RP503x Series

600mA* PWM/VFM Step-down DC/DC Converter with Synchronous Rectifier

The RP503x Series are low supply current CMOS-based PWM/VFM step-down DC/DC converters with synchronous rectifier. RP503x is PWM/VFM auto switching control in which mode automatically switches to high-efficiency VFM mode in low output current. The efficiency in low output current (VFM mode) improved compared with existing products. RP503x includes a soft start circuit, an under-voltage lockout circuit (UVLO), and a latch protection circuit. By simply using an inductor and capacitors as external components, a high-efficiency step-down DC/DC converter can be easily configured.

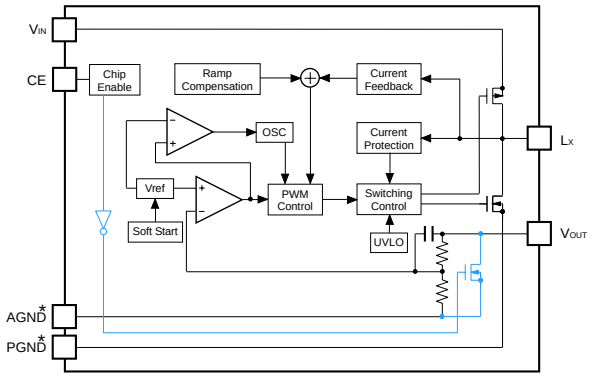
FEATURES

- Supply Current (I_{DD2}) ····· Typ. 20μA (No switching, VFM)
- Standby Current ($I_{standby}$) ····· Typ. 0μA (CE="L")
- Input Voltage Range (V_{IN}) ····· 2.5V to 5.5V (Absolute maximum rating : 6.5V)
- Output Voltage Range (V_{OUT}) ····· 0.8V to 2.5V (Internally fixed)
- Output Voltage Accuracy ····· ± 1.5%
- Output Current (I_{OUT}) ····· 600mA*
- Oscillator Frequency (f_{osc}) ····· 2MHz
- Oscillator Maximum Duty Cycle (Maxduty) · Min. 100%
- UVLO Detect Voltage (V_{UVLO}) ····· Typ. 2.2V
- Soft Start Time (t_{start}) ····· Typ. 0.15ms
- Coil-current Limit Circuit ····· Current limit Typ. 800mA
- Latch Protection Circuit ····· Delay time for protection Typ. 1.5ms
- Auto-discharge Function ····· xx2 Version
- Packages ····· DFN1616-6, SOT-23-5

*) This is an approximate value, because output current depending on conditions and external parts.

BLOCK DIAGRAM

RP503x

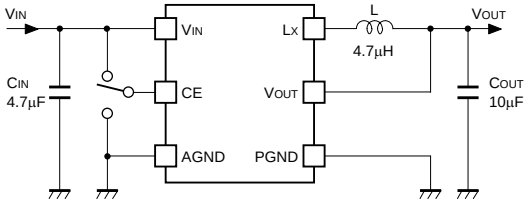


Blue line : RP503xx2A only

* RP503N has only GND pin.
For details, please refer to the datasheet.

TYPICAL APPLICATION

RP503L



L : NR3010T4R7M (TAIYO YUDEN)
CIN : C1608JB0J475K (TDK)
COUT : C1608JB0J106M (TDK)

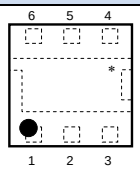
SELECTION GUIDES

Halogen Free	Package	Q'ty per Reel	Part No.
H/F	DFN1616-6	5,000 pcs	RP503L xx*A-TR
H/F	SOT-23-5	3,000 pcs	RP503N xx*A-TR-FE

xx : Specify the output voltage within the range of 0.8V (08) to 2.5V (25) in 0.1V steps.
* : Select from (1) without auto-discharge function or (2) with auto-discharge function.

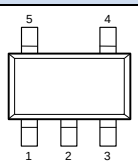
PACKAGES (Top View)

DFN1616-6



1	CE
2	AGND
3	VIN
4	LX
5	PGND
6	VOUT

SOT-23-5

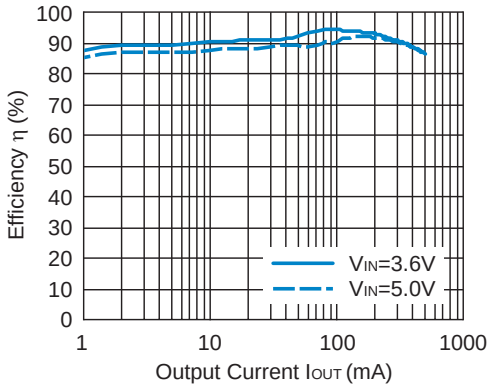


1	VOUT
2	GND
3	LX
4	VIN
5	CE

*) The tab is substrate level (GND).

TYPICAL CHARACTERISTIC

RP503x25xA Efficiency vs. Output Current



APPLICATIONS

- Power source for battery-powered equipment
- Power source for compact HDD
- Power source for hand-held communication equipment, cameras, and VCRs

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http://www.e-devices.ricoh.co.jp/en/

Sales & Support Offices

RICOH ELECTRONIC DEVICES CO., LTD.
Higashi-Shinagawa Office (International Sales)
3-32-3, Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-8655, Japan
Phone: +81-3-5479-2857 Fax: +81-3-5479-0502

RICOH EUROPE (NETHERLANDS) B.V.
Semiconductor Support Centre
Prof. W.H. Keesomlaan 1, 1183 DJ Amstelveen, The Netherlands
Phone: +31-20-5474-309

RICOH ELECTRONIC DEVICES KOREA CO., LTD.
3F, Haesung Bldg, 504, Teheran-ro, Gangnam-gu, Seoul, 135-725, Korea
Phone: +82-2-2135-5700 Fax: +82-2-2051-5713

RICOH ELECTRONIC DEVICES SHANGHAI CO., LTD.
Room 403, No.2 Building, No.690 Bibo Road, Pu Dong New District, Shanghai 201203, People's Republic of China
Phone: +86-21-5027-3200 Fax: +86-21-5027-3299

RICOH ELECTRONIC DEVICES CO., LTD.
Taipei office
Room 109, 10F-1, No.51, Hengyang Rd., Taipei City, Taiwan (R.O.C.)
Phone: +886-2-2313-1621/1622 Fax: +886-2-2313-1623