

STi²GaN 650V IC for EV emergency power supply

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STMicroelectronics – Spoke 6, WP 1.4.2

SAMOTHRACE 2nd Year:
Experimental Prototypes Demo Showcase

SAMOTHRACE PROJECT ECS00000022

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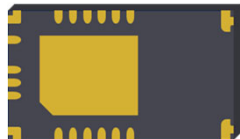
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The emergency power supply on safety-critical loads

- Automotive market requires ASIL D on safety-critical loads supply
- Main example: BEV traction inverter → need for a 2nd aux. supply
- Discrete implementation can lead to a bulky system
- At least one traction inverter for each BEV (TAM ~ 60M BEVs in 2030)



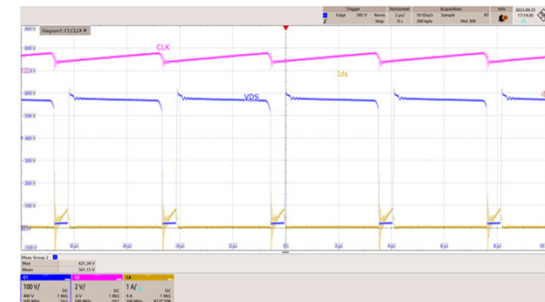
- STi²GaN Flyback primary switcher: power HEMT + driver + controller**
- Highly integrated GaN drastically reduces system BOM
 - Compact system, can be embedded inside traction inverter module
 - Up to 68W continuous at 300 kHz and 500+ V input with $\eta \sim 87.2\%$



**7x4 mm²
QFN Package**



6.5 x 3.2 cm² demo-board



500V V_{IN} operation



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DEVELOPMENT PLAN UNDER SAMOTHRACE ECOSYSTEM

- Project started with 1st device cut design – initial TRL 2
- Key milestones:
 - 1st cut samples in service package + application board
 - Final package design, design validation, In-appl. validation
 - Demo-board tested and validated – current TRL 4



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NEXT STEP UNDER SAMOTHRACE ECOSYSTEM

- Next steps within the end of the project:
 - Device partial redesign to minimize standby losses → **Done**
 - Partial package redesign for improved creepage → **Done**
 - In-Application validation on new version
- Further demo-board tests to be performed – target TRL 5



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