

# PQ7VZ5

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

## ■ Features

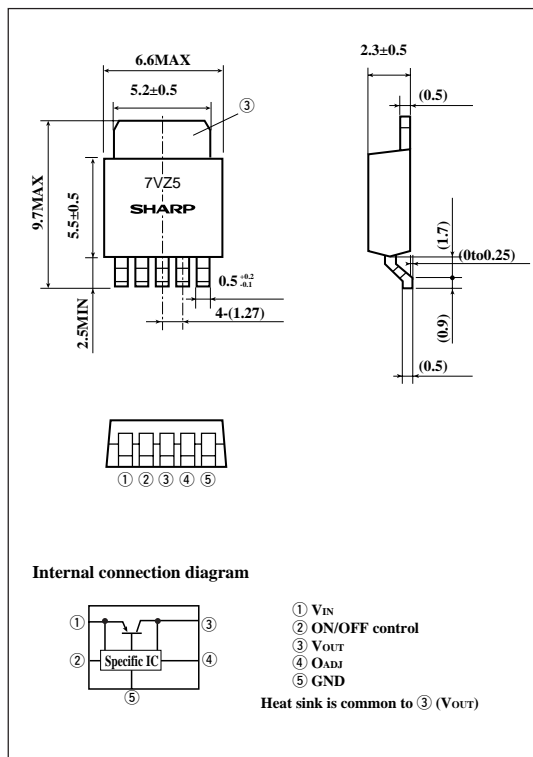
- Low power-loss (Dropout voltage:MAX. 0.5V)
- Variable output type (1.5V to 7V)
- Surface mount type package (equivalent to EIAJ SC-63)
- Output current:MAX.0.5A
- Low dissipation current at OFF-state (Iqs:MAX.5μA)
- Built-in ON/OFF control function
- Reference voltage precision:±2.0%
- Tape packaged type is also available. (Reel:3 000pcs.)

## ■ Applications

- Personal computers
- Word processors
- Printers
- Camcoders
- Personal Information Tools(PDA)

## ■ Outline Dimensions

(Unit : mm)



## ■ Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V <sub>IN</sub>	10	V
*1 ON/OFF control terminal voltage	V <sub>C</sub>	10	V
*1 Output adjustment terminal voltage	V <sub>ADJ</sub>	7	V
Output current	I <sub>O</sub>	0.5	A
*2 Power dissipation	P <sub>D</sub>	8	W
*3 Junction temperature	T <sub>j</sub>	150	°C
Operating temperature	T <sub>opr</sub>	-20 to +80	°C
Storage temperature	T <sub>stg</sub>	-40 to +150	°C
Soldering temperature	T <sub>sol</sub>	260 (For 10s)	°C

\*1 All are open except GND and applicable terminals.

\*2 P<sub>D</sub>.With infinite heat sink.

\*3 Overheat protection may operate at 125=<T<sub>j</sub>=<150°C

· Please refer to the chapter " Handling Precautions ".

**SHARP**

" In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device. "

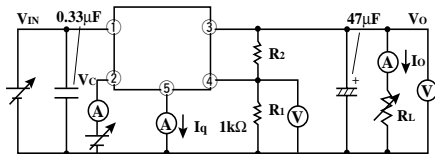
■ Electrical Characteristics

(Unless otherwise specified, conditions shall be  $V_{IN}=5V$ ,  $V_O=3V(R_1=1k\Omega)$ ,  $I_O=0.3A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$ )

Parameter	Symbol	Condition	NIN.	TYP.	MAX.	Unit
Input voltage	$V_{IN}$	-	3.4	-	10.0	V
Output voltage variable range	$V_O$	-	1.5	-	7.0	V
Load regulation	$R_{egL}$	$I_O=5mA$ to $0.5A$	-	0.2	2.0	%
Line regulation	$R_{egI}$	$V_{IN}=4$ to $10V$ , $I_O=5mA$	-	0.2	2.5	%
Ripple rejection	RR	Refer to Fig. 2	45	60	-	dB
Dropout voltage	$V_{i-o}$	$V_{IN}=3.4$ , $I_O=0.3A$	-	-	0.5	V
Reference voltage	$V_{ref}$	-	1.225	1.25	1.275	V
Temperature coefficient of reference voltage	$T_C V_{ref}$	$I_O=5mA$ , $T_j=0$ to $125^\circ C$	-	$\pm 1.0$	-	%
ON-state voltage for control	$V_C(ON)$	*4	2.0	-	-	V
ON-state current for control	$I_C(ON)$	-	-	-	200	$\mu A$
OFF-state voltage for control	$V_C(OFF)$	$I_C=0A$	-	-	0.8	V
OFF-state current for control	$I_C(OFF)$	$V_C=0.4V$ , $I_C=0A$	-	-	2	$\mu A$
Quiescent current	$I_q$	$I_C=0A$	-	4	7	mA
Output OFF-state consumption current	$I_{qs}$	$V_C=0.4V$	-	-	5	$\mu A$

\*4 In case of opening control terminal ②, output voltage turns off.

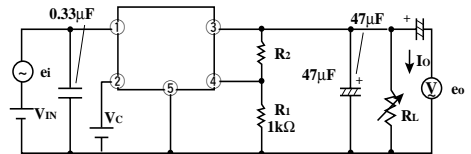
Fig.1 Test Circuit



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

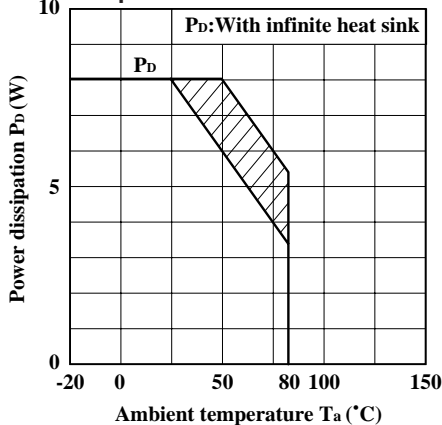
[ $R_1=390\Omega$ ,  $V_{ref} \approx 1.25V$ ]

Fig.2 Test Circuit for Ripple Rejection



$f=120Hz$  (sine wave)  
 $e_i=0.5V_{rms}$   
 $I_O=0.3A$   
 $RR=20 \log(e_i/e_o)$   
 $V_{IN}=5V$   
 $V_O=3V (R_1=1k\Omega)$

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)

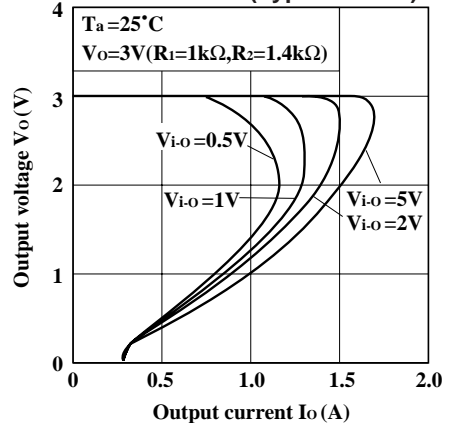


Fig.5 Output Voltage Adjustment Characteristics

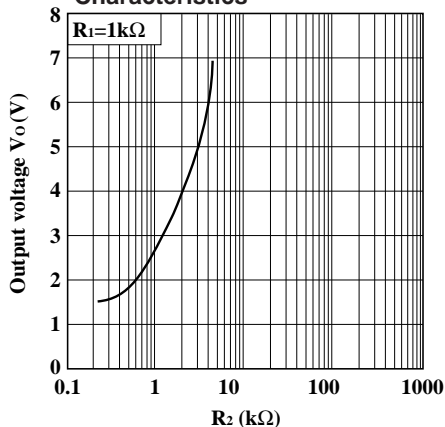


Fig.6 Reference Voltage Deviation vs. Junction Temperature(Typical Value)

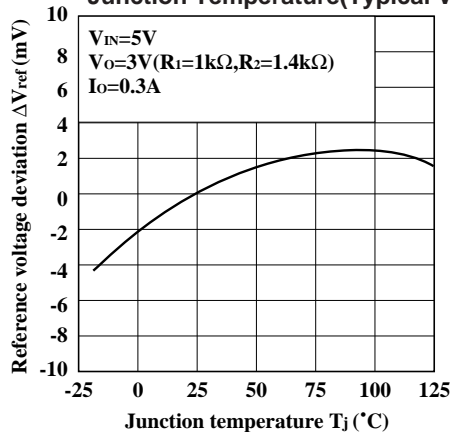


Fig.7 Output Voltage vs. Input Voltage

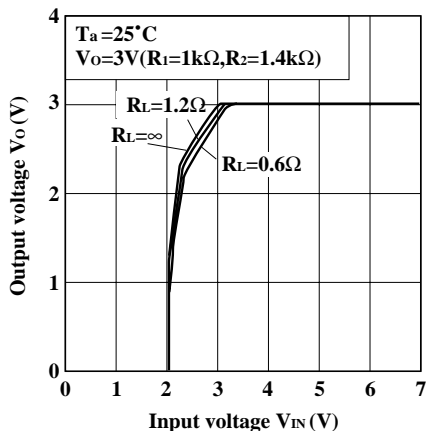


Fig.8 Circuit Operating Current vs. Input Voltage

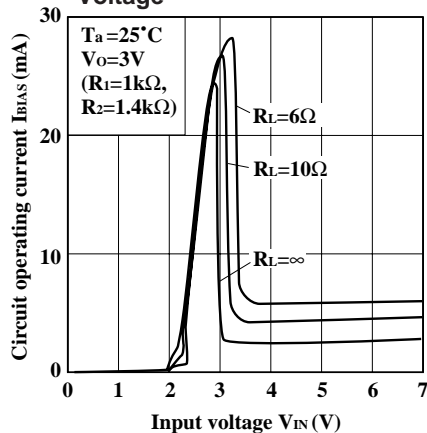


Fig.9 Dropout Voltage vs. Junction Temperature(Typical Value)

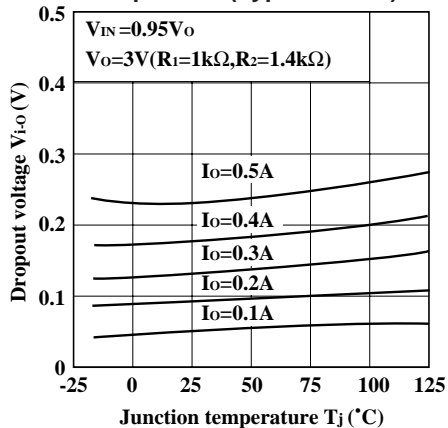


Fig.10 ON-state Voltage for Control vs. Junction Temperature(Typical Value)

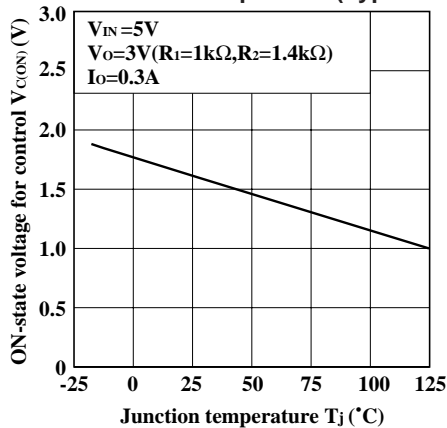


Fig.11 Quiescent Current vs. Junction Temperature(Typical Value)

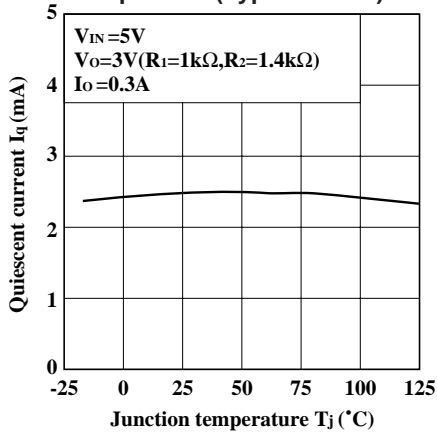


Fig.12 Ripple Rejection vs. Input Ripple Frequency

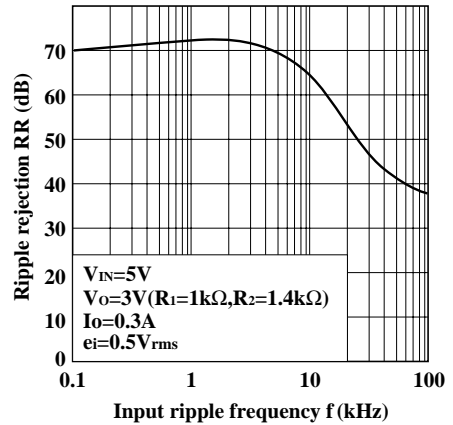


Fig.13 Output Peak Current vs. Junction Temperature(Typical Value)

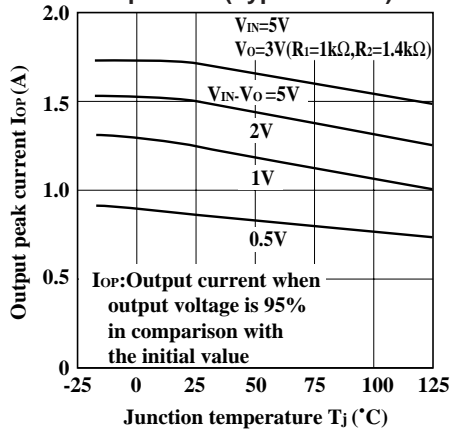
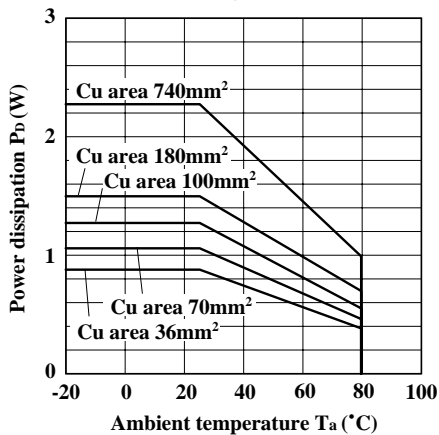
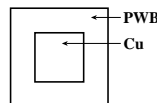


Fig.14 Power Dissipation vs. Ambient Temperature(Typical Value)



PWB



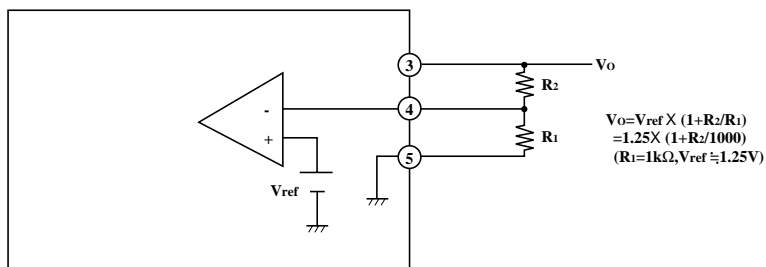
Material : Glass-cloth epoxy resin  
 Size : 50X50X1.6mm<sup>3</sup>  
 Cu thickness : 35μm

■ 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	-	PQ7VZ5	-	PQ7VZ5U

■ Adjustment of Output Voltage

Output voltage is able to be set from 1.5V to 7V when resistors R<sub>1</sub>, R<sub>2</sub> are attached to ③, ④, ⑤ terminals. As for the external resistors to set output voltage, refer to the following figure or Fig.5.



$$\begin{aligned}
 V_o &= V_{ref} \times (1 + R_2/R_1) \\
 &\approx 1.25 \times (1 + R_2/1000) \\
 (R_1 &= 1k\Omega, V_{ref} \approx 1.25V)
 \end{aligned}$$