PQ1CZ38M2Z

Chopper Regulator built-in 300kHz oscillation circuit

■ Features

- Maximum switching current: 0.8A
- 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. 300kHz)
- Built-in overheat, overcurrent protection functions
- SC-63 package
- Variable output voltage
  (Output variable range: V_{REF} to 35V/-V_{REF} to -30V)
  [Possible to select step-down output/inversing output according to external connection circuit]

■ Applications

- Color TV
- Digital OA equipment
- Facsimiles, printers and other OA equipment
- 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
	Switching current	I_{SW}	0.8	A
*2	Output-COM voltage	V_{OUT}	−1	V
*3	ON/OFF control voltage	V_C	−0.3 to 40	V
*4	Power dissipation	P_D	8	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
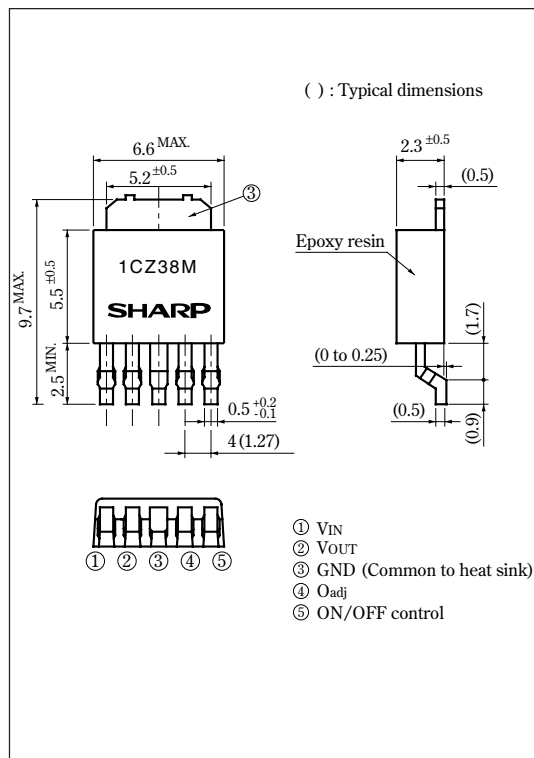*2 Voltage between V_{OUT} terminal and COM terminal
*3 Voltage between ON/OFF control and COM terminal
*4 In case of with infinite heat sink,please refer fig.2.
*5 Overheat protection may operate at T_j=125°C to 150°C

■ Outline Dimensions

(Unit : mm)

( ) : Typical dimensions

1CZ38M
SHARP

① V_{IN}
② V_{OUT}
③ GND (Common to heat sink)
④ O_{adj}
⑤ ON/OFF control

- 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}=0.5A	–	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°C	–	±0.5	–	%
Load regulation	$|R_{eg}L|$	I_O=0.1 to 0.5A	–	0.2	1.5	%
Line regulation	$|R_{eg}I|$	V_{IN}=8 to 35V	–	1	2.5	%
Efficiency	η	I_O=0.5A	–	80	–	%
Oscillation frequency	f_O	–	270	300	330	kHz
Oscillation frequency temperature fluctuation	Δf_O	T_j=0 to 125°C	–	±3	–	%
Overcurrent detecting level	I_L	–	0.85	1.2	1.6	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 terminal=1.1V,⑤ terminal	–	2.1	–	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	–	120	400	μA
Output OFF-state dissipation current	I_{QS}	V_{IN}=40V,④terminal=0V,⑤terminal=0.9V	–	5	10	mA

Fig.1   Test Circuit
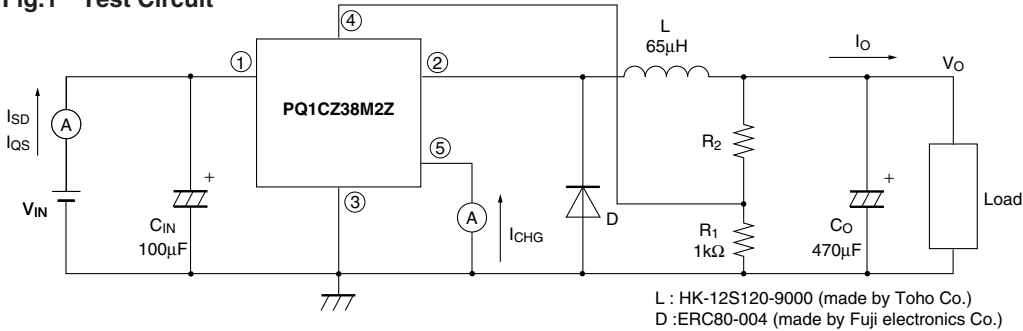

L : HK-12S120-9000 (made by Toho Co.)
D :ERC80-004 (made by Fuji electronics Co.)

Fig.2   Power Dissipation vs. Ambient Temperature

Note) Oblique line portion:Overheat protection may operate in this area
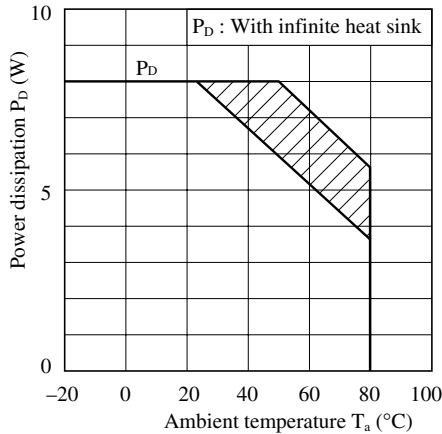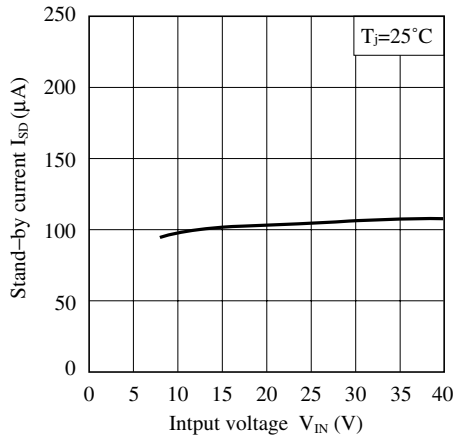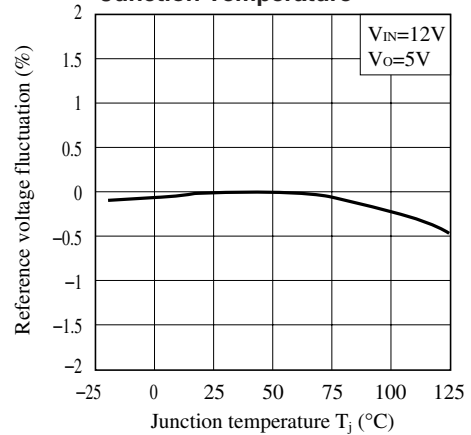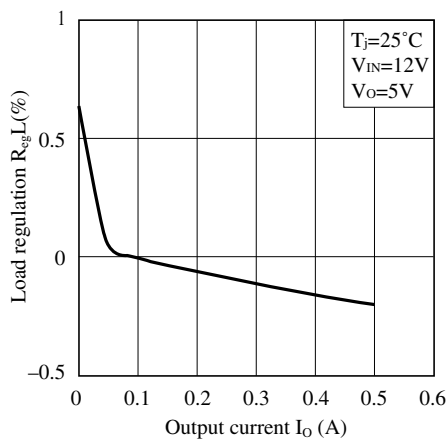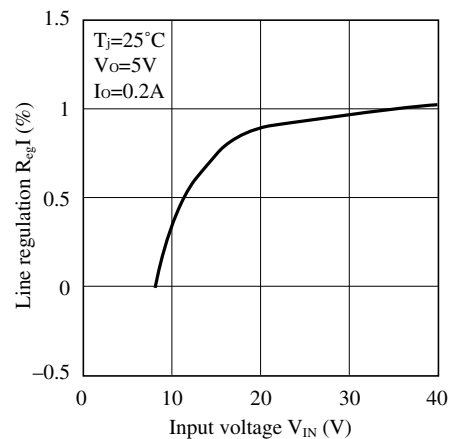
Fig.3   Overcurrent Protection Characteristics (Typical Value)

SHARP
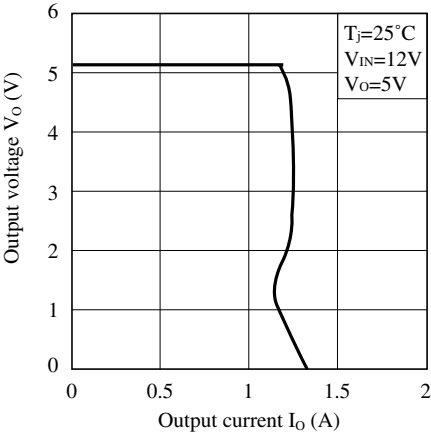
Fig.4   Efficiency vs. Input Voltage
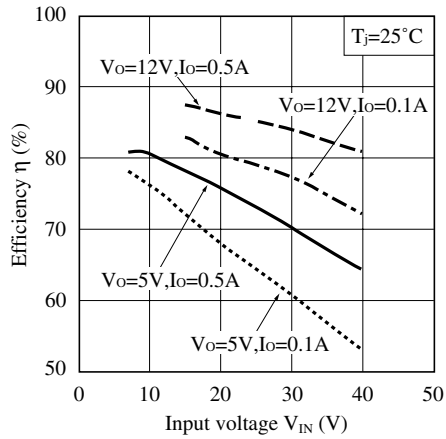
Fig.5   Output Saturation Voltage vs. Switching Current
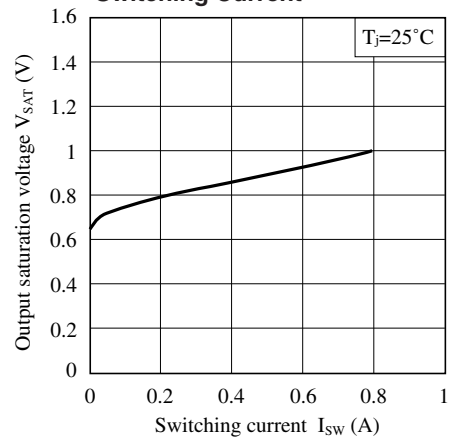
Fig.6   Stand-by Current vs. Intput Voltage

Fig.7   Reference Voltage Fluctuation vs. Junction Temperature

Fig.8   Load Regulation vs. Output Current

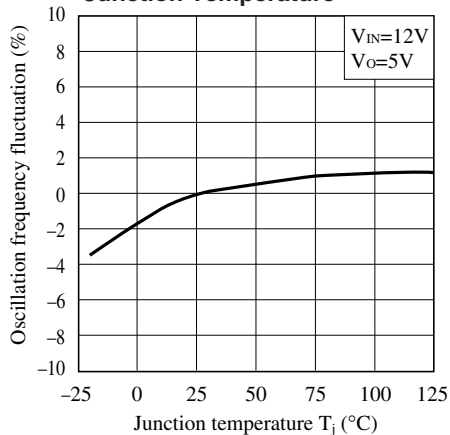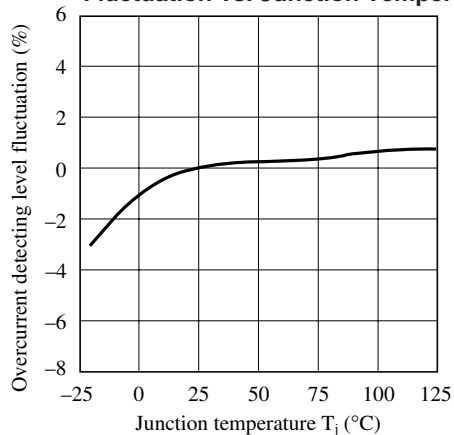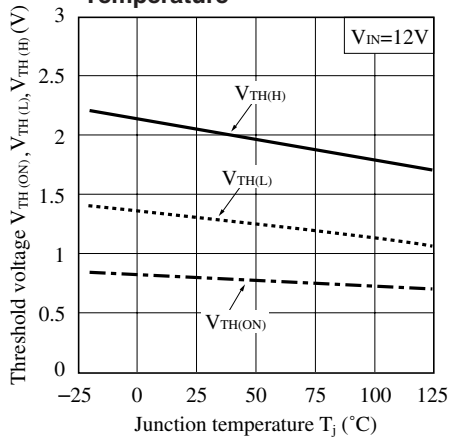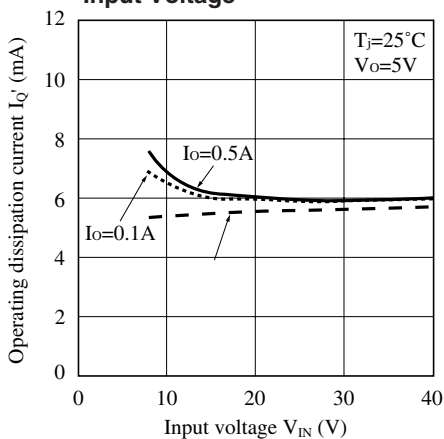**Fig.9   Line Regulation vs. Input Voltage**
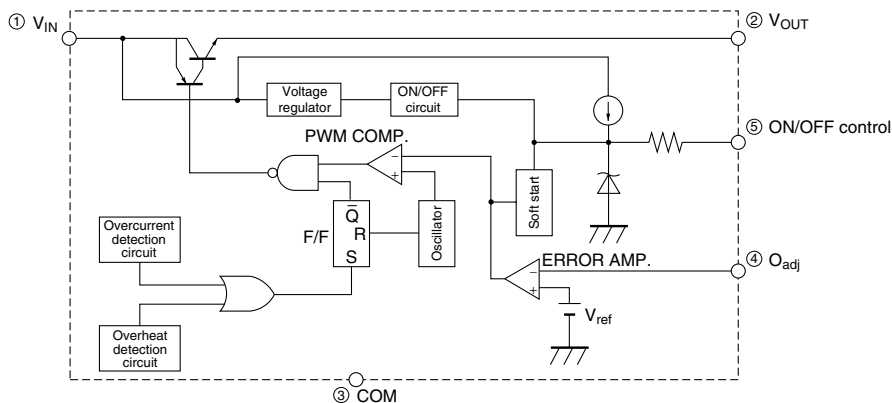

SHARP

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
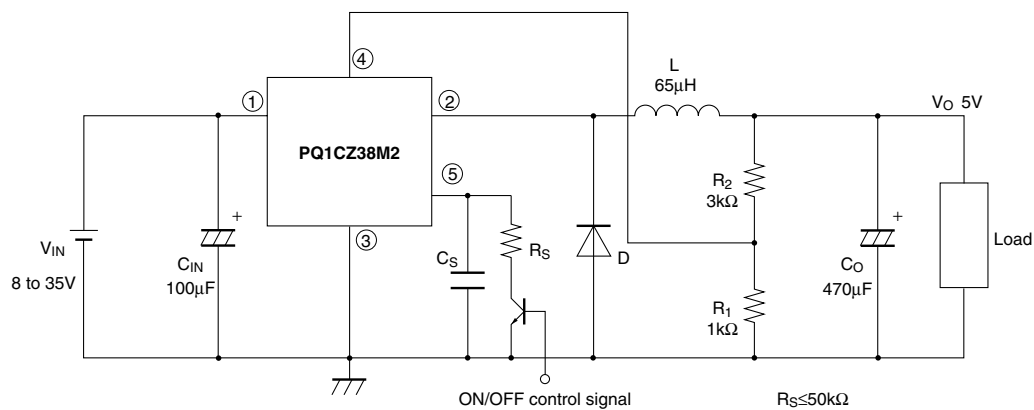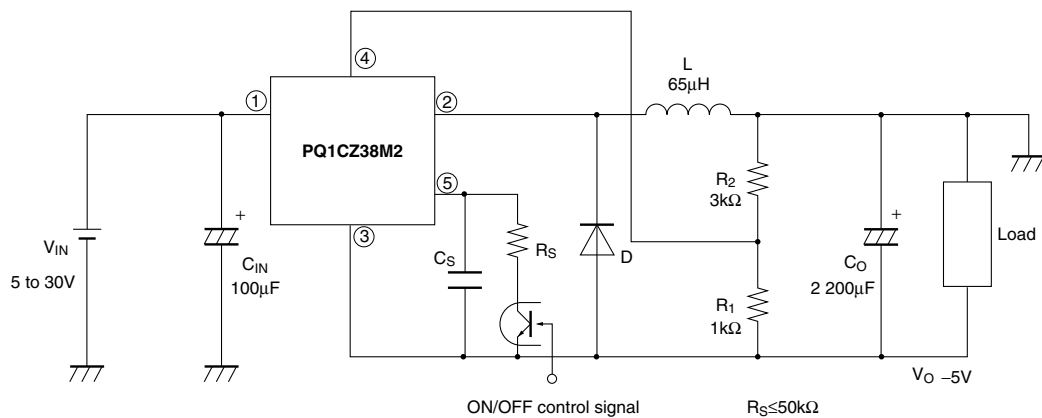

SHARP

Fig.15 Step Down Type Circuit Diagram

Fig.16 Polarity Inversion Type Circuit Diagram

SHARP

NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.

- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.

- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:

  (i) The devices in this publication are designed for use in general electronic equipment designs such as:
  --- Personal computers
  --- Office automation equipment
  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
  --- Industrial control
  --- Audio visual equipment
  --- Consumer electronics

  (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
  --- Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
  --- Traffic signals
  --- Gas leakage sensor breakers
  --- Alarm equipment
  --- Various safety devices, etc.

  (iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
  --- Space applications
  --- Telecommunication equipment [trunk lines]
  --- Nuclear power control equipment
  --- Medical and other life support equipment (e.g., scuba).

- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Law of Japan, it is necessary to obtain approval to export such SHARP devices.

- This publication is the proprietary product of SHARP and is copyrighted, with all rights reserved. Under the copyright laws, no part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, in whole or in part, without the express written permission of SHARP. Express written permission is also required before any use of this publication may be made by a third party.

- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.