THE DATASHEET OF

PQ09DZ5UJ00H

PQxxDZ51J00H Series/PQxxDZ11J00H Series PQ3DZ53J000H/PQ3DZ13J000H

0.5A/1.0A Output,Surface Mount type
Low Power-Loss Voltage Regulators

■ Features

1.Low power-loss
(Dropout voltage: MAX.0.5V)
2.Surface mount package (equivalent to SC-63)
3.Output voltage precision:±3.0%
4.Built-in ON/OFF control function
5.Low dissipation current at OFF-state(Iqs: MAX.5μA)
6.Built-in overcurrent protection,overheat protection function,ASO protection function
7.RoHS directive compliant

■ Applications

1.Personal computers
2.CD-ROM drivers
3.Power supplies for various OA equipment

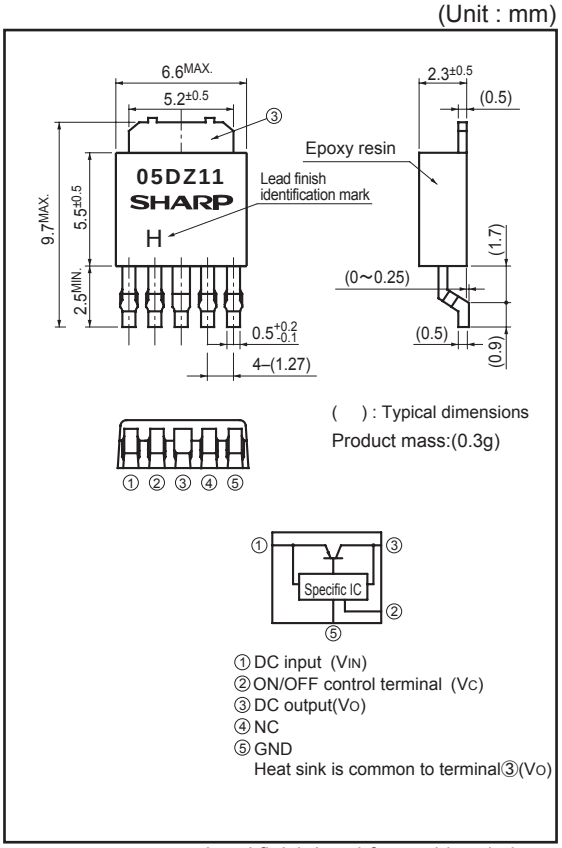
■ Model Line-up

Output current (I_O)	Package type	Output voltage (V_O)		
		3.3V	5.0V	9.0V
0.5A	Taping	PQ3DZ53UJ00H	PQ05DZ5UJ00H	PQ09DZ5UJ00H
	Sleeve	PQ3DZ53J000H	PQ05DZ51J00H	PQ09DZ51J00H
1A	Taping	PQ3DZ13UJ00H	PQ05DZ1UJ00H	PQ09DZ1UJ00H
	Sleeve	PQ3DZ13J000H	PQ05DZ11J00H	PQ09DZ11J00H

Output current (I_O)	Package type	Output voltage (V_O)
		12.0V
0.5A	Taping	PQ12DZ5UJ00H
	Sleeve	PQ12DZ51J00H
1A	Taping	PQ12DZ1UJ00H
	Sleeve	PQ12DZ11J00H

■ Outline Dimensions

(Unit : mm)



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

■ Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
*1 Input voltage		V_{IN}	24	V
*1 ON/OFF control terminal voltage		V_C	24	V
Output current	PQxxDZ51J00H Series PQ3DZ53J000H	I_O	0.5	A
	PQxxDZ11J00H Series PQ3DZ13J000H		1.0	
*2 Power dissipation		P_D	8	W
*3 Junction temperature		T_j	150	°C
Operating temperature		T_{opr}	-20～+80	°C
Storage temperature		T_{stg}	-40～+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 There is case that overheat protection function operates at the Tj:125°C to 150°C , this item cannot be used in this temperature range.

■ Electrical Characteristics

(Unless otherwise specified, condition shall be V_C=2.7V,I_O=0.3A[**PQxxDZ51J00H** series/**PQ3DZ53J000H**], I_O=0.5A,[**PQxxDZ11J00H** series/**PQ3DZ13J000H**],※4,Ta=25˚C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	PQ3DZ53J000H/PQ3DZ13J000H	V_O	※4	3.201	3.3	3.399	V
	PQ05DZ51J00H/PQ05DZ11J00H			4.85	5.0	5.15	
	PQ09DZ51J00H/PQ09DZ11J00H			8.73	9.0	9.27	
	PQ12DZ51J00H/PQ12DZ11J00H			11.64	12.0	12.36	
Load regulation	**PQxxDZ51J00H series**	R_{egL}	I_O=5mA to 0.5A※4	—	※8 0.2	2.0	%
	PQxxDZ11J00H series		I_O=5mA to 1.0A※4				
Line regulation		R_{egI}	※5,I_O=5mA	—	※8 0.1	2.5	%
Temperature coefficient of output voltage		T_CV_O	Tj=0 to 125°C, I_O=5mA,※4	—	※9 ±0.01	—	%/°C
Ripple Rejection		RR	Refer to Fig.2	45	60	—	dB
Dropout voltage	PQxxDZ51J00H series/PQ3DZ53J000H	V_{I-O}	※6,I_O=0.3A	—	※8 0.2	0.5	V
	PQxxDZ11J00H series/PQ3DZ13J000H		※6,I_O=0.5A				
※7 ON-state voltage for control		$V_{C(ON)}$	※4	2.0	—	—	V
ON-state current for control		$I_{C(ON)}$	※4	—	—	200	μA
OFF-state voltage for control		$V_{C(OFF)}$	I_O=0A,※4	—	—	0.8	V
OFF-state current for control		$I_{C(OFF)}$	V_C=0.4V,I_O=0A,※4	—	—	2	μA
Quiescent current		I_q	I_O=0A,※4	—	※8 4	10	mA
Output OFF-state dissipation current		I_{qs}	V_C=0.4V,I_O=0A,※4	—	—	5	μA

※4 **PQ3DZ53J000H/PQ3DZ13J000H**: V_{IN}=5V,**PQ05DZ51J00H/11J00H**: V_{IN}=7V,**PQ09DZ51J00H/11J00H**: V_{IN}=11V,**PQ12DZ51J00H/11J00H**: V_{IN}=14V
※5 **PQ3DZ53J000H/13J000H**: V_{IN}=4 to 10V,**PQ05DZ51J00H/11J00H**: V_{IN}=6 to 16V,**PQ09DZ51J00H/11J00H**: V_{IN}=10 to 20V,**PQ12DZ51J00H/11J00H**: V_{IN}=13 to 23V
※6 Input voltage shall be the value when output voltage is 95% in comparison with the initial value. **PQ3DZ53J000H/13J000H**: V_{IN}=3.7V
※7 In case of opening control terminal ② , output voltage turns off.
※8 Applied only to **PQ05DZ51J00H/11J00H**.
※9 **PQ3DZ53J000H/PQ3DZ13J000H**: ±0.02

Fig.1 Test Circuit

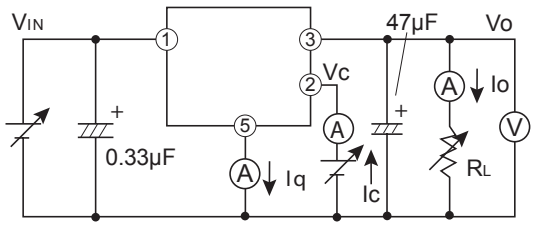
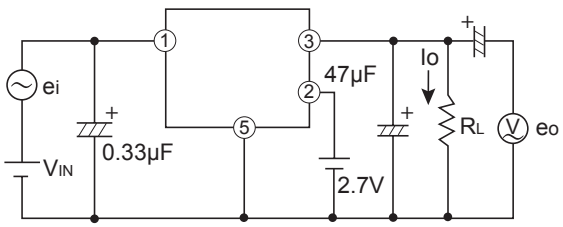
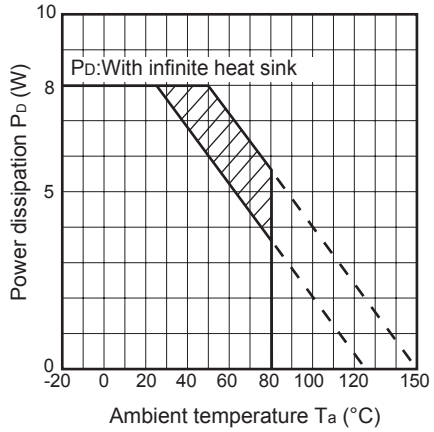


Fig.2 Test Circuit for Ripple Rejection



f=120Hz(sine wave)
ei(rms)=0.5V
VIN=5V(**PQ3DZ53J000H/13J000H**)
7V(**PQ05DZ51J00H/11J00H**)
11V(**PQ09DZ51J00H/11J00H**)
14V(**PQ12DZ51J00H/11J00H**)
Io=0.3A
RR=20 log(ei(rms)/eo(rms))

Fig.3 Power Dissipation vs. Ambient Temperature



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

Fig.4 Overcurrent Protection Characteristics (Typical Value) (**PQ3DZ53J000H**)

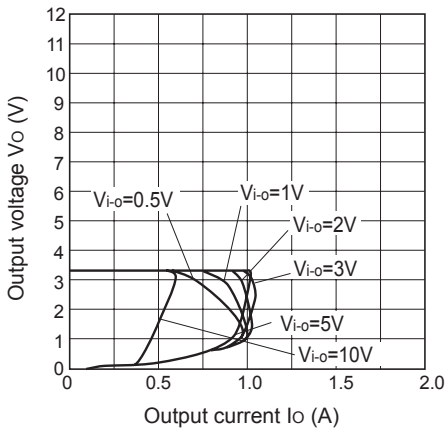


Fig.5 Overcurrent Protection Characteristics (Typical Value) (**PQ3DZ13J000H**)

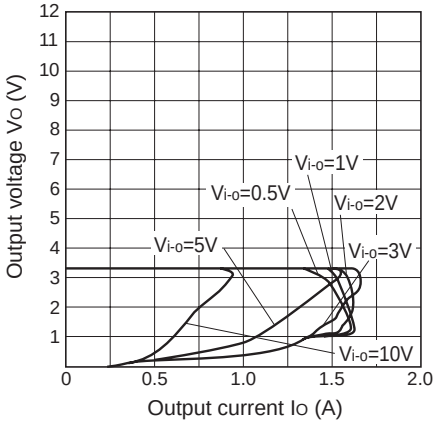


Fig.6 Overcurrent Protection Characteristics (Typical Value) (**PQ05DZ51J00H**)

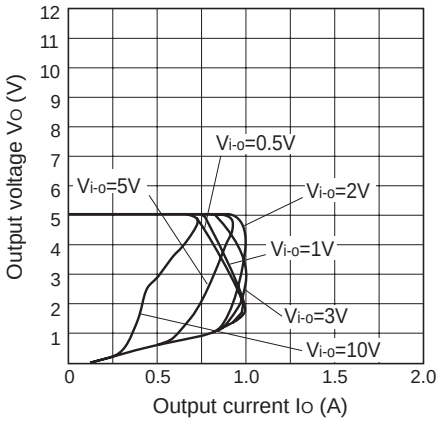


Fig.7 Overcurrent Protection Characteristics (Typical Value) (**PQ09DZ51J00H**)

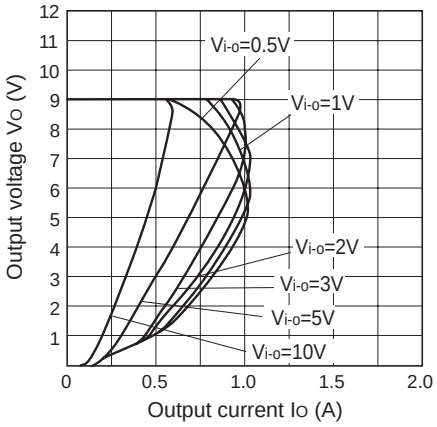


Fig.8 Overcurrent Protection Characteristics (Typical Value) (**PQ12DZ51J00H**)

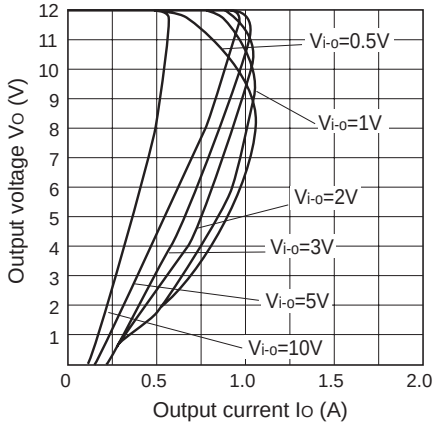


Fig.9 Overcurrent Protection Characteristics (Typical Value) (**PQ05DZ11J00H**)

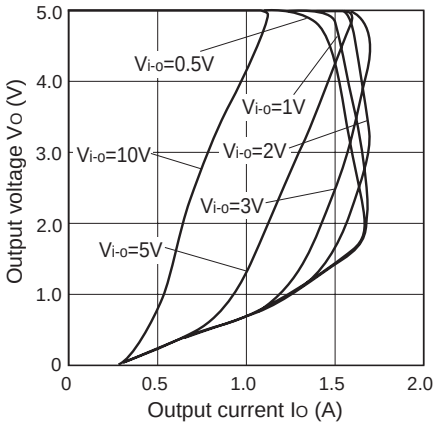


Fig.10 Overcurrent Protection Characteristics (Typical Value) (**PQ09DZ11J00H**)

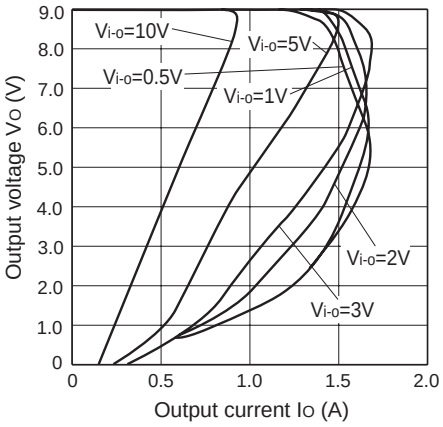


Fig.11 Overcurrent Protection Characteristics (Typical Value) (**PQ12DZ11J00H**)

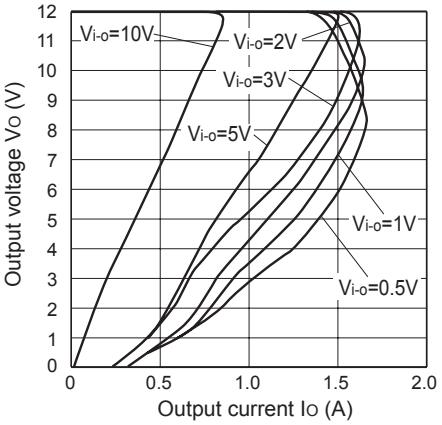
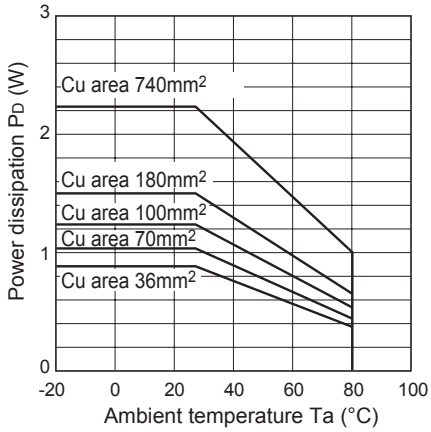
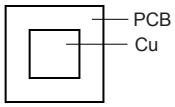


Fig.12 Power Dissipation vs. Ambient Temperature (Typical Value)



Mounting PCB



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

Fig.13 Output Voltage Deviation vs. Junction Temperature (**PQ3DZ53J000H/PQ3DZ13J000H**)

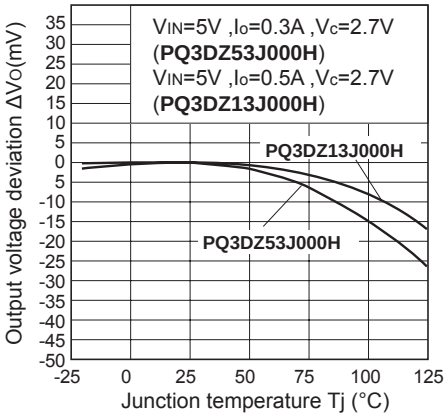


Fig.14 Output Voltage Deviation vs. Junction Temperature (**PQ05DZ51J00H/PQ05DZ11J00H**)

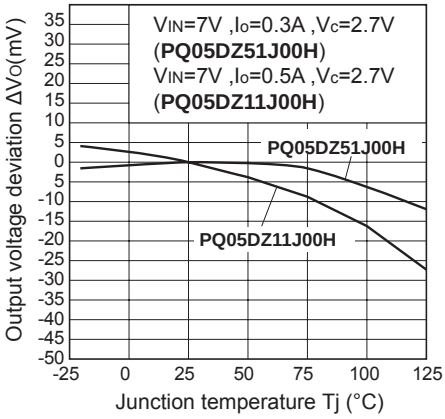


Fig.15 Output Voltage Deviation vs. Junction Temperature (**PQ09DZ51J00H/PQ09DZ11J00H**)

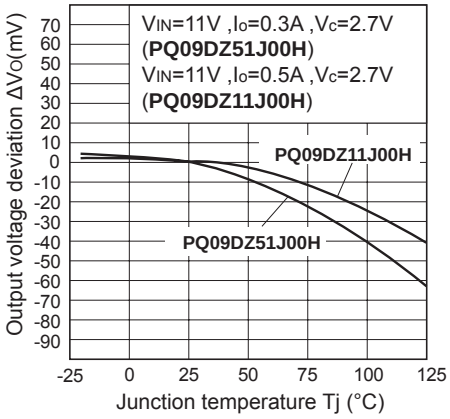


Fig.16 Output Voltage Deviation vs. Junction Temperature (**PQ12DZ51J00H/PQ12DZ11J00H**)

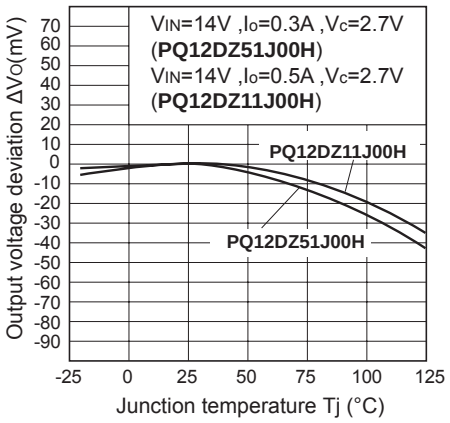


Fig.17 Output Voltage vs. Input Voltage (Typical Value) (**PQ3DZ53J000H**)

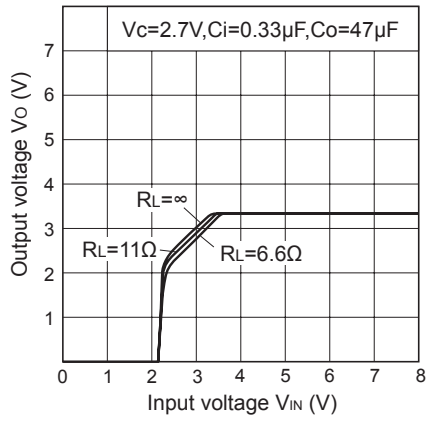


Fig.18 Output Voltage vs. Input Voltage (Typical Value) (**PQ05DZ51J00H**)

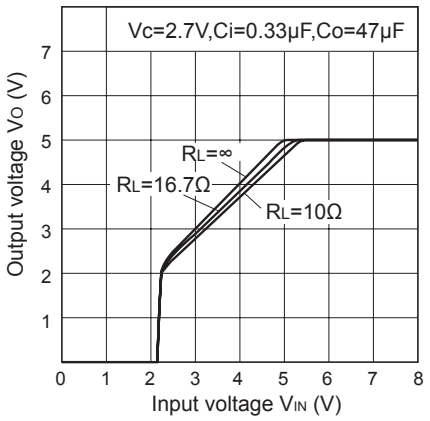


Fig.19 Output Voltage vs. Input Voltage (Typical Value) (**PQ09DZ51J00H**)

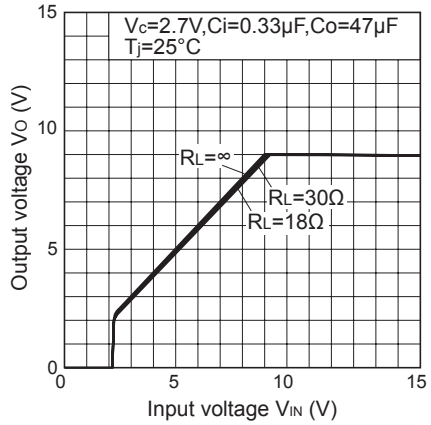


Fig.20 Output Voltage vs. Input Voltage (Typical Value) (**PQ12DZ51J00H**)

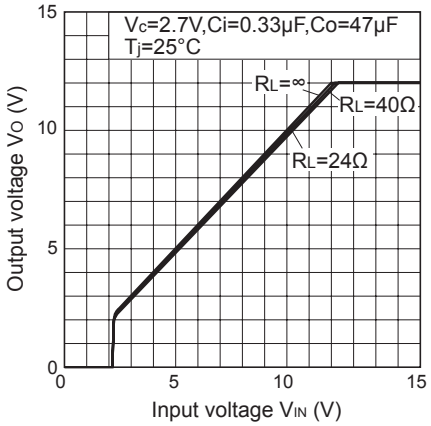


Fig.21 Output Voltage vs. Input Voltage (Typical Value) (**PQ3DZ13J000H**)

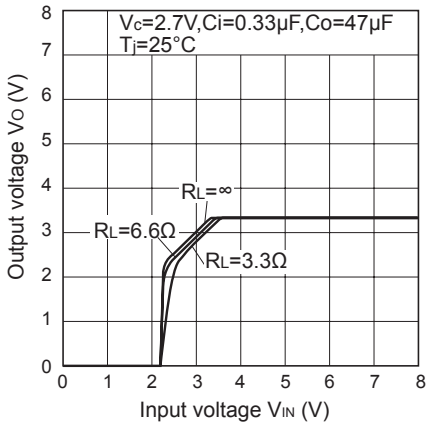


Fig.22 Output Voltage vs. Input Voltage (Typical Value) (**PQ05DZ11J00H**)

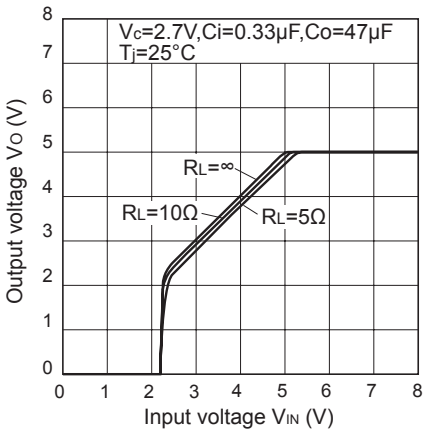


Fig.23 Output Voltage vs. Input Voltage (Typical Value) (**PQ09DZ11J00H**)

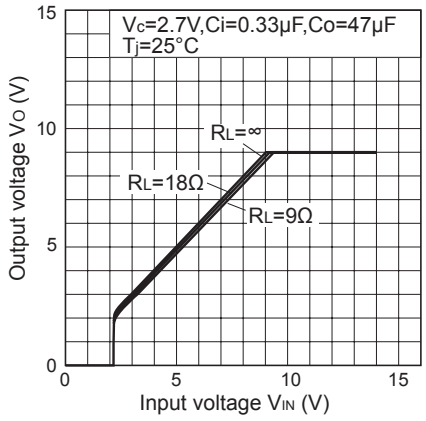


Fig.24 Output Voltage vs. Input Voltage (Typical Value) (**PQ12DZ11J00H**)

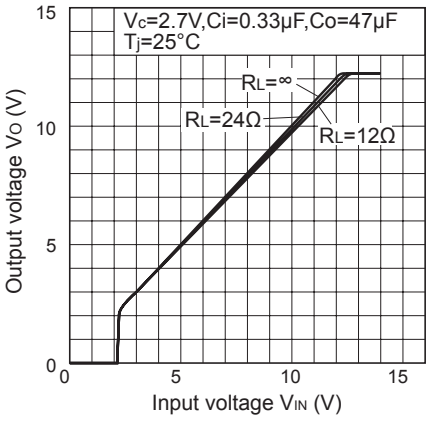


Fig.25 Circuit Operating Current vs. Input Voltage(**PQ3D53J000H**)

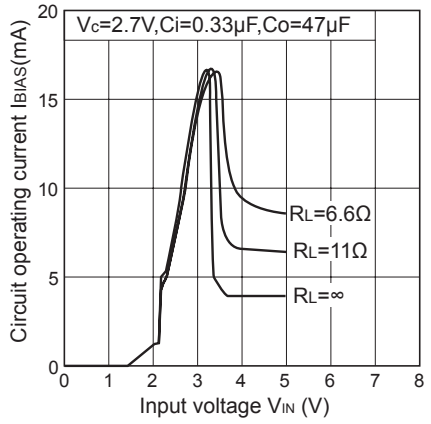


Fig.26 Circuit Operating Current vs. Input Voltage(**PQ05D51J00H**)

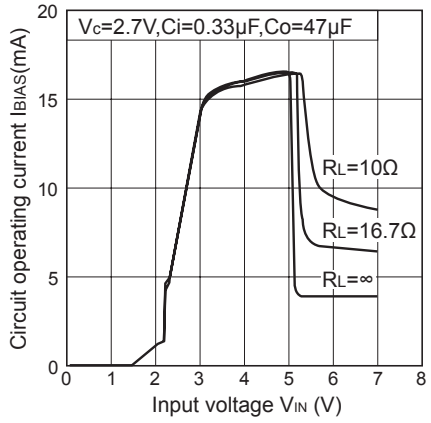


Fig.27 Circuit Operating Current vs. Input Voltage(**PQ09DZ51J00H**)

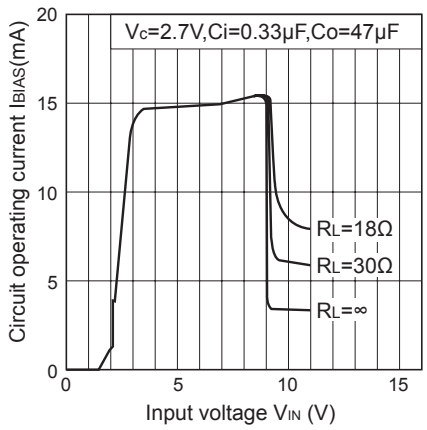


Fig.28 Circuit Operating Current vs. Input Voltage(**PQ12DZ51J00H**)

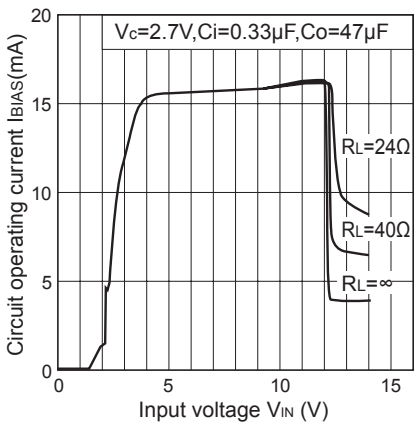


Fig.29 Circuit Operating Current vs. Input Voltage(**PQ3DZ13J000H**)

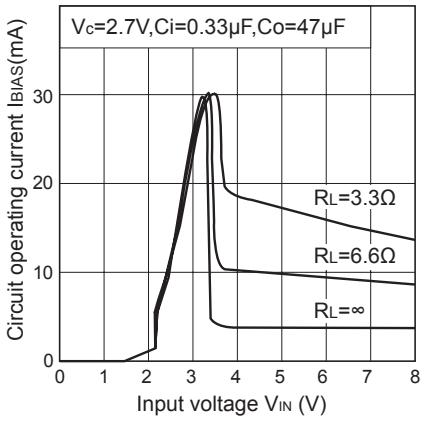


Fig.30 Circuit Operating Current vs. Input Voltage(**PQ05DZ11J00H**)

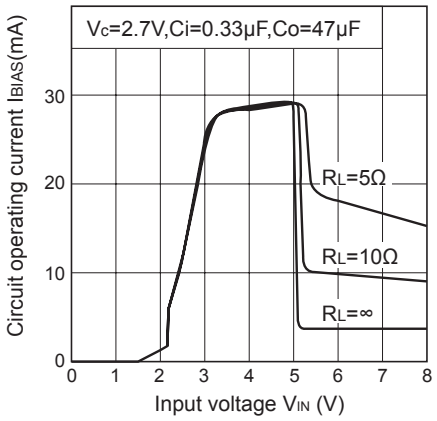


Fig.31 Circuit Operating Current vs. Input Voltage(**PQ09DZ11J00H**)

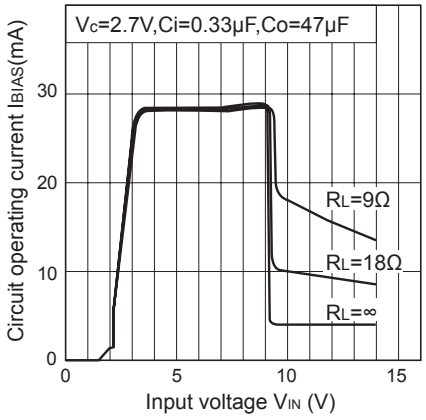


Fig.32 Circuit Operating Current vs. Input Voltage(**PQ12DZ11J00H**)

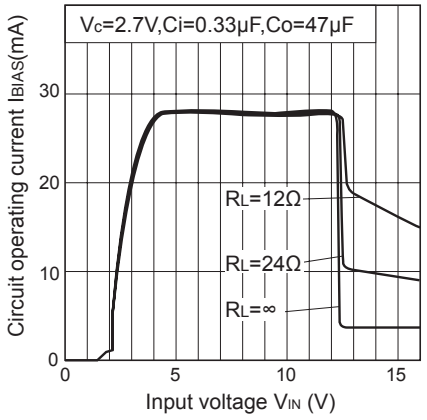


Fig.33 Dropout Voltage vs. Junction Temperature
(**PQxxDZ51J00H series/PD3DZ53J000H)**

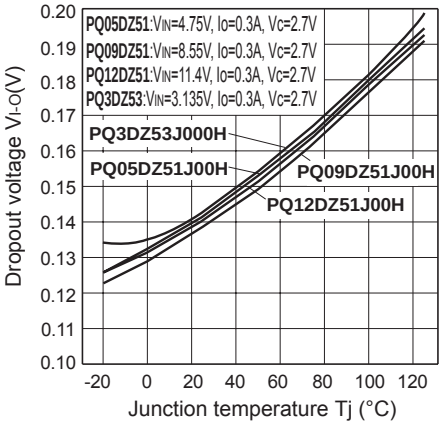


Fig.34 Dropout Voltage vs. Junction Temperature
(**PQxxDZ11J00H series/PD3DZ13J000H)**

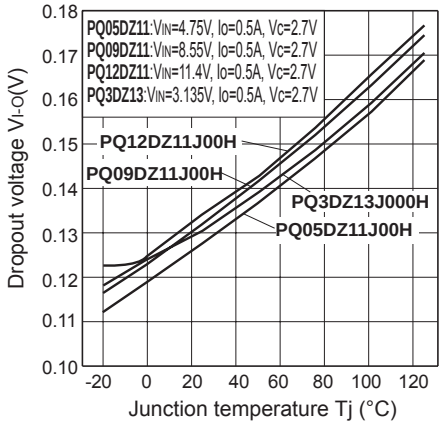


Fig.35 Quiescent Current vs. Junction Temperature
(**PQxxDZ51J00H series/PQ3DZ53J000H**)

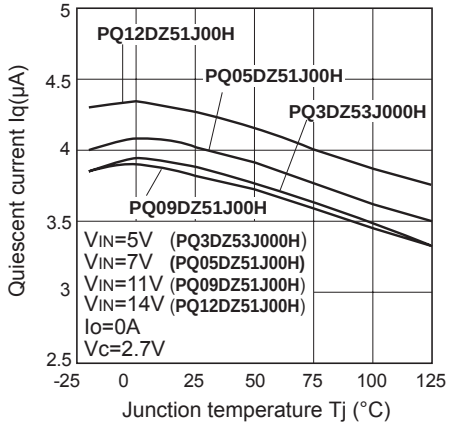


Fig.36 Quiescent Current vs. Junction Temperature
(**PQxxDZ11J00H series/PQ3DZ13J000H**)

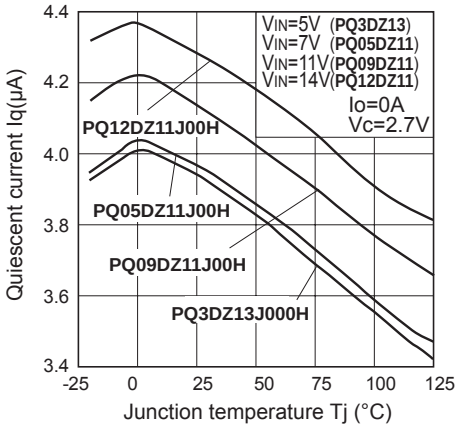


Fig.37 Ripple Rejection vs. Input Ripple Frequency
(**PQxxDZ51J00H series/PQ3DZ53J000H**)

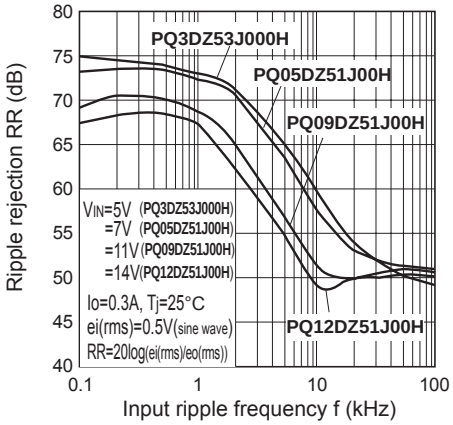


Fig.38 Ripple Rejection vs. Input Ripple Frequency
(**PQxxDZ11J00H series/PQ3DZ13J000H**)

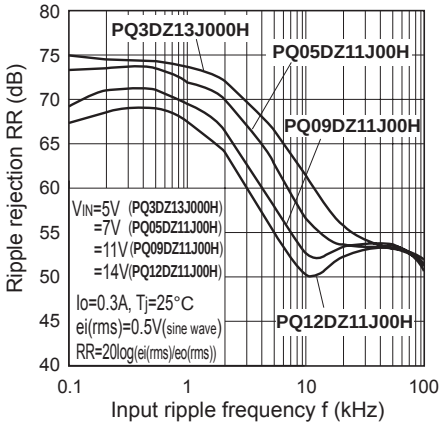


Fig.39 Ripple Rejection vs. Output Current
(**PQxxDZ51J00H series/PQ3DZ53J000H**)

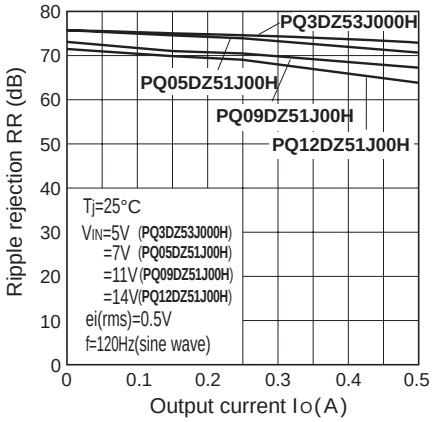
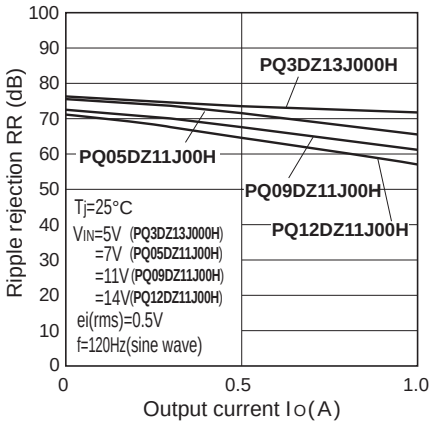
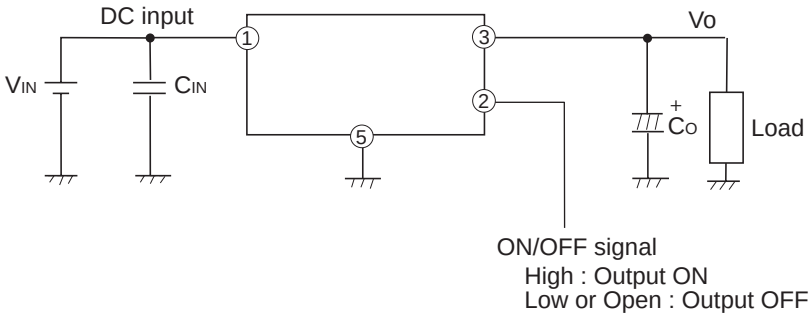


Fig.40 Ripple Rejection vs. Output Current
(**PQxxDZ11J00H series/PQ3DZ13J000H**)



■ Typical Application



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