PQ05VY3H3Z/PQ05VY053Z

Surface Mount, Large Output Current Type Low Power-Loss Voltage Regulators

■ Features

- Low power-loss
  (Dropout voltage: MAX. 0.5V)
- Surface mount type (10.6×13.7×3.5mm)
- Large output current
- Low voltage operation (minimum operating voltage: 2.35V)
- High-precision reference voltage type
  (Reference voltage precision: ±1.0%)
- Overcurrent, overheat protection functions

■ Applications

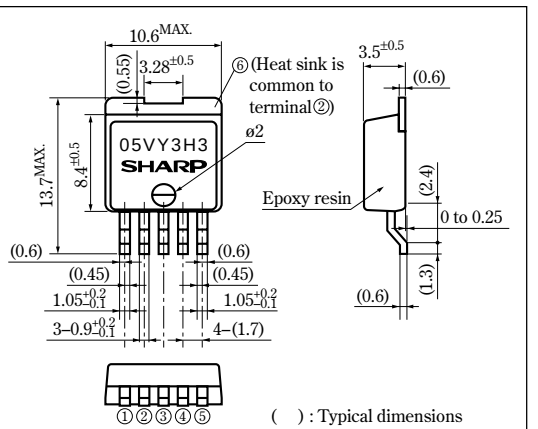
- Peripheral equipment of personal computers
- Power supplies for various electronic equipment such as AV or OA equipment

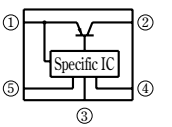
■ Model Line-up

Output current (I_O)	Package type	Variable output
3.5A	Taping	**PQ05VY3H3ZP**
	Sleeve	**PQ05VY3H3ZZ**
5A	Taping	**PQ05VY053ZP**
	Sleeve	**PQ05VY053ZZ**

■ Outline Dimensions

(Unit : mm)





① DC input (V_{IN})
② DC output (V_O)
③ GND
④ Output voltage adjustment (V_{ADJ})
⑤ ON/OFF control terminal (V_C)
⑥ DC output (V_O)

■ Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input voltage		V_{IN}	7	V
Dropout voltage		V_{I-O}	4	V
※1 ON/OFF control terminalvoltage		V_C	7	V
※1 Output adjustment terminal voltage		V_{ADJ}	5	V
Output current	**PQ05VY3H3Z**	I_O	3.5	A
	PQ05VY053Z		5	
※2 Power dissipation		P_D	35	W
※3 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 (10s)	˚C

※1 All are open except GND and applicable terminals.
※2 P_D:With infinite heat sink
※3 Overheat protection may operate at T_j=125˚C to 150˚C

• Please refer to the chapter " Handling Precautions ".

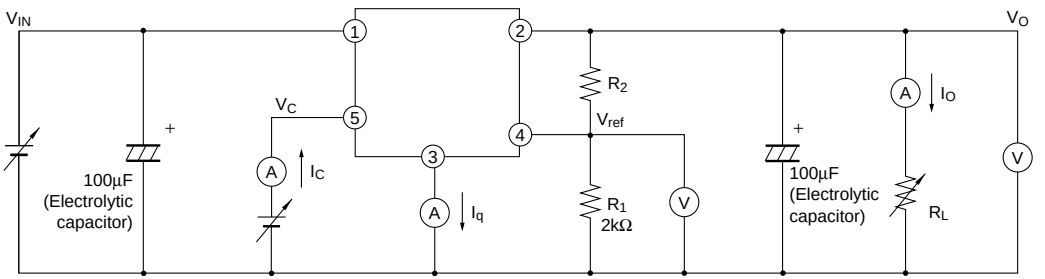
■ Electrical Characteristics

(Unless otherwise specified, condition shall be V_{IN}=5V, I_O=1.75A(**PQ05VY3H3Z**), I_O=2.5A(**PQ05VY053Z**), 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	**PQ05VY3H3Z**	$R_{eg}L$	I_O=5mA to 3.5A	–	0.1	0.5	%
	PQ05VY053Z		I_O=5mA to 5A				
Line regulation		$R_{eg}I$	V_{IN}=4 to 7V, I_O=5mA	–	0.05	0.1	%
Temperature coefficient of reference voltage		T_CV_{ref}	T_j=0 to 125°C, I_O=5mA	–	±1	–	%
Ripple rejection		RR	Refer to Fig.2	60	70	–	dB
Dropout voltage	**PQ05VY3H3Z**	V_{I-O}	※4 I_O=3.5A	–	–	0.5	V
	PQ05VY053Z		※4 I_O=5A				
※5ON-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	–	5	10	mA

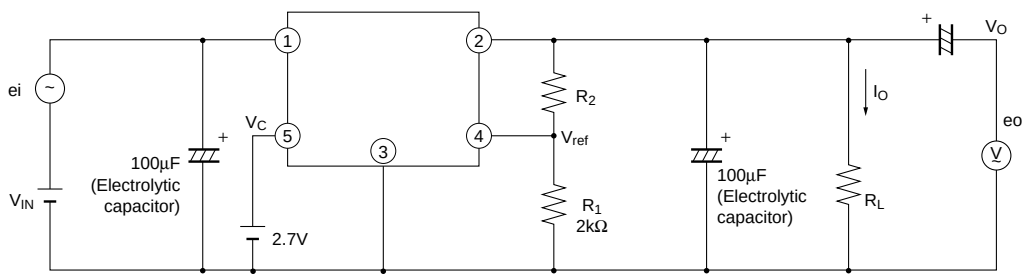
※4 The values of input voltage when output voltage is 0.95V.
※5 In case of opening control terminal ⑤, output voltage turns on.

Fig.1 Test Circuit



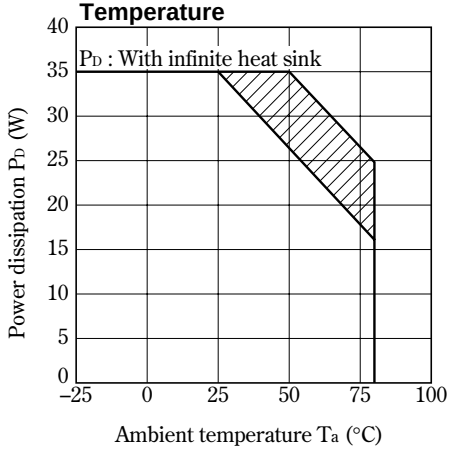
$V_O=V_{ref}\times(1+R_2/R_1)$
$[R_1=2k\Omega, V_{ref}\fallingdotseq 1.24V]$

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 (PQ05VY3H3Z)

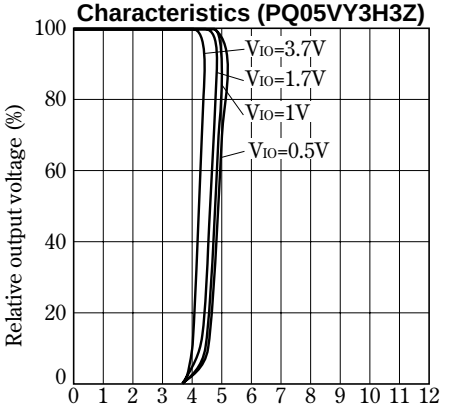


Fig.5 Overcurrent Protection Characteristics (PQ05VY053Z)

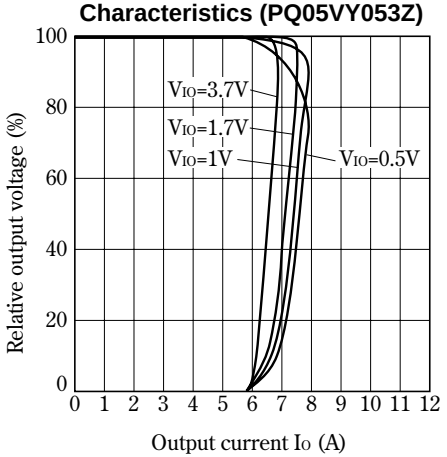


Fig.6 Reference Voltage Fluctuation vs. Ambient Temperature

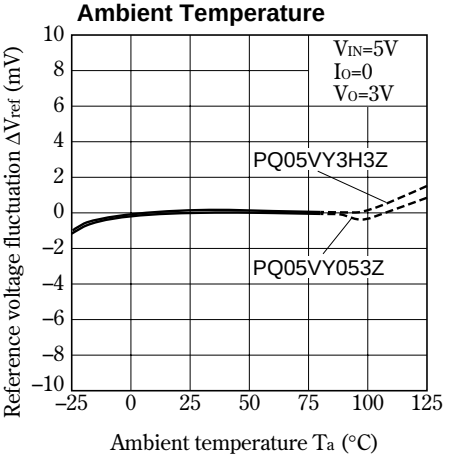


Fig.7 Output Voltage vs. Input Voltage (PQ05VY3H3Z)

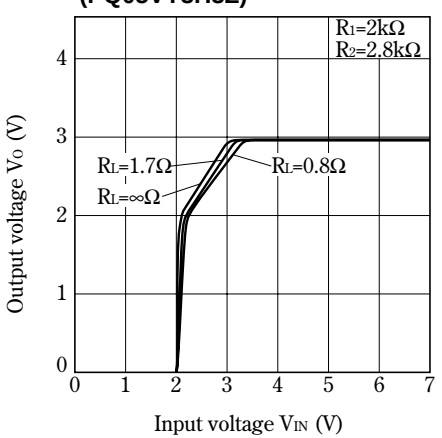


Fig.8 Output Voltage vs. Input Voltage (PQ05VY053Z)

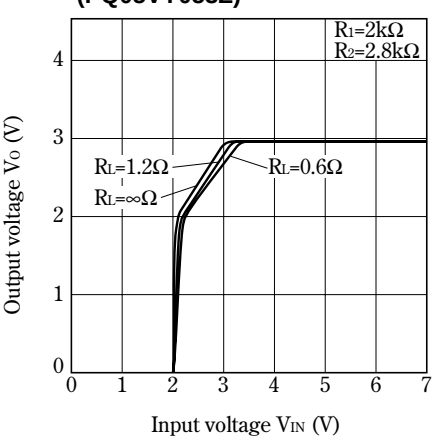


Fig.9 Circuit Operating Current vs. Input Voltage (PQ05VY3H3Z)

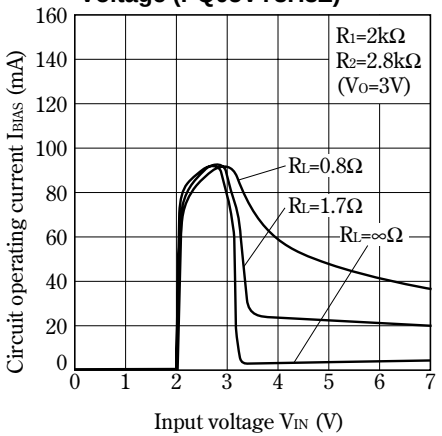


Fig.10 Circuit Operating Current vs. Input Voltage (PQ05VY053Z)

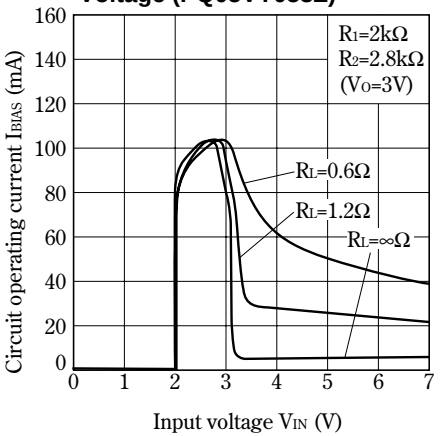


Fig.11 Dropout Voltage vs. Ambient Temperature

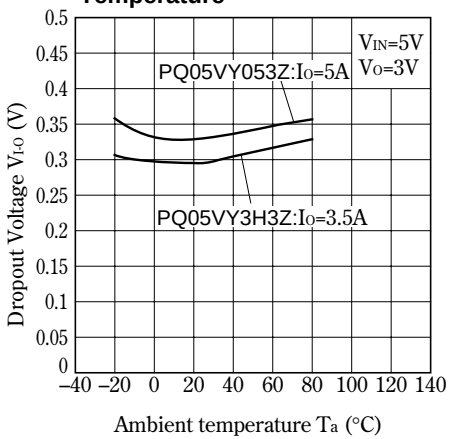


Fig.12 Quiescent Current vs. Ambient Temperature

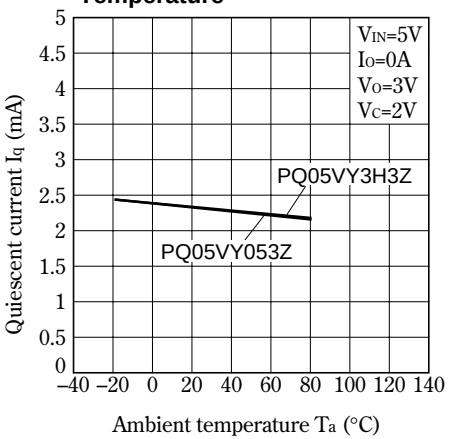


Fig.13 ON-OFF Threshold Voltage vs. Ambient Temperature

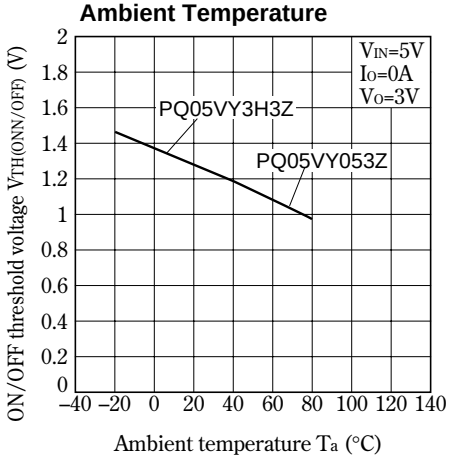


Fig.14 Ripple Rejection vs. Input Ripple Frequency

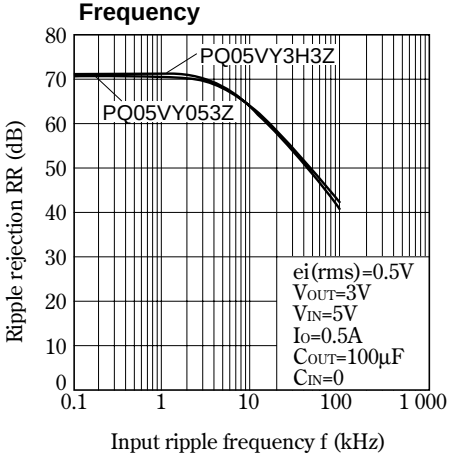
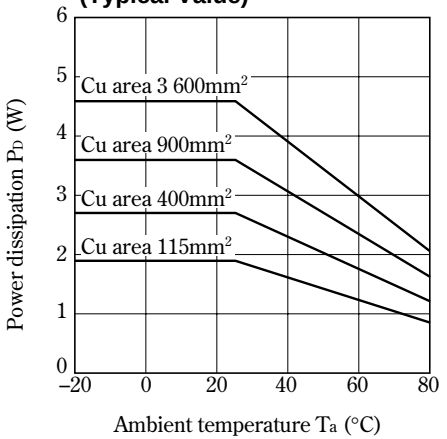


Fig.15 Power Dissipation vs. Ambient Temperature (Typical Value)



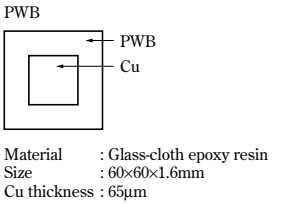


Fig.16 Output Voltage Adjustment Characteristics (Typical Value)

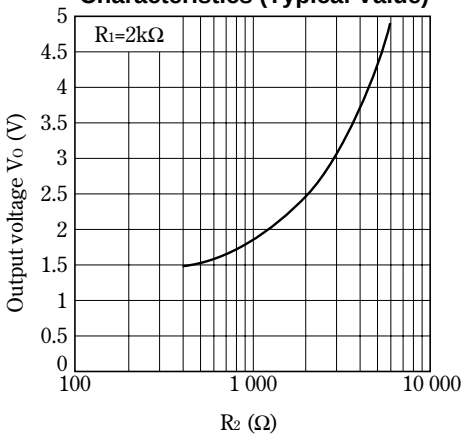
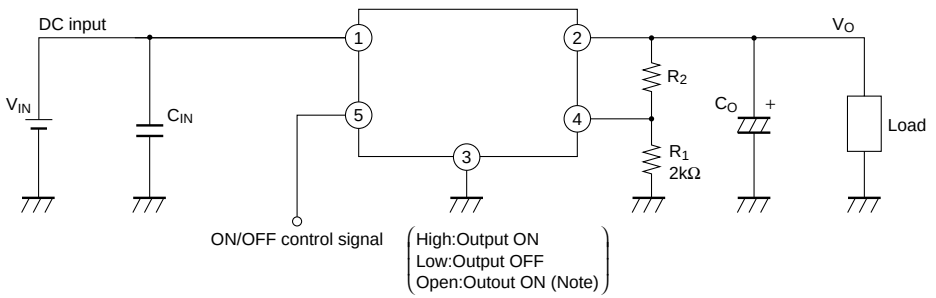


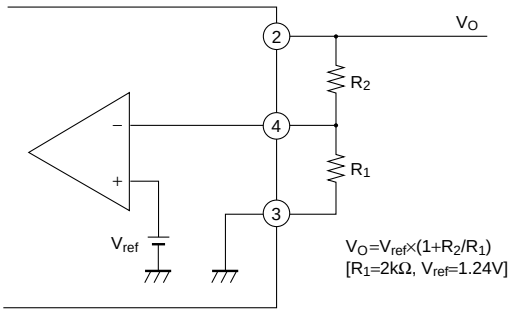
Fig.17 Typical Application



❋ Please make sure to use this device, pulling up to the power supply with less than 7V at the resistor less than 50kΩ in switching ON/OFF with open collector output or in not using ON/OFF function (in keeping "ON"), because input impedance is high in ON/OFF terminals.

■ Setting of Output Voltage

Output voltage is able to set from 1.5V to 5V when resistors R_1 and R_2 are attached to ②, ③, ④ terminals. As for the external resistors to set output voltage, refer to the figure below and Fig.16.



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  --- Office automation equipment
  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
  --- Industrial control
  --- Audio visual equipment
  --- Consumer electronics

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  --- Traffic signals
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  --- Alarm equipment
  --- Various safety devices, etc.

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