

PQ20WZ51/PQ20WZ11

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

■ Features

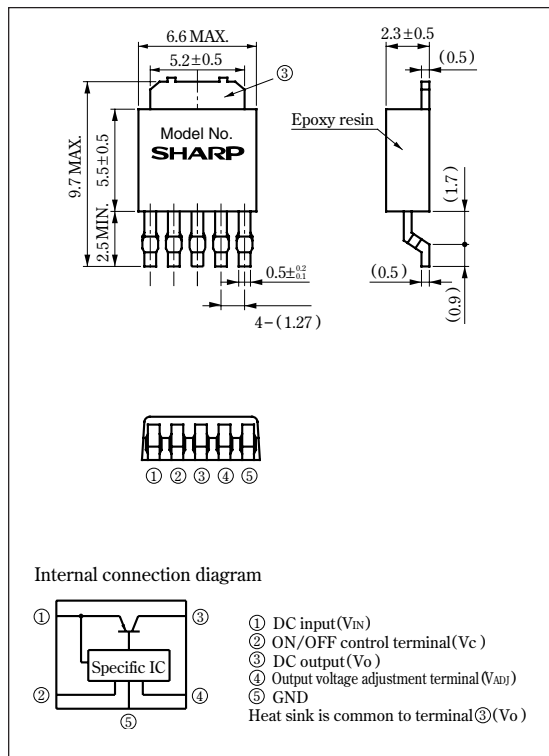
- Low power-loss
(Dropout voltage : MAX. 0.5V)
- Surface mount package (equivalent to SC-63)
- Variable output voltage (3.0 to 20V)
- Output current (0.5A : PQ20WZ51)
(1.0A : PQ20WZ11)
- Reference voltage precision : $\pm 2.5\%$
- Built-in ON/OFF control function
- Low dissipation current at OFF-state (I_{qs} : MAX. $5\mu\text{A}$)
- Built-in overcurrent, overheat protection functions, ASO protection circuit
- Available tape-packaged products
($\phi 330\text{mm}$ reel : 3 000 pcs., PQ20WZ5U/1U)

■ Applications

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

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

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

Parameter	Symbol	Rating		Unit
		PQ20WZ51	PQ20WZ11	
*1 Input voltage	V_{IN}	24		V
*1 ON/OFF control terminal voltage	V_c	24		V
*1 Output adjustment terminal voltage	V_{ADJ}	5		V
Output current	I_o	0.5	1.0	A
Power dissipation (with infinite heat sink)	P_D	8		W
*2 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		$^\circ\text{C}$
*3 Soldering temperature	T_{sol}	260		$^\circ\text{C}$

*1 All are open except GND and applicable terminals.

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

*3 For 10s

• Please refer to the chapter "Handling Precautions".

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Electrical Characteristics

(Unless otherwise specified, conditions shall be $V_{IN}=5V$, $V_O=3.3V$,^{#4}, $R_1=2k\Omega$, $R_2=500\Omega$, $V_C=2.7V$, $T_a=25^\circ C$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage	V_{IN}	—	3.5	—	24	V
Output voltage	V_O	—	3.0	—	20	V
Load regulation	R_{egL}	$\#5$	—	—	2.0	%
Line regulation	R_{egI}	$V_{IN}=4$ to $10V$, $I_O=5mA$	—	—	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	$V_C V_{ref}$	$T_J=0$ to $125^\circ C$, $I_O=5mA$	—	± 1.0	—	%
Dropout voltage	V_{I-O}	$\#4, 6$	—	—	0.5	V
Quiescent current	I_q	$I_O=0A$	—	—	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	$V_C(OFF)$	$I_O=0A$	—	—	0.8	V
OFF-state current for control	$I_C(OFF)$	$I_O=0A$, $V_C=0.4V$	—	—	2.0	μA
Output OFF-state consumption current	I_{qs}	$I_O=0A$, $V_C=0.4V$	—	—	5.0	μA

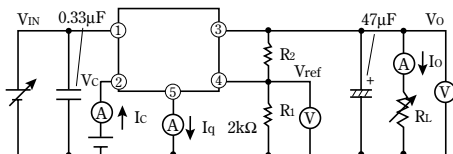
^{#4} PQ20WZ51: $I_O=0.3A$, PQ20WZ11: $I_O=0.5A$

^{#5} PQ20WZ51: $I_O=5mA$ to $0.5A$, PQ20WZ11: $I_O=5mA$ 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.

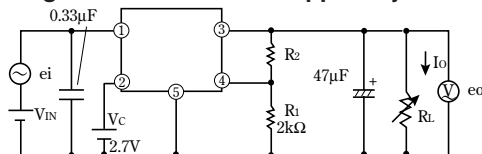
Fig. 1 Test Circuit



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

[$R_1=2k\Omega$, V_{ref} Nearly $\approx 2.64V$]

Fig. 2 Test Circuit for Ripple Rejection



$f=120Hz$ (sine wave)

$e_i(rms)=0.5V$

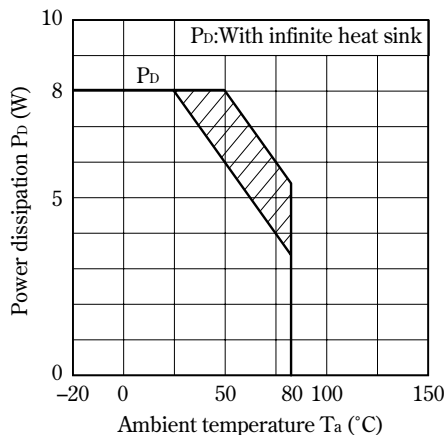
$I_O=0.3A$

$RR=20 \log(e_i(rms)/e_o(rms))$

$V_{IN}=5V$

$V_O=3.3V$ ($R_1=2k\Omega$)

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)

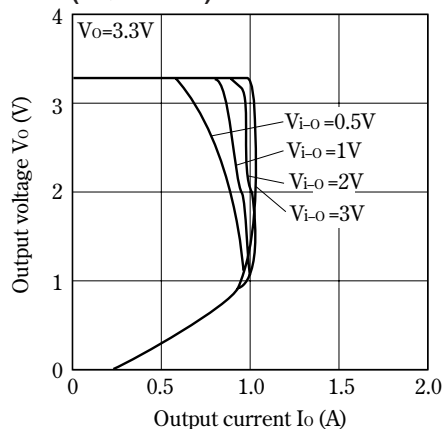


Fig. 5 Overcurrent Protection Characteristics (Typical Value) (PQ20WZ11)

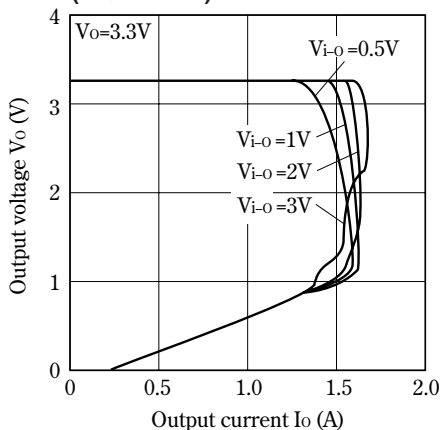


Fig. 6 Output Voltage Adjustment Characteristics

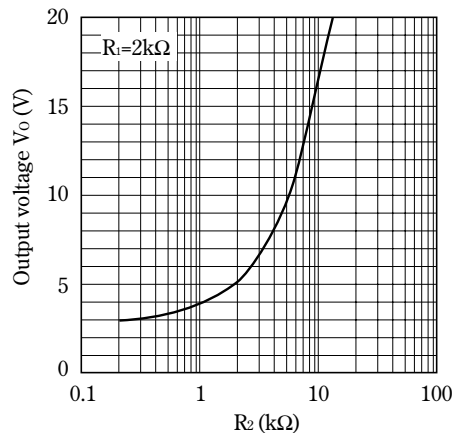


Fig. 7 Reference Voltage Deviation vs. Junction Temperature (Typical Value)

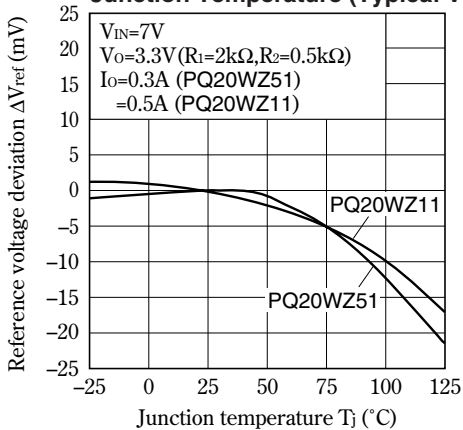


Fig. 8 Output Voltage vs. Input Voltage (PQ20WZ51)

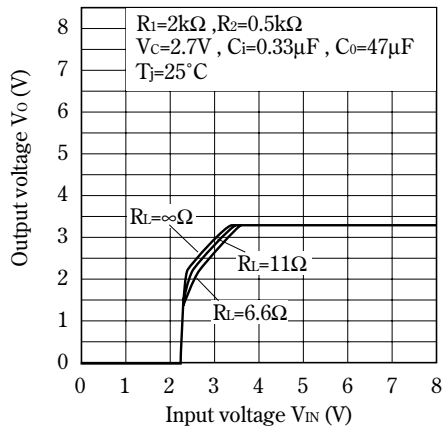


Fig. 9 Output Voltage vs. Input Voltage (PQ20WZ11)

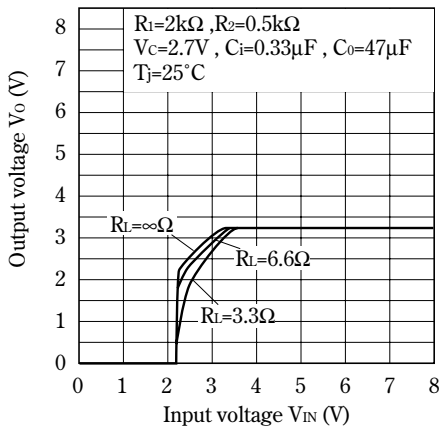


Fig.10 Dropout Voltage vs. Junction Temperature (PQ20WZ51)

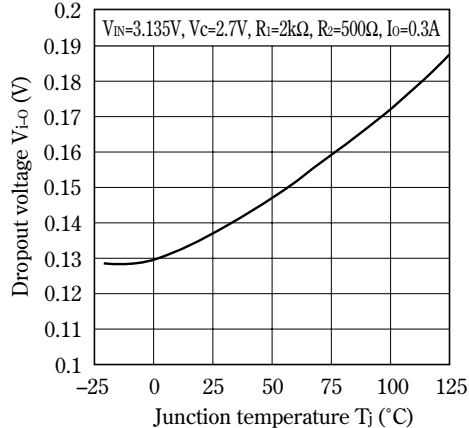


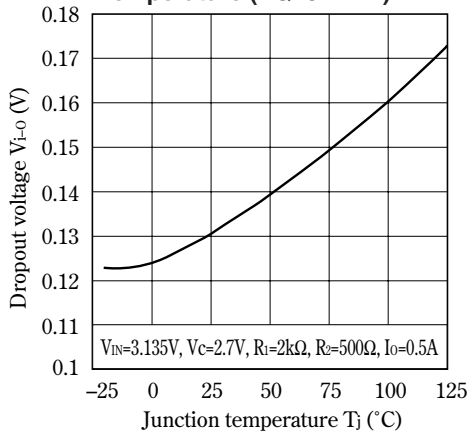
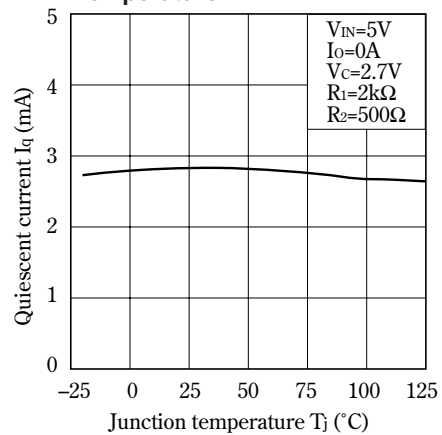
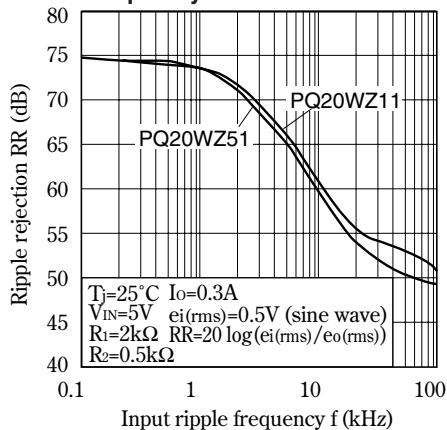
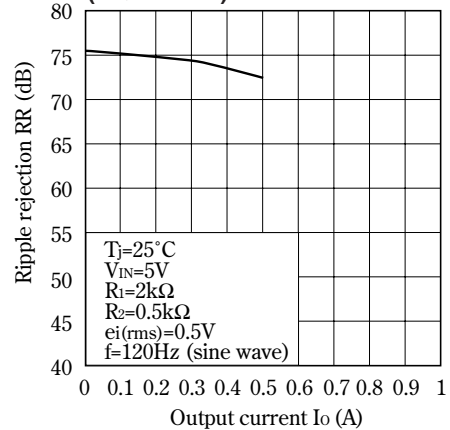
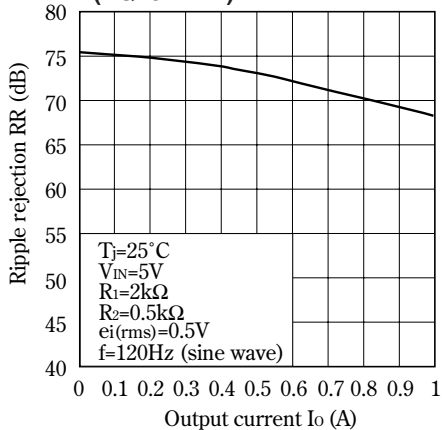
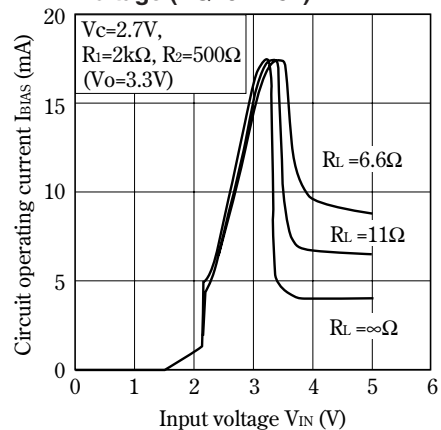
Fig.11 Dropout Voltage vs. Junction Temperature (PQ20WZ11)**Fig.12 Quiescent Current vs. Junction Temperature****Fig.13 Ripple Rejection vs. Input Ripple Frequency****Fig.14 Ripple Rejection vs. Output Current (PQ20WZ51)****Fig.15 Ripple Rejection vs. Output Current (PQ20WZ11)****Fig.16 Circuit Operating Current vs. Input Voltage (PQ20WZ51)**

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

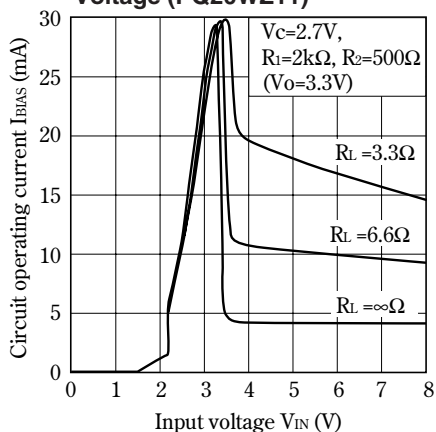
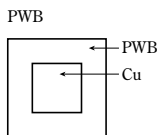
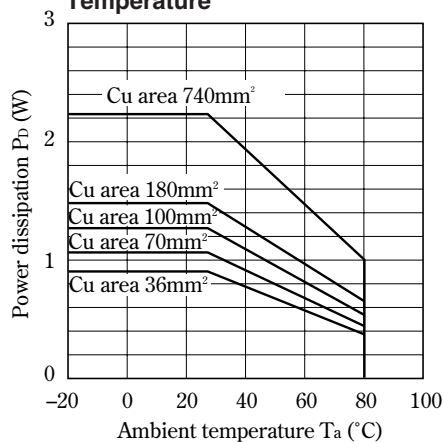
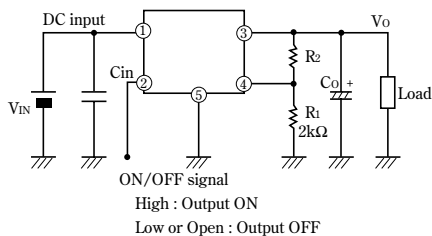


Fig.18 Power Dissipation vs. Ambient Temperature



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

Typical Application



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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