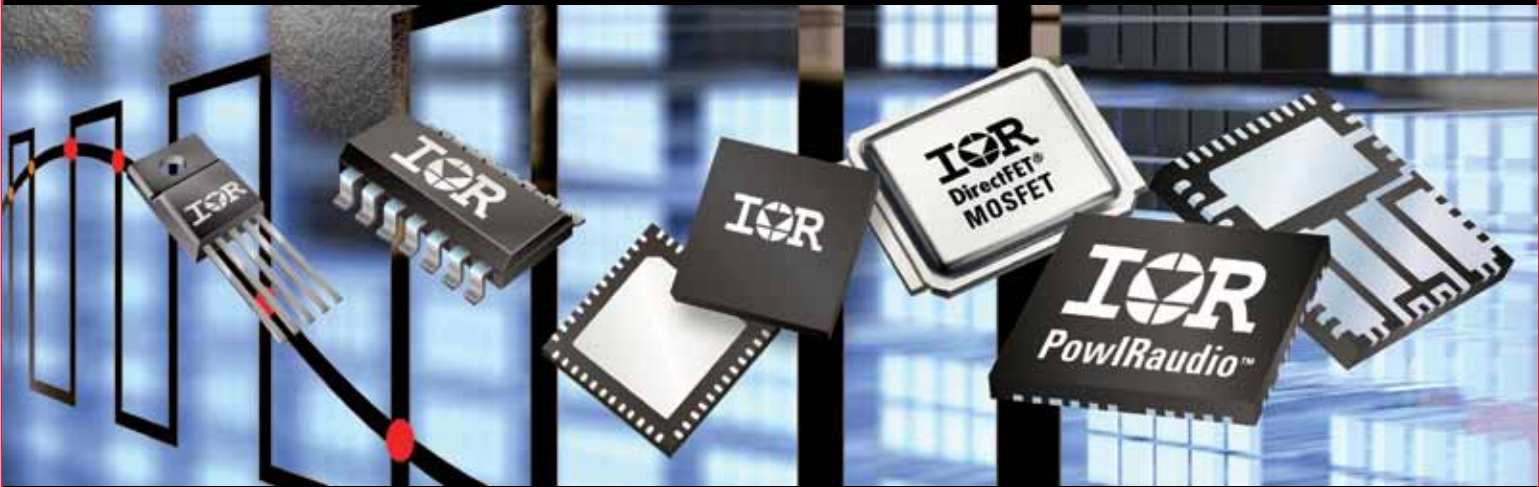
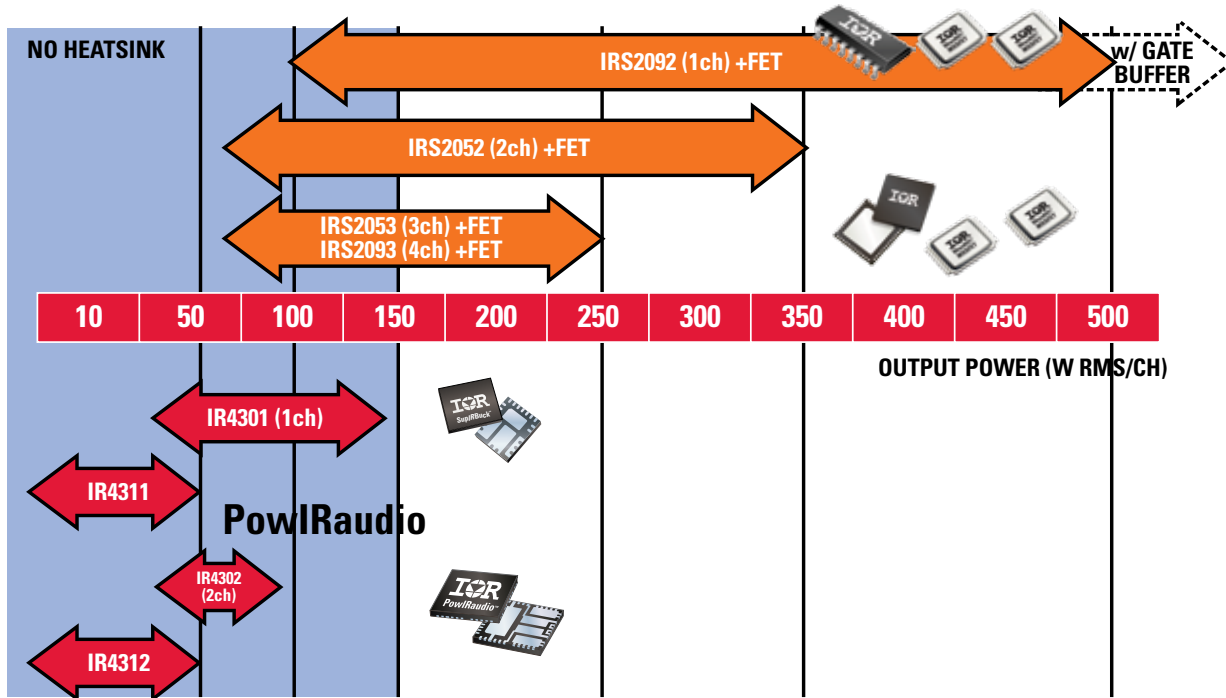


# Class D Audio Product Selection Guide

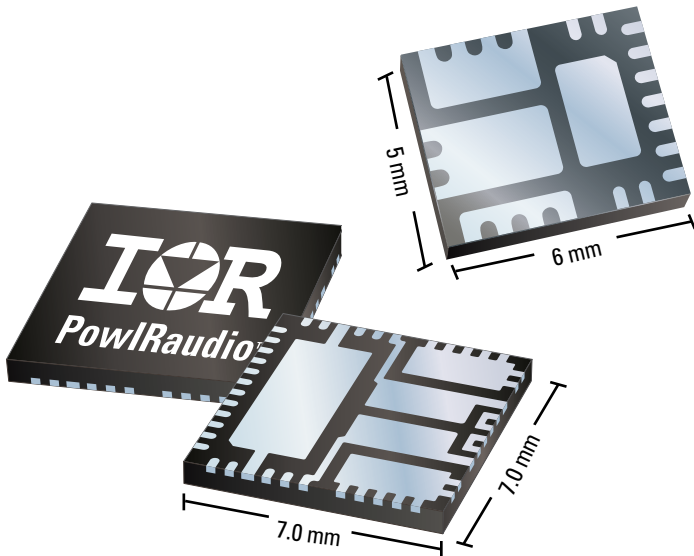


International  
**IOR** Rectifier  
THE POWER MANAGEMENT LEADER

## Class D Driver + Digital Audio MOSFET



## PowlRadio™ Integrated Class D Audio Amplifier



### The PowlRadio Advantage

- No heatsink required
- Best-in-class power efficiency and audio performance
- Reduce component count, simplify design
- Compatible with single supply or split rail configuration

### PowlRadio™ Integrated Class D Amplifier

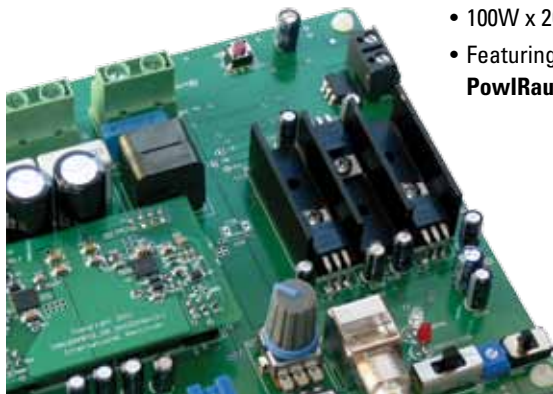
<b>IR4301*</b>	4Ω	130W/ch
	3Ω	100W/ch
	2Ω	70W/ch
<b>IR4311</b>	4Ω	35W/ch
	3Ω	45W/ch
	2Ω	60W/ch

### PowlRadio™ Integrated Two-Channel Class D Amplifier

<b>IR4302*</b>	4Ω	70W + 70W
	3Ω	50W + 50W
	2Ω	40W + 40W
<b>IR4312</b>	4Ω	35W + 35W
	3Ω	40W + 40W
	2Ω	30W + 30W

\*Higher power capable if heatsink is used

## PowlRaudio™ Reference Designs



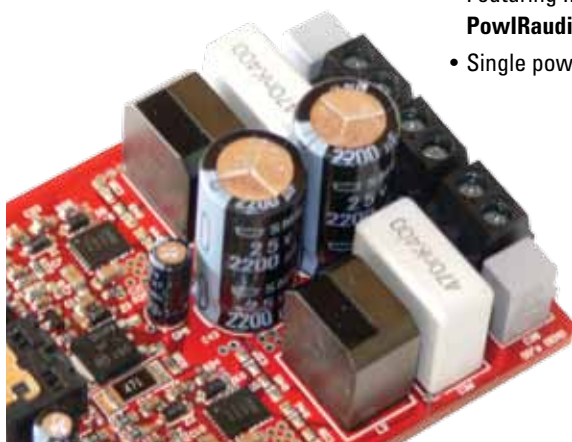
### IRAUDAMP12

- 100W x 2Channel (4Ω)
- Featuring IR4301  
**PowlRaudio**



### IRAUDAMP17

- 100W x 2Channel (4Ω)
- Featuring IR4302  
**PowlRaudio**
- Single power supply



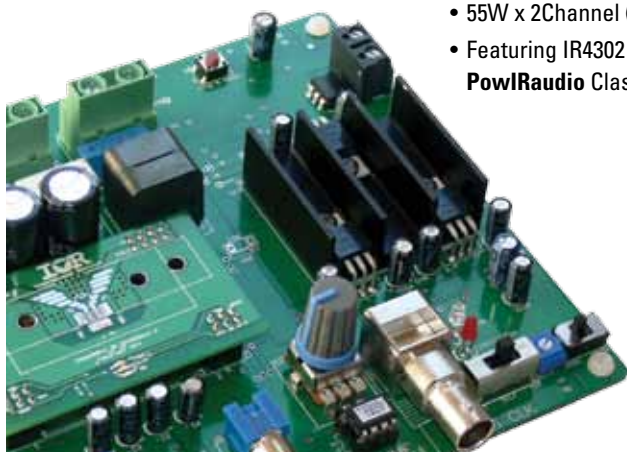
### IRAUDAMP15

- 25W x 2Channel (4Ω)
- Featuring IR4311  
**PowlRaudio**
- Single power Supply



### IRAUDAMP18

- 25W x 2Channel (4Ω)
- Featuring IR4312  
**PowlRaudio**



### IRAUDAMP16

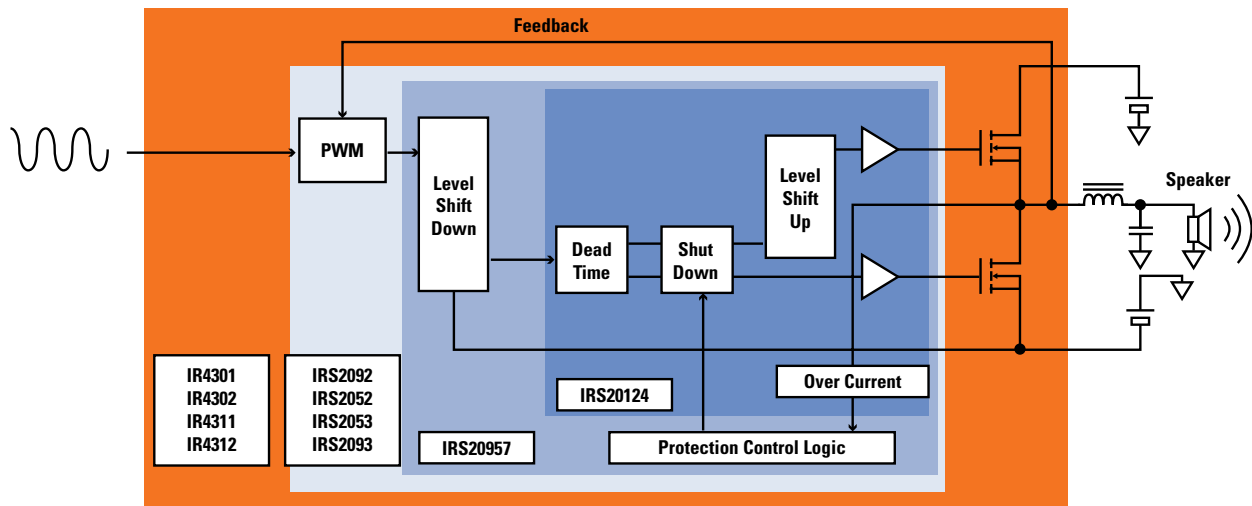
- 55W x 2Channel (4Ω)
- Featuring IR4302  
**PowlRaudio Class D IC**



### IRAUDAMP19

- 100W x 2Channel (4Ω)
- Featuring IR4301  
**PowlRaudio**
- Single power Supply

## PowlRaudio™ Integrated Class D Audio Amplifier



## Class D Driver IC Selection Chart

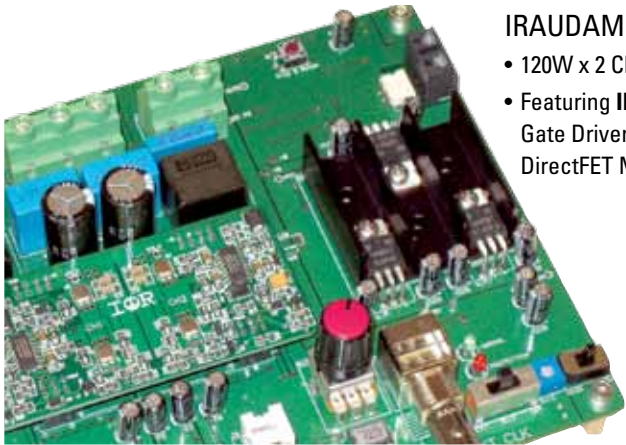
### The IR Advantage

- Unified design platform; scalable output power by replacing MOSFET
- Best-in-class power efficiency
- Class D tailored MOSFETs offer high efficiency and improve audio performance
- Large voltage and current headroom

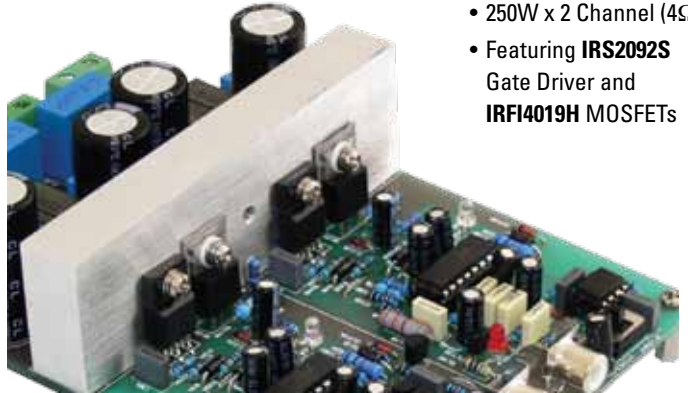


<b>Specifications</b>	IRS20124SPbF	IRS20957SPbF	IRS2092(S)PbF	IRS2052MPbF	IRS2053MPbF	IRS2093MPbF
Number of Audio Channels	1	1	1	2	3	4
Max Power per Channel	500 W	500 W	500 W	300 W	300 W	300 W
Supply Voltage	200V	+/-100V	+/-100V	+/-100V	+/-100V	+/-100V
Max PWM Frequency	1MHz	800kHz	800kHz	800kHz	800kHz	800kHz
Gate Sink/Source Current	1.2/1.0A	1.2/1.0A	1.2/1.0A	0.6/0.5A	0.6/0.5A	0.6/0.5A
<b>Features</b>	IRS20124SPbF	IRS20957SPbF	IRS2092(S)PbF	IRS2052MPbF	IRS2053MPbF	IRS2093MPbF
Over-Current Sensing	•	•	•	•	•	•
PWM Input	•	•				
Floating Input		•	•	•	•	•
Shut Down	•	•	•	•	•	•
Protection Control Logic		•	•	•	•	•
PWM controller			•	•	•	•
Clip Detection				•	•	•
Click Noise Reduction			•	•	•	•
Temperature Sensor Input				•	•	
Thermal Shutdown				•		
DC Offset Protection					•	
Clock Oscillator				•		
<b>Package and Reference Design</b>	IRS20124SPbF	IRS20957SPbF	IRS2092(S)PbF	IRS2052MPbF	IRS2053MPbF	IRS2093MPbF
Package type	14-pin SOIC narrow	16-pin SOIC narrow	16-pin PDIP 16-pin SOIC narrow	MLPQ48	MLPQ48	MLPQ48
Reference Design		IRAUDAMP4A, IRAUDAMP6	"IRAUDAMP5, IRAUDAMP7S, IRAUDAMP7D, IRAUDAMP9"	IRAUDAMP10	IRAUDAMP11	IRAUDAMP8

# IR Audio Reference Designs

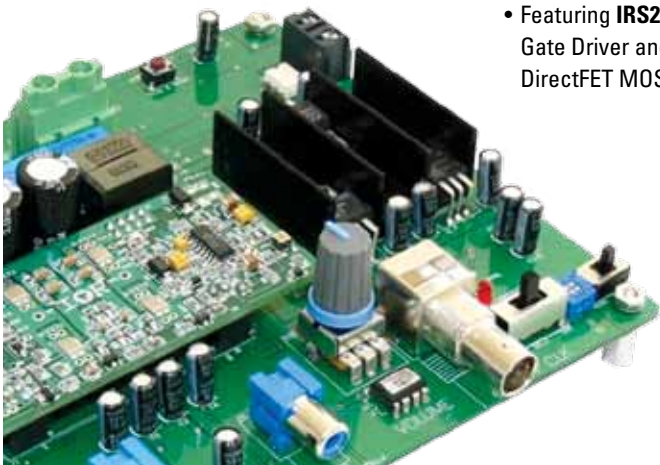


- IRAUDAMP4A**
- 120W x 2 Channel (4Ω)
  - Featuring **IRS20957S** Gate Driver and **IRF6645** DirectFET MOSFETs

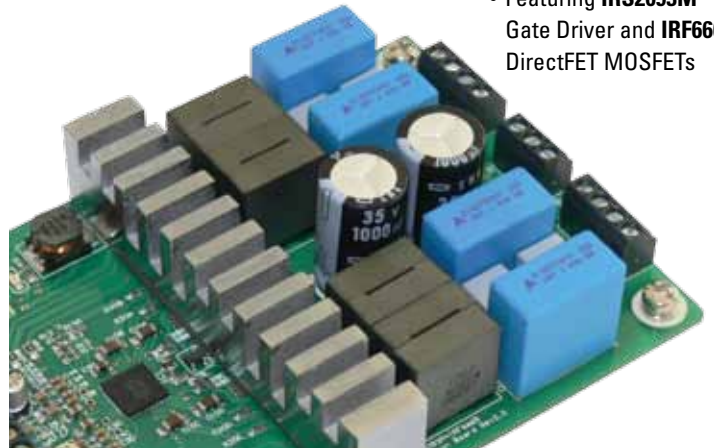


- IRAUDAMP7S**
- 250W x 2 Channel (4Ω)
  - Featuring **IRS2092S** Gate Driver and **IRF14019H** MOSFETs

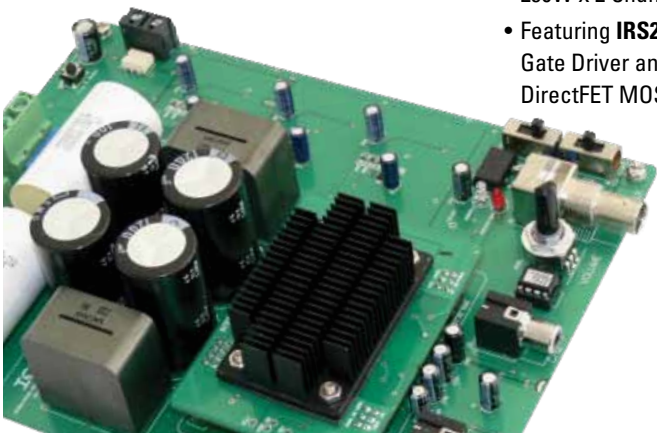
IRAUDAMP7D available for through-hole design



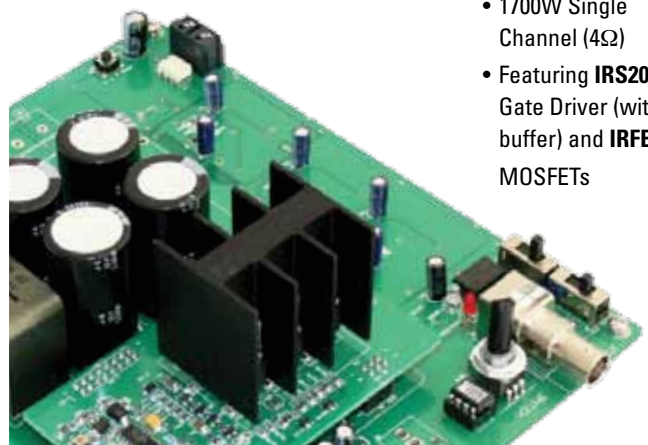
- IRAUDAMP5**
- 120W x 2 Channel (4Ω)
  - Featuring **IRS2092S** Gate Driver and **IRF6645** DirectFET MOSFETs



- IRAUDAMP8**
- 120W x 4 Channel (4Ω)
  - Featuring **IRS2093M** Gate Driver and **IRF6665** DirectFET MOSFETs



- IRAUDAMP6**
- 250W x 2 Channel (8Ω)
  - Featuring **IRS20957S** Gate Driver and **IRF6785** DirectFET MOSFETs

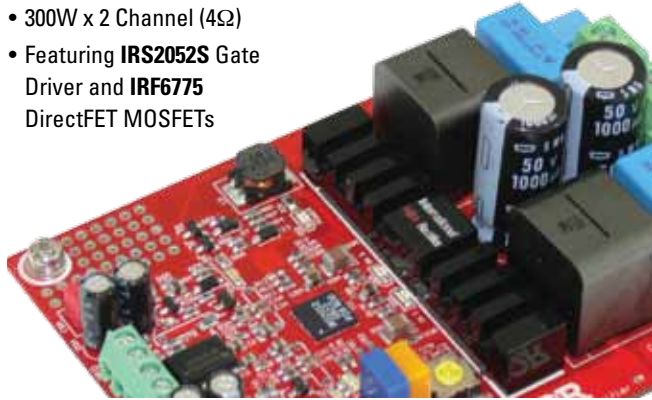


- IRAUDAMP9**
- 1700W Single Channel (4Ω)
  - Featuring **IRS2092S** Gate Driver (with external buffer) and **IRFB4227** MOSFETs

## Digital Audio MOSFETs

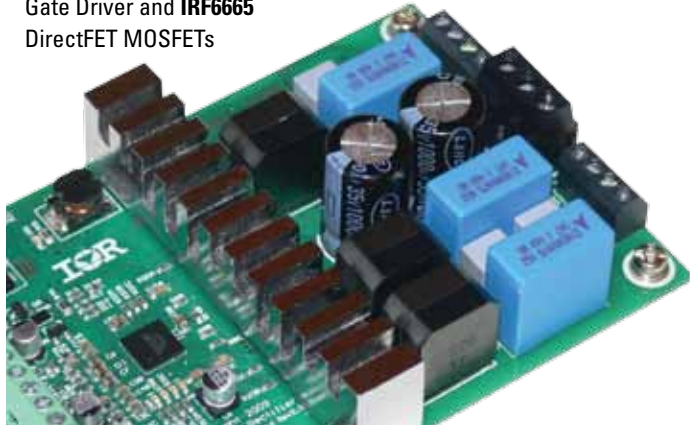
### IRAUDAMP10

- 300W x 2 Channel (4Ω)
- Featuring **IRS2052S** Gate Driver and **IRF6775** DirectFET MOSFETs



### IRAUDAMP11

- 120W x 3 Channel (4Ω)
- Featuring **IRS2053M** Gate Driver and **IRF6665** DirectFET MOSFETs



### IRAUDPS3-30V

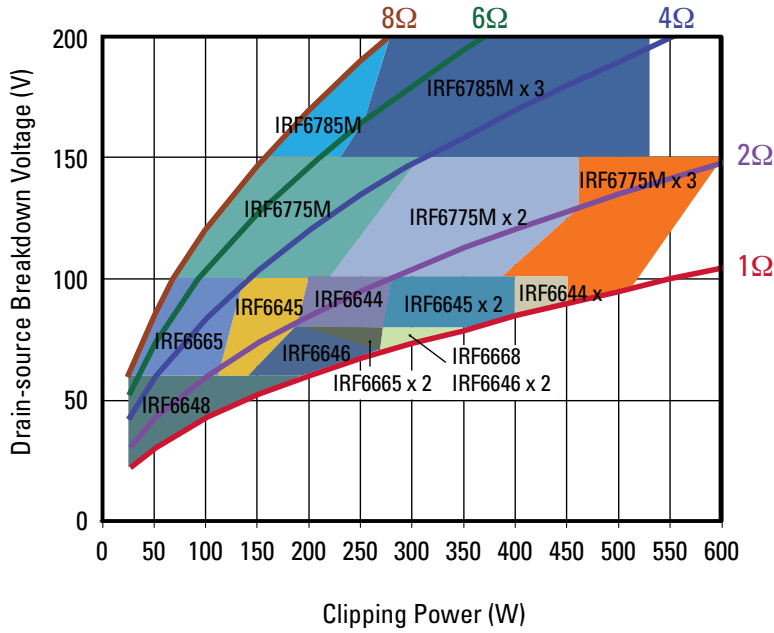
- 200 W Switch Mode Power Supply for Class D amplifiers
- +/- 30V Rails
- Featuring **IRS27952S** resonant half-bridge control

Part number	BVDss	$R_{DS(on)}$ (mΩ)	Q <sub>gtot</sub> (nC)	Package
IRF6644	100	10.3	35	DFET SJ
IRF6645	100	28	14	DFET SJ
IRF6665	100	53	8.4	DFET SH
IRF6646	80	7.6	36	DFET MN
IRF6648	60	5.5	36	DFET MN
IRF6668	80	12	22	DFET MZ
IRF6775M	150	47	25	DFET MZ
IRF6785M	200	85	26	DFET MZ
IRFB4212pbf	100	72	15	TO-220
IRFB4019pbf	150	80	13	TO-220
IRFB4020pbf	200	80	18	TO-220
IRFB4227pbf	200	19.7	70	TO-220
IRFB4229pbf	300	38	72	TO-220
IRFB5615pbf	150	32	26	TO-220
IRFB5620pbf	200	60	25	TO-220
IRFI4024H-117P	55	48	8.9	5-pin TO-220
IRFI4212H-117P	100	72.5	15	5-pin TO-220
IRFI4019H-117P	150	80	13	5-pin TO-220
IRFI4020H-117P	200	80	19	5-pin TO-220

# Digital Audio MOSFETs Selection Chart

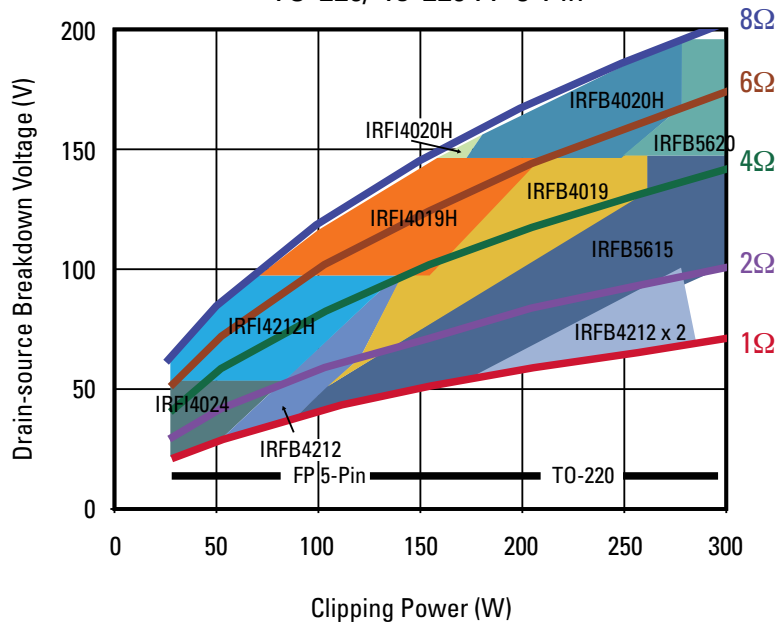
## DirectFET®

DirectFET® Voltage vs. Audio Output Power



## T0220

MOSFET Voltage vs. Audio Power Output  
TO-220/ To-220 FP 5-Pin



Product Line	Applications	Key Products
 <p><b>Energy Saving Products</b></p> <p>Integrated design platforms that enable customers to add energy-conserving features that achieve lower operating energy costs and manufacturing Bill of Material (BOM) costs.</p>	<ul style="list-style-type: none"> <li>• Appliances</li> <li>• Audio</li> <li>• Display</li> <li>• Industrial</li> <li>• Lighting</li> <li>• SMPS</li> </ul>	<ul style="list-style-type: none"> <li>• Digital Control ICs</li> <li>• High-Voltage ICs</li> <li>• IGBTs</li> <li>• IRAM Integrated Power Modules</li> <li>• MERs</li> </ul>
 <p><b>Enterprise Power</b></p> <p>Optimized power management system solutions that deliver benchmark power density, efficiency and performance in enterprise power.</p>	<ul style="list-style-type: none"> <li>• Servers</li> <li>• Storage Networks</li> <li>• Switchers &amp; Routers</li> <li>• Workstations</li> <li>• Notebooks</li> <li>• Game Stations</li> <li>• Set-Top Box</li> </ul>	<ul style="list-style-type: none"> <li>• DirectFET<sup>®</sup> <i>plus</i></li> <li>• Low-Voltage ICs</li> <li>• SupIRBuck<sup>®</sup></li> <li>• iPOWIR<sup>®</sup></li> <li>• PowIRstage<sup>®</sup></li> <li>• CHiL Digital Controllers</li> </ul>
 <p><b>Automotive</b></p> <p>Automotive grade power management solutions qualified to meet the needs of 12V, 24V and HEV/EV applications with a zero defect goal.</p>	<ul style="list-style-type: none"> <li>• AC and DC Motor Drives</li> <li>• Powertrain / Engine control</li> <li>• Body Electronics</li> <li>• Lighting</li> <li>• Class D Audio</li> <li>• Heavy Loads and Actuators</li> </ul>	<p>Automotive Qualified:</p> <ul style="list-style-type: none"> <li>• HEXFET<sup>®</sup> Power MOSFETs</li> <li>• Intelligent Power Switches</li> <li>• Driver ICs</li> <li>• IGBTs</li> <li>• DirectFET<sup>®</sup> <b>2</b></li> </ul>
 <p><b>Benchmark MOSFETs</b></p> <p>IR continues to lead the industry by offering power MOSFETs with the lowest <math>R_{DS(on)}</math> and widest range of packages up to 250V for a diverse range of applications.</p>	<ul style="list-style-type: none"> <li>• Audio</li> <li>• Computing</li> <li>• Communications</li> <li>• Motor Control</li> <li>• Power Supply</li> <li>• Synchronous Rectification</li> </ul>	<ul style="list-style-type: none"> <li>• Discrete HEXFET<sup>®</sup> MOSFETs</li> <li>• Dual HEXFET<sup>®</sup> MOSFETs</li> <li>• FETKY<sup>®</sup></li> </ul>
 <p><b>HiRel</b></p> <p>Our discrete components, complex hybrid power module assemblies and rugged DC-DC converters utilize leading-edge power technology which, together with demanding environmental specifications help engineers to meet their toughest design challenges.</p>	<ul style="list-style-type: none"> <li>• Space</li> <li>• Military</li> <li>• Commercial Aviation</li> <li>• Rugged Industrial</li> <li>• Medical</li> </ul>	<ul style="list-style-type: none"> <li>• RAD-Hard MOSFETs</li> <li>• Power Modules/Hybrid Solutions</li> <li>• Motor Control Solutions</li> <li>• DC-DC Converters</li> </ul>