

## 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.

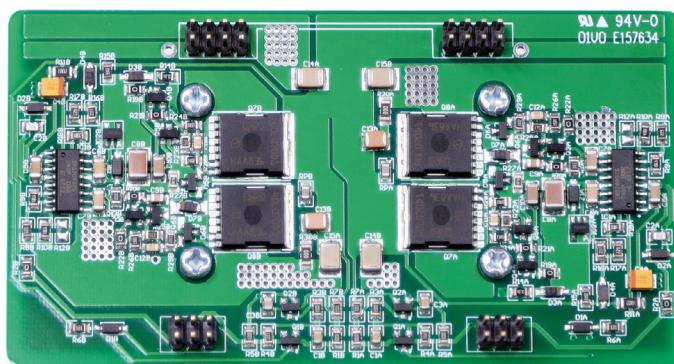
In addition, the enhancement-mode concept offers fast turn-on and turn-off speed as well as a better path towards integration either on a chip or package level. This feature also simplifies pairing CoolGaN™ with the IRS20957SPBF class D controller and therefore enables faster design-in and time-to-market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



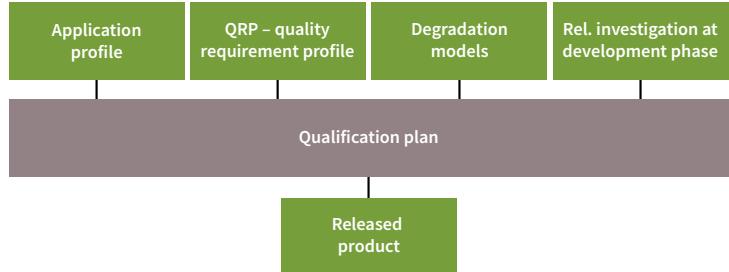
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## The highest quality

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 $\Omega$
Typical part number	IGT40R070D1 E8220

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Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

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