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# SQZF140ELPW Integrated 40 V Half-Bridge MOSFETs

## Enabling More Compact and Efficient Automotive Power Management Systems



### ADVANTAGE

The SQZF140ELPW reduces component counts and enables higher switching frequencies and power density for DC/DC converter designs.

### KEY PRODUCT FEATURES

- ✓ AEC-Q101 qualified,  $T_J = +175\text{ }^{\circ}\text{C}$
- ✓ Two internally connected MOSFETs in a half-bridge configuration
- ✓ Internally formed switch node reduces external PCB traces and associated parasitics
- ✓ Optimized pin configuration for synchronous buck and buck-boost converters
- ✓ Wettable flanks promote solder fillet formation and enables AOI

2 discrete packages  $\sim 62\text{ mm}^2$



PowerPAIR integrated solution  $\sim 31\text{ mm}^2$

### MARKETS AND APPLICATIONS



#### MOBILITY

- Automotive
- 12 V systems
- Battery management
- DC/DC converters, including synchronous buck
- Motor drive control

#### Key Product Benefits

On-resistance	↓
$R_{DS-Q_g}$ FOM	↓
Power losses	↓
Component count	↓
PCB real estate requirement for MOSFETs	↓
Passive and magnetic component size	↓
Energy efficiency	↑
Current output	↑
Power density	↑
Board-level reliability	↑

### RESOURCES



[Product Page](#)



[Related Documents](#)

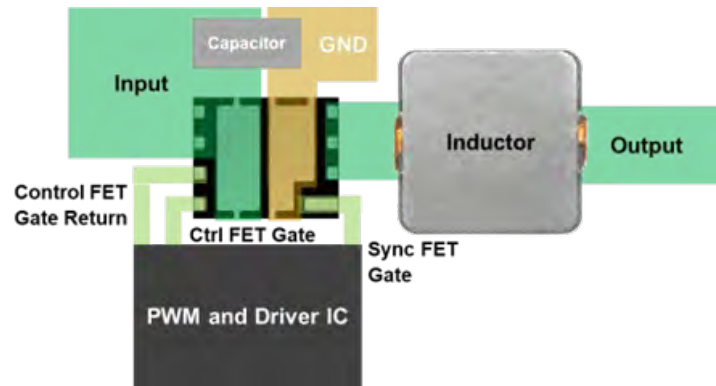


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## ADDITIONAL BENEFITS

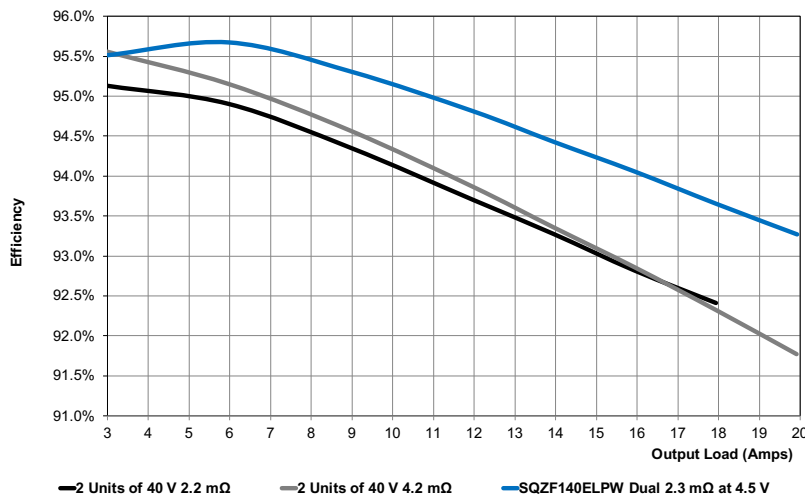
- Integration reduces component count - combining high side "control" FET and low side "synchronous" FET in a single package
- Achieves higher efficiency at higher switching frequencies than discrete components, allows use of smaller capacitors and magnetic components
- Simplifies PCB designs
- Low  $R_{DS(ON)}$  reduces power loss
- Logic level operation

## System Block Diagram



### Efficiency vs. Load at 500 kHz Switching

12 VIN / 5 Vout / 5.5 VGS / 1.5  $\mu$ H Inductor



Our internal test compared the SQZF140ELPW with two discrete MOSFETs with similar  $R_{DS(ON)}$  in a synchronous buck converter for the conversion of a 12 V input to a 5 V output. While switching at 500 kHz, the converter circuit using the SQZF140ELPW demonstrated 1.5 % higher efficiency than the discrete solutions, and reduced power losses. The PowerPAIR<sup>®</sup> 6 x 5FSW also utilizes a 50 % smaller PCB real estate area for the MOSFETs. The increased frequencies and faster transient response allow for the use of smaller magnetic and passive components, enabling higher power density.