Buck Converter IC For ADAS Achieves Highly Stable Operation

ROHM Semiconductor's BD9S402MUF-C is a buck converter IC with built-in MOSFET for automotive applications such as infotainment and ADAS (advanced driver assistance systems) incorporating onboard sensors and cameras. The BD9S402MUF-C supports output voltages down to 0.6 V and 4-A output current at switching frequencies higher than 2 MHz in a compact size demanded by increasingly sophisticated secondary power supply applications for high-performance MCUs and SoCs.

In addition, the buck converter IC incorporates the company's QuiCur high-speed load response technology, which enables stable operation with just 30 mV of output voltage fluctuation given a 0- to 2-A load current step in 2 µs and 5-V input, 1.2-V output and 44-µF output capacitance. According to the vendor, this represents industry-leading performance and translates to a 25% reduction in output voltage fluctuation over class-leading standard products with equivalent functionality (Fig. 1). This makes the buck converter well suited for use in the latest ADAS applications with severe power supply conditions requiring stable operation within 5% even with low voltage output.

The BD9S402MUF-C is also equipped with a new load response performance selection function that allows users to easily switch priority between "voltage fluctuation" (for industry-leading stable operation), and "capacitance reduction" (to ensure stable operation at 22 µF) via terminal setting. The result is that users can significantly reduce the resources required for power circuit design, as stable operation can be easily achieved not only at the initial design, but also during specification or model changes (Fig. 2).

In addition to the BD9S402MUF-C, which specifies ±1.0% output voltage accuracy, Rohm offers a version with ±1.5% output voltage accuracy, the BD9S400MUF-C. See the table.

Samples of the BD9S402MUF are available now with mass production due in April 2023. Samples are available for purchase through online distributors Digi-Key, Mouser, and Farnell. For more information, see the BD9S402MUF page.

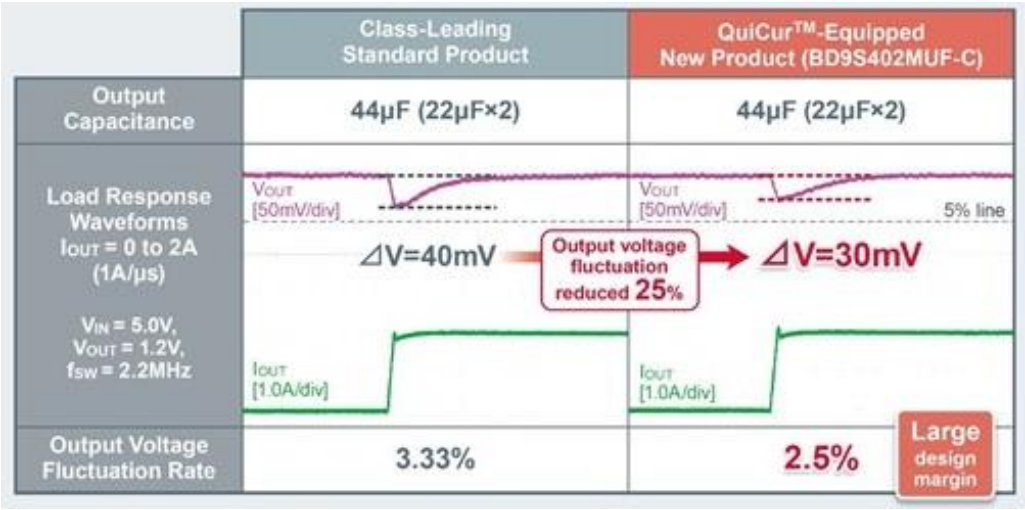

Fig. 1. The BD9S402MUF-C achieves stable operation with just 30-mV fluctuation at 1.2-V output, meeting the ±5% accuracy requirement for next generation ICs even at low output voltages. That output voltage variation represents a 25% improvement versus a competing product when evaluating those that support 4 A of output at 1.2 V.

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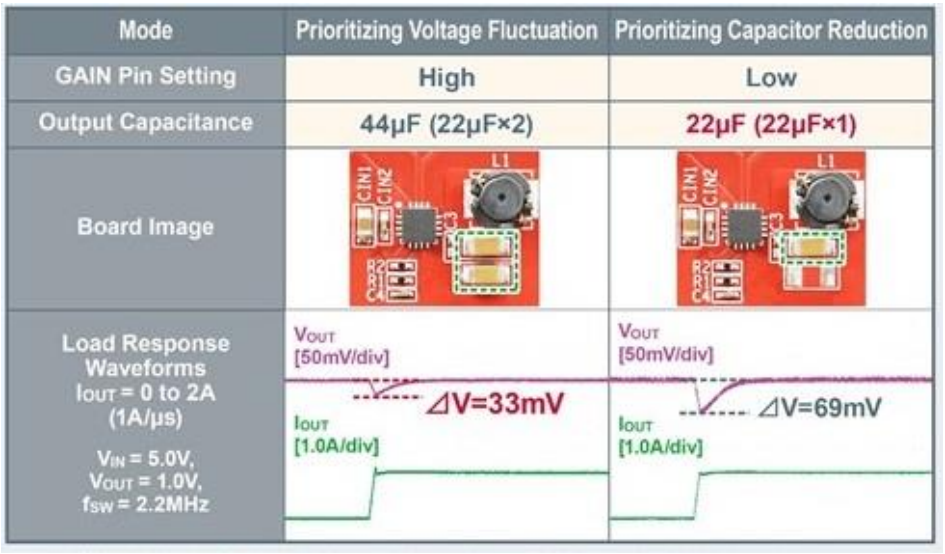

Fig. 2. The BD9S402MUF enables selection of the priority load response performance by setting the GAIN pin.

Table. Key specs for the BD9S402MUF-C 4-A buck converter IC and the related BD9S400MUF-C.

Part number	Input voltage (V)	Output voltage (V)	Output current, max (A)	Output voltage accuracy (%)	Switching frequency	Output capacitance (µF)	QuiCur technology	Operating temperature (°C)
BD9S402MUF-C	2.5 to 5.5	0.6 to V_{IN} x 0.75	4.0	±1.0	2.2 ±0.2	22/44	Yes	-40°C to +125°C
BD9S400MUF-C	2.7 to 5.5	0.8 to V_{IN} x 0.8		±1.5		22 to 470	No	

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