

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

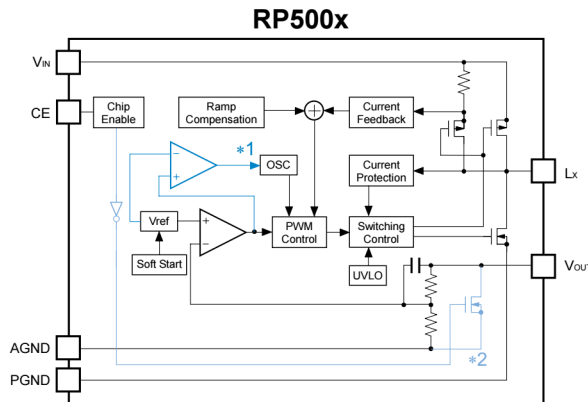
The RP500x Series are low supply current CMOS-based PWM/VFM step-down DC/DC converters with synchronous rectifier. RP500x can be selected from two control types - fixed PWM control or PWM/VFM auto switching control in which mode automatically switches to high-efficiency VFM mode in low output current. RP500x 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<sub>DD1</sub>) ..... Typ. 400μA (Switching)
- Supply Current (I<sub>DD2</sub>) ..... Typ. 100μA (No switching, VFM)
- Supply Current (I<sub>DD2</sub>) ..... Typ. 400μA (No switching, PWM)
- Standby Current (I<sub>standby</sub>) ..... Typ. 0μA (CE="L")
- Input Voltage Range (V<sub>IN</sub>) ..... 2.55V to 5.5V (Absolute maximum rating : 6.5V)
- Output Voltage Range (V<sub>OUT</sub>) ..... 1.1V to 3.3V (Internally fixed)
- Output Voltage Accuracy ..... ± 1.5%
- Output Current (I<sub>OUT</sub>) ..... 600mA\*
- Oscillator Frequency (f<sub>osc</sub>) ..... 1.2MHz
- Oscillator Maximum Duty Cycle (Maxduty) · Min. 100%
- UVLO Detect Voltage (V<sub>UVLO</sub>) ..... Typ. 2.2V
- Soft Start Time (t<sub>start</sub>) ..... Typ. 0.12ms
- Coil-current Limit Circuit ..... Current limit Typ. 900mA
- Latch Protection Circuit ..... Delay time for protection Typ. 1.5ms
- Auto-discharge Function ..... 3, 4 Version
- Packages ..... DFN1616-6, DFN(PLP)1820-6, SOT-23-6W
- Ceramic capacitors can be used ... C<sub>IN</sub>=C<sub>OUT</sub>=10μF or more

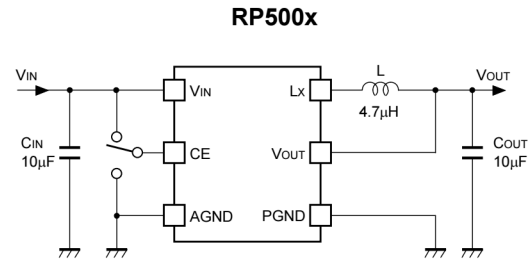
\*) This is an approximate value, because output current depending on conditions and external parts.

### BLOCK DIAGRAM



\*1) This block does not exist in xx2A/xx4A  
\*2) This block does not exist in xx1A/xx2A

### TYPICAL APPLICATION



L : VLF3010AT-4R7MR30  
C<sub>IN</sub>, C<sub>OUT</sub> : C2012JB0J106 (TDK)

### SELECTION GUIDES

Halogen Free	Package	Q'ty per Reel	Part No.
H/F	DFN1616-6	5,000 pcs	RP500Lxx* A-TR
H/F	DFN(PLP)1820-6	5,000 pcs	RP500Kxx* A-TR
H/F	SOT-23-6W	3,000 pcs	RP500Nxx* A-TR-FE

- xx : Specify the output voltage within the range of 1.1V (11) to 3.3V (33) in 0.1V steps.
- \* : Select from (1) PWM/VFM auto switching control, without auto-discharge function, (2) fixed PWM control, without auto-discharge function, (3) PWM/VFM auto switching control, with auto-discharge function or (4) fixed PWM control, with auto-discharge function. (RP500Kxx3A does not exist.)

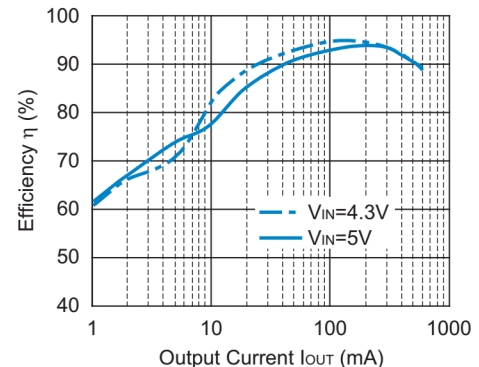
### PACKAGES (Top View)

DFN1616-6		DFN(PLP)1820-6		SOT-23-6W	
1	CE	1	CE	1	V <sub>OUT</sub>
2	AGND	2	AGND	2	PGND
3	V <sub>IN</sub>	3	V <sub>IN</sub>	3	L <sub>x</sub>
4	L <sub>x</sub>	4	L <sub>x</sub>	4	V <sub>IN</sub>
5	PGND	5	PGND	5	AGND
6	V <sub>OUT</sub>	6	V <sub>OUT</sub>	6	CE

\*) The tab is substrate level (GND).

### TYPICAL CHARACTERISTIC

RP500x331A/333A Efficiency vs. Output Current



### APPLICATIONS

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



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