

# 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

## Model Line-up

Output current (I <sub>o</sub> )	Package type	1.0V Output	1.2V Output
0.5A	Taping	<b>PQ010FZ5MZP</b>	<b>PQ012FZ5MZP</b>
	Sleeve	<b>PQ010FZ5MZZ</b>	<b>PQ012FZ5MZZ</b>
1A	Taping	<b>PQ010FZ01ZP</b>	<b>PQ012FZ01ZP</b>
	Sleeve	<b>PQ010FZ01ZZ</b>	<b>PQ012FZ01ZZ</b>

## Absolute Maximum Ratings

(T<sub>a</sub>=25°C)

Parameter	Symbol	Rating	Unit
Input voltage	V <sub>IN</sub>	3.7	V
Bias supply voltage	V <sub>B</sub>	7	V
*1 Output 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

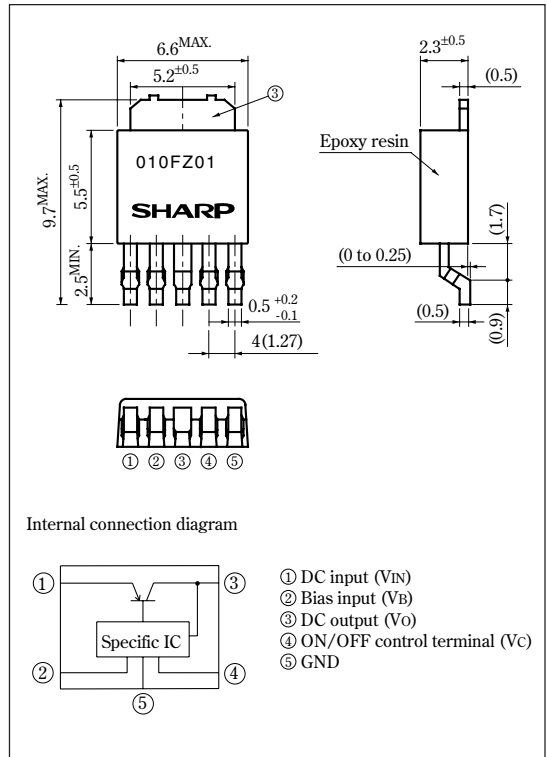
\*1 All are open except GND and applicable terminals.

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

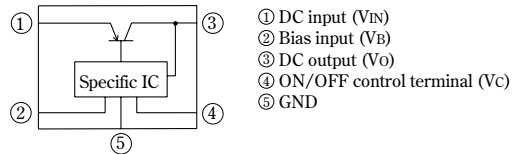
\*3 Overheat protection may operate at T<sub>j</sub>=125°C to 150°C.

## Outline Dimensions

(Unit : mm)



Internal connection diagram



• Please refer to the chapter " Handling Precautions ".

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**Electrical Characteristics** (Unless otherwise specified,  $V_{IN}=1.8V$ ,  $V_B=3.3V$ ,  $I_O=0.3A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$  (PQxxxFZ5MZ))  
 (Unless otherwise specified,  $V_{IN}=1.8V$ ,  $V_B=3.3V$ ,  $I_O=0.5A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$  (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	$I_O=5mA$ to $0.5A$	-	0.2	1	%
	PQxxxFZ01Z					
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	$TcV_O$	$T_j=0$ to $125^\circ C$ , $I_O=5mA$	-	0.5	-	%/ $^\circ C$
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	$\mu A$
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	$I_B$	$I_O=0$	-	1.5	3	mA
Output OFF-state dissipation current	$I_{qs}$	$I_O=0$ , $V_C=0.4V$	-	-	10	$\mu A$

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

**Output Voltage Line-up** (Unless otherwise specified,  $V_{IN}=1.8V$ ,  $V_B=3.3V$ ,  $I_O=0.3A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$  (PQxxxFZ5MZ))  
 (Unless otherwise specified,  $V_{IN}=1.8V$ ,  $V_B=3.3V$ ,  $I_O=0.5A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$  (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

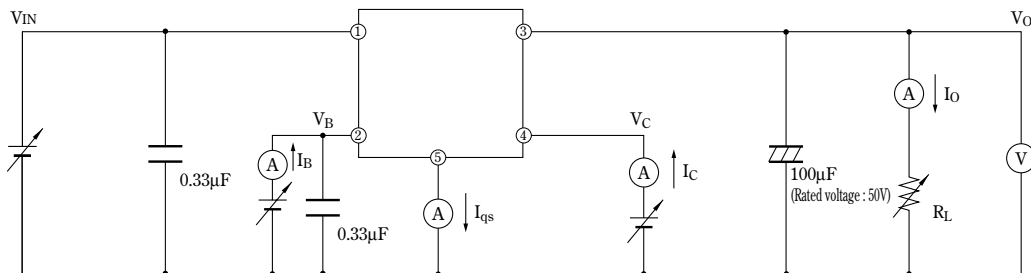


Fig.2 Test Circuit for Ripple Rejection

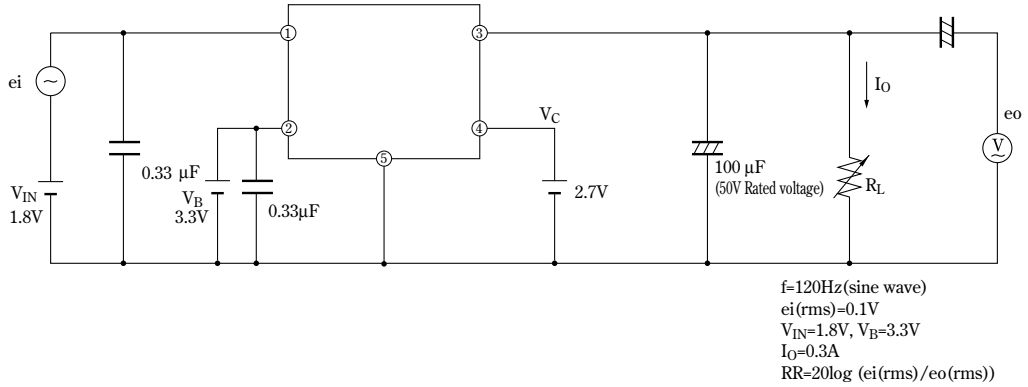


Fig.3 Test Circuit for Ripple Rejection

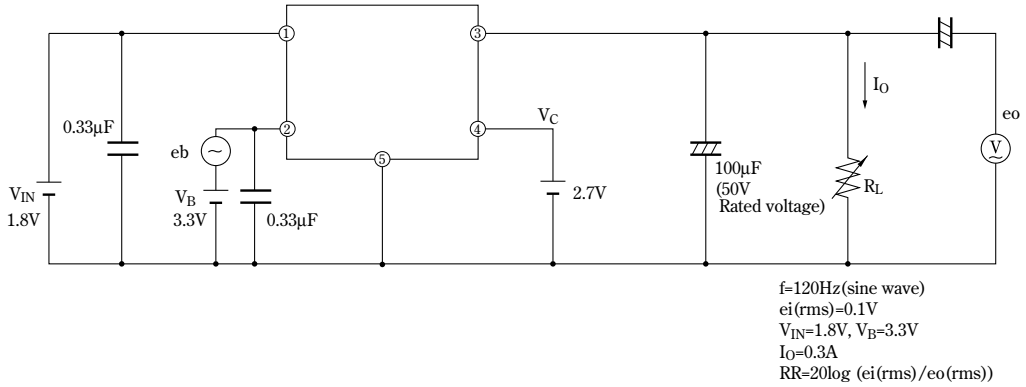
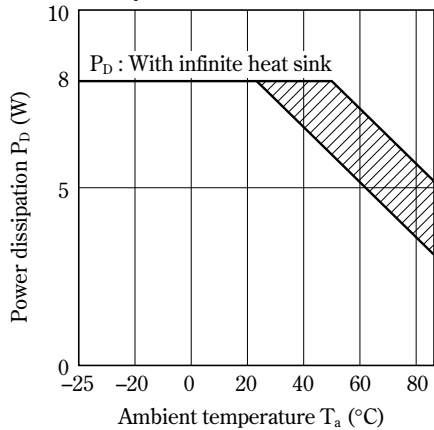
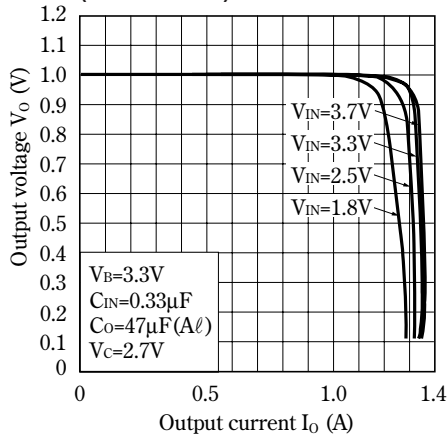


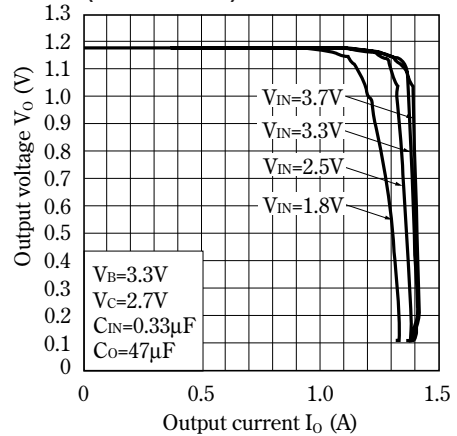
Fig.4 Power Dissipation vs. Ambient Temperature



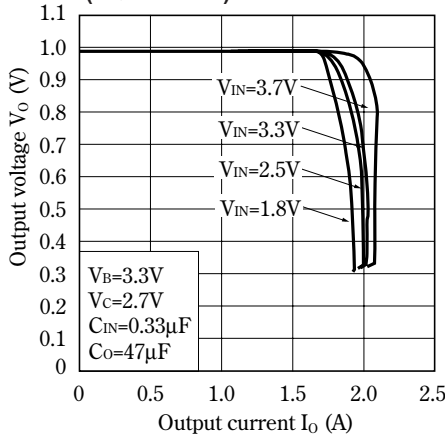
**Fig.5 Overcurrent Protection Characteristics (PQ010FZ5MZ)**



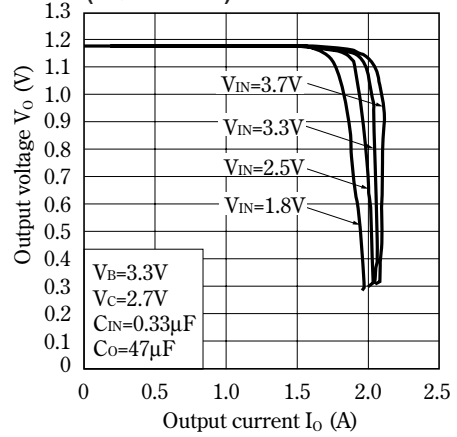
**Fig.6 Overcurrent Protection Characteristics (PQ012FZ5MZ)**



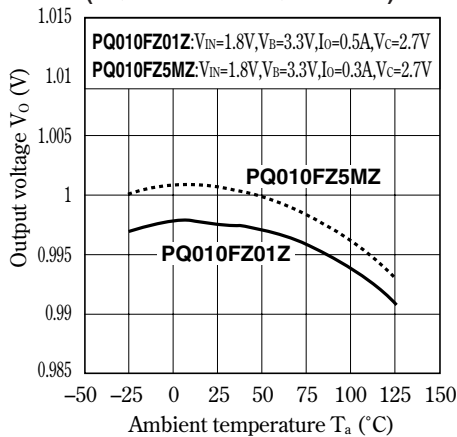
**Fig.7 Overcurrent Protection Characteristics (PQ010FZ01Z)**



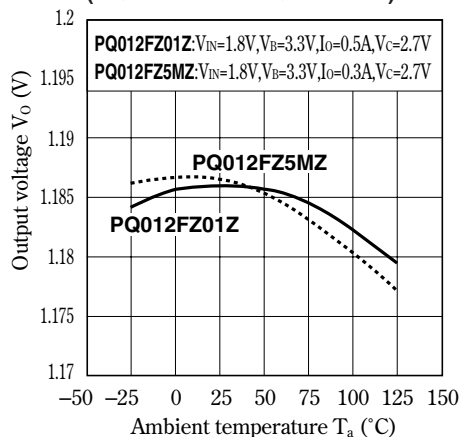
**Fig.8 Overcurrent Protection Characteristics (PQ012FZ01Z)**



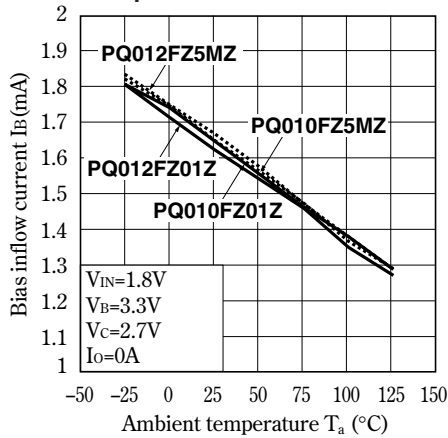
**Fig.9 Output Voltage vs. Ambient Temperature (PQ010FZ5MZ / PQ010FZ01Z)**



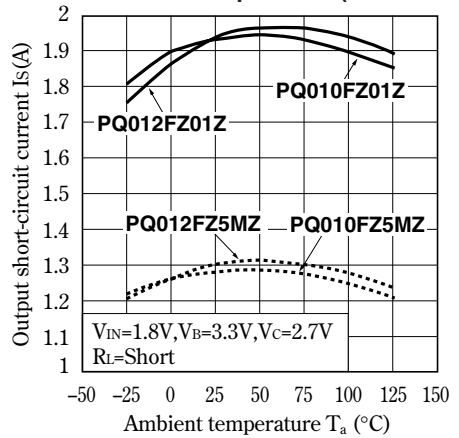
**Fig.10 Output Voltage vs. Ambient Temperature (PQ012FZ5MZ / PQ012FZ01Z)**



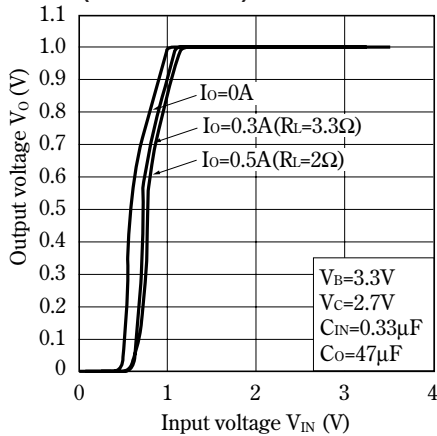
**Fig.11 Bias Inflow Current vs. Ambient Temperature**



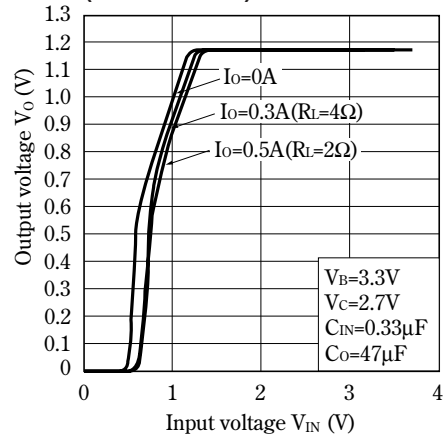
**Fig.12 Output Short-circuit Current vs. Ambient Temperature (Reference)**



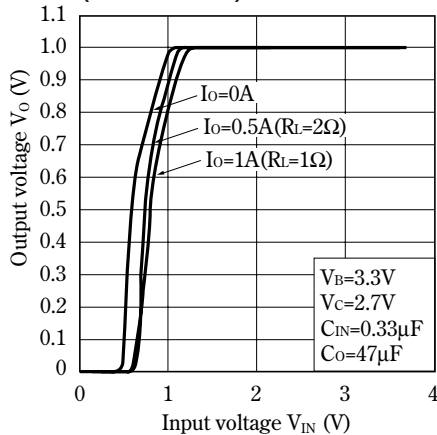
**Fig.13 Output Voltage vs. Input Voltage (PQ010FZ5MZ)**



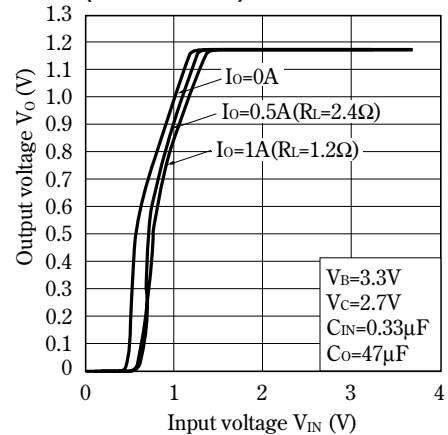
**Fig.14 Output Voltage vs. Input Voltage (PQ012FZ5MZ)**



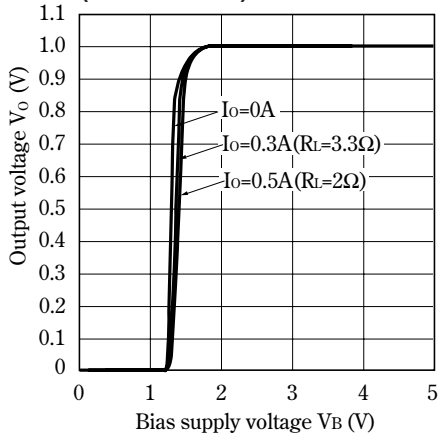
**Fig.15 Output Voltage vs. Input Voltage (PQ010FZ01Z)**



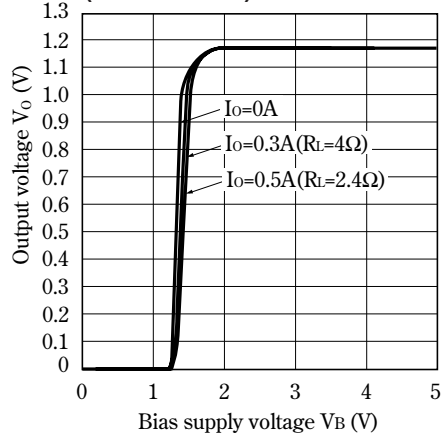
**Fig.16 Output Voltage vs. Input Voltage (PQ012FZ01Z)**



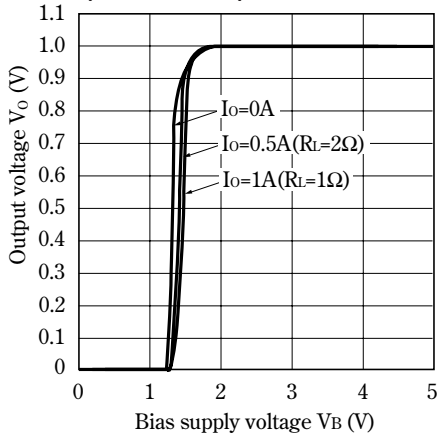
**Fig.17 Output Voltage vs. Bias Supply Voltage (PQ010FZ5MZ)**



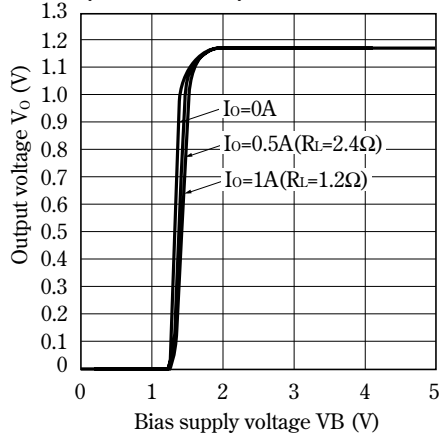
**Fig.18 Output Voltage vs. Bias Supply Voltage (PQ012FZ5MZ)**



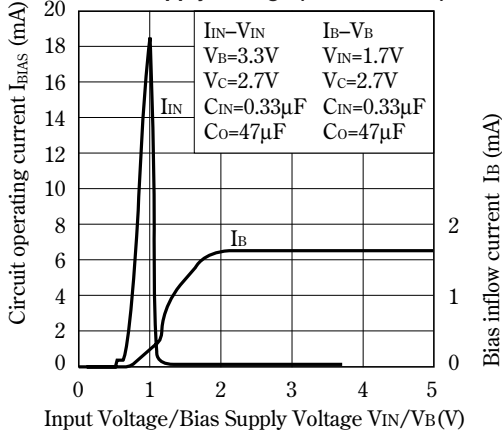
**Fig.19 Output Voltage vs. Bias Supply Voltage (PQ010FZ01Z)**



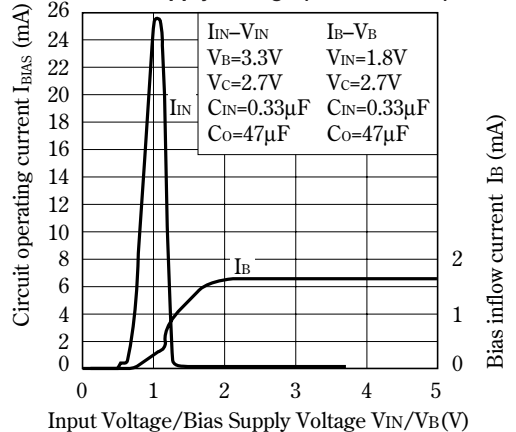
**Fig.20 Output Voltage vs. Bias Supply Voltage (PQ012FZ01Z)**



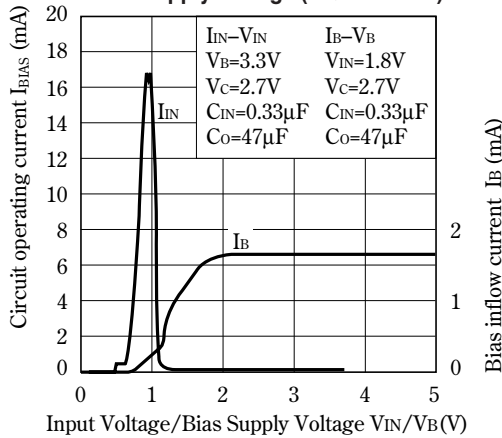
**Fig.21 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ010FZ5MZ)**



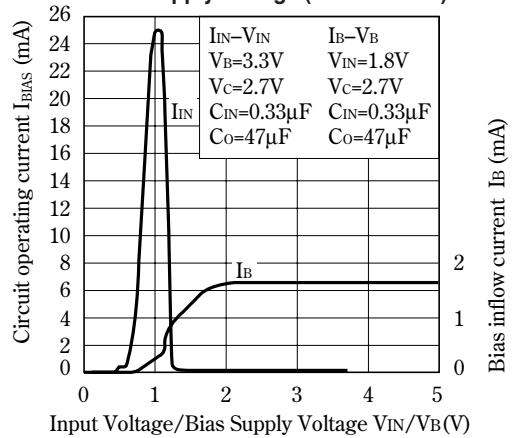
**Fig.22 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ012FZ5MZ)**



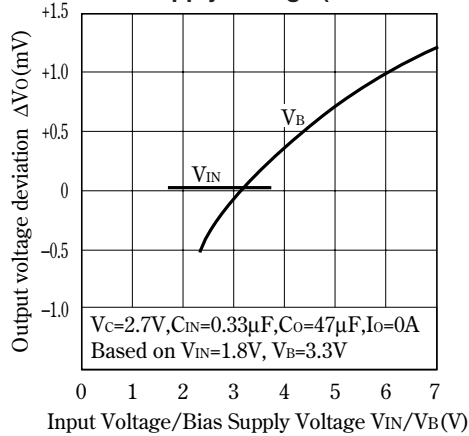
**Fig.23 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ010FZ01Z)**



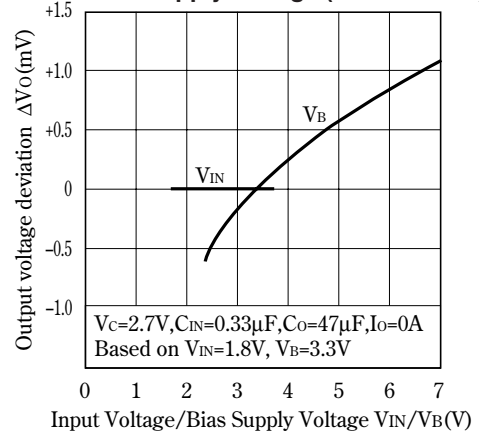
**Fig.24 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ012FZ01Z)**



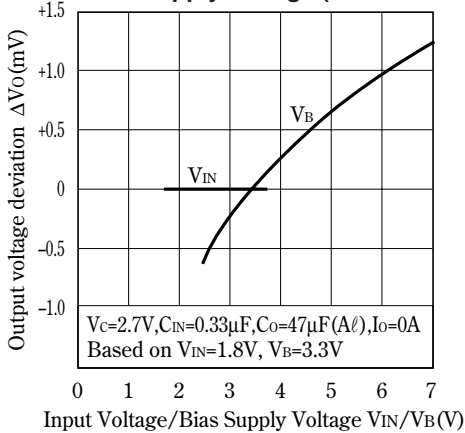
**Fig.25 Output Voltage vs. Input Voltage / Bias Supply Voltage (PQ010FZ5MZ)**



**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)**

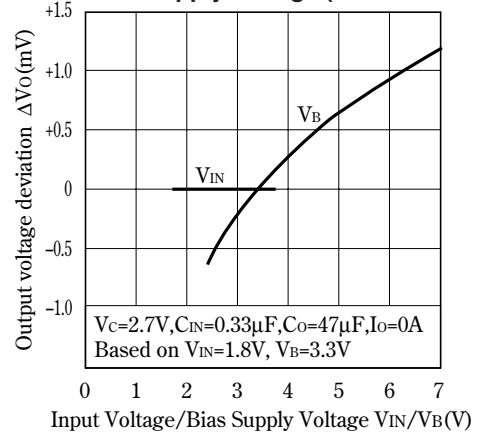


Fig.29 Output Voltage vs. Output Current

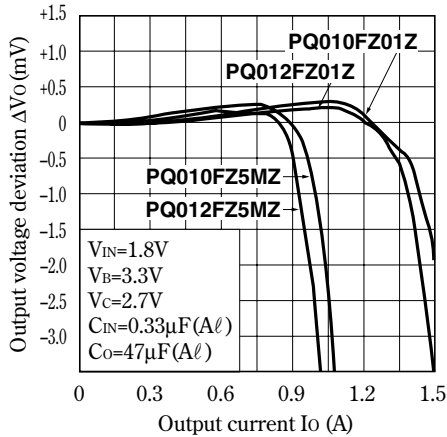


Fig.30 Ripple Rejection vs. Input Ripple Frequency(PQ010FZ5MZ/PQ010FZ01Z)

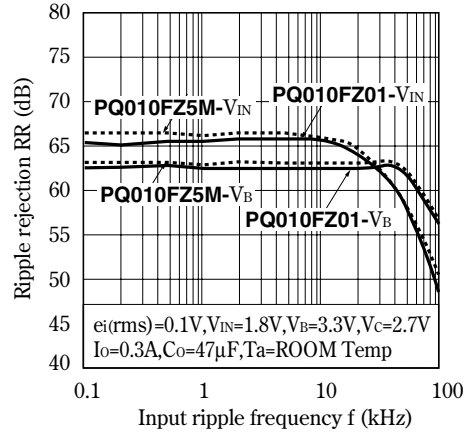


Fig.31 Ripple Rejection vs. Input Ripple Frequency(PQ012FZ5MZ/PQ012FZ01Z)

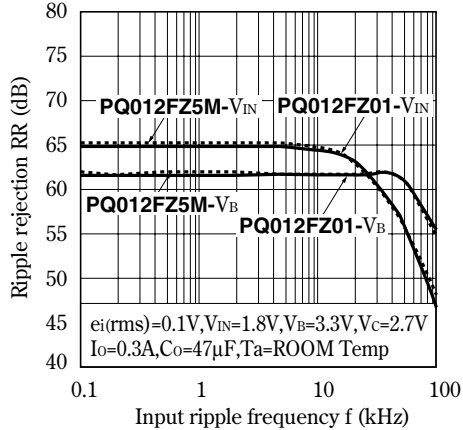


Fig.32 Ripple Rejection vs. Output Current (PQ010FZ5MZ / PQ010FZ01Z)

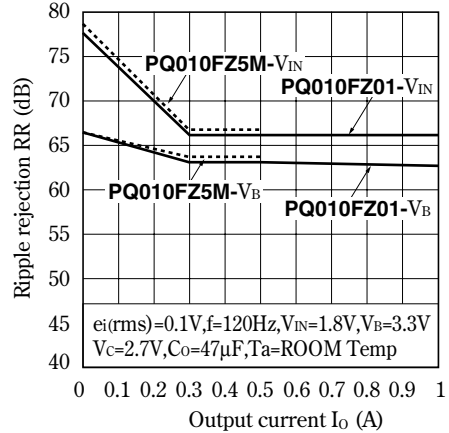


Fig.33 Ripple Rejection vs. Output Current (PQ010FZ5MZ / PQ010FZ01Z)

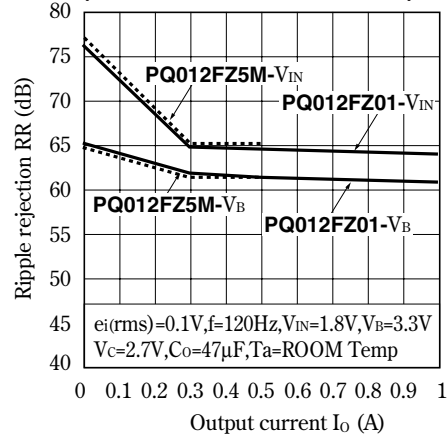




Fig.34 Typical Application

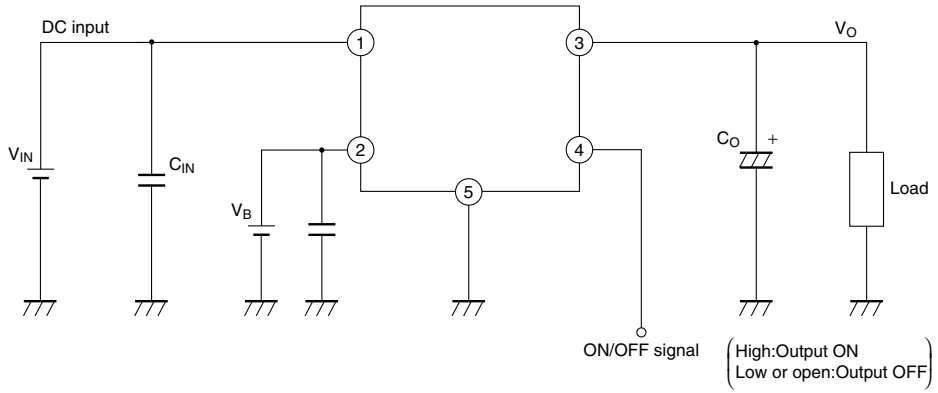
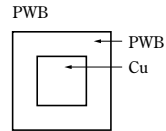
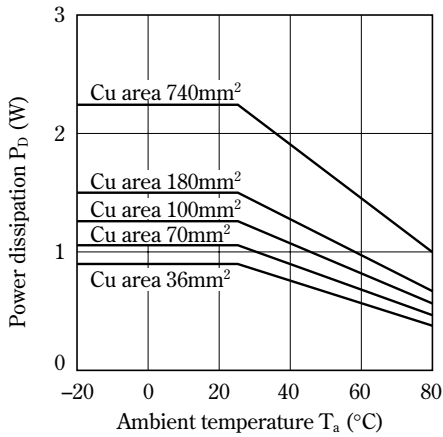


Fig.35 Power Dissipation vs. Ambient Temperature (Typical Value)



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

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