

PQ07VZ5M2Z/PQ07VZ012Z

Low Voltage Operation Type Low Power-Loss Voltage Regulator

Features

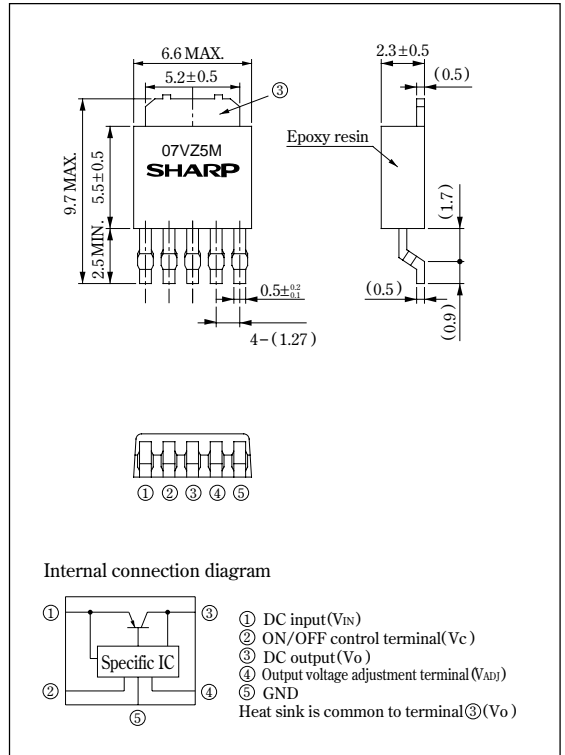
- Low power-loss
(Dropout voltage: MAX. 0.5V)
- Compact surface mount type package
(Equivalent to SC-63)
- Low voltage operation (Minimum supply voltage: 3.0V)
- 0.5A output : PQ07VZ5M2Z
1.0A output : PQ07VZ012Z
- Variable output voltage (1.5V to 7V)
- High-precision output type
(Reference voltage precision: $\pm 2.0\%$)
- Low dissipation current at OFF-state (I_{qs} : MAX. 5 μ A)
- Tape packaged type is also available.
($\phi 330$ mm reel: 3 000pcs.)
- Overcurrent, overheat protection functions

Applications

- Personal information tools
- Amusement equipment

Outline Dimensions

(Unit : mm)



Absolute Maximum Ratings

($T_a=25^\circ\text{C}$)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V_{IN}	10	V
Dropout voltage	V_{i-o}	5	V
*1 ON/OFF control terminal voltage	V_c	10	V
Output adjustment terminal voltage	V_{ADJ}	7	V
*2 Output current	PQ07VZ5M2Z	0.5	A
	PQ07VZ012Z	1	
*3 Power dissipation	P_D	8	W
Junction temperature	T_j	150	$^\circ\text{C}$
Operating temperature	T_{opr}	-20 to +80	$^\circ\text{C}$
Storage temperature	T_{stg}	-40 to +150	$^\circ\text{C}$
Soldering temperature	T_{sol}	260 (For 10s)	$^\circ\text{C}$

*1 All are open except GND and applicable terminals.

*2 P_D : With infinite heat sink

*3 Overheat protection may operate at $125 \leq T_j < 150^\circ\text{C}$.

• Please refer to the chapter " Handling Precautions ".

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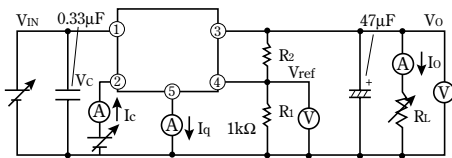
Electrical Characteristics

(Unless otherwise specified, $V_{IN}=5V$, $I_o=0.3A$ [PQ07VZ5M2Z], $I_o=0.5A$ [PQ07VZ012Z], $V_o=3V$ ($R_l=1k\Omega$), $V_c=2.7V$, $T_a=25^\circ C$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage	V_{IN}	—	3.0	—	10	V
Output voltage	V_o	—	1.5	—	7.0	V
Load regulation	PQ07VZ5M2Z	R_{regL} $I_o=5mA$ to $0.5A$	—	0.2	2.0	%
	PQ07VZ012Z					
Line regulation	R_{regI}	$V_{IN}=4$ to $10V$, $I_o=5mA$	—	0.2	2.5	%
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	—	%
Ripple rejection	RR	$f=120Hz$ sine wave, $e_i=0.5V_{rms}$	45	60	—	dB
Dropout voltage	PQ07VZ5M2Z	V_{i-o}	—	—	0.5	V
	PQ07VZ012Z					
*4 ON-state voltage for control	$V_c(ON)$	—	2.0	—	—	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	$I_c(OFF)$	$V_c=0.4V$, $I_o=0A$	—	—	2	μA
Quiescent current	I_q	$I_o=0A$	—	4	7	mA
Output OFF-state consumption current	I_{qs}	$V_c=0.4V$	—	—	5	μA

*4 In case of opening ON/OFF control terminal ②, output voltage turns off.

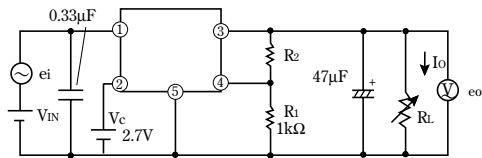
Fig. 1 Test Circuit



$$V_o = V_{ref} \times \left(1 + \frac{R_2}{R_1} \right)$$

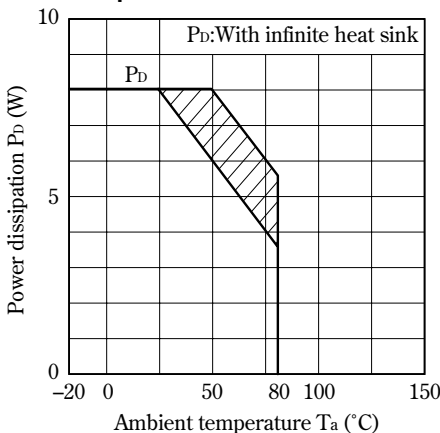
[$R_1=1k\Omega$, V_{ref} Nearly=1.25V]

Fig. 2 Test Circuit of Ripple Rejection



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

Fig. 3 Power Dissipation vs. Ambient Temperature



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

Fig. 4 Overcurrent Protection Characteristics (Typical Value) (PQ07VZ5M2Z)

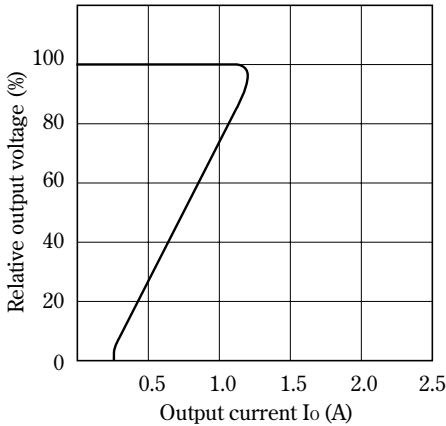


Fig. 5 Overcurrent Protection Characteristics (Typical Value) (PQ07VZ012Z)

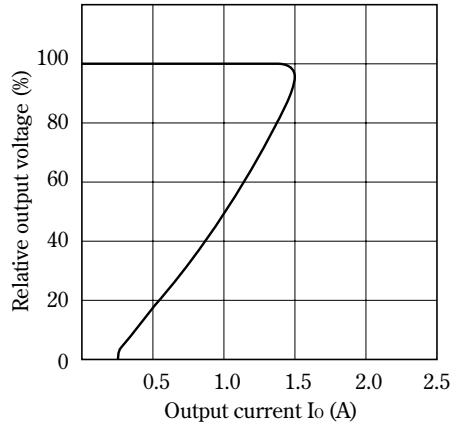


Fig. 6 Output Voltage Adjustment Characteristics

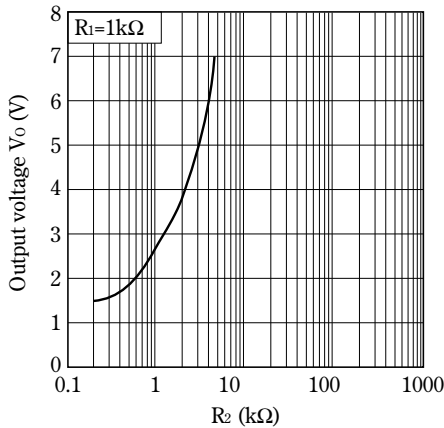


Fig. 7 Reference Voltage Deviation vs. Junction Temperature (Typical Value)

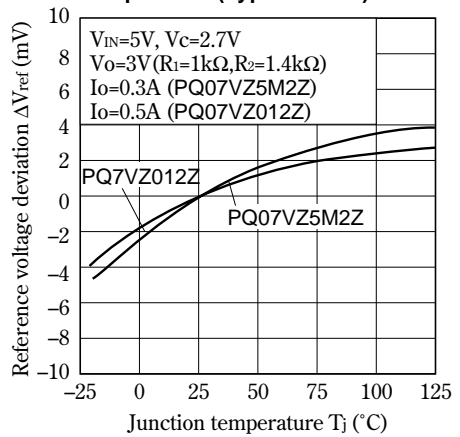


Fig. 8 Output Voltage vs. Input Voltage (PQ07VZ5M2Z)

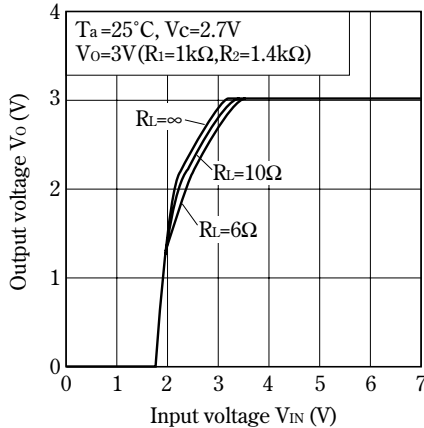


Fig. 9 Output Voltage vs. Input Voltage (PQ07VZ012Z)

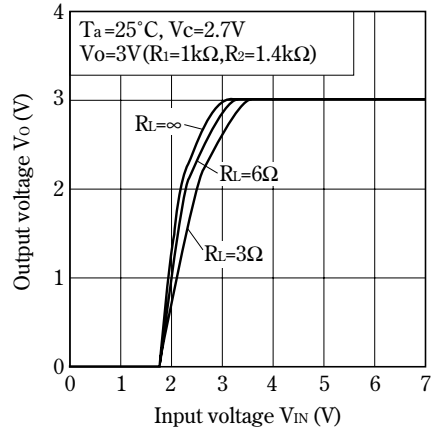


Fig.10 Circuit Operating Current vs. Input Voltage (PQ07VZ5M2Z)

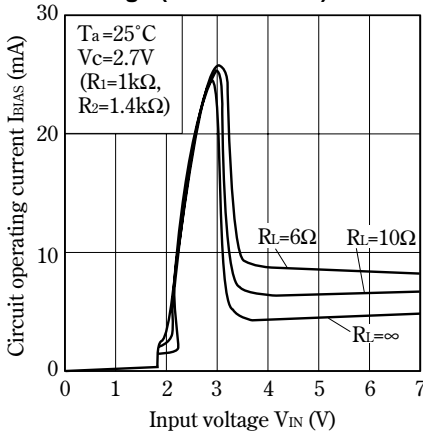


Fig.11 Circuit Operating Current vs. Input Voltage (PQ07VZ012Z)

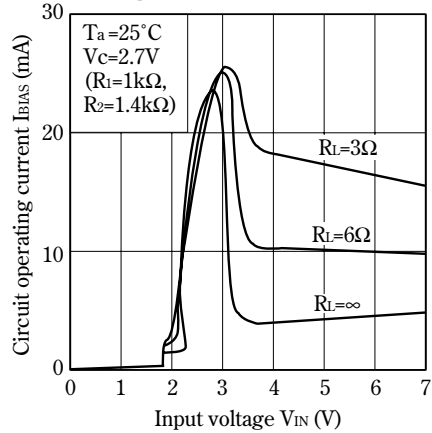


Fig.12 Dropout Voltage vs. Junction Temperature (Typical Value) (PQ07VZ5M2Z)

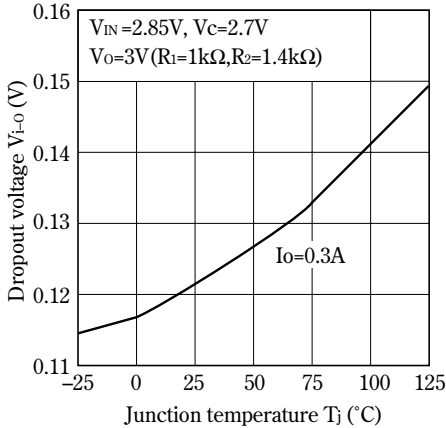


Fig.13 Dropout Voltage vs. Junction Temperature (Typical Value) (PQ07VZ012Z)

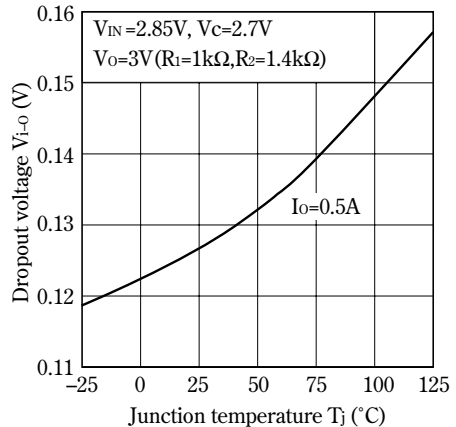


Fig.14 Quiescent Current vs. Junction Temperature (Typical Value)

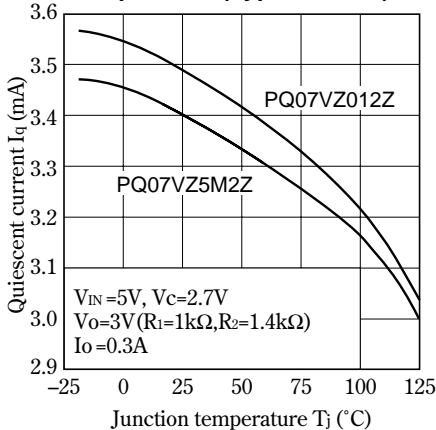


Fig.15 Ripple Rejection vs. Input Ripple Frequency

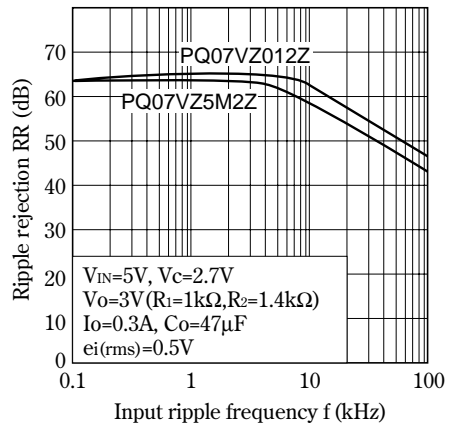


Fig.16 Ripple Rejection vs. Output Current (PQ07VZ5M2Z)

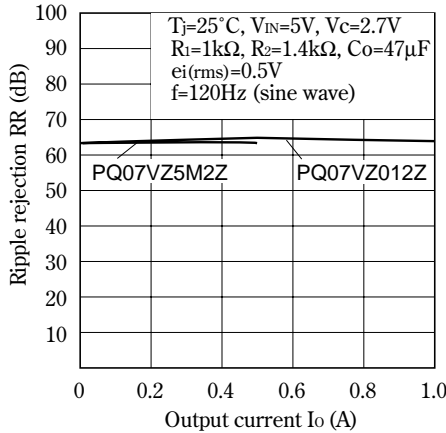
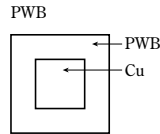
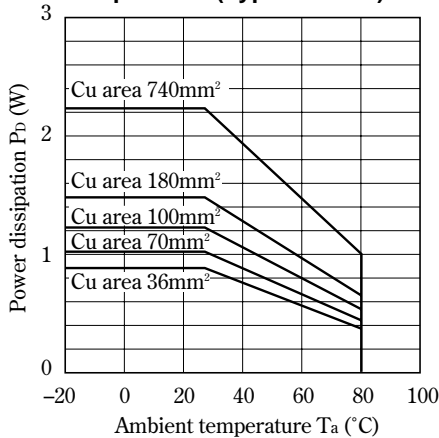
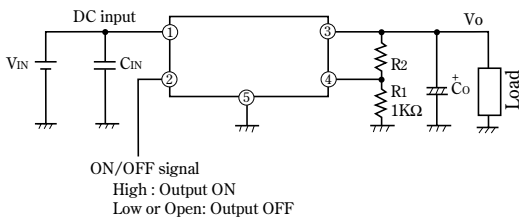


Fig.17 Power Dissipation vs. Ambient Temperature (Typical Value)



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

Typical Application



Model Line-ups for Tape-packaged Products

Output current	Sleeve-packaged products	Tape-packaged products
0.5A output	PQ07VZ5M2ZZ	PQ07VZ5M2ZP
1.0A output	PQ07VZ012ZZ	PQ07VZ012ZP

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