

# PQxxxFZ5MZxH Series

# PQxxxFZ01ZxH Series

Low Voltage Operation  
Low Power-Loss Voltage Regulators

## ■ Features

- 1.Low voltage operation (Minimum operating voltage: 1.7V)  
1.8V input → available 1.0 to 1.2V
- 2.Surface mount package(equivalent to EIAJ SC-63)
- 3.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 <sub>o</sub> ) | Package type | Output voltage (V <sub>o</sub> ) |              |
|----------------------------------|--------------|----------------------------------|--------------|
|                                  |              | 1.0V                             | 1.2V         |
| 0.5A                             | Taping       | PQ010FZ5MZPH                     | PQ012FZ5MZPH |
|                                  | Sleeve       | PQ010FZ5MZZH                     | PQ012FZ5MZZH |
| 1A                               | Taping       | PQ010FZ01ZPH                     | PQ012FZ01ZPH |
|                                  | Sleeve       | PQ010FZ01ZZH                     | PQ012FZ01ZZH |

## ■ Absolute Maximum Ratings (Ta=25°C)

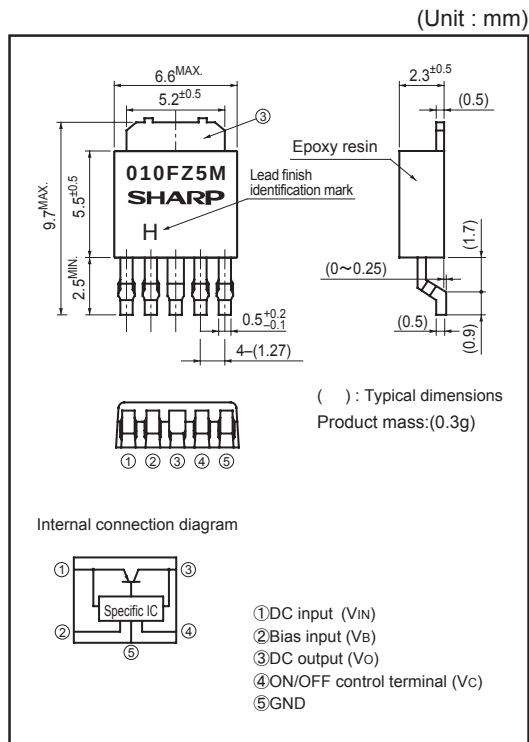
| Parameter               | Symbol           | Rating      | Unit |
|-------------------------|------------------|-------------|------|
| Input voltage           | V <sub>IN</sub>  | 3.7         | V    |
| *1 Bias supply voltage  | V <sub>B</sub>   | 7           | V    |
| Output control voltage  | V <sub>C</sub>   | 7           | V    |
| Output current          | I <sub>o</sub>   | 0.5         | A    |
|                         |                  | 1           |      |
| *2 Power dissipation    | P <sub>D</sub>   | 8           | W    |
| *3 Junction temperature | T <sub>j</sub>   | 150         | °C   |
| Operating temperature   | T <sub>opr</sub> | -25 to +85  | °C   |
| Storage temperature     | T <sub>stg</sub> | -40 to +150 | °C   |
| Soldering temperature   | T <sub>sol</sub> | 260(10s)    | °C   |

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

\*2 P<sub>D</sub>: With infinite heat sink

\*3 Overheat protection may operate at T<sub>j</sub>:125°C to 150°C

## ■ Outline Dimensions



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

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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 device specification sheets before using any SHARP device.

### Electrical Characteristics

(Unless otherwise specified, condition shall be  $V_{IN}=1.8V$ ,  $V_B=3.3V$ ,  $I_O=0.3A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$  (PQxxxFZ5MZxH))

(Unless otherwise specified, condition shall be  $V_{IN}=1.8V$ ,  $V_B=3.3V$ ,  $I_O=0.5A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$  (PQxxxFZ01ZxH))

| Parameter                                 | Symbol       | Conditions                                              | MIN.                 | TYP. | MAX. | Unit    |
|-------------------------------------------|--------------|---------------------------------------------------------|----------------------|------|------|---------|
| Input voltage                             | $V_{IN}$     | —                                                       | 1.7                  | —    | 3.7  | V       |
| Bias supply voltage                       | $V_B$        | —                                                       | 2.35                 | —    | 7    | V       |
| Output voltage                            | $V_O$        | —                                                       | Refer to below table |      |      | V       |
| Load regulation                           | PQxxxFZ5MZxH | RegL<br>$I_O=5mA$ to 0.5A                               | —                    | 0.2  | 1    | %       |
|                                           | PQxxxFZ01ZxH |                                                         |                      |      |      |         |
| Line regulation                           | RegI         | $V_{IN}=1.7$ to $3.7V$ , $V_B=2.35$ to $7V$ , $I_O=5mA$ | —                    | 0.2  | 1    | %       |
| Temperature coefficient of output voltage | $T_C V_O$    | $T_J=0$ to $125^\circ C$ , $I_O=5mA$                    | —                    | 0.5  | —    | %       |
| Ripple Rejection                          | PQxxxFZ5MZxH | RR1<br>Refer to Fig.2                                   | —                    | 65   | —    | dB      |
|                                           | PQxxxFZ01ZxH | RR2<br>Refer to Fig.3                                   | —                    | 60   | —    | dB      |
| *4 ON-state voltage for control           | $V_{C(ON)}$  | —                                                       | 2                    | —    | —    | V       |
| ON-state current for control              | $I_{C(ON)}$  | —                                                       | —                    | —    | 200  | $\mu A$ |
| OFF-state voltage for control             | $V_{C(OFF)}$ | —                                                       | —                    | —    | 0.8  | V       |
| OFF-state current for control             | $I_{C(OFF)}$ | $V_C=0.4V$                                              | —                    | —    | 2    | $\mu A$ |
| Bias inflow current                       | $I_B$        | $I_O=0A$                                                | —                    | 1.5  | 3    | mA      |
| Output OFF-state dissipation current      | $I_{qs}$     | $I_O=0A$ , $V_C=0.4V$                                   | —                    | —    | 10   | $\mu A$ |

\*4 In case of opening control terminal ④, output voltage turns off.

### Output voltage

(Unless otherwise specified, condition shall be  $V_{IN}=1.8V$ ,  $V_B=3.3V$ ,  $I_O=0.3A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$  (PQxxxFZ5MZxH))

(Unless otherwise specified, condition shall be  $V_{IN}=1.8V$ ,  $V_B=3.3V$ ,  $I_O=0.5A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$  (PQxxxFZ01ZxH))

| Model No.                   | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|-----------------------------|--------|------------|------|------|------|------|
| PQ010FZ5MZxH / PQ010FZ01ZxH | $V_O$  | —          | 0.97 | 1.0  | 1.03 | V    |
| PQ012FZ5MZxH / PQ012FZ01ZxH | $V_O$  | —          | 1.17 | 1.2  | 1.23 |      |

Fig.1 Test Circuit

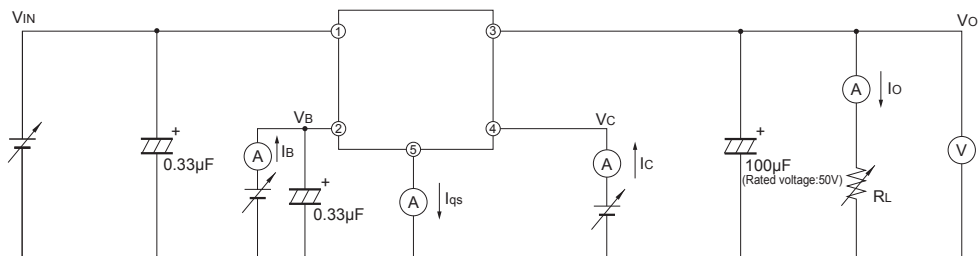


Fig.2 Test Circuit for Ripple Rejection

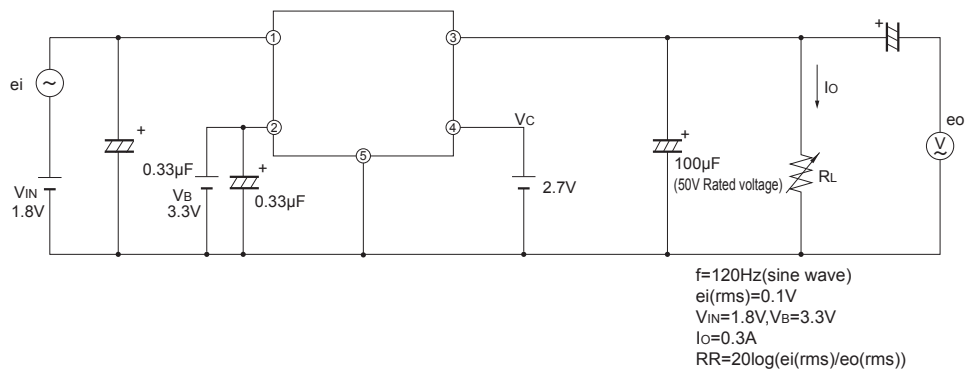


Fig.3 Test Circuit for Ripple Rejection

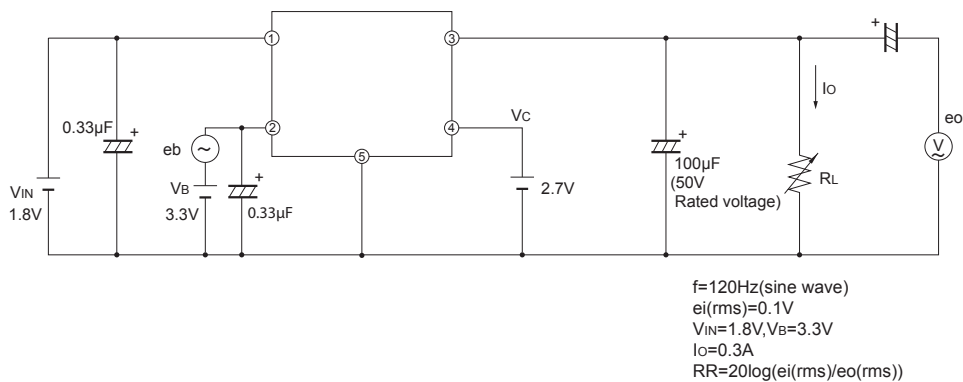


Fig.4 Power Dissipation vs. Ambient Temperature

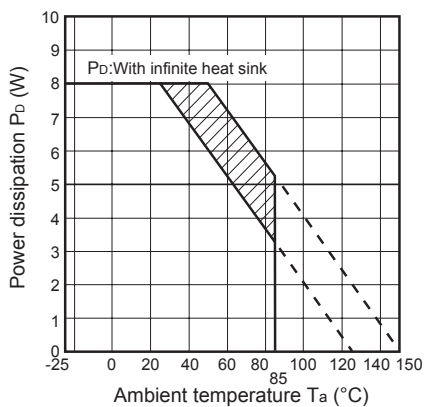


Fig.5 Overcurrent Protection Characteristics (PQ010FZ5MZxH)

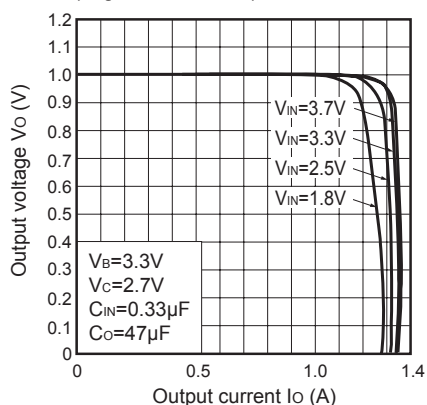


Fig.6 Overcurrent Protection Characteristics (PQ012FZ5MZxH)

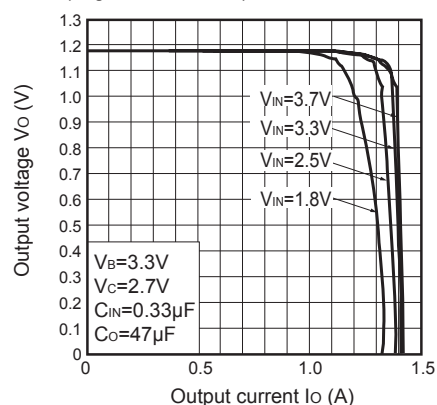


Fig.7 Overcurrent Protection Characteristics (PQ010FZ01ZxH)

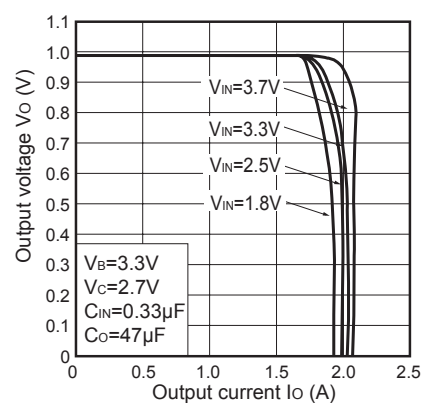


Fig.8 Overcurrent Protection Characteristics (PQ012FZ01ZxH)

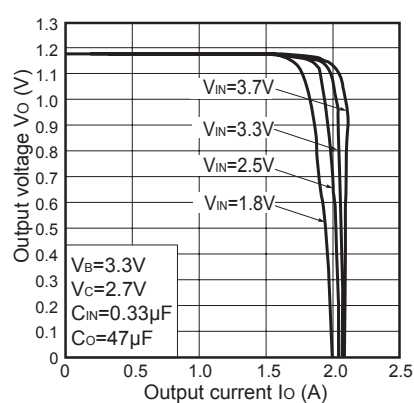


Fig.9 Output Voltage vs. Ambient Temperature (PQ010FZ5MZxH / PQ010FZ01ZxH)

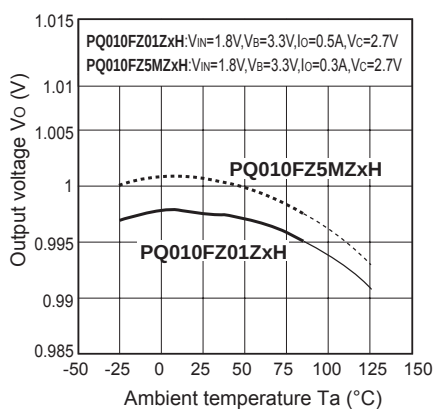


Fig.10 Output Voltage vs. Ambient Temperature (PQ012FZ5MZxH / PQ012FZ01ZxH)

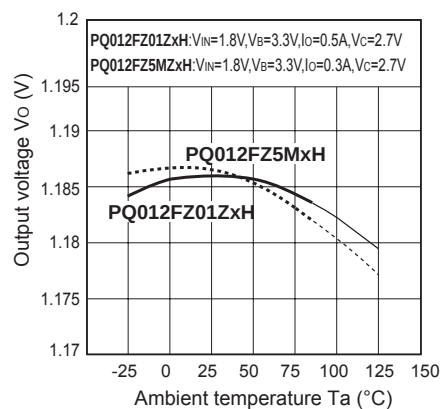


Fig.11 Bias Inflow Current vs. Ambient Temperature

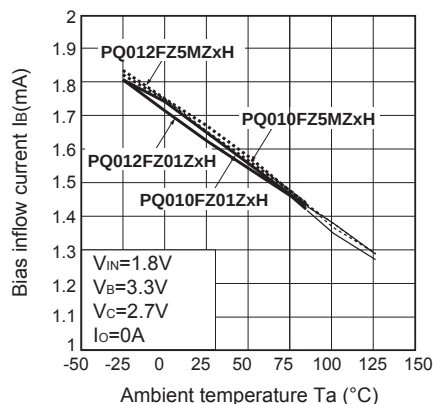


Fig.12 Output Short-circuit Current vs. Ambient Temperature (Reference)

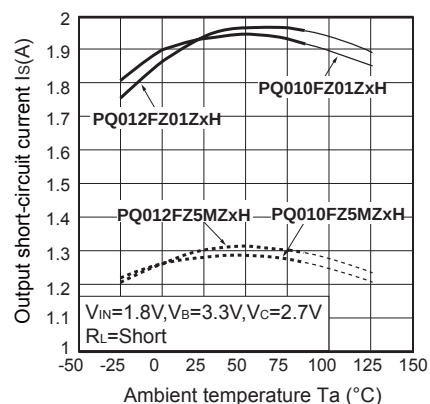


Fig.13 Output Voltage vs. Input Voltage (PQ010FZ5MZxH)

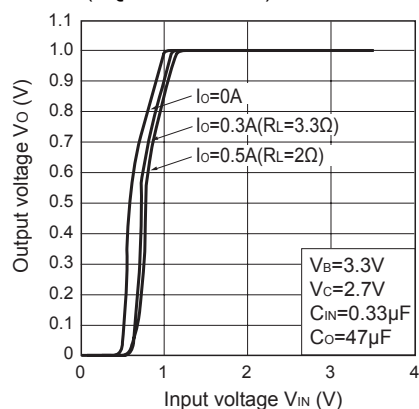


Fig.14 Output Voltage vs. Input Voltage (PQ012FZ5MZxH)

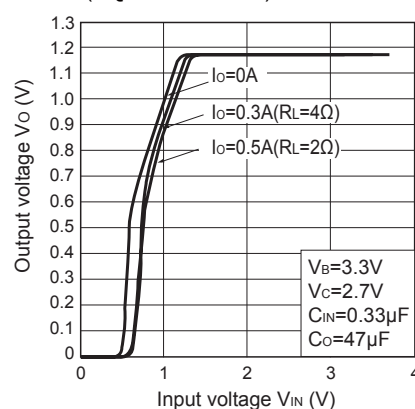


Fig.15 Output Voltage vs. Input Voltage (PQ010FZ01ZxH)

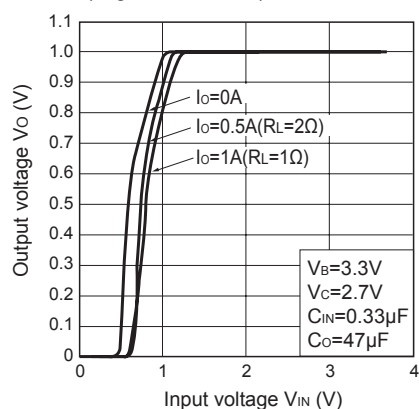


Fig.16 Output Voltage vs. Input Voltage (PQ012FZ01ZxH)

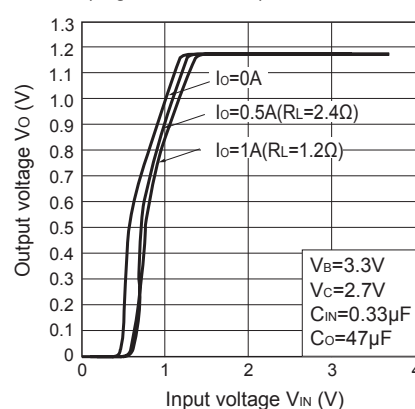


Fig.17 Output Voltage vs. Bias Supply Voltage (PQ010FZ5MZxH)

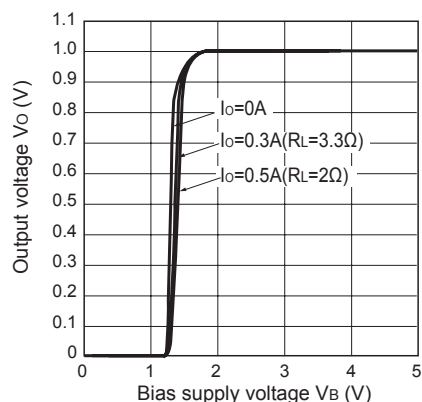


Fig.18 Output Voltage vs. Bias Supply Voltage (PQ012FZ5MZxH)

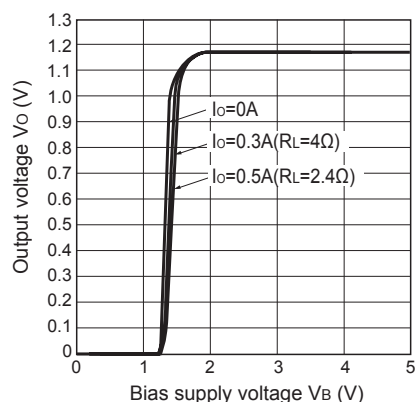


Fig.19 Output Voltage vs. Bias Supply Voltage (PQ010FZ01ZxH)

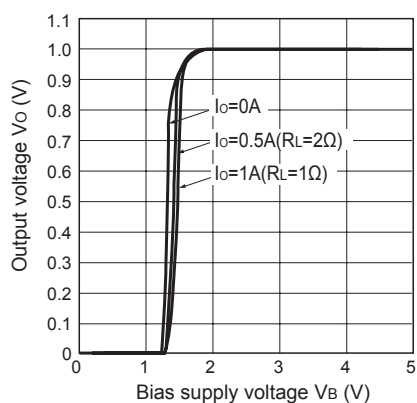


Fig.20 Output Voltage vs. Bias Supply Voltage (PQ012FZ01ZxH)

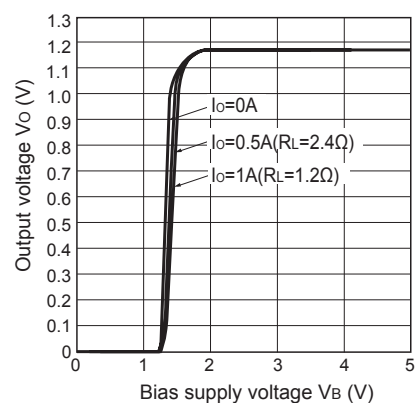


Fig.21 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (PQ010FZ5MZxH)

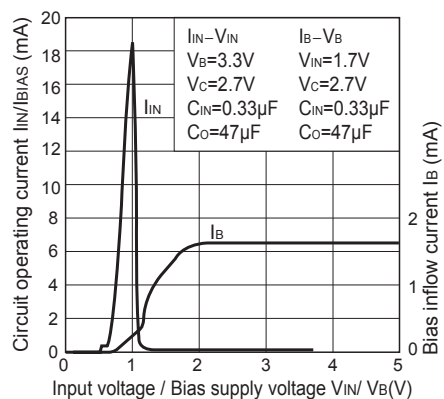


Fig.22 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (PQ012FZ5MZxH)

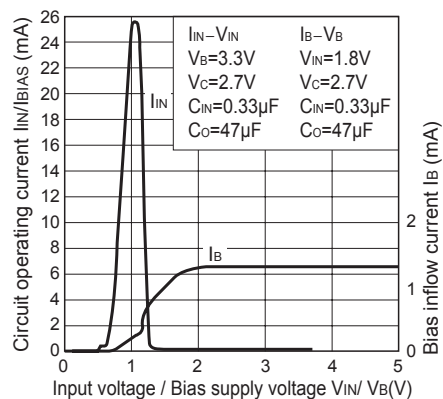


Fig.23 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (PQ010FZ01ZxH)

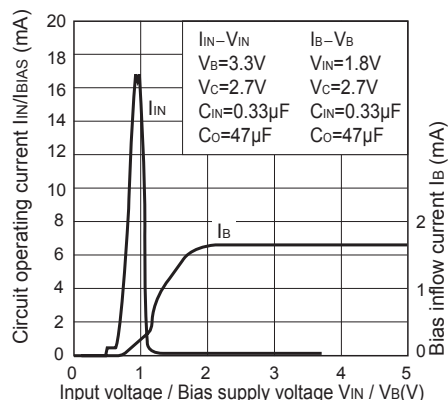


Fig.24 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (PQ012FZ01ZxH)

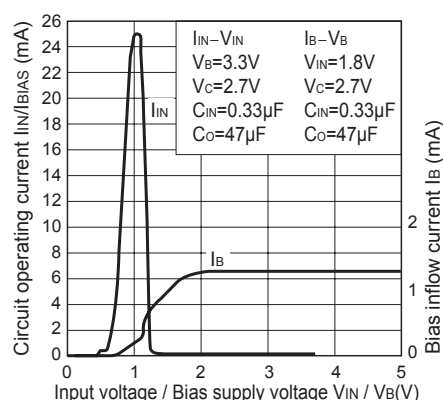


Fig.25 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (PQ010FZ5MZxH)

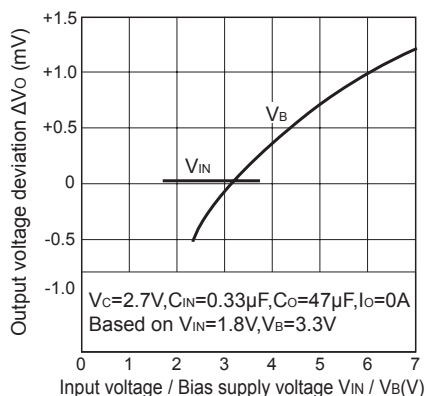


Fig.26 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (PQ010FZ01ZxH)

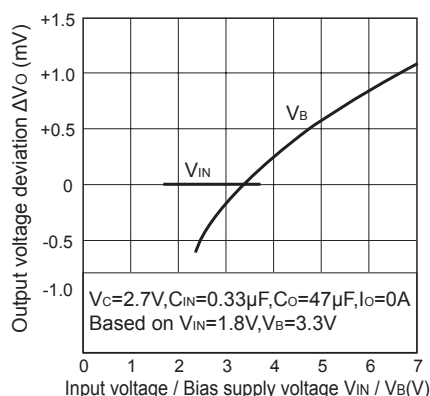


Fig.27 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (PQ012FZ5MZxH)

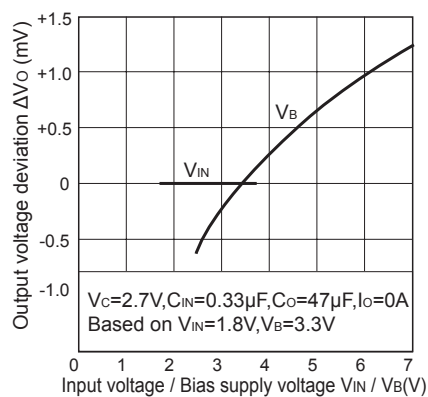


Fig.28 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (PQ012FZ01ZxH)

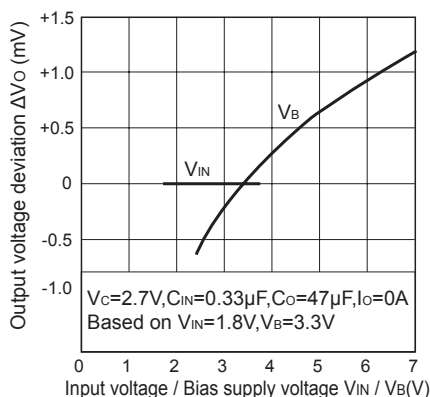


Fig.29 Output Voltage Deviation vs. Output Current

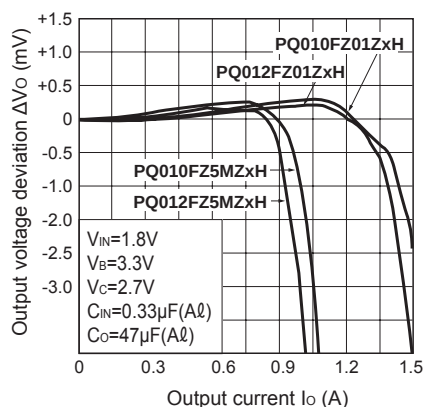


Fig.30 Ripple Rejection vs. Input Ripple Frequency (PQ010FZ5MZxH / PQ010FZ01ZxH)

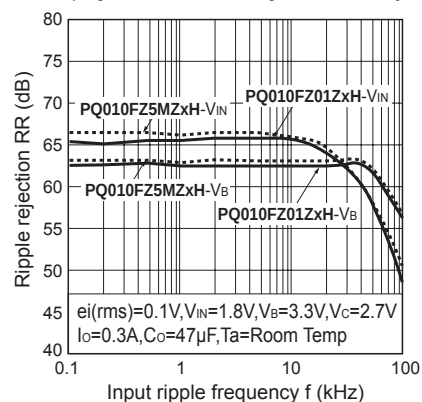


Fig.31 Ripple Rejection vs. Input Ripple Frequency (PQ012FZ5MZxH / PQ012FZ01ZxH)

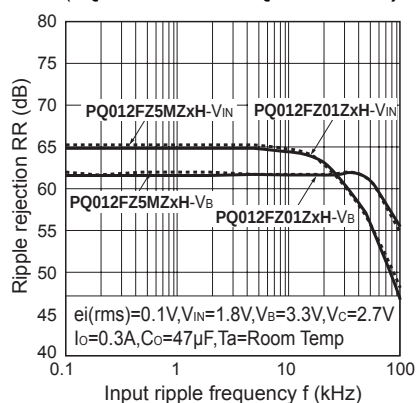


Fig.32 Ripple Rejection vs. Output Current (PQ010FZ5MZxH / PQ010FZ01ZxH)

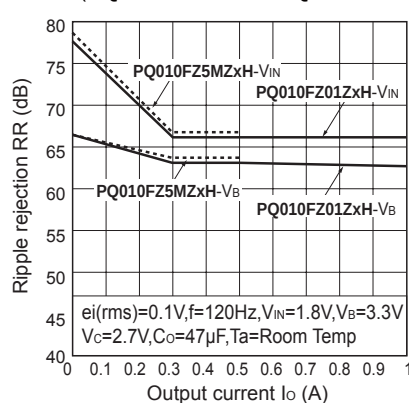


Fig.33 Ripple Rejection vs. Output Current (PQ012FZ5MZxH / PQ012FZ01ZxH)

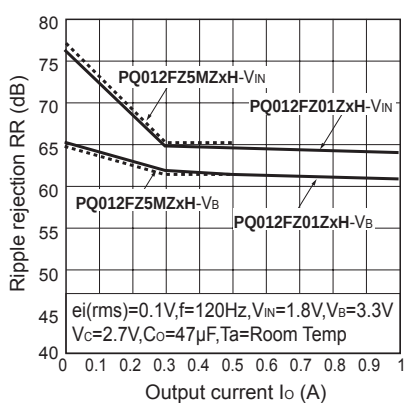


Fig.34 Typical Application

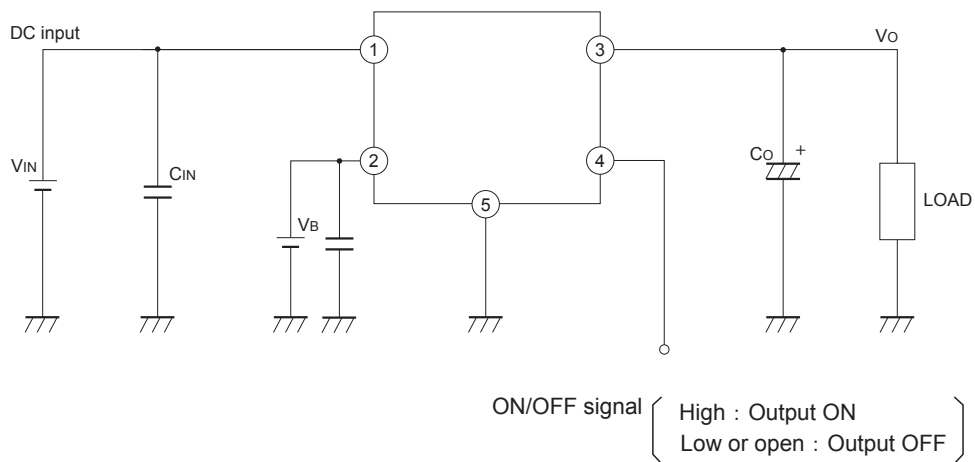
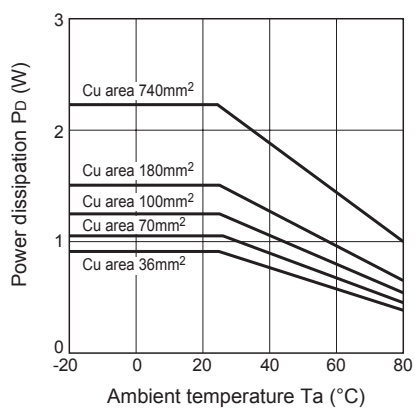
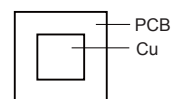


Fig.35 Power Dissipation vs. Ambient Temperature (Typical Value)



Mounting PCB



Material : Glass-cloth epoxy resin  
Size : 50×50×1.6mm  
Cu thickness : 35μm