



MAX8785A Evaluation Kit

General Description

The MAX8785A evaluation kit (EV kit) is an assembled and tested PCB that demonstrates the MAX8785A full-bridge cold-cathode fluorescent lamp (CCFL) controller for piezoelectric transformer-based back light power supplies. Lamp brightness is adjustable by an on-board potentiometer.

Features

- ◆ +8V to +25V Input Range
- ◆ Brightness Adjustable by an On-Board Potentiometer
- ◆ 10:1 Digital Pulse-Width Modulation (DPWM)
- ◆ Strike Voltage Up to 2kV
- ◆ Fully Assembled and Tested

Ordering Information

PART	TYPE
MAX8785AEVKIT#	EV Kit

#Denotes RoHS compliant.

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10 μ F \pm 20%, 25V X5R ceramic capacitor (1206) TDK C3216X5R1E106M
C2, C4	2	1 μ F \pm 20%, 10V X5R ceramic capacitors (0603) AVX 0603ZD105MAT TDK C1608X5R1A105M
C3	1	6800pF \pm 10%, 50V X7R ceramic capacitor (0603) KEMET C0603C682K5RAC TDK C1608X7R1H682K
C5	1	0.22 μ F \pm 10%, 6.3V X5R ceramic capacitor (0402) Murata GRM155R60J224K Taiyo Yuden JMK105BJ224KV TDK C1005X5R0J224M
C6	1	0.22 μ F \pm 10%, 25V X5R ceramic capacitor (0603) Murata GRM188R61E224KA TDK C1608X5R1E224K
C7	1	0.047 μ F \pm 10%, 16V X7R ceramic capacitor (0402) Murata GRM155R71C473K TDK C1005X7R1C473K

DESIGNATION	QTY	DESCRIPTION
C8, C9, C10	3	0.1 μ F \pm 10%, 10V X5R ceramic capacitors (0402) Murata GRP155R61A104K Taiyo Yuden LMK105BJ104KV TDK C1005X5R1A104K
C11	1	0.047 μ F \pm 10%, 50V X7R ceramic capacitor (0603) Murata GRM188R71H473K TDK C1608X7R1H473K
C12	1	1000pF \pm 10%, 50V X7R ceramic capacitor (0603) KEMET C0603C102K5RAC TDK C1608X7R1H102K
C13, C14	0	Not installed, ceramic capacitors (0402)
CN1	1	Shrouded header for CCFL lamp connection, 3.5mm pin spacing, PCB mount
D1	1	3.6V zener diode (SOD-523) Central CMOZ3V6 lead free
F1	1	2A, 32V fuse (1206) Cooper 3216FF2-R Digi-Key 283-2544-1-ND

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Component List (continued)

DESIGNATION	QTY	DESCRIPTION
GL1, GL2, VFB, IFB	0	Not installed, test points
JU1	1	2-pin header
L1	1	27 μ H, 0.8A inductor TOKO D73F 636FY-270M
N1A/B, N2A/B	2	30V 2.5A dual n-channel MOSFET (6-pin SOT23) Fairchild FDC6561AN (Top Mark: 561)
N3A/B, N4A/B	0	Not installed, dual n-channel MOSFET (8-pin SO) Fairchild FDS6912A
R1	1	105k Ω \pm 1% resistor (0603)
R2, R3, R4	3	100k Ω \pm 5% resistors (0402)
R5	1	100k Ω \pm 5% resistor (0603)
R6	1	150k Ω \pm 1% resistor (0603)
R7	1	150 Ω \pm 1% resistor (0603)
R8	1	280k Ω \pm 5% resistor (0603)
R9–R15	7	200k Ω \pm 1% resistors (0805)
R16	1	1.54k Ω \pm 1% resistor (0603)
R17	1	100k Ω potentiometer (multiturn), 3/8in ²

DESIGNATION	QTY	DESCRIPTION
R18	0	Not installed, resistor (0603)
R19	0	Not installed, shorted by PC trace (0402)
R20	0	Not installed, shorted by PC trace (0603)
R21	0	Not installed, resistor (0402)
R22	1	1k Ω \pm 5% resistor (0603)
R23	1	1M Ω \pm 5% resistor (0402)
R24	1	10 Ω \pm 5% resistor (0603)
R25	0	Not installed, shorted by PC trace (0603)
R26	0	Not installed, resistor (0402)
T1	1	4.5W, 50kHz \pm 1.5kHz piezoelectric transformer TOKIN HT320628-21(2.5)CB
U1	1	Full-bridge controller for piezoelectric transformers (28 TQFN-EP*) MAX8785AETI+
—	1	Shunt
—	1	PCB: MAX8785A EVALUATION KIT#

*EP = Exposed pad.

Component Suppliers

SUPPLIER	PHONE	WEBSITE
AVX Corporation	843-946-0238	www.avxcorp.com
Central Semiconductor Corp.	631-435-1110	www.centrasemi.com
Digi-Key Corp.	800-344-4539	www.digikey.com
Fairchild Semiconductor	888-522-5372	www.fairchildsemi.com
KEMET Corp.	864-963-6300	www.kemet.com
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
NEC TOKIN America, Inc.	408-324-1790	www.nec-tokinamerica.com
Taiyo Yuden	800-348-2496	www.t-yuden.com
TDK Corp.	847-803-6100	www.component.tdk.com
TOKO America, Inc.	847-297-0070	www.tokoam.com

Note: Indicate that you are using the MAX8785A when contacting these component suppliers.

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Quick Start

Recommended Equipment

- A DC power supply capable of supplying a voltage between +8V to +25V at 2A to power the MAX8785A board
- A CCFL lamp with the following specifications:
 - Maximum RMS strike voltage $\leq 2\text{kV}$
 - RMS lamp current = 6mA
 - Input power $\leq 4\text{W}$

Procedure

The MAX8785A EV kit is fully assembled and tested. Follow the steps below to verify board operation.

Warning: High voltage is present on this evaluation kit. **Do not turn on power until all connections are made.**

- 1) Connect the lamp to the connector CN1.
- 2) Connect the +8V and +25V supply to the pads labeled IN and GND on the MAX8785A EV kit.
- 3) Turn on the power supply.
- 4) Enable the MAX8785A by installing the shunt on JU1.

Detailed Description

The MAX8785A EV kit demonstrates the MAX8785A full-bridge cold-cathode fluorescent lamp (CCFL) controller for piezoelectric transformer-based back light power supplies. The MAX8785A guarantees lamp striking by sweeping the switching frequency from high to low until the lamp is struck. The MAX8785A achieves 10:1 dimming range using either analog or digital dimming control.

Shutdown

A shunt installed on JU1 enables the MAX8785A EV kit. To set the MAX8785A to shutdown mode, remove the shunt on JU1.

Dimming Control

The MAX8785A EV kit sets the MAX8785A with analog dimming-control mode. The brightness of the lamp is adjustable by turning potentiometer R17.

To set the EV kit to external digital dimming-control mode, cut open the trace shorting R20 pad, then install a 0Ω resistor on R18 (or short R18 pad). Connect an external signal to LSYNC pad. Refer to the *External Digital (DPWM) Control* section in the MAX8785A IC data sheet for more detail.

Setting the Lamp Current

The MAX8785A EV kit sets the default lamp current with 6mA. To set the lamp current other than 6mA, select R7 as follows:

$$R7 = (\pi \times 800\text{mV}) / (2\sqrt{2} \times I_{\text{LAMP}} (\text{RMS}))$$

Refer to the *Setting the Lamp Current* section in the MAX8785A IC data sheet for more detail.

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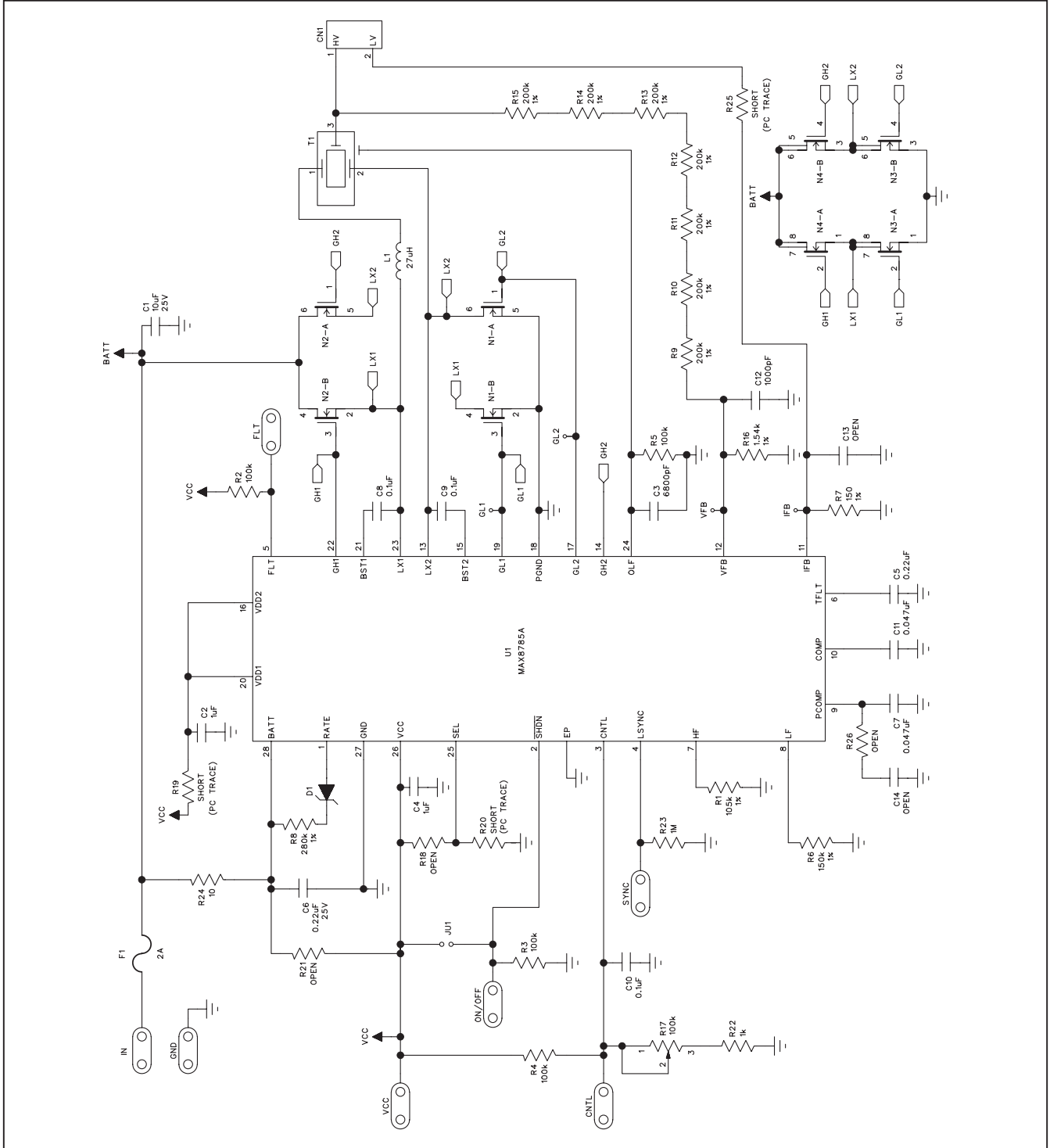


Figure 1. MAX8785A EV Kit Schematic

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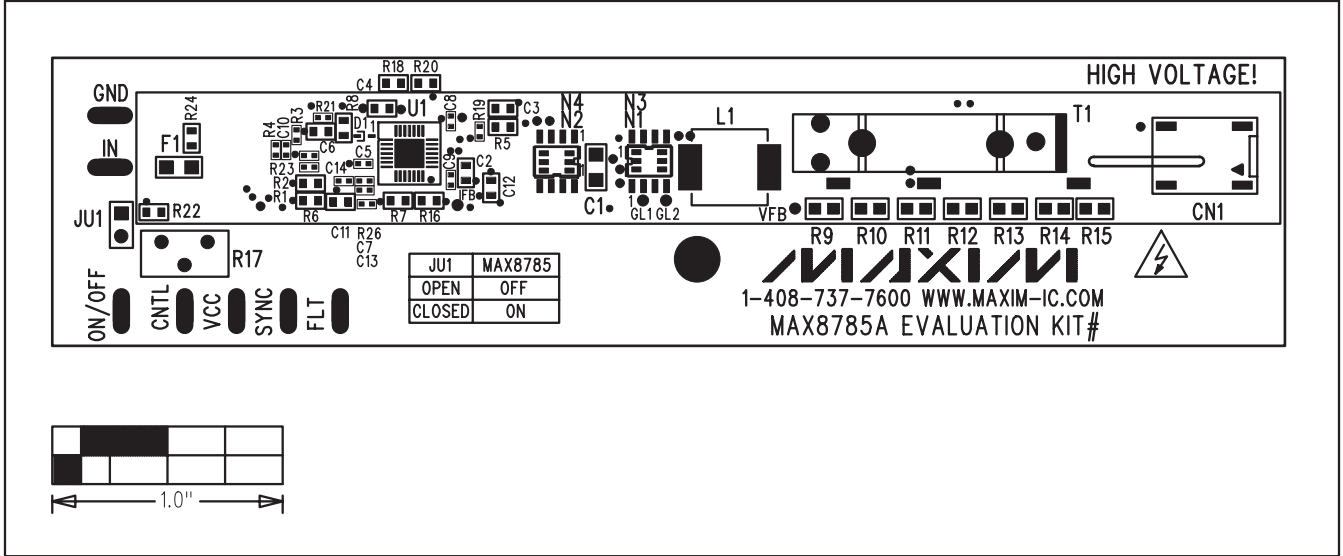


Figure 2. MAX8785A EV Kit Component Placement Guide—Component Side

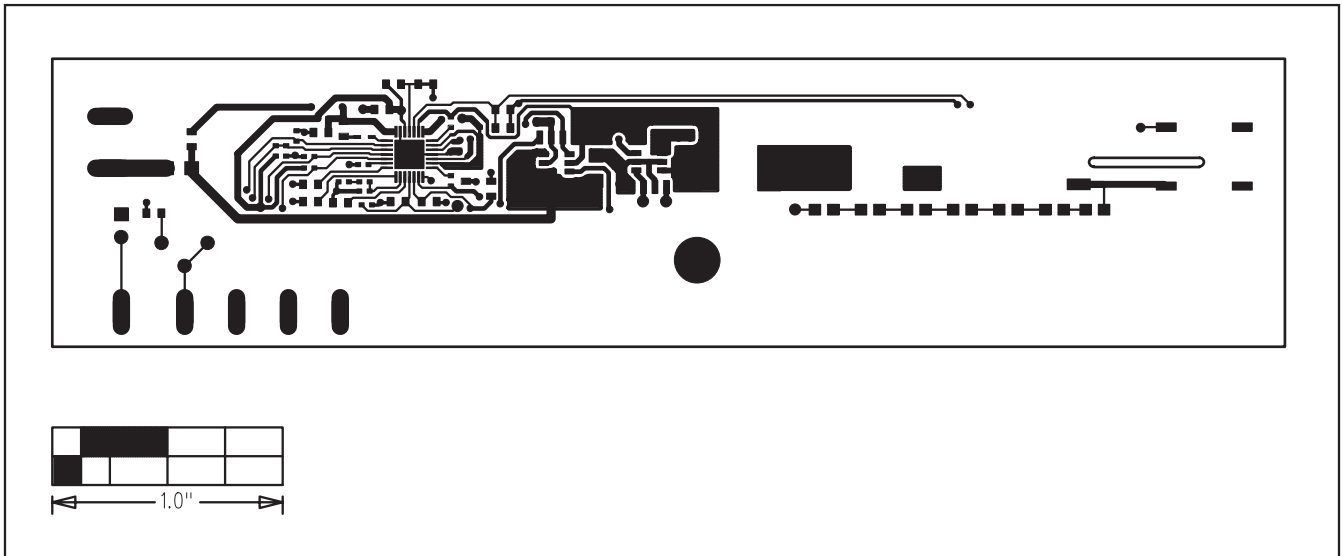


Figure 3. MAX8785A EV Kit PCB Layout—Component Side

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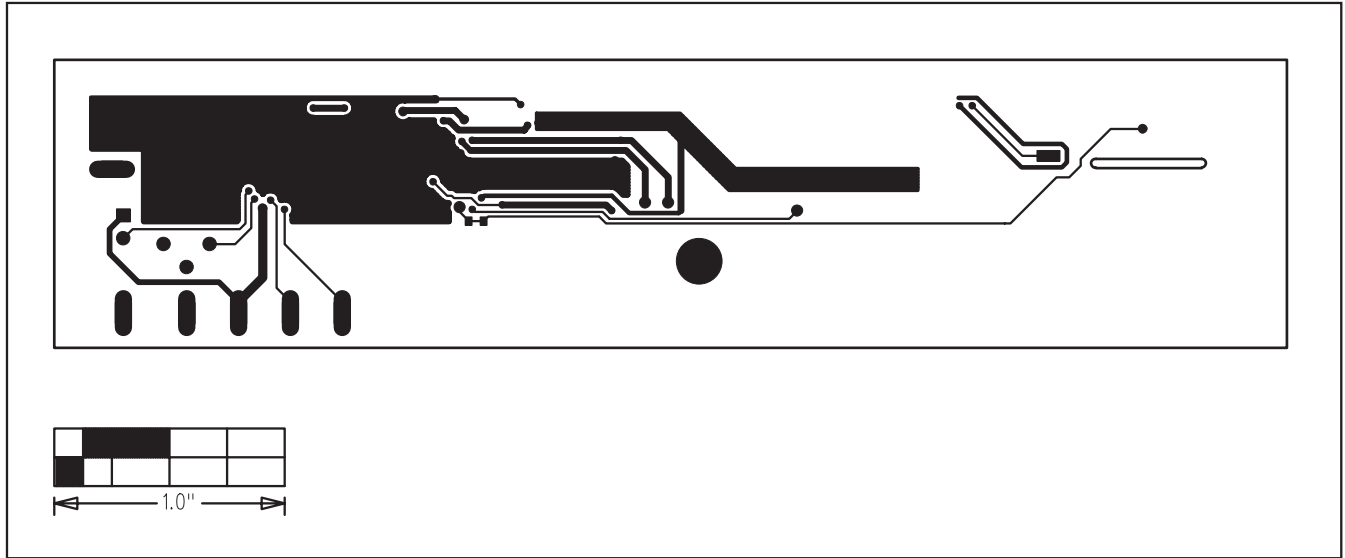


Figure 4. MAX8785A EV Kit PCB Layout—Solder Side

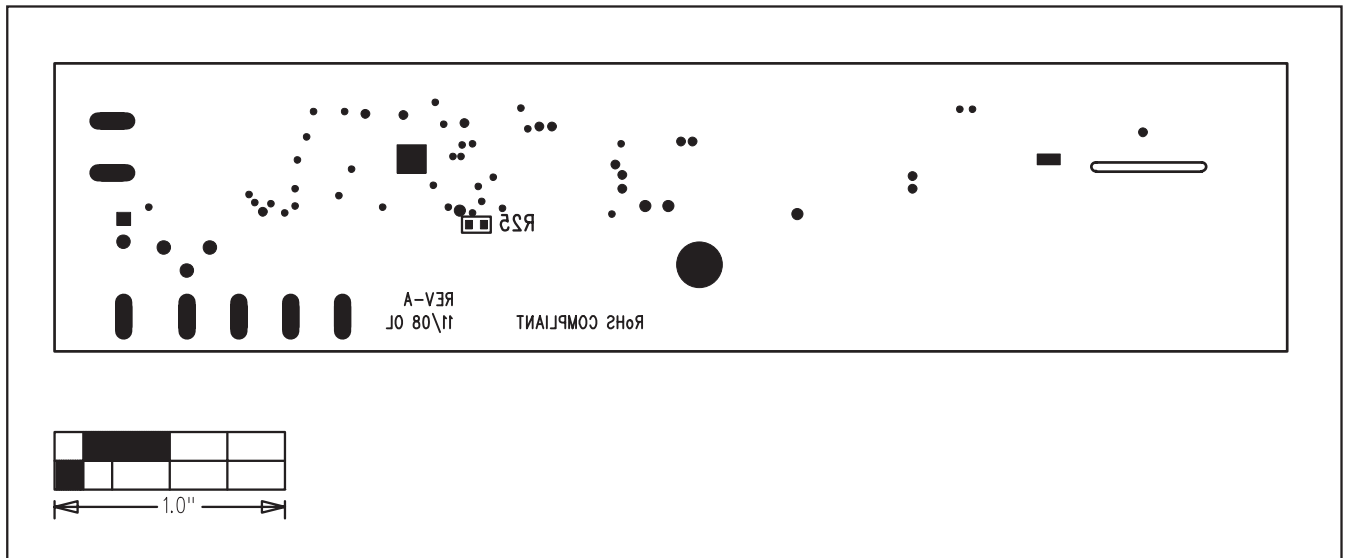


Figure 5. MAX8785A EV Kit Component Placement Guide—Solder Side

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Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	9/07	Initial Release	—
1	12/08	Changed part number from MAX8785 to MAX8785A	1-6
2	11/09	Changed voltage input range and replaced Figure 1	1-4

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