

## PQ1KAxx3MZPH Series

Compact Surface Mount Type  
Low Power-Loss Voltage Regulators

### ■ Features

- 1.Compact surface mount package (3.4×2.2×1.2mm)
- 2.Output current : MAX.300mA
- 3.Built-in ON/OFF control function
- 4.Built-in overcurrent, overheat protection functions
- 5.Use of ceramic capacitor is possible as output smooth capacitor
- 6.RoHS directive compliant

### ■ Applications

- 1.CD-ROM drives
- 2.DVD-ROM drives

### ■ Model Line-up

Output Voltage (TYP.)	Model No.
1.5V	PQ1KA153MZPH
1.8V	PQ1KA183MZPH
2.5V	PQ1KA253MZPH
3.0V	PQ1KA303MZPH
3.3V	PQ1KA333MZPH
5.0V	PQ1KA503MZPH
9.0V	PQ1KA903MZPH

### ■ Absolute Maximum Ratings

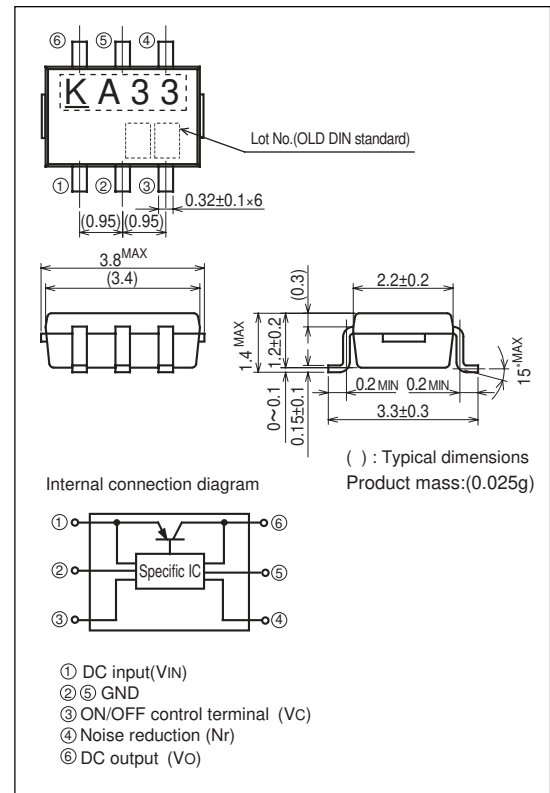
(Ta=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V <sub>IN</sub>	15	V
*1 Output control voltage	V <sub>C</sub>	15	V
Output current	I <sub>O</sub>	300	mA
*2 Power dissipation	P <sub>D</sub>	400	mW
*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>	-55 to +150	°C
Soldering temperature	T <sub>sol</sub>	270(10s)	°C

- \*1 All are open except GND and applicable terminals.  
 \*2 At surface-mounted condition  
 \*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  $V_{IN}=V_O(TYP.)+1.0V, I_o=30mA, V_C=1.8V, T_a=25^\circ C$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	$V_O$	—	Refer to list.1			V
Input voltage	$V_{IN}$	—	2.5	—	15	V
Load regulation	$Reg_L$	$V_O < 3V, I_o = 5 \text{ to } 300mA$	—	10	60	mV
		$V_O \geq 3V, I_o = 5 \text{ to } 300mA$	—	0.2	2	%
Line regulation	$Reg_L$	$V_O < 3V, V_{IN} = V_O(TYP.) + 1V \text{ to } V_O(TYP.) + 6V$	—	5	15	mV
		$V_O \geq 3V, V_{IN} = V_O(TYP.) + 1V \text{ to } V_O(TYP.) + 6V$	—	0.05	0.5	%
Temperature coefficient of output voltage	$T_C V_O$	$I_o = 10mA, T_j = 0 \text{ to } 100^\circ C$	—	$\pm 0.5$	—	%
*4 Ripple rejection	RR	Refer to Fig.2	—	55	—	dB
*4 Output noise voltage	$V_{no(rms)}$	$10Hz < f < 100kHz, C_n = 0.1\mu F, I_o = 30mA$	—	50	—	$\mu V$
Dropout voltage	$V_{I-O}$	$I_o = 300mA, *5, *6$	—	0.4	0.7	V
*7 On-state voltage for control	$V_{C(ON)}$	—	1.8	—	—	V
On-state current for control	$I_{C(ON)}$	$V_C = 1.8V$	—	5	30	$\mu A$
Off-voltage for control	$V_{C(OFF)}$	—	—	—	0.4	V
Quiescent current	$I_q$	$I_o = 0mA$	—	550	800	$\mu A$
Output off-state consumption current	$I_{qs}$	$V_C = 0.2V$	—	—	1	$\mu A$

\*4 Typical value of 3.3V output model.

\*5 Input voltage when output voltage falls 0.1V from that at  $V_{IN}=V_O(TYP.)+1.0V$ .

\*6 Excluding **PQ1KA153MZPH**, **PQ1KA183MZPH**

\*7 In case that the control terminal (③ pin) is non-connection, output voltage should be OFF state.

List.1 Output voltage Line-up

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
<b>PQ1KA153MZPH</b>	$V_O$	$V_{IN}=V_O(TYP.)+1.0V, I_o=30mA, V_C=1.8V, T_a=25^\circ C$	1.440	1.5	1.560	V
<b>PQ1KA183MZPH</b>			1.740	1.8	1.860	
<b>PQ1KA253MZPH</b>			2.440	2.5	2.560	
<b>PQ1KA303MZPH</b>			2.940	3.0	3.060	
<b>PQ1KA333MZPH</b>			3.234	3.3	3.366	
<b>PQ1KA503MZPH</b>			4.900	5.0	5.100	
<b>PQ1KA903MZPH</b>			8.820	9.0	9.180	

Fig.1 Standard measuring circuit of Regulator portion

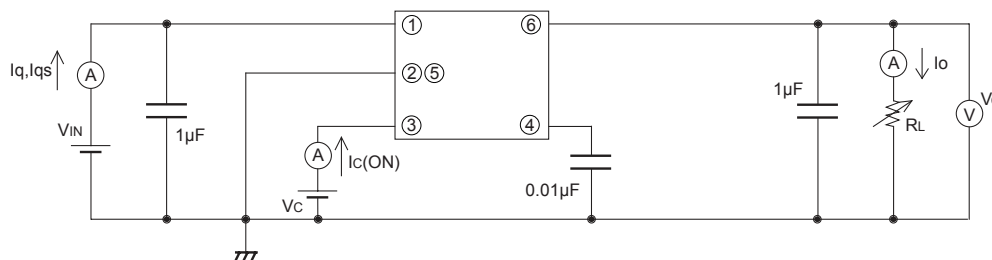


Fig.2 Standard measuring circuit of critical rate of ripple rejection

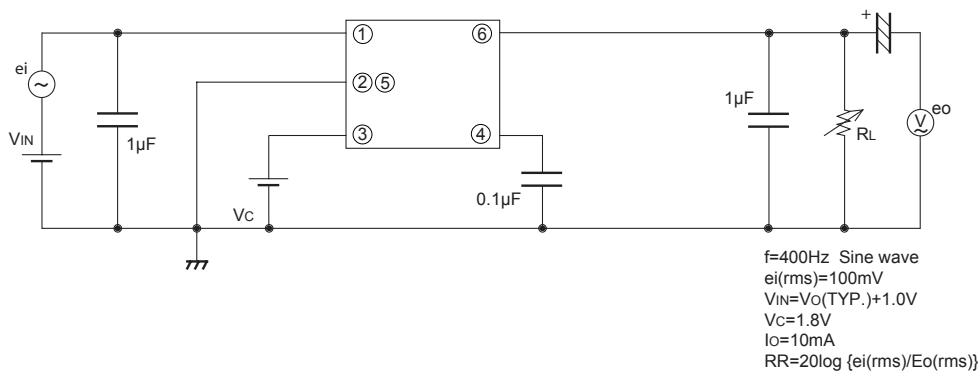
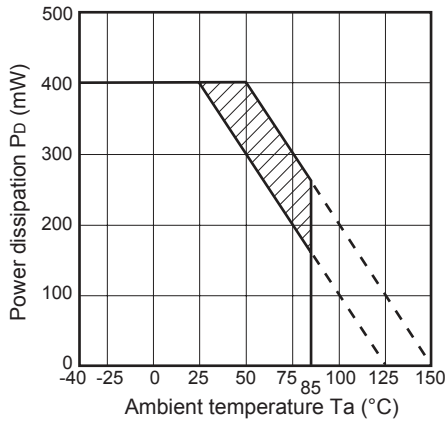


Fig.3 Power Dissipation vs. Ambient Temperature



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

Fig.4 Overcurrent Protection Characteristics

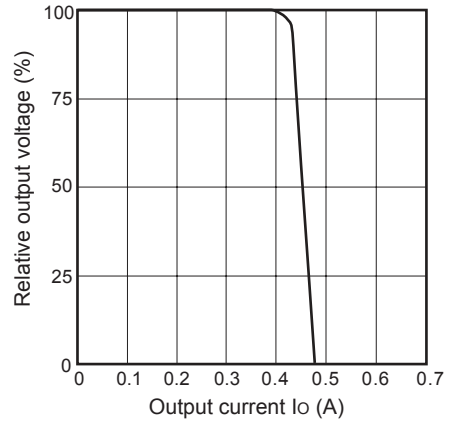


Fig.5 Output Voltage vs. Input Voltage (Typical Value) (PQ1KA333MZPH)

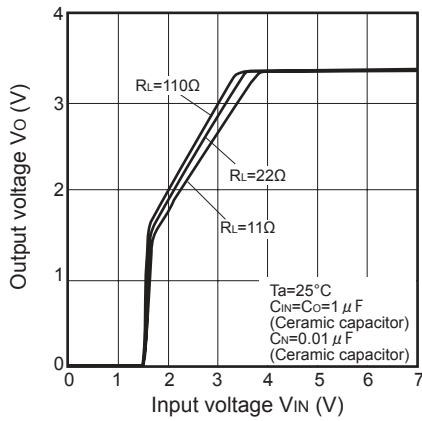


Fig.6 Circuit Operating Current vs. Input Voltage (Typical Value) (PQ1KA333MZPH)

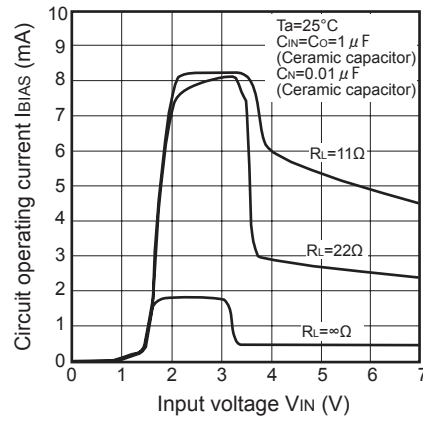


Fig.7 Quiescent Current vs. Junction Temperature (Typical Value)

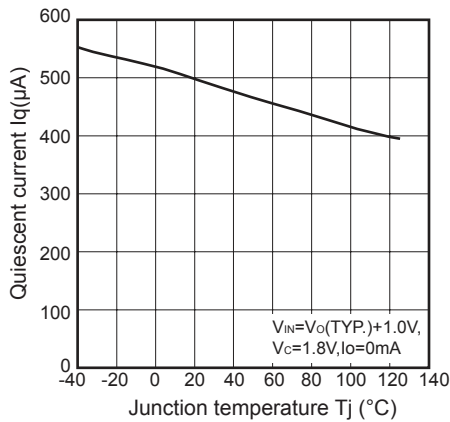


Fig.8 Dropout Voltage vs. Junction Temperature (Typical Value) (PQ1KA333MZPH)

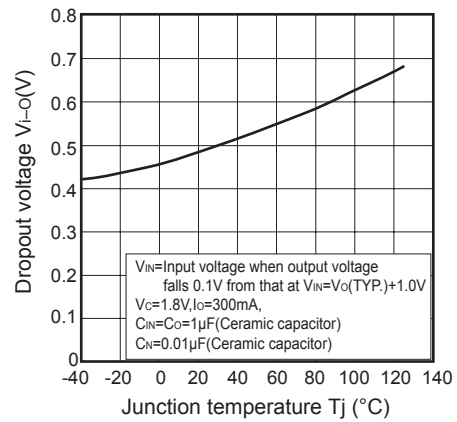


Fig.9 Output Voltage Deviation vs. Junction Temperature (Typical Value) (PQ1KA333MZPH)

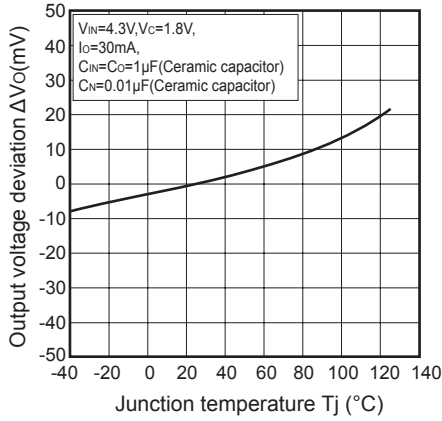


Fig.10 Dropout Voltage vs. Output Current (Typical Value)

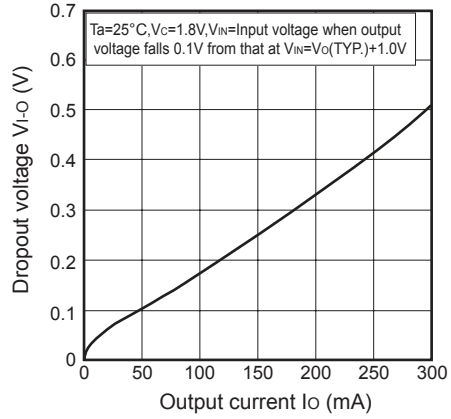


Fig.11 Ripple Rejection vs. Input Ripple Frequency (Typical Value) (PQ1KA333MZPH)

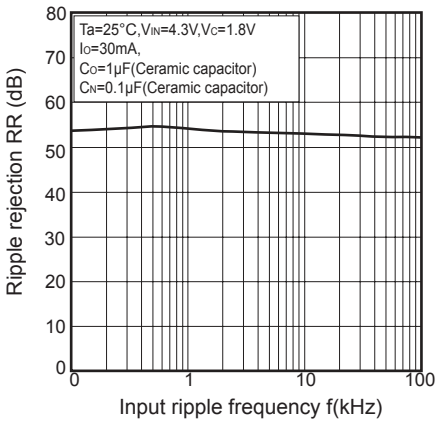
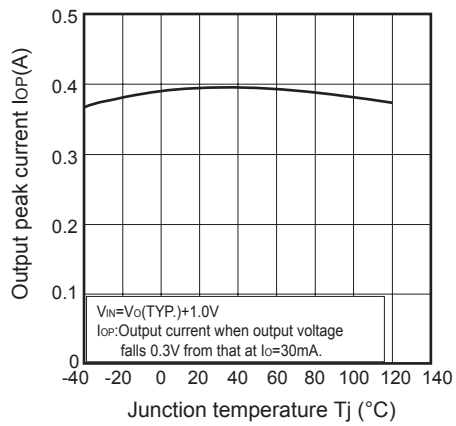


Fig.12 Output Peak Current vs. Junction Temperature (Typical Value)



■ Example of application

