

# PQ1CF1

TO-220 Package Chopper Regulator

## ■ Features

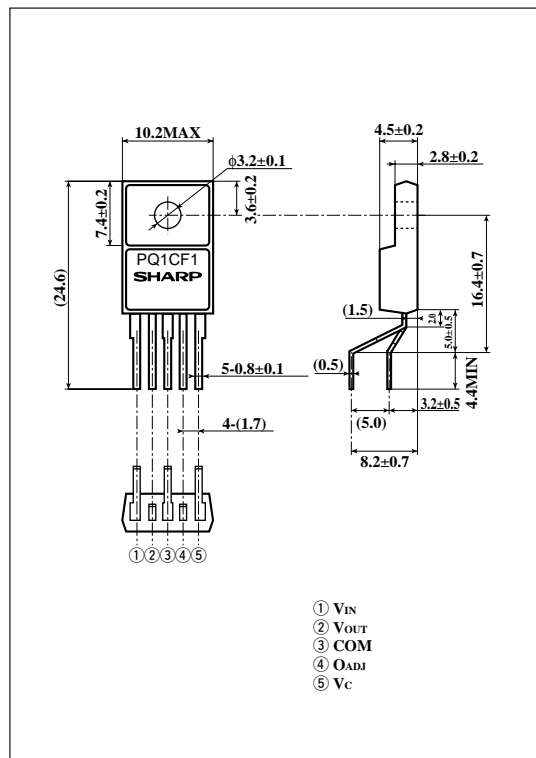
- Maximum switching current : 3.5A
- With ON/OFF control function
- Built-in oscillation circuit  
(oscillation frequency : TYP.70kHz)
- Built-in overheat protection, overcurrent protection function
- Variable output voltage (1.26 to 35V /-1.26 to -30V)  
[Possible to choose step down output/inverting output according to external connection circuit]

## ■ Applications

- Facsimiles
- Printers
- Switching power supplies
- Personal computers

## ■ Outline Dimensions

(Unit : mm)



## ■ Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
<sup>*1</sup> Input voltage	V <sub>IN</sub>	40	V
Error input voltage	V <sub>ADJ</sub>	7	V
Input-output voltage	V <sub>i-o</sub>	41	V
<sup>*2</sup> Output-COM voltage	V <sub>OUT</sub>	-1	V
<sup>*3</sup> ON/OFF control voltage	V <sub>C</sub>	-0.3 to 40	V
Switching current terminal voltage	I <sub>SW</sub>	3.5	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
<sup>*4</sup> 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

<sup>\*1</sup> Voltage between V<sub>IN</sub> terminal and COM terminal.

<sup>\*2</sup> Voltage between V<sub>OUT</sub> terminal and COM terminal.

<sup>\*3</sup> Voltage between V<sub>C</sub> terminal and COM terminal.

<sup>\*4</sup> Overheat protection may operate at 125<T<sub>j</sub><150°C

· Please refer to the chapter " Handling Precautions ".

### SHARP

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■ Electrical Characteristics

(Unless otherwise specified, conditions shall be  $V_{IN}=12V, I_o=0.5A, V_o=5V, T_a=25^{\circ}C$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output saturation voltage	$V_{SAT}$	$I_{SW}=3A$	-	1.4	1.8	V
Reference voltage	$V_{ref}$	-	1.235	1.26	1.285	V
Temperature coefficient in reference voltage	$\Delta V_{ref}$	$T_j=0$ to $125^{\circ}C$	-	$\pm 0.6$	-	%
Load regulation	$ R_{egL} $	$I_o=0.5$ to $3A$	-	0.2	1.5	%
Line regulation	$ R_{egI} $	$V_{IN}=8$ to $35V$	-	0.6	2.5	%
Efficiency	$\eta$	$I_o=3A$	-	80	-	%
Oscillation frequency	$f_o$	-	60	70	80	kHz
Oscillation frequency temperature fluctuation	$\Delta f_o$	$T_j=0$ to $125^{\circ}C$	-	$\pm 5$	-	%
Maximum duty	$D_{MAX}$	④terminal is open	90	-	-	%
Overcurrent detecting level	$I_L$	-	3.9	5.1	6.3	A
Charge current1	$I_{CHG1}$	②④terminal is open, ⑤terminal	-50	-30	-10	$\mu A$
Charge current2	$I_{CHG2}$	②④terminal is open, ⑤terminal=0.7V	-150	-100	-50	$\mu A$
Input threshold voltage	$V_{THL}$	Duty=0%, ④terminal=0V, ⑤terminal	0.75	0.9	1.2	V
	$V_{THH}$	Duty= $D_{MAX}$ , ④terminal is open, ⑤terminal	1.55	1.8	2.05	V
On threshold voltage	$V_{TH(ON)}$	④terminal=0V, ⑤terminal	0.5	0.6	0.7	V
Stand-by current	$I_{SD}$	$V_{IN}=40V, ⑤terminal=0V$	-	140	400	$\mu A$
Output OFF-state consumption current	$I_{qS}$	$V_{IN}=40V, ⑤terminal=0.7V$	-	8	16	mA

■ Block Diagram

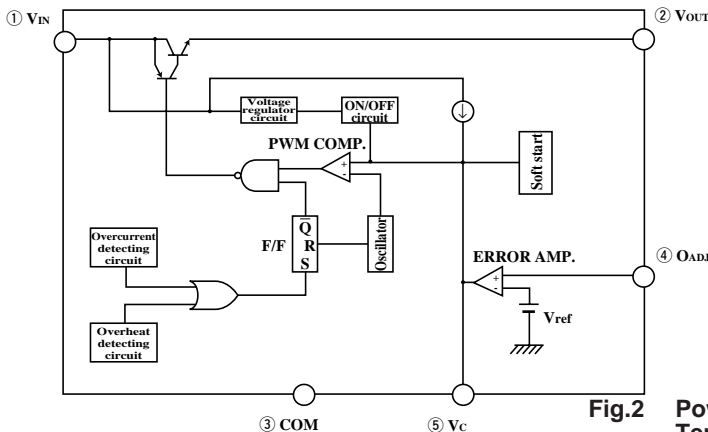
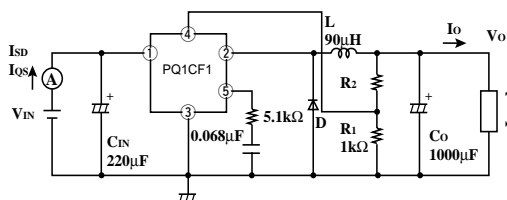
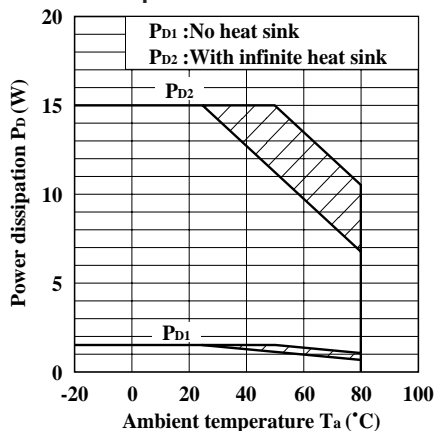


Fig.2 Power Dissipation vs. Ambient Temperature

Fig.1 Test Circuit

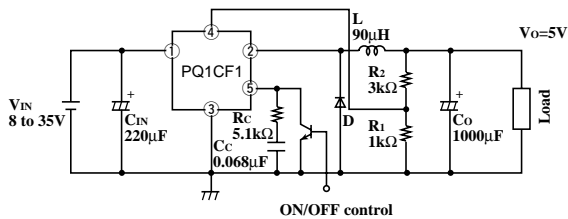


L : HK-12S120-9000R (made by Toho Co.)  
 D : ERC80-004 (made by Fuji electronics Co.)



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

■ Step Down Type Circuit Diagram (5V output)



■ Polarity Inversion Type Circuit Diagram (-5V output)

