

# 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 low turn-off energy with low saturation voltage ( $V_{CE(SAT)}$ ) down to 1.6 V (typical). In addition, 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, 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
- Specific diode option for different application
- Switching frequency range 16 - 60 kHz

#### KEY BENEFITS

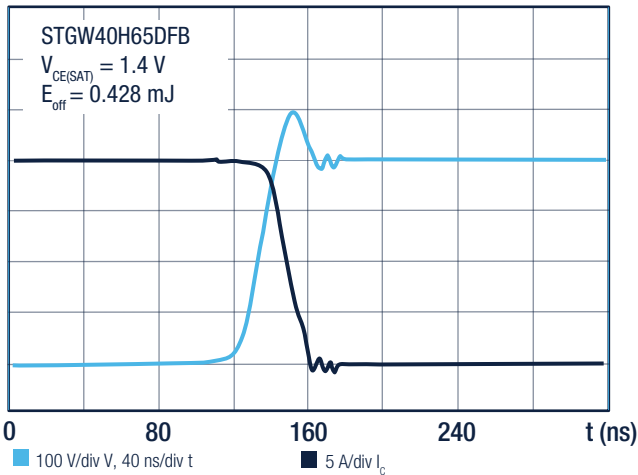
- Higher robustness and reliability
- Increase system efficiency for energy saving
- Safer paralleling operations

#### TARGETED APPLICATIONS

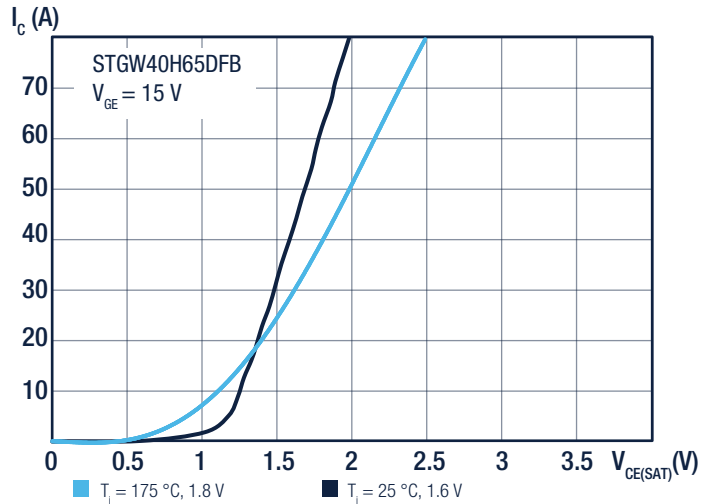
- Welding
- Photovoltaic inverters
- Uninterruptible power supply
- Power factor correction
- Induction cooking
- High frequency converters

## 650 V HB series positioning

### STGW40H65DFB Switching-off



### Saturation voltage characteristic



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

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 <sub>CES</sub> [V]	I <sub>CN</sub> <sup>(1)</sup> [A]	V <sub>CE(sat)</sub> <sup>(2)</sup> [V]	E <sub>off</sub> [mJ]	FRD option	Packages						
						D <sup>2</sup> PAK	T0-220	T0-247	T0-247 LL	T0247-4	T0-3P	T0-3PF
STGx20H65FB	650	20	1.55	0.17	-			W			WT	FW
STGx20HP65FB	650	20	1.55	0.17	Protection purpose only						WT	
STGx20H65DFB	650	20	1.55	0.17	Very Fast				WA			
STGx30H65FB	650	30	1.55	0.29	-	B		W	WA		WT (NRND)	FW
STGx30HP65FB	650	30	1.55	0.29	Protection purpose only				WA		WT	
STGx30H60DFB	600	30	1.55	0.29	Very Fast	B	P	W	WA		WT	
STGx30H60DLFB	600	30	1.55	0.15 <sup>(3)</sup>	Low drop (soft switching)	B		W				
STGx30H65DFB	650	30	1.55	0.29	Very Fast				WA			
STGx40H65FB	650	40	1.6	0.36	-	B		W	WA			FW
STGx40HP65FB	650	40	1.6	0.36	Protection purpose only				WA		WT	
STGx40H60DLFB	600	40	1.6	0.19 <sup>(3)</sup>	Low drop (soft switching)			W	WA			
STGx40H65DFB	650	40	1.6	0.36	Very Fast			W	WA	W...-4	WT	
STGx60H65FB	650	60	1.6	0.9	-			W			WT	
STGx60H60DLFB	600	60	1.6	0.45 <sup>(3)</sup>	Low drop (soft switching)			W			WT (NRND)	
STGx60H65DFB	650	60	1.6	0.9	Very Fast			W	WA	W...-4	WT	
STGx80H65FB	650	80	1.6	1.5	-			W	WA		WT	
STGx80H65DFB	650	80	1.6	1.5	Very Fast			W	WA	W...-4	WT	

<sup>(1)</sup> I<sub>CN</sub>: IGBT nominal collector current @ T<sub>j</sub>=100°C

<sup>(2)</sup> V<sub>CE(sat)</sub>: typical conduction losses @ I<sub>CN</sub>, T<sub>j</sub>=25°C

<sup>(3)</sup> E<sub>off</sub>: switching-off energy @ I<sub>CN</sub>, T<sub>j</sub> = 25 °C on capacitive load (20 nF)



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