Product brief

HybridPACK™ Drive 750 V
FS820R08A6P2x, FS660R08A6P2Fx, FS770R08A6P2x, FS950R08A6P2x

The HybridPACK™ Drive is a very compact power module optimized for hybrid and electric vehicle main inverter applications (xEV). The lead type FS820R08A6P2B (820 A/750 V) is a six-pack module optimized for 150 kW inverters. The power module implements the new EDT2 IGBT chip generation, which is an automotive Micro-Pattern Trench-Field-Stop cell design. The chipset has benchmark current density combined with short circuit ruggedness and increased blocking voltage for reliable inverter operation under harsh environmental conditions. The EDT2 IGBTs also show excellent light load power losses, which help to improve the system efficiency over a real driving cycle significantly. The chipset was optimized for switching frequencies in the range of 10 kHz.

The new power module family HybridPACK™ Drive comes with mechanical guiding elements supporting easy assembly processes for customers. Furthermore, the press-fit pins for the signal terminals avoid time consuming selective solder processes, which provide cost savings on system level and increases system reliability.

The lead type FS820R08A6P2B has a PinFin baseplate for an optimized direct fluid cooling and thus high current density. The Wave product derivate (FS770R08A6P2x) offers optimized costs for fluid cooling with a Ribbon-bond baseplate. The flat baseplate options FS660R08A6P2Fx enable cost savings in case lower inverter performances are suitable. The performance FS950R08A6P2B introduces Silicon Nitride ceramic resulting in highest power rates within the Drive family.

The HybridPACK™ Drive power module comes with high clearance and creepage distances and makes this new module family also well suited for increased system working voltages. Furthermore, the flexible signal pin and power tab concept allows further product variants and thus support best modular inverter approaches.

Key features

- Benchmark current density and improved light load power losses for extended EV driving ranges
- 750 V EDT2 IGBT and diodes chipset for up to $T_{j} = 175^\circ$ C switching operation
- Extreme low conduction losses
- Single digit stray inductance and smooth, efficient switching behavior
- Short circuit ruggedness up to $T_{j} = 175^\circ$ C for reliable inverter operation under extreme conditions
- Press-fit signal pins
- Mechanical guiding elements for efficient and cost-saving inverter assembly

Block Diagram

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Sales code nomenclature

Fx: topology of the power module
FS: B6 bridge (six-pack)

XXX: implemented DC collector current
820: 820 Ampere ($I_{CRM} = 1640$ A repetitive peak current)
660: 660 Ampere ($I_{CRM} = 1320$ A repetitive peak current)
770: 770 Ampere ($I_{CRM} = 1540$ A repetitive peak current)
950: 950 Ampere ($I_{CRM} = 1900$ A repetitive peak current)

R: reverse conducting (antiparallel diodes)

yy: package derivate
- - - : short power tabs without holes
B - - : short power tabs with holes
L B - : long AC power tabs with holes
F B - : flat baseplate and short power tabs with holes
L M - : long power tabs without holes

xx: technology
P2: 750 V automotive EDT2 IGBT/diode
T4: 1200 V automotive IGBT4 / emitter controlled diode

A6: HybridPACK™ drive package

Typical appearance of HybridPACK™ Drive 750 V modules

Flat

Lowest cost at lower inverter performance

Wave

Optimized cost for fluid cooling

PinFin

Best direct fluid cooling performance

Performance

Highest power enabled by new Silicon Nitride ceramic

Product table

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