ISSUE: October 2024

40-V MOSFETs For Automotive Motors And Low-Power Control Systems

Magnachip Semiconductor's AMDV040N029LVRH, AMDV040N036LVRH, AMDV040N042LVRH and AMDV040N048VRH are 40-V MXT MV MOSFETs designed in power dual flat no-lead (PDFN) 33 packages for automotive applications. (MXT stands for Magnachip eXtreme Trench Medium Voltage MOSFET.)

According to the company, the PDFN 33 package reduces the device area by more than 60% and the weight by approximately 75% when compared to 40-V MOSFETs packaged in the PDFN56. This small size makes them even more suitable for automotive motors and low-power control systems, where performance, fuel efficiency, and space flexibility are crucial.

Three of these models—the AMDV040N029LVRH, AMDV040N036LVRH, and AMDV040N042LVRH—are distinguished by their low gate-threshold voltage of 1.8 V, which reduces the energy required to operate the MOSFET, thereby decreasing the overall power consumption of the system. Another device, the AMDV040N048VRH offers a gate threshold voltage of 3.0 V. Other key specifications are listed in the table.

For further details and a datasheet, see Magnachip's Automotive Solutions page.

Table. Key specifications for Magnachip's AEC-Q101, automotive 40-V MXT MV MOSFETs in the PDFN33.

Product	V_{DS} (V)	$V_{GS(th)}$, typ. (V)	$R_{DS(ON)}$ (mΩ) at V_{GS}=4.5 V		$R_{DS(ON)}$ (mΩ) at V_{GS} = 10 V		Q_g typ. (nC) at V_{GS} = 1 0 V
			Typ.	Max.	Typ.	Max.	
AMDV040N029LVRH	40	1.8	3.8	5.0	2.5	2.9	30
AMDV040N036LVRH	40	1.8	4.2	6.0	2.7	3.6	27
AMDV040N042LVRH	40	1.8	4.8	6.9	3.1	4.2	22
AMDV040N048VRH	40	3.0	-	-	3.5	4.8	21