

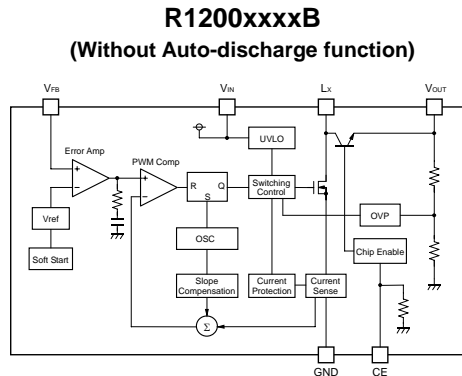
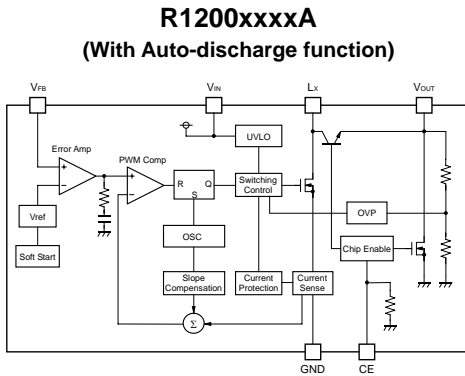
PWM Step-up DC/DC Converter for PMOLED and General Use with shutdown function

The R1200x Series are CMOS-based PWM step-up DC/DC converters, which are optimized to drive PMOLED or white LEDs with constant current. The R1200x includes an under-voltage lockout circuit (UVLO), a soft-start circuit, and an over-voltage protection circuit (OVP). By simply using an inductor, divider resistors, and capacitors as external components, PMOLEDs and white LEDs can be driven with high efficiency. At the standby mode, the internal NPN transistor can separate the output from the input. (Shutdown function) By this shutdown function, the LED current can be completely shutdown, and output voltage for PMOLED can be completely cut off, therefore, the R1200x does not have bad impact on the life expectancy of PMOLED. The version with auto-discharge function is available.

FEATURES

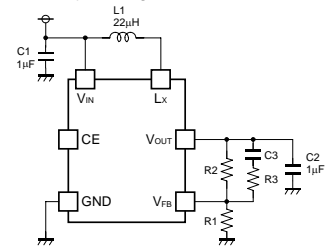
- Supply Current (I_{DD}) Typ. 500 μ A (No switching)
- Standby Current ($I_{standby}$) Typ. 0 μ A (CE="L")
- Input Voltage Range (V_{IN}) 2.3V to 5.5V
(Absolute maximum rating: 6.5V)
- Output Voltage Range (V_{OUT}) Externally adjustable
- Feedback Voltage (V_{FB}) 1.0V
- Feedback Voltage Accuracy ± 15 mV
- Temp. Coeff. of Feedback Voltage ± 150 ppm/ $^{\circ}$ C
- Oscillator Frequency (f_{osc}) 1.2MHz
- Oscillator Maximum Duty Cycle (Maxduty) .. Min. 86%, Typ. 91%
- UVLO Detect Voltage (V_{UVLO1}) Typ. 2.0V
- Coil-current Limit Circuit Current limit Typ. 700mA
- Over Voltage Protection Circuit (OVP)
- Soft Start Time (t_{start}) Typ. 1.5ms
- Shutdown Function
- Auto-discharge Function A Version
- Packages DFN1616-6, DFN(PLP)1820-6, SOT-23-6

BLOCK DIAGRAMS



TYPICAL APPLICATION

By simply using an inductor, divider resistors and capacitors as external components, a high-efficiency step-up DC/DC converter can be easily configured.



* R1, R2 : For setting output voltage
R3 : 2k Ω , C3 : 220pF

SELECTION GUIDES

Halogen Free	Package	Q'ty per Reel	Part No.
H/F	DFN1616-6	5,000 pcs	R1200Lxxx\$-TR
H/F	DFN(PLP)1820-6	5,000 pcs	R1200Kxxx\$-TR
H/F	SOT-23-6	3,000 pcs	R1200Nxxx\$-TR-FE

xxx : Specify the OVP voltage.

001: OVP : 17V, 002: OVP : 19V, 003: OVP : 21V

\$: Select from (A) with auto-discharge function or (B) without auto-discharge function

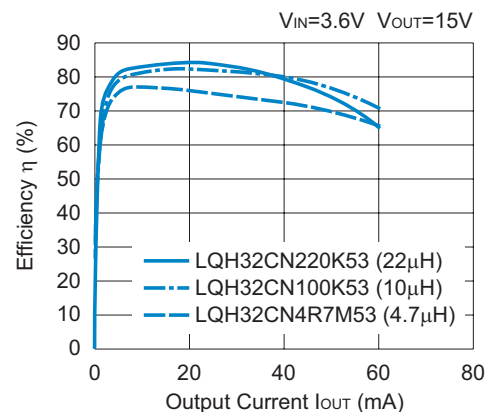
PACKAGES (Top View)

DFN1616-6	DFN(PLP)1820-6	SOT-23-6
1 CE	1 CE	1 CE
2 V _{FB}	2 V _{FB}	2 V _{OUT}
3 L _X	3 L _X	3 V _{IN}
4 GND	4 GND	4 L _X
5 V _{IN}	5 V _{IN}	5 GND
6 V _{OUT}	6 V _{OUT}	6 V _{FB}

*) The tab is substrate level (GND).

TYPICAL CHARACTERISTIC

R1200x Efficiency vs. Output Current



APPLICATIONS

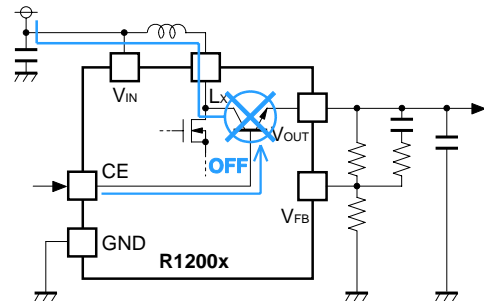
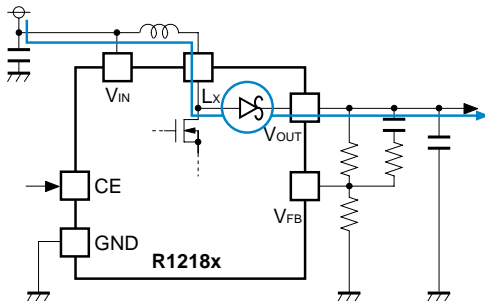
- PMOLED power supply for hand-held equipment
- White LED driver for hand-held equipment

Step-up DC/DC Converter for OLED Back Light with shutdown function

The Shutdown Function

Due to the typical step-up DC/DC converter circuit, a voltage may appear at the output of the circuit even if the driver IC is in the standby mode. A current flows from the battery, through the inductor and diode to the output pins. In case an OLED display is connected, it is powered constantly and it may have an impact to the lifetime of the OLED. In addition, when the input voltage is close to the V_f voltage of a white LED, it is unable to turn these off properly.

The R120xx Series have an internal NPN transistor instead of a diode. In standby mode, the NPN transistor turns off and isolates the current flow from input to output.



Comparison of PMOLED and General Use DC/DC Converter

Product Name	R1200x	R1202xxxxA/B	R1204xxxxB/C/E/F
Control	PWM	PWM	PWM(B/E), PWM/VFM Auto Switching (C/F)
Input Voltage Range	2.3V to 5.5V	2.3V to 5.5V	2.3V to 5.5V
Output Voltage Range	Ext. adjustable (Up to 20.0V) (V _{FB} =1.0V)	Ext. adjustable (Up to 22.2V) (V _{FB} =1.0V)	Ext. adjustable (Up to 40.2V) (V _{FB} =1.0V)
Feedback Voltage Accuracy	±15mV	±15mV	±15mV
Oscillator Frequency	1.2MHz	1.2MHz	750kHz(E/F), 1MHz(B/C)
Diode	Internal	Internal	External
Coil-current Limit Circuit	700mA	350mA, 700mA	900mA
UVLO Detect Voltage	TYP. 2.0V	TYP. 2.0V	TYP. 2.0V
Soft Start Time	TYP. 1.5ms	TYP. 2ms	TYP. 10ms
Over Voltage Protection Circuit	17.0V, 19.0V, 21.0V	14.0V, 17.0V, 19.0V, 21.0V, 23.0V	23.0V, 33.0V, 42.0V
Package	DFN1616-6, DFN(PLP)1820-6, SOT-23-6	DFN1616-6B, TSOT-23-6	DFN(PLP)1820-6, TSOT-23-6
Others	Shutdown Function Auto-discharge Function (A)	Shutdown Function Auto-discharge Function (A) Thermal Shutdown Circuit	Thermal Shutdown Circuit



Ricoh is committed to reducing the environmental loading materials in electrical devices with a view to contributing to the protection of human health and the environment.

Ricoh has been providing RoHS compliant products since April 1, 2006 and Halogen-free products since April 1, 2012.

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