

# PQxxxEH02ZxH Series

Low Voltage Operation  
Low Power-Loss Voltage Regulators

■ Features

- 1.Low voltage operation  
(Minimum operating voltage: 2.35V)  
2.5V input → available 1.5 to 1.8V output
- 2.Large output current type (I<sub>o</sub>: 2A)
- 3.Low dissipation current  
(Quiescent current : MAX. 2mA  
Output OFF-state dissipation current: MAX.5μA)
- 4.Low power-loss
- 5.Built-in overcurrent and overheat protection functions
- 6.TO-263 package
- 7.RoHS directive compliant

■ Applications

- 1.Personal computers and peripheral equipment
- 2.Power supplies for various digital electronic equipment such as DVD player or STB
- 3.Power supplies for automotive equipment such as car navigation system

■ Model Line-up

Output current (I <sub>o</sub> )	Package type	Output voltage (V <sub>o</sub> )		
		1.5V	1.8V	2.5V
2A	Taping	PQ015EH02ZPH	PQ018EH02ZPH	PQ025EH02ZPH
	Sleeve	PQ015EH02ZZH	PQ018EH02ZZH	PQ025EH02ZZH

■ Absolute Maximum Ratings

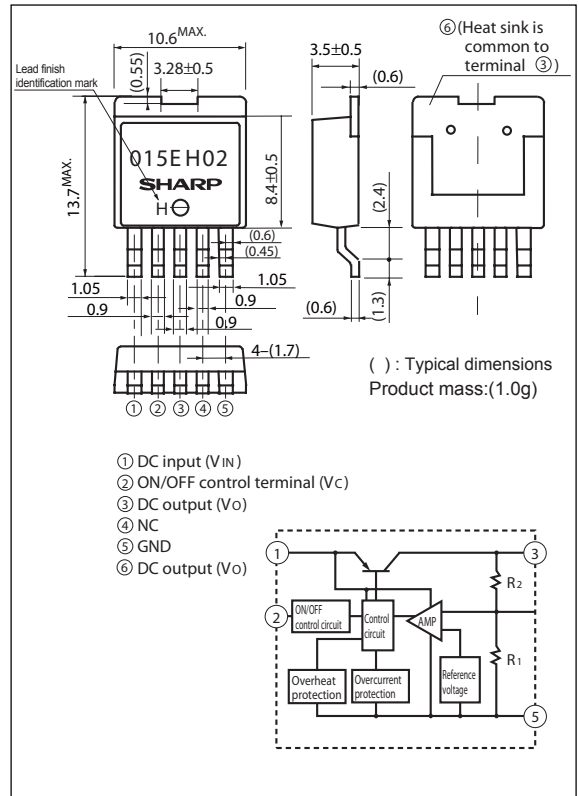
(T<sub>a</sub>=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V <sub>IN</sub>	10	V
*1 Output control voltage	V <sub>C</sub>	10	V
Output current	I <sub>o</sub>	2	A
*2 Power dissipation	P <sub>D</sub>	35	W
*3 Junction temperature	T <sub>J</sub>	150	°C
Operating temperature	T <sub>opr</sub>	-40 to +85	°C
Storage temperature	T <sub>stg</sub>	-40 to +150	°C
Soldering temperature	T <sub>sol</sub>	260(10s)	°C

\*1 All are open except GND and applicable terminals.  
\*2 P<sub>D</sub>:With infinite heat sink  
\*3 Overheat protection may operate at T<sub>J</sub>:125°C to 150°C

■ Outline Dimensions

(Unit : mm)



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

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In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

### Electrical Characteristics

(Unless otherwise specified, condition shall be  $V_{IN}=V_O(TYP.)+1V$ ,  $I_O=1A$ ,  $V_C=2.7V$ ,  $T_a=25^\circ C$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage	$V_{IN}$	-	Refer to the table below			V
Output voltage	$V_O$	-	Refer to the table below			V
Load regulation	RegL	$I_O=5mA$ to 2A	-	0.2	2.0	%
Line regulation	Regl	$V_{IN}=V_O(TYP.)+1V$ to $V_O(TYP.)+6V$ , $I_O=5mA$	-	0.1	1.0	%
Temperature coefficient of output voltage	$T_C V_O$	$T_j=0$ to $+125^\circ C$ , $I_O=5mA$	-	$\pm 0.01$	-	%/ $^\circ C$
Ripple rejection	RR	Refer to Fig.2	45	60	-	dB
*4 ON-state voltage for control	$V_{C(ON)}$	-	2.0	-	-	V
ON-state current for control	$I_{C(ON)}$	-	-	-	200	$\mu A$
OFF-state voltage for control	$V_{C(OFF)}$	-	-	-	0.8	V
OFF-state current for control	$I_{C(OFF)}$	$V_C=0.4V$	-	-	2	$\mu A$
Quiescent current	$I_q$	$I_O=0A$	-	1	2	mA
Output OFF-state dissipation current	$I_{qs}$	$I_O=0A$ , $V_C=0.4V$	-	-	5	$\mu A$

\*4 In case of opening control terminal ②, output voltage turns off

### Input Voltage range

Model No.	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
PQ015EH02ZxH	$V_{IN}$	$I_O=2A$ , $V_C=2.7V$ , $T_a=25^\circ C$	2.35	-	10	V
PQ018EH02ZxH			2.35	-	10	
PQ025EH02ZxH			3.0	-	10	

### Output Voltage

Model No.	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
PQ015EH02ZxH	$V_O$	$V_{IN}=V_O(TYP.)+1V$ , $I_O=1A$ , $V_C=2.7V$ , $T_a=25^\circ C$	1.45	1.5	1.55	V
PQ018EH02ZxH			1.75	1.8	1.85	
PQ025EH02ZxH			2.438	2.5	2.562	

Fig.1 Test Circuit

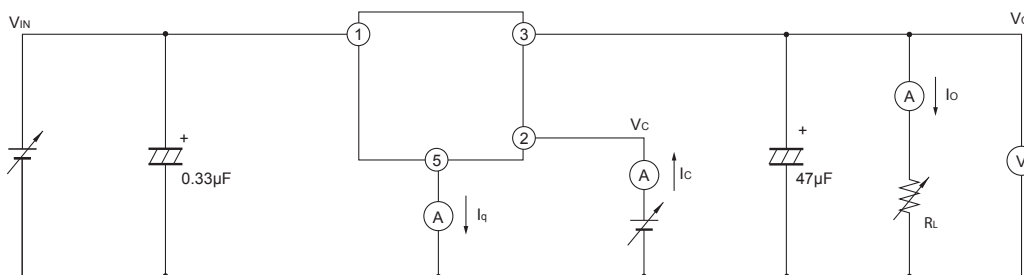
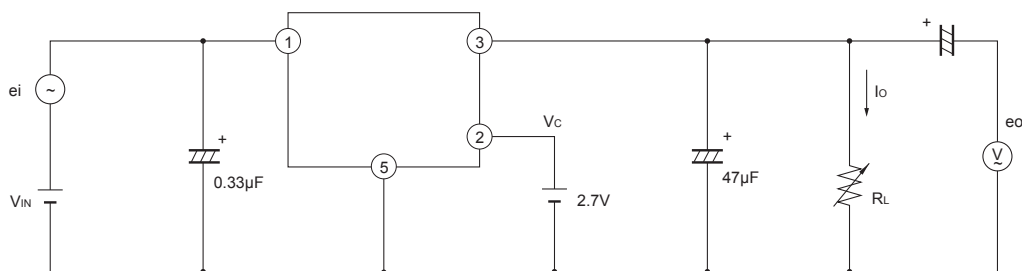
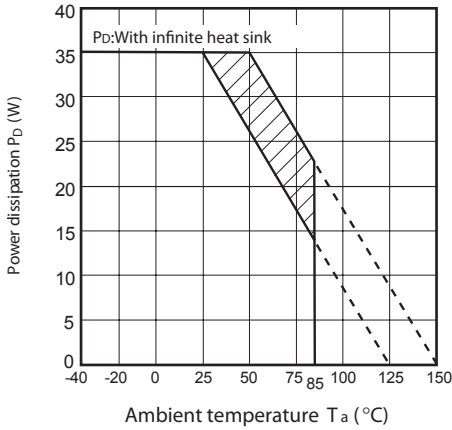


Fig.2 Test circuit of Ripple Rejection



$f=120Hz$ (sine wave)  
 $e_i(rms)=0.5V$   
 $V_{IN}=V_O(TYP.)+2V$   
 $I_O=0.3A$   
 $RR=20\log(e_i(rms)/e_o(rms))$

Fig.3 Power Dissipation vs. Ambient Temperature



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

Fig.4 Overcurrent Protection Characteristics (PQ015EH02ZxH)

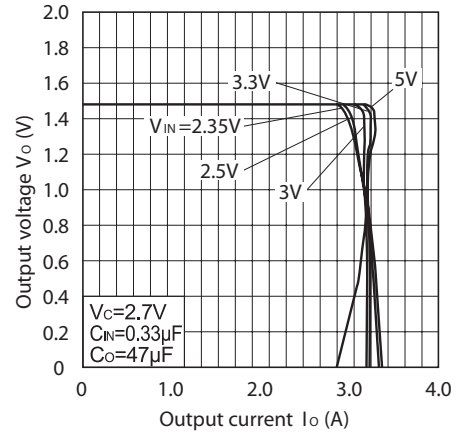


Fig.5 Overcurrent Protection Characteristics (PQ018EH02ZxH)

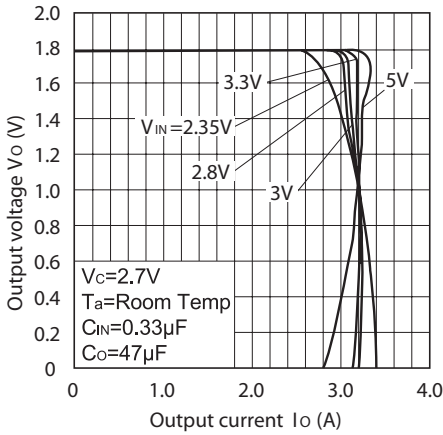


Fig.6 Overcurrent Protection Characteristics (PQ025EH02ZxH)

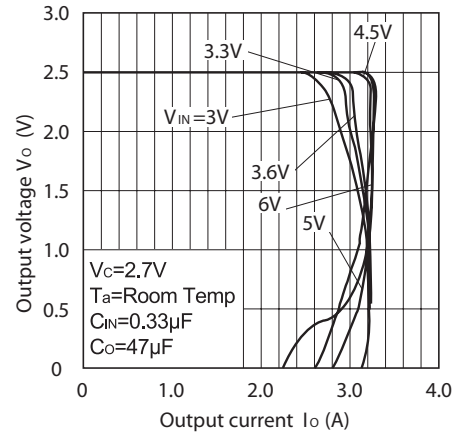


Fig.7 Output Voltage Fluctuation vs. Junction Temperature (PQ015EH02ZxH)

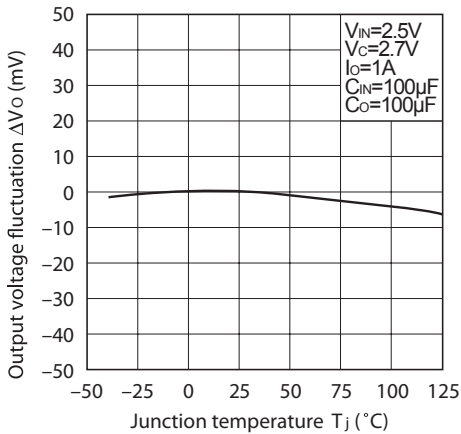


Fig.8 Output Voltage Fluctuation vs. Junction Temperature (PQ018EH02ZxH)

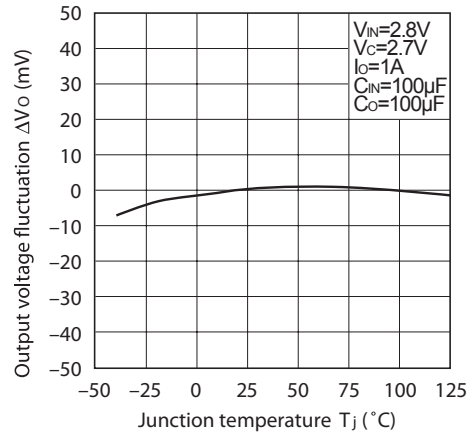


Fig.9 Output Voltage Fluctuation vs. Junction Temperature (PQ025EH02ZxH)

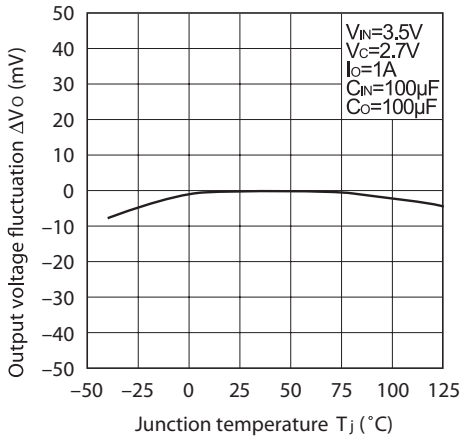


Fig.10 Output Voltage vs. Input Voltage (PQ015EH02ZxH)

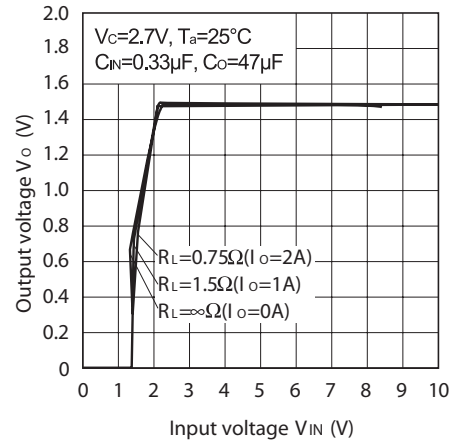


Fig.11 Output Voltage vs. Input Voltage (PQ018EH02ZxH)

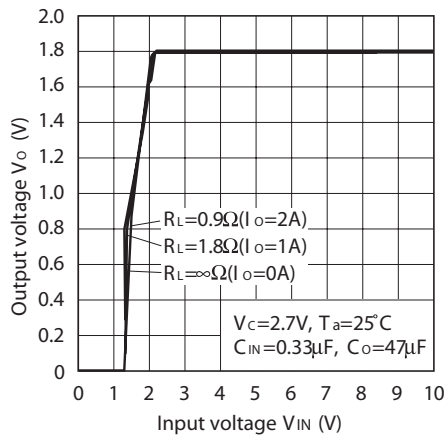


Fig.12 Output Voltage vs. Input Voltage (PQ025EH02ZxH)

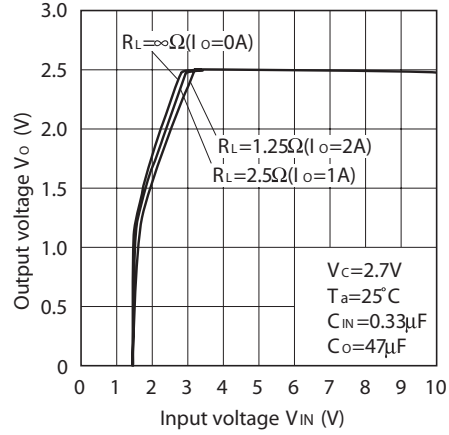


Fig.13 Circuit Operating Current vs. Input Voltage (PQ015EH02ZxH)

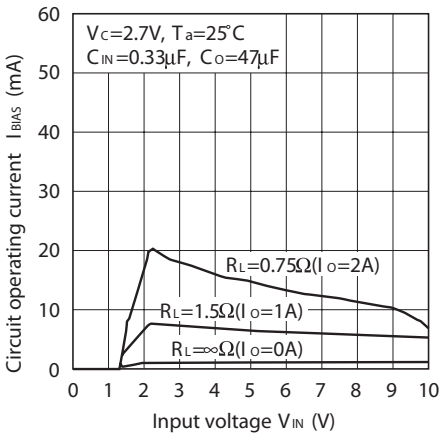


Fig.14 Circuit Operating Current vs. Input Voltage (PQ018EH02ZxH)

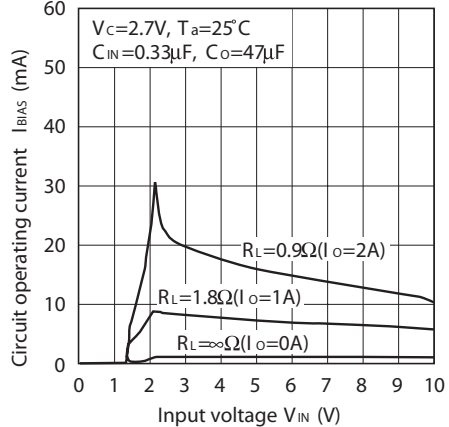


Fig.15 Circuit Operating Current vs. Input Voltage (PQ025EH02ZxH)

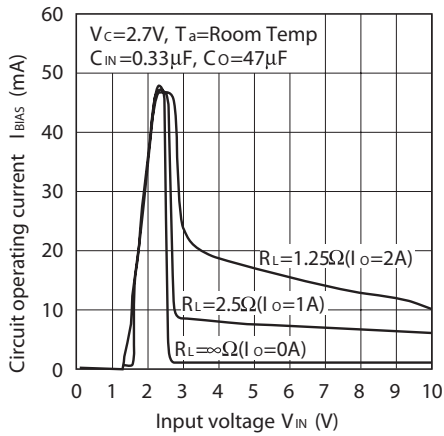


Fig.16 Quiescent Current vs. Junction Temperature

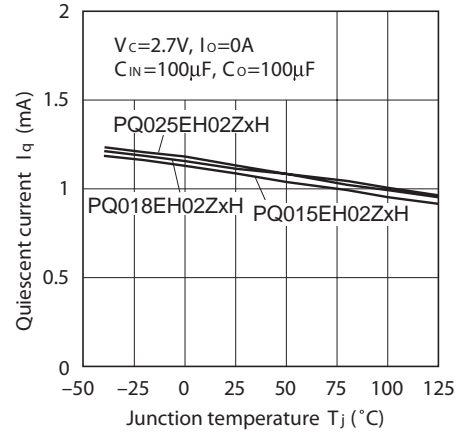


Fig.17 ON-OFF Control Voltage vs. Junction Temperature

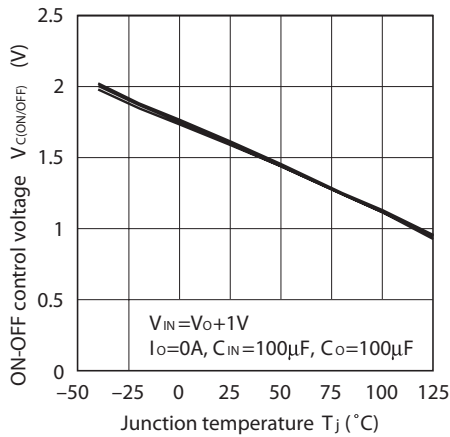


Fig.18 Ripple Rejection vs. Input Ripple Frequency

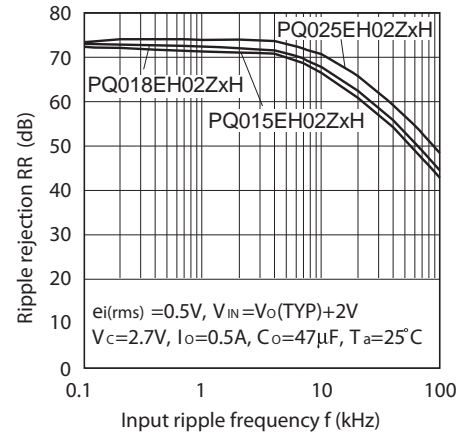


Fig.19 Ripple Rejection vs. Output Current

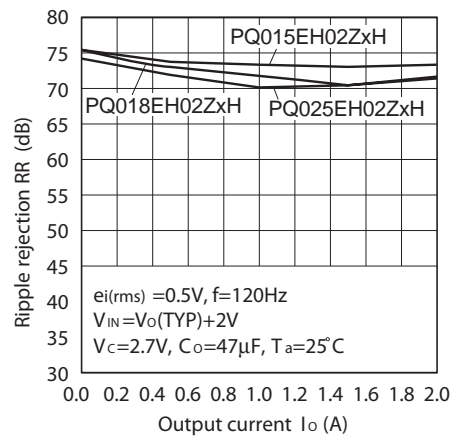
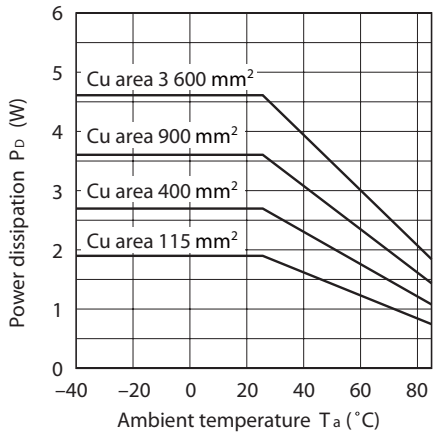
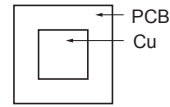


Fig.20 Power Dissipation vs. Ambient Temperature (Typical Value)



Mounting PCB



Material : Glass-cloth epoxy resin  
 Size : 60×60×1.6mm  
 Cu thickness : 65μm

Fig.21 Typical Application

