PQ07VZ5M2Z/PQ07VZ012Z

Low Voltage Operation Type Low Power-Loss Voltage Regulator

■ Features

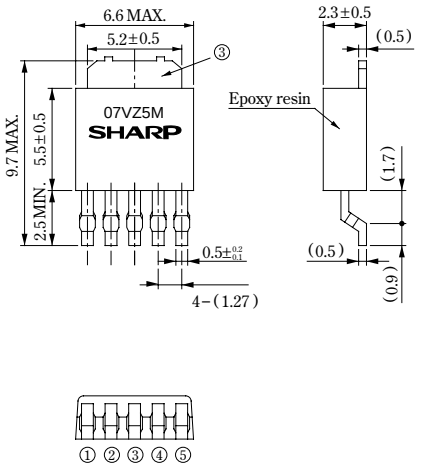
- Low power-loss
  (Dropout voltage: MAX. 0.5V)
- Compact surface mount type package
  (Equivalent to SC-63)
- Low voltage operation (Minimum supply voltage: 3.0V)
- 0.5A output : PQ07VZ5M2Z
  1.0A output : PQ07VZ012Z
- Variable output voltage (1.5V to 7V)
- High-precision output type
  (Reference voltage precision: ±2.0%)
- Low dissipation current at OFF-state (Iqs: MAX. 5μA)
- Tape packaged type is also available.
  (ø330mm reel: 3 000pcs.)
- Overcurrent, overheat protection functions

■ Applications

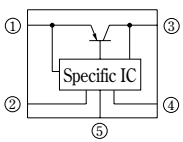
- Personal information tools
- Amusement equipment

■ Outline Dimensions

(Unit : mm)



Internal connection diagram



① DC input (V_{IN})
② ON/OFF control terminal (Vc)
③ DC output (Vo)
④ Output voltage adjustment terminal (V_{ADJ})
⑤ GND
Heat sink is common to terminal ③ (Vo)

■ Absolute Maximum Ratings

(T_a=25°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		Vc	10	V
Output adjustment terminal voltage		V_{ADJ}	7	V
※2 Output current	PQ07VZ5M2Z	Io	0.5	A
	PQ07VZ012Z		1	
※3 Power dissipation		P_D	8	W
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 (For 10s)	°C

※1 All are open except GND and applicable terminals.
※2 P_D: With infinite heat sink
※3 Overheat protection may operate at 125<=Tj<=150°C.

• Please refer to the chapter " Handling Precautions ".

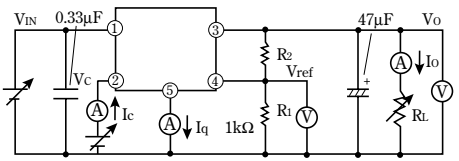
■ Electrical Characteristics

(Unless otherwise specified, V_{IN}=5V, Io=0.3A[PQ07VZ5M2Z], Io=0.5A[PQ07VZ012Z], Vo=3V(R_1=1kΩ), Vc=2.7V, Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage		V_{IN}	—	3.0	—	10	V
Output voltage		Vo	—	1.5	—	7.0	V
Load regulation	PQ07VZ5M2Z	$R_{eg}L$	Io=5mA to 0.5A	—	0.2	2.0	%
	PQ07VZ012Z		Io=5mA to 1.0A				
Line regulation		$R_{eg}I$	V_{IN}=4 to 10V, Io=5mA	—	0.2	2.5	%
Reference voltage		V_{ref}	—	1.225	1.25	1.275	V
Temperature coefficient of reference voltage		$T_C V_{ref}$	Tj=0 to 125°C, Io=5mA	—	±1.0	—	%
Ripple rejection		RR	f=120Hz sine wave, ei=0.5Vrms	45	60	—	dB
Dropout voltage	PQ07VZ5M2Z	V_{i-O}	V_{IN}=3V, Io=0.3A	—	—	0.5	V
	PQ07VZ012Z		V_{IN}=3V, Io=0.5A				
※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		$V_{C(OFF)}$	Io=0A	—	—	0.8	V
OFF-state current for control		$I_{C(OFF)}$	Vc=0.4V, Io=0A	—	—	2	μA
Quiescent current		I_q	Io=0A	—	4	7	mA
Output OFF-state consumption current		I_{qs}	Vc=0.4V	—	—	5	μA

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

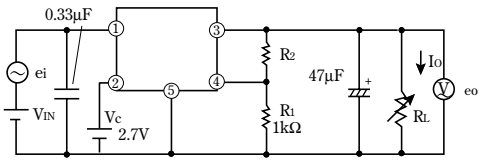
Fig. 1 Test Circuit



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

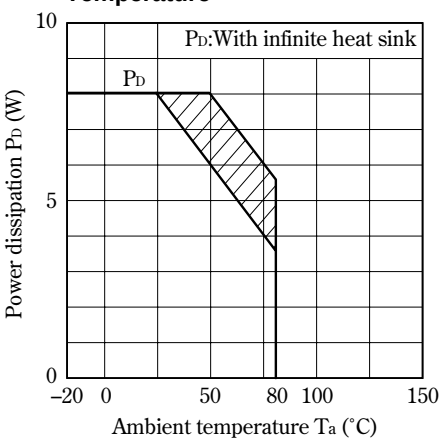
[R_1=1kΩ, V_{ref} Nearly=1.25V]

Fig. 2 Test Circuit of Ripple Rejection



f=120Hz(sine wave)
ei(rms)=0.5V
Io=0.3A
RR=20 log(ei(rms)/eo(rms))
V_{IN}=5V
Vo=3V(R_1=1kΩ)

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)

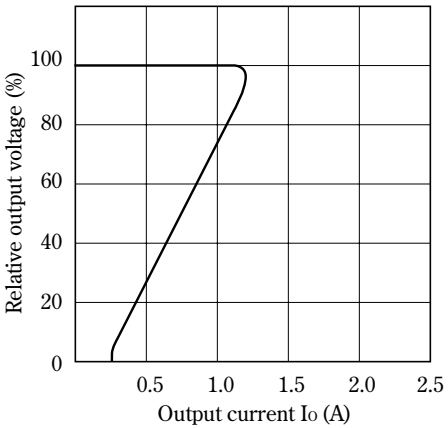


Fig. 5 Overcurrent Protection Characteristics (Typical Value) (PQ07VZ012Z)

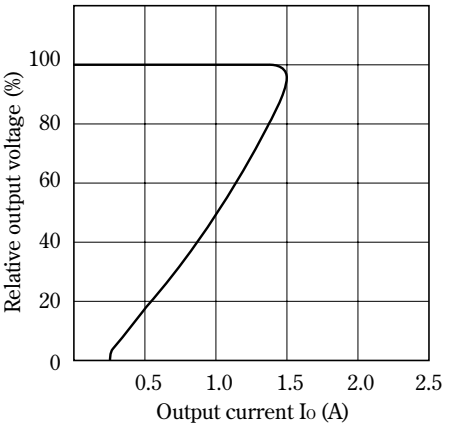


Fig. 6 Output Voltage Adjustment Characteristics

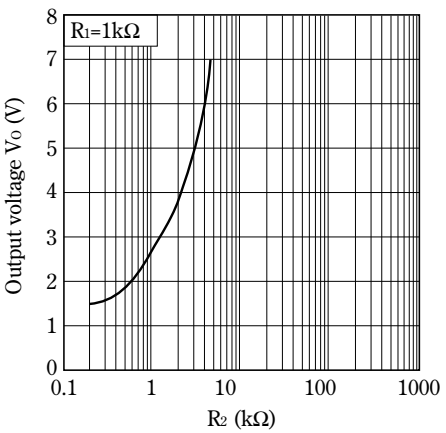


Fig. 7 Reference Voltage Deviation vs. Junction Temperature (Typical Value)

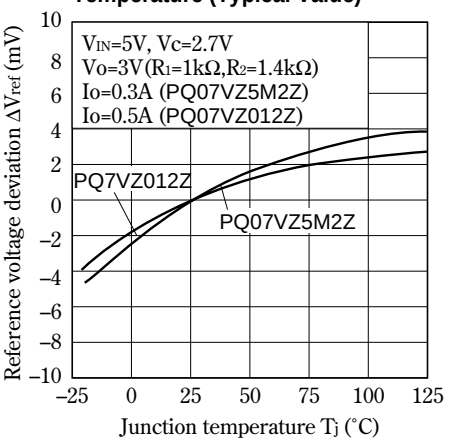


Fig. 8 Output Voltage vs. Input Voltage (PQ07VZ5M2Z)

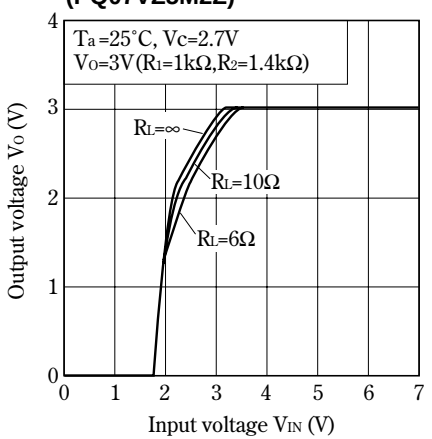


Fig. 9 Output Voltage vs. Input Voltage (PQ07VZ012Z)

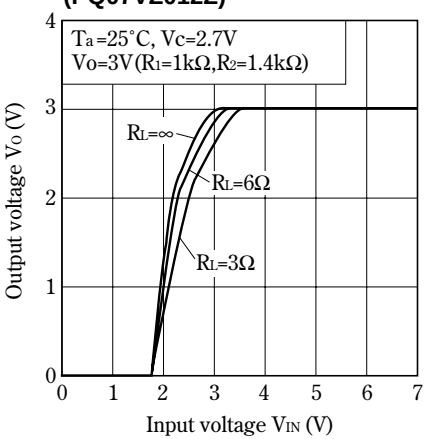


Fig.10 Circuit Operating Current vs. Input Voltage (PQ07VZ5M2Z)

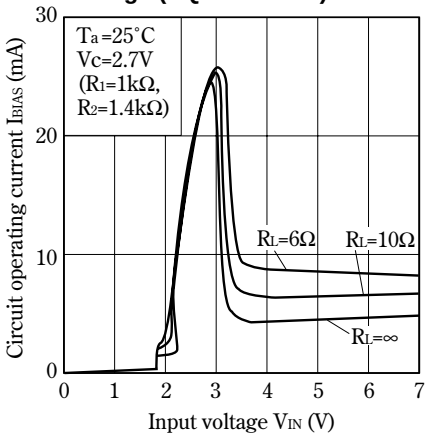


Fig.11 Circuit Operating Current vs. Input Voltage (PQ07VZ012Z)

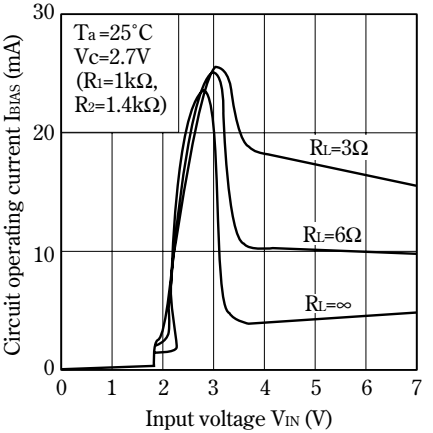


Fig.12 Dropout Voltage vs. Junction Temperature (Typical Value) (PQ07VZ5M2Z)

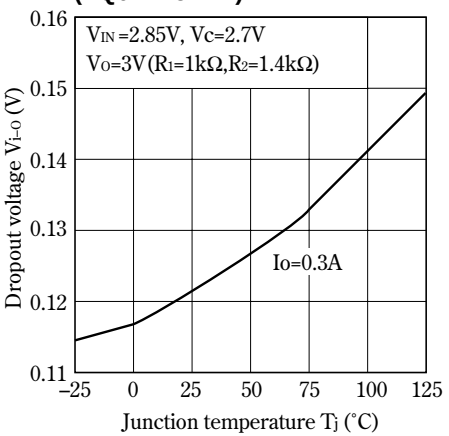


Fig.13 Dropout Voltage vs. Junction Temperature (Typical Value) (PQ07VZ012Z)

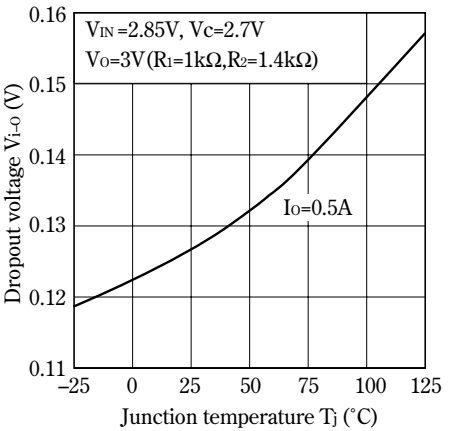


Fig.14 Quiescent Current vs. Junction Temperature (Typical Value)

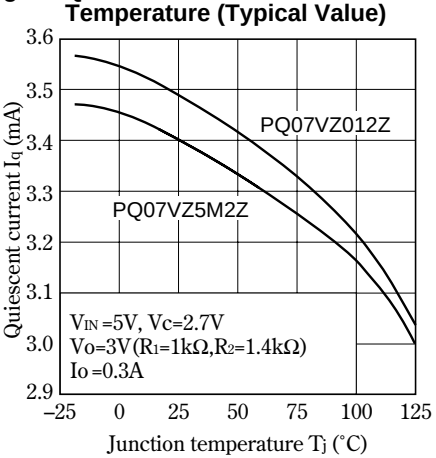


Fig.15 Ripple Rejection vs. Input Ripple Frequency

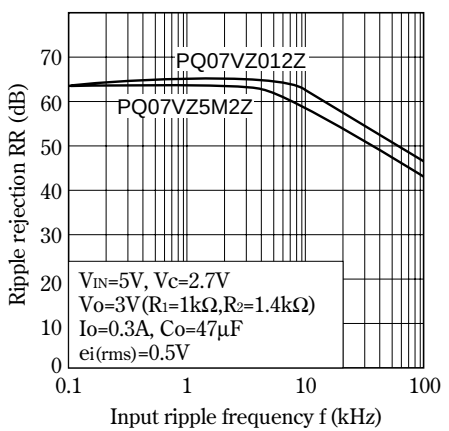


Fig.16 Ripple Rejection vs. Output Current (PQ07VZ5M2Z)

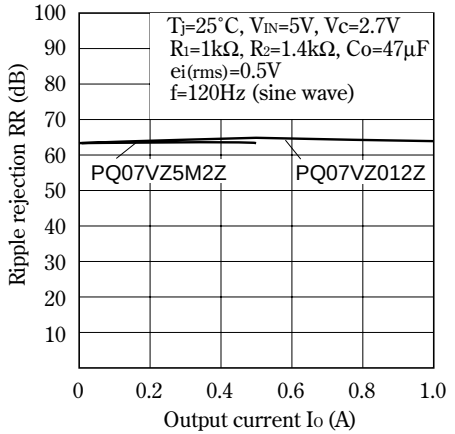
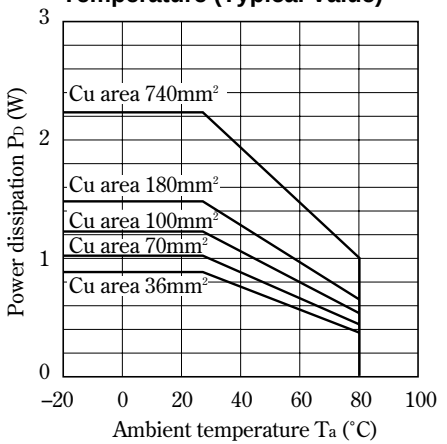
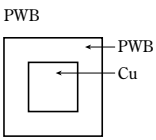


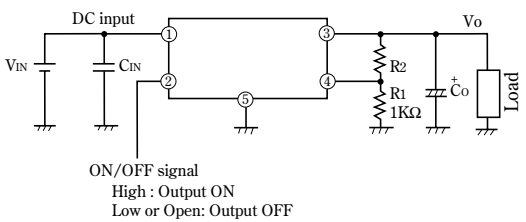
Fig.17 Rower Dissipation vs. Ambient Temperature (Typical Value)





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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  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
  --- Industrial control
  --- Audio visual equipment
  --- Consumer electronics

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