# PQ1Xxx1M2ZP Series

Low Output Current, Compact Surface Mount Type Low Power-Loss Voltage Regulators

# Features

- Compact surface mount package (2.9×1.6×1.1mm)
- Low power-loss (Dropout voltage: TYP. 0.11 V/MAX. 0.26V at Io=60mA)
- Also compatible ceramic capacitors because of suppressing oscillation level
- High ripple rejection (TYP. 70dB)
- Low dissipation current (Dissipation current at no load: TYP. 150µA)
- Built-in ON/OFF control function (Dissipation current at OFF-state: MAX. 1μA)
- Built-in overcurrent and overheat protection functions
- \*It is available for every 0.1V of output voltage (1.3V to 5.0V)

# Applications

- Cellular phones
- Cordless phones
- Personal information tools
- Cameras/Camcoders
- PCMCIA cards for notebook PCs

## Model Line-up

Output Voltage (TYP.)	Model No.	Output Voltage (TYP.)	Model No.
2.5V	PQ1X251M2ZP	3.8V	PQ1X381M2ZP
2.8V	PQ1X281M2ZP	4.0V	PQ1X401M2ZP
3.0V	PQ1X301M2ZP	4.2V	PQ1X421M2ZP
3.3V	PQ1X331M2ZP	4.5V	PQ1X451M2ZP
3.6V	PQ1X361M2ZP	5.0V	PQ1X501M2ZP

Absolute Maximum Ratings (Ta=2				
Parameter	Symbol	Rating	Unit	
*Input voltage	VIN	9	V	
**1ON/OFF control terminal voltage	Vc	9	V	
Output current	Io	300	mA	
*2Power dissipation	PD	350	mW	
*3Junction temperature	Tj	150	°C	
Operating temperature	Topr	-30 to +80	°C	
Storage temperature	Tstg	-55 to +150	°C	

Tsol

260 (10s)

Soldering temperature

#1 All are open except GND and applicable terminals #2 At mounted on PCB

\*3 Overheat protection may operate at Tj:125°C to 150°C



·Please refer to the chapter " Handling Precautions ".

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°C

## Outline Dimensions (Unit : mm)

Electrical Characteristics	teristics (Unless otherwise specified, V <sub>IN</sub> =Vo(TYP)+1.0V, Io=30mA, Vc=1.8V, Ta					
Parameter	Symbol	Conditions	MIN. TYP. MAX.		Unit	
Output voltage	Vo	_	Refer to the following table.1		V	
*4Output peak current	Iop	_	180 300 -		-	mA
Recommended output current	-	_	-	-	150	mA
	RegL1	Io=5 to 60mA	-	10	50	mV
Load regulation	RegL2	Io=5 to 100mA	-	20	100	mV
	RegL3	Io=5 to 150mA	-	40	160	mV
Line regulation	RegI	VIN=Vo(TYP)+1V to Vo(TYP)+6V(MAX. 9.0V)	-	3.0	20	mV
Temperature coefficient of output voltage	TcVo	Io=10mA, Tj=-25 to +75°C	- 0.05 -		-	mV/°C
Ripple rejection	RR	Refer to Fig.2	-	70	-	dB
Output noise voltage	Vno (rms)	10Hz <f<100khz, cn="0.1µF," io="30mA&lt;/td"><td>Refer to t</td><td>he followi</td><td>ng table.2</td><td>μV</td></f<100khz,>	Refer to t	he followi	ng table.2	μV
	VI-01	Io=60mA **5	A Refer to the following table.2   - 0.11 0.26   - 0.20 0.4		0.26	V
Dropout voltage	VI-02	Io=150mA <sup>*5</sup>			v	
*6ON-state voltage for control	VC (ON)	_	1.8	-	-	V
ON-state current for control	IC (ON)	Vc=1.8V	-	5	30	μΑ
OFF-state voltage for control	VC (OFF)	_	-	-	0.4	V
Quiescent current	Iq	Io=0mA	-	150	200	μA
Output OFF-state dissipation current	Iqs	Vc=0.2V	-	-	1	μA

#4 Output current shall be the value when output voltage lowers 0.3V from the voltage at Io=30mA.

\*5 Input voltage when output voltage falls 0.1V from that at Vin=Vo(TYP)+1.0V.

\*6 In case that the control terminal (③ pin) is open, output voltage should be OFF state.

#### Table.1 Output Voltage Line-up

(VIN=Vo(TYP)+1.0V, Io=30mA, Vc=1.8V, Ta=25°C)

Model No.	Symbol	MIN.	TYP.	MAX.	Unit
PQ1X251M2ZP	Vo	2.440	2.5	2.560	V
PQ1X281M2ZP	Vo	2.740	2.8	2.860	V
PQ1X301M2ZP	Vo	2.940	3.0	3.060	V
PQ1v331M2ZP	Vo	3.234	3.3	3.366	V
PQ1X361M2ZP	Vo	3.528	3.6	3.672	V
PQ1X381M2ZP	Vo	3.724	3.8	3.876	V
PQ1X401M2ZP	Vo	3.920	4.0	4.080	V
PQ1X421M2ZP	Vo	4.116	4.2	4.284	V
PQ1X451M2ZP	Vo	4.410	4.5	4.590	V
PQ1X501M2ZP	Vo	4.900	5.0	5.100	V

#### Table.2 Output Noise Voltage Line-up

(VIN=Vo(TYP)+1.0V, Io=30mA, Vc=1.8V, Cn=0.1µF, 10Hz<f<100kHz, Ta=25°C)

Model No.	Symbol	MIN.	TYP.	MAX.	Unit
PQ1X251M2ZP	V <sub>no(rms)</sub>	-	25	-	μV
PQ1X281M2ZP	V <sub>no(rms)</sub>	-	25	-	μV
PQ1X301M2ZP	Vno(rms)	-	30	-	μV
PQ1X331M2ZP	V <sub>no(rms)</sub>	-	30	-	μV
PQ1X361M2ZP	Vno(rms)	-	35	-	μV
PQ1X381M2ZP	Vno(rms)	-	35	-	μV
PQ1X401M2ZP	Vno(rms)	-	40	-	μV
PQ1X421M2ZP	V <sub>no(rms)</sub>	-	40	-	μV
PQ1X451M2ZP	Vno(rms)	-	45	-	μV
PQ1X501M2ZP	Vno(rms)	-	50	-	μV

## Fig.1 Test Circuit



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# Fig.2 Test Circuit for Ripple Rejection







Junction temperature T<sub>i</sub> (°C)

40

20

0

Fig.11 Dropout Voltage vs. Output Current (Typical Value)



**Dropout Voltage vs. Junction Temperature** (PQ1X301M2ZP)(Typical Value)



Fig.10 Ripple Rejection vs. Input Ripple Frequency (PQ1X281M2ZP)(Typical Value)



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