

Product Brief

800 V CoolMOS™ P7 series

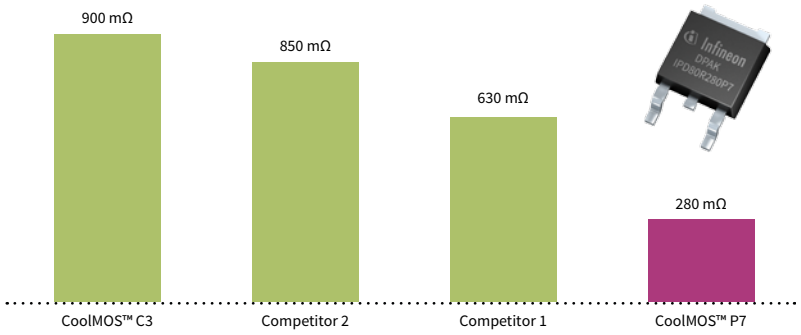
A new benchmark in efficiency and thermal performance

The latest 800 V CoolMOS™ P7 series sets a new benchmark in 800 V superjunction technologies and combines best-in-class performance with state-of-the-art ease-of-use, resulting from Infineon's more than 18 years pioneering superjunction technology innovation. This product family offers 0.1 percent to 0.6 percent efficiency gain and 2°C to 8°C lower MOSFET temperature as compared to 800 V CoolMOS™ C3 tested in flyback based applications. Such best-in-class performance comes from a combination of various optimized device parameters such as more than 50 percent reduction in E_{oss} and Q_g and reduced C_{iss} and C_{oss}.

Ease-of-use is an intrinsic feature designed into this product family. The integrated Zener Diode ESD protection significantly improves ESD robustness, thus reducing ESD related yield loss. With best-in-class $V_{(GS)th}$ of 3 V CoolMOS™ P7 is easy to drive and the smallest $V_{GS(th)}$ variation of only ± 0.5 V makes it easy to design-in. This product family continues to deliver well recognized best-in-class CoolMOS™ quality.

In addition, CoolMOS™ P7 offers a new best-in-class $R_{DS(on)}$: in DPAK a $R_{DS(on)}$ of 280 mΩ is available, more than 50 percent lower than the nearest 800 V MOSFET competitor. This new benchmark enables higher power density designs, BOM savings, as well as lower assembly cost.

Overview of lowest DPAK $R_{DS(on)}$ for 800 V superjunction MOSFETs



800 V CoolMOS™ P7 sets benchmark in best-in-class DPAK $R_{DS(on)}$

Key features

- Best-in-class FOM $R_{DS(on)}$ * E_{oss}; reduced Q_g, C_{iss} and C_{oss}
- Best-in-class DPAK $R_{DS(on)}$ of 280 mΩ
- Best-in-class $V_{(GS)th}$ of 3 V and smallest $V_{(GS)th}$ variation of ± 0.5 V
- Integrated Zener Diode ESD protection up to Class 2 (HBM)
- Best-in-class quality and reliability
- Fully optimized portfolio

Key benefits

- 0.1% to 0.6% efficiency gain and 2°C to 8°C lower MOSFET temperature as compared to CoolMOS™ C3
- Enabling higher power density designs, BOM savings and lower assembly cost
- Easy to drive and to design-in
- Better production yield by reducing ESD related failures
- Less production issues and reduced field returns
- Easy to select right parts for fine tuning of designs



www.infineon.com/p7

800 V CoolMOS™ P7 series

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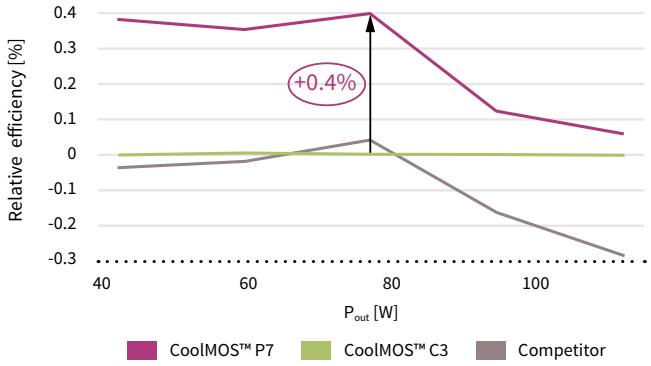
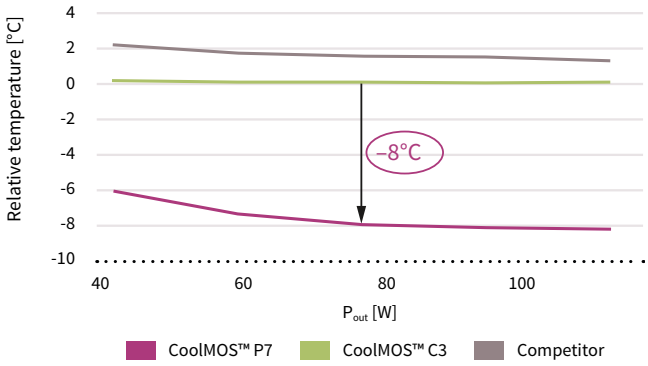
800 V CoolMOS™ P7 offers best-in-class efficiency and thermal performance

Plug-and-play at 240 V_{AC} in a 110 W LED driver: TO-220 FullPAK 280 mΩ equivalent





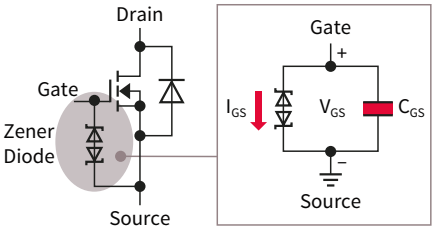
800 V CoolMOS™ P7 significantly reduces ESD related failures with integrated Zener Diode ESD protection

Zener Diode ESD protection mechanism under ESD

- V_{GS} is clamped by Zener Diode
- I_{GS} mainly flows through Zener Diode
- Less stress on gate oxide between gate and source

Customer benefits

- Better assembly yield thus less cost
- Lower field failure rate
- Higher quality and better reputation



$R_{DS(on)}$ [mΩ]	TO-220 FullPAK	TO-252 DPAK	TO-220	TO-247	TO-251 IPAK	TO-251 IPAK SL	ESD class	
							HBM	CDM
4500		IPD80R4K5P7			IPU80R4K5P7		Class 1C (1 kV-2 kV)	Class C3 (≥1 kV)
3300*		IPD80R3K3P7			IPU80R3K3P7			
2400*		IPD80R2K4P7			IPU80R2K4P7	IPS80R2K4P7		
2000*		IPD80R2K0P7			IPU80R2K0P7	IPS80R2K0P7		
1400	IPA80R1K4P7	IPD80R1K4P7	IPP80R1K4P7		IPU80R1K4P7	IPS80R1K4P7	Class 2 (2 kV-4 kV)	
1200*	IPA80R1K2P7	IPD80R1K2P7	IPP80R1K2P7		IPU80R1K2P7	IPS80R1K2P7		
900*	IPA80R900P7	IPD80R900P7	IPP80R900P7		IPU80R900P7	IPS80R900P7		
750*	IPA80R750P7	IPD80R750P7	IPP80R750P7		IPU80R750P7	IPS80R750P7		
600*	IPA80R600P7	IPD80R600P7	IPP80R600P7		IPU80R600P7	IPS80R600P7		
450	IPA80R450P7	IPD80R450P7	IPP80R450P7					
360*	IPA80R360P7	IPD80R360P7	IPP80R360P7	IPW80R360P7				
280	IPA80R280P7	IPD80R280P7	IPP80R280P7	IPW80R280P7				

* Coming Q2 2017

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