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_O)	Package type	Output voltage (V_O) 1.0V	1.2V
0.5A	Taping	PQ010FZ5MZPH	PQ012FZ5MZPH
	Sleeve	PQ010FZ5MZZH	PQ012FZ5MZZH
1A	Taping	PQ010FZ01ZPH	PQ012FZ01ZPH
	Sleeve	PQ010FZ01ZZH	PQ012FZ01ZZH

■ Absolute Maximum Ratings

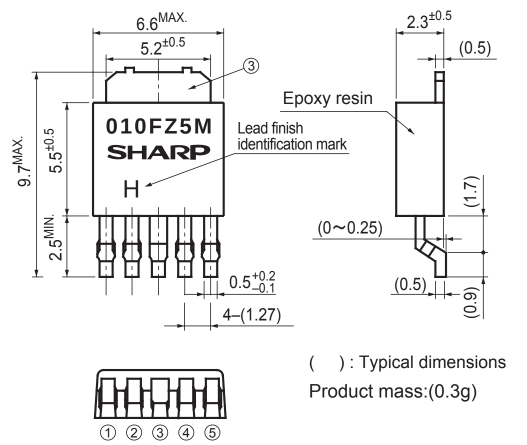
(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input voltage		V_{IN}	3.7	V
*1 Bias supply voltage		V_B	7	V
Output control voltage		V_C	7	V
Output current	PQxxxFZ5MZxH Series	I_O	0.5	A
	PQxxxFZ01ZxH 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 Tj:125°C to 150°C

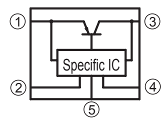
■ Outline Dimensions

(Unit : mm)



( ) : Typical dimensions
Product mass:(0.3g)

Internal connection diagram



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

Lead finish:Lead-free solder plating
(Composition: Sn2Cu)

■ Electrical Characteristics

(Unless otherwise specified, condition shall be V_{IN}=1.8V,V_B=3.3V, I_O=0.3A,V_C=2.7V,Ta=25°C(**PQxxxFZ5MZxH**))
(Unless otherwise specified, condition shall be V_{IN}=1.8V,V_B=3.3V, I_O=0.5A,V_C=2.7V,Ta=25°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		T_CV_O	Tj=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	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=0A	–	1.5	3	mA
Output OFF-state dissipation current		I_{qs}	I_O=0A, V_C=0.4V	–	–	10	μA

※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,Ta=25°C(**PQxxxFZ5MZxH**))
(Unless otherwise specified, condition shall be V_{IN}=1.8V,V_B=3.3V, I_O=0.5A,V_C=2.7V,Ta=25°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

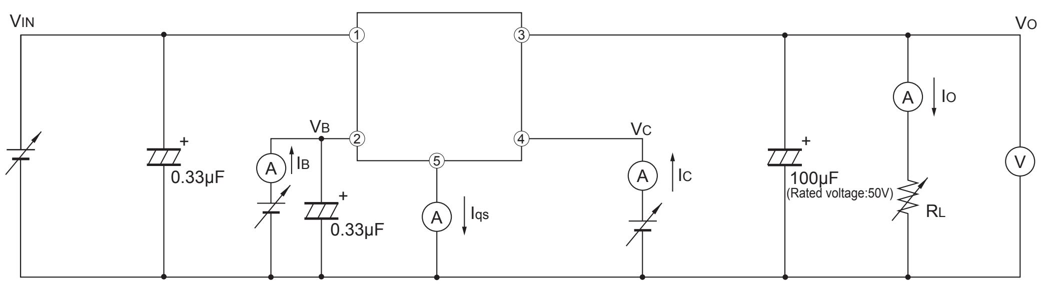
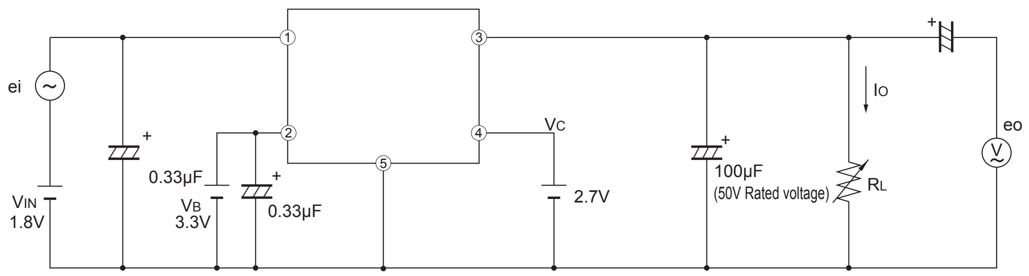
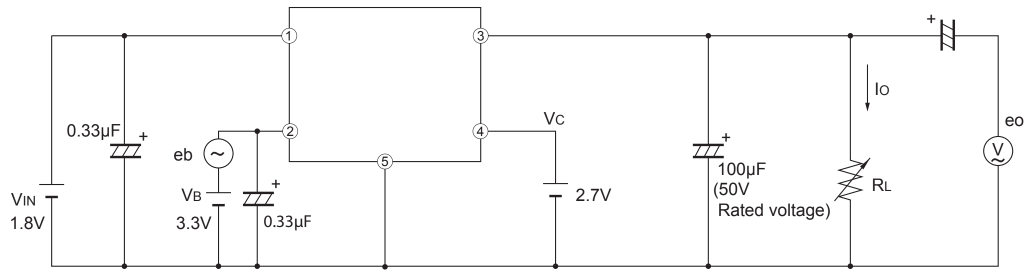


Fig.2 Test Circuit for Ripple Rejection



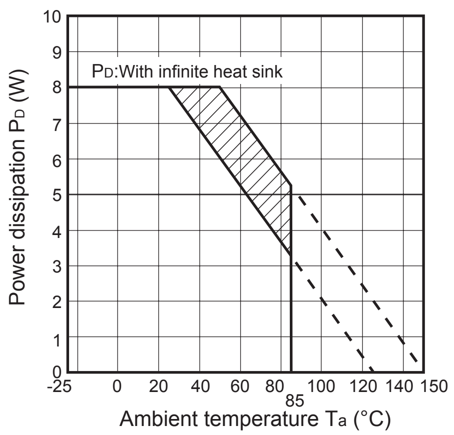
f=120Hz(sine wave)
ei(rms)=0.1V
V_{IN}=1.8V,V_B=3.3V
I_O=0.3A
RR=20log(ei(rms)/eo(rms))

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



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

Fig.5 Overcurrent Protection Characteristics (**PQ010FZ5MZxH**)

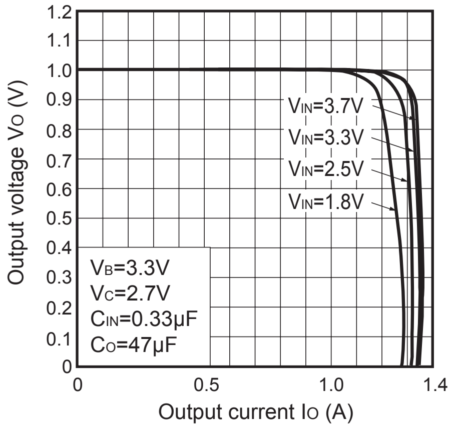


Fig.6 Overcurrent Protection Characteristics (**PQ012FZ5MZxH**)

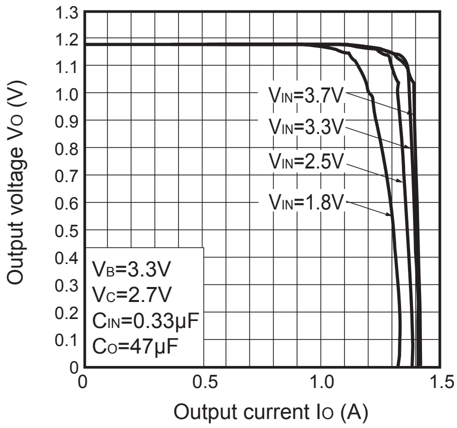


Fig.7 Overcurrent Protection Characteristics (**PQ010FZ01ZxH**)

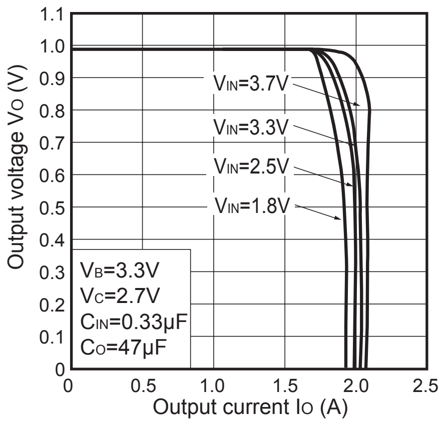


Fig.8 Overcurrent Protection Characteristics (**PQ012FZ01ZxH**)

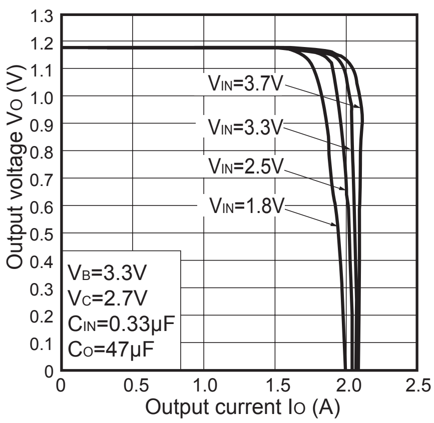


Fig.9 Output Voltage vs. Ambient Temperature (**PQ010FZ5MZxH / PQ010FZ01ZxH)**

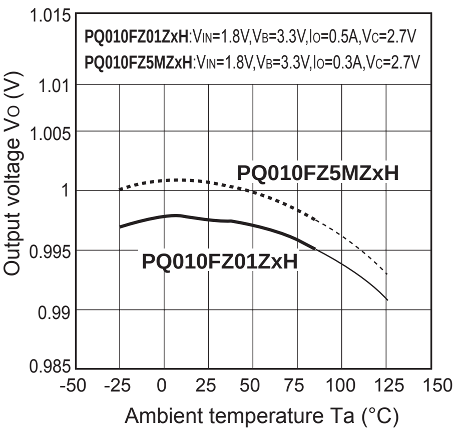


Fig.10 Output Voltage vs. Ambient Temperature (**PQ012FZ5MZxH / PQ012FZ01ZxH)**

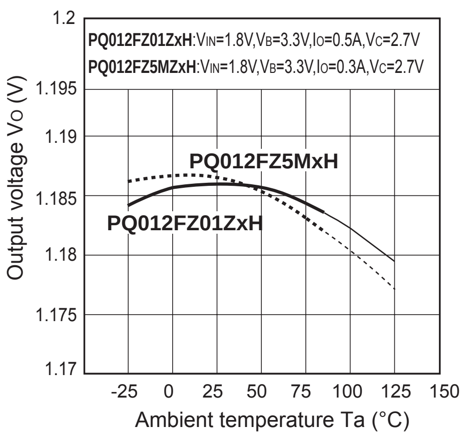


Fig.11 Bias Inflow Current vs. Ambient Temperature

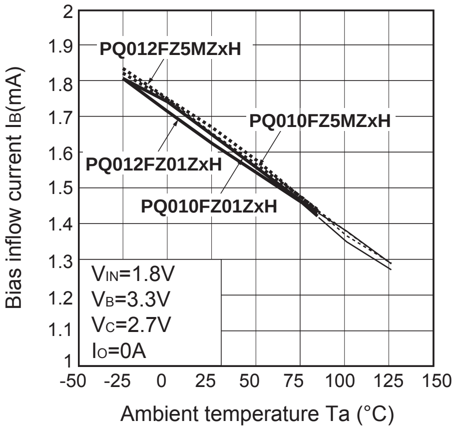


Fig.12 Output Short-circuit Current vs. Ambient Temperature (Reference)

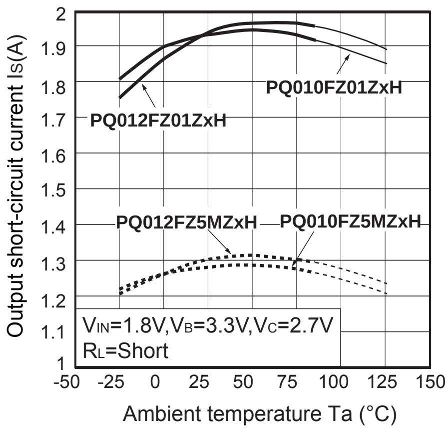


Fig.13 Output Voltage vs. Input Voltage (**PQ010FZ5MZxH**)

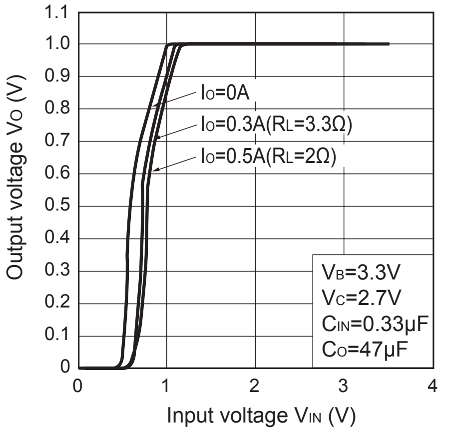


Fig.14 Output Voltage vs. Input Voltage (**PQ012FZ5MZxH**)

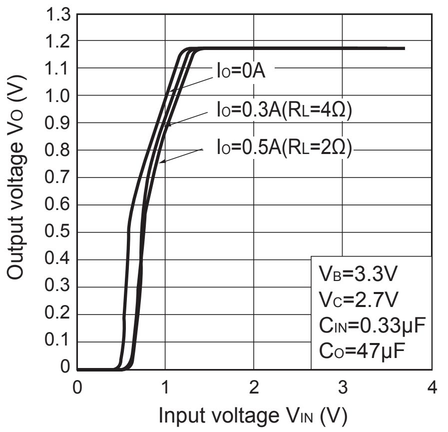


Fig.15 Output Voltage vs. Input Voltage (**PQ010FZ01ZxH**)

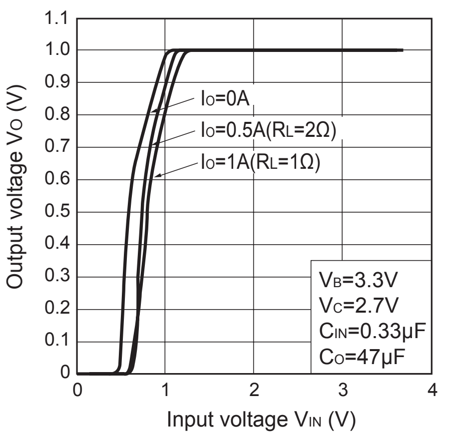
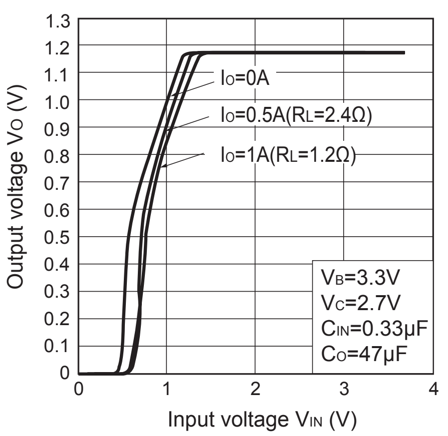


Fig.16 Output Voltage vs. Input Voltage (**PQ012FZ01ZxH**)



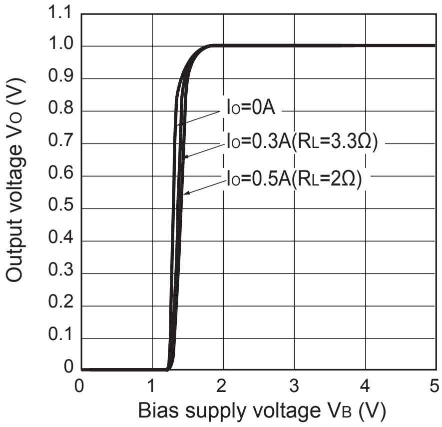


Fig.17 Output Voltage vs. Bias Supply Voltage (**PQ010FZ5MZxH)**

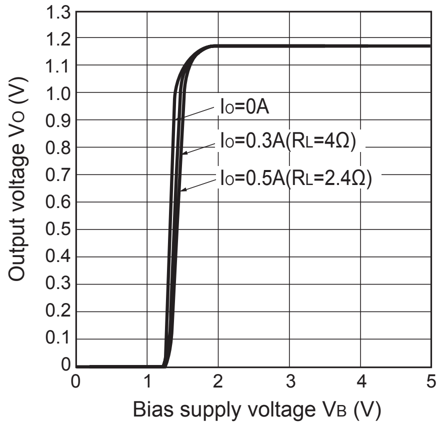


Fig.18 Output Voltage vs. Bias Supply Voltage (**PQ012FZ5MZxH)**

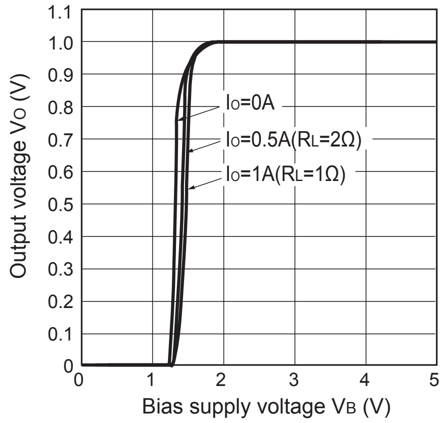


Fig.19 Output Voltage vs. Bias Supply Voltage (**PQ010FZ01ZxH)**

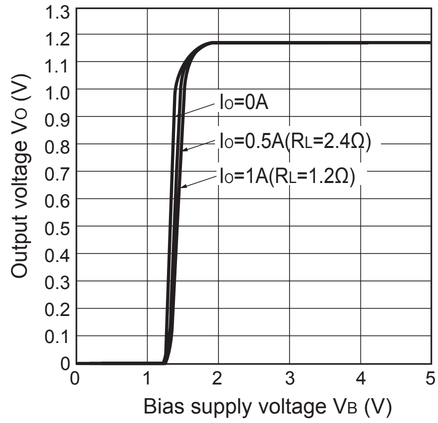


Fig.20 Output Voltage vs. Bias Supply Voltage (**PQ012FZ01ZxH)**

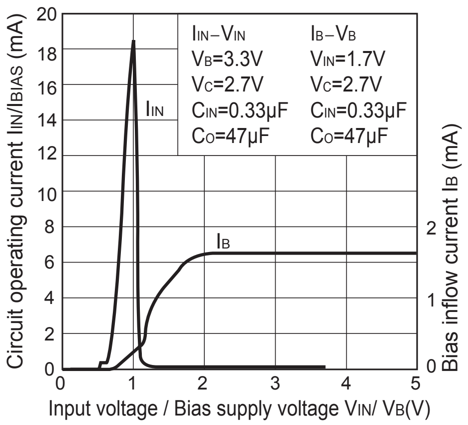


Fig.21 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (**PQ010FZ5MZxH**)

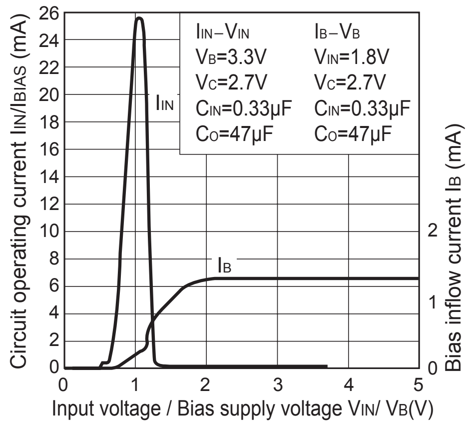


Fig.22 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (**PQ012FZ5MZxH**)

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

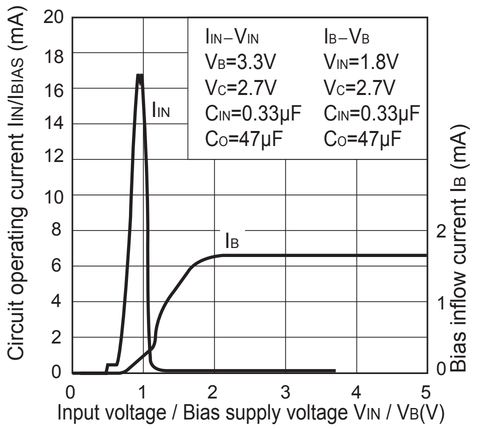


Fig.24 Circuit Operating Current vs. Input Voltage / Bias Supply Voltage (**PQ012FZ01ZxH**)

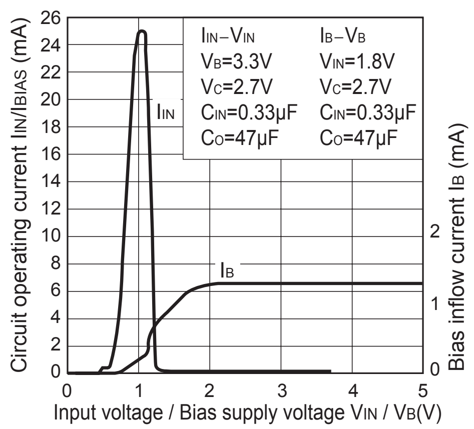


Fig.25 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (**PQ010FZ5MZxH**)

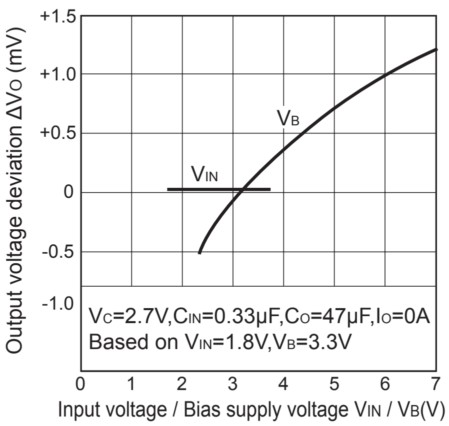


Fig.26 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (**PQ010FZ01ZxH**)

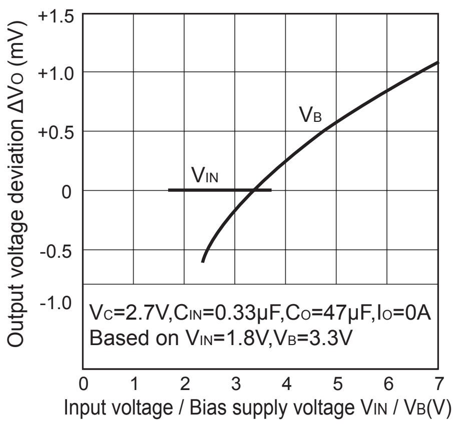


Fig.27 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (**PQ012FZ5MZxH**)

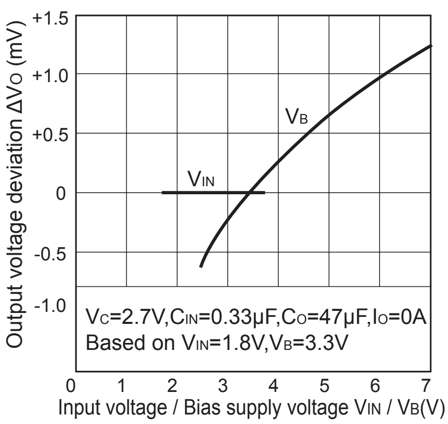


Fig.28 Output Voltage Deviation vs. Input Voltage / Bias Supply Voltage (**PQ012FZ01ZxH**)

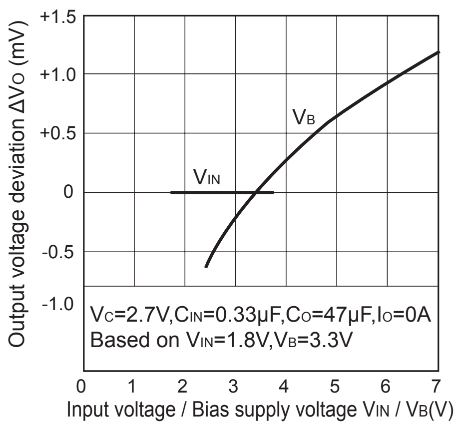


Fig.29 Output Voltage Deviation vs. Output Current

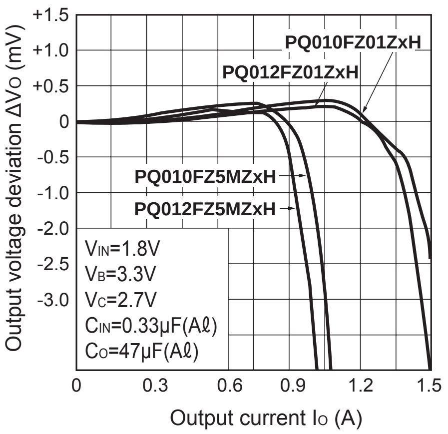


Fig.30 Ripple Rejection vs. Input Ripple Frequency (**PQ010FZ5MZxH / PQ010FZ01ZxH)**

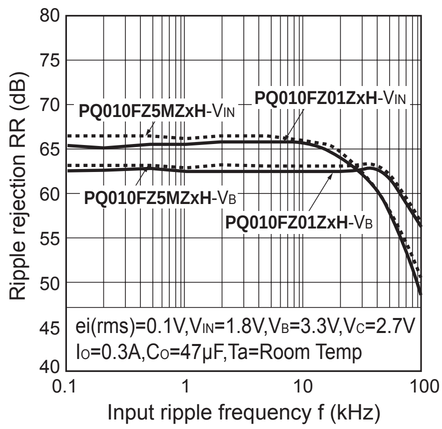


Fig.31 Ripple Rejection vs. Input Ripple Frequency (**PQ012FZ5MZxH / PQ012FZ01ZxH)**

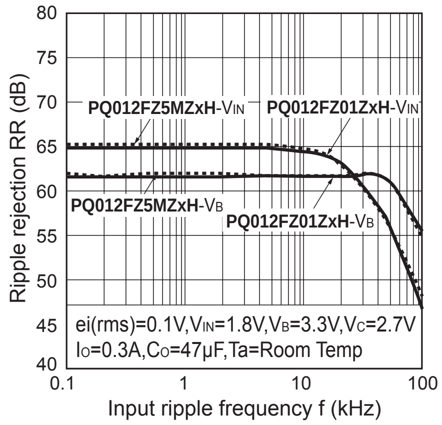


Fig.32 Ripple Rejection vs. Output Current (**PQ010FZ5MZxH / PQ010FZ01ZxH)**

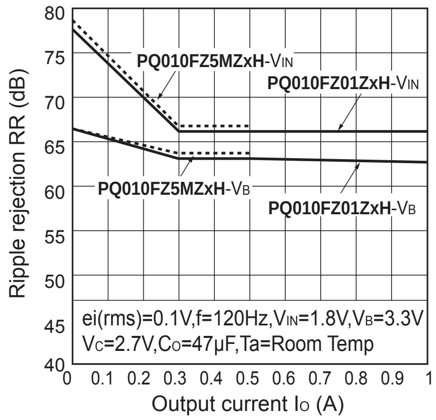


Fig.33 Ripple Rejection vs. Output Current (**PQ012FZ5MZxH / PQ012FZ01ZxH)**

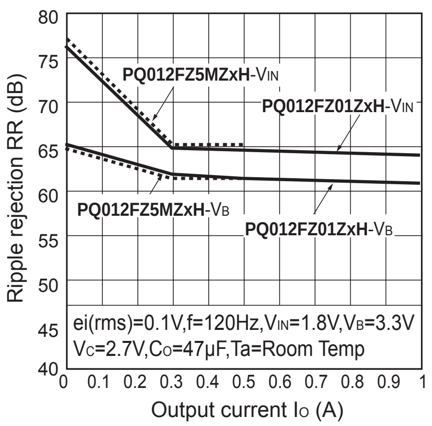


Fig.34 Typical Application

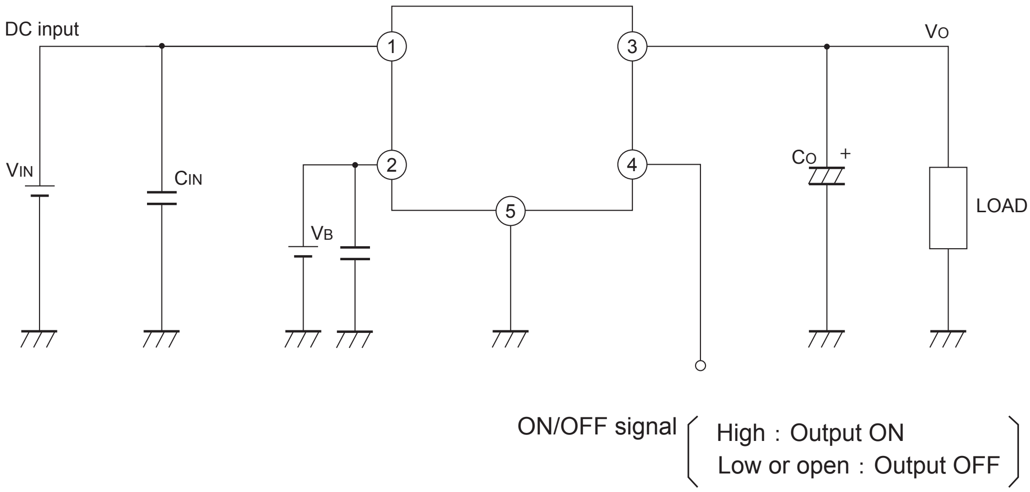
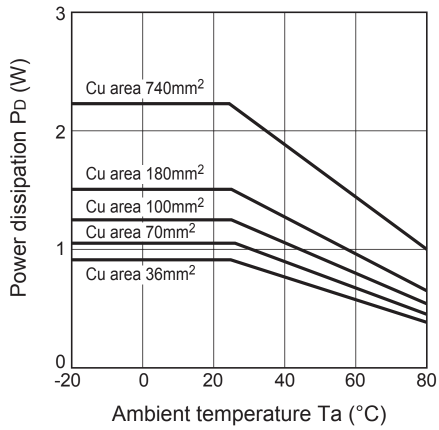
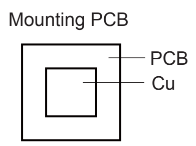


Fig.35 Power Dissipation vs. Ambient Temperature (Typical Value)





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