

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)

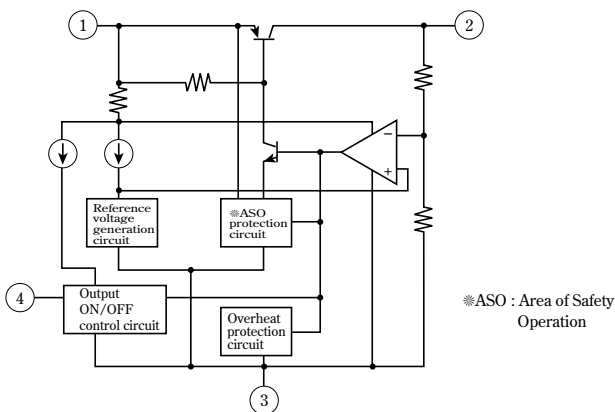
■ Applications

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

■ Model Line-ups

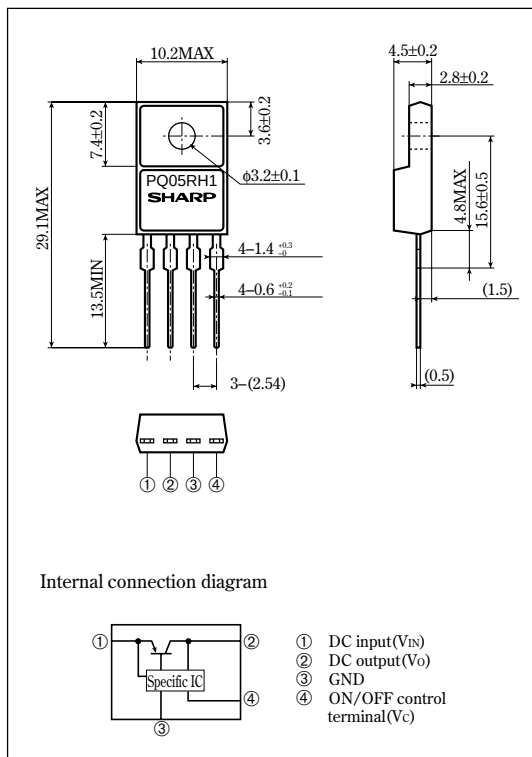
Output voltage	5V Output	9V Output	12V Output
Output voltage precision:±5%	PQ05RH1	PQ09RH1	PQ12RH1
Output voltage precision:±2.5%	PQ05RH11	PQ09RH11	PQ12RH11

■ Equivalent Circuit Diagram



■ Outline Dimensions

(Unit : mm)



•Please refer to the chapter " Handling Precautions ".

SHARP

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Internet	Internet address for Electronic Components Group http://sharp-world.com/ecg/

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	RegL	I _O =5mA to 1.5A	-	0.3	2.0	%
Line regulation	RegI	*4	-	0.5	2.5	%
Temperature coefficient of output voltage	TcV _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 12V

PQ09RH1/PQ09RH11:V_{IN}=10 to 25V

PQ12RH1/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

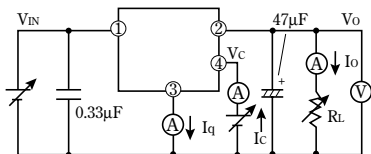
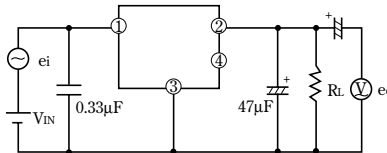


Fig.2 Test Circuit of Ripple Rejection

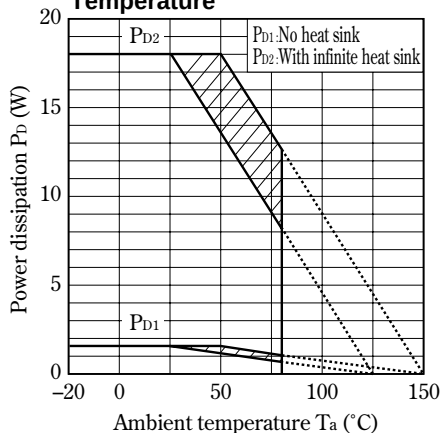


f=120Hz(sine wave)

ei(rms)=0.5V

RR=20 log(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 (Typical value)

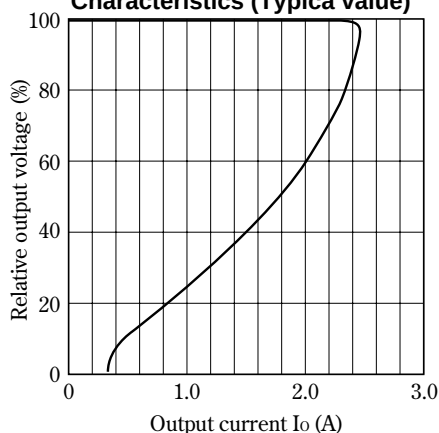


Fig.5 Output Voltage Deviation vs. Junction Temperature (PQ05RH1/PQ05RH11)

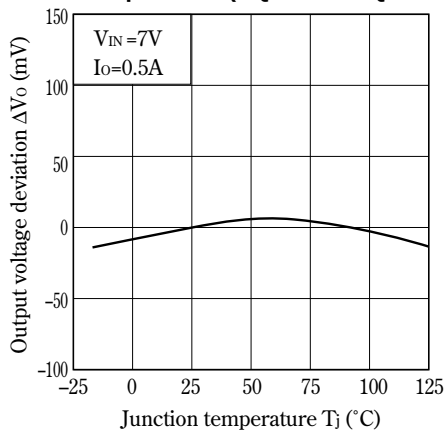


Fig.6 Output Voltage Deviation vs. Junction Temperature (PQ09RH1/PQ09RH11)

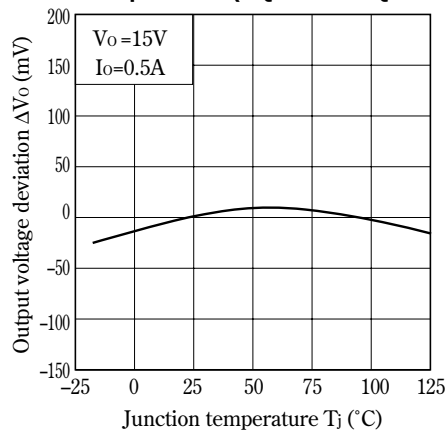


Fig.7 Output Voltage Deviation vs. Junction Temperature (PQ12RH1/PQ12RH11)

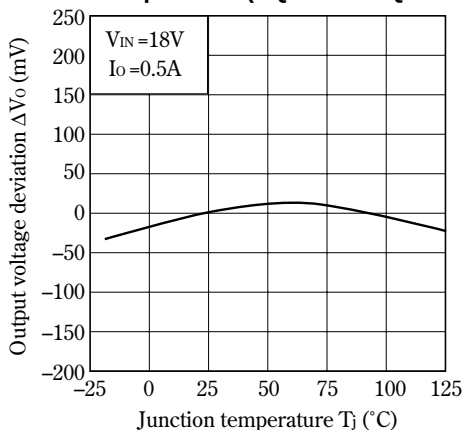


Fig.8 Output Voltage vs. Input Voltage (PQ05RH1/PQ05RH11)

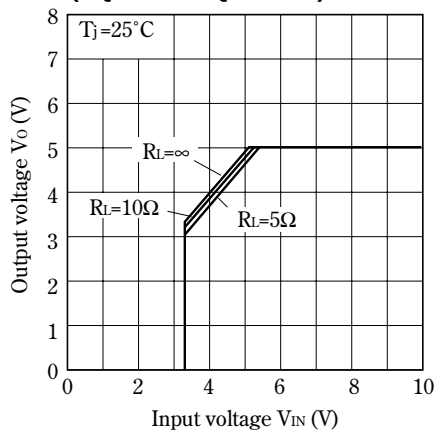


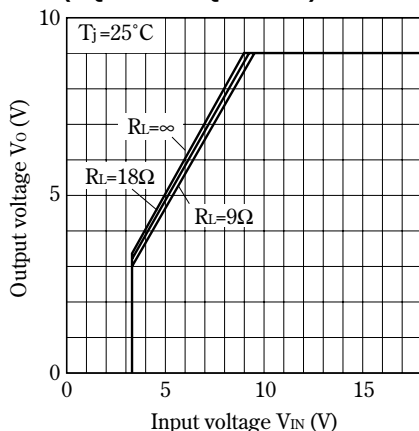
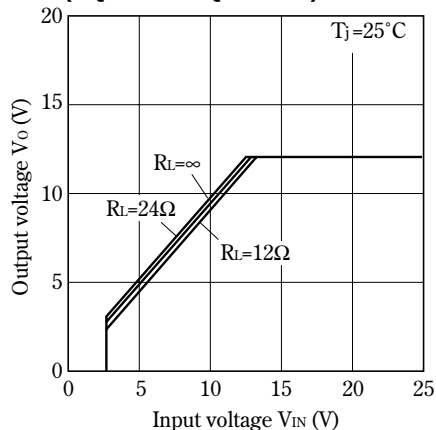
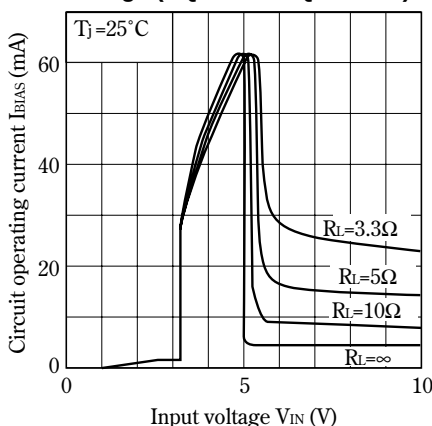
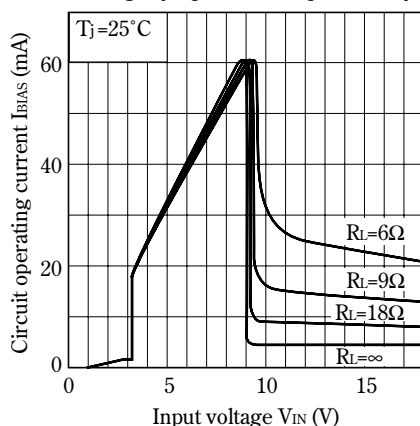
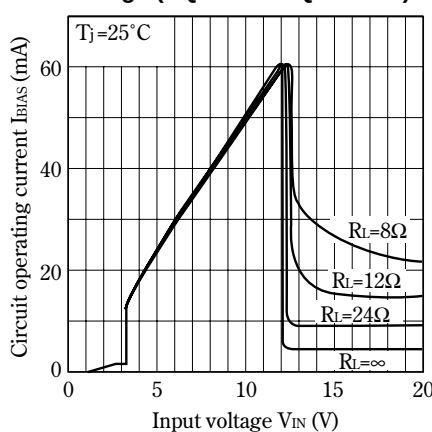
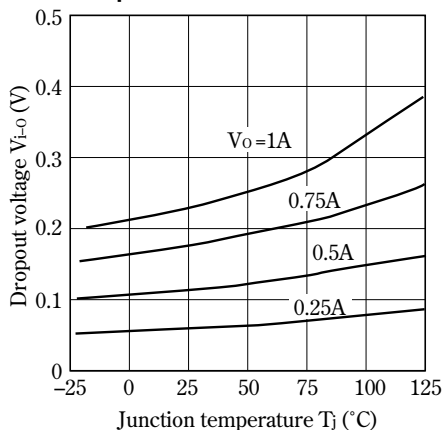
Fig.9 Output Voltage vs. Input Voltage (PQ09RH1/PQ09RH11)**Fig.10 Output Voltage vs. Input Voltage (PQ12RH1/PQ12RH11)****Fig.11 Circuit Operating Current vs. Input Voltage (PQ05RH1/PQ05RH11)****Fig.12 Circuit Operating Current vs. Input Voltage (PQ09RH1/PQ09RH11)****Fig.13 Circuit Operating Current vs. Input Voltage (PQ12RH1/PQ12RH11)****Fig.14 Dropout Voltage vs. Junction Temperature**

Fig.15 Quiescent Current vs. Junction Temperature

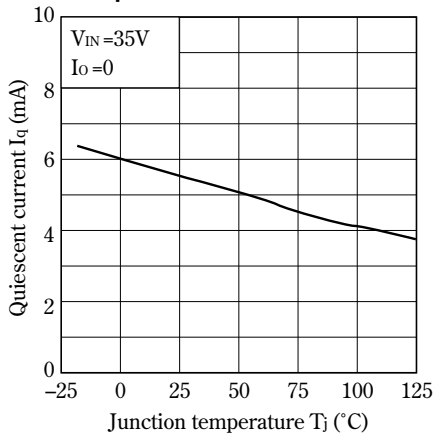


Fig.16 Repple Rejection vs. Input Ripple Frequency

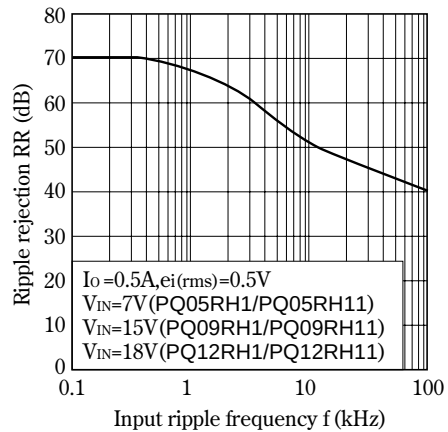


Fig.17 Ripple Rejection vs. Output Current

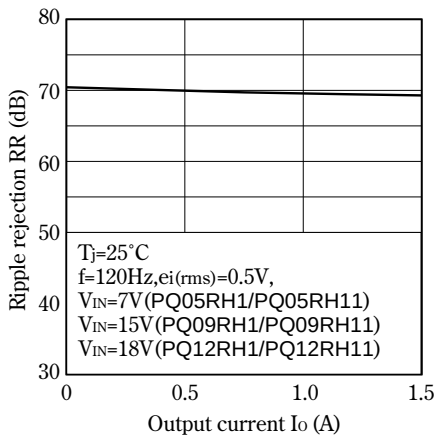
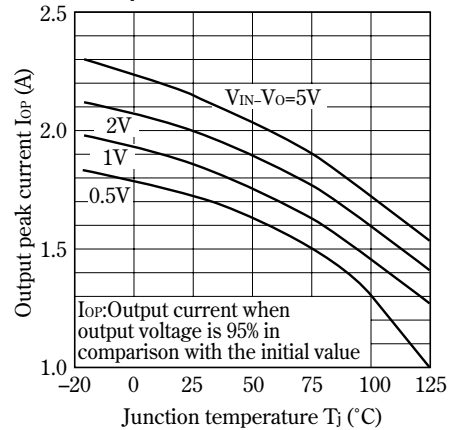
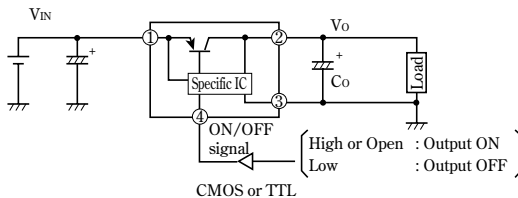


Fig.18 Output Peak Current vs. Junction Temperature



Typical Application

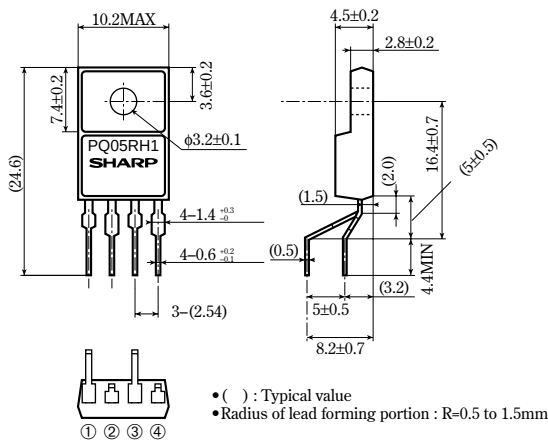


Model Line-ups for Lead Forming Type

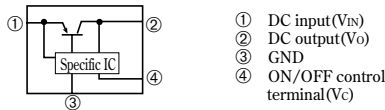
Output voltage	5V Output	9V Output	12V Output
Output voltage precision:±5%	PQ05RH1A	PQ09RH1A	PQ12RH1A
Output voltage precision:±2.5%	PQ05RH1B	PQ09RH1B	PQ12RH1B

Outline Dimensions (PQ05RH1A/PQ05RH1B Series)

(Unit : mm)



Internal connection diagram



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

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