

# LT3494/LT3494A

## ABSOLUTE MAXIMUM RATINGS

(Note 1)

|                                          |                |
|------------------------------------------|----------------|
| $V_{CC}$ Voltage .....                   | 16V            |
| SW Voltage .....                         | 40V            |
| CAP Voltage .....                        | 40V            |
| $V_{OUT}$ Voltage .....                  | 40V            |
| SHDN Voltage .....                       | 16V            |
| CTRL Voltage .....                       | 16V            |
| FB Voltage .....                         | 2.5V           |
| Maximum Junction Temperature .....       | 125°C          |
| Operating Temperature Range (Note 2) ... | –40°C to 85°C  |
| Storage Temperature Range .....          | –65°C to 125°C |

## PACKAGE/ORDER INFORMATION

|                                                                                                                                                                                                                                |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <p>TOP VIEW</p> <p>DDB PACKAGE<br/>8-LEAD (3mm × 2mm) PLASTIC DFN<br/><math>T_{JMAX} = 125^{\circ}\text{C}</math>, <math>\theta_{JA} = 76^{\circ}\text{C/W}</math><br/>EXPOSED PAD (PIN 9) IS GND, MUST BE SOLDERED TO PCB</p> |                  |
| ORDER PART NUMBER                                                                                                                                                                                                              | DDB PART MARKING |
| LT3494EDDB                                                                                                                                                                                                                     | LCCD             |
| LT3494AEDDB                                                                                                                                                                                                                    | LCRW             |
| <p><b>Order Options</b> Tape and Reel: Add #TR<br/>Lead Free: Add #PBF Lead Free Tape and Reel: Add #TRPBF<br/>Lead Free Part Marking: <a href="http://www.linear.com/leadfree/">http://www.linear.com/leadfree/</a></p>       |                  |

Consult LTC Marketing for parts specified with wider operating temperature ranges.

## ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at  $T_A = 25^{\circ}\text{C}$ .  $V_{CC} = 3\text{V}$ ,  $V_{SHDN} = V_{CC}$ , unless otherwise noted. (Note 2)

| PARAMETER                           | CONDITIONS                                                                                                                                                    | MIN        | TYP        | MAX        | UNITS                          |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|--------------------------------|
| Minimum Operating Voltage           |                                                                                                                                                               |            | 2.3        | 2.5        | V                              |
| Maximum Operating Voltage           |                                                                                                                                                               |            |            | 16         | V                              |
| Feedback Voltage                    | $V_{CTRL} = 3\text{V}$ (Note 3)                                                                                                                               | ● 1.205    | 1.225      | 1.245      | V                              |
| FB Resistor                         |                                                                                                                                                               | ● 179      | 182        | 184        | k $\Omega$                     |
| Quiescent Current                   | Not Switching                                                                                                                                                 |            | 65         | 75         | $\mu\text{A}$                  |
| Quiescent Current in Shutdown       | $V_{SHDN} = 0\text{V}$ , $V_{CC} = 3\text{V}$                                                                                                                 |            | 0          | 1          | $\mu\text{A}$                  |
| Minimum Switch Off Time             | After Start-Up Mode, $V_{FB} = 1\text{V}$ , $V_{CTRL} = 3\text{V}$ (Note 4)<br>During Start-Up Mode, $V_{FB} = 0.2\text{V}$ , $V_{CTRL} = 3\text{V}$ (Note 4) |            | 100<br>450 |            | ns<br>ns                       |
| Maximum Switch Off Time             | $V_{FB} = 1.5\text{V}$                                                                                                                                        | ● 15       | 20         | 30         | $\mu\text{s}$                  |
| Switch Current Limit                | LT3494A (Note 5)<br>LT3494 (Note 5)                                                                                                                           | 225<br>115 | 350<br>180 | 450<br>250 | mA<br>mA                       |
| Switch $V_{CESAT}$                  | LT3494A, $I_{SW} = 200\text{mA}$<br>LT3494, $I_{SW} = 100\text{mA}$                                                                                           |            | 180<br>110 |            | mV<br>mV                       |
| Switch Leakage Current              | $V_{SW} = 5\text{V}$ , $V_{SHDN} = 0$                                                                                                                         |            | 0.01       | 1          | $\mu\text{A}$                  |
| Schottky Forward Voltage            | $I_{DIODE} = 100\text{mA}$                                                                                                                                    |            | 900        | 1100       | mV                             |
| Schottky Reverse Leakage            |                                                                                                                                                               |            | 0.05       | 1          | $\mu\text{A}$                  |
| PMOS Disconnect $V_{CAP} - V_{OUT}$ | $I_{OUT} = 10\text{mA}$ , $V_{CAP} = 5\text{V}$                                                                                                               |            | 250        |            | mV                             |
| SHDN Input Voltage High             |                                                                                                                                                               | 1.5        |            |            | V                              |
| SHDN Input Voltage Low              |                                                                                                                                                               |            |            | 0.3        | V                              |
| SHDN Pin Bias Current               | $V_{SHDN} = 3\text{V}$<br>$V_{SHDN} = 0\text{V}$                                                                                                              |            | 5<br>0     | 10<br>0.1  | $\mu\text{A}$<br>$\mu\text{A}$ |

3494fb

## ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at  $T_A = 25^\circ\text{C}$ .  $V_{CC} = 3\text{V}$ ,  $V_{SHDN} = V_{CC}$ , unless otherwise noted. (Note 2)

| PARAMETER             | CONDITIONS                                            | MIN | TYP | MAX | UNITS         |
|-----------------------|-------------------------------------------------------|-----|-----|-----|---------------|
| CTRL Pin Bias Current | $V_{CTRL} = 0.5\text{V}$ , Current Flows Out of Pin ● |     | 20  | 100 | nA            |
| CTRL to FB Offset     | $V_{CTRL} = 0.5\text{V}$                              |     | 8   | 15  | mV            |
| Maximum Shunt Current | $V_{FB} = 1.3\text{V}$ , $V_{CAP} = 5\text{V}$        |     | 230 |     | $\mu\text{A}$ |

**Note 1:** Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.

**Note 2:** The LT3494/LT3494A are guaranteed to meet performance specifications from  $0^\circ\text{C}$  to  $85^\circ\text{C}$ . Specifications over the  $-40^\circ\text{C}$  to  $85^\circ\text{C}$  operating temperature range are assured by design, characterization and correlation with statistical process controls.

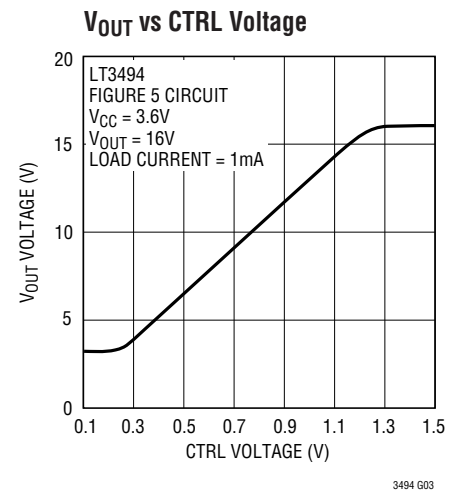
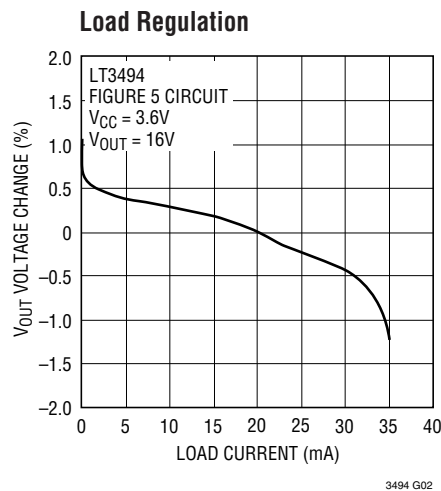
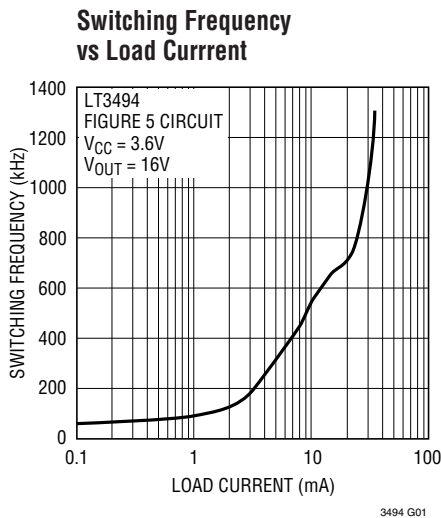
**Note 3:** Internal reference voltage is determined by finding  $V_{FB}$  voltage level which causes quiescent current to increase  $20\mu\text{A}$  above "Not Switching" level.

**Note 4:** If CTRL is overriding the internal reference, Start-Up mode occurs when  $V_{FB}$  is less than half the voltage on CTRL. If CTRL is not overriding the internal reference, Start-Up mode occurs when  $V_{FB}$  is less than half the voltage of the internal reference.

**Note 5:** Current limit guaranteed by design and/or correlation to static test.

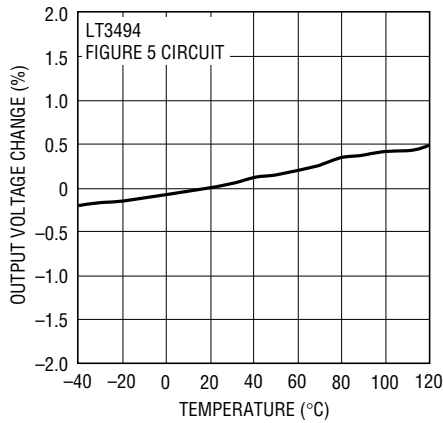
## TYPICAL PERFORMANCE CHARACTERISTICS

$T_A = 25^\circ\text{C}$  unless otherwise noted.

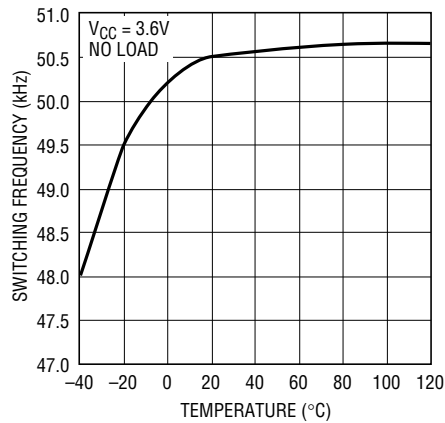


## TYPICAL PERFORMANCE CHARACTERISTICS $T_A = 25^\circ\text{C}$ unless otherwise noted.

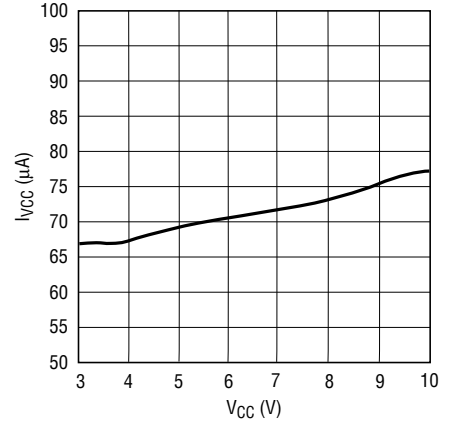
Output Voltage vs Temperature



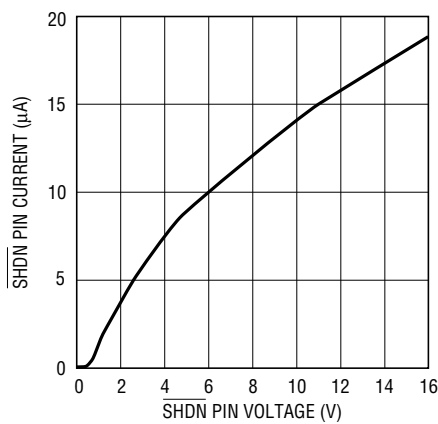
Minimum Switching Frequency



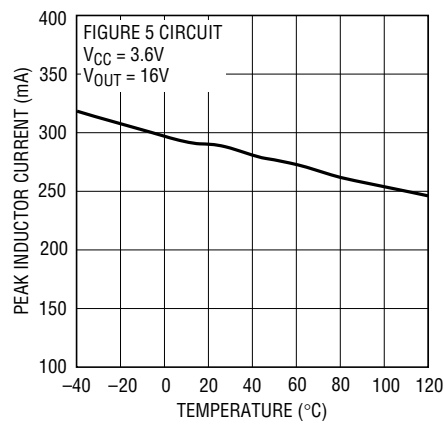
Quiescent Current—Not Switching



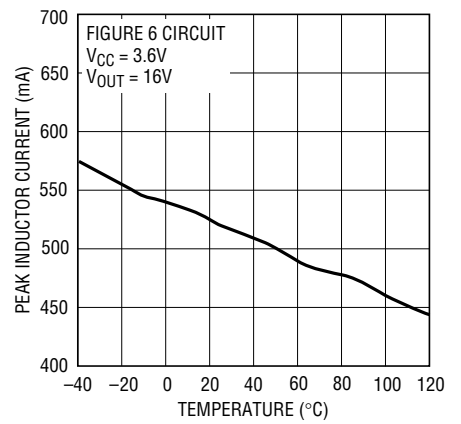
SHDN Current vs SHDN Voltage



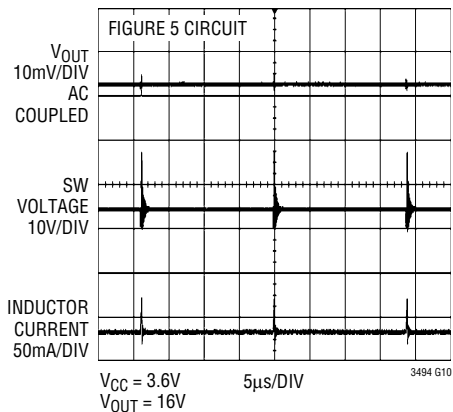
Peak Inductor Current (LT3494)



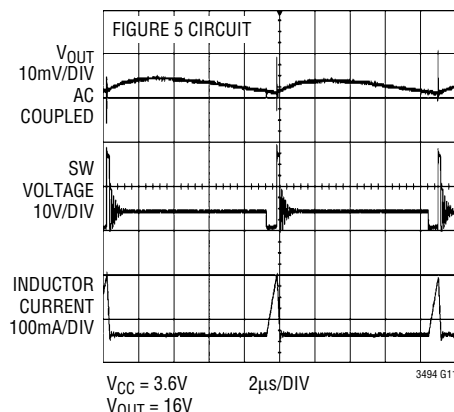
Peak Inductor Current (LT3494A)



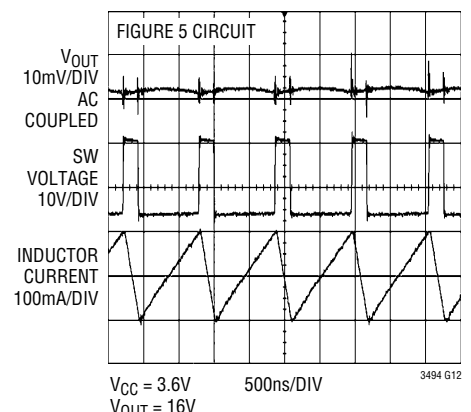
LT3494 Switching Waveforms at No Load



LT3494 Switching Waveforms at 1mA Load

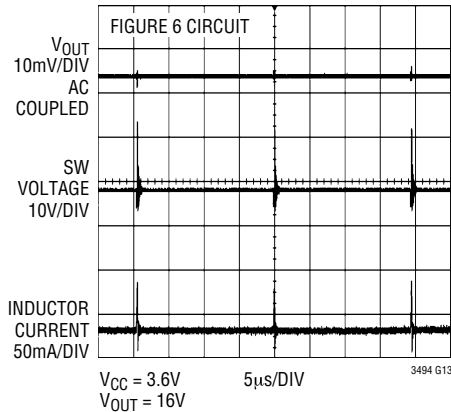


LT3494 Switching Waveforms at 25mA Load

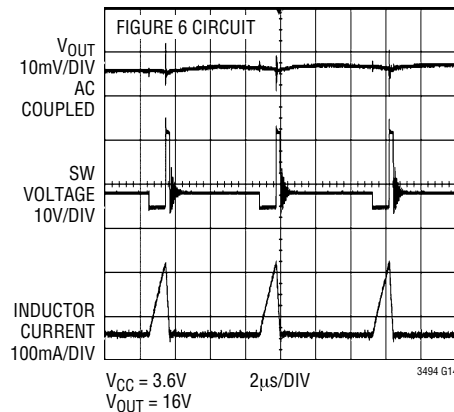


# TYPICAL PERFORMANCE CHARACTERISTICS $T_A = 25^\circ\text{C}$ unless otherwise noted.

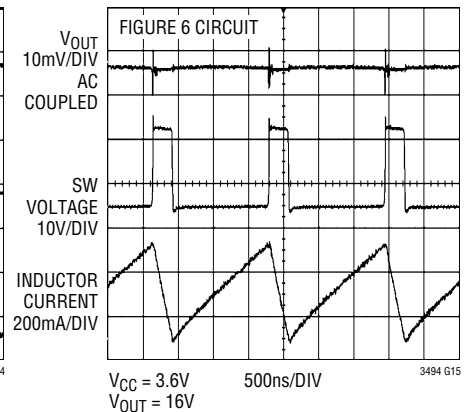
**LT3494A Switching Waveforms at No Load**



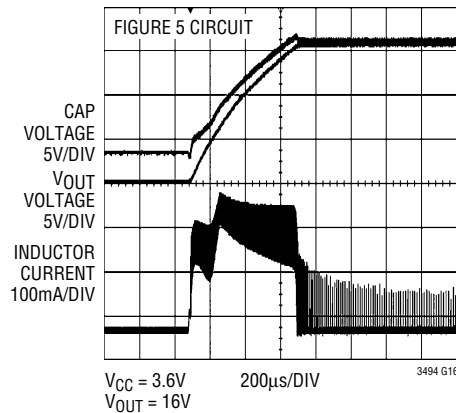
**LT3494A Switching Waveforms at 5mA Load**



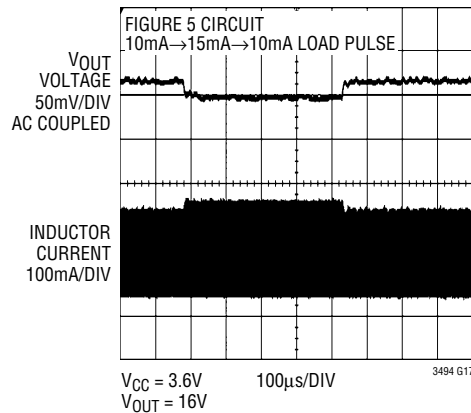
**LT3494A Switching Waveforms at 30mA Load**



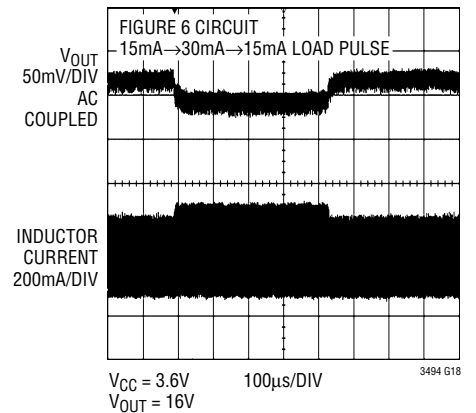
**LT3494 Start-Up Waveforms**



**LT3494 Transient Response**



**LT3494A Transient Response**



## PIN FUNCTIONS

**SW (Pin 1):** Switch Pin. This is the collector of the internal NPN power switch. Minimize the metal trace area connected to this pin to minimize EMI.

**GND (Pin 2):** Ground. Tie directly to local ground plane.

**V<sub>CC</sub> (Pin 3):** Input Supply Pin. Must be locally bypassed.

**CTRL (Pin 4):** Dimming Pin. If not used, tie CTRL to 1.5V or higher. If in use, drive CTRL below 1.225V to override the internal reference. See Applications Information for more information.

**SHDN (Pin 5):** Shutdown Pin. Tie to 1.5V or more to enable device. Ground to shut down.

**FB (Pin 6):** Feedback Pin. Reference voltage is 1.225V. There is an internal 182k resistor from the FB pin to GND. To achieve the desired output voltage, choose R1 according to the following formula:

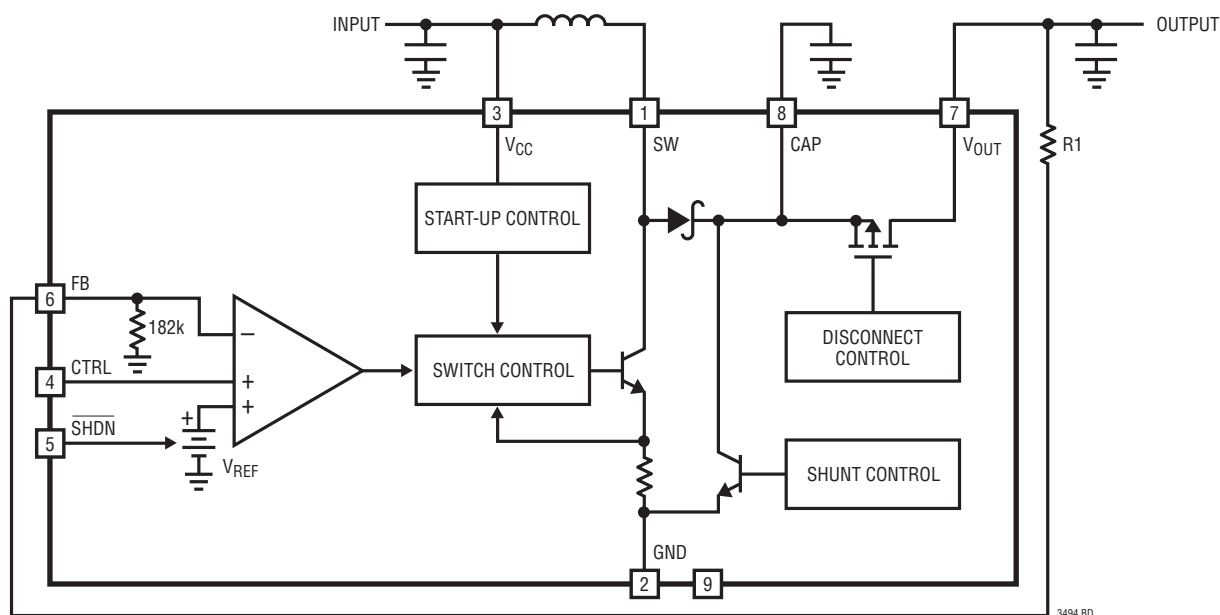
$$R1 = 182 \cdot \left( \frac{V_{OUT(MAX)}}{1.225} - 1 \right) k\Omega$$

**V<sub>OUT</sub> (Pin 7):** Drain of Output Disconnect PMOS. Place a bypass capacitor from this pin to GND. See Applications Information.

**CAP (Pin 8):** This is the cathode of the internal Schottky diode. Place a bypass capacitor from this pin to GND.

**Exposed Pad (Pin 9):** Ground. This pin must be soldered to PCB.

## BLOCK DIAGRAM



3494 BD

## OPERATION

The LT3494/LT3494A use a novel control scheme to provide high efficiency over a wide range of output current. In addition, this technique keeps the switching frequency above the audio band over all load conditions.

The operation of the part can be better understood by referring to the Block Diagram. The part senses the output voltage by monitoring the voltage on the FB pin. The user sets the desired output voltage by choosing the value of the external top feedback resistor. The parts incorporate a precision 182k bottom feedback resistor. Assuming that output voltage adjustment is not used (CTRL pin is tied to 1.5V or greater), the internal reference ( $V_{REF} = 1.225V$ ) sets the voltage at which FB will servo to during regulation.

The Switch Control block senses the output of the amplifier and adjusts the switching frequency as well as other parameters to achieve regulation. During the start-up of the circuit, special precautions are taken to insure that the inductor current remains under control.

Because the switching frequency is never allowed to fall below approximately 50kHz, a minimum load must be present to prevent the output voltage from drifting too high. This minimum load is automatically generated within the part via the Shunt Control block. The level of this current is adaptable, removing itself when not needed to improve efficiency at higher load levels.

The LT3494/LT3494A also have an integrated Schottky diode and PMOS output disconnect switch. The PMOS switch is turned on when the part is enabled via the SHDN pin. When the parts are in shutdown, the PMOS switch turns off, allowing the  $V_{OUT}$  node to go to ground. This type of disconnect function is often required in power supplies.

The only difference between the LT3494A and LT3494 is the level of the current limit. The LT3494A has a typical peak current limit of 350mA while the LT3494 has a 180mA limit.

## APPLICATIONS INFORMATION

### Choosing an Inductor

Several recommended inductors that work well with the LT3494/LT3494A are listed in Table 1, although there are many other manufacturers and devices that can be used. Consult each manufacturer for more detailed information and for their entire selection of related parts. Many different sizes and shapes are available. Use the equations and recommendations in the next few sections to find the correct inductance value for your design.

### Inductor Selection—Boost Regulator

The formula below calculates the appropriate inductor value to be used for a boost regulator using the LT3494/LT3494A (or at least provides a good starting point).

This value provides a good trade off in inductor size and system performance. Pick a standard inductor close to this value. A larger value can be used to slightly increase the available output current, but limit it to around twice the value calculated below, as too large of an inductance will decrease the output voltage ripple without providing much additional output current. A smaller value can be used (especially for systems with output voltages greater than 12V) to give a smaller physical size. Inductance can be calculated as:

$$L = (V_{OUT} - V_{IN(MIN)} + 0.5V) \cdot 0.66 (\mu H)$$

where  $V_{OUT}$  is the desired output voltage and  $V_{IN(MIN)}$  is the minimum input voltage. Generally, a 10 $\mu H$  or 15 $\mu H$  inductor is a good choice.

**Table 1. Recommended Inductors**

| PART          | FOR USE WITH   | VALUE ( $\mu H$ ) | MAX DCR ( $\Omega$ ) | MAX DC I (mA) | SIZE (mm $\times$ mm $\times$ mm) | VENDOR         |
|---------------|----------------|-------------------|----------------------|---------------|-----------------------------------|----------------|
| LQH32CN100K53 | LT3494/LT3494A | 10                | 0.3                  | 450           | 3.5 $\times$ 2.7 $\times$ 1.7     | Murata         |
| LQH32CN150K53 | LT3494         | 15                | 0.58                 | 300           | 3.5 $\times$ 2.7 $\times$ 1.7     | www.murata.com |
| CDRH3D11-100  | LT3494         | 10                | 0.24                 | 280           | 4.0 $\times$ 4.0 $\times$ 1.2     | Sumida         |
| CDHED13/S-150 | LT3494/LT3494A | 15                | 0.55                 | 550           | 4.0 $\times$ 4.2 $\times$ 1.4     | www.sumida.com |

3494fb

## APPLICATIONS INFORMATION

### Capacitor Selection

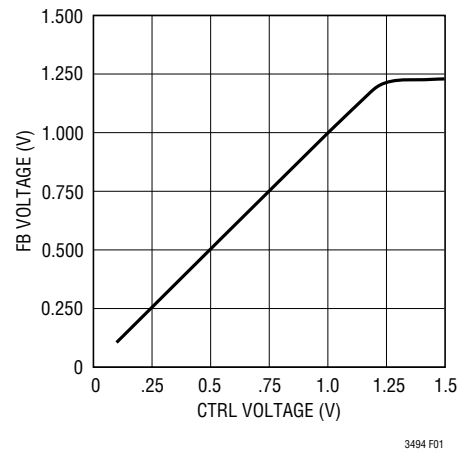
The small size and low ESR of ceramic capacitors makes them suitable for most LT3494/LT3494A applications. X5R and X7R types are recommended because they retain their capacitance over wider voltage and temperature ranges than other types such as Y5V or Z5U. A 4.7μF input capacitor and a 2.2μF to 10μF output capacitor are sufficient for most LT3494/LT3494A applications. Always use a capacitor with a sufficient voltage rating. Many capacitors rated at 2.2μF to 10μF, particularly 0805 or 0603 case sizes, have greatly reduced capacitance when bias voltages are applied. Be sure to check actual capacitance at the desired output voltage. Generally a 1206 size capacitor will be adequate. A 0.22μF or 0.47μF capacitor placed on the CAP node is recommended to filter the inductor current while the larger 2.2μF to 10μF placed on the V<sub>OUT</sub> node will give excellent transient response and stability. Table 2 shows a list of several capacitor manufacturers. Consult the manufacturers for more detailed information and for their entire selection of related parts.

**Table 2. Recommended Ceramic Capacitor Manufacturers**

| MANUFACTURER | PHONE        | URL             |
|--------------|--------------|-----------------|
| Taiyo Yuden  | 408-573-4150 | www.t-yuden.com |
| AVX          | 843-448-9411 | www.avxcorp.com |
| Murata       | 814-237-1431 | www.murata.com  |
| Kemet        | 408-986-0424 | www.kemet.com   |

### Setting Output Voltage and the Auxiliary Reference Input

The LT3494/LT3494A are equipped with both an internal 1.225V reference and an auxiliary reference input. This allows the user to select between using the built-in reference and supplying an external reference voltage. The voltage at the CTRL pin can be adjusted while the chip is operating to alter the output voltage of the LT3494/LT3494A for purposes such as display dimming or contrast adjustment. To use the internal 1.225V reference, the CTRL pin must be held higher than 1.5V. When the CTRL pin is held between 0V and 1.5V, the LT3494 will regulate the output such that the FB pin voltage is nearly equal to the CTRL pin voltage. At CTRL voltages close to 1.225V, a soft transition occurs between the CTRL pin and the internal reference. Figure 1 shows this behavior.



**Figure 1. CTRL to FB Transfer Curve**

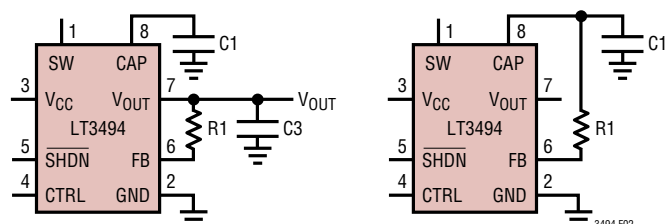
To set the maximum output voltage, select the values of R1 according to the following equation:

$$R1 = 182 \cdot \left( \frac{V_{OUT(MAX)}}{1.225} - 1 \right) k\Omega$$

When CTRL is used to override the internal reference, the output voltage can be lowered from the maximum value down to nearly the input voltage level. If the voltage source driving the CTRL pin is located at a distance to the LT3494/LT3494A, a small 0.1μF capacitor may be needed to bypass the pin locally.

### Choosing a Feedback Node

The single feedback resistor may be connected to the V<sub>OUT</sub> pin or to the CAP pin (see Figure 2). Regulating the V<sub>OUT</sub> pin eliminates the output offset resulting from the voltage drop across the output disconnect PMOS. Regulating the CAP pin does not compensate for the voltage drop across the output disconnect, resulting in an output voltage V<sub>OUT</sub> that is slightly lower than the voltage set by the resistor divider. Under most conditions, it is advised that the feedback resistor be tied to the V<sub>OUT</sub> pin.



**Figure 2. Feedback Connection Using the CAP Pin or the V<sub>OUT</sub> Pin**

## APPLICATIONS INFORMATION

### Connecting the Load to the CAP Node

The efficiency of the converter can be improved by connecting the load to the CAP pin instead of the V<sub>OUT</sub> pin. The power loss in the PMOS disconnect circuit is then made negligible. By connecting the feedback resistor to the V<sub>OUT</sub> pin, no quiescent current will be consumed in the feedback resistor string during shutdown since the PMOS transistor will be open (see Figure 3). The disadvantage of this method is that the CAP node cannot go to ground during shutdown, but will be limited to around a diode drop below V<sub>CC</sub>. Loads connected to the part should only sink current. **Never force external power supplies onto the CAP or V<sub>OUT</sub> pins.** The larger value output capacitor (2.2μF to 10μF) should be placed on the node to which the load is connected.

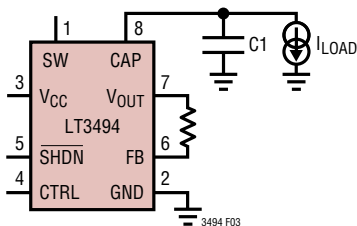


Figure 3. Improved Efficiency

### Maximum Output Load Current

The maximum output current of a particular LT3494/LT3494A circuit is a function of several circuit variables. The following method can be helpful in predicting the maximum load current for a given circuit:

Step 1: Calculate the peak inductor current:

$$I_{PK} = I_{LIMIT} + \frac{V_{IN} \cdot 400 \cdot 10^{-9}}{L} \text{ amps}$$

where  $I_{LIMIT}$  is 0.180A and 0.350A for the LT3494 and LT3494A respectively.  $L$  is the inductance value in Henrys and  $V_{IN}$  is the input voltage to the boost circuit.

Step 2: Calculate the inductor ripple current:

$$I_{RIPPLE} = \frac{(V_{OUT} + 1 - V_{IN}) \cdot 150 \cdot 10^{-9}}{L} \text{ amps}$$

where  $V_{OUT}$  is the desired output voltage.

If the inductor ripple current is greater than the peak current, then the circuit will only operate in discontinuous conduction mode. The inductor value should be increased so that  $I_{RIPPLE} < I_{PK}$ . An application circuit can be designed to operate only in discontinuous mode, but the output current capability will be reduced.

Step 3: Calculate the average input current:

$$I_{IN(AVG)} = I_{PK} - \frac{I_{RIPPLE}}{2} \text{ amps}$$

Step 4: Calculate the nominal output current:

$$I_{OUT(NOM)} = \frac{I_{IN(AVG)} \cdot V_{IN} \cdot 0.75}{V_{OUT}} \text{ amps}$$

Step 5: Derate output current:

$$I_{OUT} = I_{OUT(NOM)} \cdot 0.7 \text{ amps}$$

For low output voltages the output current capability will be increased. When using output disconnect (load current taken from V<sub>OUT</sub>), these higher currents will cause the drop in the PMOS switch to be higher resulting in reduced output current capability than those predicted by the preceding equations.

### Inrush Current

When  $V_{CC}$  is stepped from ground to the operating voltage while the output capacitor is discharged, a higher level of inrush current may flow through the inductor and integrated Schottky diode into the output capacitor. Conditions that increase inrush current include a larger more abrupt voltage step at  $V_{IN}$ , a larger output capacitor tied to the CAP pin and an inductor with a low saturation current. While the internal diode is designed to handle such events, the inrush current should not be allowed to exceed 1A. For circuits that use output capacitor values within the recommended range and have input voltages of less than 5V, inrush current remains low, posing no hazard to the device. In cases where there are large steps at  $V_{CC}$  (more than 5V) and/or a large capacitor is used at the CAP pin, inrush current should be measured to ensure safe operation. The LT3494A circuits experience higher levels of current during start-up and steady-state operation. An external diode placed from the SW pin to

APPLICATIONS INFORMATION

the CAP pin will improve efficiency and lower the stress placed on the internal Schottky diode.

Board Layout Considerations

As with all switching regulators, careful attention must be paid to the PCB board layout and component placement. To maximize efficiency, switch rise and fall times are made as short as possible. To prevent electromagnetic interference (EMI) problems, proper layout of the high frequency switching path is essential. The voltage signal of the SW pin has sharp rising and falling edges. Minimize the length and area of all traces connected to the SW pin and always use a ground plane under the switching regulator to minimize interplane coupling. In addition, the FB connection for the feedback resistor R1 should be tied directly from the Vout pin to the FB pin and be kept as short as possible, ensuring a clean, noise-free connection. Recommended component placement is shown in Figure 4.

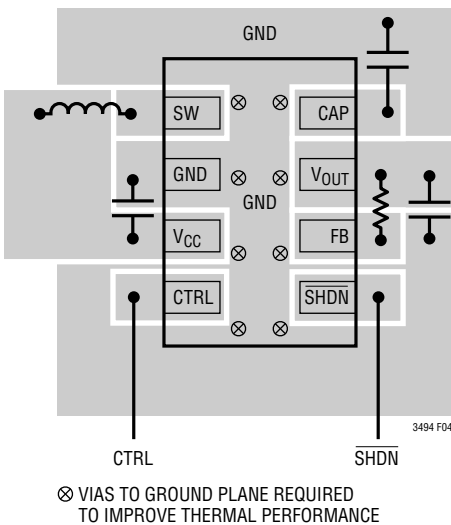


Figure 4. Recommended Layout

TYPICAL APPLICATIONS

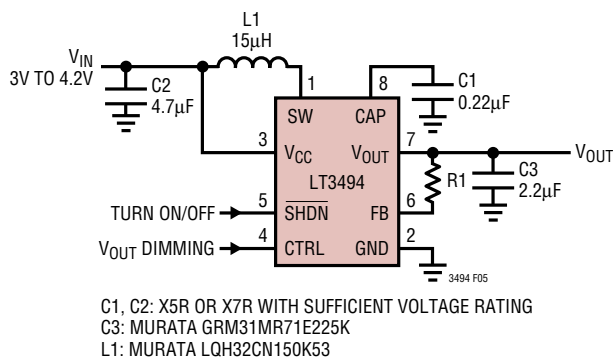
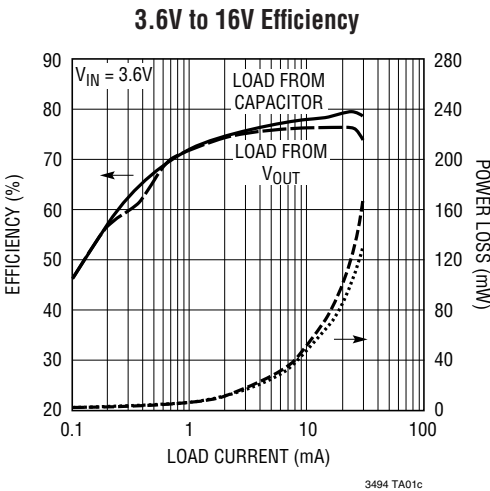


Figure 5. One Li-Ion Cell Input Boost Converter with the LT3494

| V <sub>OUT</sub> | R1 VALUE REQUIRED (MΩ) | MAXIMUM OUTPUT CURRENT AT 3V INPUT (mA) |
|------------------|------------------------|-----------------------------------------|
| 25               | 3.57                   | 8.6                                     |
| 24               | 3.40                   | 9.3                                     |
| 23               | 3.24                   | 10.0                                    |
| 22               | 3.09                   | 10.6                                    |
| 21               | 2.94                   | 11.3                                    |
| 20               | 2.80                   | 12.1                                    |
| 19               | 2.67                   | 12.9                                    |
| 18               | 2.49                   | 13.6                                    |
| 17               | 2.37                   | 14.8                                    |
| 16               | 2.21                   | 16.0                                    |
| 15               | 2.05                   | 17.2                                    |





## TYPICAL APPLICATION

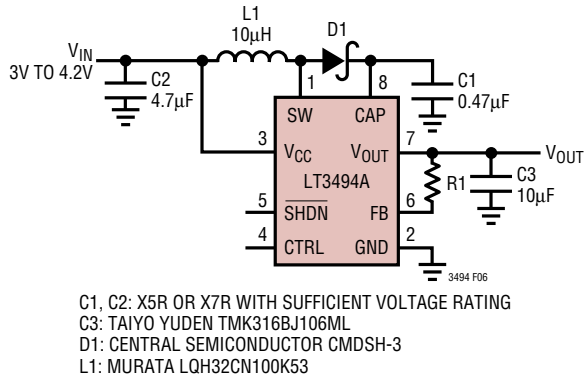
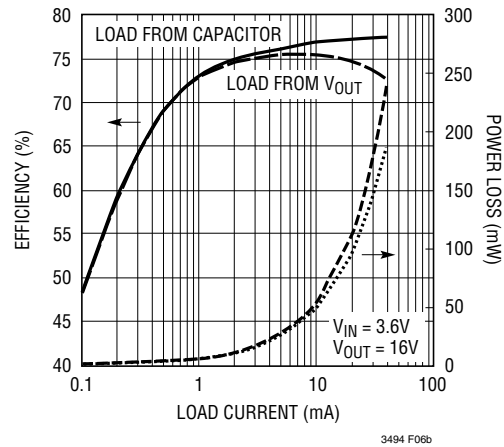
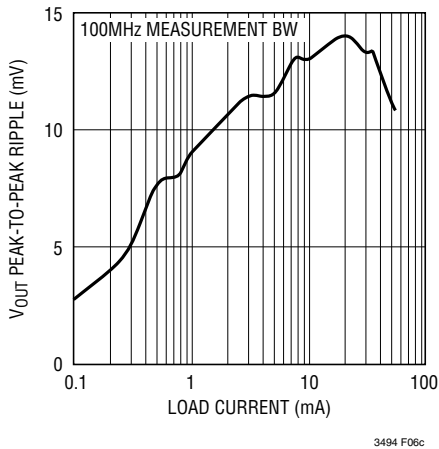


Figure 6. One Li-Ion Cell Input Boost Converter with the LT3494A

### Efficiency and Power Loss vs Load Current



### Output Voltage Ripple vs Load Current



| V <sub>OUT</sub> | R1 VALUE REQUIRED (MΩ) | MAXIMUM OUTPUT CURRENT AT 3V INPUT (mA) |
|------------------|------------------------|-----------------------------------------|
| 25               | 3.57                   | 13.0                                    |
| 24               | 3.40                   | 14.0                                    |
| 23               | 3.24                   | 15.0                                    |
| 22               | 3.09                   | 16.5                                    |
| 21               | 2.94                   | 17.5                                    |
| 20               | 2.80                   | 19.0                                    |
| 19               | 2.67                   | 20.0                                    |
| 18               | 2.49                   | 21.5                                    |
| 17               | 2.37                   | 23.0                                    |
| 16               | 2.21                   | 25.0                                    |
| 15               | 2.05                   | 27.0                                    |

## RELATED PARTS

| PART NUMBER     | DESCRIPTION                                                                                                                                  | COMMENTS                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| LT1613          | 550mA (I <sub>SW</sub> ), 1.4MHz, High Efficiency Step-Up DC/DC Converter                                                                    | V <sub>IN</sub> : 0.9V to 10V, V <sub>OUT(MAX)</sub> = 34V, I <sub>Q</sub> = 3mA, I <sub>SD</sub> < 1µA, ThinSOT Package        |
| LT1615/LT1615-1 | 300mA/80mA (I <sub>SW</sub> ), High Efficiency Step-Up DC/DC Converters                                                                      | V <sub>IN</sub> : 1V to 15V, V <sub>OUT(MAX)</sub> = 34V, I <sub>Q</sub> = 20µA, I <sub>SD</sub> < 1µA, ThinSOT Package         |
| LT1930/LT1930A  | 1A (I <sub>SW</sub> ), 1.2MHz/2.2MHz, High Efficiency Step-Up DC/DC Converters                                                               | V <sub>IN</sub> : 2.6V to 16V, V <sub>OUT(MAX)</sub> = 34V, I <sub>Q</sub> = 4.2A/5.5mA, I <sub>SD</sub> < 1µA, ThinSOT Package |
| LT1945 (Dual)   | Dual Output, Boost/Inverter, 350mA (I <sub>SW</sub> ), Constant Off-Time, High Efficiency Step-Up DC/DC Converter                            | V <sub>IN</sub> : 1.2V to 15V, V <sub>OUT(MAX)</sub> = ±34V, I <sub>Q</sub> = 40µA, I <sub>SD</sub> < 1µA, 10-Lead MS Package   |
| LT1946/LT1946A  | 1.5A (I <sub>SW</sub> ), 1.2MHz/2.7MHz, High Efficiency Step-Up DC/DC Converters                                                             | V <sub>IN</sub> : 2.45V to 16V, V <sub>OUT(MAX)</sub> = 34V, I <sub>Q</sub> = 3.2mA, I <sub>SD</sub> < 1µA, 8-Lead MS Package   |
| LT3467/LT3467A  | 1.1A (I <sub>SW</sub> ), 1.3MHz/2.1MHz, High Efficiency Step-Up DC/DC Converters with Soft-Start                                             | V <sub>IN</sub> : 2.4V to 16V, V <sub>OUT(MAX)</sub> = 40V, I <sub>Q</sub> = 1.2mA, I <sub>SD</sub> < 1µA, ThinSOT Package      |
| LT3463/LT3463A  | Dual Output, Boost/Inverter, 250mA (I <sub>SW</sub> ), Constant Off-Time, High Efficiency Step-Up DC/DC Converters with Integrated Schottkys | V <sub>IN</sub> : 2.3V to 15V, V <sub>OUT(MAX)</sub> = ±40V, I <sub>Q</sub> = 40µA, I <sub>SD</sub> < 1µA, DFN Package          |
| LT3471          | Dual Output, Boost/Inverter, 1.3A (I <sub>SW</sub> ), High Efficiency Boost-Inverting DC/DC Converter                                        | V <sub>IN</sub> : 2.4V to 16V, V <sub>OUT(MAX)</sub> = ±40V, I <sub>Q</sub> = 2.5mA, I <sub>SD</sub> < 1µA, DFN Package         |

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