PQxxxFZ5MZ Series/PQxxxFZ01Z Series

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

■ Features

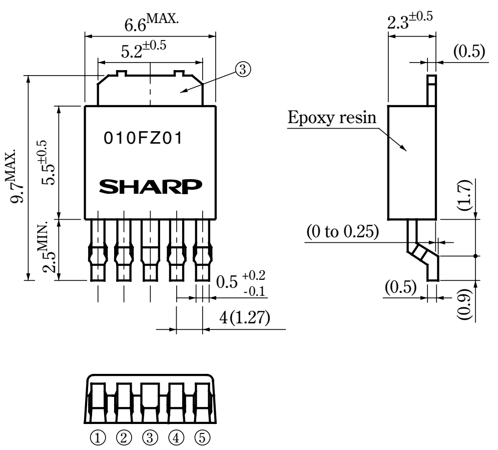
- Low voltage operation (Minimum operating voltage: 1.7V)
  1.8V input → available 1.0 to 1.2V output
- Surface mount package (equivalent to EIAJ SC-63)

■ Applications

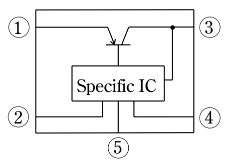
- Personal computers, power supply in peripherals
- Power supplies for various electronic equipment such as DVD player or STB

■ Outline Dimensions

(Unit : mm)



Internal connection diagram



① DC input (V_{IN})
② Bias input (V_B)
③ DC output (V_O)
④ ON/OFF control terminal (V_C)
⑤ GND

■ Model Line-up

Output current (I_O)	Package type	1.0V Output	1.2V Output
0.5A	Taping	**PQ010FZ5MZP**	**PQ012FZ5MZP**
	Sleeve	**PQ010FZ5MZZ**	**PQ012FZ5MZZ**
1A	Taping	**PQ010FZ01ZP**	**PQ012FZ01ZP**
	Sleeve	**PQ010FZ01ZZ**	**PQ012FZ01ZZ**

■ Absolute Maximum Ratings

(Ta=25°C)

	Parameter		Symbol	Rating	Unit
	Input voltage		V_{IN}	3.7	V
	Bias supply voltage		V_B	7	V
※1	Output Voltage		V_C	7	V
	Output current	PQxxxFZ5MZ series	I_O	0.5	A
		PQxxxFZ01Z series		1	
※2	Power dissipation		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 ".

■ Electrical Characteristics

(Unless otherwise specified, V_{IN}=1.8V, V_B=3.3V, I_O=0.3A, V_C=2.7V, T_a=25˚C(**PQxxxFZ5MZ**))
(Unless otherwise specified, V_{IN}=1.8V, V_B=3.3V, I_O=0.5A, V_C=2.7V, T_a=25˚C(**PQxxxFZ01Z**))

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 following table			V
Load regulation	**PQxxxFZ5MZ**	$R_{eg}L$	I_O=5mA to 0.5A	–	0.2	1	%
	PQxxxFZ01Z		I_O=5mA to 1A				
Line regulation		$R_{eg}I$	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_CV_O	T_j=0 to 125˚C, I_O=5mA	–	0.5	–	%/˚C
Ripple rejection		RR1	Refer to Fig.2	–	65	–	dB
		RR2	Refer to Fig.3	–	60	–	dB
※4 ON-state voltage for control		$V_{C\ (ON)}$	–		–	–	V
ON-state current for control		$I_{C\ (ON)}$	–	2	–	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
Bias inflow current		I_B	I_O=0	–	1.5	3	mA
Output OFF-state dissipation current		I_{qs}	I_O=0, V_C=0.4V	–	–	10	µA

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

■ Output Voltage Line-up

(Unless otherwise specified, V_{IN}=1.8V, V_B=3.3V, I_O=0.3A, V_C=2.7V, T_a=25˚C(**PQxxxFZ5MZ**))
(Unless otherwise specified, V_{IN}=1.8V, V_B=3.3V, I_O=0.5A, V_C=2.7V, T_a=25˚C(**PQxxxFZ01Z**))

Model No.	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
PQ010FZ5MZ/PQ010FZ01Z	V_O	–	0.97	1.0	1.03	V
PQ012FZ5MZ/PQ012FZ01Z	V_O	–	1.17	1.2	1.23	

Fig.1 Test Circuit

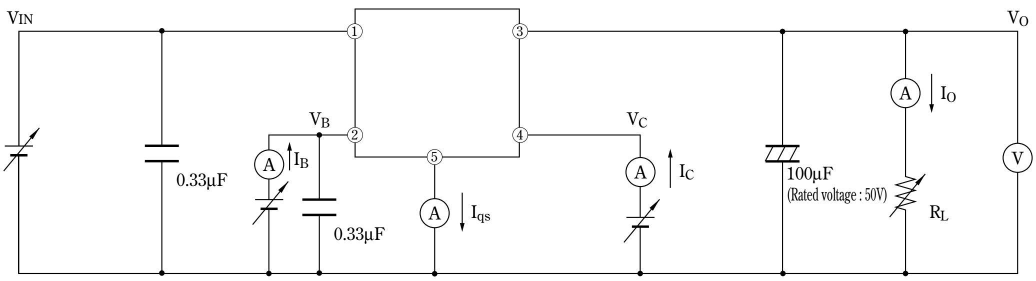
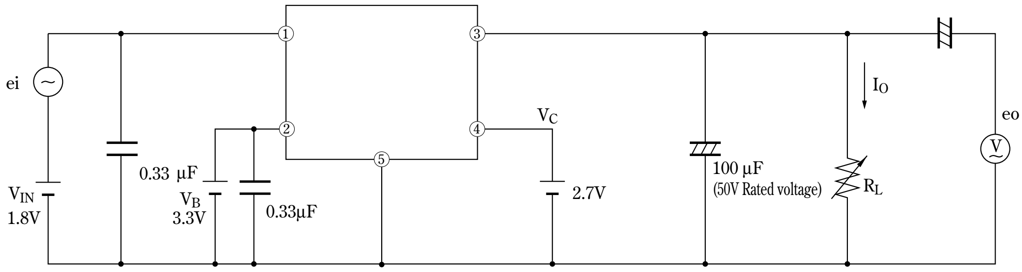
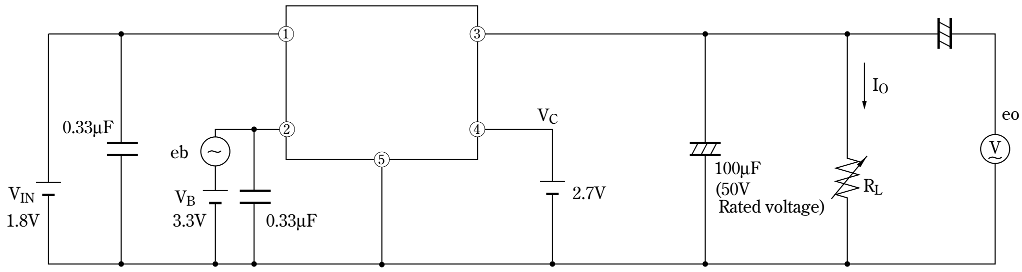


Fig.2 Test Circuit for Ripple Rejection



f=120Hz (sine wave)
ei (rms)=0.1V
V_{IN}=1.8V, V_B=3.3V
I_O=0.3A
RR=20log (ei(rms)/eo(rms))

Fig.3 Test Circuit for Ripple Rejection



f=120Hz (sine wave)
ei (rms)=0.1V
V_{IN}=1.8V, V_B=3.3V
I_O=0.3A
RR=20log (ei(rms)/eo(rms))

Fig.4 Power Dissipation vs. Ambient Temperature

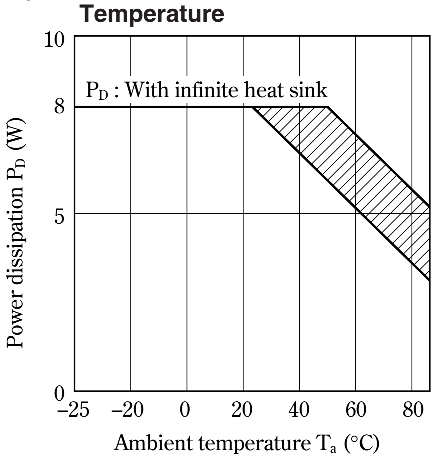


Fig.5 Overcurrent Protection Characteristics (PQ010FZ5MZ)

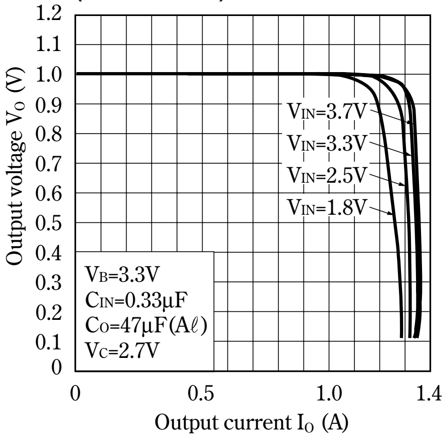


Fig.6 Overcurrent Protection Characteristics (PQ012FZ5MZ)

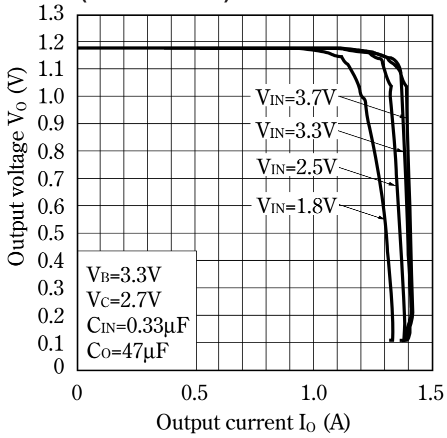


Fig.7 Overcurrent Protection Characteristics (PQ010FZ01Z)

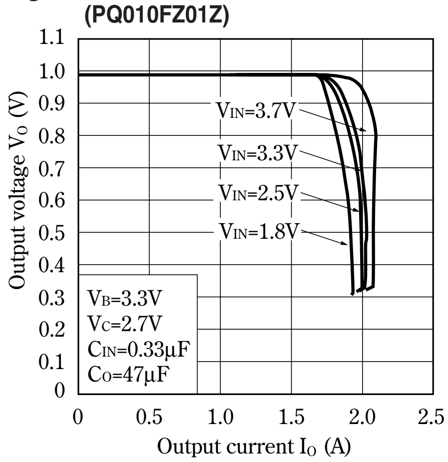


Fig.8 Overcurrent Protection Characteristics (PQ012FZ01Z)

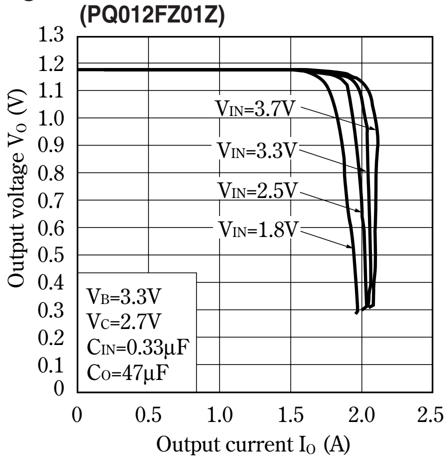


Fig.9 Output Voltage vs. Ambient Temperature (PQ010FZ5MZ / PQ010FZ01Z)

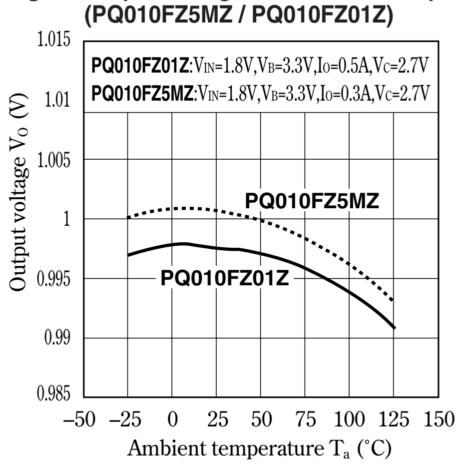


Fig.10 Output Voltage vs. Ambeint Temperature (PQ012FZ5MZ / PQ012FZ01Z)

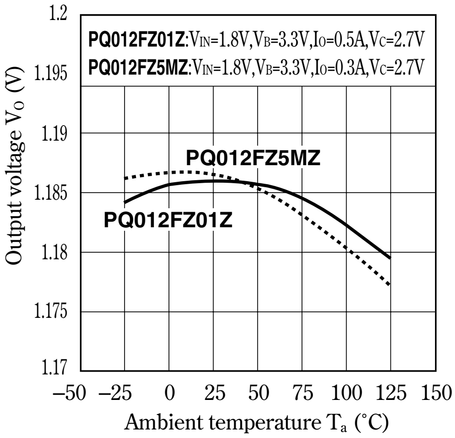


Fig.11 Bias Inflow Current vs. Ambient Temperature

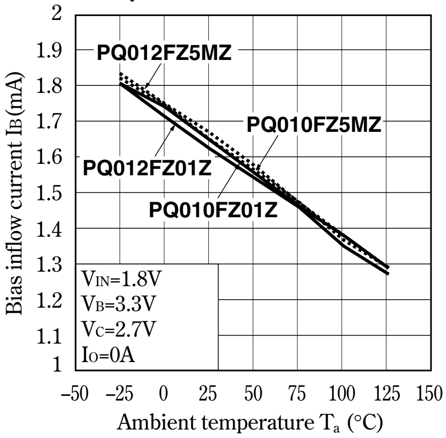


Fig.12 Output Short-circuit Current vs. Ambient Temperature (Reference)

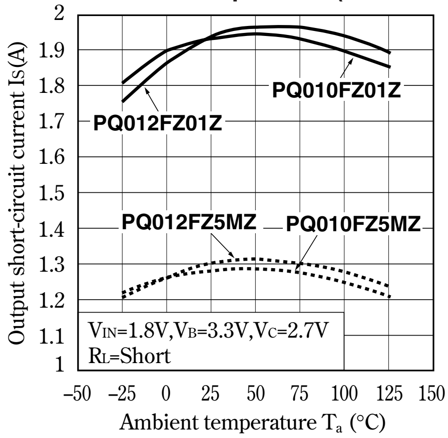


Fig.13 Output Voltage vs. Input Voltage (PQ010FZ5MZ)

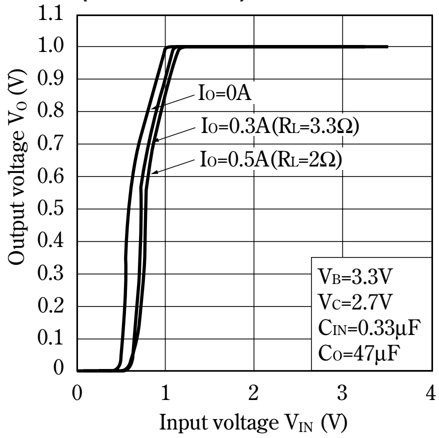


Fig.14 Output Voltage vs. Input Voltage (PQ012FZ5MZ)

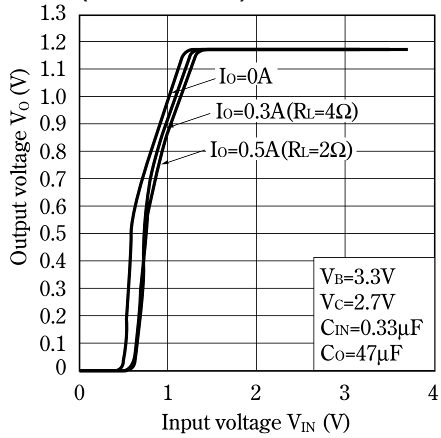


Fig.15 Output Voltage vs. Input Voltage (PQ010FZ01Z)

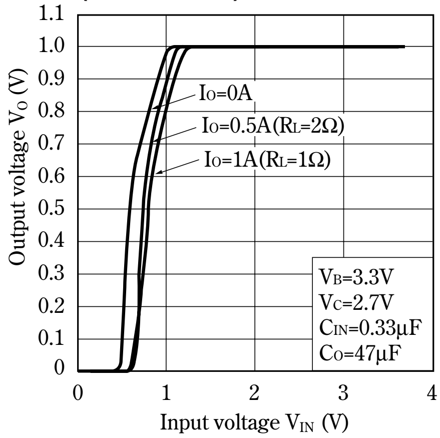


Fig.16 Output Voltage vs. Input Voltage (PQ012FZ01Z)

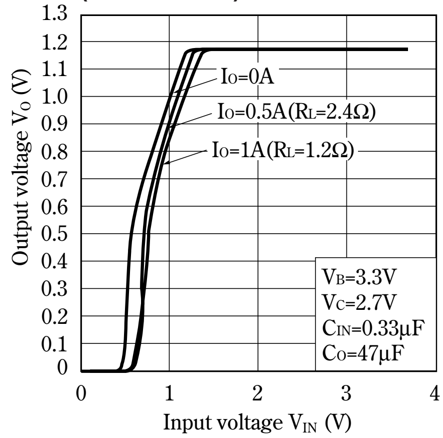


Fig.17 Output Voltage vs. Bias Supply Voltage (PQ010FZ5MZ)

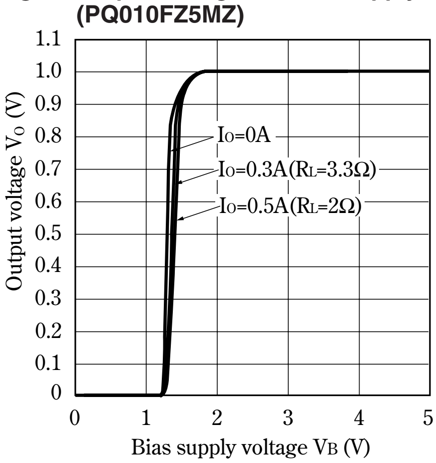


Fig.18 Output Voltage vs. Bias Supply Voltage (PQ012FZ5MZ)

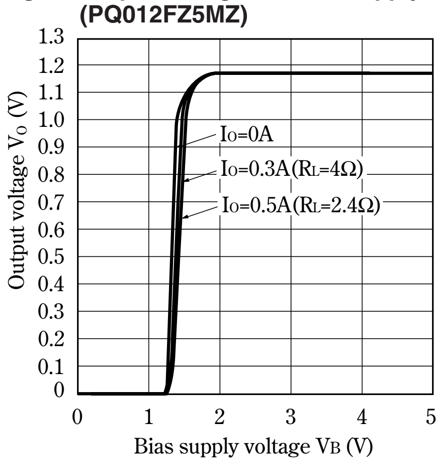


Fig.19 Output Voltage vs. Bias Supply Voltage (PQ010FZ01Z)

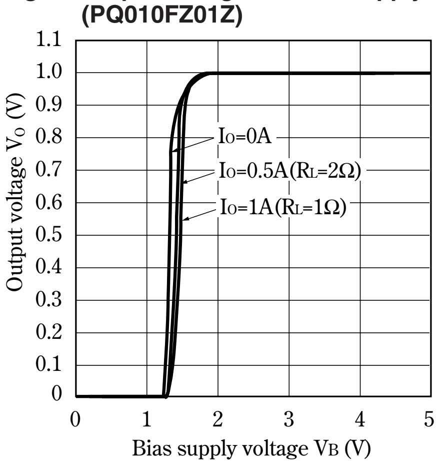


Fig.20 Output Voltage vs. Bias Supply Voltage (PQ012FZ01Z)

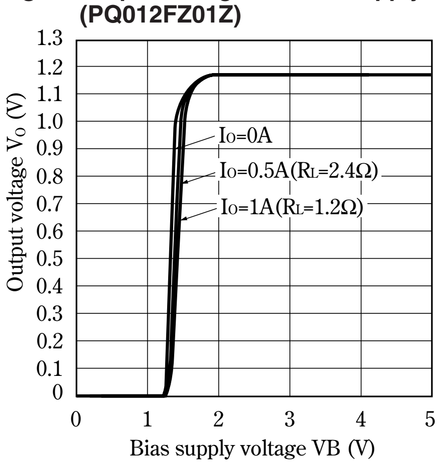


Fig.21 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ010FZ5MZ)

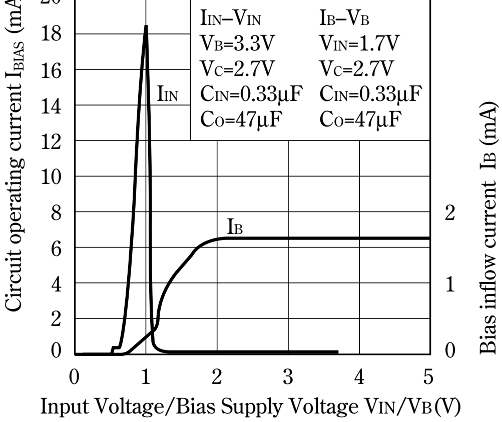


Fig.22 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ012FZ5MZ)

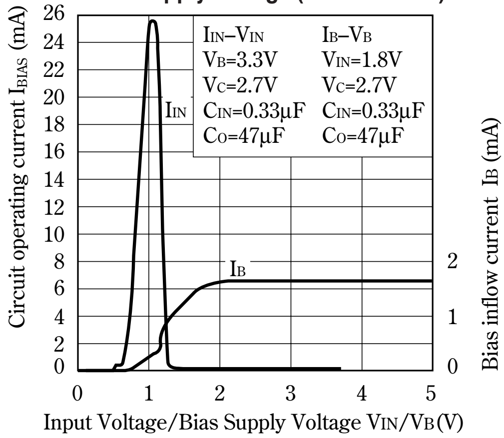


Fig.23 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ010FZ01Z)

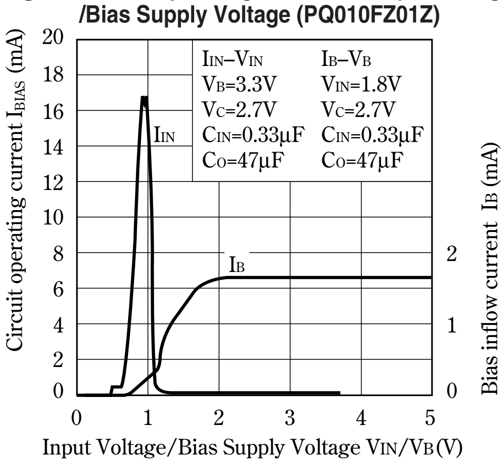


Fig.24 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ012FZ01Z)

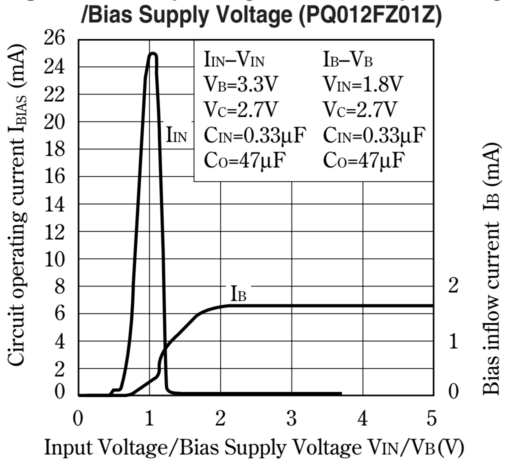


Fig.25 Output Voltage vs. Input Voltage / Bias Supply Voltage (PQ010FZ5MZ)

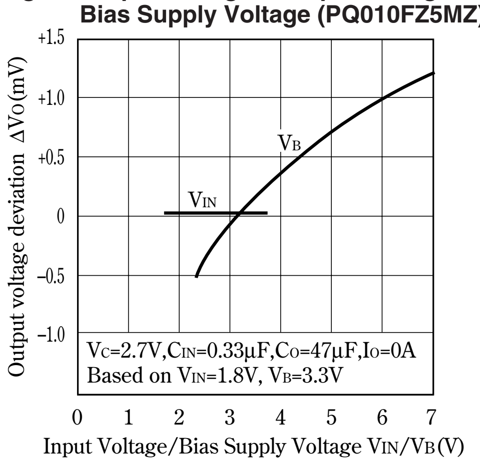


Fig.26 Output Voltage vs. Input Voltage / Bias Supply Voltage (PQ010FZ01Z)

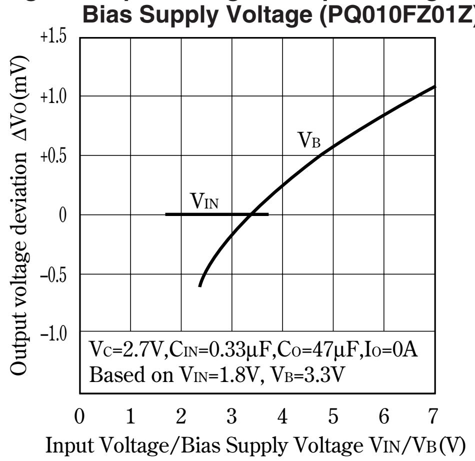


Fig.27 Output Voltage vs. Input Voltage / Bias Supply Voltage (PQ012FZ5MZ)

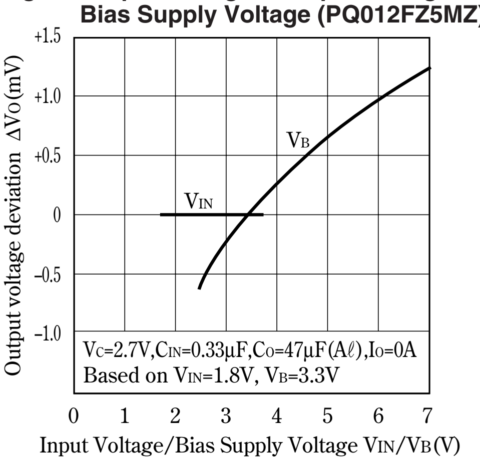


Fig.28 Output Voltage vs. Input Voltage / Bias Supply Voltage (PQ012FZ01Z)

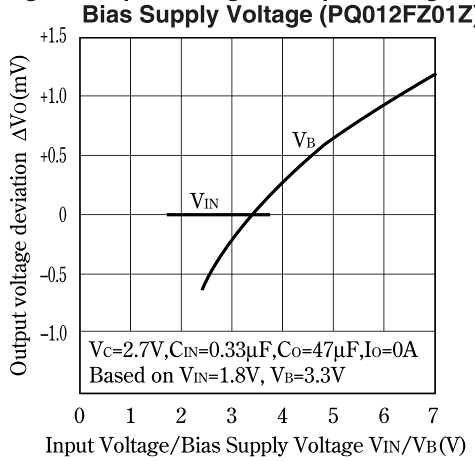


Fig.29 Output Voltage vs. Output Current

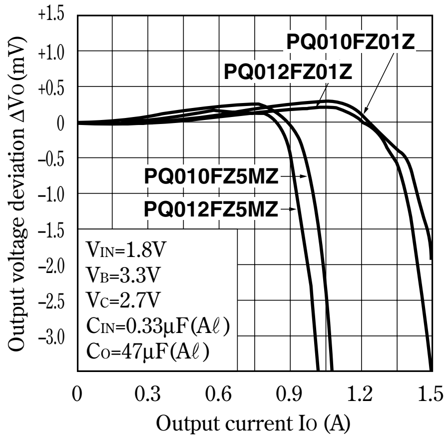


Fig.30 Ripple Rejection vs. Input Ripple Frequency(PQ010FZ5MZ/PQ010FZ01Z)

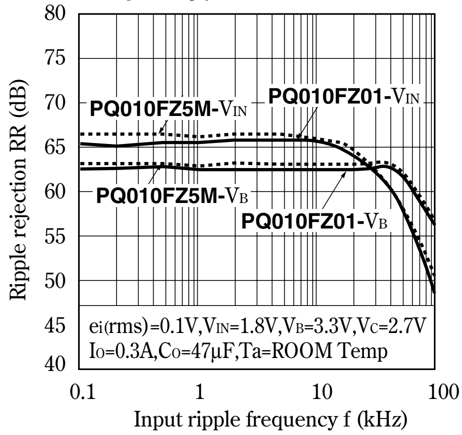


Fig.31 Ripple Rejection vs. Input Ripple Frequency(PQ012FZ5MZ/PQ012FZ01Z)

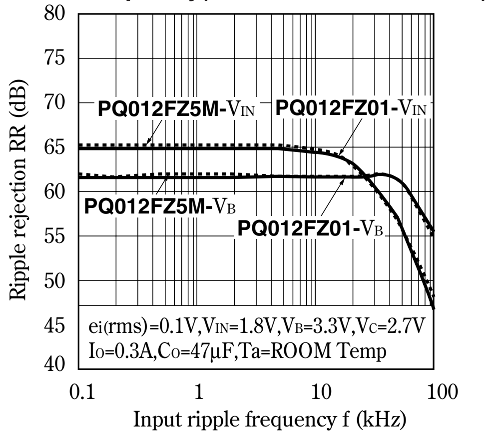


Fig.32 Ripple Rejection vs. Output Current (PQ010FZ5MZ / PQ010FZ01Z)

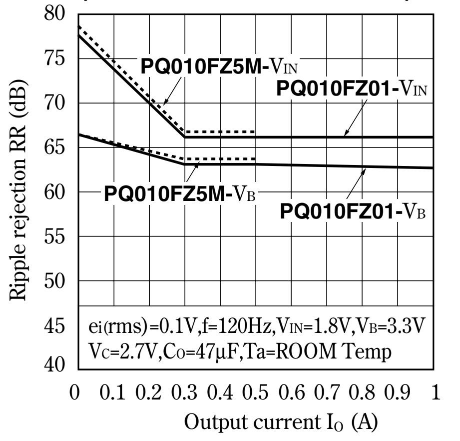


Fig.33 Ripple Rejection vs. Output Current (PQ010FZ5MZ / PQ010FZ01Z)

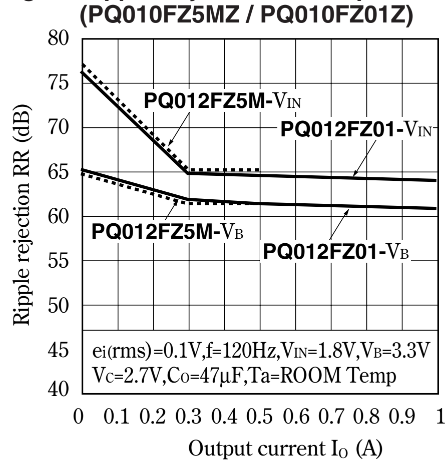


Fig.34 Typical Application

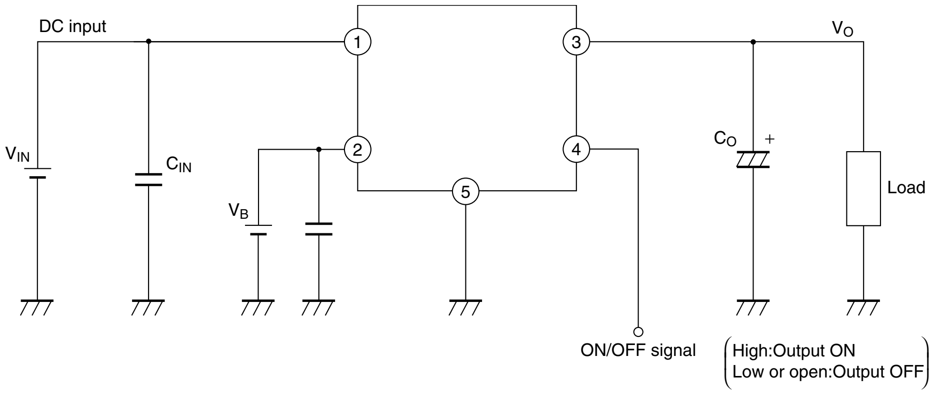
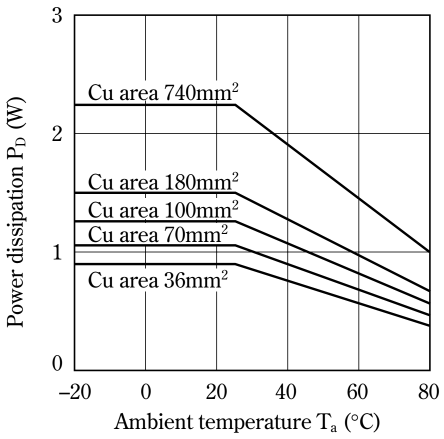
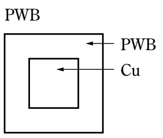


Fig.35 Power Dissipation vs. Ambient Temperature (Typical Value)





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

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--- Office automation equipment
--- Telecommunication equipment [terminal]
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--- Industrial control
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--- Consumer electronics

(ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
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--- Traffic signals
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--- Alarm equipment
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