# THE DATASHEET OF

# PQ025EH01ZPH

# PQxxxEH01ZxH Series

Low Voltage Operation
Low Power-Loss Voltage Regulators

## ■ Features

1.Low voltage operation
(Minimum operating voltage: 2.35V)
2.5V input → available 1.5 to 1.8V output
2.Large output current type ($I_O$: 1A)
3.Low dissipation current
(Dissipation current at no load: MAX. 2mA
Output OFF-state dissipation current: MAX.5μA)
4.Low power-loss
5.Built-in overcurrent and overheat protection functions
6.TO-263 package
7.RoHS directive compliant

## ■ Applications

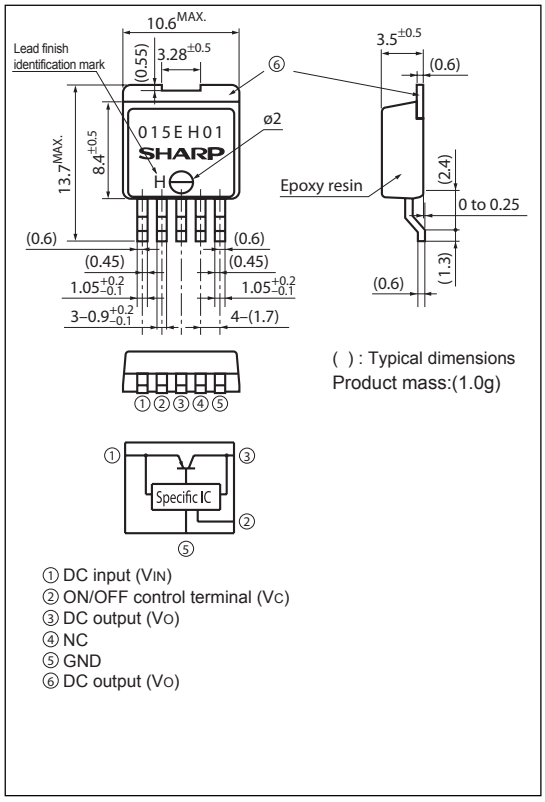
1.Peripheral equipment of personal computers
2.Power supplies for various electronic equipment such as DVD player or STB

## ■ Model Line-up

| Output current ($I_O$) | Package type | Output voltage ($V_O$) | | |
|---|---|---|---|---|
| | | 1.5V | 1.8V | 2.5V |
| 1A | Taping | PQ015EH01ZPH | PQ018EH01ZPH | PQ025EH01ZPH |
| | Sleeve | PQ015EH01ZZH | PQ018EH01ZZH | PQ025EH01ZZH |

## ■ Outline Dimensions

(Unit : mm)




Lead finish:Lead-free solder plating
(Composition: Sn2Cu)

## ■ Absolute Maximum Ratings

(Ta=25°C)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| *1 Input voltage | $V_{IN}$ | 10 | V |
| *1 Output control voltage | $V_C$ | 10 | V |
| Output current | $I_O$ | 1 | A |
| *2 Power dissipation | $P_D$ | 35 | W |
| *3 Junction temperature | $T_j$ | 150 | °C |
| Operating temperature | $T_{opr}$ | -40 to +85 | °C |
| Storage temperature | $T_{stg}$ | -40 to +150 | °C |
| Soldering temperature | $T_{sol}$ | 260(10s) | °C |

*1 All are open except GND and applicable terminals.
*2 $P_D$:With infinite heat sink
*3 Overheat protection may operate at Tj:125°C to 150°C

## ■ Electrical Characteristics

(Unless otherwise specified, condition shall be $V_{IN}$=$V_O$(TYP)+1V, $I_O$=0.5A, $V_C$=2.7V,Ta=25°C)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|
| Input voltage | $V_{IN}$ | - | Refer to below table | | | V |
| Output voltage | $V_O$ | - | Refer to below table | | | V |
| Load regulation | RegL | $I_O$=5mA to 1A | - | 0.2 | 2.0 | % |
| Line regulation | RegI | $V_{IN}$=$V_O$(TYP)+1V to $V_O$(TYP)+6V , $I_O$=5mA | - | 0.1 | 1.0 | % |
| Temperature coefficient of output voltage | $T_CV_O$ | Tj=0 to +125°C, $I_O$=5mA | - | ±0.01 | - | %/°C |
| Ripple rejection | RR | Refer to Fig.2 | 45 | 60 | - | dB |
| ※4 ON-state voltage for control | $V_{C(ON)}$ | - | 2.0 | - | - | V |
| ON-state current for control | $I_{C(ON)}$ | - | - | - | 200 | µA |
| 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 | - | 1 | 2 | mA |
| Output OFF-state consumption current | $I_{qs}$ | $I_O$=0A, $V_C$=0.4V | - | - | 5 | µA |

※4 In case of opening control terminal ②, output voltage turns off

## ■ Input voltage range

| Model No. | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|
| PQ015EH01ZxH | $V_{IN}$ | $I_O$=0.5A, $V_C$=2.7V, Ta=25°C | 2.35 | - | 10 | V |
| PQ018EH01ZxH | | | 2.35 | - | 10 | |
| PQ025EH01ZxH | | | 3.0 | - | 10 | |

## ■ Output voltage

| Model No. | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|
| PQ015EH01ZxH | $V_O$ | $V_{IN}$=$V_O$(TYP)+1V, $I_O$=0.5A, $V_C$=2.7V, Ta=25°C | 1.45 | 1.5 | 1.55 | V |
| PQ018EH01ZxH | | | 1.75 | 1.8 | 1.85 | |
| PQ025EH01ZxH | | | 2.438 | 2.5 | 2.562 | |

Fig.1 Test Circuit

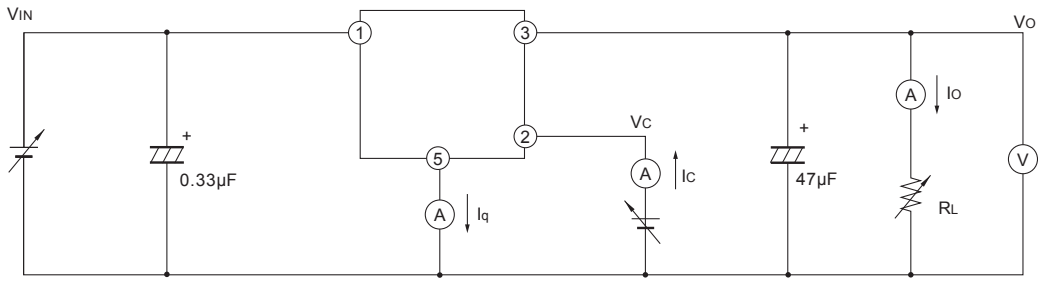


Fig.2 Test Circuit for Ripple Rejection

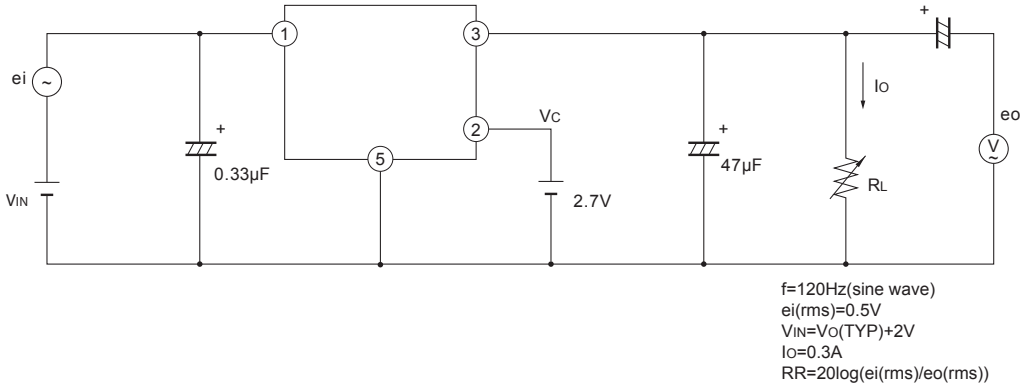
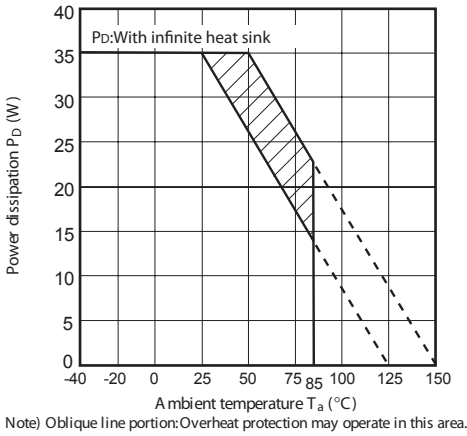



Fig.3 Power Dissipation vs. Ambient Temperature




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

Fig.4 Overcurrent Protection Characteristics (Typical Value) (**PQ015EH01ZxH**)

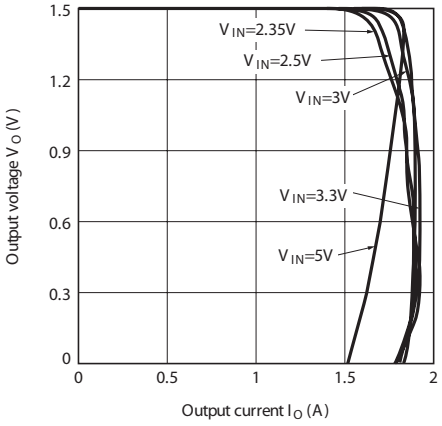



Fig.5 Overcurrent Protection Characteristics (Typical Value) (**PQ018EH01ZxH**)

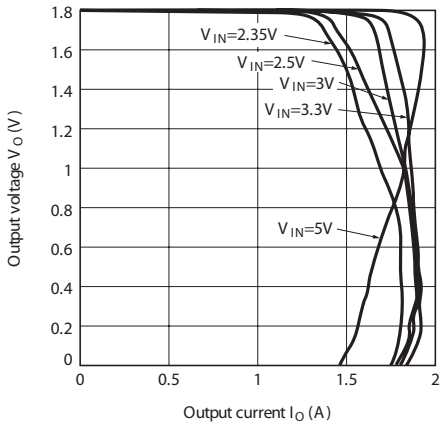



Fig.6 Overcurrent Protection Characteristics (Typical Value) (**PQ025EH01ZxH**)

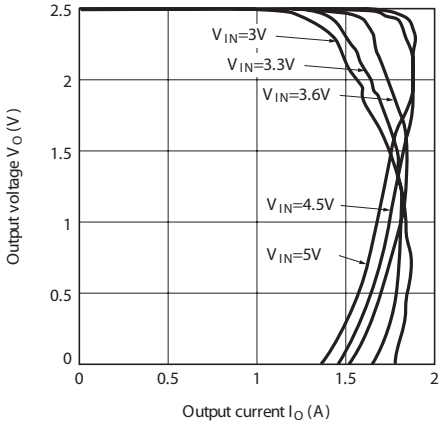


Fig.7 Output Voltage vs. Ambient Temperature (**PQ015EH01ZxH**)

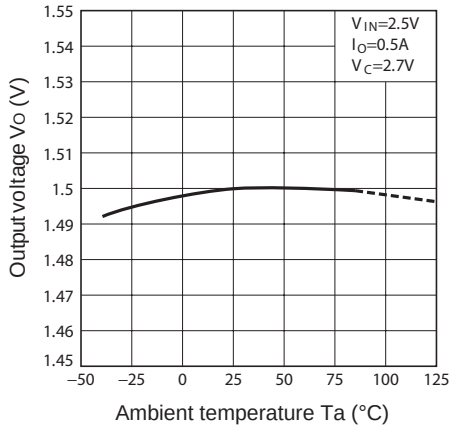



Fig.8 Output Voltage vs. Ambient Temperature (**PQ018EH01ZxH**)

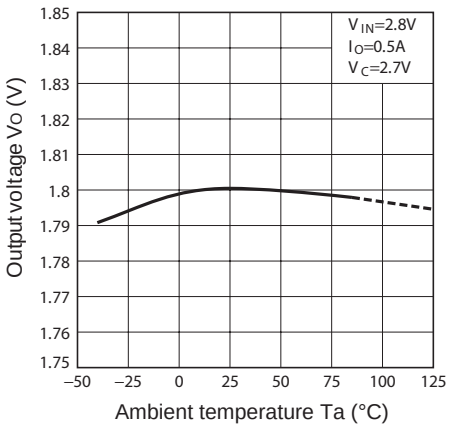



Fig.9 Output Voltage vs. Ambient Temperature (**PQ025EH01ZxH**)

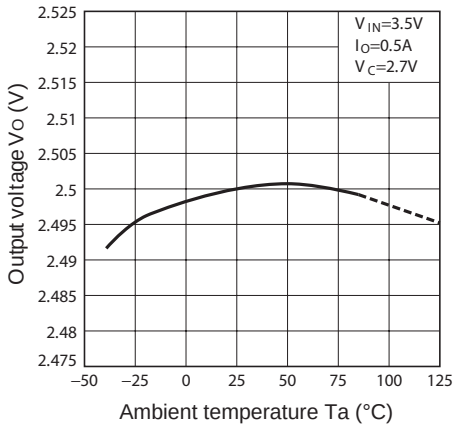



Fig.10 Output Voltage vs. Input Voltage (**PQ015EH01ZxH**)

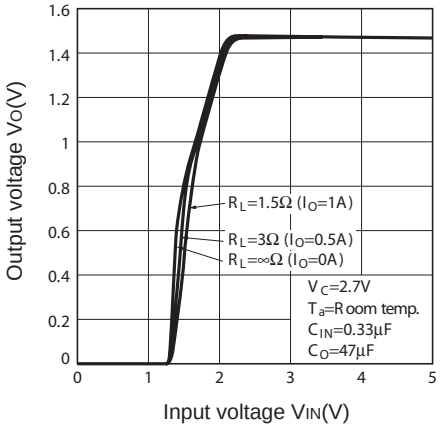



Fig.11 Output Voltage vs. Input Voltage (**PQ018EH01ZxH**)

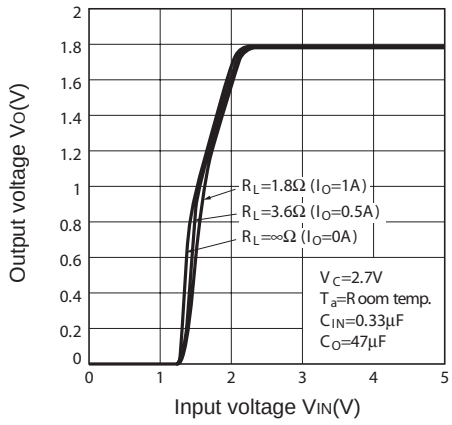



Fig.12 Output Voltage vs. Input Voltage (**PQ025EH01ZxH**)

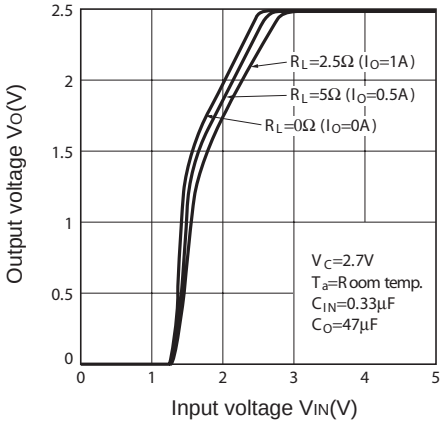


Fig.13 Circuit Operating Current vs. Input Voltage (**PQ015EH01ZxH**)

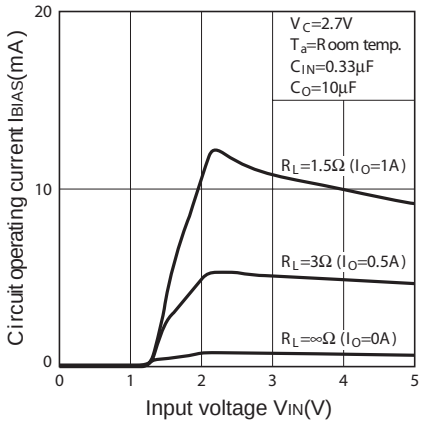



Fig.14 Circuit Operating Current vs. Input Voltage (**PQ018EH01ZxH**)

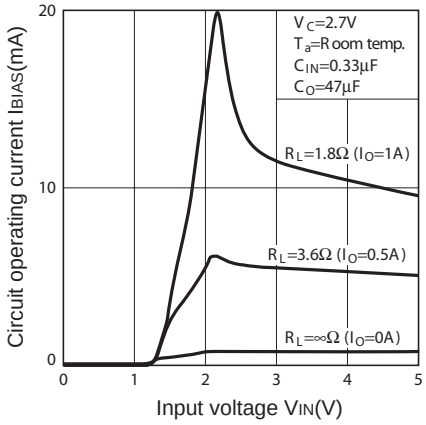



Fig.15 Circuit Operating Current vs. Input Voltage (**PQ025EH01ZxH**)

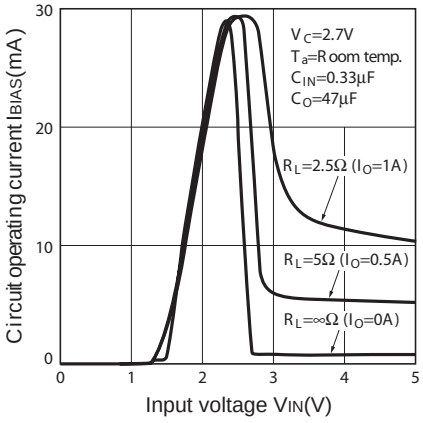



Fig.16 Quiescent Current vs. Junction Temperature

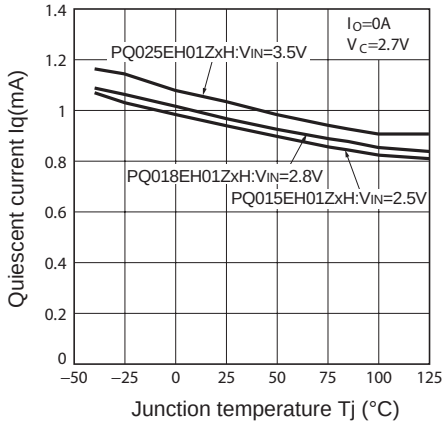



Fig.17 ON-OFF Threshold Voltage vs. Ambient Temperature (**PQ018EH01ZxH**)

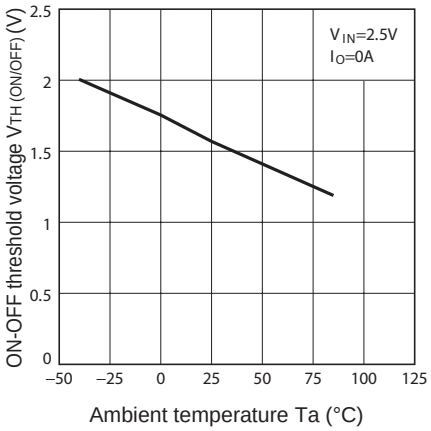



Fig.18 Ripple Rejection vs. Input Ripple Frequency

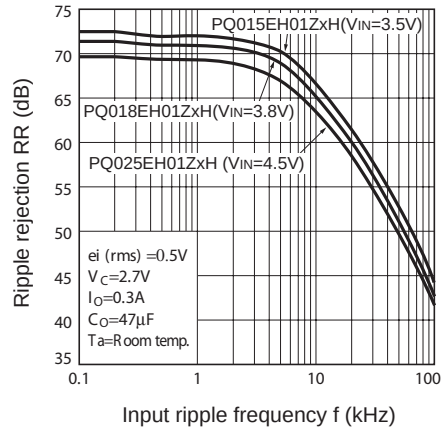


Fig.19 Ripple Rejection vs. Output Current

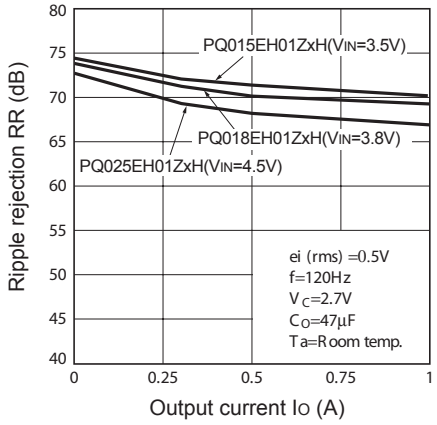
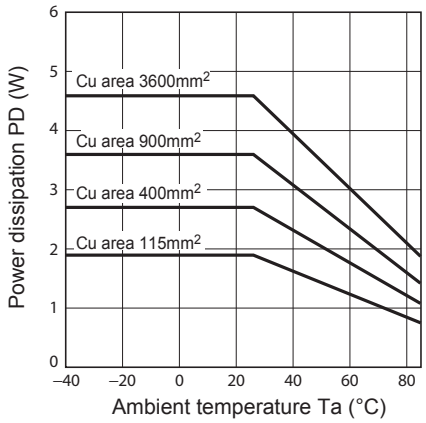
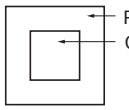



Fig.20 Power Dissipation vs. Ambient Temperature (Typical Value)

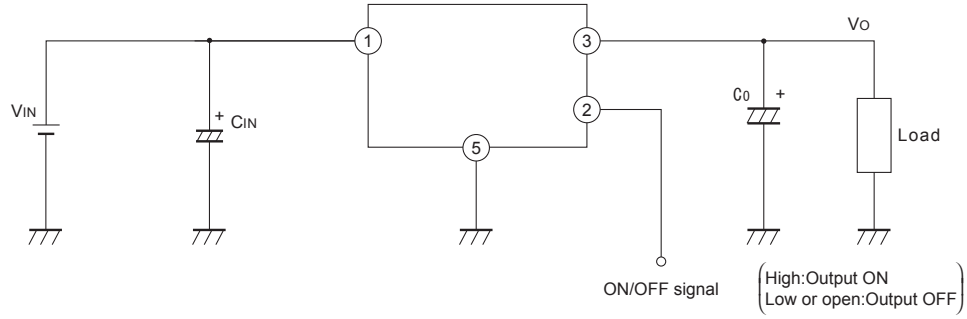



Mounting PCB




Material : Glass-cloth epoxy resin
Size : 60×60×1.6mm
Cu thickness : 65µm

Fig.21 Typical Application



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