Product brief

CoolGaN™ 600 V e-mode GaN HEMTs

The highest efficiency and power density with the highest quality

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. CoolGaN™ enables simpler half-bridge topologies.

E-mode is more suitable for multi-chip integration. As enhancement mode-based solutions reach maturity, ease of use and solution costs will make them the more prominent solution.

The CoolGaN™ 600 V series is realized according to a specific, GaN-tailored qualification process which goes further beyond other GaN products in the market.

CoolGaN™ 600 V addresses telecom, datacom and server SMPS as well as wireless charging, charger and adapter, among others. It is the most rugged and reliable solution in the market. The CoolGaN™ portfolio is built around high performing SMD packages to fully exploit the benefits of GaN.

CoolGaN™ for PFC

CoolGaN™ enables the adoption of simpler half-bridge topologies for PFC (including elimination of the lossy input bridge rectifier). The result is a record efficiency (>99%) with a potential for BOM savings.

Key features

› Best FOM of 600 V power devices
› Excellent for hard and soft switching topologies
› Optimized for turn-on and turn-off
› The cutting-edge technology for innovative solutions and high volumes

Key benefits

› Highest efficiency for SMPS
› Highest power density, small and light design
› Surface mount packaging ensures that switching capabilities of GaN are fully accessed
› Easy to use thanks to a compelling driver IC portfolio

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The highest power density

**CoolGaN™ enables higher power density at the same efficiency**

- 160 W/in³
- 3.6 kW LLC, \( f_{\text{sw}} \) 350 kHz, 380 V-54 V, using IGT60R070D1
- 24 W/in³
- 65 W hybrid flyback, \( f_{\text{sw}} \) 72 to 196 kHz, \( V_{\text{in}} \) 90 to 264 V, \( V_{\text{out}} \) 3 to 20 V, using IGLD60R190D1

**CoolGaN™ for resonant topologies**
- In resonant applications, 10 times lower \( Q_{\text{oss}} \) and \( Q_{\text{g}} \) enables high frequency operations at the highest efficiency levels
- Linear output capacitance leads to 8 to 10 times lower dead time
- Devices can be paralleled
- Power density can be pushed even further by optimizing the thermal management
- CoolGaN™ technology pushes the efficiency forward thus enabling further gain in power density, e.g. in low-power chargers/adapters

The highest quality

The qualification of GaN switches requires a dedicated approach, well beyond other GaN products in the market
- Infineon qualifies GaN devices well beyond the standards
- Application profiles are an integral part of the qualification
- Failure models, based on accelerated test conditions, ensure target lifetime
- Infineon sets the next level of wide-bandgap quality

**CoolGaN™ 600 V e-mode GaN HEMTs product portfolio**

<table>
<thead>
<tr>
<th>( R_{\text{D(on)max}} )</th>
<th>DSO-20-8S Bottom-side cooling</th>
<th>DSO-20-87 Top-side cooling</th>
<th>HSOF-8-3 (TO-leadless)</th>
<th>LSON-8-1 DFN 8x8</th>
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<tbody>
<tr>
<td>35 mΩ</td>
<td>IGO60R035D1**</td>
<td>IGT60R035D1**</td>
<td>IGT60R035D1**</td>
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<td>70 mΩ</td>
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<td>IGT60R070D1</td>
<td>IGLD60R070D1</td>
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<td>IGT60R190D15*</td>
<td>IGLD60R190D1</td>
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</table>

*Standard grade
**Coming soon

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