

# PQ2CF1

TO-220 Package, Step Up Output Chopper Regulator

## ■ Features

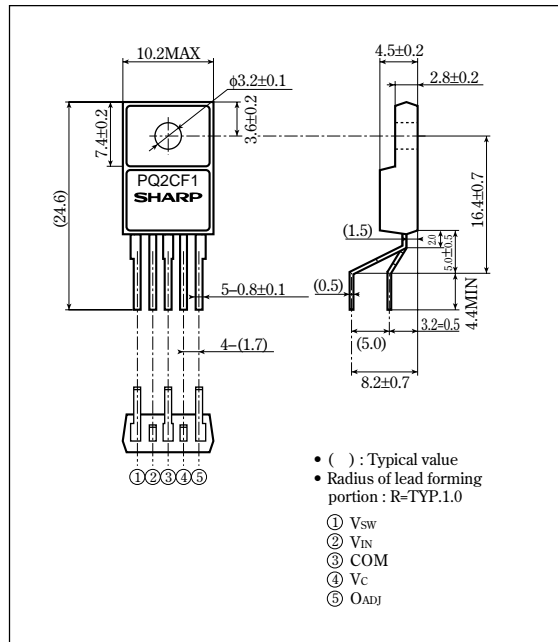
- Maximum switching current: 2.5A
- Built-in soft start function
- Built-in oscillation circuit  
(oscillation frequency: TYP. 50kHz)
- Built-in overheat protection, overcurrent protection function
- Variable output voltage (4.5 to 35V)  
[Possible to choose step up output / flyback method according to external connection circuit]

## ■ Applications

- Personal computers / Word processors
- Printers
- Switching power supplies
- Facsimiles

## ■ Outline Dimensions

(Unit : mm)



## ■ Absolute Maximum Ratings

(T<sub>a</sub>=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V <sub>IN</sub>	35	V
*2 Switching voltage	V <sub>SW</sub>	35	V
Error input voltage	V <sub>ADJ</sub>	7	V
*3 ON/OFF control voltage	V <sub>c</sub>	7	V
Switching current	I <sub>SW</sub>	2.5	A
Power dissipation (No heat sink)	P <sub>D1</sub>	1.5	W
Power dissipation (With infinite heat sink)	P <sub>D2</sub>	15	W
*4 Junction temperature	T <sub>j</sub>	150	°C
Operating temperature	T <sub>opr</sub>	-20 to +80	°C
Storage temperature	T <sub>stg</sub>	-40 to +150	°C
Soldering temperature	T <sub>sol</sub>	260 (For 10s)	°C

\*1 Voltage between V<sub>IN</sub> terminal and COM terminal\*2 Voltage between V<sub>SW</sub> terminal and COM terminal\*3 Voltage between V<sub>c</sub> terminal and COM terminal\*4 Overheat protection may operate at 125<=T<sub>j</sub><=150°C.

• Please refer to the chapter " Handling Precautions ".

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## Electrical Characteristics

(Unless otherwise specified, conditions shall be  $V_{IN}=5V, I_o=0.2A, V_o=12V, T_a=25^\circ C$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output saturation voltage	$V_{SAT}$	$I_{SW}=2A$	—	0.6	1.2	V
Reference voltage	$V_{ref}$	—	1.235	1.26	1.285	V
Reference voltage temperature fluctuation	$\Delta V_{ref}$	$T_j=0$ to $125^\circ C$	—	$\pm 0.5$	—	%
Load regulation	$ R_{egL} $	$I_o=70$ to $570mA$	—	0.1	1.5	%
Line regulation	$ R_{egI} $	$V_{IN}=3.5$ to $10V$	—	0.2	1.5	%
Efficiency	$\eta$	$I_o=0.5A$	—	85	—	%
Oscillation frequency	$f_o$	—	40	50	60	kHz
Oscillation frequency temperature fluctuation	$\Delta f_o$	$T_j=0$ to $125^\circ C$	—	$\pm 5$	—	%
Maximum duty	$D_{MAX}$	⑤ terminal is open	90	—	—	%
Over current detecting level	$I_L$	Duty=50%,	2.7	4.4	5.8	A
Charge current 1	$I_{CHG1}$	④ terminal=0V, ④ terminal	-80	-50	-20	$\mu A$
Charge current 2	$I_{CHG2}$	④ terminal=0.5V, ④ terminal	-150	-100	-50	$\mu A$
Input threshold voltage	$V_{THL}$	Duty=0%, ④ terminal	0.55	0.75	0.95	V
Vc terminal low level voltage	$V_{CH}$	① terminal is open, ⑤ terminal=1.1V	1.65	1.85	2.05	V
Vc terminal high level voltage	$V_{CL}$	① terminal is open, ⑤ terminal=1.4V	0.3	0.45	0.6	V
On threshold voltage	$V_{THON}$	① terminal is open, ④ terminal	0.1	0.2	0.3	V
Stand-by current	$I_{SD}$	$V_{IN}=35V$ , ④ terminal=0V, No L, Co, D, R <sub>1</sub> , R <sub>2</sub>	—	270	400	$\mu A$
Output OFF-state dissipation current	$I_{qS}$	$V_{IN}=35V$ , ④ terminal=0.5V, No L, Co, D, R <sub>1</sub> , R <sub>2</sub>	—	4.0	12	mA

## Block Diagram

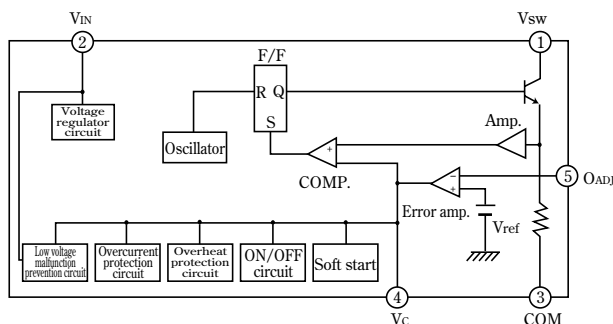
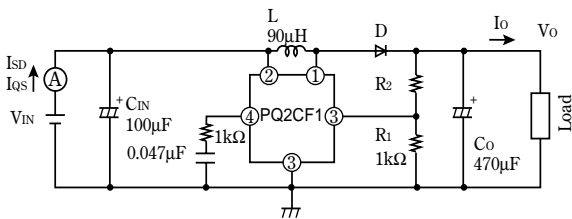
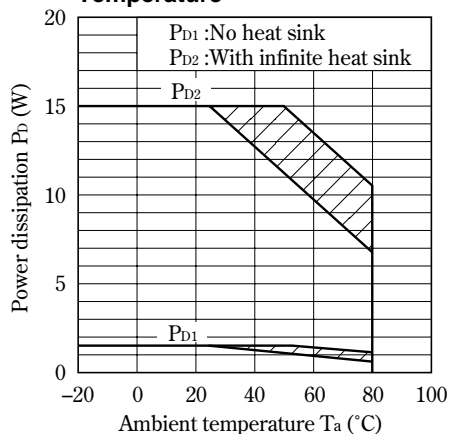


Fig. 1 Test Circuit



L : HK-12S100-9000 (made by Toho Co.)  
 D : ERC80-004 (made by Fuji electronics Co.)

Fig. 2 Power Dissipation vs. Ambient Temperature



Note) Oblique line portion : Overheat protection may operate in this area.

Fig. 3 Overcurrent Protection Characteristics

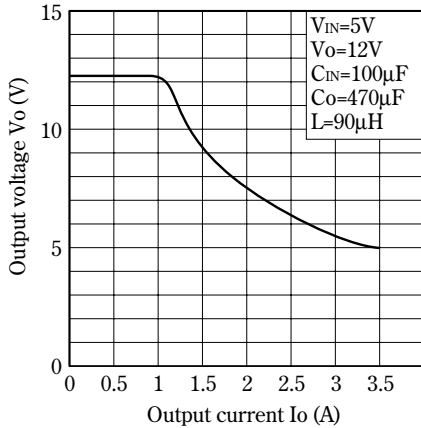


Fig. 4 Efficiency vs. Input Voltage

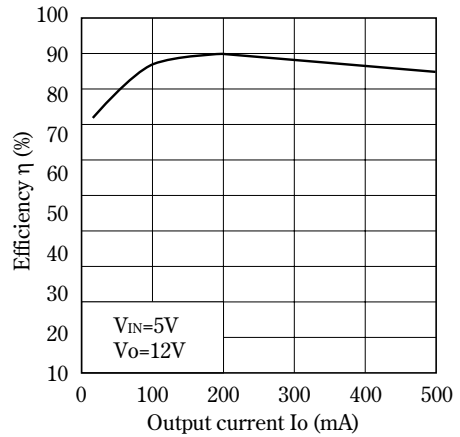


Fig. 5 Reference Voltage Fluctuation vs. Junction Temperature

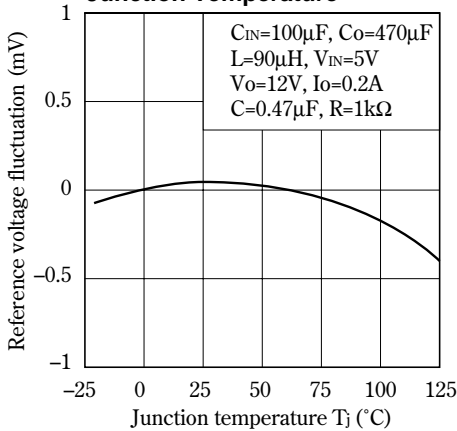


Fig. 6 Load Regulation vs. Output current

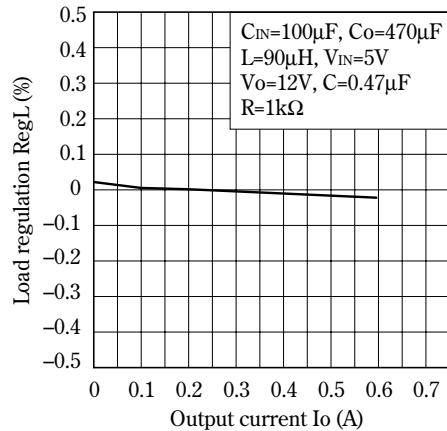


Fig. 7 Line Regulation vs. Input Voltage

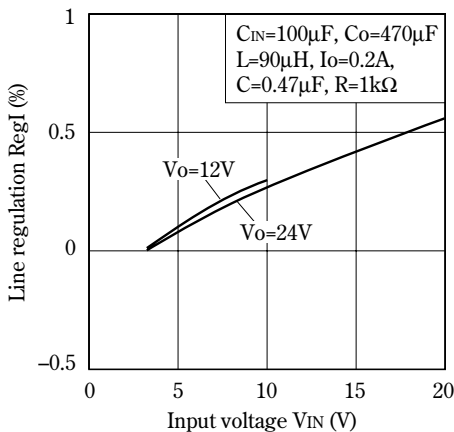
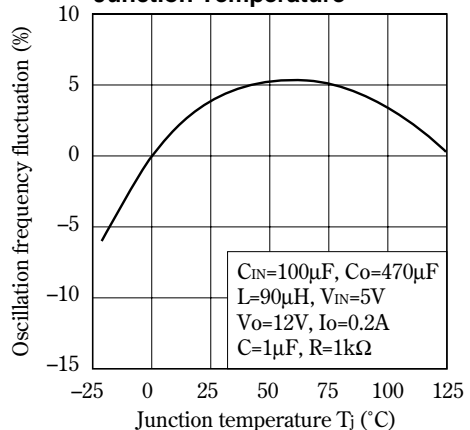
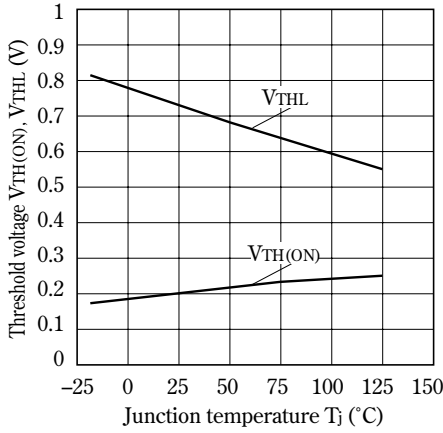


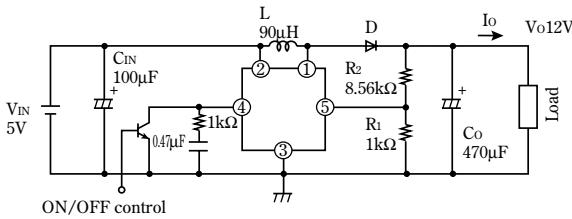
Fig. 8 Oscillation Frequency Fluctuation vs. Junction Temperature



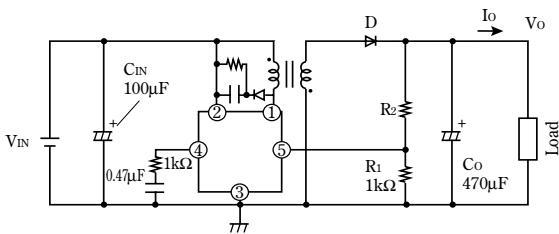
**Fig. 9 Threshold Voltage vs. Junction Temperature**



■ **Step - Up Type Circuit Diagram (12V Output)**



■ **Flyback Method Circuit Diagram**



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    - Alarm equipment
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