

PQ015YZ5MZ Series/PQ015YZ01Z Series

Low Voltage Operation, Low Power-Loss Voltage Regulators (SC-63 Package)

Features

- Low voltage operation (Minimum operating voltage: 1.7V)
1.8V input → available 1.0 to 1.5V output
- Variable output voltage type
- Surface mount package (equivalent to EIAJ SC-63)

Applications

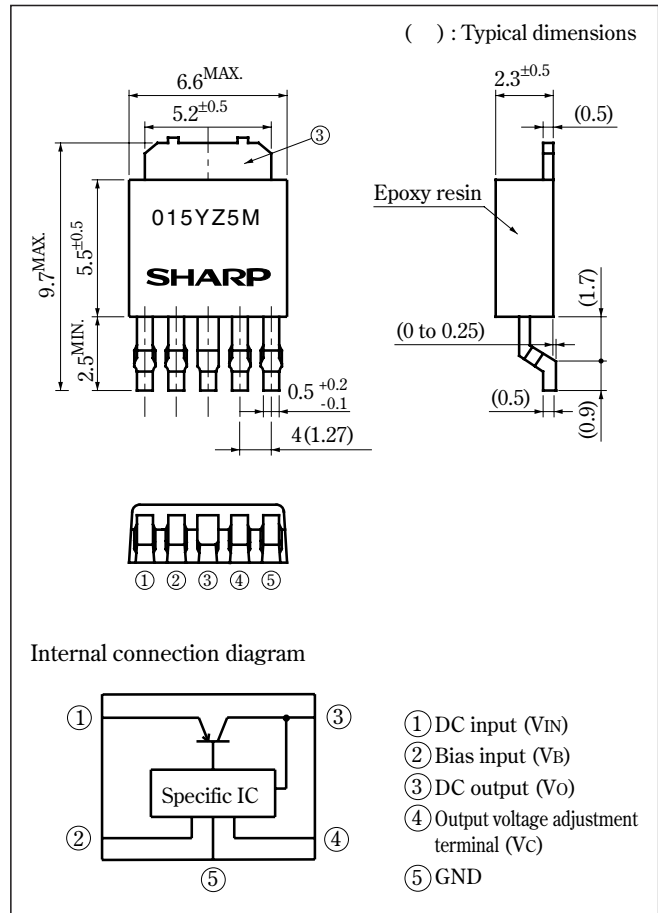
- Personal computers, power supply in peripherals
- Power supplies for various electronic equipment such as DVD player or STB

Model Line-up

| Output current (I _o) | Package type | Variable output |
|----------------------------------|--------------|--------------------|
| 0.5A | Taping | PQ015YZ5MZP |
| | Sleeve | PQ015YZ5MZZ |
| 1A | Taping | PQ015YZ01ZP |
| | Sleeve | PQ015YZ01ZZ |

Outline Dimensions

(Unit : mm)



Absolute Maximum Ratings

(T_a=25°C)

| Parameter | Symbol | Rating | Unit |
|--|------------------|-------------------|------|
| *1 Input voltage | V _{IN} | 3.7 | V |
| Bias supply voltage | V _B | 7 | V |
| *1 Output adjustment terminal voltage | V _{ADJ} | 5 | V |
| Output current | I _O | PQ015YZ5MZ series | 0.5 |
| | | PQ015YZ01Z series | 1 |
| *2 Power dissipation (with infinite heat sink) | P _D | 8 | W |
| *3 Junction temperature | T _j | 150 | °C |
| Operating temperature | T _{opr} | -25 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 T_j=125°C to 150°C

•Please refer to the chapter " Handling Precautions ".

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Internet Internet address for Electronic Components Group <http://sharp-world.com/ecg/>

Electrical Characteristics

(Unless otherwise specified, condition shall be (PQ015YZ5MZ))

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| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|--|---------------|---|-----------|-----------|------|------|
| Input voltage | V_{IN} | On condition that $1.0V \leq V_o \leq 1.2V$ | 1.7 | - | 3.7 | V |
| | | On condition that $1.2V \leq V_o \leq 1.5V$ | $V_o+0.5$ | - | 3.7 | |
| Bias supply voltage | V_B | - | 2.35 | - | 7 | V |
| Output voltage | V_o | - | 1.0 | - | 1.5 | V |
| Load regulation | R_{regL} | $I_o=5mA$ to 0.5A | - | 0.2 | 1 | % |
| | | $I_o=5mA$ to 1A | - | 0.2 | 1 | |
| Line regulation | R_{regI} | $V_{IN}=1.7$ to 3.7V, $V_B=2.35$ to 7V, $I_o=5mA$ | - | 0.2 | 1 | % |
| Ripple Rejection | RR_1 | Refer to Fig.2 | - | 65 | - | dB |
| | RR_2 | Refer to Fig.3 | - | 60 | - | dB |
| Reference voltage | V_{REF} | - | 0.97 | 1 | 1.03 | V |
| Temperature coefficient of reference voltage | $T_C V_{REF}$ | $T_j=0$ to 125°C, $I_o=5mA$ | - | ± 0.5 | - | % |
| Bias inflow current | I_B | - | - | 1.5 | 3 | mA |

Fig.1 Test Circuit

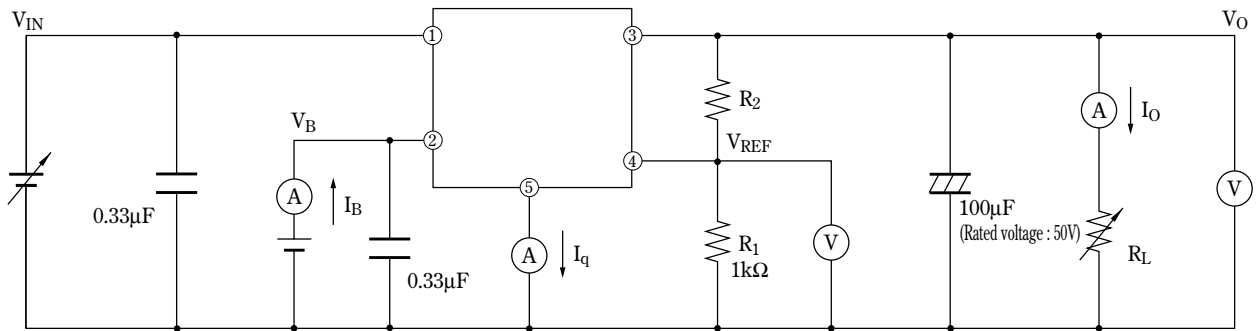


Fig.2 Test Circuit for Ripple Rejection (1)

$$V_o = V_{REF} \times (1 + R_2/R_1)$$

[$R_1=1k\Omega$, $V_{REF} \approx 1.0V$]

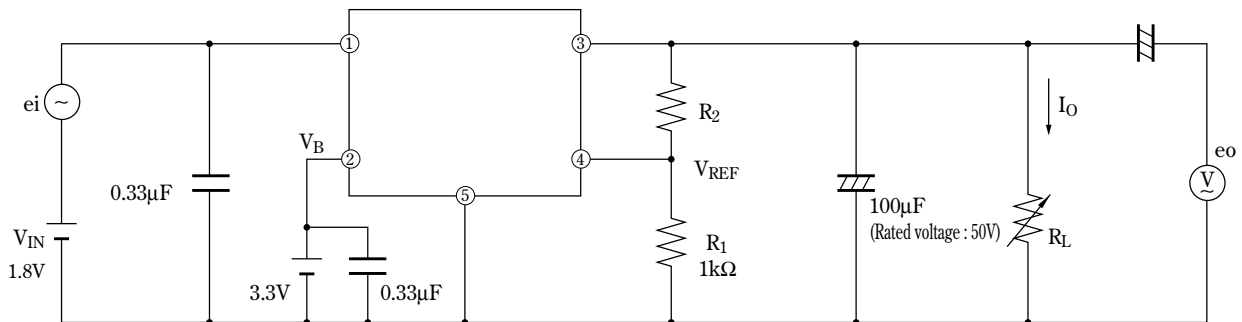
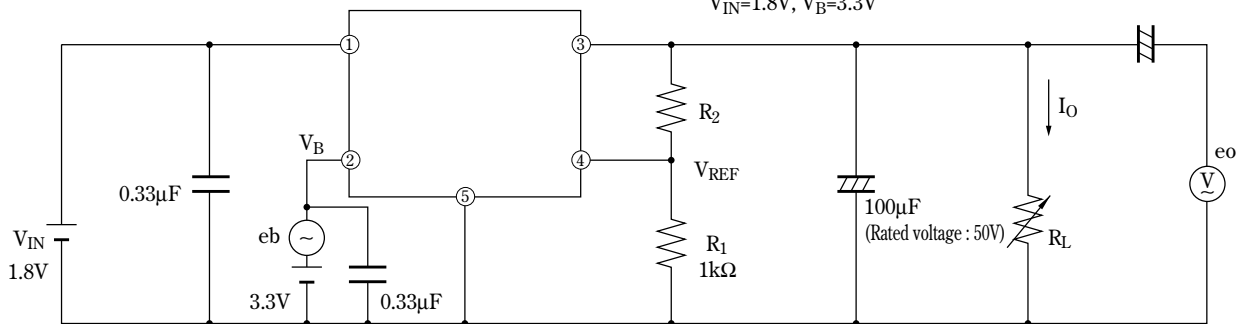


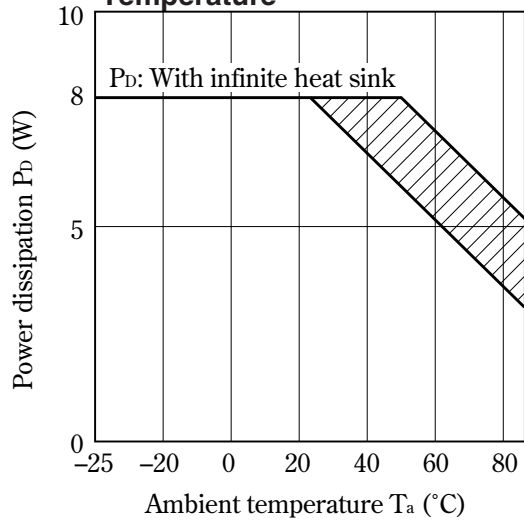
Fig.3 Test Circuit for Ripple Rejection (2)

$f=120Hz$ (sine wave)
 $e_i(rms)=0.1V$
 $V_{IN}=1.8V, V_B=3.3V$
 $I_o=0.3A$
 $RR=20\log(e_i(rms)/e_o(rms))$



$f=120Hz$ (sine wave)
 $e_b(rms)=0.1V$
 $V_{IN}=1.8V, V_B=3.3V$
 $I_o=0.3A$
 $RR=20\log(e_b(rms)/e_o(rms))$

Fig.4 Power Dissipation vs. Ambient Temperature



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

Fig.5 Overcurrent Protection Characteristics (PQ015YZ5MZ)

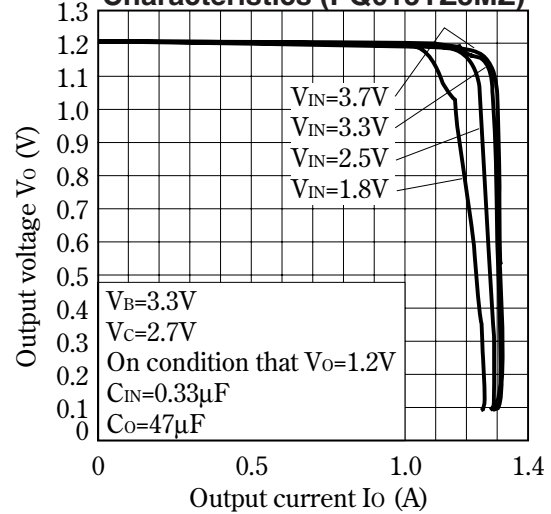


Fig.6 Overcurrent Protection Characteristics

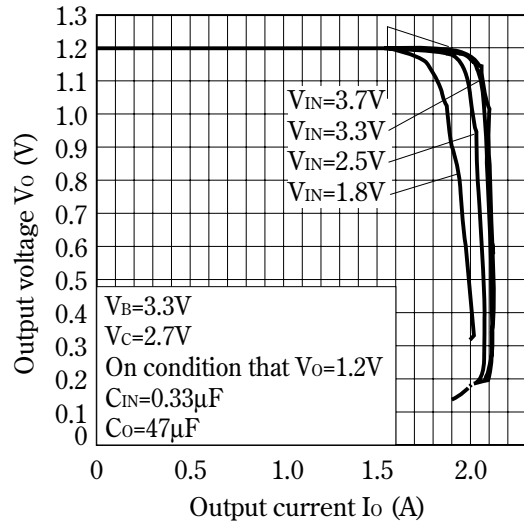


Fig.7 Reference Voltage vs. Ambient Temperature

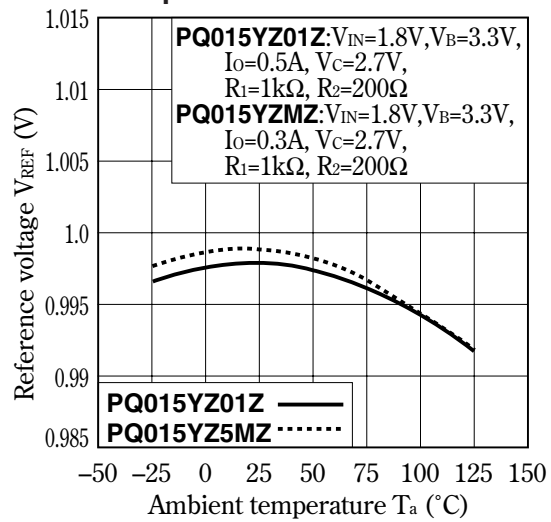


Fig.8 Bias Inflow Current vs. Ambient Temperature

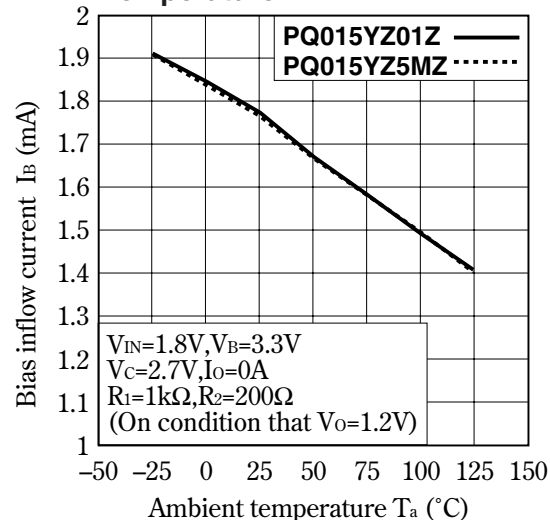


Fig.9 Output Short circuit Current vs. Ambient Temperature

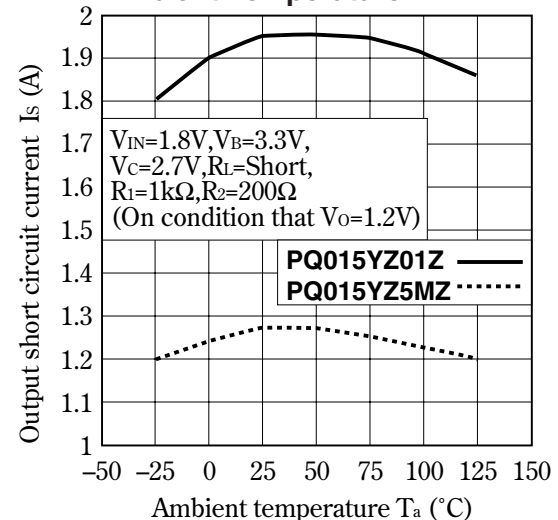


Fig.10 Output Voltage vs. Input Voltage (PQ015YZ5MZ)

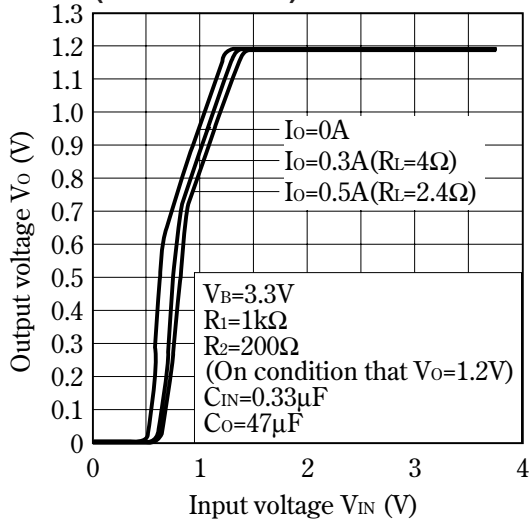


Fig.11 Output Voltage vs. Input Voltage (PQ015YZ01Z)

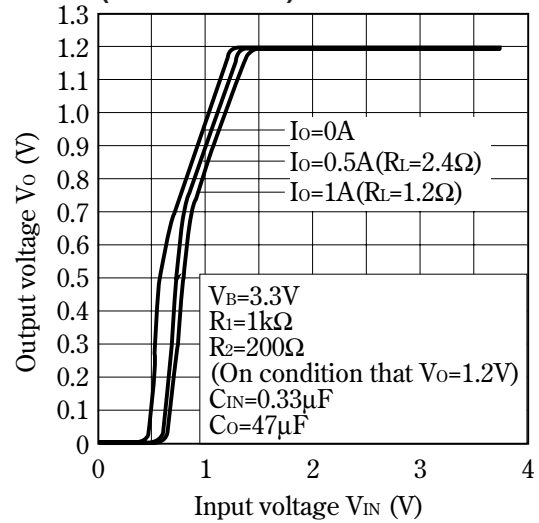


Fig.12 Output Voltage vs. Bias Supply Voltage (PQ015YZ5MZ)

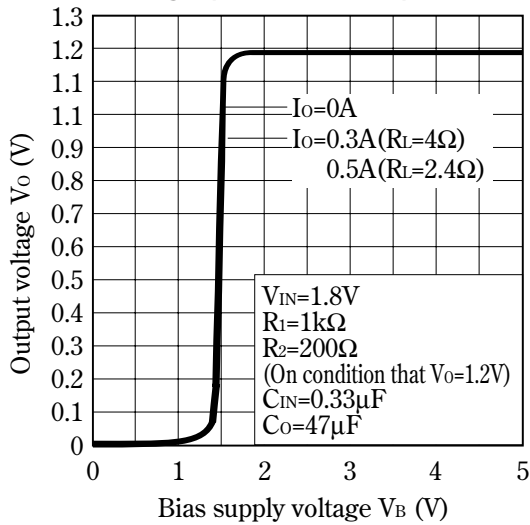


Fig.13 Output Voltage vs. Bias Supply Voltage (PQ015YZ01Z)

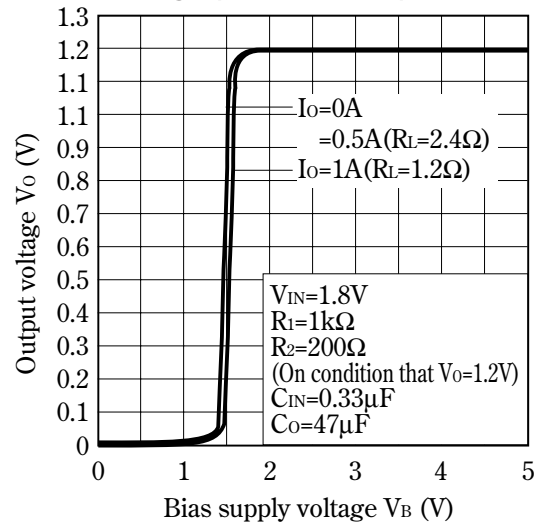


Fig.14 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ5MZ)

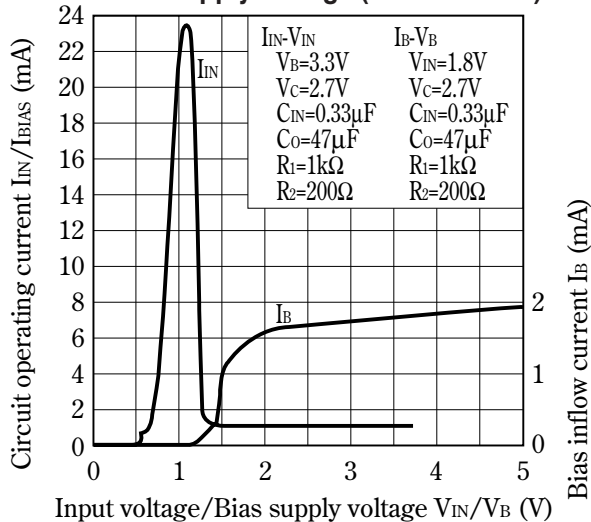


Fig.15 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ01Z)

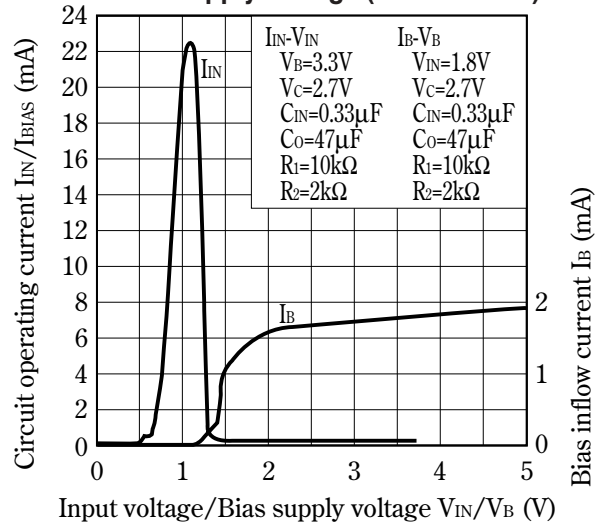


Fig.16 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ01Z)

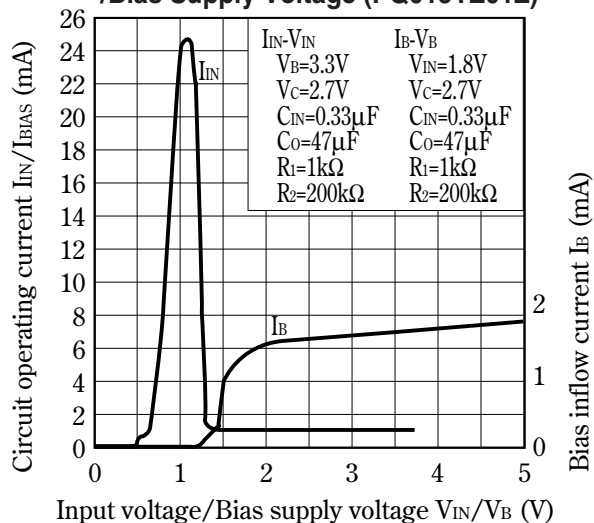


Fig.17 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ5MZ)

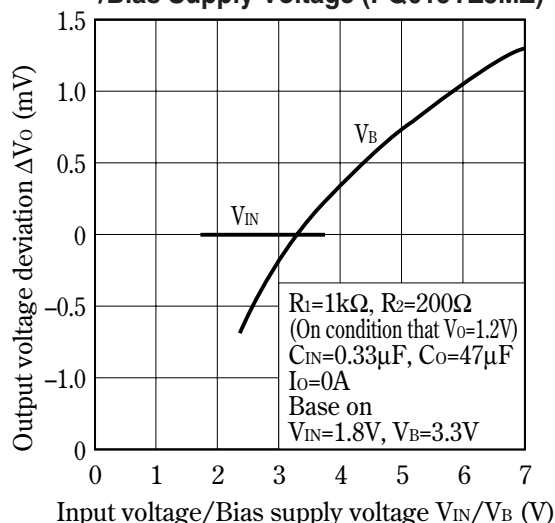


Fig.18 Output Voltage vs. Input Voltage/Bias Supply Voltage (PQ015YZ01Z)

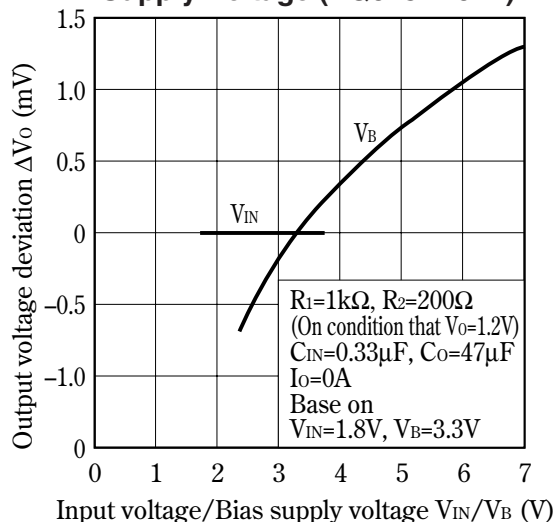


Fig.19 Output Voltage vs. Output Current

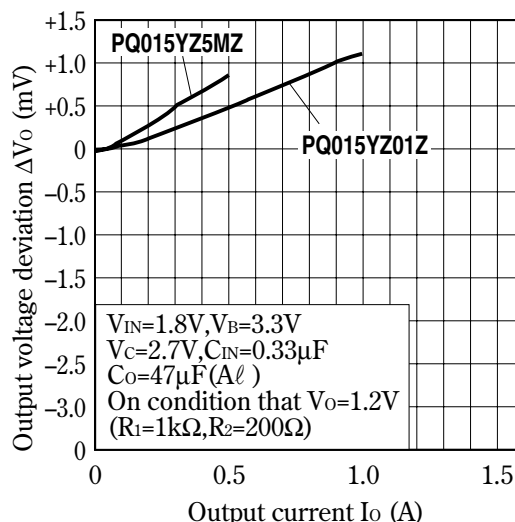


Fig.20 Ripple Rejection vs. Input Ripple Frequency

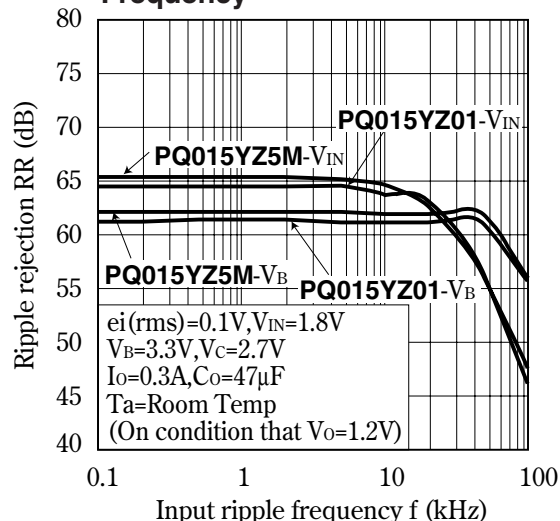


Fig.21 Ripple Rejection vs. Output Current

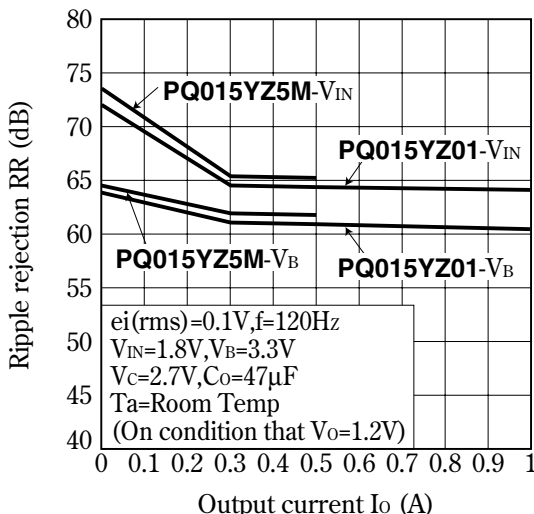


Fig.22 Typical Application

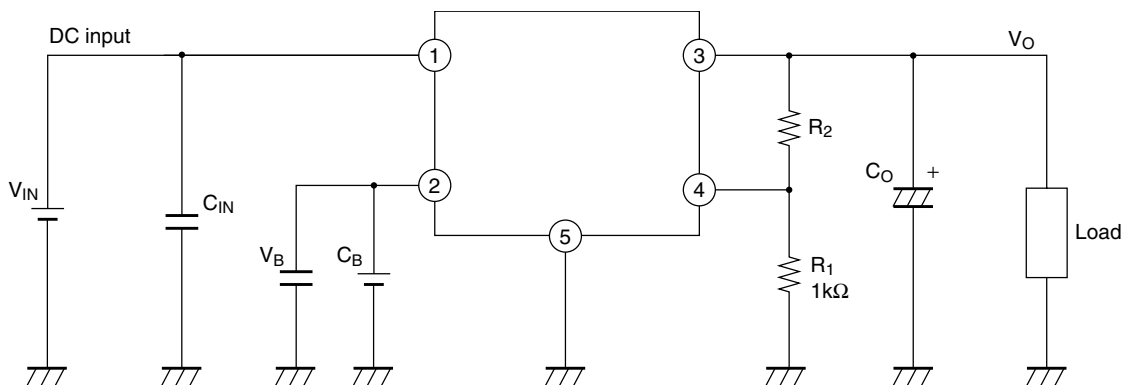
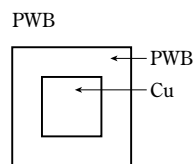
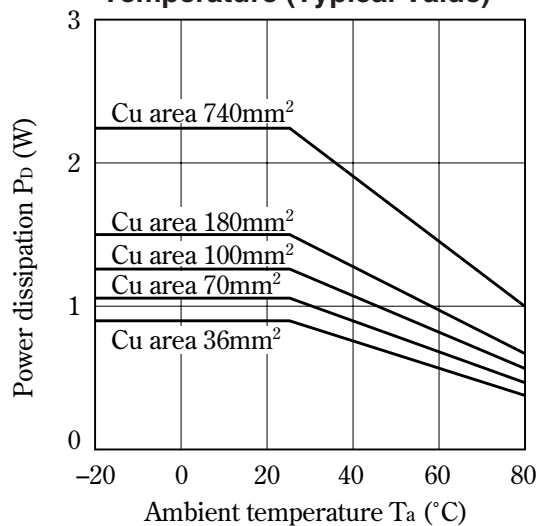
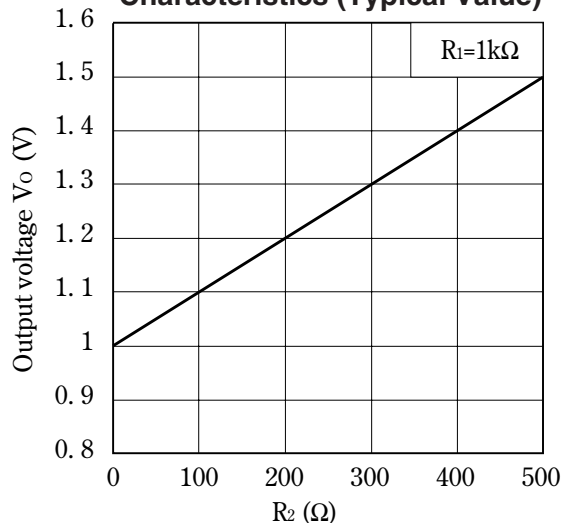


Fig.23 Power Dissipation vs. Ambient Temperature (Typical Value)



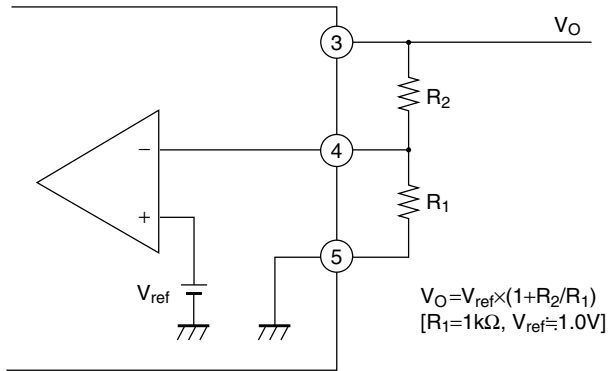
Material : Glass-cloth epoxy resin
 Size : 50×50×1.6mm
 Cu thickness : 35μm

Fig.24 Output Voltage Adjustment Characteristics (Typical Value)



■ Setting of Output Voltage

Output voltage is able to set from 1.0V to 1.5V when resistors R₁ and R₂ are attached to ③, ④, ⑤ terminals. As for the external resistors to set output voltage, refer to the figure below and Fig.24.



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