



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.

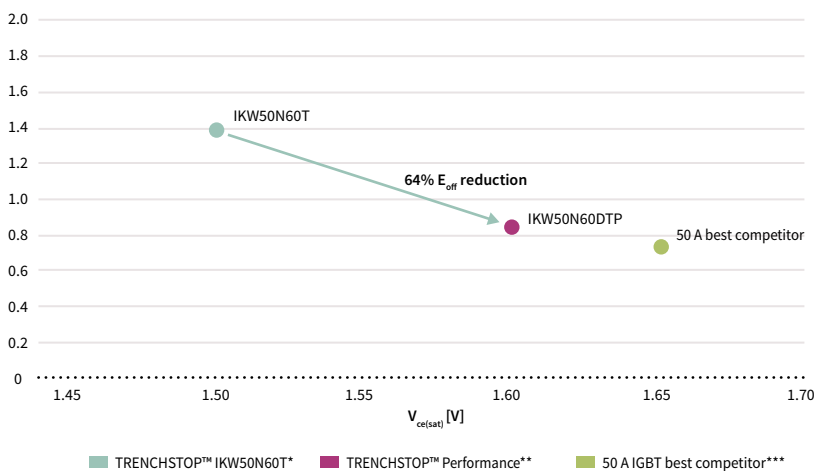
Key features and benefits

600 V TRENCHSTOP™ Performance is the new medium speed switching IGBT with 5 µsec short circuit capability.

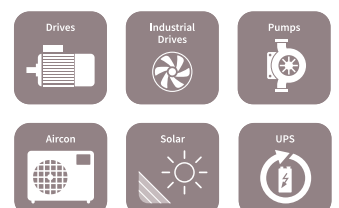
The new TRENCHSTOP™ Performance enables a **1:1 replacement** of predecessor TRENCHSTOP™ products offering:

- > lower total switching losses (E_{ts}) 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/ns)
- > Low EMI
- > Improved cell design for higher reliability

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



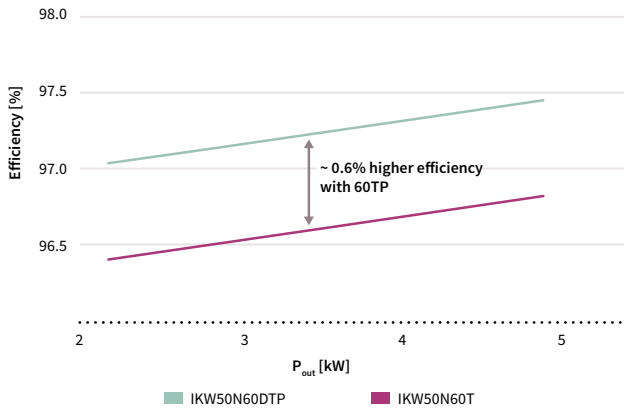
E_{off} Conditions: * $V_{cc} = 400$ V, $I_c = 50$ A, $R_G = 10$ Ω, $T_j = 25^\circ\text{C}$
 ** $V_{cc} = 400$ V, $I_c = 50$ A, $R_G = 7$ Ω, $T_j = 25^\circ\text{C}$
 *** $V_{cc} = 400$ V, $I_c = 50$ A, $R_G = 6.0$ Ω, $T_j = 25^\circ\text{C}$



TRENCHSTOP™ Performance IGBT

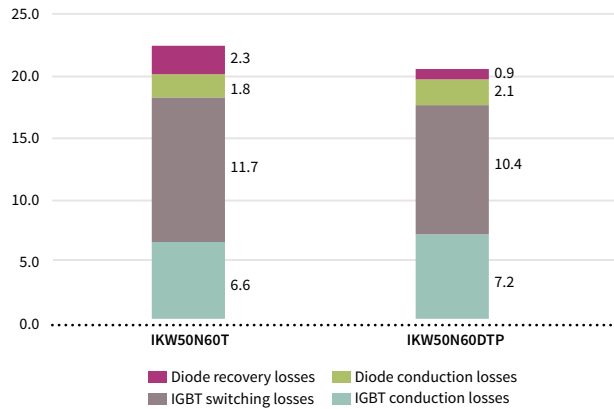
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Efficiency in B6-test board*



* 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%

Space vector power loss modulation-losses distribution at T_j = 120°C**



** B6 inverter with motor load. V_{BUS} = 400 V, f_{sw} = 15 kHz, P_{out} = 6 kW, M = 1, cos phi = 0.9

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.

Product portfolio

	Product name***	I _c at 100°C [A]	V _{CE(sat)} [V]	E _{on} [mJ]	E _{off} [mJ]	Q ₆ [nC]	I _F at 100°C [A]	Q _{rr} [µC]
Single IGBT	IGW30N60TP	38	1.6	0.71	0.42	130	-	-
	IGW40N60TP	48	1.6	1.06	0.61	177	-	-
	IGW50N60TP	61	1.6	1.53	0.85	249	-	-
IGBT + Rapid 1 diode	IKW30N60DTP	38	1.6	0.71	0.42	130	24	0.45
	IKW40N60DTP	48	1.6	1.06	0.61	177	35	0.56
	IKW50N60DTP	61	1.6	1.53	0.85	249	39	0.75

*** Datasheet parameters at 25°C unless other is specified

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