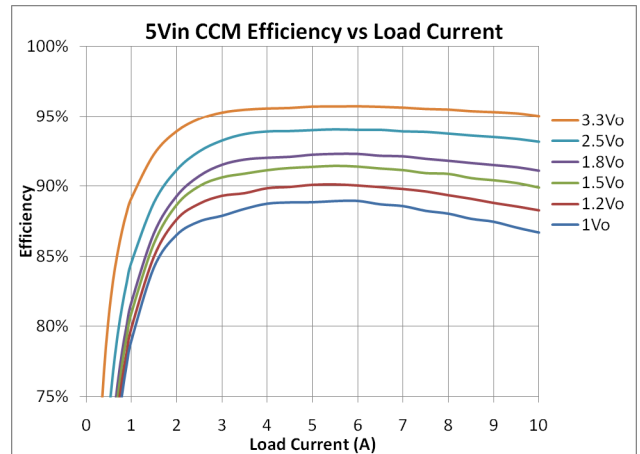
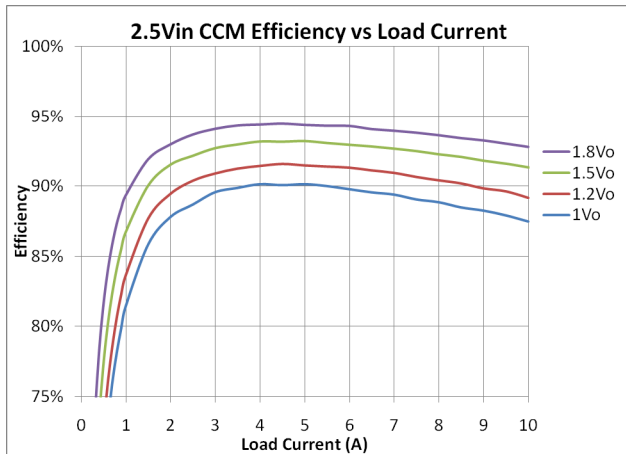
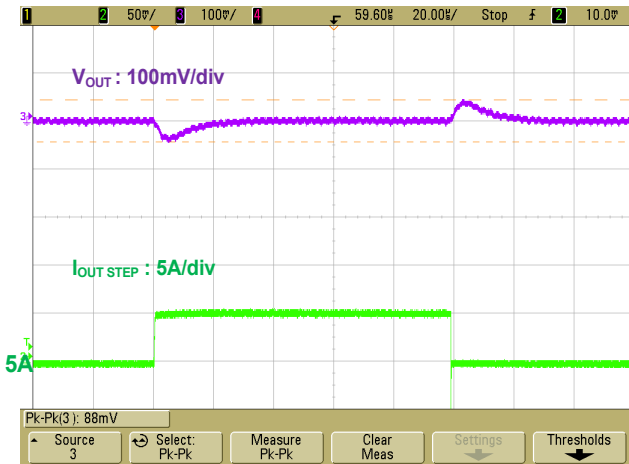
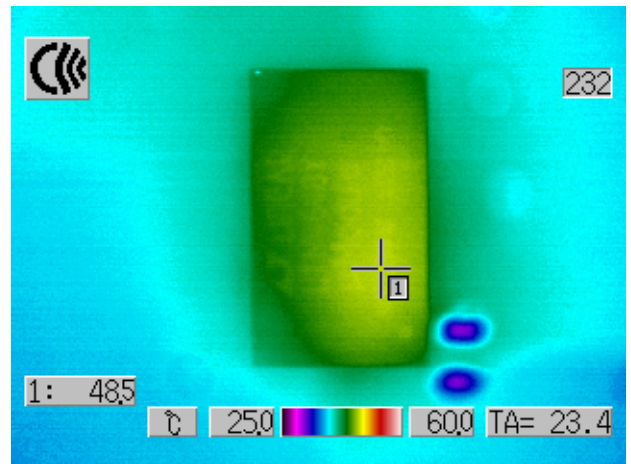


Figure 2. Measured Supply Efficiency at 2.5Vin & 5Vin



V _{in} (V)	V _{out} (V)	C _{out} Ceramic
5	1	2x100uF/6.3V + 1x22uF/6.3V

Figure 3. Measured load transient response (5A-10A load step)

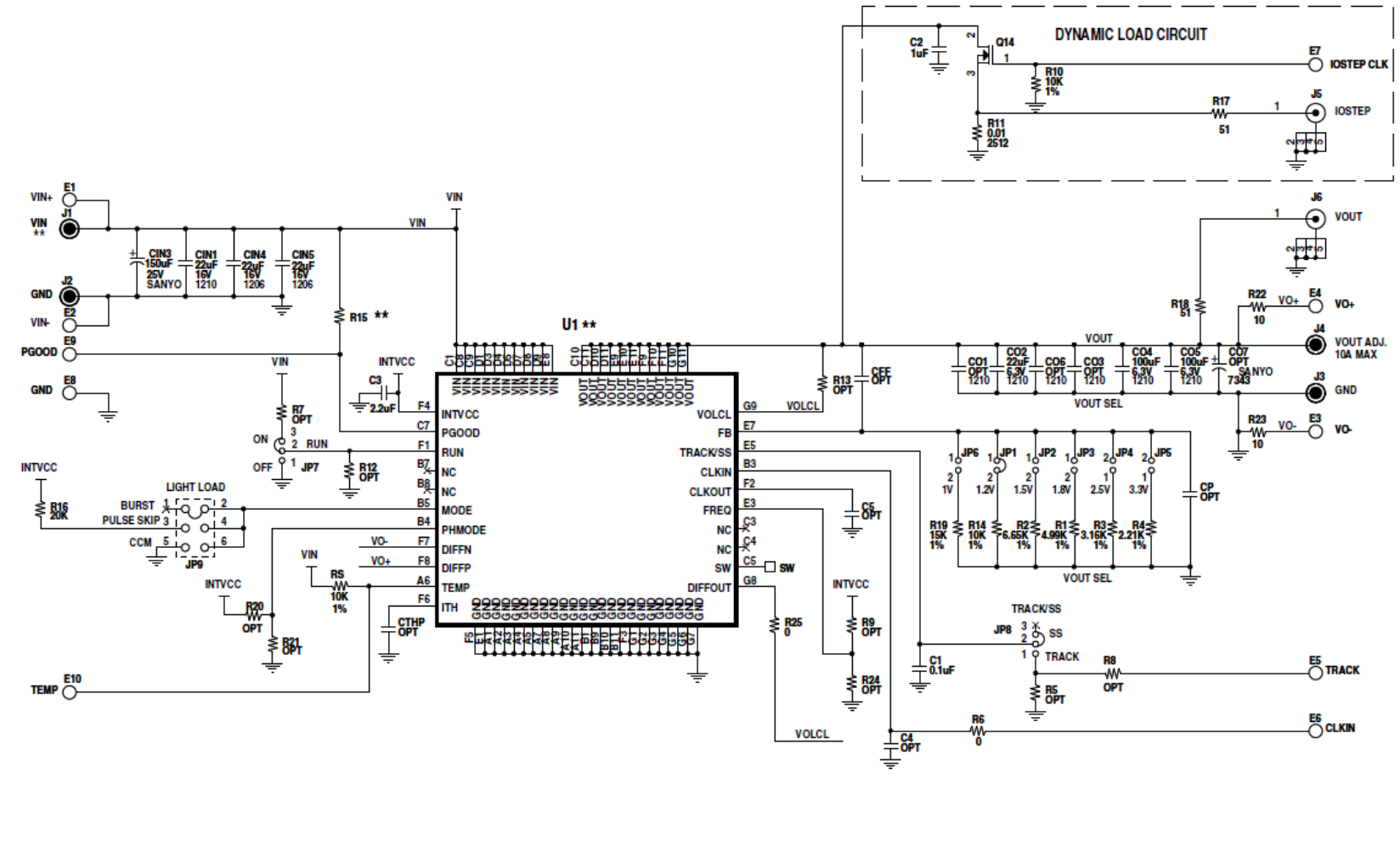


V _{in} (V)	V _{out} (V)	I _{out} (A)	Airflow	Ambient (°C)
5	3.3	10	Natural Convection	23

Figure 4. Measured thermal capture

LTM4648EY

REVISION HISTORY				
ECO	REV	DESCRIPTION	APPROVED	DATE
-	2	PRODUCTION	SAM Y./HENRY Z.	06-18-12



ASSY	U1	VIN	R15
-A	LTM4648EY	2.375V - 5.5V	100k
-B	LTM4649EY	4.5V - 16V	OPT

NOTE: UNLESS OTHERWISE SPECIFIED
 1. ALL RESISTORS ARE IN OHMS 5% 0603.
 ALL CAPACITORS ARE IN MICROFARADS 0603.

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.

APPROVALS	
PCB DES.	LT
APP ENG.	SAM Y. HENRY Z.
SCALE	NONE

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TITLE: SCHEMATIC
HIGH EFFICIENCY, 10A STEP-DOWN μ MODULE REGULATOR

SIZE	IC NO.	REV.
N/A	LTM4648EY / LTM4649EY DEMO CIRCUIT 1856A	2

DATE: Monday, June 18, 2012 SHEET 1 OF 1

REQUIRED CIRCUIT COMPONENTS:				
Item	Qty	Reference	Part Description	Manufacturer / Part #
1	2	CO4,CO5	CAP, 100uF 20% 6.3V X5R 1210	AVX 12106D107MAT2A
2	1	CO2	CAP, 22uF 20% 6.3V X5R 1210	AVX 12106D226MAT2A
3	1	CIN1	CAP, 22uF 20% 16V X7R 1210	MURATA, GRM32ER71C226KE18L
4	1	CIN3	CAP, 150uF 10% 25V OS-CON	SANYO, 25HVH150MT
5	2	CIN4,CIN5	CAP, 22uF 20% 16V X5R 1206	TAIYO YUDEN, EMK316BJ226ML-T
6	2	R22,R23	RES, 0603 10 OHMS 5% 1/10W	VISHAY CRCW060310R0JNEA
7	1	R19	RES, 0603 1% 1/10W	OPTION
8	1	C1	CAP, 0.1uF 20% 25V X7R 0603	AVX 06033C104MAT2A
9	1	C3	CAP, 2.2uF 20% 10V X5R 0603	TAIYO YUDEN LMK107BJ225MA-T
10	1	U1	I.C. LOW VOLTAGE POWER MODULE	LINEAR TECH. LTM4648
ADDITIONAL DEMO BOARD CIRCUIT COMPONENTS:				
1	0	CO7	CAP, OPTION POSCAP 7343	OPTION
2	0	CO1,CO3,CO6	CAP, OPTION 1210	OPTION
3	1	C2	CAP, 1uF 20% 10V X5R 0603	TAIYO YUDEN LMK107BJ105MA-T
4	0	C4,C5,CTHP,CP,CFF	CAP, OPTION 0603	OPTION
5	1	R11	RES, 2512 0.01 OHM 5% 1W	PANASONIC ERJ-M1WSF10MU
6	2	R10,RS, R14	RES, 0603 10K OHMS 1% 1/10W	VISHAY CRCW060310K0FKEA
7	1	R16	RES, 0603 20K OHMS 5% 1/10W	VISHAY CRCW060320K0JNEA
8	2	R17,R18	RES, 0603 51 OHMS 5% 1/10W	VISHAY CRCW060351R0JNEA
9	1	R15	RES, 100K OHMS 5% 1/10W 0603	VISHAY CRCW0603100K0JNEA
10	1	R1	RES, 0603 4.99K OHMS 1% 1/10W	VISHAY CRCW06034K99FKEA
11	1	R2	RES, 0603 6.65K OHMS 1% 1/10W	VISHAY CRCW06036K65FKEA
12	1	R3	RES, 0603 3.16K OHMS 1% 1/10W	VISHAY CRCW06033K16FKEA
13	1	R4	RES, 0603 2.21K OHMS 1% 1/10W	VISHAY CRCW06032K21FKEA
14	0	R5,R7,R8,R9,R12,R13,R20,R21,R24	RES, 0603 OPTION	OPTION
15	2	R6,R25	RES, 0603 0 OHM JUMPER	VISHAY CRCW06030000Z0EA
16	1	Q14	XSTR, SUD50N03-09P MOSFET	SILICONIX SUD50N03-09P-GE3
HARDWARE				
1	10	E1-E10	TESTPOINT TURRET 0.094"	MILL MAX 2501-2-00-80-00-00-07-0
2	6	JP1,JP2,JP3,JP4,JP5,JP6	HEADER,2PIN, 2mm	SAMTEC TMM 102-02-L-S
3	2	JP7,JP8	HEADER,3PIN, 2mm	SAMTEC TMM-103-02-L-S
4	1	JP9	HEADER, 3X2 2mm	SAMTEC TMM-103-02-L-D
5	4	J1,J2,J3,J4	JACK, BANANA	KEYSTONE 575-4
6	2	J5,J6	CONN,BNC,5 PINS	CONNEX 112404
7	4	XJP1,XJP7,XJP8,XJP9	SHUNT, 2mm	SAMTEC 2SN-BK-G
8	4		STANDOFF, SNAP ON	KEYSTONE 8834