

AC Propulsion Power Module for 200kW Drive Unit Inverter

Delivering unmatched efficiency with UnitedSiC low RDS(on) SiC FETs

OVERVIEW

Unique low cost SiC Inverter for a 200kW drive unit made possible with a patented SiC power module created by AC Propulsion using the UnitedSiC 4 lead TO-247 1200V SiC FETs

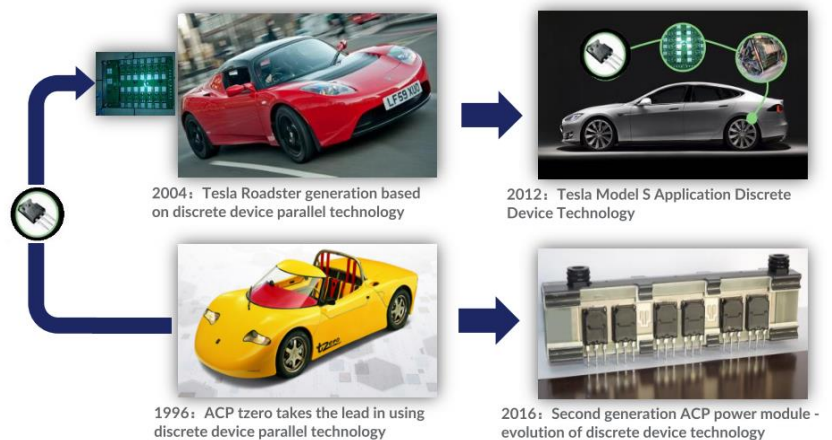
SOLUTIONS

UF3SC120009K4S:
 New 1200V SiC FETs with the lowest RDS(on) (<10mΩ) in the industry

BENEFITS

- Outstanding inverter efficiencies
- High switching frequencies
- Dramatic reduction in losses
- Cost-effective

► **To learn more, go to:**
<http://bit.ly/lowestrdsdn>



AC Propulsion develops electric vehicle technology and provides products and engineering services to automotive and other clients throughout the world. When developing the second generation of its Power Module for its unique low-cost drive unit inverter, AC Propulsion required power semiconductors that delivered a switching efficiency 2-5% higher versus existing IGBT-based design.

SOLUTIONS

AC Propulsion designed in the UnitedSiC UF3SC120009K4S, a 1200V, 9mohm SiC FET, delivering improved efficiency over competing SiC devices in a 3-phase AC traction inverter for EVs. The is also packaged in the versatile TO-247 package, making it a more efficient and cost-effective drop-in replacement.



George Woody
Vice President of
Engineering for AC
Propulsion, Inc.

“Drive cycle efficiency increased 3-5% when we used the low RDS(on) FETs from UnitedSiC”

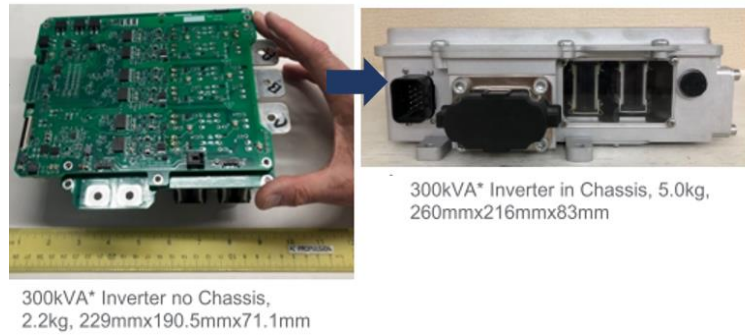


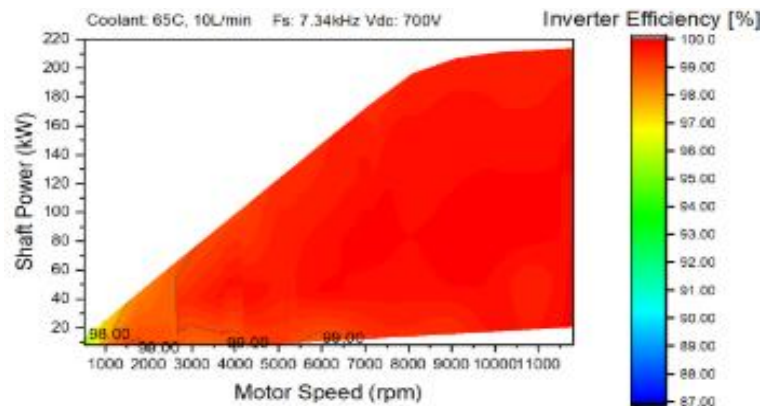
Figure 1. UnitedSiC devices within AC Propulsion Inverter

BENEFITS

Because of the low RDS(on) of 9mohm, the new high-performance power module design used fewer discrete components resulting in lower system cost and space savings. Its efficiency allows the use of a self-contained heatsink while achieving outstanding performance.

Drive cycle efficiency is increased by 3%-5% using the UnitedSiC FETs vs IGBTs. This means range is increased while battery size could be reduced.

Performance Data



Actual Measured SiC Inverter Efficiency for a 200kW Drive Unit

Highest Efficiency	99.98%
Eff. > 95% Area	98.62%
Avg Eff. 500-2000rpm	97.64%

Note: 300kVA capable SiC inverter. Efficiency 99% and 295A rms per phase at 700VDC input used for 222kW shaft output power PM motor for efficiency map shown.