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PQ20WZ51/PQ20WZ11

Variable Output, General Purpose, Surface Mount Type Low Power-Loss Voltage Regulator

■ Features

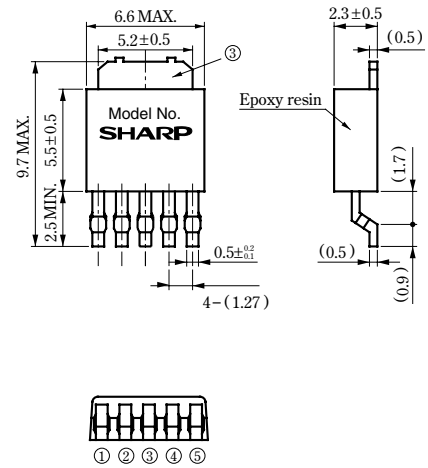
- Low power-loss
  (Dropout voltage : MAX. 0.5V)
- Surface mount package (equivalent to SC-63)
- Variable output voltage (3.0 to 20V)
- Output current (0.5A : PQ20WZ51)
  (1.0A : PQ20WZ11)
- Reference voltage precision : ±2.5%
- Built-in ON/OFF control function
- Low dissipation current at OFF-state (Iqs : MAX. 5μA)
- Built-in overcurrent, overheat protection functions, ASO protection circuit
- Available tape-packaged products
  (ø330mm reel : 3 000 pcs., PQ20WZ5U/1U)

■ Applications

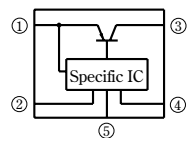
- Personal computers
- CD-ROM drives
- Power supplies for various OA equipment

■ 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
		PQ20WZ51	PQ20WZ11	
*1 Input voltage	V_{IN}	24		V
*1 ON/OFF control terminal voltage	Vc	24		V
*1 Output adjustment terminal voltage	V_{ADJ}	5		V
Output current	Io	0.5	1.0	A
Power dissipation (with infinite heat sink)	P_D	8		W
*2 Junction temperature	T_j	150		°C
Operating temperature	T_{opr}	−20 to +80		°C
Storage temperature	T_{stg}	−40 to +150		°C
*3 Soldering temperature	T_{sol}	260		°C

*1 All are open except GND and applicable terminals.
*2 Overheat protection may operate at 125<=Tj<=150°C
*3 For 10s

• Please refer to the chapter " Handling Precautions ".

■ Electrical Characteristics

(Unless otherwise specified, conditions shall be V_{IN}=5V, Vo=3.3V,*4,R_1=2kΩ, R_2=500Ω, Vc=2.7V, T_a=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage	V_{IN}	—	3.5	—	24	V
Output voltage	Vo	—	3.0	—	20	V
Load regulation	R_{egL}	*5	—	—	2.0	%
Line regulation	R_{egI}	V_{IN}=4 to 10V, Io=5mA	—	—	2.5	%
Ripple rejection	RR	Refer to Fig. 2	45	60	—	dB
Reference voltage	V_{ref}	*4	2.574	2.64	2.706	V
Temperature coefficient of Reference voltage	V_cV_{ref}	T_j=0 to 125°C, Io=5mA	—	±1.0	—	%
Dropout voltage	V_{i-o}	*4, 6	—	—	0.5	V
Quiescent current	I_q	Io=0A	—	—	8	mA
*7 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	$I_{C(OFF)}$	Io=0A, Vc=0.4V	—	—	2.0	µA
Output OFF-state consumption current	I_{qs}	Io=0A, Vc=0.4V	—	—	5.0	µA

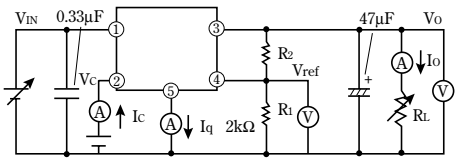
*4 PQ20WZ51:Io=0.3A, PQ20WZ11:Io=0.5A

*5 PQ20WZ51:Io=5mA to 0.5A, PQ20WZ11:Io=5mA to 1.0A

*6 Input voltage shall be the value when output voltage is 95% in comparison with the initial value.

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

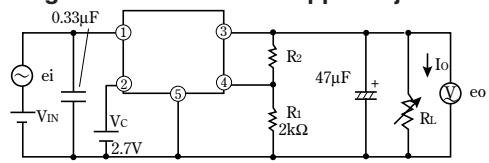
Fig. 1 Test Circuit



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

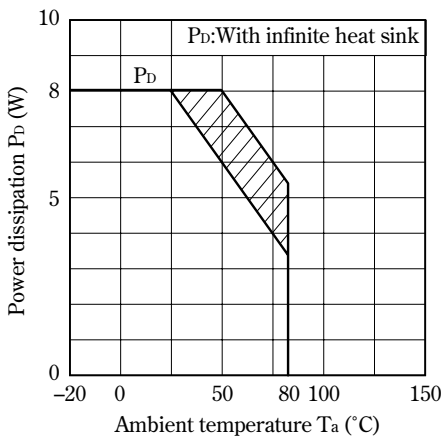
[R_1=2kΩ, Vref Nearly =2.64V]

Fig. 2 Test Circuit for Ripple Rejection



f=120Hz (sine wave)
ei(rms)=0.5V
Io=0.3A
RR=20 log (ei(rms)/eo(rms))
V_{IN}=5V
Vo=3.3V(R_1=2kΩ)

Fig. 3 Power Dissipation vs. Ambient Temperature



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

Fig. 4 Overcurrent Protection Characteristics (Typical Value) (PQ20WZ51)

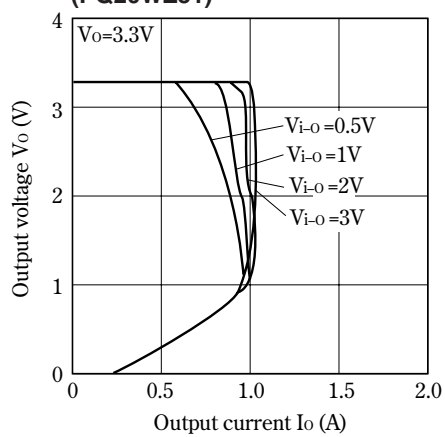


Fig. 5 Overcurrent Protection Characteristics (Typical Value) (PQ20WZ11)

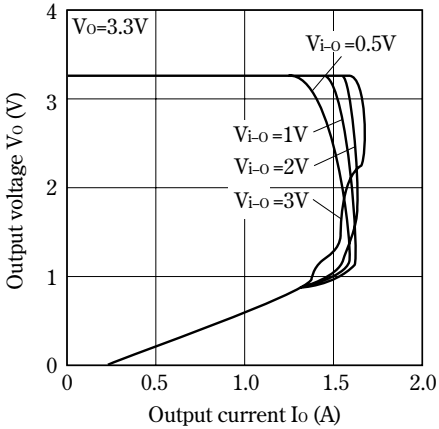


Fig. 6 Output Voltage Adjustment Characteristics

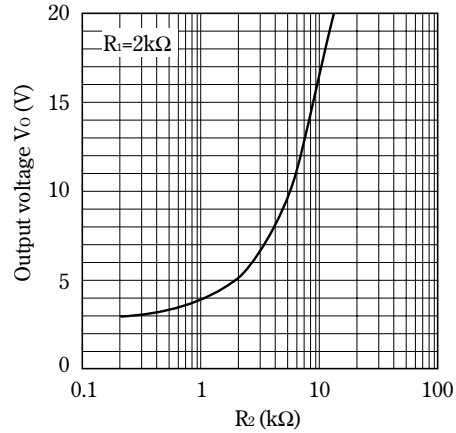


Fig. 7 Reference Voltage Deviation vs. Junction Temperature (Typical Value)

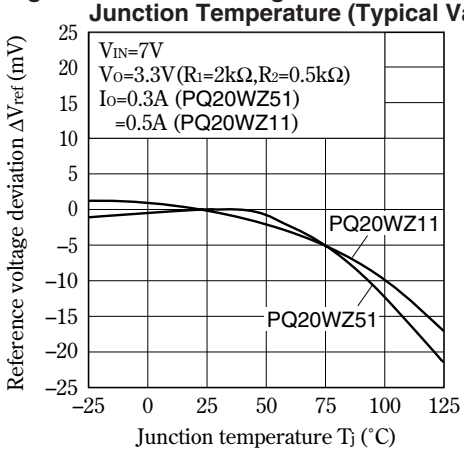


Fig. 8 Output Voltage vs. Input Voltage (PQ20WZ51)

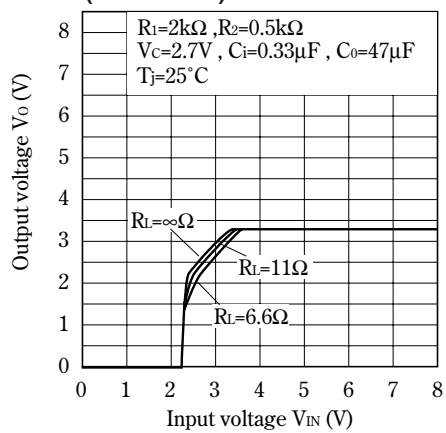


Fig. 9 Output Voltage vs. Input Voltage (PQ20WZ11)

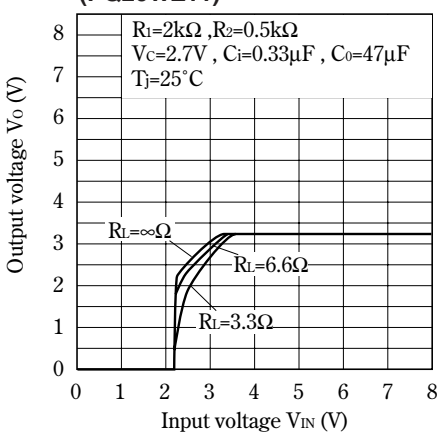


Fig.10 Dropout Voltage vs. Junction Temperature (PQ20WZ51)

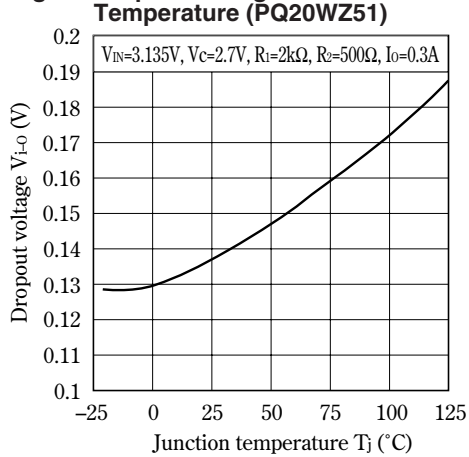


Fig.11 Dropout Voltage vs. Junction Temperature (PQ20WZ11)

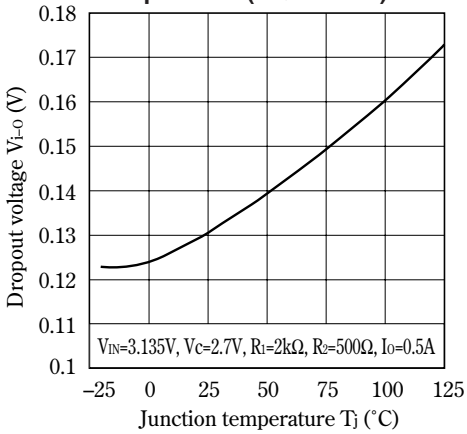


Fig.12 Quiescent Current vs. Junction Temperature

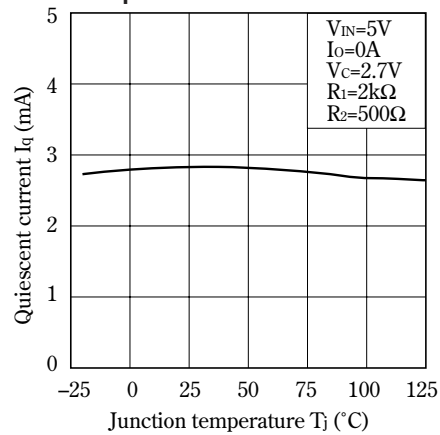


Fig.13 Ripple Rejection vs. Input Ripple Frequency

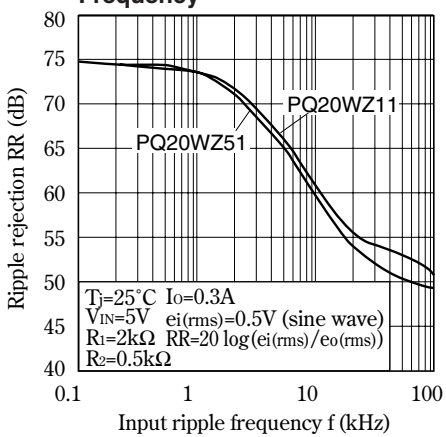


Fig.14 Ripple Rejection vs. Output Current (PQ20WZ51)

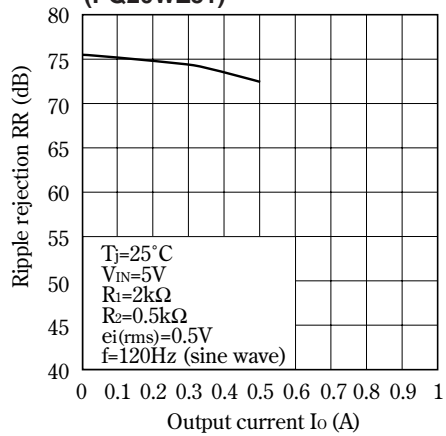


Fig.15 Ripple Rejection vs. Output Current (PQ20WZ11)

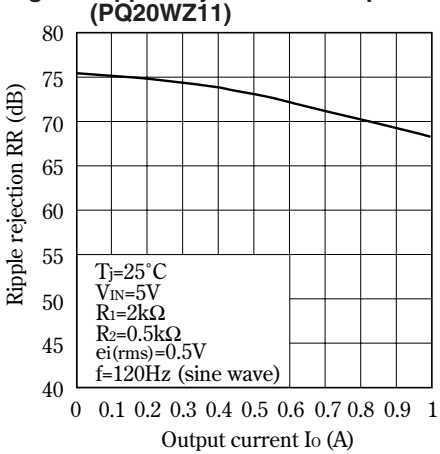


Fig.16 Circuit Operating Current vs. Input Voltage (PQ20WZ51)

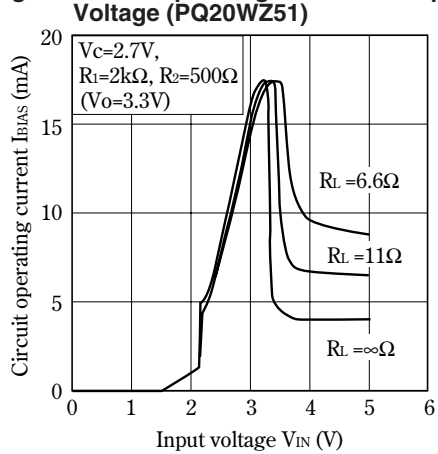


Fig.17 Circuit Operating Current vs. Input Voltage (PQ20WZ11)

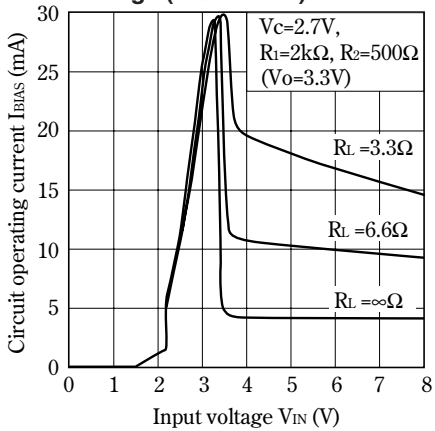
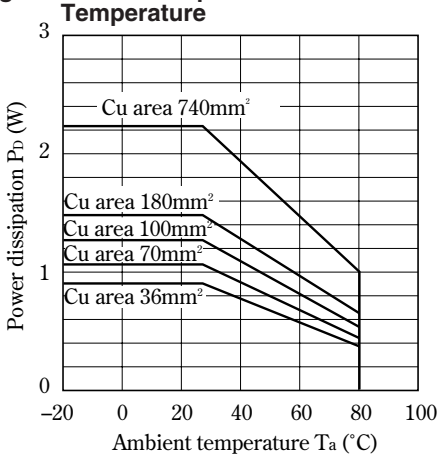
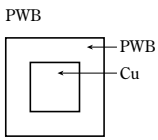


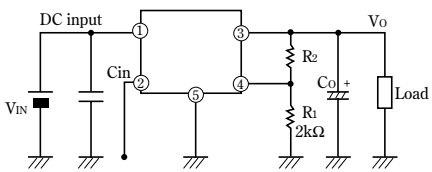
Fig.18 Power Dissipation vs. Ambient Temperature





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

■ Typical Application



High : Output ON
Low or Open : Output OFF

■ Model Line-ups for Tape-packaged Products

	Sleeve-packaged products	Tape-packaged products
Output current	High-precision output type	High-precision output type
0.5A output	PQ20WZ51	PQ20WZ5U
1.0A output	PQ20WZ11	PQ20WZ1U

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  --- Industrial control
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