

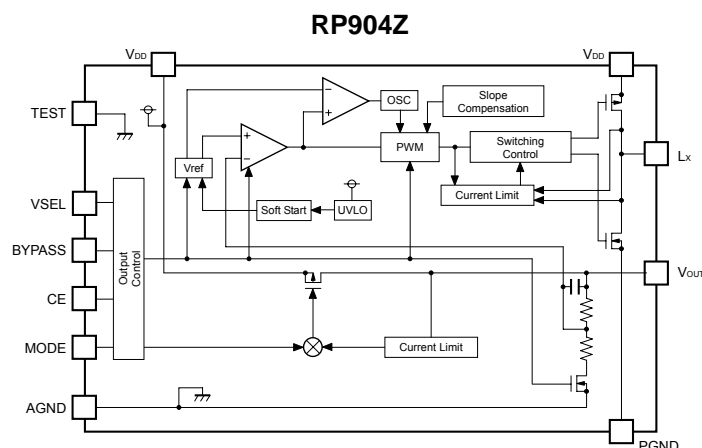
## 1A\*\* Step-down DC/DC Converter with Synchronous Rectifier and Through mode

The RP904Z Series are CMOS-based step-down DC/DC converters with Synchronous Rectifier featuring 1A\*\* output current and have through mode. RP904Z includes an under-voltage lockout circuit (UVLO), a soft start circuit and a timer 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. The output voltage of DC/DC converter can be selected from 2 voltage by inputting signal to VSEL pin. The DC/DC converter is PWM/VFM manual switching control. RP904Z is able to select DC/DC mode or through mode by inputting signal to BYPASS pin. WLCSP-11-P2 package is available.

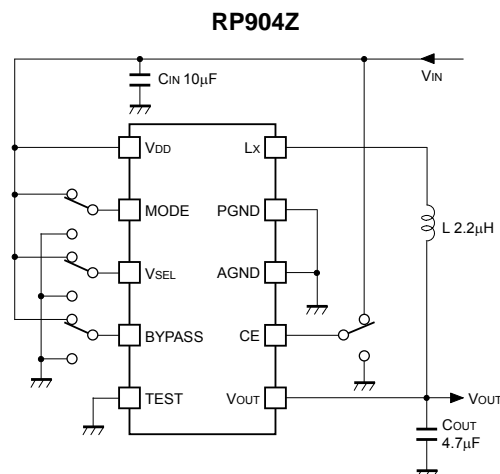
### FEATURES

- Supply Current (I<sub>DD2</sub>) ..... Typ. 435μA (Through mode)
  - Supply Current (I<sub>DD3</sub>) ..... Typ. 410μA (PWM mode, Non-switching)
  - Supply Current (I<sub>DD4</sub>) ..... Typ. 165μA (VFM mode, Non-switching)
  - Standby Current (I<sub>standby</sub>) ..... Max. 5μA (V<sub>IN</sub>=5.5V, CE="L")
  - Input Voltage Range (V<sub>IN</sub>) ..... 2.5V to 5.5V
  - Output Voltage Range (V<sub>OUT1</sub>) ..... 1.2V to 3.3V \* (internally fixed)
  - Output Voltage Range (V<sub>OUT2</sub>) ..... 1.0V to 1.5V \* (internally fixed)
  - \*) V<sub>OUT1</sub> ≥ V<sub>OUT2</sub> + 0.2V, V<sub>OUT</sub>=1.0V (V<sub>OUT</sub>=1.1V : V<sub>IN</sub> ≥ 5.0V)
  - Output Voltage Accuracy ..... ± 2%
  - Output Current (I<sub>OUT</sub>) ..... 1A\*\*
  - Oscillator Frequency (f<sub>osc</sub>) ..... 2MHz
  - Oscillator Maximum Duty Cycle (Maxduty) ..... Min. 100%
  - UVLO Detect Voltage (V<sub>UVLO</sub>) ..... Typ. 2.25V
  - Soft Start Time (t<sub>start</sub>) ..... Typ. 0.135ms
  - Latch Protection Circuit ..... Delay time for protection Typ. 0.8ms
  - Package ..... WLCSP-11-P2
- \*\*) This is an approximate value, because output current depending on conditions and external parts.

### BLOCK DIAGRAM



### TYPICAL APPLICATION



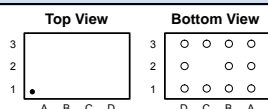
### SELECTION GUIDE

Halogen Free	Package	Q'ty per Reel	Part No.
H/F	WLCSP-11-P2	4,000 pcs	RP904Zxx1A-E2-F

xx : Specify a combination of output voltage using serial numbers.

### PACKAGE (Top View)

#### WLCSP-11-P2

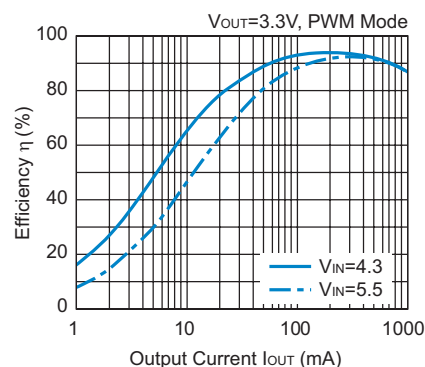


A1	AGND	C1	VDD*
A2	VSEL		
A3	MODE	C3	VDD*
B1	PGND	D1	CE
B2	TEST	D2	VOUT
B3	Lx	D3	BYPASS

\*) The VDD pins must be wired together when it is mounted on board.

### TYPICAL CHARACTERISTIC

#### RP904Z Efficiency vs. Output Current



### APPLICATION

- Power source for hand-held communication equipment, cameras, and VCRs



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Ricoh completed the organization of the Lead-free production for all of our products. After Apr. 1, 2006, we will ship out the lead free products only. Thus, all products that will be shipped from now on comply with RoHS Directive.