PQ1MX55M2SPQ

Compact Surface Mount Type
Low Power-Loss Voltage Regulators

■ Features

1.Compact surface mount package (4.5×4.3×1.5mm)
2.Output current : MAX.500mA
3.Power dissipation : MAX.900mW
4.Low power-loss
(Dropout voltage : MAX. 0.7V at I_O=500mA)
5.Built-in ON/OFF control function
6.Built-in overcurrent, overheat protection functions
7.Use of ceramic capacitor is possible as output smooth capacitor
8.RoHS directive compliant

■ Applications

1.DVD player
2.Optical disk drives

■ Absolute Maximum Ratings

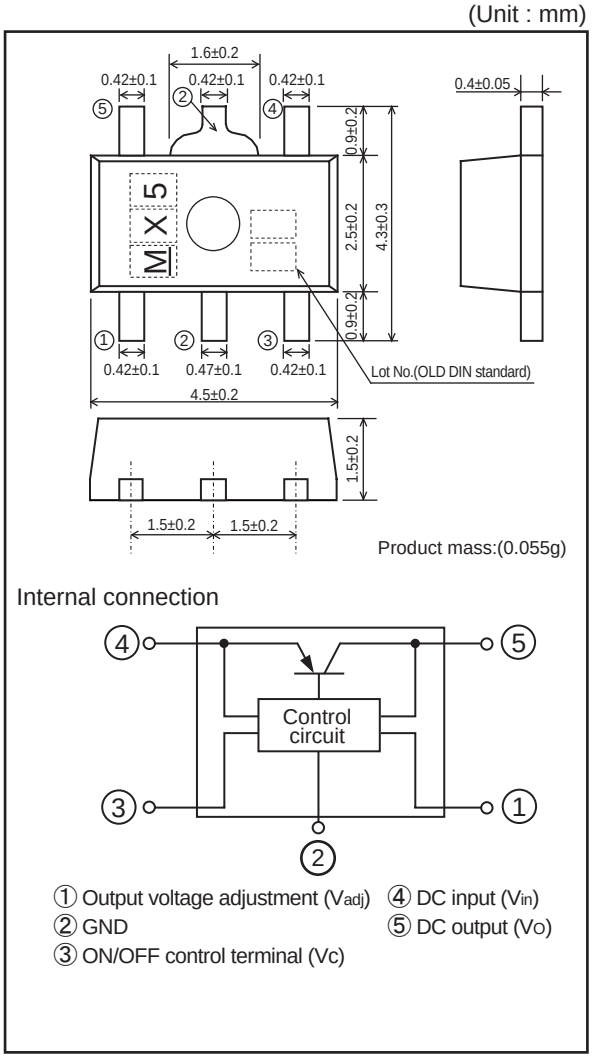
(Ta=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V_{IN}	9	V
*1 Output control voltage	V_C	9	V
*1 Output adjustment pin voltage	V_{adj}	5	V
Output current	I_O	500	mA
*2 Power dissipation	P_D	900	mW
*3 Junction temperature	T_j	150	°C
Operating temperature	T_{opr}	-30 to +85	°C
Storage temperature	T_{stg}	-55 to +150	°C
Soldering temperature	T_{sol}	270(10s)	°C

*1 All are open except GND and applicable terminals.
*2 At surface-mounted condition
*3 Overheat protection may operate at Tj:125°C to 150°C

■ Outline Dimensions

(Unit : mm)



Product mass:(0.055g)

Internal connection

① Output voltage adjustment (V_{adj})
② GND
③ ON/OFF control terminal (Vc)
④ DC input (V_{in})
⑤ DC output (V_O)

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

■ Electrical Characteristics

Unless otherwise specified condition shall be V_{IN}=3.5V,V_O=2.44V(R1=R2=100kΩ),I_O=30mA,V_C=1.8V,Ta=25°C

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating input voltage	V_{IN}	-	2.6	-	9.0	V
Output voltage	V_O	-	1.3	-	5.0	V
Reference voltage	V_{ref}	-	1.196	1.22	1.244	V
Load regulation	RegL	I_O=5mA to 500mA	-	10	100	mV
Line regulation	RegI	V_{IN}=3.5V to 8.5V	-	6.0	20	mV
Dropout voltage	V_{i-o}	V_{IN}=2.6V,I_O=500mA	-	-	0.7	V
Temperature coefficient of output voltage	TcVo	I_O=10mA,Tj=-25 to +75°C	-	±0.1	-	mV/°C
Ripple rejection	RR	Refer to Fig.2	-	55	-	dB
Output noise voltage	$V_{no(rms)}$	10Hz<f<100kHz	-	100	-	μV
*4 ON-state voltage for control	$V_{C(ON)}$	-	1.8	-	-	V
ON-state current for control	$I_{C(ON)}$	V_C=1.8V	-	20	70	μA
OFF-state voltage for control	$V_{C(OFF)}$	-	-	-	0.4	V
Quiescent current	I_q	I_O=0mA	-	0.8	1.2	mA
Output OFF-state dissipation current	I_{qs}	V_C=0.2V	-	-	1	μA

*4 In case of opening control terminal ③,output voltage turns off.

Fig.1 Test Circuit

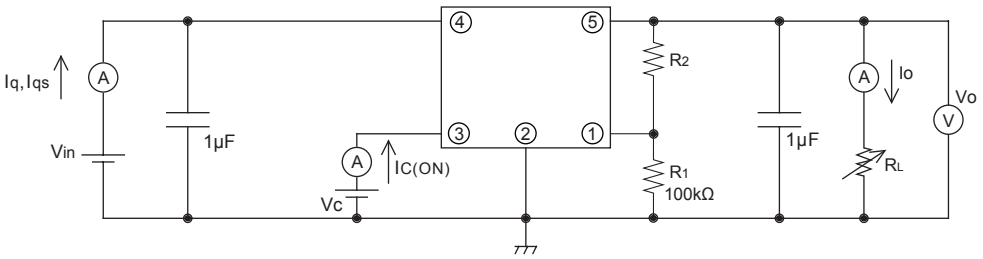
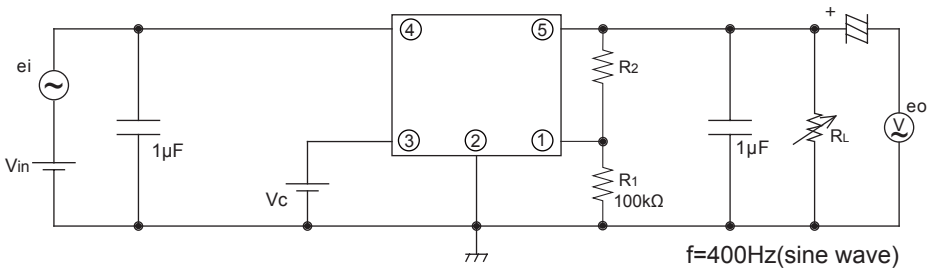
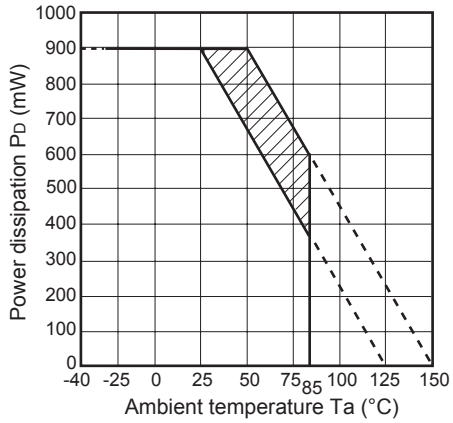


Fig.2 Test Circuit for Ripple Rejection

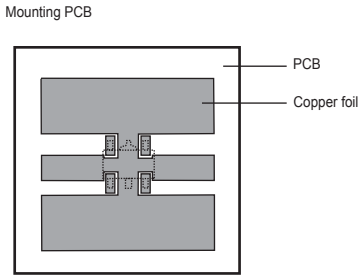


f=400Hz(sine wave)
ei(rms)=100mV
Vin=3.5V
Vc=1.8V
V_O=2.44V(R1=100kΩ)
I_O=30mA
RR=20log(ei(rms)/eo(rms))

Fig.3 Power Dissipation vs. Ambient Temperature



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



Material	: Glass-cloth epxy resin
PCB Size	: 20mm × 20mm × 1.0mm
Copper foil area	: 180mm^2
Thickness of copper	: 35µm

Fig.4 Overcurrent Protection Characteristics (Typical Value)

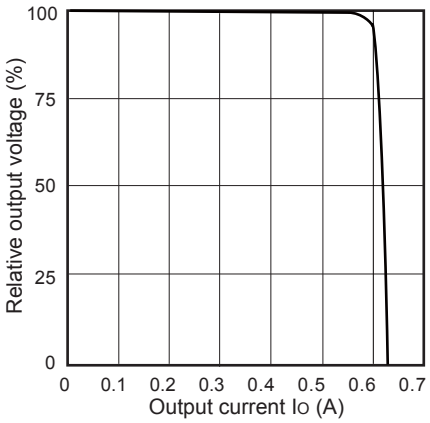


Fig.5 Output Voltage vs. Input Voltage (Typical Value)

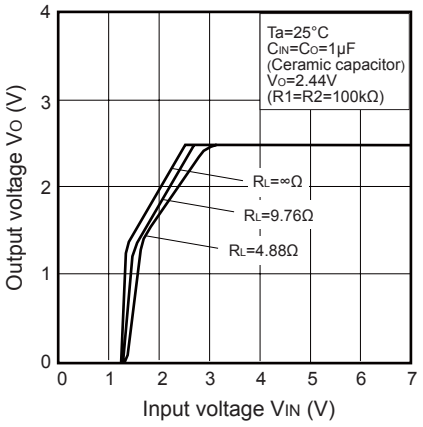


Fig.6 Circuit Operating Current vs. Input Voltage (Typical Value)

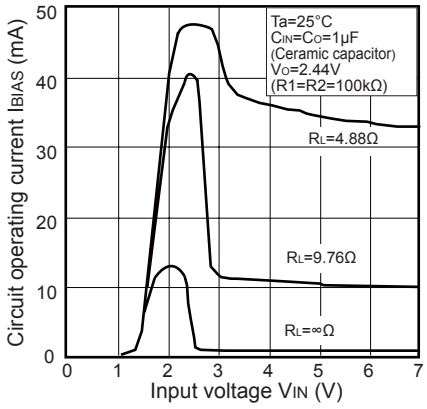


Fig.7 Quiescent Current vs. Junction Temperature (Typical Value)

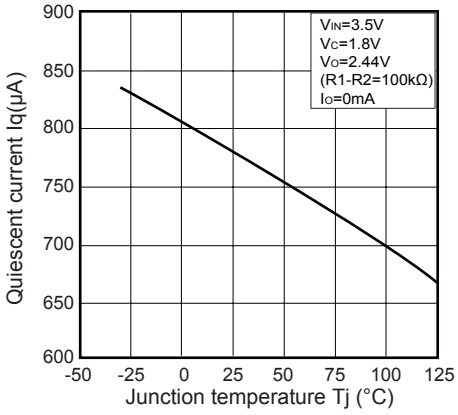


Fig.8 Dropout Voltage vs. Junction Temperature (Typical Value)

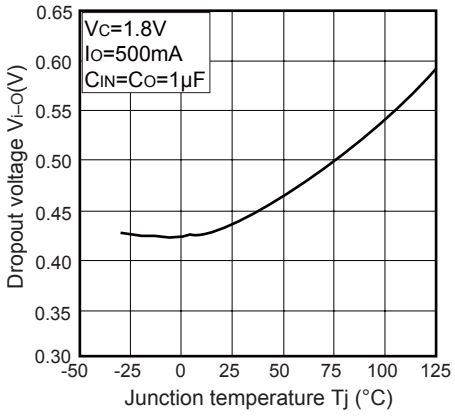


Fig.9 Output Voltage Deviation vs. Junction Temperature (Typical Value)

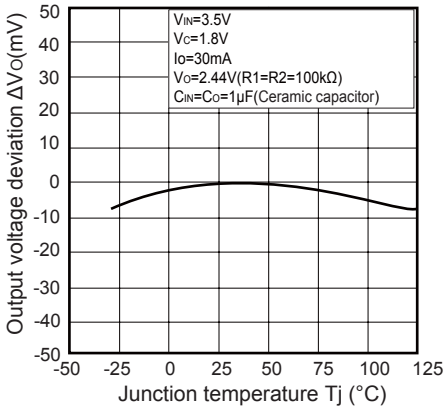


Fig.10 Reference Voltage Deviation vs. Junction Temperature (Typical Value)

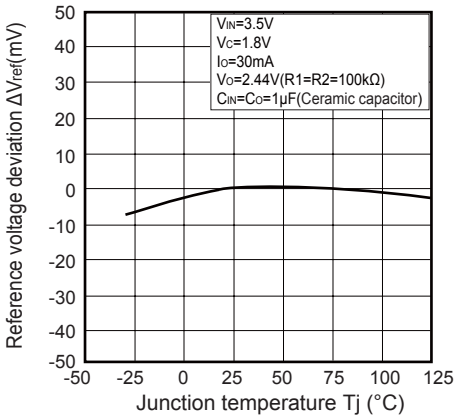


Fig.11 Dropout Voltage vs. Output Current (Typical Value)

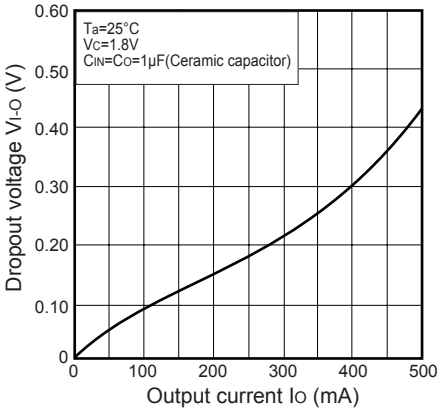


Fig.12 Ripple Rejection vs. Input Ripple Frequency (Typical Value)

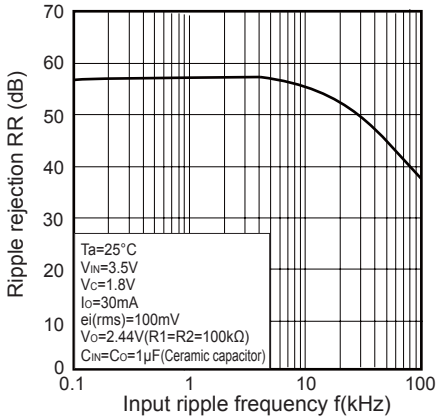
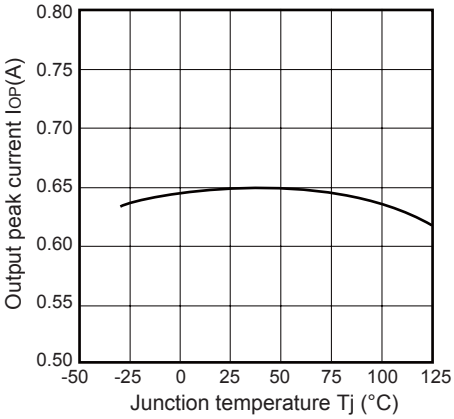


Fig.13 Output Peak Current vs. Junction Temperature (Typical Value)



■ Example of application