

HB series 650 V IGBTs Trench Gate Field-stop High-speed technologies



Energy-saving power family to boosts efficiency, safety, and reliability

Leveraging latest ST's advanced Trench Gate Field-Stop High-Speed technology the HB series IGBTs combine this picture turn-off efficiency with a very low saturation voltage ($V_{CE(SAT)}$) down to 1.6 V (typical). In addition to the above features the extended voltage rating (BV_{CES}) at 650 V, the maximum operating junction temperature (T_j) of 175 °C and a wide Safe Operating Area (SOA) results in an increased robustness and so reliability and lifetime.

The HB series enhance the energy efficiency of solar inverters, induction heaters, welders, uninterruptible power supplies, power-factor correction, and other high-frequency power converters.

KEY FEATURES

- Maximum junction temperature: $T_j = 175\text{ °C}$
- Very low & minimized Tail in switching-off
- $V_{CE(SAT)} = 1.6\text{ V (typ.) @ } I_{CN} (100\text{ °C})$
- Positive derating of $V_{CE(SAT)}$ with temperature
- Tight parameters distribution
- Co-packed different feature diode
- Switching frequency range 16 - 60 kHz

KEY BENEFITS

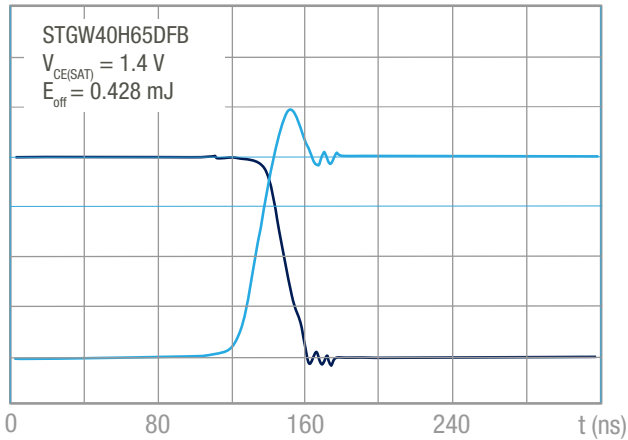
- Higher robustness and reliability
- Increase system efficiency for energy saving
- Safer paralleling operations
- Specific diode option for different application

TARGETED APPLICATIONS

- Welding
- Photovoltaic inverters
- Uninterruptible power supply
- Power factor correction
- Induction cooking
- High frequency converters

650V HB SERIES POSITIONING

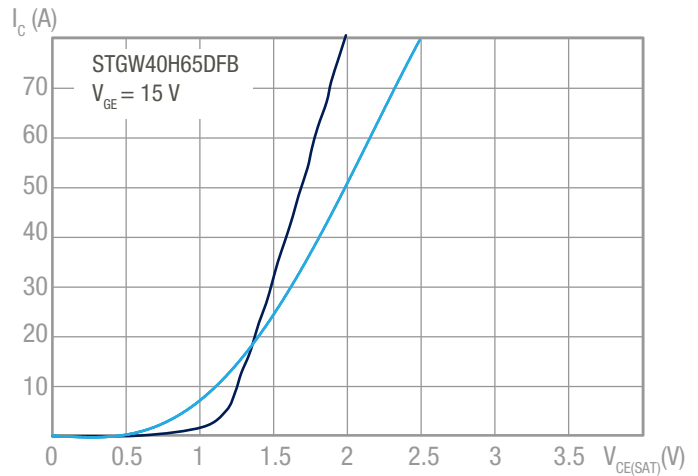
STGW40H65DFB Switching-off



■ 100 V/div V, 40 ns/div t ■ 5 A/div I_C

Test condition: $V_{CC} = 400\text{ V}$, $R_G = 10\ \Omega$, $I_C = 1/2 I_{CN} = 20\text{ A}$,
 $V_{GE} = 15\text{ V}$, $T_J = 175\text{ }^\circ\text{C}$

Saturation voltage characteristic



■ $T_J = 175\text{ }^\circ\text{C}$, 1.8 V ■ $T_J = 25\text{ }^\circ\text{C}$, 1.6 V

Options include maximum current ratings from 20 A to 80 A (at 100 °C), a selection of popular power packages, and co-packed diode optimized for soft or hard-switching circuits.

650 V IGBT "HB" SERIES PRODUCT LINE

IGBT P/N	BV _{CES} V	I _{CN} ⁽¹⁾ A	V _{CE(SAT)} ⁽²⁾ V	E _{on} mJ	E _{off} mJ	FRD option	Package					
							D ² PAK	TO220	TO-247	TO-247LL	TO-3P	TO-3PF
STGx20H65FB	650	20	1.55	0.08 ⁽³⁾	0.17	-			W		WT	FW
STGWA20H65DFB(*)	650	20	1.55	0.12	0.17	Very Fast				WA		
STGx30H65FB	650	30	1.55	0.15 ⁽³⁾	0.29	-			W		WT	FW
STGx30H60DFB	600	30	1.55	0.38	0.29	Very Fast	B	P	W		WT	
STGx30H60DLFB	600	30	1.55	-	0.15 ⁽⁴⁾	Low Drop (Soft Switching)	B		W			
STGWA30H65DFB	650	30	1.55	0.3	0.29	Very Fast				WA		
STGx40H65FB	650	40	1.6	0.49	0.36	-	B		W		WT	FW
STGWT40HP65FB	650	40	1.6	-	0.36	Protection Purpose Only					WT	
STGx40H65DFB	650	40	1.6	0.5	0.36	Very Fast			W		WT	
STGW40H65DFB-4	650	40	1.6	0.2	0.41	Very Fast					W(4L)	
STGx40H60DLFB	600	40	1.6	-	0.19 ⁽⁴⁾	Low Drop (Soft Switching)			W	WA	WT	
STGx60H65FB	650	60	1.6	-	0.9	-			W		WT	
STGx60H65DFB	650	60	1.6	1.59	0.9	Very Fast			W	WA	WT	
STGW60H65DFB-4	650	60	1.6	0.9	1	Very Fast					W(4L)	
STGx60H60DLFB	600	60	1.6	-	0.45 ⁽⁴⁾	Low Drop (Soft Switching)			W		WT	
STGx80H65DFB	650	80	1.6	2.1	1.5	Very Fast			W	WA	WT	
STGW80H65FB-4	650	80	1.6	-	1.7	-					W(4L)	
STGW80H65DFB-4	650	80	1.6	1	1.7	Very Fast					W(4L)	

Note: (*) In development - preliminary data

(1) I_{CN} : I_{GBT} nominal collector current @ $T_J = 100\text{ }^\circ\text{C}$

(2) $V_{CE(SAT)}$: typical conduction losses @ I_{CN} , $T_J = 25\text{ }^\circ\text{C}$

(3) Turn-on energy have been measured applying as freewheeling an external SiC diode STPSC206W

(4) E_{off} : switching-off energy @ I_{CN} , $T_J = 25\text{ }^\circ\text{C}$ on capacitive load (20 nF)



© STMicroelectronics - March 2019 - Printed in United Kingdom - All rights reserved
 The STMicroelectronics corporate logo is a registered trademark of the STMicroelectronics group of companies
 All other names are the property of their respective owners

