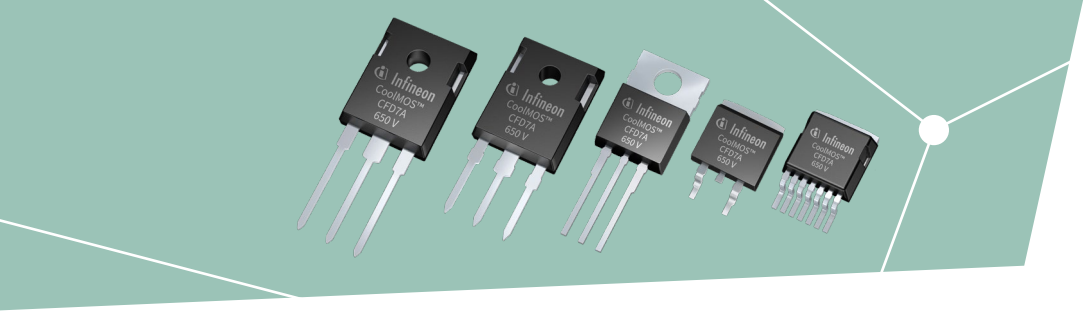


Product brief

# 650 V CoolMOS™ CFD7A

## On the fast lane in automotive applications

Electric mobility is no longer just a buzz word. The evident momentum in the car industry reflects the global electric car sales forecasts for the next decade and manifests one clear trend: electrification has arrived on the streets.

**Showcasing profound expertise on technology, quality and production**

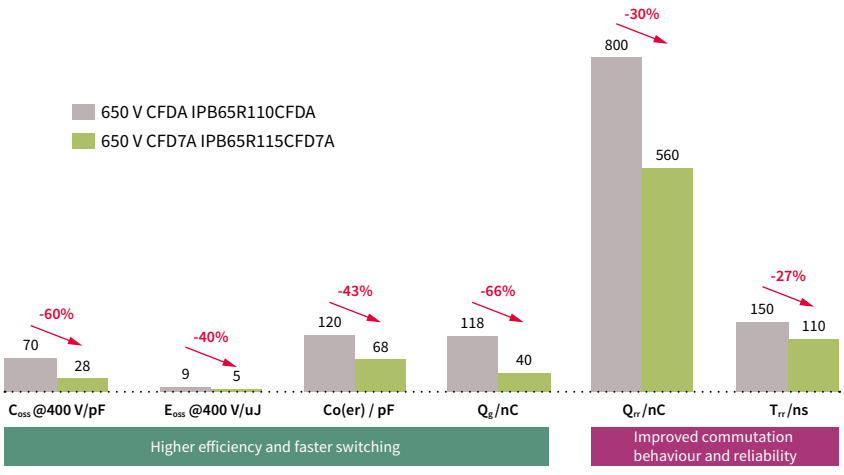
The latest silicon-based 650 V CoolMOS™ SJ power MOSFETs CFD7A are specifically optimized to meet the requirements for electric-vehicle applications such as on-board chargers, HV-LV DC-DC converters, and auxiliary power supplies. With more than 10 years of automotive experience, CoolMOS™ CFD7A combines highest quality going well beyond the AEC Q101 standard with unrivalled technology know-how. The CoolMOS™ CFD7A family is manufactured on the highly automated 300 mm production line, which contributes to reach the zero-defect target in mass production while fulfilling the growing market demand.

**Making automotive applications more compact and higher performing.**

**1. High power density for more compact designs**

Boosting efficiency to the next level, CoolMOS™ CFD7A shows improvements in hard- and resonant-switched topologies especially in light-load conditions. Higher switching frequencies can be achieved at gate-loss levels comparable with former generations; and this promising combination makes CFD7A one key enabler for decreased system weight and space to achieve more compact designs.

**Performance improvements in key parameters**




## Key features

- Battery voltages up to 475 V without compromising on reliability standards
- Efficiency improvements in hard- and soft-switched topologies up to 98.4%
- Kelvin-source concept for further efficiency improvement
- Intrinsic fast body diode with -30% lower $Q_{rr}$ compared to CoolMOS™ CFDA

## Key benefits

- Highest reliability in the field meeting automotive lifetime requirements
- Enabling higher power density designs
- Scalable as designed for use in PFC and DC-DC stage
- Granular portfolio available

www.infineon.com/cfd7a
www.infineon.com/coolmos-automotive
www.infineon.com/ev-solutions

# 650 V CoolMOS™ CFD7A

## On the fast lane in automotive applications

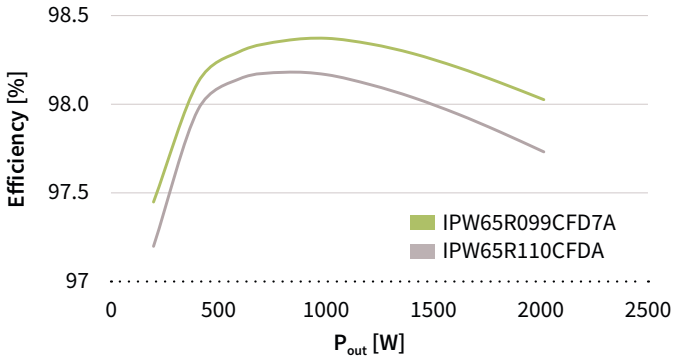
**2. Highest reliability compliant with automotive lifetime requirements**

As a result of improved cosmic-radiation robustness, the CoolMOS™ CFD7A technology allows applying higher battery voltages at the same reliability rate as previous generations and other market offerings.

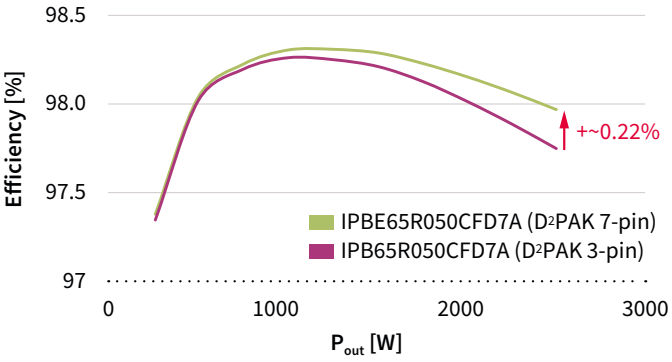
**3. Increased design flexibility and scalability**

The CFD7A devices can be used in PFC and DC-DC stages thanks to the intrinsic fast body diode and the broad portfolio line-up.

**Efficiency boost to reach above 98%**




**Efficiency improvements realized with D²PAK 7-pin**

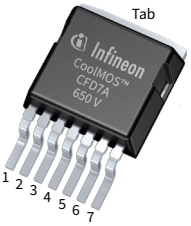



**Beyond technology our packages are the key to excellent efficiency and thermal performance**

When using Infineon's 650 V CoolMOS™ CFD7A technology in combination with the D²PAK 7-pin package customers benefit from enhanced efficiency and thermal behavior. As compared to the D²PAK 3-pin, the Kelvin-source concept used in the D²PAK 7-pin (driver-source pin) overcomes the limitations caused by the source inductance and improves the switching performance. Resulting advantages at system level, especially at high currents, are the reduction of switching losses and heat. Furthermore, the increased creepage distance of 4.2 mm between drain and source/gate facilitates device usage for higher battery voltage classes up to 475 V .

**Product portfolio**

| $R_{DS(on)}$ max. [mΩ] | TO-263 D²PAK 3-pin | TO-263-7 D²PAK 7-pin | TO-220 | TO-247 | TO-247 short leads |
|---|---|---|---|---|---|
| 230 | IPB65R230CFD7A | IPBE65R230CFD7A | | | |
| 190 | IPB65R190CFD7A | IPBE65R190CFD7A | IPP65R190CFD7A | IPW65R190CFD7A | |
| 145 | IPB65R145CFD7A | IPBE65R145CFD7A | IPP65R145CFD7A | IPW65R145CFD7A | |
| 115 | IPB65R115CFD7A | IPBE65R115CFD7A | IPP65R115CFD7A | IPW65R115CFD7A | |
| 99 | IPB65R099CFD7A | IPBE65R099CFD7A | IPP65R099CFD7A | IPW65R099CFD7A | |
| 75 | IPB65R075CFD7A | IPBE65R075CFD7A | IPP65R075CFD7A | IPW65R075CFD7A | IPWS65R075CFD7A |
| 50 | IPB65R050CFD7A | IPBE65R050CFD7A | IPP65R050CFD7A | IPW65R050CFD7A | IPWS65R050CFD7A |
| 35 | | | | IPW65R035CFD7A | IPWS65R035CFD7A |
| 22 | | | | IPW65R022CFD7A | IPWS65R022CFD7A |




Tab: Drain
1: Gate
2: Kelvin source
3–7: Power source

Published by
Infineon Technologies Austria AG
9500 Villach, Austria



Document number: B152-I1108-V1-7600-EU-EC-
PDate: 08/2021