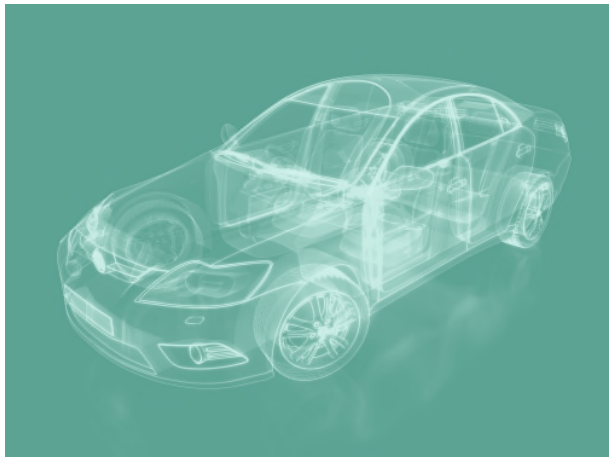


OptiMOS™ 7 Overview
The new Automotive MOSFET Technology

Axel Hahn, Senior Vice President & General Manager LV MOSFETs

PCIM 2023

Automotive MOSFETs are widely used in many automotive applications





Powertrain	Chassis	Body
Injection	EPS	HVAC
Transmission	ABS Control	Window Lift
Battery Mgmt	E-Brake Booster	Seat Control
Pumps (Water, Oil, Fuel)	E-Parking Brake	Wipers
HV/12 V DCDC Inverter	Roll Stabilization Control	48 V/12 V DCDC
Engine Cooling Fan	Brake by wire	Lighting (HID, LED)

in 2025:

~123 MOSFETs in a standard ICE car

~180 MOSFETs in a mild hybrid

~130 MOSFETs in every car

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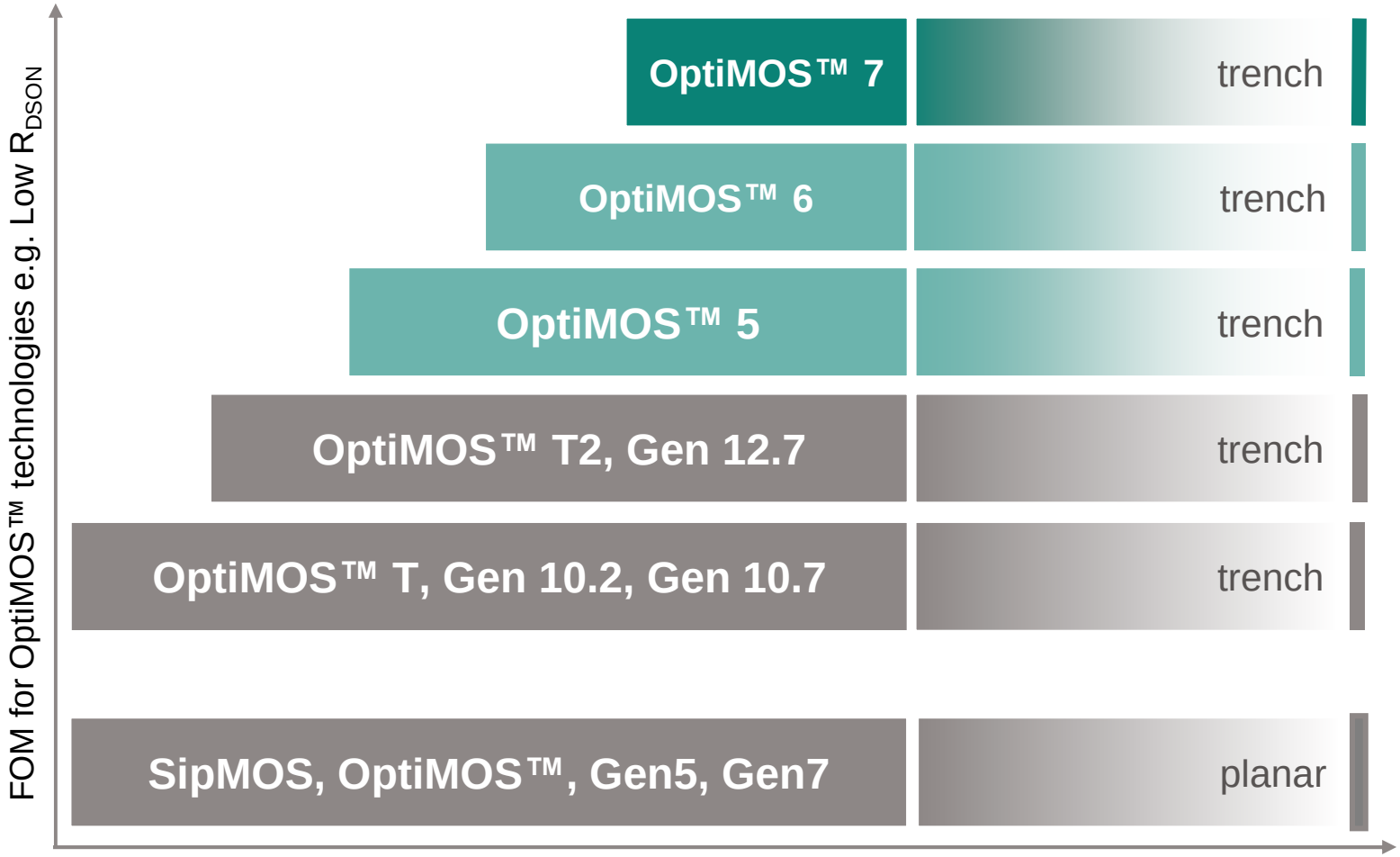
Infineon keeps leadership on wafer technologies with OptiMOS™ 7



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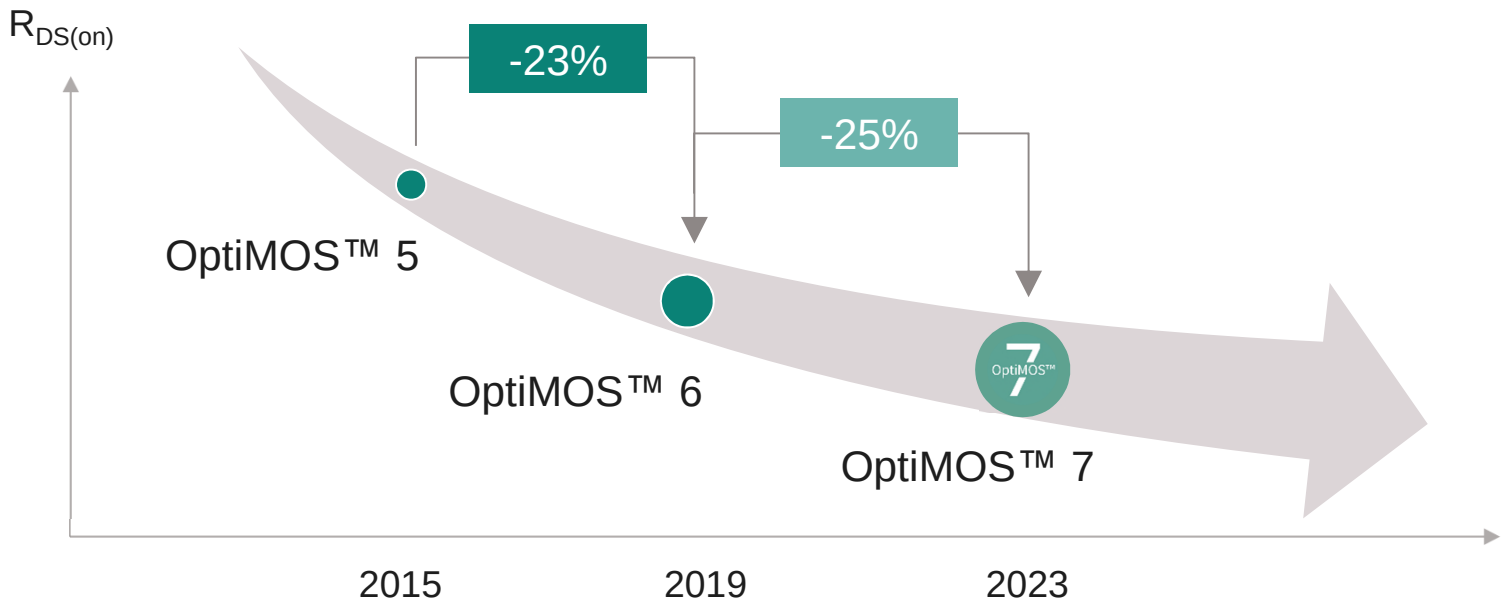
OptiMOS™ 7 40 V
The next leading MOSFET technology with lowest $R_{DS(on)}$





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Infineos's next leading edge Automotive MOSFET Technology

5th Trench Technology released by Infineon Automotive MOSFET

State of the art dual poly trench technology

Leading Edge
300 mm
Technology & Production



25% $R_{DS(on)}$ reduction
vs. OptiMOS™ 6 40 V

Infineon's **unique copper metallization**
Outstanding electrical and thermal conductivity

Ruggedness improvement
High avalanche current capability

Reduction of Switching losses

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OptiMOS™ 7 40 V Overview
Focus Applications – Map for Packages



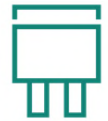
12 V
board net


Electric power steering



Battery


Segmentation range zones


Fuses




Electric parking brake


Battery disconnect


DC-DC

Exceeding AEC-Q 101 qualification

Application / Packages	Drives	Power Distribution Safety Switch	Power Conversion
S3O8 (3x3)	x		x
SSO8 (5x6 Dual)	x		x
SSO8 (5x6 Single)	x	x	x
sTOLL (7x8)	x	x	x
TOLL (10x12)	x	x	x

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OptiMOS™ 7 40 V Overview
Applications, main features and benefits

Key Applications	Main Key Features	Key Benefits
Electric power steering & Brake booster	Very low $R_{DS(on)}$ Fast switching times (turn on/off) Innovative packages	High power density Low switching loses Excellent cooling
USB – Charging	Fast switching times Compact leadless packages	Lower switching losses Optimized switching performance with lower stray inductance
Power disconnect switches in zonal architectures & E-Fuses	High avalanche robustness High SOA ruggedness Leadless Packages w/ Cu-Clip	Increased current capability Improved design ruggedness Robust power packages
BLDC drives in a wide variety	Leadless Packages w/ Cu-Clip Compact leadless packages	Small footprint & efficient cooling Optimized switching performance
Braking systems	Leadless packages w/ Cu-Clip Leading thin wafer Cu-technology	Excellent thermal and electrical conductivity enabling high current capability and power density
Power conversion – DC/DC	Fast switching times Compact leadless packages	Lower switching losses Optimized switching performance with lower stray inductance
All automotive applications	Leading 300 mm in-house production Leading thin wafer Cu-technology	High automotive quality FE&BE production

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OptiMOS™ 7 40 V Overview
Applications, main features and benefits

Key Applications	Main Key Features	Key Benefits
Electric power steering	Very low $R_{DS(on)}$	High power efficiency
Battery management	High Avalanche capability	Increased design ruggedness
Power disconnect switches in zonal architectures	High SOA ruggedness	Optimized switching performance
E-fuse boxes	Fast switching times (turn on/off)	Innovative + robust power packages
BLDC drives in a wide variety	Leadless Packages w/ Cu-Clip	High quality product design for Automotive
Braking systems	Leading thin wafer Cu-technology	High quality FE&BE production for Automotive
DC/DC	Leading 300 mm in-house production	Full allocation control

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Infineon Automotive packages for the whole range of Automotive application

Infineon Automotive Packages
Innovative & Robust

S3O8 Single (TSDSON-8) 3x3	SSO8 Dual (TDSON-8) 5x6	SSO8 Single (TDSON-8) 5x6	sTOLL Single (HSOF-5) 7x8	TOLL Single (HSOF-8) 10x12
		 Samples available*		
down to 1,2 mΩ	down to 1,9 mΩ	down to 0,4 mΩ	down to 0,3 mΩ	down to 0,2 mΩ

OptiMOS™ 7 40 V

*Contact your Infineon sales channel

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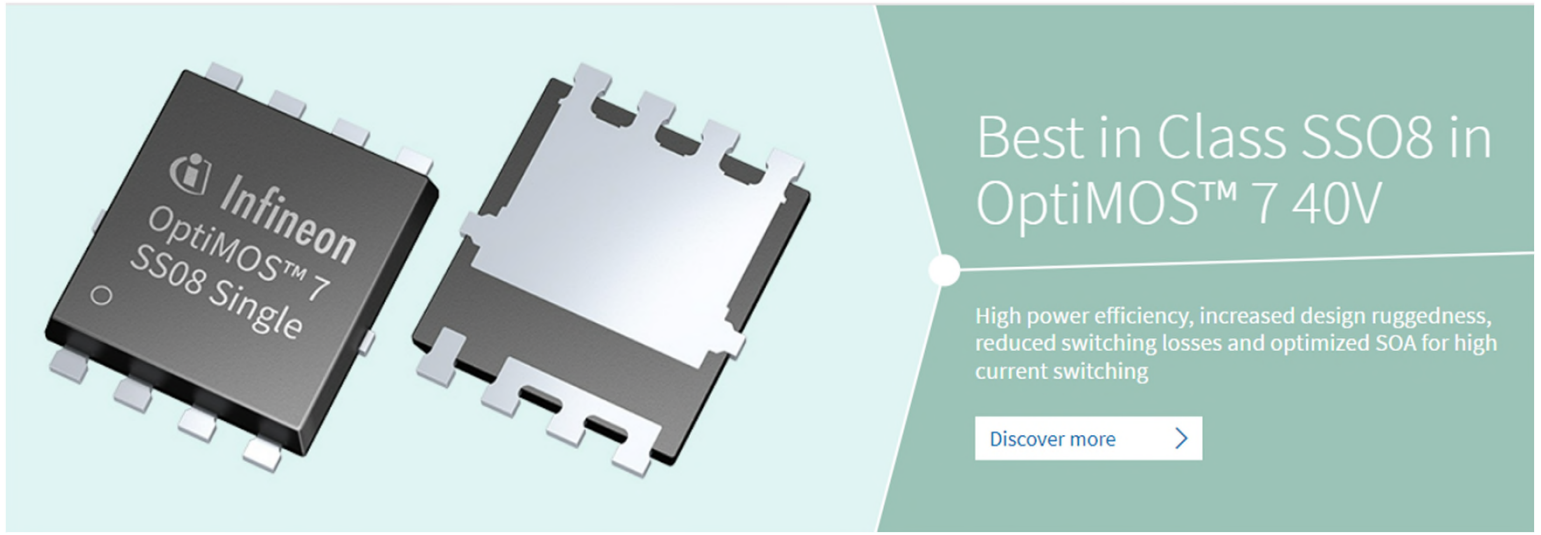
New OptiMOS™ 7 technology the leading MOSFET generation for tomorrows Automotive applications





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