

# PQ1CZ21H2ZxH

Low Dissipation Current at OFF-state  
Chopper Regulator

## ■ Features

1. Maximum switching current: 1.5A
2. Low dissipation current at OFF-state(Iqs:Max.1mA)
3. Built-in oscillation circuit  
(Oscillation frequency: TYP.100kHz)
4. Built-in overheat, overcurrent protection functions
5. Variable output voltage  
(Output variable range:  $V_{ref}$  to 35V/- $V_{ref}$  to -30V)  
[Possible to select step-down output/inverting output according to external connection circuit]
6. **PQ1CZ21H2ZZH**: Sleeve-packaged product  
**PQ1CZ21H2ZPH**: Tape-packaged product
7. RoHS directive compliant

## ■ Applications

1. Facsimiles
2. Printers
3. Switching power supplies

## ■ Absolute Maximum Ratings

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

Parameter	Symbol	Rating	Unit
*1 Input voltage	$V_{IN}$	40	V
Error input voltage	$V_{ADJ}$	7	V
Input - output voltage	$V_{I-O}$	41	V
*2 Output - COM voltage	$V_{OUT}$	-1	V
*3 ON/OFF control voltage	$V_C$	-0.3 to +40	V
Switching current	$I_{SW}$	1.5	A
*4 Power dissipation	$P_D$	8	W
*5 Junction temperature	$T_j$	150	$^\circ\text{C}$
Operating temperature	$T_{opr}$	-40 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-40 to +150	$^\circ\text{C}$
Soldering temperature	$T_{sol}$	260(10s)	$^\circ\text{C}$

\*1 Voltage between  $V_{IN}$  terminal and COM terminal

\*2 Voltage between  $V_{OUT}$  terminal and COM terminal

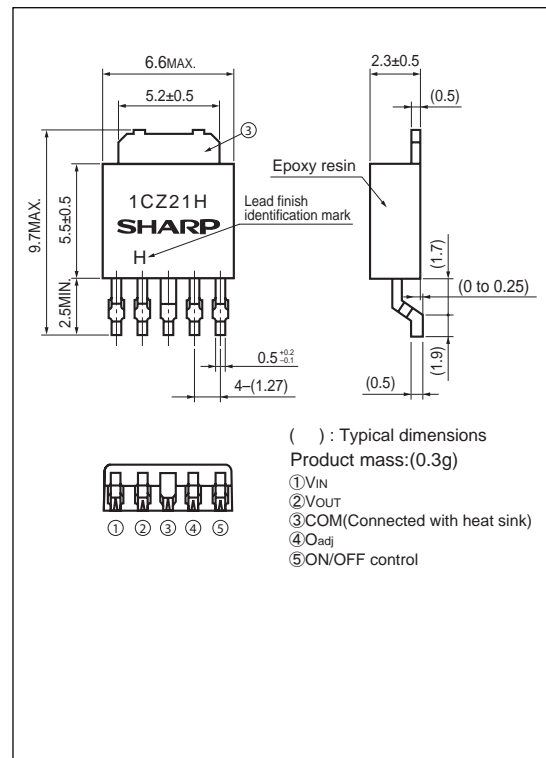
\*3 Voltage between ON/OFF control and COM terminal

\*4  $P_D$ : With infinite heat sink

\*5 There is case that over heat protection function operates at the temperature  $T_j=125^\circ\text{C}$  to  $150^\circ\text{C}$ , so this item cannot be used in this temperature range.

## ■ Outline Dimensions

(Unit:mm)



Lead finish: Lead-free solder plating  
(Composition: Sn2Cu)

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### Electrical Characteristics

(Unless otherwise specified, condition shall be  $V_{IN}=12V, I_o=0.2A, V_o=5V, ON-OFF\ terminal=2.7V, T_a=25^\circ C$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output saturation voltage	$V_{SAT}$	$I_{SW}=1A$	—	0.9	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	$\Delta f_o$	$T_j=0\ to\ 125^\circ C$	—	$\pm 3$	—	%
Overcurrent detecting level	$I_L$	Switching current peak	1.55	2	2.6	A
ON threshold voltage	$V_{TH(ON)}$	④ terminal=0V, ⑤ terminal	0.8	1.5	2	V
ON-state current for control	$I_{C(ON)}$	⑤ terminal=2.7V	—	—	200	$\mu A$
OFF-state current for control	$I_{C(OFF)}$	⑤ terminal=0.4V	—	—	2	$\mu A$
Stand-by current	$I_{SD}$	$V_{IN}=40V, ⑤\ terminal=0V$	—	—	1	$\mu A$
Output OFF-state dissipation current	$I_{QS}$	$V_{IN}=40V, ④\ terminal=3V$	—	8	12	mA

Fig.1 Test Circuit

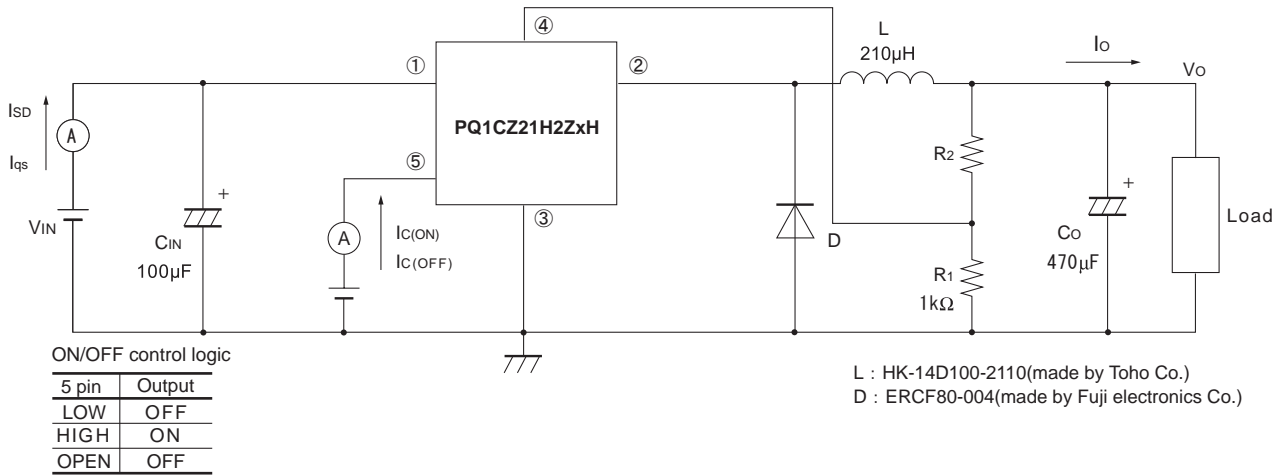


Fig.2 Power Dissipation vs. Ambient Temperature

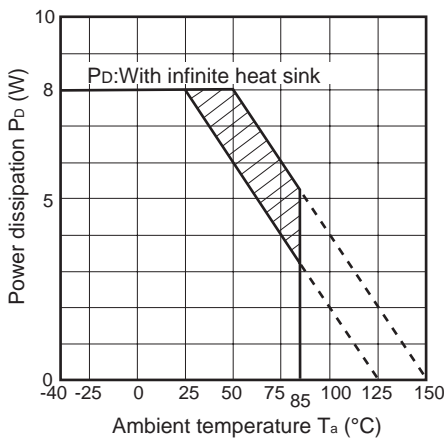


Fig.3 Overcurrent Protection Characteristics (Typical Value)

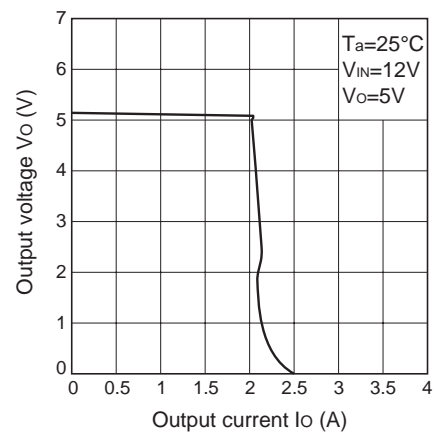


Fig.4 Efficiency vs. Input Voltage

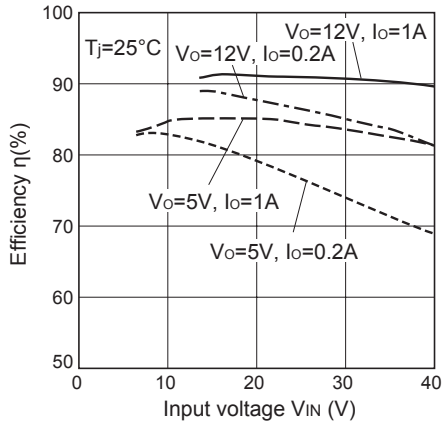


Fig.5 Output Saturation Voltage vs. Switching Current

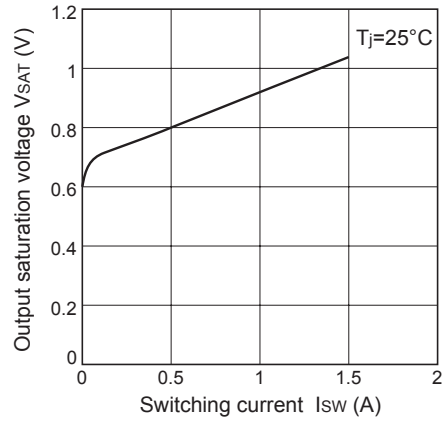


Fig.6 Reference Voltage Fluctuation vs. Junction Temperature

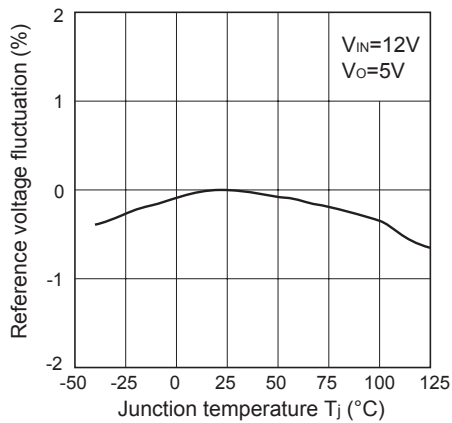


Fig.7 Load Regulation vs. Output Current

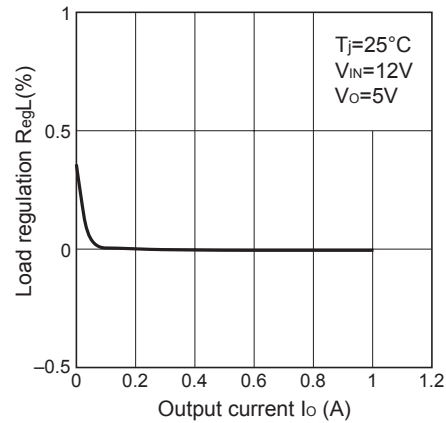


Fig.8 Line Regulation vs. Input Voltage

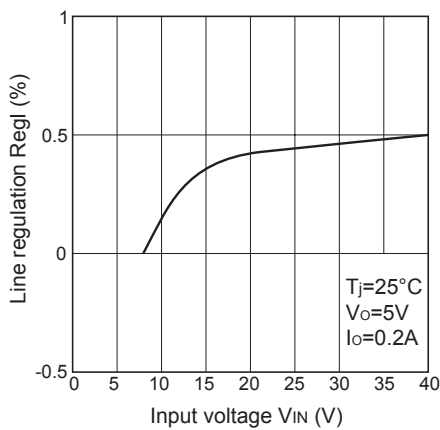


Fig.9 Oscillation Frequency Fluctuation vs. Junction Temperature

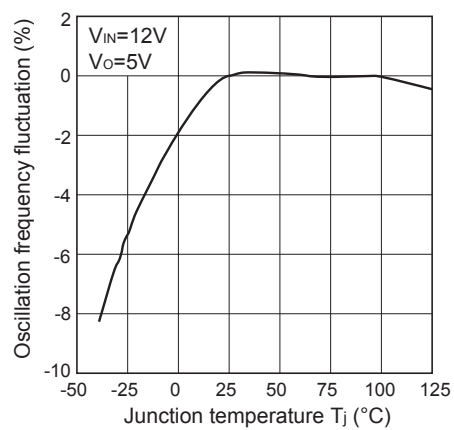


Fig.10 Overcurrent Detecting Level Fluctuation vs. Junction Temperature

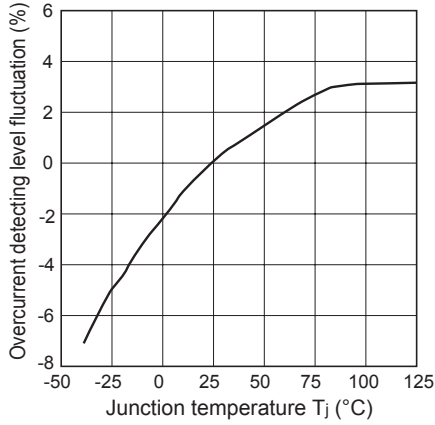


Fig.11 On Threshold Voltage vs. Junction Temperature

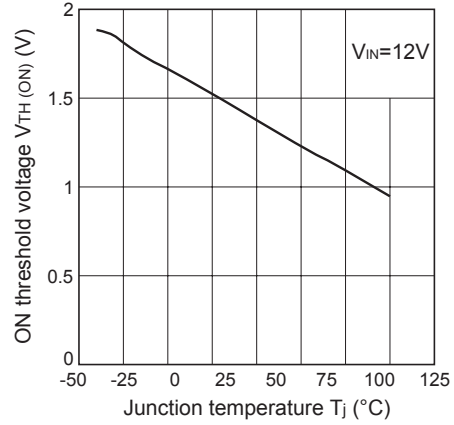


Fig.12 Operating Dissipation Current vs. Input Voltage

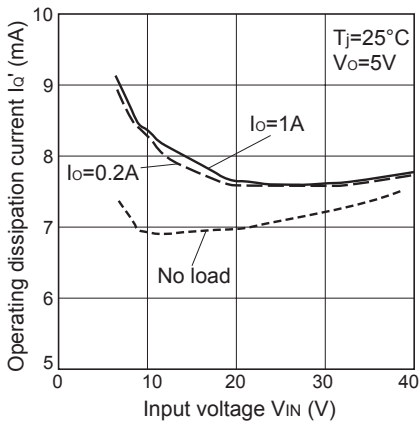


Fig.13 Power Dissipation vs. Ambient Temperature (Typical Value)

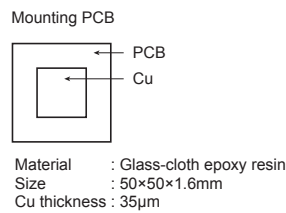
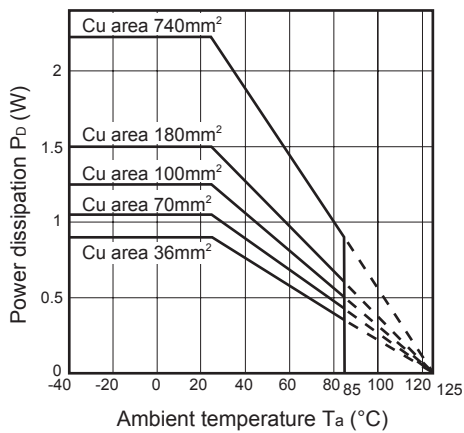


Fig.14 Block Diagram



- ① VIN
- ② VOUT
- ③ COM (Common to heat sink)
- ④ Oadj
- ⑤ ON/OFF control

Fig.15 Step Down Type Circuit Diagram

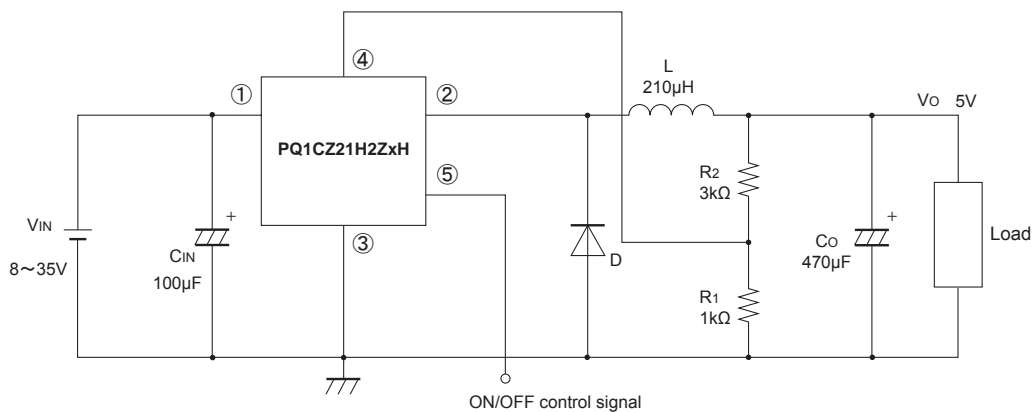
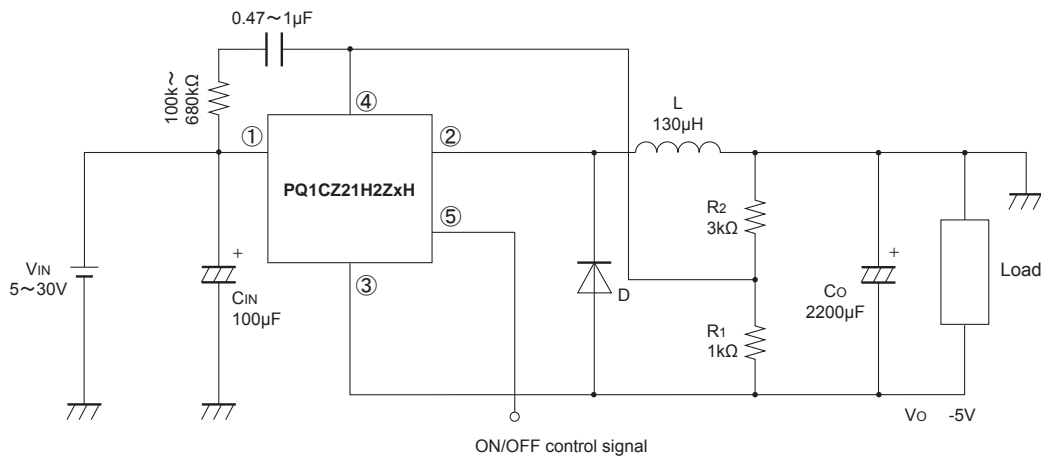


Fig.16 Polarity Inversion Type Circuit Diagram



In case that polarity is reverse, depending on the conditions, there is cases that output voltage can not gain, please use this device after confirming the output voltage at the actual conditions.