

Quick Reference Card

NexFET™ for Buck Controllers



4Q 2009

In synchronous buck-converter power supplies that serve applications with higher output current needs, the power MOSFET is a critical element in driving the overall DC/DC converter efficiency. The two main parameters driving power MOSFET efficiency are gate charge and on resistance. The NexFET MOSFETs technology delivers less than half the gate charge (Qg) than standard products on the market. Lower charge means that converters can run at higher frequencies while maintaining the same power loss or run more efficiently at the same frequency.

In combination with the DC/DC controller products and the offered 'rule of thumb' table this quick reference card will lead to a fast result. To see the complete power portfolio, please visit power.ti.com. To simulate your design, please visit www.ti.com/switcherpro.

Optimized for $V_{in} = 12V$ to $V_{out} \leq 1.8V$ at 300kHz

			<=8A	15A	20A	25A
Performance	Maximum Performance	High Side	CSD16411Q3	CSD16323Q3	CSD16323Q3	CSD16322Q5
		Low Side	CSD16323Q3	CSD16321Q5	CSD16325Q5	CSD16321Q5x2
	Volume	High Side	CSD16411Q3	CSD16409Q3	CSD16406Q3	CSD16406Q3
		Low Side	CSD16406Q3	CSD16403Q5A	CSD16321Q5	CSD16325Q5
	Value	High Side	CSD16412Q5A	CSD16412Q5A	CSD16410Q5A	CSD16410Q5
		Low Side	CSD16410Q5A	CSD16413Q5A	CSD16403Q5A	CSD16321Q5

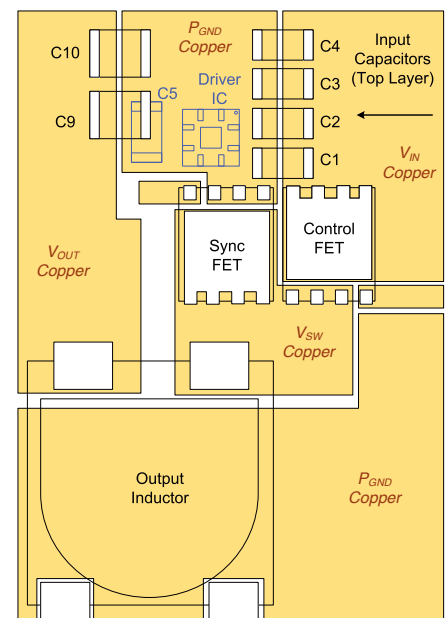
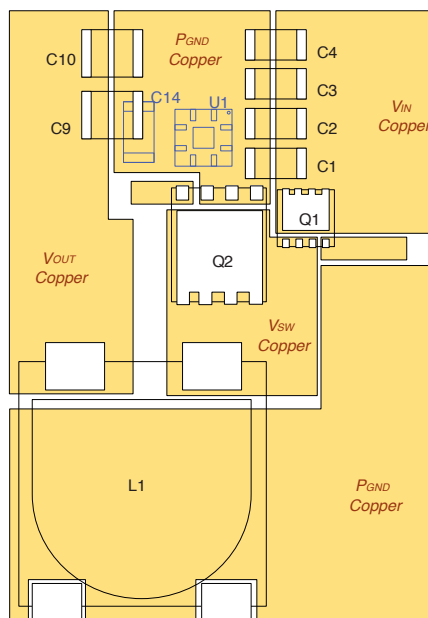
Optimized for $V_{in} = 5V$ to $V_{out} \leq 1.8V$ at 300kHz

			<=8A	15A	20A	25A
Performance	Maximum Performance	High Side	CSD16406Q3	CSD16321Q5	CSD16321Q5	CSD16321Q5
		Low Side	CSD16323Q3	CSD16321Q5	CSD16325Q5	CSD16321Q5x2
	Volume	High Side	CSD16409Q3	CSD16323Q3	CSD16323Q3	CSD16413Q5A
		Low Side	CSD16409Q3	CSD16323Q3	CSD16321Q5	CSD16325Q5
	Value	High Side	CSD16411Q3	CSD16409Q3	CSD16406Q3	CSD16404Q5A
		Low Side	CSD16411Q3	CSD16406Q3	CSD16403Q5A	CSD16407Q5

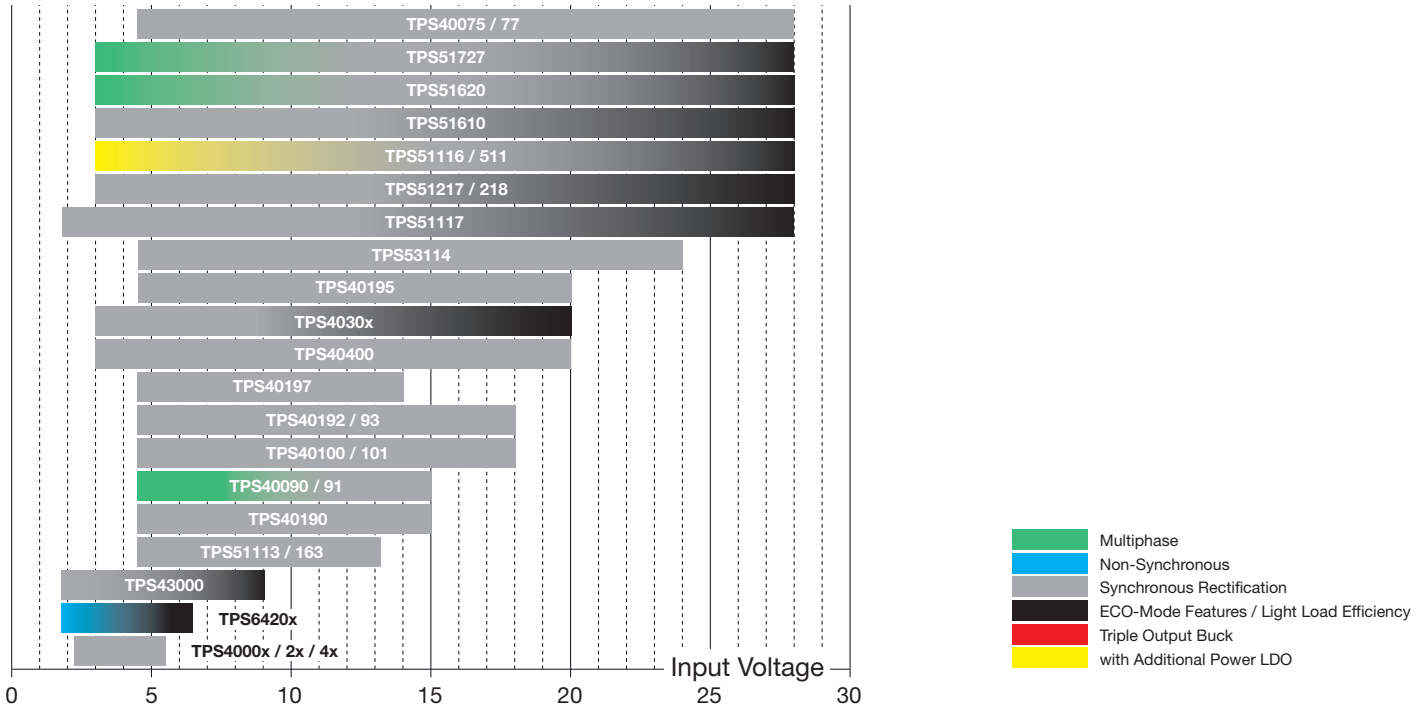
Layout advise to ensure best performance & low EMI

- Minimize distance between positive node of input ceramic cap & drain pin of control FET
- Minimize distance between negative node of input ceramic cap & source pin of sync FET
- Use minimum 4x 10uF ceramic capacitors for input caps
TDK C3216X5R1A106M
- Continuous flow of power planes

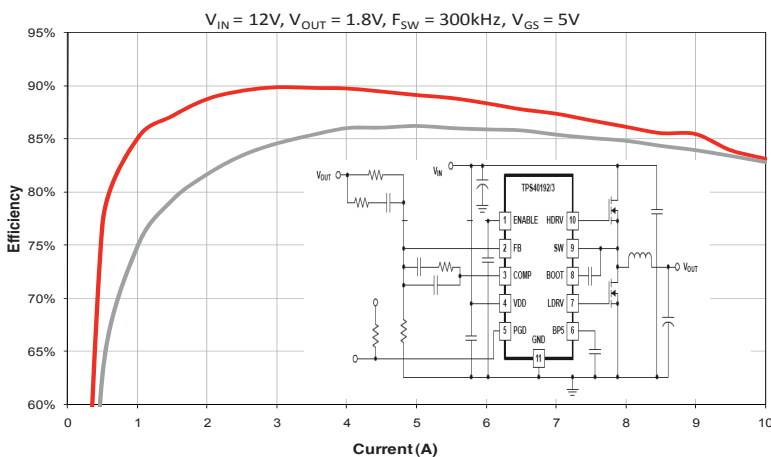
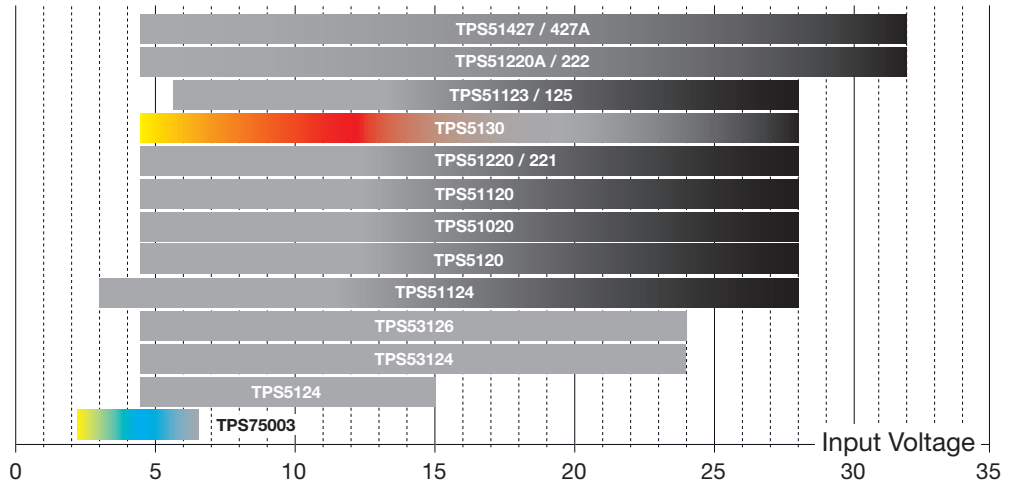
Table	
	Top Copper Layer
	Bottom Copper Layer
	Top Components
	Bottom Components



Single Output Buck DC/DC Controllers



Dual / (Triple) Output Buck DC/DC Controllers



Improved efficiency

- Up to 10% improvement at light load
- Efficiency tests performed on TPS40192EVM

High Side	Low Side
CSD16412Q5Ax1 (13mΩ, 2.8nC)	CSD16410Q5Ax1 (9.6mΩ, 3.9nC)
Competition (13mΩ, 16nC)	Competition (4.4mΩ, 29nC)

For more information, visit www.ti.com/nexfet

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