

PQ7DV5

Variable Output Type, High Output Current(5A)Type Low Power-loss Voltage Regulators

■ Features

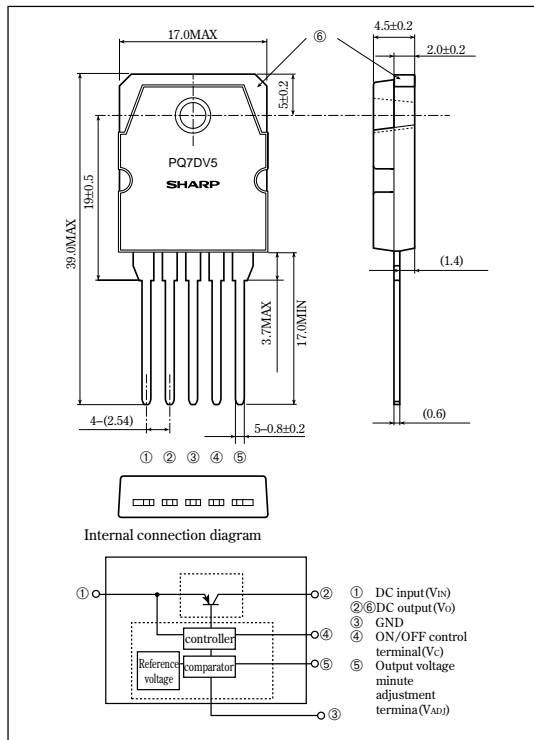
- TO-3P package
- Low power-loss(Dropout voltage: MAX. 0.5V at $I_o=5A$)
- Variable output type(1.5V to 7V)
- Minimum input voltage: 3.0V
- High output current type(5A)
- Reference voltage precision: $\pm 2.0\%$
- Built-in ON/OFF control function
- Built-in overcurrent protection, overheat protection function

■ Applications

- Power supplies for various electronic equipment such as personal computers

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

($T_a=25^\circ C$)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V_{IN}	10	V
*1 ON/OFF control terminal voltage	V_C	10	V
*1 Output adjustment terminal voltage	V_{ADJ}	5	V
Output current	I_O	5.0	A
Power dissipation (No heat sink)	P_{D1}	2.2	W
Power dissipation (With infinite heat sink)	P_{D2}	60	W
*2 Junction temperature	T_j	150	$^\circ C$
Operating temperature	T_{opr}	-20 to +80	$^\circ C$
Storage temperature	T_{stg}	-40 to +150	$^\circ C$
Soldering temperature	T_{sol}	260 (For 10s)	$^\circ C$

*1 All are open except GND and applicable terminals.

*2 Overheat protection may operate at $125 < T_j < 150^\circ C$.

•Please refer to the chapter " Handling Precautions ".

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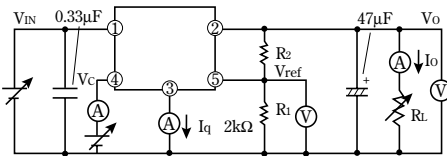
Electrical Characteristics

(Unless otherwise specified, conditions shall be $V_{IN}=5V, I_o=2.5A, V_o=3V[R_1=2k\Omega]T_a=25^\circ C$)

Parameter	Symbol	Conditions	NIN.	TYP.	MAX.	Unit
Input voltage	V_{IN}	-	3	-	10	V
Output voltage	V_o	-	1.5	-	7	V
Reference voltage	V_{ref}	-	1.225	1.25	1.275	V
Load regulation	$RegL$	$I_o=5mA$ to 5.0A	-	0.5	2.0	%
Line regulation	$RegI$	$V_{IN}=4$ to 10V	-	0.5	2.5	%
Temperature coefficient of reference voltage	TcV_o	$T_j=0$ to $125^\circ C$	-	± 0.01	-	%/ $^\circ C$
Ripple rejection	RR	Refer to Fig. 2	45	55	-	dB
Dropout voltage	V_{I-O}	$V_{IN}=3V, I_o=5A$	-	-	0.5	V
*3 ON-state voltage for control	$V_{C(ON)}$	-	2.0	-	-	V
ON-state current for control	$I_{C(ON)}$	$V_C=2.7V$	-	-	20	μA
OFF-state voltage for control	$V_{C(OFF)}$	-	-	-	0.8	V
OFF-state current for control	$I_{C(OFF)}$	$V_C=0.4V$	-	-	-0.4	mA
Quiescent current	I_q	$I_o=0A$	-	-	17	mA

*3 In case of opening control terminal ④, output voltage turns on.

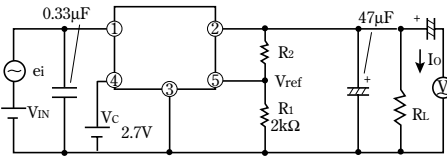
Fig. 1 Test Circuit



$$V_o = V_{ref} \times (1 + R_2/R_1)$$

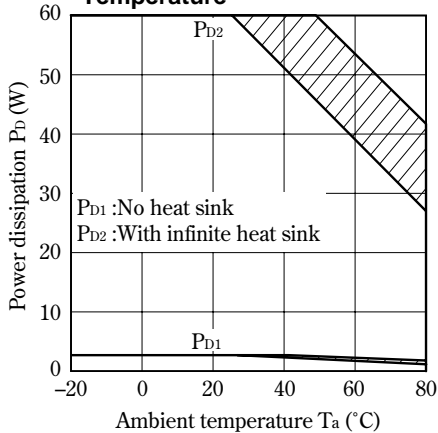
[$R_1=2k\Omega, V_{ref}$ Nearly $=1.25V$]

Fig. 2 Test Circuit for Ripple Rejection



$f=120Hz$ (sine wave)
 $e_i(rms)=0.5V$
 $V_{IN}=5V$
 $V_o=3V(R_1=2k\Omega)$
 $I_o=0.5A$
 $RR=20 \log(e_i(rms)/e_o(rms))$

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)

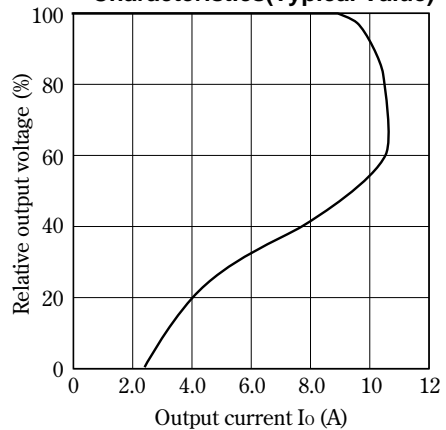


Fig. 5 Reference Voltage Deviation vs. Junction Temperature

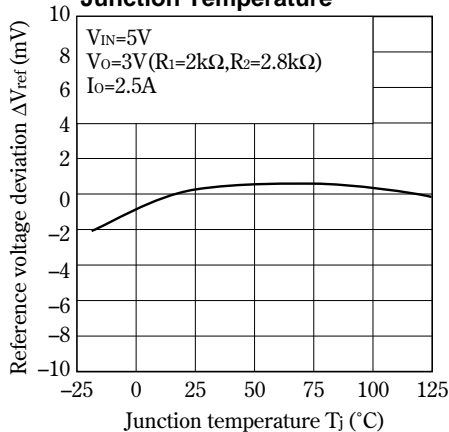


Fig. 6 Output Voltage vs. Input Voltage

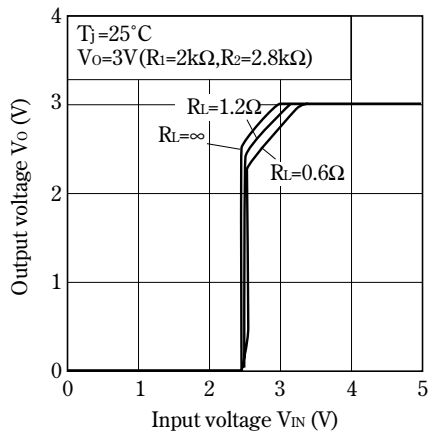


Fig. 7 Circuit Operating Current vs. Input Voltage

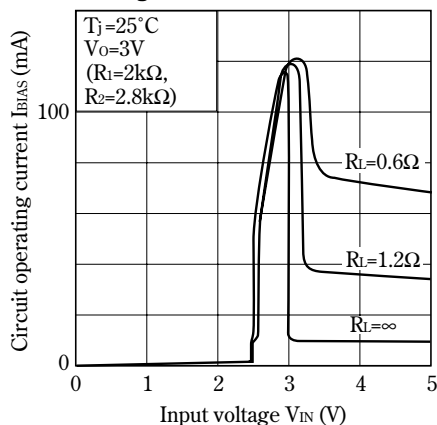


Fig. 8 Dropout Voltage vs. Junction Temperature

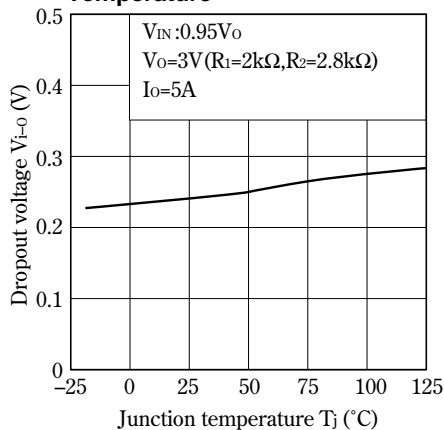


Fig. 9 Quiescent Current vs. Junction Temperature

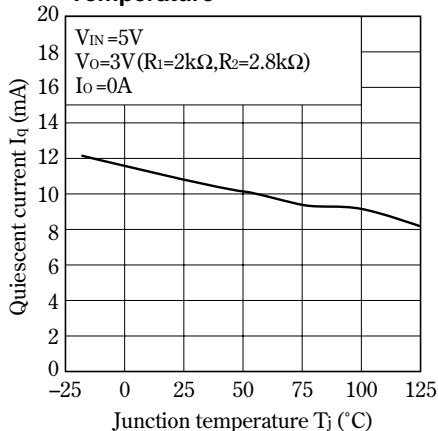


Fig.10 Ripple Rejection vs. Input Ripple Frequency

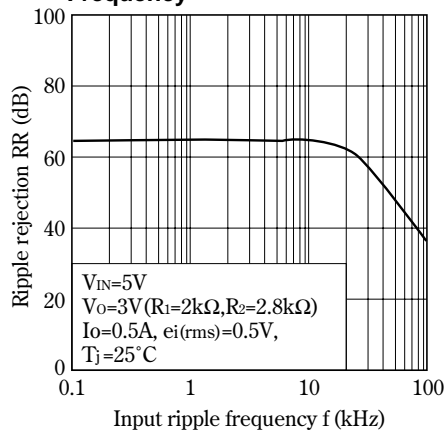
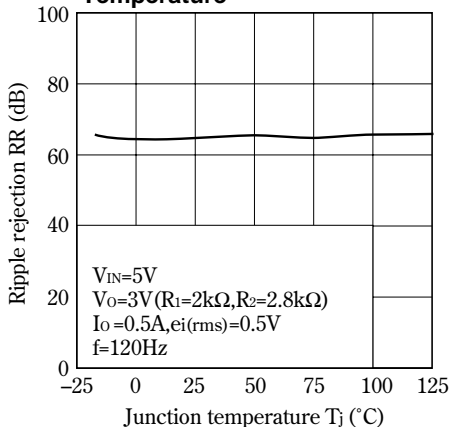
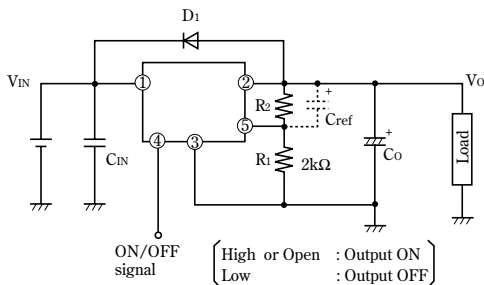


Fig.11 Ripple Rejection vs. Junction Temperature



■ **Standard Connection**



D1 : This device is necessary to protect the element from damage when reverse voltage may be applied to the regulator in case of input short-circuiting.

Cref : This device is necessary when it is required to enhance the ripple rejection or to delay the output start-up time*. Otherwise, it is not necessary.

(Care must be taken since Cref may raise the gain, facilitating oscillation.)

*The output start-up time proportional to $C_{ref} \times R_2$.

CIN, CO : Be sure to mount the devices CIN and CO as close to the device terminal as possible so as to prevent oscillation.

The standard specification of $C_{IN}=0.33\mu$, $C_O=47\mu$, respectively. However, adjust them as necessary after checking.

R1, R2 : These devices are necessary to set the output voltage. The output voltage VO is given by the following formula:

$$V_O = V_{ref} \times (1 + R_2/R_1)$$

(Vref is 1.25V TYP)

The standard value of R1 is 2Ω. But value up to 10kΩ.

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