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

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

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

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### 650V HB SERIES POSITIONING

**STGW40H65DFB** Switching-off

![Graph showing VCE(SAT) and Eoff](image-url)

- **Test condition:** $V_{cc} = 400V, R_g = 10 \Omega, I_c = 1/2 I_N = 20A, V_{GE} = 15V, T_J = 175^\circ C$

Options include maximum current ratings from 20A to 80A (at 100 ^\circ 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

<table>
<thead>
<tr>
<th>IGBT P/N</th>
<th>BV_{CES} (V)</th>
<th>I_{ON} (A)</th>
<th>$V_{CE(SAT)}$ (V)</th>
<th>$E_{on}$ (mJ)</th>
<th>$E_{off}$ (mJ)</th>
<th>FRD option</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>STGx20H65FB</td>
<td>650</td>
<td>20</td>
<td>1.55</td>
<td>0.08</td>
<td>0.17</td>
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<td>W</td>
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<td>STGW20H65DFB(*)</td>
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<td>20</td>
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<td>Low Drop (Soft Switching)</td>
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<td>W(4L)</td>
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</table>

**Note:** (*) In development - preliminary data  
(1) $I_{ON}$ : nominal collector current @ $T_J = 100 ^\circ C$  
(2) $V_{CE(SAT)}$ : typical conduction losses @ $I_{ON}, T_J = 25 ^\circ C$  
(3) Turn-on energy have been measured applying as freewheeling an external SiC diode STPSC206W  
(4) $E_{off}$ : switching-off energy @ $I_{ON}, T_J = 25 ^\circ C$ on capacitive load (20 nF)  
(5) $E_{on}$ : switching-off energy @ $I_{ON}, T_J = 25 ^\circ C$ on capacitive load (20 nF)