PQ5EV3/PQ5EV5/PQ5EV7

Large Output Current Type Low Power-Loss Voltage Regulator

■ Features

- Low power-loss (Dropout voltage: MAX.0.5V)
- Package with exposed radiation fin (Equivalent to TO-220)
- Large output current
  3.5A: PQ5EV3, 5A: PQ5EV5, 7.5A: PQ5EV7
- Variable output voltage (1.5V to 5V)
- High-precision reference voltage type
  (Reference voltage precision: ±1.0%)
- Overcurrent, overheat protection functions

■ Applications

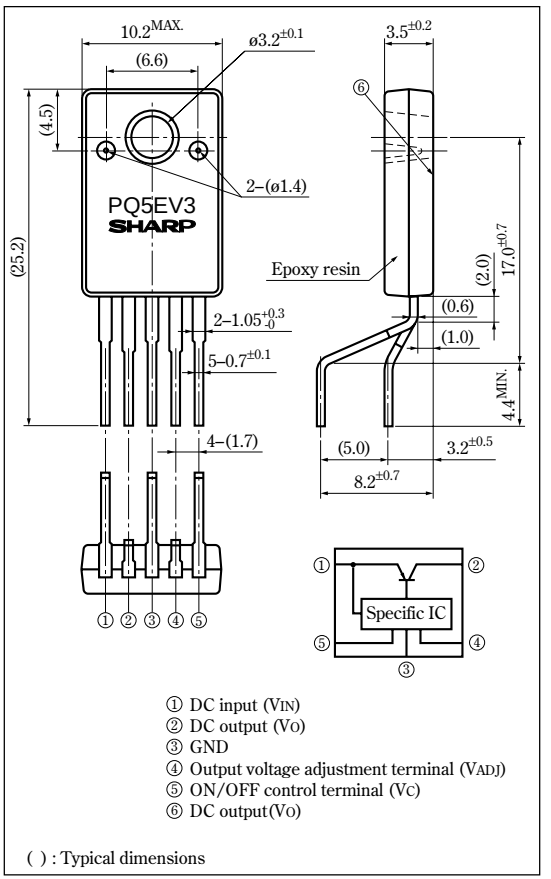
- Personal computers
- Power supplies for various electronic equipment such as AV or OA

■ Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
※1 Input voltage		V_{IN}	7	V
Dropout voltage		V_{I-O}	4	V
※1 ON/OFF control terminal voltage		V_C	7	V
※1 Output adjustment terminal voltage		V_{ADJ}	5	V
Output current	PQ5EV3	I_O	3.5	A
	PQ5EV5		5.0	
	PQ5EV7		7.5	
※2 Power dissipation		P_{D1}	1.6	W
		P_{D2}	45	W
※3 Junction temperature		T_j	150	˚C
Operating temperature		T_{opr}	−20 to +80	˚C
Storage temperature		T_{stg}	−40 to +150	˚C
※4 Soldering temperature		T_{sol}	260 (10s)	˚C

※1 All are open except GND and applicable terminals
※2 P_{D1}:No heat sink, P_{D2}:With infinite heat sink
※3 Overheat protection may operate at the condition T_j=125˚C to 150˚C

■ Outline Dimensions (Unit : mm)



• Please refer to the chapter " Handling Precautions ".

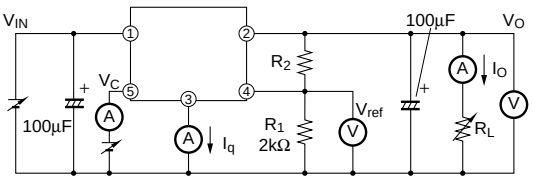
■ Electrical Characteristics

(Unless otherwise specified, V_{IN}=5V, ※4,V_O=3V (R_1=2kΩ) , Ta=25˚C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage	V_{IN}	–	2.35	–	7	V
Output voltage	V_O	–	1.5	–	5	V
Reference voltage	V_{ref}	–	1.2276	1.24	1.2524	V
Load regulation	$R_{eg}L$	I_O=5mA to rating	–	0.1	0.5	%
Line regulation	$R_{eg}I$	V_{IN}=4 to 7V, I_O=5mA	–	0.05	0.1	%
Reference voltage temperature coefficient	T_CV_{ref}	T_j=0 to 125˚C	–	±1	–	%
Ripple Rejection	RR	Refer to Fig.2	60	70	–	dB
Dropout voltage	V_{I-O}	※5	–	–	0.5	V
※6 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	–	10	15	mA

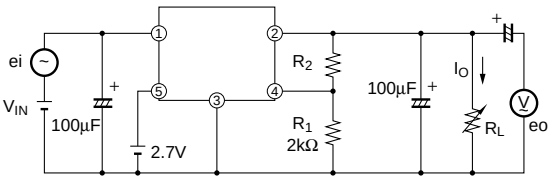
※4 **PQ5EV3**:I_O=1.75A, **PQ5EV5**:I_O=2.5A, **PQ5EV7**:I_O=3.75A
※5 **PQ5EV3**:I_O=3.5A, **PQ5EV5**:I_O=5A, **PQ5EV7**:I_O=7.5A. Input voltage shall be the value when output voltage is 95% in comparison with the initial value
※6 In case of opening control terminal ⑤, output voltage turns on.

Fig.1 Test Circuit



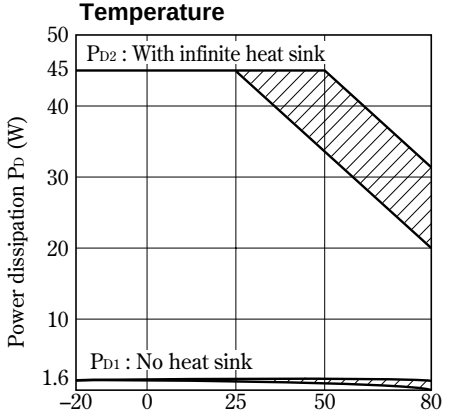
$V_O=V_{ref}\times(1+R_2/R_1)$
[R_1=2kΩ, V_{ref}≒1.24V]

Fig.2 Test Circuit for Ripple Rejection



f=120Hz (sine wave)
ei(rms)=0.5V
V_O=3V (R_1=2kΩ)
V_{IN}=5V
I_O=0.5A
RR=20log (ei(rms)/eo(rms))

Fig.3 Power Dissipation vs. Ambient Temperature



Note) Oblique line portion:Overheat protection may operate in this area

Fig.4 Overcurrent Protection Characteristics (PQ5EV3)

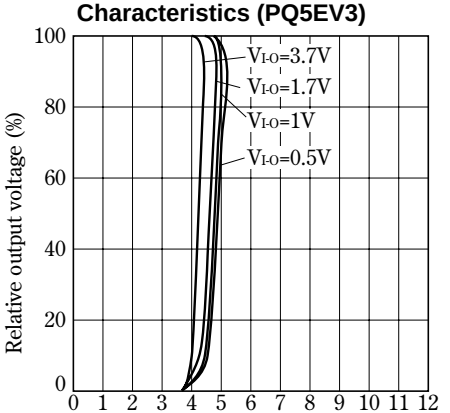


Fig.5 Overcurrent Protection Characteristics (PQ5EV5)

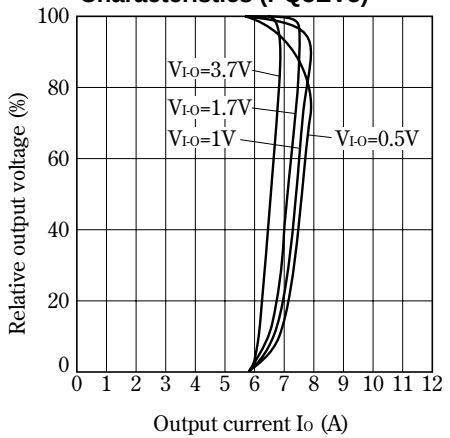


Fig.6 Overcurrent Protection Characteristics (PQ5EV7)

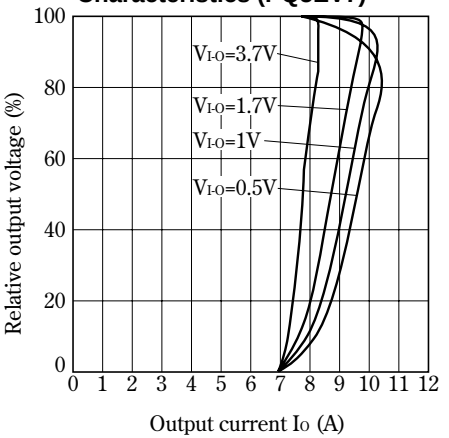


Fig.7 Reference Voltage Fluctuation vs. Junction Temperature

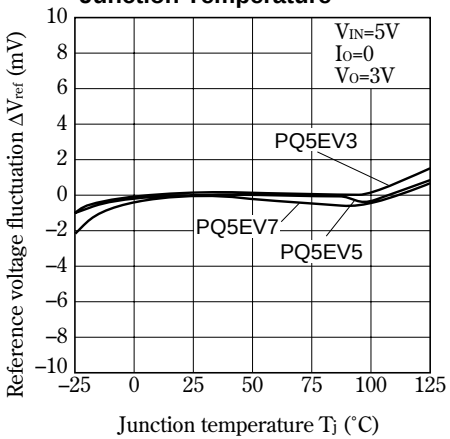


Fig.8 Output Voltage vs. Input Voltage (PQ5EV3)

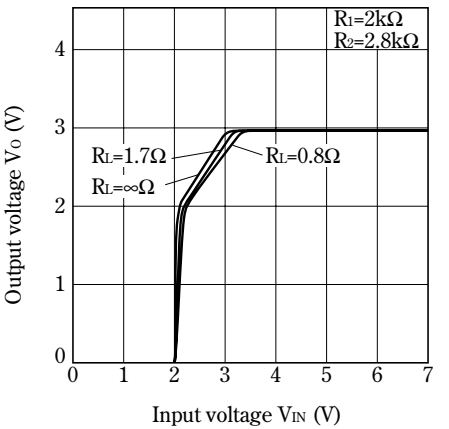


Fig.9 Output Voltage vs. Input Voltage (PQ5EV5)

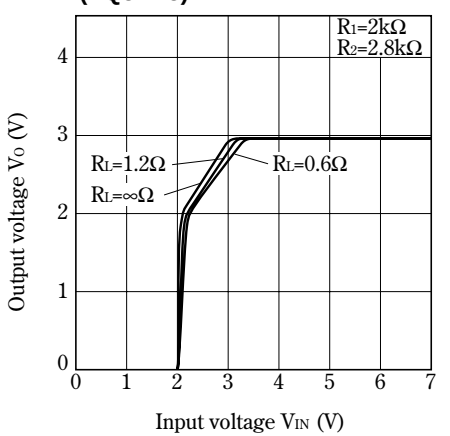


Fig.10 Output Voltage vs. Input Voltage (PQ5EV7)

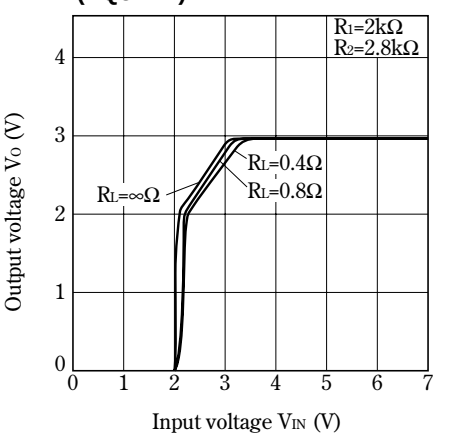


Fig.11 Circuit Operating Current vs. Input Voltage (PQ5EV3)

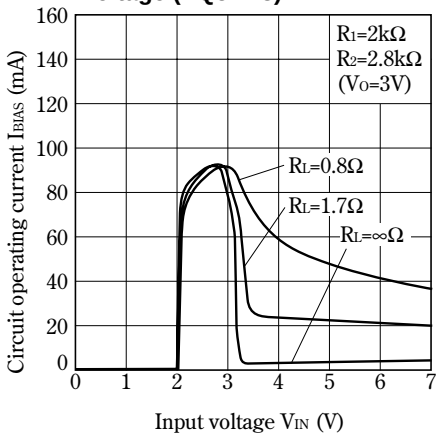


Fig.12 Circuit Operating Current vs. Input Voltage (PQ5EV5)

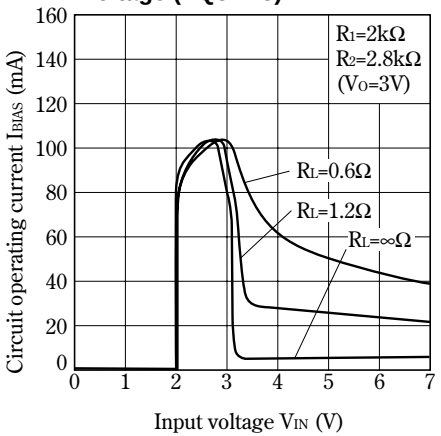


Fig.13 Circuit Operating Current vs. Input Voltage (PQ5EV7)

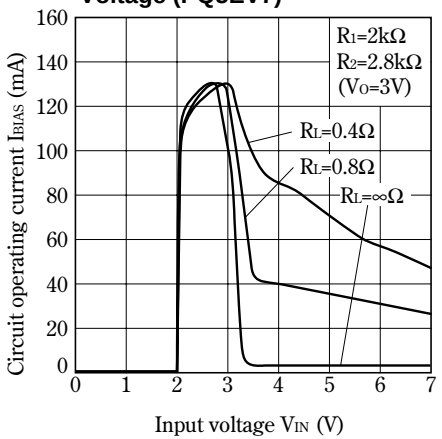


Fig.14 Dropout Voltage vs. Junction Temperature

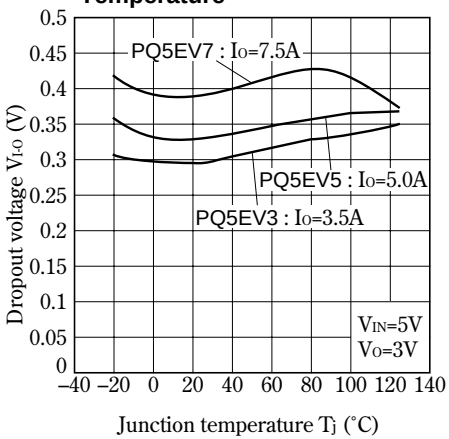


Fig.15 ON-OFF Threshold Voltage vs. Junction Temperature

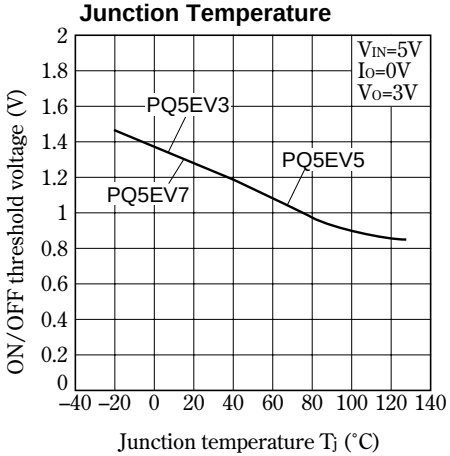


Fig.16 Quiescent Current vs. Junctiion Temperature

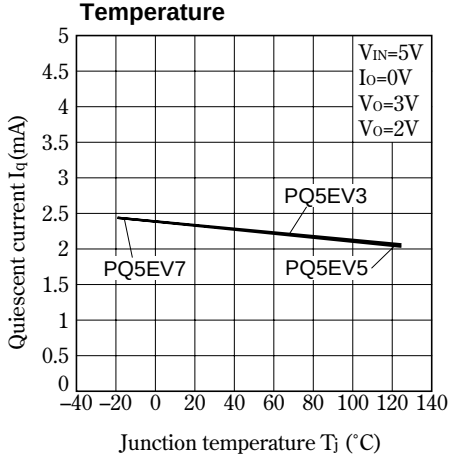


Fig.17 Ripple Rejection vs. Input Ripple Frequency

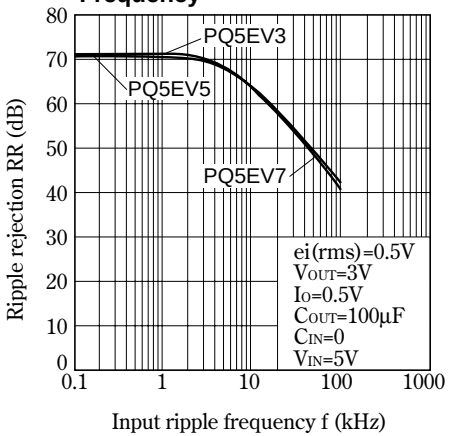


Fig.18 Output Voltage Adjustment Characteristics

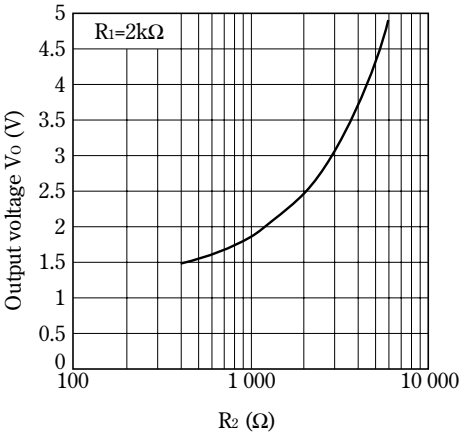
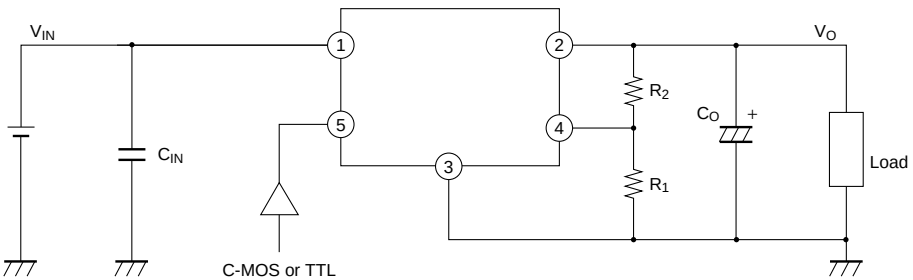
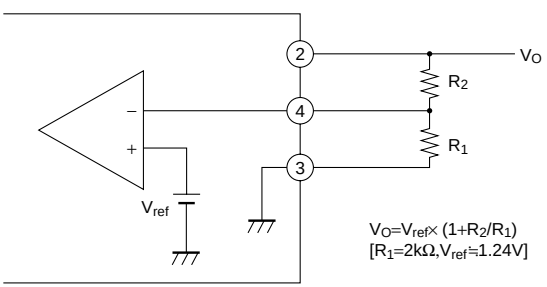


Fig.19 External Connection



■ Setting of Output Voltage

Output voltage is able to set (1.5V to 5V) when resistors R_1, R_2 are attached to ②, ③, ④ terminals. As for the external resistors to set output voltage, refer to the following figure and Fig.18.



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  --- Consumer electronics

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