

## GENERAL DESCRIPTION

The EV8046DF-00A is the evaluation board for the MP8046, a high current, dual channel power half-bridge. It accepts PWM modulated inputs for operation.

The MP8046 features a low current shutdown mode, standby mode, input under voltage protection, thermal shutdown and fault flag signal output. Each channel can be driven independently as stereo single-ended audio amplifiers, or driven complementary in a bridge-tied load (BTL) audio amplifier configuration. Both channels of the driver interface with standard logic signals. The MP8046 is available in a 20-pin TSSOP (with Exposed Pad) package.

## ELECTRICAL SPECIFICATIONS

| Parameter           | Symbol            | Value    | Units |
|---------------------|-------------------|----------|-------|
| Supply Voltage      | V <sub>DD</sub>   | 7.5 – 26 | V     |
| Peak Output Current | I <sub>PEAK</sub> | 5        | A     |

## FEATURES

- ±5A Peak Current Output
- Up to 600kHz Switching Frequency
- Protected Integrated Power 150mΩ Switches
- 30ns Switch Dead Time
- All Switches Current Limited
- Under Voltage Protection
- Thermal Protection
- 4μA Quiescent Current at Shutdown
- Fault Output Flag
- Stereo Single-Ended: 21W/Channel, at V<sub>DD</sub>=26V, 4Ω Load
- Bridge Tied-Load Output Power: 43W, at V<sub>DD</sub>=26V, 8Ω Load

## APPLICATIONS

- Class D Audio Drivers

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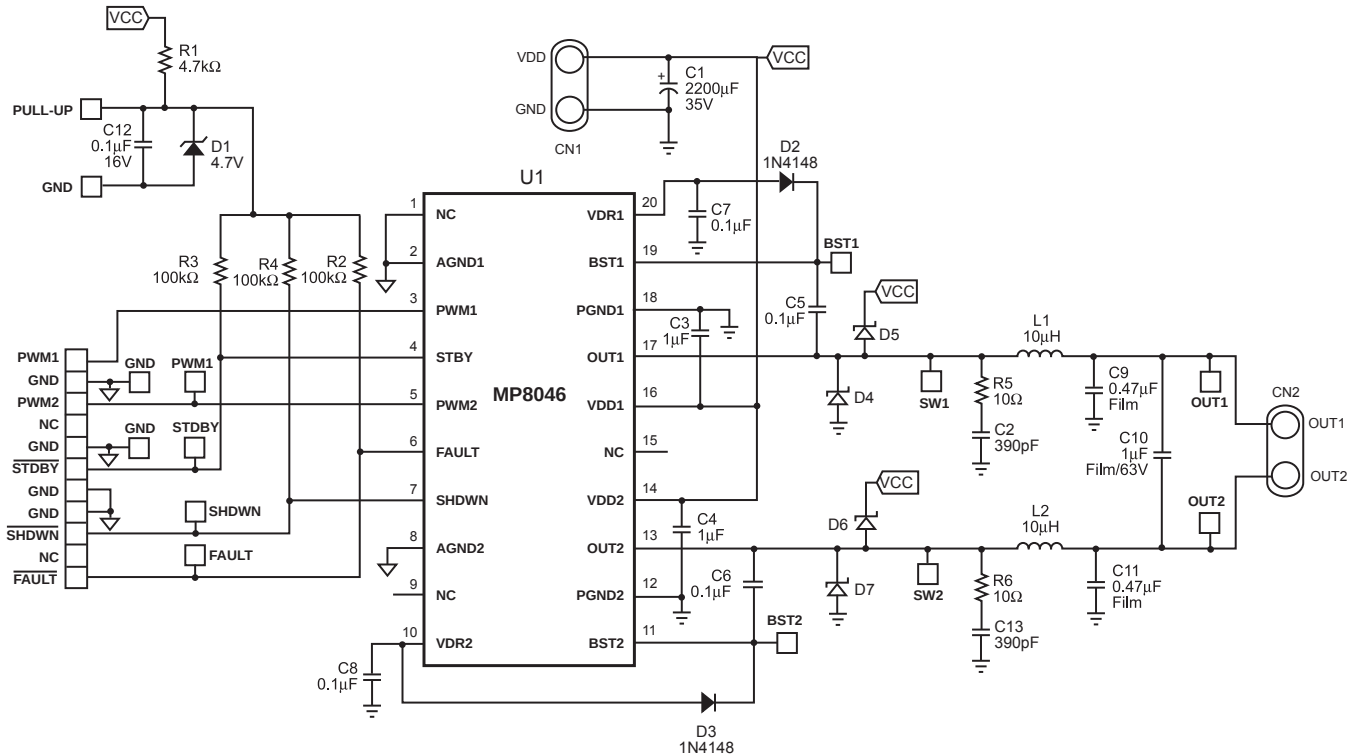
## EV8046DF-00A EVALUATION BOARD



(L x W x H) 4.1" x 3.6" x 1.1"  
(10.2cm x 9.0cm x 2.8cm)

| Board Number | MPS IC Number |
|--------------|---------------|
| EV8046DF-00A | MP8046DF      |

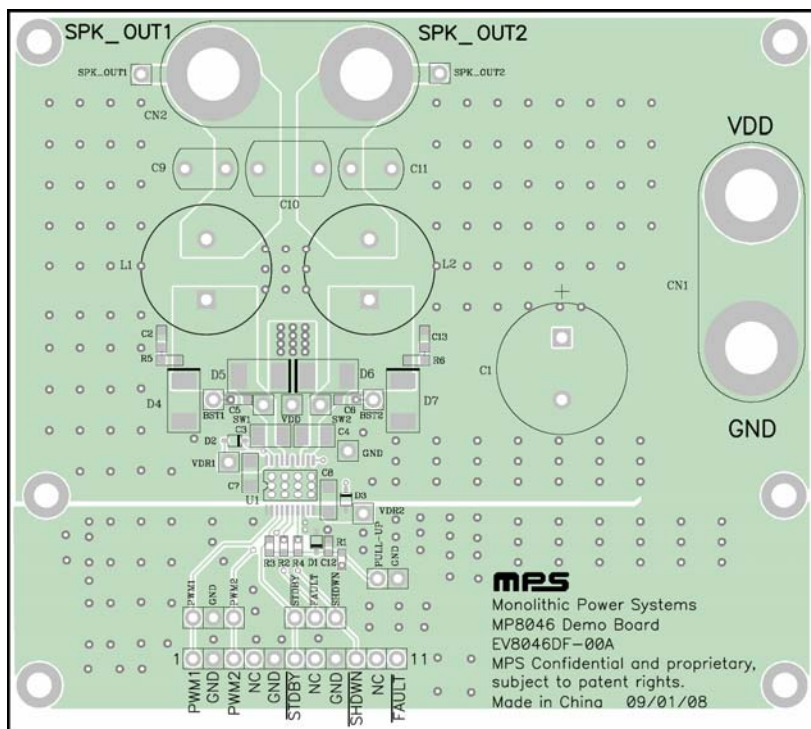
# EVALUATION BOARD SCHEMATIC



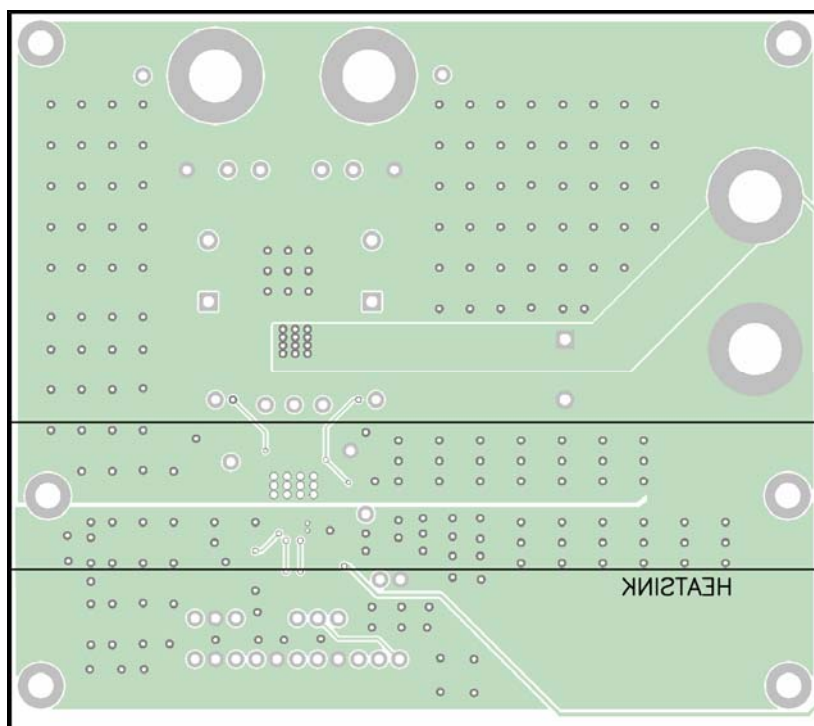
# EV8046DF-00A BILL OF MATERIALS

| Qty | RefDes         | Value  | Description                 | Package  | Manufacturer | Manufacturer P/N |
|-----|----------------|--------|-----------------------------|----------|--------------|------------------|
| 1   | C1             | 2200uF | Electrolytic Cap., 35V, NHG | Radial   | Panasonic    | ECA-1VHG222      |
| 2   | C2, C13        | 390pF  | Ceramic Cap, X7R, 50V       | 0805     | Panasonic    | ECU-V1H391KBN    |
| 2   | C3, C4         | 1uF    | Ceramic Cap., 50V, X7R      | 1210     | TDK          | C3225X7R1H105K   |
| 2   | C5, C6         | 0.1uF  | Ceramic Cap., 50V, X7R      | 0805     | TDK          | C2012X7R1H104K   |
| 2   | C7, C8         | 0.1uF  | Ceramic Cap., 25V, X7R      | 1206     | Panasonic    | ECJ-3VB1E104K    |
| 2   | C9, C11        | 0.47uF | Cap., 50V, Stack Metal Film | Radial   | Panasonic    | ECQ-V1H474JL     |
| 1   | C10            | 1uF    | Cap., 63V, Stack Metal Film | Radial   | Panasonic    | ECQ-V1J105JM     |
| 1   | C12            | 0.1uF  | Ceramic Cap., 16V, X7R      | 0603     | TDK          | C1608X7R1C104K   |
| 2   | CN1            |        | Banana Jacks, Red and Black |          |              |                  |
| 2   | CN2            |        | 2 Red Banana Jacks          |          |              |                  |
| 1   | D1             |        | Diode Zener, 4.7V, 200mW    | SOD-323  | Diodes Inc.  | BZT52C4V7S-7     |
| 2   | D2, D3         |        | Diode Switch, 75V, 200mW    | SOD-323  | Diodes Inc.  | 1N4148WS-7       |
| 4   | D4, D5, D6, D7 |        | Diode Schottky, 30V, 1A     | SMB      | IR           | MBRS130LTR       |
|     |                |        | Diode Schottky, 40V, 1A     | SMA      | Diodes Inc.  | B140-13-F        |
| 2   | L1, L2         | 10uH   | Power Inductor, 7A, 16RHBP  | Radial   | Toko         | 16RHBP-100M      |
| 1   | R1             | 4.7k   | Film Res., 5%               | 0603     | Panasonic    | ERJ-3GEYJ472V    |
| 3   | R2, R3, R4     | 100k   | Film Res., 5%               | 0603     | Panasonic    | ERJ-3GEYJ104V    |
| 2   | R5, R6         | 10Ω    | Ceramic Res, 5%             | 0805     | Panasonic    | ERJ-6GEYJ100V    |
| 29  |                |        | 29-Pins Sip Header, 0.1"    |          | Keystone     | 5000             |
| 1   | U1             |        | Class D Amplifier           | TSSOP-20 | MPS          | MP8046DF-R10     |

## PRINTED CIRCUIT BOARD LAYOUT



### Figure 1—Top Silk Layer



### Figure 2— Bottom Silk Layer

## QUICK START GUIDE

The EV8046DF-00A comes pre-configured to operate as a BTL (Bridge-Tied Load) audio power driver, where a complementary PWM modulated audio signal (PWM and  $\overline{\text{PWM}}$ ) is used as an input, and music is played to a speaker connected to the output. For BTL operation, follow the steps in the Quick Start Guide for BTL Operation section. For Single-Ended operation, make modifications and follow the steps as described in the Quick Start Guide for Single-Ended Operation section.

### Quick Start Guide for BTL (Bridge-Tied Load) Operation

#### Input/Output Requirements

1. Power supply: 7.5V to 26V.
2. Complementary PWM Signal Source (PWM,  $\overline{\text{PWM}}$ ).
3. Speaker Load: 8 $\Omega$ .

#### Setup Condition for Operation

4. Connect the speaker between SPK\_OUT1 and SPK\_OUT2 terminals.
5. Connect a PWM signal source to PWM1 and the complementary signal source  $\overline{\text{PWM}}$  to PWM2, respectively. Use the GND terminal between PWM1 and PWM2 as the ground connection for the PWM inputs.
6. Apply power to the board.
7. Audio should be heard through the speaker.

### Quick Start Guide for SE (Single-Ended) Operation

#### Input/Output Requirements

1. Power supply: 7.5V to 26V. Stereo PWM Signal Source.
2. Two Speaker Loads: 4 $\Omega$  or 8 $\Omega$  each.

#### Setup Condition for Operation

3. Remove C10 and connect the speakers as shown in Figure 3.
4. Connect the stereo PWM signal source to the EV board. Connect channel 1 to PWM1 and channel 2 to PWM2, respectively. Use the GND terminals between PWM1 and PWM2 as the ground connections for the PWM inputs.
5. Apply power to the board.
6. Audio should be heard through the speakers.

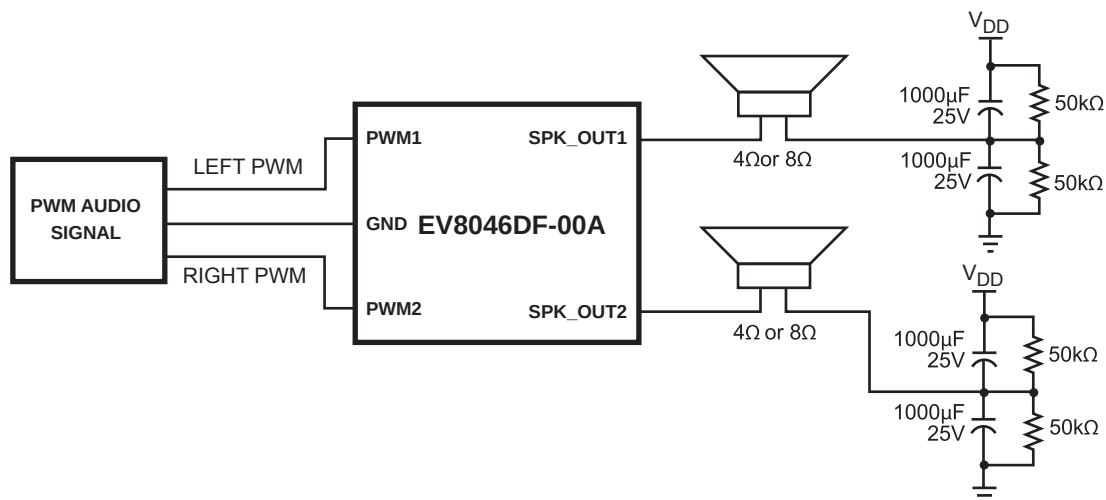


Figure 3—Setup for Single-Ended Operation

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