

ADDITIONAL REFERENCES

1. Maxim - Class D Amplifiers: Fundamentals of Operation and Recent Developments – [Theory #1]
<http://pdfserv.maxim-ic.com/en/an/AN3977.pdf>
2. International Rectifier - Class D Audio Amplifier Basics – [Theory #4]
www.irf.com/technical-info/appnotes/an-1071.pdf
3. Electronic Design Magazine - Designing With Class D Amplifier ICs – [News #2]
<http://electronicdesign.com/content/print.aspx?topic=designing-with-class-d-amplifier-ics13874>
4. National Semiconductor - Filterless Class D Amplifiers – [Theory # 2]
<http://www.national.com/an/AN/AN-1497.pdf>
5. Analog Devices - Class D Audio Amplifiers: What, Why, and How
http://www.analog.com/library/analogDialogue/archives/40-06/class_d.pdf
6. EDN Magazine – Class D: Generation 3 – [News #1]
<http://www.edn.com/contents/images/408383.pdf>
7. Thermal Considerations for a Class D Amplifier – [Theory #3]
<http://pdfserv.maxim-ic.com/en/an/AN3879.pdf>

NEWS - Miscellaneous

Class D Amplifiers Empower Mobile Multimedia

http://www.esemagazine.com/index.php?option=com_content&task=view&id=421&Itemid=2

Designing With Class D Amplifier ICs

<http://electronicdesign.com/content/print.aspx?topic=designing-with-class-d-amplifier-ics13874>

NEWS

<http://www.edn.com/article/CA6648691.html?text=class+D+applications>

<http://www.edn.com/pressRelease/2140344285.html?text=class+D+applications>

<http://www.edn.com/contents/images/408383.pdf>

International Rectifier***List of IRF application notes on class D***

www.irf.com/technical-info/appnotes.htm#audio

Class D Audio Amplifier Basics

www.irf.com/technical-info/appnotes/an-1071.pdf

A Class D audio amplifier is basically a switching amplifier or PWM amplifier. There are a number of different classes of amplifiers. This application note takes a look at the definitions for the main classifications.

Class D Audio Amplifier Performance Relationship to MOSFET Parameters

<http://www.irf.com/technical-info/appnotes/an-1070.pdf>

This application note discusses key parameters to be considered in the selection of MOSFETs for class D audio amplifier and their relationship with amplifier's performance such as efficiency, EMI, and THD. In addition, benefits and advantages of IR Digital Audio MOSFETs in class D audio amplifier are presented.

PCB Layout with IR Class D Audio Gate Drivers

<http://www.irf.com/technical-info/appnotes/an-1135.pdf>

...The layout of a class D amplifier remains the most obscure part of the design process. The purpose of this application note is to highlight aspects of the PCB layout which require a designer's careful attention.

IRS2092(S) Functional Description

<http://www.irf.com/technical-info/appnotes/an-1138.pdf>

The IRS2092(S) is a Class D audio amplifier driver with integrated PWM modulator and over current protection. Combined with two external MOSFETs and a few external components, the IRS2092(S) forms a complete Class D amplifier with dual over current, and shoot-through protection, as well as UVLO protection for the three bias supplies.

IRS2093M Functional Description

<http://www.irf.com/technical-info/appnotes/an-1146.pdf>

The IRS2093M is a four channel Class D audio amplifier driver with integrated PWM modulators and over current protection. Combined with eight external MOSFETs and external passive components, the IRS2093M forms four complete Class D amplifiers.

National Semiconductor

www.national.com

Class D Amplifier FAQ

http://www.national.com/vcm/NSC_Content/Files/en_US/Audio/ClassDAmplifierFAQ.pdf

This FAQ is intended to capture a variety of knowledge about the selection, application, and measurement of Class D amplifiers. The emphasis of this FAQ is towards Class D amplifiers in the 0.5W to 2W range intended for portable media devices such as mobile phones, portable DVD players, and portable navigation systems. However, the vast majority of this information can be applied to Class D amplifiers from milliwatts to kilowatts of output power.

Rane Corporation

www.rane.com

Commercializing Class D Amplifier Technologies

<http://www.rane.com/pdf/ranenotes/Class%20D%20Amplifier%20Technologies.pdf>

The popularity of commercial audio systems having large numbers of channels has resulted in a growing demand for smaller, lighter, and less expensive multichannel power amplifier products. This paper describes how careful integration of power factor corrected switchmode power supplies, class D power amplifiers, and digital signal processors yields high power density and especially reliable and electromagnetically quiet products at a reasonable cost.

Elliott Sound Products

(Professional results for the Do-It-Yourself enthusiast)

<http://sound.westhost.com/>

Class D Audio Amplifiers - Theory and Design

<http://sound.westhost.com/articles/pwm.htm>

MAXIMwww.maxim-ic.com

Minimize Noise in Audio Channels with Smart PCB Layout

<http://pdfserv.maxim-ic.com/en/an/AN4079.pdf>

Class D Amplifiers: Fundamentals of Operation and Recent Developments

<http://pdfserv.maxim-ic.com/en/an/AN3977.pdf>

Thermal Considerations for a Class D Amplifier

<http://pdfserv.maxim-ic.com/en/an/AN3879.pdf>

Reference Design for a Class-D, 2.1 Channel, Audio Amplifier for an MP3 Player Docking Station

<http://pdfserv.maxim-ic.com/en/an/AN4320.pdf>

Overview of 2.1 (Satellite/Subwoofer) Speaker Systems

<http://pdfserv.maxim-ic.com/en/an/AN4046.pdf>

- for 2.1 stereo PC speakers

Spread-Spectrum-Modulation Mode Minimizes Electromagnetic Interference in Class D Amplifiers

<http://pdfserv.maxim-ic.com/en/an/AN3881.pdf>

- no output filter needed in class D!

Reduce EMI from Class D Amplifiers Using New Modulation Techniques and Filter Architectures

<http://pdfserv.maxim-ic.com/en/an/AN3878.pdf>

Feature-Rich, Complete Audio Record/Playback for GSM/GPRS Cell Phones

<http://pdfserv.maxim-ic.com/en/an/AN3573.pdf>

Class D Audio Amplifiers Save Battery Life – 2002

<http://pdfserv.maxim-ic.com/en/an/AN1760.pdf>

Class D Audio Amplifier Output Filter Optimization – 2002

<http://pdfserv.maxim-ic.com/en/an/AN624.pdf>

Amplifier Considerations in Ceramic Speaker Applications - (pg 3-6)

http://www.maxim-ic.com/appnotes.cfm/an_pk/4164/

<http://pdfserv.maxim-ic.com/en/ej/EJ62.pdf>

Class G and Charge-Pump Technologies Maximize Efficiency in Boosted Amplifiers with Minimal Support Components

<http://pdfserv.maxim-ic.com/en/an/AN4121.pdf>

- class D cannot drive ceramic (piezoelectric) speakers

Circuit Refinements Ensure Quality Audio in Portable Devices

<http://pdfserv.maxim-ic.com/en/an/AN2980.pdf>

National Semiconductor**www.national.com****Personal Mobile Devices – Selection Guide**http://www.national.com/vcm/NSC_Content/Files/Documents/national_personal_mobile.pdf**Analog Product Guide 2009 Vol 2**http://www.national.com/vcm/NSC_Content/Files/Documents/national_analog_product_selguide.pdf**Filterless Class D Amplifiers**<http://www.national.com/an/AN/AN-1497.pdf>**Managing EMI in Class D Audio Applications**<http://www.national.com/an/AN/AN-1737.pdf>**Noise, TDMA Noise, and Suppression Techniques**<http://www.national.com/an/AN/AN-1496.pdf>**LM49352 - Mono Class D Audio Codec Subsystem with Ground Referenced Headphone Amplifiers, Earpiece Driver, and Audio DSP from the PowerWise® Family**<http://www.national.com/pf/LM/LM49352.html#Overview>

National Semiconductor Extends Family of Low-Power, Premium Quality Audio Subsystems for Handheld Devices

<http://www.national.com/news/item/0,1735,1390,00.html>

App Notes:

<http://www.national.com/an/AN/AN-1451.pdf><http://www.national.com/an/AN/AN-1432.pdf>**LM48511 - 3W, Ultra-Low EMI, Filterless, Mono, Class D Audio Power Amplifier with Spread Spectrum**<http://www.national.com/pf/LM/LM48511.html#Overview>

National Semiconductor's New Audio Amplifier with Spread Spectrum and Integrated Boost Architecture Reduces EMI Sensitivity in Portable Applications

<http://www.national.com/news/item/0,1735,1288,00.html>**Reference Design 167 - High Efficiency Portable Media Player (PMP) Docking Station**<http://www.national.com/rd/RDhtml/RD-167.html>**LM4962 Stereo Ceramic Speaker Driver Application Note**<http://www.national.com/an/AN/AN-1440.pdf>

- not class D

National Semiconductor NEWS:

2009 - National Semiconductor's New Stereo Headphone Amplifier Doubles Audio Playback Time for Portable Devices

<http://www.national.com/news/item/0,1735,1391,00.html>

- class G amp

2004 - National Semiconductor Introduces Two High Efficiency Class D Boomer Audio Amplifiers for Cellular Phones and Flat Panel Monitors

<http://www.national.com/news/item/0,1735,957,00.html>

- one of these amps is obsolete

Analog Devices

www.analog.com

Class D Audio Amplifiers: What, Why, and How

http://www.analog.com/library/analogDialogue/archives/40-06/class_d.pdf

NEWS:**Stereo Audio Codecs Deliver Best Audio Experience with Lowest Power Dissipation**

http://www.analog.com/static/imported-files/solutions_bulletins/consumer01-09/consumer6.html#b

FIRST PULSE DENSITY MODULATION (PDM) DIGITAL-INPUT CLASS D AUDIO AMPLIFIER

http://www.analog.com/en/press-release/9_25_09_First_Pulse_Density_Modulation_PDM_Digital/press.html

D2Audio

<http://www.intersil.com/audio/>

D2Audio® DAE-1: D2-814xx PWM Controllers – The World's First Intelligent Digital Amplifier Solution

<http://www.intersil.com/audio/DAE1/DAE-1%20Product%20Sheet.pdf>

Reference Design

D2AUDIO® TXF15-2 – Advanced Audio Processing Solution for Stereo, 2.1 and Bi-Amp TV's

<http://www.intersil.com/audio/DAE1/TXF15-2%20Product%20Sheet.pdf>

Audio Engineering Society

www.aes.org

Call for comment on reaffirmation of AES17-1998

<http://www.aes.org/standards/comments/drafts/aes17-cfc-reaff-091207.pdf>