

Philips Semiconductors' new SiliconMAX™ power MOSFET range - a next generation development of the company's advanced TrenchMOS technology - brings the benefits of ultra-low $R_{DS(on)}$ and high-speed switching to applications requiring transistors with voltage ratings up to 200V. By significantly reducing power dissipation, these high-performance MOSFETs enable many applications to move from through-hole to SMD packages.



Key benefits

- 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
- High-speed, low-loss switching performance
- Replacement of through-hole mounting power packages with surface-mount devices
- Reduced heatsinking requirement
- Lower system cost and higher performance

Features

- Voltage ratings of 25V, 55V, 100V, 150V and 200V
- Comprehensive range of D²-PAK, D-PAK, TO220 and TO247 package options
- $R_{DS(on)}$ values as low as 15 mΩ in TO220 and 25 mΩ in D-PAK for 100-volt devices
- Very low gate-charge (Q_{GD})

SiliconMAX - fulfilling Philips' EcoVision for a less power-hungry world

SiliconMAX™ ultra-low $R_{DS(on)}$ power MOSFETs to 200V

Unsurpassed performance for SMPS and DC/DC converter applications

Description

Based on next generation enhancements to the TrenchMOS process that minimise on-resistance ($R_{DS(on)}$), reduce gate charge (Q_{GD}) and increase breakdown voltage, SiliconMAX power MOSFETs provide unsurpassed levels of performance in switchmode power supply and DC/DC converter applications. Available with voltage ratings of 25V, 55V, 100V, 150V and 200V, they not only extend to higher voltages the range of applications that can benefit from TrenchMOS technology, they also offer improved performance in applications currently using first-generation TrenchMOS transistors.

Compared to the conventional DMOS FETs that currently dominate 100V to 200V applications, Philips Semiconductors' SiliconMAX MOSFETs feature far lower $R_{DS(on)}$ values for similar sized packages, or allow the use of smaller sized packages for the same $R_{DS(on)}$ ratings. At 100V, for example, the TO220 packaged SiliconMAX device achieves a world-beating 15 mΩ maximum $R_{DS(on)}$ figure. The 100V D-PAK version achieves 25 mΩ — the same as typical benchmark competitor performance in a TO220 package.

For a given load current capability, you can therefore downsize your power switching components, moving from bulky TO247 packaged transistors to TO220 SiliconMAX devices, or even replace them with D²-PAK surface-mounting SiliconMAX transistors. Similarly, existing D²-PAK transistors can be replaced with much smaller D-PAK devices. In high power applications, where two or more parallel transistors are currently used, replacing them with a single SiliconMAX transistor offers a significant reduction in component count.

Featuring gate-charge (Q_{GD}) values that are less than half those of conventional DMOS transistors with the same $R_{DS(on)}$ ratings, SiliconMAX transistors also switch much faster than DMOS devices. As a result, they have less than half the switching losses.

SPICE models of these transistors are available for circuit simulation. (downloadable from <http://www.semiconductors.philips.com/models>)

Applications

SiliconMAX power MOSFETs are suitable for use in a wide range of switchmode power supply, DC/DC converter, industrial motor control and load switching applications, particularly those that previously required the use of 100V, 150V or 200V DMOS transistors.

Added Value

Smaller size, lower power dissipation, ease of assembly and lower overall system cost are among the many benefits of using Philips Semiconductors' new SiliconMAX devices.




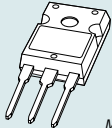
Product Overview

see overleaf

Let's make things better.

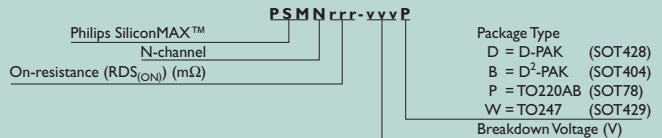


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V _{DS} (V)	R _{DS(on)} (mΩ)	I _D (A)	Package			
			Surface Mount		Leaded	
			D-PAK** (SOT428)	D ² -PAK* (SOT404)	TO220AB* (SOT78)	TO247*** (SOT429)
			 M3D300	 M3D166	 M3D307	 M3D314
25	3.5	200				PSMN003-25W
25	4	160		PSMN004-25B	PSMN004-25P	
25	5.8	100	PSMN005-25D			
55	4.5	180				PSMN004-55W
55	5.8	130		PSMN005-55B	PSMN005-55P	
55	10.5	80	PSMN010-55D			
100	9	130				PSMN009-100W
100	15	80		PSMN015-100B	PSMN015-100P	
100	25	45	PSMN025-100D			
150	20	75				PSMN020-150W
150	35	50		PSMN035-150B	PSMN035-150P	
150	63	30	PSMN063-150D			
200	40	50				PSMN040-200W
200	70	35		PSMN070-200B	PSMN070-200P	
200	130	20	PSMN130-200D			

D-PAK and D²-PAK are registered trademarks of Motorola Inc.

- * All types are available now
- ** All types will be available in Q3 1999
- *** All types will be available in Q4 1999



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