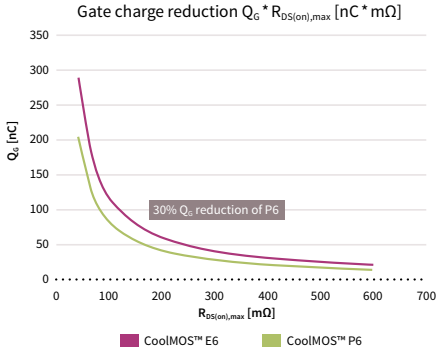
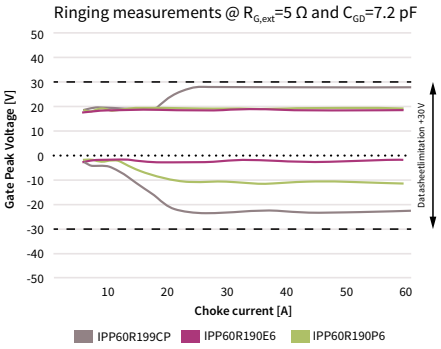
Product Brief

600 V CoolMOS™ P6 Power MOSFET

Optimized Power MOSFETs merging high energy efficiency with ease of use

CoolMOS™ P6 is Infineon's seventh generation of high voltage Power MOSFETs designed according to the revolutionary superjunction (SJ) principle. The new CoolMOS™ P6 series combines our experience as the leading SJ MOSFET supplier with innovation focusing on high efficiency solutions. The resulting CoolMOS™ P6 technology is tailored to provide high performance in hard and soft switching topologies (e.g. PFC, LLC) while not sacrificing the ease of use. CoolMOS™ P6 achieves extremely low conduction and switching losses especially in light load condition enabling switching applications to work more efficiently and be designed more compact, lighter and cooler. Moreover, with its granular portfolio, CoolMOS™ P6 can address the specific needs of applications such as server, PC power, telecom rectifiers and consumer applications, while additionally offering the best price/performance ratio on the market today.





CoolMOS™ P6 offers a 30% Q_G reduction in comparison to CoolMOS™ E6, which mainly comes from the reduction of the plateau charge. It also allows a very fast switching for turn on and turn off. The driver circuit current capability for CoolMOS™ P6 is reduced over the whole $R_{DS(on)}$ range.

The V_{GS} peak is measured in a typical PFC stage with 5 Ω $R_{G,ext}$ and exhibiting 7.2 pF capacitive coupling between gate and drain emulating the parasitic capacitance of the PCB. In the measurement, CoolMOS™ P6 shows very good gate switching waveform with reduced Q_G and internal R_G. The slight increase in magnitude of oscillations in CoolMOS™ P6 over CoolMOS™ E6 is expected due to its faster switching characteristic.

Main Features

- Reduced gate charge (Q_G)
- Optimized V_{th} for soft switching
- Good body diode ruggedness
- Optimized integrated R_G
- Improved dv/dt

Main Benefits

- Improved efficiency especially in light load condition
- Better efficiency in soft switching applications due to earlier turn-off
- Suitable for hard- and soft-switching topologies
- Optimized balance of robustness, ease of use and good controllability of switching behavior
- Outstanding quality and reliability

Applications

- PFC and PWM (TTF, LLC) stages for server, telecom rectifier, PC power, gaming consoles, solar

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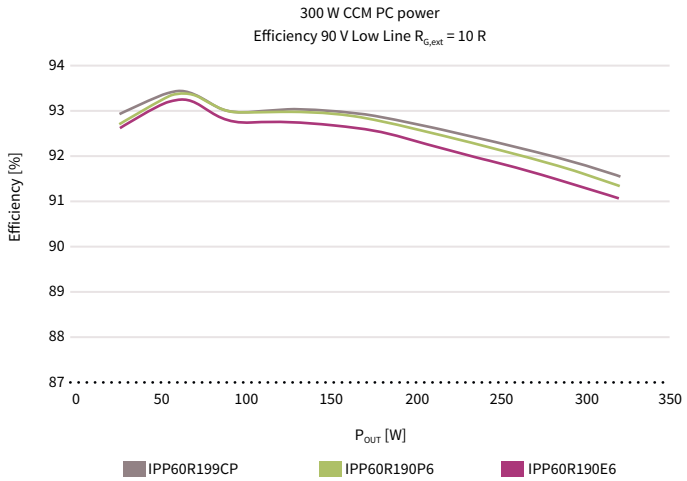
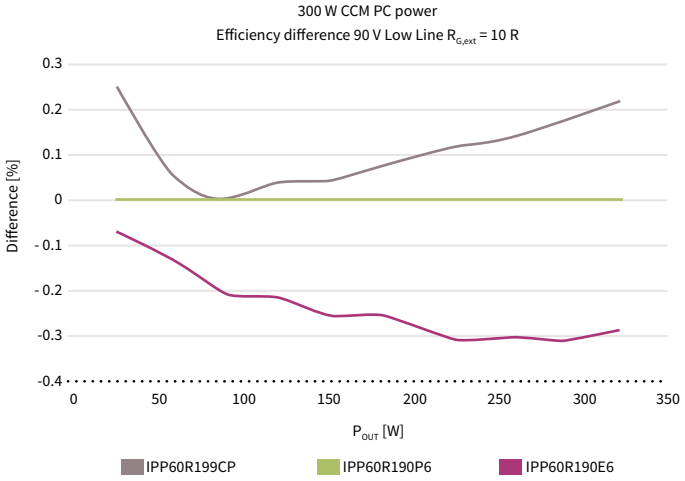
$R_{DS(on)}$ [mΩ]	DPAK	D²PAK	TO-220	TO-220 FullPAK	TO-247	TO-247 4pin	ThinPAK 8x8	ThinPAK 5x6
600/650	IPD60R600P6	IPB60R600P6	IPP60R600P6	IPA60R600P6				IPL60R650P6S
380	IPD60R380P6	IPB60R380P6	IPP60R380P6	IPA60R380P6				
330/360		IPB60R330P6	IPP60R330P6	IPA60R330P6	IPW60R330P6			IPL60R360P6S
280		IPB60R280P6	IPP60R280P6	IPA60R280P6	IPW60R280P6			
230/255		IPB60R230P6	IPP60R230P6	IPA60R230P6	IPW60R230P6		IPL60R255P6	
190/210		IPP60R190P6	IPP60R190P6	IPA60R190P6	IPW60R190P6		IPL60R210P6	
160/180		IPB60R160P6	IPP60R160P6	IPA60R160P6	IPW60R160P6		IPL60R180P6	
125			IPP60R125P6	IPA60R125P6	IPW60R125P6	IPZ60R125P6		
99			IPP60R099P6	IPA60R099P6	IPW60R099P6	IPZ60R099P6		
70					IPW60R070P6	IPZ60R070P6		
41					IPW60R041P6	IPZ60R041P6		





This plug and play measurement shows the benefit of CoolMOS™ P6 in comparison to CoolMOS™ E6 and CoolMOS™ CP. In this 300 W continuous conduction mode (CCM) PC power, CCM operates after output power until 70 W or higher otherwise it works in DCM. Even in this light load condition, which is not a one to one comparison, CoolMOS™ P6 has a slight efficiency improvement. When the output power over 70 W CCM is operated, the efficiency improvement of CoolMOS™ P6 is visible in the range of 0.2% till 0.3% in full-load, compared with that of CoolMOS™ E6. This efficiency benefit is due to Q_G reduction and relatively high V_{th} values.

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