

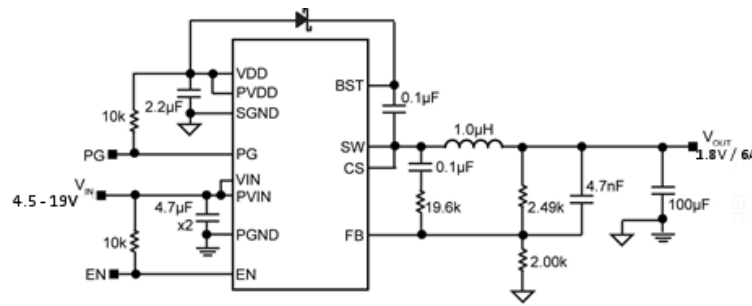
Brief Description

The ZSPM4022-06 is a constant-frequency, synchronous DC/DC buck regulator featuring adaptive on-time control architecture. The ZSPM4022-06 operates over a 4.5V to 19V supply range (12V typical). It has an internal linear regulator that provides a regulated 5V to power the internal control circuitry. The ZSPM4022-06 operates at a constant 600kHz (typical) switching frequency in continuous-conduction mode and can be used to provide up to 6A of output current. The output voltage is adjustable from 5.5V down to 0.8V.

Under medium to heavy loads, the ZSPM4022-06 provides high efficiency and ultra-fast transient response via its rapid-control architecture. Under light load conditions, it maintains high efficiency and a superior transient response by transitioning to variable-frequency, discontinuous mode operation with its ultra-light-load architecture.

The ZSPM4022-06 offers a full suite of protection features to ensure protection of the IC during fault conditions. These include under-voltage lockout to ensure proper operation under power-sag conditions; thermal shutdown; internal soft-start to reduce inrush current; foldback current limiting; and “hiccup” mode short-circuit protection. The ZSPM4022-06 includes a power good (PG) output to allow simple sequencing.

ZSPM4022-06 Typical Application



Benefits

- Ultra-light load efficiency – up to 80% at 10mA
- Up to 95% efficiency
- Feedback reference accuracy as high as ±1%

Features

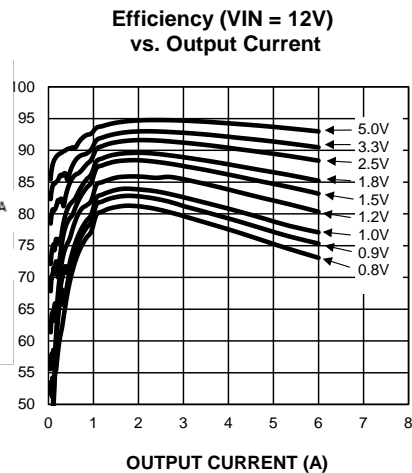
- Rapid-control architecture enables operation with a high input/output voltage ratio (e.g., $V_{IN} = 19V$ and $V_{OUT} = 0.8V$) and small output capacitance
- Adjustable output voltage from 0.8V to 5.5V
- Universally compatible with most output capacitors—stable with zero to high ESR
- Power good (PG) output
- Foldback current limiting and “hiccup” mode short-circuit protection
- Safe start-up into pre-biased loads

Available Support

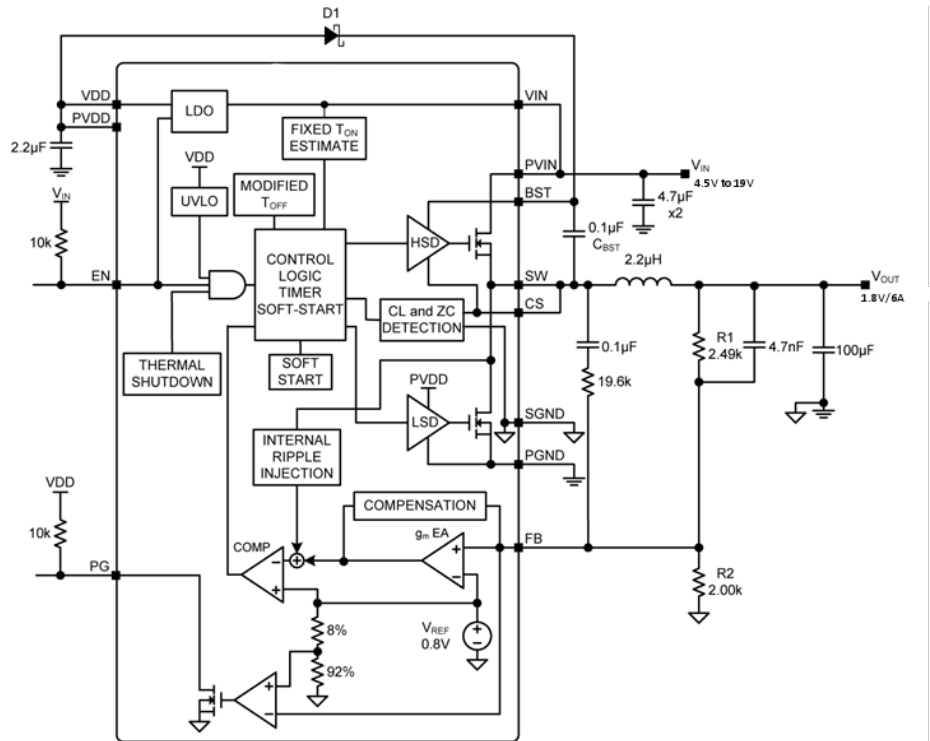
- Evaluation Kit
- Support documentation

Physical Characteristics

- Input voltage range: 4.5V to 19V
- Output current: up to 6A
- Switching frequency: 600kHz
- Junction temperature: -40°C to +125°C
- 28-pin 5mm × 6mm QFN package



ZSPM4022-06 Functional Diagram



Typical Applications

- ❖ Servers, work stations
- ❖ Routers, switches, and telecom equipment
- ❖ Base stations

Ordering Information

Product Sales Code	Description	Package
ZSPM4022AA1W06	ZSPM4022-06 QFN28 5mmx6mm — Temperature range: -40°C to +125°C	7" reel with 1000 ICs
ZSPM4022-06-KIT	Evaluation Kit for ZSPM4022-06, including ZSPM4022-06 Evaluation Board.	Kit

IMPORTANT NOTICE AND DISCLAIMER

RENESAS ELECTRONICS CORPORATION AND ITS SUBSIDIARIES (“RENESAS”) PROVIDES TECHNICAL SPECIFICATIONS AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THIRD-PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for developers who are designing with Renesas products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. Renesas grants you permission to use these resources only to develop an application that uses Renesas products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Renesas intellectual property or to any third-party intellectual property. Renesas disclaims responsibility for, and you will fully indemnify Renesas and its representatives against, any claims, damages, costs, losses, or liabilities arising from your use of these resources. Renesas' products are provided only subject to Renesas' Terms and Conditions of Sale or other applicable terms agreed to in writing. No use of any Renesas resources expands or otherwise alters any applicable warranties or warranty disclaimers for these products.

(Disclaimer Rev.1.01 Jan 2024)

Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

Contact Information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit www.renesas.com/contact-us/.