

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 357

550KHZ SYNCHRONOUS BUCK CONVERTER AND LINEAR REGULATOR

LTC1704/LTC1704B

DESCRIPTION

Demonstration circuit 357 is a dual power supply with one switcher and one LDO regulator. It features the LTC1704 and LTC1704B. The LTC1704 version features burst mode operation at light load. The B version does not have burst mode. The input voltage is 5V nominal, the switcher output is set at 1.8V by a feedback resistor divider and the LDO output is set at 1.5V by its feedback resistor divider. The switcher uses Mosfet $R_{DS(ON)}$

for current limit. This improves efficiency and eliminates cost and power loss of discrete sense resistors. The LDO can use the switcher output or an external supply as its input. The output voltages can be reprogrammed within certain limits in accordance with LTC1704 specifications.

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

Table 1. PERFORMANCE SUMMARY

| PARAMETER | CONDITION | VALUE |
|----------------------------------|--|----------------|
| Minimum Input Voltage | | 4.75V |
| Maximum Input Voltage | | 5.5V |
| V_{OUT1} | $V_{IN} = 4.75V \text{ to } 5.5V, I_{OUT1} = 0A \text{ to } 15A$ | $1.8V \pm 2\%$ |
| V_{OUT2} | $V_{IN_LDO} = 1.8V, I_{OUT2} = 0A \text{ to } 1.5A$ | $1.5V \pm 2\%$ |
| Typical V_{OUT1} Output Ripple | $V_{IN} = 5V, I_{CORE} = 15A$ | $15mV_{P-P}$ |
| Nominal Switching Frequency | | 550kHz |
| | | |

QUICK START PROCEDURE

Demonstration circuit 357 is easy to set up to evaluate the performance of the LTC1704. 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.

1. Place jumper JP1 in the ON position.
2. Place Jumper JP2 in VOUT1 position.
3. With power off, connect the input power supply to Vin and GND, making sure voltage is not set greater than 6V.
4. Turn on the power at the input. Set $V_{in}=5V$
5. Check for the proper output voltages. $V_{out1} = 1.764V \text{ to } 1.836V, V_{out2} = 1.470V \text{ to } 1.530V$
If there is no output, temporarily disconnect the load to make sure that the load is not set too high.
6. Once the proper output voltages are established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage, efficiency, and other parameters.

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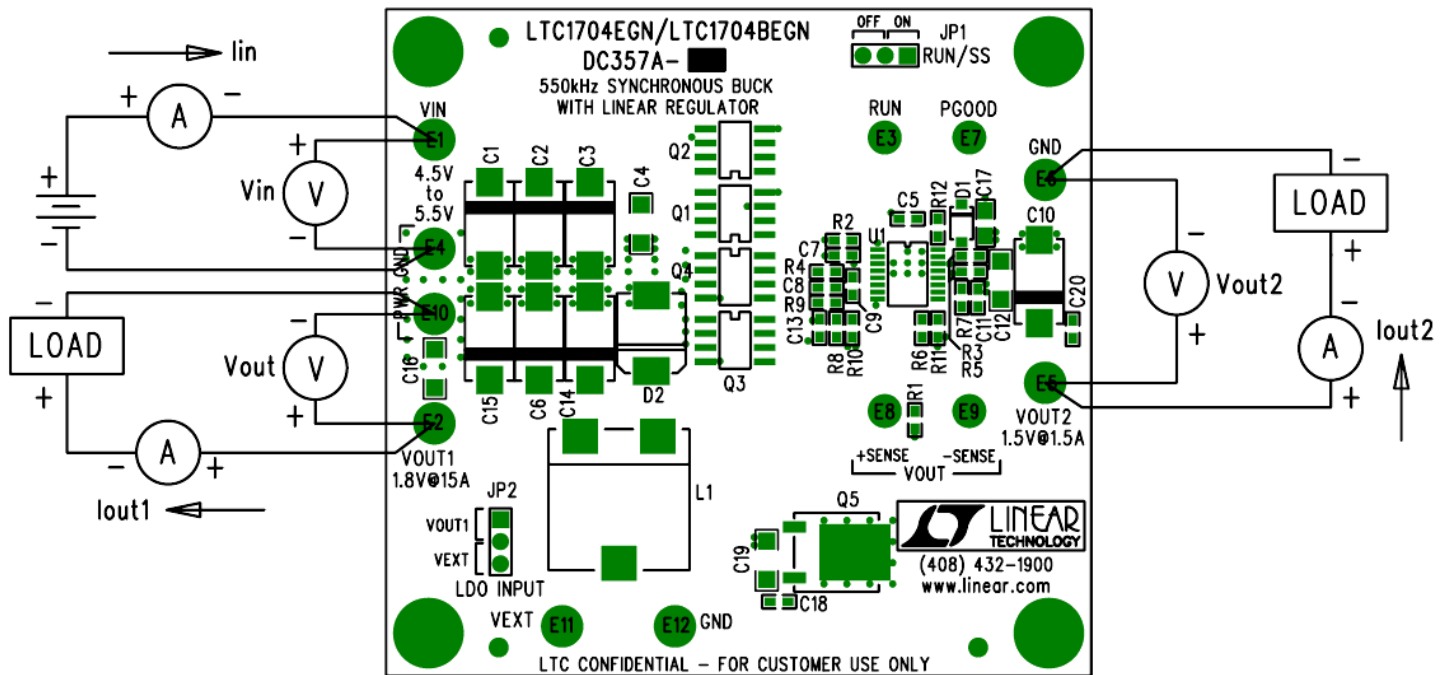


Figure 1. DC357 Hookup Diagram

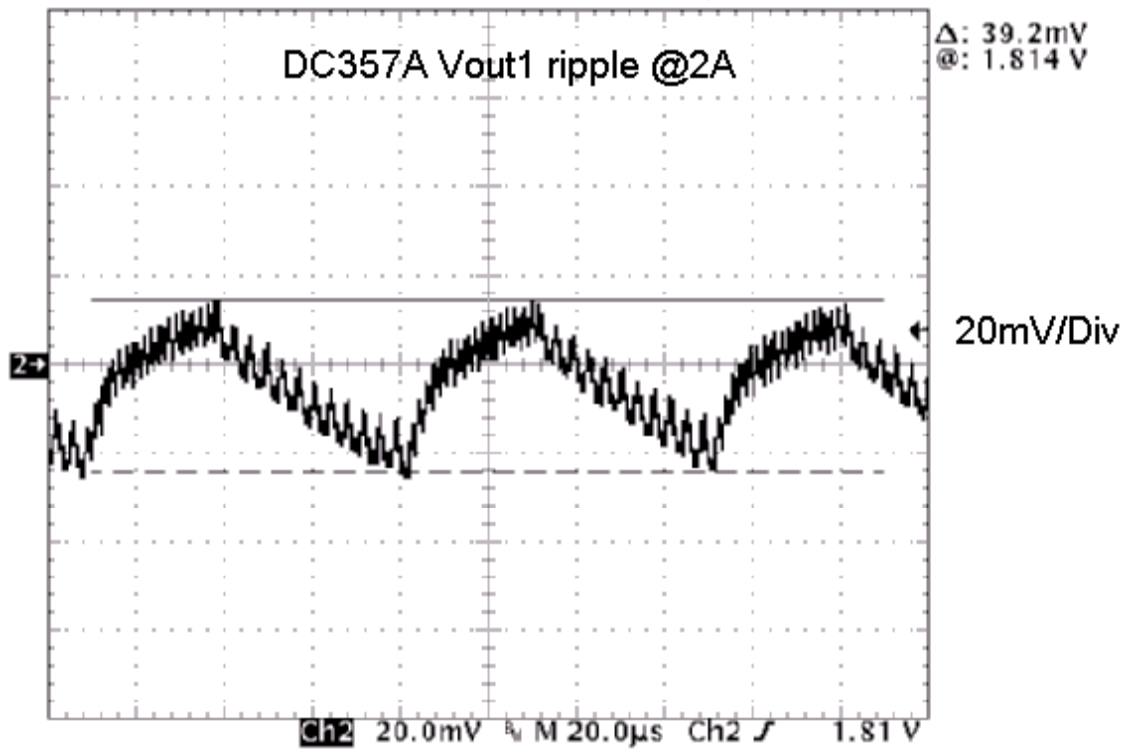


Figure 2. Vout1 ripple at 1.8V, 2A (–A version with Burst Mode.)

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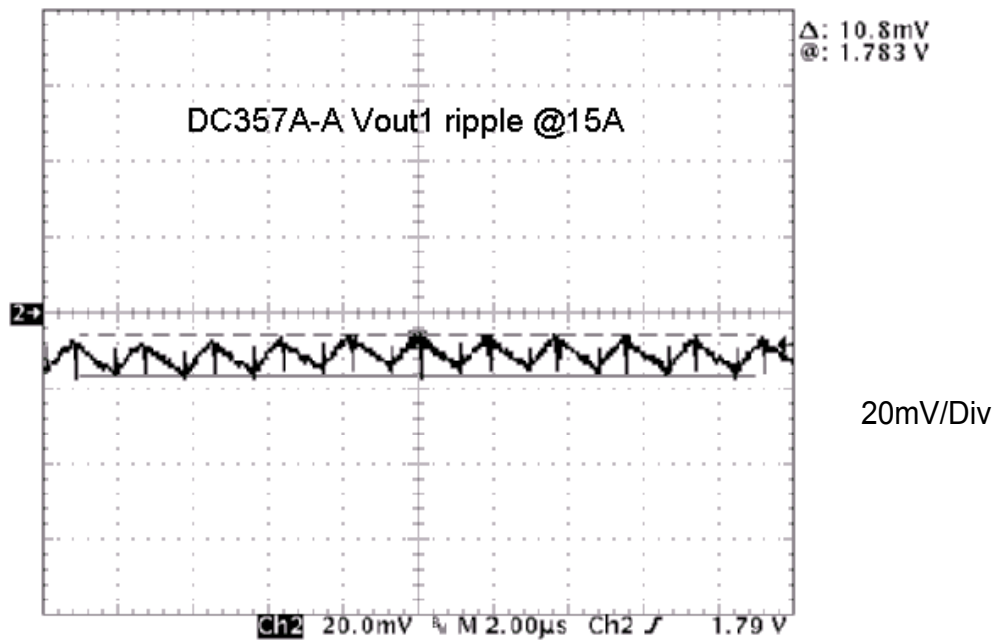


Figure 3. Vout1 ripple at 1.8V 15A

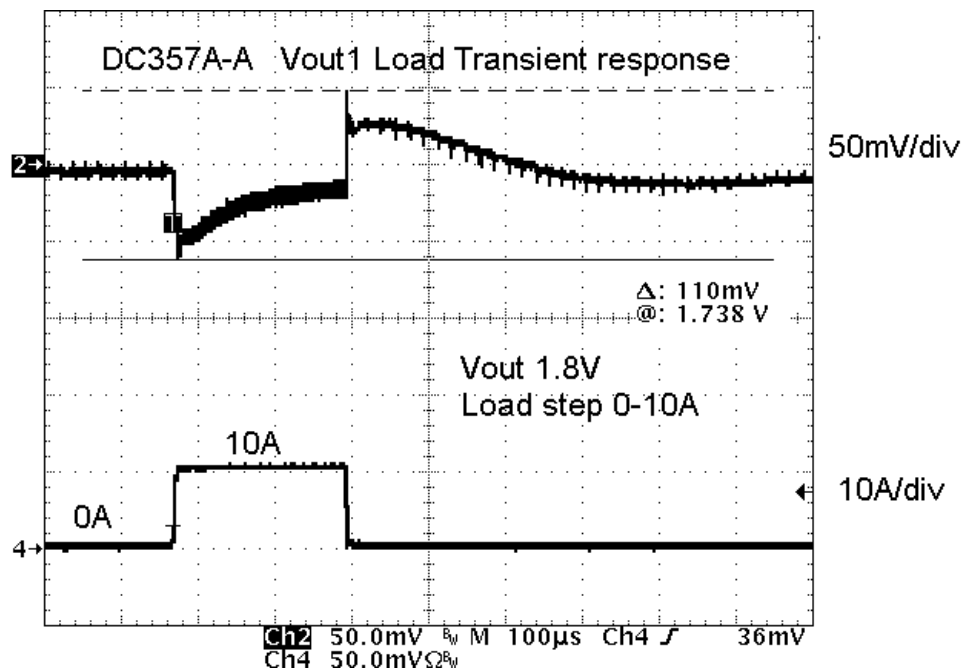


Figure 4. Load transient response of Vout1 @ 0-10A (-A version with Burst Mode)

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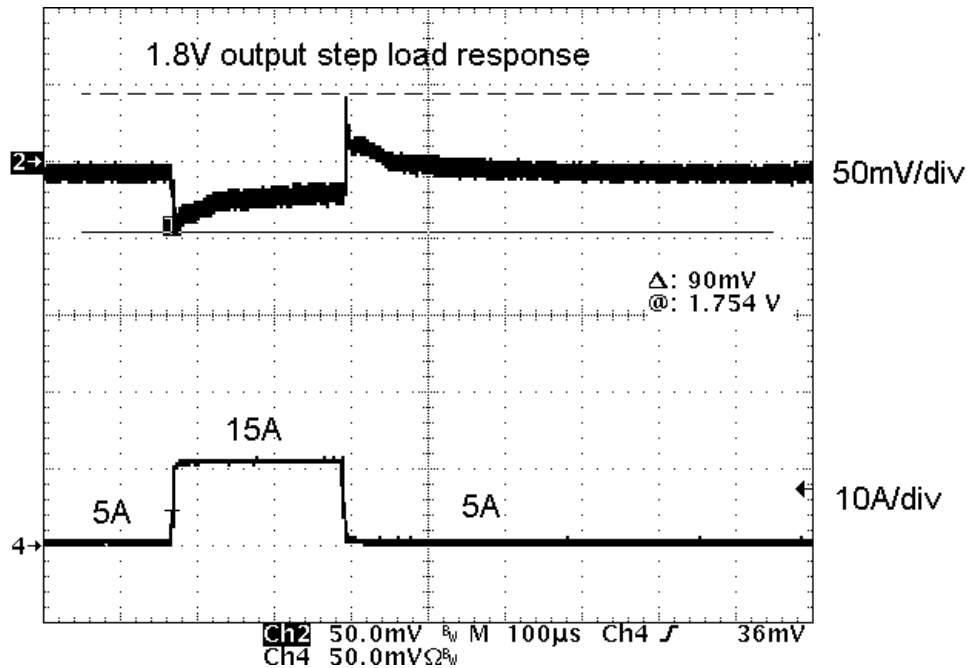


Figure 5. Load transient response of Vout1 @ 5-15A (-A with Burst Mode)

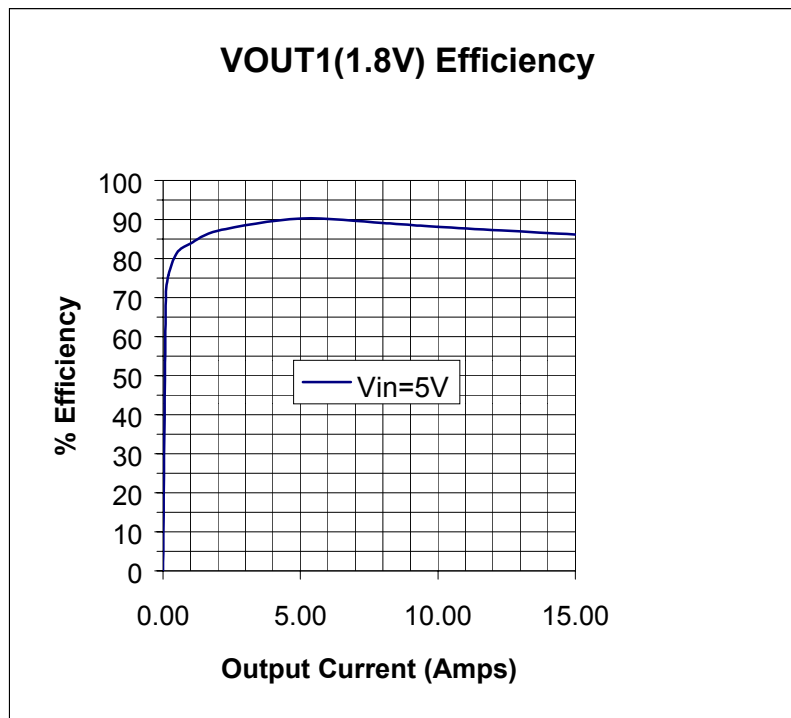


Figure 6. Vout1 Efficiency (-A with Burst Mode)

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