# PQ7DV10

Variable Output, (1.5 to 7V) 10A Output Low Power-loss Voltage Regulator

## ■ Feature

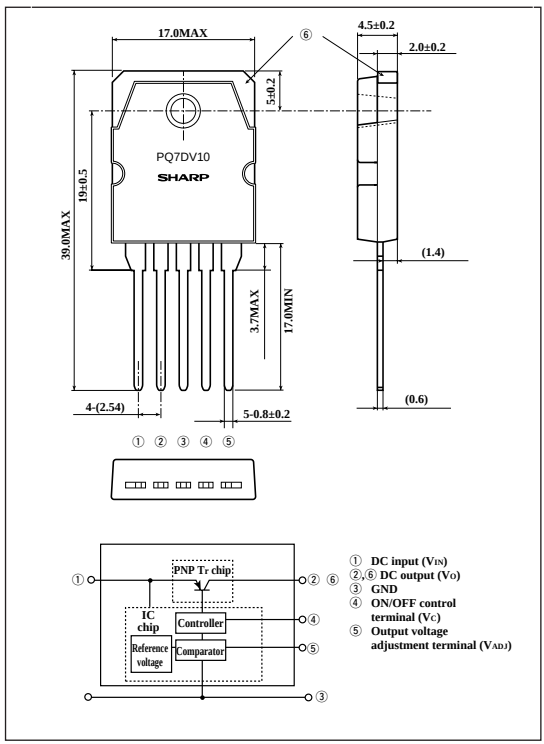
- 10A output type
- Low power-loss (Dropout voltage : MAX.0.5V at Io= 10A)
- Variable output type (1.5 to 7V)
- Low operating voltage (Minimum input voltage : 3.0V)
- High-precision reference voltage type (Reference voltage precision : ±2.0%)
- TO-3P package
- Built-in ON/OFF control function
- Built-in 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˚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 | $I_O$ | 10 | 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 | ˚C |
| Operating temperature | $T_{opr}$ | -20 to +80 | ˚C |
| Storage temperature | $T_{stg}$ | -40 to +150 | ˚C |
| Soldering temperature | $T_{sol}$ | 260 (For 10s) | ˚C |

*1 All are open except GND and applicable terminals.

*2 Overheat protection may operate at 125<=$T_j$<=150˚C.

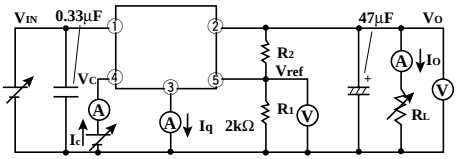
## ■ Electrical Characteristics

**(Unless otherwise specified, conditions shall be $V_{IN}$=5V, $I_O$=5A, $V_O$=3V($R_1$=2kΩ) $T_a$=25˚C)**

| Parameter | Symbol | Conditions | NIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|
| Input voltage | $V_{IN}$ | - | 3 | - | 10 | V |
| Reference voltage | $V_O$ | - | 1.5 | - | 7 | V |
| Reference voltage | $V_{ref}$ | - | 1.225 | 1.25 | 1.275 | V |
| Load regulation | $R_{eg}L$ | $I_O$=5mA to 10A | - | 0.5 | 2 | % |
| Line regulation | $R_{eg}I$ | $V_{IN}$=4 to 10V | - | 0.5 | 2.5 | % |
| Temperature coefficient of output voltage | $T_CV_O$ | $T_j$=0 to 125˚C | - | ±0.01 | - | %/˚C |
| Ripple rejection | RR | - | 45 | 55 | - | dB |
| Dropout voltage | $V_{i-o}$ | $V_{IN}$=3V, $I_O$=10A | - | - | 0.5 | V |
| *3 ON-state voltage for control | $V_{C\ (ON)}$ | - | 2 | - | - | 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 |

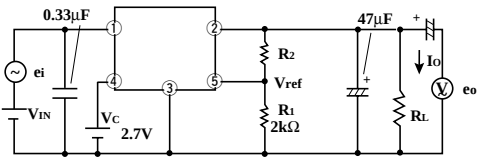
*3 In case of opening control terminal ④,output voltage turns on.

### Fig.1 Test Circuit



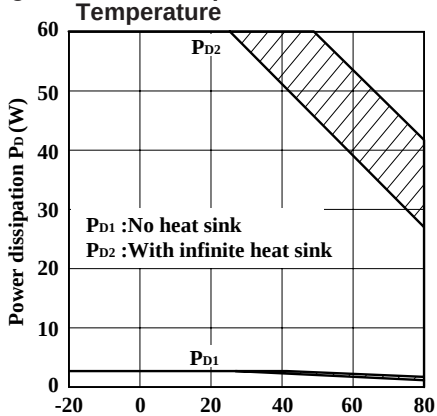

$V_o=V_{ref}\times(1+R_2/R_1)$
$\fallingdotseq 1.25\times(1+R_2/R_1)$
$[R_1=2k\Omega, V_{ref}\fallingdotseq 1.25V]$

### Fig.2 Test Circuit for Ripple Rejection




f=120Hz (sine wave)
ei=0.5Vrms
$V_{IN}$=5V
$V_O$=3V ($R_1$=2kΩ)
$I_O$=0.5A
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)

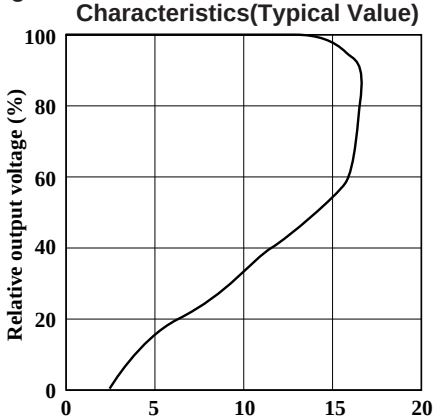


**Fig.5 Output Voltage Adjustment Characteristics**

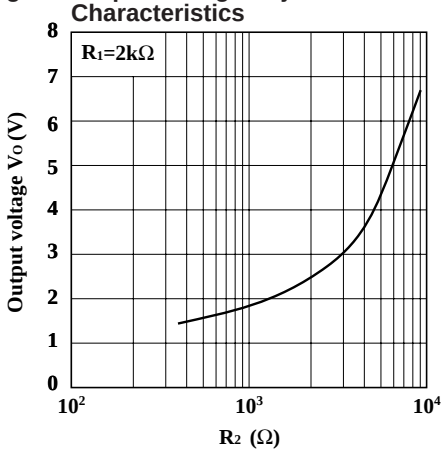



**Fig.6 Output Voltage Deviation vs. Junction Temperature**

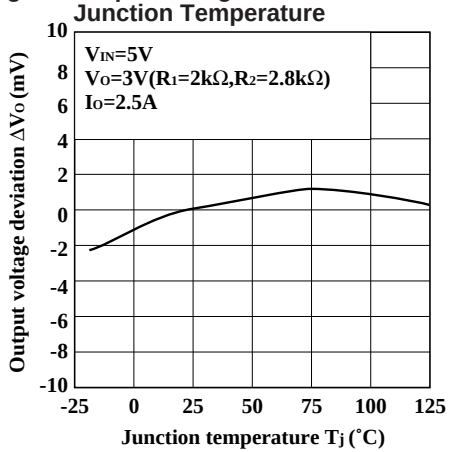



**Fig.7 Output Voltage vs. Input Voltage**

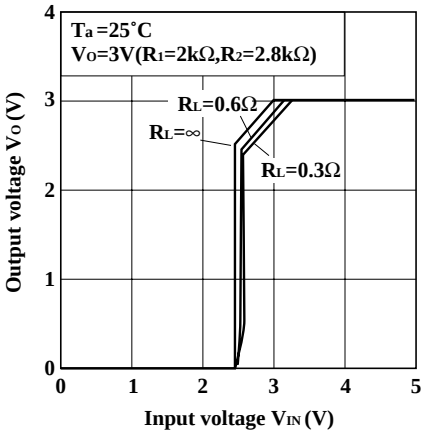



**Fig.8 Circuit Operating Current vs. Input Voltage**

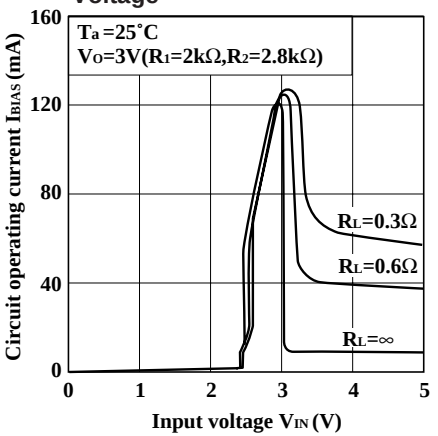



**Fig.9 Dropout Voltage vs. Junction Temperature**

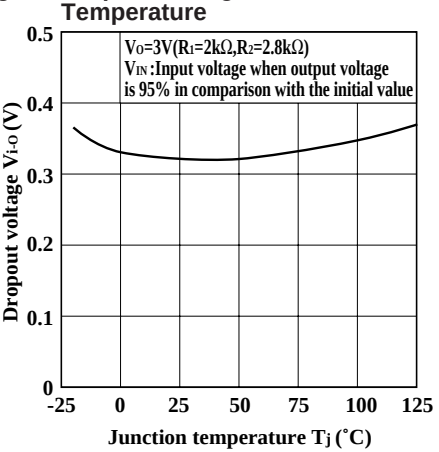



**Fig.10 Ripple Rejection vs. Junction Temperature**

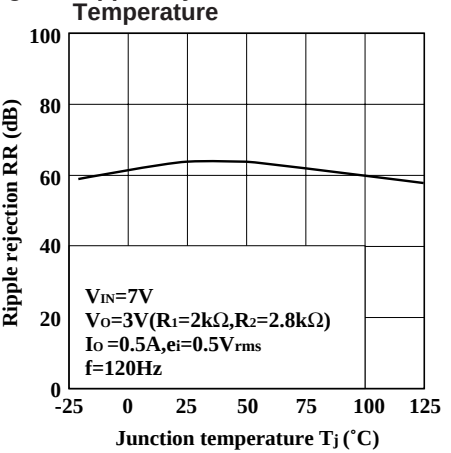


**Fig.11 Quiescent Current vs. Junction Temperature**

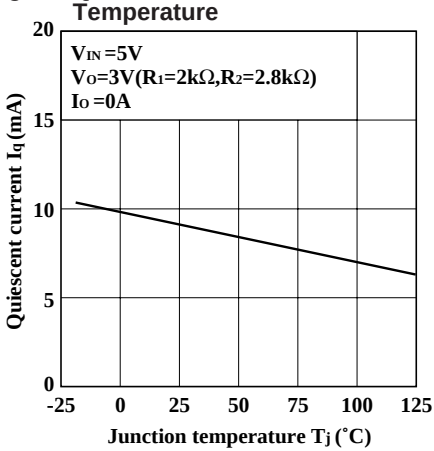
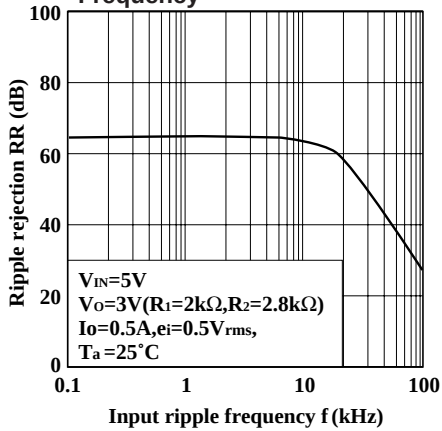
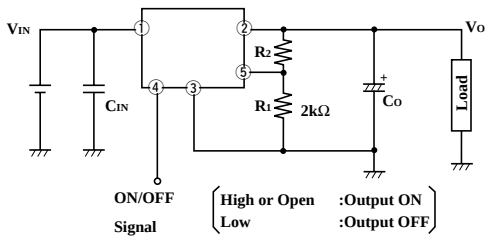



**Fig.12 Ripple Rejection vs. Input Ripple Frequency**




## ■ Typical Application



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