# DEMO CIRCUIT 1188
# QUICK START GUIDE

## LT3684EMSE
## 2A, 34V Step-Down Switching Regulator

## DESCRIPTION

Demonstration circuit 1188 is a monolithic step-down DC/DC switching regulator featuring the LT3684. The demo circuit is designed for a 3.3V output from a 4.5V to 34V input. The wide input range of the LT3684 allows a variety of input sources. The typical sources are automotive batteries, wall adaptors and industrial supplies. The programmed 800kHz switching frequency allows the use of small, low cost inductor and ceramic capacitors, resulting in low, predictable output ripple. The current mode control scheme creates fast transient response and good loop stability. The gate drive of the internal switch is boosted to a voltage that is higher than the Vin to ensure saturation of the switch. The LT3684's integrated boost diode reduces the parts count. The RUN/SS pin can be used to set the part in micropower shutdown mode, reducing the supply current to less than 1uA. The RUN/SS pin can also be used to program soft start. In this mode, the RUN/SS pin is driven through an external RC filter to create a voltage ramp on this pin. The soft start function reduces the input current surge during start-up.

The LT3684 datasheet gives a complete description of the part, operation and application information. The datasheet must be read in conjunction with this quick start guide for demo circuit 1188.

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

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**Performance Summary for Step-down Switching Regulator ( $T_A$ = 25°C )**

| PARAMETER FOR BUCK REGULATOR | CONDITION | VALUE |
|---|---|---|
| Minimum Input Voltage | | 4.5V |
| Maximum Input Voltage | | 34V |
| Output Voltage $V_{OUT}$ | | 3.3V +/- 4% |
| Maximum Output Current | | 2A |
| Typical Switching Frequency | | 800kHz |

## QUICK START PROCEDURE

Demonstration circuit 1188 is easy to set up to evaluate the performance of the LT3684. 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 JP1 on the RUN position:
2. With power off, connect the input power supply to Vin and GND.
3. Turn on the power at the input.

   NOTE. Make sure that the input voltage does not exceed the maximum input voltage.
4. Check for the proper output voltage.

   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.

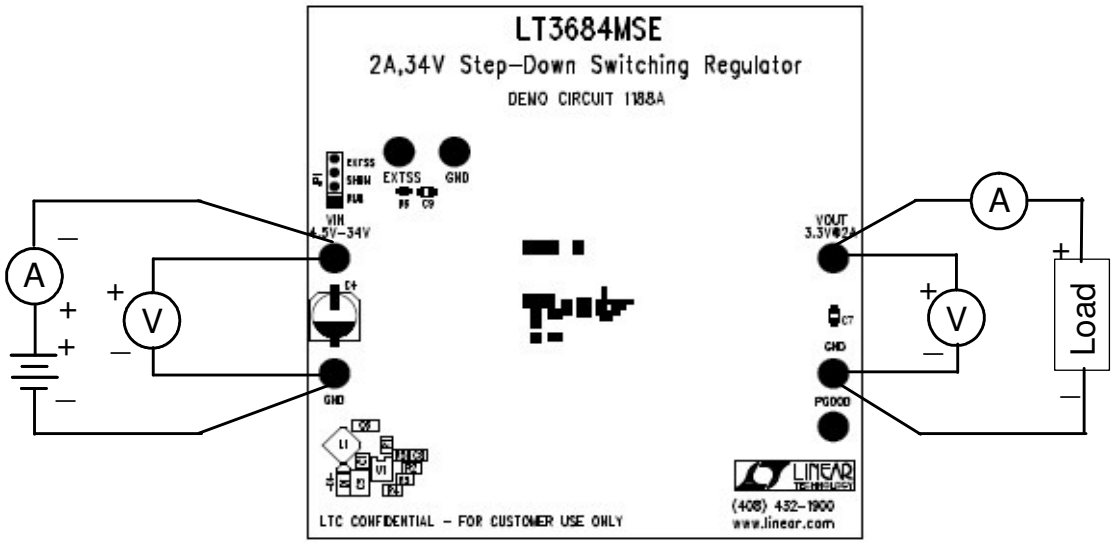



**Figure 1. Proper Measurement Equipment Setup**

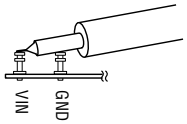
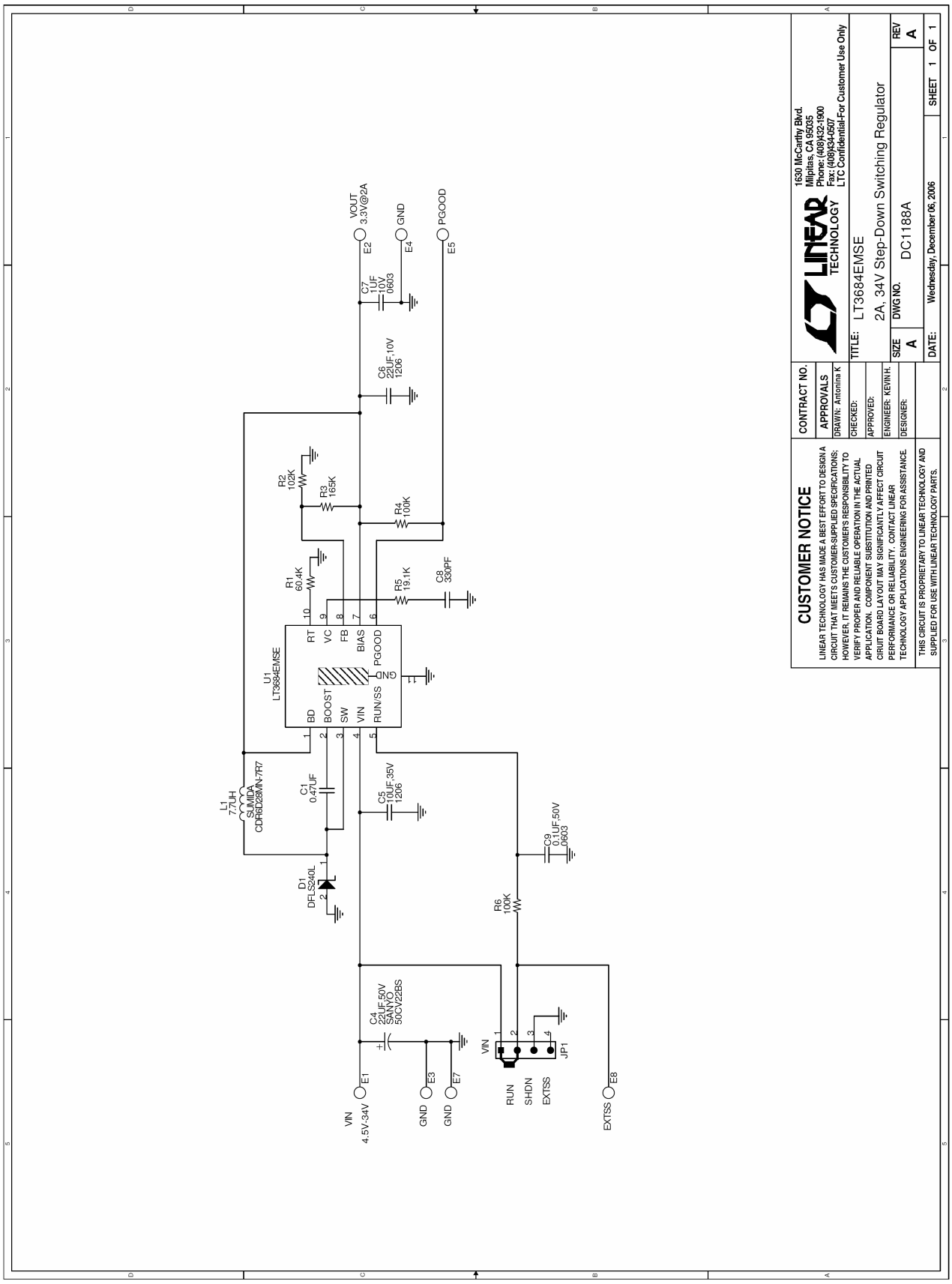



**Figure 2. Measuring Input or Output Ripple**




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CONTRACT NO.

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TITLE: LT3684EMSE

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