PQ20VZ51/PQ20VZ11

Variable Output, Surface Mount Type Low Power-Loss Voltage Regulators

■ Features

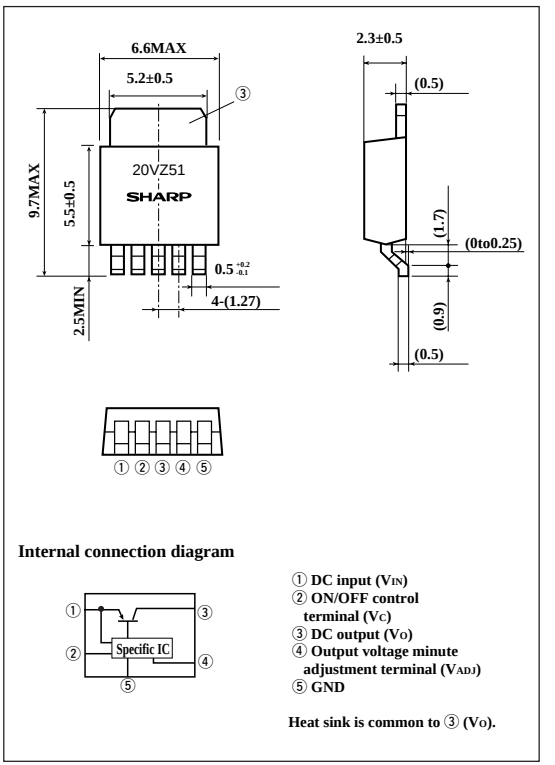
- Low power-loss (Dropout voltage : 0.5V)
- Compact surface mount package
- Both the 0.5A output PQ20VZ51 and the 1A output PQ20VZ11 have high-precision outputs (Reference voltage precision : ±2.0%)
- Variable output type (Output voltage variable range : 1.5V to 20V)
- Built-in ON-OFF control function
- Low dissipation current at OFF-state (Iqs : MAX.5μA)
- Tape packaged type is available.
  (φ330mm reel : 3 000pcs.,PQ20VZ5U/PQ20VZ1U)

■ Applications

- Car audio equipment
- VCR

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(Ta=25˚C)

Parameter		Symbol	Rating	Unit
*1 Input voltage		VIN	24	V
*1 Output contorol voltage		VC	24	V
*1 Output adjustment terminal Voltage		VADJ	7	V
Output current	PQ20VZ51	IO	0.5	A
	PQ20VZ11		1	
Power dissipation (With infinite heat sink)		PD	8	W
*2 Junction temperature		Tj	150	˚C
Operating temperature		Topr	-20 to +80	˚C
Storage temperature		Tstg	-40 to +150	˚C
*3 Soldering temperature		Tsol	260 (For 10s)	˚C

*1 All are open except GND and applicable terminals.

*2 Overheat protection may operate at 125˚C=<Tj=<150˚C

*3 For 10s

· Please refer to the chapter“ Handling Precautions ”.

■ Electrical Characteristics

Unless otherwise specified, V_{IN}=12V, Vo=10V,*4, R_1=1kΩ, V_C=2.7V(T_a=25˚C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage	V_i	V_O=1.5V	4.5	-	-	V
Output voltage	V_O	R_2=225Ω to 14.6kΩ	1.5	-	20	V
Load regulation	$R_{eg}L$	*5	-	0.2	2.0	%
Line regulation	$R_{eg}I$	V_{IN}=11 to 21V, I_O=5mA	-	0.2	2.5	%
Ripple rejection	RR	Refer to Fig. 2	45	60	-	dB
Reference voltage	V_{ref}	*4	1.225	1.25	1.275	V
Temperature coefficient of reference voltage	T_CV_{ref}	T_j=0 to 125˚C, Io=5mA	-	±1.0	-	%
Dropout voltage	V_{i-O}	*4,*6	-	0.2	0.5	V
Quiescent current	I_q	I_O=0	-	4	7	mA
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=0	-	-	0.8	V
OFF-state current for control	$I_{C(OFF)}$	-	-	-	2.0	μA
Output OFF-state consumption current	I_{qs}	V_C=0.4V	-	-	5.0	μA

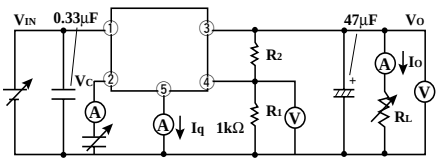
*4 PQ20VZ51:Io=0.3A, PQ20VZ11:Io=0.5A

*5 PQ20VZ51:Io=5mA to 0.5A, PQ20VZ11: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.

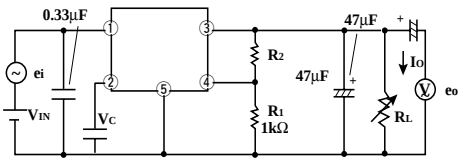
Fig.1 Test Circuit



$$V_O=V_{ref}\times\left(1+\frac{R_2}{R_1}\right)\fallingdotseq 1.25\times\left(1+\frac{R_2}{R_1}\right)$$

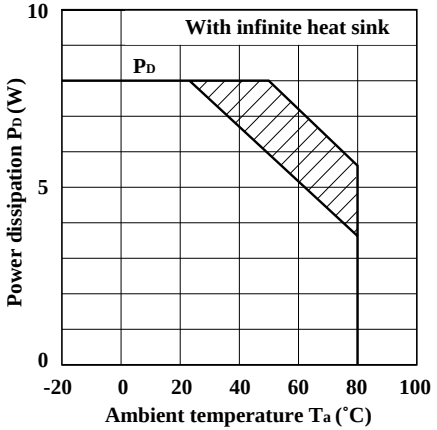
[R_1=1kΩ,V_{ref}≒1.25V]

Fig.2 Test Circuit of Ripple Rejection



f=120Hz (sine wave)
ei=0.5Vrms
I_O=0.3A
RR=20 log (ei/eo)

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)

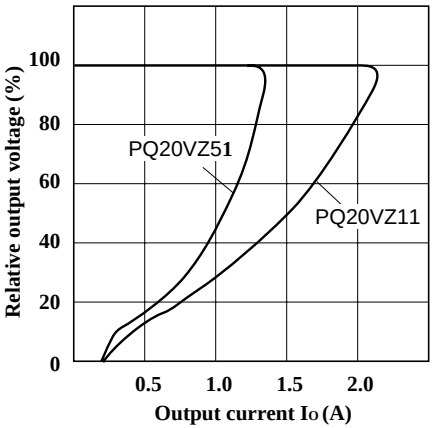


Fig.5 Output Voltage Adjustment Characteristics

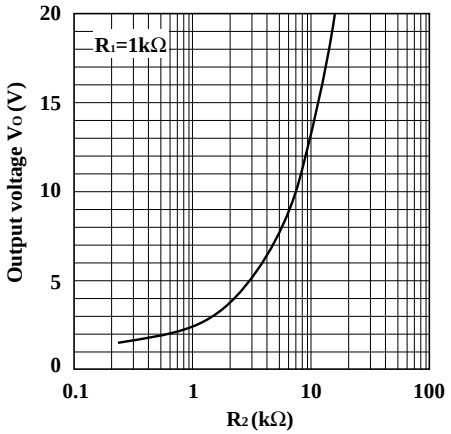


Fig.6 Reference Voltage Deviation vs. Junction Temperature

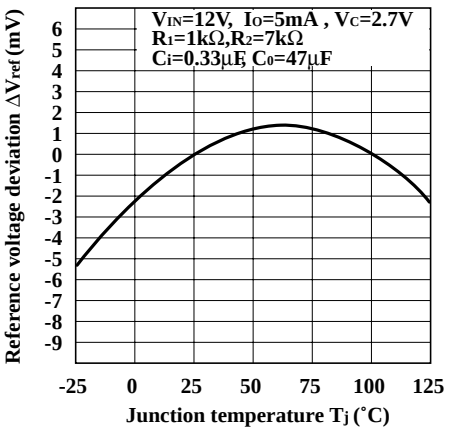


Fig.7 Output Voltage vs. Input Voltage (PQ20VZ51)

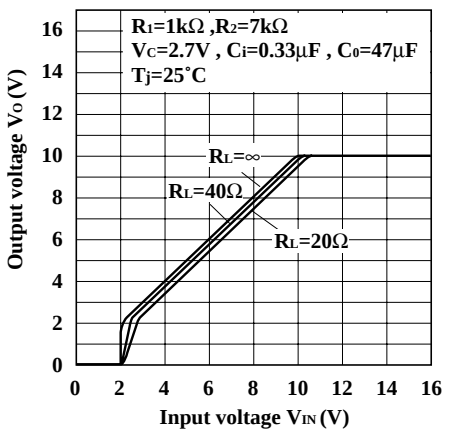


Fig.8 Output Voltage vs. Input Voltage (PQ20VZ11)

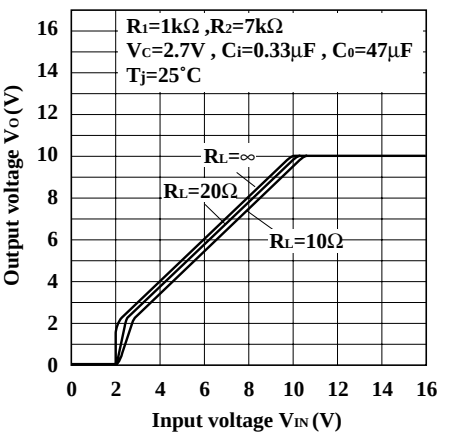


Fig.9 Dropout Voltage vs. Junction Temperature (PQ20VZ51)

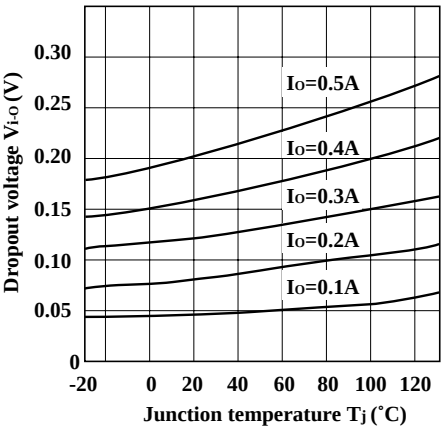


Fig.10 Dropout Voltage vs. Junction Temperature (PQ20VZ11)

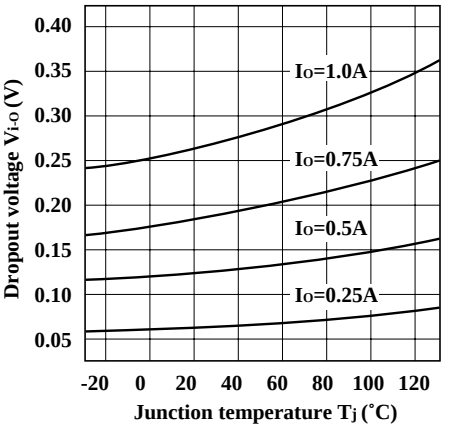


Fig.11 Quiescent Current vs. Junction Temperature

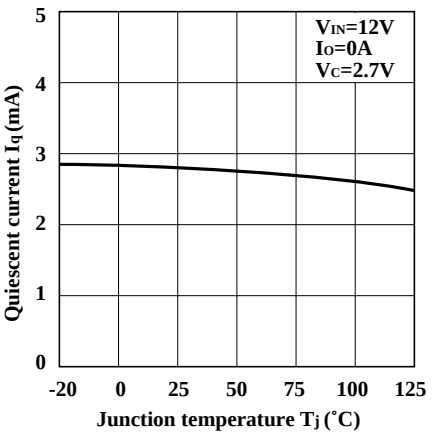


Fig.12 Ripple Rejection vs. Input Ripple Frequency

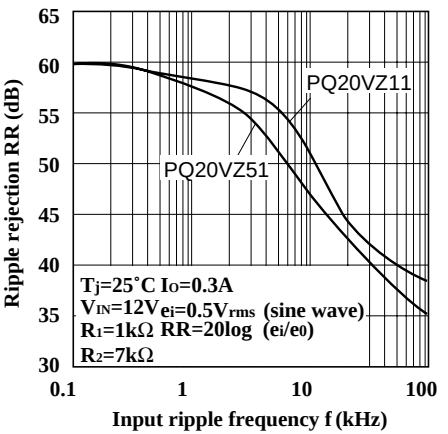


Fig.13 Ripple Rejection vs. Output Current (PQ20VZ51)

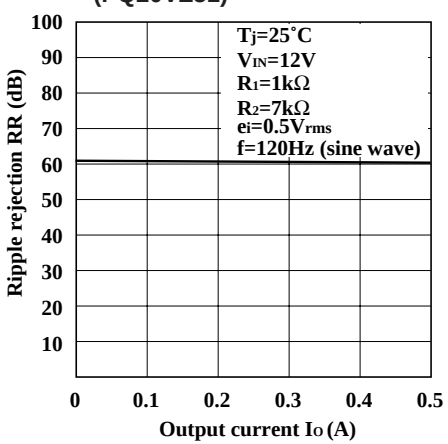


Fig.14 Ripple Rejection vs. Output Current (PQ20VZ11)

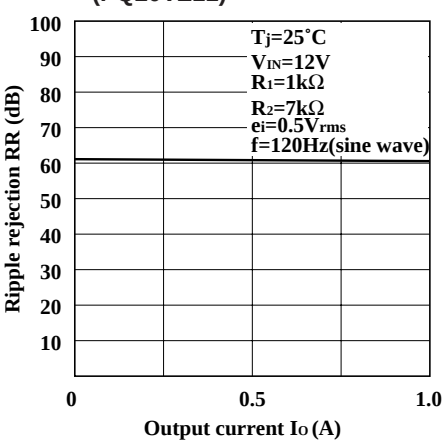


Fig.15 Output Peak Current vs. Dropout Voltage (PQ20VZ51)

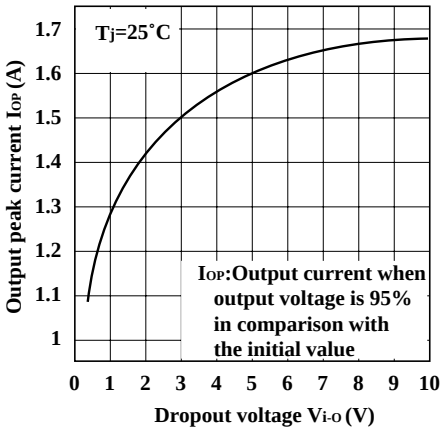


Fig.16 Output Peak Current vs. Dropout Voltage (PQ20VZ11)

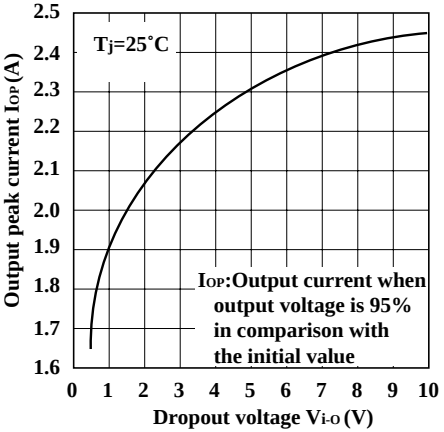


Fig.17 Output Peak Current vs. Junction Temperature (PQ20VZ51)

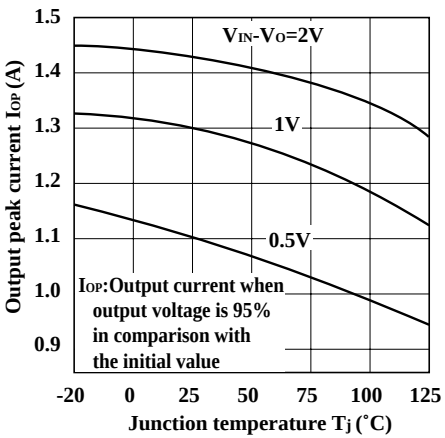


Fig.18 Output Peak Current vs. Junction Temperature (PQ20VZ11)

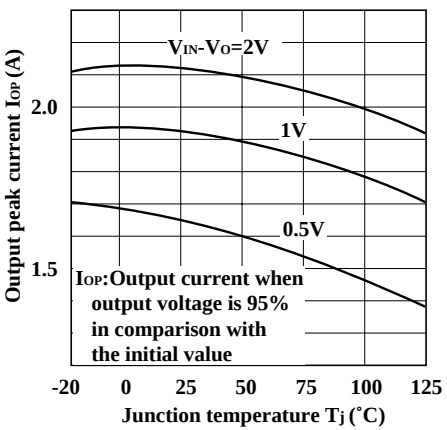
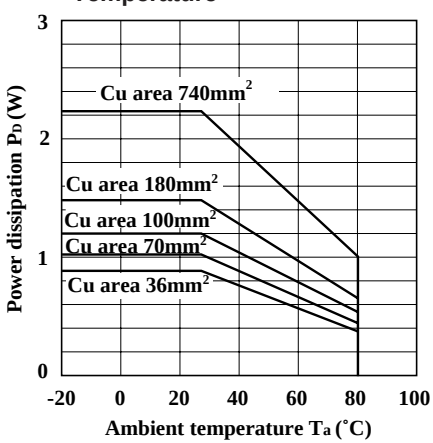
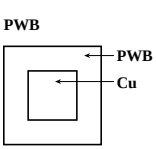


Fig.19 Power Dissipation vs. Ambient Temperature

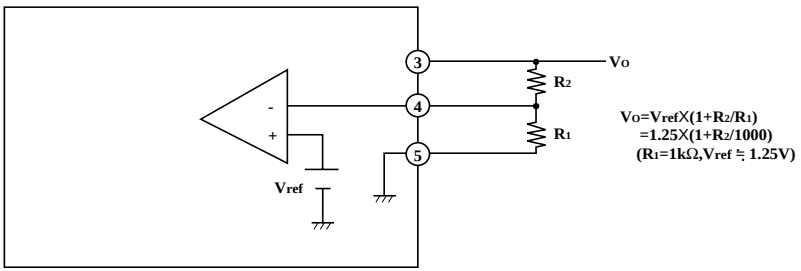




Material : Glass-cloth epoxy resin
Size : 50X50X1.6mm^3
Cu thickness : 35μm

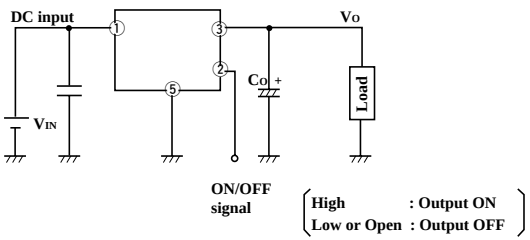
■ Adjustment of Output Voltage

Output voltage is able to be set from 1.5V to 20V when resistors R1,R2 are attached to③,④,∞ terminals. As for the external resistors to set output voltage, refer to the following figure or Fig.5.



■ ON/OFF Operation

As shown in the figure,ON/OFF control function is available.



■ Model Line-ups for Tape-packaged Products

	Sleeve-packaged products		Tape-packaged products	
Output current	**Standard type**	**High-precision output type**	**Standard type**	**High-precision output type**
0.5A output	-	PQ20VZ51	-	PQ20VZ5U
1.0A output	-	PQ20VZ11	-	PQ20VZ1U