

# Power MOSFETs

for SMPS in Computer and Telecom



## Selection Guide

STMicroelectronics  
More Intelligent Solutions



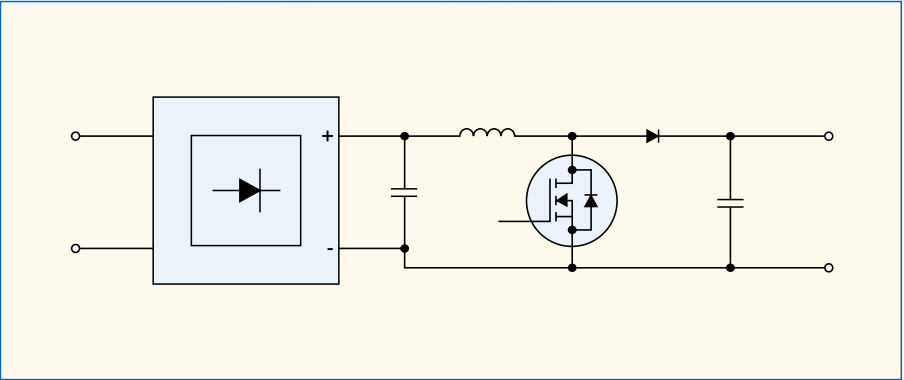
# Power Factor Correction (PFC)

V <sub>DSS</sub> (V)	R <sub>DS(on)</sub> max @ 10V (Ω)	P / N	Package	ID(cont) (A)	ADDITIONAL DATA	
					Qg @ 10V (Typ) (nC)	Note
500	0.25	STW20NB50	TO-247	20	85	
	0.27	IRFP460	TO-247	20	100	
	0.35	STW14NM50	TO-247	14	28	MDmesh
	0.36	STW15NB50	TO-247	14.6	60	
	0.4	IRFP450	TO-247	14	75	
	0.4	STP12NM50/FP	TO-220 / FP	12	28	MDmesh
600	0.45	STW14NB50	TO-247	14	50	
	0.35	STW16NB60	TO-247	16	85	
	0.54	STW13NB60	TO-247	13	58	
	0.65	STW12NB60	TO-247	12	54	
	0.8	STW10NB60	TO-247	10	40	

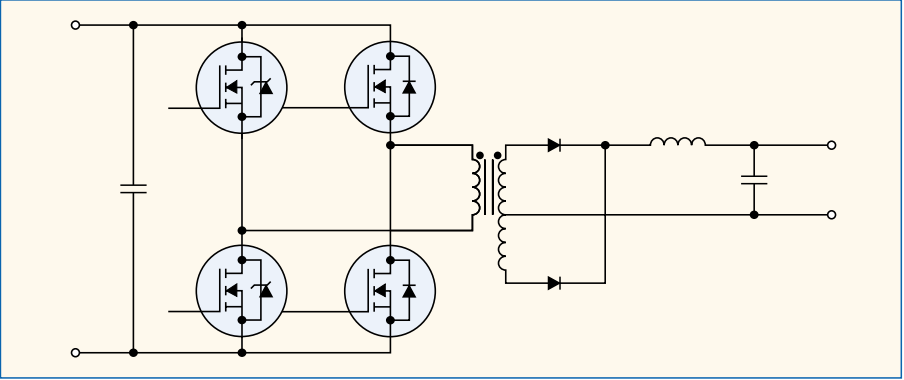
# Full and Half Bridge

V <sub>DSS</sub> (V)	R <sub>DS(on)</sub> max @ 10V (Ω)	P / N	Package	ID(cont) (A)	ADDITIONAL DATA	
					Qg @ 10V (Typ) (nC)	Note
400	0.26	STW18NB40	TO-247	18.4	60	
	0.55	IRF740	TO-220	10	35	
	0.55	STP11NB40/FP	TO-220	10.7	29	
	0.9	STP7NB40	TO-220	7	21	
	1	IRF730	TO-220	5.5	21	
	1.8	STP5NB40/FP	TO-220 / FP	4.7	14.5	
500	0.05	STY60NM50	Max247	50	240	MDmesh
	0.1	STW45NM50	TO-247	45	87	MDmesh
	0.25	STW20NB50	TO-247	20	85	
	0.27	IRFP460	TO-247	20	100	
	0.27	STW20NC50	TO-247	18.4	95	
	0.35	STW14NM50	TO-247	14	28	MDmesh
	0.36	STW15NB50	TO-247	14.6	60	
	0.38	STW14NC50	TO-247	14	65	
	0.4	IRFP450	TO-247	14	75	
	0.4	STP12NM50/FP	TO-220 / FP	12	28	MDmesh
	0.45	STW14NB50	TO-247	14	50	
	0.52	STP10NC50/FP	TO-220 / FP	10	41	
	0.52	STW12NC50	TO-247	10	41	
	0.6	STP10NB50/FP	TO-220 / FP	10.6	38	
	0.85	STP8NC50/FP	TO-220 / FP	8	36	
	0.85	STP9NB50/FP	TO-220 / FP	8.6	32	
	1.5	IRF830	TO-220	4.5	22	
	1.5	STP5NC50/FP	TO-220 / FP	5.5	18	
	1.5	STP6NB50/FP	TO-220 / FP	5.8	20.5	
	2.8	STP4NB50/FP	TO-220 / FP	3.8	14.5	
600	3	IRF820	TO-220	2.5	12	
	0.35	STW16NB60	TO-247	16	85	
	0.45	STP11NM60	TO-220	11	30	MDmesh
	0.54	STW13NB60	TO-247	13	58	
	0.65	STW12NB60	TO-247	12	54	
	0.75	STP9NB60/FP	TO-220 / FP	9	40	
	0.75	STP9NC60/FP	TO-220 / FP	9	44	
	0.8	STW10NB60	TO-247	10	40	
	1.2	IRFBC40	TO-220	6.2	38	
	1.2	STP6NC60/FP	TO-220 / FP	6	35	
	1.2	STP7NB60/FP	TO-220 / FP	7.2	30	
	2	STP5NB60/FP	TO-220 / FP	5	21	
	2.2	IRFBC30	TO-220	3.6	21	
	2.2	STP4NC60/FP	TO-220 / FP	4.2	16.5	
	3.6	STP3NB60/FP	TO-220 / FP	3.3	15	

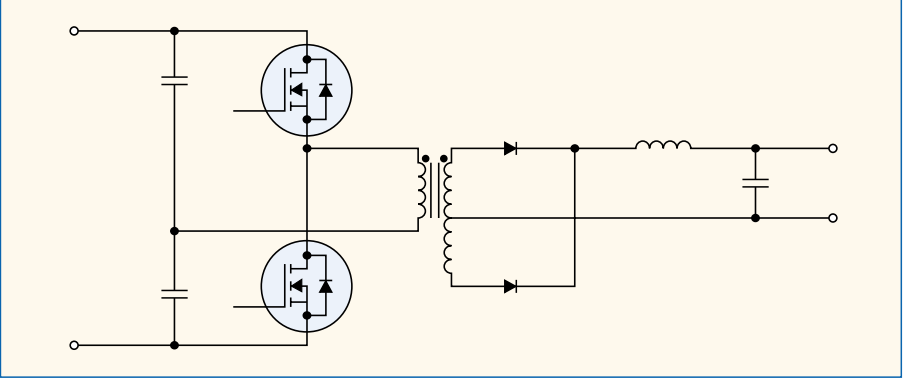
# Power Factor Correction



# Full-Bridge



# Half-Bridge

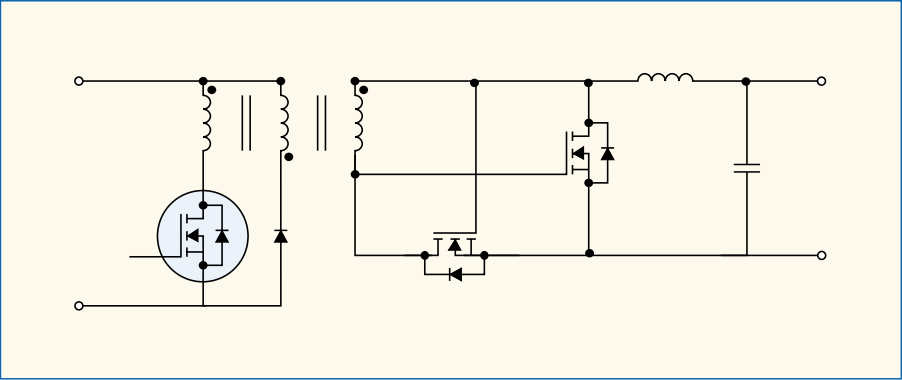


# Primary Side in Isolated DC to DC Converters

$V_{DS}$ (V)	$R_{DS(on)}$ max @ 10V (m $\Omega$ )	P / N	Package	$I_{D(cont)}$ (A)	ADDITIONAL DATA		
					$R_{DS(on)}$ max @ 4.5V (m $\Omega$ )	Qg @ 10V (Typ) (nC)	Note
100	15	STB80NF10	D <sup>2</sup> PAK	80		140	Primary switch
	15	STP80NF10/FP	TO-220 / FP	80		140	Primary switch
	29	STB40NF10L	D <sup>2</sup> PAK	40	36	60	Primary switch
	30	STB40NF10	D <sup>2</sup> PAK	40		60	Primary switch
	30	STP40NF10	TO-220	40		60	Primary switch
	45	STB35NF10	D <sup>2</sup> PAK	35		55	Primary switch
	45	STP35NF10	TO-220	35		55	Primary switch
	48	STD25NF10	DPAK	25		55	Primary switch
	60	STB30NF10	D <sup>2</sup> PAK	30		40	Active reset switch
	70	STL22NF10	PowerFLAT	22		30	Active reset switch
	70	STP24NF10	TO-220	24		30	Active reset switch
	70	STS4NF100	SO-8	2		12	Active reset switch
	77	STB24NF10	D <sup>2</sup> PAK	24		30	Active reset switch
	80	STD15NF10	DPAK	15		30	Active reset switch
	85	STD16NE10	DPAK	16		38	Active reset switch
	85	STD16NE10L	DPAK	16	100	48	Active reset switch
	180	STD10NF10	DPAK	10		15.3	Active reset switch
	250	STD6NF10	DPAK	6		11	Active reset switch
	250	STN2NF10	SOT-223	2		12	Active reset switch
	250	STS2NF100	SO-8	2		12	Active reset switch
	400	STD5NE10/-1	DPAK	5		10	Active reset switch
	400	STD5NE10L/-1	DPAK	5	450	10	Active reset switch
150	65	STB30NS15-1	D <sup>2</sup> PAK	30		65	Low $R_{DS(on)}$ & Qg for 48V input voltage
	65	STS5NS150	SO-8	5		65	Low $R_{DS(on)}$ & Qg for 48V input voltage
200	180	STP19NB20/FP	TO-220 / FP	19		29	Primary switch with passive clamp
	400	STP10NB20/FP	TO-220 / FP	10		17	Primary switch with passive clamp

Primary Switch = Low  $R_{DS(on)}$       Active Reset Switch = Low Qg

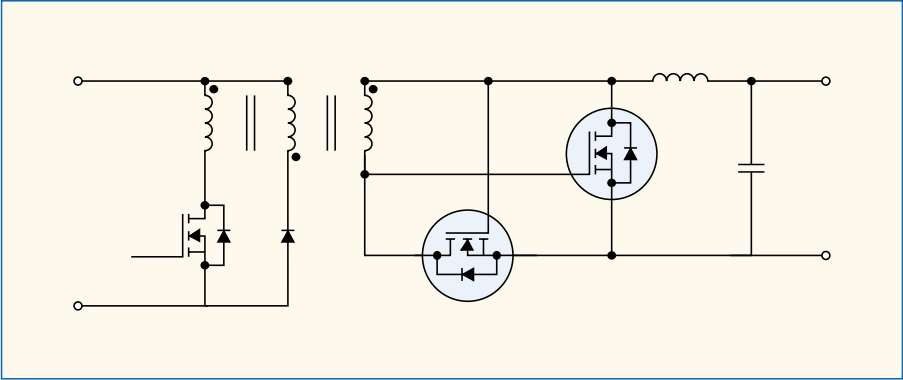
# Primary Side in Isolated DC to DC Converters



# Synchronous Rectification in Secondary Side Isolated Converters

$V_{DS}$ (V)	$R_{DS(on)}$ max @ 10V (m $\Omega$ )	P / N	Package	$I_{D(cont)}$ (A)	ADDITIONAL DATA		
					$R_{DS(on)}$ max @ 4.5V (m $\Omega$ )	Qg @ 10V (Typ) (nC)	Note
20	2.5	STV160NF02L	PowerSO-10	160	6	115	Low $R_{DS(on)}$
	2.7	STV160NF02LA	PowerSO-10	160	6.4	130	Low $R_{DS(on)}$
30	2.8	STV160NF03L	PowerSO-10	160	6.7	103	Low $R_{DS(on)}$
	3	STB160NF03L	D <sup>2</sup> PAK	160	7	123	Low $R_{DS(on)}$
	3	STB160NF3LL	D <sup>2</sup> PAK	160	4.3	160	Low $R_{DS(on)}$
	3	STV160NF03LA	PowerSO-10	160	7	123	Low $R_{DS(on)}$
	3.2	STB100NF03L-03	D <sup>2</sup> PAK	100	4.5	160	Low $R_{DS(on)}$
	6	STS17NF3LL	SO-8	17	7	60	Low $R_{DS(on)}$ for HF DC to DC
	6.5	STB90NF03L	D <sup>2</sup> PAK	90	9.5	70	Low $R_{DS(on)}$ for HF DC to DC
	6.5	STL28NF3LL	PowerFLAT	28	9.5	90	Low $R_{DS(on)}$
	7	STL35NF03L	PowerFLAT	35	12	70	Low $R_{DS(on)}$
	9.5	STD60NF3LL	DPAK	60	10.5	60	High Freq. DC-DC
	10	STB70NF03L	D <sup>2</sup> PAK	70	18	35	Best trade-off $R_{DS(on)}$ & Qg for HF DC to DC
	10	STB70NF3LL	D <sup>2</sup> PAK	70	12	43	Best trade-off $R_{DS(on)}$ & Qg for HF DC to DC
	10	STB70NFS03L	D <sup>2</sup> PAK	70	18	35	+ Schottky Diode
	10	STS12NF30L	SO-8	12	12	70	
	11	STS11NF3LL	SO-8	11	13	50	Best trade-off $R_{DS(on)}$ & Qg for HF DC to DC
	11	STSJ25NF3LL	PowerSO-8	25	13	42	Best trade-off $R_{DS(on)}$ & Qg in new package
	11.5	STD40NF3LL	DPAK	40	13.5	43	High Freq. DC-DC
	12	STD40NF03L	DPAK	40	20	35	High Freq. DC-DC
	12	STS11NF30L	SO-8	11	18.5	38	High Freq. DC-DC

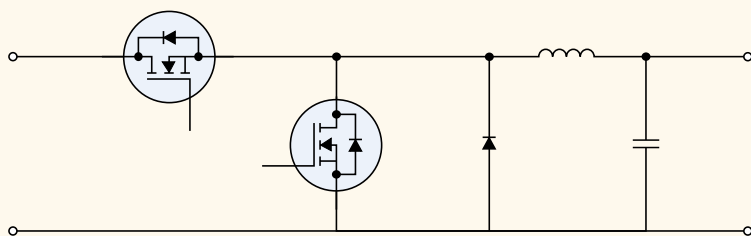
# Synchronous Rectification in Secondary Side Isolated Converters



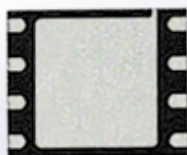
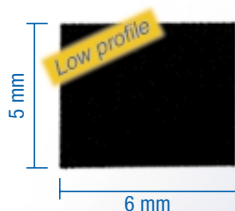
# Synchronous Buck Converters

V <sub>DSS</sub> (V)	R <sub>DS(on)</sub> max @ 10V (mΩ)	P / N	Package	I <sub>D(cont)</sub> (A)	ADDITIONAL DATA		
					R <sub>DS(on)</sub> max @ 4.5V (mΩ)	Qg @ 10V (Typ) (nC)	Note
20	2.5	STV160NF02L	PowerSO-10	160	6	115	High current for Synchronous Rectifier
	2.7	STV160NF02LA	PowerSO-10	160	6.4	130	High current for Synchronous Rectifier
	9	STB70NF02L	D <sup>2</sup> PAK	70	15	36	Best trade-off R <sub>DS(on)</sub> & Qg
30	11.5	STD40NF02L	DPAK	40	19	36	Best trade-off R <sub>DS(on)</sub> & Qg
	2.8	STV160NF03L	PowerSO-10	160	6.7	103	High current for Synchronous Rectifier
	3	STB160NF03L	D <sup>2</sup> PAK	160	7	23	High current for Synchronous Rectifier
	3	STB160NF3LL	D <sup>2</sup> PAK	160	4.3	160	High current for Synchronous Rectifier
	3	STV160NF03LA	PowerSO-10	160	7	123	High current for Synchronous Rectifier
	3.2	STB100NF03L-03	D <sup>2</sup> PAK	100	4.5	160	High Freq. DC-DC
	4	STB80NF03L-04/-1	D <sup>2</sup> PAK	80	5	160	High Freq. DC-DC
	6	STB80NF03L-06	D <sup>2</sup> PAK	80			
	6	STS17NF3LL	SO-8	17	7	60	Low R <sub>DS(on)</sub> for HF DC to DC for notebook
	6.5	STB90NF03L	D <sup>2</sup> PAK	90	9.5	70	Synchronous rectifier
	6.5	STL28NF3LL	PowerFLAT	28	9.5	90	
	6.5	STP90NF03L	TO-220	90	9.5	70	Synchronous rectifier
	7	STL35NF03L	PowerFLAT	35	12	70	Synchronous rectifier
	8	STB85NF3LL	D <sup>2</sup> PAK	85	9.5	60	Synchronous rectifier
	9.5	STD60NF3LL	DPAK	60	10.5	60	High Freq. DC-DC Converter
	10	STB70NF03L	D <sup>2</sup> PAK	70	18	35	Synchronous rectifier
	10	STB70NF3LL	D <sup>2</sup> PAK	70	12	43	Synchronous rectifier
	10	STB70NFS03L	D <sup>2</sup> PAK	70	18	35	N-channel plus Schottky Diode
	10	STP70NF03L	TO-220	70	18	35	High Freq. DC-DC
	10	STP70NF3LL	TO-220	70	12	43	High Freq. DC-DC
	10	STS12NF30L	SO-8	12	12	70	
	11	STS11NF3LL	SO-8	11	13	50	High Freq. DC-DC
	11	STSJ25NF3LL	PowerSO-8	25	13	42	Low Qg for HF DC to DC for notebook
	11.5	STD40NF3LL	DPAK	40	13.5	43	High Freq. DC-DC
	12	STD40NF03L	DPAK	40	20	35	High Freq. DC-DC
	12	STS11NF30L	SO-8	11	18.5	38	High Freq. DC-DC
	13	STB55NF03L	D <sup>2</sup> PAK	55	21	40	Best trade-off R <sub>DS(on)</sub> & Qg
	13.5	STP55NF03L	TO-220	55		40	Best trade-off R <sub>DS(on)</sub> & Qg
	17	STB45NF3LL	D <sup>2</sup> PAK	45	20	22	Low Qg in High Freq. DC-DC
	19	STS9NF3LL	SO-8	9	21	22	Low Qg in High Freq. DC-DC
	20	STB36NF03L	D <sup>2</sup> PAK	36	35	18	High Freq. DC-DC

# Synchronous Buck Converter



## New Tiny High Power Packages



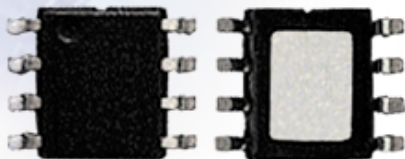
### PowerFLAT™

- Same footprint as SO-8
- 118% larger die size than standard SO-8
- Exposed pad for better thermal performance
- Lower parasitic inductance for better electrical performance

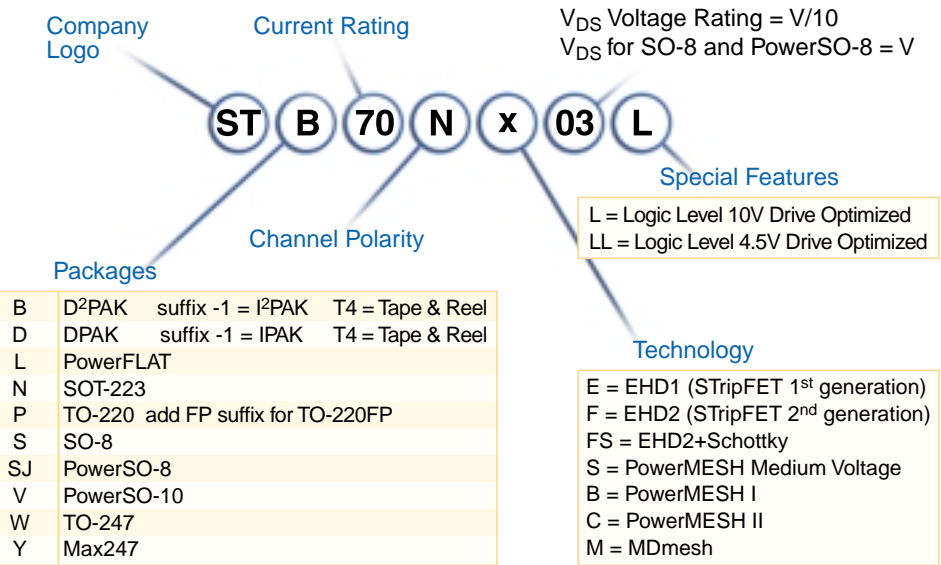


### New PowerSO-8™

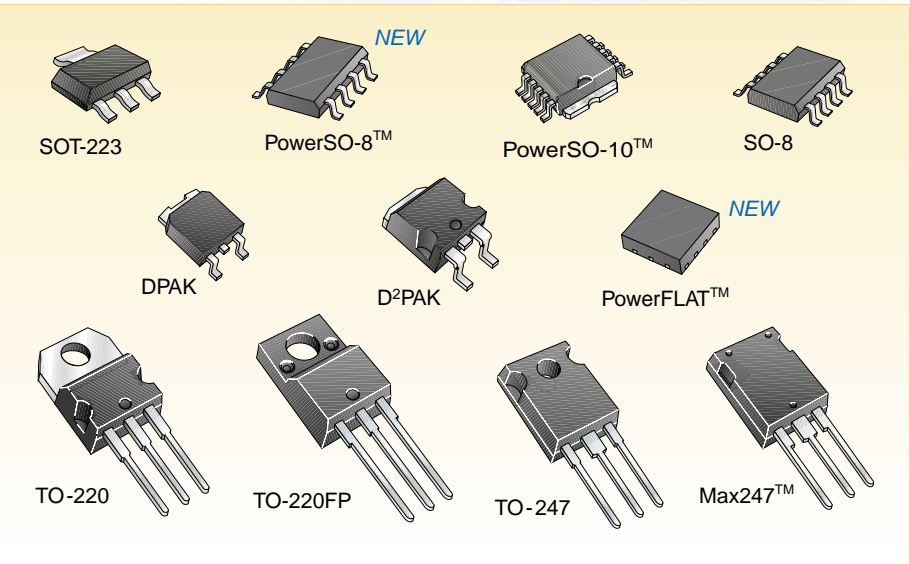
- Exposed pad for lower thermal resistance
- Increased power capability
- Higher current capability
- Same footprint as standard SO-8 package
- No change in the board
- Heat slug nearly the same as the package footprint



# Part Nomenclature



## Innovative Package Range



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