

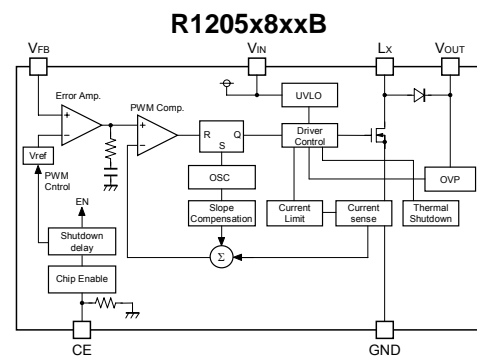
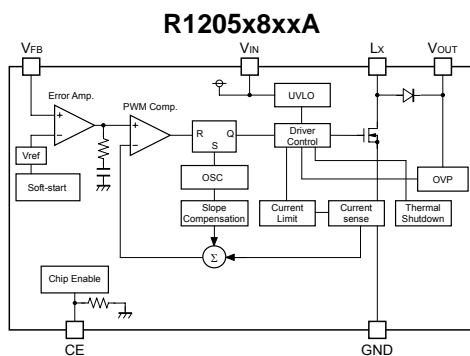
PWM Step-up DC/DC Converter for White LED/PMOLED and General Use

The R1205x Series are CMOS-based PWM step-up DC/DC converters, which are optimized to drive white LEDs with constant current. There are two types. The A versions are optimized for the general use, and the B version is optimized for the serial drive of white LED with constant current. The R1205x includes a forward diode, an under-voltage lockout circuit (UVLO), a soft-start circuit, and an over-voltage protection circuit (OVP), a thermal shutdown circuit. By simply using an inductor, divider resistors, and capacitors as external components, white LEDs can be driven with high efficiency. B version can set LED current with feedback resistor (R1). The brightness of the LEDs and the soft-start time can be adjusted by applying a PWM signal (200Hz to 300kHz) to the CE pin. In addition to DFN1616-6B, 0.95mm thickness TSOT-23-6 is available.

FEATURES

- Supply Current (I_{DD}) Typ. 800 μ A (V_{IN} = 5.5V, V_{FB} = 0V, Lx at no load)
- Standby Current ($I_{standby}$) Max. 5 μ A (V_{IN} = 5.5V, V_{CE} = 0V)
- Input Voltage Range (V_{IN}) 2.3V to 5.5V (A Version)
1.8V to 5.5V (B Version)
- Feedback Voltage (V_{FB}) 1.0V (A Version)
0.2V (B Version)
- Feedback Voltage Accuracy $\pm 1.5\%$ (A Version)
 $\pm 10mV$ (B Version)
- Oscillator Frequency (f_{osc}) 1.2MHz
- Oscillator Maximum Duty Cycle (Maxduty) Typ. 91%
- UVLO Detect Voltage (V_{UVLO}) Typ. 2.0V (A Version)
Typ. 1.6V (B Version)
- Coil-current Limit Circuit Current Limit Typ. 350mA
/ Typ. 700mA selectable
- Over Voltage Protection Circuit (OVP) Typ. 25V
- Soft Start Time (t_{start}) Typ. 2ms (A Version)
Controllable by PWM signal to the CE pin (B Version)
- Thermal Shutdown Circuit Stops at 150°C
- Packages DFN1616-6B, TSOT-23-6

BLOCK DIAGRAMS

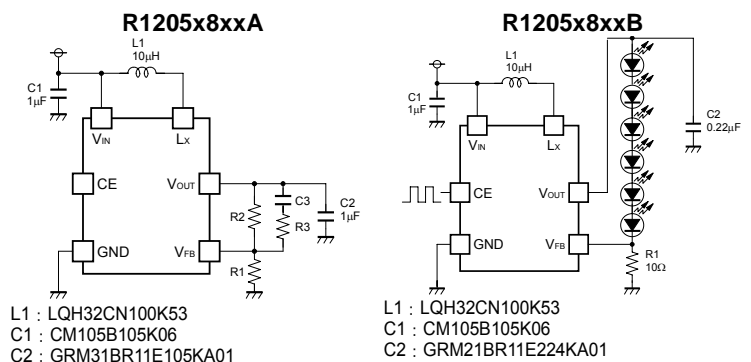


SELECTION GUIDES

Halogen Free	Package	Q'ty per Reel	Part No.
H/F	DFN1616-6B	5,000 pcs	R1205L8X1*-TR
H/F	TSOT-23-6	3,000 pcs	R1205N8X3*-TR-FE

- X : Specify the Coil Current limit.
(1) Typ. 350mA, (2) Typ. 700mA
* : Specify the feedback voltage.
(A) 1.0V, (B) 0.2V

TYPICAL APPLICATIONS



PACKAGES (Top View)

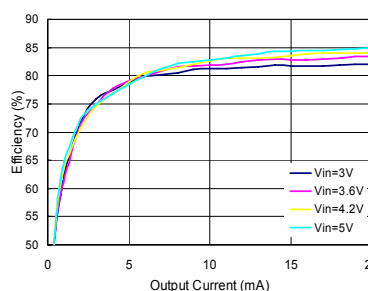
DFN1616-6B				TSOT-23-6			
1	CE	4	GND	1	CE	4	Lx
2	VFB	5	VIN	2	VOUT	5	GND
3	Lx	6	VOUT	3	VIN	6	VFB

* The tab is substrate level (GND).

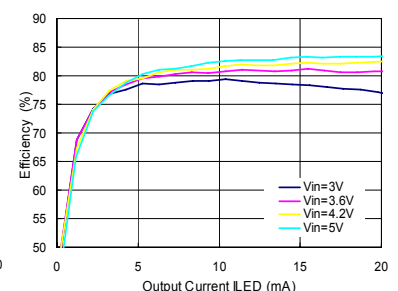
TYPICAL CHARACTERISTIC

Efficiency vs. LED Output Current

R1205N823A
 $V_{OUT}=10V$ (10 μ F)



R1205N823B
6LEDs (10 μ F)



APPLICATION

- OLED power supply for hand-held equipment

- White LED backlight for hand-held equipment

PWM Step-up DC/DC Converter for White LED/PMOLED and General Use

Comparison of R1205x with R1202x

Product Name	R1205x8xxA	R1202xxxxA/B	R1205x8xxB	R1202xxxxD
Application	PMOLED, General Use		White LED (Serial drive)	
V _{FB} Voltage	1.0V		0.2V	
Input Voltage Range	2.3V to 5.5V		1.8V to 5.5V	
OVP Voltage	25V	Select from 14V, 17V, 19V, 21V, 23V	Up to 6 lights 25V	Up to 5 lights Select from 14V, 23V
Function	Thermal Shutdown Circuit	Thermal Shutdown Circuit Shutdown Function Auto-Discharge Function	Thermal Shutdown Circuit	Thermal Shutdown Circuit Shutdown Function
Output Capacitor	1μF to 4.7μF		0.22μF to 1μF	
Comment	The Method of Output Voltage Setting $\text{Output Voltage} = (R1 + R2) / R1$ The total value of R1 and R2 should be equal or less than 300kΩ. Voltage rating of capacitor (C2) is recommended to use 1.5 times or more the output setting voltage. Soft-Start Time The soft start time is set to Typ. 2ms within the IC.		LED Current setting When CE pin input is "H" (Duty=100%), LED current can be set with feedback resistor (R1). $I_{LED} = 0.2 / R1$ LED Dimming Control The LED brightness can be controlled by inputting the PWM signal to the CE pin. The current of LEDs when High-Duty of the CE input is "Hduty" reaches the value as in next formula. $I_{LED} = Hduty \times V_{FB} / R1$ The frequency of the PWM signal is using the range between 200Hz to 300kHz. When controlling the LED brightness by the PWM signal of 20kHz or less, the increasing or decreasing of the inductor current might be make a sounds in the hearable sound wave area. In that case, please use the PWM signal in the high frequency area.	

In case of 7 lights or more, we recommends the R1218x Series*.

More than 5 lights of R1218x Series requires an external diode and OVP Voltage is set up to 31.5V. (Maximum rating of V_{OUT} pin is 34V)

*) For detail, please check our website.

Ricoh Co.,LTD. Electronic Devices Company



■ Ricoh presented with the Japan Management Quality Award for 1999.

Ricoh continually strives to promote customer satisfaction, and shares the achievements of its management quality improvement program with people and society.



■ Ricoh awarded ISO 14001 certification.

The Ricoh Group was awarded ISO 14001 certification, which is an international standard for environmental management systems, at both its domestic and overseas production facilities. Our current aim is to obtain ISO 14001 certification for all of our business offices.



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.

<http://www.ricoh.com/LSI/>

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