

# PQ070XZ1HZ

Low Voltage Operation Low Power-loss Voltage Regulator

## Features

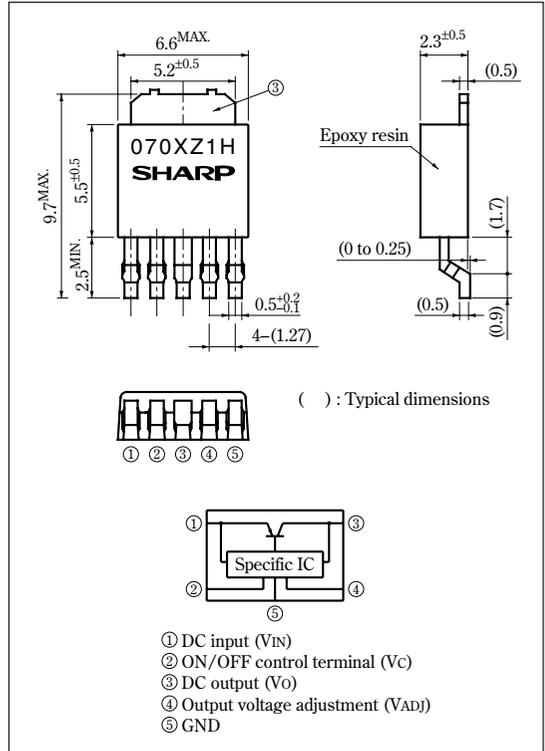
- Low voltage operation (Minimum operating voltage: 2.35V)
- Low dissipation current  
 Dissipation current at no load: MAX.2mA  
 Output OFF-state dissipation current: MAX.5μA
- Low power-loss (Dropout voltage: MAX.0.5V)
- Built-in overcurrent and overheat protection functions

## Applications

- Power supplies for personal computers and peripheral equipment
- Power supplies for various electronic equipment such as DVD player or STB

## Outline Dimensions

(Unit : mm)



## Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V <sub>IN</sub>	10	V
*1 ON/OFF control terminal voltage	V <sub>C</sub>	10	V
*1 Output adjustment terminal voltage	V <sub>ADJ</sub>	5	V
Output current	I <sub>O</sub>	1.5	A
*2 Power dissipation	P <sub>D</sub>	8	W
*3 Junction temperature	T <sub>J</sub>	150	°C
Operating temperature	T <sub>opr</sub>	-40 to +85	°C
Storage temperature	T <sub>sig</sub>	-40 to +150	°C
Soldering temperature	T <sub>sol</sub>	260 (10s)	°C

\*1 All are open except GND and applicable terminals

\*2 P<sub>D</sub>:With infinite heat sink

\*3 Overheat protection may operate at T<sub>J</sub>=125°C to 150°C

•Please refer to the chapter " Handling Precautions ".

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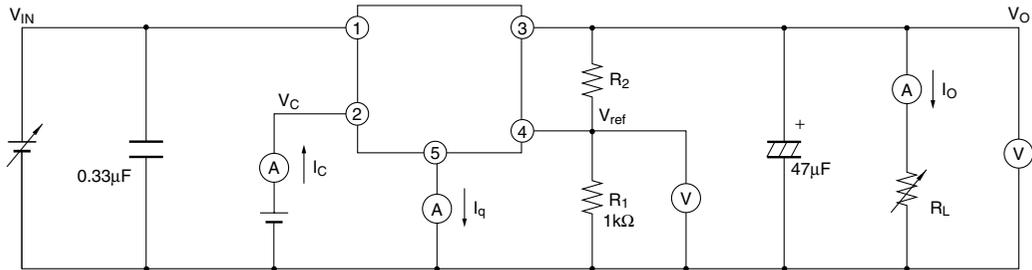
■ Electrical Characteristics

(Unless otherwise specified, condition shall be  $V_{IN}=5V$ ,  $V_O=3V(R_1=1k\Omega)$ ,  $I_O=0.5A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage	$V_{IN}$	—	2.35	—	10	V
Output voltage	$V_O$	—	1.5	—	7	V
Load regulation	$R_{egL}$	$I_O=5mA$ to 1.5A	—	0.2	2	%
Line regulation	$R_{egI}$	$V_{IN}=4$ to 8V, $I_O=5mA$	—	0.2	1	%
Ripple rejection	RR	Refer to Fig.2	45	60	—	dB
Dropout voltage	$V_{L-O}$	$V_{IN}=3.3V$ , $I_O=1.25A$	—	—	1	V
Reference voltage	$V_{ref}$	—	1.225	1.25	1.275	V
Temperature coefficient of reference voltage	$T_C V_{ref}$	$T_J=0$ to $125^\circ C$ , $I_O=5mA$	—	$\pm 1.0$	—	%
*4 ON-state voltage for control	$V_{C(ON)}$	*4	2	—	—	V
ON-state current for control	$I_{C(ON)}$	—	—	—	200	$\mu A$
OFF-state voltage for control	$V_{C(OFF)}$	$I_O=0A$	—	—	0.8	V
OFF-state current for control	$I_{C(OFF)}$	$I_O=0A$ , $V_C=0.4V$	—	—	2	$\mu A$
Quiescent current	$I_q$	$I_O=0A$	—	1	2	mA
Output OFF-state dissipation current	$I_{qs}$	$V_C=0.4V$	—	—	5	$\mu A$

\*4 In case of opening control terminal ②, output voltage turns off.

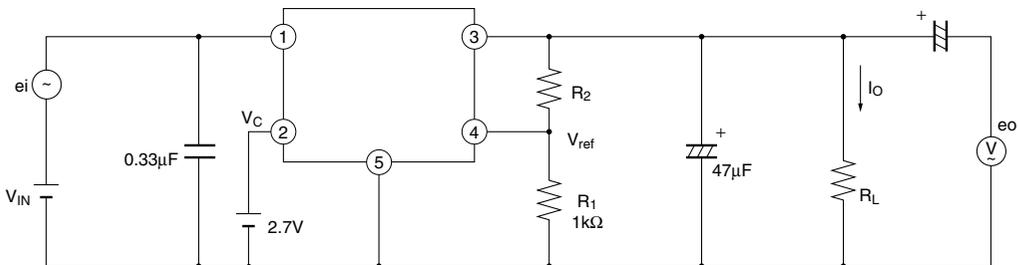
Fig.1 Test Circuit



$$V_O = V_{ref} \times (1 + R_2/R_1)$$

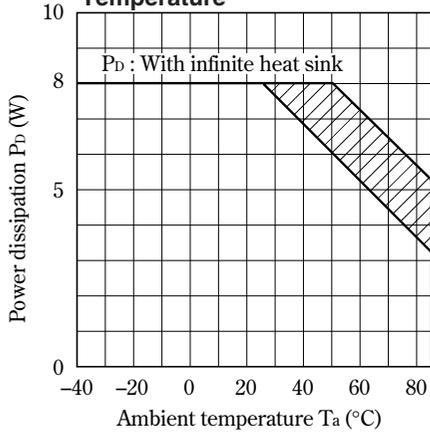
[ $R_1=1k\Omega$ ,  $V_{ref}=1.25V$ ]

Fig.2 Test Circuit for Ripple Rejection



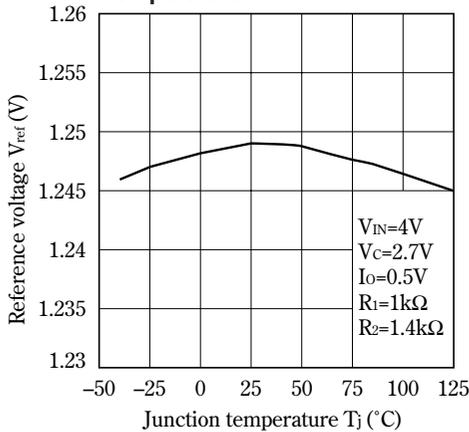
$f=120Hz$ (sine wave)  $V_{IN}=5V$   
 $e_i(rms)=0.5V$   $I_O=0.3A$   
 $V_O=3V(R_1=1k\Omega)$   $RR=20\log(e_i(rms)/e_o(rms))$

**Fig.3 Power Dissipation vs. Ambient Temperature**

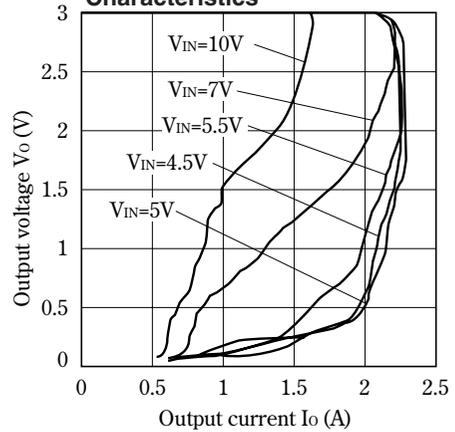


Note) Oblique line portion: Overheat protection may operate in this area.

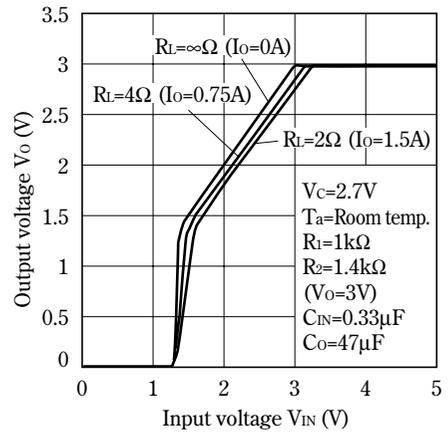
**Fig.5 Reference Voltage vs. Junction Temperature**



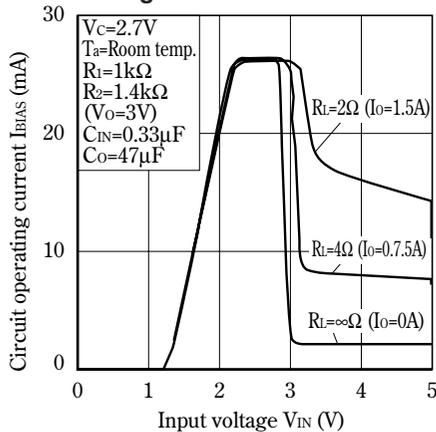
**Fig.4 Overcurrent Protection Characteristics**



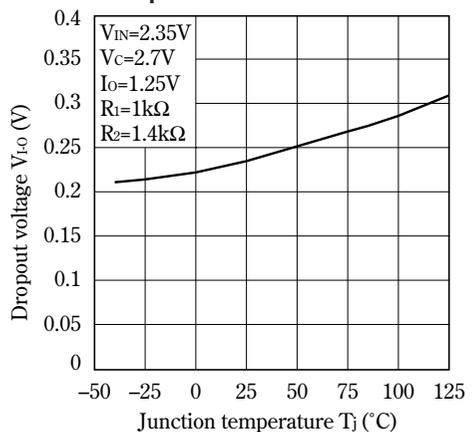
**Fig.6 Output Voltage vs. Input Voltage**



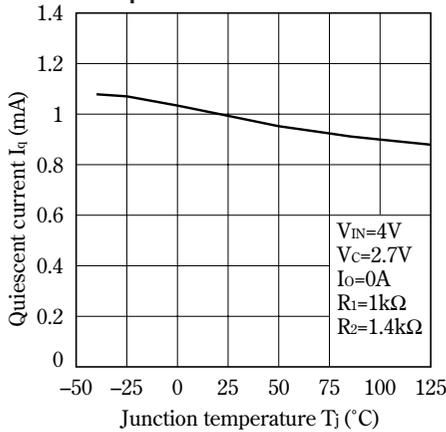
**Fig.7 Circuit Operating Current vs. Input Voltage**



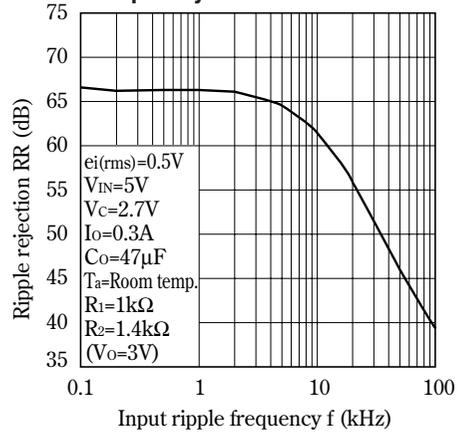
**Fig.8 Dropout Voltage vs. Junction Temperature**



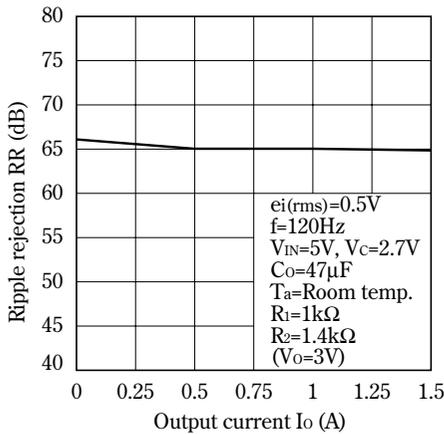
**Fig.9 Quiescent Current vs. Junction Temperature**



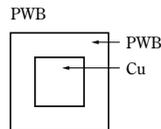
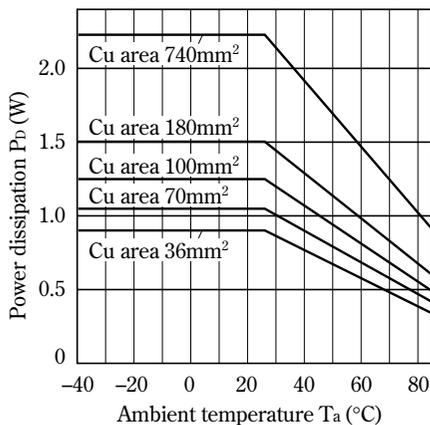
**Fig.10 Ripple Rejection vs. Input Ripple Frequency**



**Fig.11 Ripple Rejection vs. Output Current**

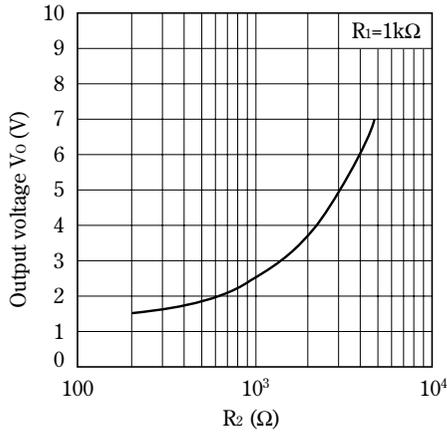


**Fig.12 Power Dissipation vs. Ambient Temperature (Typical Value)**

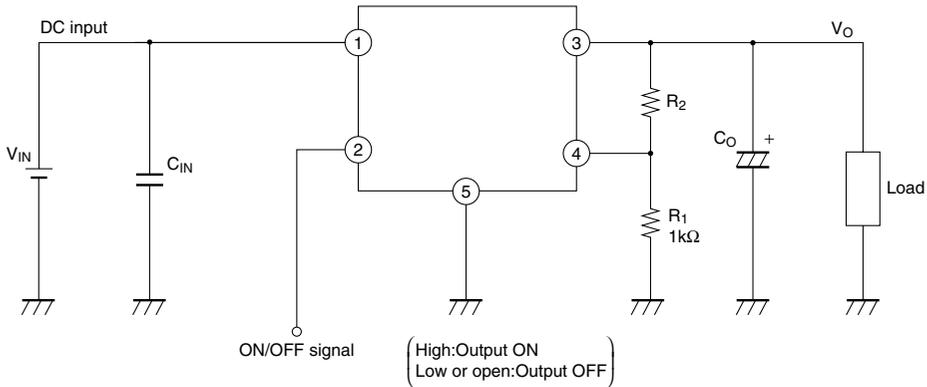


Material : Glass-cloth epoxy resin  
 Size : 50×50×1.6mm  
 Cu thickness : 35μm

Fig.13 Output Voltage Adjustment Characteristics (Typical Value)

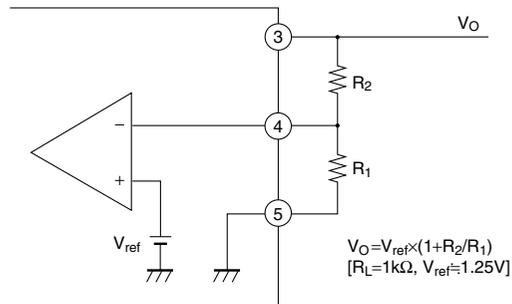


■ Typical Application



■ Setting of Output Voltage

Output voltage is able to set from 1.5V to 7V when resistors R<sub>1</sub> and R<sub>2</sub> are attached to ③, ④, ⑤ terminals. As for the external resistors to set output voltage, refer to the figure below and Fig.13.



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