

PQ20RX05/PQ20RX11

Variable Output Type Low Power-Loss Voltage Regulator with ON/OFF Control Function

■ Features

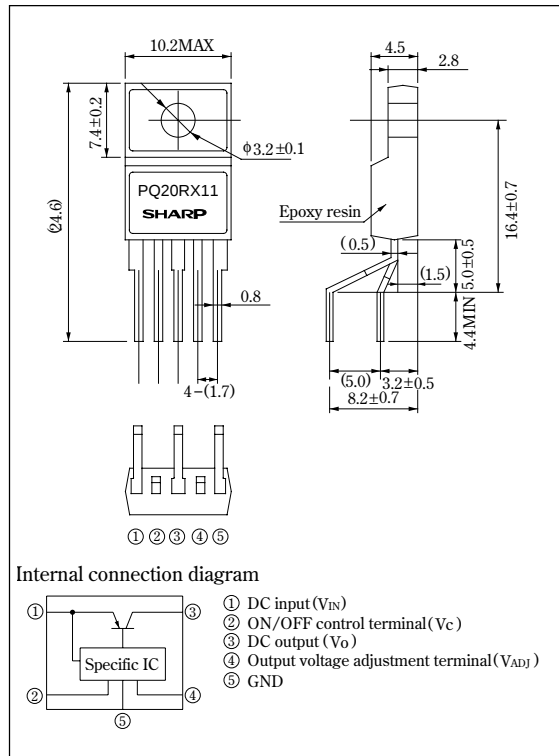
- Low power-loss
(Dropout voltage: MAX. 0.5V)
- Compact resin full mold package
(Equivalent to TO-220)
- With built-in ON/OFF control function
- Variable output voltage (setting range: 3.0 to 20V)
- 0.5A output (PQ20RX05)
1.0A output (PQ20RX11)
- Reference voltage precision: $\pm 2.5\%$
- With built-in overcurrent protection, overheat protection,
ASO protection circuit
ASO: Area of Safety Operation

■ Applications

- Power supplies for various electronic equipment such as
AV, OA equipment
- CRT displays

■ Outline Dimensions

(Unit : mm)



■ 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
*1 Output adjustment terminal voltage	V _{ADJ}	7	V
Output current	PQ20RX05	0.5	A
	PQ20RX11	1	
*2 Power dissipation	P _{D1}	1.5(PQ20RX11), 1.25(PQ20RX05)	W
	P _{D2}	15(PQ20RX11), 10(PQ20RX05)	
*3 Junction temperature	T _j	150	°C
Operating temperature	T _{opr}	-20 to +80	°C
Storage temperature	T _{stg}	-40 to +150	°C
Soldering temperature	T _{sol}	260(for 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 125<T_j<150°C.

• Please refer to the chapter "Handling Precautions".

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Electrical Characteristics

(Unless otherwise specified, VIN=5V, VO=3.3V, ※4, R1=2kΩ, R2=500Ω, VC=2.7V, Ta=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage	VIN	—	3.5	—	24	V
Output voltage	VO	—	3.0	—	20	V
Load regulation	RegL	※5	—	—	2.0	%
Line regulation	RegI	VIN=4 to 10V, Io=5mA	—	—	2.5	%
Ripple rejection	RR	Refer to Fig. 2	45	—	—	dB
Reference voltage	Vref	—	2.574	2.64	2.706	V
Temperature coefficient of reference voltage	TcVref	Tj=0 to 125°C, Io=5mA	—	±1.0	—	%
Dropout voltage	ViO	※4, ※6	—	—	0.5	V
Quiescent current	Iq	Io=0A	—	—	8	mA
※7 ON-state voltage for control	VC(ON)	—	2.0	—	—	V
ON-state current for control	IC(ON)	—	—	—	200	μA
OFF-state voltage for control	VC(OFF)	Io=0A	—	—	0.8	V
OFF-state current for control	IC(OFF)	Io=0A, VC=0.4V	—	—	2.0	μA
Output OFF-state consumption current	Iqs	VC=0.4V	—	—	5.0	μA

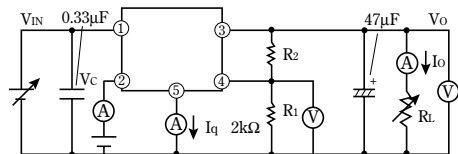
※4 PQ20RX05: Io=0.3A, PQ20RX11: Io=0.5A

※5 PQ20RX05: Io=5mA to 0.5A, PQ20RX11: Io=5mA to 1.0A

※6 Input voltage shall be the value when output voltage is 95% in comparison with the initial value.

※7 In case of opening ON/OFF control terminal②, output voltage turns off.

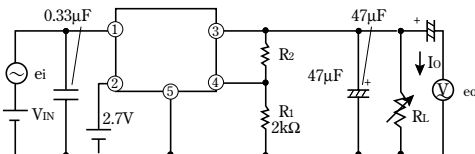
Fig. 1 Test Circuit



$$V_O = V_{ref} \times \left(1 + \frac{R_2}{R_1}\right)$$

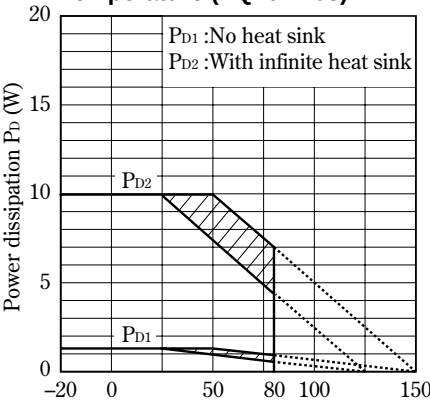
[R1=2kΩ, Vref Nearly=2.64V]

Fig. 2 Test Circuit of Ripple Rejection



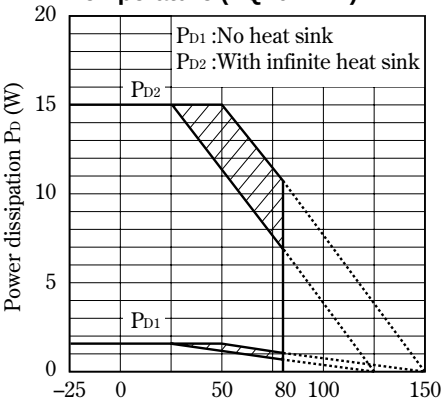
f=120Hz(sine wave)
ei(rms)=0.5V
Io=0.3A
RR=20 log(ei(rms)/eo(rms))
VIN=5V
VO=3.3V(R1=2kΩ)

Fig. 3 Power Dissipation vs. Ambient Temperature (PQ20RX05)



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

Fig. 4 Power Dissipation vs. Ambient Temperature (PQ20RX11)



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

Fig. 5 Overcurrent Protection Characteristics (Typical Value) (PQ20RX05)

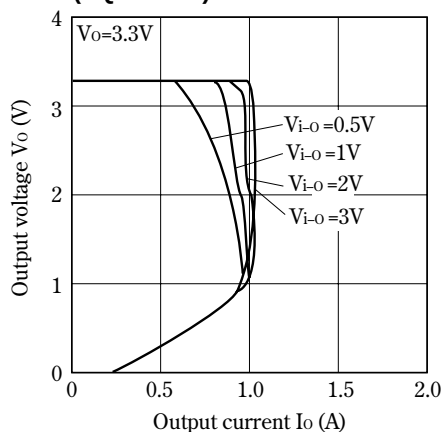


Fig. 6 Overcurrent Protection Characteristics (Typical Value) (PQ20RX11)

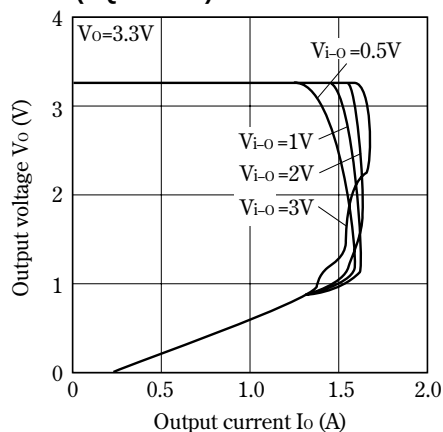


Fig. 7 Output Voltage Adjustment Characteristics

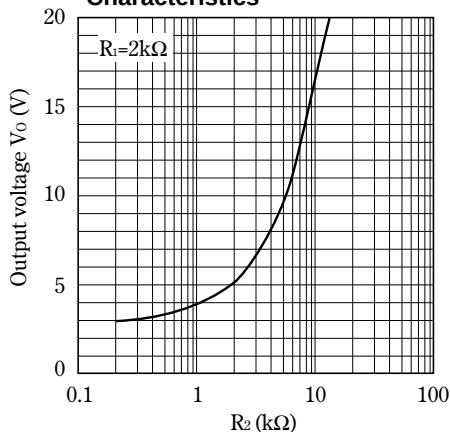


Fig. 8 Reference Voltage Deviation vs. Junction Temperature (Typical Value)

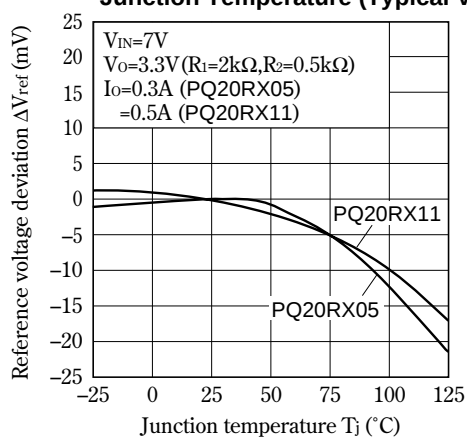


Fig. 9 Output Voltage vs. Input Voltage (PQ20RX05)

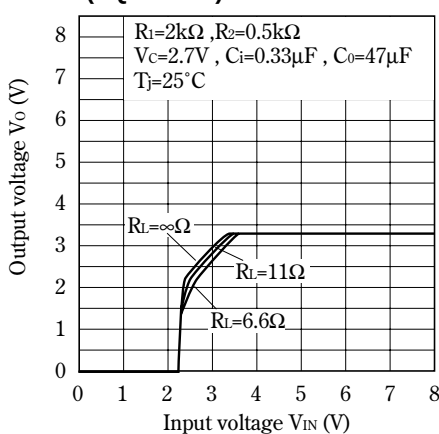


Fig.10 Output Voltage vs. Input Voltage (PQ20RX11)

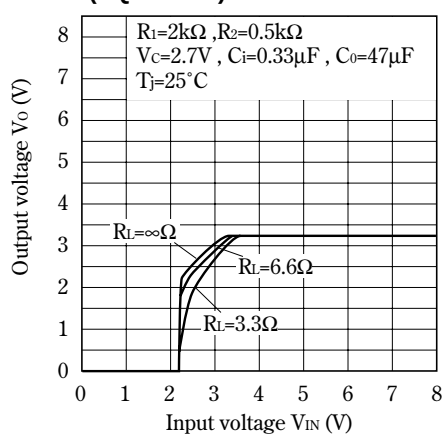


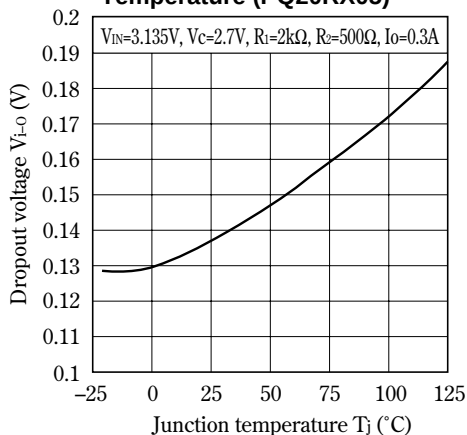
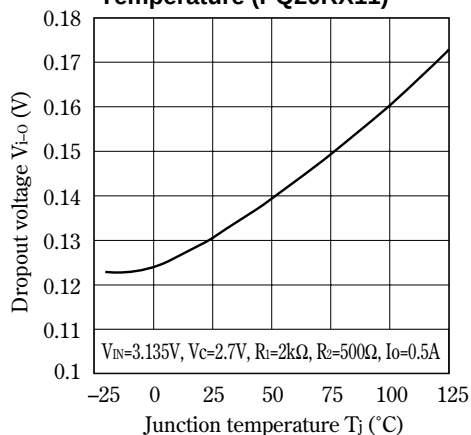
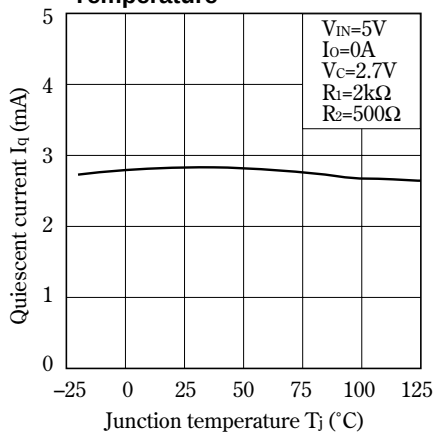
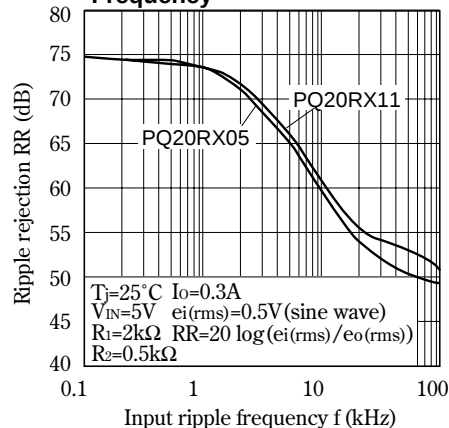
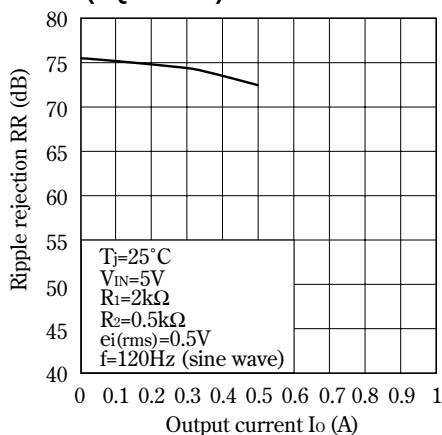
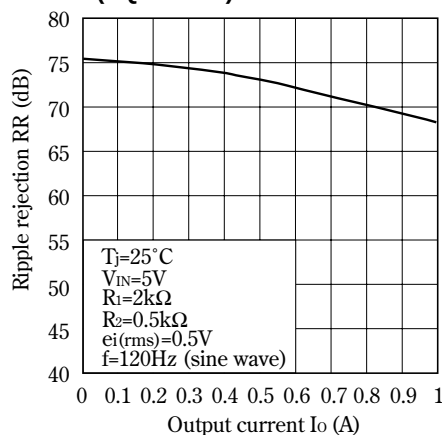
Fig.11 Dropout Voltage vs. Junction Temperature (PQ20RX05)**Fig.12 Dropout Voltage vs. Junction Temperature (PQ20RX11)****Fig.13 Quiescent Current vs. Junction Temperature****Fig.14 Ripple Rejection vs. Input Ripple Frequency****Fig.15 Ripple Rejection vs. Output Current (PQ20RX05)****Fig.16 Ripple Rejection vs. Output Current (PQ20RX11)**

Fig.17 Circuit Operating Current vs. Input Voltage (PQ20RX05)

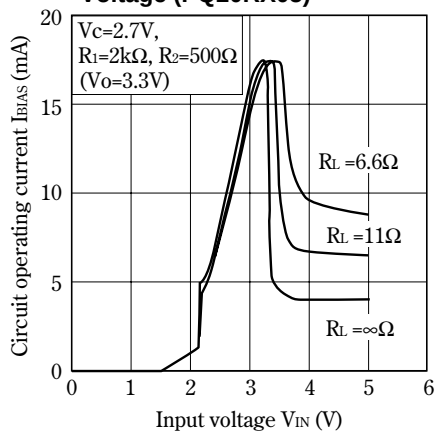
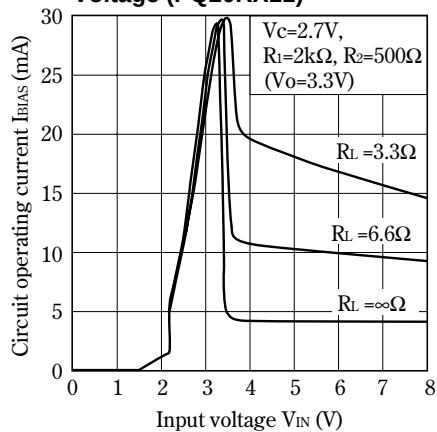
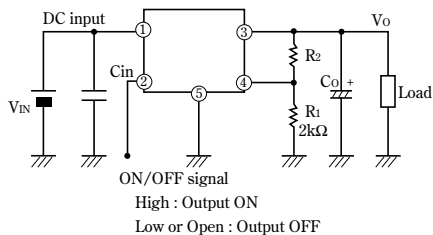


Fig.18 Circuit Operating Current vs. Input Voltage (PQ20RX11)



Typical Application



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