

SiliconMAX™ Power MOSFETs

from
Philips Semiconductors

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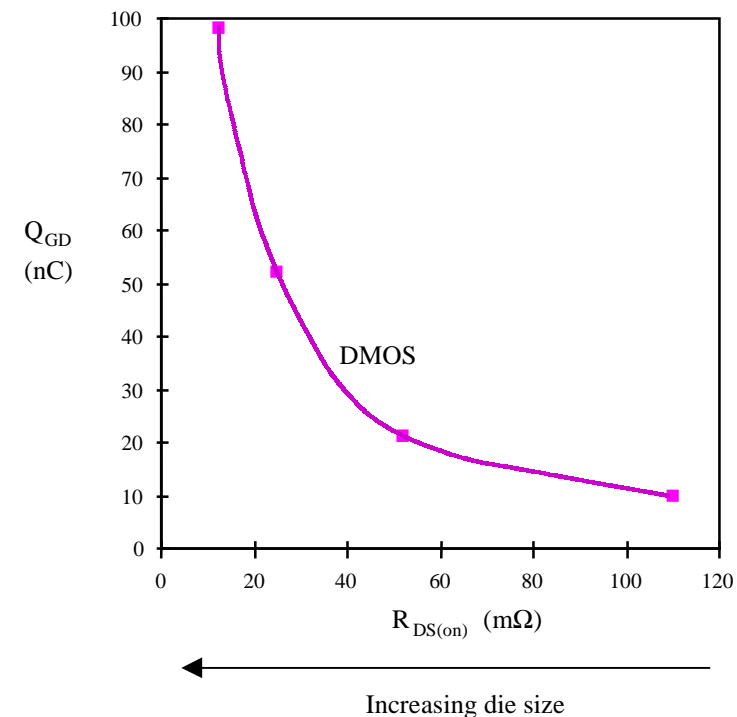
Bringing the advantages of ultra-low on-resistance ($R_{DS(ON)}$) and fast switching to applications up to 200V

- $R_{DS(ON)}$ values as low as
15 m Ω (max) in TO220 or D²-PAK at 100V
25 m Ω (max) in D-PAK at 100V
- Half the switching losses of existing 100V - 200V DMOS MOSFETs

Low $R_{DS(ON)}$ + low switching losses = low power dissipation = smaller package size

Conventional DMOS MOSFETs provide low $R_{DS(ON)}$ or fast switching not both

- low $R_{DS(ON)}$ demands increased die size
- for conventional DMOS technology, gate-charge (Q_{GD}) increases rapidly with increasing die size
- increased Q_{GD} means slower switching speeds



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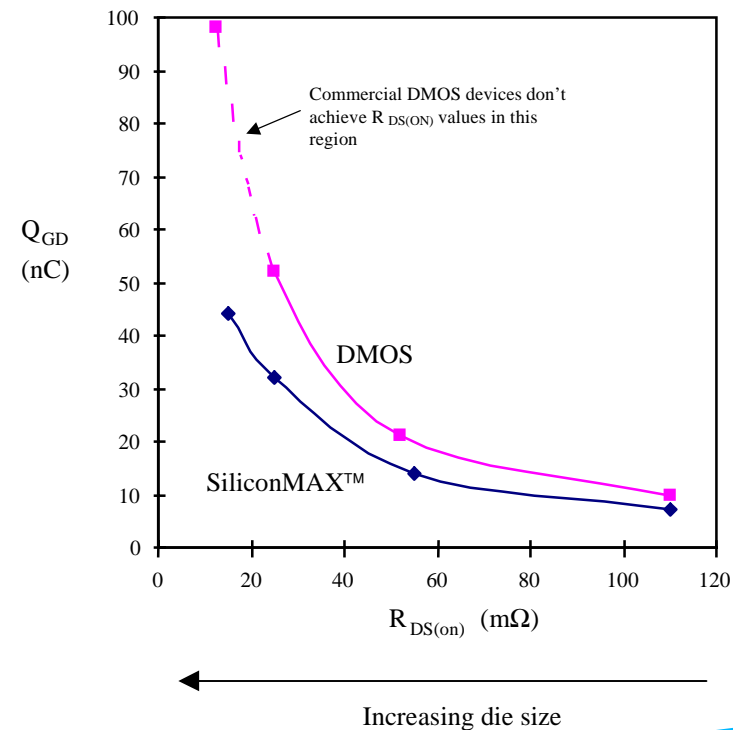
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SiliconMAX™ MOSFETs achieve the best of both worlds — low $R_{DS(on)}$ and fast switching

- for SiliconMAX™ power MOSFETs, gate charge (Q_{GD}) increases much more slowly with die size
- lower Q_{GD} means faster switching speeds



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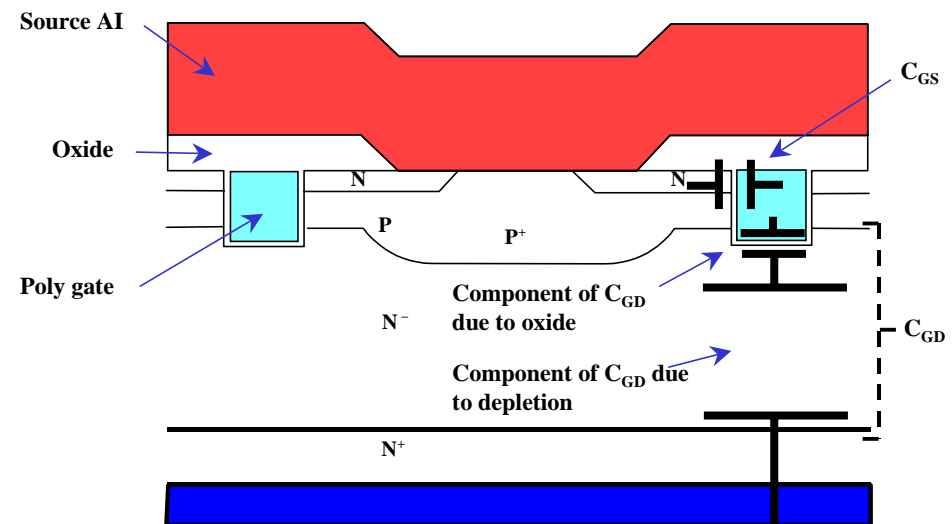
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TrenchMOS is the key to reduced gate-charge in SiliconMAX™ MOSFETs

- the vertical gate structure of TrenchMOS reduces gate-drain capacitance (C_{GD})
- reduced gate-drain capacitance reduces gate-charge



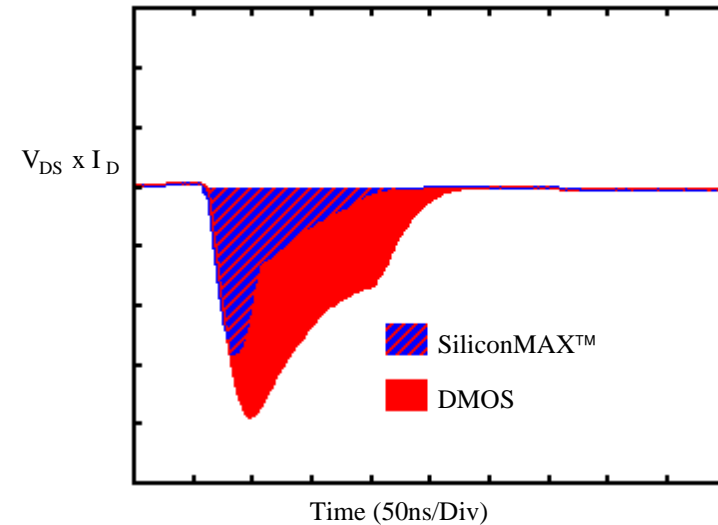
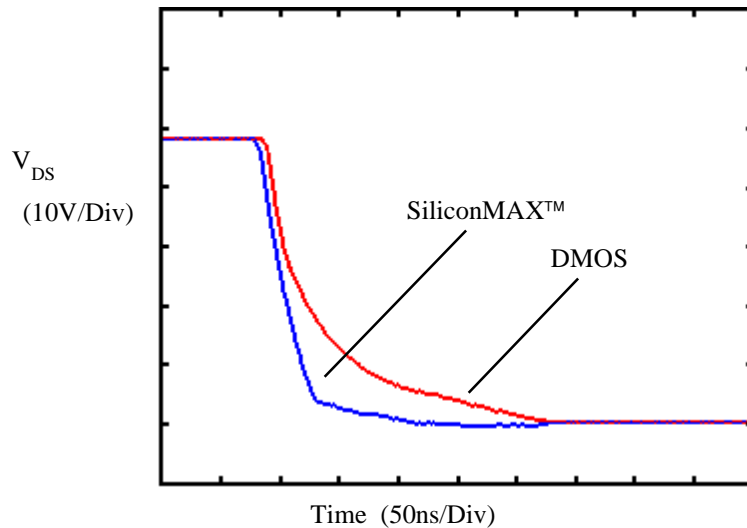
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As a result, SiliconMAX™ MOSFETs



**switch several
times faster than
DMOS devices**

and

**exhibit half the
switching losses of
DMOS devices**

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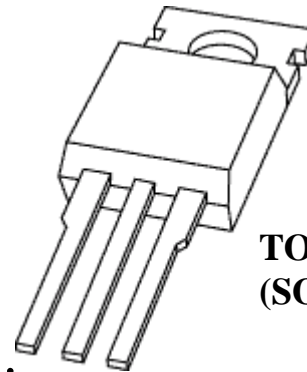


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Benefits of SiliconMAX™

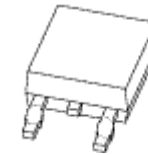
- lower $R_{DS(ON)}$ for the same size transistor package
- smaller package size for the same $R_{DS(ON)}$ value and/or reduced component count, resulting in greater power densities (W/mm^3)
- high-speed, low-loss switching performance
- replacement of through-hole mounting power packages with surface-mount devices

replace



TO220AB
(SOT78)

with



D-PAK
(SOT428)

- reduced heatsinking
- smaller size of end application
- lower system cost and higher performance

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The Initial SiliconMAX™ Range

V_{DS} (V)	$R_{DS(ON)}$ (mΩ)	Package			
		Surface Mount D-PAK (SOT428)	D ² -PAK (SOT404)	Leaded TO220AB (SOT78)	TO247 (SOT429)
25	3.5				PSMN003-25W
25	4		PSMN004-25B	PSMN004-25P	
25	5.8	PSMN005-25D			
55	4.5				PSMN004-55W
55	5.8		PSMN005-55B	PSMN005-55P	
55	10.5	PSMN010-55D			
100	9				PSMN009-100W
100	15		PSMN015-100B	PSMN015-100P	
100	25	PSMN025-100D			
150	20				PSMN020-150W
150	35		PSMN035-150B	PSMN035-150P	
150	63	PSMN063-150D			
200	40				PSMN040-200W
200	70		PSMN070-200B	PSMN070-200P	
200	130	PSMN130-200D			

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SiliconMAX™ – fulfilling Philips' EcoVision for a less power hungry world

- less power wasted in end-user equipment
- less energy/materials consumed during manufacture
- less energy/materials consumed during heatsink production
- less industrial waste

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