PQ1CG2032FZ/PQ1CG2032RZ

TO-220 Type Chopper Regulators

■ Features

- Maximum switching current: 3.5A
- 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. 70kHz)
- Built-in overheat, overcurrent protection function
- TO-220 package
- Variable output voltage
  (Output variable range: Vref to 35V/-Vref to -30V)
  [Possible to select step-down output/inversing output according to external connection circuit]
- PQ1CG2032FZ: Zigzag forming
  PQ1CG2032RZ: Self-stand forming

■ Applications

- Switching power supplies
- Facsimiles, printers and other OA equipment
- Battery chargers
- Personal computers and amusement equipment

■ Absolute Maximum Ratings

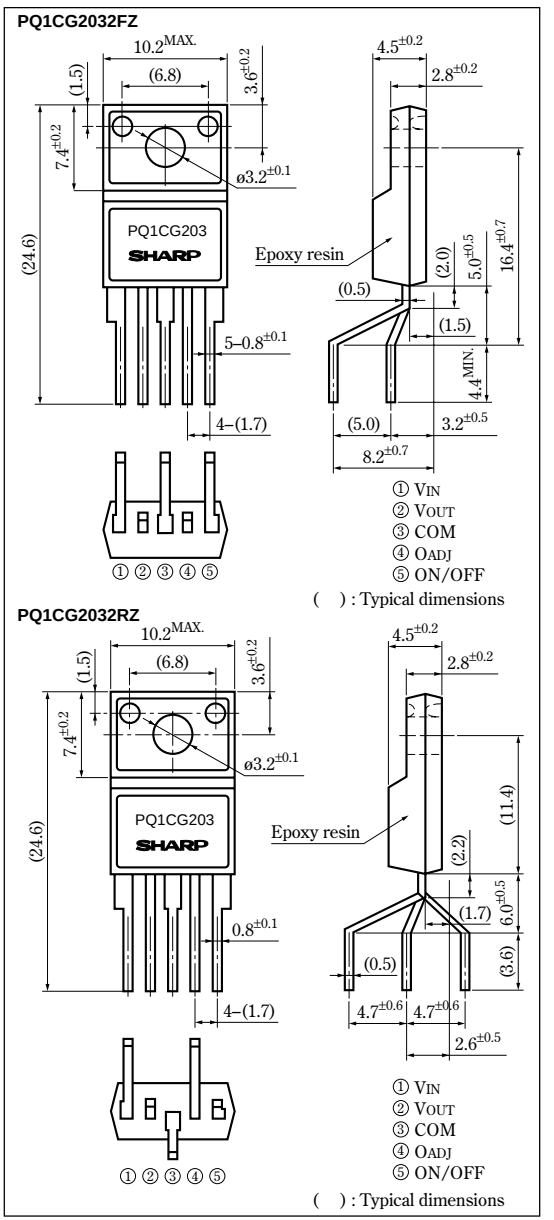
(Ta=25°C)

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}	3.5	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 T_j=125˚C to 150˚C

■ Outline Dimensions

(Unit : mm)



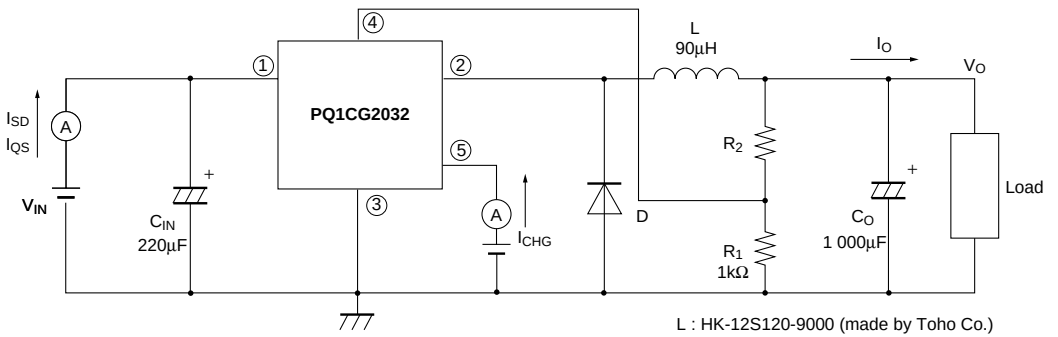
• Please refer to the chapter " Handling Precautions ".

■ Electrical Characteristics

(Unless otherwise specified, condition shall be V_{IN}=12V, I_O=0.2A, V_O=5V, ON-OFF terminals is open, Ta=25˚C)

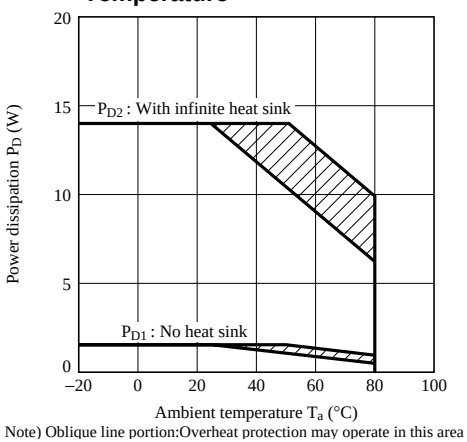
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output saturation voltage	V_{SAT}	I_{SW}=3A	–	1.4	1.8	V
Reference voltage	V_{ref}	–	1.235	1.26	1.285	V
Reference voltage temperature fluctuation	ΔV_{ref}	T_j=0 to 125˚C	–	±0.5	–	%
Load regulation	$\|R_{egL}\|$	I_O=0.5 to 3A	–	0.2	1.5	%
Line regulation	$\|R_{egI}\|$	V_{IN}=8 to 35V	–	0.5	2.5	%
Efficiency	η	I_O=3A	–	80	–	%
Oscillation frequency	f_O	–	60	70	80	kHz
Oscillation frequency temperature fluctuation	Δf_O	T_j=0 to 125˚C	–	±2	–	%
Overcurrent detecting level	I_L	–	3.6	4.2	5.8	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	16	mA

Fig.1 Test Circuit



L : HK-12S120-9000 (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)

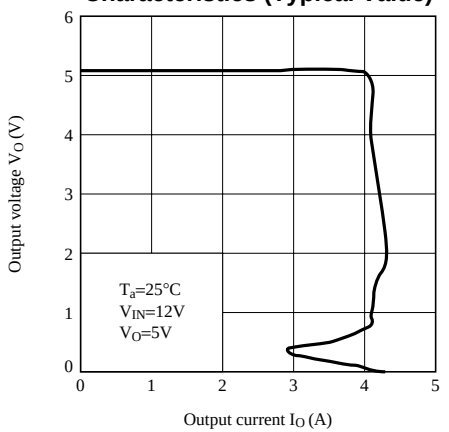


Fig.4 Efficiency vs. Input Voltage

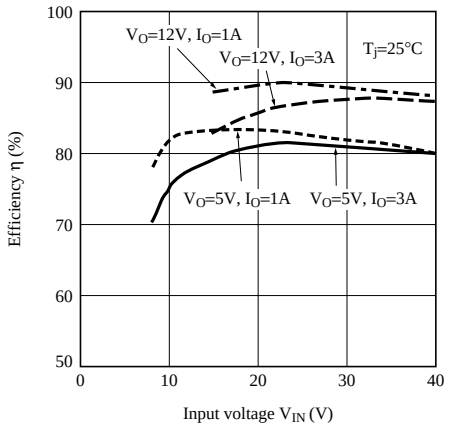


Fig.5 Output Saturation Voltage vs. Switching Current

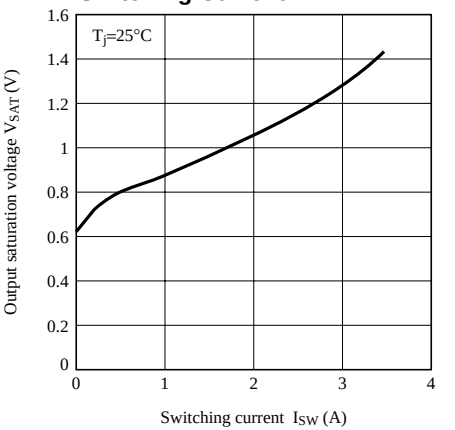


Fig.6 Stand-by Current vs. Intput Voltage

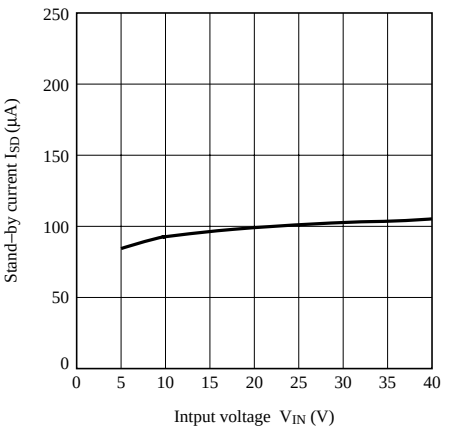


Fig.7 Reference Voltage Fluctuation vs. Junction Temperature

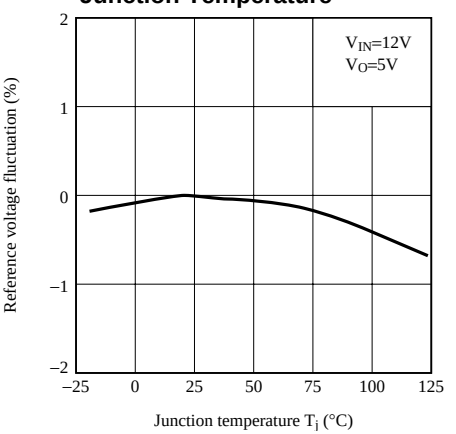


Fig.8 Load Regulation vs. Output Current

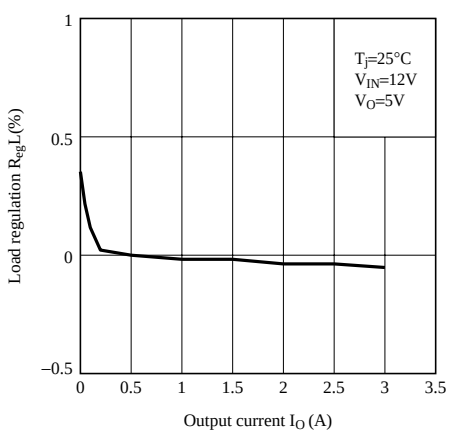


Fig.9 Line Regulation vs. Input Voltage

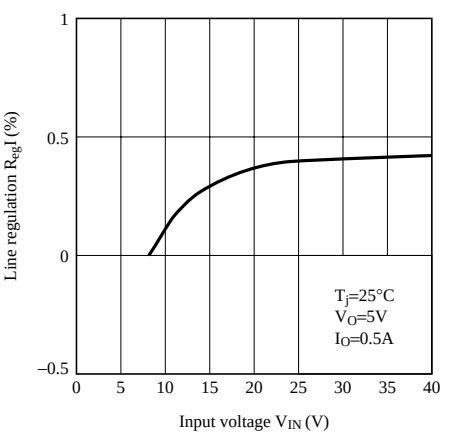


Fig.10 Oscillation Frequency Fluctuation vs. Junction Temperature

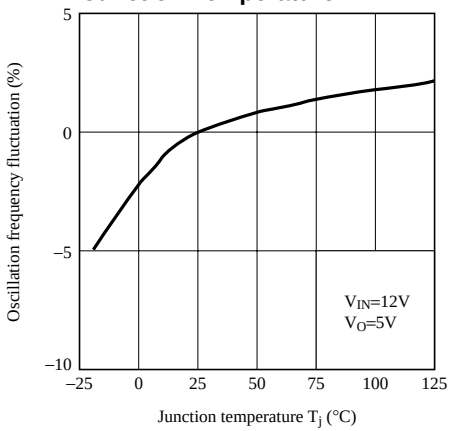


Fig.11 Overcurrent Detecting Level Fluctuation vs. Junction Temperature

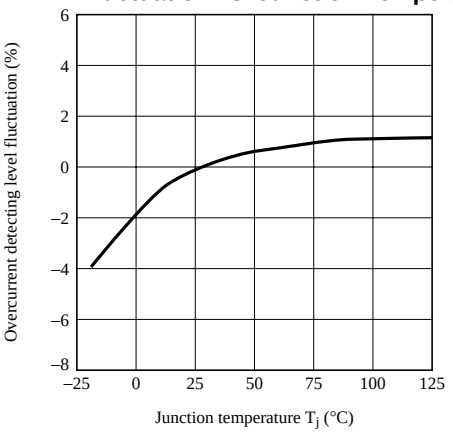


Fig.12 Threshold Voltage vs. Junction Temperature

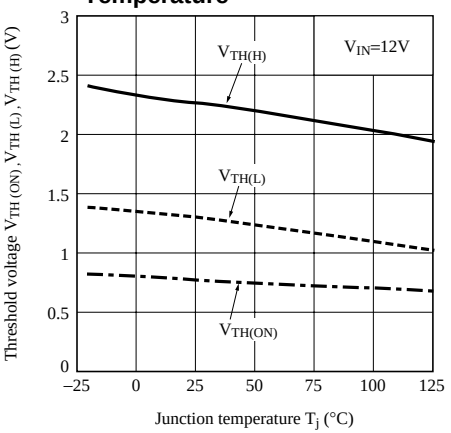


Fig.13 Operating Dissipation Current vs. Input Voltage

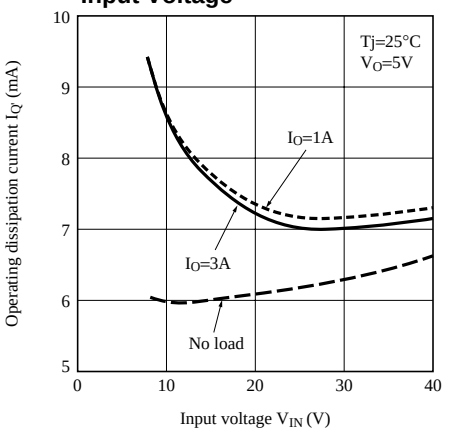


Fig.14 Block Diagram

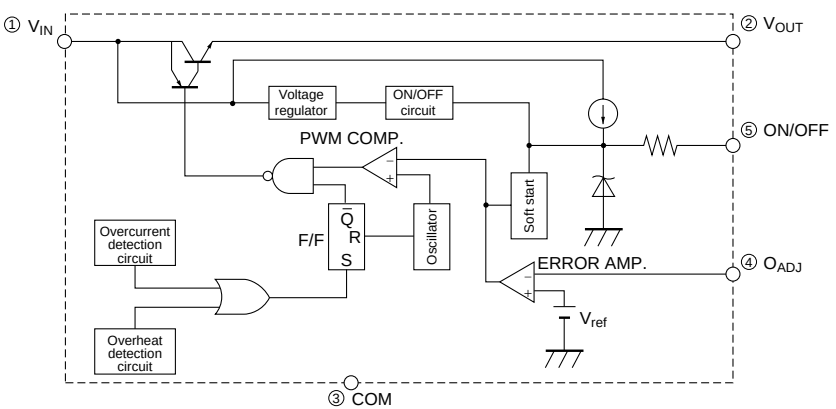


Fig.15 Step Down Type Circuit Diagram

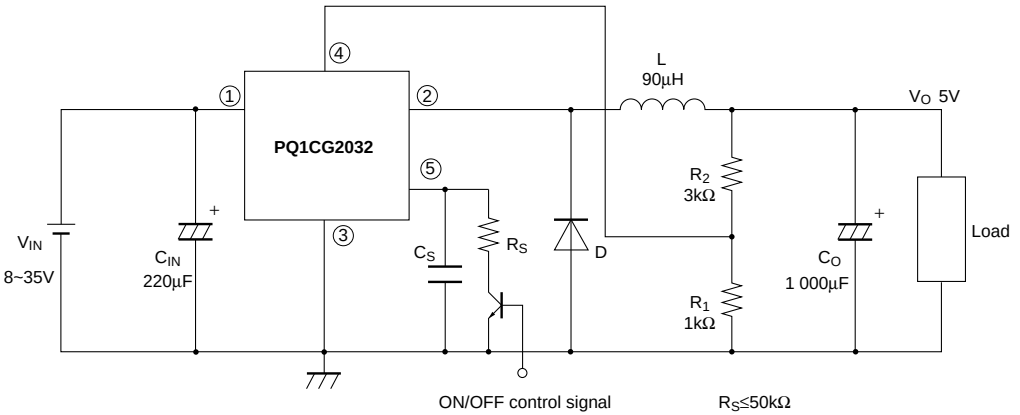
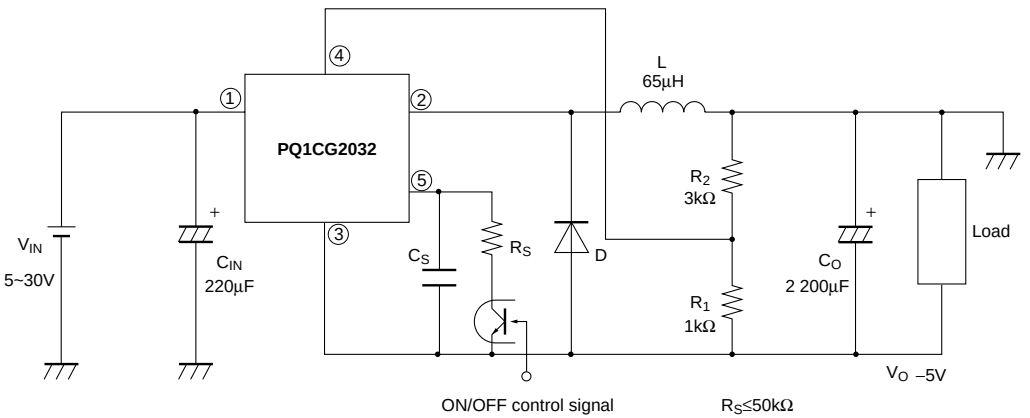


Fig.16 Polarity Inversion Type Circuit Diagram



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  --- Office automation equipment
  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
  --- Industrial control
  --- Audio visual equipment
  --- Consumer electronics

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  --- Traffic signals
  --- Gas leakage sensor breakers
  --- Alarm equipment
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