PQxxxRDA2SZH Series

TO-220 Type,2A Output Low
Power-Loss Voltage Regulators

■ Features

1.Low power-loss
  Dropout voltage: MAX.1.0V(I_O=2.0A)
2.Output current: 2A
3.Low dissipation current
  (Dissipation current at no load: MAX. 8mA
  Output OFF-state dissipation current: MAX.5μA)
4.Built-in ON/OFF function
5.Built-in overcurrent and overheat protection functions
6.Built-in ASO protect function
7.RoHS directive compliant

■ Applications

1.Power supplies for various electronic equipment such as AV,OA

■ Model Line-up

Output voltage	Model No.	Output voltage	Model No.
3.3V	**PQ033RDA2SZH**	9.0V	**PQ090RDA2SZH**
5.0V	**PQ050RDA2SZH**	12.0V	**PQ120RDA2SZH**

■ Absolute Maximum Ratings

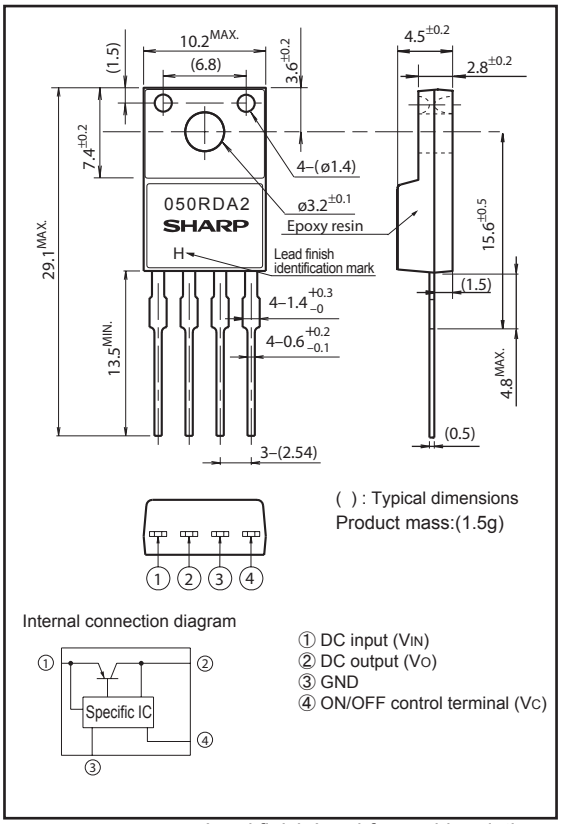
(Ta=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V_{IN}	20	V
*1 ON/OFF control terminal voltage	V_C	20	V
Output current	I_O	2.0	A
*2 Power dissipation	P_{D1}	1.4	W
	P_{D2}	15	
*3 Junction temperature	T_j	150	°C
Operating temperature	T_{opr}	-40 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_{D1}: No heat sink,P_{D2}: With infinite heat sink.
*3 Overheat protection may operate at Tj=125°C to 150°C

■ Outline Dimensions

(Unit : mm)



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

■ Electrical Characteristics

(Unless otherwise specified,condition shall be V_{IN}=V_O(TYP.)+2V,I_O=1.0A,V_C=2.7V,Ta=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	V_O	-	Refer to the table below			V
Load regulation	RegL	I_O=5mA to 2A	-	0.1	1.0	%
Line regulation	RegI	V_{IN}=V_O(TYP.)+1V to V_O(TYP.)+7V , I_O=5mA	-	0.1	1.0	%
Temperature coefficient of output voltage	T_CV_O	Tj=0 to +125°C, I_O=5mA	-	±0.01	-	%/°C
Ripple rejection	RR	-	-	60	-	dB
Dropout voltage	V_{I-O}	※4 I_O=2.0A	-	-	1.0	V
※5 ON-state voltage for control	$V_{C(ON)}$	-	2.0	-	-	V
ON-state current for control	$I_{C(ON)}$	V_C=2.7V	-	-	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
Quiescent current	I_q	I_O=0A	-	-	8	mA
Output OFF-state dissipation current	I_{qs}	I_O=0A, V_C=0.4V	-	-	5	μA

※4 V_{IN}=3.8V(**PQ033RDA2SZH**) , Input voltage shall be the value when output voltage is 95% in comparison with the initial value(**PQ050RDA2SZH,PQ090RDA2SZH,PQ120RDA2SZH**).

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

Table.1 Output Voltage Line-up

Model No.	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
PQ033RDA2SZH	V_O	V_{IN}=V_O (TYP.)+2V, I_O=1.0A, V_C=2.7V, T_a=25°C	3.218	3.3	3.382	V
PQ050RDA2SZH			4.875	5.0	5.125	
PQ090RDA2SZH			8.775	9.0	9.225	
PQ120RDA2SZH			11.70	12.0	12.30	

Fig.1 Test Circuit

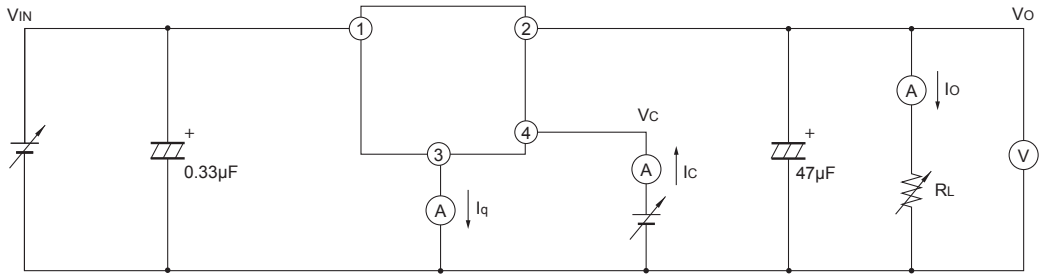
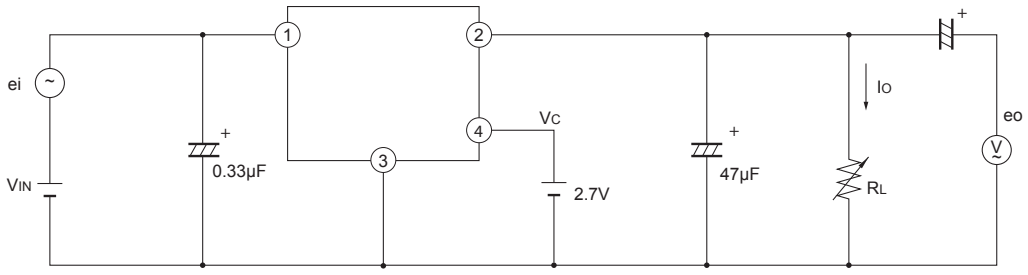
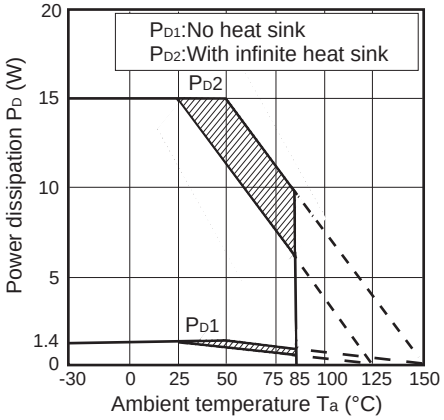


Fig.2 Test Circuit of Ripple Rejection



f=120Hz (sine wave)
$e_{i(rms)}$=0.5V
V_{IN}=5.3V (**PQ033RDA2SZH**)
V_{IN}=7V (**PQ050RDA2SZH**)
V_{IN}=11V (**PQ090RDA2SZH**)
V_{IN}=14V (**PQ120RDA2SZH**)
I_O=0.5A
RR=20 log($e_{i(rms)}$/$e_{o(rms)}$)

Fig.3 Power Dissipation vs. Ambient Temperature



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

Fig.4 Overcurrent Protection Characteristics (**PQ033RDA2SZH**)

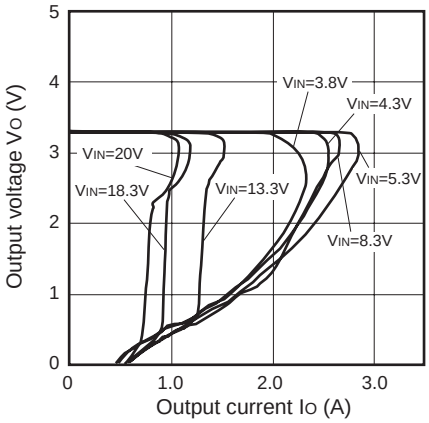


Fig.5 Overcurrent Protection Characteristics (**PQ050RDA2SZH**)

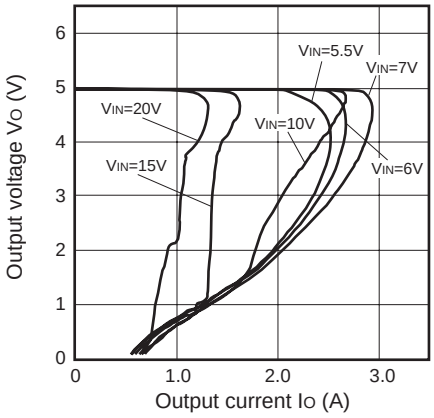


Fig.6 Overcurrent Protection Characteristics (**PQ090RDA2SZH**)

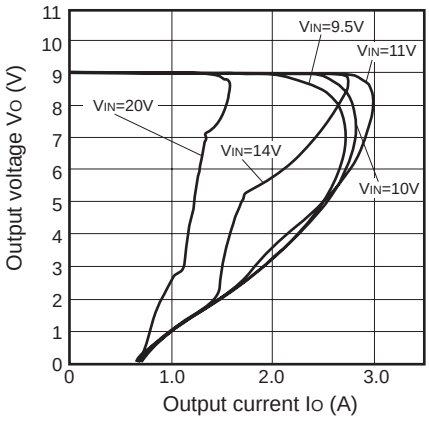


Fig.7 Overcurrent Protection Characteristics (**PQ120RDA2SZH**)

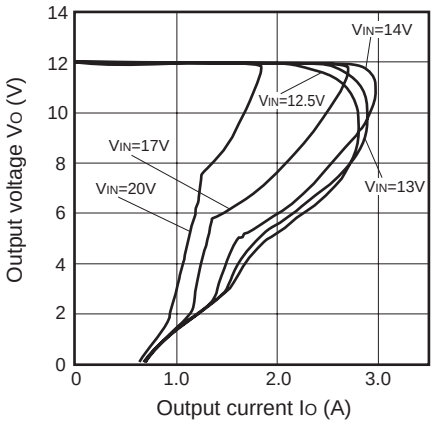


Fig.8 Output Voltage vs. Input Voltage (**PQ033RDA2SZH**)

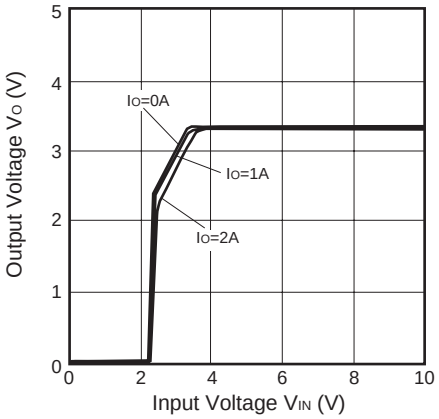


Fig.9 Output Voltage vs. Input Voltage (**PQ050RDA2SZH**)

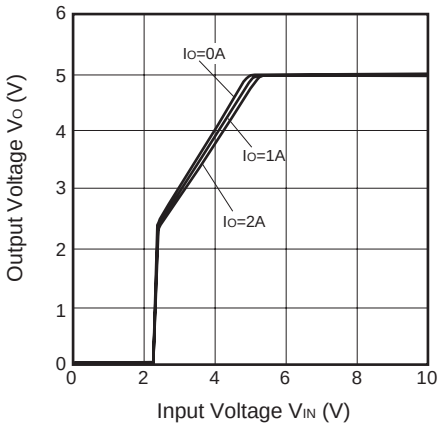


Fig.10 Output Voltage vs. Input Voltage (**PQ090RDA2SZH**)

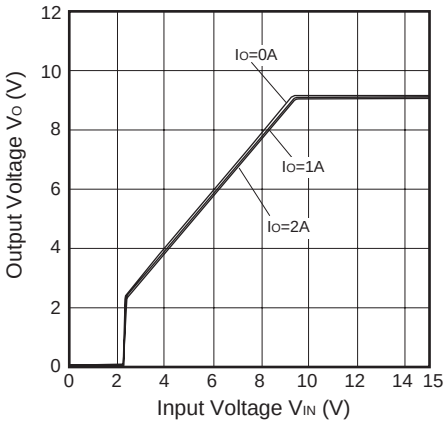


Fig.11 Output Voltage vs. Input Voltage (**PQ120RDA2SZH**)

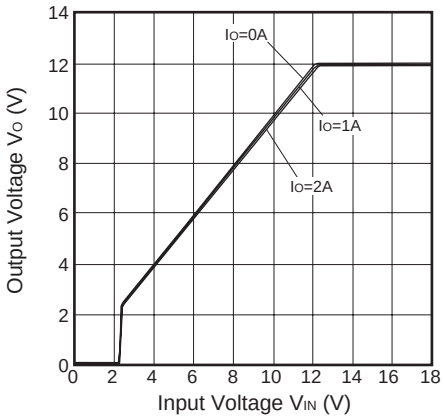


Fig.12 Circuit Operating Current vs. Input Voltage (**PQ033RDA2SZH**)

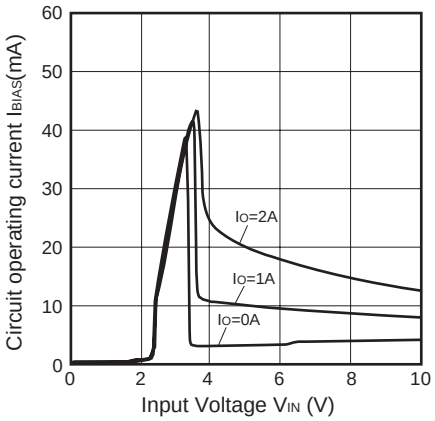


Fig.13 Circuit Operating Current vs. Input Voltage (**PQ050RDA2SZH**)

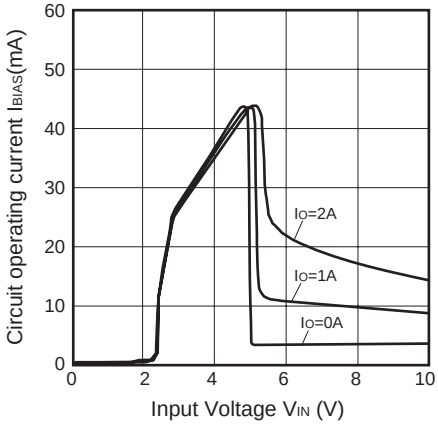


Fig.14 Circuit Operating Current vs. Input Voltage (**PQ090RDA2SZH**)

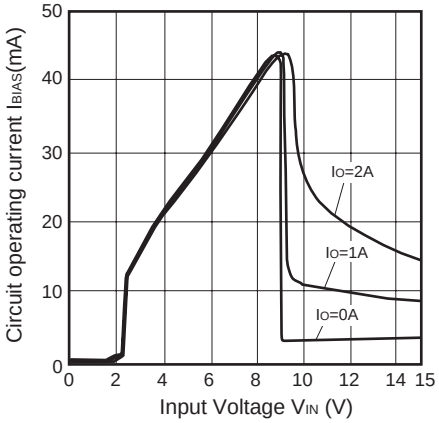


Fig.15 Circuit Operating Current vs. Input Voltage (**PQ120RDA2SZH**)

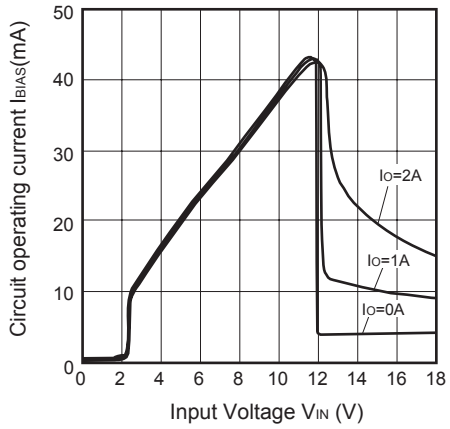


Fig.16 Dropout Voltage vs. Output Current (**PQxxxRDA2SZH**)

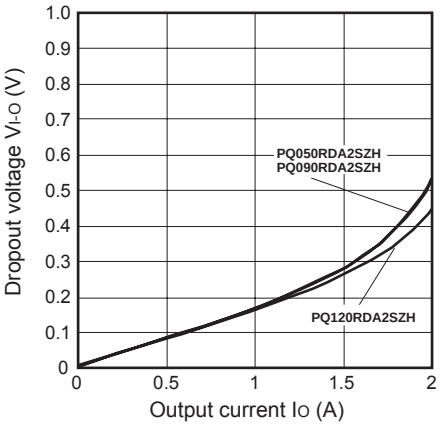


Fig.17 Output Voltage Fluctuation vs. Junction Temperature (**PQ033RDA2SZH)**

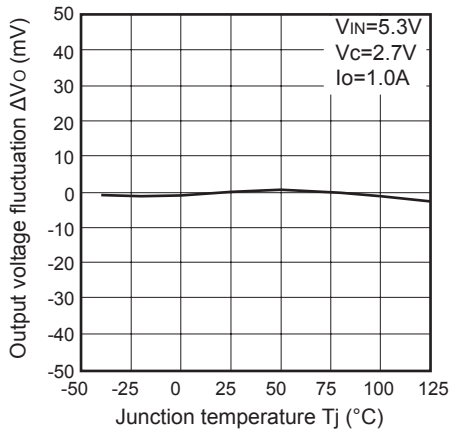


Fig.18 Output Voltage Fluctuation vs. Junction Temperature (**PQ050RDA2SZH)**

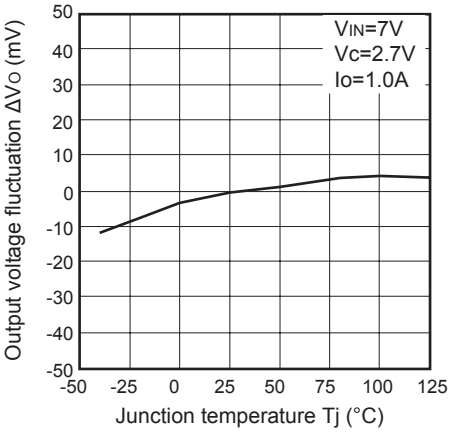


Fig.19 Output Voltage Fluctuation vs. Junction Temperature (**PQ090RDA2SZH)**

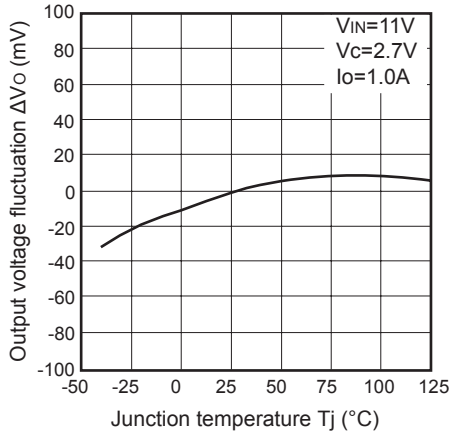


Fig.20 Output Voltage Fluctuation vs. Junction Temperature (**PQ120RDA2SZH)**

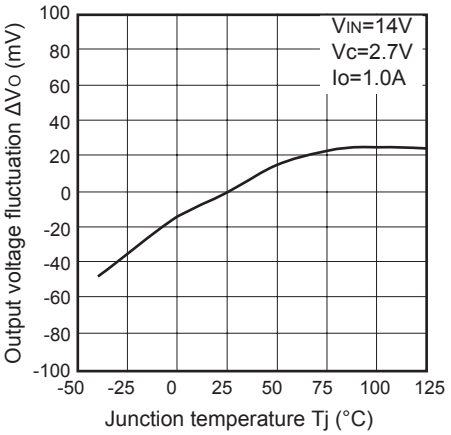


Fig.21 Dropout Voltage vs. Junction Temperature (**PQxxxRDA2SZH**)

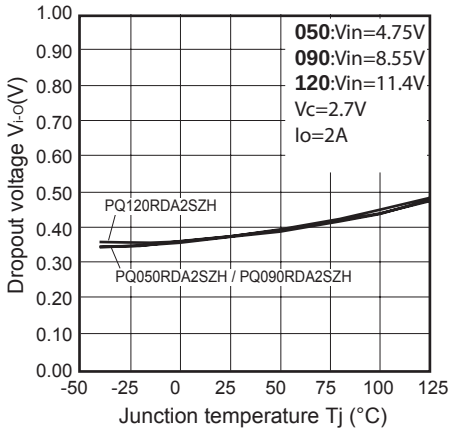


Fig.22 Quiescent Current vs. Junction Temperature(**PQxxxRDA2SZH**)

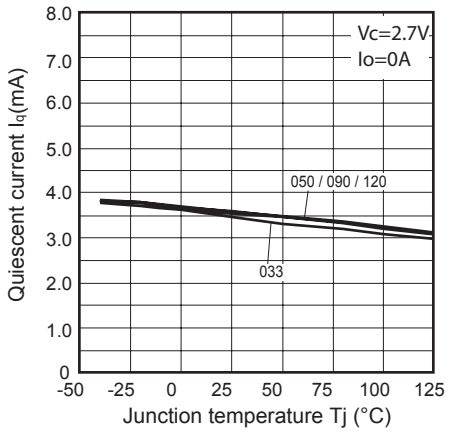


Fig.23 ON/OFF Threshold Voltage vs. Junction Temperature (**PQ090RDA2SZH**)

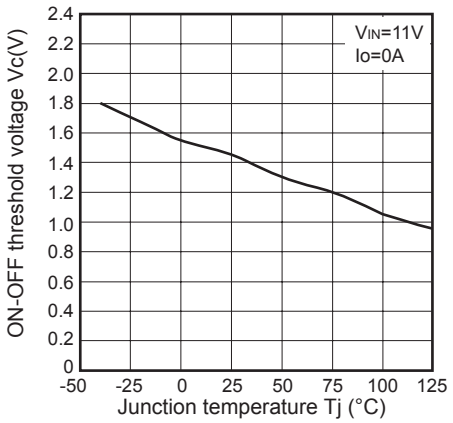


Fig.24 Ripple Rejection vs. Input Ripple Frequency (**PQxxxRDA2SZH**)

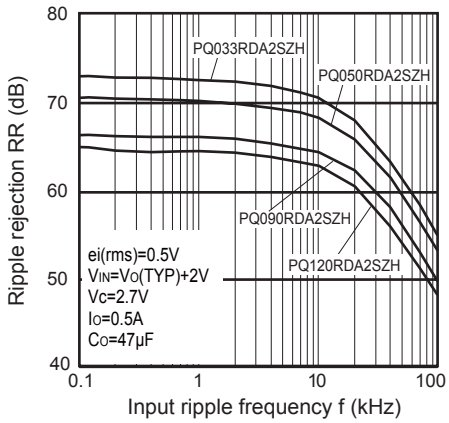
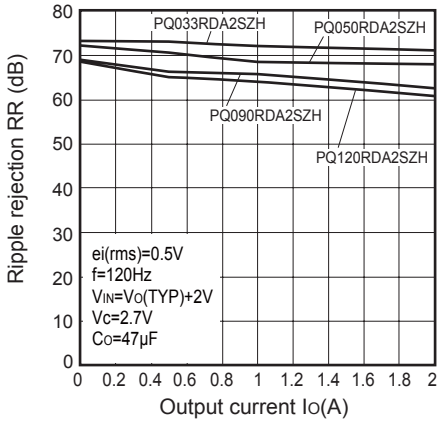


Fig.25 Ripple Rejection vs. Output Current (**PQxxxRDA2SZH**)



■ Typical Application