

650V HB2 Series IGBTs



Best performance in high-speed applications



Outstanding performance and power density to address high efficiency demand

Combining both lower saturation voltage (1.55 V typ.) and lower total gate charge, the improved medium/high-speed 650 V IGBTs ensure minimal overshoot voltages during turn-off and lower turn-off energy in applications.

Thanks to an extended current capability up to 100 A, and an optimized co-packaged diode with three different options (protection, half-rated and full-rated), our new 650 V IGBT HB2 series ensures higher efficiency in applications working at medium to high frequencies such as welding machines,

PFC converters, UPS and solar inverters.

The 40 A in TO-247 Long lead package with three different diode options is already available.

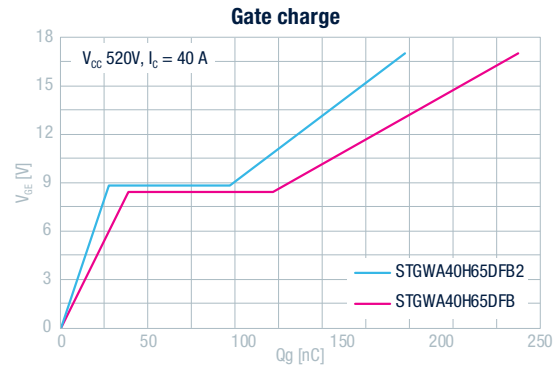
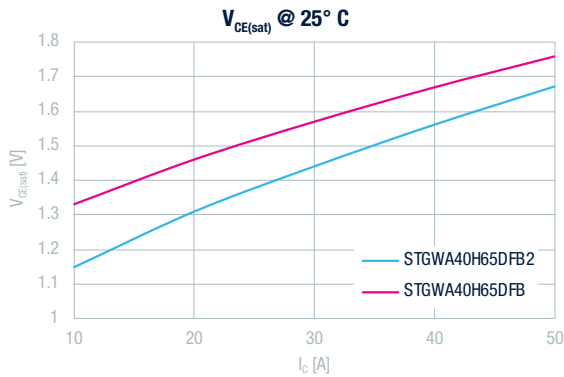
A complete product portfolio covering a current range from 15 to 100 A is in development in several power packages including D²PAK, TO-220, and TO-220FP as well as long-lead and 4-lead TO-247 packages.

KEY FEATURES

- Wide frequency ranges from 16 to 60 kHz
- Very low $V_{CE(sat)}$ (1.55 V typ.)
- Low thermal resistance
- Lower gate charge
- Maximum operating T_J of 175 °C
- Automotive eligible (AEC-Q101)
- Different diode options

The 650 V IGBT HB2 series, based on trench field-stop (TFS) technology and optimized for applications working at a switching frequency between 16 and 60 kHz and automotive eligible (AEC-Q101 Rev. D), ensures lower $V_{CE(sat)}$ and gate charge values than the previous HB IGBT series. Figure 1 compares the performance between two products belonging to each of the two technologies (HB2 (in blue) and HB (in red)).

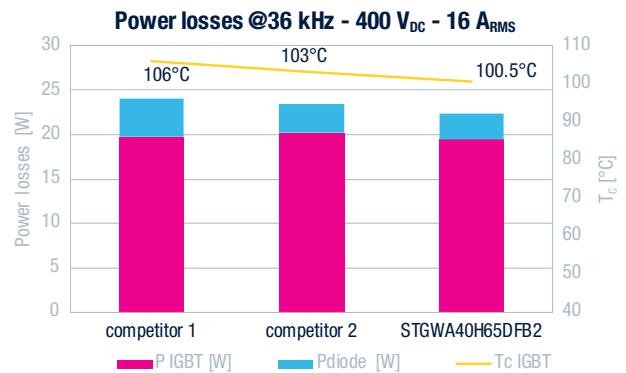
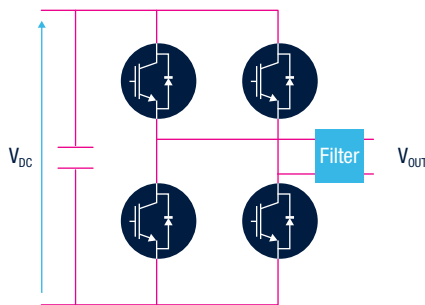
Figure 1: $V_{CE(sat)}$ vs I_C (left) and gate charge (right) comparison



APPLICATION BENCHMARK

In a generic DC/AC converter in full bridge topology with a maximum output power of 3.6 kW, the power losses and case temperature have been evaluated.

The results of the STGWA40H65DFB2 high-speed HB2 series IGBT compared to main competitors' devices are shown in the figure below.



Product portfolio

IGBT PINs	BVces	I_{CN}	$V_{CE(sat)}$	E_{OFF}	Diode option	Package
	[A]	[A]	[V]	[μJ]		T0-247 long leads
STGWA40HP65FB2	650	40	1.55	410	Protection	WA
STGWA40H65DFB2(*)					Half-rated	
STGWA40H65DFB2(*)					Full-rated	

Note: mass production within Q2 2019

Additional high-speed HB2 series IGBTs with a current range from 15 to 100 A are currently in development and will be available soon. Check our website for availability.

To explore the complete HB2 series IGBTs product portfolio, visit www.st.com or use our [ST-IGBT-Finder mobile app](#) for Android and iOS.



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