

LT3480EDD/LT3685EDD

2A, 38V Step-down Switching Regulator with SYNC Function and EMC filters

DESCRIPTION

Demonstration circuit 1212 is a monolithic step-down DC/DC switching regulator featuring LT3480/LT3685. The LT3480 is on DC1212A-A circuit and the LT3685 is on DC1212A-B circuit. Both the LT3685 and LT3480 can be synchronized over a 250 KHz to 2 MHz range. The demo board is designed for 5V output from a 6.3V to 38V input with transient up to 60V. The wide input range allows a variety of input sources. The typical sources are automotive batteries, wall adaptors and industrial supplies.


The EMC filter at the input makes the circuit compatible with EMC standard, EN55022 Class B. The current mode control scheme creates fast transient response and good loop stability. 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 LT3480/LT3685 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 1212.

Note: It is best to ground the SYNC pin if the SYNC function is not being used.

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

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Performance Summary for Step-down Switching Regulator ($T_A = 25^{\circ}\text{C}$)

| PARAMETER FOR BUCK REGULATOR | CONDITION | VALUE |
|------------------------------|-----------|-----------|
| Minimum Input Voltage | | 6.3V |
| Maximum Input Voltage | | 38V |
| Output Voltage V_{OUT} | | 5V +/- 4% |
| Maximum Output Current | | 2A |
| Typical Switching Frequency | | 800kHz |

QUICK START PROCEDURE

Demonstration circuit 1212 is easy to set up to evaluate the performance of the LT3480/LT3685. 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.

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

LT3480/LT3685

output voltage regulation, ripple voltage, efficiency and other parameters.

6. An external clock can be added to the SYNC pin when SYNC function is used. See synchronization section in the datasheet for details.

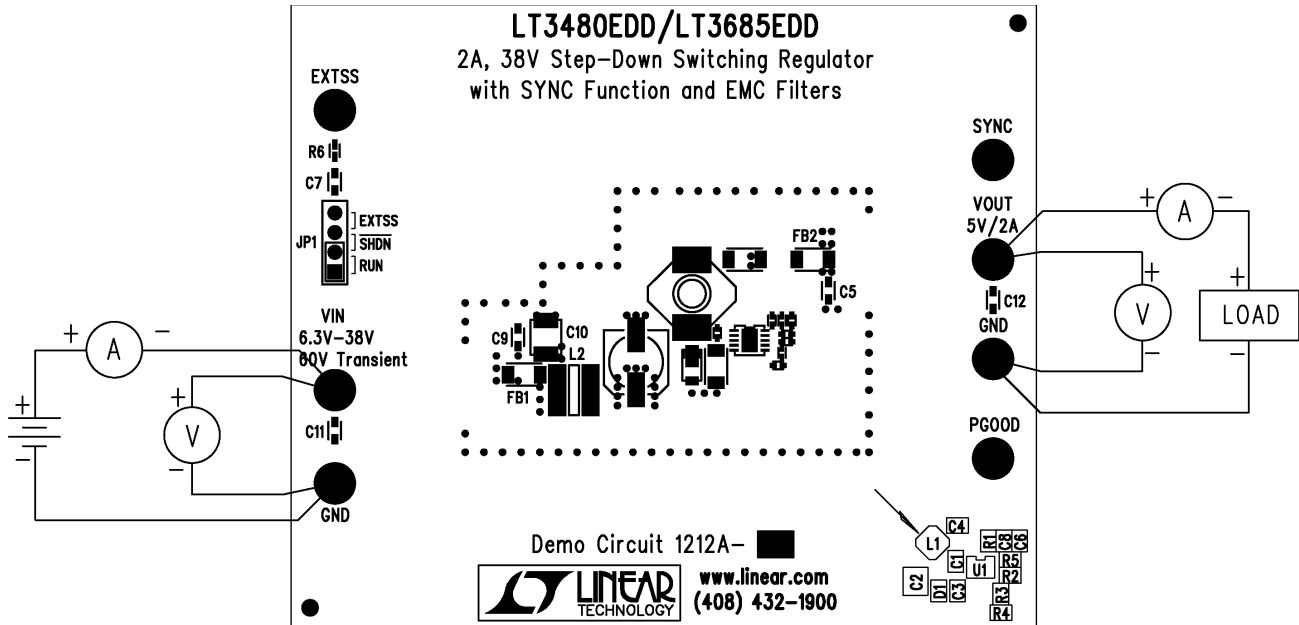


Figure 1. Proper Measurement Equipment Setup

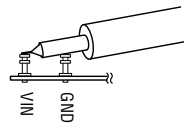


Figure 2. Measuring Input or Output Ripple

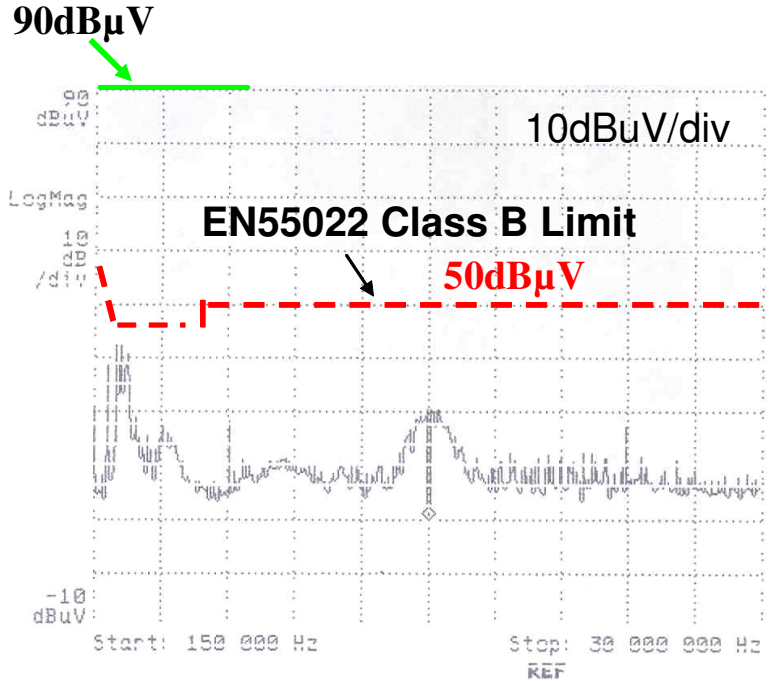


Figure 3. 12V to 5V @2A conductive emission result

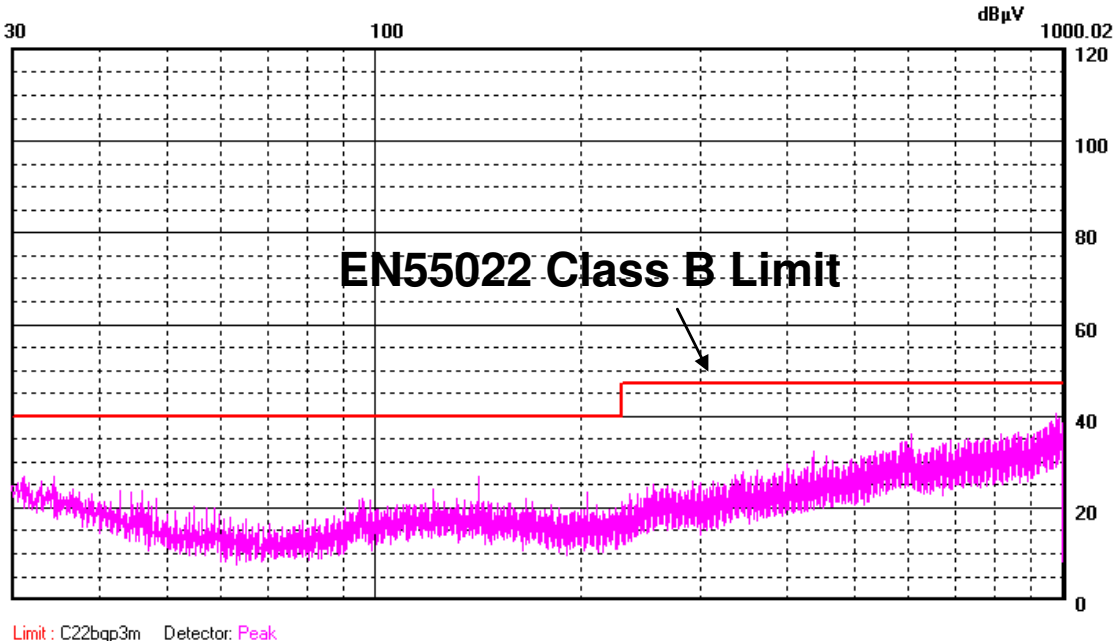
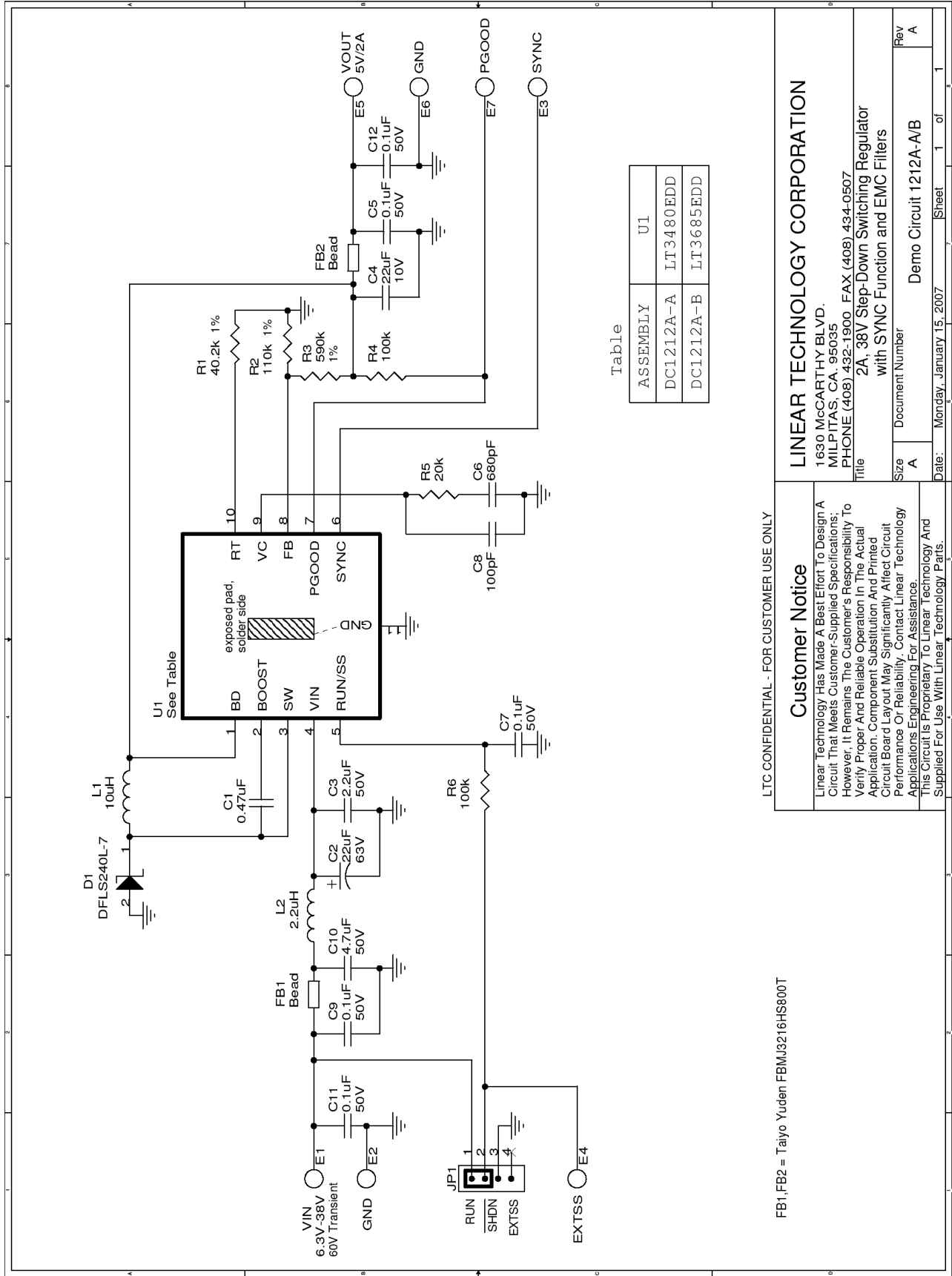


Figure 4. 12V to 5V @2A radiated emission result



Table

| ASSEMBLY | U1 |
|-----------|-----------|
| DC1212A-A | LT3480EDD |
| DC1212A-B | LT3685EDD |

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FB1,FB2 = Taiyo Yuden FBMJ3216HS800T

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.

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Title 2A, 38V Step-Down Switching Regulator with SYNC Function and EMC Filters

| Size | Document Number | Rev |
|------|------------------------|-----|
| A | Demo Circuit 1212A-A/B | A |

Date: Monday, January 15, 2007 Sheet 1 of 1