

# AI POWER SOLUTIONS Selector Guide

## FEATURED PRODUCTS

- E Series Superjunction Standard MOSFETs
- EF Series Superjunction MOSFETs with Integrated Fast Body Diode
- Gen IV and Gen V Medium Voltage MOSFETs

## PACKAGE OPTIONS

- PowerPAK® 8 x 8
- PowerPAK® 10 x 12
- PowerPAK® SO-8DC
- PowerPAK® 1212-F
- PowerPAK® SO-8S



## OPTIMIZING POWER FOR AI SERVERS

AI servers are rapidly emerging as a focal point in today's technology landscape, placing unprecedented demands on AI server power supplies. With heightened requirements for efficiency, power density, and power ratings, power supplies must now meet rigorous standards to support these advanced systems. This AI selector guide is designed to streamline the selection process, enabling designers to efficiently identify solutions that deliver up to 97.5 % efficiency and meet stringent space and performance needs.

## RESOURCES

- For technical support, contact [pmostechsupport@vishay.com](mailto:pmostechsupport@vishay.com)
- For further information, visit [www.vishay.com/en/mosfets/](http://www.vishay.com/en/mosfets/)
- Engineer's Toolbox: [Servers](#)



**RoHS**  
COMPLIANT



# MOSFETS FOR AI SERVER POWER SOLUTIONS

## Low Voltage and High Voltage Superjunction Solutions

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### 25 V to 600 V MOSFET Technology Introduction

#### E Series Superjunction Standard MOSFETs

- 600 V device options
- Best in class PFC or hard-switching topology solutions
- Lowest FOM

#### EF Series Superjunction MOSFETs with Integrated Fast Body Diode

- 600 V device options
- Fast body diode provides as much as a 10x reduction in  $Q_{rr}$  over the standard E Series MOSFET for lifetime control
- 2x reduction in charge and discharge time over the competition
- Designed and developed for soft-switching topologies such as LLC resonant converters

#### Gen IV and Gen V Low / Medium Voltage MOSFETs

- 25 V to 100 V device options
- Optimized combination of  $R_{DS(on)}$ ,  $Q_g$ , and  $C_{oss}$



# MOSFETS FOR AI SERVER POWER SOLUTIONS

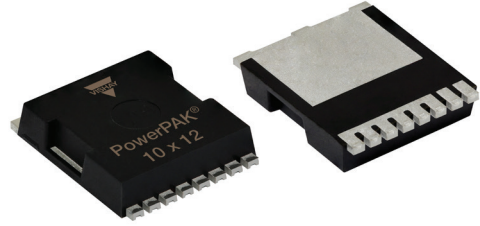
## Low Voltage and High Voltage Superjunction Solutions

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### Available in Latest Surface-Mount Packages

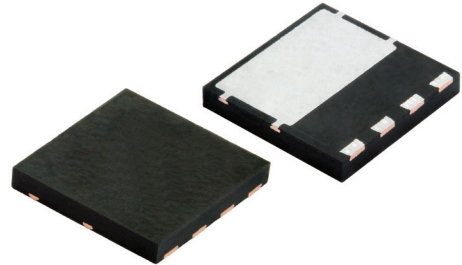
#### PowerPAK® 10 x 12

- Low profile: 9.9 mm x 11.7 mm x 2.3 mm
- TO-leadless package
- Integrated Kelvin source connection



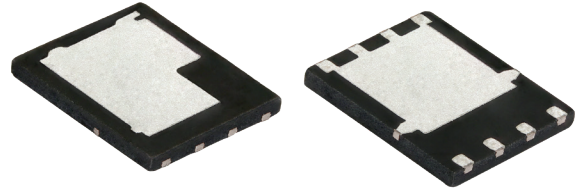
#### PowerPAK® 8 x 8

- Low profile: 8 mm x 8 mm x 1 mm
- Integrated Kelvin source connection
- Fully RoHS-compliant, halogen-free, and 100% lead (Pb)-free



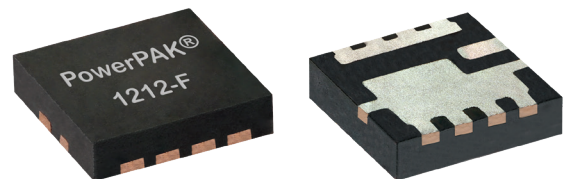
#### PowerPAK® SO-8DC

- Low profile: 6 mm x 5 mm x 0.61 mm
- Excellent  $R_{DS(on)} * Q_g$  and  $R_{DS(on)} * Q_{oss}$  FOMs for switchmode power supply designs
- High performance products that improve efficiency of power conversion and increase power density
- SiDRXXEP: 175 °C junction temperature upgrade



#### PowerPAK® 1212-F

- Low profile: 3.3 mm x 3.3 mm x 0.75 mm
- Source flip to optimal layout
- Thermal performance improved
- Center gate design for easy parallel MOSFET





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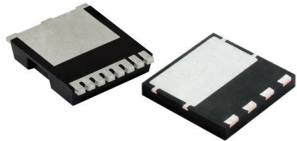
# MOSFETS FOR AI SERVER POWER SOLUTIONS

## Low Voltage and High Voltage Superjunction Solutions

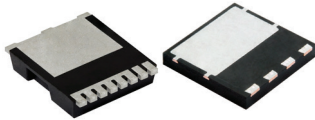
### AI Server Power Solutions

#### E and EF Series

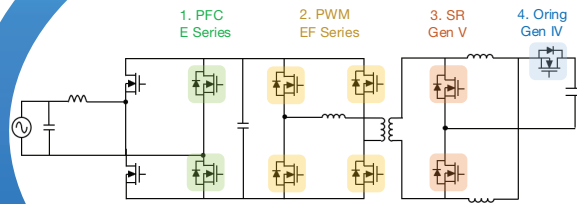
- Best in class PFC & DC/DC solutions
- **SJ4 E + PowerPAK® 10 x 12**
- **SJ4 E + PowerPAK® 8 x 8**
- Lowest FOM
  - SiHK045N60E
  - SiHK055N60E
  - SiHH068N60E



- **SJ4 EF + PowerPAK® 10 x 12**
- **SJ4 EF + PowerPAK® 8 x 8**
  - SiHK045N60EF
  - SiHK055N60EF
  - SiHK075N60EF
  - SiHH070N60EF



AC/DC Power Architecture



High performance solutions for all sockets



**High Power, High Efficiency, High Power Density**

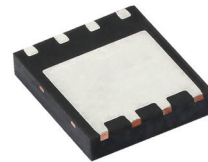
#### SR Gen V Med Voltage

- **Low combination of  $R_{DS(on)}$ ,  $Q_g$  and  $C_{oss}$** 
  - SiR58XDP - 80 V Series
  - SiRS5800DP - 80 V Series
  - SiR51XDP - 100 V Series
  - SiRS5100DP - 100 V Series



#### OR-ing Gen IV and V Low Voltage

- **Ultra Low  $R_{DS(on)}$** 
  - SiR580DP - 80 V Series
  - SiRS5800DP - 80 V Series





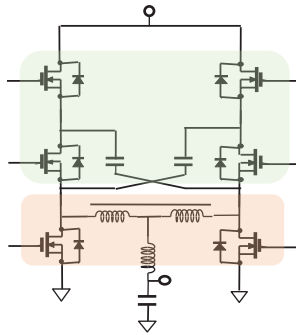
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# MOSFETS FOR AI SERVER POWER SOLUTIONS

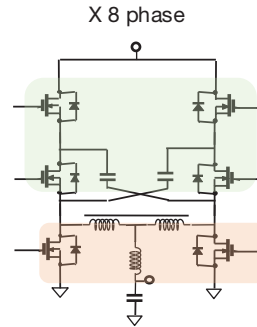
## Low Voltage and High Voltage Superjunction Solutions

### AI Server Opportunity

Main Board Diagram – 1 (DC/DC Brick)



Main Board Diagram – 2 (PDB)

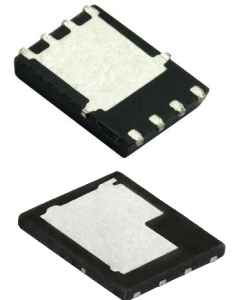
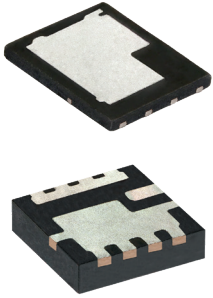


**Main Board BOM Contents:**

- **PowerPAK® SO-8DC**  
SiDR5802EP / SiDR626EP
- **PowerPAK® 1212-8-F**  
SiSD5806DN / SiSD4604LDN

**Main Board BOM Contents:**

- **PowerPAK® SO-8**  
SiR626LDP / SiR680ADP
- **PowerPAK® SO-8DC**  
SiDR626LDP / SiDR680ADP





# MOSFETS FOR AI SERVER POWER SOLUTIONS

## Low Voltage and High Voltage Superjunction Solutions

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### LOW VOLTAGE MOSFETs

Part Number	Package	$V_{DS}$	$V_{GS}$	$R_{DS(on)}$ (Ω) Max.	$R_{DS(on)}$ (Ω) Max.	$R_{DS(on)}$ (Ω) Max.	$Q_g$ (nC) Typ.	$Q_{gs}$ Typ.	$Q_{gd}$ Typ.	$I_D$ (A)	$R_{\theta}$ Typ. (Ω)
		(V)	(V)	$V_{GS} = 10\text{ V}$	$V_{GS} = 7.5\text{ V}$	$V_{GS} = 4.5\text{ V}$	$V_{GS} = 10\text{ V}$	(nC)	(nC)	$T_C =$	
<a href="#">SiJK5100E</a>	PowerPAK® 10x12	100	20	0.0014	0.0016		131	53	5.3	417	0.8
<a href="#">SiRS5100DP</a>	PowerPAK® SO-8S	100	20	0.0025	0.0029		68	24	5.1	225	1.4
<a href="#">SiDR510EP</a>	PowerPAK® SO-8DC	100	20	0.0036	0.0042		54	23.3	3	148	1.15
<a href="#">SiR510DP</a>	PowerPAK® SO-8	100	20	0.0036	0.0042		54	23.3	3	126	1.15
<a href="#">SiR5102DP</a>	PowerPAK® SO-8	100	20	0.0041	0.0056		33.7	15.7	1.7	110	1.15
<a href="#">SiR512DP</a>	PowerPAK® SO-8	100	20	0.0045	0.0051		41	17.9	2.3	100	1.05
<a href="#">SiSD5110DN</a>	PowerPAK® 1212-F	100	20	0.0095	0.0115		19.3	8	1.2	55	0.84
<a href="#">SiRS5800DP</a>	PowerPAK® SO-8S	80	20	0.0018	0.0023		81	31	7.6	265	1.3
<a href="#">SiDR5802EP</a>	PowerPAK® SO-8DC	80	20	0.0029	0.004		37.3	16.5	3.2	153	1.1
<a href="#">SiR580DP</a>	PowerPAK® SO-8	80	20	0.0027	0.0032		50.6	22	3.9	146	1.1
<a href="#">SiSD5806DN</a>	PowerPAK® 1212-F	80	20	0.0069	0.0086		22	8.8	1.8	64	0.45
<a href="#">SiRS4600DP</a>	PowerPAK® SO-8S	60	20	0.00115	0.0013		108	33	14	334	1.2
<a href="#">SiDR626EP</a>	PowerPAK® SO-8DC	60	20	0.00174	0.0021		68	25	7.4	227	0.62
<a href="#">SiR626DP</a>	PowerPAK® SO-8	60	20	0.0017	0.002		68	21	8.2	100	0.91
<a href="#">SiSD4604LDN</a>	PowerPAK® 1212-F	60	20	0.0034		0.0051	42	8.5	5.5	91	0.6
<a href="#">SiJK140E</a>	PowerPAK® 10x12	40	20	0.00047			312	84	70	795	1.1
<a href="#">SiRS4400DP</a>	PowerPAK® SO-8S	40	20	0.00069		0.00096	195	45	18	440	0.95
<a href="#">SiDR402EP</a>	PowerPAK® SO-8DC	40	20	0.00088		0.00116	110	22.5	9.5	291	0.88
<a href="#">SiR638ADP</a>	PowerPAK® SO-8	40	20	0.00088		0.00116	110	22.5	9.5	100	0.88
<a href="#">SiRS4300DP</a>	PowerPAK® SO-8S	30	20	0.0004		0.00068	180	40	18	680	1.4
<a href="#">SiRS4302DP</a>	PowerPAK® SO-8S	30	20	0.00057		0.00083	153	30	17	478	1.2
<a href="#">SiDR500EP</a>	PowerPAK® SO-8DC	30	16	0.00047		0.00068	120	25.6	8.7	421	0.9
<a href="#">SiR500DP</a>	PowerPAK® SO-8	30	16	0.00047		0.00068	120	25.6	8.7	350	0.9
<a href="#">SiSD5300DN</a>	PowerPAK® 1212-F	30	16	0.00087		0.0013	59	12	4.4	198	0.8
<a href="#">SiRA20DDP</a>	PowerPAK® SO-8	25	16	0.00061		0.0082	121	27	6.7	337	1.1



# MOSFETS FOR AI SERVER POWER SOLUTIONS

## Low Voltage and High Voltage Superjunction Solutions

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### E SERIES HIGH VOLTAGE MOSFETs

Part Number	Package	V <sub>DS</sub>	V <sub>GS</sub>	R <sub>DS(on)</sub> (Ω) Max.	Q <sub>g</sub> (nC) Typ.	Q <sub>gs</sub> Typ.	Q <sub>gd</sub> Typ.	I <sub>D</sub> (A)	R <sub>g</sub> Typ. (Ω)
		(V)	(V)	V <sub>GS</sub> = 10 V	V <sub>GS</sub> = 10 V	(nC)	(nC)	T <sub>C</sub> =	
<a href="#">SiHK045N60E</a>	PowerPAK® 10x12	600	± 30	0.049	65	28	14	48	0.8
<a href="#">SiHK055N60E</a>	PowerPAK® 10x12	600	± 30	0.056	54	26	11	42	0.8
<a href="#">SiHH068N60E</a>	PowerPAK® 8x8	600	± 30	0.068	53	17	20	34	0.7

### EF SERIES HIGH VOLTAGE MOSFETs

Part Number	Package	V <sub>DS</sub>	V <sub>GS</sub>	R <sub>DS(on)</sub> (Ω) Max.	Q <sub>g</sub> (nC) Typ.	Q <sub>gs</sub> Typ.	Q <sub>gd</sub> Typ.	I <sub>D</sub> (A)	R <sub>g</sub> Typ. (Ω)
		(V)	(V)	V <sub>GS</sub> = 10 V	V <sub>GS</sub> = 10 V	(nC)	(nC)	T <sub>C</sub> =	
<a href="#">SiHK045N60EF</a>	PowerPAK® 10x12	600	± 30	0.052	70	29	15	47	1.2
<a href="#">SiHK055N60EF</a>	PowerPAK® 10x12	600	± 30	0.058	60	26	14	40	0.7
<a href="#">SiHK075N60EF</a>	PowerPAK® 10x12	600	± 30	0.071	48	20	21	33	0.7
<a href="#">SiHH070N60EF</a>	PowerPAK® 8x8	600	± 30	0.071	50	20	17	36	0.7