

SiC solutions for EV applications

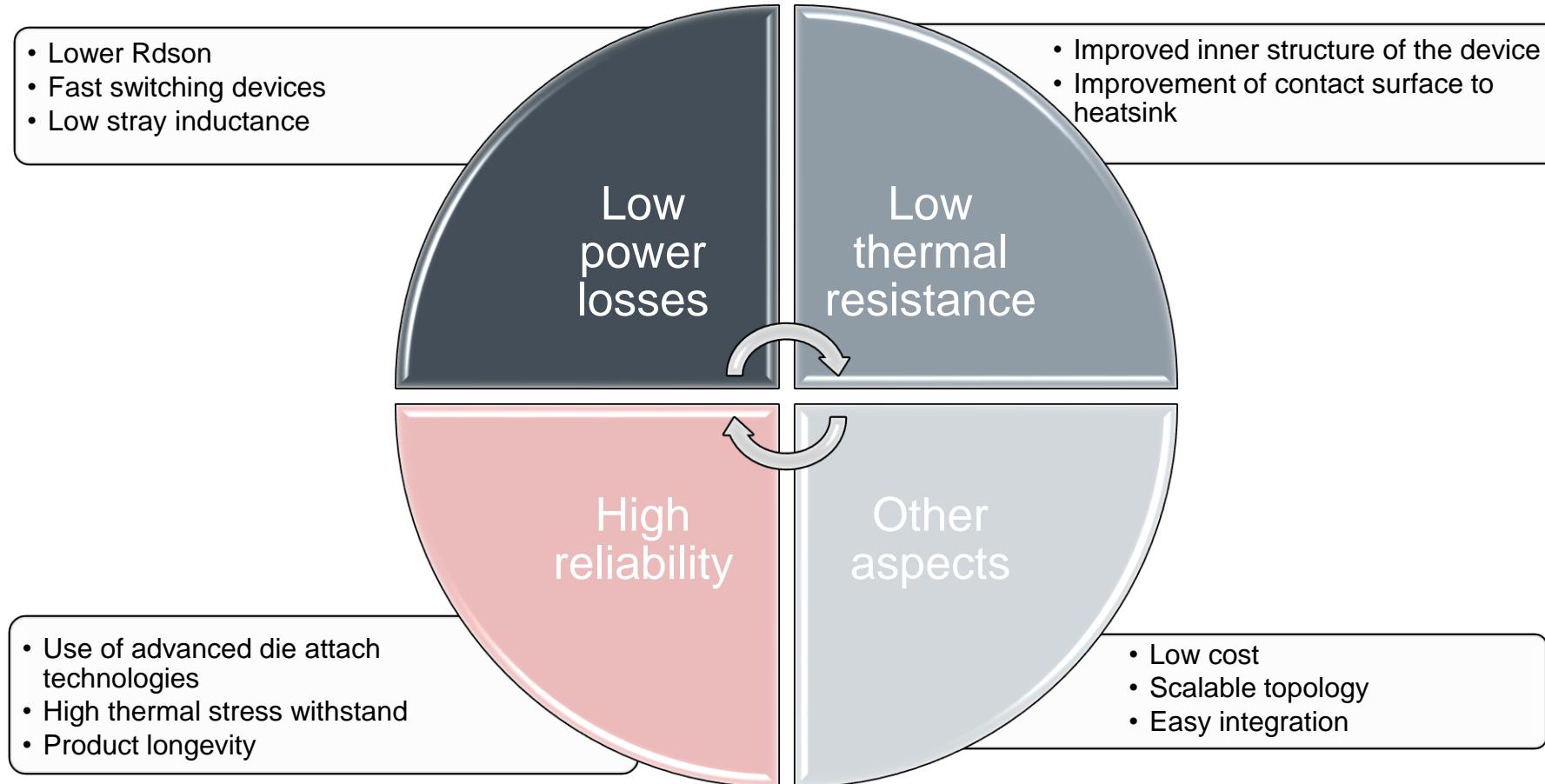
Imane Fouaide, Marketing Manager, Rohm Semiconductor

Bodo's Wide Bandgap Event 2024

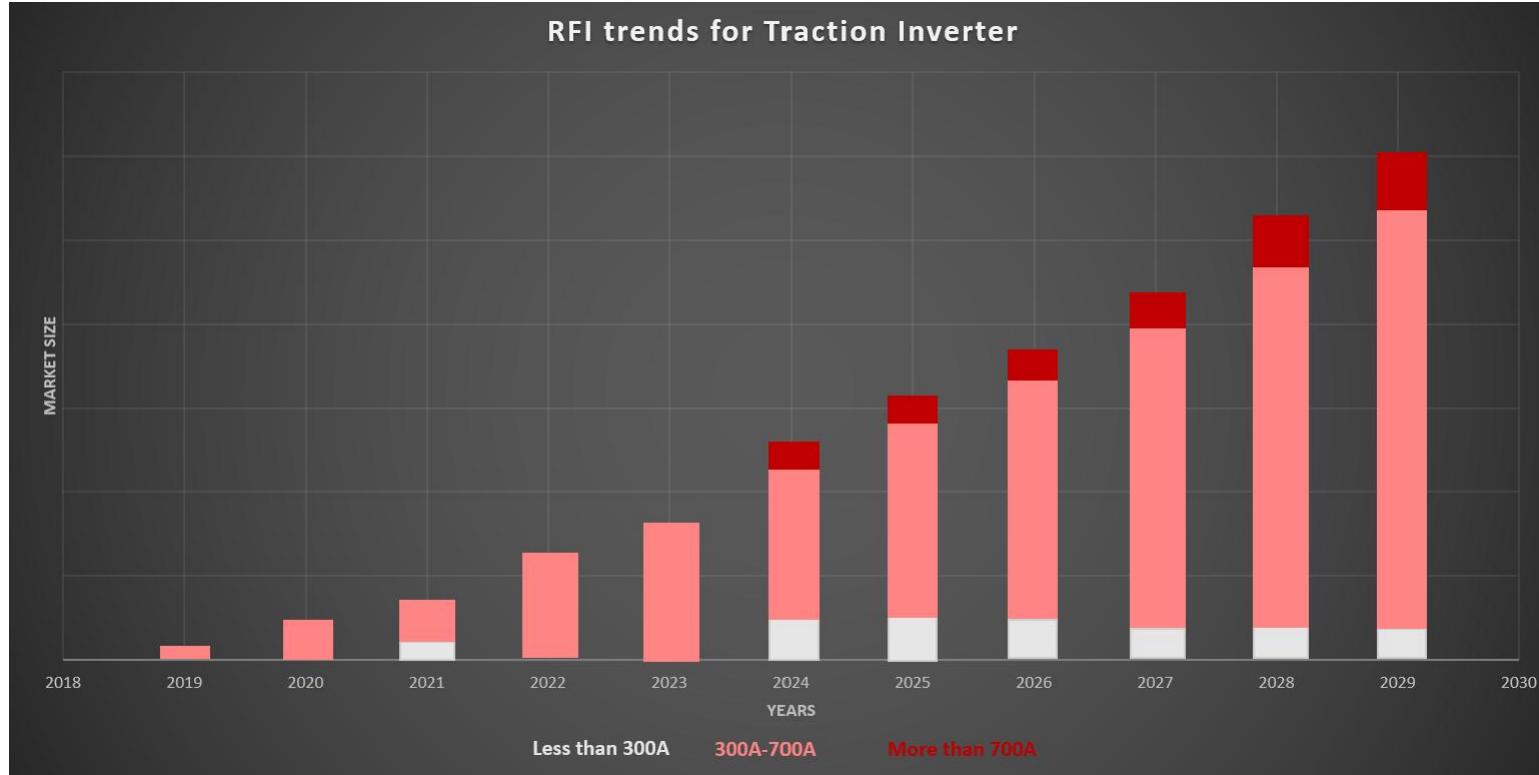
Making WBG Designs Happen

SiC

Trending requirement for xEV applications



Traction inverter – Market demand

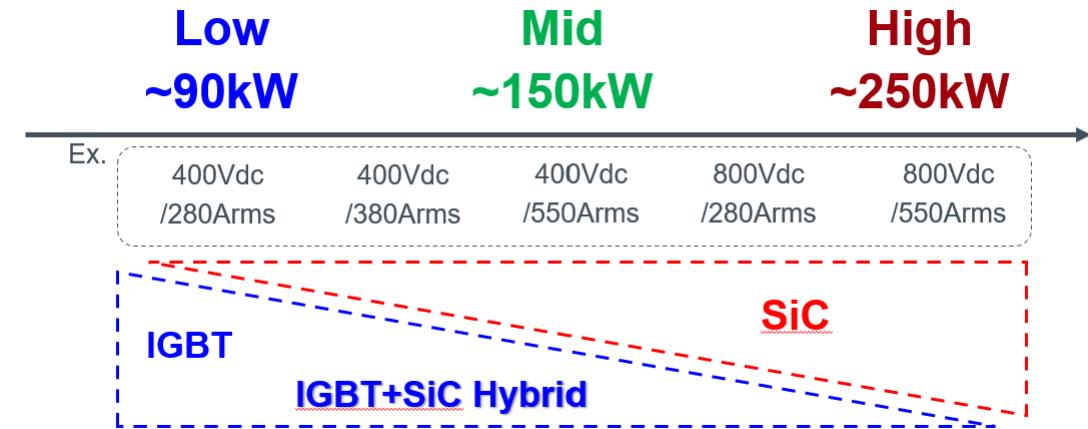
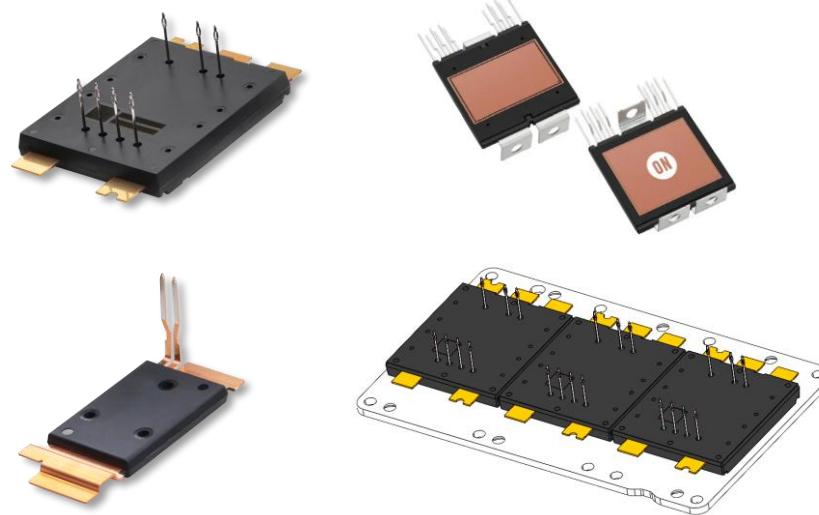


Main market : 80% of the RFI volume are between 300 and 700 Arms current

Source : Rohm

- Disparity in general demand with several currents requirements
- 400V and 800V batteries are still co existing
- Platform approach with scalability required

Traction inverter – Market available solutions



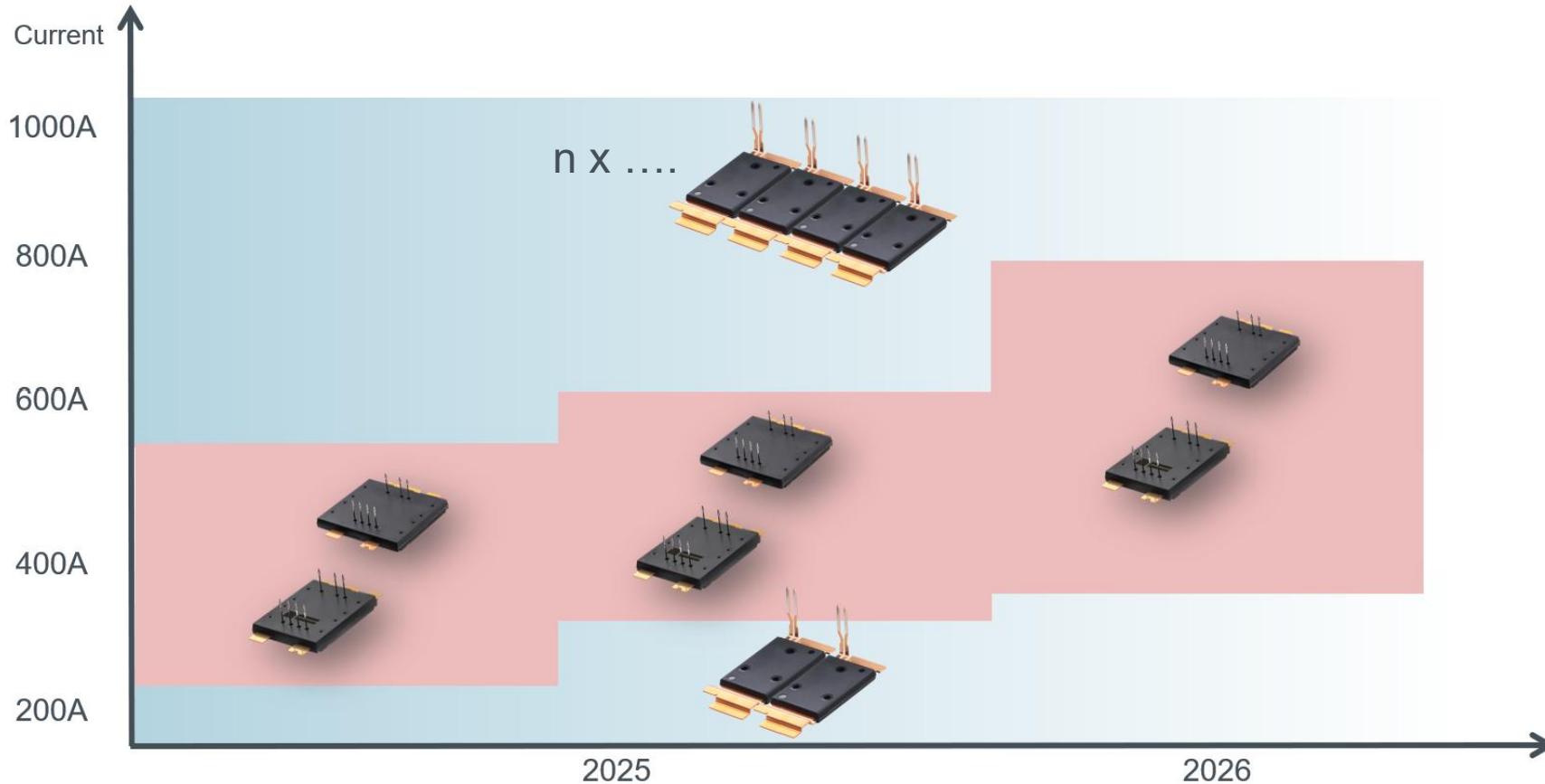
	B2 single side cooling	B2 double side cooling	Single switch	B6	Embedded
SiC	+	+	+	+	+
IGBT	+	+		+	

ROHM SiC market solutions overview



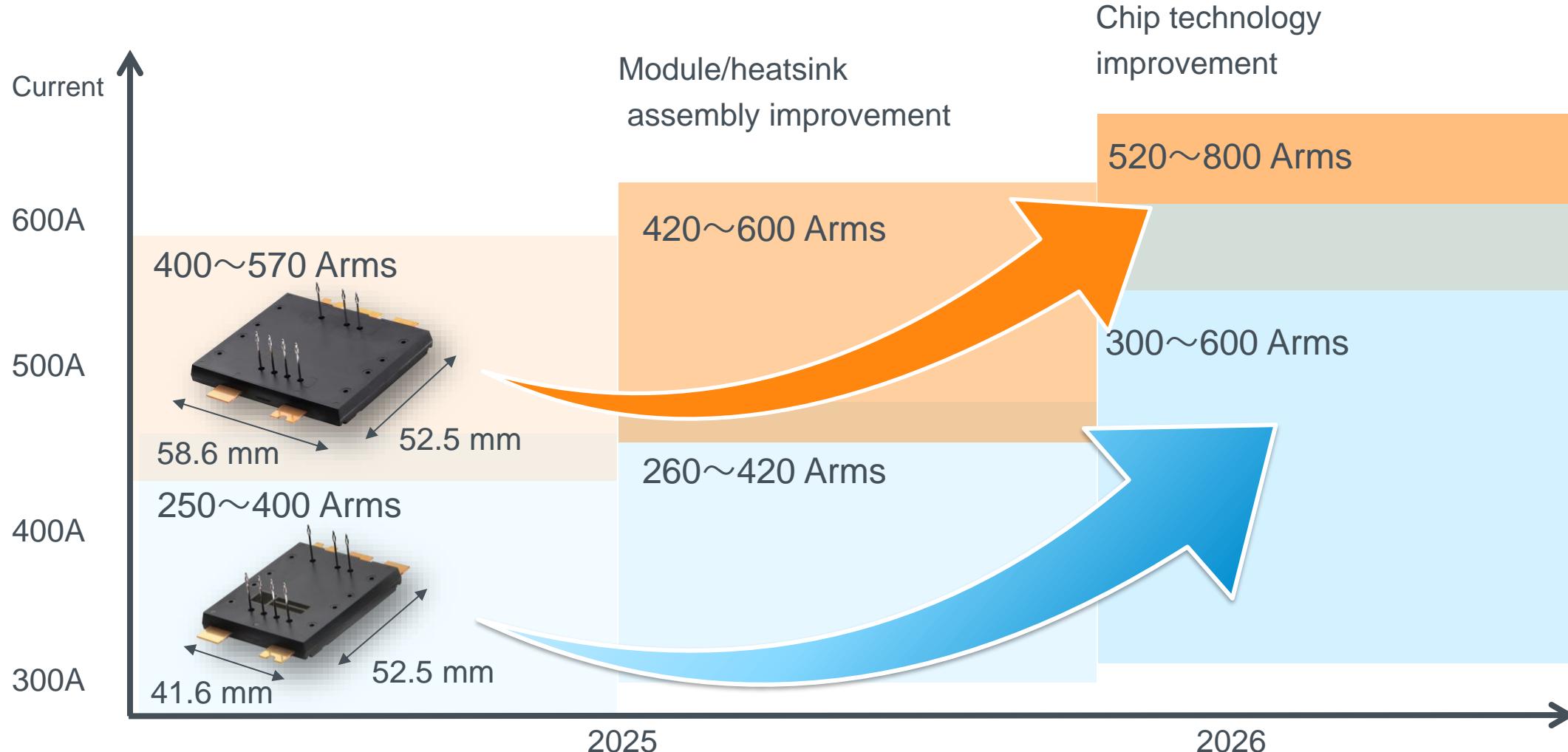
TRCDrive pack as suitable solution for main market

BSTB as a suitable solution for very high and very low currents

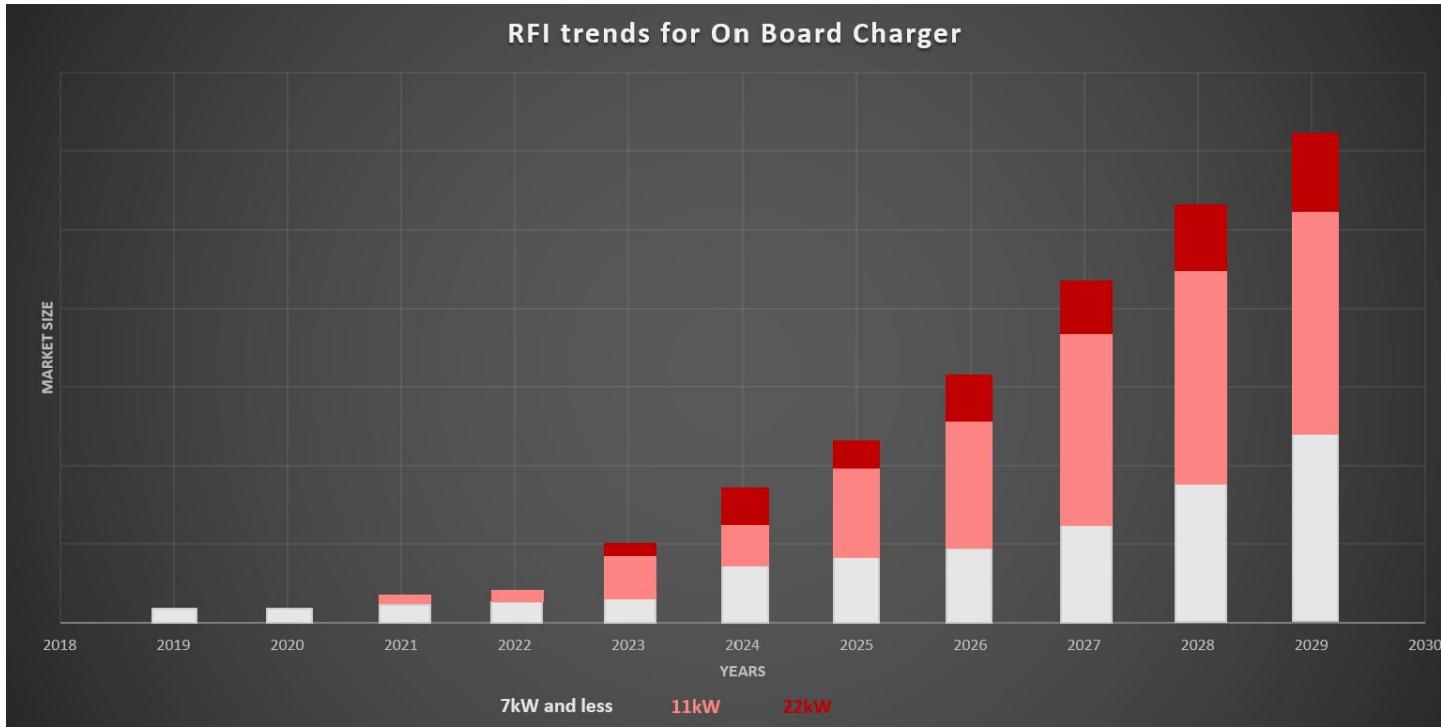


Parameter	TRCDrive	BSTB
Voltage (V)	1200 750	1200 750
Current (A)	~394	~170
DC current density (A/cm ²)	36	32
Inductance (nH)	5	6
Thermal resistance R _{thj-c} (K/W)*	0.36	0.4
Isolation voltage (kV)	4.2	4.3
Topology	Half bridge	Single switch

ROHM TRCDrive pack for main market



On Board Charger – Market demand



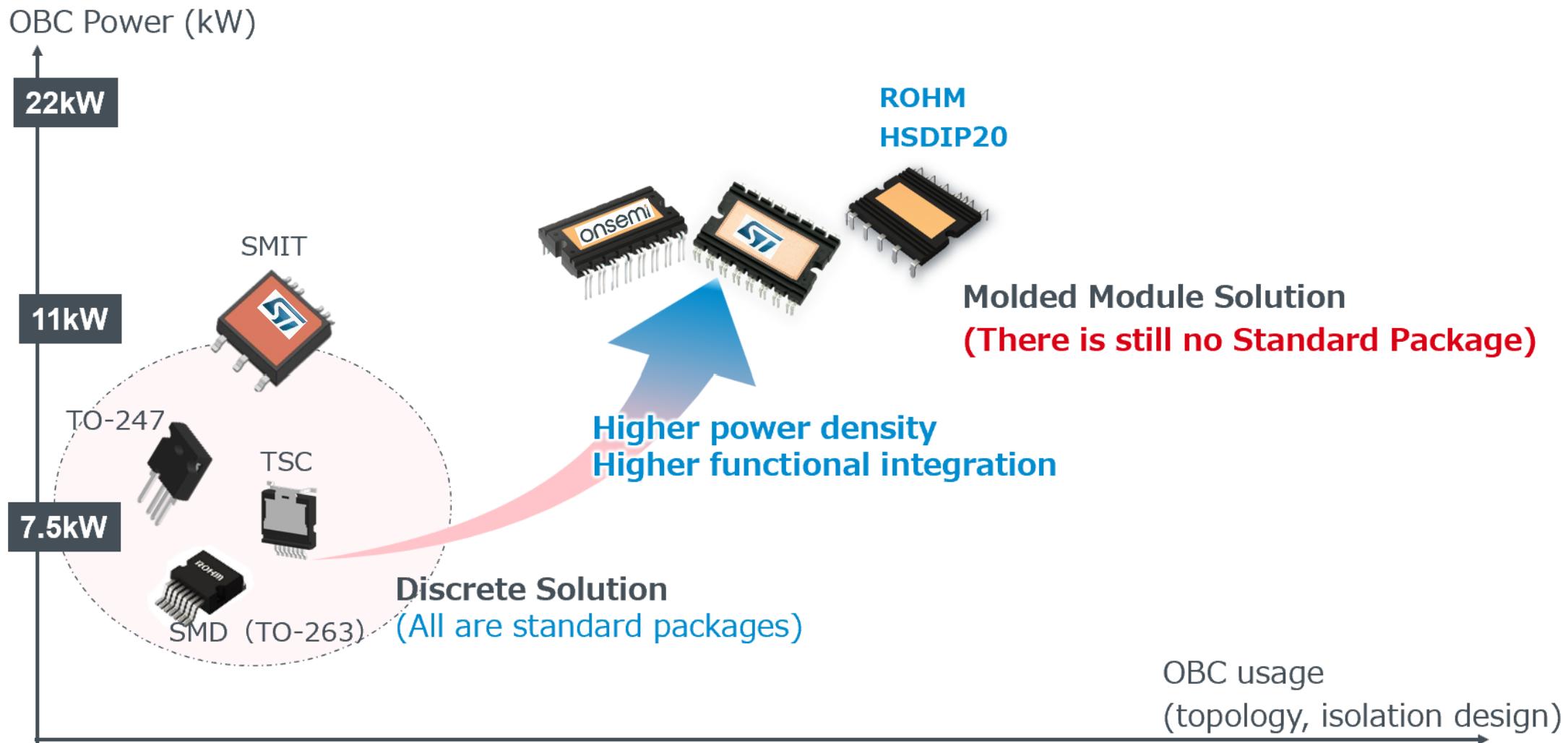
Source : Rohm

Market is oriented towards 11kW (EU) and 7kW (Asia) power ranges

22kW demand will remain for high end power class

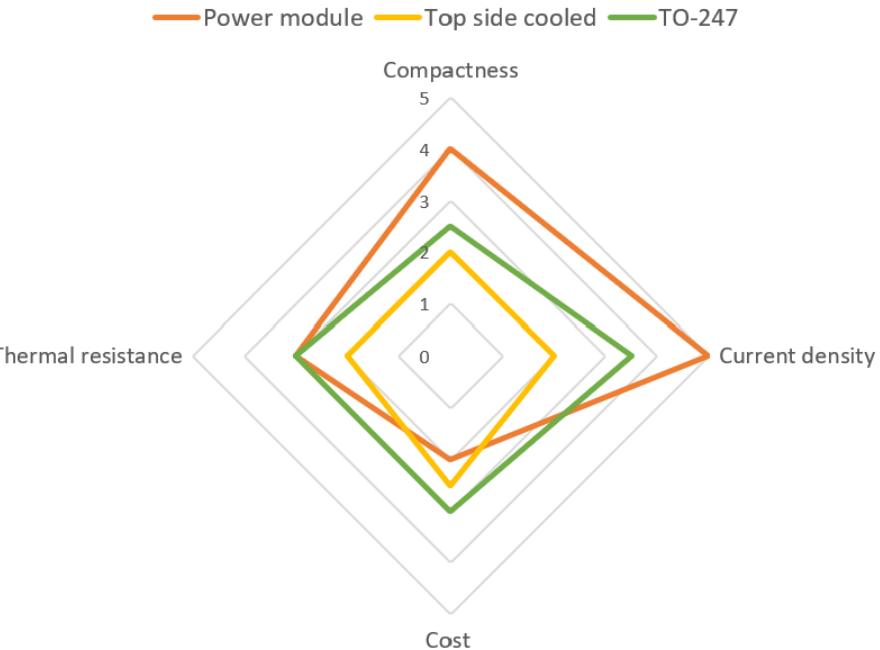
Same remark as before : 400V and 800V battery are still co existing

SiC packages co-existence in the market



SiC discrete vs module comparison

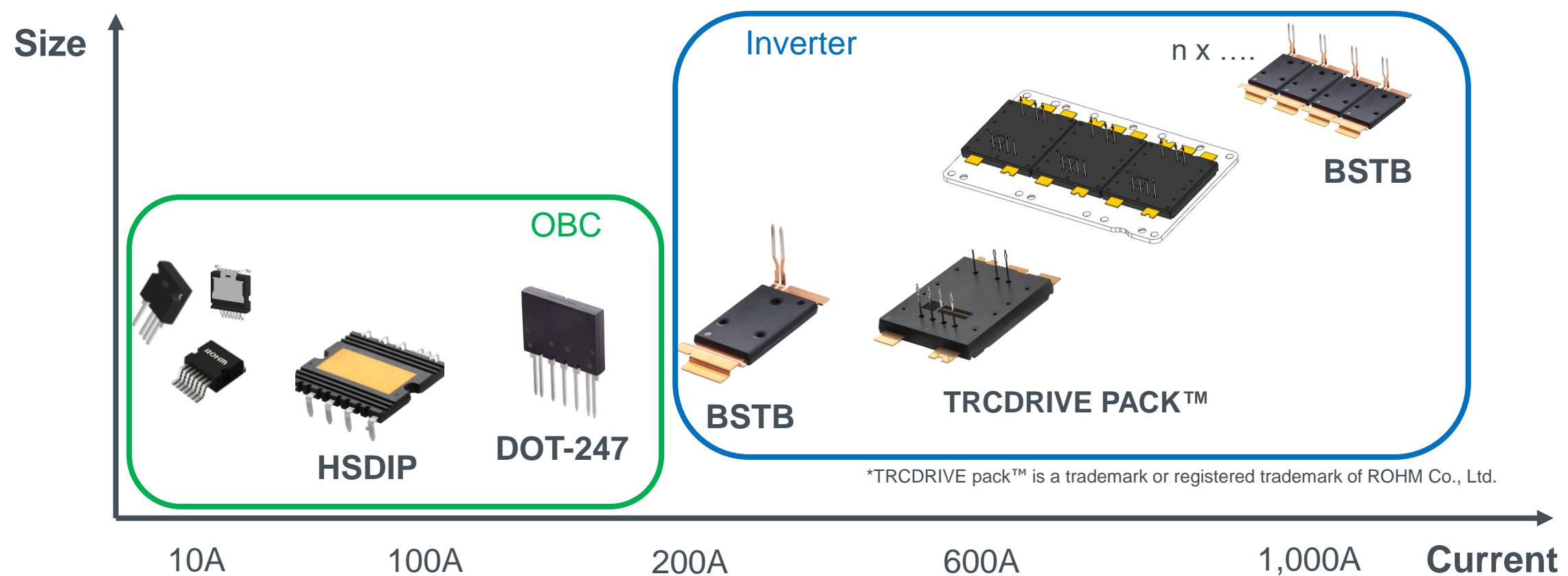
Parameter	TO247-4L	Top Side Cooled	Power module
Voltage (V)	1200 750	1200 750	1200 750
Current (A)	81	50	70
Package Size (6in1) (mm×mm)	2491	1800	1189
Current density (A/cm ²)	3,3	1.7	5
Topology	Single	single	4in1 6in1
Inductance (nH)	18	10	35
Thermal resistance R _{thj-w} (K/W)	1.5	2.0	1.5
Internal isolation	✗	✗	✓
PKG			



High power density solution : power module
Cost effective solution : standard discrete

Focus on Molded Modules to cover main market demand for xEV

Discrete devices destined to very low or very high power requirements





Thank you !

Any questions ?