

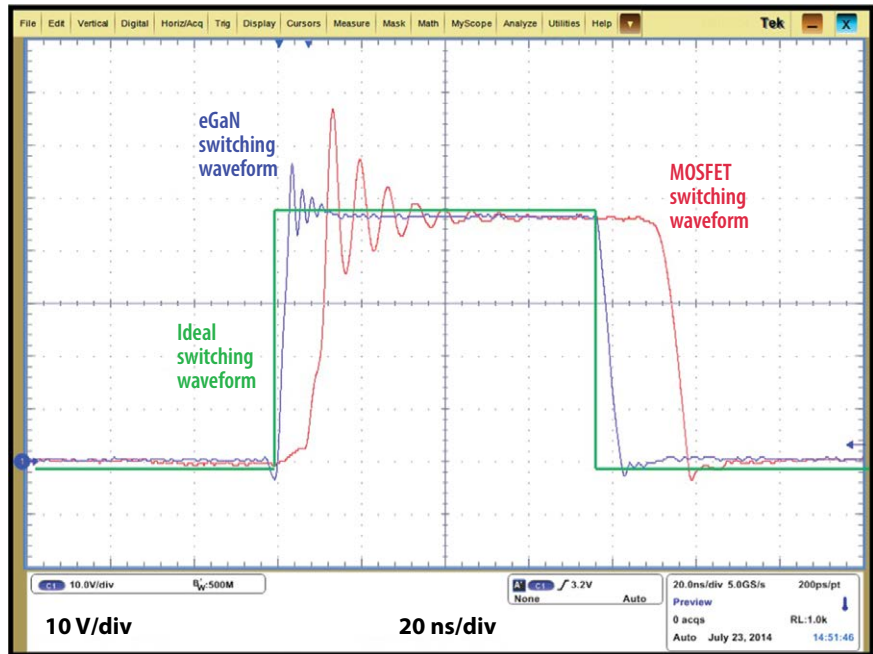
# eGaN® FETs and ICs for Class-D Audio Applications



The quality of sound reproduced by the audio amplifier, measured by THD (Total Harmonic Distortion), DF (damping factor), and IMD (inter-modulation distortion) is influenced by the characteristics of the power transistors used.

eGaN FETs' near ideal switching performance due to lower propagation delays and faster slew rates (due to their lower gate capacitance) and zero  $Q_{RR}$  enable very short dead times to provide lower open loop distortion, lowering the THD and overall losses. This reduces feedback, driving down T-IMD and DF to provide a step jump in the sonic quality of Class-D audio amplifiers and lowering overall losses.

EPC9106 Demonstration Board showing excellent THD+N across a wide range of output power



## Benefits of eGaN FETs and ICs in Your Class-D Audio Amplifier Designs

- **Lower IMD and THD** – faster switching, shorter dead-time, and zero reverse recovery ( $Q_{RR}$ )
- **Higher Efficiency** – lower conduction and switching losses, and lower drive power
- **Smaller Footprint** – Higher power density
- **Eliminate heat sinks**

### Class-D Audio Reference Designs

Reference Design	Description	Output Power	Frequency Response
<b>DigiGaN-2005</b>	Class-D High-Performance eGaN FET Amplifier Module w/DSP	50 W x 4 / 8 Ω 200 W x 2 / 8 Ω	20 Hz-20k Hz +/-0.2 dB
<b>DigiGaN-4005</b>	Class-D High-Performance eGaN FET Amplifier Module w/DSP	100 W x 4 / 8 Ω 400 W x 2 / 8 Ω	20 Hz-20k Hz +/-0.2 dB
<b>GaNAMP2001</b>	Class-D High-Performance eGaN FET Amplifier Module	200 W x 4 / 8 Ω 400 W x 2 / 8 Ω	20 Hz-20 kHz +/-0.5 dB
<b>GaNAMP1002</b>	Class-D High-Performance eGaN FET Amplifier Module	100 W x 4 / 8 Ω 400 W x 2 / 8 Ω	20 Hz-20 kHz +/-0.5 dB
<b>EPC9192</b>	2 x 700 W/4 Ω Class-D Amplifier	700 W / 4 Ω	5 Hz - 20 kHz +/- 0.5 dB



## eGaN FETs and ICs

## Recommended Devices for Class-D Audio Amplifier Designs

Application	Part Number	Configuration	V <sub>DS</sub>	Max R <sub>DS(on)</sub> (mΩ) @ 5V <sub>GS</sub>	Q <sub>G</sub> typ (nC)	Q <sub>GS</sub> typ (nC)	Q <sub>GD</sub> typ (nC)	Q <sub>OSS</sub> typ (nC)	Q <sub>RR</sub> (nC)	I <sub>D</sub> (A)	Pulsed I <sub>D</sub> (A)	Package (mm)	Half Bridge Development Board		
Pro	Consumer	EPC2055	Single	40	3.6	6.6	2.3	0.7	13	0	29	161	LGA 2.5 x 1.5	EPC90132	
		EPC2214	Single – AEC-Q101	80	20	1.8	0.5	0.3	8	0	10	47	BGA 1.35 x 1.35	n/a	
		EPC2036	Single	100	73	0.7	0.17	0.14	3.9	0	1.7	18	BGA 0.9 x 0.9	EPC9050	
		EPC2052	Single	100	13.5	3.5	1.5	0.5	13	0	8.2	74	BGA 1.5 x 1.5	EPC9092	
		EPC2044	Single	100	10.5	4.3	1.3	0.5	15	0	9.4	89	BGA 2.5 x 1.5	EPC90128	
		EPC2031	Single	60	3	16	5	3	48	0	48	450	BGA 4.6 x 2.6	EPC9061	
	Prosumer	EPC2252	Single – AEC-Q101	80	11	3.5	1	0.5	15	0	8.2	75	BGA 1.5 x 1.5	EPC9179	
		EPC2103	Half Bridge	80	5.5	6.5	2.2	1.1	30 34	0	30	195	BGA 6.05 x 2.3	EPC9039	
		EPC2065	Single	80	3.6	9.4	2.6	1.7	33	0	60	215	LGA 3.5 x 2	EPC90137	
		EPC2206	Single – AEC-Q101	80	2.2	15	4.1	3	72	0	90	390	LGA 6.05 x 2.3	EPC90122	
		EPC2107	Dual with Sync Boot	100	390 3300	0.19 0.044	0.077 0.02	0.041 0.004	0.9 1.25 0.134	0	1.7 0.5	3.8 0.5	BGA 1.35 x 1.35	EPC9063	
		EPC2106	Half Bridge	100	70	0.73	0.24	0.140	3.96 4.68	0	1.7	18	BGA 1.35 x 1.35	EPC9055	
		EPC2051	Single	100	25	1.8	0.6	0.3	7.3	0	1.7	37	BGA 1.3 x 0.85	EPC9091	
		EPC2212	Single – AEC-Q101	100	13.5	3.2	0.9	0.6	18	0	18	75	LGA 2.1 x 1.6	n/a	
		EPC2104	Half Bridge	100	6.8	6.8	2.3	1.4	35 41	0	30	180	BGA 6.05 x 2.3	EPC9040	
		EPC2204	Single	100	6	5.7	1.8	0.8	25	0	29	125	LGA 2.5 x 1.5	EPC9097	
		EPC2306	Single	100	3.8	11.0		1.1	41	0	48	197	QFN 3 x 5	EPC90145	
		EPC2619	Single	100	3.3	8.3	2.1	1	27	0	29	164	LGA 2.5 x 1.5	EPC90153	
		EPC2088	Single	100	3.2	12.5	4.4	1.4	47	0	60	231	LGA 3.5 x 1.95	EPC90123	
		EPC2071	Single	100	2.2	18	6	1.8	71	0	64	350	LGA 4.45 x 2.3	EPC90146	
		EPC2302	Single	100	1.8	23	8	2.3	85	0	101	408	QFN 3 x 5	EPC90142	
		EPC2361	Single	100	1.0 (typ)	28	7.2	2.5	86	0	101	519	QFN 3 x 5	EPC90156	
		Prosumer	EPC2219	Single with Gate Diode – AEC-Q101	65	3300	0.044	0.02	0.004	0.104	0	0.5	0.5	BGA 0.9 x 0.9	n/a
			EPC2308	Single	150	6	11	3.8	1.3	50	0	48	157	QFN 3 x 5	EPC90148
	EPC2305		Single	150	4	21	6.3	2.6	105	0	80	329	QFN 3 x 5	EPC90143	
	EPC2059		Single	170	9	5.7	1.3	0.9	35	0	24	102	LGA 2.8 x 1.4	EPC9098	
	EPC2054		Single	200	43	2.9	0.9	0.30	15	0	3.0	32	BGA 1.3 x 1.3	EPC9094	
EPC2207	Single		200	22	4.5	1.3	0.7	23	0	14	54	LGA 2.8 x 0.9	EPC90124		
EPC2307	Single		200	10	10.6		1.3	58	0	48	130	QFN 3 x 5	EPC90150		
EPC2215	Single		200	8	13.6	3.3	2.1	69	0	32	162	LGA 4.6 x 1.6	EPC9099		
EPC2304	Single		200	5	21	0.0	2.6	115	0	102	260	QFN 3 x 5	EPC90140		

Table data subject to change. Please refer to the Product section on [epc-co.com/epc/products/gan-fets-and-ics](http://epc-co.com/epc/products/gan-fets-and-ics)

## For More Information

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