

## 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

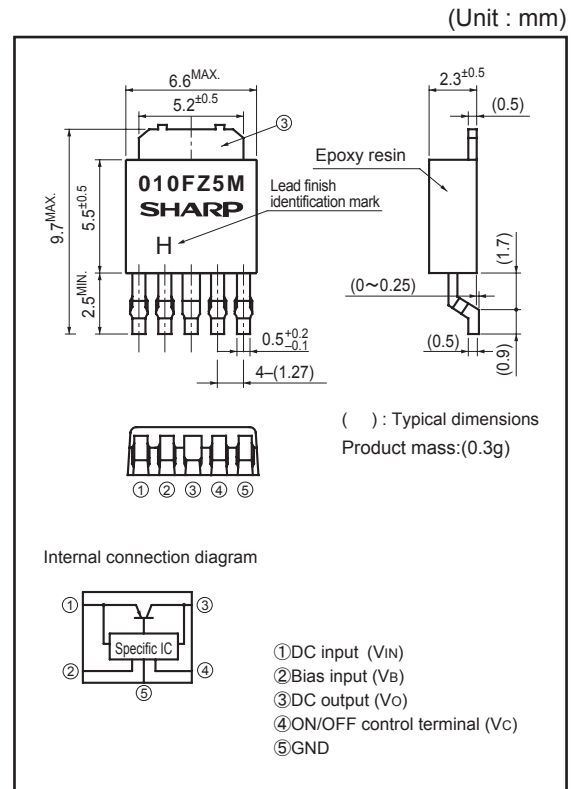
Output current (I <sub>o</sub> )	Package type	Output voltage (V <sub>o</sub> )	
		1.0V	1.2V
0.5A	Taping	PQ010FZ5MZPH	PQ012FZ5MZPH
	Sleeve	PQ010FZ5MZZH	PQ012FZ5MZZH
1A	Taping	PQ010FZ01ZPH	PQ012FZ01ZPH
	Sleeve	PQ010FZ01ZZH	PQ012FZ01ZZH

### ■ 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	PQxxxFZ5MZxH Series	0.5	A
	PQxxxFZ01ZxH Series	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)

Notice The content of data sheet is subject to change without prior notice.

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	$I_o=5mA$ to 0.5A		—	0.2	1	%
	PQxxxFZ01ZxH		$I_o=5mA$ to 1A					
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°C, $I_o=5mA$	—	0.5	—	%		
Ripple Rejection	PQxxxFZ5MZxH	RR1	Refer to Fig.2		—	65	—	dB
	PQxxxFZ01ZxH	RR2	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

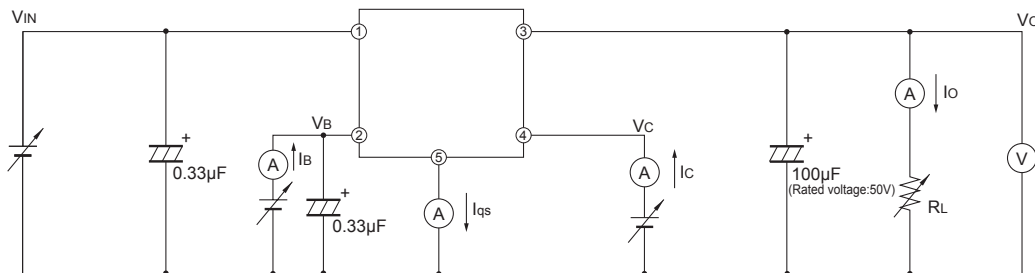


Fig.2 Test Circuit for Ripple Rejection

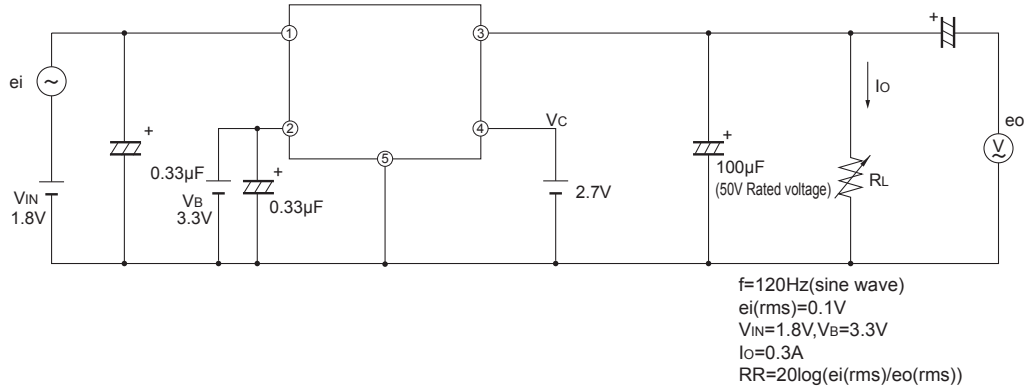


Fig.3 Test Circuit for Ripple Rejection

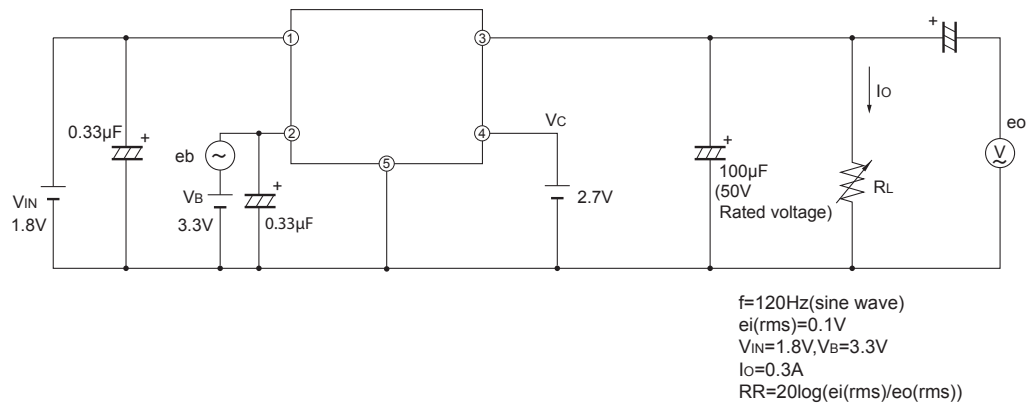
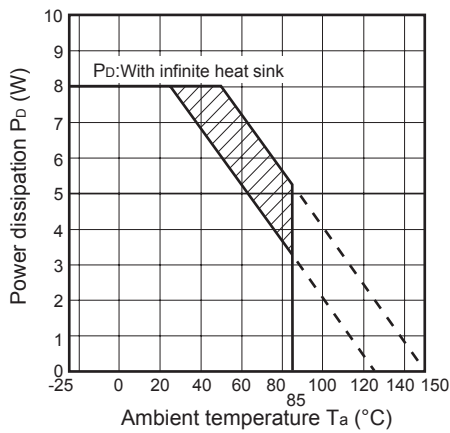


Fig.4 Power Dissipation vs. Ambient Temperature



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

Fig.5 Overcurrent Protection Characteristics (PQ010FZ5MZxH)

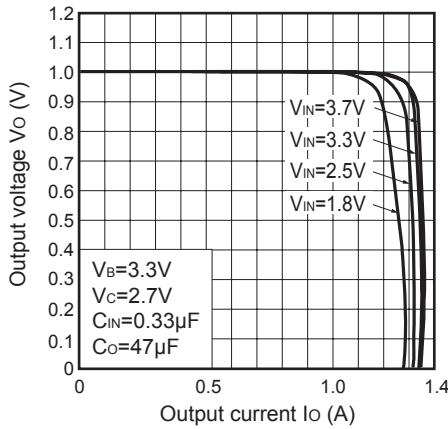


Fig.6 Overcurrent Protection Characteristics (PQ012FZ5MZxH)

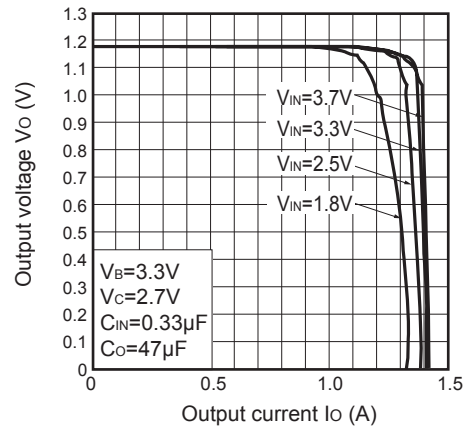


Fig.7 Overcurrent Protection Characteristics (PQ010FZ01ZxH)

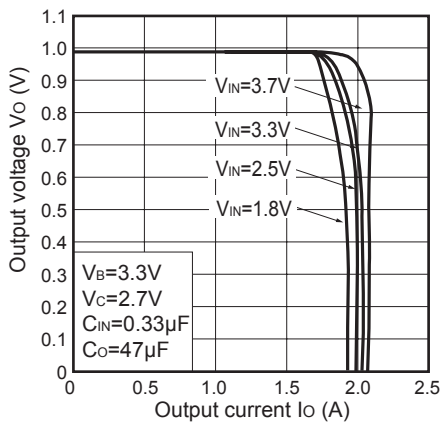


Fig.8 Overcurrent Protection Characteristics (PQ012FZ01ZxH)

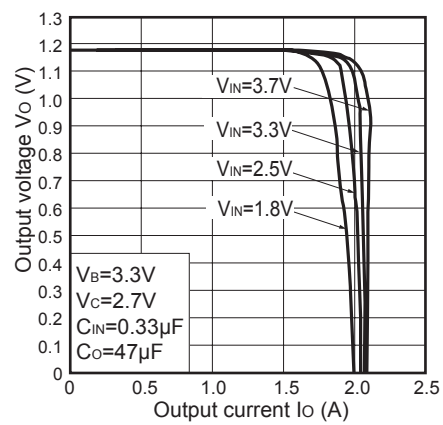


Fig.9 Output Voltage vs. Ambient Temperature (PQ010FZ5MZxH / PQ010FZ01ZxH)

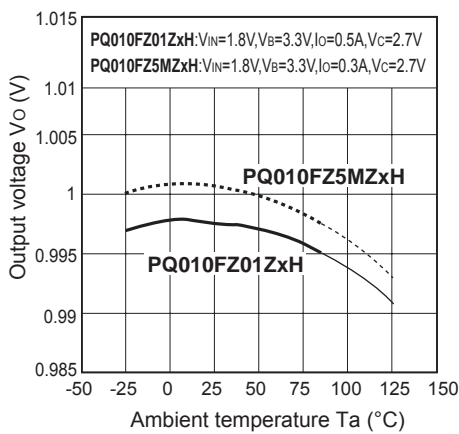


Fig.10 Output Voltage vs. Ambient Temperature (PQ012FZ5MZxH / PQ012FZ01ZxH)

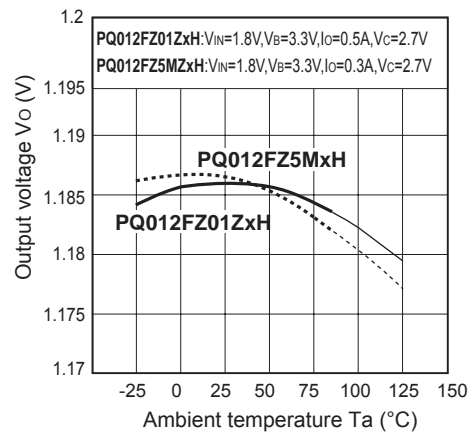


Fig.11 Bias Inflow Current vs. Ambient Temperature

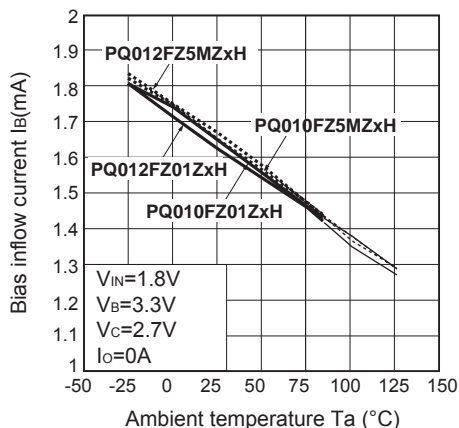


Fig.12 Output Short-circuit Current vs. Ambient Temperature (Reference)

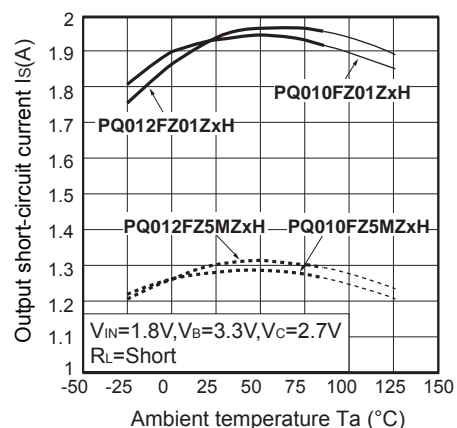


Fig.13 Output Voltage vs. Input Voltage (PQ010FZ5MZxH)

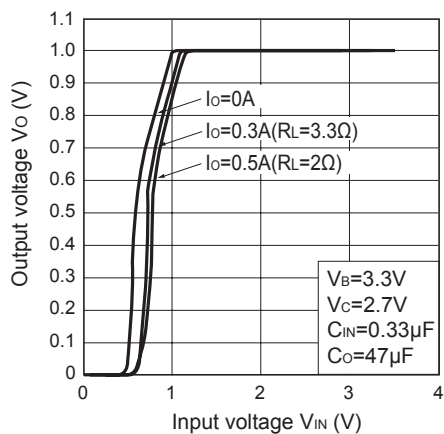


Fig.14 Output Voltage vs. Input Voltage (PQ012FZ5MZxH)

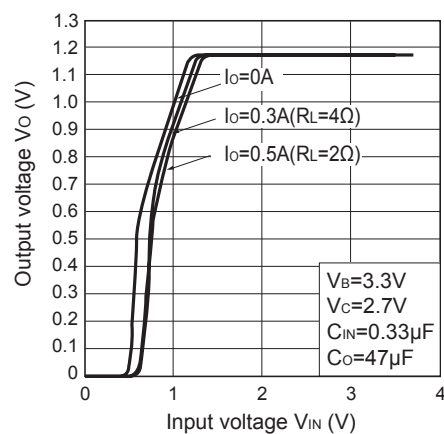


Fig.15 Output Voltage vs. Input Voltage (PQ010FZ01ZxH)

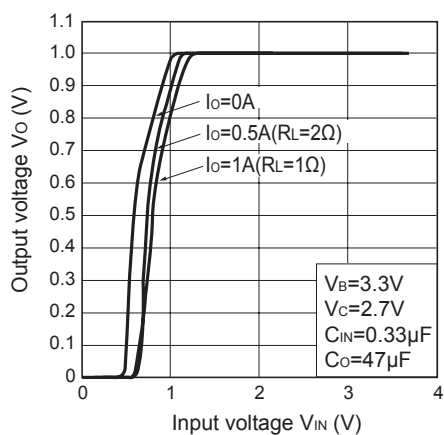


Fig.16 Output Voltage vs. Input Voltage (PQ012FZ01ZxH)

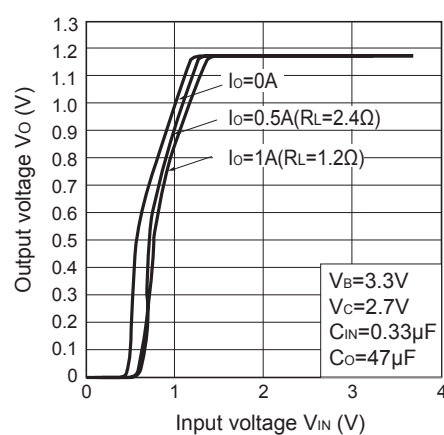


Fig.17 Output Voltage vs. Bias Supply Voltage (PQ010FZ5MZxH)

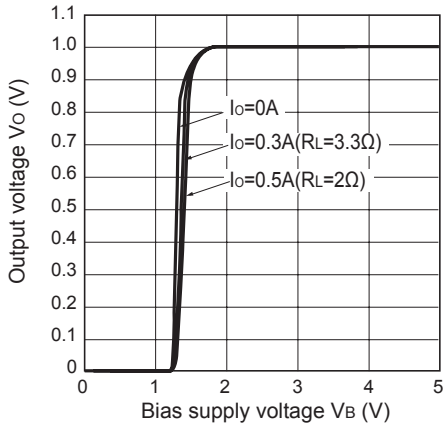


Fig.18 Output Voltage vs. Bias Supply Voltage (PQ012FZ5MZxH)

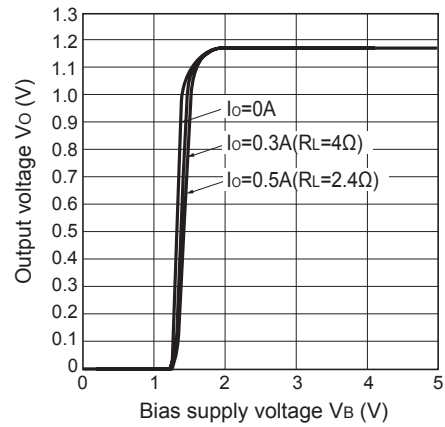


Fig.19 Output Voltage vs. Bias Supply Voltage (PQ010FZ01ZxH)

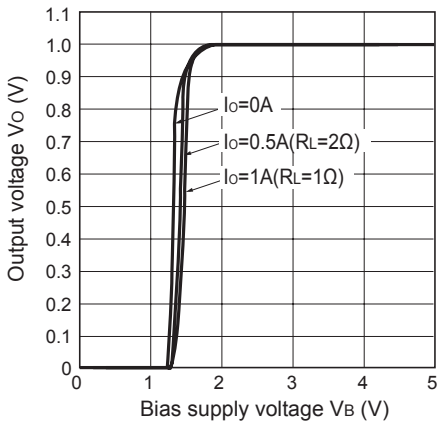


Fig.20 Output Voltage vs. Bias Supply Voltage (PQ012FZ01ZxH)

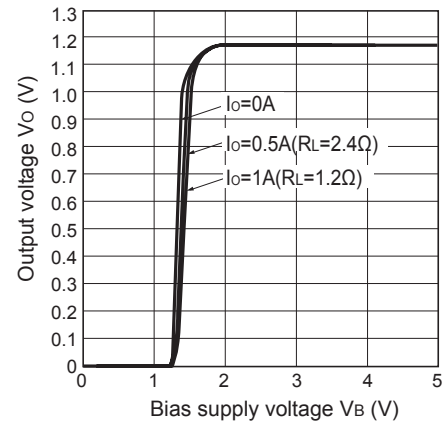


Fig.21 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (PQ010FZ5MZxH)

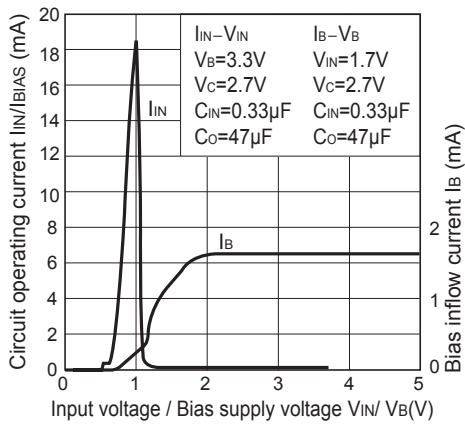


Fig.22 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (PQ012FZ5MZxH)

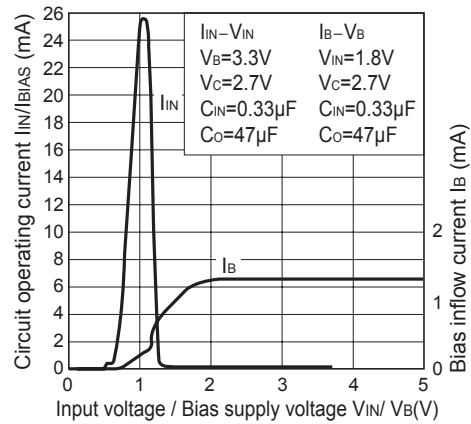


Fig.23 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (PQ010FZ01ZxH)

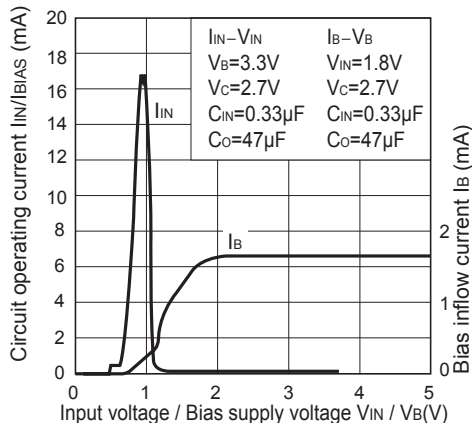


Fig.24 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (PQ012FZ01ZxH)

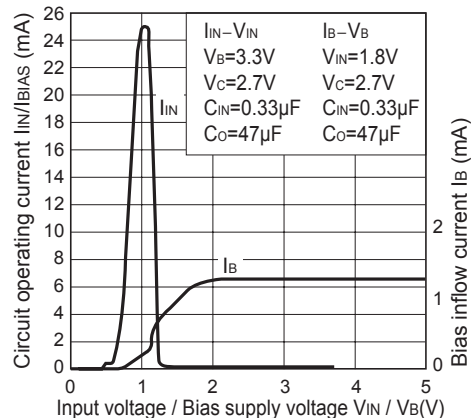


Fig.25 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (PQ010FZ5MZxH)

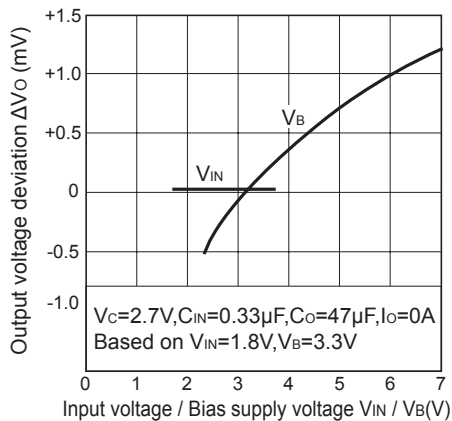


Fig.26 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (PQ010FZ01ZxH)

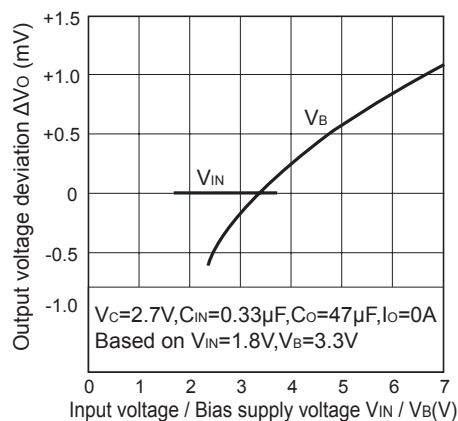


Fig.27 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (PQ012FZ5MZxH)

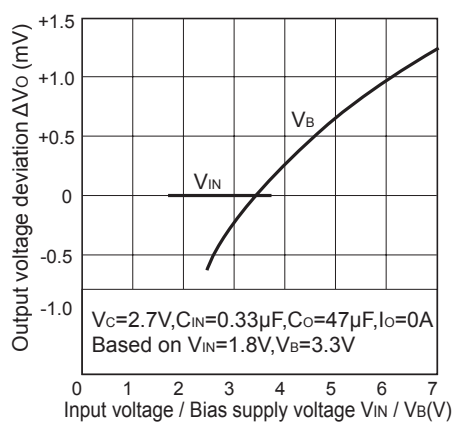


Fig.28 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (PQ012FZ01ZxH)

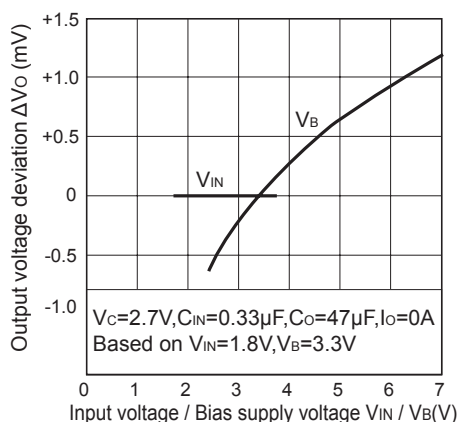


Fig.29 Output Voltage Deviation vs. Output Current

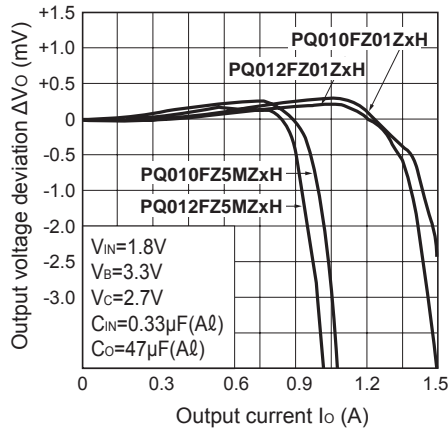


Fig.30 Ripple Rejection vs. Input Ripple Frequency (PQ010FZ5MZxH / PQ010FZ01ZxH)

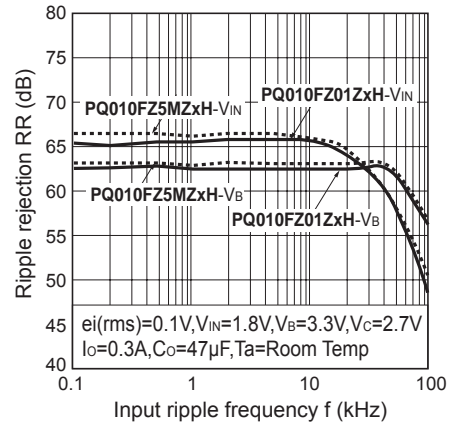


Fig.31 Ripple Rejection vs. Input Ripple Frequency (PQ012FZ5MZxH / PQ012FZ01ZxH)

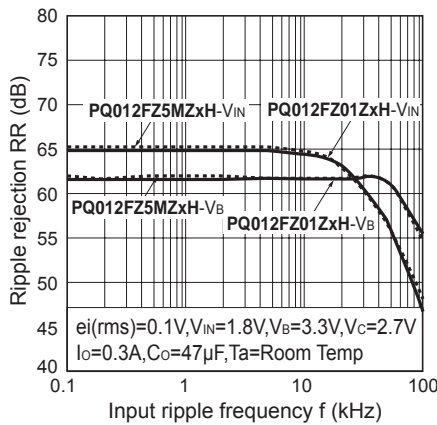


Fig.32 Ripple Rejection vs. Output Current (PQ010FZ5MZxH / PQ010FZ01ZxH)

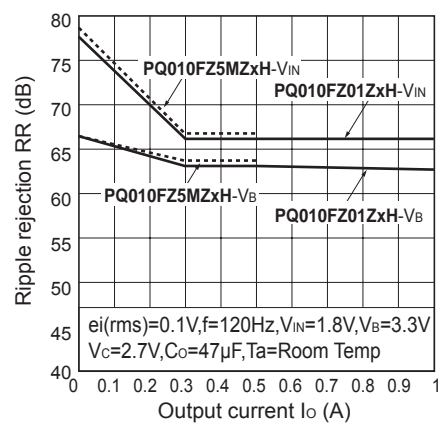


Fig.33 Ripple Rejection vs. Output Current (PQ012FZ5MZxH / PQ012FZ01ZxH)

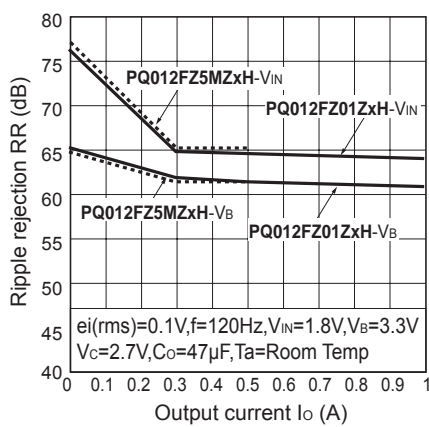




Fig.34 Typical Application

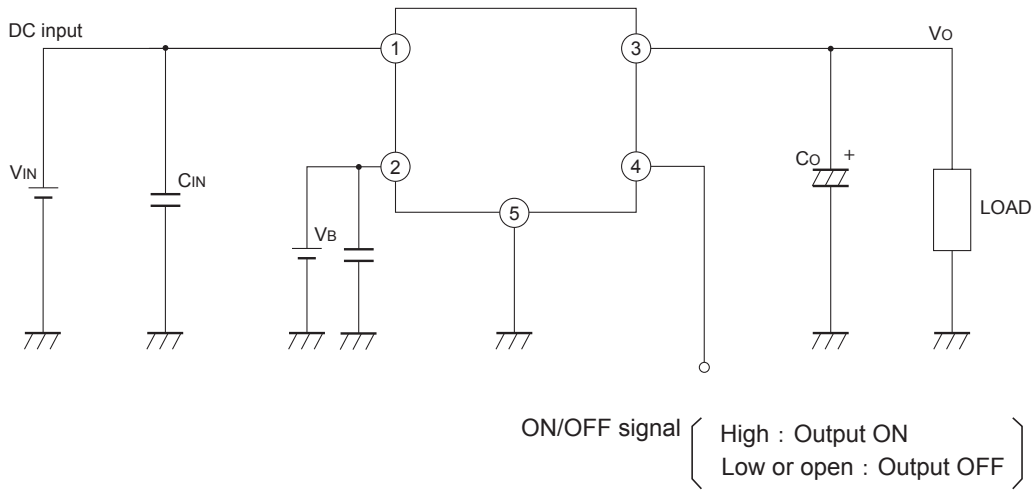


Fig.35 Power Dissipation vs. Ambient Temperature (Typical Value)

