



MAX8751 评估板

评估板：MAX8751

概述

MAX8751 评估板是组装并经过测试的PC板，用于演示MAX8751低成本、多路CCFL背光控制器。灯管亮度可以通过板上分压器调节。

元件供应商

SUPPLIER	PHONE	WEBSITE
Central Semiconductor	631-435-1110	www.centrasemi.com
Diodes Incorporated	805-446-4800	www.diodes.com
Fairchild Semiconductor	888-522-5372	www.fairchildsemi.com
JST	847-473-1957	www.jst.com
Kemet	864-963-6300	www.kemet.com
Murata	770-436-1300	www.murata.com
Sumida	847-545-6700	www.sumida.com
TDK	847-803-6100	www.component.tdk.com
Vishay Semiconductor	402-564-3131	www.vishay.com

注：与上述供应商联系时请说明您正在使用的是MAX8751。

特性

- ◆ +8V至+24V输入范围
- ◆ 板上分压器调节亮度
- ◆ 10:1亮度调节范围
- ◆ 带有超时控制的灯管断开检测
- ◆ 带有超时控制的次级电流限制
- ◆ 可承受高达1.6kV的冲击电压
- ◆ 较高的电光转换效率
- ◆ 完全安装并经过测试

订购信息

PART	TEMP RANGE	IC PACKAGE
MAX8751EVKIT	0°C to +70°C	32 TQFN-EP*

*EP = 裸焊盘。

元件列表

DESIGNATION	QTY	DESCRIPTION
C1	1	22 μ F $\pm$ 20%, 25V X5R ceramic capacitor (1812) TDK C4532X5R1E226M
C2, C4, C6, C7, C18	5	0.1 μ F $\pm$ 10%, 25V X7R ceramic capacitors (0603) Kemet C0603C104K3RAC Murata GRM188R71E104K TDK C1608X7R1E104K
C3	1	1 μ F $\pm$ 10%, 10V X5R ceramic capacitor (0603) Kemet C0603C105K8RAC Murata GRM188R61A105K TDK C1608X5R1A105K
C5	1	0.22 μ F $\pm$ 10%, 16V X7R ceramic capacitor (0603) Kemet C0603C224K4RAC Murata GRM188R71C224K TDK C1608X7R1C224K

DESIGNATION	QTY	DESCRIPTION
C8, C19	2	0.01 μ F $\pm$ 10%, 50V X7R ceramic capacitors (0603) Kemet C0603C103K5RAC Murata GRM188R71H103K TDK C1608X7R1H103K
C9, C10	2	1000pF $\pm$ 10%, 50V ceramic capacitors (0603) Kemet C0603C102K5RAC Murata GRM188R71H102K TDK C1608X7R1H102K
C11, C12	2	12pF $\pm$ 10%, 3kV HV ceramic capacitors (1808) Kemet C1808C120KHGAC TDK C4520C0G3F120K
C13	0	Not installed (0603)
C14-C17	4	100pF $\pm$ 10%, 3kV HV ceramic capacitors (1808) Kemet C1808C101KHGAC TDK C4520C0G3F101K



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元件列表(续)

DESIGNATION	QTY	DESCRIPTION
C20	1	4.7μF ±10%, 25V X7R ceramic capacitor (1206) TDK C3216X7R1E475K
C23, C24	2	2.2μF ±10%, 25V X7R ceramic capacitors (1206) TDK C3216X7R1E225K
CN1–CN4	4	Shrouded headers for CCFL lamp connection, 3.5mm pin spacing, PC board mount JST SM02B-BHSS-1-TB
D1	1	Dual diode, common cathode, 1N4148-type, SOT23 Central Semiconductor CMPD2838 Fairchild Semiconductor MMBD4148CC
D2–D11	10	Diodes, 1N4148-type, SOD123 Central Semiconductor CMHD4448 Diodes Inc. 1N4148W Fairchild Semiconductor MMSD4148 Vishay Semiconductors 1N4148W
F1	1	Fuse, 3A, 32V (1206) Littelfuse 0466003 NR
J1	1	2 x 5 right-angle female receptacle
J2	1	2 x 5 right-angle header
JU1, JU3, JU4, JU5	4	3-pin headers
JU2, JU6, JU7	3	2-pin headers
JU8–JU12	0	Not installed
M1	1	2N7002 MOSFET, SOT23 Central Semiconductor 2N7002 Diodes Inc. 2N7002 Fairchild Semiconductor 2N7002
N1–N4	4	n-channel MOSFETs, 8-pin SO Fairchild Semiconductor FDS9412
Q1	1	2N3906-type pnp transistor, SOT23 Central Semiconductor CMPT3906 Diodes Inc. MMBT3906 Vishay Semiconductors MMBT3906
R1	1	10Ω ±5% resistor (0603)
R2	1	100kΩ ±1% resistor (0603)

DESIGNATION	QTY	DESCRIPTION
R3	1	150kΩ ±1% resistor (0603)
R4–R7	0	Not installed (0603)
R8	1	15Ω ±5% resistor (0603)
R9, R12, R13, R14	4	100kΩ ±5% resistors (0603)
R10	1	100kΩ potentiometer (multiturn), 3/8in square
R11	1	1kΩ ±5% resistor (0603)
R15	1	20kΩ ±5% resistor (0603)
R16, R17, R34	3	1MΩ ±5% resistors (0603)
R18, R19, R26–R29	6	10kΩ ±5% resistors (0603)
R20, R21	2	470kΩ ±5% resistors (0603)
R22–R25, R35–R38	8	510kΩ ±5% resistors (1206)
R30–R33, R40	5	3.0kΩ ±5% resistors (0603)
R39	1	27kΩ ±5% resistor (0603)
T1, T2	2	CCFL transformers, 1980:18 Sumida 1348-T009 (CEPH249 style)
T3, T4, T5	3	Current balancing transformers, 1:1 Sumida P05NZ-054
U1	1	MAX8751ETJ (32-pin thin QFN, 5mm x 5mm)
—	1	PC board MAX8751 evaluation kit
—	6	Shunts

快速入门

推荐设备

在开始测试前，您需要以下设备：

- +8V 至 +24V、5A 直流电源，为MAX8751评估板供电
- 符合下列规格的四只CCFL灯：
 - a) 最大RMS冲击电压 ≤ 1.6kV
 - b) RMS灯电流 ≤ 6mA
 - c) 输入功率 ≤ 4W

警告! 评估板工作在高压下。在连线和加电时，必须按照高压电气设备的操作规范和安全流程谨慎操作。

在没有完成所有的连接之前，严禁打开电源。

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步骤

- 1) 将灯连接到连接器CN1–CN4。
- 2) 将+8V至+24V电源接至MAX8751评估板的VIN和GND焊盘。
- 3) 打开电源。

从器件模式

在JU2上放置短路器，以便在使用菊花链方式时使能从器件工作模式。详细资料请参考菊花链配置部分。跳线设置请参考表2。

关断

在JU3 2-3上安装短路器使MAX8751进入关断模式。跳线设置请参考表2。

详细说明

亮度

灯管亮度由分压器R10调节。

相移(PS1和PS2)

跳线JU4和JU5可配置采用菊花链方式连接的5片MAX8751的相移。相移设置请参考表1。

亮度控制选择输入

跳线JU1将亮度控制选择输入(SEL引脚)连接至VCC或GND。SEL接VCC时(JU1 = 1-2)，由外部同步信号调节亮度；SEL接GND时(JU1 = 2-3)，使能模拟控制，亮度通过CNTL引脚上的模拟电压调节。跳线设置请参考表2。

HSYNC

主开关频率同步输入，开关频率可与HSYNC外部信号同步。更多信息请参考MAX8751 IC数据资料。在JU6上放置短路器，禁止HSYNC功能。跳线设置请参考表2。

表 1. 相移

PIN SETTINGS		PHASE SHIFT IN DEGREES				
JU4 (PS1)	JU5 (PS2)	MASTER	SLAVE 1	SLAVE 2	SLAVE 3	SLAVE 4
2-3 (GND)*	2-3 (GND)*	0	180	—	—	—
1-2 (VCC)	2-3 (GND)	0	120	240	—	—
2-3 (GND)	1-2 (VCC)	0	90	180	270	—
1-2 (VCC)	1-2 (VCC)	0	72	144	216	288

*默认位置。

表 2. 跳线选择

JUMPER	SHUNT LOCATION	FUNCTION
JU1	1-2	An external sync signal controls the brightness.
	2-3*	An analog voltage on the CNTL pin controls the brightness.
JU2	Not installed*	Configures the MAX8751 for master operation.
	Installed	Configures the MAX8751 for slave operation.
JU3	1-2*	Enables the MAX8751.
	2-3	Disables the MAX8751.
	Not installed	Drive pad $\overline{\text{SHDN}}$ with an external logic signal.
JU4	—	Phase-shift select input 1 (PS1). See the phase shift table (Table 1).
JU5	—	Phase-shift select input 2 (PS2). See the phase shift table (Table 1).
JU6	Not installed	The switching frequency synchronizes to an external signal applied to HSYNC.
	Installed*	Disables the HSYNC feature.
JU7	Not installed	The DPWM frequency synchronizes to an external signal applied to LSYNC.
	Installed*	Disables the LSYNC feature.

*默认位置。

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LSYNC

DPWM同步输入，DPWM频率可与LSYNC外部信号同步。更多信息请参考MAX8751 IC数据资料。在JU7放置短路器，禁止LSYNC功能。跳线设置请参考表2。

表3. 菊花链连接

LOCATION IN DAISY CHAIN	CONNECTOR	CONNECTION
Master	J1	Not connected.
	J2	Connect to J1 of slave 1.
Slave 1	J1	Connect to J2 of master.
	J2	Connect to J1 of slave 2.
Slave 2	J1	Connect to J2 of slave 1.
	J2	Connect to J1 of slave 3.
Slave 3	J1	Connect to J2 of slave 2.
	J2	Connect to J1 of slave 4.
Slave 4	J1	Connect to J2 of slave 3.
	J2	Not connected.

菊花链配置

可将5块MAX8751评估板按照菊花链方式连接到一起。将从机1的J1连接到主机的J2。菊花链连接和跳线配置请参考表3和表4。

表4. 主/从跳线配置

MASTER		SLAVE	
JUMPER	SHUNT LOCATION	JUMPER	SHUNT LOCATION
JU1	User defined	JU1	2-3
JU2	Not installed	JU2	Installed
JU3	2-3	JU3	Not installed
JU4	See Table 1	JU4	Same setting as master
JU5	See Table 1	JU5	Same setting as master
JU6	User defined	JU6	Installed
JU7	User defined	JU7	Installed

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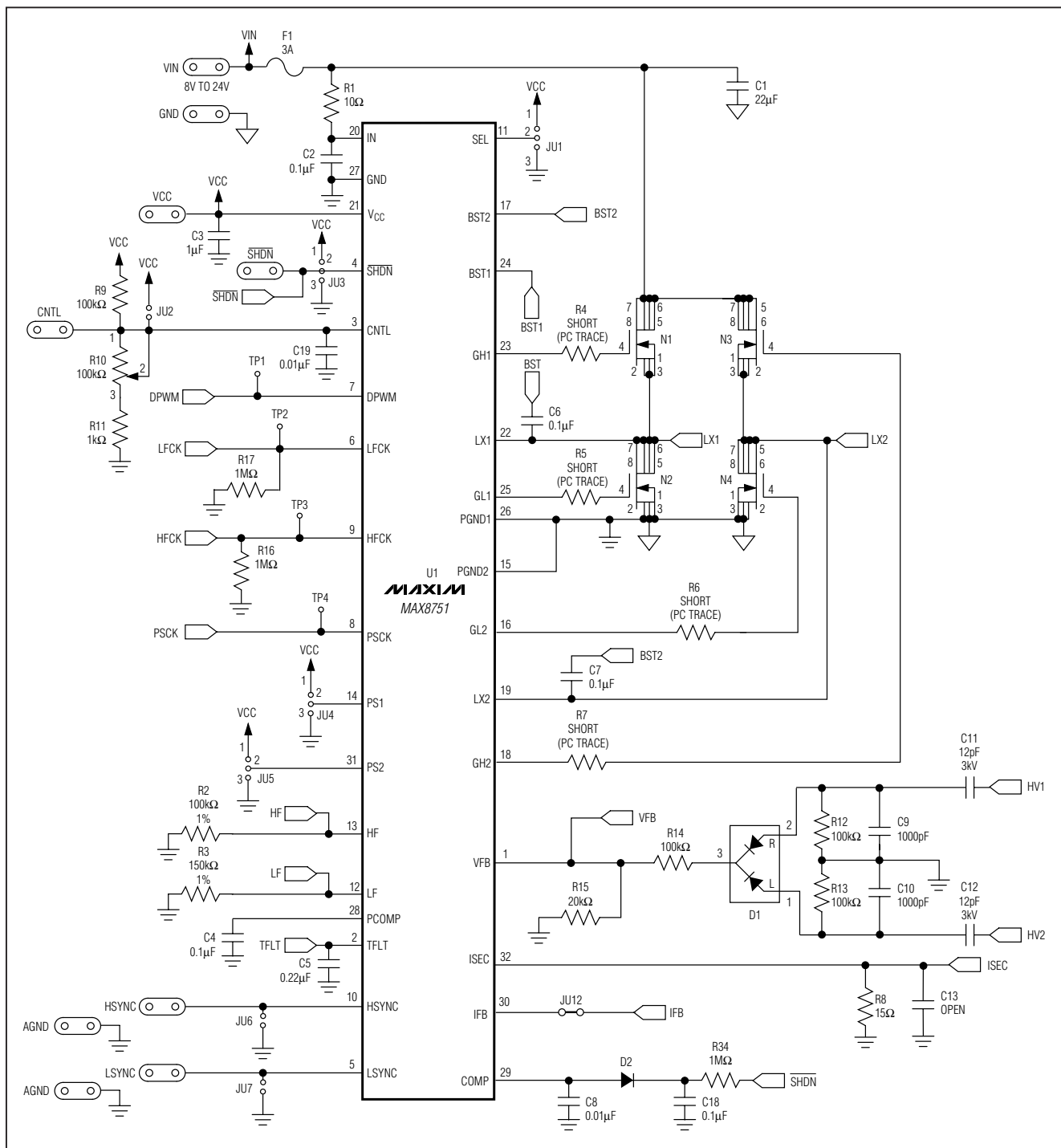
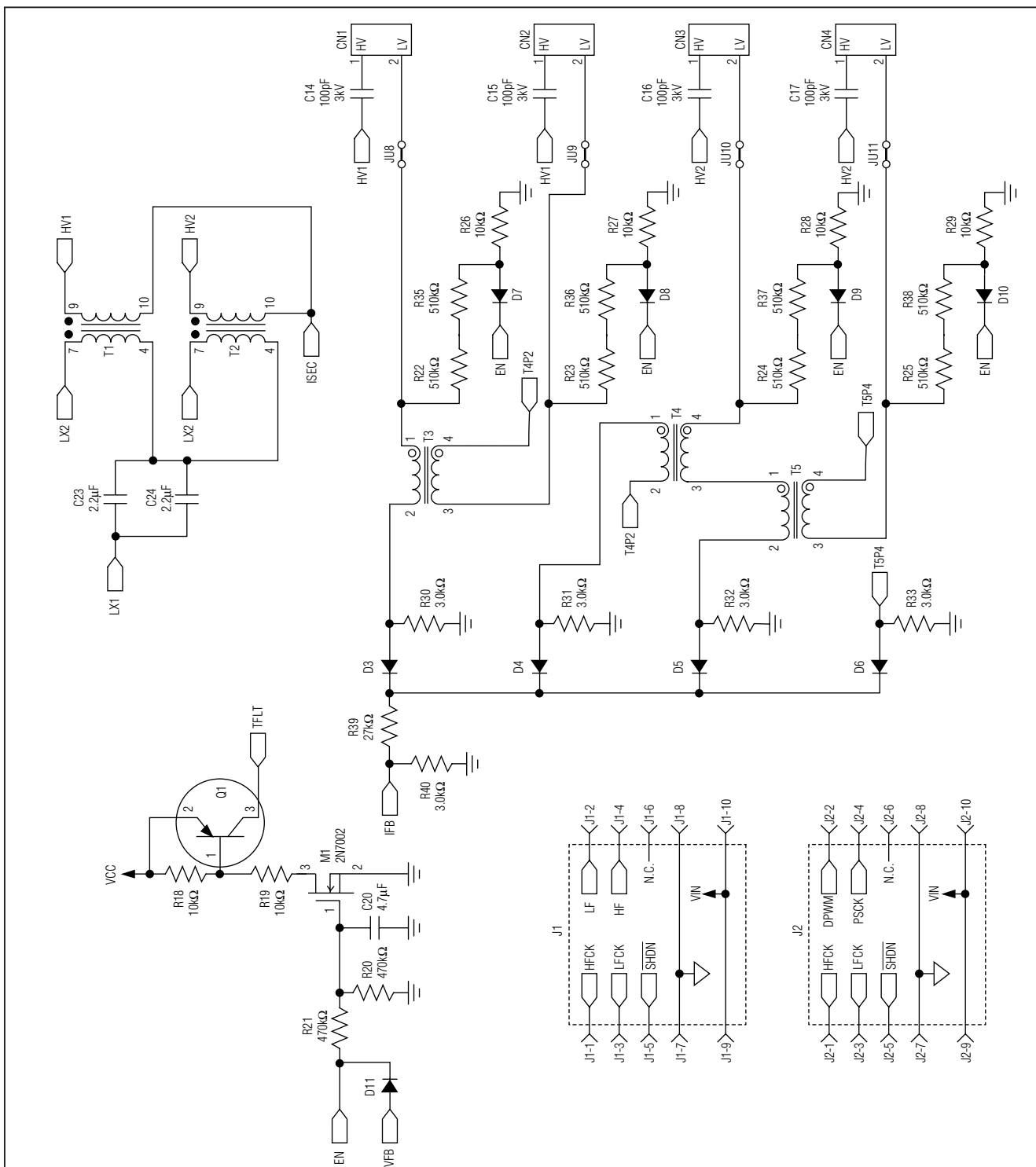


图1. MAX8751 评估板原理图

评估板: MAX8751



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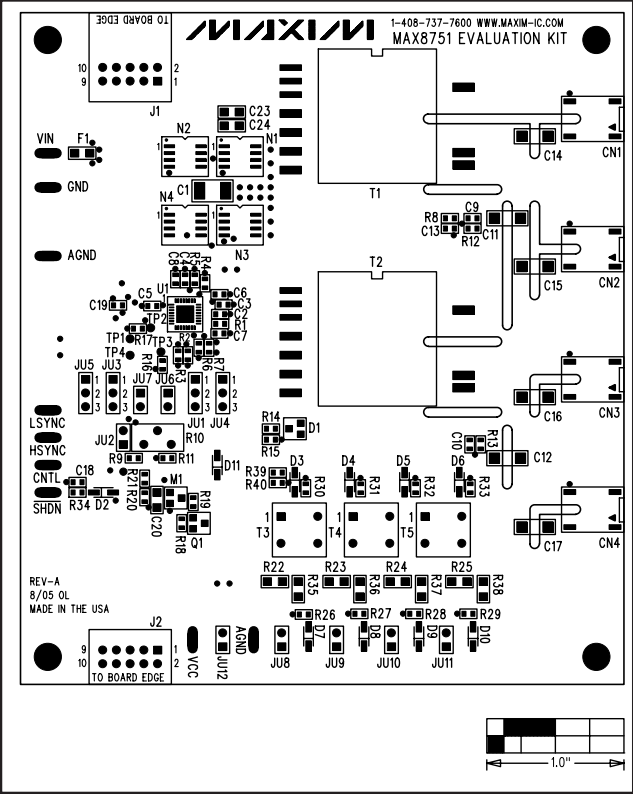


图2. MAX8751评估板元件布局—元件

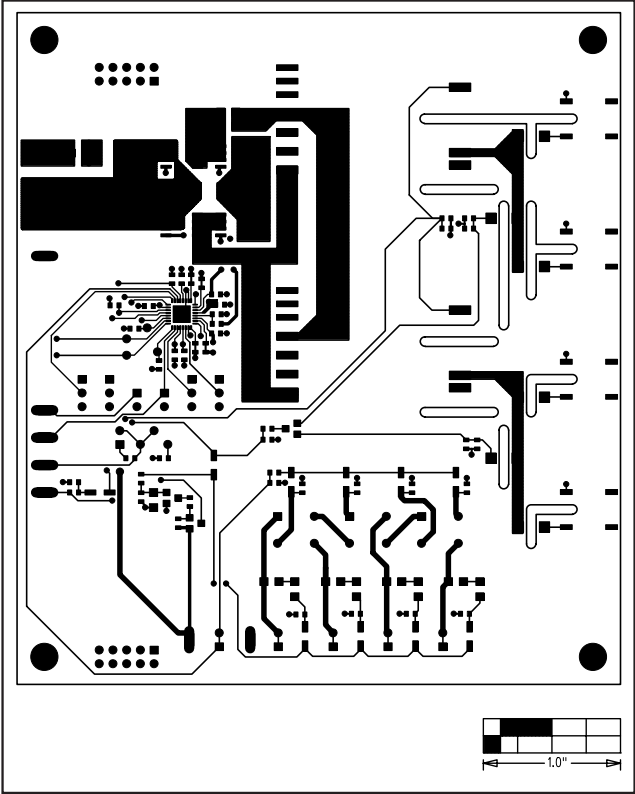


图3. MAX8751评估板PC板布局—元件层

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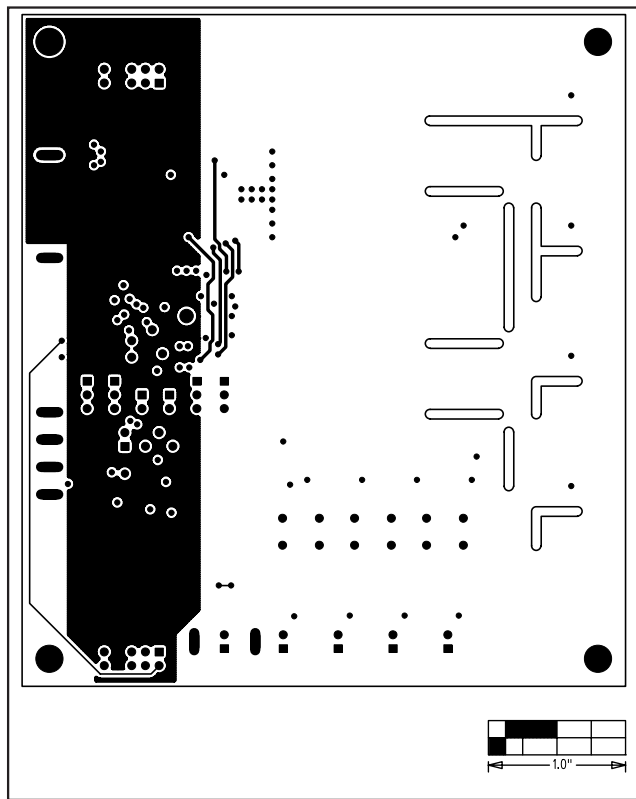


图4. MAX8751 评估板PC板布局—第2层

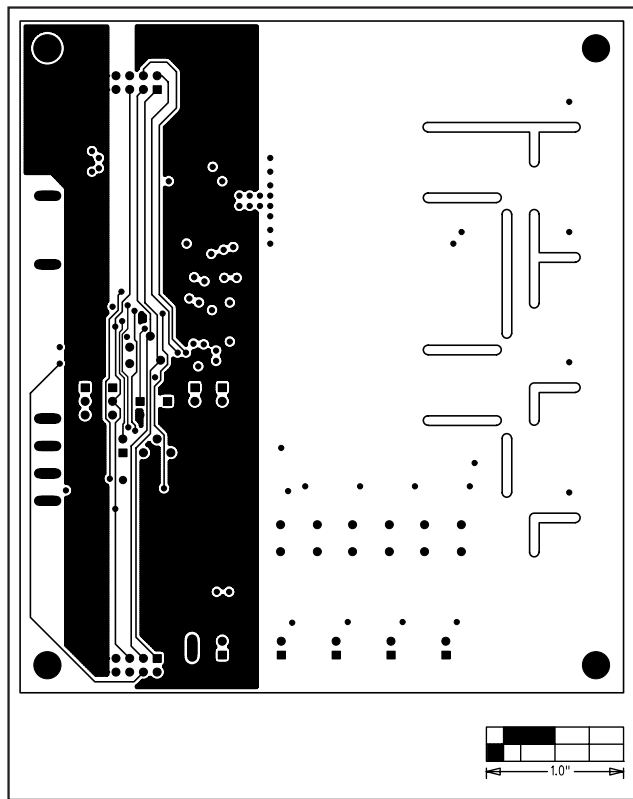


图5. MAX8751 评估板PC板布局—第3层

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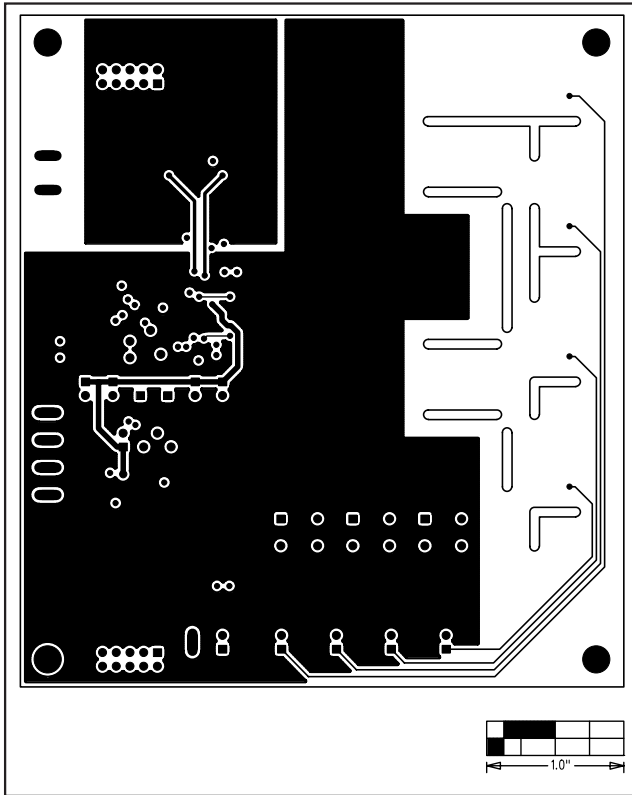


图6. MAX8751 评估板PC板布局—焊接层

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