



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

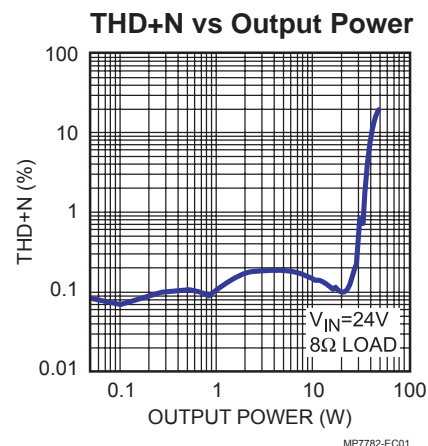
- 2 x 40W Peak, 2 x 30W Continuous into 8Ω with V<sub>DD</sub> = 24V
- 90% Efficiency
- THD+N = 0.1%
- 9.5V to 24V Supply Voltage Operation
- Full Bridge Output Drive
- 4 Integrated 180mΩ Switches
- Turn-On / Turn-Off Click and Pop Suppression
- Integrated Short Circuit Protection
- Integrated Thermal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

"MPS" and "The Future of Analog IC Technology" are Registered Trademarks of Monolithic Power Systems, Inc.

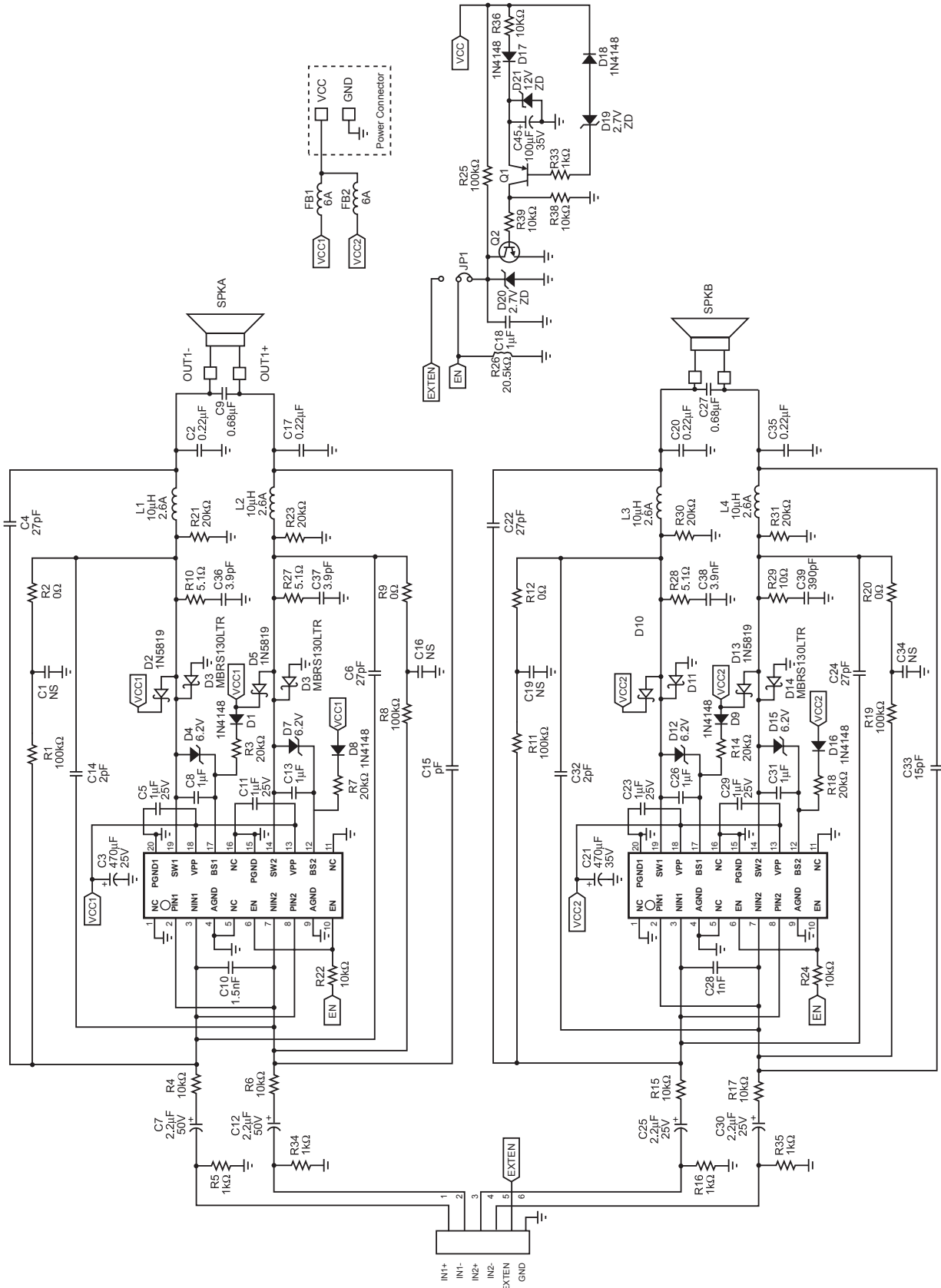
## EV7782DF-01A EVALUATION BOARD



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

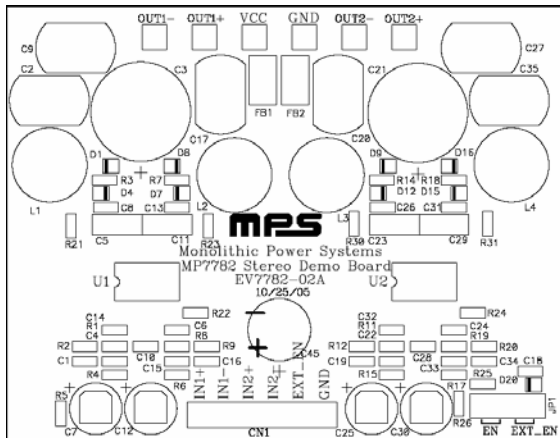
**EV7782DF-02A BILL OF MATERIALS**

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"			

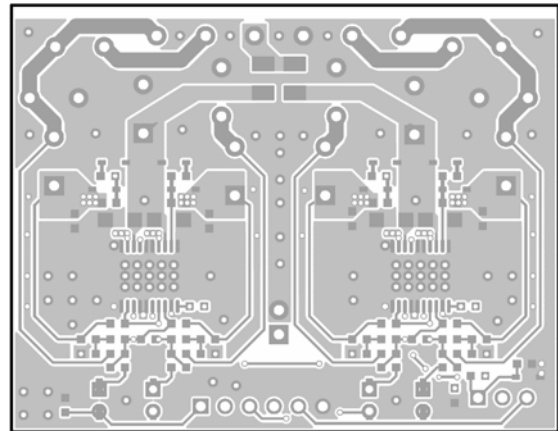
**EV7782DF-02A BILL OF MATERIALS** (continued)

Qty	Ref	Value	Description	Package	Manufacturer P/N	Distributor P/N
4	L1, L2, L3, L4	10μH	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	0Ω	Film Resistor, 5%	0603	Panasonic ERJ-3GEY0R00V	Digikey P0.0GCT-ND
5	R5, R16, R34, R33, R35	1kΩ	Film Resistor, 5%	0603	Panasonic ERJ-3GEYJ102V	Digikey P1.0KGCT-ND
9	R4, R6, R15, R17, R22, R24, R36, R38, R39	10kΩ	Film Resistor, 5%	0603	Panasonic ERJ-3GEYJ103V	Digikey P10KGCT-ND
8	R3, R7, R14, R18, R21, R23, R30, R31	20kΩ	Film Resistor, 5%	0603	Panasonic ERJ-3GEYJ203V	Digikey P20KGCT-ND
1	R26	20.5kΩ	Film Resistor, 1%	0603	Panasonic ERJ-3EKF2052V	Digikey P20.5KHCT-ND
5	R1, R8, R11, R19, R25	100kΩ	Film Resistor, 1%	0603	Panasonic ERJ-3EKF1003V	Digikey P100KHCT-ND
4	R10, R27, R28, R29	5.1Ω	Film Resistor, 5%	1206	Panasonic ERJ-8GEYJ5R1V	Digikey P5.1ECT-ND
2	U1, U2		Class D Audio Amplifier	TSSOP20	MPS MP7782DF	

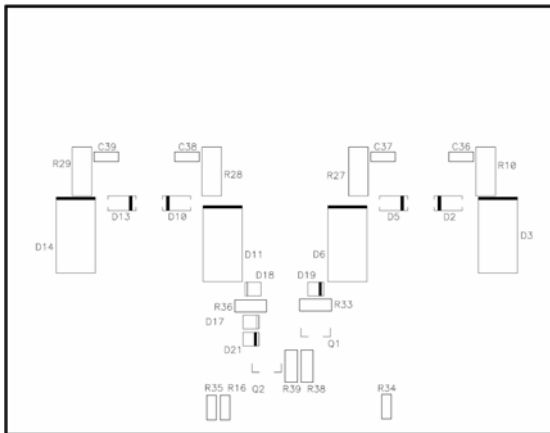
**PRINTED CIRCUIT BOARD LAYOUT**



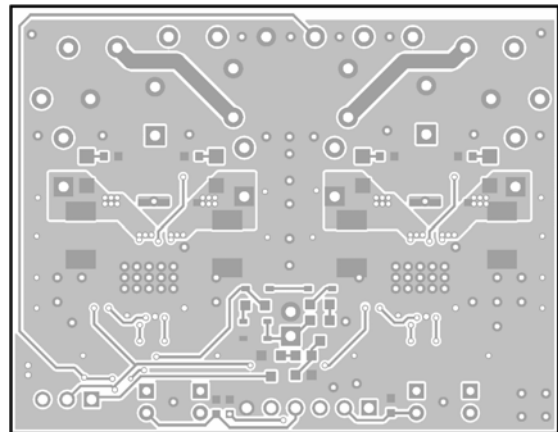
**Figure 1—Top Silk Layer**



**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.

**NOTICE:** The information in this document is subject to change without notice. Please contact MPS for current specifications. Users should warrant and guarantee that third party Intellectual Property rights are not infringed upon when integrating MPS products into any application. MPS will not assume any legal responsibility for any said applications.