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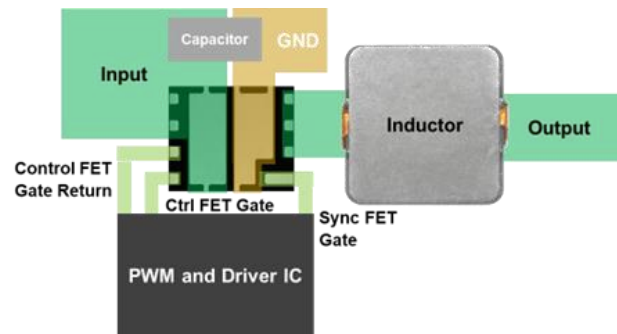
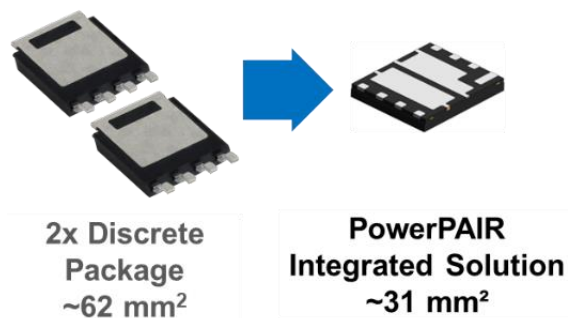
Fast Facts



Product Group: Vishay Siliconix, Automotive MOSFETs / January 2025

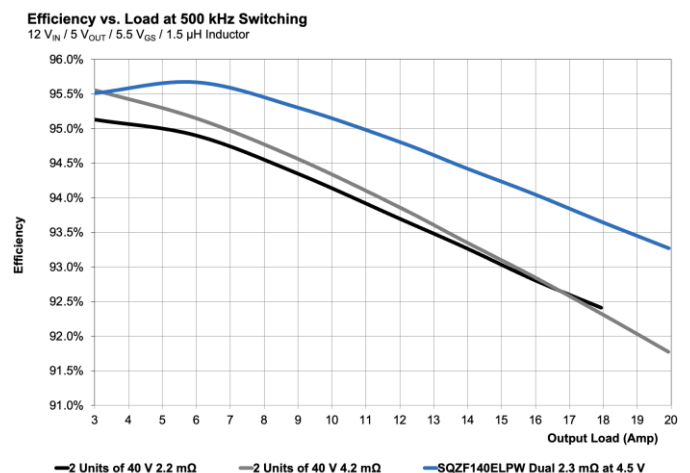
SQZF140ELPW 40 V Integrated Dual MOSFET in Half-Bridge Configuration for Automotive Power Management Applications

Vishay has introduced the SQZF140ELPW, a dual 40 V n-channel MOSFET in the PowerPAIR® 6 x 5FSW package. Built on the latest 40 V TrenchFET® Gen IV technology, this AEC-Q101 qualified, Automotive Grade device features a pair of n-channel MOSFETs with a maximum $R_{DS(ON)}$ of 1.5 m Ω .



Within the PowerPAIR 6 x 5FSW package, the two 1.5 m Ω devices are connected in a half-bridge configuration, which reduces the external traces required to form the switch node. As the connection between the source of the high side control FET and the drain of the low side synchronous FET are made in the package, the PCB traces can be reduced to diminish the negative impact of parasitic inductance. In addition, the pin configuration is optimized for the capacitor's placement, and the enlarged source terminal maximizes the contact surface to the PGND to improve thermal transfer.

The result is a more elegant design for the power management circuit that is better optimized for higher switching frequencies. The increased frequencies and faster transient response allow for the use of smaller magnetic and passive components, enabling higher power density. Our internal test compared the SQZF140ELPW with discrete MOSFETs of similar $R_{DS(ON)}$ in a synchronous buck converter for the conversion of a 12 V input to a 5 V output. The converter circuit using the SQZF140ELPW demonstrated 1.5 % higher efficiency than the discrete solutions, and reduced power losses. The PowerPAIR 6 x 5FSW also utilizes a 50 % smaller PCB real estate area and potentially enables designs with higher power density.





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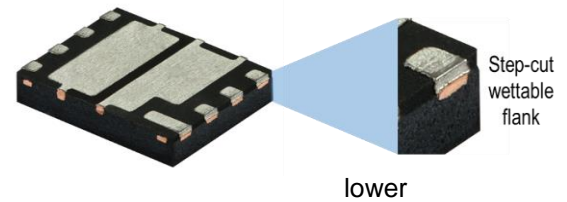


Furthermore, the package features wettable flank terminals, which promote solder fillet formation and enables automotive optical inspection (AOI) to ensure the integrity of the solder joint. This enhances board-level reliability and improves quality.

The SQZF140ELPW offers a maximum junction temperature up to 175 °C, which leads to an extended lifetime compared to devices with temperature ratings.

Product Benefits:

- Low $R_{DS(ON)}$ reduces conduction loss
- Excellent $R_{DS} \cdot Q_g$ FOM for fast switching applications
- Logic-level operation
- Integration reduces components
- Increases power density
- Simplifies PCB layout
- Enables higher switching frequencies and the utilization of smaller magnetic and passive components



Market Applications:

- 12 V board net and secondary power distribution
- Buck-boost converter
- Synchronous buck converter
- Non-isolated DC/DC conversion
- Motor drive control

The Key Specifications:

Package	Part Number	Ch.	V_{DS} (V)	V_{GS} (V)	$R_{DS(ON)}$ (m Ω) @ $V_{GS} = 10$ V		$R_{DS(ON)}$ (m Ω) @ $V_{GS} = 4.5$ V		Q_g typ. @ $V_{GS} = 10$ V (nC)	$R_{DS} \cdot Q_g$ FOM @ $V_{GS} = 10$ V (m $\Omega \cdot$ nC)
					Tyo.	Max.	Tyo.	Max.		
PowerPAIR 6 x 5FSW	SQZF140ELPW	N	40	± 20	1.25	1.5	1.85	2.4	72	90
		N	40	± 20	1.25	1.5	1.85	2.4	72	90

The SQZF140ELPW has been released to production and is ready for sampling and order entry.

Useful Links

- [Datasheet](#)
- [Product Page](#)
- [Automotive Grade MOSFETs](#)

Contact Information

Technical Support

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