

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 |

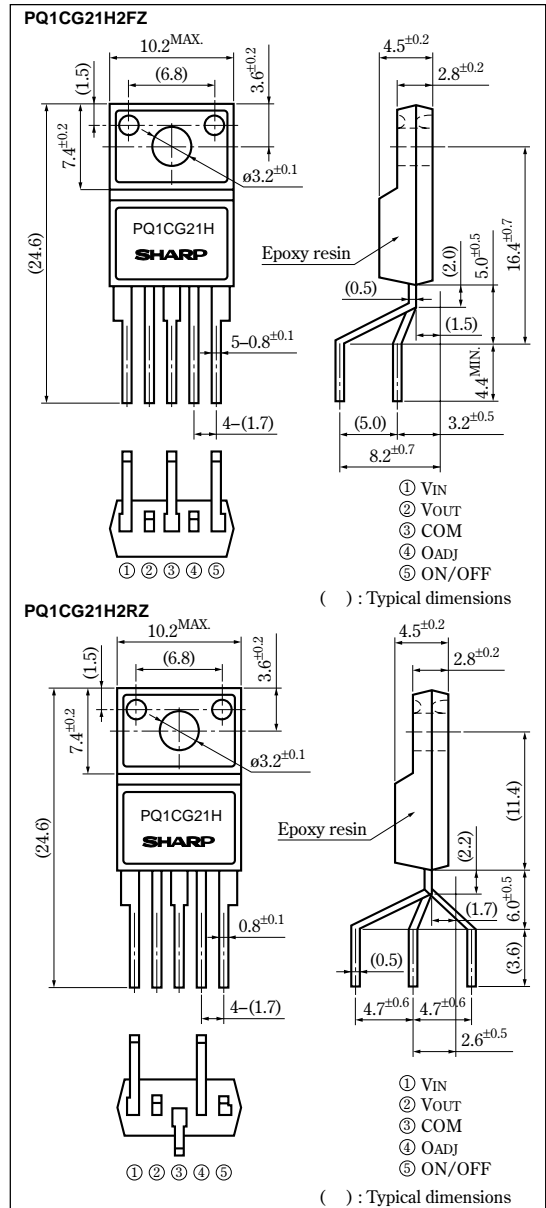
*1 Voltage between V_{IN} terminal and COM terminal*2 Voltage between V_{OUT} terminal and COM terminal

*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)

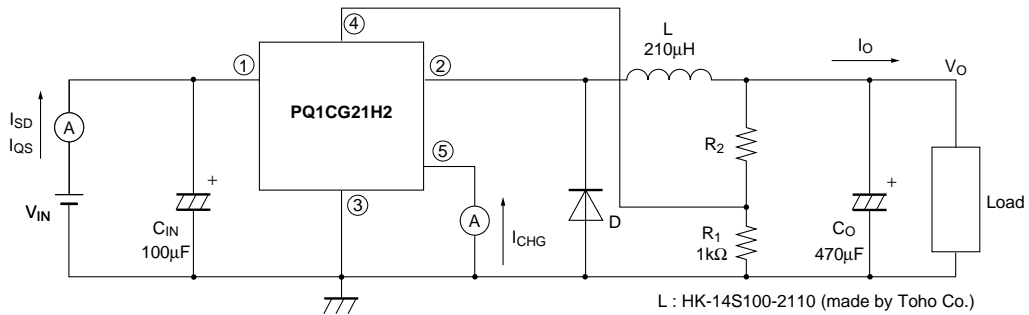

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Electrical Characteristics

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

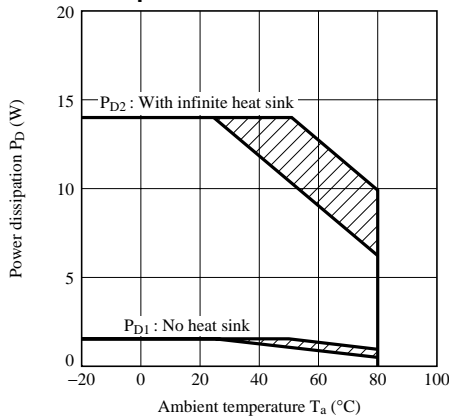
| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|-----------------------------------------------|------------------|--------------------------------------------------|-------|-----------|-------|---------|
| Output saturation voltage | V_{SAT} | $I_{SW}=1A$ | - | 1.0 | 1.5 | V |
| Reference voltage | V_{ref} | - | 1.235 | 1.26 | 1.285 | V |
| Reference voltage temperature fluctuation | ΔV_{ref} | $T_j=0$ to $125^\circ C$ | - | ± 0.5 | - | % |
| Load regulation | $ R_{regL} $ | $I_o=0.2$ to $1A$ | - | 0.2 | 1.5 | % |
| Line regulation | $ R_{regI} $ | $V_{IN}=8$ 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 | $T_j=0$ 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_{OS} | $V_{IN}=40V$, ⑤ terminal=0.9V | - | 8 | 12 | mA |

Fig.1 Test Circuit



L : HK-14S100-2110 (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)

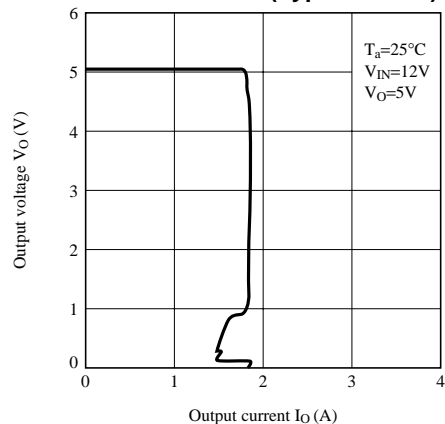


Fig.4 Efficiency vs. Input Voltage

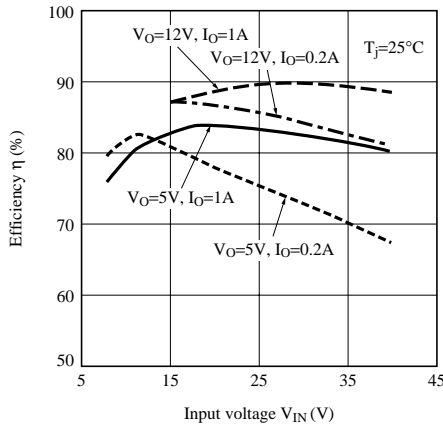


Fig.5 Output Saturation Voltage vs. Switching Current

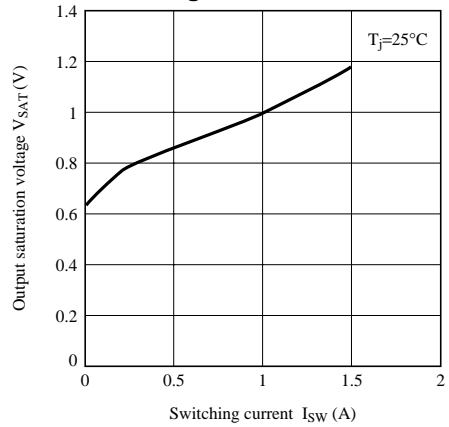


Fig.6 Stand-by Current vs. Input Voltage

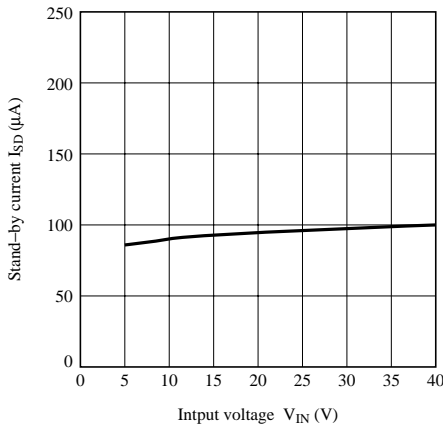


Fig.7 Reference Voltage Fluctuation vs. Junction Temperature

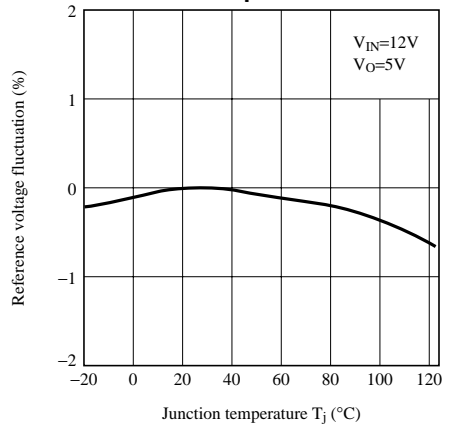


Fig.8 Load Regulation vs. Output Current

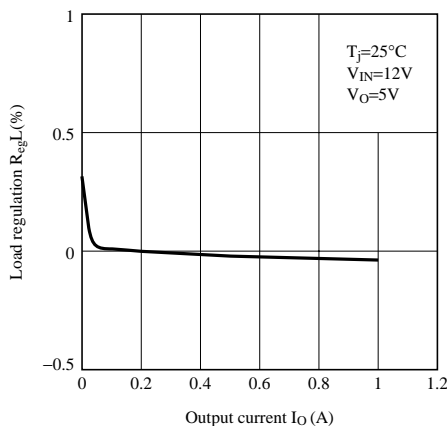


Fig.9 Line Regulation vs. Input Voltage

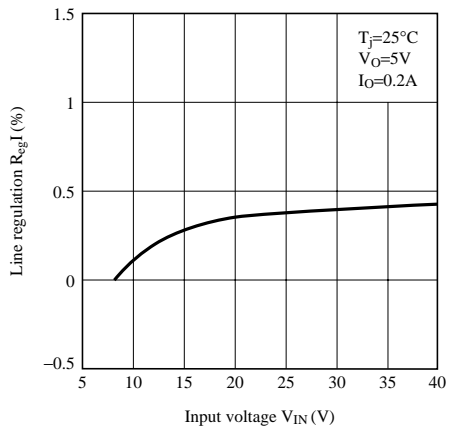


Fig.10 Oscillation Frequency Fluctuation vs. Junction Temperature

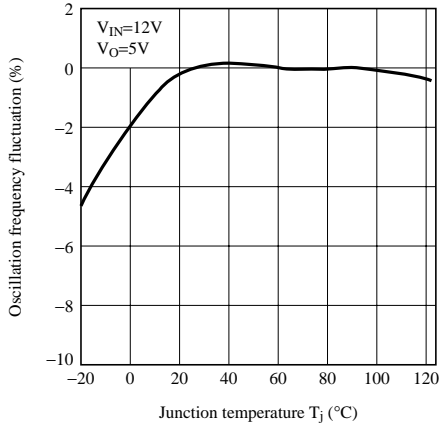


Fig.11 Overcurrent Detecting Level Fluctuation vs. Junction Temperature

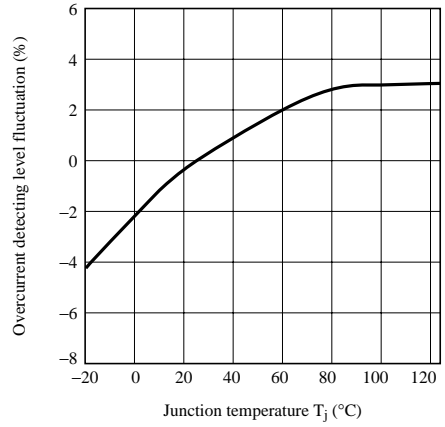


Fig.12 Threshold Voltage vs. Junction Temperature

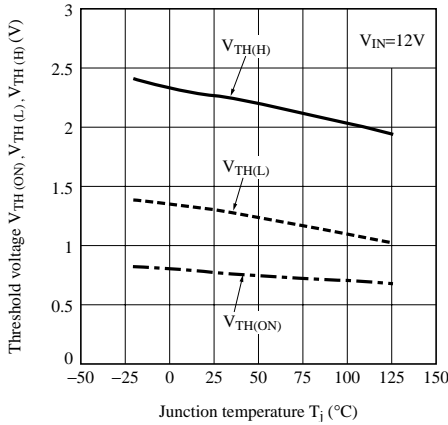


Fig.13 Operating Dissipation Current vs. Input Voltage

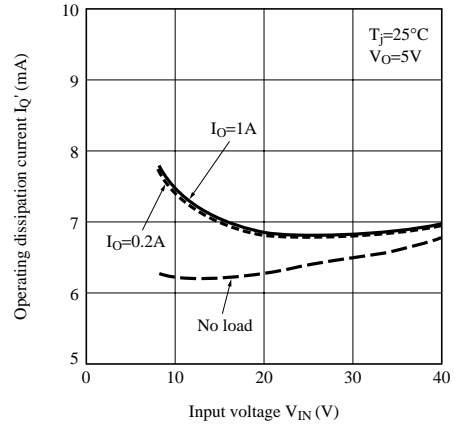


Fig.14 Block Diagram

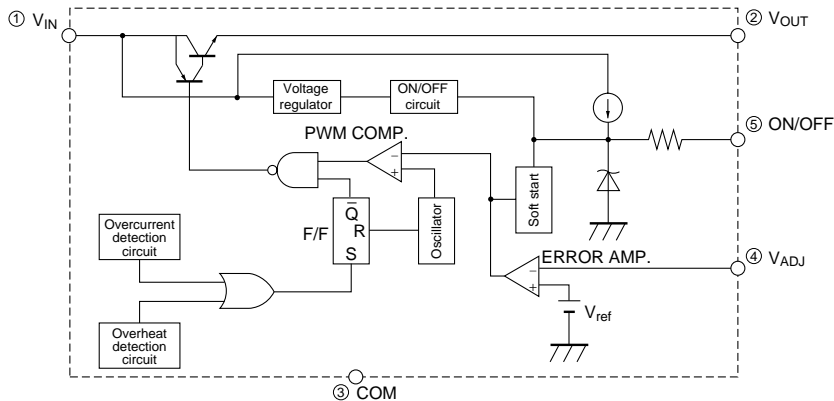


Fig.15 Step Down Type Circuit Diagram

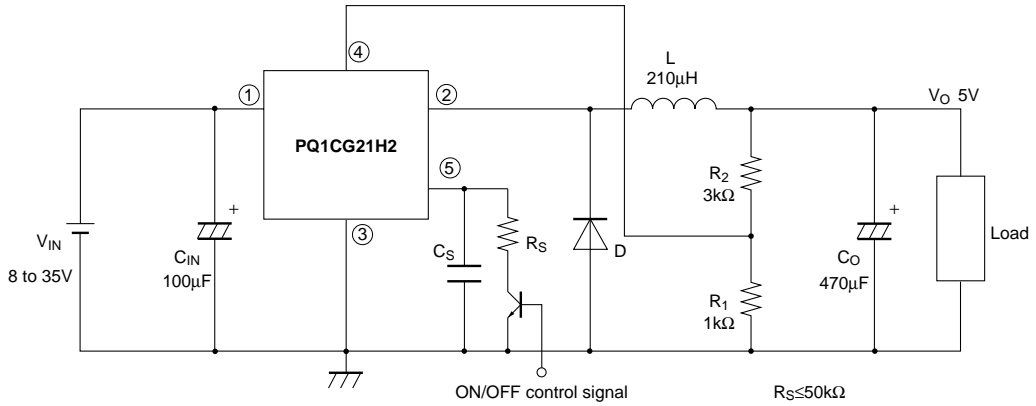
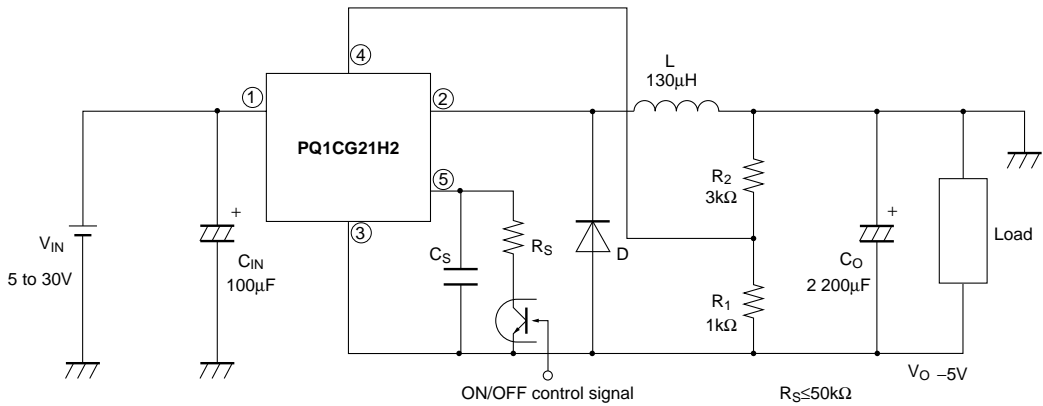


Fig.16 Polarity Inversion Type Circuit Diagram



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