



PRODUCT OVERVIEW

The Marvell® DSP Switcher™ MVPG15/16/30/31 integrated DC-DC regulators are ultra-high performance, digitally controlled, single and dual-output voltage regulators. These products include a synchronous step-down (buck) switching regulator and an on-chip LDO regulator controller housed in tiny 3mm x 4mm DFN-12 packages. The ultra-high efficiency step-down regulators are based on innovative DSP-based architecture and fully integrated with on-board power MOSFETs and internal frequency compensation. The internal compensation simplifies design, reduces external component count and allows the use of low-ESR output capacitors.

The switching regulator features switching frequency of 1 MHz, allowing the use of low profile surface mount inductors and low value capacitors. The output voltage range is programmable using a single resistor and ranges from 0.72V to 3.63V. The Marvell proprietary "single-resistor" programming scheme simplifies design and improves system immunity to component tolerances and noise. The switching regulators are available in 1A (MVPG15/16) and 2A (MVPG30/31) continuous output current versions. Undervoltage, short-circuit and thermal protection are built-in.

The on-chip LDO regulator controller (MVPG15/30), with an external P-channel MOSFET forms a low dropout regulator capable of driving 800mA output current. The output voltage of the LDO regulator is internally fixed. LDO voltage options are listed in the product selection table. Current limiting protection is adjustable for each application.

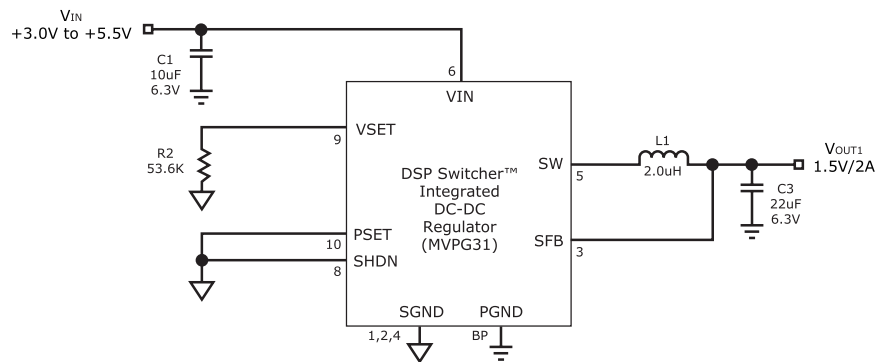


Fig 1. DSP Switcher™ Integrated DC-DC Regulator (MVPG31) Application Diagram

FEATURES

- Small 3mm x 4mm DFN-12 package
- Integrated power MOSFETs
- 1 MHz switching frequency
- Digital Pulse Width Modulation (PWM) control
- Internal frequency compensation
- Over 95% efficiency
- High peak switch current limit: 3.0A
- Input voltage range at 3.0V to 5.5V
- "Single-resistor" programmable output voltage for the step-down regulator

BENEFITS

- Minimizes board space with smallest footprint in the industry
- Integration reduces component count and board space, while achieving superior performance
- Allows the use of small, low profile surface-mount inductors and small capacitors
- Fast loop/load transient response. Adaptive algorithm for better performance across operating range.
- Simplifies design, minimizes board space and reduces the amount of external components
- Superior performance, longer battery life and less power dissipation
- Supports a variety of applications including modern mobile CPUs
- Makes the device well-suited for portable applications. Ideal for single-cell Li-ion.
- Fewer external components, noise immunity and component tolerance immunity





FEATURES

- Output voltage range (step-down regulator: 0.72V to 3.63V)
- Up to +/-10% output "voltage trimming"
- P-channel LDO regulator controller with programmable current limit (MVPG15/30)
- Built-in undervoltage lockout, cycle-by-cycle current limit and thermal shutdown

BENEFITS

- Supports the latest low-voltage, low power VLSI designs
- Allows easy system characterization (corner testing)
- Built-in LDO controller further reduces external component requirements
- Reliable and safe system operation

APPLICATIONS

The Marvell DSP Switcher MVPG regulators are ideal for a range of power supply applications, such as hand-held, portable and desktop computing, mobile communications, consumer electronics, datacom point-of-load, DSP, and storage. Small solution size and ultra-high efficiency make these devices particularly suited to battery-powered equipment.

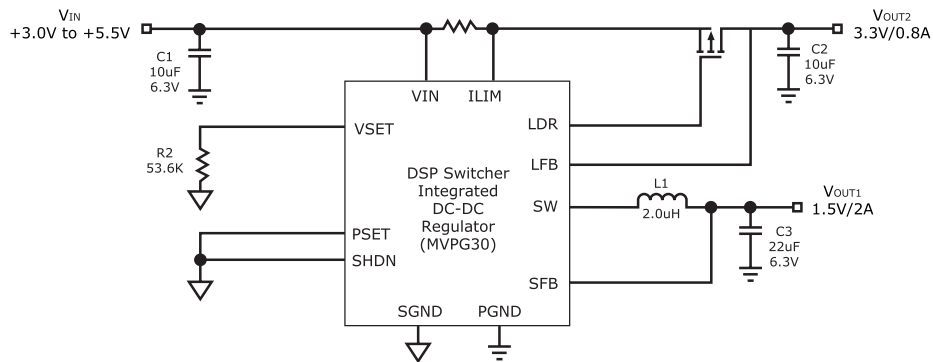


Fig 2. DSP Switcher Integrated DC-DC Regulator (MVPG30) Application Diagram (Dual Output)

Part Numbers	Input Voltage Range (V)	Number of Outputs	Buck Output Current	Buck Output Voltage (V)	LDO Output Voltage (V)	LDO Output Current	Package Type
MVPG31	3.0-5.5	1	2A	0.72-3.63	N/A	N/A	3mm x 4mm DFN-12
MVPG30	3.0-5.5	2	2A	0.72-3.63	2.5V to 3.45V	800mA	3mm x 4mm DFN-12
MVPG16	3.0-5.5	1	1A	0.72-3.63	N/A	N/A	3mm x 4mm DFN-12
MVPG15	3.0-5.5	2	1A	0.72-3.63	2.5V to 3.45V	800mA	3mm x 4mm DFN-12

Fig 3. DSP Switcher Integrated DC-DC Regulators (MVPG15/16/30/31) Product Selection Guide

THE MARVELL ADVANTAGE: The Marvell DSP Switcher MVPG15/16/30/31 integrated DC-DC regulators come with a complete set of hardware and software development tools to assist network hardware engineers with product evaluation. Marvell's worldwide field applications engineers collaborate closely with network equipment vendors to develop and deliver new competitive products to market on time. Marvell utilizes recognized world-leading semiconductor foundry and packaging services to reliably deliver high-volume and low cost total solutions.

For more information, visit our website at www.marvell.com.



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MVPG15/16/30/31-001 2/04

Patent Pending