Product Overview

DRV8317 versus Competitor M

What are the Differences Between the DRV8317 and Competitor M's M-drive?

The DRV8317 and Competitor M's M-drive are integrated FET brushless DC motor drivers. Although they are similar at a high level, the DRV8317 offers key features and component integration which set it apart from the competitor. Table 1 highlights the key features that differentiate the two devices:

Table 1. Key Features Differentiating the Two Devices

Feature	DRV8317	M-drive
3× Current Sense Amplifiers	Integrated	External example component: INA181A1IDBVR
3.3 regulator	Integrated	External example component: TPS715A33DRVR
Package size (L x W) (square mm)	5 × 4 = 20 square mm	5 × 5 = 25 square mm
100% duty cycle capable?	Yes	No
Adjustable slew rate	Yes	No
Control Interface	3× PWM 6× PWM	3× PWM
SPI Variant Available?	Yes	No
Protection Features	VM under voltage lockout, VM over voltage protection, Charge pump under voltage, Over current protection, Over temperature warning and shutdown	Bottom gate driver under voltage, Top gate driver under voltage, Over current protection, Over temperature shutdown
Typical RDS(ON) (HS+LS) (mΩ)	130	140
Peak Output Current (A)	5	5.5
Operating Voltage	4.5 – 20 V	5 – 26 V
Absolute Maximum Voltage	24 V	28 V
Vs Shutdown Current (µA)	3	30
Package Type	WQFN	QFN
Pin count	36	40

Given that Competitor M's M-drive does not integrate some of the features that are included in the DRV8317, we can estimate the additional cost required to implement these features externally. The three Current Sense Amplifiers are estimated to cost an additional $0.09 each for a total of $0.27 per board, and these components can require an extra 25 square millimeters of board area each for a total of 75 square millimeters. Meanwhile, the 3.3 V linear regulator is estimated to cost an additional $0.18 per board and can require an extra 12 square millimeters of board area. The DRV8317 integrates both of these features into a single 20 square millimeter package.

The DRV8317 and Competitor M's M-drive are both integrated FET drivers with similar power output. However, there are key differences which separate the two devices. The DRV8317 has three current sense amplifiers and a 3.3 V LDO which can support a maximum external load of 80 mA, while the M-drive does not have these features. The integration of these components results in a smaller bill-of-materials cost, less board space needed for implementation, and time saved on development in finding additional parts. In addition to the level of feature and component integration which the DRV8317 offers over the M-drive, the DRV8317 comes in a package size that is 5 square millimeters smaller than the M-drive. Furthermore, the DRV8317 has the capability of supporting 100% duty cycle operation because it uses a charge pump and linear regulator to drive the integrated FETs. The M-drive has a bootstrap architecture, which means it cannot support 100% duty cycle operation.

Aside from component integration, the DRV8317 also offers a greater degree of configurability and control over the M-drive. The DRV8317 has configurable settings such as input PWM mode, slew rate, and current sense amplifier gain. It is also available in a SPI variant, which offers an ease of configuration and detailed Fault reporting.

Lastly, the two devices differ in power loss during sleep or operation. While the M-drive can support a higher operating voltage and peak output current than the DRV8317, this comes at the cost of thermal performance. The DRV8317 has a 10x lower shutdown current than the M-drive, which helps preserve battery life in battery operated systems. It also has a lower RDS(ON) value of 130 mΩ in comparison to the 140 mΩ RDS(ON) of the M-drive. This lower RDS(ON) will lead to less power loss during operation through the internal MOSFETs, which results in improved thermal performance.

Altogether, the DRV8317 provides significant added value in addition to optimal performance metrics. The device is well suited for low power applications where board space and thermal performance are primary considerations, and its integrated features (such as SPI communication and current sense amplifiers) provide significant configuration and system monitoring options that are certain to take your system to the next level.

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