

DESCRIPTION

Demonstration board DC088 is a complete DC/DC converter that can generate 5V at 200mA from a 2-cell input. Just two capacitors, an inductor, a diode and the LT1304CS8-5 IC are required to realize the DC/DC function. High efficiency is maintained over a broad range of load current due to the LT1304-5's 120 μ A quiescent

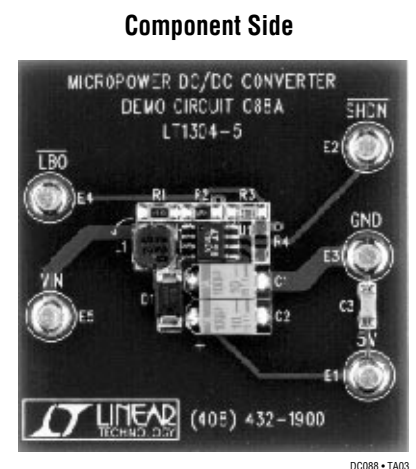
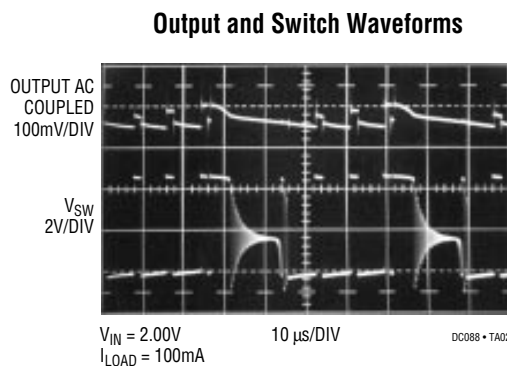
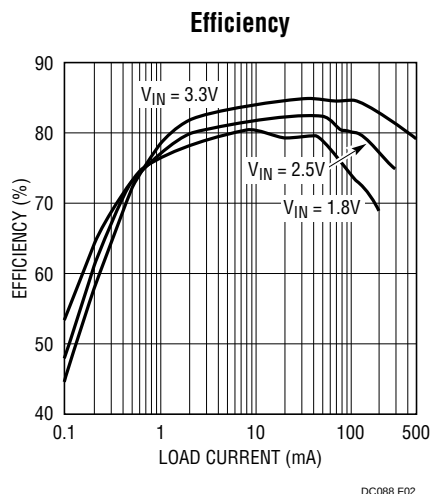
current and Burst Mode™ operation. A $\overline{\text{SHDN}}$ pin disables the converter when pulled low, reducing supply current to 10 μ A. An independent low-battery detector with open-collector output remains active in shutdown.

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PERFORMANCE SUMMARY $0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$, $V_{\text{IN}} = 2.5\text{V}$, $V_{\text{SHDN}} = 2\text{V}$ unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage		1.65	2.50		V
Output Voltage		4.80	5.05	5.25	V
Load Current	$V_{\text{IN}} = 3.30\text{V}$		500		mA
Quiescent Current	Not Switching		120	200	μA
Shutdown Current	$\overline{\text{SHDN}} = 0\text{V}$		10		μA

TYPICAL PERFORMANCE CHARACTERISTICS AND BOARD PHOTO



OPERATION

either event, the switch will be forced off and the ON time will be reduced from 6μs to some value greater than the propagation delay of the current-limit circuitry (about 200ns).

Low-Battery Detector

The low-battery comparator is a hysteretic comparator with one side referred to 1.17V. The divider consisting of R1 and R2 has been selected to provide a low-battery output signal when the input voltage falls below 2.14V. R1 can be changed to obtain other low-battery threshold voltages according to the formula:

$$R1 = R2 \left(\frac{V_{IN}}{1.17} - 1 \right)$$

The output, LBO, is an open collector capable of sinking 500μA in the low-battery detected state. The creative designer may find this comparator useful in other applications similar to those found in the LT1304-5 data sheet. The regulator can be placed in a 10μA shutdown state by pulling the SHDN pin 7 to ground (<0.4V). In this state the low-battery detector remains active, yet the input current is a mere 10μA.

COMPONENTS

Capacitors

The capacitors on this board are low ESR tantalum units specifically designed for switch mode power supply applications. The LT1304-5 requires a good input bypass capacitor located less than 0.25 inches from the device for

proper operation. The 100μF, 10V input capacitor may be replaced by a lower cost (>0.1ESR) 100μF unit at a slight loss of efficiency.

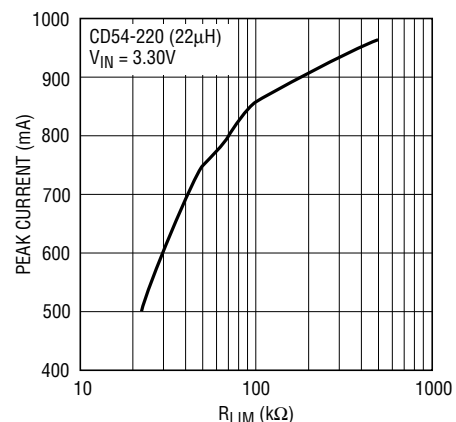
Inductors

The Sumida CD54-220 inductor is a low cost, ferrite, unshielded unit. Wire resistance (DCR) is specified at 0.1Ω. For improved efficiency, the Sumida DC75-220 can be used. A toroidal core unit may be preferred in some cases due to superior flux containment, resulting in improved RFI/EMI suppression.

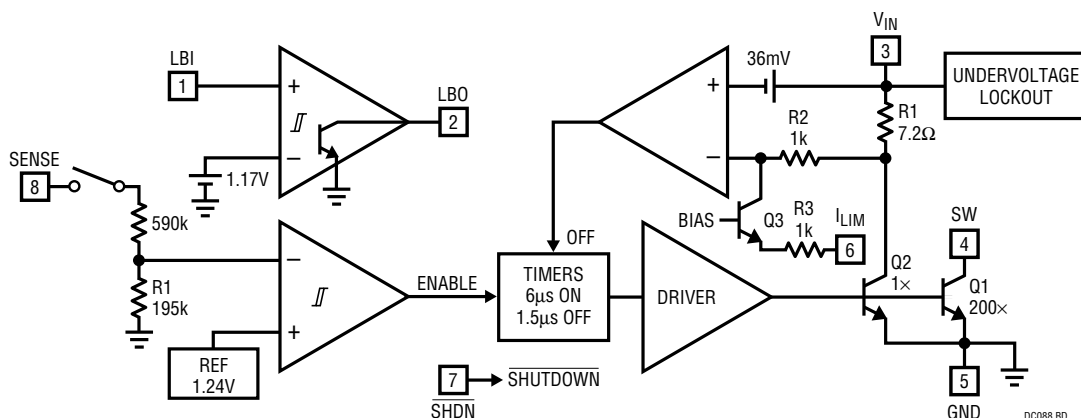
Diodes

The MBRS120 Schottky diode has an excellent forward drop and 20V breakdown. Using an MBRS130 may result in improved efficiency at low load currents at the expense of greater forward drop. A 1N5818 diode is also suitable.

Peak Switch Current Can Be Reduced by Connecting a Resistor Between I_{LIM} and Ground

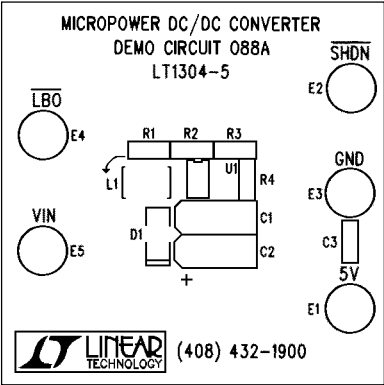


LT1304-5 Block Diagram

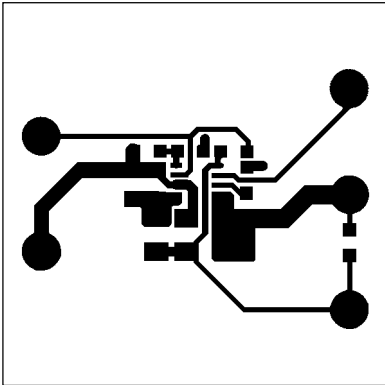


DEMO MANUAL DC088

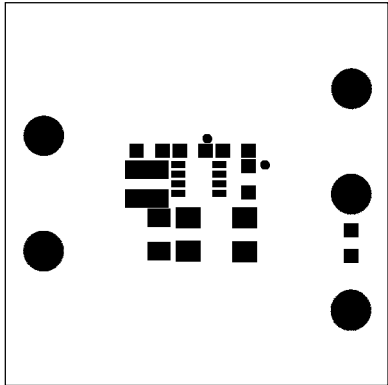
PCB LAYOUT AND FILM



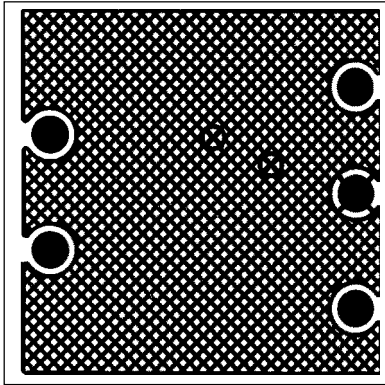
Component Side Silkscreen



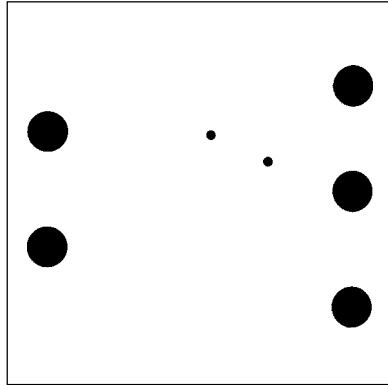
Component Side



Component Side Solder Mask

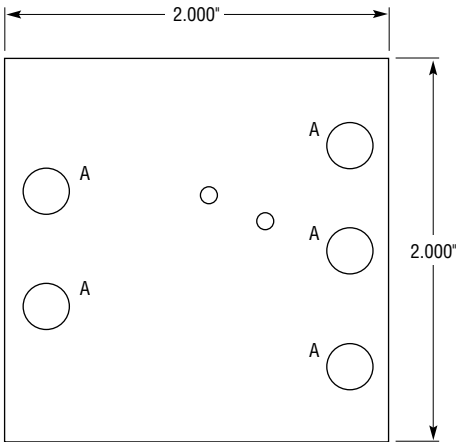


Solder Side



Solder Side Solder Mask

PC FAB DRAWING



- NOTES:**
1. FINISHED MATERIAL IS FR4, 0.062 THICK, 2-OZ COPPER
 2. PCB WILL BE DOUBLE-SIDED WITH PLATED THROUGH-HOLES
 3. PTH SIZES AFTER PLATING, 0.001 MIN WALL THICKNESS
 4. SOLDER MASK BOTH SIDES USING PC401 OR EQUIVALENT
 5. SILKSCREEN COMPONENT SIDE USING WHITE NONCONDUCTIVE INK
 6. ALL DIMENSIONS IN INCHES, ± 0.005
 7. ALL HOLE SIZES AFTER PLATING, -0 TO 0.003 MAX

HOLE CHART			
SYMBOL	DIAMETER	QTY	PLT
NONE	0.025	2	YES
A	0.094	5	YES
TOTAL HOLES 11			



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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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