

STGAP1S

Breakthrough in robustness and flexibility



IGBT/MOSFET driver with 1500 V rated on-chip galvanic isolation provides enhanced robustness, noise immunity and design flexibility

The STGAP1S's on-chip isolation layer provides galvanic separation between input and control stages from high current gate driving and diagnostics.

Its (extremely) high signal integrity and reduced propagation delay, together with extensive diagnostics, help developers design solutions with superior robustness and safety.

The device's high current capability allows a large application spectrum, in the several kW range.

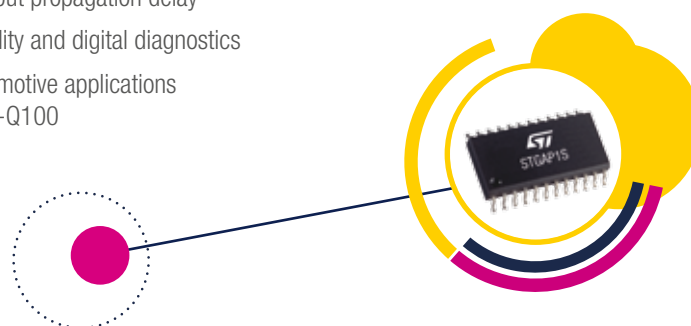
SPI communication enables complete and easy configurability as well as full digital diagnostics.

KEY FEATURES

- Up to 1500 V high voltage rail
- 5 A sink/source driver current capability
- Negative gate turn-off
- 2-level turn-off
- Active Miller and V_{CE} clamping
- IGBT desaturation detection
- ± 50 V/ns transient immunity
- 100 ns input-output propagation delay
- SPI programmability and digital diagnostics
- Qualified for automotive applications according to AEC-Q100

KEY APPLICATIONS

- Inverters for electrical vehicles
- Electrical vehicle chargers
- 600/1200 V inverters
- Solar inverters
- Uninterruptible power supplies (UPS)



In ST's STGAP1S, a thick oxide isolation layer is grown on-chip to build a miniature transformer with up to 1500 V isolation capabilities. The transformer is used to inductively transfer logic signals between an input chip, where all interface circuitry is placed, and an output chip that includes high current driver and diagnostic blocks.

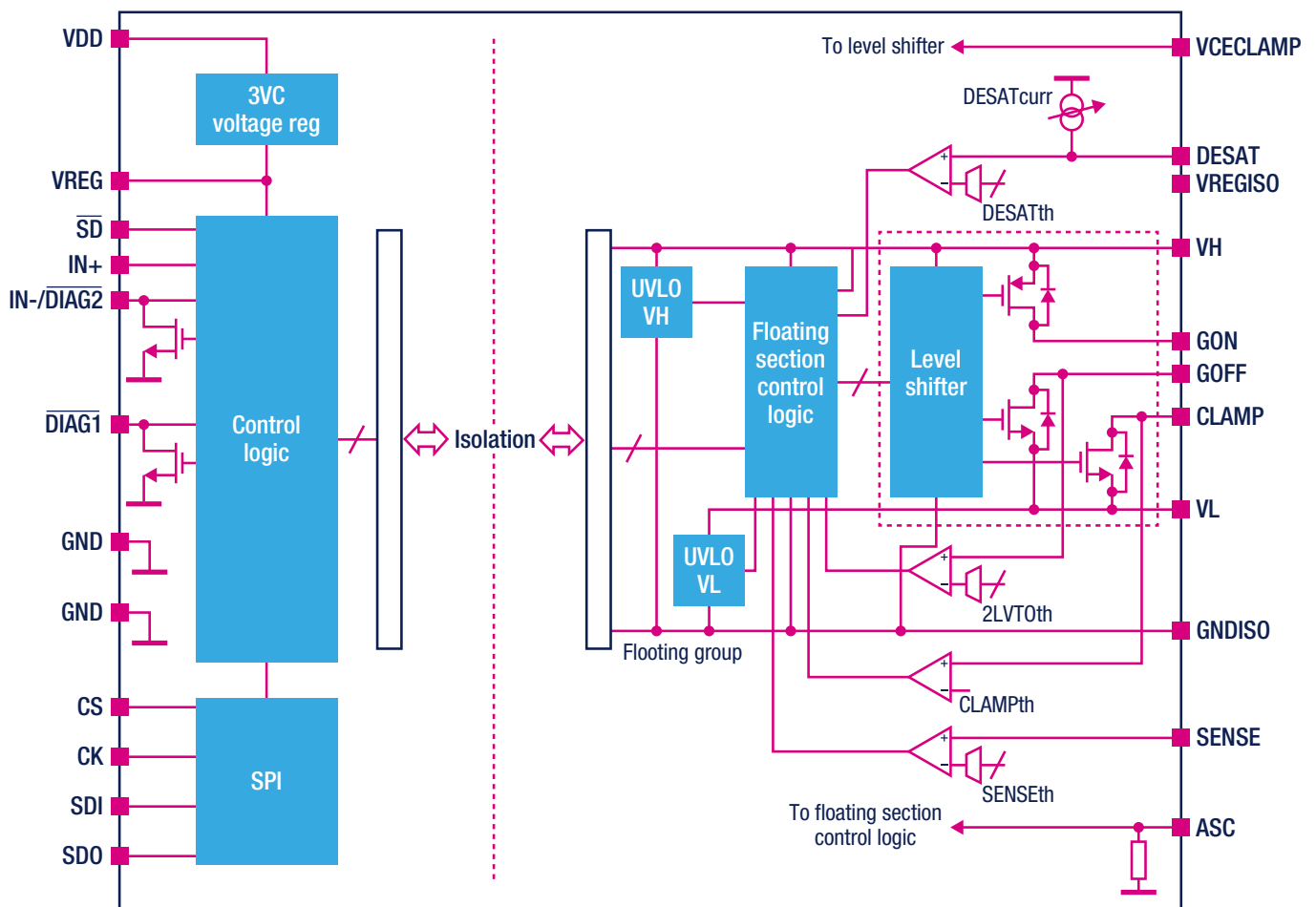
Particular care was taken in designing the IGBT/ MOSFET driving section that features 30 V/ 5 A drive capability with separate sink and source paths for enhanced design flexibility and BOM reduction.

A programmable two-step turn-off with negative drive and Miller clamp enables designs with the highest immunity to induced turn-on. The device is perfectly tailored to drive wide band-gap devices.

STGAP1S embeds a comprehensive palette of protection and diagnostic features including anti-desaturation and over-current detection, under-voltage and over-voltage detection coupled with just a 100 ns of input-output propagation delay ensuring fast reaction times.

All protection parameters and diagnostic information are accessible through a series of on-chip registers, for monitoring and control purposes, through an SPI bus, thus reducing pin count.

The result is a compact, robust and highly noise-immune IGBT/ MOSFET driver offering enhanced design flexibility for high power applications such as inverters for electrical vehicles and electrical vehicle charging stations as well as inverters for harsh industrial environments.



DEVICE SUMMARY

Order code	Package	Packing	Evaluation board
STGAP1S/STGAP1STR	S024W	Tube/Tape & reel	EVALSTGAP1S

