PQ2CF1 (Under Development)

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 40V)
  [Possible to choose step up output/flyback method
  acording to external connection circuit]

■ Applications

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

■ Outline Dimensions

(Unit : mm)

· ( ) : Typical value
· Radius of lead forming
  portion:R=TYP.1.0

① V_{SW}
② V_{IN}
③ COM
④ V_C
⑤ O_{ADJ}
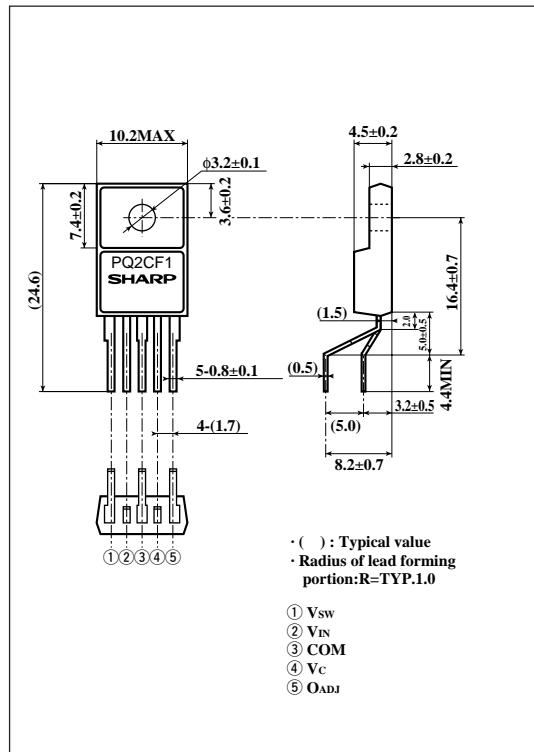
■ Absolute Maximum Ratings

(T_a=25$^\cdot$C)

Parameter	Symbol	Rating	Unit
[*1] Input voltage	V_{IN}	35	V
[*2] Switching voltage	V_{SW}	35	V
Error input voltage	V_{ADJ}	7	V
[*3] ON/OFF control voltage	V_C	7	V
Switching current	I_{SW}	2.5	A
Power dissipation (No heat sink)	P_{D1}	1.5	W
Power dissipation (With infinite heat sink)	P_{D2}	15	W
[*4] Junction temperature	T_j	150	$^\cdot$C
Operating temperature	T_{opr}	-20 to +80	$^\cdot$C
Storage temperature	T_{stg}	-40 to +150	$^\cdot$C
Soldering temperature	T_{sol}	260 (For 10s)	$^\cdot$C

[*1] Voltage between V_{IN} terminal and COM terminal
[*2] Voltage between V_{SW} terminal and COM terminal
[*3] Voltage between V_C terminal and COM terminal
[*4] Overheat protection may operate at 125=<T_j=<150$^\cdot$C.

· Please refer to the chapter" Handling Precautions ".

■ **Electrical Characteristics** (Unless otherwise specified, conditions shall be $V_{IN}=5V$, $I_O=0.2A$, $V_C=12V$, $T_a=25°C$)

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
Temperature change in reference voltage	ΔV_{ref}	$T_j=0$ to $125°C$	-	±0.5	-	%
Load regulation	$|Reg L|$	$I_O=70$ to $570mA$	-	0.1	1.5	%
Line regulation	$|Reg I|$	$V_{IN}=3.5$ to $10V$	-	0.2	1.5	%
Efficiency	η	$I_O=0.5A$	-	85	-	%
Oscillation frequency	fo	-	40	50	60	kHz
Oscillation frequency temperature fluctuation	Δfo	$T_j=0$ to $125°C$	-	±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	μA
Charge current 2	I_{CHG2}	④ terminal=0.5V, ④ terminal	-150	-100	-50	μA
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,C_O, D,R_1,R_2	-	270	400	μA
Output OFF-state consump-tion current	I_{qS}	$V_{IN}=35V$, ④ terminal=0.5V,No L, C_O,D,R_1,R_2	-	4.0	12	mA

Fig.1   Test Circuit
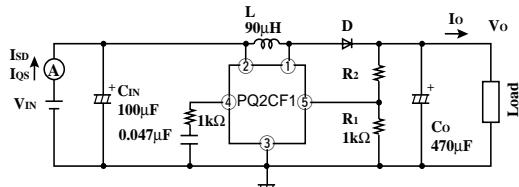

L : HK-12S100-9000 (made by Toho Co.)
D : ERC80-004 (made by Fuji electronics Co.)
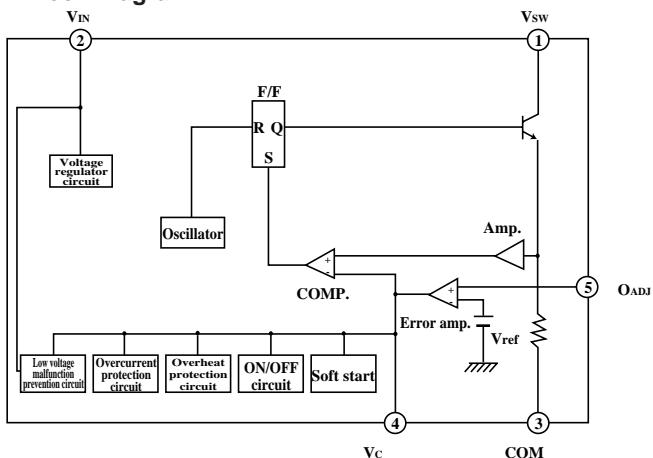
Fig.2   Power Dissipation vs. Ambient Temperature
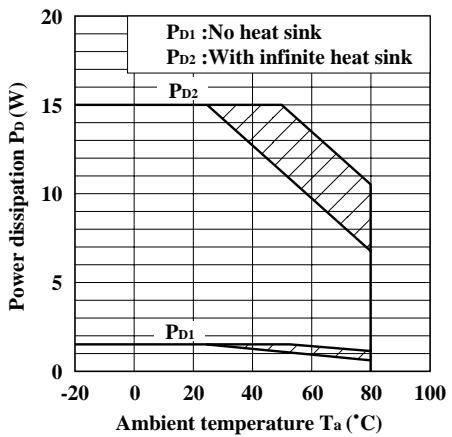
Note) Oblique line portion : Overheat protection may operate in this area.

■ **Block Diagram**

■ **Step Up Type Circuit Diagram (12V output)**

L
90μH
D
I_O
V_O12V

C_{IN}
100μF

V_{IN}
5V

R₂
8.56kΩ

R₁
1kΩ

C_O
470μF

Load

1kΩ

0.47μF

ON/OFF control
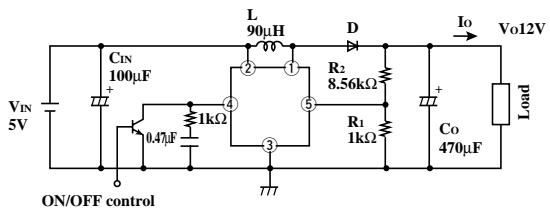
■ **Flyback Method Circuit Diagram**

C_{IN}
100μF

D
I_O
V_O

V_{IN}

R₂

R₁
1kΩ

C_O
470μF

Load

1kΩ

0.47μF