

# PQ05RD11 Series

1A Output, General Purpose Low Power-loss Voltage Regulators

## ■ Features

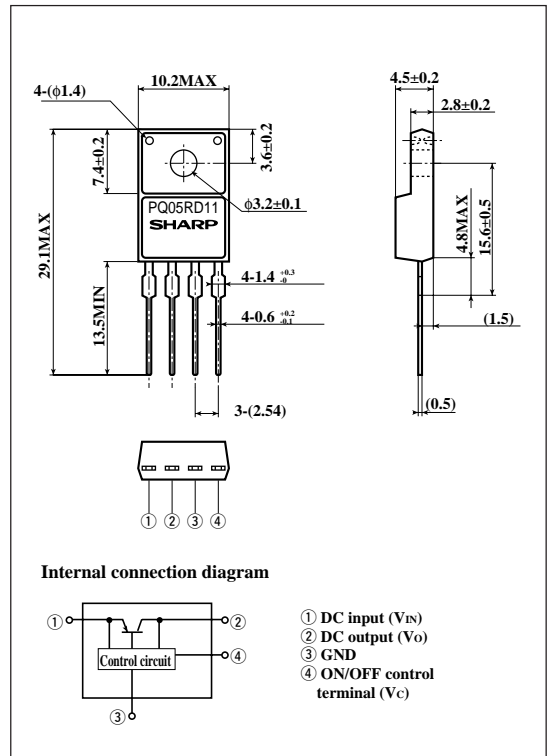
- Low Power-loss (Dropout voltage : MAX.0.5V at  $I_o=0.5A$ )
- Line-up for 5V, 9V and 12V output type
- Compact resin package (TO-220 package)
- High-precision output voltage type  
Output voltage precision :  $\pm 3.0\%$
- Built-in ON/OFF control function
- Built-in overcurrent protection, overheat protection, ASO protection circuit

## ■ Applications

- Power supplies for various electronic equipment such as AV, OA equipment

## ■ Outline Dimensions

(Unit : mm)



## ■ Absolute Maximum Ratings

( $T_a=25^{\circ}C$ )

Parameter	Symbol	Rating	Unit
*1 Input voltage	$V_{IN}$	20	V
*1 ON/OFF control terminal voltage	$V_C$	20	V
Output current	$I_o$	1.0	A
Power dissipation (No heat sink)	$P_{D1}$	1.4	W
Power dissipation (With infinite heat sink)	$P_{D2}$	15	
*2 Junction temperature	$T_j$	150	$^{\circ}C$
Operating temperature	$T_{opr}$	-20 to +80	$^{\circ}C$
Storage temperature	$T_{stg}$	-40 to +150	$^{\circ}C$
Soldering temperature	$T_{sol}$	260 (For 10s)	$^{\circ}C$

\*1 All are open except GND and applicable terminals.

\*2 Overheat protection may operate at  $125 < T_j < 150^{\circ}C$

· Please refer to the chapter "Handling Precautions".

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"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, conditions shall be  $I_o=0.5A$ , <sup>\*3</sup>,  $T_a=25^{\circ}C$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	V <sub>o</sub>	-	4.85	5.0	5.15	V
			8.73	9.0	9.27	
			11.64	12.0	12.36	
Load regulation	R <sub>egL</sub>	I <sub>o</sub> =5mA to 1.0A	-	0.1	2.0	%
Line regulation	R <sub>egI</sub>	<sup>*4</sup> , I <sub>o</sub> =5mA	-	0.5	2.5	%
Temperature coefficient of output voltage	T <sub>c</sub> V <sub>o</sub>	T <sub>j</sub> =0 to 125°C, I <sub>o</sub> =5mA	-	±0.02	-	%/°C
Ripple rejection	RR	-	45	55	-	dB
Dropout voltage	V <sub>i-o</sub>	<sup>*5</sup>	-	-	0.5	V
<sup>*6</sup> ON-state voltage for control	V <sub>C(ON)</sub>	-	2	-	-	V
ON-state current for control	I <sub>C(ON)</sub>	V <sub>C</sub> =2.7V	-	-	20	μA
OFF-state voltage for control	V <sub>C(OFF)</sub>	-	-	-	0.8	V
OFF-state current for control	I <sub>C(OFF)</sub>	V <sub>C</sub> =0.4V	-	-	-0.4	mA
Quiescent current	I <sub>q</sub>	I <sub>o</sub> =0A	-	-	10	mA

<sup>\*3</sup> PQ05RD11: V<sub>IN</sub> = 7V, PQ09RD11: V<sub>IN</sub> = 11V, PQ12RD11: V<sub>IN</sub> = 14V

<sup>\*4</sup> PQ05RD11: V<sub>IN</sub> = 6 to 12V, PQ09RD11: V<sub>IN</sub> = 10 to 16V, PQ12RD11: V<sub>IN</sub> = 13 to 19V

<sup>\*5</sup> Input voltage shall be the value when output voltage is 95% in comparison with the initial value.

<sup>\*6</sup> In case of opening control terminal ④, output voltage turns on.

Fig.1 Test Circuit

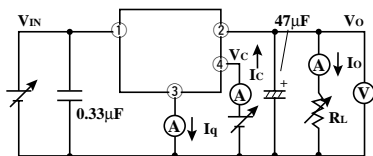
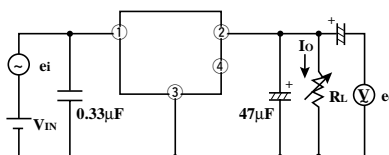
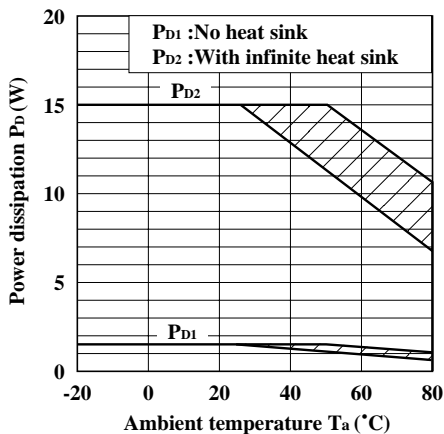


Fig.2 Test circuit for Ripple Rejection



f=120Hz (sine wave)  
 ei=0.5V<sub>rms</sub>  
 V<sub>IN</sub>= 7V (PQ05RD11)  
 V<sub>IN</sub>=11V (PQ09RD11)  
 V<sub>IN</sub>=14V (PQ12RD11)  
 I<sub>o</sub>=0.3A  
 RR=20 log (ei/eo)

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) (PQ05RD11)

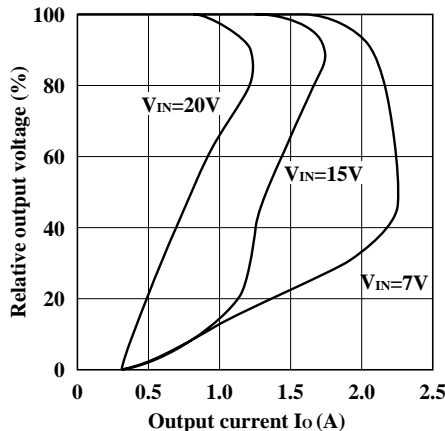


Fig.5 Overcurrent Protection Characteristics (Typical Value) (PQ09RD11)

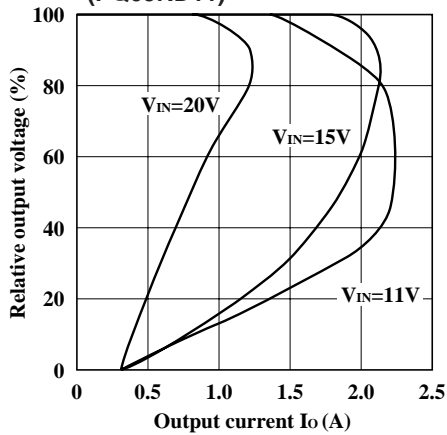


Fig.6 Overcurrent Protection Characteristics (Typical Value) (PQ12RD11)

