PQ25VB8M2FZ/PQ25VB012FZ

Variable Output Type, Low Power-Loss Voltage Regulator with Built-in Overheat Shut-down Function

■ Features

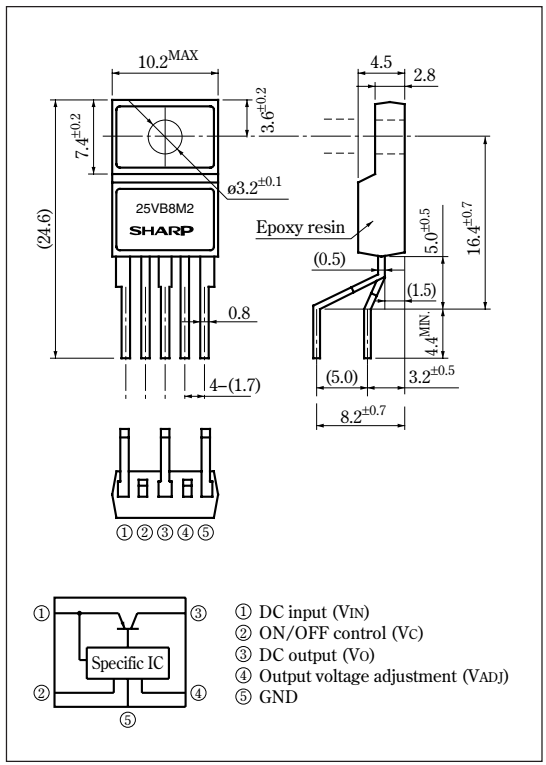
- Compact resin full mold package (Equivalent to TO-220)
- Low power-loss (Dropout voltage: MAX. 0.5V at I_O=0.5A)
- Overheat shut-down function (keep shut-down output until power-on again)
- Variable output voltage (setting range: 1.5 to 25V)
- With built-in overcurrent protection
- Reference voltage precision: ±2.0%
- With built-in ON/OFF control function

■ Applications

- Series power supply for TVs and VCRs
- Power supplies for equipment
- CRT displays

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
*1 Input voltage		V_{IN}	27	V
*1 ON/OFF control terminal voltage		V_C	27	V
*1 Output adjustment terminal voltage		V_{ADJ}	7	V
Output current	PQ25VB8M2FZ	I_O	0.8	A
	PQ25VB012FZ		1	
*2 Power dissipation		P_{D1}	1.25	W
		P_{D2}	12.5	W
*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 (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 shut-down function operates at Tj≥110°C

• Please refer to the chapter " Handling Precautions ".

■ Electrical Characteristics

(Unless otherwise specified, condition shall be V_{IN}=12V, V_O=10V (R_1=390Ω), I_O=0.5A, V_O=2.7V, Ta=25˚C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Minimum operating supply voltage		$V_{IN(MIN.)}$	–	4.5	–	27	V
Output voltage		V_O	–	1.5	–	25	V
Load regulation	PQ25VB8M2FZ	$R_{eg}L$	I_O=5mA to 0.8A	–	0.3	1.0	%
	PQ25VB012FZ		I_O=5mA to 1A				
Line regulation		$R_{eg}I$	V_{IN}=11 to 20V, I_O=5mA	–	0.5	1.0	%
Ripple rejection		RR	Refer to Fig.2	45	55	–	dB
Reference voltage		V_{ref}	–	1.225	1.25	1.275	V
Reference voltage temperature coefficient		T_CV_{ref}	T_J=0 to 110˚C, I_O=5mA	–	±1.0	–	%
Dropout voltage		V_{I-O}	※4 I_O=0.5A	–	–	0.5	V
※5 ON-state voltage for control		$V_{C(ON)}$	※5	2.0	–	–	V
ON-state current for control		$I_{C(ON)}$	V_C=2.7V	–	–	20	µA
OFF-state voltage for control		$V_{C(OFF)}$	–	–	–	0.8	V
OFF-state current for control		$I_{C(OFF)}$	V_C=0.4V	–	–	–0.4	mA
Quiescent current		I_q	I_O=0A	–	–	7	mA
Overheating shutdown temperature		T_{SD}	–	110	130	150	˚C

※4 Input voltage shall be the value when output voltage is 95% in comparison with the initial value
※5 In case of opening ON/OFF control terminal② , output voltage turns on

Fig.1 Test Circuit

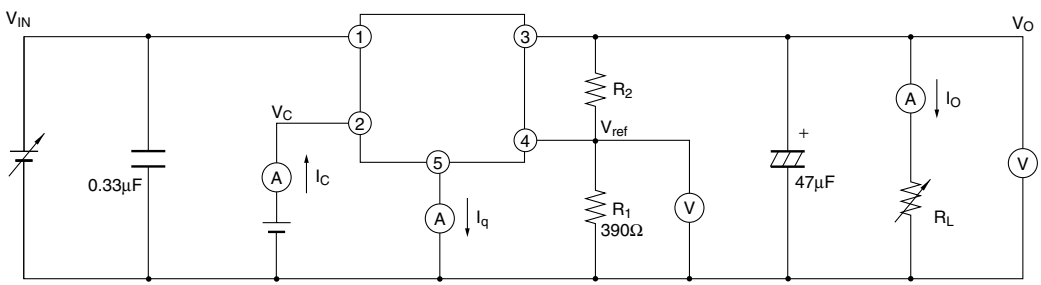
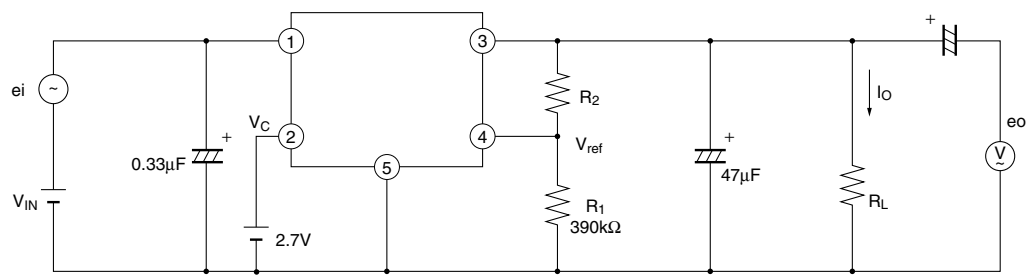
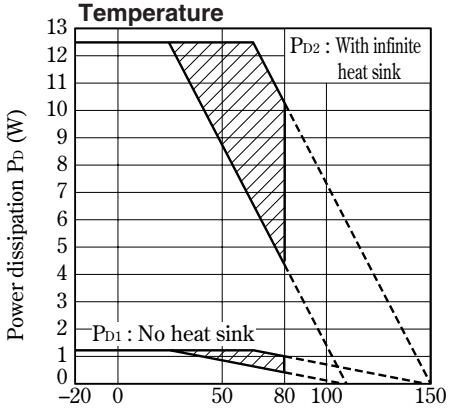


Fig.2 Test Circuit for Ripple Rejection



f=120Hz(sine wave)
ei(rms)=0.5V
V_O=10V(R_1=390Ω)
V_{IN}=12V
I_O=0.5A
RR=20log(ei(rms)/eo(rms))

Fig.3 Power Dissipation vs. Ambient Temperature



Note) Oblique line portion: Overheat shut down operates in this area

Fig.4 Overcurrent Protection Characteristics (Typical Value) (PQ25VB8M2FZ)

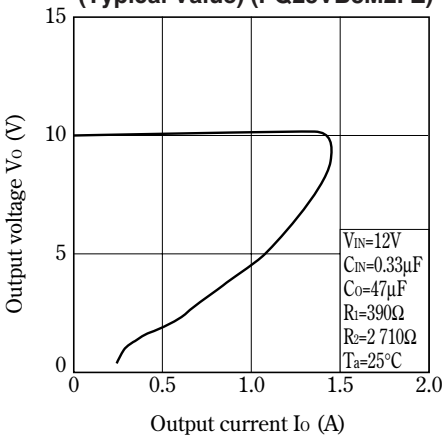


Fig.5 Overcurrent Protection Characteristics (Typical Value) (PQ25VB012FZ)

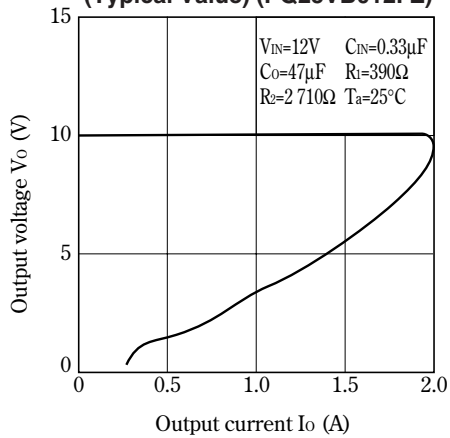


Fig.6 Reference Voltage Fluctuation vs. Junction Temperature (PQ25VB8M2FZ)

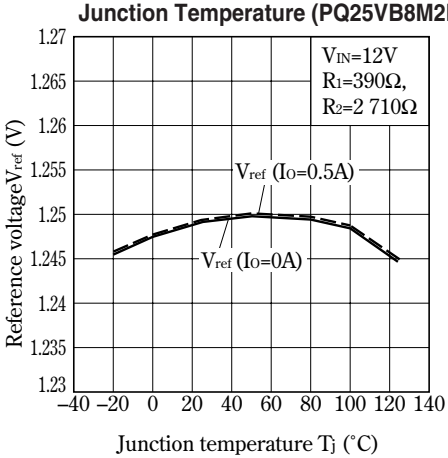


Fig.7 Reference Voltage Fluctuation vs. Junction Temperature (PQ25VB012FZ)

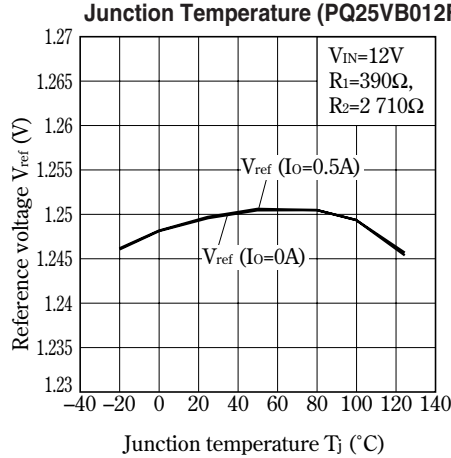


Fig.8 Output Voltage vs. Input Voltage (PQ25VB8M2FZ)

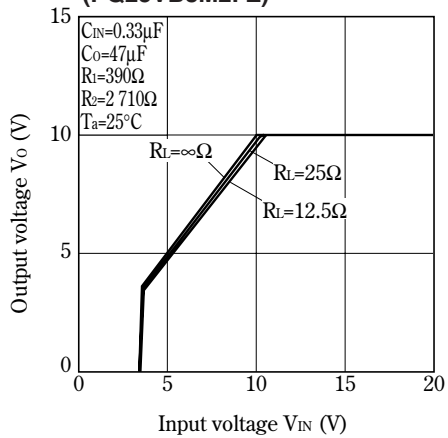


Fig.9 Output Voltage vs. Input Voltage (PQ25VB012FZ)

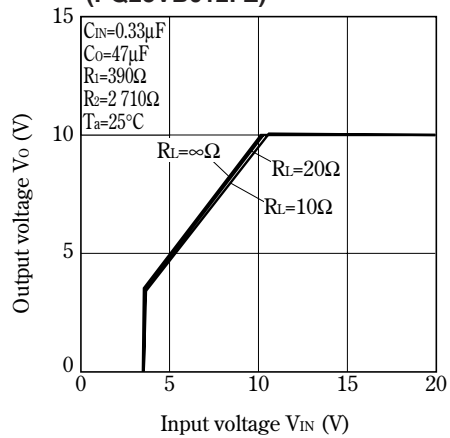


Fig.10 Circuit Operating Current vs. Input Voltage (PQ25VB8M2FZ)

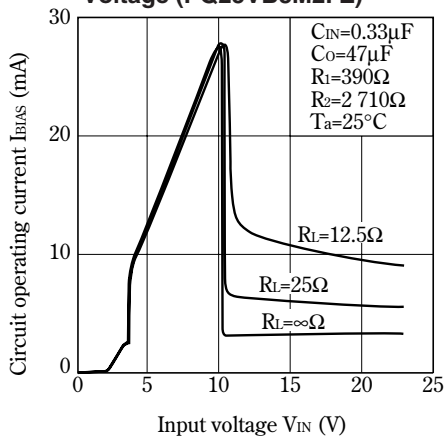


Fig.11 Circuit Operating Current vs. Input Voltage (PQ25VB012FZ)

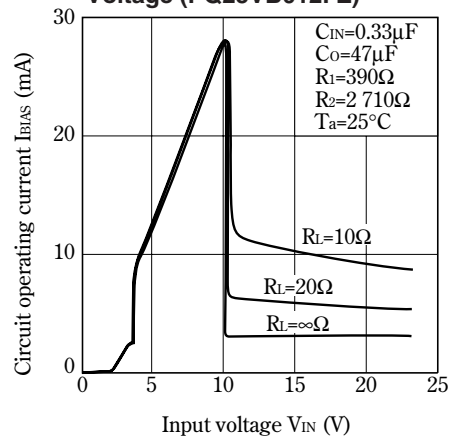


Fig.12 Dropout Voltage vs. Junction Temperature (PQ25VB8M2FZ)

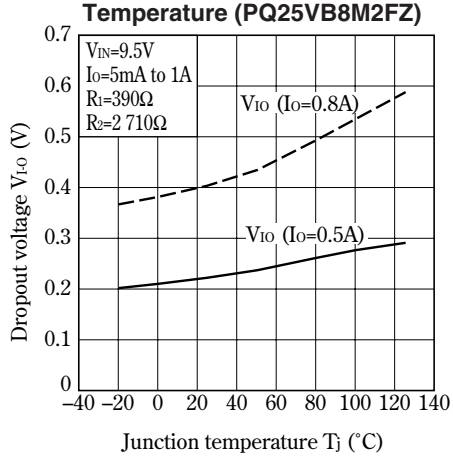


Fig.13 Dropout Voltage vs. Junction Temperature (PQ25VB012FZ)

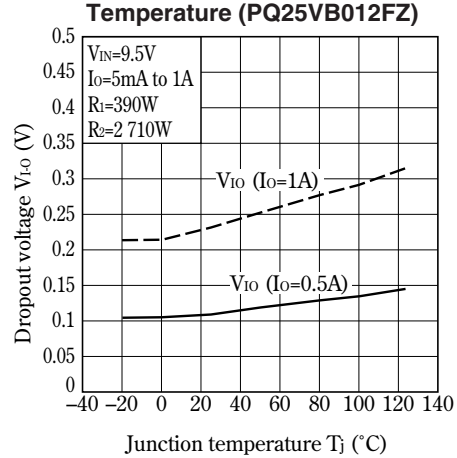


Fig.14 Quiescent Current vs. Junction Temperature (PQ25VB8M2FZ)

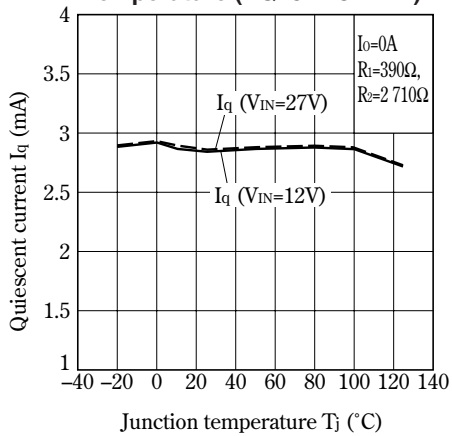


Fig.15 Quiescent Current vs. Junction Temperature (PQ25VB012FZ)

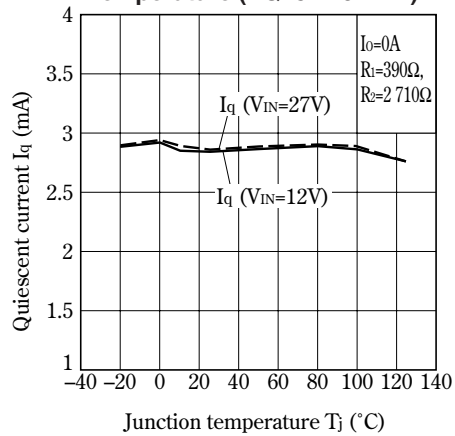


Fig.16 Ripple Rejection vs. Input Ripple Frequency (PQ25VB8M2FZ)

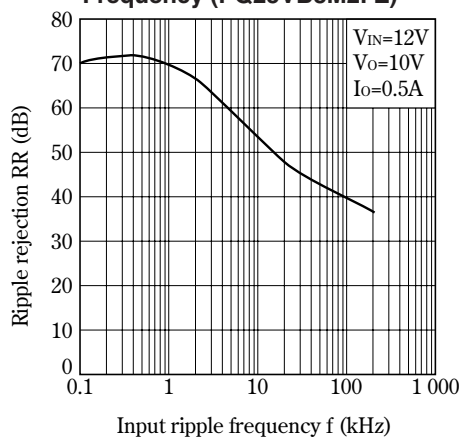


Fig.17 Ripple Rejection vs. Input Ripple Frequency (PQ25VB012FZ)

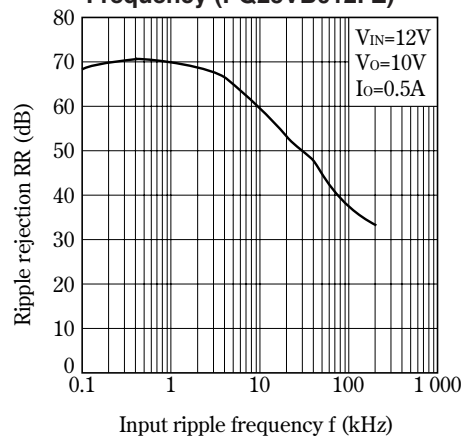
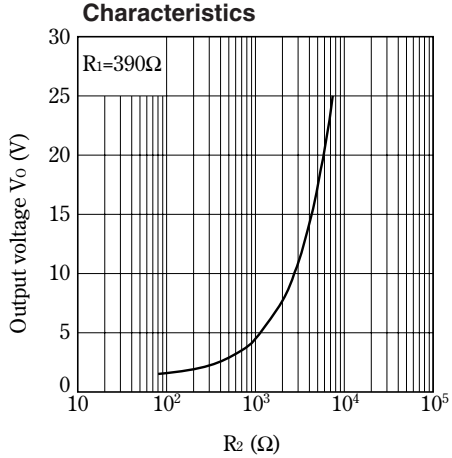
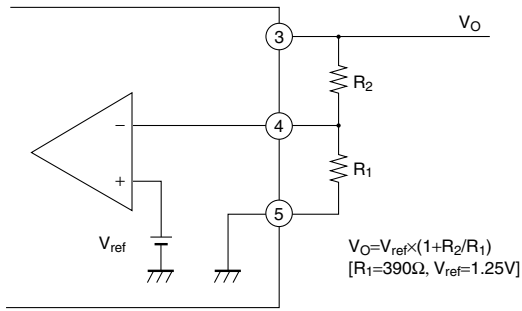


Fig.18 Output Voltage Adjustment Characteristics

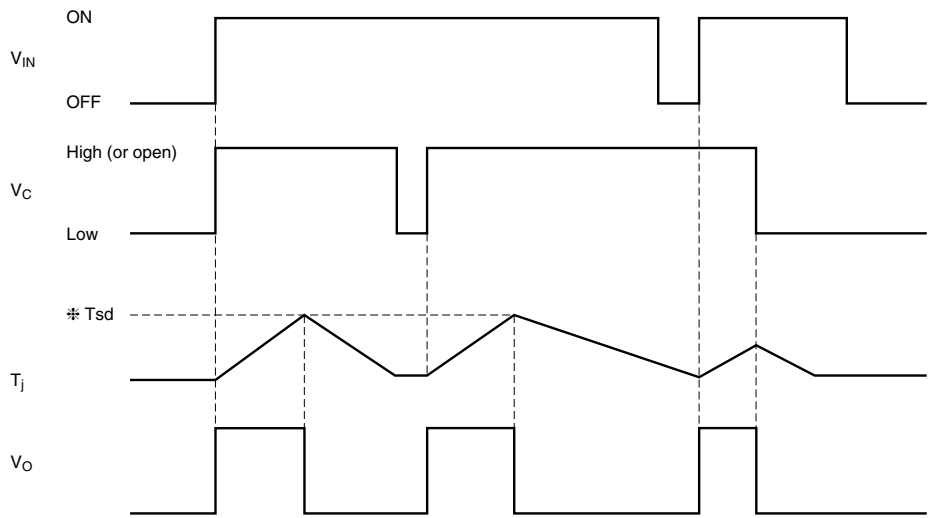


■ Setting of Output Voltage

Output voltage is able to set from 1.5V to 25V when resistors R_1 and R_2 are attached to ③, ④, ⑤ terminals. As for the external resistors to set output voltage, refer to the figure below and Fig.18.



■ Overheat Shut-down Characteristics



✻Tsd:Overheat shut-down temperature (Tj≥110˚C)

(1) Overheat shut-down operates at Tj=Tsd and output OFF-state is maintained.
(2) OFF-state is kept until V_{IN} is once turned off.

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  --- Office automation equipment
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  --- Consumer electronics

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