

Product brief

650 V CoolMOS™ CFD7

Tailored to win in resonant topologies

The need for improved efficiency and higher power density in industrial SMPS applications is driven by the megatrends of the 21st century such as big data and digitalization or e-mobility. Furthermore, over the last few years, due to the higher nominal input voltages in the US, a trend towards 450 V bus voltage, and the need for worldwide applicable designs, the demand for 650 V breakdown voltage has increased significantly - also for resonant topologies.

The 650 V device family is the voltage-range extension of Infineon's renowned CoolMOS™ CFD7 family, the successor to the well-established CoolMOS™ CFD2. It comes along with additional 50 V breakdown voltage, integrated fast body diode, improved switching performance (compared to previous generations) and excellent thermal behavior. Thanks to these features, the 650 V CoolMOS™ CFD7 allows for highest efficiency and power density levels in soft-switching applications such as LLC and ZVS phase-shift-full-bridge.

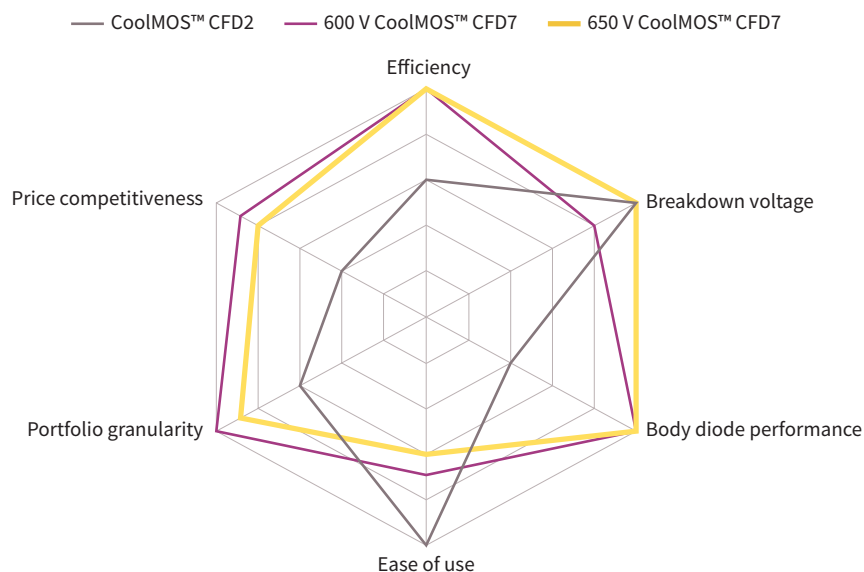
The best-in-class $R_{DS(on)}$ in TO-247, TO-220 and D2PAK enables customers to increase the power density level of their designs primarily addressing telecom, server, solar, and (off-board) EV-charging applications.

Key features

- > Ultrafast body diode and very low Q_{rr}
- > 650 V breakdown voltage
- > Best-in-class $R_{DS(on)}$ / package combinations
- > Significantly reduced switching losses
- > Lower $R_{DS(on)}$ dependency over temperature

Key benefits

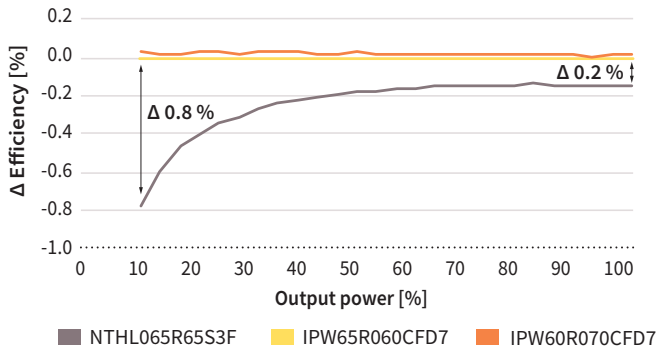
- > Very good hard-commutation ruggedness
- > Extra safety margin for designs with increased bus voltage
- > Enabling increased power density
- > Outstanding light-load efficiency in industrial SMPS applications
- > Improved full-load efficiency in industrial SMPS applications compared to competition
- > Price competitiveness compared to alternative offerings in the market



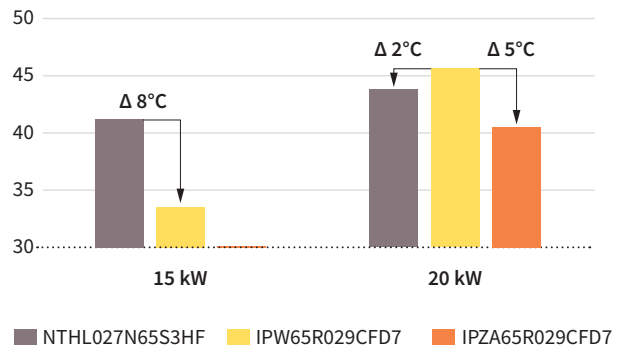
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Efficiency comparison in SMPS applications



Thermal comparison in EV-charging stations



The 650 V CoolMOS™ CFD7 family increases efficiency over the whole load range. Thanks to the improved gate charge (Q_g) and the fast switching performance, in light-load conditions 0.8 percent while in full-load conditions 0.2 percent higher efficiency is achievable compared to alternative offerings in the market.

The 650 V CoolMOS™ CFD7 is also a perfect fit for off-board EV-charging station designs. In the typical high-current operation of a 15 kW design, the 650 V CoolMOS™ CFD7 offers up to 8 °C lower temperature over other devices in the segment. In 20 kW EV-charging designs, the 650 V CoolMOS™ CFD7 offers improved thermals, especially when using a 4-pin package as the Kelvin source connections - a feature that helps to reduce the parasitic source inductance - offers the best possible benefit in high current operation mode, typical for EV charging station designs.

650 V CoolMOS™ CFD7 product portfolio

$R_{DS(on)}$ [mΩ]	TO-220	TO-247	TO247-4	TO-263 D ² PAK	ThinPAK 8x8	TOLL	QDPAK
190/200	IPP65R190CFD7				IPL65R195CFD7	IPT65R190CFD7	
155/160	IPP65R155CFD7	IPW65R155CFD7		IPB65R155CFD7	IPL65R160CFD7	IPT65R155CFD7	
125/130		IPW65R125CFD7		IPB65R125CFD7	IPL65R130CFD7	IPT65R125CFD7	IPDQ65R125CFD7
110/115	IPP65R110CFD7	IPW65R110CFD7		IPB65R110CFD7	IPL65R115CFD7		
90/95/99	IPP65R090CFD7	IPW65R090CFD7		IPB65R090CFD7	IPL65R095CFD7	IPT65R099CFD7	IPDQ65R099CFD7
80						IPT65R080CFD7	IPDQ65R080CFD7
60/65	IPP65R060CFD7	IPW65R060CFD7			IPL65R065CFD7	IPT65R060CFD7	IPDQ65R060CFD7
40/41	IPP65R041CFD7	IPW65R041CFD7		IPB65R041CFD7		IPT65R040CFD7	IPDQ65R040CFD7
29		IPW65R029CFD7	IPZA65R029CFD7				IPDQ65R029CFD7
17/18		IPW65R018CFD7	IPZA65R018CFD7				IPDQ65R017CFD7

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