PQ1Uxx1M2ZP 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 at I_O=60mA)
- High ripple rejection (TYP. 70dB)
- Built-in ON/OFF control function
  (Dissipation current at OFF-state: MAX. 1μA)
- Built-in overcurrent, overheat protection functions

*It is available for every 0.1V of output voltage (1.3V to 5.0V)

■ Applications

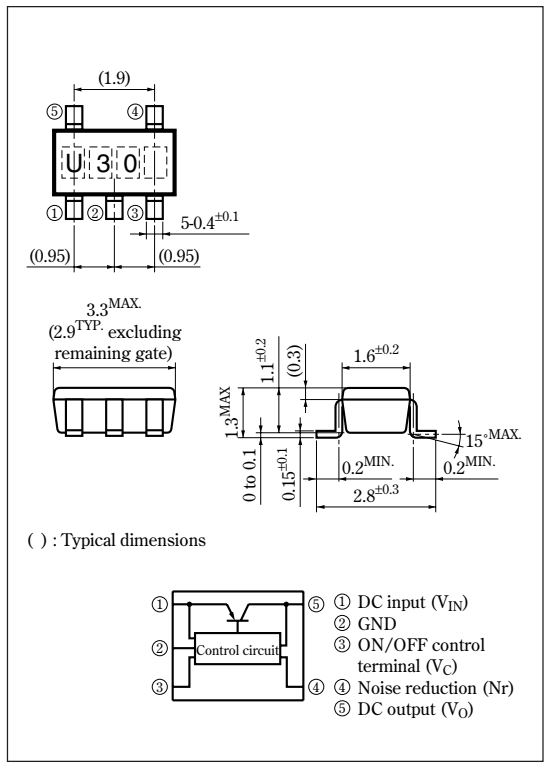
- Cellular phones
- Cordless phones
- Personal information tools (PDA)
- Cameras/Camcoders
- PCMCIA cards for notebook PCs

■ Model Line-up

Output Voltage (TYP.)	Model No.	Output Voltage (TYP.)	Model No.
2.5V	**PQ1U251M2ZP**	3.5V	**PQ1U351M2ZP**
2.8V	**PQ1U281M2ZP**	3.6V	**PQ1U361M2ZP**
3.0V	**PQ1U301M2ZP**	3.8V	**PQ1U381M2ZP**
3.3V	**PQ1U331M2ZP**	4.0V	**PQ1U401M2ZP**
3.4V	**PQ1U341M2ZP**	5.0V	**PQ1U501M2ZP**

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V_{IN}	16	V
*1 ON/OFF control terminal voltage	V_C	16	V
Output current	I_O	300	mA
*2 Power dissipation	P_D	350	mW
*3 Junction temperature	T_j	150	˚C
Operating temperature	T_{opr}	−30 to +80	˚C
Storage temperature	T_{stg}	−55 to +150	˚C
Soldering temperature	T_{sol}	260 (10s)	˚C

*1 All are open except GND and applicable terminals.
*2 At mounted on PCB
*3 Overheat protection may operate at T_j=125°C to 150°C

• Please refer to the chapter " Handling Precautions ".

■ Electrical Characteristics

(Unless otherwise specified, V_{IN}=V_O(TYP)+1.0V, I_O=30mA, V_C=1.8V, Ta=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	V_O	–	Refer to the following table.1			V
※4 Output peak current	I_{op}	–	180	300	–	mA
Recommended output current	–	–	–	–	150	mA
Load regulation	$R_{eg}L1$	I_O=5 to 60mA	–	10	50	mV
	$R_{eg}L2$	I_O=5 to 100mA	–	20	100	mV
	$R_{eg}L3$	I_O=5 to 150mA	–	30	160	mV
Line regulation	$R_{eg}I$	V_{IN}=V_O(TYP)+1V to V_O(TYP)+6V	–	3.0	20	mV
Temperature coefficient of output voltage	T_CV_O	I_O=10mA, T_j=–25 to +75°C	–	0.05	–	mV/°C
Ripple rejection	RR	Refer to Fig.2	–	70	–	dB
Output noise voltage	$V_{no\ (rms)}$	10Hz<f<100kHz, C_n=0.1µF, I_O=30mA	Refer to the following table.2			µV
Dropout voltage	$V_{I-O}1$	I_O=60mA ※5	–	0.11	0.26	V
	$V_{I-O}2$	I_O=150mA ※5	–	0.20	0.4	
※6 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	µA
OFF-state voltage for control	$V_{C\ (OFF)}$	–	–	–	0.4	V
Quiescent current	I_q	I_O=0mA	–	130	200	µA
Output OFF-state dissipation current	I_{qs}	V_C=0.2V	–	–	1	µA

※4 Output current shall be the value when output voltage lowers 0.3V from the voltage at I_O=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.
※7 In case of **PQ1U181M2ZP**, V_{IN} minimum=2.3V.

Table.1 Output Voltage Line-up

(V_{IN}=V_O(TYP)+1.0V, I_O=30mA, V_C=1.8V, Ta=25°C)

Model No.	Symbol	MIN.	TYP.	MAX.	Unit
PQ1U181M2ZP	V_O	1.740	1.8	1.860	V
PQ1U251M2ZP		2.440	2.5	2.560	
PQ1U281M2ZP		2.740	2.8	2.860	
PQ1U291M2ZP		2.840	2.9	2.960	
PQ1U301M2ZP		2.940	3.0	3.060	
PQ1U331M2ZP		3.234	3.3	3.366	
PQ1U341M2ZP		3.332	3.4	3.468	
PQ1U351M2ZP		3.430	3.5	3.570	
PQ1U361M2ZP		3.528	3.6	3.672	
PQ1U381M2ZP		3.724	3.8	3.876	
PQ1U401M2ZP		3.920	4.0	4.080	
PQ1U501M2ZP		4.900	5.0	5.100	

Table.2 Output Noise Voltage Line-up

(V_{IN}=V_O(TYP)+1.0V, I_O=30mA, V_C=1.8V, C_n=0.1µF, 10Hz<f<100kHz, Ta=25°C)

Model No.	Symbol	MIN.	TYP.	MAX.	Unit
PQ1U181M2ZP	$V_{no(rms)}$	–	15	–	µV
PQ1U251M2ZP		–	25	–	
PQ1U281M2ZP		–	25	–	
PQ1U291M2ZP		–	25	–	
PQ1U301M2ZP		–	30	–	
PQ1U331M2ZP		–	30	–	
PQ1U341M2ZP		–	30	–	
PQ1U351M2ZP		–	35	–	
PQ1U361M2ZP		–	35	–	
PQ1U381M2ZP		–	35	–	
PQ1U401M2ZP		–	40	–	
PQ1U501M2ZP		–	50	–	

Fig.1 Test Circuit

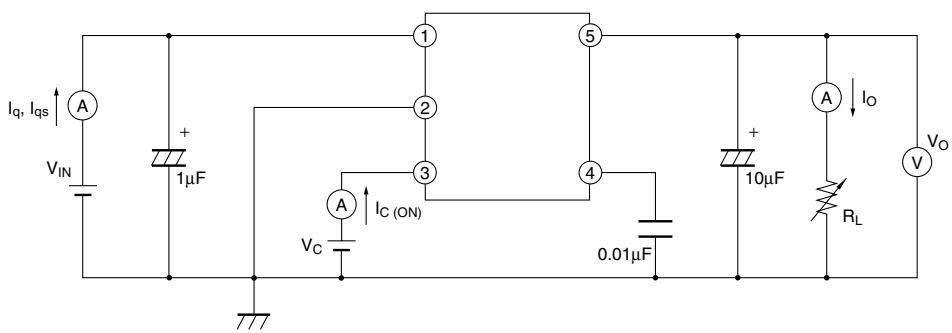
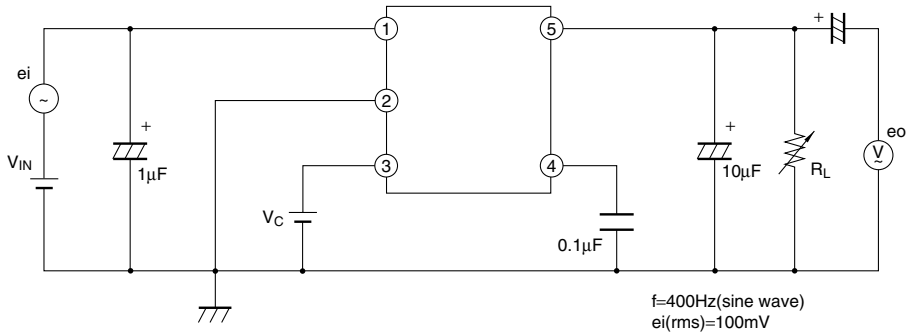
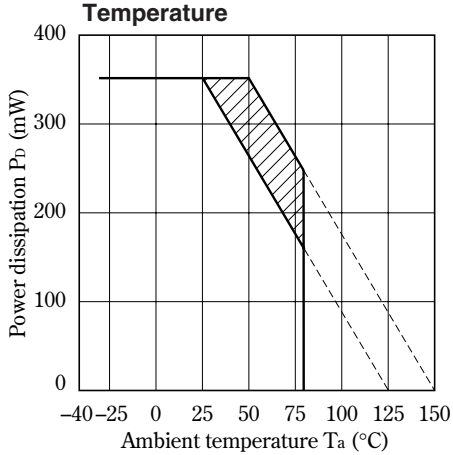


Fig.2 Test Circuit for Ripple Rejection



f=400Hz(sine wave)
ei(rms)=100mV
$V_{IN}=V_O(TYP)+1.0V$
$V_C=1.8V$
$I_O=10mA$
RR=20log(ei(rms)/eo(rms))

Fig.3 Power Dissipation vs. Ambient Temperature



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

Fig.4 Overcurrent Protection Characteristics (Typical Value)

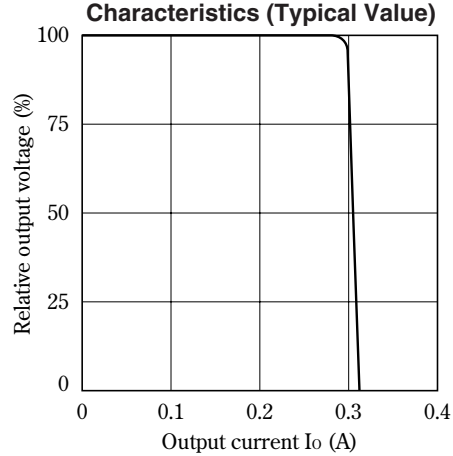


Fig.5 Output Voltage Fluctuation vs. Junction Temperature (PQ1U281M2ZP)(Typical Value)

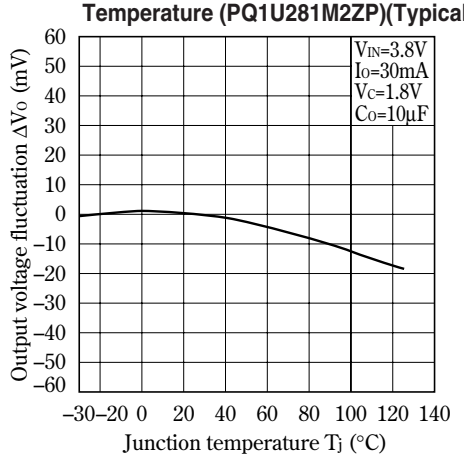


Fig.6 Output Voltage vs. Input Voltage (PQ1U281M2ZP)(Typical Value)

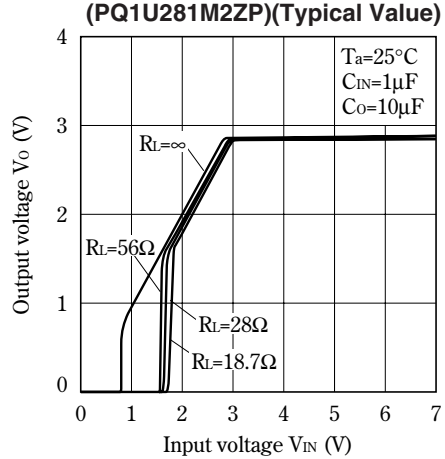


Fig.7 Circuit Operating Current vs. Input Voltage (PQ1U281M2ZP)(Typical Value)

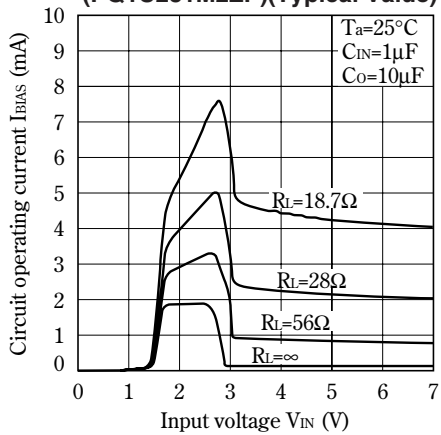


Fig.8 Dropout Voltage vs. Junction Temperature (PQ1U281M2ZP)(Typical Value)

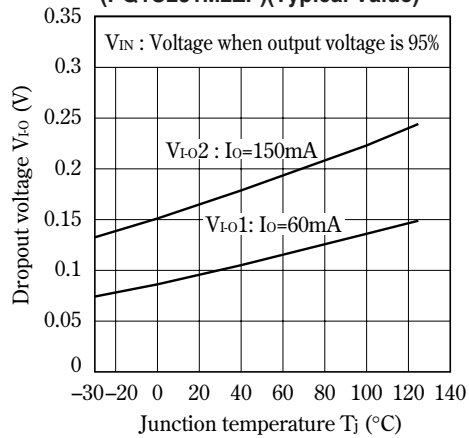


Fig.9 Quiescent Current vs. Junction Temperature (Typical Value)

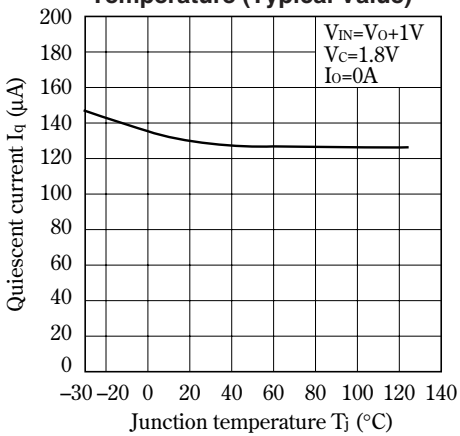


Fig.10 Ripple Rejection vs. Input Ripple Frequency (PQ1U281M2ZP)(Typical Value)

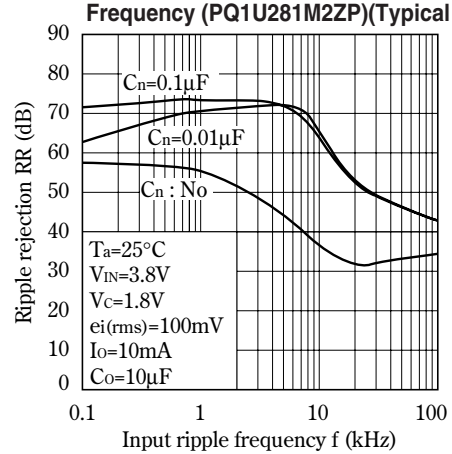
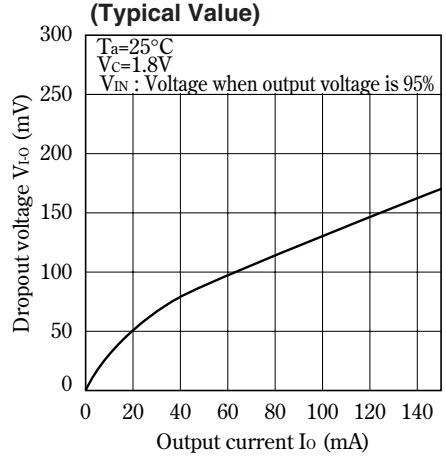


Fig.11 Dropout Voltage vs. Output Current (Typical Value)



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  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
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  --- Alarm equipment
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