

PQ1CZ21H2Z

Low Dissipation Current at OFF-state Chopper Regulator

Features

- Maximum switching current: 1.5A
- Low dissipation current at OFF-state (I_{qs} : Max. 1mA)
- Built-in oscillation circuit
(Oscillation frequency: TYP. 100kHz)
- Built-in overheat, overcurrent protection functions
- 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]
- PQ1CZ21H2ZZ: sleeve-packaged product
PQ1CZ21H2ZP: tape-packaged product

Applications

- Facsimiles
- Printers
- 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(For 10s)	$^\circ\text{C}$

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

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

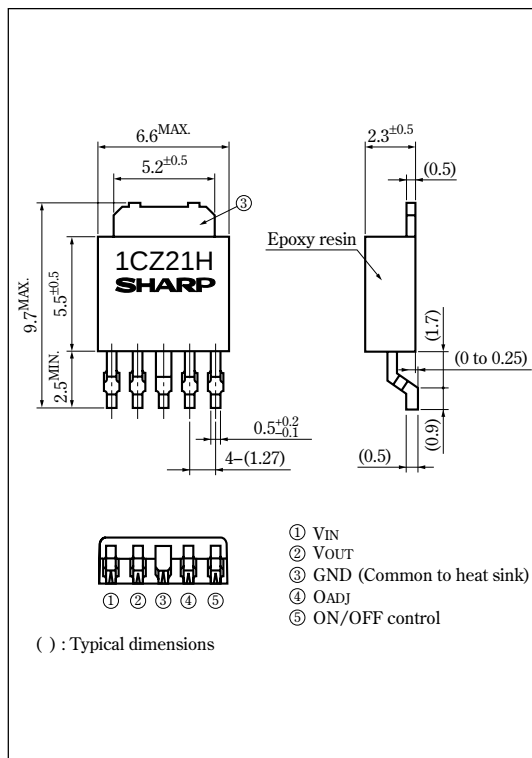
*3 Voltage between ON/OFF control and COM terminal

*4 P_D : With infinite heat sink

*5 Overheat protection may operate at the condition T_j : 125 $^\circ\text{C}$ to 150 $^\circ\text{C}$

Outline Dimensions

(Unit : mm)



•Please refer to the chapter " Handling Precautions ".

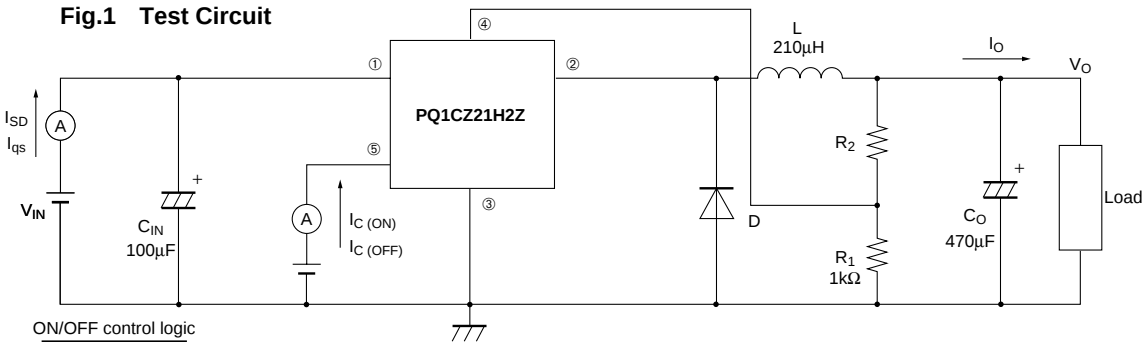
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■ Electrical Characteristics

(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	ΔV_{ref}	$T_j=0$ to $125^{\circ}C$	—	± 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	η	$I_O=1A$	—	82	—	%
Oscillation frequency	f_O	—	80	100	120	kHz
Oscillation frequency temperature fluctuation	Δf_O	$T_j=0$ to $125^{\circ}C$	—	± 3	—	%
Overcurrent detecting level	I_L	No L, C, D	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	μA
OFF-state current for control	$I_C(OFF)$	⑤ terminal= $0.4V$	—	—	2	μA
Stand-by current	I_{SD}	$V_{IN}=40V$, ⑤ terminal= $0V$	—	—	1	μA
Output OFF-state dissipation current	I_{qs}	$V_{IN}=40V$, ④ terminal= $3V$	—	8	12	mA

Fig.1 Test Circuit

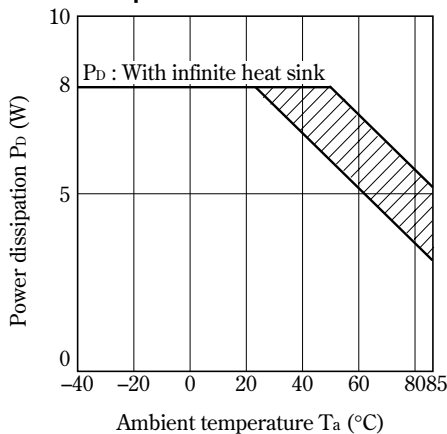


ON/OFF control logic

5 pin	Output
LOW	OFF
HIGH	ON
OPEN	OFF

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)

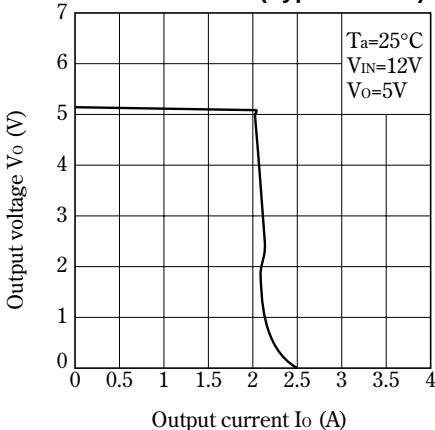


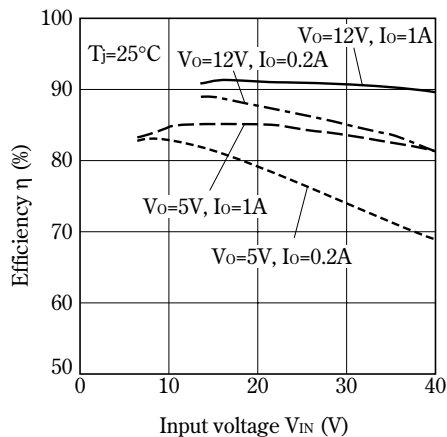
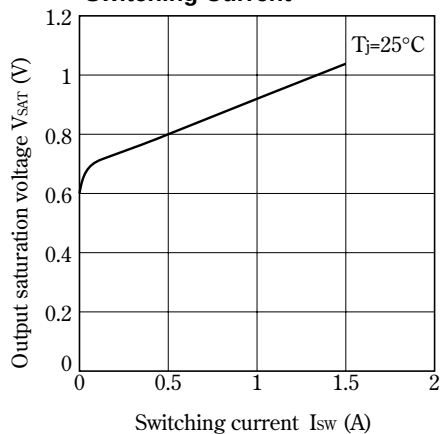
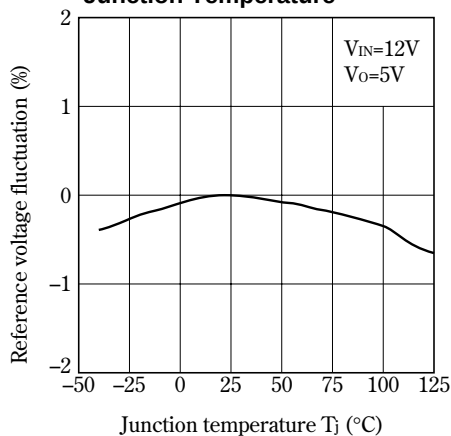
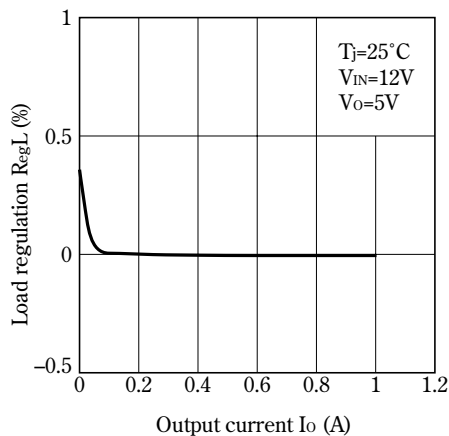
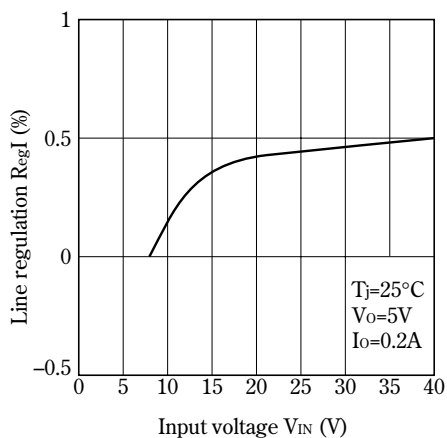
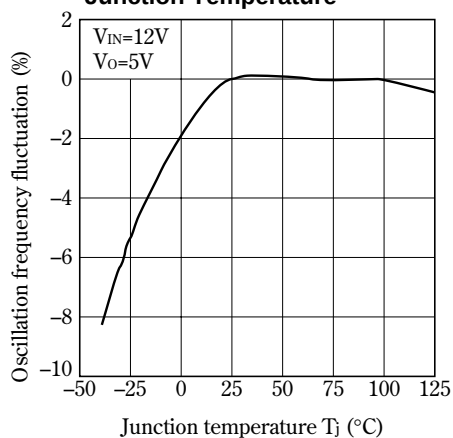
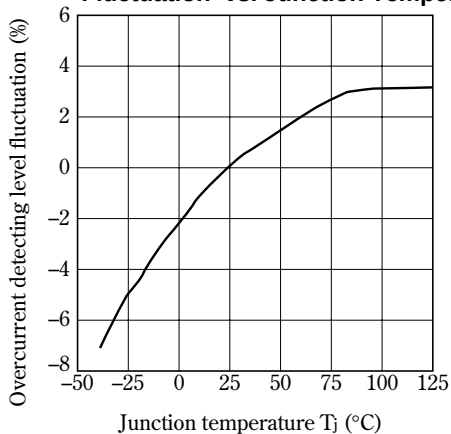
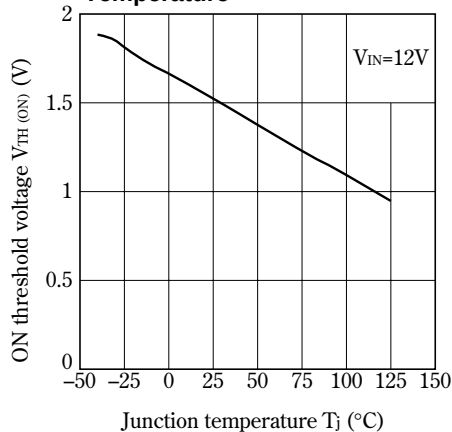
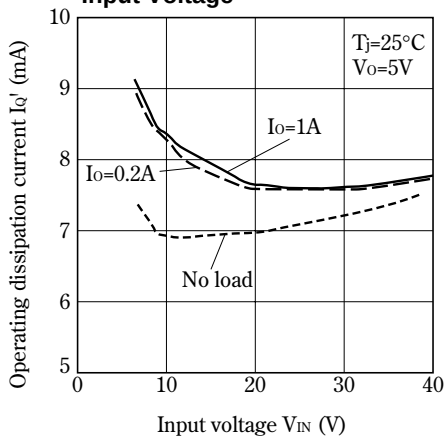
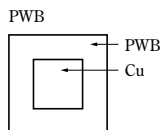
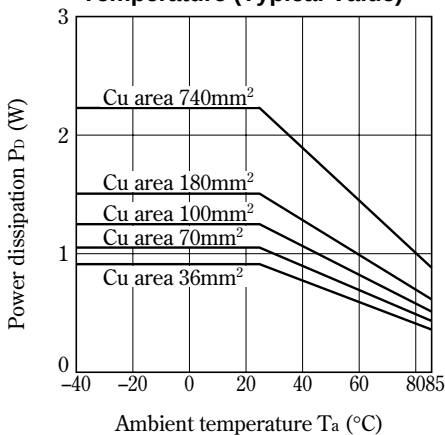
Fig.4 Efficiency vs. Input Voltage**Fig.5 Output Saturation Voltage vs. Switching Current****Fig.6 Reference Voltage Fluctuation vs. Junction Temperature****Fig.7 Load Regulation vs. Output Current****Fig.8 Line Regulation vs. Input Voltage****Fig.9 Oscillation Frequency Fluctuation vs. Junction Temperature**

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)**

Material : Glass-cloth epoxy resin
 Size : 50×50×1.6mm
 Cu thickness : 35μm

Fig.14 Block Diagram

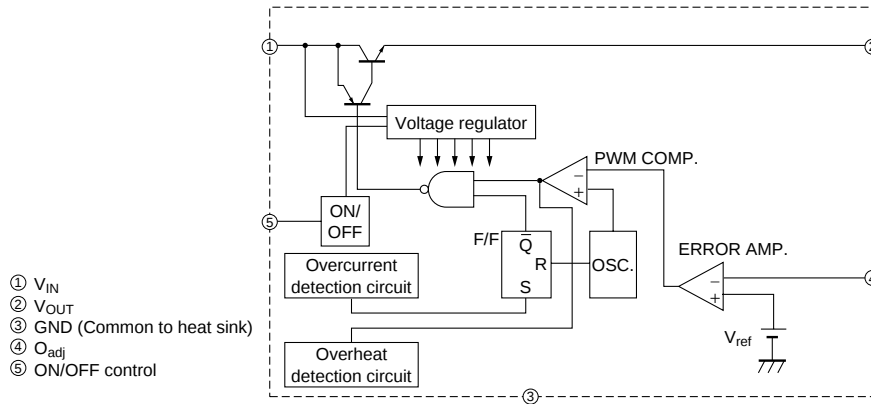


Fig.15 Step Down Type Circuit Diagram (5V output)

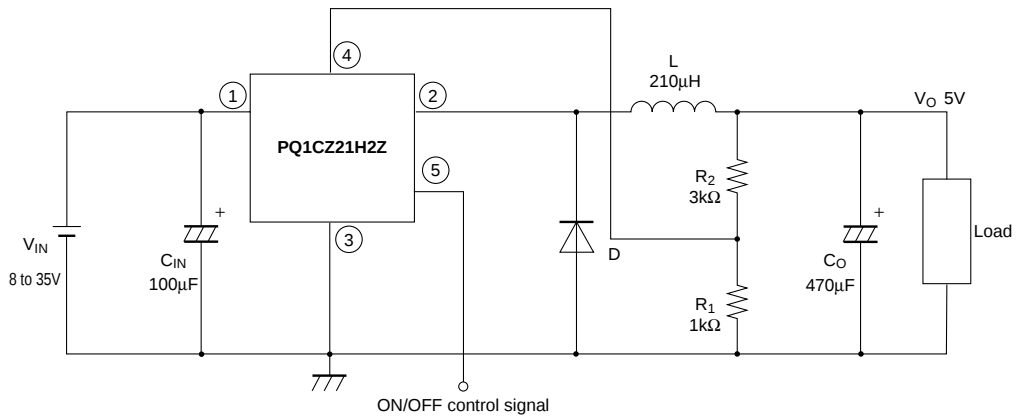
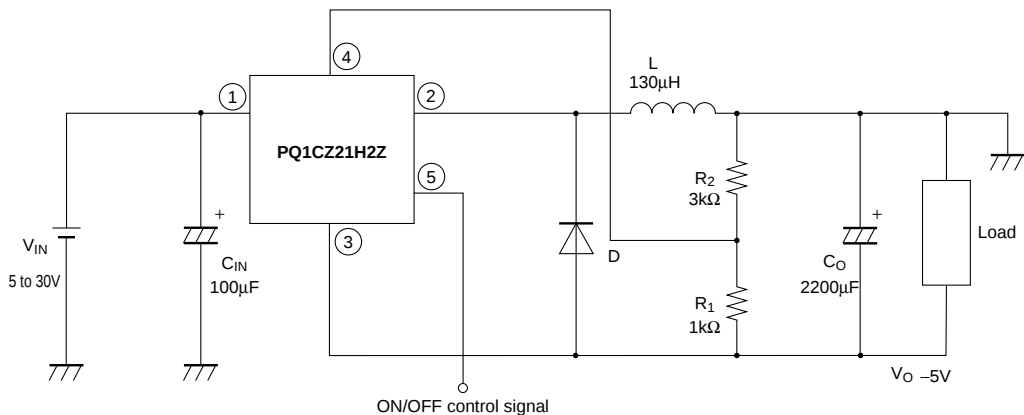


Fig.16 Polarity Inversion Type Circuit Diagram (-5V output)



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