

PQ1CG21H2FZ/PQ1CG21H2RZ

TO-220 Type Chopper Regulators

Features

- Maximum switching current: 1.5A
- Built-in ON/OFF control function
- Built-in soft start function to suppress overshoot of output voltage in power on sequence or ON/OFF control sequence
- Built-in oscillation circuit
(Oscillation frequency: TYP. 100kHz)
- Built-in overheat, overcurrent protection functions
- TO-220 package
- 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]
- PQ1CG21H2FZ: Zigzag forming
PQ1CG21H2RZ: Self-stand forming

Applications

- Switching power supplies
- Facsimiles, printers and other OA equipment
- Color TVs and video CDs
- Personal computers and amusement equipment

Absolute Maximum Ratings

(Ta=25°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_{D1}	1.4	W
	P_{D2}	14	W
*5 Junction temperature	T_j	150	°C
Operating temperature	T_{opr}	-20 to +80	°C
Storage temperature	T_{stg}	-40 to +150	°C
Soldering temperature	T_{sol}	260 (10s)	°C

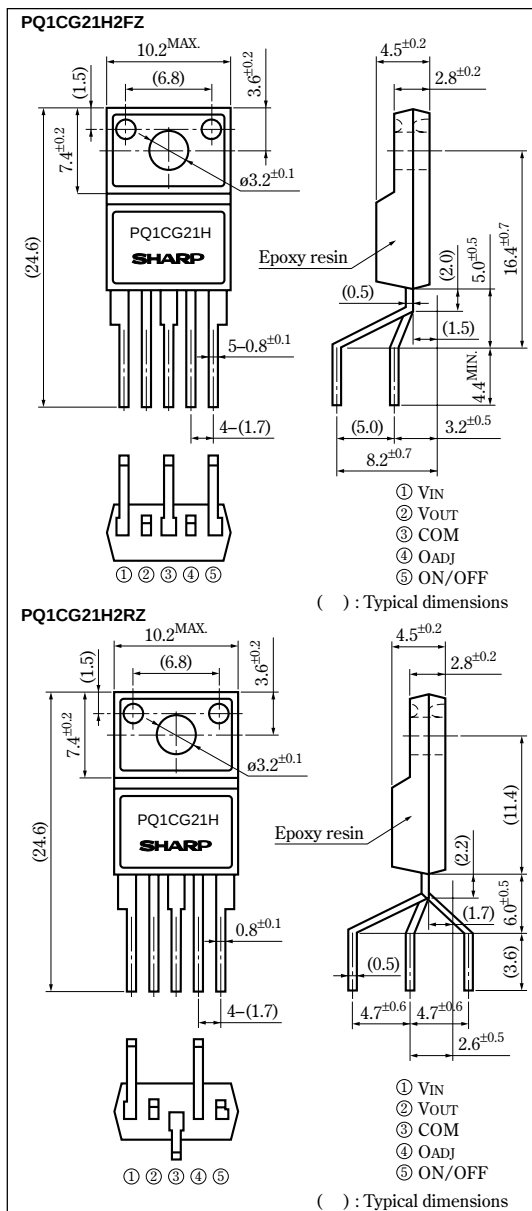
*1 Voltage between V_{IN} terminal and COM terminal*2 Voltage between V_{OUT} terminal and COM terminal

*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°C to 150°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 terminals is open, $T_a=25^{\circ}C$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output saturation voltage	V_{SAT}	$I_{SW}=1A$	—	1.0	1.5	V
Reference voltage	V_{ref}	—	1.235	1.26	1.285	V
Reference voltage temperature fluctuation	ΔV_{ref}	$T_j=0 \text{ to } 125^{\circ}C$	—	± 0.5	—	%
Load regulation	$ R_{egL} $	$I_O=0.2 \text{ to } 1A$	—	0.2	1.5	%
Line regulation	$ R_{egI} $	$V_{IN}=8 \text{ to } 35V$	—	0.5	2.5	%
Efficiency	η	$I_O=1A$	—	84	—	%
Oscillation frequency	f_O	—	80	100	120	kHz
Oscillation frequency temperature fluctuation	Δf_O	$T_j=0 \text{ to } 125^{\circ}C$	—	± 2	—	%
Overcurrent detecting level	I_L	—	1.55	2.0	2.6	A
Charge current	I_{CHG}	②, ④ terminals is open, ⑤ terminal	—	-10	—	μA
Input threshold voltage	V_{THL}	Duty ratio=0%, ④ terminal=0V, ⑤ terminal	—	1.3	—	V
	V_{THH}	Duty ratio=100%, ④ terminals is open, ⑤ terminal	—	2.3	—	V
ON threshold voltage	$V_{TH(ON)}$	④ terminal=0V, ⑤ terminal	0.7	0.8	0.9	V
Stand-by current	I_{SD}	$V_{IN}=40V$, ⑤ terminal=0V	—	140	400	μA
Output OFF-state dissipation current	I_{QS}	$V_{IN}=40V$, ⑤ terminal=0.9V	—	8	12	mA

Fig.1 Test Circuit

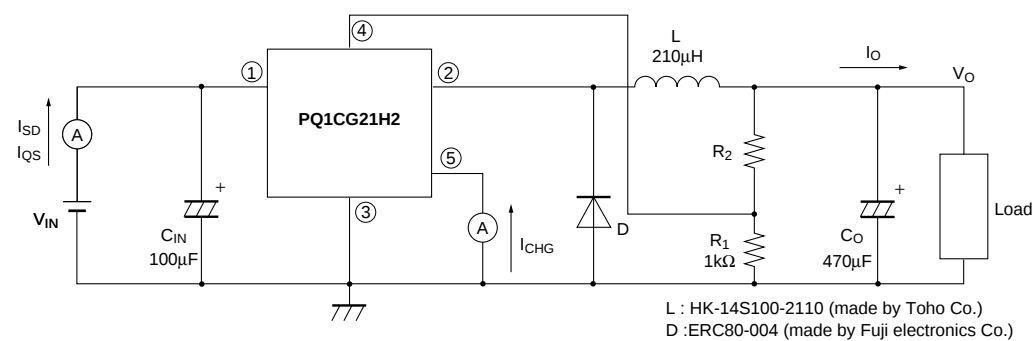
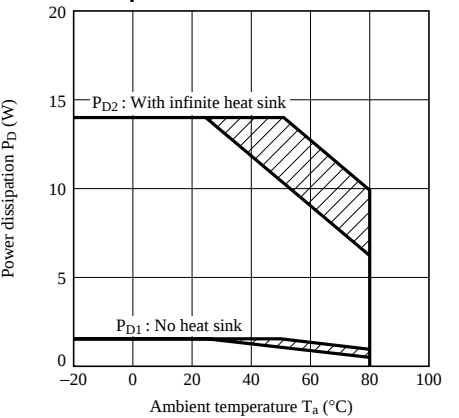


Fig.2 Power Dissipation vs. Ambient Temperature



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

Fig.3 Overcurrent Protection Characteristics (Typical Value)

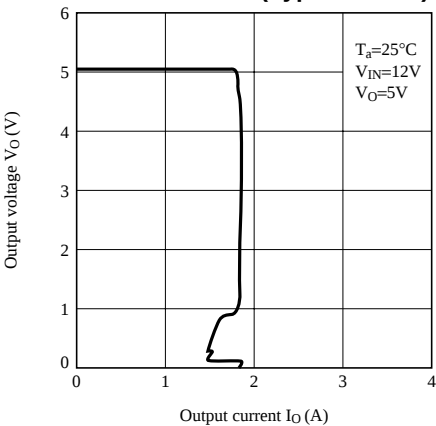


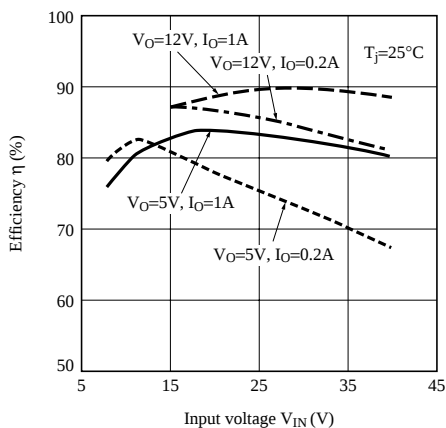
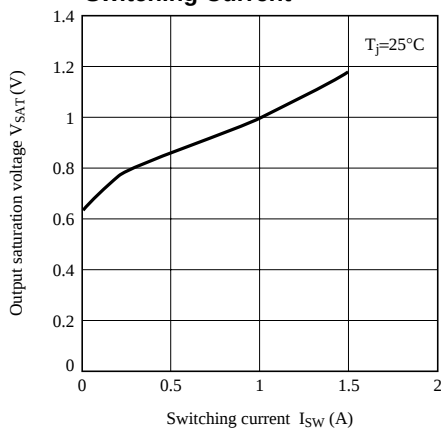
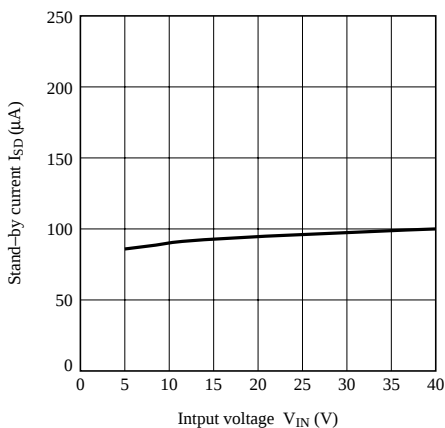
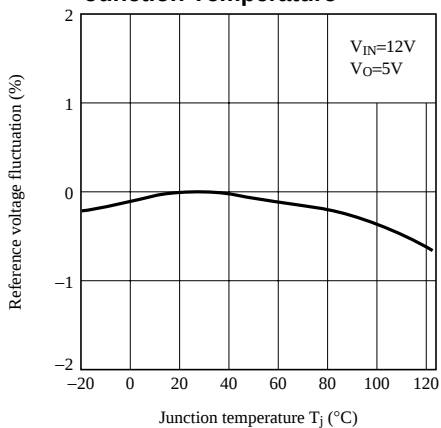
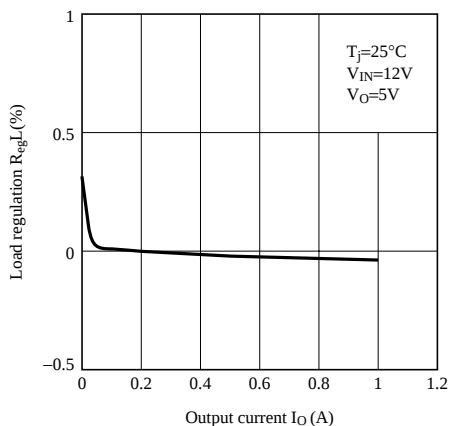
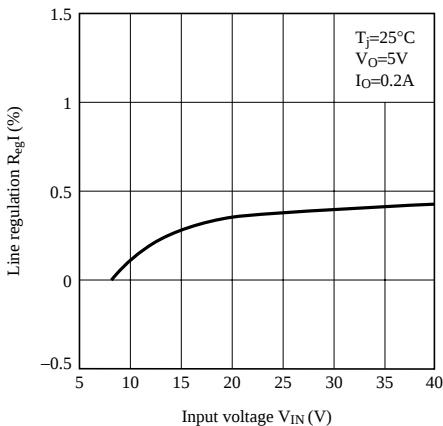
Fig.4 Efficiency vs. Input Voltage**Fig.5 Output Saturation Voltage vs. Switching Current****Fig.6 Stand-by Current vs. Input Voltage****Fig.7 Reference Voltage Fluctuation vs. Junction Temperature****Fig.8 Load Regulation vs. Output Current****Fig.9 Line Regulation vs. Input Voltage**

Fig.10 Oscillation Frequency Fluctuation vs. Junction Temperature

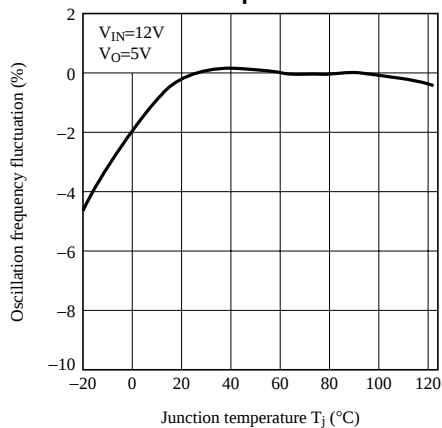


Fig.11 Overcurrent Detecting Level Fluctuation vs. Junction Temperature

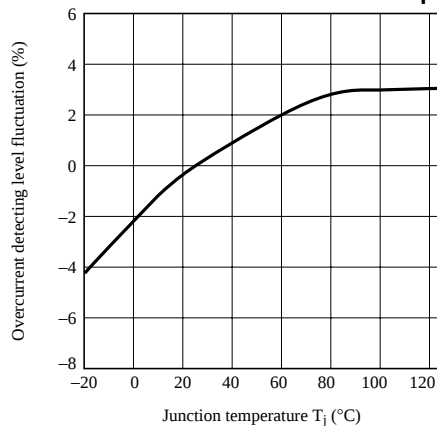


Fig.12 Threshold Voltage vs. Junction Temperature

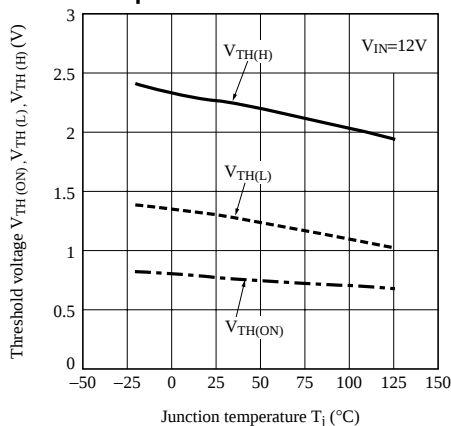


Fig.13 Operating Dissipation Current vs. Input Voltage

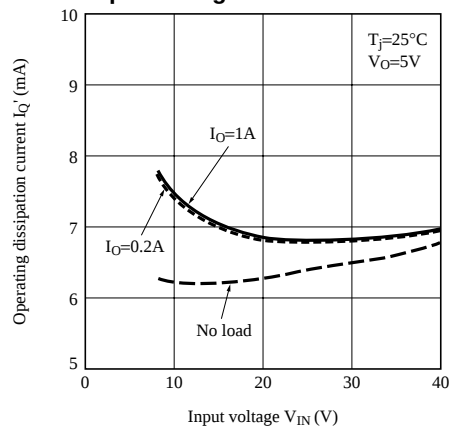


Fig.14 Block Diagram

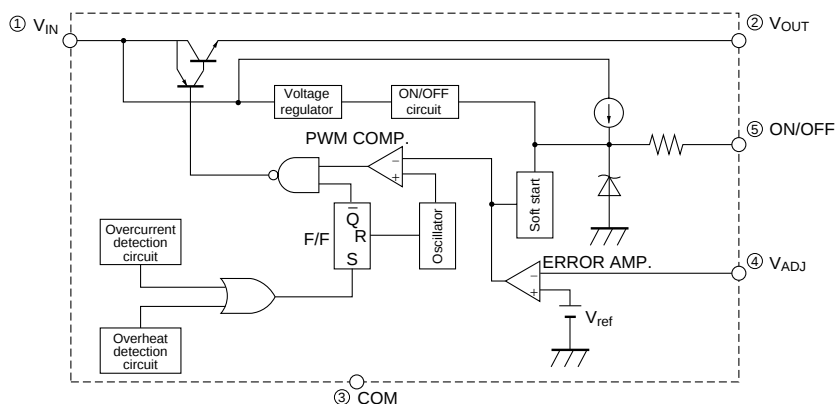


Fig.15 Step Down Type Circuit Diagram

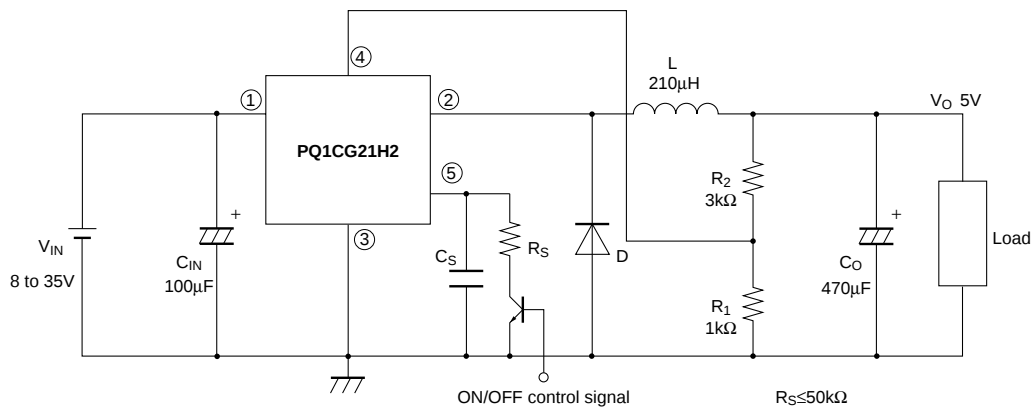
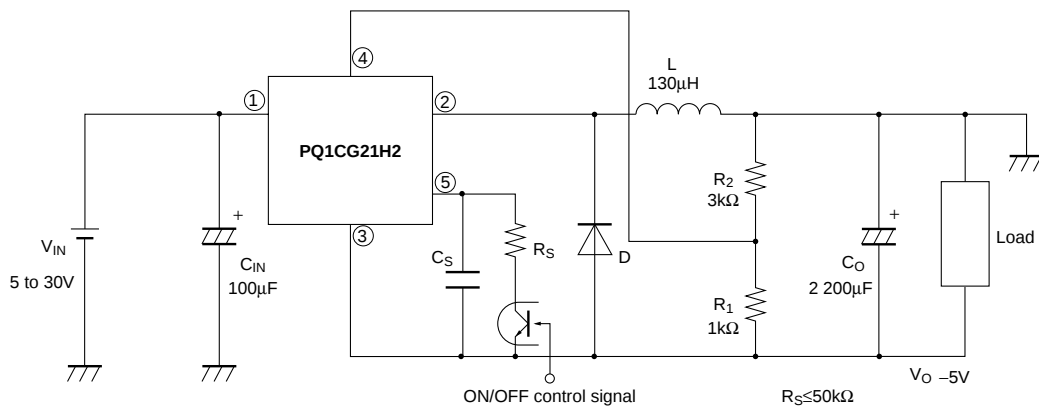


Fig.16 Polarity Inversion Type Circuit Diagram



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