

PQ070XZ5MZ/PQ070XZ01Z

SC-63 Package, Low Voltage Operation Low Power-loss Voltage Regulators

Features

- Low voltage operation (Minimum operating voltage: 2.35V)
2.5V input → available 1.5 to 1.8V
- Low dissipation current
Dissipation current at no load: MAX. 2mA
Output OFF-state dissipation current: MAX. 5μA

Applications

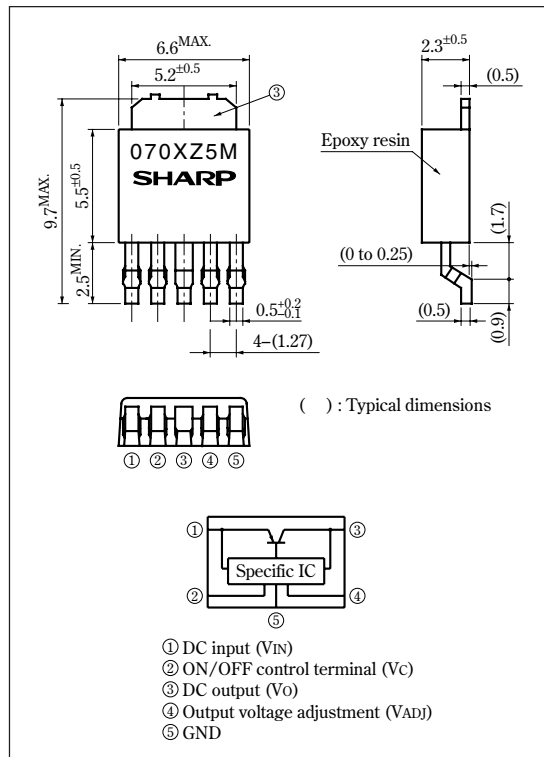
- Peripheral equipment of personal computers
- Power supplies for various electronic equipment such as DVD player or STB

Model Line-up

Output current (I _O)	Package type	Variable output
0.5A	Taping	PQ070XZ5MZP
	Sleeve	PQ070XZ5MZZ
1A	Taping	PQ070XZ01ZP
	Sleeve	PQ070XZ01ZZ

Outline Dimensions

(Unit : mm)



Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V _{IN}	10	V
*1 ON/OFF control terminal voltage	V _c	10	V
*1 Output adjustment terminal voltage	V _{ADJ}	5	V
Output current	I _O	0.5	A
		1	
*2 Power dissipation	P _D	8	W
*3 Junction temperature	T _j	150	°C
Operating temperature	T _{opr}	-40 to +85	°C
Storage temperature	T _{stg}	-40 to +150	°C
Soldering temperature	T _{sol}	260 (10s)	°C

*1 All are open except GND and applicable terminals.

*2 P_D:With infinite heat sink

*3 Overheat protection may operate at T_j=125°C to 150°C

•Please refer to the chapter " Handling Precautions ".

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■ Electrical Characteristics

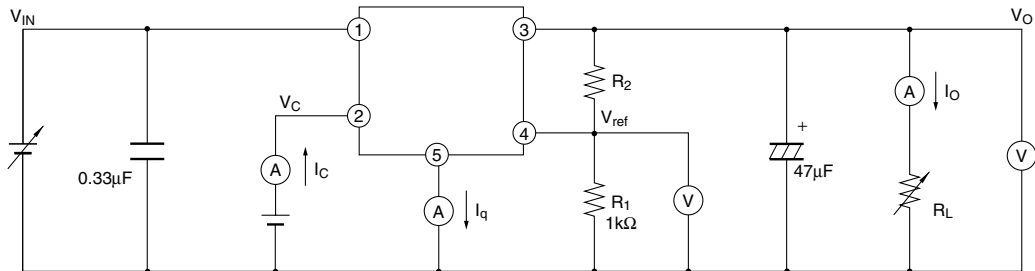
(Unless otherwise specified, condition shall be $V_{IN}=5V$, $V_O=3V(R_1=1k\Omega)$, $I_O=0.3A$, $V_C=2.7V$, $T_a=25^\circ C$, (**PQ070XZ5MZ**))

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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	PQ070XZ5MZ PQ070XZ01Z	R_{egL}	$I_O=5mA$ to 0.5A	—	0.2	2	%
			$I_O=5mA$ to 1A	—	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	PQ070XZ5MZ PQ070XZ01Z	V_{I-O}	$V_{IN}=2.85V$, $I_O=0.3A$	—	—	0.5	V
			$V_{IN}=2.85V$, $I_O=0.5A$	—	—	0.5	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 $125^\circ C$, $I_O=5mA$	—	± 1.0	—	%	
*4 ON-state voltage for control	$V_{C(ON)}$	*4	2	—	—	V	
ON-state current for control	$I_{C(ON)}$	—	—	—	200	μA	
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	μA	
Quiescent current	I_q	$I_O=0A$	—	1	2	mA	
Output OFF-state dissipation current	I_{qs}	$V_C=0.4V$	—	—	5	μA	

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

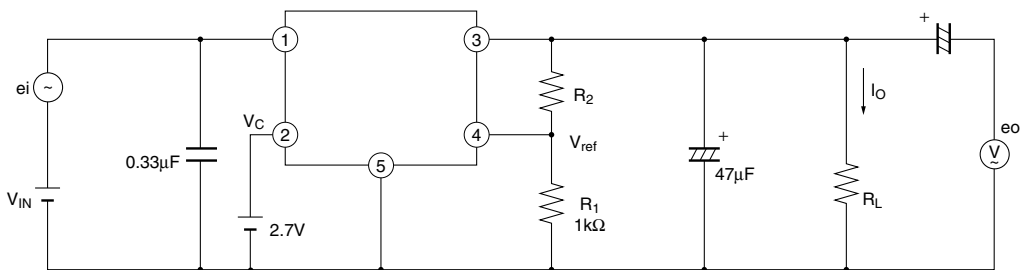
Fig.1 Test Circuit



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

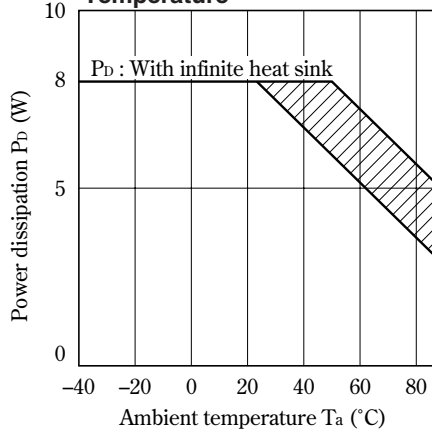
$$[R_1 = 1k\Omega, V_{ref} = 1.25V]$$

Fig.2 Test Circuit for Ripple Rejection



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

Fig.3 Power Dissipation vs. Ambient Temperature



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

Fig.5 Overcurrent Protection Characteristics (PQ070XZ5MZ)

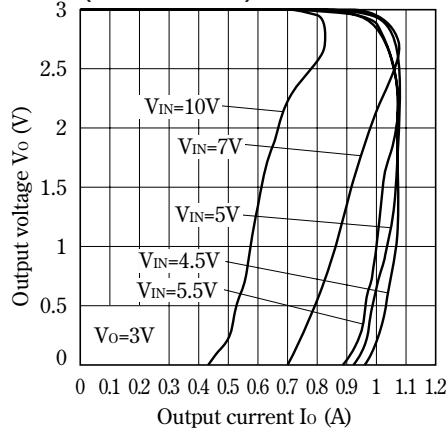


Fig.7 Output Voltage vs. Input Voltage (PQ070XZ5MZ)

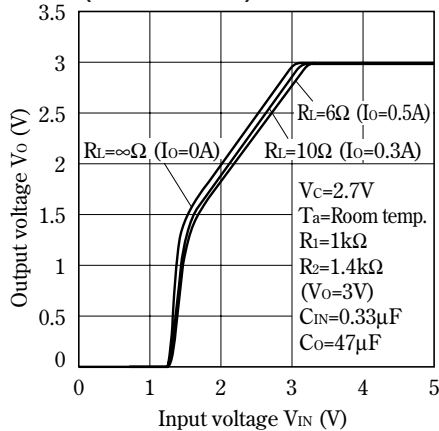


Fig.4 Overcurrent Protection Characteristics (PQ070XZ01Z)

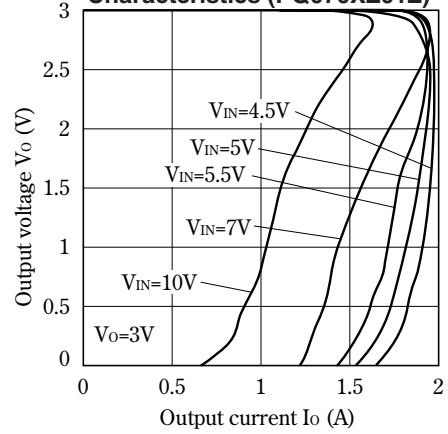


Fig.6 Reference Voltage vs. Ambient Temperature

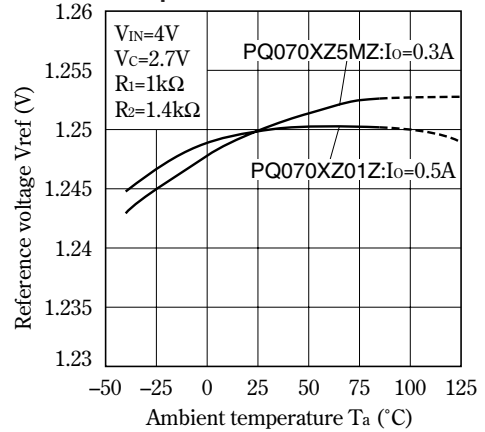


Fig.8 Output Voltage vs. Input Voltage (PQ070XZ01Z)

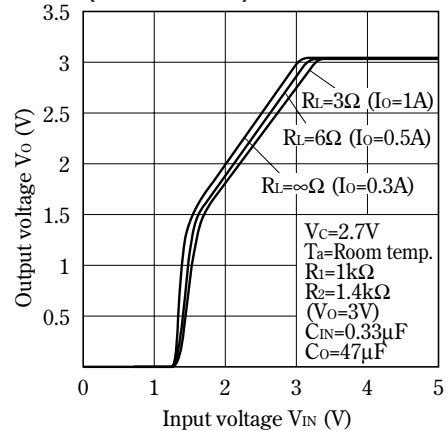


Fig.9 Circuit Operating Current vs. Input Voltage (PQ070XZ5MZ)

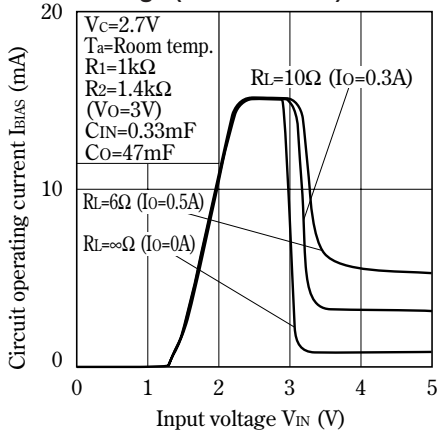


Fig.10 Circuit Operating Current vs. Input Voltage (PQ070XZ01Z)

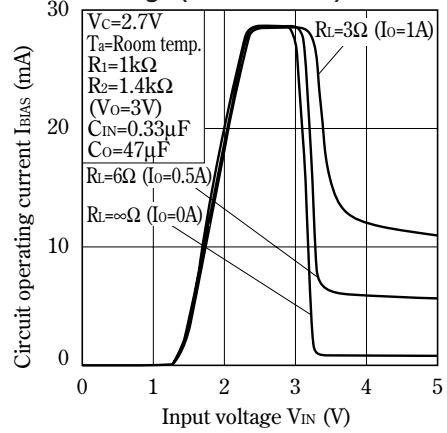


Fig.11 Dropout Voltage vs. Ambient Temperature

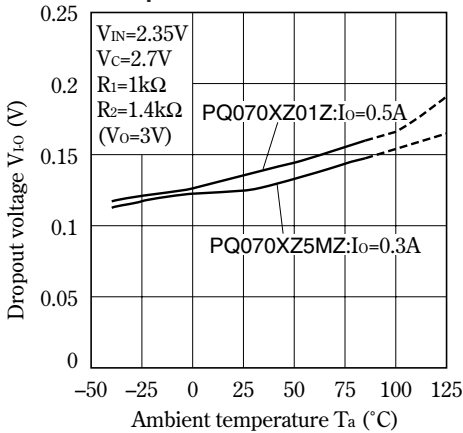


Fig.12 Quiescent Current vs. Ambient Temperature

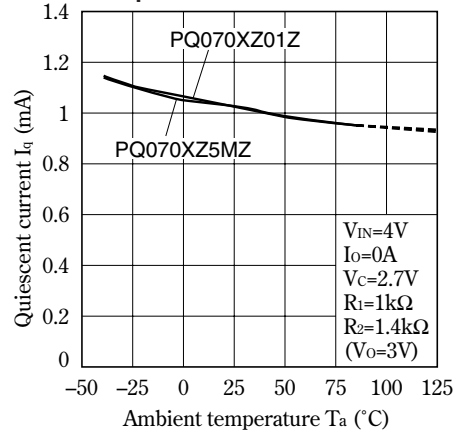


Fig.13 Ripple Rejection vs. Input Ripple Frequency

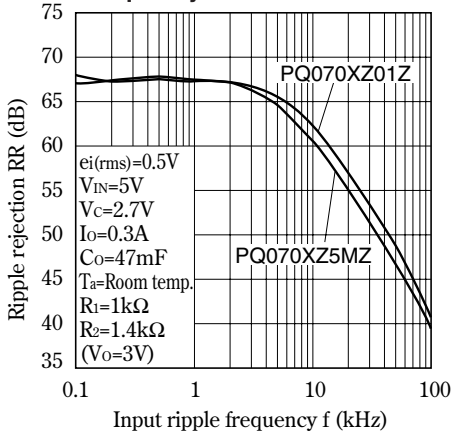


Fig.14 Ripple Rejection vs. Output Current

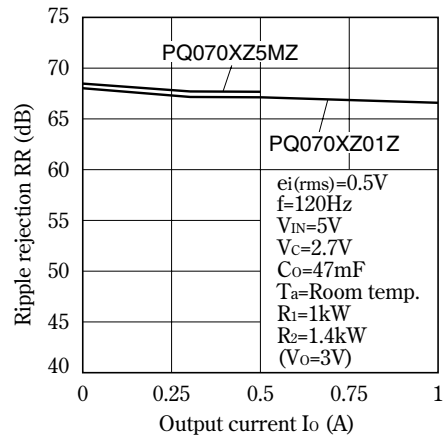


Fig.15 Typical Application

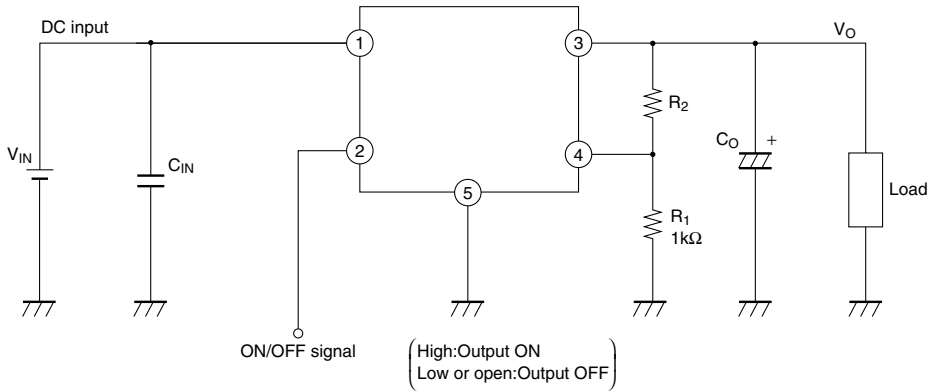
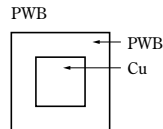
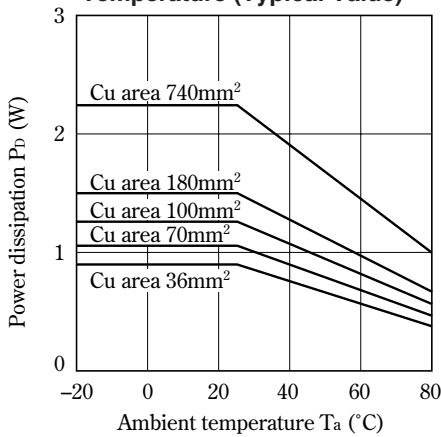
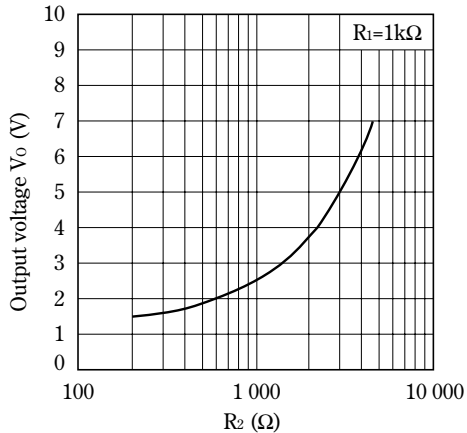


Fig.16 Power Dissipation vs. Ambient Temperature (Typical Value)



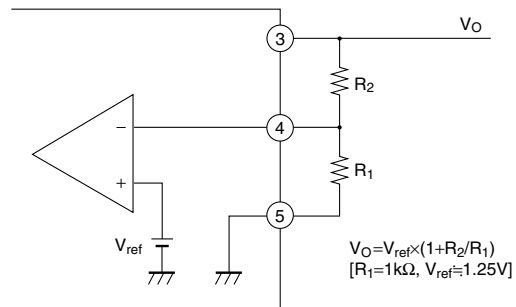
Material : Glass-cloth epoxy resin
 Size : 50x50x1.6mm
 Cu thickness : 35μm

Fig.17 Output Voltage Adjustment Characteristics



■ Setting of Output Voltage

Output voltage is able to set from 1.5V to 7V when resistors R₁ and R₂ are attached to ③, ④, ⑤ terminals. As for the external resistors to set output voltage, refer to the figure below and Fig.17.



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