

# Diode solutions for on-board battery charger (OBC) applications

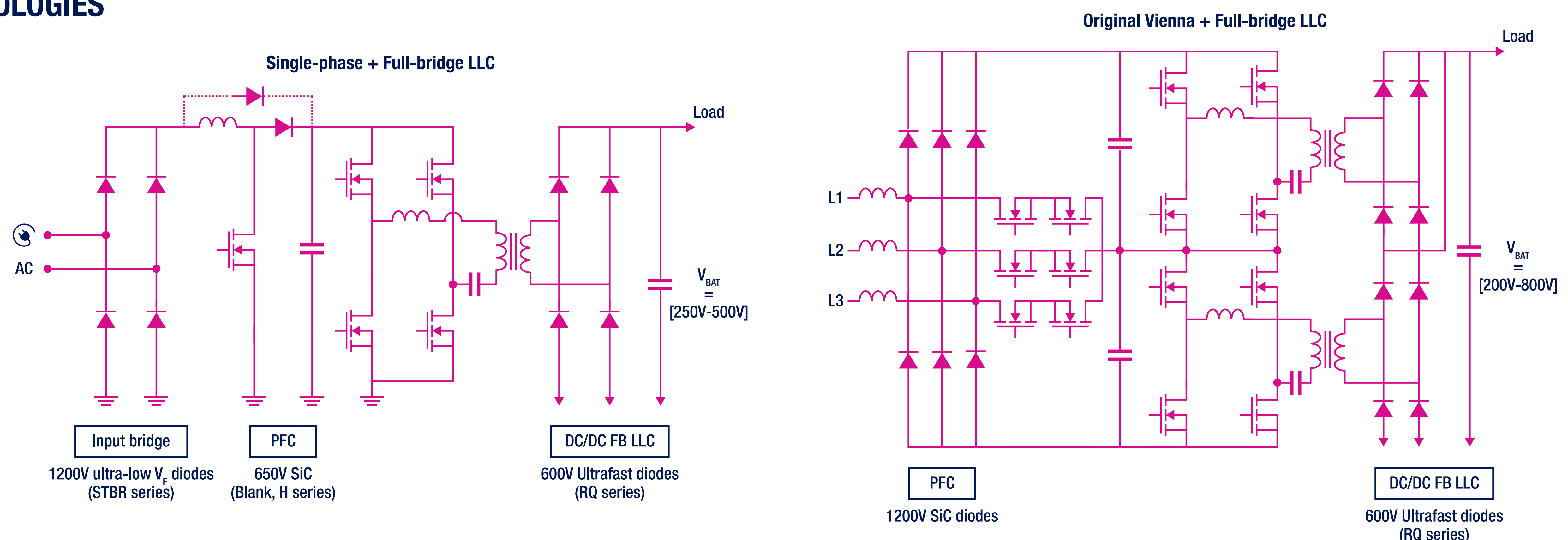
## for input bridge, power factor correction and LLC topologies

### 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.

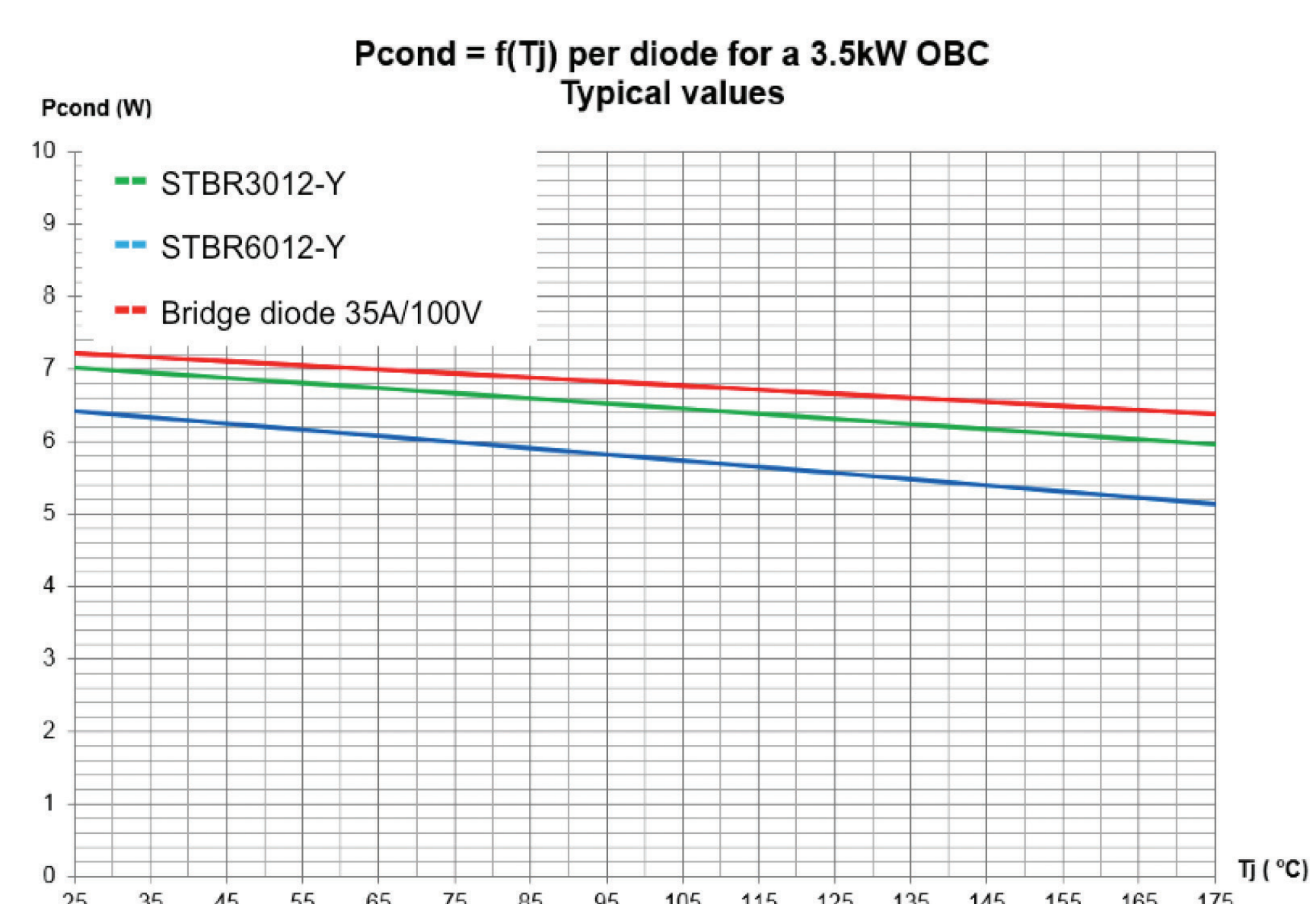
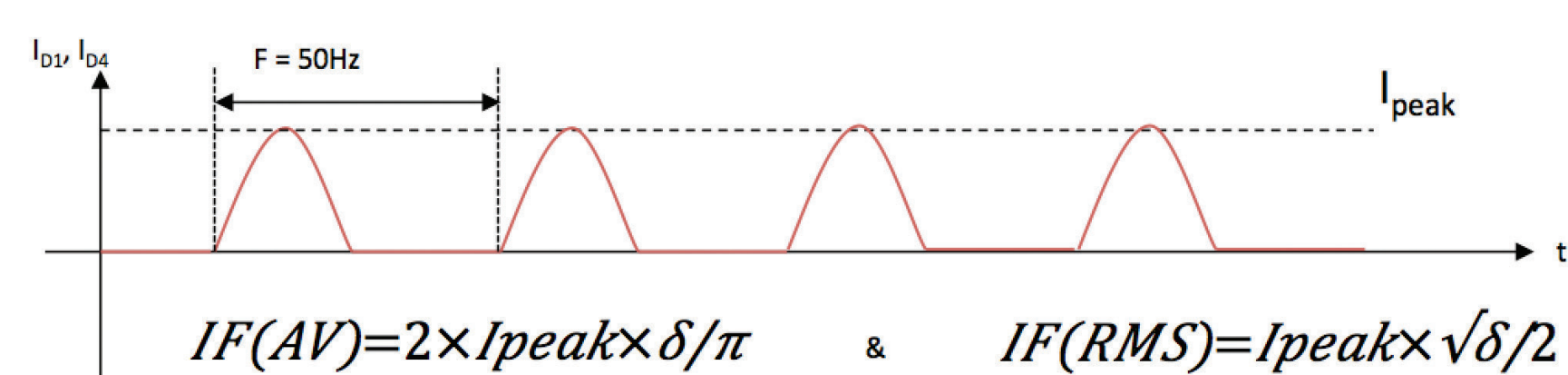
### TOPOLOGIES



### FEATURES AND BENEFITS

#### 1200V STBR diodes for input bridge:

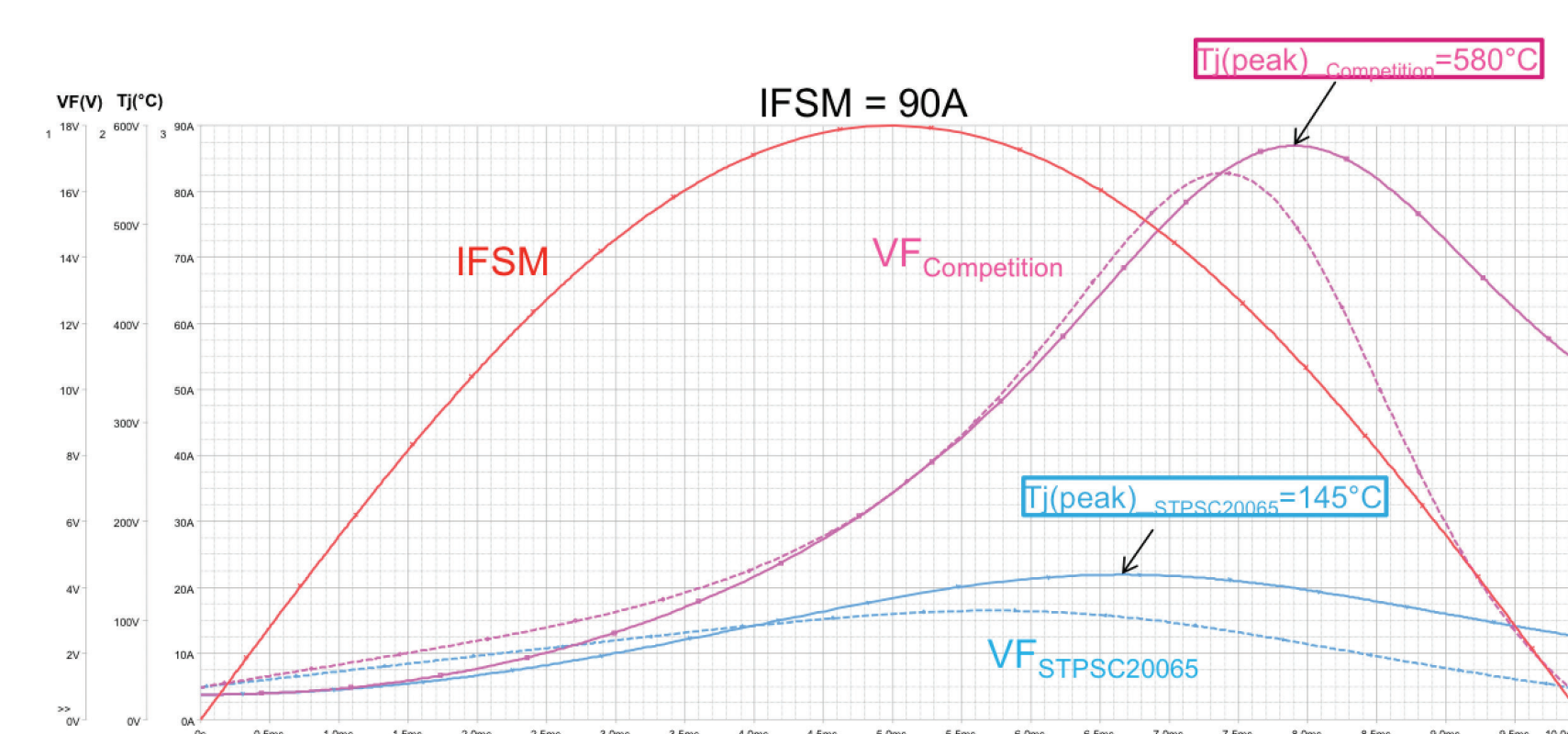
- Ultra low  $V_F$
- High  $I_{FSM}$
- Products available in SMD & TH packages
- $V_{RRM} = 600V @ -40^\circ C (< > 650V @ 25^\circ C)$  to be compliant with load dump test



→ Improved efficiency compared to standard bridge diodes

#### 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

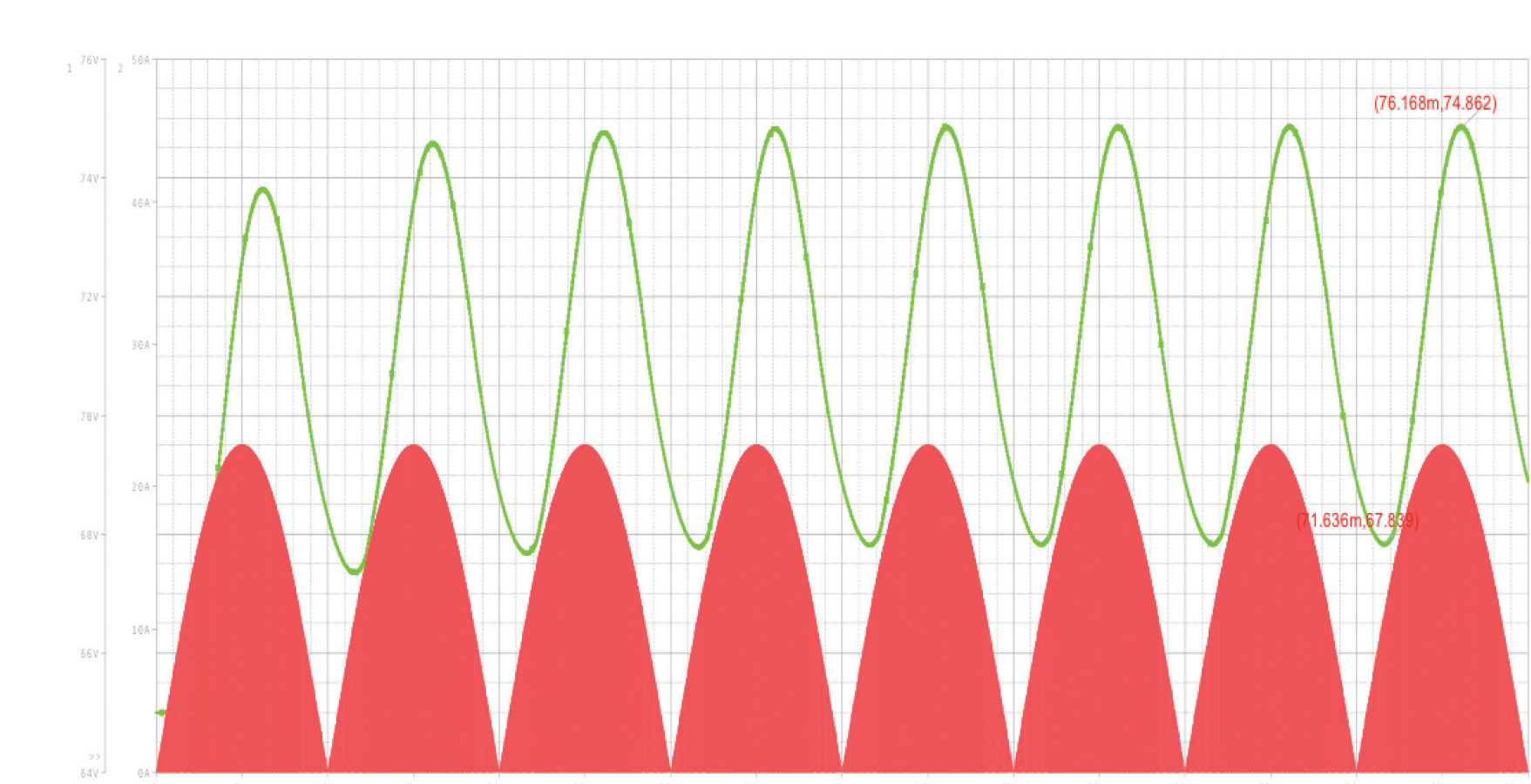
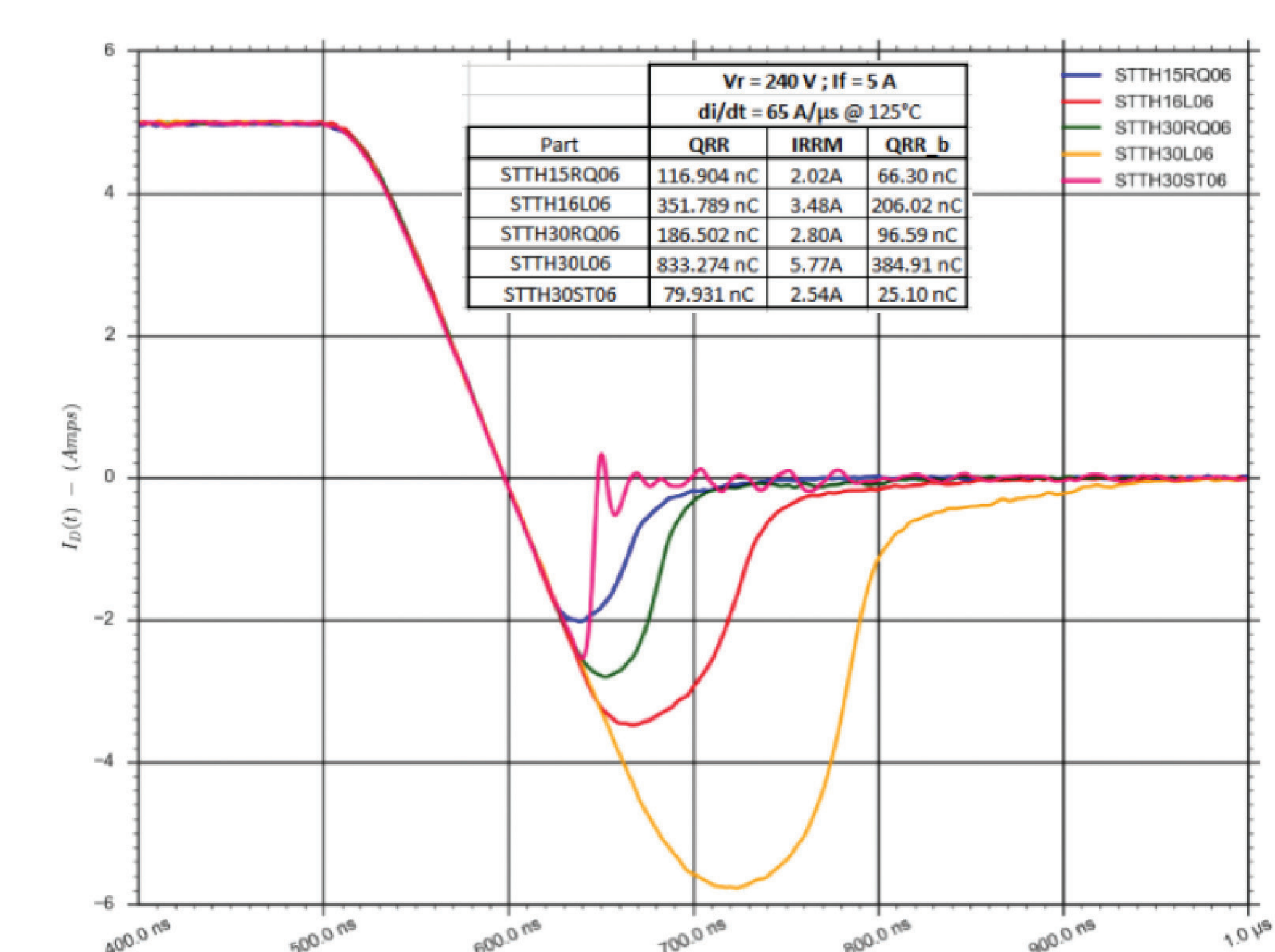


→ During high current surges, the  $V_F$  is clamped and the temperature is controlled to avoid thermal runaway phenomena

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

#### 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.

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

