

# PQ1CY1032ZxH

To-263 Surface Mount Type  
Chopper Regulator

## ■ Features

1. Maximum switching current: 3.5A
2. Built-in ON/OFF control function
3. Built-in soft start function to suppress overshoot of output voltage in power on sequence or ON/OFF control sequence
4. Built-in oscillation circuit (Oscillation frequency: TYP. 150kHz)
5. Built-in overheat protection function, overcurrent shut-down function
6. TO-263 package
7. **PQ1CY1032ZZH**: Sleeve-packaged product  
**PQ1CY1032ZPH**: Tape-packaged product
8. 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]
9. RoHS directive compliant

## ■ Applications

1. LCD monitors
2. Car navigation systems
3. 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 $V_{soft}$ terminal voltage	$V_{soft}$	-0.3 to +40	V
Switching current	$I_{SW}$	3.5	A
*4 Power dissipation	$P_D$	35	W
*5 Junction temperature	$T_j$	150	$^\circ\text{C}$
Operating temperature	$T_{opr}$	-20 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-40 to +150	$^\circ\text{C}$
Soldering temperature	$T_{sol}$	260(10s)	$^\circ\text{C}$

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

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

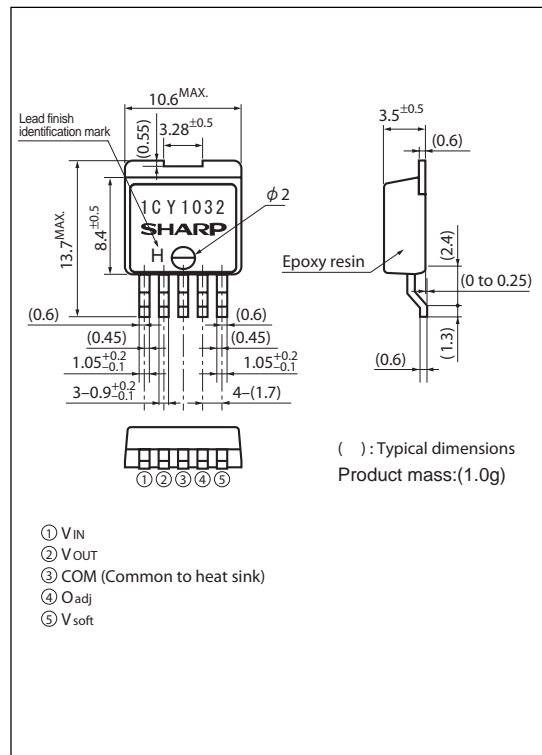
\*3 Voltage between  $V_{SOFT}$  terminal and COM terminal

\*4  $P_D$ : With infinite heat sink

\*5 There is case that over heat protection function operates at the temperature  $T_j=125^\circ\text{C}$  to  $150^\circ\text{C}$ , so this item cannot be used in this temperature range.

## ■ Outline Dimensions

(Unit:mm)



Lead finish:Lead-free solder plating  
(Composition: Sn2Cu)

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In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

### Electrical Characteristics

(Unless otherwise specified, condition shall be  $V_{IN}=12V, I_o=0.5A, V_o=5V, V_{soft}$  terminal=0.1 $\mu$ F,  $T_a=25^\circ C$ )

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	$\Delta V_{ref}$	$T_j=0$ to $125^\circ C$	—	$\pm 0.5$	—	%
Load regulation	$ R_{egL} $	$I_o=0.5$ to $3A$	—	0.2	1.5	%
Line regulation	$ R_{eg} $	$V_{IN}=8$ to $35V$	—	1	2.5	%
Efficiency	$\eta$	$I_o=3A$	—	80	—	%
Oscillation frequency	$f_o$	—	135	150	165	kHz
Oscillation frequency temperature fluctuation	$\Delta f_o$	$T_j=0$ to $125^\circ C$	—	$\pm 2$	—	%
Overcurrent detecting level	$I_L$	Switching current peak	3.6	4.2	5.8	A
Charge current	$I_{CHG}$	②,④ terminals is open,⑤ terminal	—	-10	—	$\mu A$
Input threshold voltage	$V_{THL}$	Duty ratio=0%,④ terminal=0V,⑤ terminal	—	1.3	—	V
	$V_{THH}$	Duty ratio=100%,④ terminal 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
Overcurrent shutdown threshold voltage	$V_{THIL}$	⑤ terminal	3.8	4.6	5.5	V
Stand-by current	$I_{SD}$	$V_{IN}=40V,⑤$ terminal=0V	—	140	400	$\mu A$
Output OFF-state dissipation current	$I_{QS}$	$V_{IN}=40V,⑤$ terminal=0.9V	—	8	16	mA

Fig.1 Test Circuit

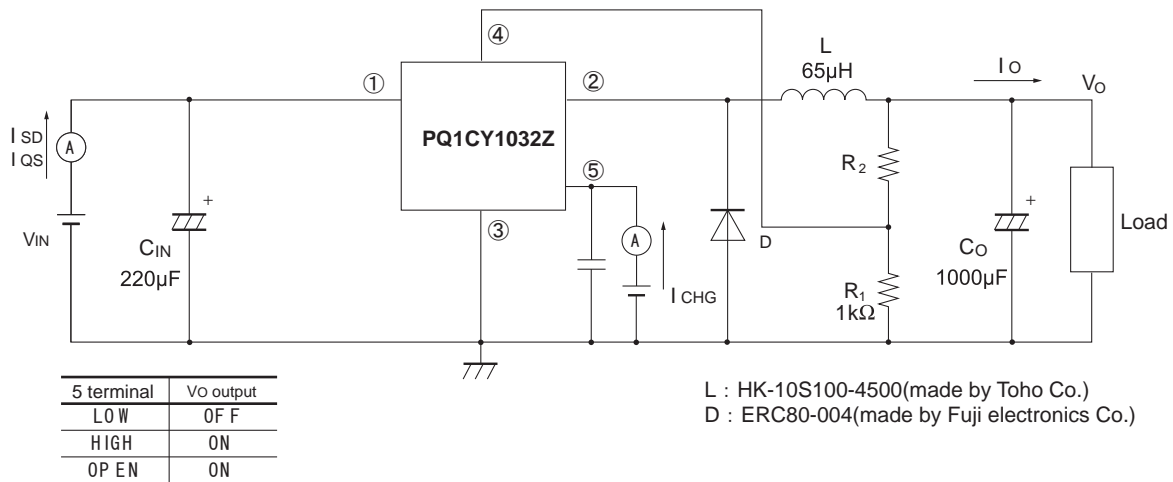
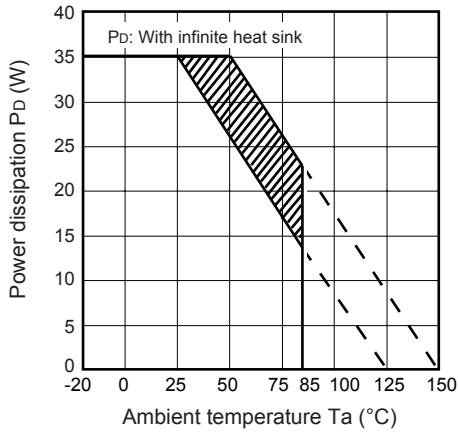


Fig.2 Power Dissipation vs.Ambient Temperature



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

Fig.3 Overcurrent Protection Characteristics (Typical Value)

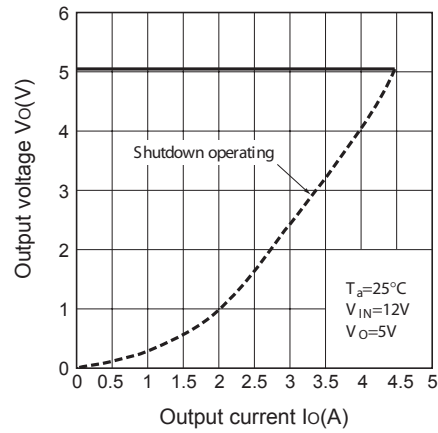


Fig.4 Efficiency vs. Input Voltage

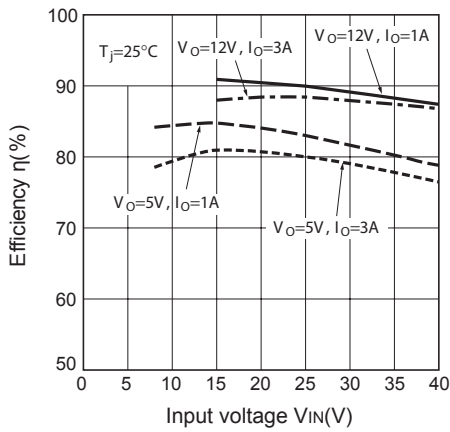


Fig.5 Switching Current vs. Output Saturation Voltage

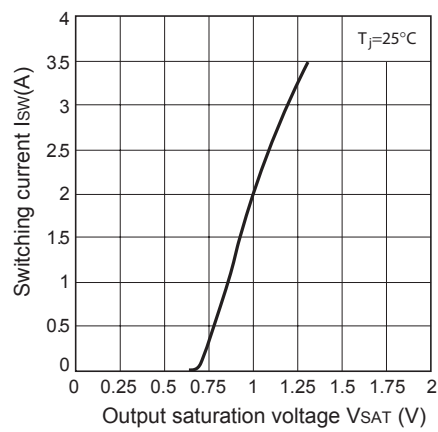


Fig.6 Operating Dissipation Current vs. Input Voltage

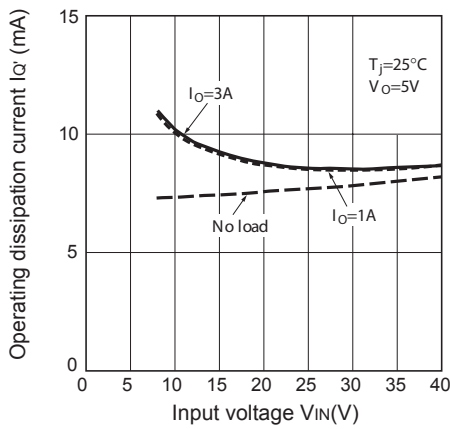


Fig.7 Reference Voltage Fluctuation vs. Junction Temperature

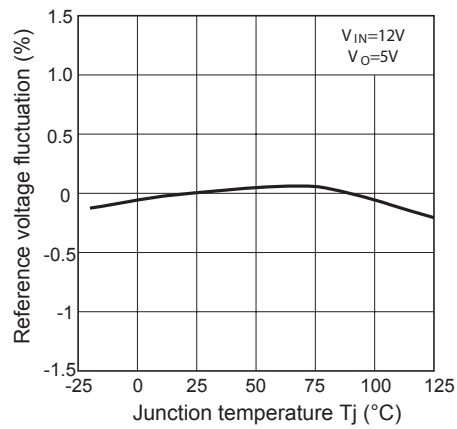


Fig.8 Load Regulation vs. Output Current

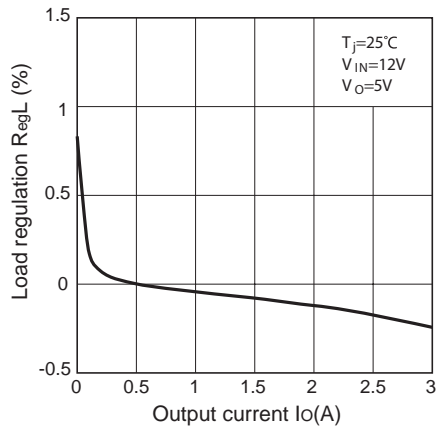


Fig.9 Line Regulation vs. Input Voltage

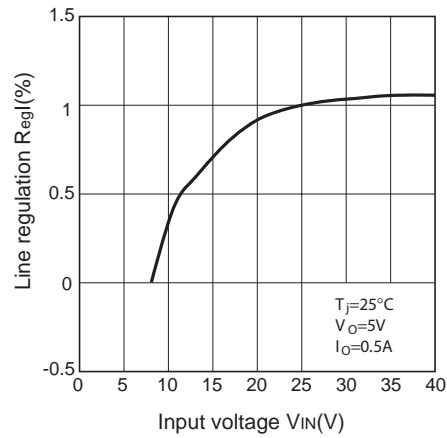


Fig.10 Oscillation Frequency Fluctuation vs. Junction Temperature

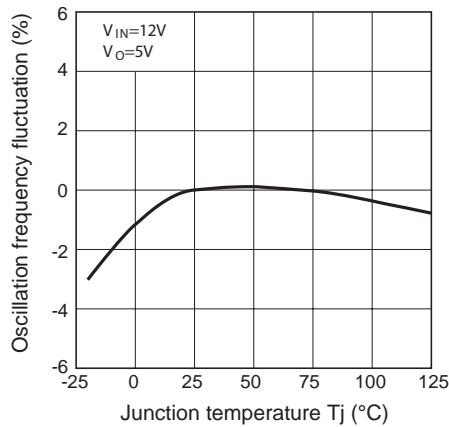


Fig.11 Overcurrent Detecting Level Fluctuation vs. Junction Temperature

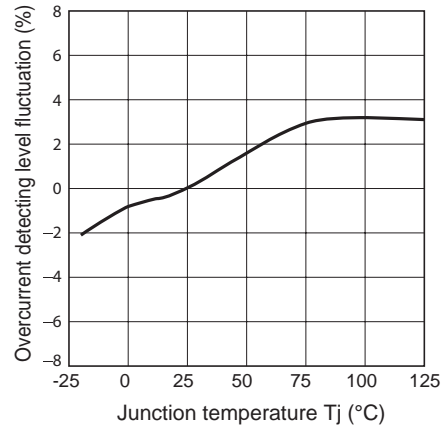


Fig.12 On Threshold Voltage vs. Junction Temperature

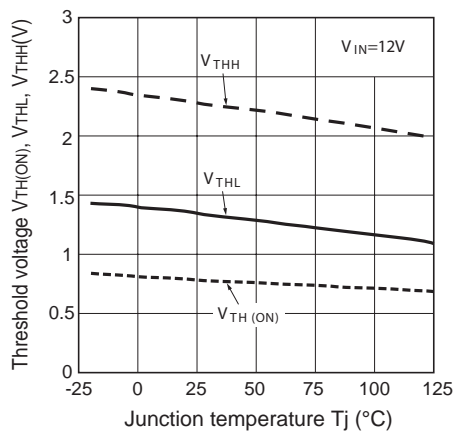


Fig.13 Overcurrent Shutdown Threshold Voltage vs. Junction Temperature

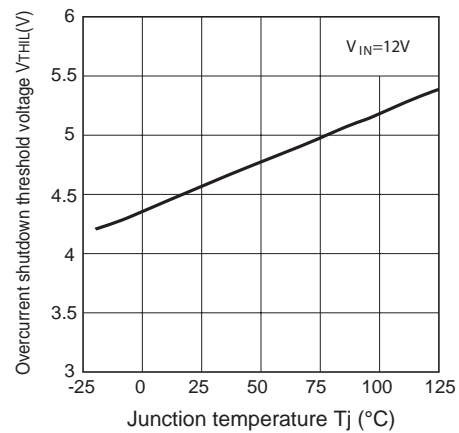


Fig.14 Power Dissipation vs. Ambient Temperature (Typical Value)

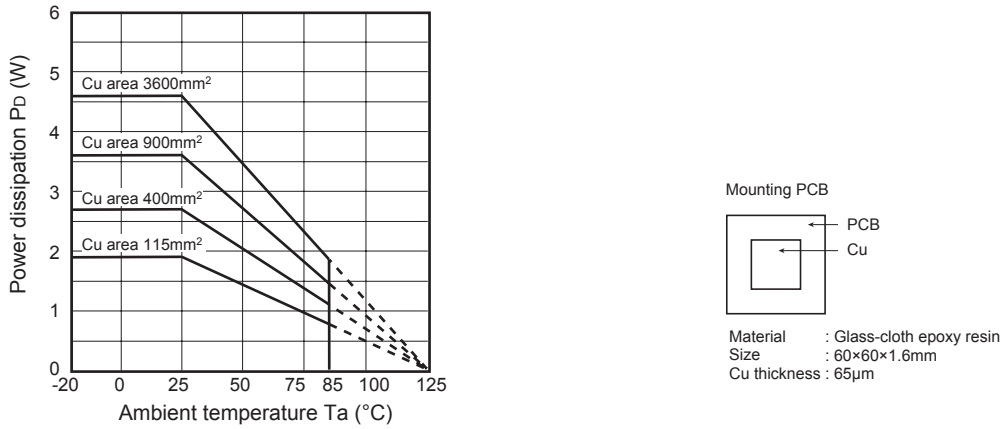


Fig.15 Block Diagram

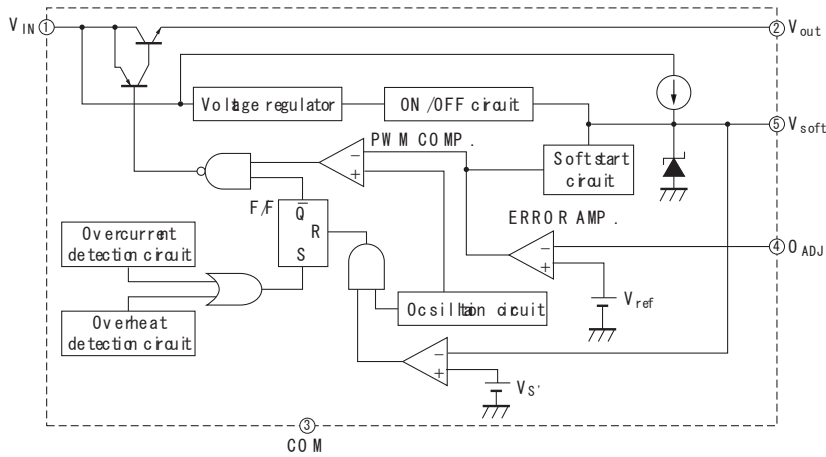


Fig.16 Step Down Type Circuit Diagram

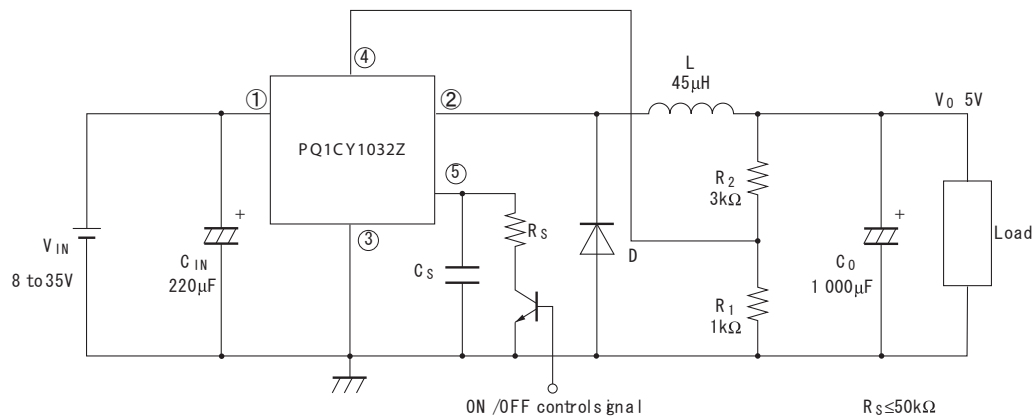
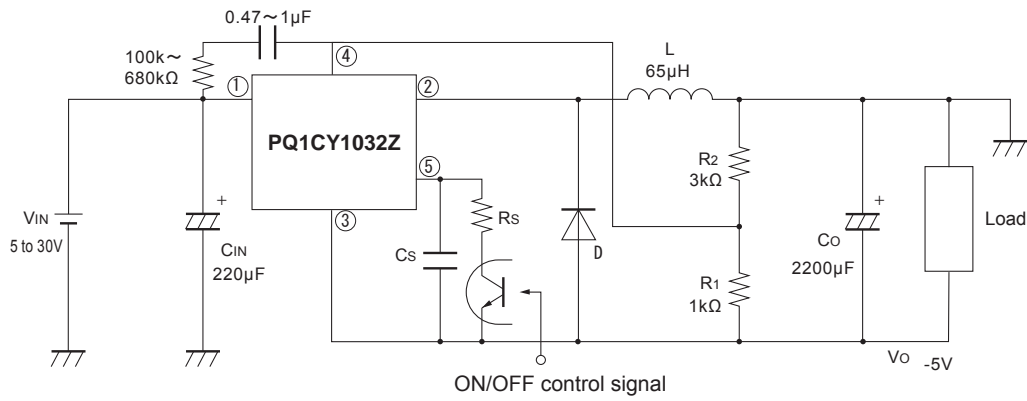


Fig.17 Polarity Inversion Type Circuit Diagram



In case of polarity is reverse, depending on the conditions, there is cases that output voltage can not gain, please use this device after confirming the output voltage at the actual conditions.