DESCRIPTION

Demonstration circuit 457B features the LTC3727-1 in a dual output—5V/4A and 12V/3A—low EMI, 2-phase, adjustable, dual switching regulator controller application.

Operating the two high side MOSFETs 180 degrees out of phase significantly reduces peak input ripple current; thereby reducing radiated and conducted EMI. External parts count; cost and size are minimized in this design. Both controllers have overcurrent latch-off, which can be externally disabled, as well as internal current foldback for overload situations. A soft latch for overvoltage conditions is also provided. In addition to the two high current outputs, on-chip 7.5V/50mA and 3.3V/25mA linear regulators are also included. In the optional standby mode, these internal regulators are capable of powering external system wake-up circuitry when both high current controllers are shut down. Two light load modes of operation are available: Burst Mode® operation offers highest efficiency, whereas burst disable mode provides low noise, constant frequency operation down to 1% of maximum designed load. The controller can operate at up to 99% duty cycle for very low dropout capability.

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

Table 1. Performance Summary (Operating Temperature Range: 0°C to 50°C)

PARAMETER	CONDITION	VALUE
Input Voltage Range	If the input voltage must exceed 25V, use higher voltage rating input capacitors and MOSFETs. The IC works up to 36V. If 12V, 3A is needed for lower than 15V input voltage, reduce the sense resistor value.	15V to 25V
Outputs	V_{OUT1} = 5V, 0A to 4A	5V ± 3%
	V_{OUT2} = 12V, 0A to 3A	12V ± 3%
	7.5V Linear Regulator	7.5V ± 4%
	3.3V Linear Regulator	3.3V ± 4%
Typical Output Ripple (V_{OUT1})	10MHz BW, 4A load, V_{IN} = 15V, frequency = 530kHz	20mV_{P-P}
Typical Output Ripple (V_{OUT2})	10MHz BW, 3A load, V_{IN} = 15V, frequency = 530kHz	10mV_{P-P}
Typical Operating Frequency	PLLLPF pin tied to 3.3V	530kHz
Efficiency	V_{IN} = 15V, 5V at 4A, 12V at 3A	96%

QUICK START PROCEDURE

Demonstration circuit 457B is easy to set up to evaluate the performance of the LTC3727-1. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place RUNSS1 and RUNSS2 in OFF position, the FREQ jumper at the selected frequency and the FCB jumper in GND position.
2. Connect the desired loads between 5V and 12V terminals and their closest PGND terminals on the board.

NOTE: The maximum load at 5V is 4A, and the maximum at 12V is 3A. Soldered wires should be used when the load current exceeds 1A in order to achieve optimum performance.

3. Connect the input power supply to the VIN and GND terminals on the right, center of the board.

NOTE: Do not increase V_{IN} over 25V. If the input voltage must exceed 25V, use higher voltage rating input capacitors and MOSFETs. The IC works up to 36V. If

12V, 3A is needed for lower than 15V input voltage, reduce the sense resistor value.

4. Switch on the desired channel(s) by removing the RUN/SS1 and/or RUN/SS2 jumper.

5. Measure the output voltages. They should be 5V ±0.1V and 12V ±0.24V respectively, at each specified load current.

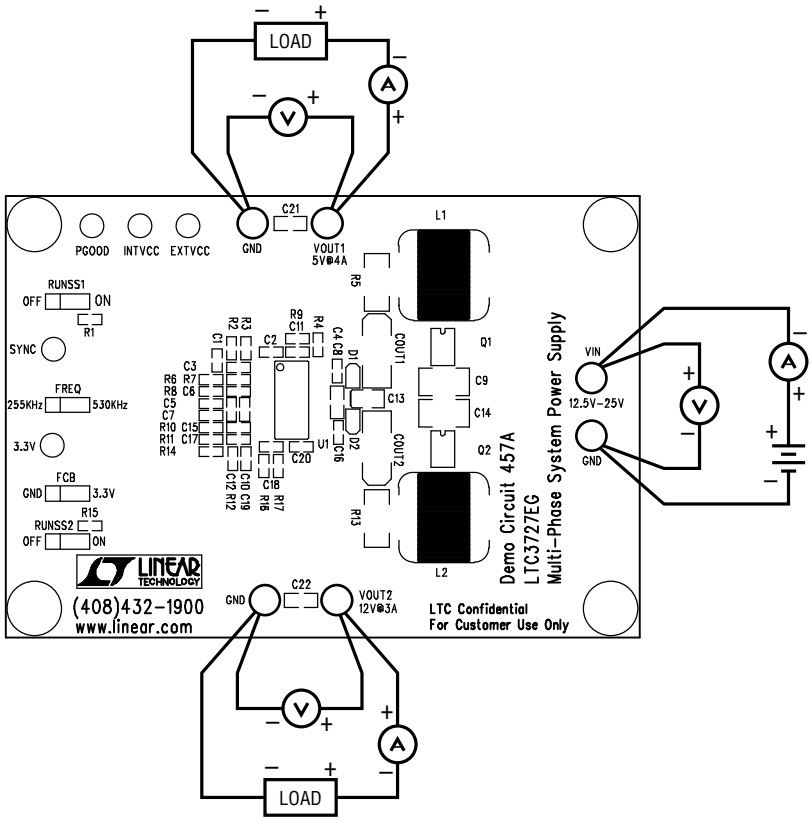

Figure 1. Proper Measurement Equipment Setup

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