6) Verify that the voltage at SYS is approximately 5V.
7) If V_{BAT} is less than 4.05V, verify that the current from BATT+ into the battery is approximately 1A.
8) Increase the load current on SYS to 1A.
9) Verify that the charge current into the battery remains near 1A.
10) Increase the load current on SYS to 1.5A.
11) Verify that the charge current into the battery is near 0.5A.
12) Increase the load current on SYS to 2.5A.
13) Verify that current out of the battery is near 0.5A.

Detailed Description

Adjusting the EV Kit for In-Circuit Evaluation

Follow the steps below to ensure that the EV kit is configured for operation in a specific application circuit:

1) Verify that the EV kit DC input current-limit setting is less than the AC adapter source current limit.
2) If necessary, replace R6 in the EV kit such that the DC input current is less than or equal to the AC adapter output-current capability.
3) Verify that the USB source can supply 100mA or 500mA.
4) Verify the maximum charge-current rating or desired charge-current rating of the battery.
5) Ensure that the charge-current setting of the EV kit does not exceed the battery rating, or replace resistor R7 as required. See the *Adjusting Input Current Limit and Charge-Current Limit* section for more details.

Adjusting Input Current Limit and Charge-Current Limit

The input and charge current limits are set, as shown in Table 2. It is often preferable to change the input current limit as the input power source is changed. The MAX8677A facilitates this by allowing different input current limits for DC and USB inputs.

When the input current limit is reached, the first action taken by the MAX8677A is to reduce battery-charge current. This allows the SYS regulator to stay in dropout, or at 5.3V, during heavy loads, thus reducing power dissipation. If, after the charge current is reduced to 0mA, the load at SYS still exceeds the input current limit, the SYS voltage starts falling. When the SYS voltage drops to BAT, the SYS-to-BAT switch turns on, using battery power to support the system load during the load peak.

The MAX8677A features flexible input connections (at the DC and USB input pins) and current-limit settings (set by PEN1, PEN2, PSET, and ISET) to accommodate nearly any input power configuration. However, it is expected that most systems use one of two external power schemes: separate connections for USB and an AC adapter, or a single connector that accepts either USB or the AC adapter output. Input and charge-current limits are controlled by PEN1, PEN2, R_{PSET}, and R_{ISET}, as shown in Table 2.

Charge Enable ($\overline{CEN}$)

When $\overline{CEN}$ is low, the charger is on. When $\overline{CEN}$ is high, the charger turns off. $\overline{CEN}$ does not affect the SYS output. In many systems there is no need for the system controller (typically a microprocessor) to disable the charger, because the MAX8677A Smart Power Selector circuitry independently manages charging and adapter/battery power hand-off. In these situations, $\overline{CEN}$ may be connected to ground.

Table 2. Input Limiter Control Logic

POWER SOURCE	$\overline{DOK}$	$\overline{UOK}$	PEN1	PEN2	USUS	DC INPUT CURRENT LIMIT	USB INPUT CURRENT LIMIT	MAXIMUM CHARGE CURRENT*
AC adapter at DC input	L	x	H	x	x	3000/R6	USB input off. DC input has priority.	3000/R7
USB power at DC input	L	x	L	L	L	100mA		100mA
	L	x	L	H	L	500mA		500mA
	L	x	L	X	H	USB suspend		0
USB power at USB input, DC unconnected	H	L	x	L	L	No DC input	100mA	3000/R7
	H	L	x	H	L		500mA	
	H	L	x	x	H		USB suspend	0
DC and USB unconnected	H	H	x	x	x		No USB input	0

**Charge current cannot exceed the input current limit. Charge may be less than the maximum charge current if the total SYS load exceeds the input current limit.*

x = Don't care.

MAX8677A Evaluation Kit

Charge Termination

When the charge current falls to the termination threshold AND the charger is in voltage mode, charging is complete. Charging continues for a brief 15s top-off period and then enters the DONE state where charging stops. The termination current threshold (I_{TERM}) is set by TSET to a percentage of the fast-charge current:

Connect TSET to GND for $I_{TERM} = I_{CHGMAX} \times 5\%$

Leave TSET open for $I_{TERM} = I_{CHGMAX} \times 10\%$

Connect TSET to VL for $I_{TERM} = I_{CHGMAX} \times 15\%$

When the charger enters DONE 15s later, the $\overline{DONE}$ output goes low. Note that if charge current falls to I_{TERM} as a result of the input or thermal limiter, the charger does not enter DONE. For the charger to enter DONE, charge current must be less than I_{TERM}, the charger must be in voltage mode, and the input or thermal limiter must not be reducing charge current.

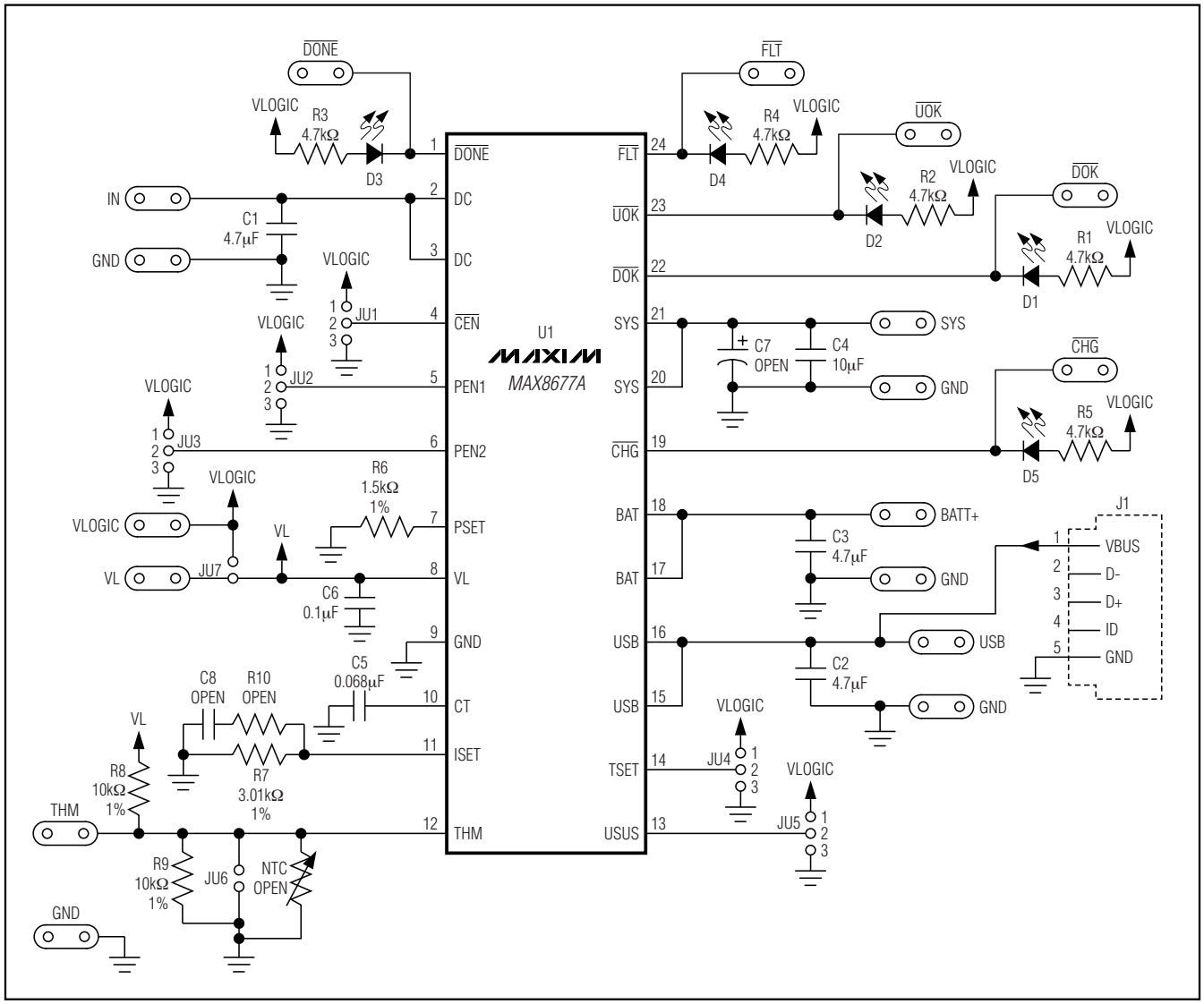

Figure 2. MAX8677A EV Kit Schematic

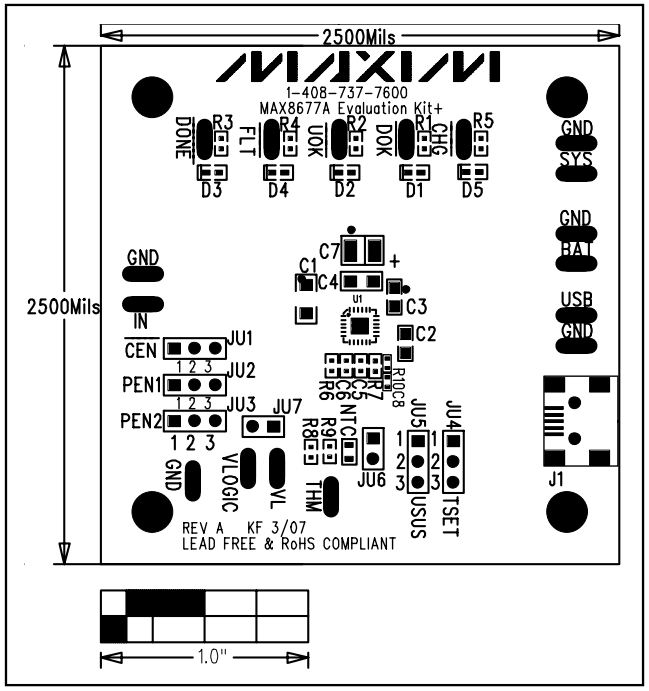

Figure 3. MAX8677A EV Kit Component Placement Guide—Component Side

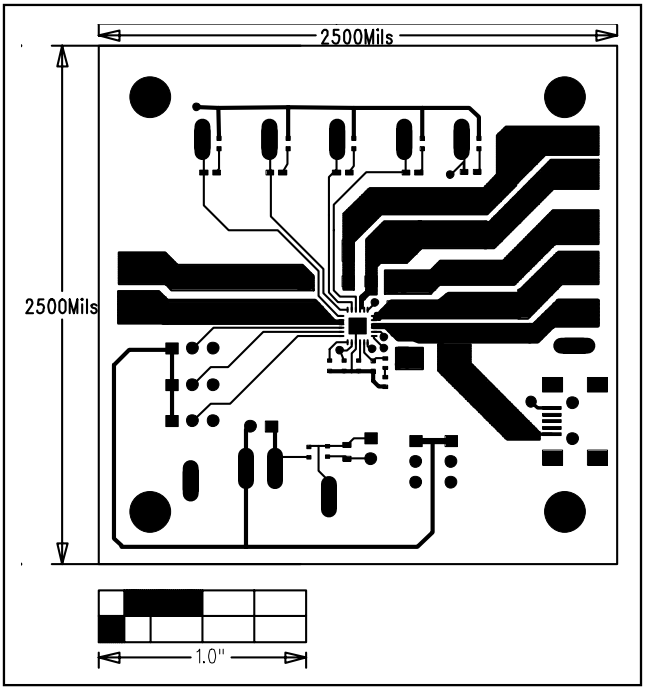

Figure 4. MAX8677A EV Kit PCB Layout—Component Side

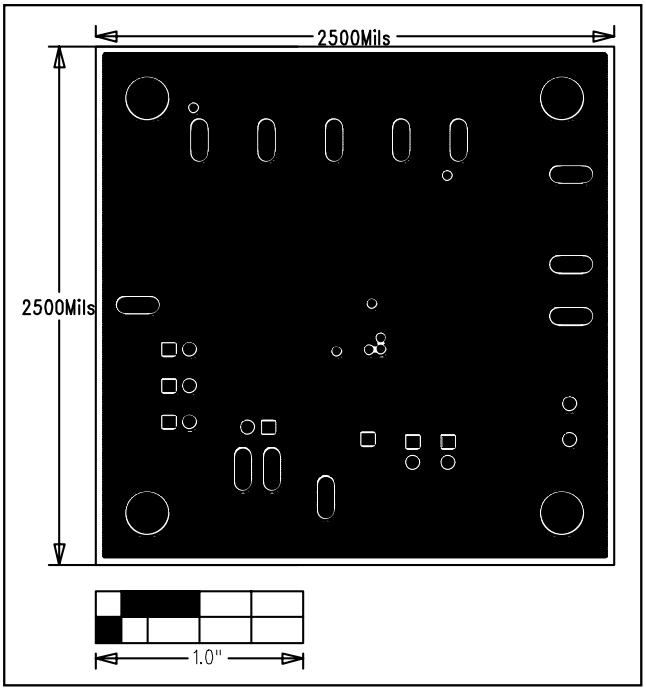

Figure 5. MAX8677A EV Kit PCB Layout—Layer 2

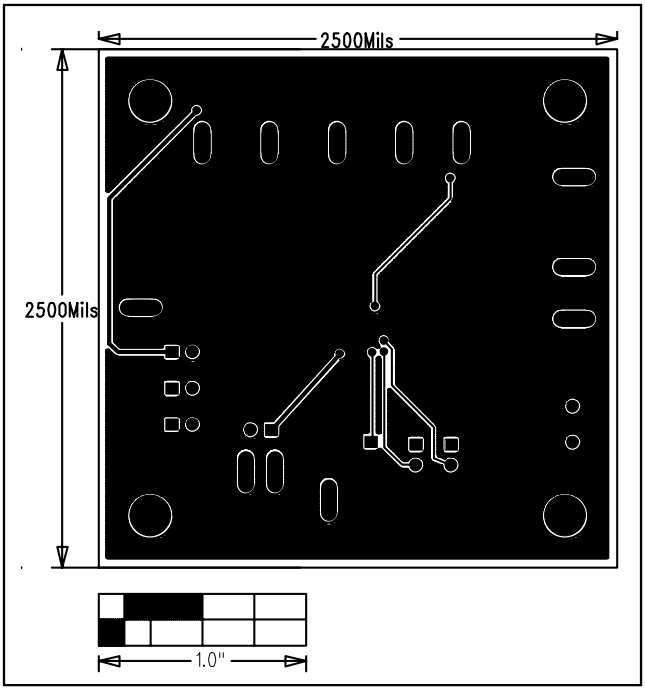

Figure 6. MAX8677A EV Kit PCB Layout—Layer 3

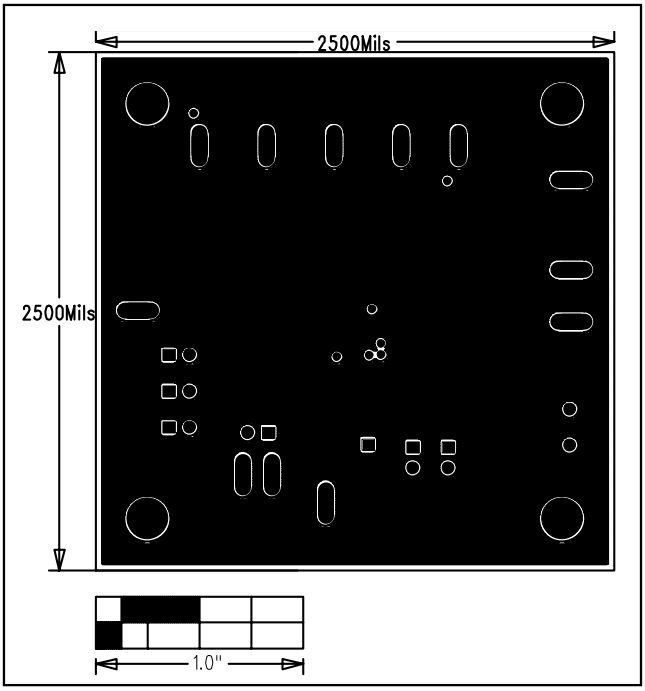

Figure 7. MAX8677A EV Kit PCB Layout—Solder Side