

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

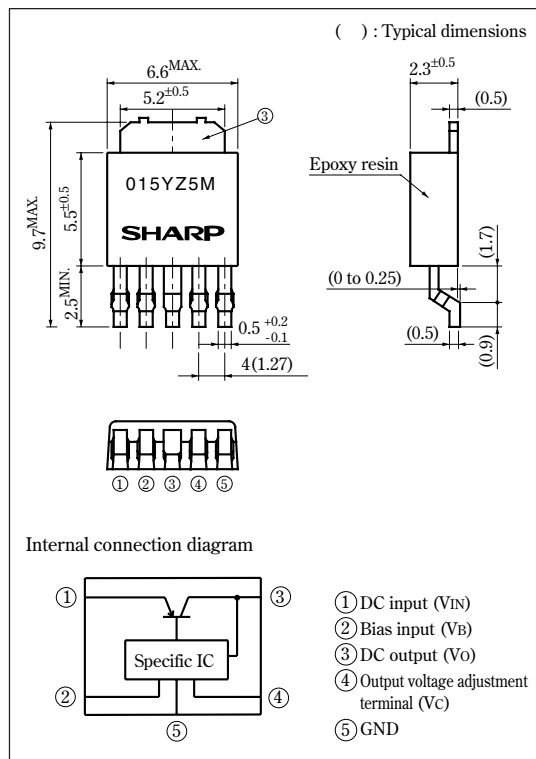
- Personal computers, power supply in peripherals
- Power supplies for various electronic equipment such as DVD player or STB

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

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

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	0.5	A
		1	
*2 Power dissipation (with infinite heat sink)	P_D	8	W
*3 Junction temperature	T_J	150	$^\circ\text{C}$
Operating temperature	T_{opr}	-25 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}	-40 to +150	$^\circ\text{C}$
Soldering temperature	T_{sol}	260 (10s)	$^\circ\text{C}$

*1 All are open except GND and applicable terminals

*2 P_D : With infinite heat sink

*3 Overheat protection may operate at $T_J=125^\circ\text{C}$ to 150°C

• Please refer to the chapter "Handling Precautions".

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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 $1A$				
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 $125^\circ C$, $I_O = 5mA$	–	± 0.5	–	%
Bias inflow current	I_B	–	–	1.5	3	mA

Fig.1 Test Circuit

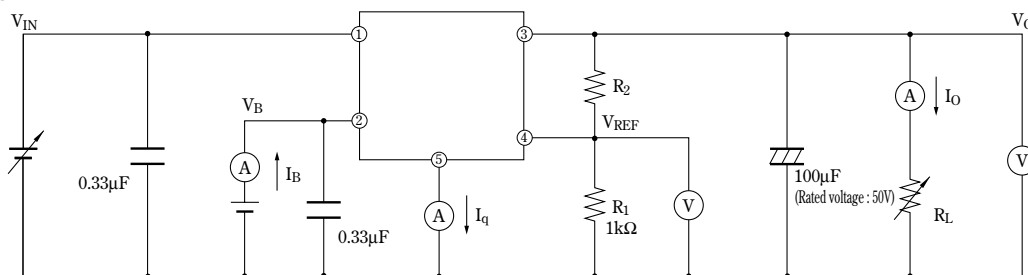


Fig.2 Test Circuit for Ripple Rejection (1)

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

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

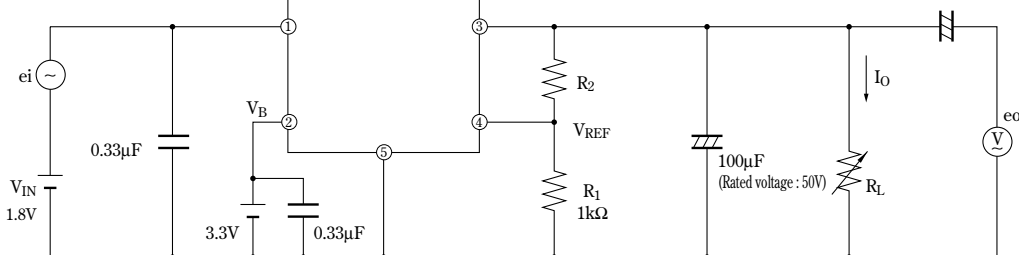


Fig.3 Test Circuit for Ripple Rejection (2)

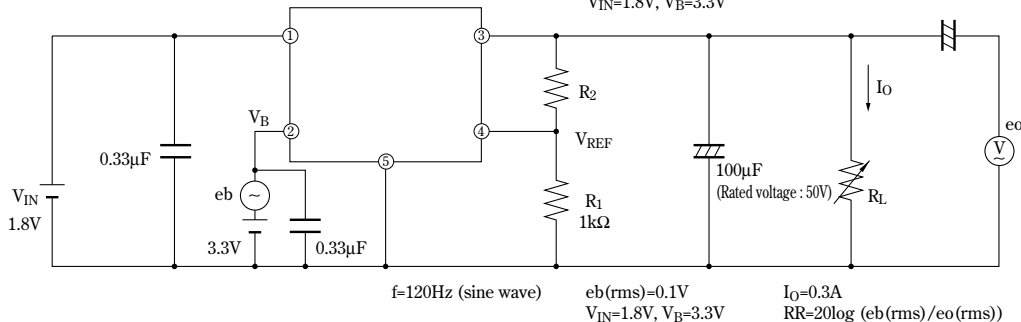
$$f = 120Hz \text{ (sine wave)}$$

$$e_i(\text{rms}) = 0.1V$$

$$V_{IN} = 1.8V, V_B = 3.3V$$

$$I_O = 0.3A$$

$$RR = 20 \log (e_i(\text{rms}) / e_o(\text{rms}))$$



$$f = 120Hz \text{ (sine wave)}$$

$$e_b(\text{rms}) = 0.1V$$

$$V_{IN} = 1.8V, V_B = 3.3V$$

$$I_O = 0.3A$$

$$RR = 20 \log (e_b(\text{rms}) / e_o(\text{rms}))$$

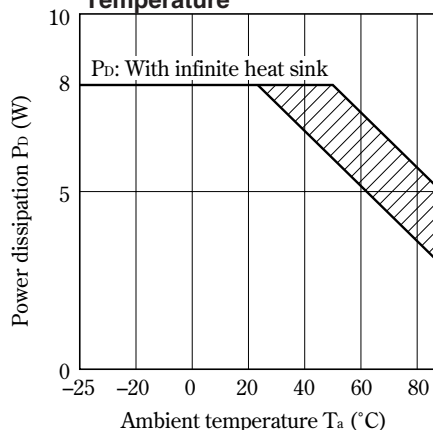
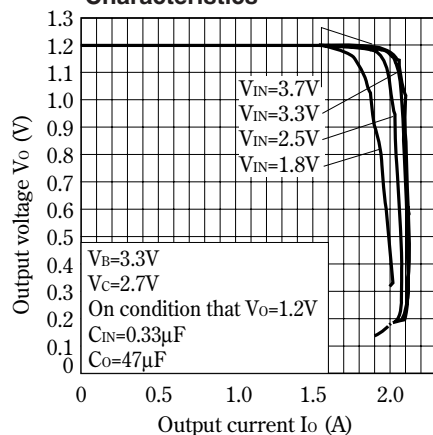
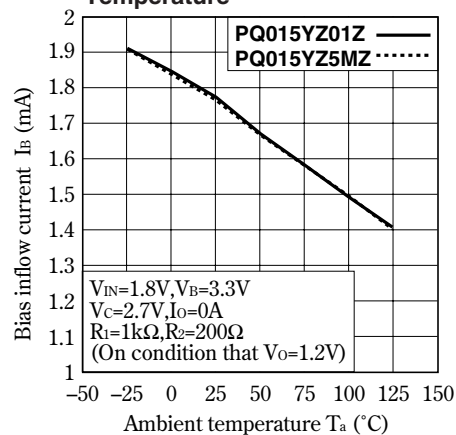
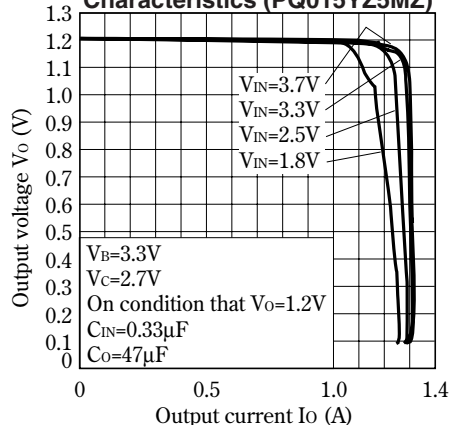
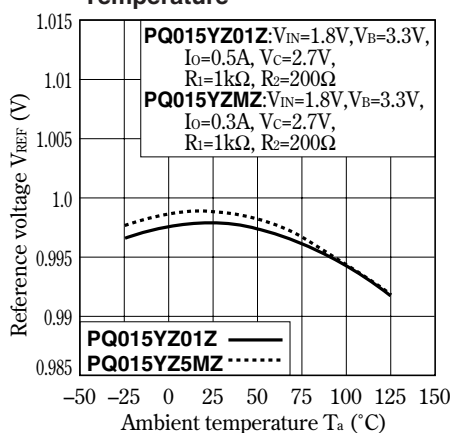
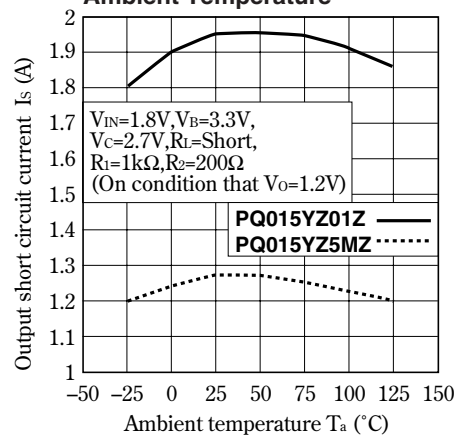
Fig.4 Power Dissipation vs. Ambient Temperature**Fig.6 Overcurrent Protection Characteristics****Fig.8 Bias Inflow Current vs. Ambient Temperature****Fig.5 Overcurrent Protection Characteristics (PQ015YZ5MZ)****Fig.7 Reference Voltage vs. Ambient Temperature****Fig.9 Output Short circuit Current vs. Ambient Temperature**

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

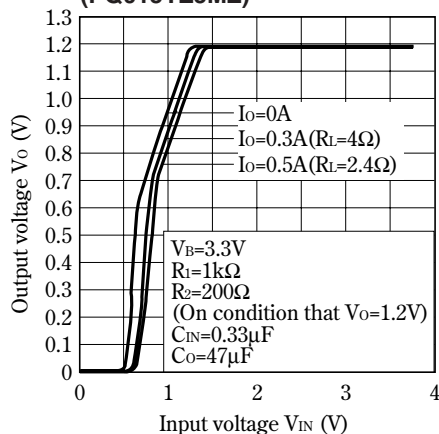


Fig.11 Output Voltage vs. Input Voltage (PQ015YZ01Z)

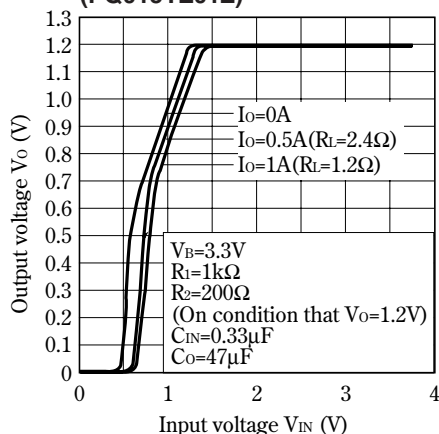


Fig.12 Output Voltage vs. Bias Supply Voltage (PQ015YZ5MZ)

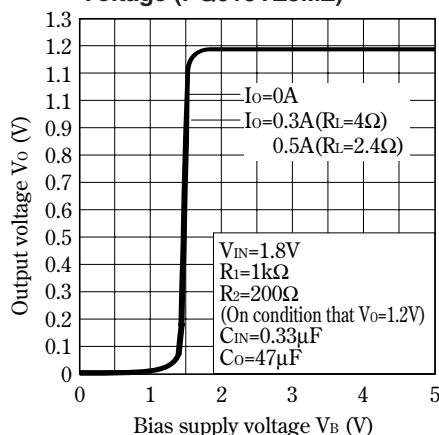


Fig.13 Output Voltage vs. Bias Supply Voltage (PQ015YZ01Z)

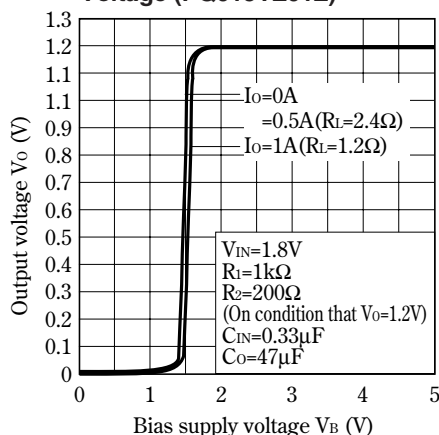


Fig.14 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ5MZ)

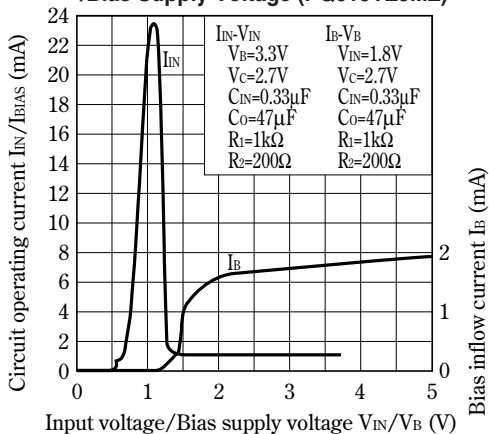


Fig.15 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ01Z)

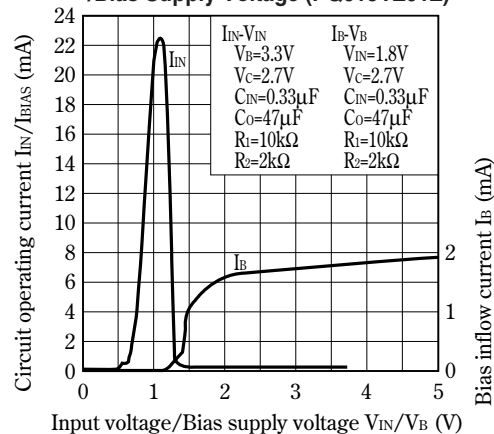


Fig.16 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ01Z)

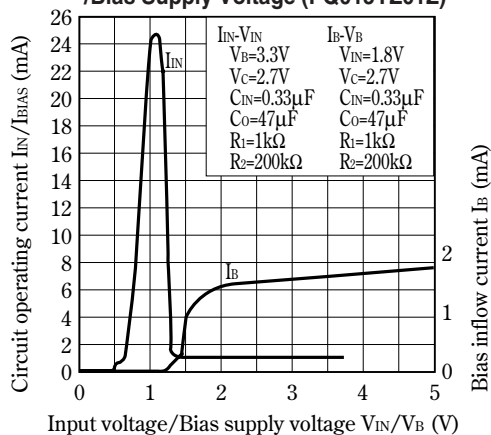


Fig.17 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ5MZ)

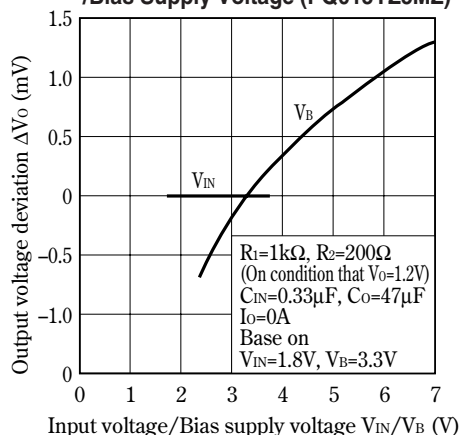


Fig.18 Output Voltage vs. Input Voltage/Bias Supply Voltage (PQ015YZ01Z)

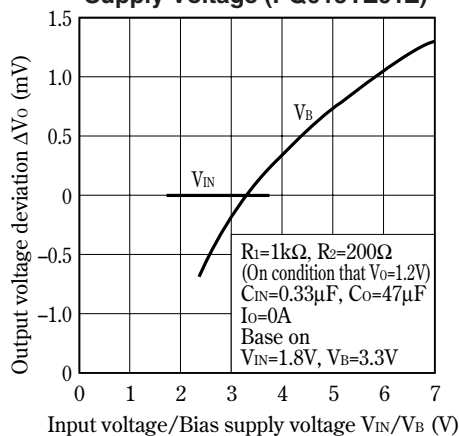


Fig.19 Output Voltage vs. Output Current

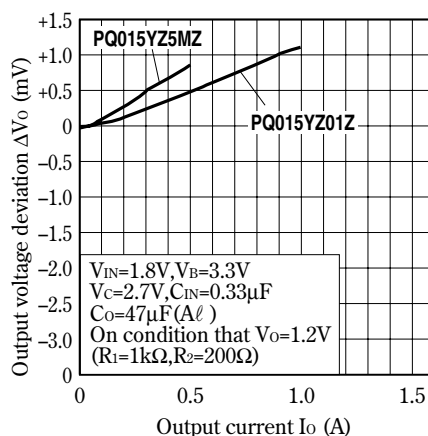


Fig.20 Ripple Rejection vs. Input Ripple Frequency

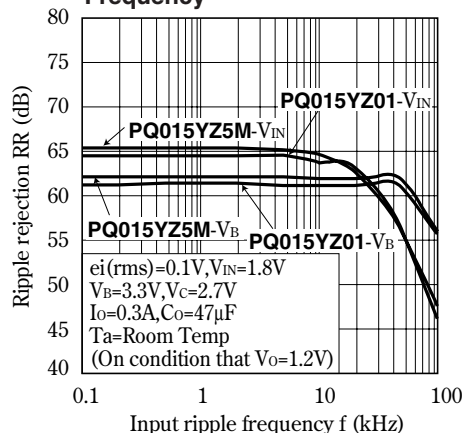


Fig.21 Ripple Rejection vs. Output Current

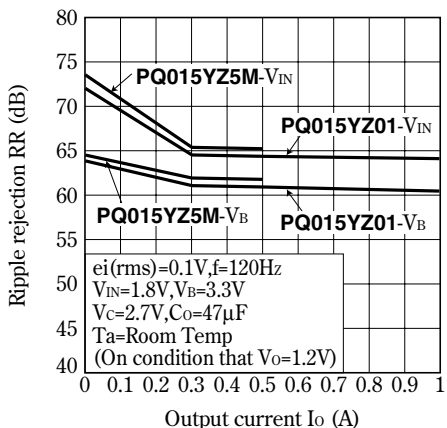


Fig.22 Typical Application

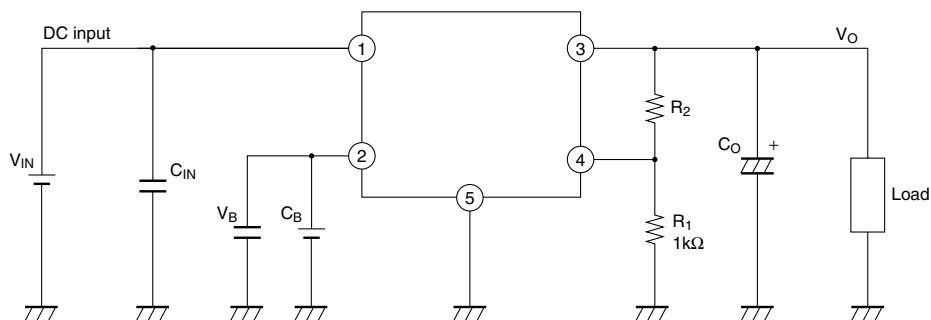
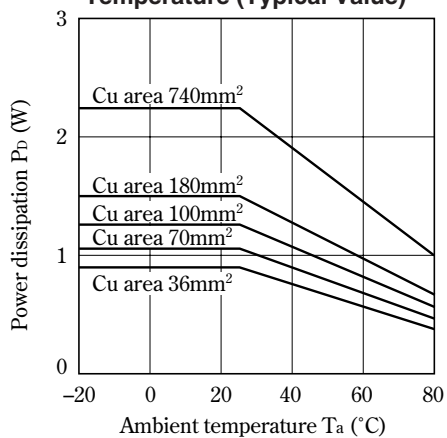
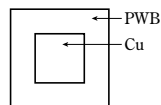


Fig.23 Power Dissipation vs. Ambient Temperature (Typical Value)

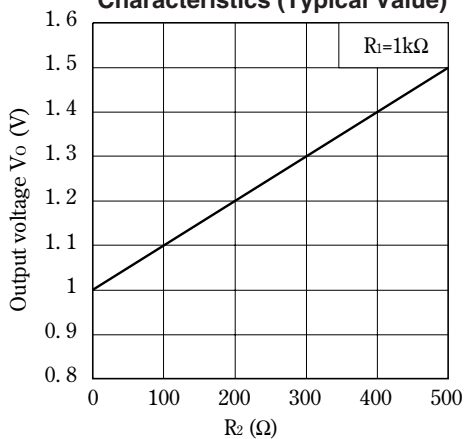


PWB



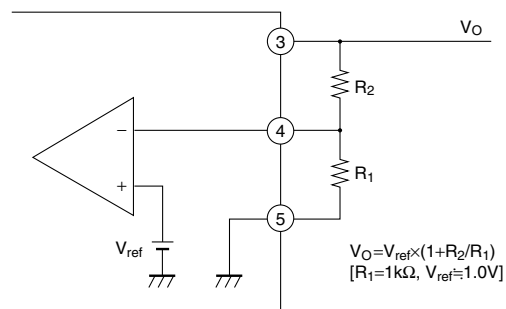
Material : Glass-cloth epoxy resin
 Size : 50×50×1.6mm
 Cu thickness : 35μm

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 R_1 and R_2 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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 - Alarm equipment
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