



The Future of Analog IC Technology®

# EV7782DF-02

## 40W Class D Stereo Bridged Audio Amplifier Evaluation Board

### DESCRIPTION

The EV7782DF-02 is a stereo evaluation board for MPS' MP7782 Class D Bridged Audio Amplifier. It is a second generation, fully integrated audio amplifier which dramatically reduces solution size by integrating four 180mΩ Power MOSFETs in a space saving TSSOP20 Package. It utilizes a full bridge output structure capable of delivering 40W into 8Ω speakers. As in all other MPS Class D Audio Amplifiers, this device exhibits the high fidelity of a Class AB amplifier with an efficiency of 90%. The circuit is based on the MPS' proprietary variable frequency modulation topology (patents pending) that delivers excellent PSRR, fast response time and operates on a single power supply.

### ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Supply Voltage	V <sub>DD</sub>	9.5 to 24	V

### FEATURES

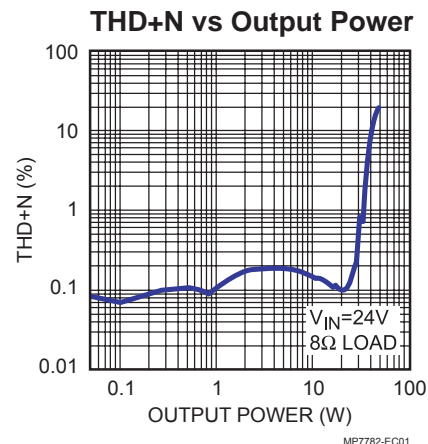
- 2 x 40W Peak, 2 x 30W Continuous into 8Ω with V<sub>DD</sub> = 24V
- 90% Efficiency
- THD+N = 0.1%
- 9.5V to 24V Supply Voltage Operation
- Full Bridge Output Drive
- 4 Integrated 180mΩ Switches
- Turn-On / Turn-Off Click and Pop Suppression
- Integrated Short Circuit Protection
- Integrated Thermal Shutdown
- Mute / Standby Mode
- Thermally Enhanced TSSOP20F Package with Exposed Pad

### APPLICATIONS

- Flat Panel LCD and PDP Displays
- Notebook and Multimedia Computers
- Televisions
- Home Stereos
- DVD and VCD Players
- Game Devices and Systems
- Subwoofer

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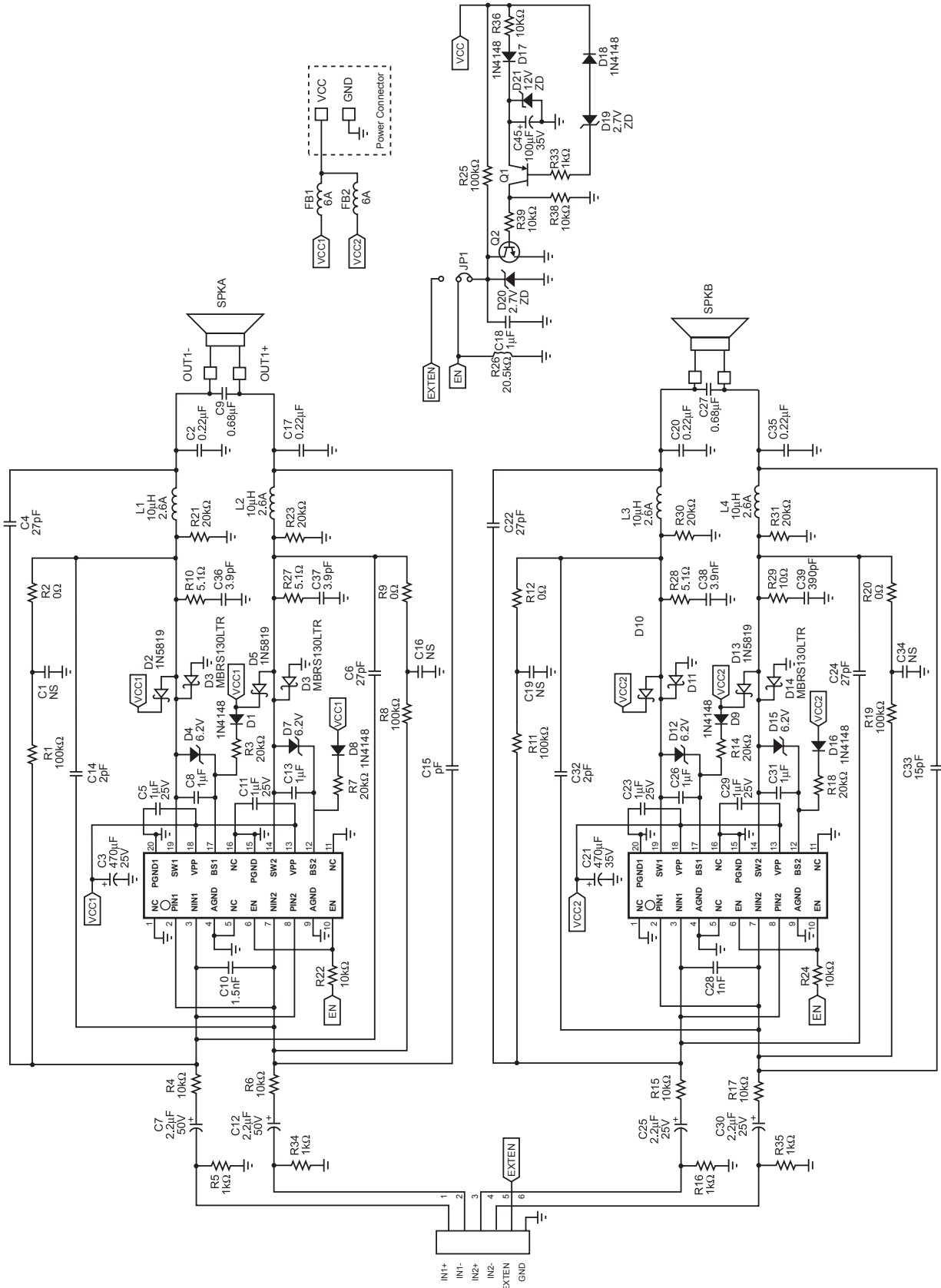
## EV7782DF-01A EVALUATION BOARD



Dimensions (L x W x H) 4.0" x 3.5" x 1.0" (10cm x 9cm x 2.5cm)

Board Number	MPS IC Number
EV7782DF-02A	2 x MP7782DF

EVALUATION BOARD SCHEMATIC



EV7782\_S01

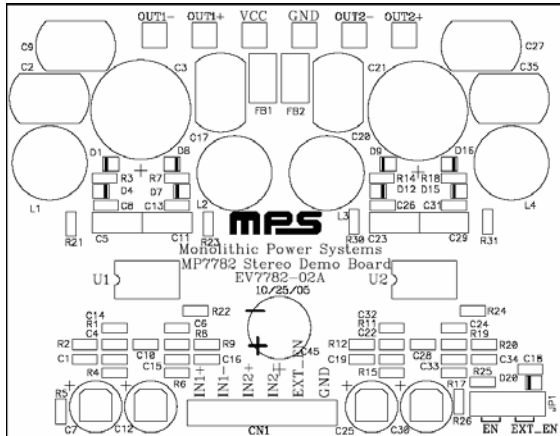
**EV7782DF-02A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer P/N	Distributor P/N
2	C10, C28	1nF	Ceramic Capacitor, 50V, X7R	0603	TDK C1608X7R1H102K	Digikey 445-1308-1-ND
5	C8, C13, C18, C26, C31	1µF	Ceramic Capacitor, 16V, X5R	0603	TDK C1608X5R1C105K	Digikey 445-1416-1-ND
4	C6, C14, C24, C32	2pF	Ceramic Capacitor, 50V, NPO	0603	Panasonic ECJ-1VC1H020C	Digikey PCC020CVCT-ND
4	C36, C37, C38, C39	3.9nF	Ceramic Capacitor, 50V, X7R	0603	Panasonic ECJ-1VB1H392K	Digikey PCC1779CT-ND
4	C4, C15, C22, C33	15pF	Ceramic Capacitor, 50V, NPO	0603	TDK C1608C0G1H150J	Digikey 445-1271-1-ND
4	C1, C16, C19, C34		Do Not Stuff	0603		
4	C5, C11, C23, C29	1µF	Ceramic Capacitor, 25V, X7R	1206	TDK C3216X7R1E105K	Digikey 445-1381-1-ND
4	C7, C12, C25, C30	2.2µF	Electrolytic Capacitor, 50V, NHG	Radial	Panasonic ECA-1HHG2R2	Digikey P5564-ND
4	C2, C17, C20, C35	0.22µF	Film Capacitor, 50V, V-Series	Radial	Panasonic ECQ-V1H224JL	Digikey P4667-ND
2	C9, C27	0.68µF	Film Capacitor, 50V, V-Series	Radial	Panasonic ECQ-V1H684JL	Digikey P4673-ND
2	C3, C21	470µF	Electrolytic Capacitor, 25V, NHG	Radial	Panasonic ECA-1EHG471	Digikey P5543-ND
1	C45	100µF	Electrolytic Capacitor, 35V, NHG	Radial	Panasonic ECA-1VHG101	Digikey P5551-ND
1	CN1		6-Pin Header, 0.1"			
6	D1, D8, D9, D16, D17, D18		Diode Switch, 75V, 200mW	SOD323	Diodes Inc. 1N4148WS-7	Digikey 1N4148WSDICT-ND
4	D2, D5, D10, D13		Diode Schottky, 40V, 1A	SOD123	Diodes Inc. 1N5819HW-7	Digikey 1N5819HWDICT-ND
4	D4, D7, D12, D15		Diode Zener, 6.2V, 200mW	SOD323	Diodes Inc. BZT52C6V2S-7	Digikey BZT52C6V2SDICT-ND
4	D3, D6, D11, D14		Diode Schottky, 30V, 1A	SMB	IR MBRS130LTR	Digikey MBRS130LCT-ND
1	D21		Diode Zener, 12V, 200mW	SOD323	Diodes Inc. BZT52C12S-7	Digikey BZT52C12SDICT-ND
1	D19		Diode Zener, 2.7V, 200mW	SOD323	Diodes Inc. BZT52C2V7S-7	Digikey BZT52C2V7SDICT-ND
1	D20		Diode Zener, 2.7V, 200mW	SOD323	Diodes Inc. BZT52C2V7S-7	Digikey BZT52C2V7SDICT-ND
2	FB1, FB2		Ferrite Bead, 6A	1206	Steward HI1206T500R-00	Digikey 240-1009-1-ND
1	JP1		3-Pin Header, 0.1"			

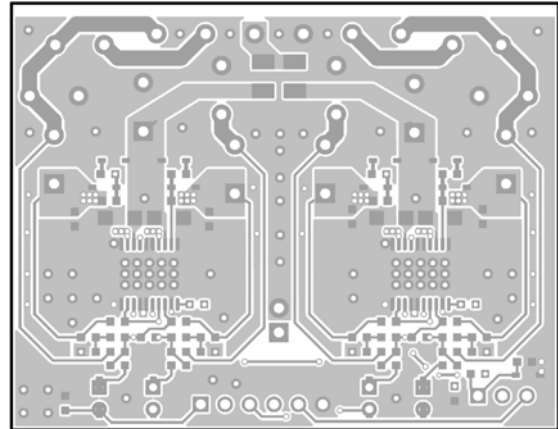
**EV7782DF-02A BILL OF MATERIALS** (continued)

Qty	Ref	Value	Description	Package	Manufacturer P/N	Distributor P/N
4	L1, L2, L3, L4	10 $\mu$ H	Inductor, 2.6A, 8RDY	Radial	Toko A7040HN-100M	
1	Q1		Transistor, PNP, 40V	SOT-23	Fairchild MMBT3906	Digikey MMBT3906FSCT-ND
1	Q2		Transistor, NPN, 40V	SOT-23	Fairchild MMBT3904	Digikey MMBT3904FSCT-ND
4	R2, R9, R12, R20	0 $\Omega$	Film Resistor, 5%	0603	Panasonic ERJ-3GEY0R00V	Digikey P0.0GCT-ND
5	R5, R16, R34, R33, R35	1k $\Omega$	Film Resistor, 5%	0603	Panasonic ERJ-3GEYJ102V	Digikey P1.0KGCT-ND
9	R4, R6, R15, R17, R22, R24, R36, R38, R39	10k $\Omega$	Film Resistor, 5%	0603	Panasonic ERJ-3GEYJ103V	Digikey P10KGCT-ND
8	R3, R7, R14, R18, R21, R23, R30, R31	20k $\Omega$	Film Resistor, 5%	0603	Panasonic ERJ-3GEYJ203V	Digikey P20KGCT-ND
1	R26	20.5k $\Omega$	Film Resistor, 1%	0603	Panasonic ERJ-3EKF2052V	Digikey P20.5KHCT-ND
5	R1, R8, R11, R19, R25	100k $\Omega$	Film Resistor, 1%	0603	Panasonic ERJ-3EKF1003V	Digikey P100KHCT-ND
4	R10, R27, R28, R29	5.1 $\Omega$	Film Resistor, 5%	1206	Panasonic ERJ-8GEYJ5R1V	Digikey P5.1ECT-ND
2	U1, U2		Class D Audio Amplifier	TSSOP20	MPS MP7782DF	

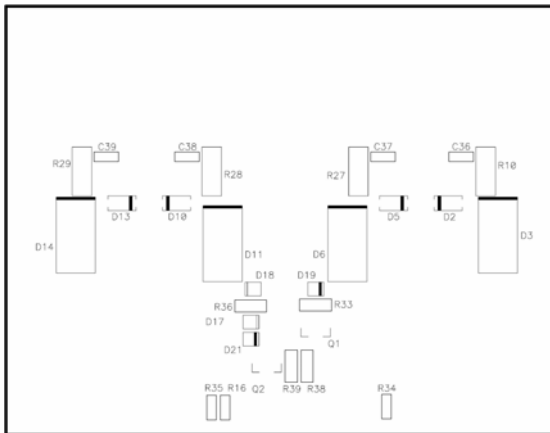
**PRINTED CIRCUIT BOARD LAYOUT**



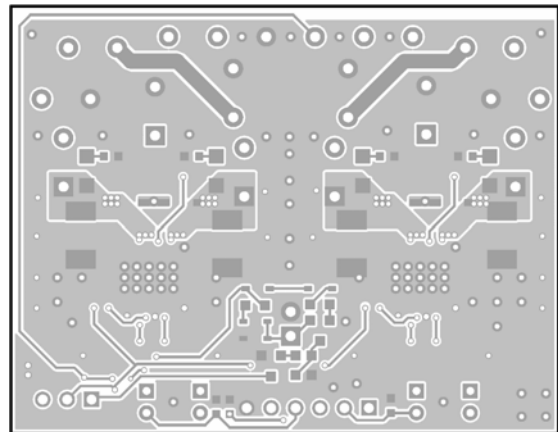
**Figure 1—Top Silk Layer**



**Figure 2—Top Layer**



**Figure 3—Bottom Silk Layer**



**Figure 4—Bottom Layer**

## QUICK START GUIDE

This board is factory set for 24V operation.

1. Power Requirements
  - a. Power supply: 24V.
  - b. 0V to 1V<sub>RMS</sub> (max) audio signal source.
  - c. Speaker: 8Ω or greater load resistance.
2. Setup Conditions
  - a. Connect the outputs to the external speakers.
  - b. Adjust the power supply to 24V, (do not turn on).
  - c. Connect the power supply to the V<sub>DD</sub> terminals.
  - d. Disable the amplifier by removing the enable jumper JP1.
  - e. Connect the audio input signal source to the amplifier inputs (IN1, IN2).
  - f. Turn on the power supply to apply power to the board.
3. Music Turn-On Sequence
  - a. Enable the amplifier by placing jumper JP1.
  - b. Audio should be heard from the speaker(s)
4. Music Turn-Off Sequence
  - a. Set the enable switch to the DISABLE position, again by removing jumper JP1.

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