Switching Regulators Offer High Operating Voltage, Wide Temp Range, Small Size

Two new switching regulator series from ROHM Semiconductor, the BD9G101G and the BU9000xGWZ, offer features such as high operating voltage, extended temperature range, and small layout requirements to satisfy high-performance, space-constrained power supply applications. Delivering high efficiency over a wide current load, these regulators are optimized to support a wide range of industrial, consumer and battery-powered power supplies.

ROHM's new switching regulators provide high integration at smaller sizes, allowing designers to reduce space by more than 20% according to the vendor. With increased efficiency and wide voltage input capabilities, designers can implement reduced power and energy saving features that improve system reliability for a broad range of applications.

The BD9G101G gives power supply designers a wide operating voltage range from 6 V to 42 V with extended operating temperature (-40°C to 105°C) in a SOT-23 (SSOP-6) package that measures only 2.9 x 2 8 x 1.25 mm. Its fixed 1.5-MHz operating frequency allows the use of small inductors and ceramic capacitors (Fig. 1.) With a 45-V/800-mΩ internal power MOSFET that delivers greater efficiency, this stepdown regulator delivers 0.75 V±1.5% feedback pin voltage and integrates overcurrent protection, undervoltage lockout and thermal shutdown functions. This converter delivers 0.5 A of dc output

The BU9000xGWZ is a high-efficiency synchronous stepdown switching regulator that includes an ultra-low current pulse-frequency modulation (PFM) operating mode and provides up to 1.0 A of load current with an input voltage range from 4.0 V to 5.5 V (Fig. 2.) Featuring built-in FETs, this regulator is offered in an ultra-compact, 1.3-mm x 0.9-mm x 0.4-mm UCSP35L1 package.

The BU9000xGWZ operates with a typical switching frequency as high as 6 MHz (depending on the model) for fast transient response and automatic PFM/PWM mode switching operation to enable high efficiency over both light and heavy loads (Fig. 3.) It also provides internal overcurrent protection, undervoltage lockout and thermal shutdown circuits.

Evaluation boards supporting the two products are available through distribution. For more information, see the BD9G101G datasheet and the BU9000xGWZ datasheet.

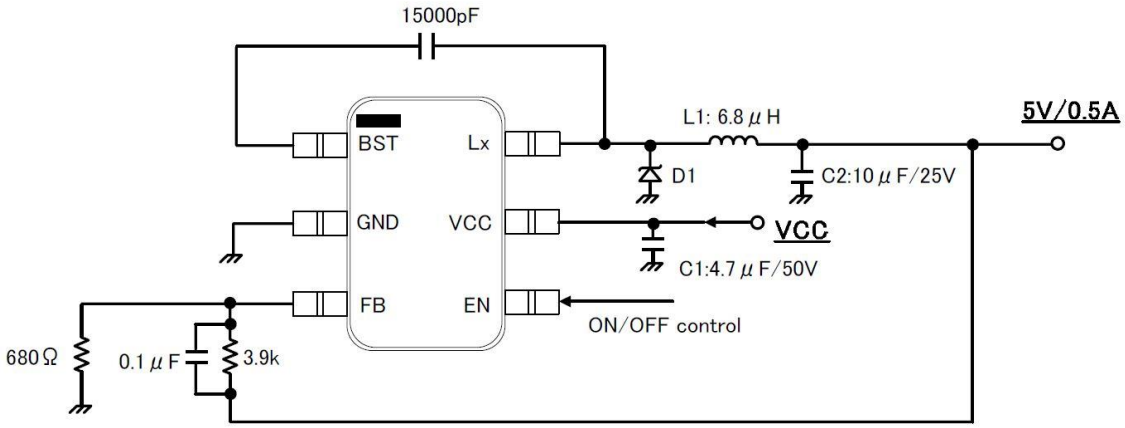

Fig. 1.Typical application circuit for the BD9G101G, a switching regulator featuring an integrated 45-V, 800-mΩ power switch. Housed in a 6-pin SOT-23, this regulator operates over an input range of 6 V to 42 V with a fixed switching frequency of 1.5 MHz. It provides 0.5 A output.

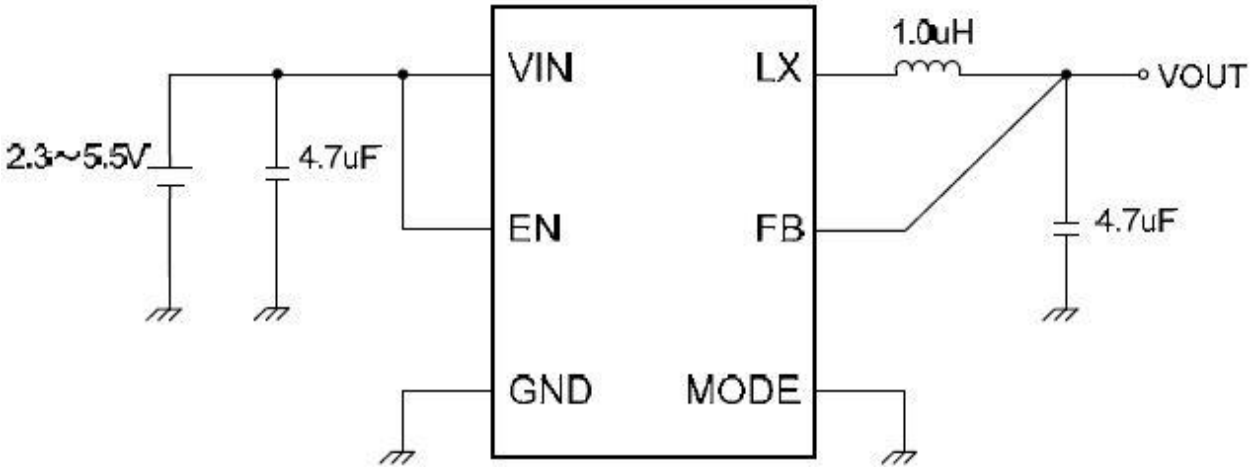

Fig. 2. Typical application circuit for the BU9000xGWZ. This 1-A synchronous switching regulator with built-in power switches, operates at a typical switching frequency ranging from 4 to 6 MHz, depending on the model, while in PWM mode. This device is housed in a 1.3- x 0.9- x 0.4-mm chipscale package.

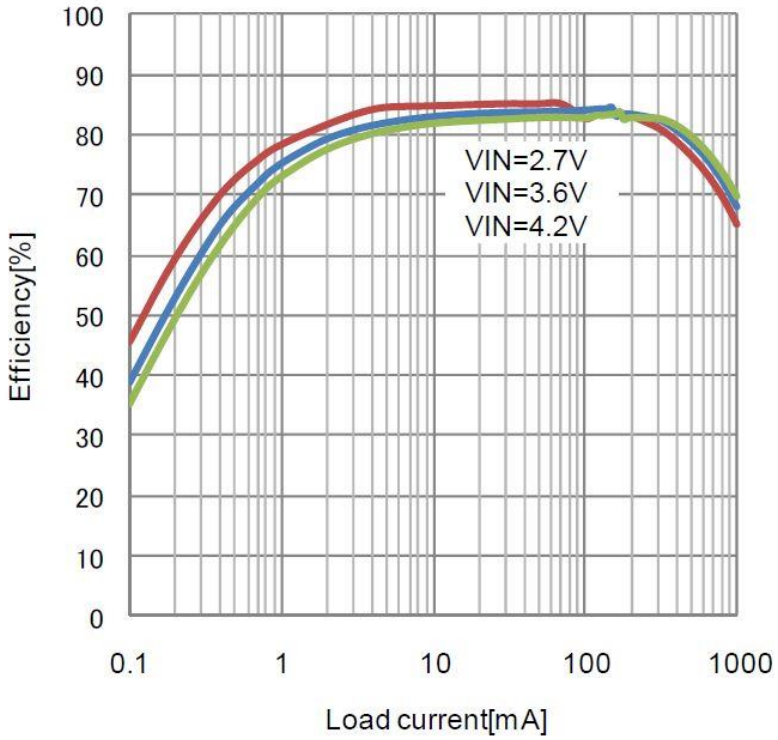

Fig. 3. The BU9000xGWZ—in this case, the BU90003GWZ which produces a 1.2-V output—switches automatically between PWM and PFM modes to achieve high efficiency over the load range.