

IRS2092 Integrated Class D Audio Driver IC with PWM Modulator

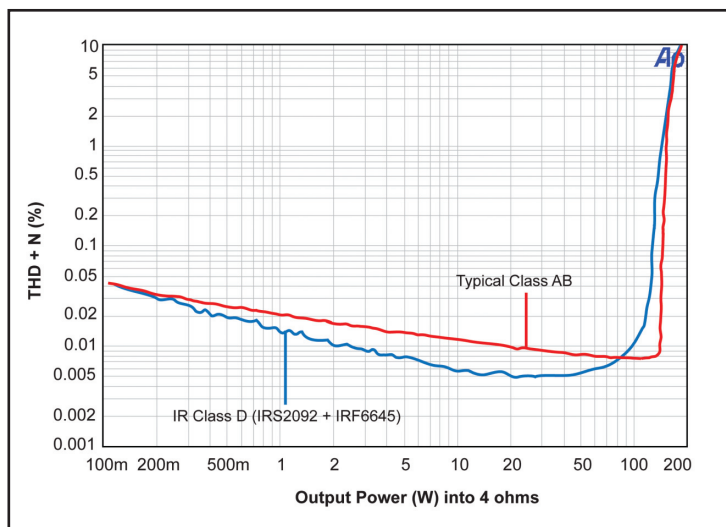
IR Advantage

- Integrated analog input
- Integrated self-oscillating PWM modulation
- Programmable bidirectional over-current protection with self-reset control
- Start and stop click noise reduction
- Floating inputs enable easy half-bridge implementation
- Programmable preset deadtime for scalable power design
- High noise immunity
- $\pm 100V$ ratings deliver up to 500W in output power
- PWM frequency up to 800kHz
- 16-pin DIP and SOIC



The IRS2092 is an integrated driver IC featuring protected PWM switching for medium power, high performance Class D audio amplifiers up to 500W in home theatre, home stereo, active speaker, musical instrument, and professional audio applications.

Based upon a half bridge topology, the new audio driver IC integrates four essential functions for Class D design implementation including error amplifier, PWM comparator, gate driver, and robust protection circuitry. As a result, this compact 16-pin IC offers high noise immunity, reduced start and stop click noise, and design scalability, while greatly reducing some of the most complicated and costly design tasks such as overload protection.



Key IRS2092 features include an analog PWM modulator with frequency up to 800 kHz, programmable bidirectional over-current protection (OCP) with self-reset control, under-voltage lockout protection (UVLO), and programmable preset deadtime for improved THD performance.

*Class D vs Class AB Comparison:
 THD + N Ratio vs Output Power*

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Digital Audio MOSFETs

The IRS2092 audio IC may be paired with an extensive range of IR digital audio MOSFETs addressing output power from 50W to 500W. These MOSFETs, have been optimized around parameters critical to audio performance such as efficiency, THD, and EMI. For detailed performance information, please refer to the MOSFET data sheets available online at www.irf.com.

The chipset forms a Class D audio solution that is much smaller than a comparable Class AB design. In a 100W application, for example, the IRS2092 IC and IRF6645 DirectFET® MOSFETs reduce board size by 60% and eliminate 20% of the parts from the typical bill of materials.

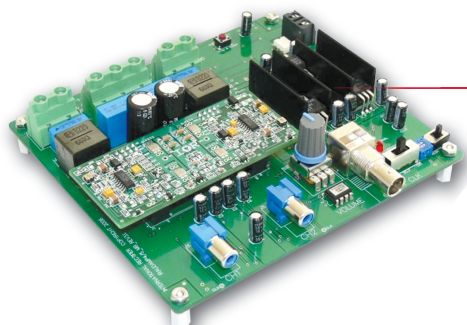
IC Specification

Part Number	Offset Voltage	Sink/Source Current	VCC Range (with UVLO)	Min/Max Output Voltage	Selectable Dead Time	Logic Compatible Input
IRS2092(S)PBF	±100V	1.2 / 1.0A	10-18V	10-18V	25/45/75/105ns	3.3 / 5.0V

Companion Digital Audio MOSFETs

DirectFET®				
Clipping Power	Without Heatsink		With Heatsink	
	4 Ohms	8 Ohms	4 Ohms	8 Ohms
50W - 100W	IRF6645	IRF6665	IRF6665	IRF6665
100W - 120W	IRF6645		IRF6645	IRF6775M
120W - 200W			IRF6645	IRF6775M
200W - 250W			IRF6775M	IRF6785M

IRFx Families			
Clipping power	Package	Load	
		4 Ohms	8 Ohms
50W - 60W	TO-220 Full-Pak 5-Pin	IRFI4024H-117P	IRFI4212H-117P
	TO-220	—	IRFB4212PbF
60W - 100W	TO-220 Full-Pak 5-Pin	IRFI4212H-117P	IRFI4212H-117P
	TO-220	IRFB4212PbF	IRFB4212PbF
100W - 200W	TO-220 Full-Pak 5-Pin	IRFI4212H-117P	IRFI4019H-117P
	TO-220	IRFB4212PbF	IRFB4019PbF
200W - 300W	TO-220 Full-Pak 5-Pin	IRFI4019H-117P	IRFI4020H-117P
	TO-220	IRFB4019PbF	IRFB4020PbF
300W - 500W	TO-220 Full-Pak 5-Pin		
	TO-220	IRFB4227PbF	IRFB4229PbF



Reference Design:

The IRAUDAMP5 reference design speeds development and evaluation. Based upon the IRS2092 IC and the IRF6645 DirectFET power MOSFETs, the two-channel design is a 120W half-bridge power amplifier which may be scaled for power and number of channels, and requires no heatsink under normal operating conditions. The design offers an efficiency of 96% at 120W in the MOSFET stage, and a THD+N of 0.005% at 60W, four ohms, (both typical).

DirectFET is a registered trademark of International Rectifier Corp.