

DESCRIPTION

Demonstration circuit 1267A is a step-up DC/DC regulator featuring the LTC3125EDCB and is ideally suited for pulsed load applications where the input current needs to be limited. Demonstration circuit 1267A is configured for 500mA maximum input current limit and can handle pulsed load currents of up to 2A, with duty cycles of up to 15%. The input voltage range is $3.3V \pm 10\%$.

The package style for the LTC3125EDCB is an 8 lead 3mm x 2mm plastic DFN. The fixed input cur-

rent limit can be adjusted by replacing one resistor.

The LTC3125 datasheet gives a complete description of the part, operation and application information and must be read in conjunction with this quick start guide for demo circuit 1267A.

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

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Table 1. Performance Summary ($T_A = 25^\circ\text{C}$)

| PARAMETER | CONDITION | VALUE |
|--------------------------|--|----------------|
| Input Voltage Range | | 3.0V – 3.6V |
| Input Current Limit | | 500mA \pm 5% |
| Output Voltage V_{OUT} | $V_{IN} = 3.0V$ to $3.6V$, $I_{IN} = 0A$ to $500mA$ | $4.0V \pm 4\%$ |
| Output Current I_{OUT} | $V_{IN} = 3.0V$, $I_{IN} = 500mA$ | $\geq 300mA$ |
| | $V_{IN} = 3.6V$, $I_{IN} = 500mA$ | $\geq 400mA$ |
| Efficiency (Figure 4) | $V_{IN} = 3.0V$, $I_{OUT} = 300mA$ | 89.8% typical |
| | $V_{IN} = 3.6V$, $I_{OUT} = 400mA$ | 91.4% typical |

QUICK START PROCEDURE

Demonstration circuit 1267A is easy to set up to evaluate the performance of the LTC3125EDCB. 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 V_{in} or V_{out} and GND terminals or directly across the capacitor. See Figure 2 for proper scope probe technique.

1. Place the jumper in the following position:

JP1 On

2. With power off, connect the input power supply to V_{in} and GND.

3. Turn on the power at the input.

NOTE: Make sure that the input voltage does not exceed 4V.

4. Check for the proper output voltage.

$V_{out} = 3.84V$ to $4.16V$,

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

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STEP-UP DC/DC REGULATOR

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

6. The method for evaluating pulsed loads will be discussed in the next section.

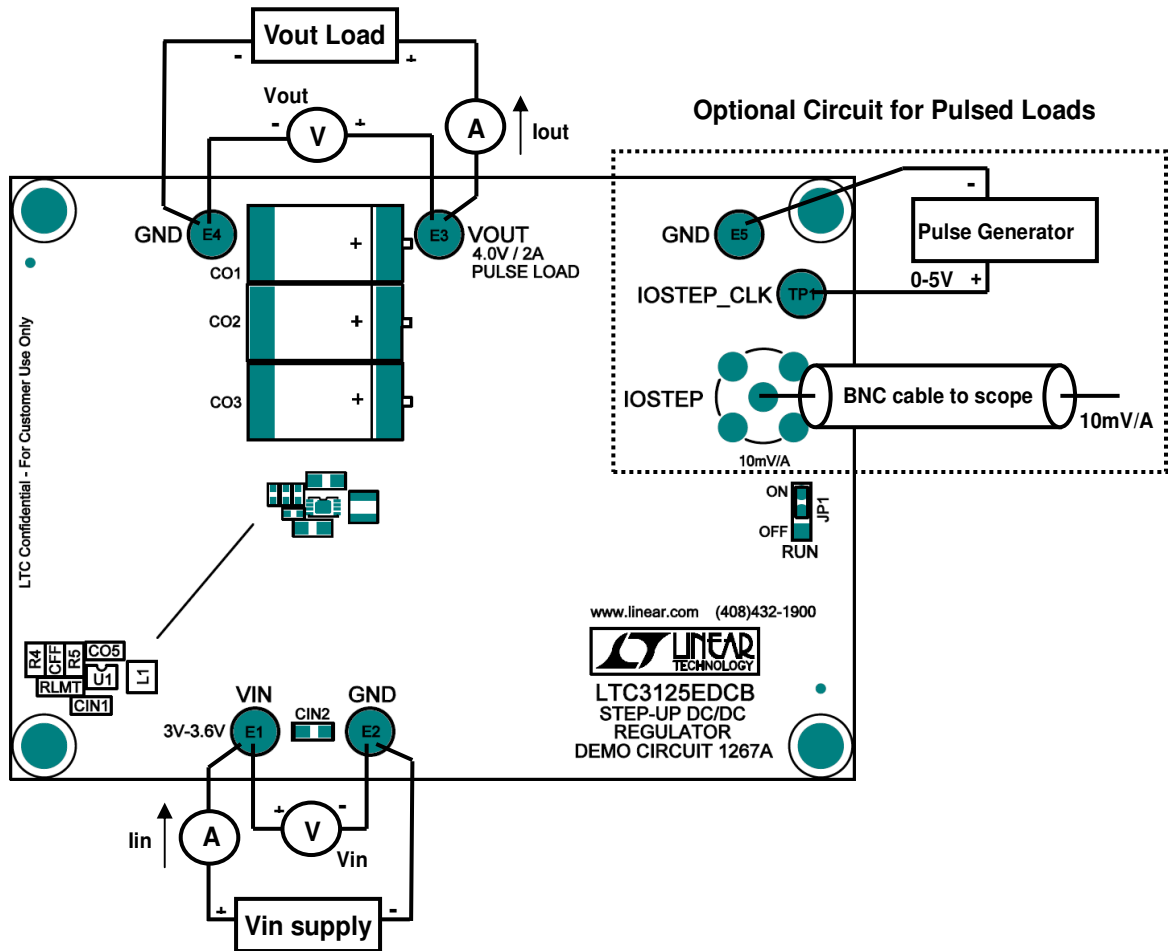


Figure 1. Proper Measurement Equipment Setup

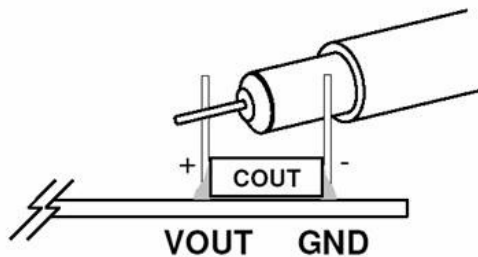


Figure 2. Measuring Input or Output Ripple Directly Across Bulk Capacitor

PULSED LOAD TESTING

Demonstration circuit 1267A can be setup for simple evaluation of pulse loads – please see optional circuit in Figure 1 for proper setup. The circuit is capable of pulsed load of up to 2A with duty cycles up to 15%. Starting from step 5 in the quick start procedure above, follow the procedure below:

1. Disconnect all loads from Vout as the pulse load circuitry is on board.
2. The pulsed load current is measured by connecting IOSTEP to the scope using a BNC cable and setting the oscilloscope to 10mV/div
3. Input current and output voltage can be measured on an oscilloscope for evaluation.
4. A pulse generator with adjustable amplitude is connected between IOSTEP_CLK and GND as indicated in Figure 1. The pulse generator should be capable of generating up to 5V pulses. Adjust the period and duty cycle of this signal to match that of the required load prior to attaching the pulse generator.
5. Adjust pulse generator amplitude until the required load current is achieved as measured on IOSTEP (10mV/A).
6. An example result showing Vout, Iin and a pulse load Iout is given in Figure 3.

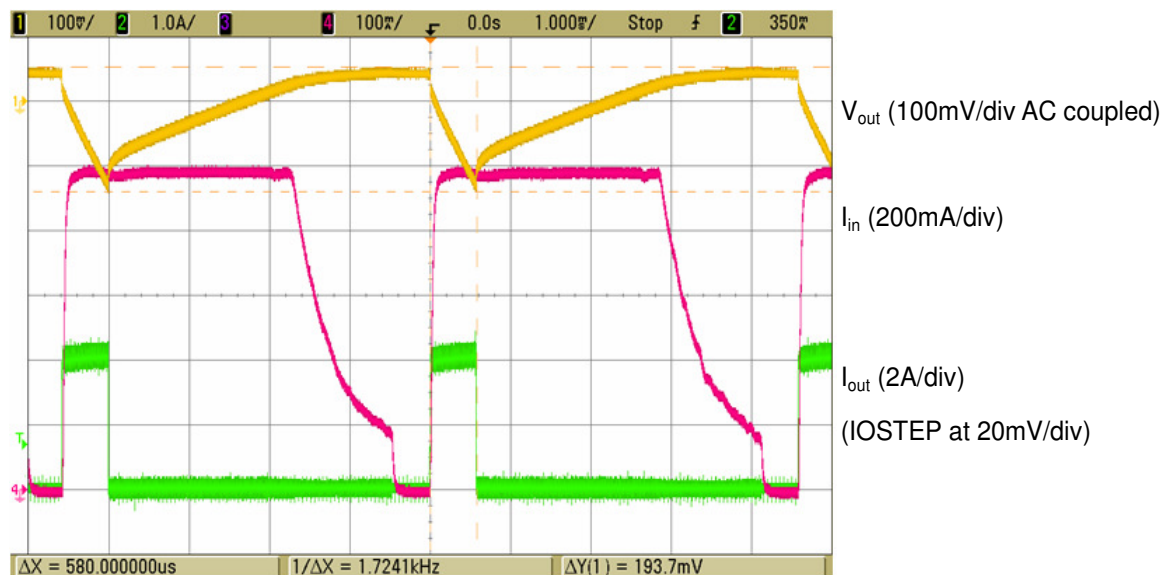


Figure 3. Pulse Load Waveforms for 2A pulsed load, 1/8th duty cycle, 4.6ms period

ADJUSTING INPUT CURRENT LIMIT

It is possible to modify the demonstration circuit for either higher or lower input current limits. This is accomplished by changing resistor RLMT to the required value as suggested in the LTC3125 datasheet. Note that for these different current values, the inductor may have to be changed. Please refer to the datasheet for more information.

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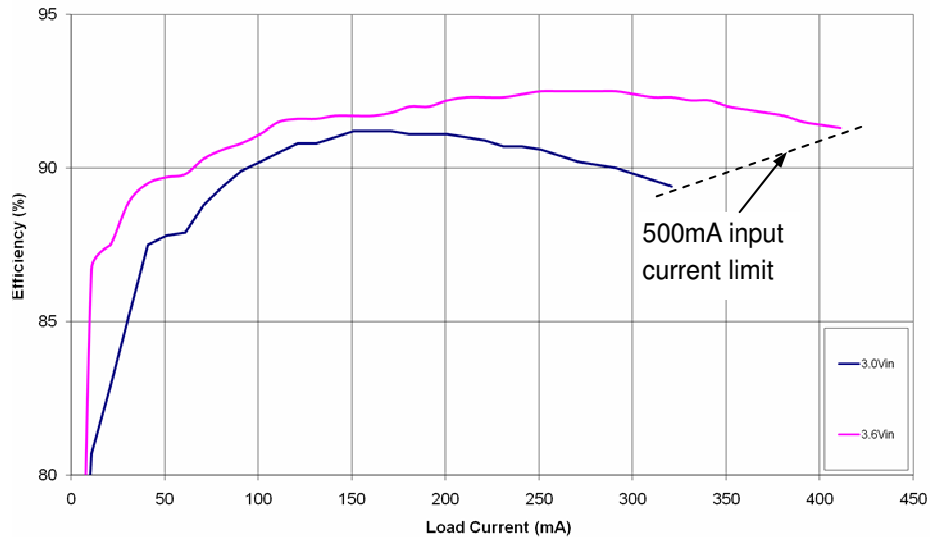
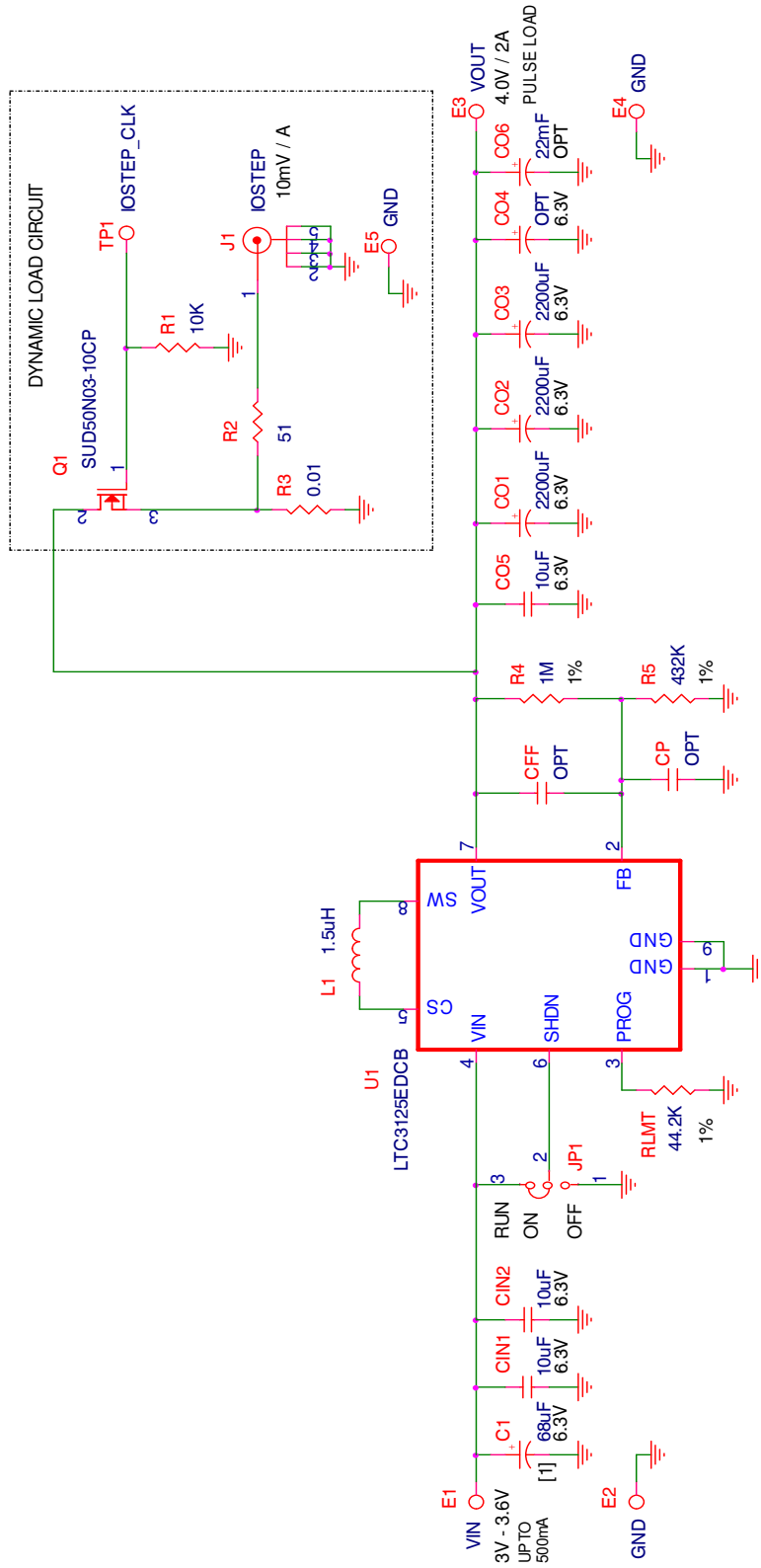


Figure 4. Typical Efficiency vs. Load Current

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NOTES: UNLESS OTHERWISE SPECIFIED,
 [1] FOR DEMO BOARD USE ONLY.

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