Product Brief

600 V CoolMOS™ C7 series

Highest efficiency superjunction MOSFET for hard and soft switching applications (PFC and LLC)

The new 600 V CoolMOS™ C7 series from Infineon offers a ~50 percent reduction in turn-off losses (E_{oss}) compared to the CoolMOS™ CP, offering a GaN-like level of performance in PFC, TTF and other hard switching topologies.

Efficiency and TCO (total cost of ownership) driven applications benefit from the higher efficiency offered by CoolMOS™ C7. Gains of 0.3 to 0.7 percent in PFC and 0.1 percent in LLC topologies can be achieved. In the case of a 2.5 kW server PSU, for example, using 600 V C7 MOSFETs in a TO-247 4pin package can result in energy cost reductions of ~10 percent for PSU energy loss.

BOM (bill of material) cost driven applications can use the efficiency gained at full load by the combination of C7 and TO-247 4pin package. This is done by increasing the R_{D(on)} of the MOSFET so that it matches previous 3pin package full load efficiency enabling benefits in costs (i.e. 40 mΩ versus 70 mΩ device). Doubling the switching frequency can also save magnetic component material. Cost savings of up to 30 percent in copper windings and 45 percent in core (dependent on material used) can be achieved.

The 600 V CoolMOS™ C7 comes with the lowest R_{D(on)} in TO-220/TO-262/TO-263 and offers TO-220 replacement for TO-247 competitor parts

C7 best-in-class R_{D(on)} max. [mΩ] competitor comparison for TO-220 and DPAK

World’s best R_{D(on)} got even better

600 V C7 in TO-220 with 36 percent lower R_{D(on)} than nearest competitor

Key features

- Reduced switching loss parameters such as Q_s, C_{iss} enabling higher switching frequency
- 50 percent E_{oss} reduction compared to older CP technology and close to GaN
- Lowest R_{D(on)} * A in the world (<1 Ω mm²)
- Suitable for high-end resonant topologies

Key benefits

- Doubling the switching frequency will reduce the size and cost of magnetic components (e.g. 65 kHz-130 kHz)
- Increased efficiency in PFC and TTF topologies
- Smaller packages for same R_{D(on)} lead to power density benefits
- Suitable for high-end LLC circuits

Applications

- Telecom
- Server
- High-end PC power
- Solar
- Industrial

www.infineon.com/600V-C7
www.infineon.com/non-isolated-gate-driver-ic
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Choke example from Infineon 800 W

130 kHz demonstrator board

Similar losses at higher frequency leads to cost reduction of magnetic components with improved power density.