RP500x Series

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.

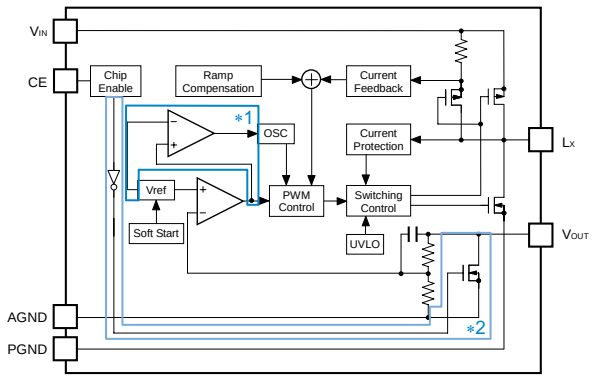
FEATURES

- Supply Current (I_{DD1}) ····· Typ. 400µA (V_{IN}=V_{CE}=5.5V, V_{OUT}=0V)
- Supply Current (I_{DD2}) ····· Typ. 100µA (V_{IN}=V_{CE}=V_{OUT}=5.5V)
- Standby Current ($I_{standby}$) ····· Max. 5µA (V_{IN}=5.5V, CE="L")
- Input Voltage Range (V_{IN}) ····· 2.55V to 5.5V
- Output Voltage Range (V_{OUT}) ····· 1.1V to 3.3V (internally fixed)
- Output Voltage Accuracy ····· ± 1.5%
- Output Current (I_{OUT}) ····· 600mA*
- Oscillator Frequency (f_{osc}) ····· 1.2MHz
- Oscillator Maximum Duty Cycle (Maxduty) ·· Min. 100%
- UVLO Detect Voltage (V_{UVLO}) ····· Typ. 2.2V
- Soft Start Time (t_{start}) ····· 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 ····· WLCSP-6-P2, DFN1616-6, DFN(PLP)1820-6, SOT-23-6W
- Ceramic capacitors can be used ···· C_{IN}=C_{OUT}=10µF or more

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

BLOCK DIAGRAM

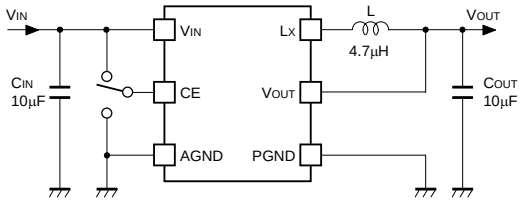
RP500x



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

TYPICAL APPLICATION

RP500x



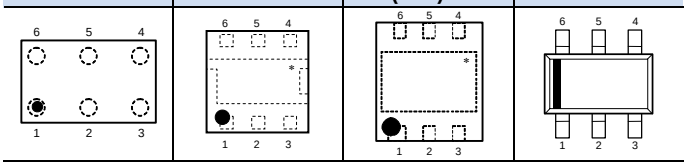
L : VLF3010AT-4R7MR30
C_{IN}, C_{OUT} : C2012JB0J106 (TDK)

SELECTION GUIDES

Halogen Free	Package	Q'ty per Reel	Part No.
H/F	WLCSP-6-P2	5,000 pcs	RP500Z xx* A-E2-F
H/F	DFN1616-6	5,000 pcs	RP500L xx* A-TR
H/F	DFN(PLP)1820-6	5,000 pcs	RP500K xx* A-TR
H/F	SOT-23-6W	3,000 pcs	RP500N xx* 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, without auto-discharge function,
(2) Fixed PWM, without auto-discharge function,
(3) PWM/VFM auto switching, with auto-discharge function or
(4) Fixed PWM, with auto-discharge function.
(RP500Kxx3A does not exist.)

PACKAGES (Top View)

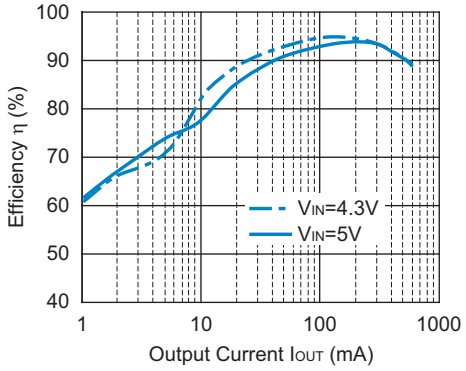


WLCSP-6-P2		DFN1616-6		DFN(PLP)1820-6		SOT-23-6W	
1	VOUT	1	CE	1	CE	1	VOUT
2	PGND	2	AGND	2	AGND	2	PGND
3	LX	3	VIN	3	VIN	3	LX
4	VIN	4	LX	4	LX	4	VIN
5	AGND	5	PGND	5	PGND	5	AGND
6	CE	6	VOUT	6	VOUT	6	CE

*) 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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