

LTM4601HV 5V_{IN} to 28V_{IN}, 12A Step-Down μModule Regulator

DESCRIPTION

Demonstration circuit DC1041A-B features the LTM®4601HVEV, a 12A high efficiency, high density switch mode step-down converter. The input voltage range is from 4.5V to 28V. The output voltage is jumper selectable for popular voltages from 0.6V to 5V. The PLLIN pin supports synchronizing the μModule® regulator to an external clock. The TRACK/SS pin allows the user to program output ramp-up and ramp-down rates which may coincidentally or ratiometrically track with another

supply's output if desired. Output voltage margining of ±5% from the nominal value is available via the margin control pins MARG0 and MARG1. The LTM4601HV data sheet must be read in conjunction with this demo manual prior to working on or modifying demo circuit DC1041A-B.

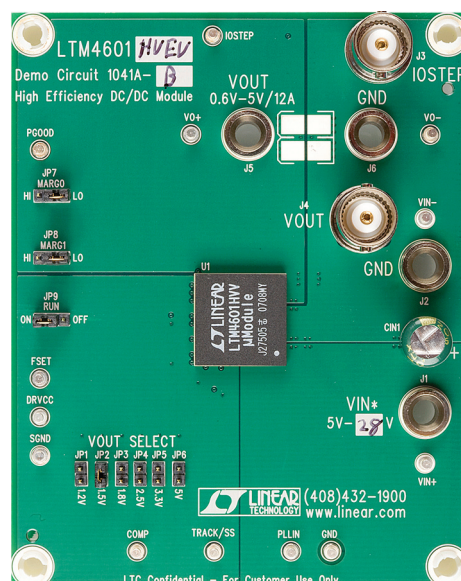
Design files for this circuit board are available at <http://www.linear.com/demo>

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PERFORMANCE SUMMARY (T_A = 25°C)

PARAMETER	CONDITION	VALUE
Input Voltage Range		4.5V to 28V
Output Voltage V _{OUT}	Jumper Selectable (Open for 0.6V)	1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5V
Maximum Continuous Output Current	Derating is Necessary for Certain V _{IN} , V _{OUT} and Thermal Conditions	12A DC
Default Operating Frequency		800kHz
External Synchronous Clock Frequency Range	Refer to Data Sheet for Details	560kHz to 1000kHz
Efficiency	V _{IN} = 12V, V _{OUT} = 1.5V, I _{OUT} = 12A	83%, See Figure 2

BOARD PHOTO



dc1041a-bf

QUICK START PROCEDURE

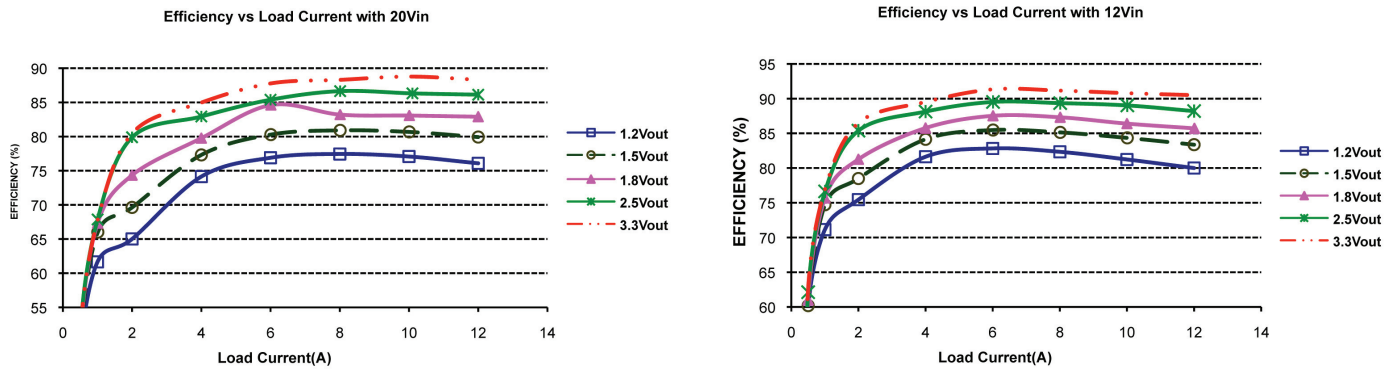


Figure 2. Measured Supply Efficiency with Different V_{IN} and V_{OUT}

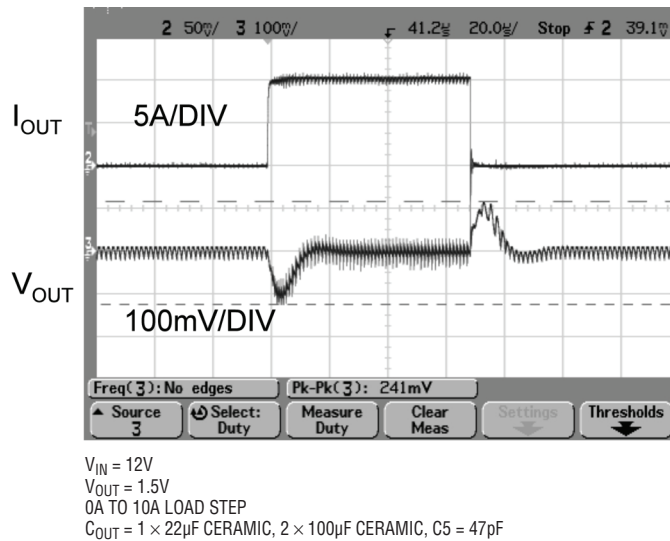


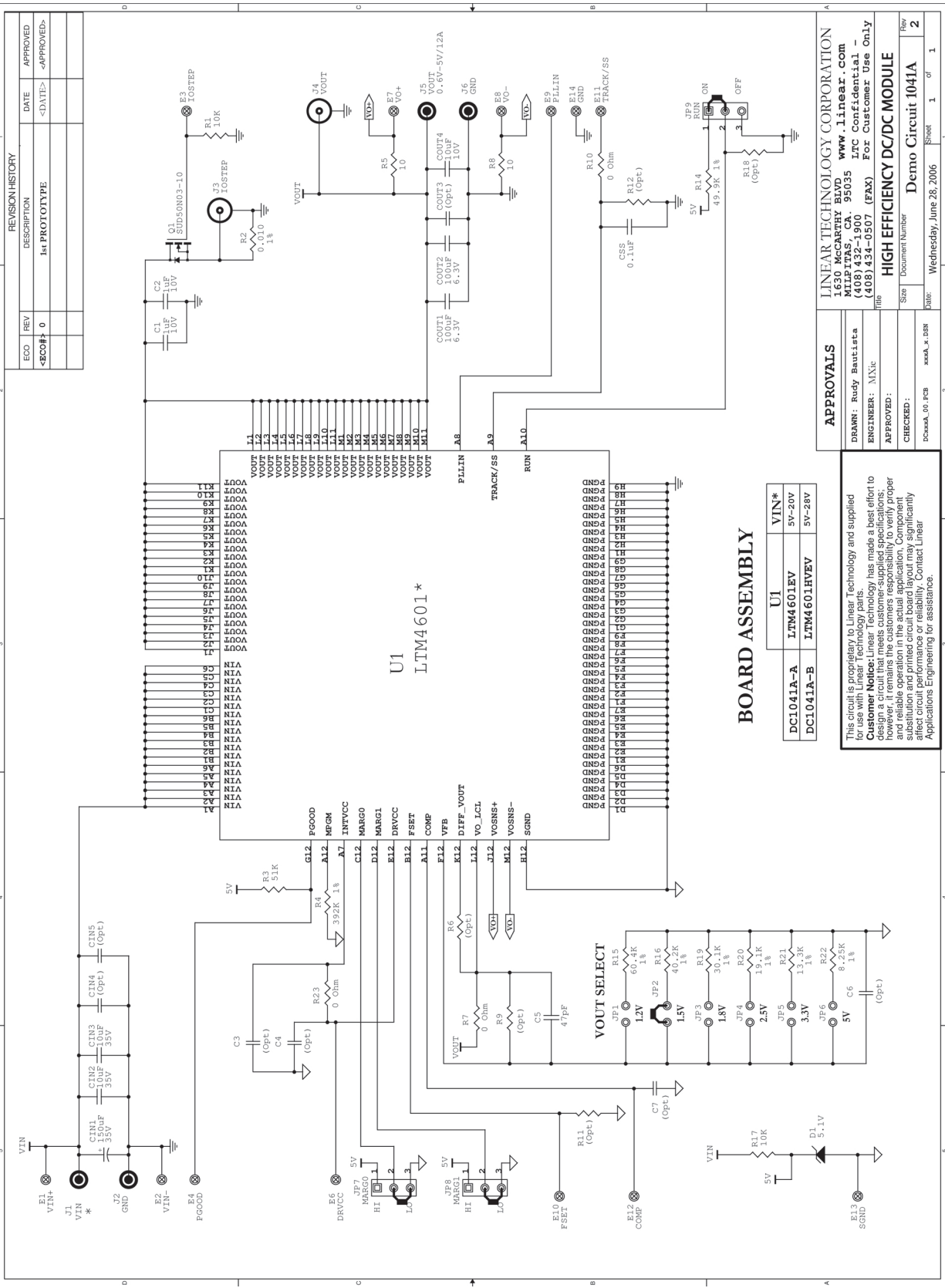
Figure 3. Measured Load Transient Response (0A to 10A Step)

DEMO MANUAL DC1041A-B

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	CIN1	Cap., Alum 150 μ F 35V 20%	Sanyo 35ME150WXV (now SUNCON 35ME150WXV)
2	2	CIN2, CIN3	Cap., X7R 10 μ F 35V 20%	Taiyo Yuden GMK316BJ106ML-T
3	2	COUT1, COUT2	Cap., X5R 100 μ F 6.3V 20%	Taiyo Yuden JMK432BJ107MU-T
4	1	COUT4	Cap., X5R 10 μ F 10V 10%	Taiyo Yuden LMK316BJ106KL-T
5	1	CSS	Cap., X7R 0.1 μ F 16V 20%	AVX 0603YC104MAT2A
6	1	R4	Res., Chip 392k 0.1W 1%	AAC CR16-3923FM
7	2	R8,R5	Res., Chip 10 Ω 0.1W 5%	AAC CR16-100JM
8	1	R19	Res., Chip 30.1k 0.06W 1%	AAC CR16-3012FM
9	1	U1	I.C., Volt. Reg.	Linear Technology Corp. LTM4601EV
Additional Demo Board Circuit Components				
1	0	CIN4, CIN5	Cap., 1206 TBD	
2	0	COUT3	Cap., 1210 TBD	
3	0	C3, C4, C5, C6, C7	Cap., 0603 TBD	
4	2	C1, C2	Cap., X5R 1 μ F 10V 10%	Taiyo Yuden LMK107BJ105KA
5	1	D1	Zener Diode, 5.1V	On Semi. MMBZ5231B
6	1	Q1	MOSFET, N-Channel 30V	Siliconix SUD50N03-10
7	0	R6, R9, R11, R12, R18	Res., 0603 TBD	
8	2	R17, R1	Res., Chip 10k 0.1W 5%	AAC CR16-103JM
9	1	R2	Res., LRC 0.010 Ω 0.25W 1%	IRC LRF1206-01-R010-F
10	1	R3	Res., Chip 51k 0.1W 5%	AAC CR16-513JM
11	3	R7, R10, R23	Res/Jumper, Chip 0 Ω 1/16W 1A	AAC CJ06-000M
12	1	R14	Res., Chip 49.9k 0.06W 1%	AAC CR16-4992FM
13	1	R15	Res., Chip 60.4k 0.1W 1%	AAC CR16-6042FM
14	1	R16	Res., Chip 40.2k 0.1W 1%	AAC CR16-4022FM
15	1	R20	Res., Chip 19.1k 0.1W 1%	AAC CR16-1912FM
16	1	R21	Res., Chip 13.3k 0.1W 1%	AAC CR16-1332FM
17	1	R22	Res., Chip 8.25k 0.1W 1%	AAC CR16-8251FM

SCHEMATIC DIAGRAM



DEMO MANUAL DC1041A-B

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This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

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