



Powerful solutions for DC/DC conversion

For DC/DC conversion, NXP offers a wide range of solutions that simplify design, improve performance, and lower the overall cost. From fast-switching MOSFETs to highly integrated power trains, we pack more power into a smaller space while keeping things cool. We design for all kinds of applications – from mobile communications and high-end servers to domestic and automotive applications – with special emphasis on high-density applications like half-bridge and forward-topology DC/DC converters. To improve power density, we specialize in small-footprint packages with superb thermal properties. Our LPAK and nanoPAK options increase supply efficiency and improve heat dissipation, bringing thermally superior operation to the TSOP6 and SO8 footprint. That means smaller, more efficient designs or improved performance in the same space.

DC/DC conversion and SMPS applications

NXP 100-V, in-rush SiliconMAX MOSFETs

- ▶ The latest TrenchMOS technology
- ▶ Fast switching
- ▶ Lowest possible on-state resistance at each voltage rating

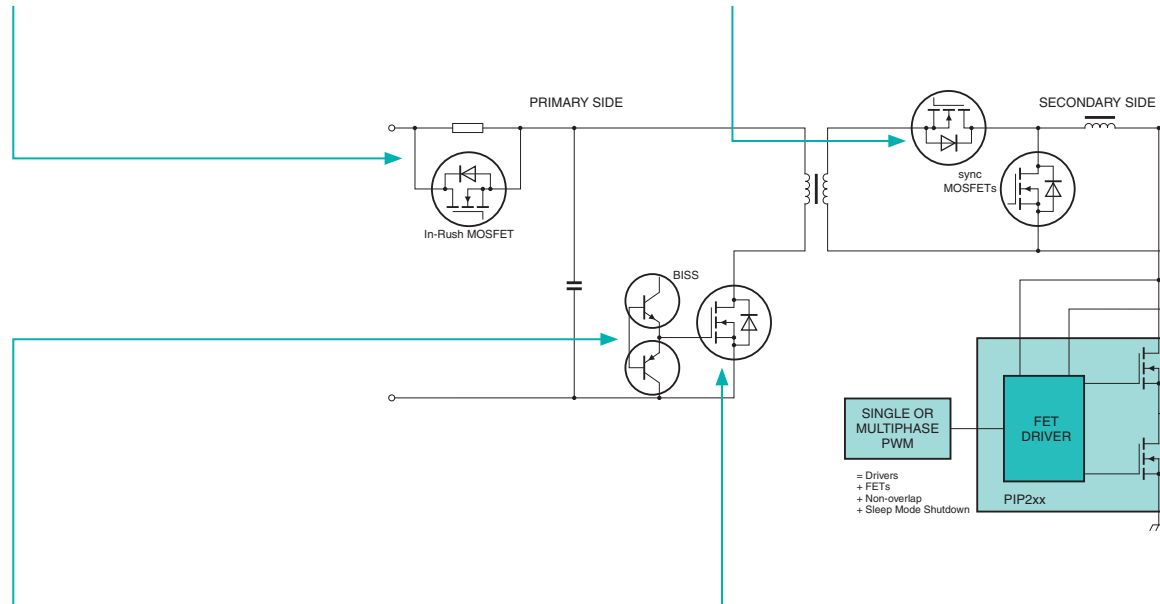
Part number	V _{DS} (V)	Max R _{DS(ON)} (mΩ)	Package
PSMN015-110B	100	15	D ² PAK
PSMN015-100B	100	15	TO220
PSMN009-100B	100	8.8	D ² PAK
PSMN009-100P	100	8.8	TO220

Synchronous rectification in secondary-side circuits

NXP 30-V, N-channel SwitchMOS MOSFETs

- ▶ High-speed, low-loss switching for power-efficient designs
- ▶ Choice of specifications for optimized performance
- ▶ Logic-level switching for simpler drive circuitry

Part number	V _{DS} (V)	Max R _{DS(ON)} (mΩ)	Q _{GD} (nC)	Package
PH3330L	30	3.3	4.6	LPAK
PH8030L	30	5.9	2.0	LPAK
PHK31NQ03LT	30	4.5	7.4	SO8
PHK18NQ03LT	30	8.7	2.7	SO8



BISS functions

NXP BISS bipolar drivers

- ▶ Low collector-emitter saturation voltage
- ▶ Exceptionally low power consumption
- ▶ Reduced heat generation
- ▶ Small footprint
- ▶ Range of applications
 - Handheld and battery-operated systems
 - Domestic and automotive applications, where low heat dissipation is often critical

Part number	Polarity	V _{CEO} (V)	Max I _C (A)	Package
PBSS4320T	NPN	20	5	SOT23
PBSS5320T	PNP	20	3	TSOP6
PBSS4140S	NPN	40	2	SOT54
PBSS5140S	PNP	40	2	SOT54

Primary-side switching

NXP 100-to-200-V SwitchMOS MOSFETs

- ▶ Latest TrenchMOS technology for superior operation in medium-voltage applications
- ▶ Low R_{DS(ON)} and fast switching for cooler running, low power loss, and high efficiency
- ▶ Small footprint with low profile, for compact designs

Part number	V _{DS} (V)	Max R _{DS(ON)} (mΩ)	Q _{GD} (nC)	Package
PH20100S	100	23	9	LPAK
PHK12NQ10T	100	28	9	SO8
PHK5NQ15T	150	75	12	SO8
PSMN062-150L	150	62	8.4	LPAK
PHK4NQ20T	200	130	8.7	SO8
PSMN109-200L	200	109	11.6	LPAK
PML260SN	200	294	5.3	nanoPAK
PML340SN	220	367	4	nanoPAK

Dedicated OR-ing

NXP OR-ing intelligent switch PIP401

- ▶ Requires no component expertise
- ▶ Very low forward-power loss (1.5 W at 25 A typ)
- ▶ Low reverse loss (<25 μ W typ)
- ▶ Very fast turn-off, retaining system integrity in fault conditions
- ▶ Slow turn-on, preventing high in-rush currents

Part number	V _{DS} (V)	Max R _{DS(ON)} (m Ω)	Package
PIP401	N/A	= 2	D ² PAK (7-pin)

NXP MOSFETs recommended for OR-ing

- ▶ High-speed, low-loss switching for power-efficient designs

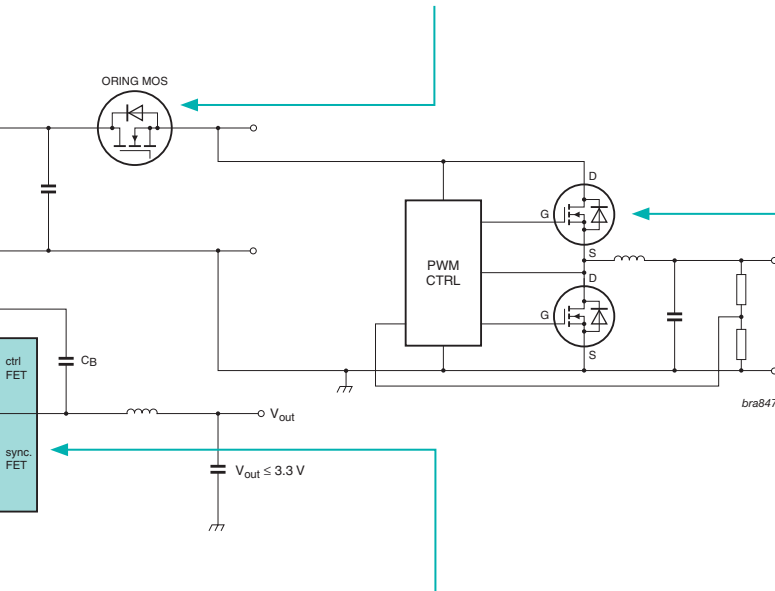
Part number	V _{DS} (V)	Max R _{DS(ON)} (m Ω)	Package
PSMN002-25x	25	2.6	D ² PAK, TO220
PSMN003-30x	30	2.8	D ² PAK, TO220
PH3330L	30	3.3	LFPAK
PSMN004-36B	36	4	D ² PAK
PSMN004-60x	60	3.6	D ² PAK, TO220

Point-of-load (POL) buck conversion

NXP 25-V, N-channel MOSFETs

- ▶ High-speed, low-loss switching for power-efficient designs
- ▶ SO8 footprint with low thermal resistance (2°K/W)

Part number	V _{DS} (V)	Max R _{DS(ON)} (m Ω)	Q _{GD} (nC)	Package
PH2525L	25	2.5	7.3	LFPAK
PH4025L	25	4.0	4.6	LFPAK
PH5525L	25	5.5	3.1	LFPAK
PH9025L	25	9.0	2.0	LFPAK



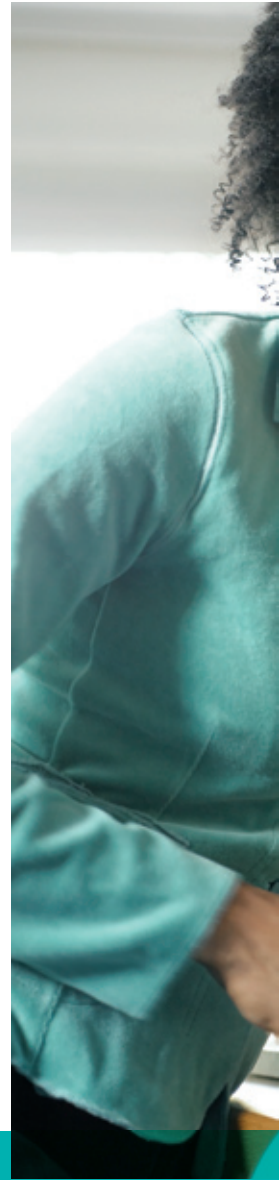
DC/DC buck conversion

NXP integrated power train PIP212-12M

- ▶ All the power and driver functions for a single-phase synchronous buck converter
- ▶ Switching frequencies up to 1 MHz
- ▶ Optimized FETs and driver for simpler design-in and faster time-to-market
- ▶ Robust, thermally enhanced package for improved heat dissipation
- ▶ Increased system reliability with a single package instead of three
- ▶ Ideal for applications requiring high current density
 - DC/DC POL converters
 - Blade and 1U servers
 - CPU VRM cards for servers
 - Space-critical DSP and ASIC designs

Part number	Input conversion rate (V)	Output voltage (V)	Max output current (A)	Max operating frequency	Package
PIP212-12M	3.3 to 16	0.8 to 6.0	35	1 MHz	HVQFN56 (8 x 8 x 0.85 mm)

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