

SHARP

PQxxxEF01SZ series PQ070XF01SZ

Under development

New product

Low Power-Loss Voltage Regulator

Low Voltage Operation Low Power-Loss Voltage Regulator

■ Features

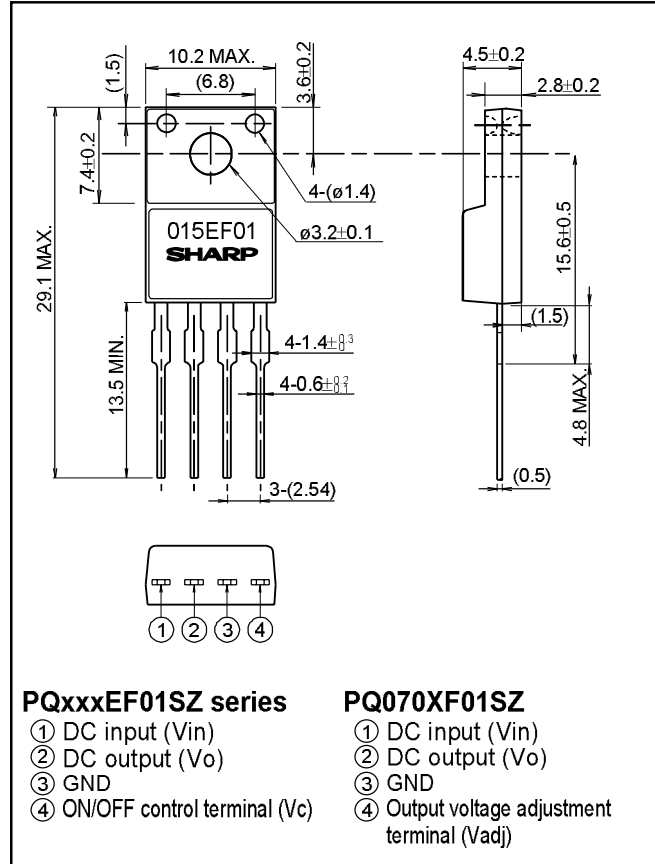
- (1) Low Voltage operation
(minimum operating voltage : 2.35V)
2.5V input → available 1.5V, 1.8V output
- (2) Low dissipation current
(Dissipation current at no load: MAX. 2mA
OFF-state dissipation current: MAX. 5μA)
- (3) Low power-loss
Dropout voltage: MAX. 0.5V
- (4) Fixed output and variable output are available.
- (5) Built-in overcurrent and overheat protection functions
- (6) TO-220 package

■ Applications

- (1) Peripheral equipment of personal computers
- (2) Power supplies for various electronic equipment
such as DVD player or STB.
- (3) LBP

■ Outline Dimensions

(Unit:mm)



■ Model line-up

Output voltage (Vo)	Fixed output type				Variable output type
	1.5V	1.8V	2.5V	3.3V	
Part No.	PQ015EF01SZ	PQ018EF01SZ	PQ025EF01SZ	PQ033EF01SZ	PQ070XF01SZ

(Notice)

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•Specifications are subject to change without notice for improvement.

(Internet)

•Data for Sharp's optoelectronic/power devices is provided on internet. (Address <http://sharp-world.com/ecg/>)

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Low Power-Loss Voltage Regulator

Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Ratings	Unit
*1 Input voltage	V _{in}	10	V
*1 ON/OFF control terminal voltage	V _C	10	V
*1 Output adjustment terminal voltage (PQ070XF01SZ)	V _{adj}	5	V
Output current	I _o	1.0	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 (for 10s)	°C

*1 All are open except GND and applicable terminals.

*2 Pd1: No heat sink, Pd2: With infinite heat sink.

*3 Overheat protection may operate at 125≤T_j≤150°C.

Electrical Characteristics

(PQxxxEF01SZ series: Unless otherwise specified, V_{in}=V_o(TYP.)+1V, I_o=0.5A, V_c=2.7V, Ta=25°C)

(PQ070XF01SZ: Unless otherwise specified, V_{in}=5V, V_o=3V(R1=1kΩ), I_o=0.5A, V_c=2.7V, Ta=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input voltage range	PQxxxEF01SZ series	V _{in}	-	Refer to the next page.			V
	PQ070XF01SZ			2.35	-	10	
Output voltage	PQxxxEF01SZ series	V _o	-	Refer to the next page.			V
	PQ070XF01SZ			1.5	-	7	
Reference voltage(PQ070XF01SZ)	V _{ref}	-	1.225	1.25	1.275	V	
Load regulation	Reg _L	I _o =5mA to 1A	-	0.2	2.0	%	
Line regulation	PQxxxEF01SZ series	Reg _L	V _{in} =V _o (TYP.)+1V to V _o (TYP.)+6V, I _o =5mA	-	0.1	1.0	%
	PQ070XF01SZ		V _{in} =4 to 8V, I _o =5mA	-	0.2	1.0	
Temperature coefficient of reference voltage	PQxxxEF01SZ series	T _c V _o	T _j =0 to 125°C, I _o =5mA	-	±0.01	-	%/°C
	PQ070XF01SZ	T _c V _{ref}	T _j =0 to 125°C, I _o =5mA	-	±1.0	-	%
Ripple rejection	RR	-	45	60	-	dB	
Dropout voltage	PQ033EF01SZ	V _{i-o}	I _o =0.5A(at V _o =0.95V)	-	-	0.5	V
	PQ070XF01SZ		V _{in} =2.85A, I _o =0.5A	-	-	0.5	
*4 ON-state voltage for control(PQxxxEF01SZ series)	V _c (on)	-	2.0	-	-	V	
ON-state current for control(PQxxxEF01SZ series)	I _c (on)	-	-	-	200	μA	
OFF-state voltage for control(PQxxxEF01SZ series)	V _c (off)	I _o =0A	-	-	0.8	V	
OFF-state current for control(PQxxxEF01SZ series)	I _c (off)	I _o =0A, V _c =0.4V	-	-	-2	μA	
Quiescent current	PQxxxEF01SZ series	I _q	I _o =0A	-	1	2	mA
	PQ070XF01SZ			-	1.3	2	
OFF-state dissipation current(PQxxxEF01SZ series)	I _{qs}	I _o =0A, V _c =0.4V	-	-	5	μA	

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

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Input Voltage Range

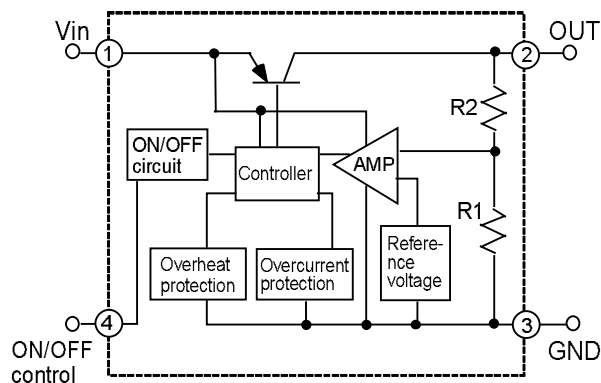
Part number	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
PQ015EF01SZ	V _{in}	I _o =0.5A, V _c =2.7V, T _a =25°C	2.35	-	10	V
PQ018EF01SZ			2.35	-	10	
PQ025EF01SZ			3.0	-	10	
PQ033EF01SZ			3.8	-	10	

Output Voltage Line-up

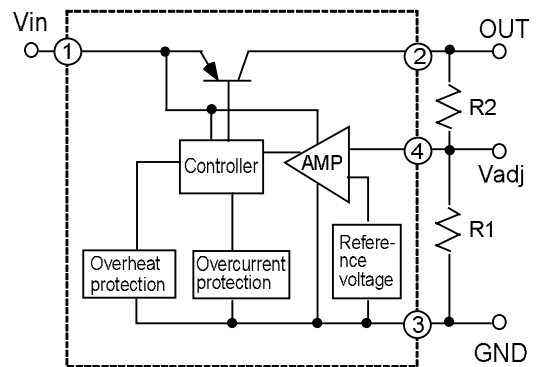
Part number	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
PQ015EF01SZ	V _o	V _{in} =V _o (TYP.)+1V, I _o =0.5A, V _c =2.7V, T _a =25°C	1.45	1.5	1.55	V
PQ018EF01SZ			1.75	1.8	1.85	
PQ025EF01SZ			2.438	2.5	2.562	
PQ033EF01SZ			3.218	3.3	3.382	

Internal Block Diagram

PQxxxEF01SZ series



PQ070XF01SZ Series



As of September 2001

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 - Consumer electronics
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 - Traffic signals
 - Gas leakage sensor breakers
 - Alarm equipment
 - Various safety devices, etc.
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