



Product Brief

DrMOS 5x5

Power MOSFET and Driver in one Small 5x5 Package

DrMOS 5x5 is an integrated power stage for high performance DC/DC Voltage Regulation solutions, comprising Infineon's Driver and OptiMOS™ 5 25 V MOSFET technologies in a 5.0x5.0x0.8 mm³ package. It utilizes low-side source-down technique, enabling a big PGND pad for improved thermal coupling to the PCB. Parasitics in the DrMOS 5x5 have been reduced, resulting in lower power loss. With OptiMOS™ 5 MOSFETs, DrMOS 5x5 can enable a peak efficiency of more than 95%. Together with Infineon's Digital VR controller, DrMOS 5x5 offers Best-in-Class efficiency and power density, developed, qualified and validated as a system solution from Infineon. It is optimized for next generation Voltage Regulation standards in Server applications, such as Intel's VR platforms.

Customer Benefits and Safety Features

DrMOS 5x5 features PWM three-state functionality, compatible to standard PWM Controller ICs with 3.3 V logic and works with +5 V high-side (HS) and low-side (LS) driving voltage. The IQFN40 package is RoHS compliant. The device can issue a thermal warning to the system, triggered by an integrated temperature sense, in case the system has reached a certain temperature. DrMOS 5x5 offers additional safety features, such as shoot-through protection to prevent simultaneous conduction of the HS and LS MOSFETs. Furthermore, UVLO (Under Voltage LockOut) protection for critical supply voltages including the boot voltage is implemented. This ensures system functionality during small drops in the input voltage. For the boot circuit, a refresh feature exists to properly maintain the boot voltage during idle periods. The integrated Remote Driver function allows to switch off the LS MOSFET at low loads, improving system efficiency.

Main Features

- Recommended input voltage +4.5 V to +16 V
- Low-side source-down for lowest parasitics and max. performance
- Fast switching technology for 500 kHz to 1 MHz high-switching frequencies

Key Benefits

- > 95% peak efficiency
- Thermal warning
- Remote Driver disable function
- Integrated bootstrap diode (no need of ext. diode) with refresh circuit

Applications

- Desktop and Server VR Buck Converter
- Single-phase and multiphase POL
- CPU/GPU Regulation in Notebook, Desktop Graphics Cards, DDR Memory, Graphic Memory
- High Power Density VRM

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System Efficiency for VR12.5 Application

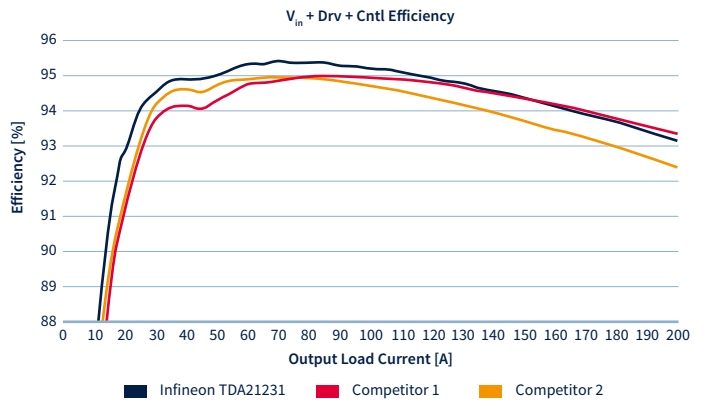
With the following conditions DrMOS 5x5 provides

>95% peak efficiency:

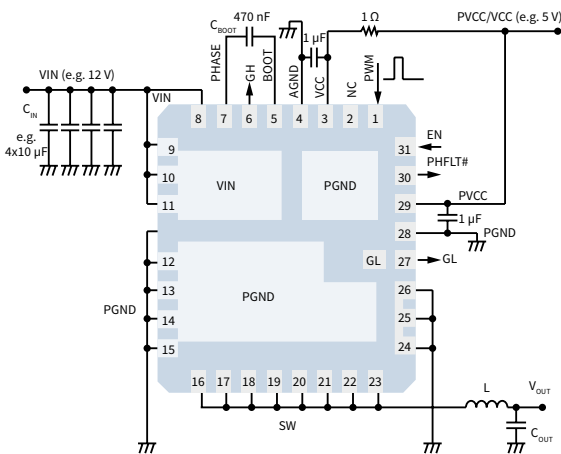
5 phases, PS0, 600 kHz,

150 nH, LL = 0 mΩ

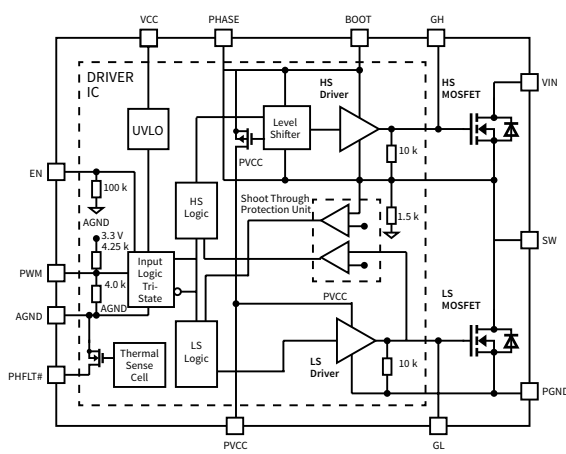
$V_{in} = 12\text{ V}$, $V_{out} = 1.82\text{ V}$



Package Footprint and Package Pin-out



Application Diagram



Product Portfolio

Product Type	Part No./Product Name	Max. Phases / Rail	Package Name
Power stage (driver + MOSFETs)	TDA21231 DrMOS 5x5	-	5.0x5.0 mm ² PG-IQFN-31
Digital VR Controller	PX7247 / PX7241 PX7143 / PX7242	6 +1 / 3+3 3 ph / 1+1	6.0x6.0 mm ² VQFN 48pin 5.0x5.0 mm ² VQFN 40pin

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