# PQ05RD11 Series

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

## ■ Features

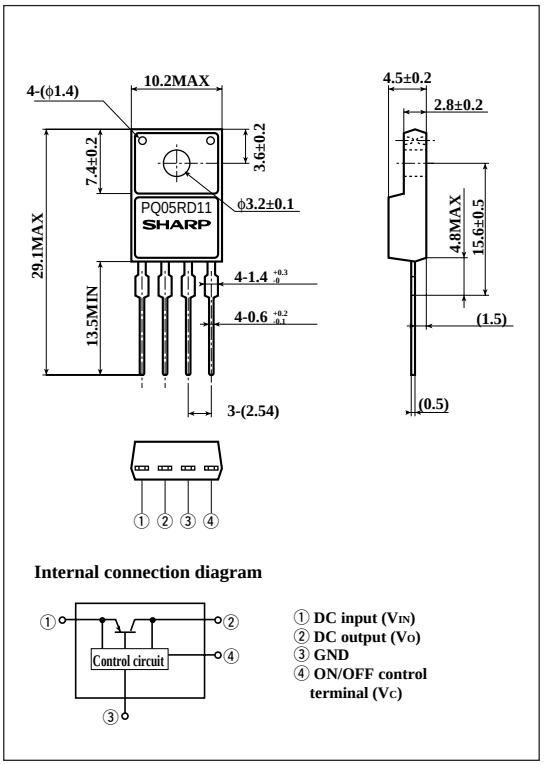
- Low Power-loss (Dropout voltage : MAX.0.5V at Io=0.5A)
- Line-up for 5V, 9V and 12V output type
- Compact resin package (TO-220 package)
- High-precision output voltage type
  Output voltage precision : ±3.0%
- Built-in ON/OFF control function
- Built-in overcurrent protection, overheat protection, 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˚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 | ˚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=<Tj=<150˚C

· Please refer to the chapter “Handling Precautions” .

## ■ Electrical Characteristics

(Unless otherwise specified, conditions shall be $I_O$=0.5A,*3,$T_a$=25˚C)

| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|---|
| Output voltage | PQ05RD11 | $V_O$ | - | 4.85 | 5.0 | 5.15 | V |
| | PQ09RD11 | | | 8.73 | 9.0 | 9.27 | |
| | PQ12RD11 | | | 11.64 | 12.0 | 12.36 | |
| Load regulation | | $R_{egL}$ | Io=5mA to 1.0A | - | 0.1 | 2.0 | % |
| Line regulation | | $R_{egI}$ | *4 , Io=5mA | - | 0.5 | 2.5 | % |
| Temperature coefficient of output voltage | | $T_CV_O$ | $T_j$=0 to 125˚C, Io=5mA | - | ±0.02 | - | %/˚C |
| Ripple rejection | | RR | - | 45 | 55 | - | dB |
| Dropout voltage | | $V_{i-o}$ | *5 | - | - | 0.5 | V |
| *6 ON-state voltage for control | | $V_{C\ (ON)}$ | - | 2 | - | - | 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 | | $I_q$ | Io=0A | - | - | 10 | mA |

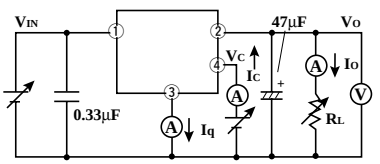
*3 PQ05RD11:$V_{IN}$ =7V, PQ09RD11:$V_{IN}$ =11V, PQ12RD11: $V_{IN}$ =14V

*4 PQ05RD11:$V_{IN}$ = 6 to 12V, PQ09RD11:$V_{IN}$ =10 to 16V, PQ12RD11: $V_{IN}$ =13 to 19V

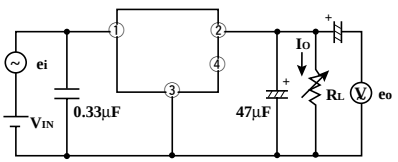
*5 Input voltage shall be the value when output voltage is 95% in comparison with the initial value.

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

### Fig.1 Test Circuit

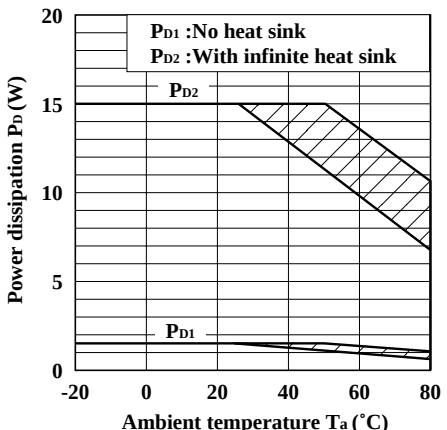



### Fig.2 Test circuit for Ripple Rejection




f=120Hz (sine wave)
ei=0.5Vrms
$V_{IN}$= 7V (PQ05RD11)
$V_{IN}$=11V (PQ09RD11)
$V_{IN}$=14V (PQ12RD11)
$I_O$=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)

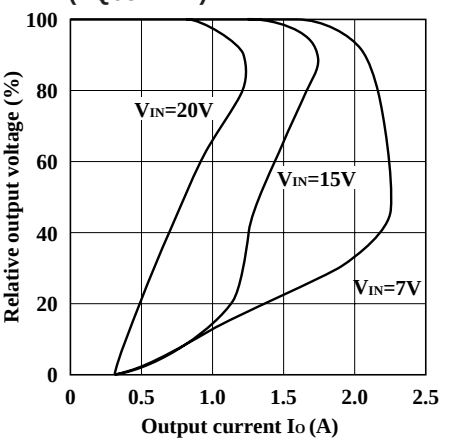


Fig.5 Overcurrent Protection Characteristics (Typical Value) (PQ09RD11)

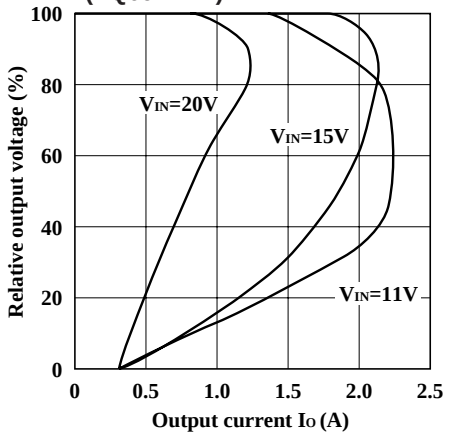



Fig.6 Overcurrent Protection Characteristics (Typical Value) (PQ12RD11)