PQ05NF1 Series

1A output, General Purpose Low Power-Loss Voltage Regulators

■ Features

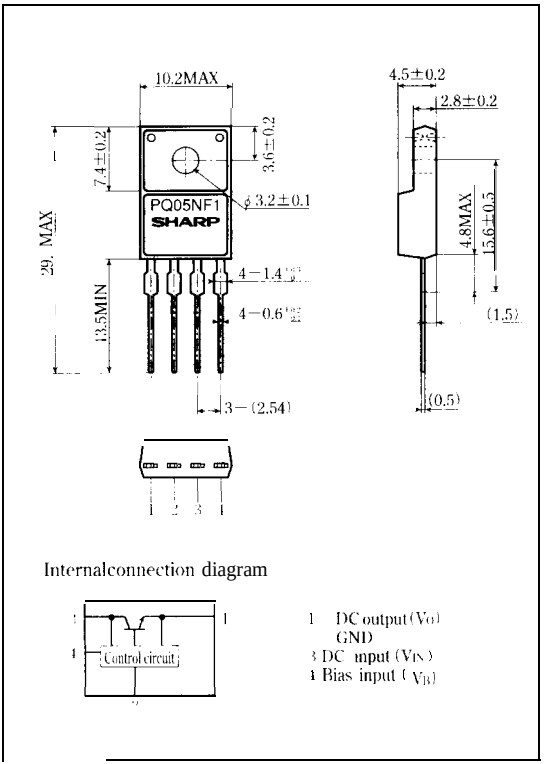
- TO-220 package
- Low power-loss (Dropout voltage MAX.0.5V)
  [Applying the voltage exceeding Vo + 2.5V to control terminal]
- Built-in ON/OFF control function
- Output voltage precision : ±4%

■ Applications

- Power supplies for various electronic equipment such as TVs, VCRS, CD stereos etc.

■ Outline Dimensions

(Unit : mm)



■ Model Line-ups

5V Output	9V output	12V output
PQ05NF1	PQ09NF1	PQI 2NF1

■ Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V_{IN}	24	V
*1 Bias supply voltage	V_B	24	V
output current	1(1	1	A
Power dissipation (No heat sink)	P_{D1}	1.4	W
Power dissipation (With infinite brat sink)	P_{D2}	14	W
*2 Junction temperature	T,	150	℃
Operating temperature	T_{opr}	-20 to +85	C
Storage temperature	T_{stg}	-40 to +150	C
Soldering temperature	T_{sol}	260 (For 10s)	°C

*1 All are open except GN 1) and applicable terminals
*2 Overheat protection may operate at 125≦T≦ 1:7(1 (

· Please refer to the chapter "Handling Precautions"

"In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown In catalogs. data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device"

■ Electrical Characteristics

(Unless otherwise specified, Io=0.5A/*3/*4/Ta=25℃)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
output voltage	**PQ05NFI**	V_O	V_{IN}=7V	**4.8**	5.0	5.2	V
	PQ09NF1		V_{IN}=11V	8.64	9.0	9.36	
	PQI 2NFI		V_{IN}= **14V**	**11.52**	**12.0**	**12.48**	
Load regulating		$R_{eg}L$	Io=5mA to 1A			2.0	%
Line regulation		$R_{eg}I$	*5 *6			2.0	%
Temperature coefficient of output voltage		T_CV_O	T_j=0 to 125[				% / ℃
Ripple rejection		RR_1	Refer to Fig.2	45			dB
		RR_2	Refer to Fig.3	45			dB
Dropout voltage		V_{i-O}	` ,$V_B \geqq V_O$+2.5V			0.5	**V**
Bias inflow current		I_{B1}	V_{IN}=V_O+1V			15	mA
Bias limitation current		$I_{B(\ell)}$	V_{IN}=0 to 24V, V_B= o to 24V			40	mA
Ground current		I_g	Io=0A		3.5	8	mA
OFF-state bias supply voltage		$V_{B(OFF)}$				0.8	V

*3 PQ05NF1 V_{IN}=7V, PQ09NF1: V_{IN}=11V, PQ12NF1: V_{IN}=14V

*4 **PQ05NFI** : V_B=8V, PQ09NF1 V_B=12V, **PQI 2NFI** : V_B= **15V**

*5 **PQ05NF1** V_{IN}=6V to 16V, PQ09NF1: V_{IN}=10V to 20V, PQ12NF1: V_{IN}=13V to 23V

*6 PQ05NF1 V_B=8V to 24V, PQ09NF1: V_B=12V to 24V, PQ12NF1: V_B=15V to 24V

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

Fig. 1 Test Circuit

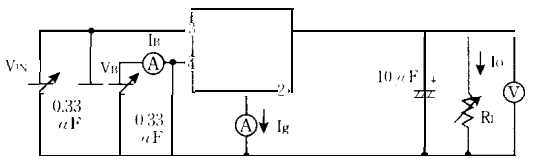
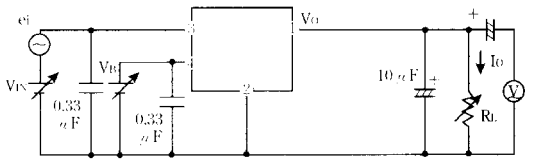
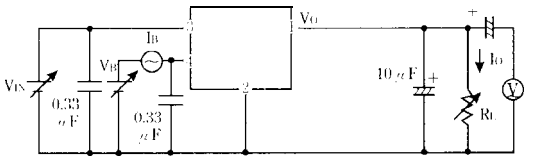


Fig. 2 Test Circuit of Ripple Rejection (1)



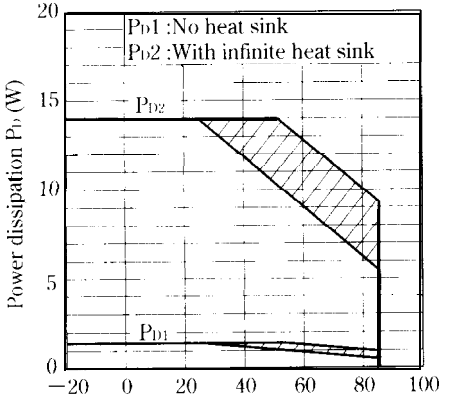
f=120Hz (Sinewave)
Io=0.5A
ei=0.5Vrms
RR= 20 1,)x(,>/.>)

Fig. 3 Test Circuit of Ripple Rejection (2)



f=120Hz (Sine wave)
Io=0.5A
ei=0.5Vrms
RR=20 log (ei/eo)

Fig. 4 Power Dissipation vs. Ambient Temperature



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

Fig. 5 Output Voltage vs. input Voltage (PQ05NF1) (Typical value)

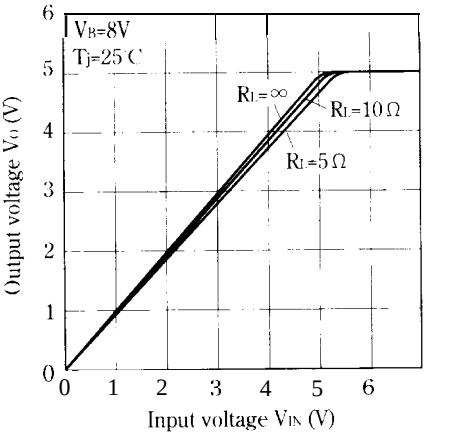


Fig. 6 Output Voltage vs. Input Voltage (PQ09NF1) (Typical value)

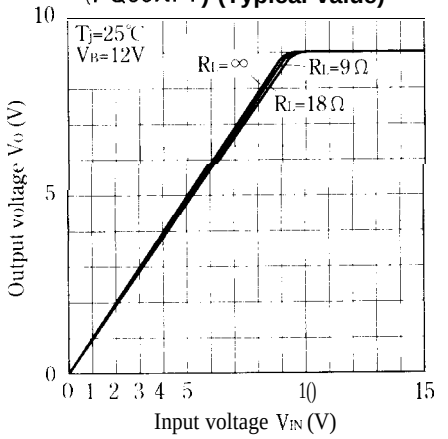


Fig. 7 Output Voltage vs. Input Voltage (PQ12NF1) (Typical value)

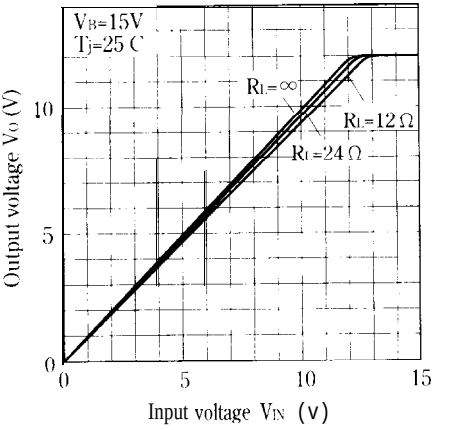


Fig. 8 Output Voltage vs. Bias Supply Voltage (PQ05NF1) (Typical value)

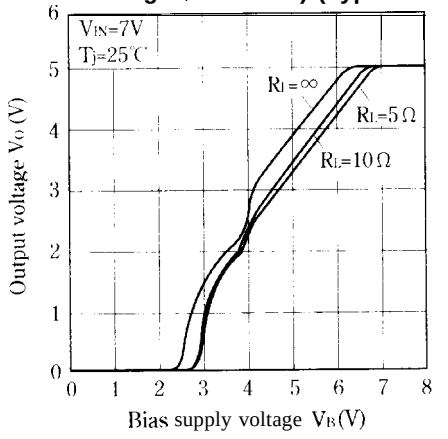


Fig. 9 Output Voltage vs. Bias Supply Voltage (PQ09NF1) (Typical value)

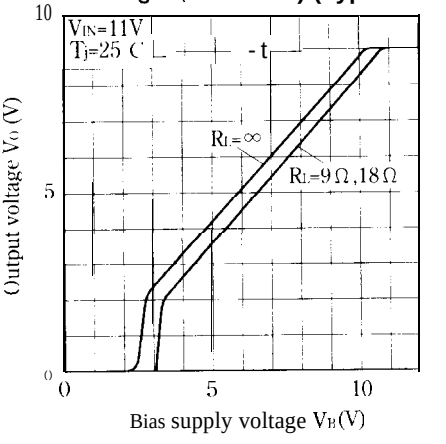


Fig.1O Output Voltage vs. Bias Supply Voltage (PQ12NF1) (Typical value)

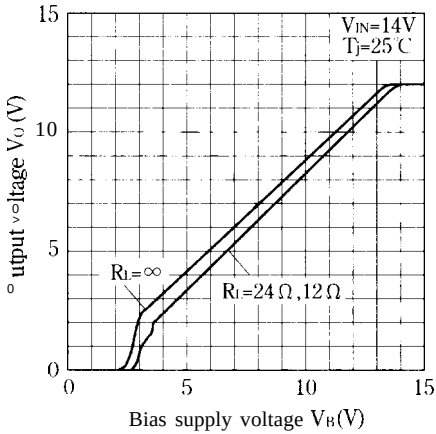


Fig.11 Bias Supply Current vs. Input Voltage (PQ05NF1) (Typical value)

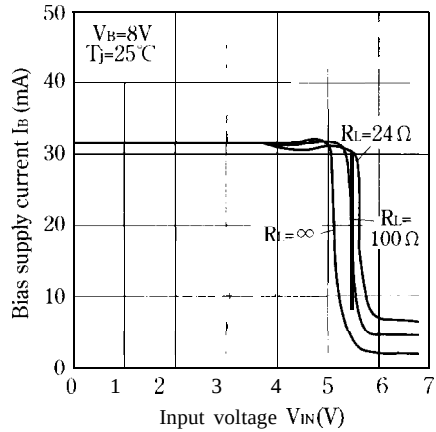


Fig.12 Bias Supply Current vs. Input Voltage (PQ09NF1) (Typical value)

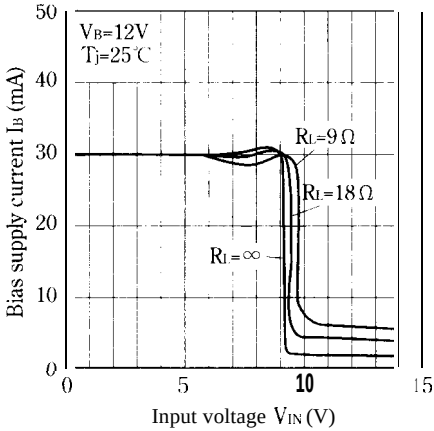


Fig.13 Bias Supply Current vs. Input Voltage (PQ12NF1) (Typical value)

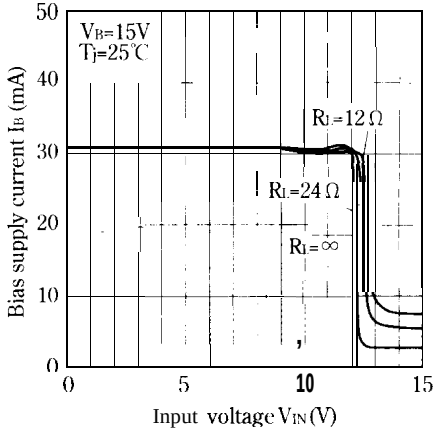


Fig.14 Bias Supply Current vs. Bias Supply Voltage (PQ05NF1) (Typical value)

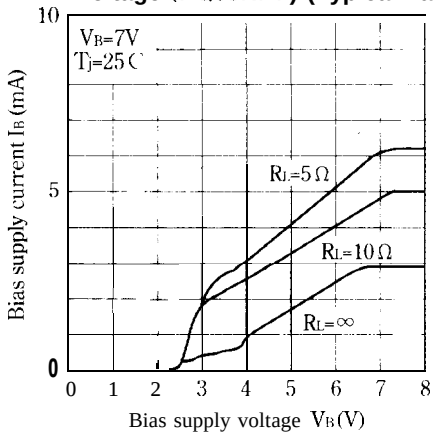


Fig.15 Bias Supply Current vs. Bias Supply Voltage (PQ09NF1) (Typical value)

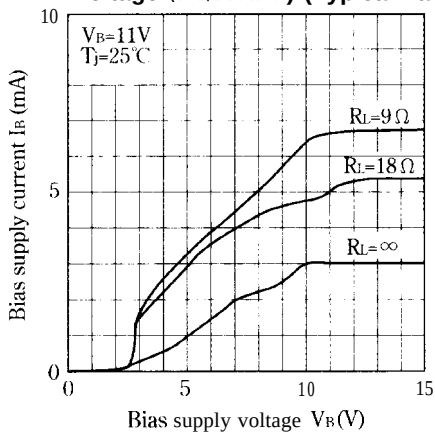
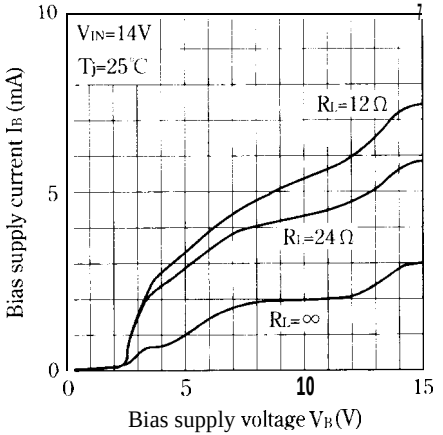
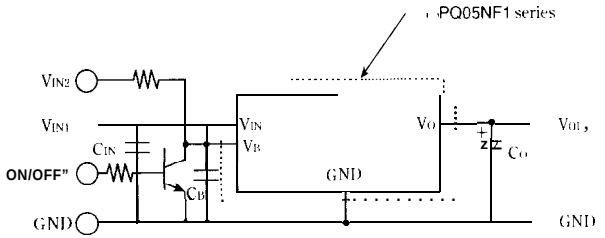


Fig.16 Bias Supply Current vs. Bias Supply Voltage (PQ12NF1) (Typical value)



■ Typical Application



(1) This device can be used as a low power-loss voltage regulator. applying the voltage exceeding Vo+2.5V to bias input terminal ④(VB). When bias input (VB) is open nr less than 0.8V, OFF-state is available.
(VB ≧Vo+2.5V : output ON, VB≦0.8V or open: output OFF)

(2) It can used as a general regulator with single power supply (dropout voltage: MAX2.5V) by connecting bias input terminal 1(VB) with DC input terminal 3