

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

Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Rating	Unit
Input voltage	V _{IN}	7	V
Dropout voltage	V _{LO}	4	V
*1 ON/OFF control terminal voltage	V _C	7	V
*1 Output adjustment terminal voltage	V _{ADJ}	5	V
Output current	PQ05VY3H3Z	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

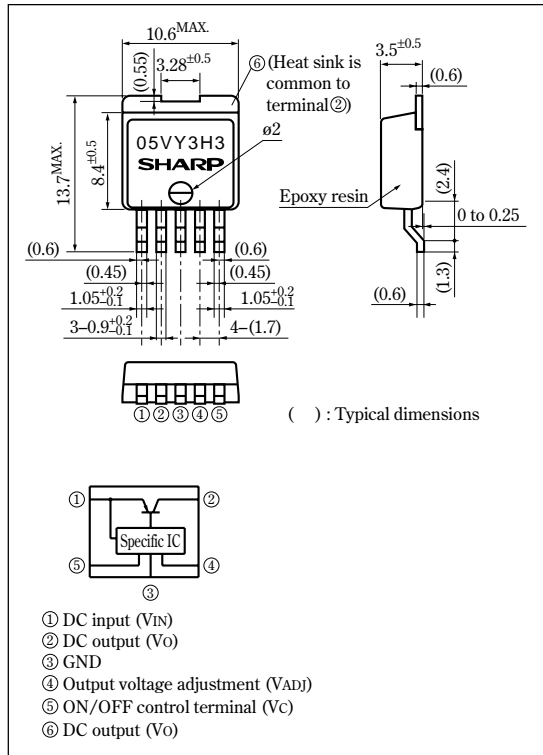
*1 All are open except GND and applicable terminals.

*2 P_D: With infinite heat sink

*3 Overheat protection may operate at T_J=125°C to 150°C

Outline Dimensions

(Unit : mm)



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•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), $V_o=3V$ ($R_l=2k\Omega$), $T_a=25^\circ C$)

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 PQ05VY053Z	R_{egL}	$I_o=5mA$ to 3.5A		—	0.1	0.5	%
			$I_o=5mA$ to 5A					
Line regulation	R_{egI}	$V_{IN}=4$ to 7V, $I_o=5mA$	—	0.05	0.1	%		
Temperature coefficient of reference voltage	TcV_{ref}	$T_j=0$ to $125^\circ C$, $I_o=5mA$	—	± 1	—	%		
Ripple rejection	RR	Refer to Fig.2	60	70	—	dB		
Dropout voltage	PQ05VY3H3Z PQ05VY053Z	V_{L-O}	*4 $I_o=3.5A$		—	—	0.5	V
			*4 $I_o=5A$					
*5 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	$I_o=0A$	—	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

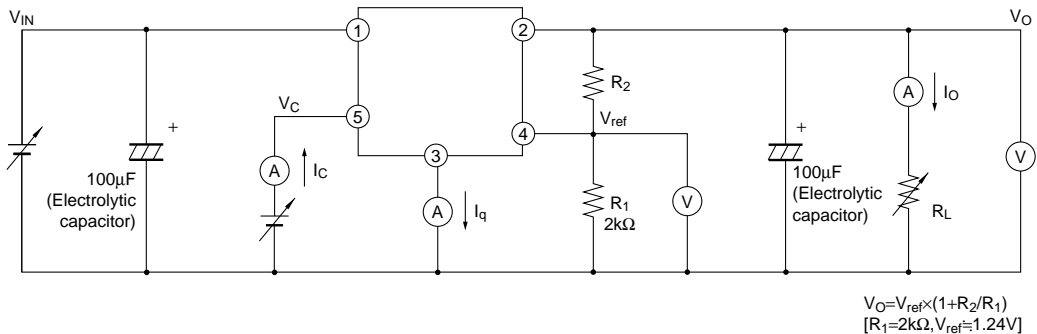


Fig.2 Test Circuit for Ripple Rejection

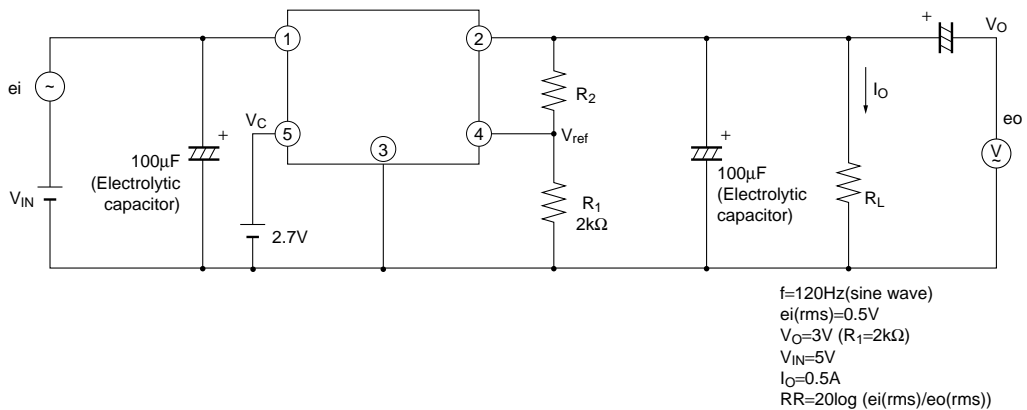
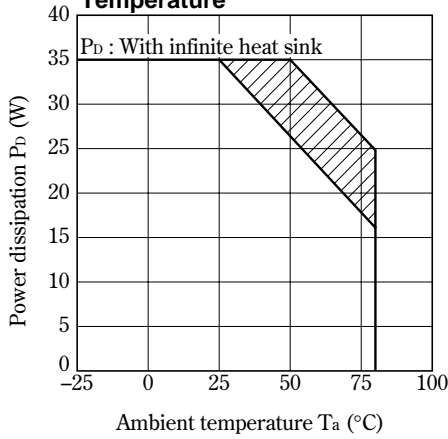


Fig.3 Power Dissipation vs. Ambient Temperature



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

Fig.5 Overcurrent Protection Characteristics (PQ05VY053Z)

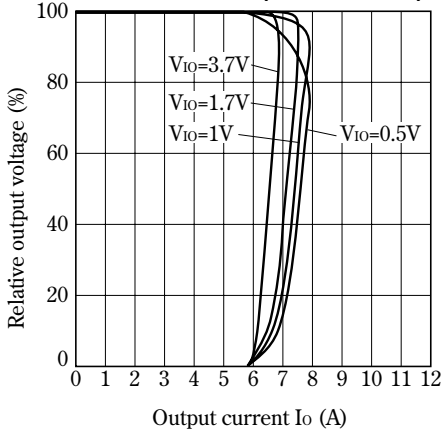


Fig.4 Overcurrent Protection Characteristics (PQ05VY3H3Z)

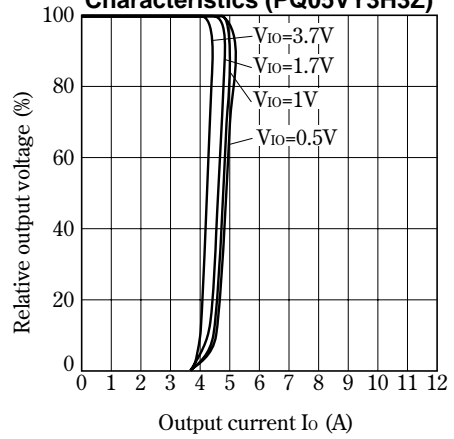


Fig.6 Reference Voltage Fluctuation vs. Ambient Temperature

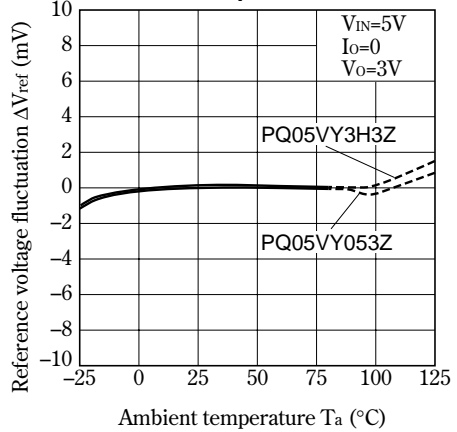


Fig.7 Output Voltage vs. Input Voltage (PQ05VY3H3Z)

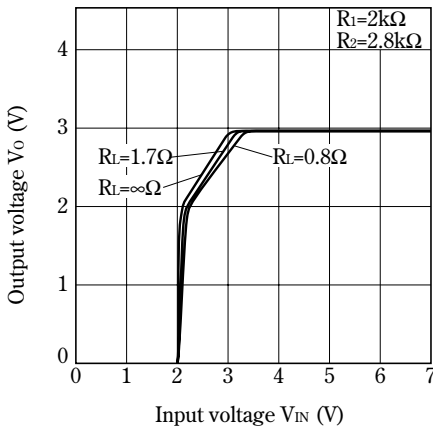


Fig.8 Output Voltage vs. Input Voltage (PQ05VY053Z)

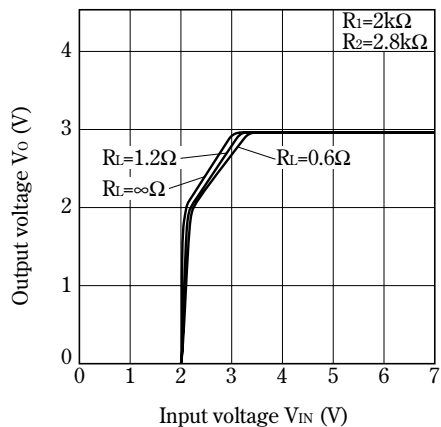


Fig.9 Circuit Operating Current vs. Input Voltage (PQ05VY3H3Z)

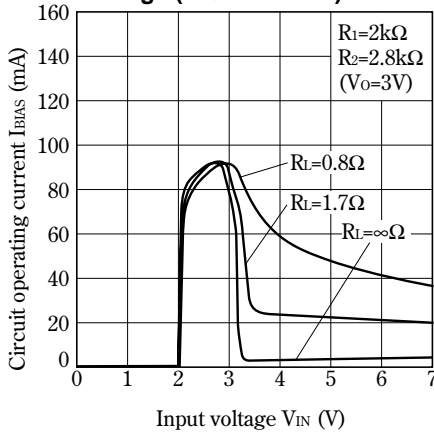


Fig.10 Circuit Operating Current vs. Input Voltage (PQ05VY053Z)

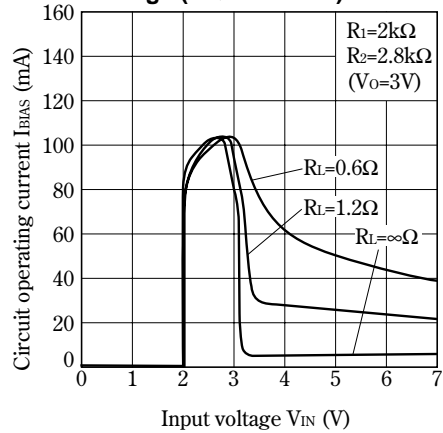


Fig.11 Dropout Voltage vs. Ambient Temperature

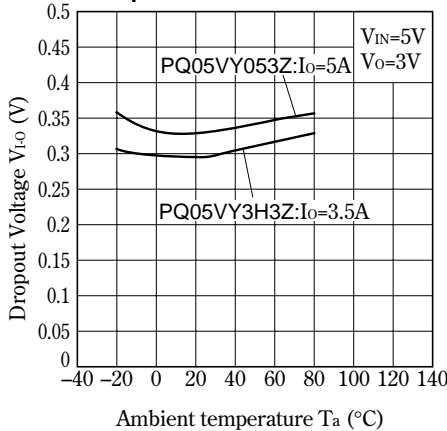


Fig.12 Quiescent Current vs. Ambient Temperature

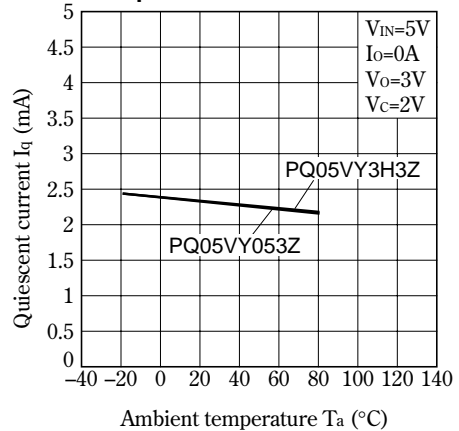


Fig.13 ON-OFF Threshold Voltage vs. Ambient Temperature

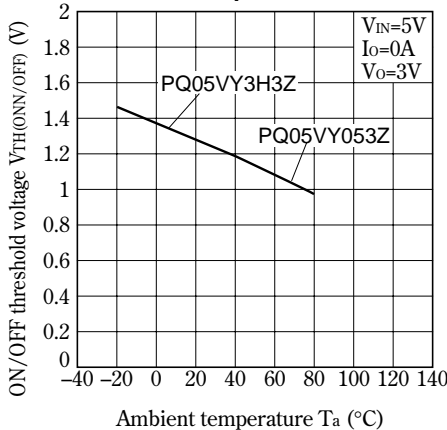


Fig.14 Ripple Rejection vs. Input Ripple Frequency

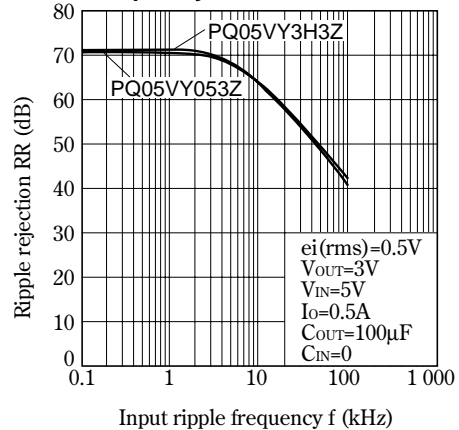
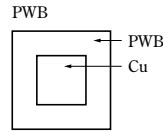
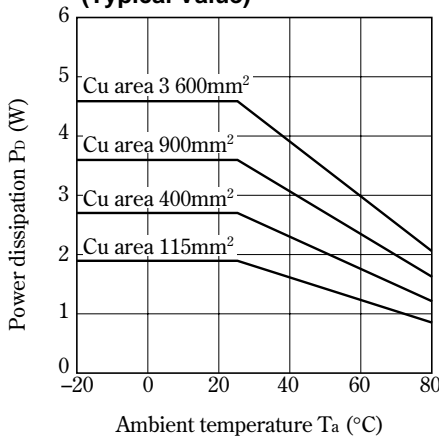


Fig.15 Power Dissipation vs. Ambient Temperature (Typical Value)



Material : Glass-cloth epoxy resin
 Size : 60×60×1.6mm
 Cu thickness : 65μm

Fig.16 Output Voltage Adjustment Characteristics (Typical Value)

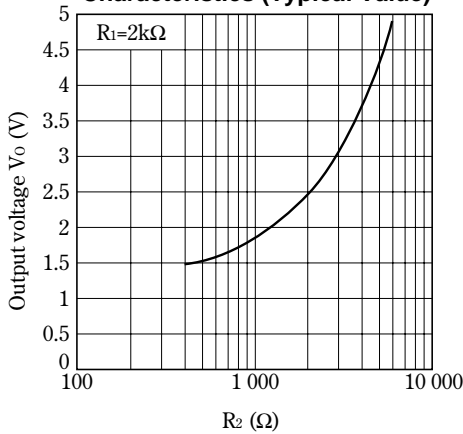
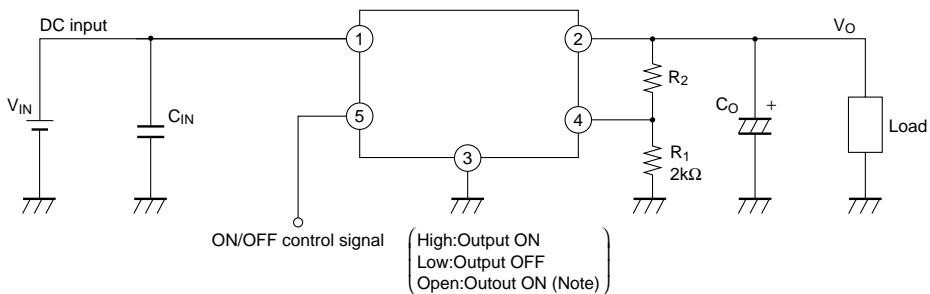


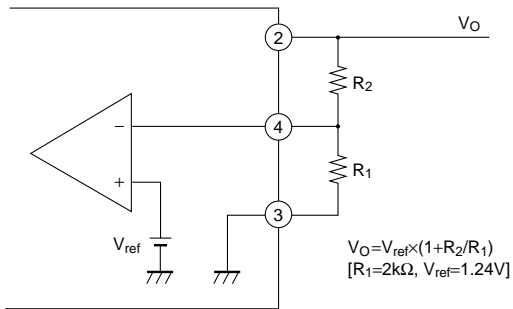
Fig.17 Typical Application



* 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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