

PQ05RH1/PQ05RH11 Series

1.5A Output, Low Power-Loss Voltage Regulators

■ Features

- Low power-loss (Dropout voltage : MAX. 0.5V)
- Compact resin full-mold package
- Built-in ON/OFF control terminal
- High-precision output (Output voltage precision : $\pm 2.5\%$) (PQ05RH11 Series)

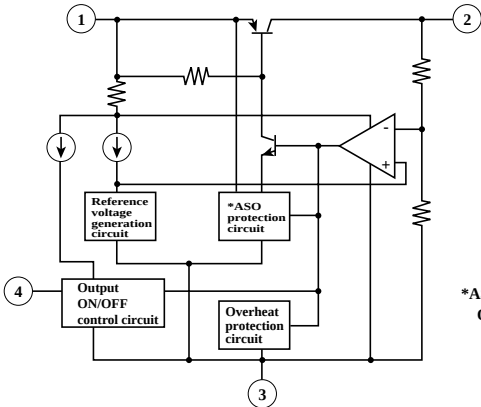
■ Applications

- Series power supply for various electronic equipment such as VCRs and OA equipment.

■ Model Line-ups

Output voltage	5V Output	9V Output	12V Output
Output voltage precision: $\pm 5\%$	PQ05RH1	PQ09RH1	PQ12RH1
Output voltage precision: $\pm 2.5\%$	PQ05RH11	PQ09RH11	PQ12RH11

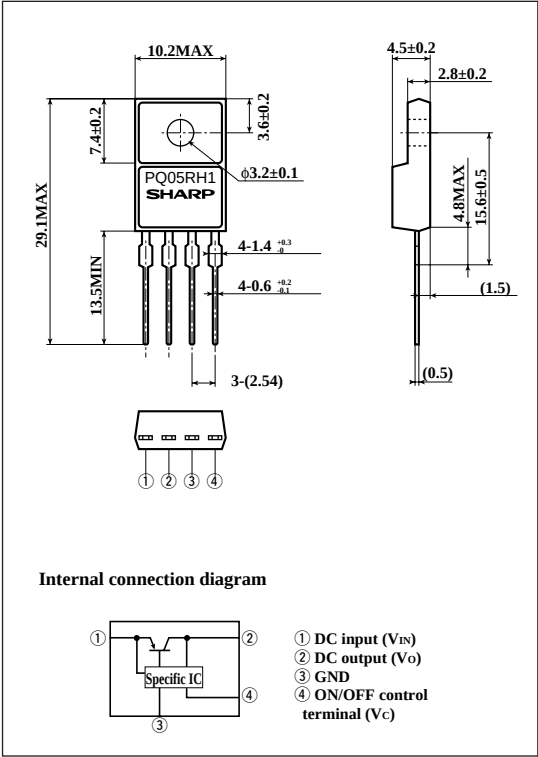
■ Equivalent Circuit Diagram



*ASO:Area of Safety Operation

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V _{IN}	35	V
*1 ON/OFF control terminal voltage	V _C	35	V
Output current	I _O	1.5	A
Power dissipation(No heat sink)	P _{D1}	1.5	W
Power dissipation(With infinite heat sink)	P _{D2}	18	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 , condition shall be I_O=0.5A, T_a=25°C*3)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	PQ05RH1	-	4.75	5.0	5.25	V
	PQ09RH1		8.55	9.0	9.45	
	PQ12RH1		11.4	12.0	12.6	
	PQ05RH11		4.88	5.0	5.12	
	PQ09RH11		8.78	9.0	9.22	
	PQ12RH11		11.7	12.0	12.3	
Load regulation	R _{egL}	I _O =5mA to 1.5A	-	0.3	2.0	%
Line regulation	R _{egI}	*4	-	0.5	2.5	%
Temperature coefficient of output voltage	T _{cV_O}	T _j =0 to 125°C	-	±0.02	-	%/°C
Ripple rejection	RR	Refer to Figs.2	45	55	-	dB
Dropout voltage	V _{I-O}	*5	-	-	0.5	V
ON-state voltage for control	V _{C(ON)}	-	2.0	*6	-	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 =0	-	-	10	mA

*3 PQ05RH1 series:V_{IN}=7V, PQ09RH1 series:V_{IN}=15V, PQ12RH1 series:V_{IN}=18V*4 PQ05RH1/PQ05RH11:V_{IN}=6 to 12VPQ09RH1/PQ09RH11:V_{IN}=10 to 25VPQ12RH1/PQ12RH11:V_{IN}=13 to 29V

*5 Input voltage shall be the value when output voltage is 95% in comparison with the initial value.

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

Fig.1 Test Circuit

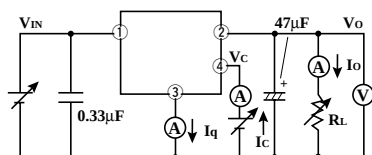
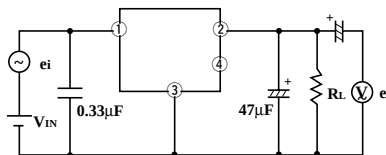


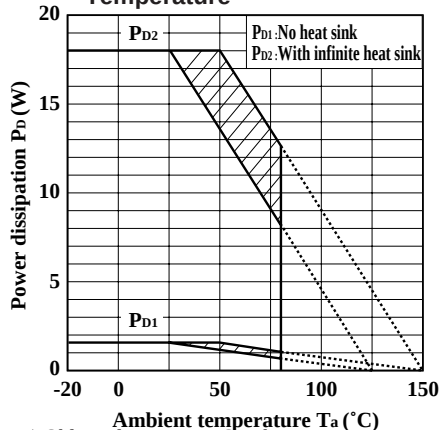
Fig.2 Test Circuit of Ripple Rejection



f=120Hz (sine wave)

e_i=0.5V_{rms}RR=20 log (e_i/e_o)

Fig.3 Power Dissipation vs. Ambient Temperature



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

Fig.5 Output Voltage Deviation vs. Junction Temperature (PQ05RH1/PQ05RH11)

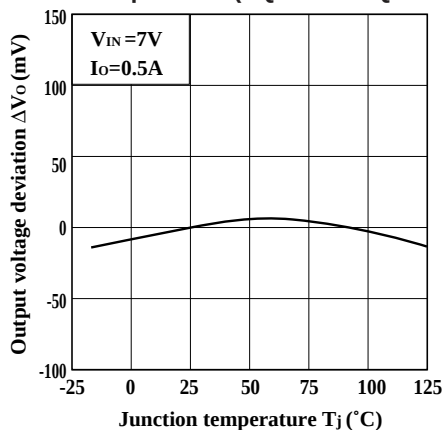


Fig.4 Overcurrent Protection Characteristics (Typical value)

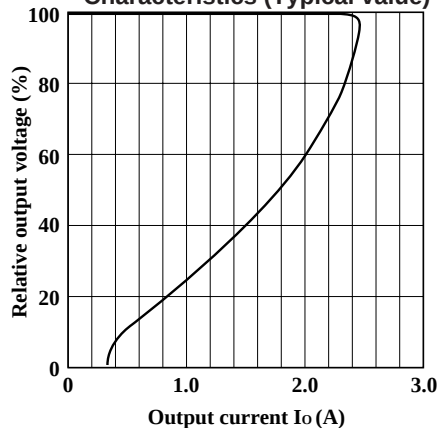


Fig.6 Output Voltage Deviation vs. Junction Temperature (PQ09RH1/PQ09RH11)

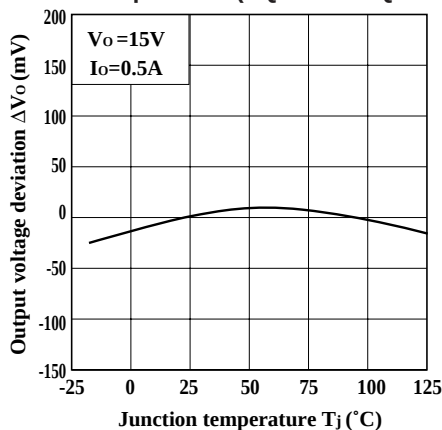


Fig.7 Output Voltage Deviation vs. Junction Temperature (PQ12RH1/PQ12RH11)

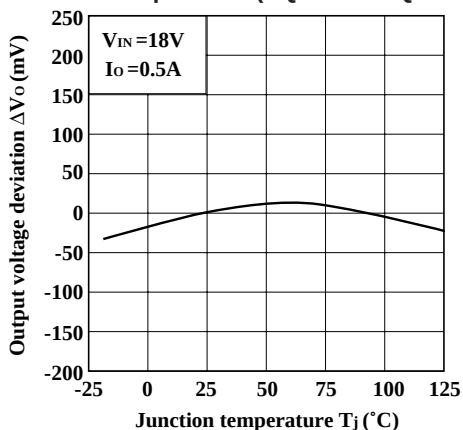


Fig.8 Output Voltage vs. Input Voltage (PQ05RH1/PQ05RH11)

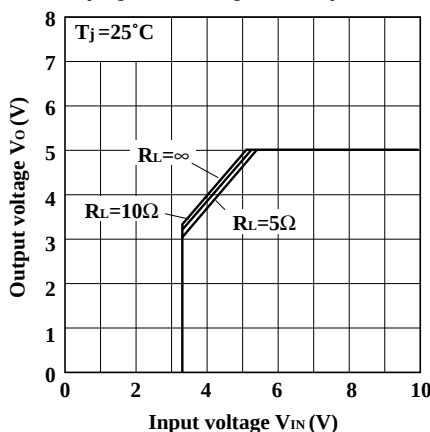


Fig.9 Output Voltage vs. Input Voltage (PQ09RH1/PQ09RH11)

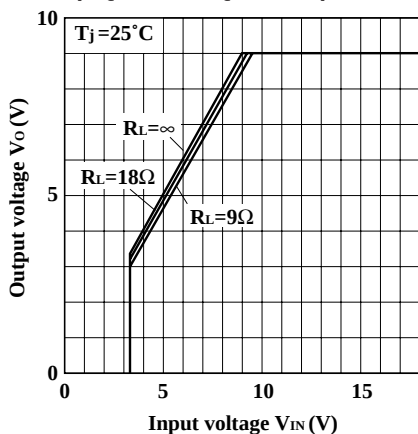


Fig.10 Output Voltage vs. Input Voltage (PQ12RH1/PQ12RH11)

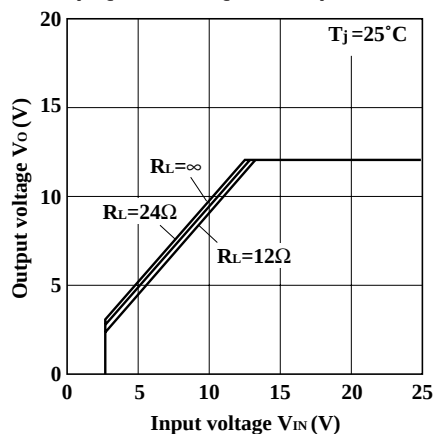


Fig.11 Circuit Operating Current vs. Input Voltage (PQ05RH1/PQ05RH11)

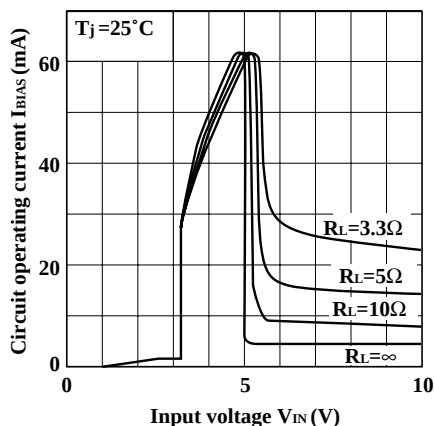


Fig.12 Circuit Operating Current vs. Input Voltage (PQ09RH1/PQ09RH11)

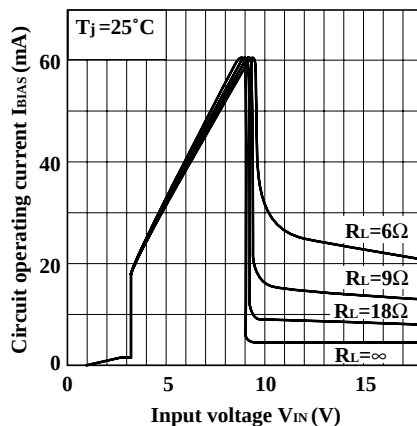


Fig.13 Circuit Operating Current vs. Input Voltage (PQ12RH1/PQ12RH11)

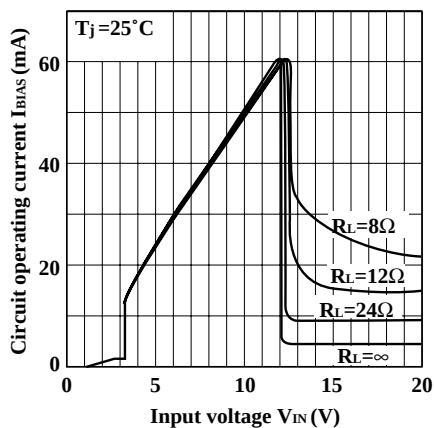


Fig.14 Dropout Voltage vs. Junction Temperature

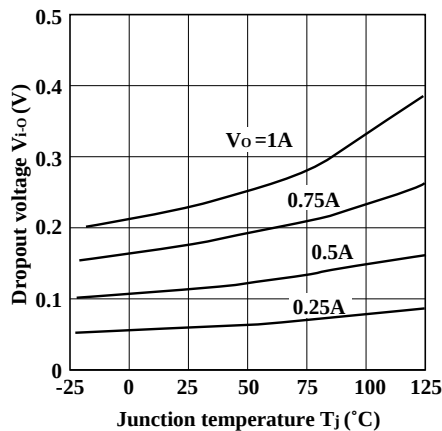


Fig.15 Quiescent Current vs. Junction Temperature

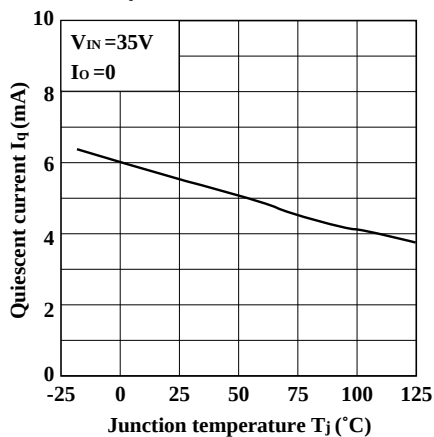


Fig.16 Ripple Rejection vs. Input Ripple Frequency

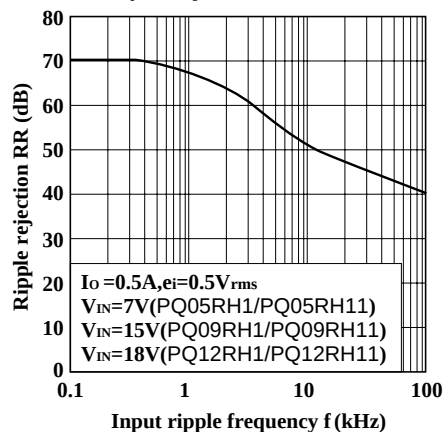


Fig.17 Ripple Rejection vs. Output Current

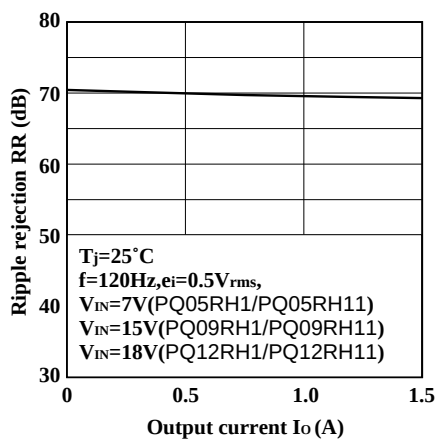
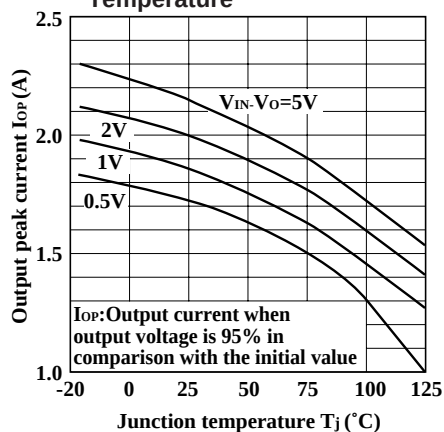
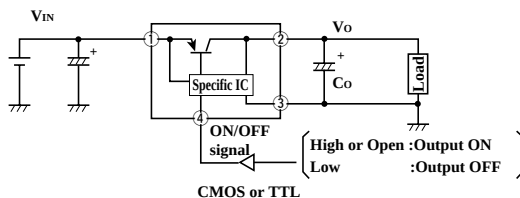


Fig.18 Output Peak Current vs. Junction Temperature

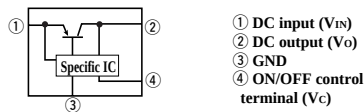


■ Typical Application



Output voltage	5V Output	9V Output	12V Output
Output voltage precision:±5%	PQ05RH1A	PQ09RH1A	PQ12RH1A
Output voltage precision:±2.5%	PQ05RH1B	PQ09RH1B	PQ12RH1B

(Unit : mm)



Note) The value of absolute maximum ratings and electrical characteristics is same as ones of PQ05RH1/11 series.

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