

**EV0041**MP8040
Full Bridge or Single Ended
Audio Amplifier

#### **EVALUATION BOARD**

## **General Description**

The EV0041 is an evaluation board designed to demonstrate the capabilities of MPS' MP8040. It can be configured as a stereo single ended amplifier (EV0041A) or a full bridge mono amplifier (EV0041B).

The MP8040 is a general purpose, high frequency half bridge power driver. The MP8040 integrates both top and bottom n-channel MOSFET power switches. The MP8040 is fully protected from both sourcing and sinking current by a preset cycle-by-cycle current limit. The MP8040 features a low-current shutdown-mode, input under-voltage protection, thermal shutdown, and fault flag signal output. The MP8040 interfaces with standard logic signals and is available in small 8-lead SOIC package.

## Ordering Information

Board Number	MPS IC Number
EV0041	MP8040DN

### **EV0041 Evaluation Board**



(Actual Size: 3.5"X x 3.5"Y)

## **Absolute Maximum Ratings**

Supply Voltage V <sub>IN</sub>	-0.3V to 26V
SW Pin Voltage V <sub>SW</sub>	$-0.3V$ to $V_{IN}$
SW to BS	-0.3V to 6V
Voltage at All Other Pins	-0.3V to 6V
RMS Output Current	6A Maximum

# **Recommended Operating Conditions**

Input Supply Voltage (V <sub>IN</sub> )	7.5 V to 25V
Peak Output Current	9A Maximum
RMS Output Current	4.5A Maximum

#### **Features**

- +/- 9A Peak Current Output
- +/- 4.25A Continuous Current Output
- Up to 1.2MHz Switching Frequency
- Protected Integrated Power 0.1 Ω Switches
  - Designed Switch Dead time of 30ns
  - All Switches Current Limited
  - Internal Under-voltage Protection
  - Internal Thermal Protection
- 1µA Standby Mode
- Fault Indicator Output

# **Applications**

- Full or Half Bridge DC-DC Switching Regulator
- Class D Audio Driver
- Motor Driver

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Figure 3: EV0041A Stereo Single Ended Schematic

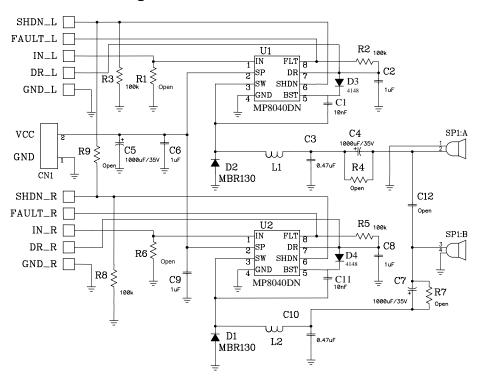


Table 1: EV0041A Stereo Single Ended Bill of Materials

Component	Description	Manufacturer Part Number	Package	Qty
U1, U2	PWM Power Driver	Monolithic Power Systems MP8040DN	SOIC8	2
C4, C5, C7	1000μF/35V	Panasonic P/N EEUFC1V102B	5.0-R10.0	3
C3, C10	0.47μF	Panasonic P/N ECQV1H474JL	5.08	3
C12	No Stuff	N/A	5.08	0
C1, C11	10nF	NIC P/N NMC0603X7R103K10	0603	2
	Alternate	Taiyo Yuden P/N UMK107BJ103MA	0603	0
C2, C8	1μF	Taiyo Yuden P/N UMK107BJ103MA	0805	2
C6, C9	1μF	NIC P/N NMC12063X7R105K16	1206	2
	Alternate	Taiyo Yuden P/N GMK316BJ105ML	1206	
L1, L2	15µH, 6A	Toko P/N 13BHBP-A7502H	13BHBP	2
R1, R6	No Stuff	Taiyo Yuden P/N GMK316BJ105ML	0805	0
R2, R3, R5, R8	100ΚΩ	Toko P/N 13BHBP-A7502H	0805	4
R4, R7, R9	No Stuff	N/A	0805	0
D1, D2	1A, 30V, Schottky	On Semiconductor P/N MBR130	SMC	2
	Alternate	Diodes Inc., P/N B130B	SMC	0
D3, D4	300mA, 100V	Diodes Inc. P/N 1N4148WS	SOD323	2
			Total	24

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Figure 4: EV0041B Mono Full Bridge Schematic

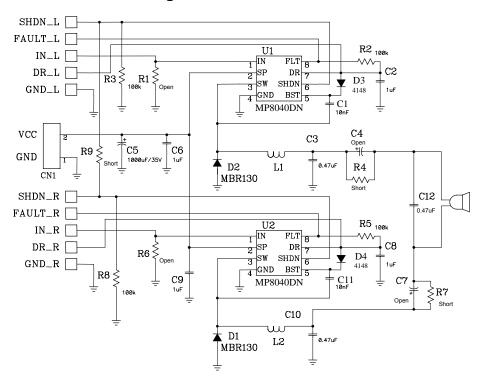


Table 2: EV0041B Mono Full Bridge Bill of Materials

Component	Description	Manufacturer Part Number	Package	Qty
U1, U2	PWM Power Driver	Monolithic Power Systems MP8040DN	SOIC8	2
C5	1000μF/35V	Panasonic P/N EEUFC1V102B	5.0-R10.0	3
C3, C10, C12	0.47μF	Panasonic P/N ECQV1H474JL	5.08	3
C4, C7	No Stuff	N/A	5.0-R10.0	0
C1, C11	10nF	NIC P/N NMC0603X7R103K10	0603	2
	Alternate	Taiyo Yuden P/N UMK107BJ103MA	0603	0
C2, C8	1μF	Taiyo Yuden P/N UMK107BJ103MA	0805	2
C6, C9	1μF	NIC P/N NMC12063X7R105K16	1206	2
	Alternate	Taiyo Yuden P/N GMK316BJ105ML	1206	0
L1, L2	15µH, 6A	Toko P/N 13BHBP-A7502H	13BHBP	2
R1, R6	No Stuff	Taiyo Yuden P/N GMK316BJ105ML	0805	0
R2, R3, R5, R8	100ΚΩ	Toko P/N 13BHBP-A7502H	0805	4
R4, R7, R9	0Ω	N/A	0805	0
D1, D2	1A, 30V, Schottky	On Semiconductor P/N MBR130	SMC	2
	Alternate	Diodes Inc., P/N B130B	SMC	0
D3, D4	300mA, 100V	Diodes Inc. P/N 1N4148WS	SOD323	2
			Total	24

EV0041

MP8040

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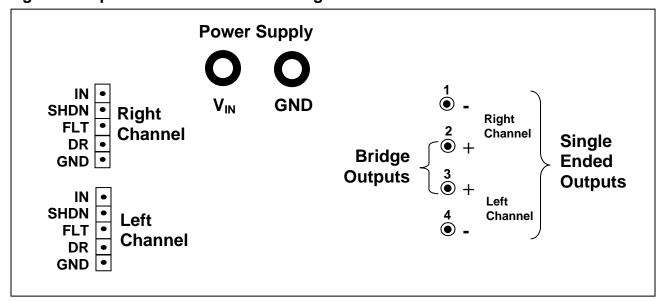
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# **Operation**

- 1. The EV0041 comes configured as a stereo single ended audio amplifier (EV0041A).
- 2. To configure the board as a full bridge circuit (EV0041B), short R4, R7, R9, remove C4, C7 and stuff C12 with a  $0.47\mu F$  capacitor.
- 3. Connect the audio inputs to the IN pins as shown in Figure 5.
- 4. Connect speakers to pins 1-4 as shown in Figure 5 for single ended configuration. Use pins 2 and 3 for bridged circuit.
- 5. Connect the power supply to the  $V_{IN}$  terminals as shown in Figure 5.
- 6. SHDN enables/disables the MP8040. Drive SHDN low to turn on the MP8040, drive it high to turn it off. If not used connect SHDN to GND.
- 7. A low output at FLT indicates that the MP8040 has detected a fault and has shutdown.
- 8. The DR pin is an optional fixed 5V voltage output capable of driving a 1mA load for external circuitry.

Figure 5: Top Side Evaluation Board Diagram



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Figure 6: Top Silk Layer

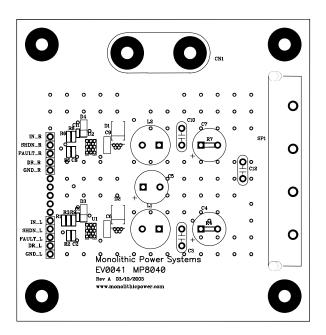


Figure 7: Top Layer

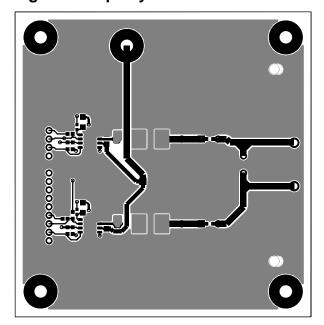
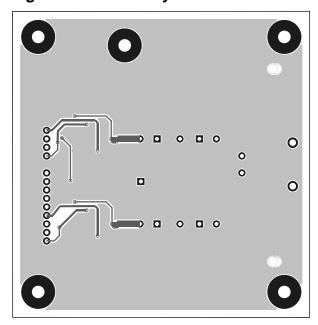


Figure 8: Bottom Layer



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