PQ05RF14

1A Output, Low Power-Loss Voltage Regulator Considering Power Line Voltage Drop

■ Features

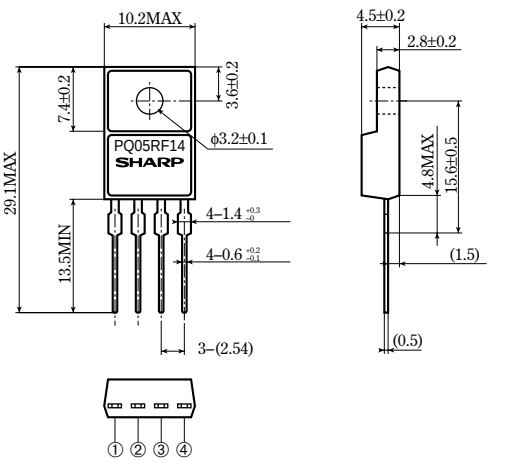
- Low power-loss (Dropout voltage: MAX. 0.5V)
- Compact resin full-mold package
- Output voltage value (5.1V) with an allowance for power line voltage drop
- High-precision output voltage type (output voltage precision: ±2.5%)
- Built-in ON/OFF control function

■ Applications

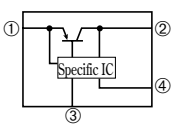
- Series power supply for various electronic equipment such as VCRs and electronic instruments

■ 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˚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	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	˚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 Over heat protection may operate at 125<=T_j<=150˚C

• Please refer to the chapter " Handling Precautions ".

■ Electrical Characteristics

(Unless otherwise specified,condition shall be V_{IN}=7V, I_O=0.5A, T_a=25˚C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	V_O	–	4.97	5.1	5.23	V
Load regulation	$R_{eg}L$	I_O=5mA to 1A	–	0.1	2.0	%
Line regulation	$R_{eg}L$	V_{IN}=6 to 16V	–	0.5	2.5	%
Temperature coefficient of output voltage	TcVo	Tj=0 to 125˚C	–	±0.02	–	%/˚C
Ripple rejection	RR	Refer to Fig. 2	45	55	–	dB
Dropout voltage	V_{i-o}	※3	–	–	0.5	V
ON-state voltage for control	$V_{C(ON)}$	※4	2.0	–	–	V
ON-state current for current	$I_{C(ON)}$	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	–	–	10	mA

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

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

Fig.1 Test Circuit

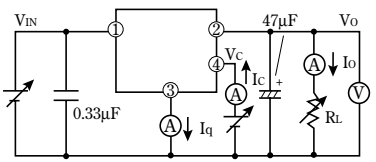
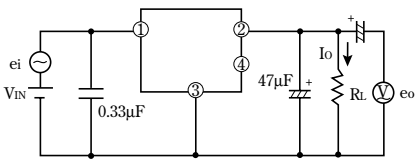
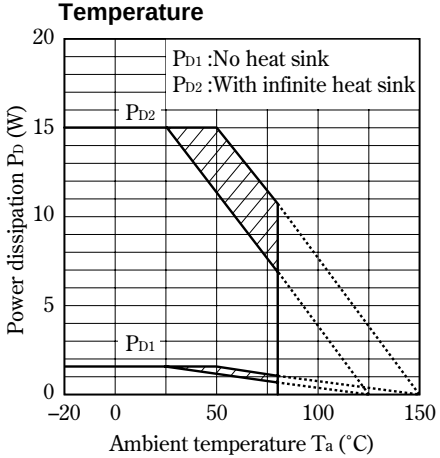


Fig.2 Test Circuit of Ripple Rejection



I_O=0.5A
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)

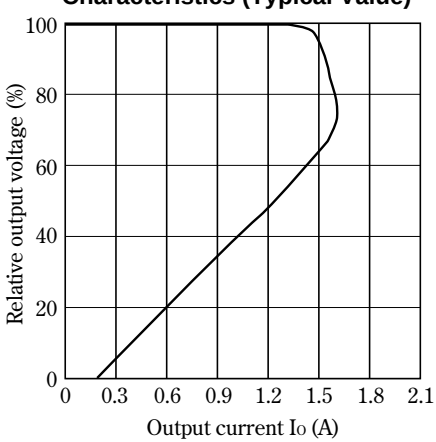


Fig.5 Output Voltage vs. Input Voltage

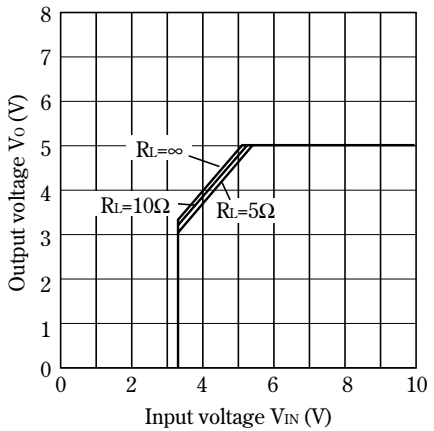


Fig.6 Circuit Operating Current vs. Input Voltage

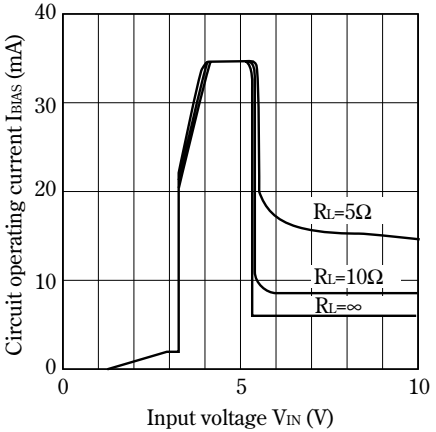


Fig.7 Dropout Voltage vs. Junction Temperature

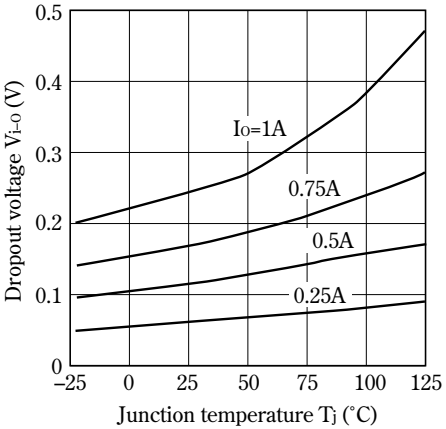


Fig.8 Quiescent Current vs. Junction Temperature

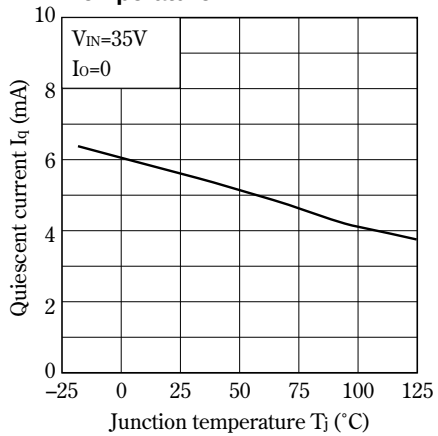


Fig.9 Ripple Rejection vs. Input Ripple Frequency

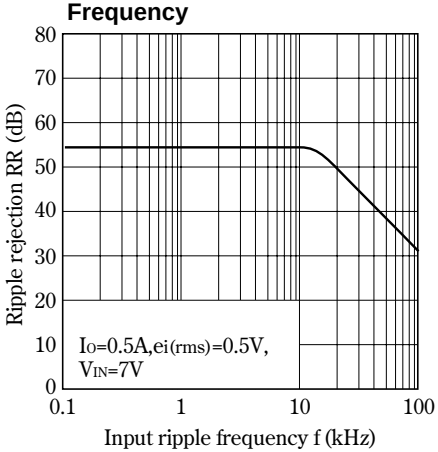


Fig.10 Ripple Rejection vs. Output Current

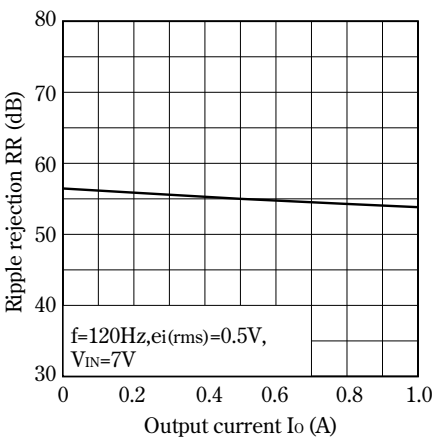


Fig.11 Output Peak Current vs. Dropout Voltage

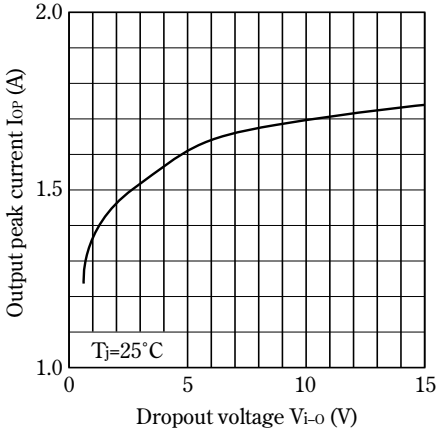
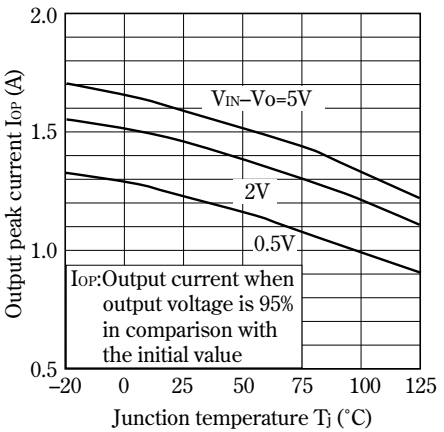


Fig.12 Output Peak Current vs. Junction Temperature



NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:

  (i) The devices in this publication are designed for use in general electronic equipment designs such as:
  --- Personal computers
  --- Office automation equipment
  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
  --- Industrial control
  --- Audio visual equipment
  --- Consumer electronics

  (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
  --- Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
  --- Traffic signals
  --- Gas leakage sensor breakers
  --- Alarm equipment
  --- Various safety devices, etc.

  (iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
  --- Space applications
  --- Telecommunication equipment [trunk lines]
  --- Nuclear power control equipment
  --- Medical and other life support equipment (e.g., scuba).

- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.
-
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.