

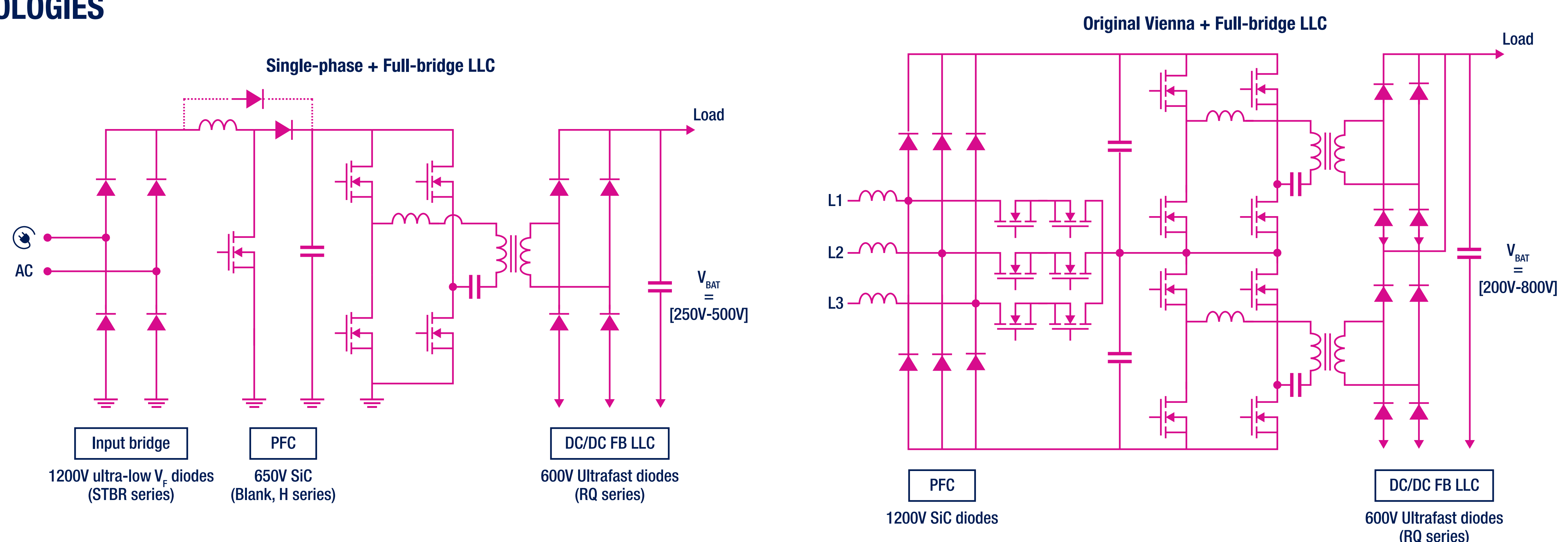
Diode solutions for on-board battery charger (OBC) applications for input bridge, power factor correction and LLC topologies

ABSTRACT

ST offers diode solutions for on-board battery charger (OBC) and charging station applications based on several common topologies:

- For input bridge: Our new 1200V STBR bridge rectifier diode provides ultra low V_F with very high robustness (I_{FSM} and ESD).
- For power factor correction (PFC): SiC diodes remain the best choice for high switching frequencies.
- For full-bridge LLC: Our new DC/DC 600V RQ series is the most suitable solution for high efficiency with optimized V_F/Q_{RR} trade off.

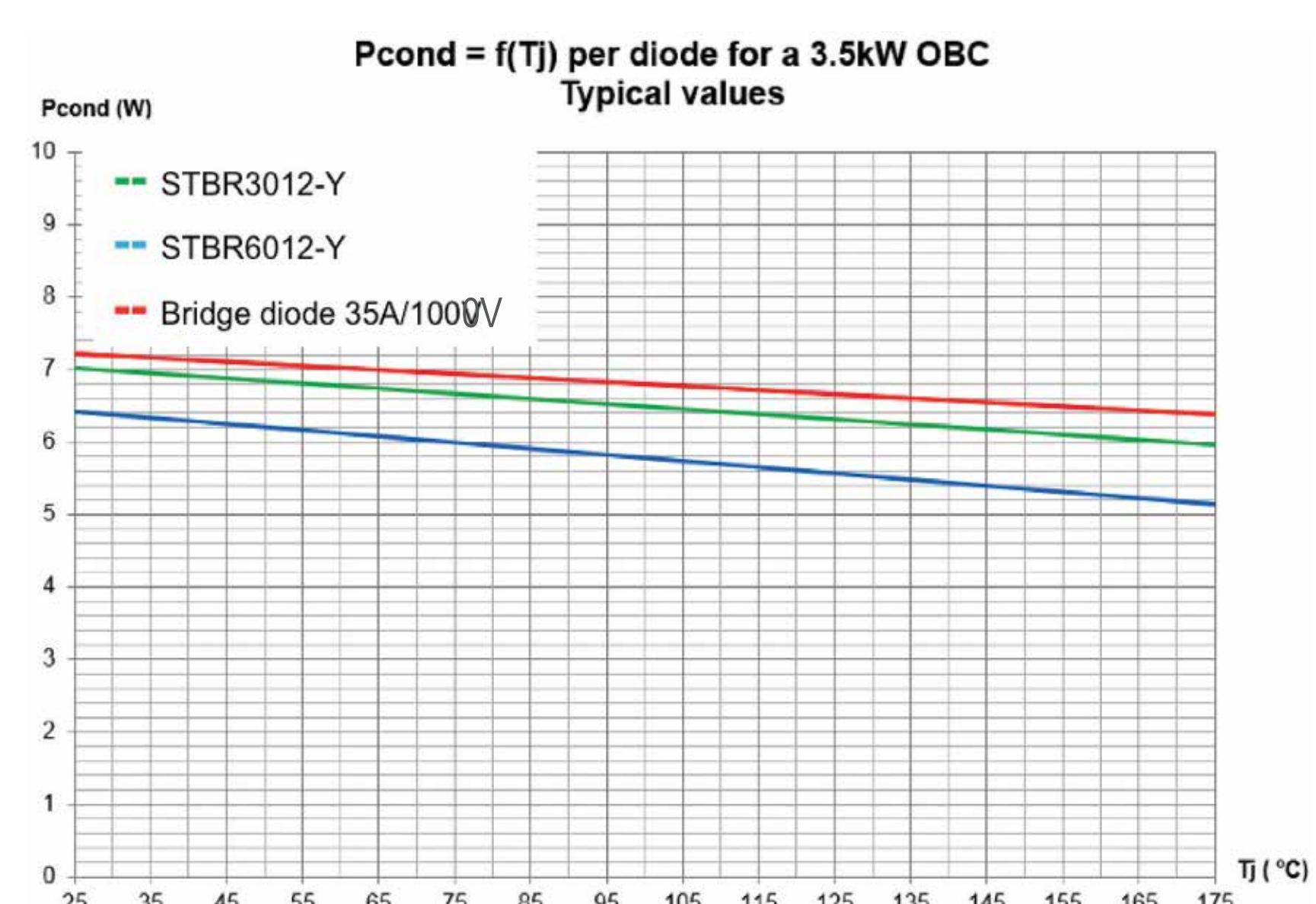
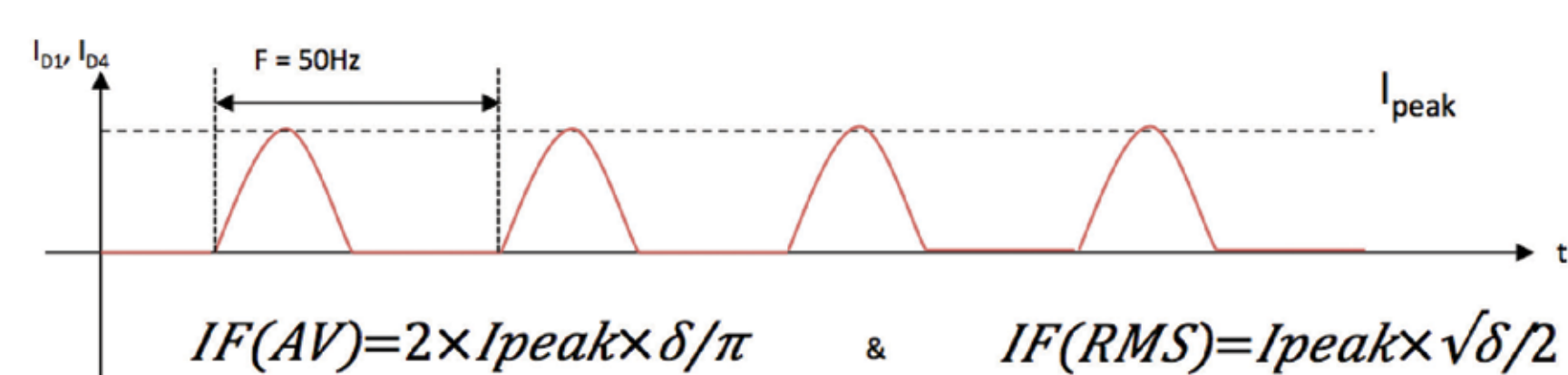
TOPOLOGIES



FEATURES AND BENEFITS

1200V STBR diodes for input bridge:

- Ultra low V_F
- High I_{FSM}
- Products available in SMD & TH packages
- $V_{RRM} = 600V @ -40^\circ C (< > 650V @ 25^\circ C)$ to be compliant with load dump test

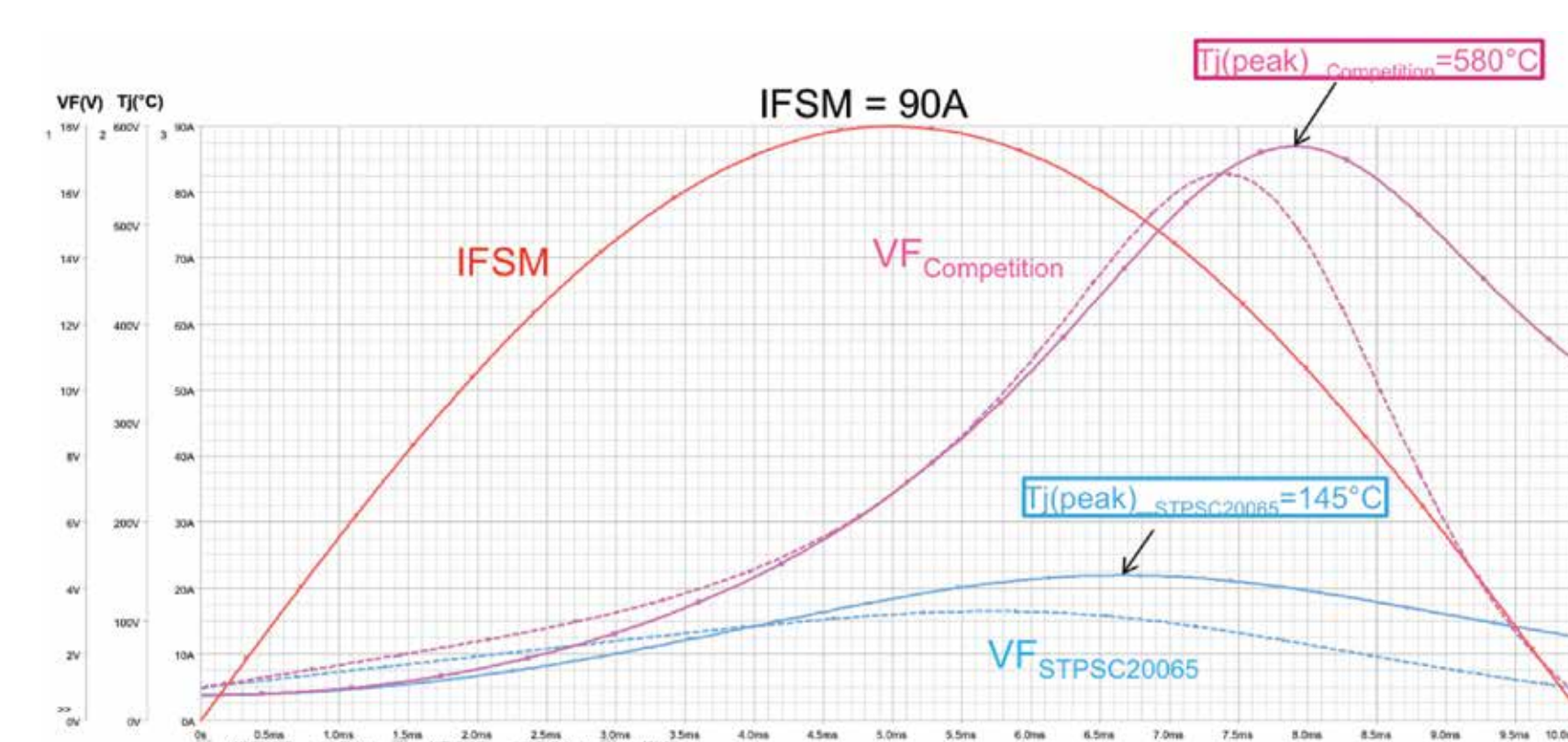


→ Improved efficiency compared to standard bridge diodes

Bridge	PFC	DC-DC full-bridge LLC
STBR3012WY	STPSC20065DY	STTH15RQ06-Y
STBR6012WY	STPSC12065DY	STTH30RQ06-Y
	STPSC20H065C-Y	
	STPSC10H12DY	
	STPSC20H12DY	

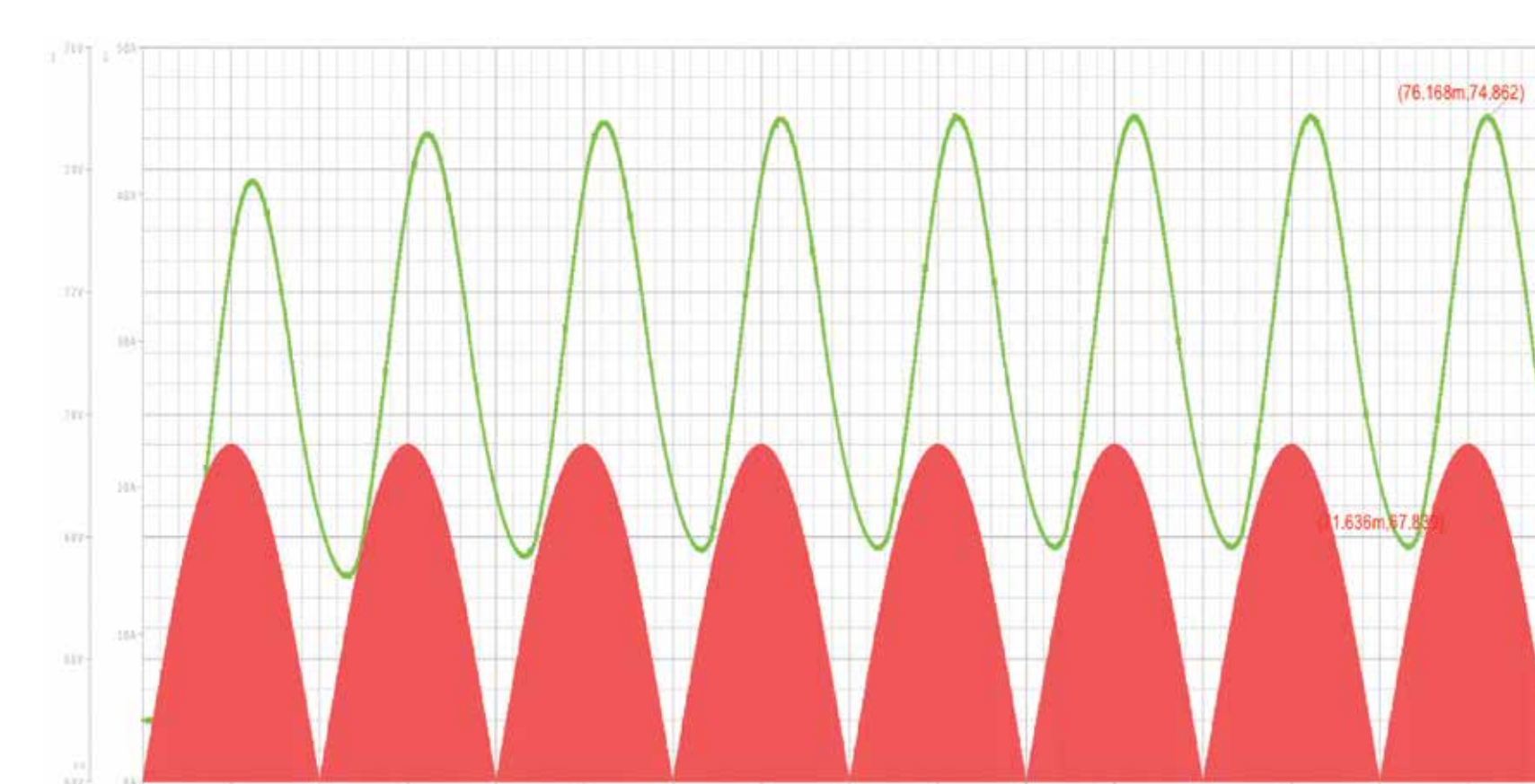
650V and 1200V SiC diodes for PFC:

- 650V and 1200V SiC with mature technology
- Lowest V_F in the market
- Optimized I_{FSM}
- Wide range of packages



→ During high current surges, the V_F is clamped and the temperature is controlled to avoid thermal runaway phenomena

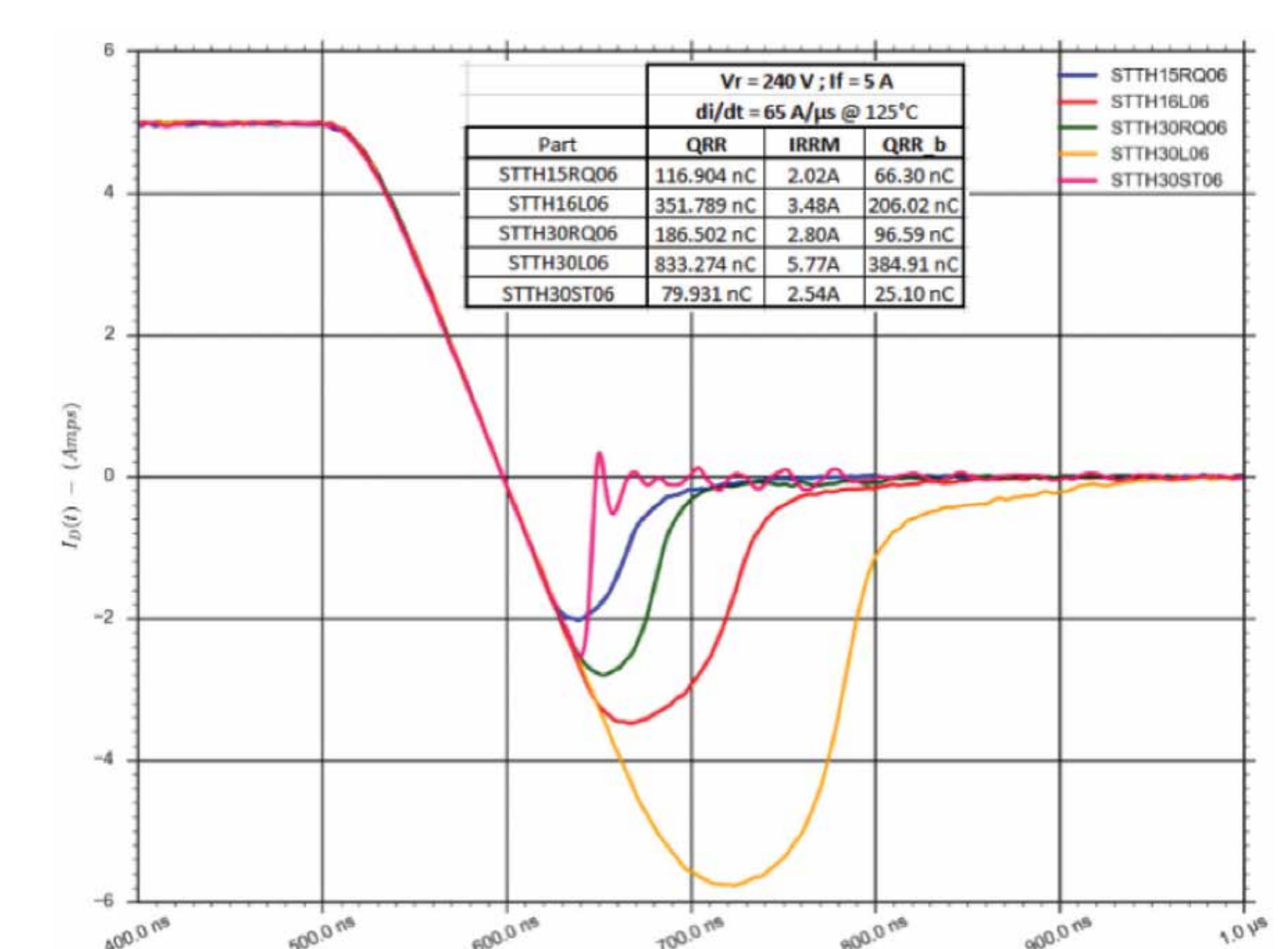
→ ST SiC diodes present the new reference V_F to reach the highest overall efficiency



→ ST can support electrothermal simulations by considering customer's conditions

600V ultrafast diode for DC-DC:

- Optimized V_F/Q_{RR} trade-off to cover wide range of output voltage and output current
- Soft behavior for good EMI results
- $V_{RRM} = 600V @ -40^\circ C (< > 650V @ 25^\circ C)$ to be compliant with load dump test



→ Good performance in secondary side of a LLC resonant topology used in OBC applications.

