

Solution brief

600 V CoolMOS™ PFD7 SJ MOSFET and half-bridge EiceDRIVER™ 2ED28073J06F

Robustness and highest efficiency for light-load applications

The next essential step towards highly efficient major home appliances and drives is based on optimizing efficiency according to specific usage profiles. For light-load applications, this often leads to the inverterization of control schemes to maximize system benefits. Infineon's 600 V CoolMOS™ PFD7 series in combination with the dedicated 600 V half-bridge gate driver 2ED28073J06F provide the optimum and most robust solution to meet these requirements.

Key advantages of the 600 V CoolMOS™ PFD7 series

The latest 600 V CoolMOS™ PFD7 series sets a new benchmark in 600 V Superjunction (SJ) technologies dedicated to ultrahigh power density designs as well as low-power motor drives.

This product family offers up to 1.17 percent efficiency increase compared to the CoolMOS™ P7 technology. This leads to a power density increase of 1.8 W/inch³ and consequently to smaller form factors and slimmer designs. This outstanding improvement is achieved by lower conduction and charge/discharge losses as well as reduced turn-off and gate-driving losses. A broad range of $R_{DS(on)}$ values in combination with a variety of packages eases selection of the right part to optimize designs. Furthermore, an integrated ESD protection of up to 2 kV eliminates ESD related yield loss. The industry-leading SMD package offering contributes to a minimized bill of material, PCB space savings and eases manufacturing at the same time.

Key advantages of the 600 V half-bridge EiceDRIVER™ 2ED28073J06F

The 2ED28073J06F has been developed to drive the 600 V CoolMOS™ PFD7 parts in motor drive applications aiming to increase the overall system performance by offering:

- › Highest reliability and quickest time to market with superior negative VS immunity
- › Lower system-level BOM cost with integrated, monolithic bootstrap diode
- › Floating channel design for bootstrap operation
- › Simple, low-cost solution to drive CoolMOS™ PFD7 MOSFETs or RC-D2 IGBTs up to 600 V
- › Independent UVLO for both high- and low-sides
- › Robust IC with increased device reliability
- › Form, fit, function, pin-to-pin, and electrically compatible with earlier generation

System features

- › Minimized bill of material (BOM)
- › Smooth start-up using inductive sensing
- › Best-in-class light-load efficiency
- › Sensorless field-orientated control (FOC)
- › Ease of use with graphical user interface (GUI)
- › 2 kV ESD protection

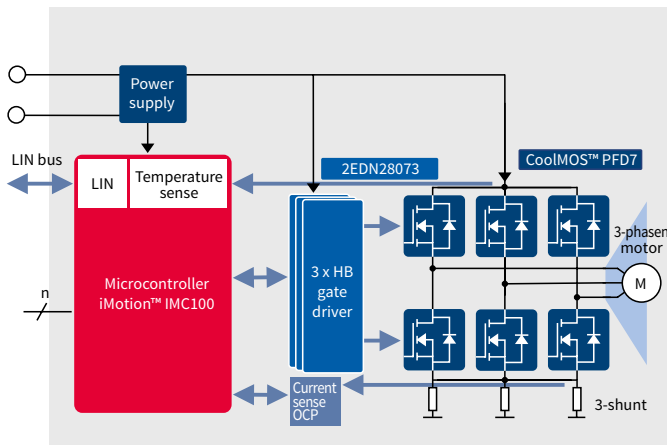
System benefits

- › Cost-effective
- › Highest efficiency
- › Simplified design
- › Accelerated time-to-market
- › High robustness

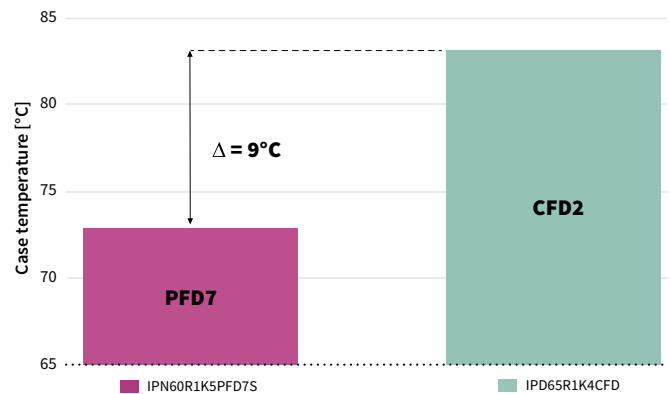
A full system solution

100 W low-power drives application

The combination of the 600 V CoolMOS™ PFD7 with the 2ED28073J06 provides up to 2 percent higher efficiency at 100 W, which results in a 9 °C thermal improvement. Considering its excellent commutation ruggedness as well as its low EMI, it is the perfect solution for low-power drives.



Low-side MOSFET temperature at 100 W



600 V CoolMOS™ PFD7 portfolio

R _{DS(on)} [mΩ]	TO-220 FullPAK narrow lead	IPAK short leads	DPAK	SOT-223	ThinPAK 5x6	EiceDRIVER™
2000			IPD60R2K0PFD7S	IPN60R2K0PFD7S		2ED28073J06F
1500			IPD60R1K5PFD7S	IPN60R1K5PFD7S	IPLK60R1K5PFD7	2ED28073J06F
1000		IPS60R1K0PFD7S	IPD60R1K0PFD7S	IPN60R1K0PFD7S	IPLK60R1K0PFD7	2ED28073J06F
600		IPS60R600PFD7S	IPD60R600PFD7S	IPN60R600PFD7S	IPLK60R600PFD7	2ED2304S06F
360	IPAN60R360PFD7S	IPS60R360PFD7S	IPD60R360PFD7S	IPN60R360PFD7S	IPLK60R360PFD7	2ED2304S06F
280	IPAN60R280PFD7S	IPS60R280PFD7S	IPD60R280PFD7S			2ED2304S06F
210	IPAN60R210PFD7S	IPS60R210PFD7S	IPD60R210PFD7S			2ED2304S06F
125	IPAN60R125PFD7S					2ED2304S06F

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