DEMO CIRCUIT 1324A
QUICK START GUIDE

LTC3672BEDC-2: Monolithic Fixed-Output 400mA Buck Regulator with Dual 150mA LDOs in 2mm X 2mm DFN

DESCRIPTION

Demonstration Circuit 1324A is a monolithic 400mA Buck regulator, with fixed output, and two 150mA, Low Drop Out linear regulators. These are housed in an 8 lead, 2mm X 2mm DFN package.

Design files for this circuit board are available. Call the LTC factory.

PERFORMANCE SUMMARY Specifications are at T_A = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
VIN	Input voltage		2.9		5.5	V
VOUT1	Output of regulator (buck) 1	$I_{OUT1} \le$ 400mA	1.17		1.23	V
VOUT2	Output of LDO1	$I_{OUT2} \le$ 150mA. Subject to dropout limitations.	2.73		2.87	V
VOUT3	Output of LDO2	IOUT3 ≤ 150mA	1.755		1.845	V

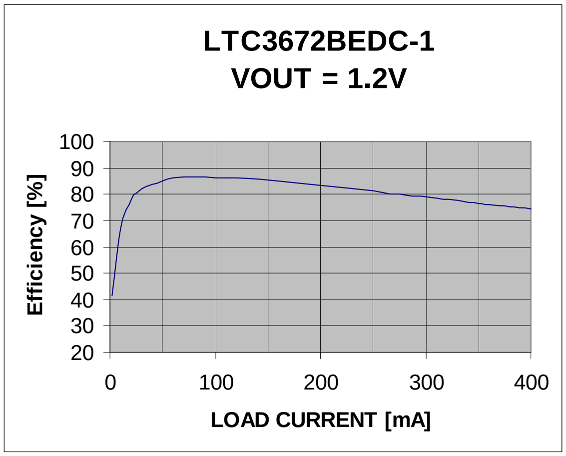
OPERATING PRINCIPLES

The LTC3672BEDC-2 is a monolithic fixed output, 400mA, synchronous buck regulator and two 150mA LDOS.

VOUT1 is driven by a high efficiency synchronous buck regulator with a fixed output of 1.2V. The buck regulator on the LTC3672BEDC-2 operates at approximately 2.25MHz, allowing the use of small inductors and capacitors.

The two fixed output LDOs, have a maximum dropout voltage of 250mV, over process and temperature. This allows all three outputs to remain in regulation with VIN as low as 2.98V.

All of the regulators on the LTC3672BEDC-2 are enabled via the ENALL pin, controlled by JP1.



Efficiency of the Buck regulator at VIN = 3.6V

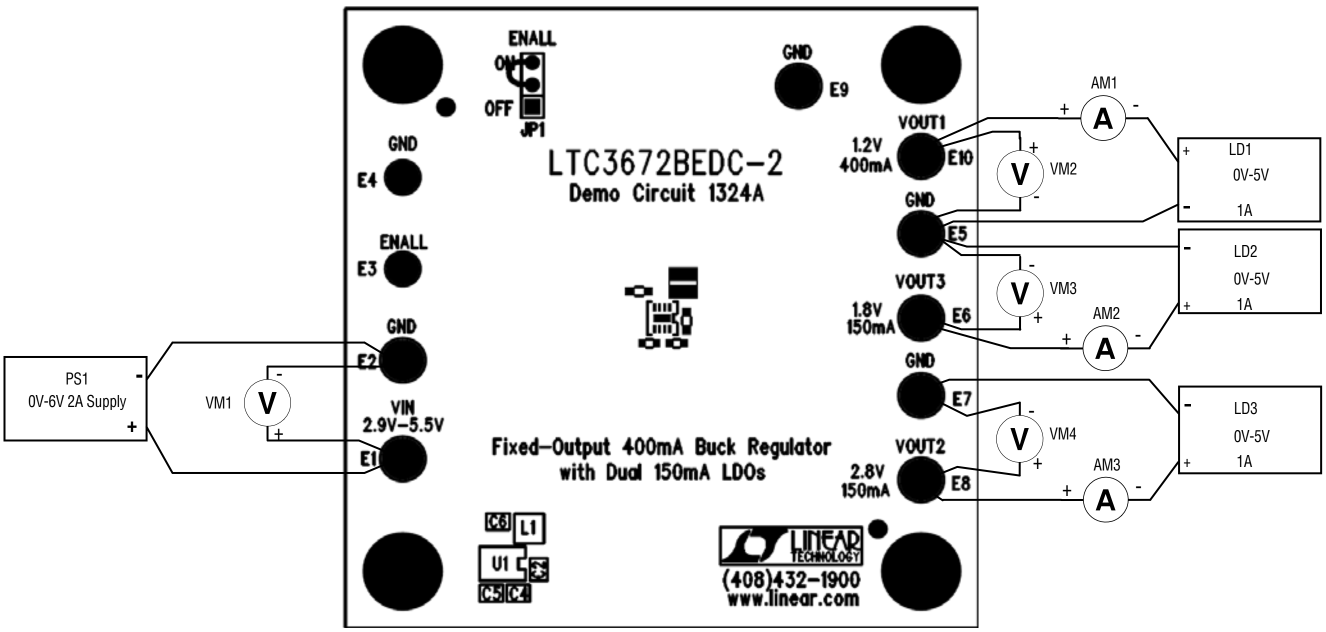
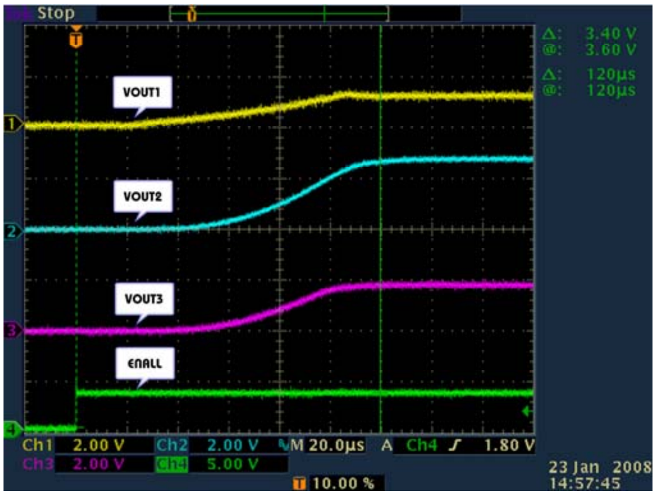
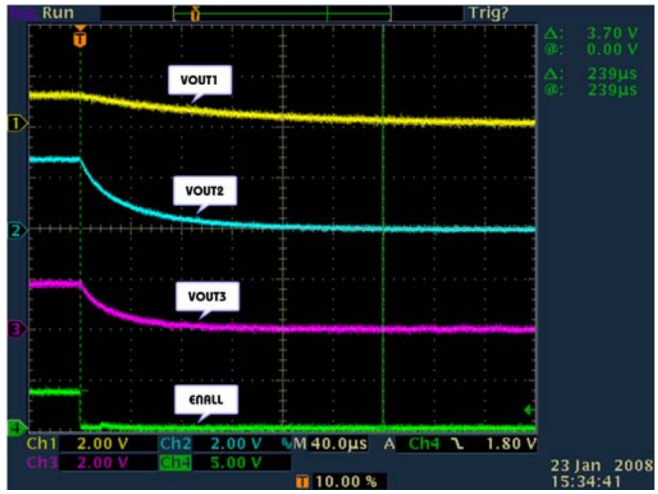


Figure 1: Test Equipment Hookup Diagram

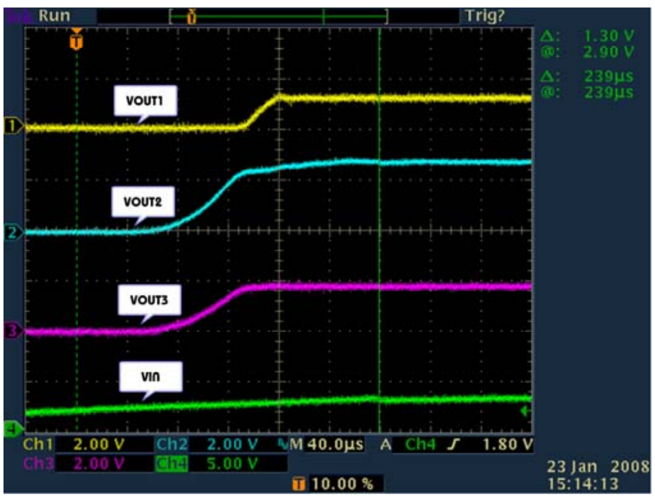
1) Connect test equipment as shown in Figure 1. Set PS1 = 0V, set PS1 Ilimit = 1A, set LD1 = 0A, LD2 = 0A, LD3 = 0A, and JP1 = ON.
2) Slowly increase PS1 and verify that all regulators are operational at VIN ≥ 2.9V.
3) Set PS1 = 3.6V, and JP1 = ON. Verify VM2 = 1.17V~1.23V, VM3 = 1.755V ~ 1.845V, and VM4 = 2.73V~2.87V.
4) Set PS1 = 2.9V, LD1 = 400mA. Verify VM2 = 1.17V~1.23V.
5) Set LD2 = 150mA, LD3=150mA. Verify that VM3 = 1.755V~1.845V, and VM4 = 2.65~2.87V.
6) Set PS1 = 5.5V, and repeat step 5.
7) Set JP1 = OFF, set PS1 = 2.9V, verify that all output voltages (VM2-4) are 0V.
8) Set PS1 = 5.5V, verify that all output voltages (VM2-4) are 0V.
9) Set PS1 = 0V, set JP1 = ON.



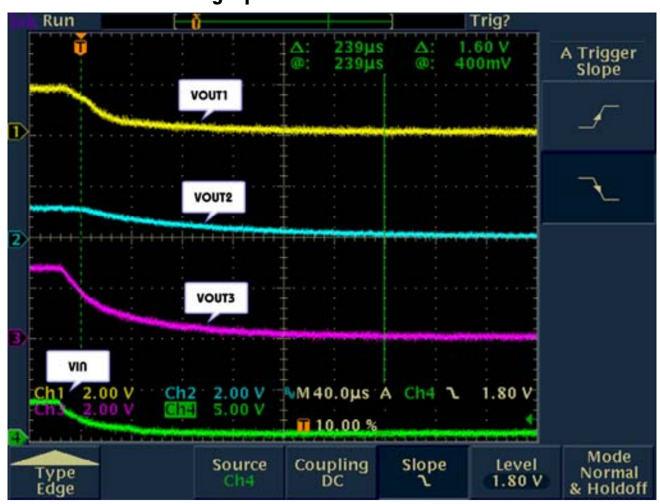
Oscillograph 1:Startup from ENALL



Oscillograph 2:Shutdown from ENALL



Oscillograph 3:Startup from VIN



Oscillograph 4:Shutdown from VIN

APPLICATIONS INFORMATION

There are several components that are only necessary under certain conditions. C1, C3, and R1, need to be used as follows.

The connection of VIN to an operating supply may have significant parasitic inductance. When this connection is made to the DC1324A PCB, the supply must charge up the local decoupling capacitance, C2. A current is established in the connecting leads, while this capacitor is charging. This current acts as a step load to induce ringing in the connection. This ringing may cause the voltage at VIN to rise to up to 2X the supply voltage, possibly damaging devices, including the LTC3672BEDC-2, on the DC1324A board. To prevent this, the damping network composed of C1&R1 has been added. R1 serves to reduce the Q of the resonant circuit, and reduces overshoot on VIN from resonant ringing. C1 blocks the DC voltage, preventing R1 from consuming any DC current.

If the connection between VIN and the power supply is very short, and has very low parasitic inductance, there is no need for this damping circuit, and it may be omitted. This is usually the case when the LTC3672BEDC-2 resides on the same PCB as the source of the VIN voltage. Please be careful with battery wiring that supplies VIN, as this may also have significant parasitic inductance.

C3 provides a decoupling function, in the event that some parasitic resistance and inductance exists between VIN and VIN1. This impedance can be problematic when the LTC3672BEDC-2 is supplying current to loads that contain high speed transients. If, in the application, a direct connection is made to VIN1, then it is unlikely that C3 will be needed.

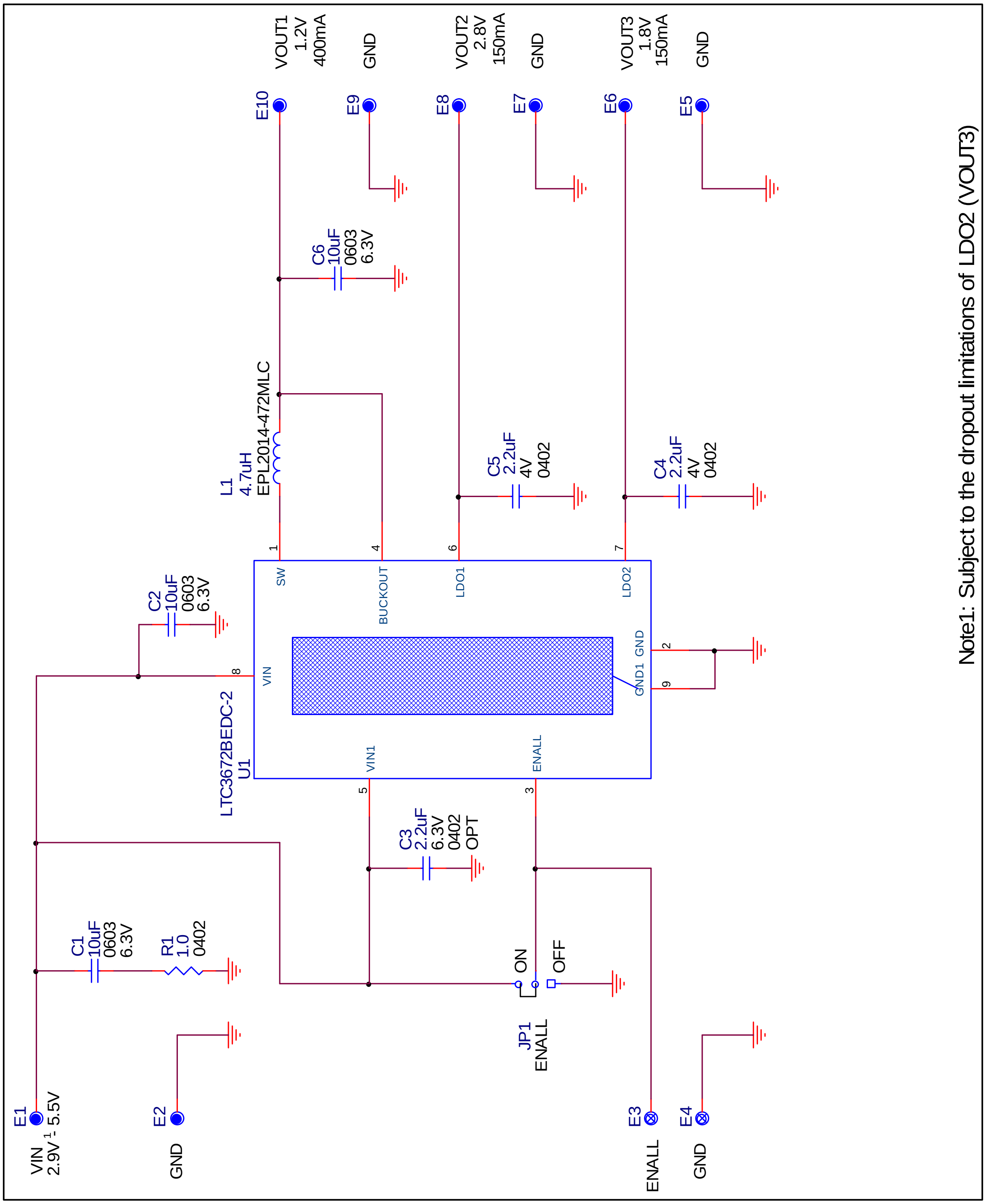


Figure 2: Schematic of DC1324A: LTC3672BEDC-2 Monolithic Fixed-Ouput 400mA Buck Regulator with Dual 150mA LDOs in 2mm X 2mm DFN

Linear Technology Corporation
LTC3672BEDC-2

Bill Of Material
Demo Circuit #DC1324A
12/6/2007

Item	Qty	Reference - Des	Part Description	Manufacturer, Part #
		REQUIRED CIRCUIT COMPONENTS:		
1	2	C2,C6	CAP, CHIP, X5R, 10uF, 6.3V, 0603	TDK, C1608X5R0J106M
2	2	C4,C5	CAP, CHIP, X5R, 2.2uF, 4V, 0402	MURATA, GRM155R60G225ME15D
3	1	L1	INDUCTOR, 4.7uH ±20%, 0.254Ω, 1.37A	COILCRAFT, EPL2014-472MLC
4	1	U1	Fixed-Output 400mA Buck Regulator with Dual 150mA LDOs	LINEAR TECH.,LTC3672BEDC-2
		ADDITIONAL DEMO BOARD CIRCUIT COMPONENTS:		
1	1	C1	CAP, CHIP, X5R, 10uF, 6.3V, 0603	TDK, C1608X5R0J106M
2	0	C3-OPT	CAP, CHIP, X5R, 2.2uF, 6.3V, 0402	MURATA, GRM155R60J225ME15D
3	1	R1	RES, CHIP, 1.0Ω, ±5%, 1/16W, 0402	VISHAY, CRCW04021R00JNED
		HARDWARE FOR DEMO BOARD ONLY:		
1	1	JP1	HEADER,3 PINS 2mm	SAMTEC, TMM-103-02-L-S
2	1	JP1	SHUNT 2mm	SAMTEC, 2SN-BK-G
3	2	E3, E4	TURRET, 0.061 DIA	MILLMAX, 2308-2
4	8	E1,E2,E5,E6,E7,E8 E9,E10	TURRET, 0.09 DIA	MILLMAX, 2501-2
5	4		STAND-OFF, NYLON 0.375" tall	KEYSTONE, 8832 (SNAP ON)
6	1		FAB, PRINTED CIRCUIT BOARD	DEMO CIRCUIT #1324A

Table 2: Bill Of Materials

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Power Management IC Development Tools ***category:***

Click to view products by Analog Devices ***manufacturer:***

Other Similar products are found below :

EVAL-ADM1168LQEBZ EVB-EP5348UI MIC23451-AAAYFL EV MIC5281YMME EV DA9063-EVAL ADP122-3.3-EVALZ ADP130-0.8-EVALZ ADP130-1.2-EVALZ ADP130-1.5-EVALZ ADP130-1.8-EVALZ ADP1714-3.3-EVALZ ADP1716-2.5-EVALZ ADP1740-1.5-EVALZ ADP1752-1.5-EVALZ ADP1828LC-EVALZ ADP1870-0.3-EVALZ ADP1871-0.6-EVALZ ADP1873-0.6-EVALZ ADP1874-0.3-EVALZ ADP1882-1.0-EVALZ ADP199CB-EVALZ ADP2102-1.25-EVALZ ADP2102-1.875EVALZ ADP2102-1.8-EVALZ ADP2102-2-EVALZ ADP2102-3-EVALZ ADP2102-4-EVALZ ADP2106-1.8-EVALZ ADP2147CB-110EVALZ AS3606-DB BQ24010EVM BQ24075TEVM BQ24155EVM BQ24157EVM-697 BQ24160EVM-742 BQ24296MEVM-655 BQ25010EVM BQ3055EVM NCV891330PD50GEVB ISLUSBI2CKIT1Z LM2744EVAL LM2854EVAL LM3658SD-AEV/NOPB LM3658SDEV/NOPB LM3691TL-1.8EV/NOPB LM4510SDEV/NOPB LM5033SD-EVAL LP38512TS-1.8EV EVAL-ADM1186-1MBZ EVAL-ADM1186-2MBZ