PQ05RA1/PQ05RA11 Series

OFF-state Low Dissipation Current 1A Output, Low Power-Loss Voltage Regulators

■ Features

- Low power-loss (Dropout voltage : MAX.0.5V)
- Compact resin full-mold package
- OFF-state low dissipation current
  (Iqs :1 μA, 1/10^4 as compared to former model PQ05RF1)
- Built-in ON/OFF control function

■ Applications

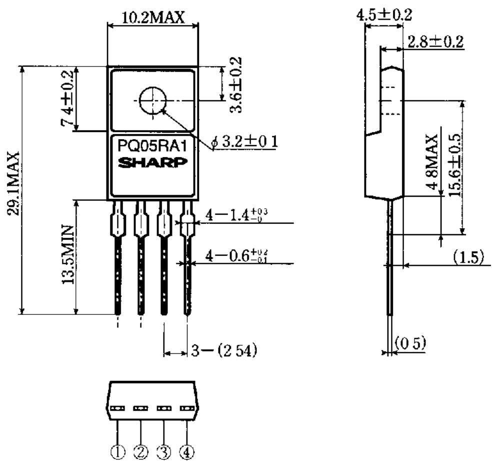
- Series power supplies for OA and AV equipment such as camcorders, word processors, etc.

■ Model Line-ups

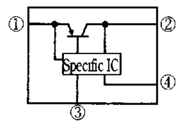
Output voltage	5V Output	9V Output	12V Output
Output voltage precision:± 5 %	PQ05RA1	PQ09RA1	PQ12RA1
Output voltage precision:±2.5%	PQ05RA11	PQ09RA11	PQ12RA11

■ Outline Dimensions

(Unit : mm)



Internal connection diagram



① DC input (V_{IN})
② DC output (V_O)
③ GND
④ ON/OFF control terminal (V_C)

■ Absolute Maximum Ratings

(T_a=25℃)

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	A
Power dissipation (No heat sink)	P_{D1}	1.5	W
Power dissipation (With infinite heat sink)	P_{D2}	15	W
※2 Junction temperature	T_j	150	℃
Operating temperature	T_{opr}	-20 to +80	℃
Storage temperature	T_{stg}	-40 to +150	℃
※3 Soldering temperature	T_{sol}	260	℃

※1 All are open except GND and applicable terminals.
※2 Overheat protection may operate at 125≦T_j≦150℃.
※3 For 10s.

· Please refer to the chapter "Handling Precautions".

Electrical Characteristics

(Unless otherwise specified condition shall be I_O=0.5A, T_a=25℃※4)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	PQ05RA1	V_O	—	4.75	5.0	5.25	V
	PQ09RA1			8.55	9.0	9.45	
	PQ12RA1			11.4	12.0	12.6	
	PQ05RA11			4.88	5.0	5.12	
	PQ09RA11			8.78	9.0	9.22	
	PQ12RA11			11.7	12.0	12.3	
Load regulation		R_{egL}	I_O=5mA to 1.0A	—	0.1	2.0	%
Line regulation		R_{egI}	※5	—	0.2	2.5	%
Temperature coefficient of output voltage		T_cV_O	T_j=0 to 125℃	—	±0.004	—	%/℃
Ripple rejection		RR	Refer to Fig.2	45	55	—	dB
Dropout voltage		V_{I-O}	※6	—	—	0.5	V
ON-state voltage for control		$V_{C(ON)}$	—	2.0	—	—	V
ON-state current for control		$I_{C(ON)}$	—	—	—	200	μA
※7 OFF-state voltage for control		$V_{C(OFF)}$	—	—	—	0.8	V
OFF-state current for control		$I_{C(OFF)}$	V_C=0.4V	—	—	2	μA
Quiescent current		I_q	I_O=0A、V_{IN}=35V	—	—	8	mA
Output OFF-state comsumpion current		I_{qs}	I_O=0A、V_{IN}=35V V_C=0.4V	—	—	1	μA

※4 PQ05RA1 series:V_{IN}=7V, PQ09RA1 series V_{IN}=11V, PQ12RA1 series:V_{IN}=14V
※5 PQ05RA1/PQ05RA11 V_{IN}=6 to 16V
PQ09RA1/PQ09RA11:V_{IN}=10 to 20V
PQ12RA1/PQ12RA11:V_{IN}=13 to 23V
※6 Input voltage shall be the value when output voltage is 95% in comparison with the initial value.
※7 In case of opening control terminal ④, output voltage turns off

Fig. 1 Test Circuit

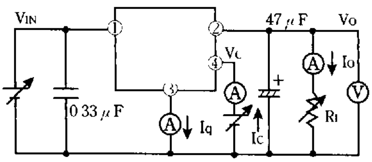


Fig. 2 Test Circuit of Ripple Rejection

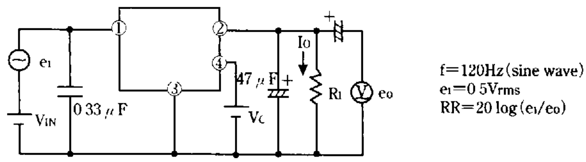
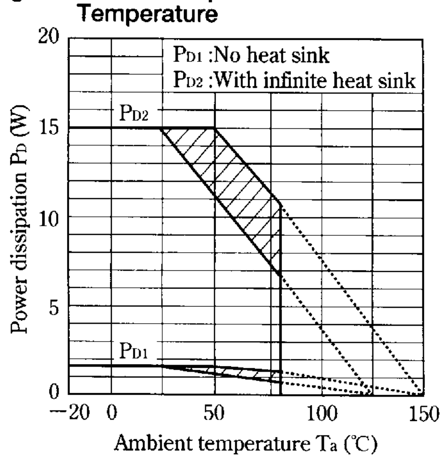
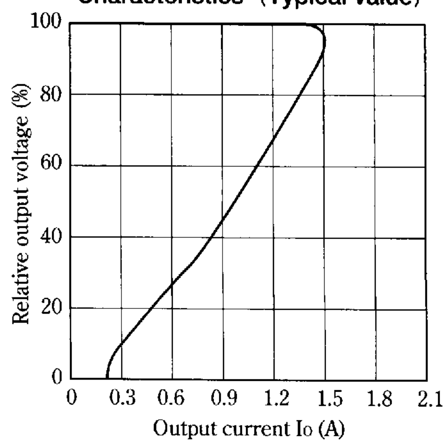


Fig. 3 Power Dissipation vs. Ambient Temperature



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

Fig. 4 Overcurrent Protection Characteristics (Typical value)



8180798 0014558 209

Fig. 5 Output Voltage Deviation vs. Junction Temperature (PQ05RA1/11)

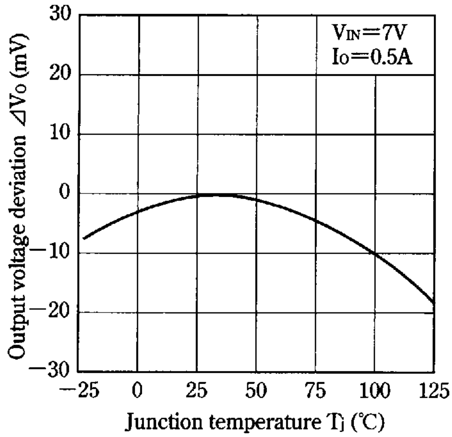


Fig. 6 Output Voltage Deviation vs. Junction Temperature (PQ09RA1/11)

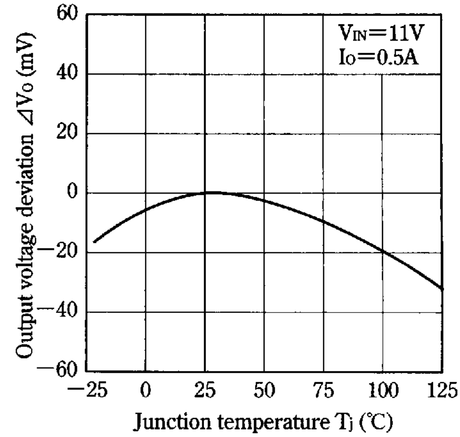


Fig. 7 Output Voltage Deviation vs. Junction Temperature (PQ12RA1/11)

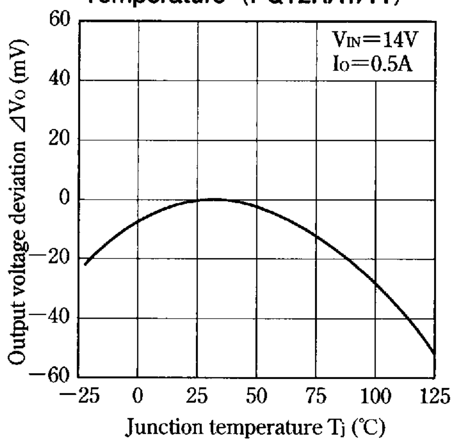


Fig. 8 Output Voltage vs. Input Voltage (PQ05RA1/11)

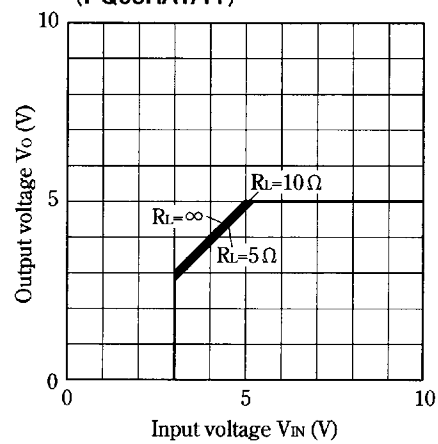


Fig. 9 Output Voltage vs. Input Voltage (PQ09RA1/11)

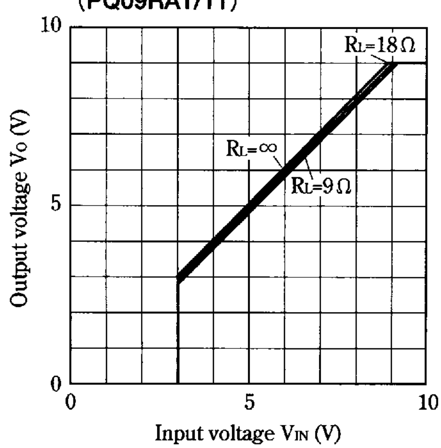


Fig.10 Output Voltage vs. Input Voltage (PQ12RA1/11)

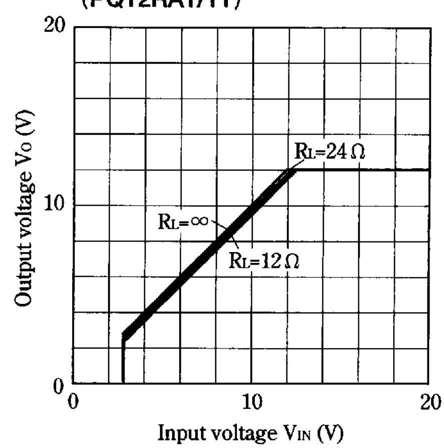


Fig.11 Circuit Operating Current vs. Input Voltage (PQ05RA1/11)

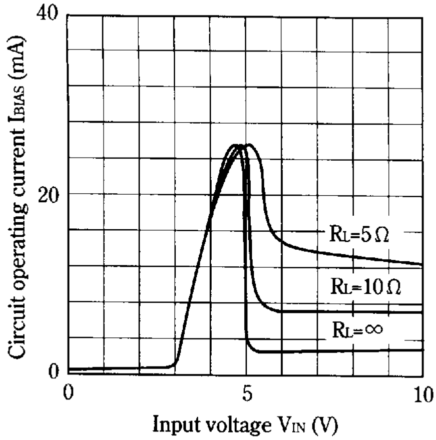


Fig.12 Circuit Operating Current vs. Input Voltage (PQ09RA1/11)

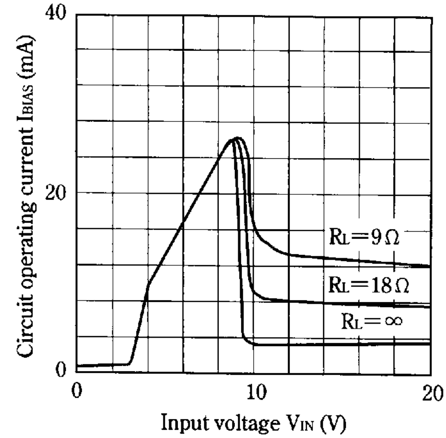


Fig.13 Circuit Operating Current vs. Input Voltage (PQ12RA1/11)

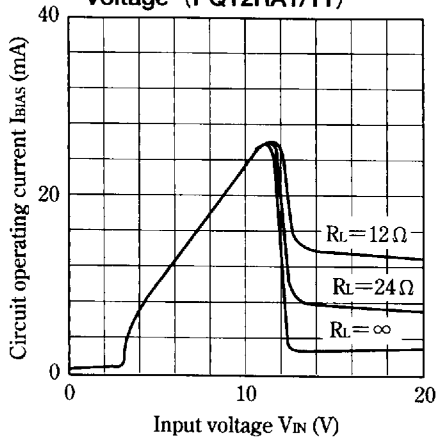


Fig.14 Dropout Voltage vs. Junction Temperature

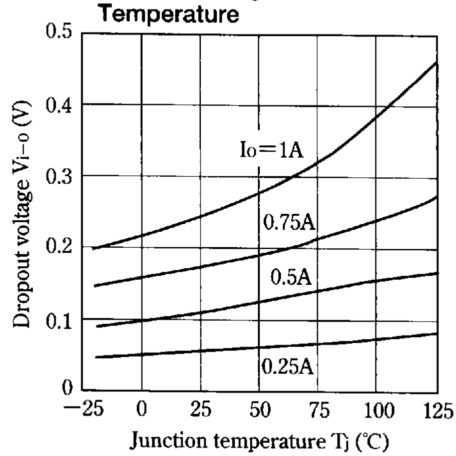


Fig.15 Quiescent Current vs. Junction Temperature

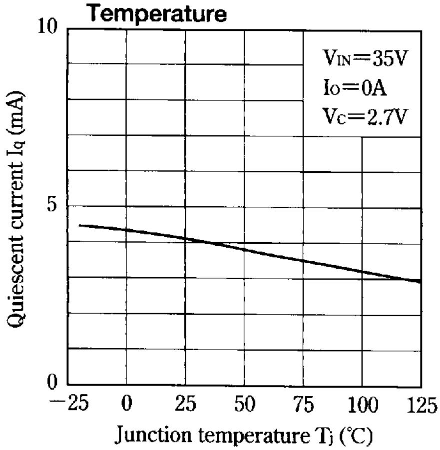


Fig.16 Ripple Rejection vs. Input Ripple Frequency

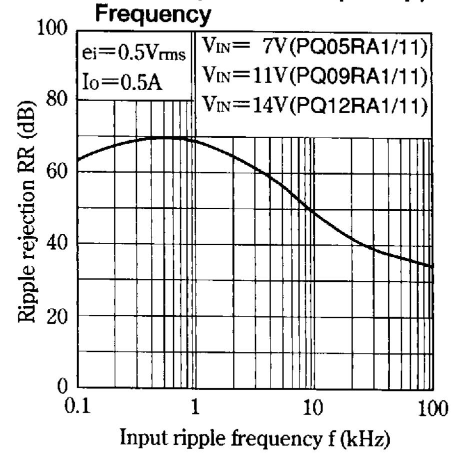


Fig.17 Ripple Rejection vs. Output Current

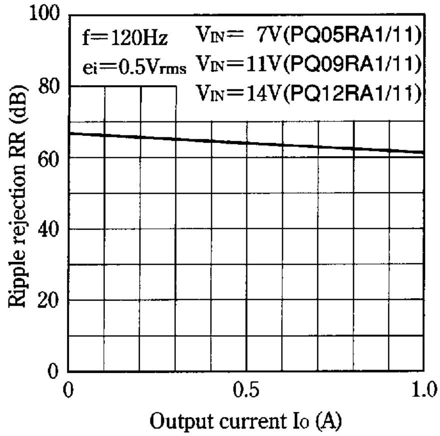


Fig.18 Output Peak Current vs. Junction Temperature

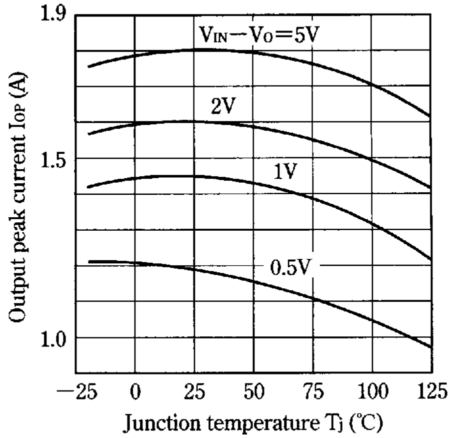
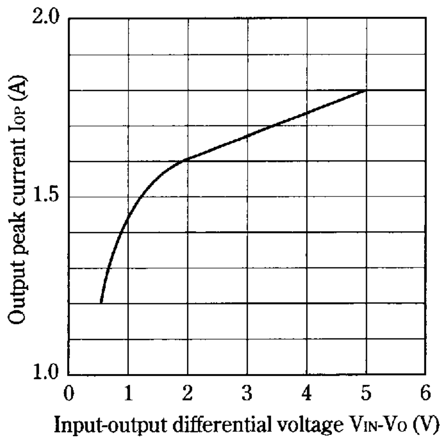


Fig.19 Output Peak Current vs. Input-output Differential Voltage



■ Typical Application