Product Brief

700 V CoolMOS™ P7 series

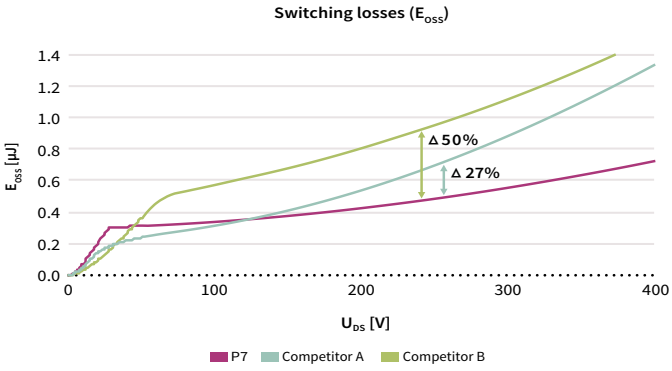
Infineon's answer for flyback topologies

Developed to serve today's and especially tomorrow's trends in flyback topologies – the new 700 V CoolMOS™ P7 series addresses the low power SMPS market, such as mobile phone chargers or notebook adapters by offering fundamental performance gains compared to superjunction technologies used today.

By combining customers' feedback with over 20 years of superjunction MOSFET experience, 700 V CoolMOS™ P7 enables best fit for target applications in terms of:

- Efficiency and thermals
- Ease-of-use
- EMI behavior

The new CoolMOS™ P7 offers 27 percent to 50 percent lower switching losses (E_{OSS}), up to 3.9 percent higher efficiency and impressively up to 16 K lower device temperature against competition. Compared to previous 650 V CoolMOS™ C6 technology it offers 2.4 percent gain in efficiency and 12 K lower device temperature, measured at a flyback based charger application, operated at 140 kHz switching speed.



To increase the ESD ruggedness up to HBM Class 2 level, 700 V CoolMOS™ P7 comes with an integrated Zener diode. This helps to support increased assembly yield, leads to less production related failures and finally manufacturing cost savings on customer side.

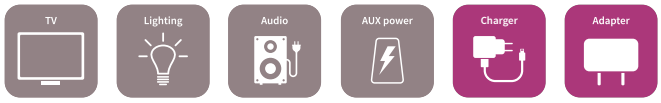
Keeping the ease-of-use in mind, the technology has been developed with an excellent $V_{GS(th)}$ of 3 V and narrow tolerance of ±0.5 V. This makes the P7 easy to design-in and enables the usage of lower gate source voltage, which makes it easier to drive and leads to less idle losses.

Key features

- Extremely low FOM $R_{DS(on)}$ x E_{oss}; lower Q_g, E_{on} and E_{off}
- Highly performant technology
  - Low switching losses (E_{OSS})
  - Highly efficient
  - Excellent thermal behavior
- Allowing high speed switching
- Integrated protection Zener diode
- Optimized $V_{(GS)th}$ of 3 V with very narrow tolerance of ±0.5 V
- Finely graduated portfolio

Key benefits

- Cost competitive technology
- Up to 2.4 percent efficiency gain and 12 K lower device temperature compared to C6 technology
- Further efficiency gain at higher switching speed
- Supporting less magnetic size with lower BOM costs
- High ESD ruggedness up to HBM Class 2 level
- Easy to drive and design-in
- Enabler for smaller form factors and high power density designs
- Excellent choice in selecting the best fitting product



www.infineon.com/700V-p7

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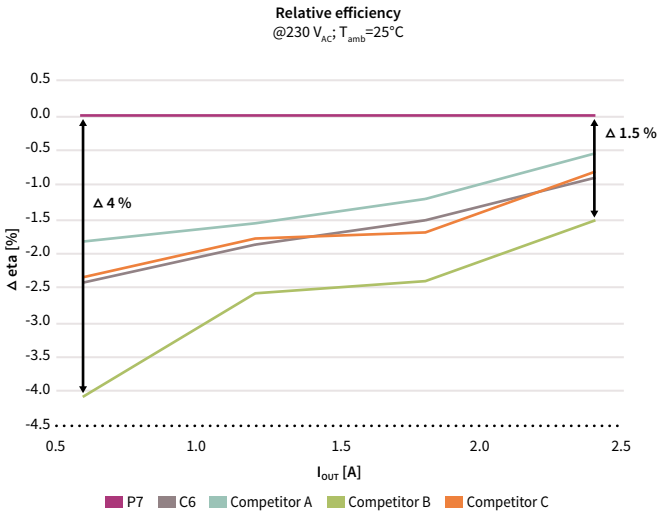
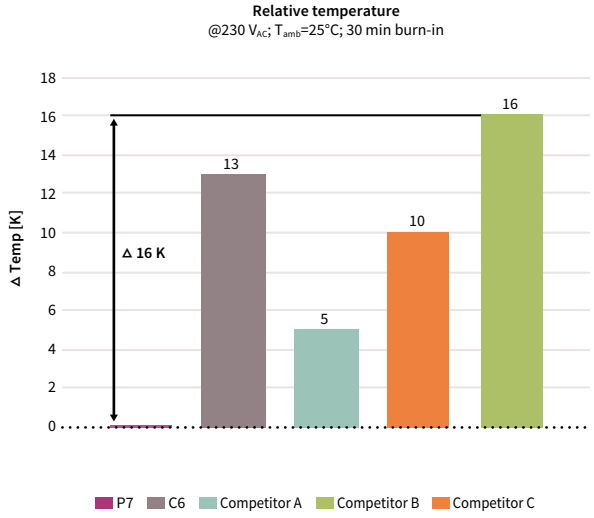
Infineon's answer for flyback topologies

Plug-and-play benchmarking at a high-end 12 W charger application

700 V CoolMOS™ P7 convinces with outstanding efficiency gains up to 4 percent and up to 16 K lower device temperature compared to similar competitor technologies.





These measurements underpin the new 700 V CoolMOS™ P7 technology is the right choice for high power density designs, very slim form factors. It results in best-in-class product performance especially when operating at high switching frequencies.

700 V CoolMOS™ P7 granular portfolio, split into actual and upcoming waves

ESD class		$R_{DS(on)}$ [mΩ]	TO-220 FullPAK	TO-252 DPAK	TO-251 IPAK Short Lead	TO-251 IPAK Short Lead with ISO Standoff	SOT-223
CDM	HBM						
Class C3 ≥1 kV	Class 1C 1–2 kV	2000				IPSA70R2K0P7S	IPN70R2K0P7S
		1400		IPD70R1K4P7S	IPS70R1K4P7S	IPSA70R1K4P7S	IPN70R1K4P7S
		1200				IPSA70R1K2P7S	IPN70R1K2P7S
		900	IPA70R900P7S	IPD70R900P7S	IPS70R900P7S	IPSA70R900P7S	IPN70R900P7S
		750	IPA70R750P7S			IPSA70R750P7S	IPN70R750P7S
	Class 2 2–4 kV	600	IPA70R600P7S	IPD70R600P7S	IPS70R600P7S	IPSA70R600P7S	IPN70R600P7S
		450	IPA70R450P7S			IPSA70R450P7S	
		360	IPA70R360P7S	IPD70R360P7S	IPS70R360P7S	IPSA70R360P7S	

In production | Next waves*

*Starting mid of 2017

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