

Product brief

CoolGaN™ 400 V e-mode GaN HEMT

Class D output stage offering the best audio experience ever

CoolGaN™ enables smoother switching and more linear class D output stage by offering low/linear C_{oss} , zero Q_{rr} and normally-off switch. Ideal class D audio amplifiers offer zero percent distortion and 100 percent efficiency. What impairs the linearity and power loss is highly dependent on switching characteristics of the switching device. Infineon's CoolGaN™ breaks through the technology barrier by introducing zero reverse recovery charge in the body diode and very small, linear input and output capacitances.

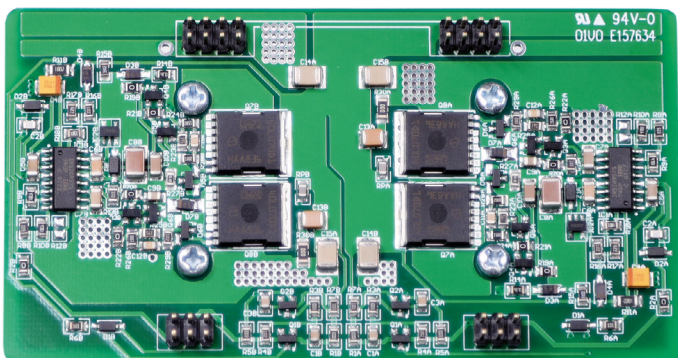
In addition, the enhancement-mode concept offers fast turn-on and turn-off speed as well as a better path towards integration either on a chip or package level. This feature also simplifies pairing CoolGaN™ with the IRS20957SPBF class D controller and therefore enables faster design-in and time-to-market for our customers.

CoolGaN™ for class D audio

CoolGaN™ 400 V is tailored for premium HiFi home audio, professional, and aftermarket car audio systems where end users demand every detail of their high-resolution soundtracks. These have been conventionally addressed by bulky linear or tube amplifiers. With CoolGaN™ 400 V as class D output stage, audio designers are able to deliver the best listening experience to their prospective audio fans.

Infineon's CoolGaN™ 400 V device, IGT40R070D1 E8220 in HSOF-8-3 (TO-leadless) package has been tested in class D audio amplifier applications on 200 W + 200 W dual channel system designs. Please refer to EVAL_AUDAMP24 for more details.

Design example with IGT40R070D1 E8220 in TO-leadless package



Ordercode: EVAL_AUDAMP24

Key features

- > Ultralow and linear C_{oss} 400 V power device
- > Zero Q_{rr}
- > Enhancement-mode transistor – normally-off switch
- > Ultrafast switching
- > Capable of reverse conduction
- > Low gate charge, low output charge
- > Superior commutation ruggedness
- > Qualified according to JEDEC standards (JESD47 and JESD22)

Key benefits

- > Outstanding audio quality
- > High reliability
- > Clean switching performance
- > Narrow dead time for better THD
- > Improves efficiency due to best figure of merit (FOM) in the 400 V class
- > Easy to use: compatible with the IRS20957SPBF class D controller



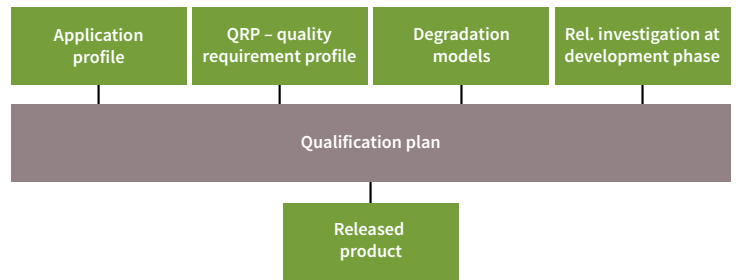
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The highest quality

The qualification of GaN switches requires a dedicated approach, well above existing silicon standards.

- › Infineon qualifies its GaN devices well beyond the standards
- › Application profiles are an integral part of the qualification process
- › Failure models, based on accelerated test conditions, ensure that target lifetime and quality are met
- › Infineon sets the next level of wide bandgap quality



The CoolGaN™ 400 V e-mode GaN HEMT is a derivative of the industry benchmark CoolGaN™ 600 V technology. It is provenly the most rugged and reliable solution in the market. The CoolGaN™ 400 V product is built around class D audio requirements in a high performing SMD package, for designer's greatest convenience.

CoolGaN™ 400 V e-mode for class D audio product offering

	HSOF-8-3 (TO-leadless)
P_{max}	Up to 200 W
$R_{DS(on) max.}$	70 Ω
Typical part number	IGT40R070D1 E8220

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