19-3314; Rev 0; 6/04

MAX8722 Evaluation Kit

Evaluates: MAX8722

General Description

The MAX8722 evaluation kit (EV kit) is an assembled and tested PC board that demonstrates the MAX8722 low-cost, cold-cathode fluorescent lamp (CCFL), backlight controller. Lamp brightness is adjustable by an on-board potentiometer.

Features

- **+7V to +24V Input Range**
- **Open-Lamp Protection with 1s Timeout**
- **Secondary Short-Circuit Protection with 10ms Timeout**
- **Brightness Adjustable by an On-Board Potentiometer**
- **10:1 Digital Pulse-Width Modulation (DPWM) Dimming Range**
- **Strike Voltage Up to 1.6kV**
- **High Power to Light Efficiency**
- **Assembled and Tested**

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX8722EVKIT	0°C to +70°C	24 QSOP

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	4.7µF ±20%, 25V X5R ceramic capacitor (1210) Murata GRM32RR61E475K Taiyo Yuden TMK325BJ475MN TDK C3225X7R1E475M
C2	1	1µF ±10%, 25V X7R ceramic capacitor (1206) Murata GRM31MR71E105K Taiyo Yuden TMK316BJ105KL TDK C3216X7R1E105K
C3	1	18pF ±10%, 3kV HV ceramic capacitor (1808) TDK C4520C0G3F180K
C4	1	0.015µF ±10%, 16V X7R ceramic capacitor (0402) Murata GRP155R71C153K Taiyo Yuden EMK105BJ153KV TDK C1005X7R1C153K
C5, C6, C13	3	0.1µF ±10%, 10V X5R ceramic capacitors (0402) Murata GRP155R61A104K Taiyo Yuden LMK105BJ104KV TDK C1005X5R1A104K
C7, C9	2	0.47µF ±10%, 10V X5R ceramic capacitors (0402) Murata GRM155R60J474K TDK C1005X5R0J474K
C8	1	0.1µF ±10%, 25V X7R ceramic capacitor (0603) Murata GRM188R71E104K Taiyo Yuden TMK107BJ104KA TDK C1608X7R1E104K
C10	0	Not installed (0603)
C11	1	0.01µF ±10%, 25V X7R ceramic capacitor (0402) Murata GRP155R71E103K Taiyo Yuden TMK105BJ103KV TDK C1005X7R1E103K
C12	1	0.22µF ±10%, 6.3V X5R ceramic capacitor (0402) Taiyo Yuden JMK105BJ224KV TDK C1005X5R0J224K
CN1	1	Shrouded header for CCFL lamp connection, 3.5mm pin spacing, PC board mount JST SM02B-BHSS-1-TB

Component List (continued)

DESIGNATION	QTY	DESCRIPTION
D1	1	Dual Schottky diode, Common Anode, SOT-323 Central Semiconductor CMSSH-3A Diodes Incorporated BAT54AW
F1	1	Fuse, 2A, 32V (1206) AVX F1206A2R00FWTR
JU1	1	2-pin header
JU2	0	Not installed (0603)
JU3	1	3-pin header
N1A/B, N2A/B	2	Dual n-channel MOSFETs, 30V, 0.095, SOT23-6 Fairchild FDC6561AN
R1	1	150Ω ±1% resistor (0402)
R2, R11	0	Not installed (0402)
R3	1	40.2Ω ±1% resistor (0603)
R4	1	200kΩ ±1% resistor (0402)
R5	1	100kΩ ±1% resistor (0402)
R6	1	169kΩ ±1% resistor (0603)
R7, R8	2	100kΩ ±5% resistors (0402)
R9	1	100kΩ potentiometer (multiturn), 3/8" square
R10	1	1kΩ ±5% resistor (0402)
T1	1	CCFL transformer, 93:1 Sumida 5371-400-W1423 (CIUH8D42 style) TOKO T912MG-1018 (BLC103B style)
U1	1	MAX8722EEG (24 QSOP)

Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
AVX	843-946-0238	843-626-3123	www.avxcorp.com
Central Semiconductor	631-435-1110	631-435-1824	www.centralsemi.com
Diodes Incorporated	805-446-4800	805-446-4850	www.diodes.com
Fairchild Semiconductor	888-522-5372	972-910-8036	www.fairchildsemi.com
JST	847-473-1957	847-473-0144	www.jst.com
Murata	770-436-1300	770-436-3030	www.murata.com
Sumida	847-545-6700	847-545-6720	www.sumida.com
Taiyo Yuden	800-348-2496	847-925-0899	www.t-yuden.com
TDK	847-803-6100	847-390-4405	www.component.tdk.com
TOKO	847-297-0070	847-699-1194	www.tokoam.com

Note: *Indicate you are using the MAX8722 when contacting these manufacturers.*

Quick Start

Recommended Equipment

Before you begin, you need the following equipment:

- A DC power supply capable of supplying a voltage between +7V to +24V at 2A to power the MAX8722 board
- A CCFL lamp with the following specifications:
  - Maximum RMS strike voltage ≤ 1.6kV
  - RMS lamp current ≤ 6mA
  - Input power ≤ 4W

Warning: High voltages are present on this evaluation kit. Use caution when making connections and applying power!

Do not turn on the power until all connections are made!

Procedure

1) Connect the lamp to the connector CN1.
2) Connect the +7V to +24V supply to the pads labeled VIN and GND on the MAX8722 EV kit.
3) Turn on the power supply.
4) Enable the MAX8722 by removing the shunt on JU1.

Detailed Description

Brightness

The brightness of the lamp is adjustable by turning potentiometer R9.

Shutdown

A shunt installed on JU1 places the MAX8722 in shutdown mode.

DPWM Chopping Frequency (Jumpers JU2 and JU3 and Resistor R6)

Resistor R6 sets the DPWM chopping frequency (f_{DPWM}) according to the following equation:

$$f_{DPWM}(Hz) = \frac{209Hz \times 169k\Omega}{R6}$$

The MAX8722 EV kit is shipped with R6 equal to 169kΩ, which sets f_{DPWM} to 209Hz.

Table 1. Jumper and Resistor Settings

JU2	JU3	R6	DPWM PIN	FREQUENCY
Open	2-3	169kΩ	DPWM is used as an output.	f_{DPWM} = 209Hz
Short	Open. Connect SYNC to an external high frequency (between 13kHz and 45kHz).	Open	DPWM is used as an output.	$f_{DPWM} = f_{EXT} / 128$
Open	1-2	169kΩ	Connect DPWM to an external low-frequency signal (between 100Hz and 350Hz).	$f_{DPWM} = f_{EXT}$

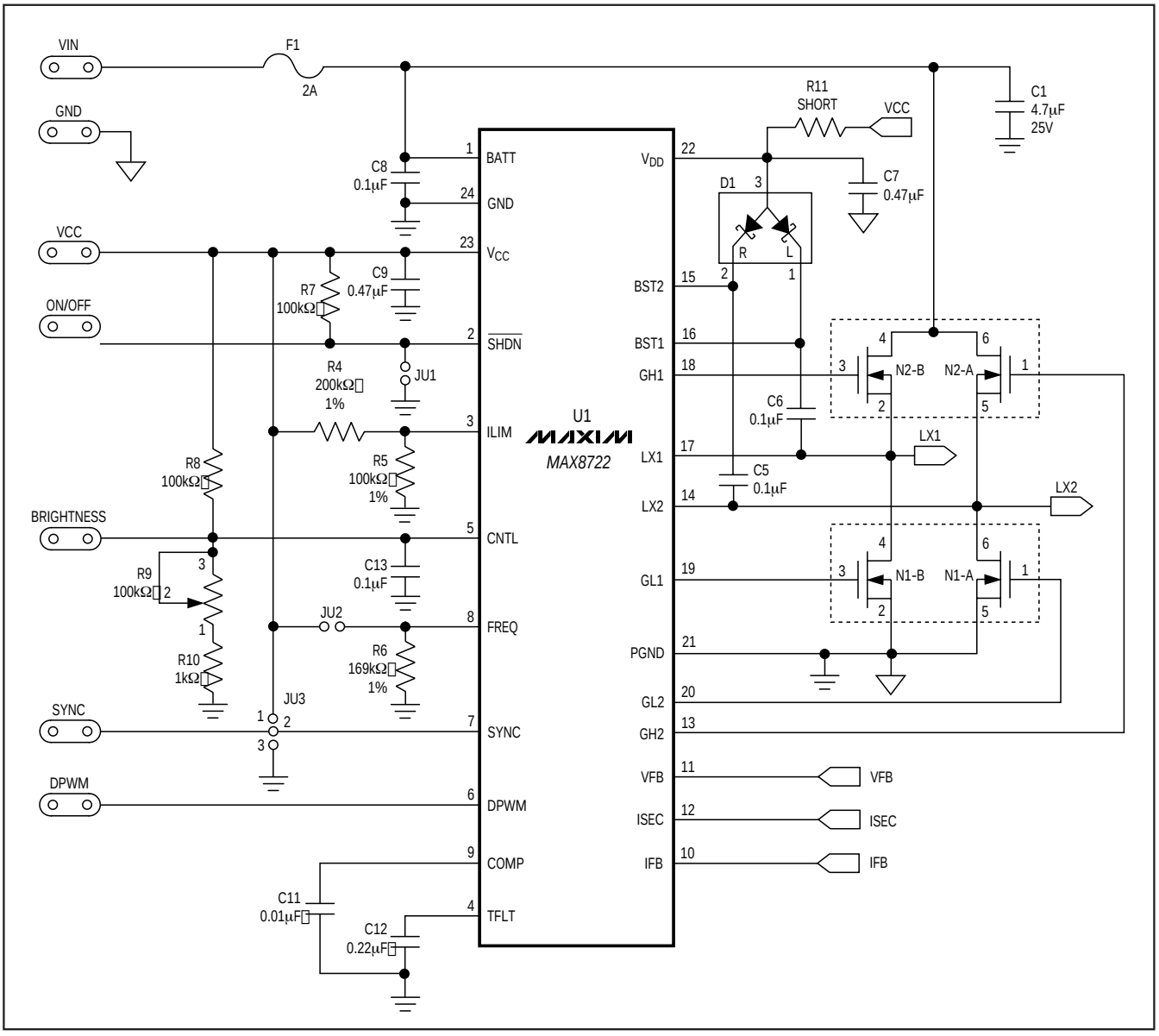

Figure 1. MAX8722 EV Kit Schematic

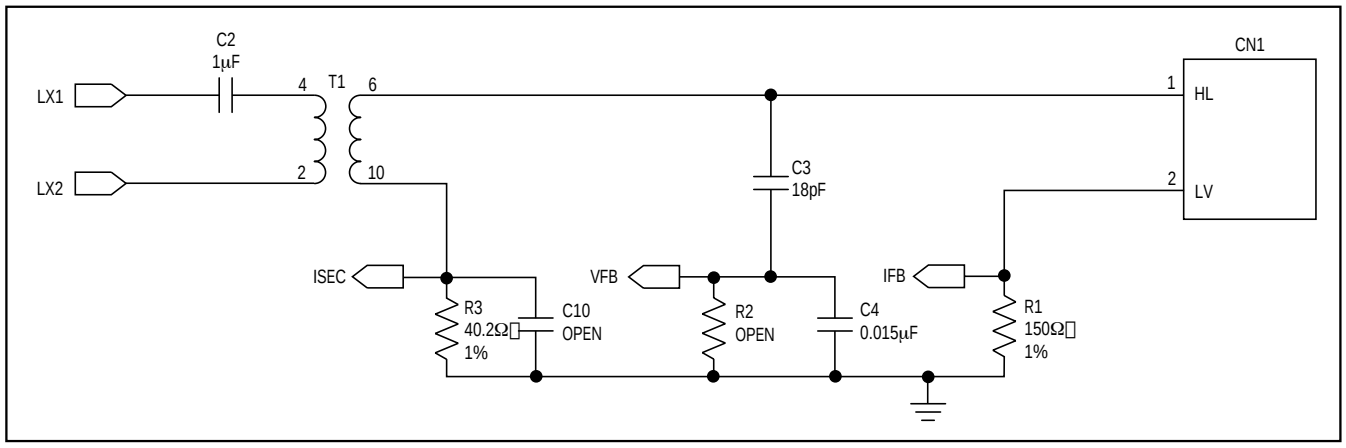

Figure 2. MAX8722 EV Kit Schematic—High-Voltage Section

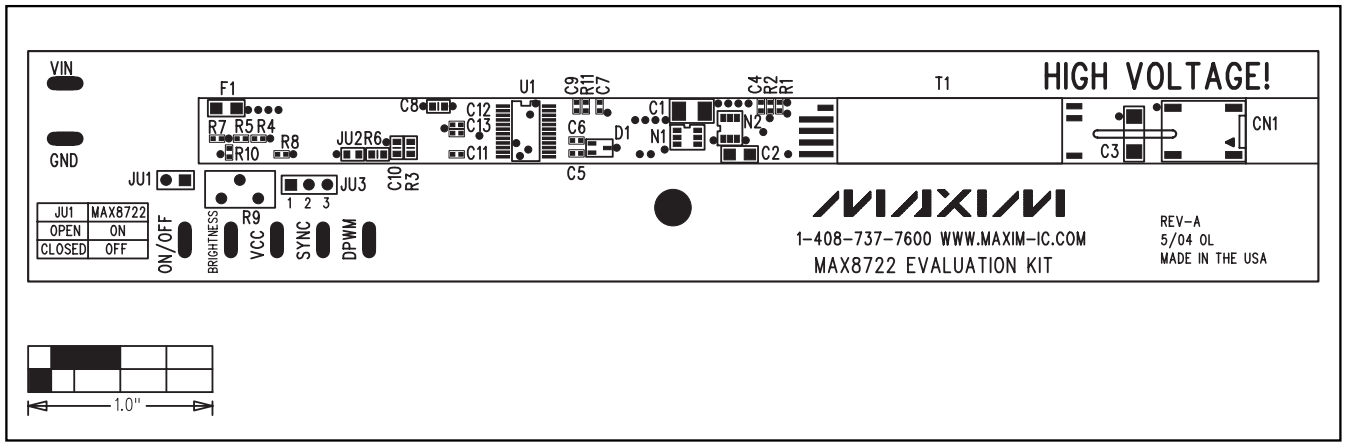

Figure 3. MAX8722 EV Kit Component Placement Guide—Component Side

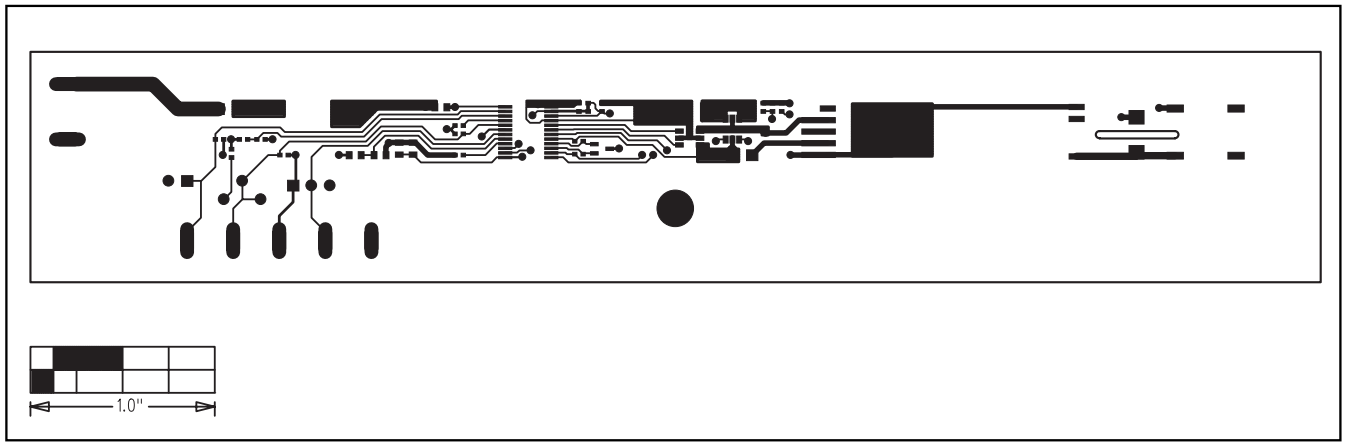

Figure 4. MAX8722 EV Kit PC Board Layout—Component Side

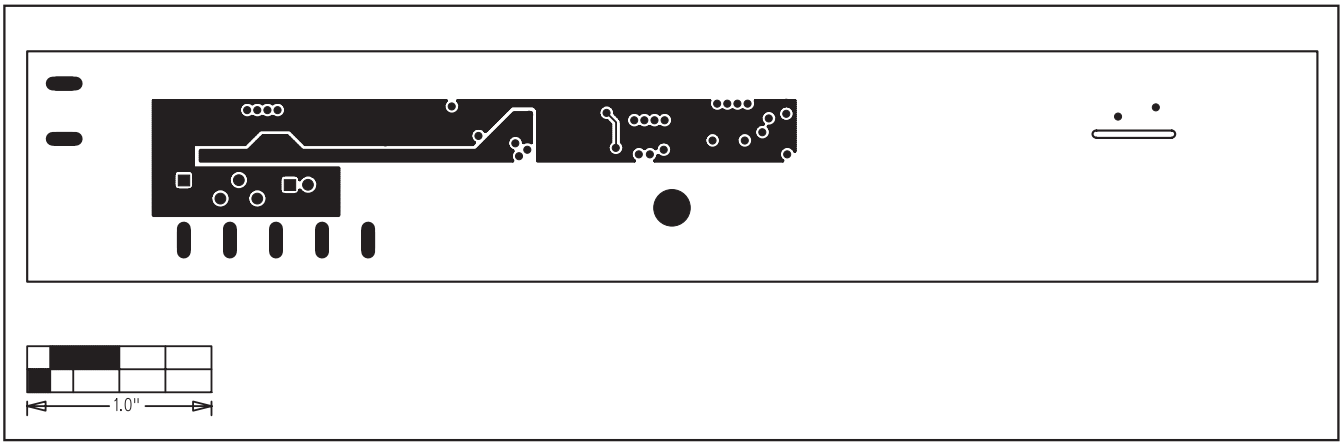

Figure 5. MAX8722 EV Kit PC Board Layout—Layer 2

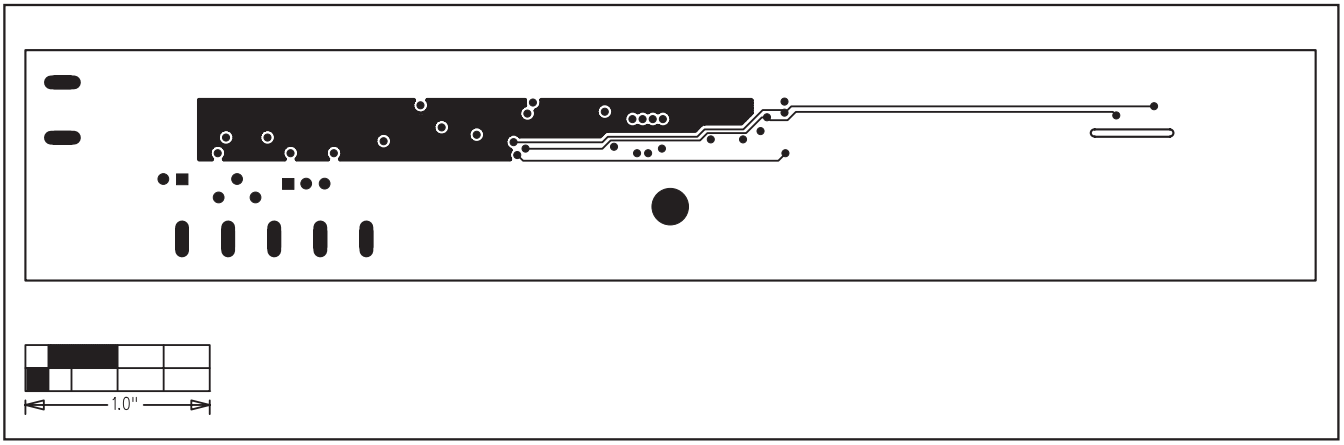

Figure 6. MAX8722 EV Kit PC Board Layout—Layer 3

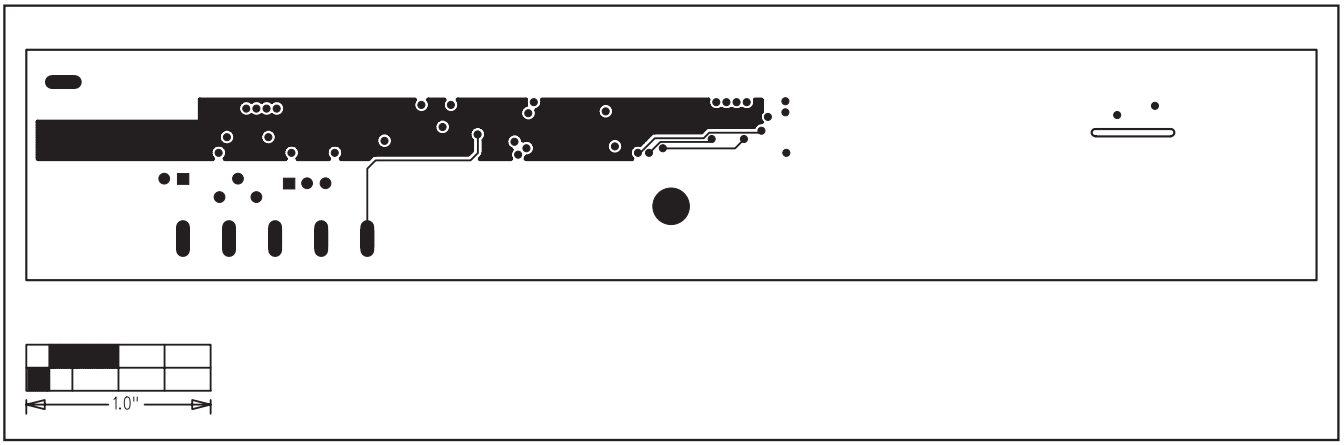

Figure 7. MAX8722 EV Kit PC Board Layout—Solder Side