

PQ05RD08 Series/PQ3RD083/PQ6RD083

0.8A Output, Low Power-Loss Voltage Regulator

Features

- Low power-loss (Dropout voltage: MAX. 0.5V at $I_o=0.5A$)
- 0.8A output type
- Compact resin package (equivalent to TO-220)
- Available 3.3V/5V/6.3V/9V/12V output type
- Output voltage precision: $\pm 3.0\%$
- Built-in ON/OFF control function
- Built-in Overcurrent, overheat protection functions, ASO protection circuit
- Lead forming type is also available.

Applications

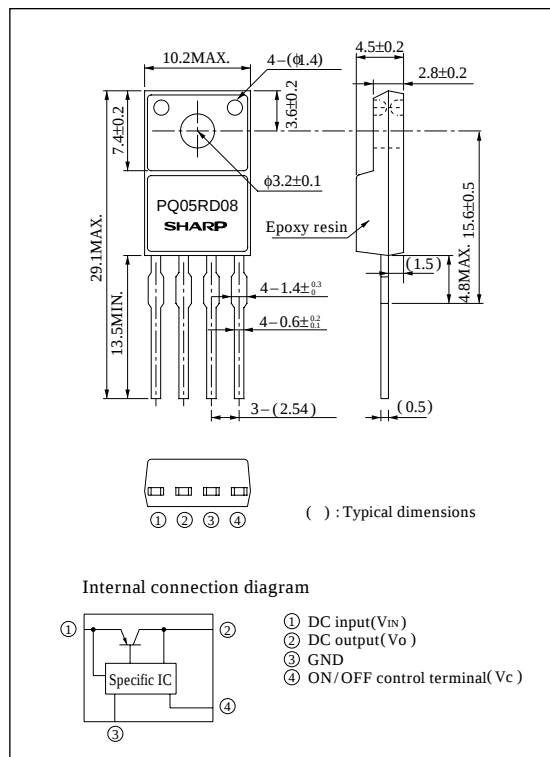
- Power supplies for various electronic equipment such as AV, OA equipment

Model Line-ups

	0.8A output
3.3V output	PQ3RD083
5.0V output	PQ05RD08
6.3V output	PQ6RD083
9.0V output	PQ09RD08
12.0V output	PQ12RD08

Outline Dimensions

(Unit : mm)



Absolute Maximum Ratings

($T_a=25^\circ\text{C}$)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V_{IN}	20	V
*1 ON/OFF control voltage	V_c	20	V
Output current	I_o	0.8	A
*2 Power dissipation	P_{D1}	1.25	W
	P_{D2}	10	W
*3 Junction temperature	T_j	150	$^\circ\text{C}$
Operating temperature	T_{opr}	-20 to +80	$^\circ\text{C}$
Storage temperature	T_{stg}	-40 to +150	$^\circ\text{C}$
Soldering temperature	T_{sol}	260 (For 10s)	$^\circ\text{C}$

*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 $125 \leq T_j \leq 150^\circ\text{C}$.

• Please refer to the chapter "Handling Precautions".

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Electrical Characteristics

(Unless otherwise specified, $I_o=0.5A$, ④ , $T_a=25^\circ\text{C}$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	V_o	④	3.201	3.3	3.399	V
			4.85	5.0	5.15	
			6.111	6.3	6.489	
			8.73	9.0	9.27	
			11.64	12.0	12.36	
Load regulation	RegL	$I_o=5\text{mA}$ to $0.8A$, ④	—	0.1	2.0	%
Line regulation	RegI	⑤ , $I_o=5\text{mA}$	—	0.5	2.5	%
			—	0.1	2.5	
Temperature coefficient of output voltage	T_cV_o	$T_j=0$ to 125°C , $I_o=5\text{mA}$	—	± 0.02	—	$\%/^\circ\text{C}$
Ripple rejection	RR	Refer to Fig.2	45	55	—	dB
Dropout voltage	V_{I-O}	⑥ , $I_o=0.5A$	—	—	0.5	V
⑦ ON-state voltage for control	$V_{C(ON)}$	④	2.0	—	—	V
ON-state current for control	$I_{C(ON)}$	$V_C=2.7V$, ④	—	—	20	μA
OFF-state voltage for control	$V_{C(OFF)}$	④	—	—	0.8	V
OFF-state current for control	$I_{C(OFF)}$	$V_C=0.4V$, ④	—	—	-0.4	mA
Quiescent current	I_q	$I_o=0A$, ④	—	—	10	mA

 ④ PQ3RD083: $V_{IN}=5V$, PQ05RD08: $V_{IN}=7V$, PQ6RD083: $V_{IN}=8V$, PQ09RD08: $V_{IN}=11V$, PQ12RD08: $V_{IN}=14V$ ⑤ PQ3RD083: $V_{IN}=4$ to $10V$, PQ6RD083: $V_{IN}=7$ to $13V$, PQ05RD08: $V_{IN}=6$ to $12V$, PQ09RD08: $V_{IN}=10$ to $16V$, PQ12RD08: $V_{IN}=13$ to $17V$ ⑥ Input voltage shall be the value when output voltage is 95% in comparison with the initial value. (PQ3RD08: $V_{IN}=3.7V$) ⑦ In case of opening control terminal ④ , output voltage turns on.

Fig. 1 Test Circuit

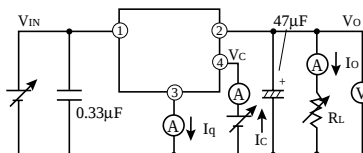


Fig. 2 Test Circuit of Ripple Rejection

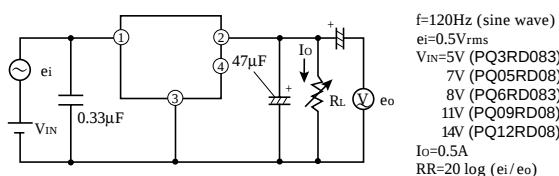
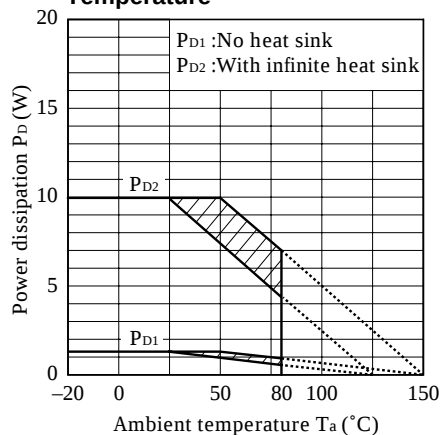


Fig. 3 Power Dissipation vs. Ambient Temperature



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

Fig. 4 Overcurrent Protection Characteristics (Typical Value)

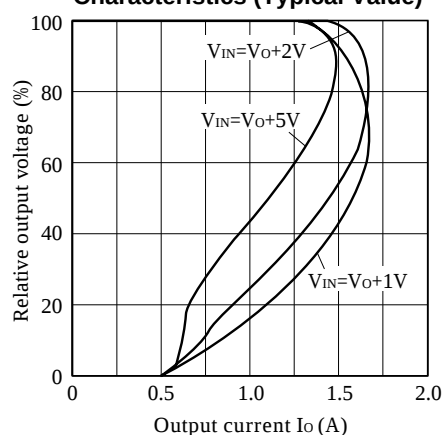


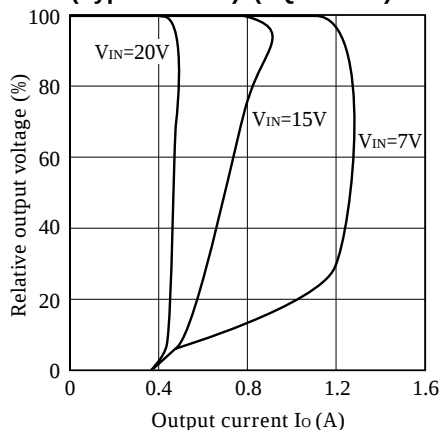
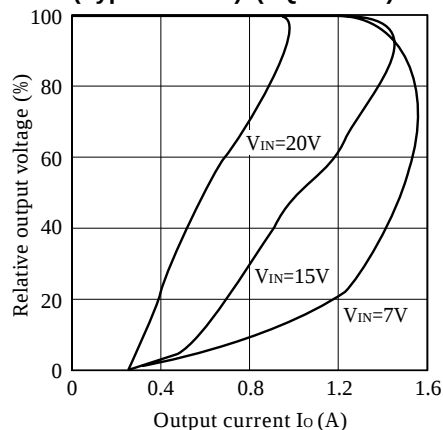
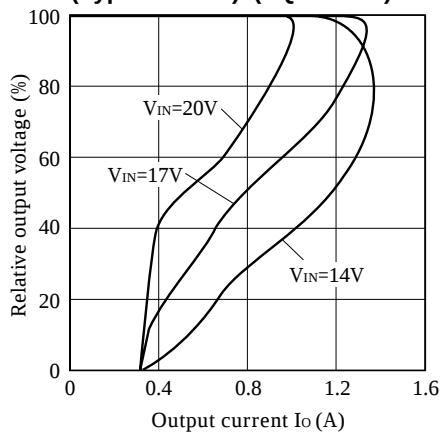
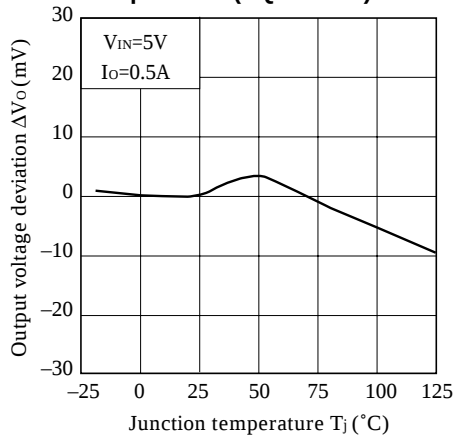
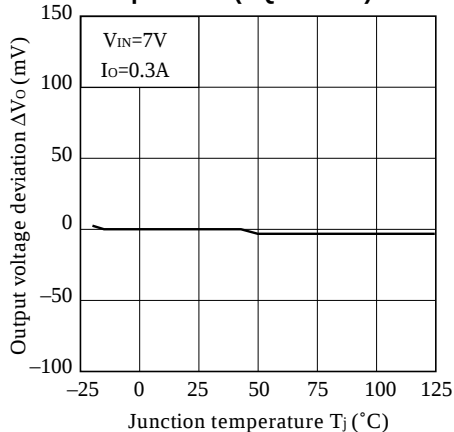
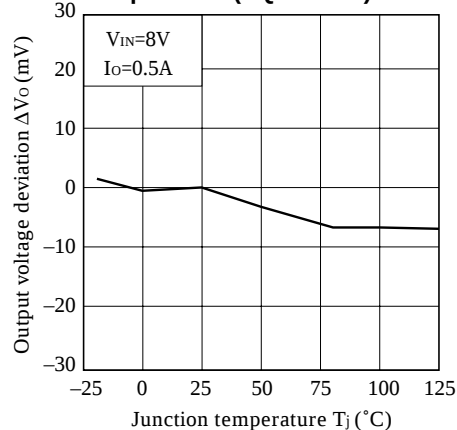
Fig. 5 Overcurrent Protection Characteristics (Typical Value) (PQ05RD08)**Fig. 6 Overcurrent Protection Characteristics (Typical Value) (PQ09RD08)****Fig. 7 Overcurrent Protection Characteristics (Typical Value) (PQ12RD08)****Fig. 8 Output Voltage Deviation vs. Junction Temperature (PQ3RD083)****Fig. 9 Output Voltage Deviation vs. Junction Temperature (PQ05RD08)****Fig.10 Output Voltage Deviation vs. Junction Temperature (PQ6RD083)**

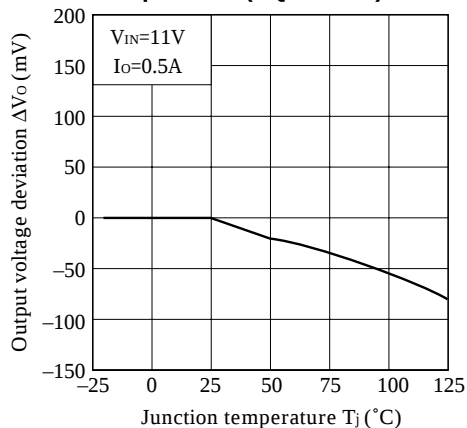
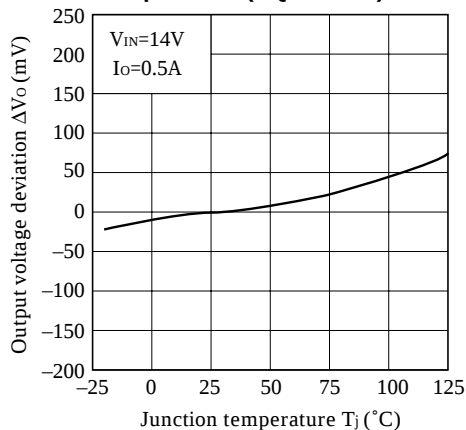
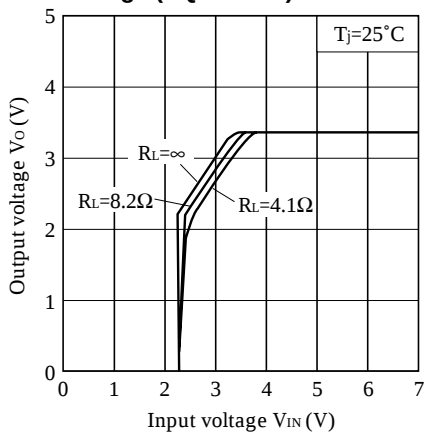
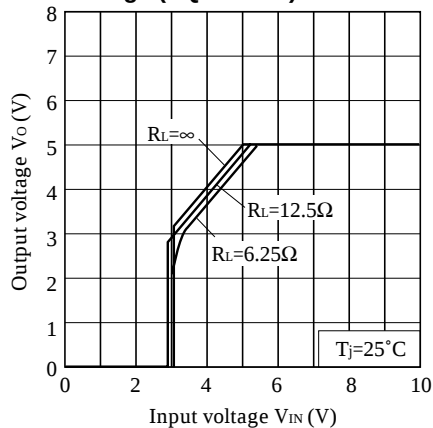
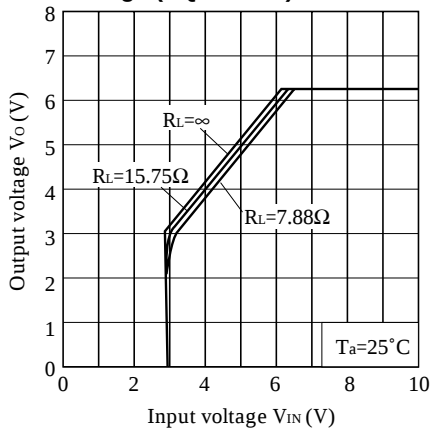
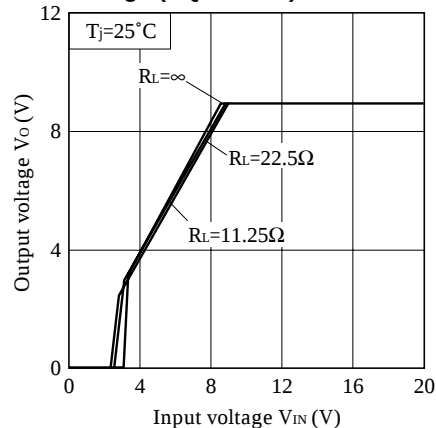
Fig.11 Output Voltage Deviation vs. Junction Temperature (PQ09RD08)**Fig.12 Output Voltage Deviation vs. Junction Temperature (PQ12RD08)****Fig.13 Output Voltage vs. Input Voltage (PQ3RD083)****Fig.14 Output Voltage vs. Input Voltage (PQ05RD08)****Fig.15 Output Voltage vs. Input Voltage (PQ6RD083)****Fig.16 Output Voltage vs. Input Voltage (PQ09RD08)**

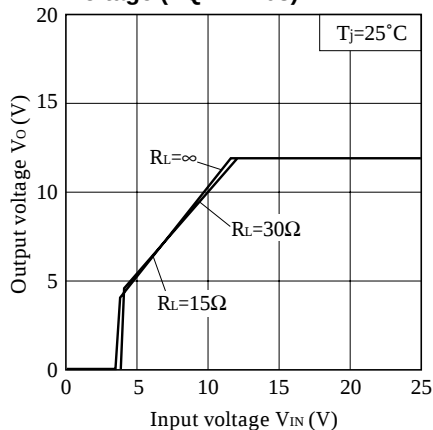
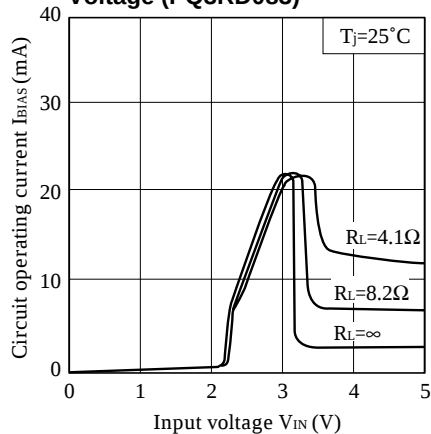
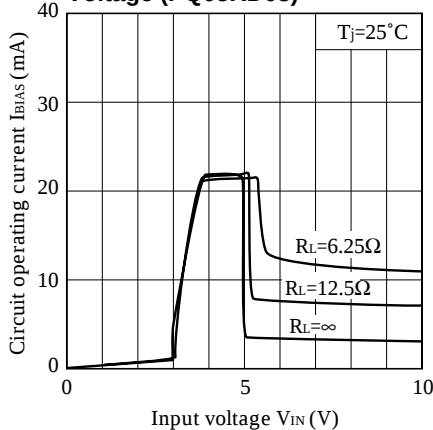
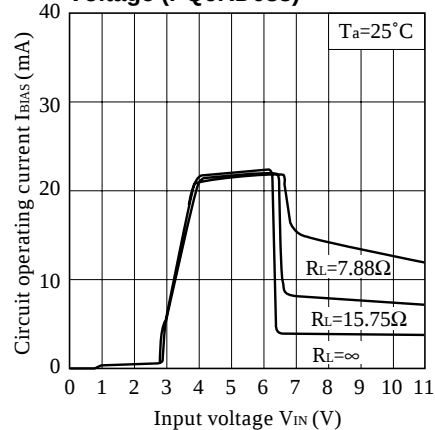
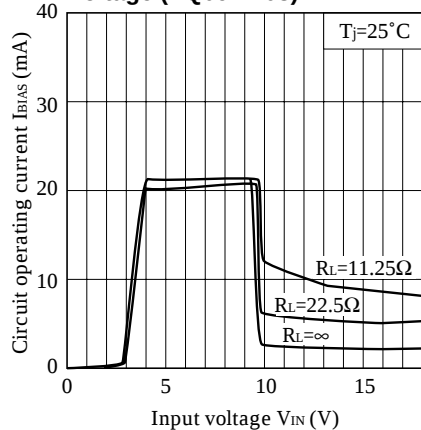
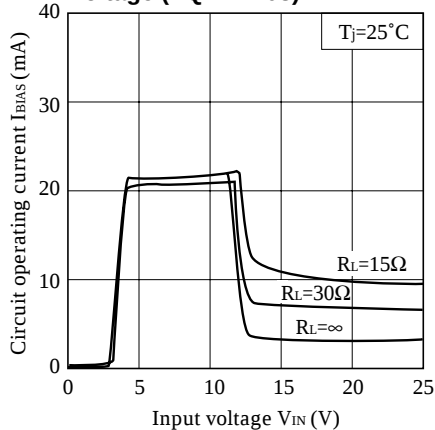
Fig.17 Output Voltage vs. Input Voltage (PQ12RD08)**Fig.18 Circuit Operating Current vs. Input Voltage (PQ3RD083)****Fig.19 Circuit Operating Current vs. Input Voltage (PQ05RD08)****Fig.20 Circuit Operating Current vs. Input Voltage (PQ6RD083)****Fig.21 Circuit Operating Current vs. Input Voltage (PQ09RD08)****Fig.22 Circuit Operating Current vs. Input Voltage (PQ12RD08)**

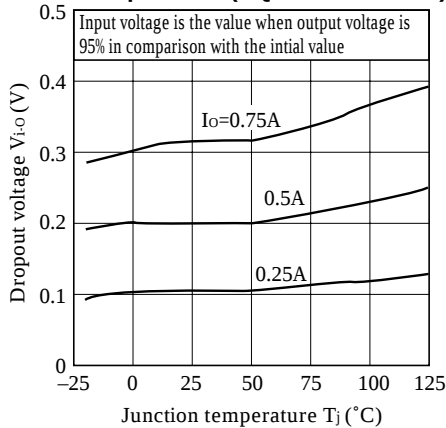
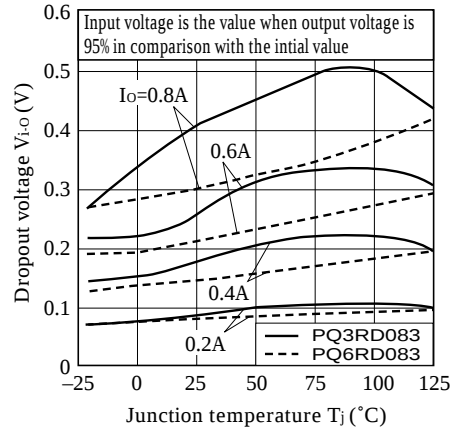
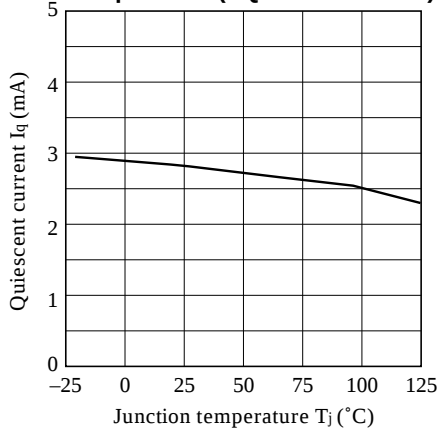
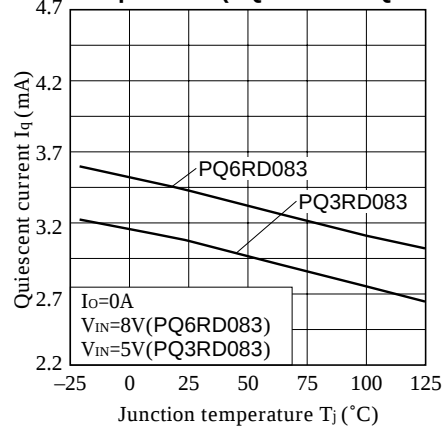
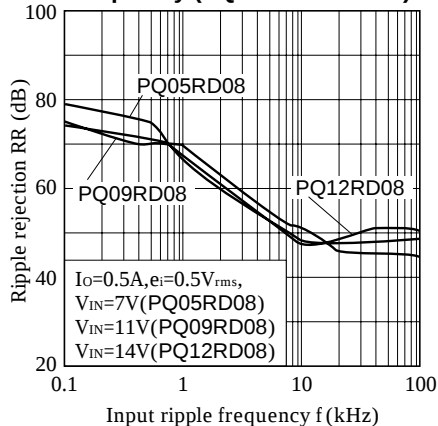
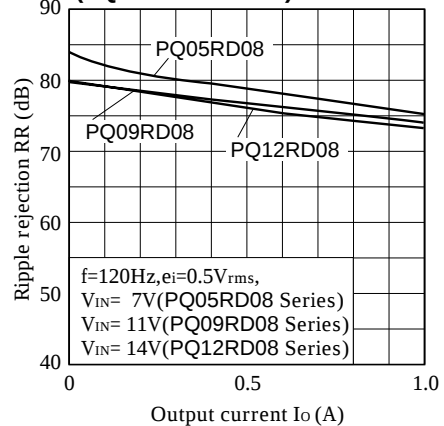
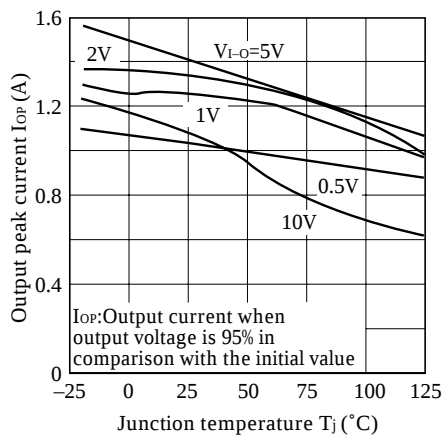
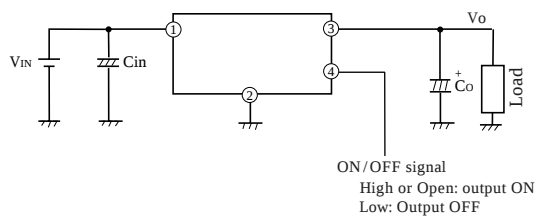
Fig.23 Dropout Voltage vs. Junction Temperature (PQ05RD08 Series)**Fig.24 Dropout Voltage vs. Junction Temperature (PQ3RD083/PQ6RD083)****Fig.25 Quiescent Current vs. Junction Temperature (PQ05RD08 Series)****Fig.26 Quiescent Current vs. Junction Temperature (PQ3RD083/PQ6RD083)****Fig.27 Ripple Rejection vs. Input Ripple Frequency (PQ05RD08 Series)****Fig.28 Ripple Rejection vs. Output Current (PQ05RD08 Series)**

Fig.29 Output Peak Current vs. Junction Temperature

■ Typical Application



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