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1600-V IGBT Thrives In Soft-Switching Appliance Applications

[STMicroelectronics'](#) STGWA30IH160DF2 IGBT combines a breakdown-voltage rating of 1600 V and high thermal performance with efficiency in soft-switching topologies and easy paralleling in high-power applications, including induction heaters and cookers, microwave ovens, and rice cookers. With maximum junction temperature of 175°C and low thermal resistance ensuring efficient dissipation, the STGWA30IH160DF2 has a current rating of 30 A and ensures long-term reliability in challenging environments, says the vendor.

Extending the STPOWER portfolio, this is the first 1600-V IGBT in ST's new IH2-generation. The devices leverage advanced trench gate field-stop (TGFS) technology to combine its high breakdown-voltage capability with low saturation voltage (V_{CEsat}) to minimize conduction losses. While the STGWA30IH160DF2 has V_{CEsat} of just 1.77 V (typical, at rated current), TGFS technology also minimizes tail current resulting in low turn-off energy. In addition, the anti-parallel diode has a low forward voltage and soft recovery that combine with the switching performance of the main transistor to ensure high efficiency in resonant and soft-switching topologies.

With these characteristics, the STGWA30IH160DF2 can be used in single-switch quasi-resonant converters over a wide switching frequency range, from 16 kHz to 60 kHz. The high breakdown voltage and thermal efficiency let the device withstand large voltage surges and spikes while minimizing reliance on external protective components, enabling a lower bill of materials (BOM).

Home appliances built with these IGBTs can compete strongly in price-sensitive markets, leveraging BOM savings, while the high efficiency lets new designs achieve outstanding energy ratings.

Also featuring a positive $V_{CE(sat)}$ temperature coefficient with tight parameter distribution, the STGWA30IH160DF2 allows connecting multiple devices in parallel for current sharing in high-power applications.

The STGWA30IH160DF2 is in production now and available in a TO-247 long lead package (see the figure) from \$1.98 for orders of 1000 pieces. For more information on the IGBT, see the STGWA30IH160DF2 [page](#). For more on the benefits of this IGBT in soft-switching applications, see "[1350-1600 V IH2 series IGBTs, ideal for soft switching applications](#)".



Figure. The STGWA30IH160DF2 is the first 1600-V IGBT in ST's IH2-generation. The IH2 series has been developed using an advanced proprietary trench gate field-stop structure, whose performance is optimized both in conduction and switching losses for soft commutation. A freewheeling diode with a low drop forward voltage is included. The result is a product specifically designed to maximize efficiency for any resonant and soft-switching applications.