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MAX3845/MAX4814E评估板

评估板：MAX3845/MAX4814E

概述

MAX3845/MAX4814E评估板(EV kit)是一块安装好的演示板，可对MAX3845 DVI™/HDMI™ 2:4 TMDS®扇出/缓冲器和MAX4814E 2:4低频开关进行评估。输入和输出通过Molex DVI和HDMI连接器直接连接到DVI和HDMI电缆。

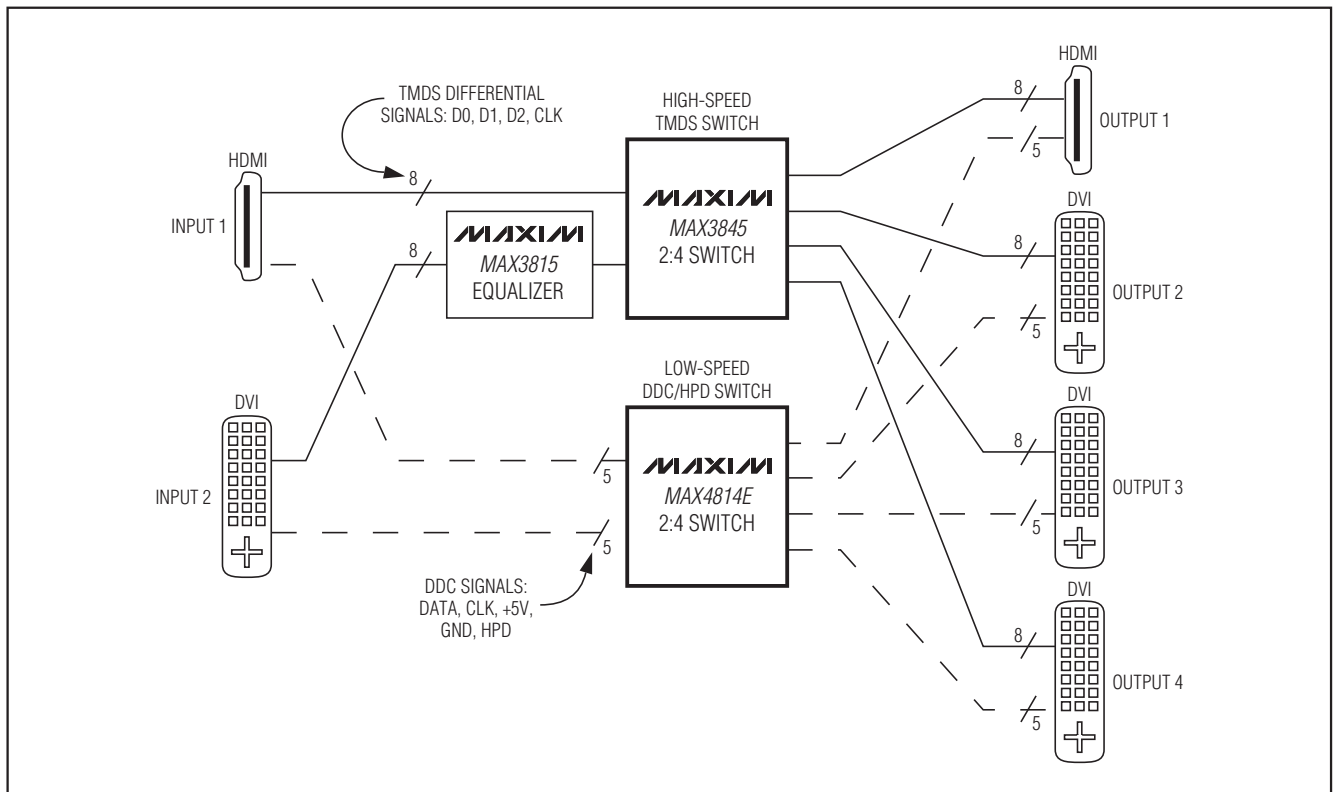AC-DC墙上电源适配器为评估板供电。电路板提供DC-DC转换电路，使+3.3V供电的MAX3845可以工作在+5V墙上直流电源适配器。

定购信息

PART	TYPE
MAX3845/4814EEVKIT	EV Kit

特性

♦ 4路输出扇出

♦ 独立的DDC可为每路输入选择任一路输出，输入1优先

♦ DVI-I和HDMI连接器

♦ 支持全高清1080p和1920 x 1200分辨率

♦ 输入2包含MAX3815，可将电缆延长至60米

♦ 每路输出可独立选择预加重电平

♦ 所有TMDS I/O都具有15kV HBM ESD保护

♦ 墙上电源适配器供电

♦ 完全安装并经过测试

方框图

DVI是Digital Display Working Group的商标。
HDMI是HDMI Licensing, LLC的商标。
TMDS是Silicon Image, Inc.的注册商标。

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_____ 元件列表

DESIGNATION	QTY	DESCRIPTION
C1–C8, C13	9	0.01µF ±10% ceramic capacitors (0402)
C9	1	0.47µF ±10% ceramic capacitor (0402)
C10	1	1000pF ±10% ceramic capacitor (0402)
C11, C24	2	22µF ±10% ceramic capacitors (1206)
C12	1	10µF ±10% ceramic capacitor (1206)
C14–C23, C25–C35	21	0.1µF ±10% ceramic capacitors (0402)
D3–D6	4	LEDs, dual color
D7–D10	4	Switching diodes
D11	1	LED red
J1, J3	2	HDMI connectors
J2, J4, J5, J6	4	DVI connectors
J9	1	Power jack, 2.1mm
JU1, JU2	2	1 x 2 pin headers (0.1in centers)
JU3	1	1 x 3 pin header (0.1in center)
L1	1	3.3µH inductor Coilcraft MSS5131-332MX
L2	1	Ferrite bead Murata BLM18EG601
Q1	1	PNP transistor Zetex FMMT591A
R1–R16, R34	17	200Ω ±5% resistors (0402)
R17–R20	4	47.5kΩ ±1% resistors (0402)
R21–R24, R47	5	100Ω ±5% resistors (0402)
R29, R30, R32, R33, R35, R36, R44, R45	8	121Ω ±1% resistors (0402)

DESIGNATION	QTY	DESCRIPTION
R31, R37, R38, R46, R51, R54–R59, R62	12	4.7kΩ ±5% resistors (0402)
R39, R40, R43, R48, R63, R64	6	10kΩ ±5% resistors (0402)
R49	1	2.21kΩ ±1% resistor (0402)
R50	1	1kΩ potentiometer
R60	1	0Ω resistor (0402)
R61	1	OPEN
S1–S8	8	SP3T switches
S9, S10	2	BCD dial switches
SW1–SW4, SW13, SW14, SW19, SW20	8	SPDT switches
TP1–TP10	10	Test points
U1	1	MAX3845UCQ+
U2, U3, U5–U9, U11, U19, U22, U28, U29	12	MAX3208EAUB+
U4	1	74ACT32P
U10	1	MAX1556ETB+
U12	1	MAX3815CCM+
U15–U18	4	Dual BJT transistors Zetex ZXTD6717E6
U20	1	MAX4814EECB+
U24	1	MAX6346XR46+T
None	4	Bumpers
None	3	Shunts
None	1	Wall-plug transformer, 120V AC to 5V DC
None	1	PCB: MAX3845 Board, Rev D

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快速入门

在评估MAX3845和MAX4814E时，请按照以下说明配置评估板：

1) 确认跳线JU1和JU2配置为使用墙式电源。将跳线JU3底部的两个引脚短路，从而利用BCD开关S9和S10直接控制MAX4814E。

2) 将电源插入120V交流插孔，并将另一端插入J9，输出LED指示灯应该点亮。如果MAX3815已上电(开关SW20置于ON位置)，时钟丢失LED指示灯(D11)被点亮，且为红色。

3) 由于电路板在默认配置下安装了背向端接电阻，故将OUTPUT LEVEL开关(SW13)置为HIGH，即使在安装背向端接电阻的情况下也能将输出摆幅建立在标称HDMI/DVI的信号范围。

4) 将DVI/HDMI源出和吸收端连接到评估板的输入和输出。当带电设备连接到输出时，LED指示灯点亮，且为绿色，这是由于在HOTPLUG处检测到+5V信号。

   注：评估板的DVI连接器允许通过单路或双路DVI电缆连接DVI-D (数字)和DVI-I (数字与模拟)连接器，但只有数字单路视频能够通过评估板。

5) 如果采用较长的DVI电缆连接信号源，请将其连接到INPUT 2。该输入有一片MAX3815视频均衡器，能够补偿长电缆的高频损耗。

6) 如果信号源连接到INPUT 2，请确保将SW20置于ON位置，将SW19置于AUTO位置，为MAX3815上电。

7) 利用S9和S10旋转开关选择DDC信号路由。开关S9选择输入1的DDC信号，开关S10选择输入2的DDC信号。

   注：INPUT 1的DDC信号优先，如果INPUT 1和INPUT 2被连接到同一输出，将断开INPUT 2的DDC连接。

8) 利用输入选择开关(S2、S4、S5和S7)选择要求出现在第1路至第4路输出的输入信号。

9) 利用预加重开关(S1、S3、S6和S8)选择每一路输出的预加重值(0dB、3dB和6dB)。

如果希望手动控制MAX3815视频均衡器，请将开关SW19置于MANUAL位置。如果需要增大均衡量(长电缆)，请沿顺时针方向旋转R50；如需减小均衡量(短电缆)，请按逆时针方向旋转R50。注意，在手动调节均衡时，所有三路TMDS数据通道都被置为相同的均衡量。

ESD保护

MAX3845的所有引脚上具有2kV的ESD保护。如果需要更高的ESD保护，可以选择MAX3208E为DVI和HDMI接口提供15kV的ESD保护。该器件的设计能够为差分线路提供保护，同时还能够保持低电容，使其对信号传输的影响最小。

评估板包括12片MAX3208E，可保护所有TMDS I/O连接。如需样品，请通过网站www.maxim-ic.com.cn/samples，或拨打电话(10) 6211-5199联系Maxim样品中心。

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表1. 调整和控制说明(请首先参考快速入门部分)

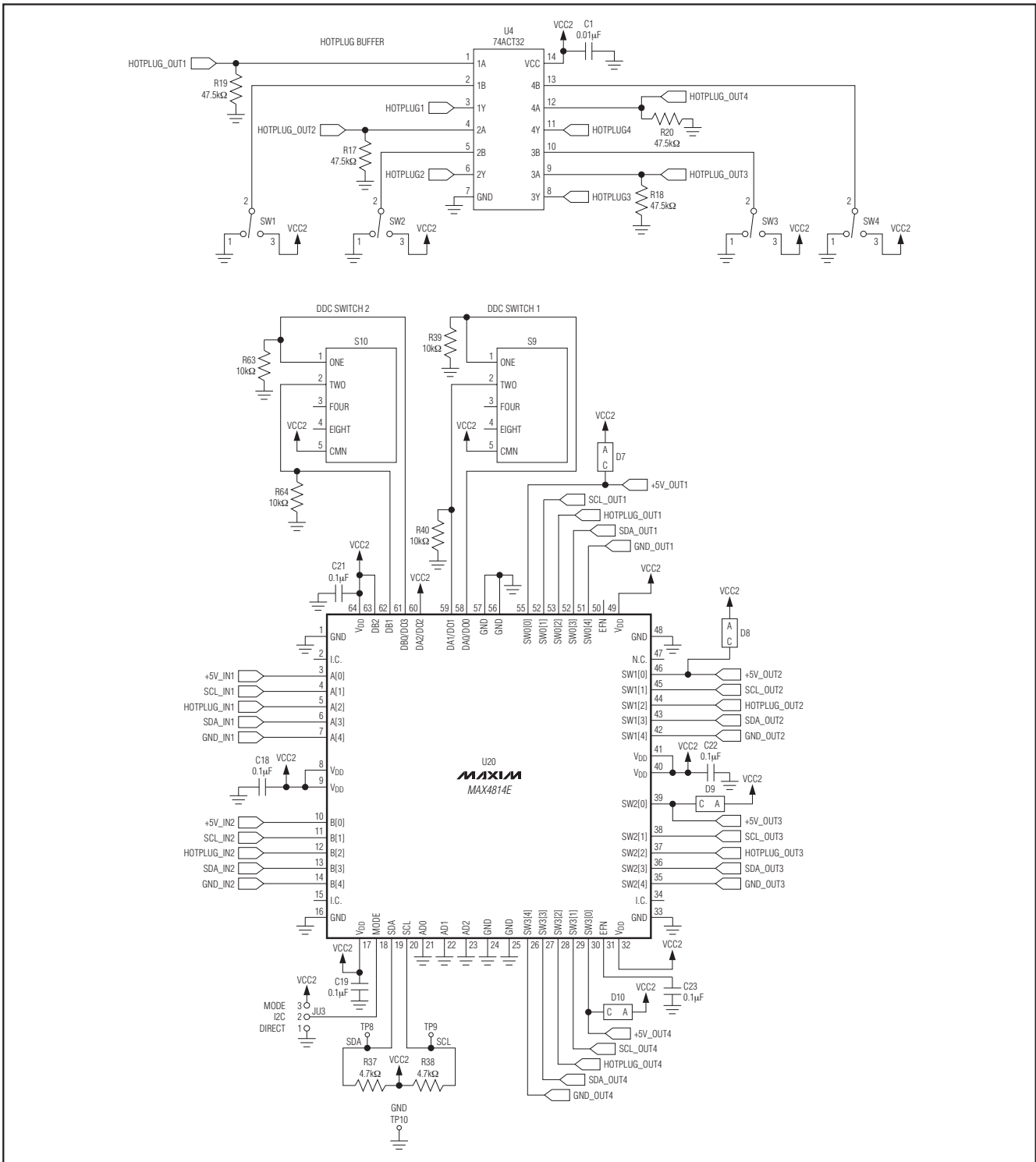| COMPONENT	NAME	FUNCTION
JU3	MODE	Short the bottom two pins of JU3 to control the MAX4814E using the rotary switches S9 and S10. Short the top two pins to control the MAX4814E through I^{2}C using TP8 (SDA) and TP9 (SCL).
R50	EQ ADJ	When manual control of the equalizer has been selected using SW19, the level of equalization on the MAX3815 is controlled by R50.
S1, S3, S6, S8	PREEMPHASIS	These switches are used to set the level of preemphasis on the MAX3845's output drivers (0dB, 3dB, or 6dB).
S2, S4, S5, S7	INPUT SELECT	These switches are used to select which input signal appears for each output. The middle position powers down the output.
S9, S10	DDC SWITCHING	These rotary switches are used to connect the DDC signals (SDA, SCL, HOTPLUG, and +5V) from one input to one output.
SW1–SW4	HOTPLUG DETECTION	These switches allow the HOTPLUG signals from the DVI sinks to power up and power down the MAX3845 outputs. To force operation of an output regardless of the HOTPLUG signal, slide the switch down.
SW13	OUTPUT LEVEL	This switch sets all the MAX3845's outputs to increased current drive (HIGH) or normal current drive (LOW). The increased current drive setting allows for 200Ω back termination resistors to be used (installed as default on the board).
SW14	POWER DOWN	This switch powers down input 1 when slid down. Note that any output selected to that input would be powered down as well. The PWRDWN_2 pin is controlled by the loss-of-clock circuit on the MAX3815. If the MAX3815 detects a signal at its RXC_IN input, it powers up input 2 of the MAX3845. If no clock signal is detected, it powers down input 2.
SW19	EQ MODE	Slide the switch up to manually control the level of equalization of the MAX3815. Slide it down to have the MAX3815 automatically control the level of equalization.
SW20	MAX3815 POWER DOWN	This switch powers down the MAX3815 when slid down.
TP2	TEMP SENSE	When the MAX3845 is powered up, the die junction temperature can be estimated by measuring the voltage on TP2 relative to GND. For more information, refer to the MAX3845 data sheet.
TP8	SDA	Connect an I^{2}C source to TP8 (SDA) and TP9 (SCL) to control the MAX4814E.
TP9	SCL	

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图1. MAX3845/MAX4814E评估板原理图(1/2)
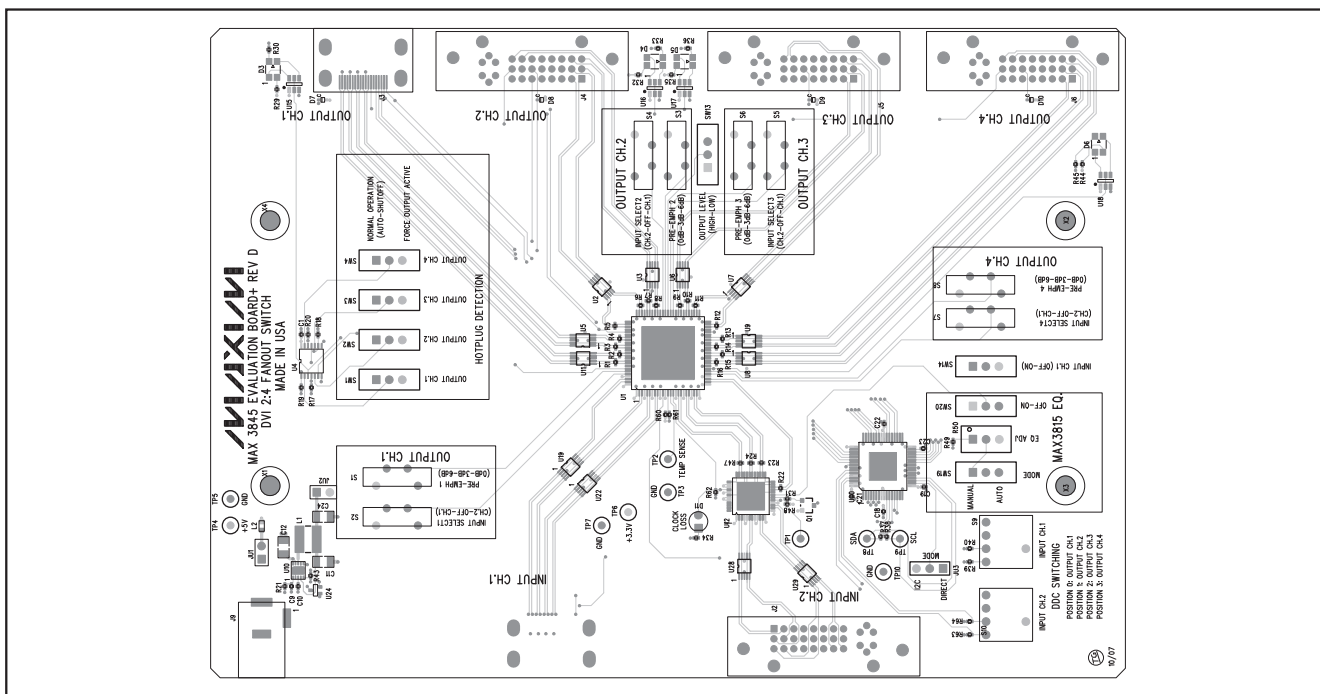
MAX3845/MAX4814E评估板

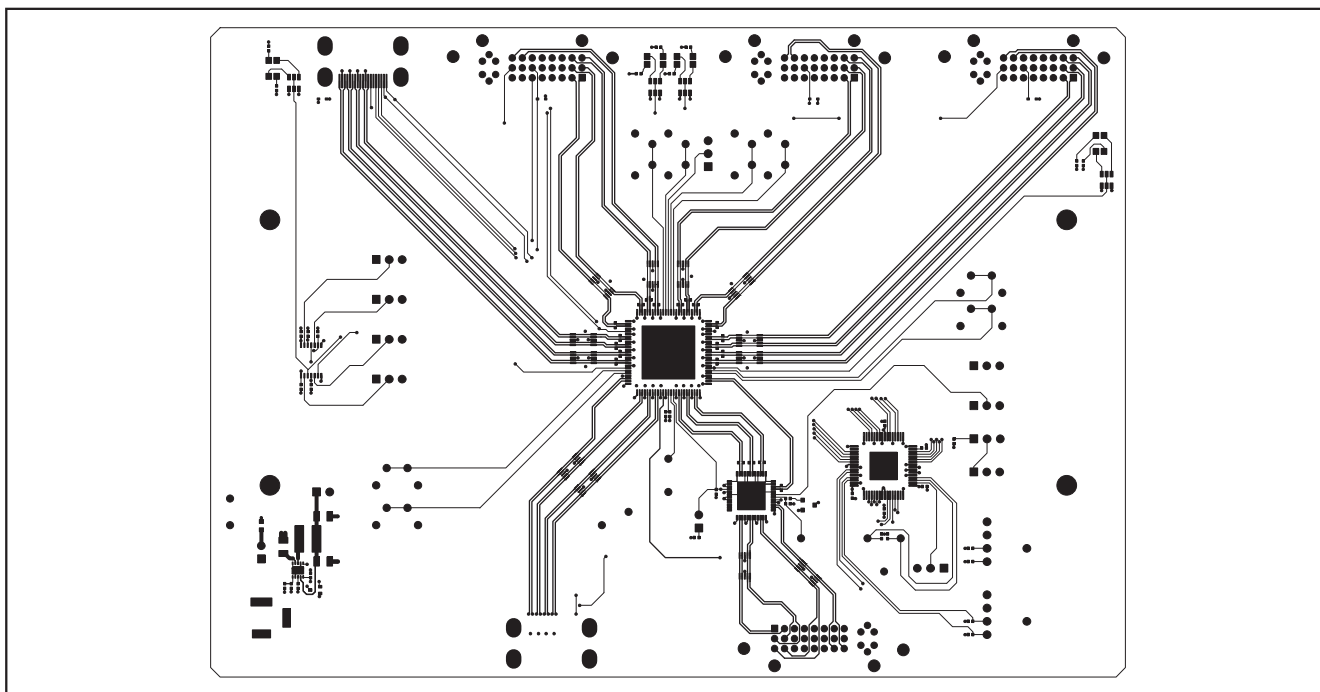图2. MAX3845/MAX4814E评估板原理图(2/2)

图3. MAX3845/MAX4814E评估板装配图——顶层

图4. MAX3845/MAX4814E评估板布局——元件层

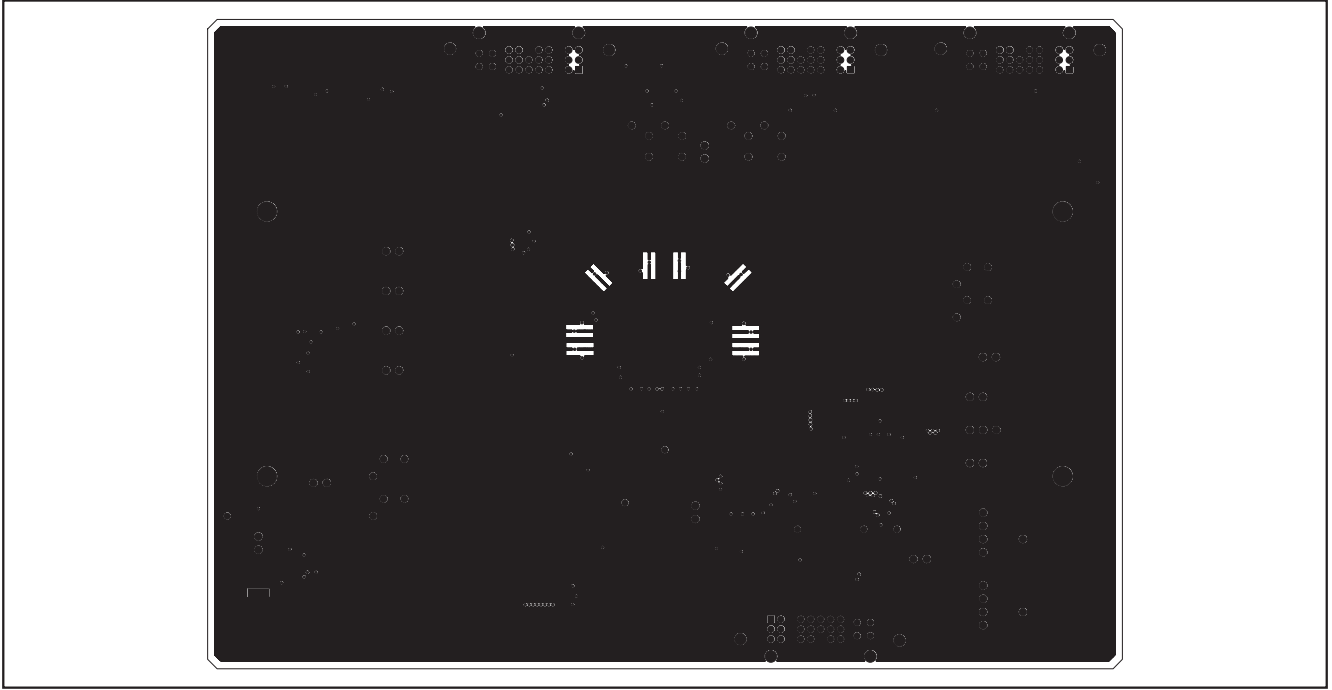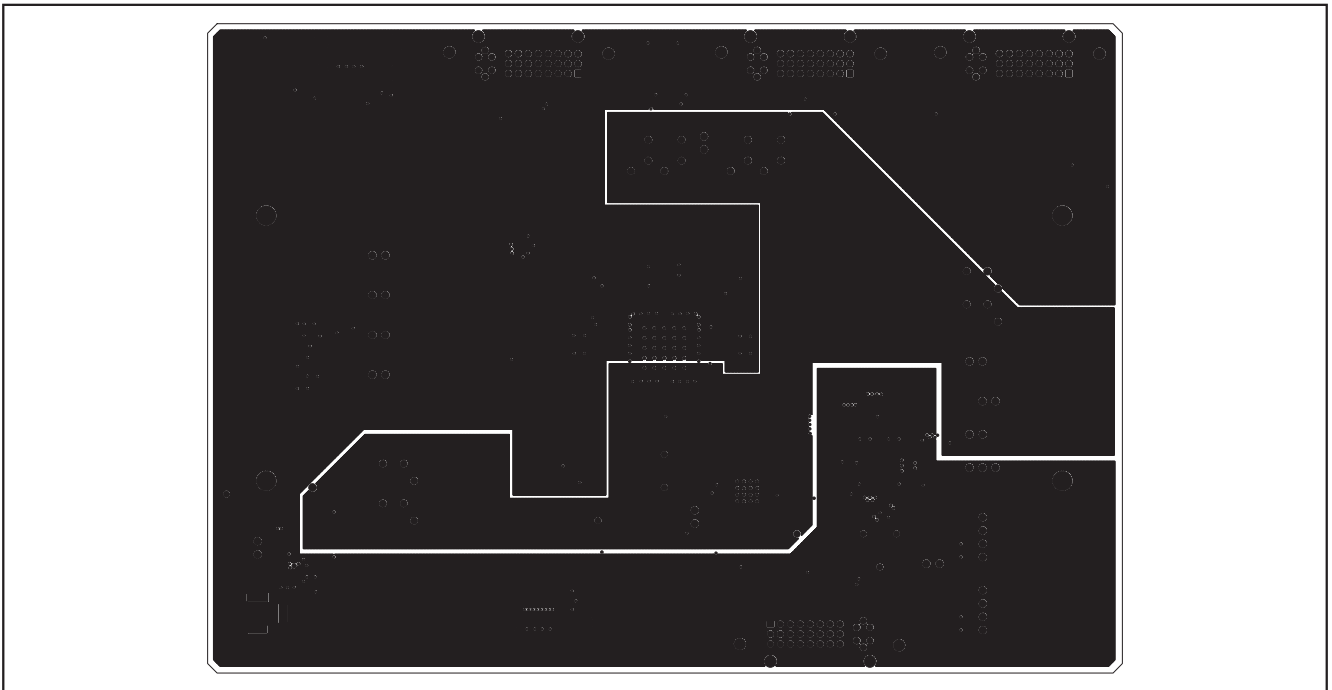# MAX3845/MAX4814E评估板

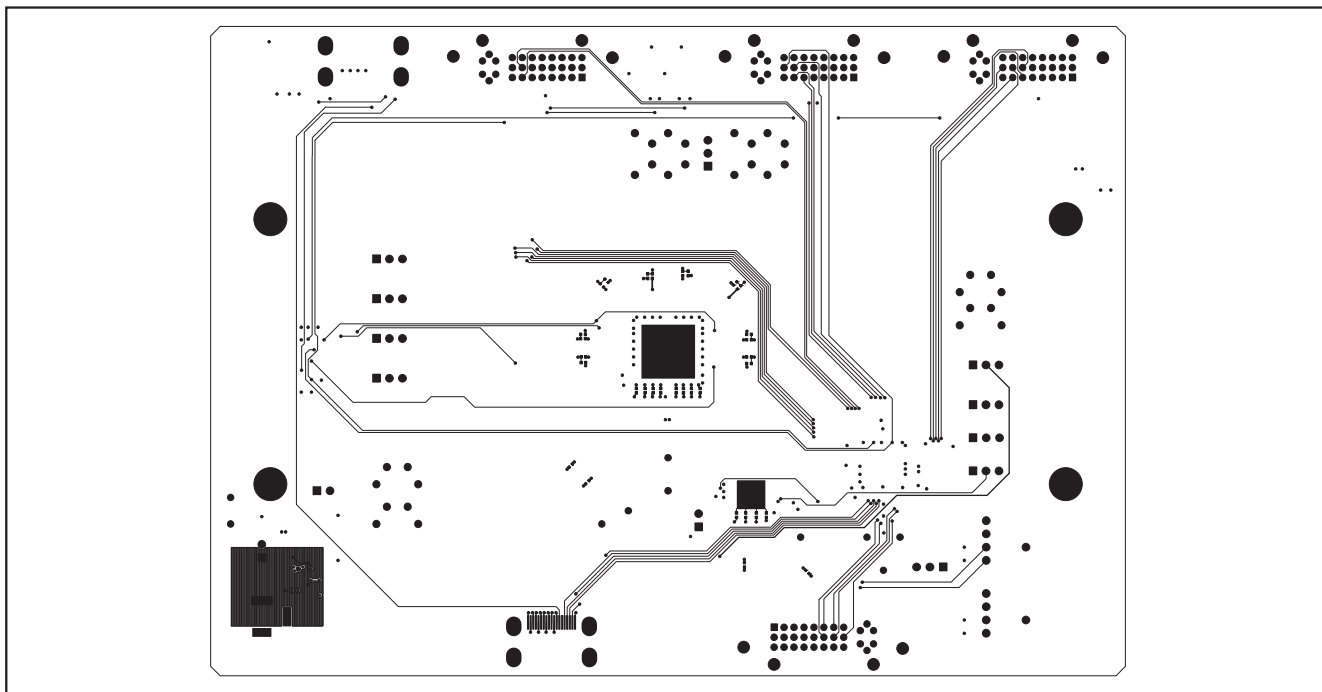图5. MAX3845/MAX4814E评估板布局——地层

图6. MAX3845/MAX4814E评估板布局——电源层

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图7. MAX3845/MAX4814E评估板布局—焊接层

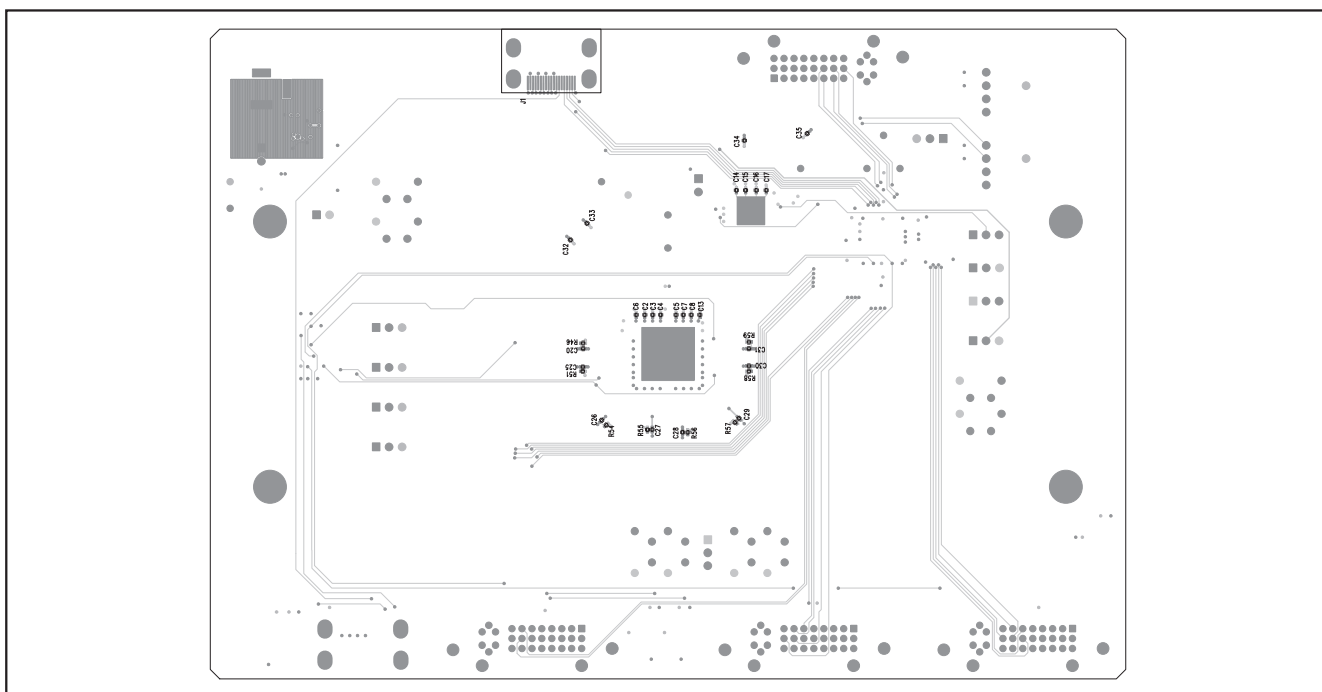图8. MAX3845/MAX4814E评估板装配图—底层

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