Product Brief

TRENCHSTOP™ Performance IGBT

Improved performance for switching speed up to 30 kHz, 5 µsec short circuit and low EMI

The new 600 V TRENCHSTOP™ Performance has been developed based on 600 V TRENCHSTOP™ IGBT technology. The new IGBT series combines the best trade-off between conduction and switch-off energy with outstanding robustness and excellent EMI behavior.

The 600 V TRENCHSTOP™ Performance IGBT enables higher efficiency in motor control, air conditioning compressors, HVAC motor drives, UPS, solar power converters and all power conversion applications working up to 30 kHz in hard-switching topologies. The product portfolio consists of 30 A, 40 A and 50 A single IGBT and 30 A, 40 A, 50 A IGBT co-packed with a Rapid 1 diode in TO-247 package.

Reduced total switching losses, low EMI, 5 µsec short-circuit withstand time, 175°C extended operating junction temperature, tight parameters distribution and low thermal dependency of the main electrical parameters are key features of the new IGBT.

**Key features and benefits**

**600 V TRENCHSTOP™ Performance**

is the new medium speed switching IGBT with 5 µsec short circuit capability.

The new TRENCHSTOP™ Performance enables a 1:1 replacement of predecessor TRENCHSTOP™ products offering:

- lower total switching losses (E_{off}) i.e. better efficiency IGBT
  - 7% lower P_{tot} for switching speed of 8 kHz
  - 11% lower P_{tot} for switching speed of 15 kHz
- Low speed dv/dt switching (< 5 V/µs)
- Low EMI
- Improved cell design for higher reliability

**Trade-off V_{CE(sat)} versus E_{off} at 25°C**

![Trade-off V_{CE(sat)} versus E_{off} at 25°C](image)

- 64% E_{off} reduction

**E_{off} conditions:**

- V_{cc} = 400 V, I_{c} = 50 A, R_{g} = 10 Ω, T_{j} = 25°C
- **V_{cc} = 400 V, I_{c} = 50 A, R_{g} = 7 Ω, T_{j} = 25°C**
- **V_{cc} = 400 V, I_{c} = 50 A, R_{g} = 6.0 Ω, T_{j} = 25°C**

www.infineon.com/trenchstop-performance
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### Efficiency in B6-test board*

![Graph showing efficiency in B6-test board](image)

*V_{BUS} = 400 V, f_{SW} = 15 kHz, P_{out} = 2.2/5 kW, three-phase motor with generator as break, dead time = 1 µsec, modulation index 99%

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The 600 V TRENCHSTOP™ Performance is an attractive alternative for predecessor TRENCHSTOP™ IGBT from Infineon as well as for its main competitors. Internal study showed that plug-and-play replacement of TRENCHSTOP™ IGBT with the new TRENCHSTOP™ Performance allowed to improve efficiency by 0.6 percent in 5 kW three-phase B6 inverter working at switching frequency of 15 kHz. The new TRENCHSTOP™ Performance IGBT provides customers with improved efficiency, tight parameters distribution, low EMI and high reliability at a very competitive price.

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### Product portfolio

<table>
<thead>
<tr>
<th>Product name***</th>
<th>I_{L} at 100°C [A]</th>
<th>V_{CE(sat)} [V]</th>
<th>E_{on} [mJ]</th>
<th>E_{off} [mJ]</th>
<th>Q_{G} [nC]</th>
<th>I_{L} at 100°C [A]</th>
<th>Q_{RR} [µC]</th>
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*** Datasheet parameters at 25°C unless other is specified

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