19-3933; Rev 0; 1/06

MAX8729评估板

评估板：MAX8729

概述

MAX8729评估板 (EV kit) 是装配好并经过测试的印刷电路板，用于演示低成本、多灯管CCFL背光控制器MAX8729的性能。可通过板上电位器调节灯的亮度。

特性

- +8V至+24V输入范围
- 通过板上电位器调节亮度
- 10:1亮度调节范围
- 带超时的灯移除检测
- 带超时的次级限流
- 启辉电压高达1.6kV
- 高转换效率
- 完全安装并经过测试

元件供应商

SUPPLIER	PHONE	WEBSITE
Central Semiconductor	631-435-1110	www.centralsemi.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：与这些制造商联系时，请指明您在使用MAX8729。

定购信息

PART	TEMP RANGE	IC PACKAGE
MAX8729EVKIT	0°C to +70°C	28 QSOP

元件列表

DESIGNATION	QTY	DESCRIPTION
C1	1	22µF ±20%, 25V X5R ceramic capacitor (1812) TDK C4532X5R1E226M
C2, C3	2	2.2µF ±10%, 25V X7R ceramic capacitors (1206) TDK C3216X7R1E225K
C4, C6, C11	3	0.1µF ±10%, 25V X7R ceramic capacitors (0603) Kemet C0603C104K3RAC Murata GRM188R71E104K TDK C1608X7R1E104K
C5, C8	2	1µF ±10%, 10V X5R ceramic capacitors (0603) Kemet C0603C105K8RAC Murata GRM188R61A105K TDK C1608X5R1A105K
C7, C9	2	0.22µF ±10%, 16V X7R ceramic capacitors (0603) Kemet C0603C224K4RAC Murata GRM188R71C224K TDK C1608X7R1C224K
C10, C19	2	0.01µF ±10%, 50V X7R ceramic capacitors (0603) Kemet C0603C103K5RAC Murata GRM188R71H103K TDK C1608X7R1H103K
C12, C23	2	12pF ±10%, 3kV HV ceramic capacitors (1808) Kemet C1808C120KHGAC TDK C4520C0G3F120K
C13, C22	2	1000pF ±10%, 50V ceramic capacitors (0603) Kemet C0603C102K5RAC Murata GRM188R71H102K TDK C1608X7R1H102K

元件列表 (续)

DESIGNATION	QTY	DESCRIPTION
C14–C17	4	100pF ±10%, 3kV HV ceramic capacitors (1808) Kemet C1808C101KHGAC TDK C4520C0G3F101K
C18	1	4.7µF ±10%, 25V X7R ceramic capacitor (1206) TDK C3216X7R1E475K
CN1–CN4	4	Shrouded headers for CCFL lamp connection, 3.5mm pin spacing, PC board mount JST SM02B-BHSS-1-TB
D1, D2	2	Schottky diodes, 3A, 40V, SMA Central Semiconductor CMSH3-40MA Diodes Incorporated B340A Vishay Semiconductors B340A
D3–D12	10	Diodes, 1N4148-type, SOD-123 Central Semiconductor CMHD4448 Diodes Incorporated 1N4148W Fairchild Semiconductor MMSD4148 Vishay Semiconductors 1N4148W
D16	1	Dual diode, common cathode, 1N4148-type, SOT23 Central Semiconductor CMPD2838 Fairchild Semiconductor MMBD4148CC
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		2N7002 MOSFET, SOT23 Central Semiconductor 2N7002 Diodes Incorporated 2N7002 Fairchild Semiconductor 2N7002
N1, N2	2	n-channel MOSFETs (SO8) Fairchild Semiconductor FDS9412
Q1	1	2N3906-type pnp transistor, SOT23 Central Semiconductor CMPT3906 Diodes Incorporated MMBT3906 Vishay Semiconductors MMBT3906
R1, R4, R5	0	Not installed (0603)
R2	1	100kΩ ±1% resistor (0603)
R3	1	150kΩ ±1% resistor (0603)
R6	1	15Ω ±5% resistor (0603)
R7–R10, R35–R38	8	510kΩ ±5% resistors (1206)
R11–R14, R19, R20	6	10kΩ ±5% resistors (0603)
R15–R18, R29	5	3.0kΩ ±5% resistors (0603)
R21, R22	2	470kΩ ±5% resistors (0603)
R23, R24, R25	3	1MΩ ±5% resistors (0603)
R26, R30, R33, R34	4	100kΩ ±5% resistors (0603)
R27	1	20kΩ ±5% resistor (0603)
R28	1	27kΩ ±5% resistor (0603)
R31	1	100kΩ potentiometer (multiturn), 3/8in square
R32	1	1kΩ ±5% resistor (0603)
T1, T2	2	CCFL transformers, 2000:11 Sumida 1348-T006 (CEPH249 style)
T3, T4, T5	3	Current balancing transformers, 1:1 Sumida P05NZ-054
U1	1	MAX8729EEI (28 QSOP)
—	1	PC board, MAX8729 EV kit
—	6	Shunts

快速入门

推荐设备

开始之前，你需要准备以下设备：

- +8V至+24V，5A直流电源，为MAX8729电路板供电。
- 四只具有以下规格的CCFL灯：

  最大RMS启辉电压 ≤ 1.6kV
  RMS灯电流 ≤ 6mA
  输入功率 ≤ 4W

警告！该评估板上存在高电压。进行连接和上电时要特别小心。

在完成所有连接之前，不要打开电源。

步骤

1) 将灯与连接器CN1–CN4相连。
2) 将+8V至+24V电源与MAX8729评估板的VIN和GND焊盘相连。
3) 打开电源。

详细说明

亮度

使用电位器R31调节灯的亮度。

亮度控制选择输入

利用跳线JU1，可将亮度控制选择输入 (SEL引脚) 与VCC或GND相连。SEL接VCC时 (JU1 = 1-2) 选择外部同步信号来控制亮度。SEL接GND时 (JU1 = 2-3) 选择加在CNTL引脚上的模拟电压来控制亮度。跳线设置见表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

**缺省位置。*

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 MAX8729 for master operation.
	Installed	Configures the MAX8729 for slave operation.
JU3	1-2*	Enables the MAX8729.
	2-3	Disables the MAX8729.
	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.

**缺省位置。*

从工作模式

当采用菊花链配置方式时，在JU2上放置短路器使能从工作模式。更多信息见*菊花链配置*一节。跳线设置参见表2。

关断

在JU3的2-3位置安装短路器，可将MAX8729置为关断模式。跳线设置见表2。

相移 (PS1和PS2)

跳线JU4和JU5用于设置相移，最多支持5个MAX8729进行菊花链连接。相移设置见表1。

HSYNC

主开关频率同步输入。开关频率与加到HSYNC上的外部信号同步。更多信息请参考MAX8729 IC的数据资料。在JU6上安装短路器时禁用HSYNC功能。跳线设置见表2。

LSYNC

DPWM同步输入。DPWM频率与加到LSYNC上的外部信号同步。更多信息请参考MAX8729 IC的数据资料。在JU7上安装短路器时禁用LSYNC功能。跳线设置见表2。

菊花链配置

多达5个MAX8729评估板可以按菊花链方式连接在一起。从器件1的J1接主器件的J2。菊花链连接和跳线配置见表3和表4。

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.

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

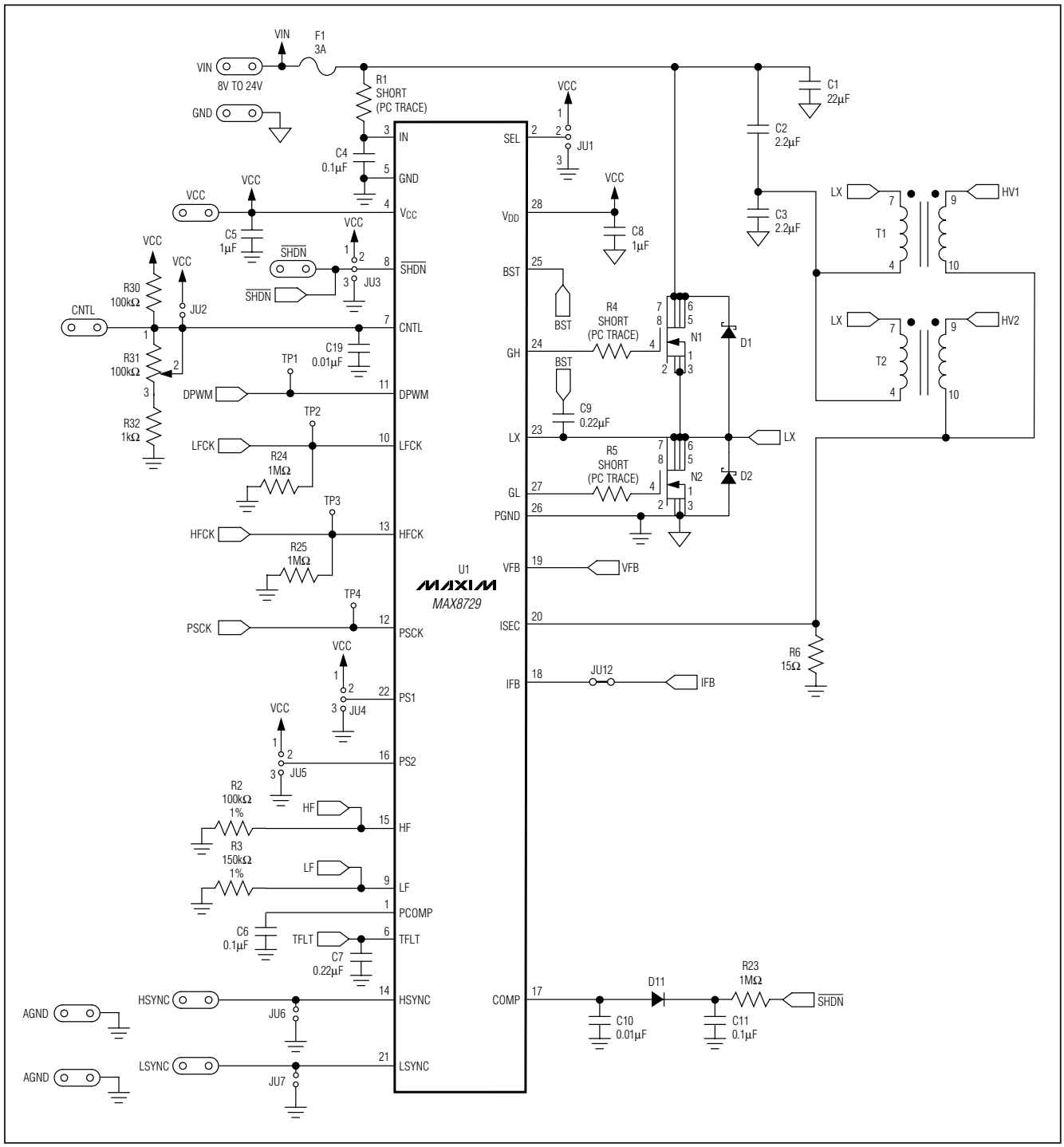

图1. MAX8729评估板电路原理图

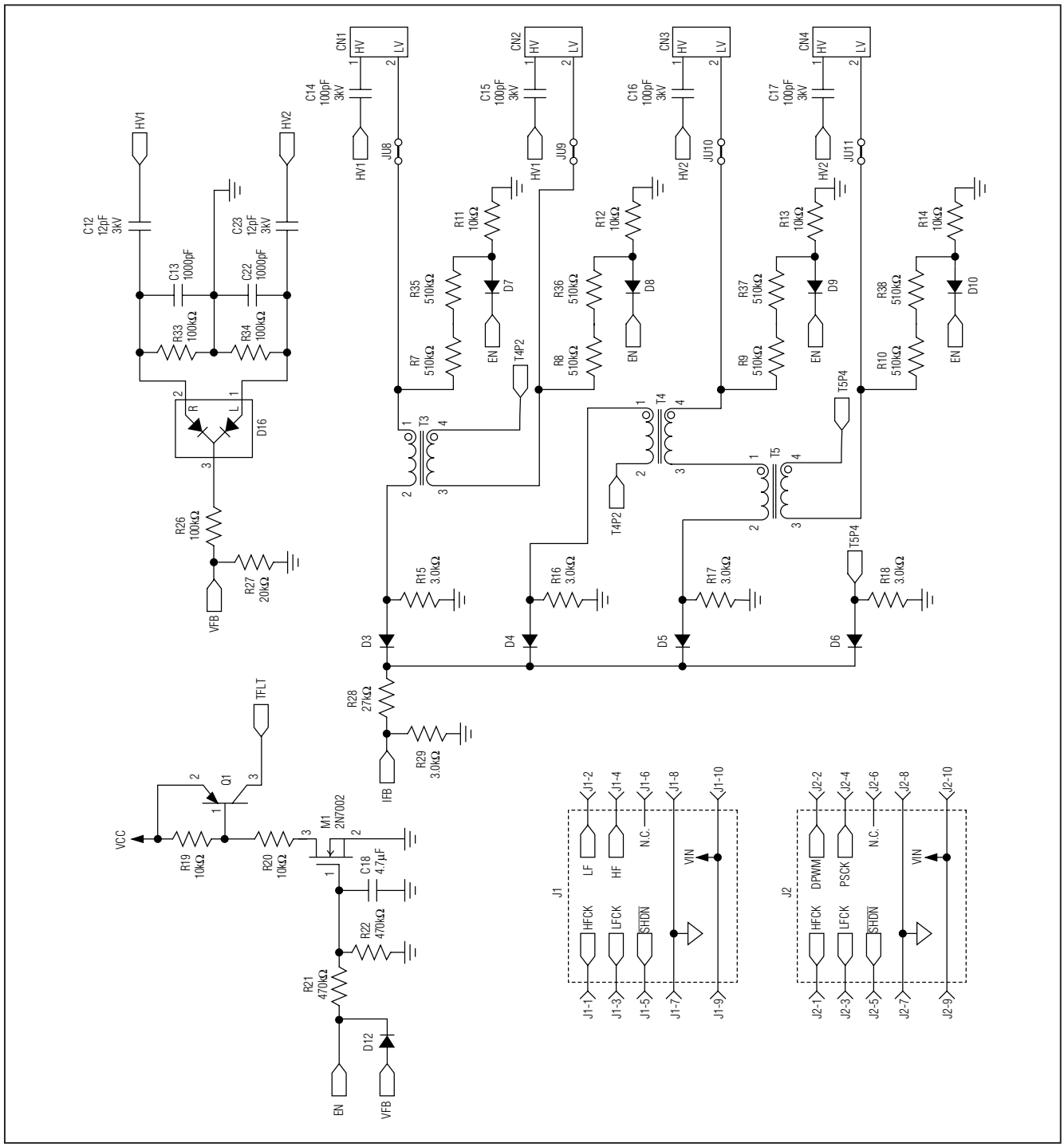

图2. MAX8729评估板原理图—高压部分

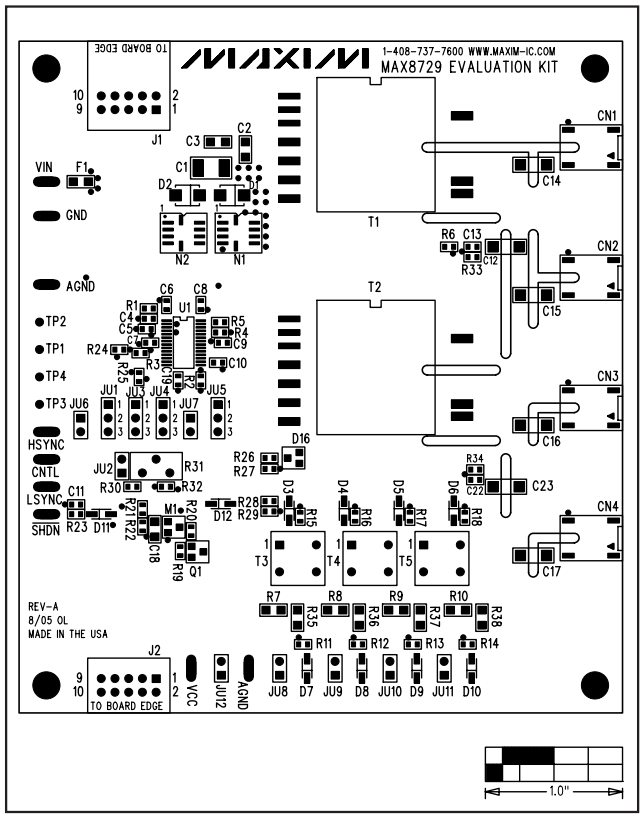

图3. MAX8729评估板元件布局—元件层

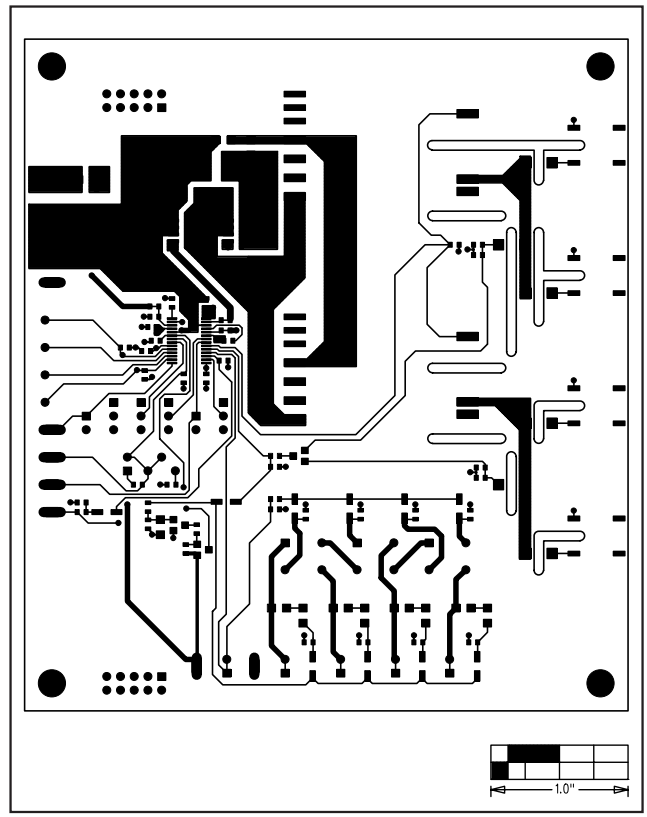

图4. MAX8729评估板PC板布局—元件层

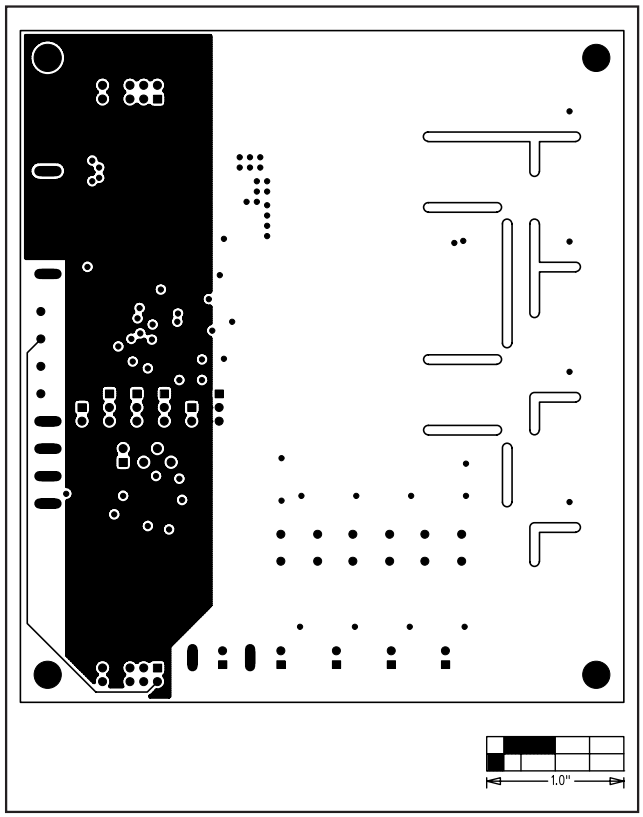

图5. MAX8729评估板PC板布局—第2层

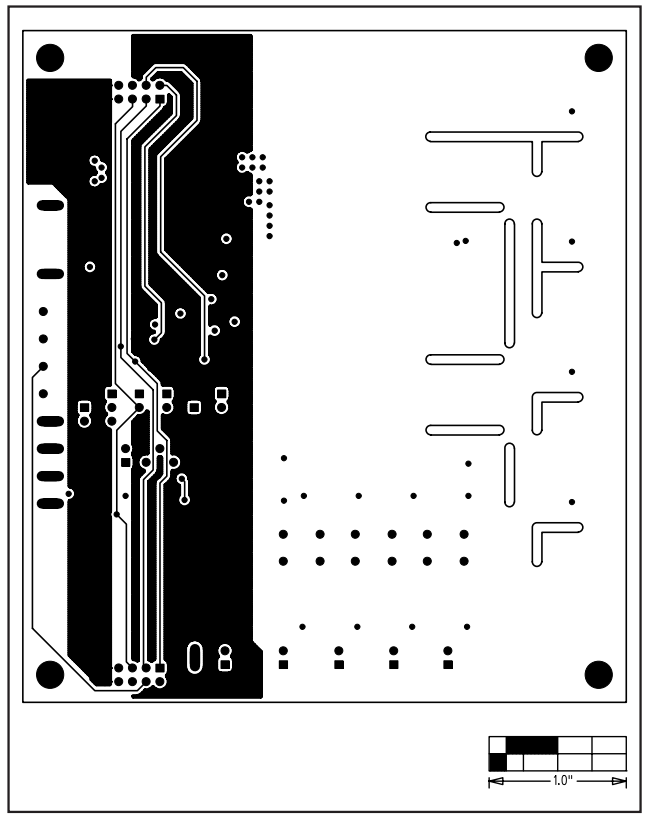

图6. MAX8729评估板PC板布局—第3层

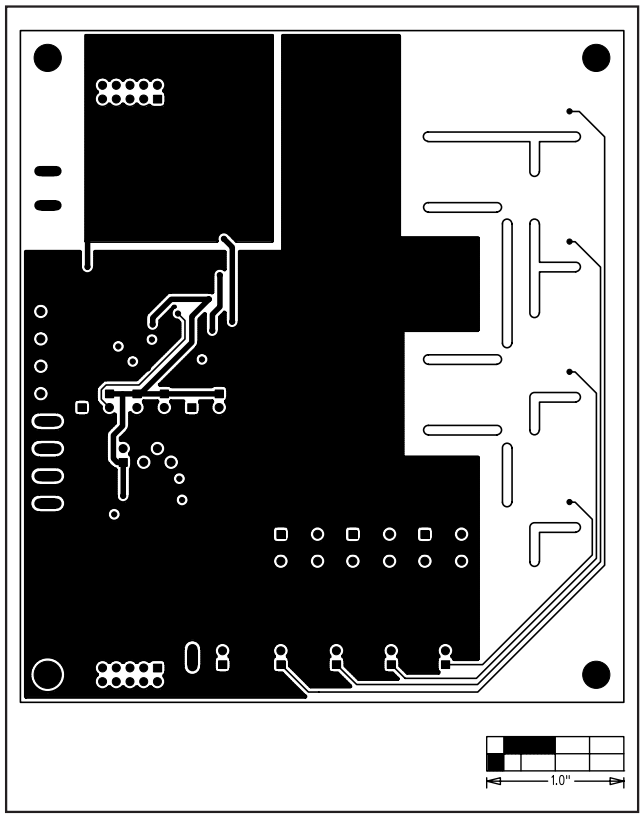

图7. MAX8729评估板PC板布局—焊接层

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