

Micropower Low Noise Boost Converters
 With Output Disconnect

DESCRIPTION

Demonstration circuits 1024A-A and 1024A-B are Micropower Low Noise Boost Converters With Output Disconnect featuring the LT3494 and LT3494A respectively. The demo circuits demonstrate small size and low component count in Boost configuration. Both demo versions are designed to convert a 3V-4.2V source to 15V. The only difference is in the load capability. The 1024A-A supplies 17mA at 3V_{IN} while the 1024A-B supplies 27mA, also at 3V_{IN}. The LT3494 features integrated Schottky diode, output disconnect function, dimming control, output sense resistor and non-audible switching frequency

over the entire load range. A 2-3% improvement in efficiency can be achieved by adding an external CMDSH-3 diode. A place holder is available on the back of the board. These circuits are intended for space-conscious applications such as OLED power, MP3 Players, and Low Noise Bias Supplies.

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

L, LTC, LTM, LT, Burst Mode, OPTI-LOOP, Over-The-Top and PolyPhase are registered trademarks of Linear Technology Corporation. Adaptive Power, C-Load, DirectSense, Easy Drive, FilterCAD, Hot Swap, LinearView, µModule, Micropower SwitcherCAD, Multimode Dimming, No Latency ΔΣ, No Latency Delta-Sigma, No R_{THRESH}, Operational Filter, PanelProtect, PowerPath, PowerSOT, SmartStart, SoftSpan, Stage Shedding, SwitcherCAD, ThinSOT, UltraFast and VLDO are trademarks of Linear Technology Corporation. Other product names may be trademarks of the companies that manufacture the products.

PERFORMANCE SUMMARY DC1024A-A Specifications are at TA = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V _{IN}	Input Supply Range		3		4.2	V
V _{OUT}	Output Voltage Range	V _{IN} = 3V, I _{LOAD} = 17mA	14.55	15	15.45	V
V _{OUT}	Output Voltage Range	V _{IN} = 3.6V, I _{LOAD} = 25mA	14.55	15	15.45	V
V _{OUT}	Output Voltage Range	V _{IN} = 4.2V, I _{LOAD} = 32mA	14.55	15	15.45	V
RIPPLE		V _{IN} = 3.6V, I _{LOAD} = 25mA		20		mV
EFFICIENCY	Load at V _{OUT}	V _{IN} = 3.6V, I _{LOAD} = 25mA		77		%
EFFICIENCY	Load at V _{CAP}	V _{IN} = 3.6V, I _{LOAD} = 25mA		79		%

PERFORMANCE SUMMARY DC1024A-B Specifications are at TA = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V _{IN}	Input Supply Range		3		4.2	V
V _{OUT}	Output Voltage Range	V _{IN} = 3V, I _{LOAD} = 27mA	14.55	15	15.45	V
V _{OUT}	Output Voltage Range	V _{IN} = 3.6V, I _{LOAD} = 35mA	14.55	15	15.45	V
V _{OUT}	Output Voltage Range	V _{IN} = 4.2V, I _{LOAD} = 44mA	14.55	15	15.45	V
RIPPLE		V _{IN} = 3.6V, I _{LOAD} = 35mA		20		mV
EFFICIENCY	Load at V _{OUT}	V _{IN} = 3.6V, I _{LOAD} = 35mA		74		%
EFFICIENCY	Load at V _{CAP}	V _{IN} = 3.6V, I _{LOAD} = 35mA		77		%

LT3494 AND LT3494A

QUICK START PROCEDURE

Demonstration circuit 1024 is easy to set up to evaluate the performance of the LT3494 and LT3494A. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

NOTE. When measuring the input or output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. Measure the input or output voltage ripple by touching the probe tip directly across the Vin or Vout and GND terminals. See Figure 2 for proper scope probe technique.

1. Place jumpers in the following positions:

JP1 Run

2. With power off, connect the input power supply to Vin and GND.

3. Turn on the power at the input.

4. Check for the proper output voltages. $V_{out1} = 14.55V$ to $15.45V$.

NOTE. If there is no output, temporarily disconnect the load to make sure that the load is not set too high.

5. 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.

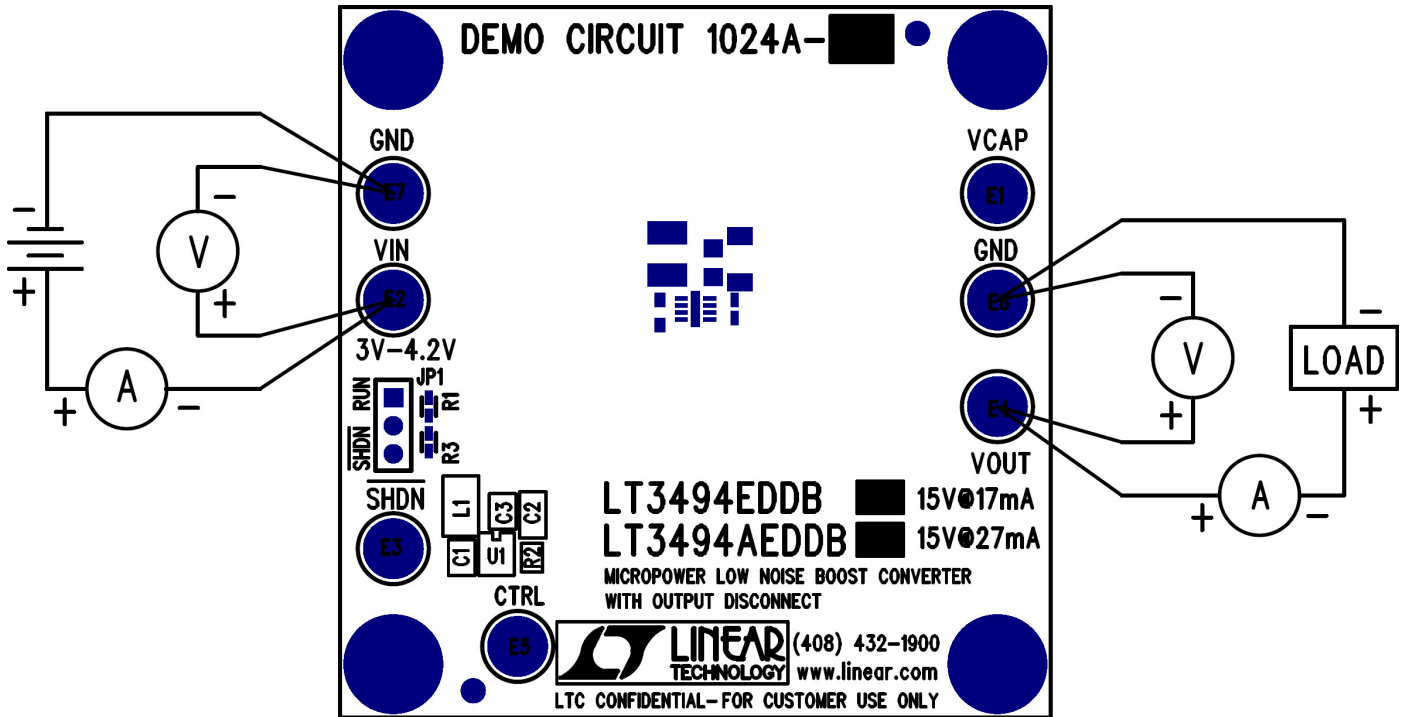


Figure 1. Proper Measurement Equipment Setup

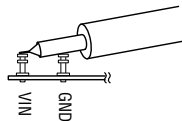
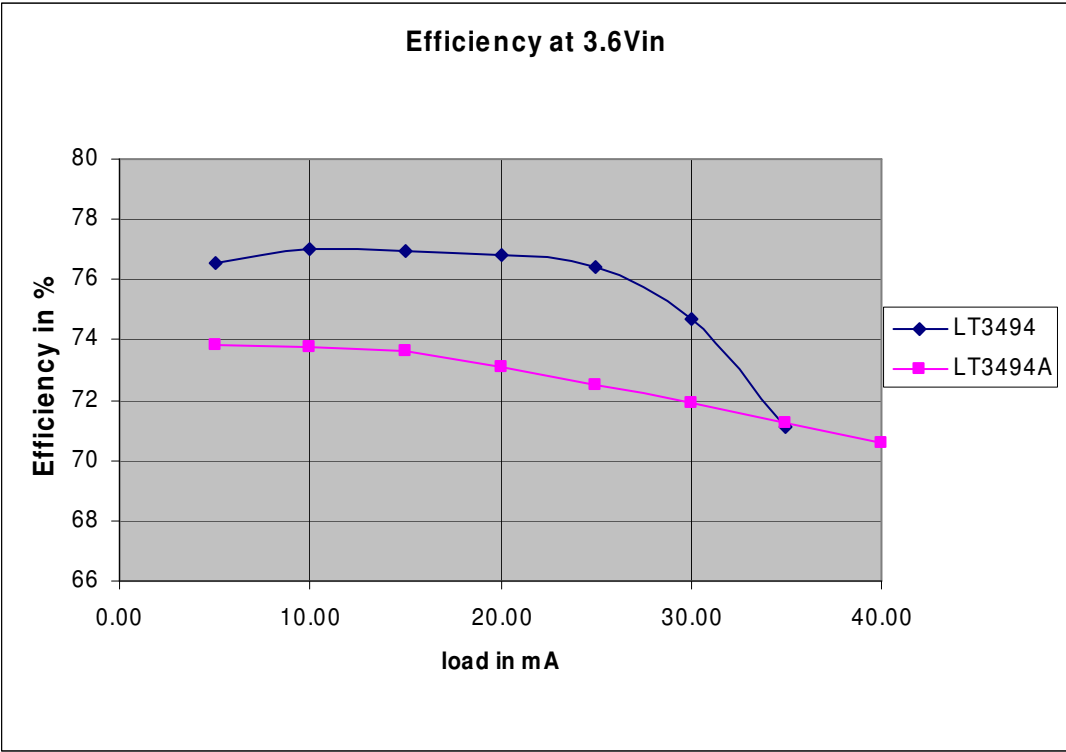
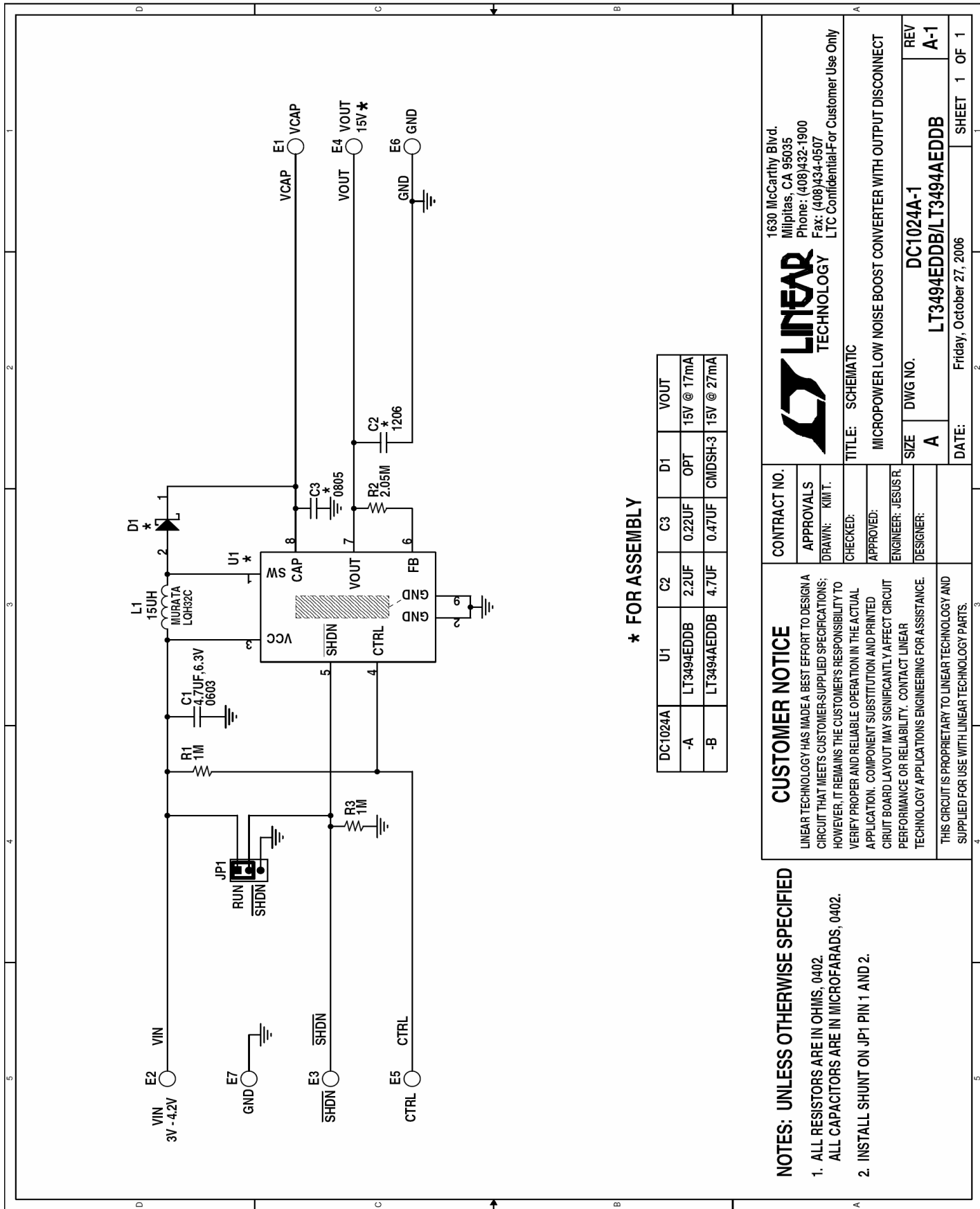


Figure 2. Measuring Input or Output Ripple

LT3494 AND LT3494A



Efficiency Comparison Between LT3494 and LT3494A



*** FOR ASSEMBLY**

DC1024A	U1	C2	C3	D1	VOUT
-A	LT3494EDDB	2.2UF	0.22UF	OPT	15V @ 17mA
-B	LT3494AEDDB	4.7UF	0.47UF	CMDSH-3	15V @ 27mA

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE IN OHMS, 0402.
2. ALL CAPACITORS ARE IN MICROFARADS, 0402.
3. INSTALL SHUNT ON JP1 PIN 1 AND 2.

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.

CONTRACT NO.

APPROVALS
DRAWN: KIM T.
CHECKED:
APPROVED:
ENGINEER: JESUS R.
DESIGNER:

TITLE: SCHEMATIC

MICROPOWER LOW NOISE BOOST CONVERTER WITH OUTPUT DISCONNECT

1630 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408)432-1900
Fax: (408)434-0507
LTC Confidential For Customer Use Only

SIZE	A	REV	A-1
DWG NO.	DC1024A-1		
DATE:	Friday, October 27, 2006	SHEET	1 OF 1