

# PQ1CG1

## TO-220 Type Chopper Regulator

### Features

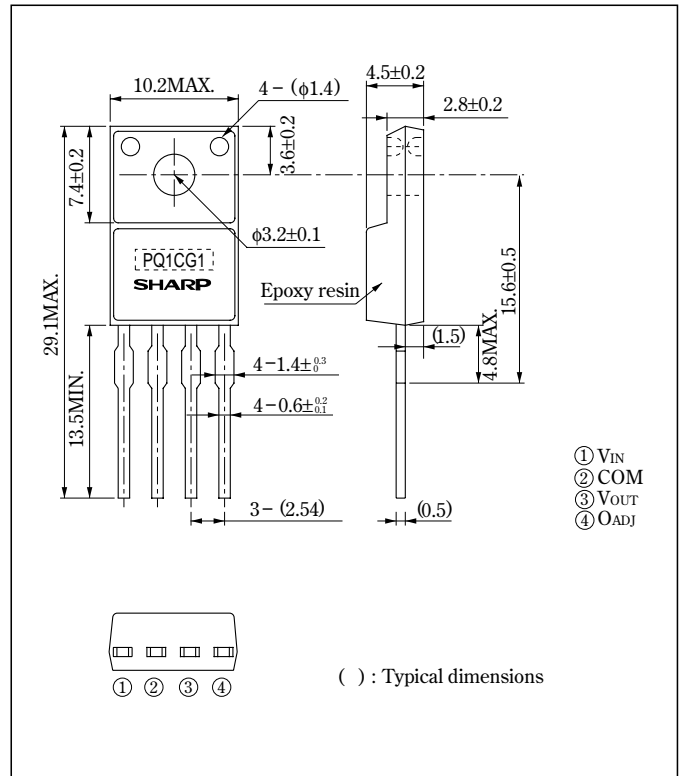
- Maximum switching current: 1.5A
- Built-in oscillation circuit  
(Oscillation frequency: TYP.100kHz)
- Built-in overheat protection, overcurrent protection function
- Variable output voltage ( $V_{ref}$  to 35V / - $V_{ref}$  to -30V)  
[Possible to select step-down output / porality inversion output according to external connection circuit]

### Applications

- Personal computers
- Printers

### Outline Dimensions

(Unit : mm)



### Absolute Maximum Ratings

( $T_a=25^{\circ}C$ )

Parameter	Symbol	Rating	Unit
*1 Input voltage	$V_{IN}$	40	V
Output adjustment terminal voltage	$V_{ADJ}$	7	V
Dropout voltage	$V_{i-O}$	41	V
*2 Output-COM voltage	$V_{OUT}$	-1	V
Switching current	$I_{SW}$	1.5	A
*3 Power dissipation	$P_{D1}$	1.4	W
	$P_{D2}$	14	W
*4 Junction temperature	$T_j$	150	$^{\circ}C$
Operating temperature	$T_{opr}$	-20 to +80	$^{\circ}C$
Storage temperature	$T_{stg}$	-40 to +150	$^{\circ}C$
Soldering temperature	$T_{sol}$	260 (For 10s)	$^{\circ}C$

- \*1 Voltage between  $V_{IN}$  and COM
- \*2 Voltage between  $V_{OUT}$  and COM
- \*3  $P_{D1}$ : No heat sink,  $P_{D2}$ : With infinite heat sink
- \*4 Overheat protection may operate at  $125 < T_j <= 150^{\circ}C$ .

• Please refer to the chapter " Handling Precautions ".



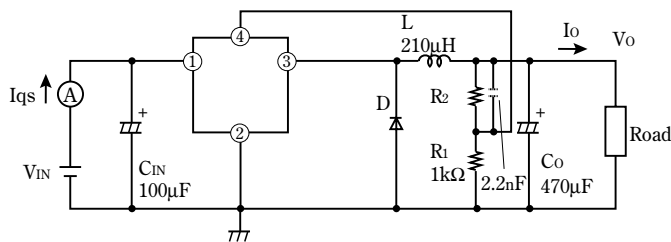
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Electrical Characteristics

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

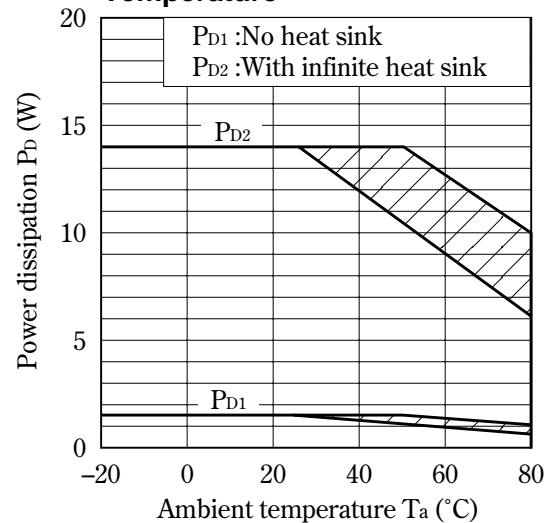
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output saturation voltage	$V_{SAT}$	$I_o=1A$ , No L, D, Co	—	1	1.5	V
Reference voltage	$V_{ref}$	—	1.235	1.26	1.285	V
Reference voltage temperature fluctuation	$\Delta V_{ref}$	$T_j=0$ to $125^\circ C$	—	$\pm 0.5$	—	%
Load regulation	$ R_{egL} $	$I_o=0.2$ to $1A$	—	0.1	1.5	%
Line regulation	$ R_{egI} $	$V_{IN}=8$ to $35V$	—	0.5	2.5	%
Efficiency	$\eta$	$I_o=1A$	—	82	—	%
Oscillation frequency	$f_o$	—	80	100	120	kHz
Oscillation frequency temperature fluctuation	$\Delta f_o$	$T_j=0$ to $125^\circ C$	—	$\pm 2$	—	%
Maximum duty	$D_{MAX}$	④ terminal=open	90	—	—	%
Overcurrent detection level	$I_L$	No L, D, Co	1.55	2	2.6	A
OFF-state dissipation current	$I_{qs}$	$V_{IN}=40V$ , No.4 pin=3V	—	8	12	mA

Fig. 1 Test Circuit



L : HK-14D100-2110 (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 (Typical Value)

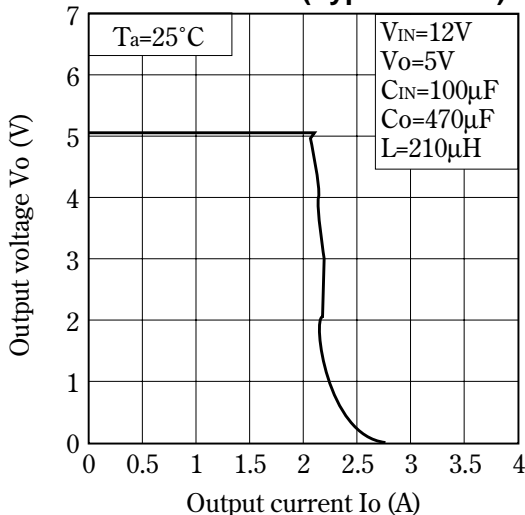
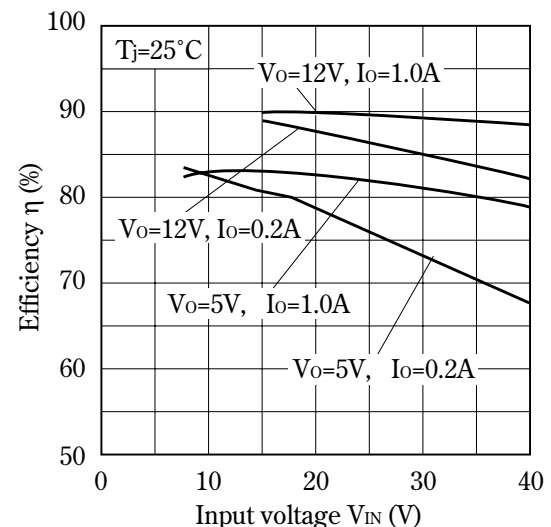
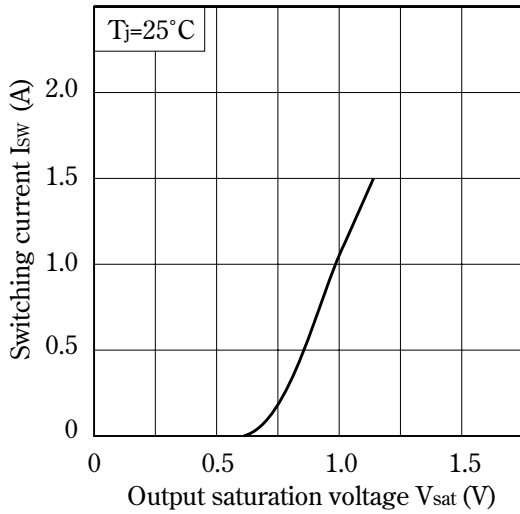


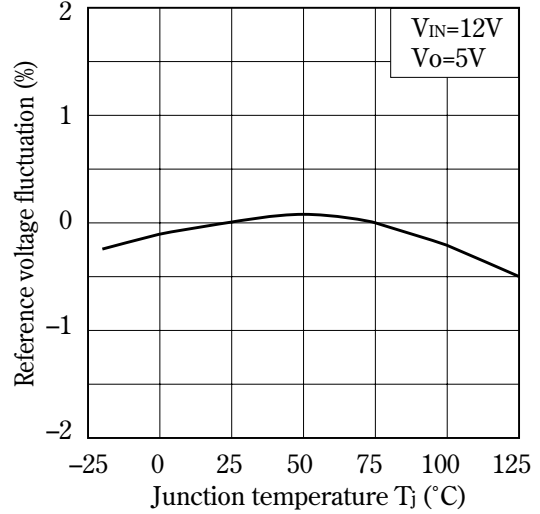
Fig. 4 Efficiency vs. Input Voltage



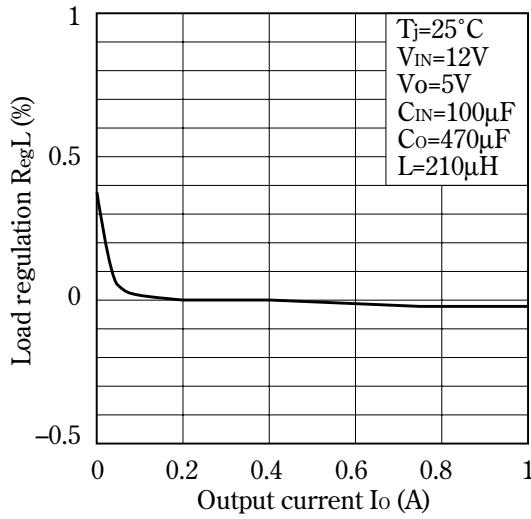
**Fig. 5 Switching Current vs. Output Saturation Voltage**



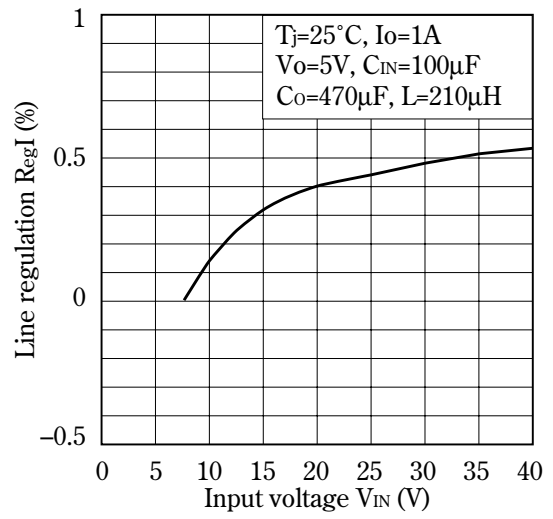
**Fig. 6 Reference Voltage Fluctuation vs. Junction Temperature**



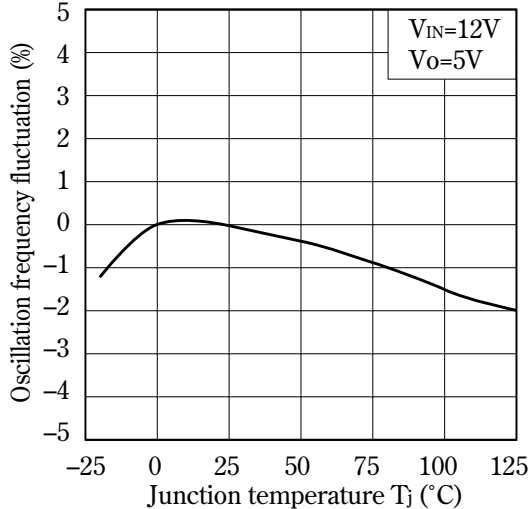
**Fig. 7 Load Regulation vs. Output Current**



**Fig. 8 Line Regulation vs. Input Voltage**



**Fig. 9 Oscillation Frequency Fluctuation vs. Junction Temperature**



**Fig.10 Overcurrent Detecting Level Fluctuation vs. Junction Temperature**

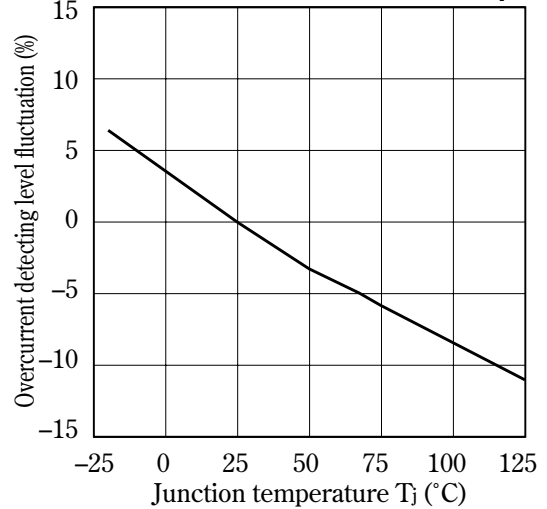
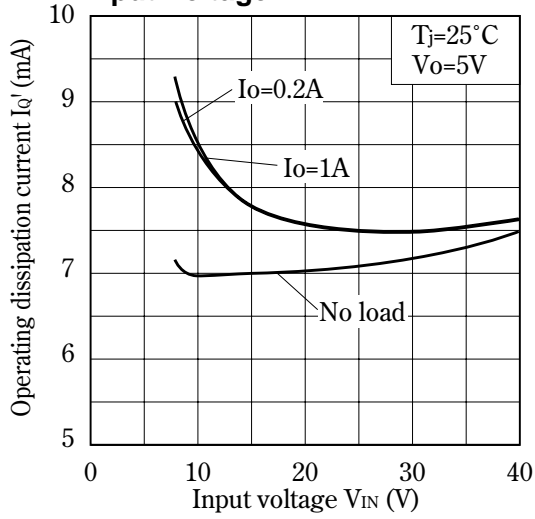
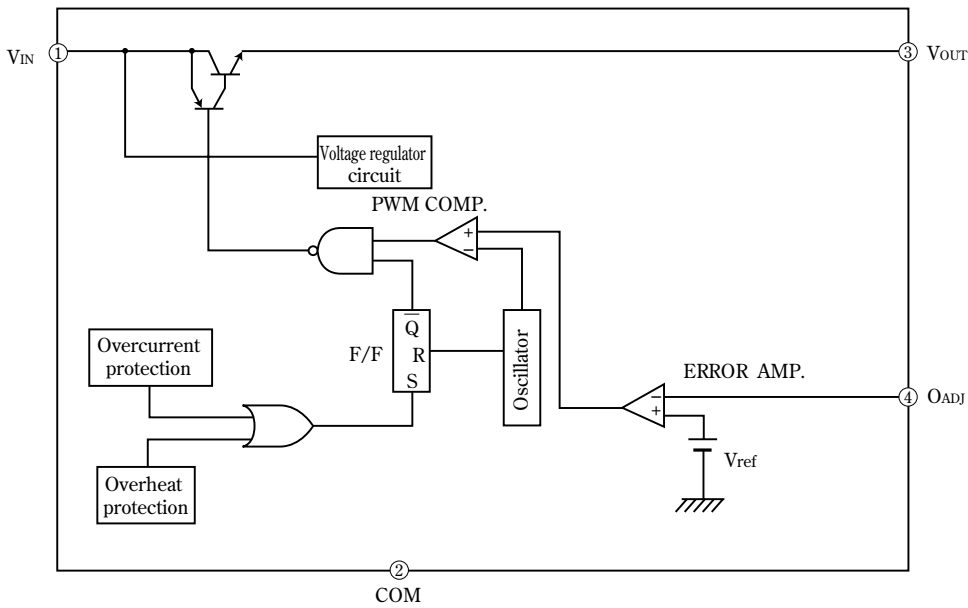


Fig.11 Operating Dissipation Current vs. Input Voltage

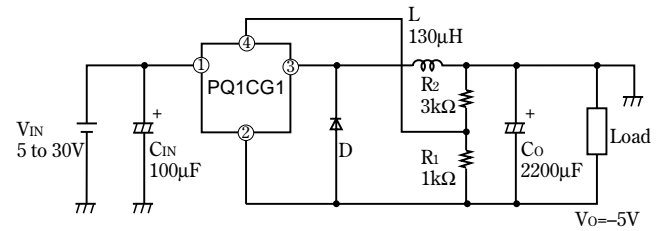
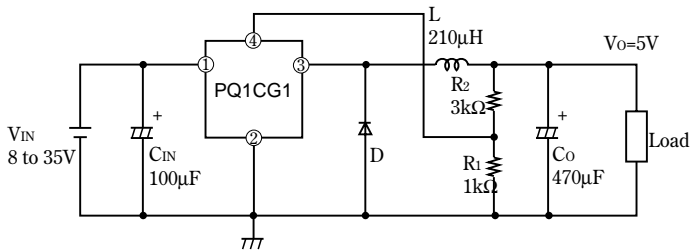


■ Block Diagram



■ Step-down Output Type Circuit Diagram(5V Output)

■ Inversion Output Type Circuit Diagram(-5V Output)



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    - Alarm equipment
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