PQxxxEZ5MZ Series/PQxxxEZ01Z Series

SC-63 Package, Low Voltage Operation Low Power-Loss Voltage Regulators

■ Features

- Low voltage operation (Minimum operating voltage: 2.35V)
  2.5V input → available 1.5 to 1.8V
- Low dissipation current
  Dissipation current at no load : MAX. 2mA
  Output OFF-state dissipation current: MAX. 5μA
- Built-in overcurrent protection and overheat protection functions

■ Applications

- Peripheral equipment of personal computers
- Power supplies for various electronic equipment such as DVD player or STB

■ Model Line-up

Output current (I_O)	Package type	Output voltage (V_O)		
		1.5V	1.8V	2.5V
0.5A	Taping	PQ015EZ5MZP	PQ018EZ5MZP	PQ025EZ5MZP
	Sleeve	PQ015EZ5MZZ	PQ018EZ5MZZ	PQ025EZ5MZZ
1A	Taping	PQ015EZ01ZP	PQ018EZ01ZP	PQ025EZ01ZP
	Sleeve	PQ015EZ01ZZ	PQ018EZ01ZZ	PQ025EZ01ZZ

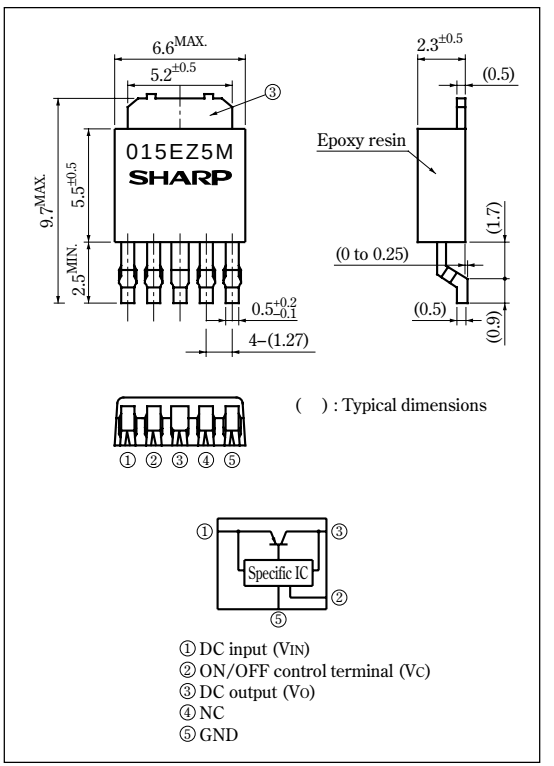
Output current (I_O)	Package type	Output voltage (V_O)	
		3V	3.3V
0.5A	Taping	PQ030EZ5MZP	PQ033EZ5MZP
	Sleeve	PQ030EZ5MZZ	PQ033EZ5MZZ
1A	Taping	PQ030EZ01ZP	PQ033EZ01ZP
	Sleeve	PQ030EZ01ZZ	PQ033EZ01ZZ

■ Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input voltage		V_{IN}	10	V
※1 ON/OFF control terminal voltage		V_C	10	V
Output current	PQxxxEZ5MZ Series	I_O	0.5	A
	PQxxxEZ01Z Series		1	
※2 Power dissipation		P_D	8	W
※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 (10s)	˚C

※1 All are open except GND and applicable terminals.
※2 P_D:With infinite heat sink
※3 Overheat protection may operate at Tj=125˚C to 150˚C

■ Outline Dimensions (Unit : mm)



•Please refer to the chapter " Handling Precautions ".

■ Electrical Characteristics

(Unless otherwise specified, condition shall be V_{IN}=V_O(TYP.)+1V, I_O=0.3A,V_C=2.7V, Ta=25˚C (**PQxxxEZ5MZ**))
(Unless otherwise specified, condition shall be V_{IN}=V_O(TYP.)+1V, I_O=0.5A,V_C=2.7V, Ta=25˚C (**PQxxxEZ01Z**))

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage		V_{IN}	–	Refer to below table			V
Output voltage		V_O	–	Refer to below table			V
Load regulation	**PQxxxEZ5MZ**	$R_{eg}L$	I_O=5mA to 0.5A	–	0.2	2	%
	PQxxxEZ01Z		I_O=5mA to 1A				
Line regulation		$R_{eg}I$	V_{IN}=V_O(TYP.)+1V to V_O(TYP.)+6V, I_O=5mA	–	0.1	1	%
Temperature coefficient of output voltage		T_CV_O	T_j=0 to 125˚C, I_O=5mA	–	±0.01	–	%/˚C
Ripple Rejection		RR	Refer to Fig.2	45	60	–	dB
※4Dropout voltage	**PQxxxEZ5MZ**	V_{I-O}	※5I_O=0.3A	–	0.2	0.5	V
	PQxxxEZ01Z		※5I_O=0.5A				
※6ON-state voltage for control		$V_{C\ (ON)}$	–	2	–	–	V
ON-state current for control		$I_{C\ (ON)}$	–	–	–	200	µA
OFF-state voltage for control		$V_{C\ (OFF)}$	–	–	–	0.8	V
OFF-state current for control		$I_{C\ (OFF)}$	V_C=0.4V	–	–	2	µA
Quiescent current		I_q	I_O=0A	–	1	2	mA
Output OFF-state dissipation current		I_{qs}	I_O=0A, V_C=0.4V	–	–	5	µA

※4 Applied **PQ030EZ5MZ**, **PQ033EZ5MZ**
※5 Input voltage shall be the value when output voltage is 95% in comparison with the initial value.
※6 In case of opening control terminal②, output voltage turns off.

■ Input Voltage Line-up

(Unless otherwise specified, condition shall be I_O=0.3A,V_C=2.7V, Ta=25˚C (**PQxxxEZ5MZ**))
(Unless otherwise specified, condition shall be I_O=0.5A,V_C=2.7V, Ta=25˚C (**PQxxxEZ01Z**))

Model No.	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
PQ015EZ5MZ/PQ015EZ01Z	V_{IN}	–	2.35	–	10	V
PQ018EZ5MZ/PQ018EZ01Z	V_{IN}	–	2.35	–	10	V
PQ025EZ5MZ/PQ025EZ01Z	V_{IN}	–	V_O+0.5	–	10	V
PQ030EZ5MZ/PQ030EZ01Z	V_{IN}	–	V_O+0.5	–	10	V
PQ033EZ5MZ/PQ033EZ01Z	V_{IN}	–	V_O+0.5	–	10	V

■ Output Voltage Line-up

(Unless otherwise specified, condition shall be V_{IN}=V_O(TYP.)+1V, I_O=0.3A,V_C=2.7V, Ta=25˚C (**PQxxxEZ5MZ**))
(Unless otherwise specified, condition shall be V_{IN}=V_O(TYP.)+1V, I_O=0.5A,V_C=2.7V, Ta=25˚C (**PQxxxEZ01Z**))

Model No.	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
PQ015EZ5MZ/PQ015EZ01Z	V_O	–	1.45	1.5	1.55	V
PQ018EZ5MZ/PQ018EZ01Z	V_O	–	1.75	1.8	1.85	V
PQ025EZ5MZ/PQ025EZ01Z	V_O	–	2.438	2.5	2.562	V
PQ030EZ5MZ/PQ030EZ01Z	V_O	–	2.925	3	3.075	V
PQ033EZ5MZ/PQ033EZ01Z	V_O	–	3.218	3.3	3.382	V

Fig.1 Test Circuit

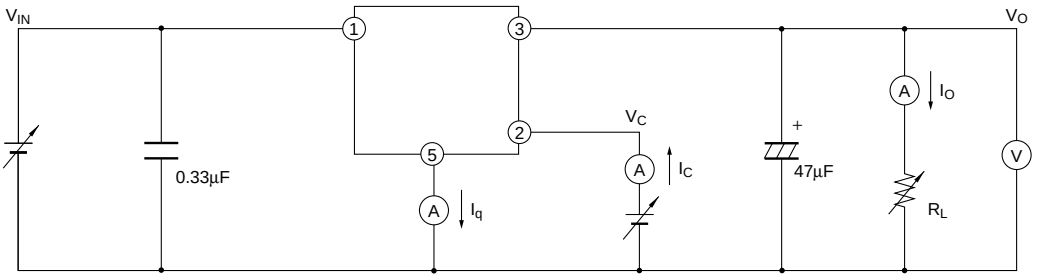
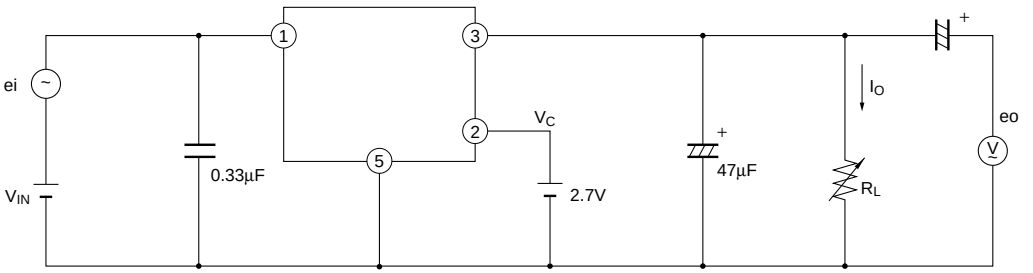
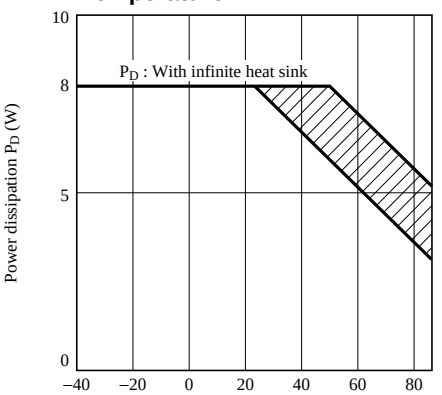


Fig.2 Test Circuit for Ripple Rejection



f=120Hz (sine wave)
ei(rms)=0.5V
$V_{IN}=V_O$(TYP)+2V
I_O=0.3A
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 (PQ015EZ5MZ)

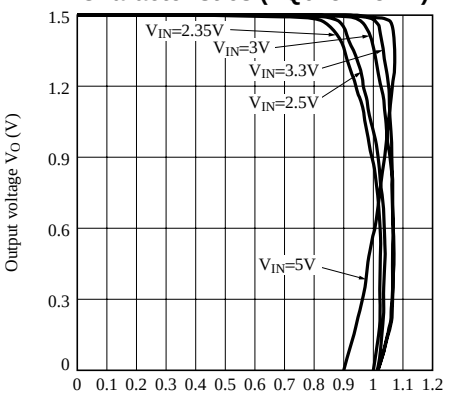


Fig.5 Overcurrent Protection Characteristics (PQ018EZ5MZ)

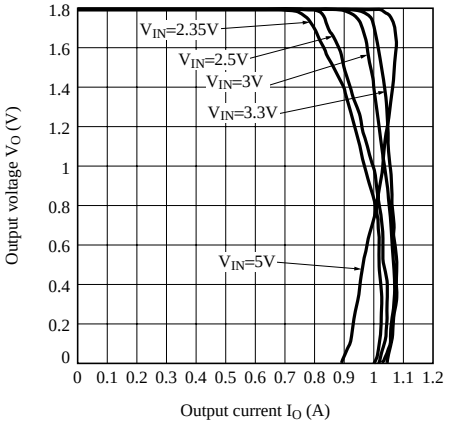


Fig.6 Overcurrent Protection Characteristics (PQ025EZ5MZ)

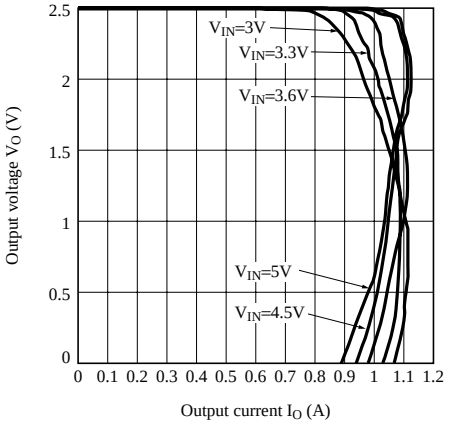


Fig.7 Overcurrent Protection Characteristics (PQ030EZ5MZ)

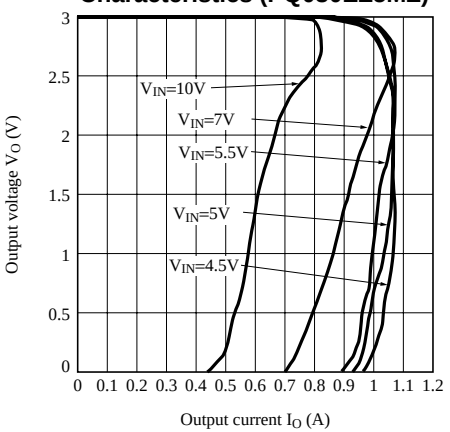


Fig.8 Overcurrent Protection Characteristics (PQ033EZ5MZ)

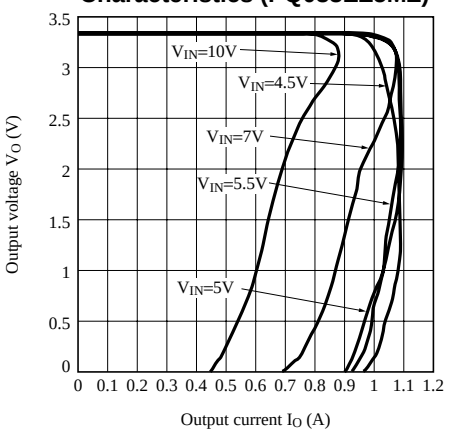


Fig.9 Overcurrent Protection Characteristics (PQ015EZ01Z)

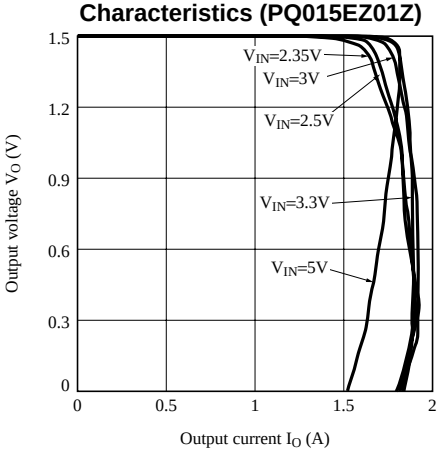


Fig.10 Overcurrent Protection Characteristics (PQ018EZ01Z)

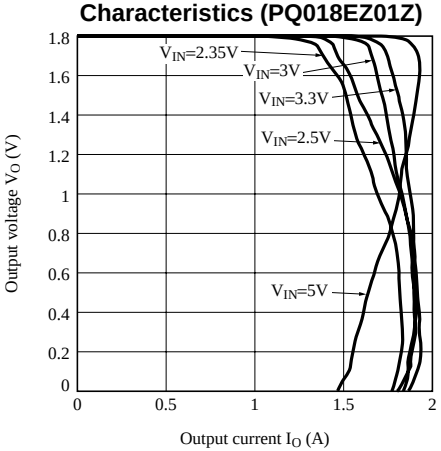


Fig.11 Overcurrent Protection Characteristics (PQ025EZ01Z)

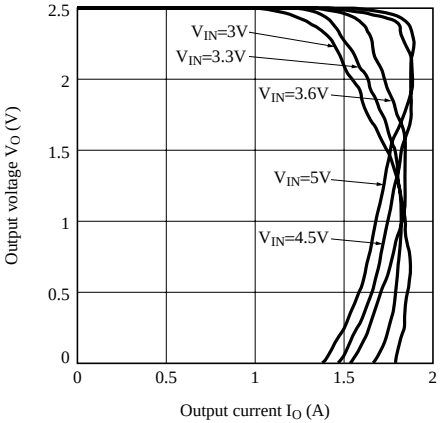


Fig.12 Overcurrent Protection Characteristics (PQ030EZ01Z)

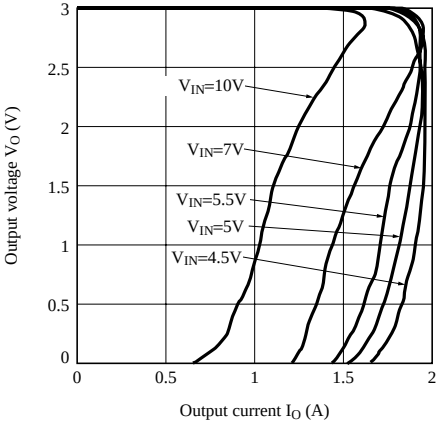


Fig.13 Overcurrent Protection Characteristics (PQ033EZ01Z)

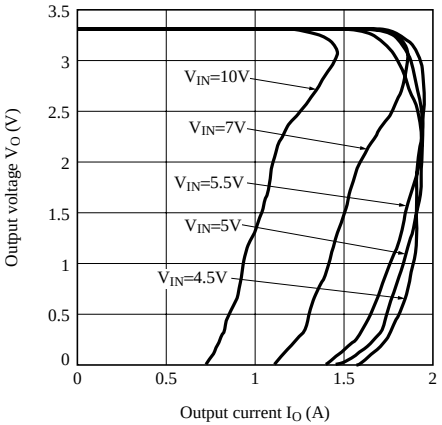


Fig.14 Output Voltage vs. Ambient Temperature (PQ015EZ5MZ/PQ015EZ01Z)

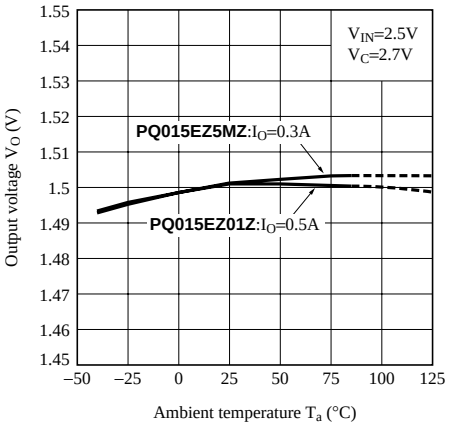


Fig.15 Output Voltage vs. Ambient Temperature (PQ018EZ5MZ/PQ018EZ01Z)

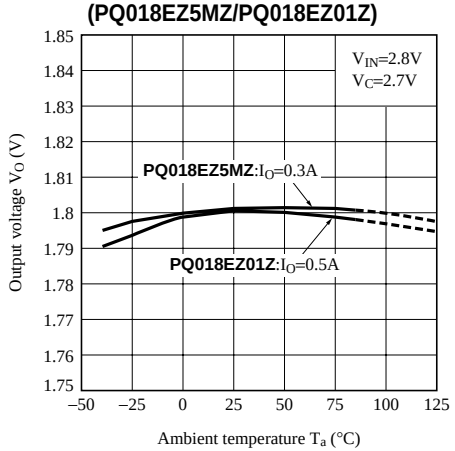


Fig.16 Output Voltage vs. Ambient Temperature (PQ025EZ5MZ/PQ025EZ01Z)

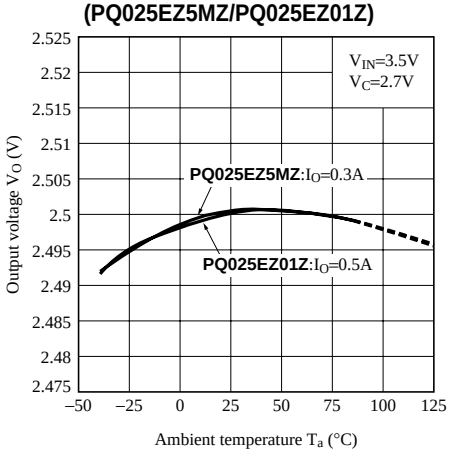


Fig.17 Output Voltage vs. Ambient Temperature (PQ030EZ5MZ/PQ030EZ01Z)

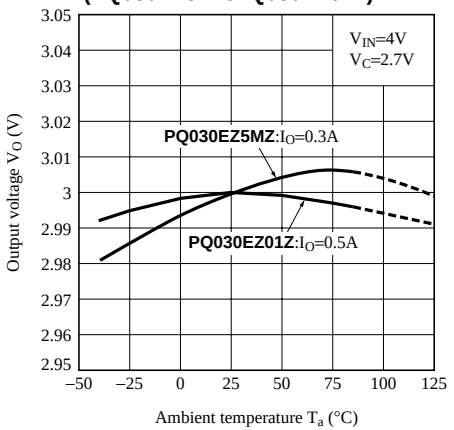


Fig.18 Output Voltage vs. Ambient Temperature (PQ033EZ5MZ/PQ033EZ01Z)

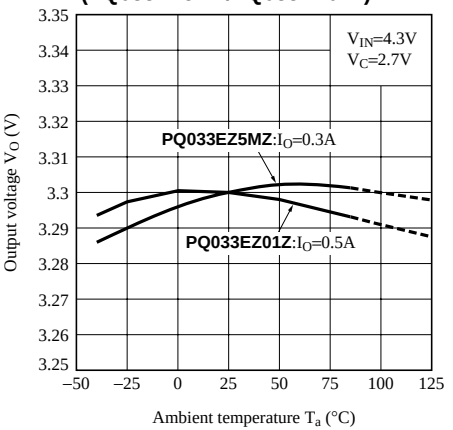


Fig.19 Output Voltage vs. Input Voltage (PQ015EZ5MZ)

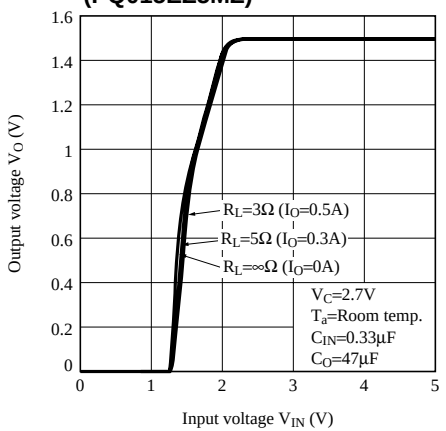


Fig.20 Output Voltage vs. Input Voltage (PQ018EZ5MZ)

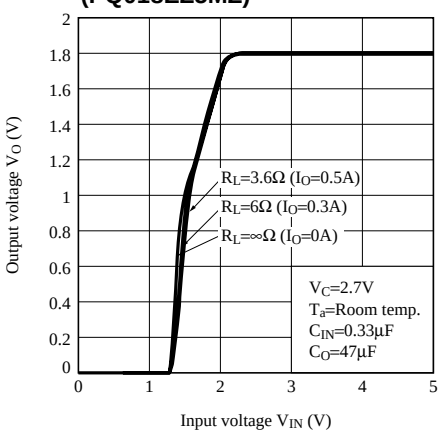


Fig.21 Output Voltage vs. Input Voltage (PQ025EZ5MZ)

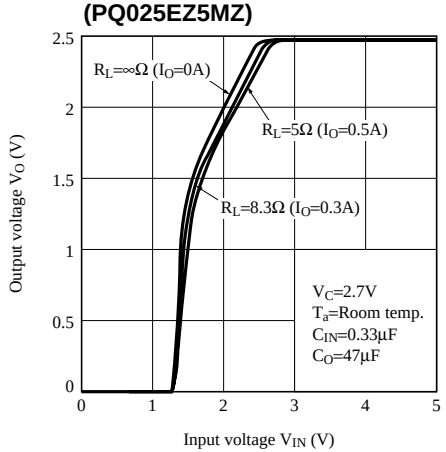


Fig.22 Output Voltage vs. Input Voltage (PQ030EZ5MZ)

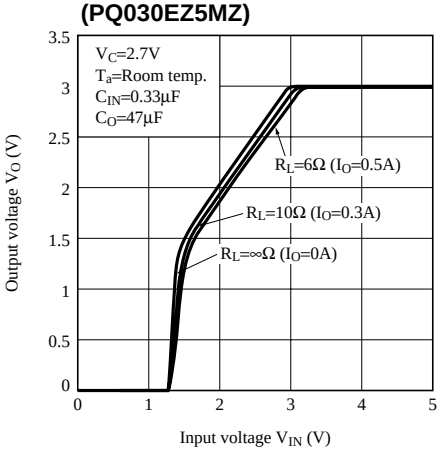


Fig.23 Output Voltage vs. Input Voltage (PQ033EZ5MZ)

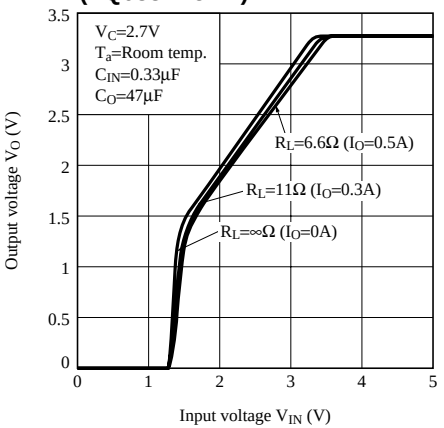


Fig.24 Output Voltage vs. Input Voltage (PQ015EZ01Z)

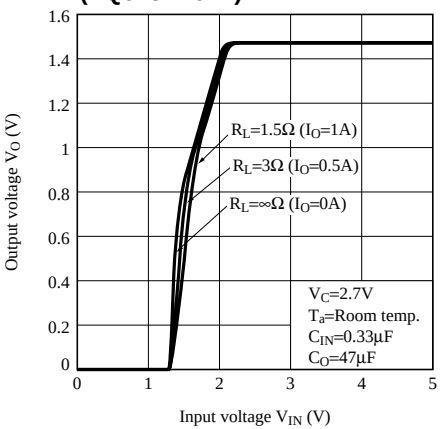


Fig.25 Output Voltage vs. Input Voltage (PQ018EZ01Z)

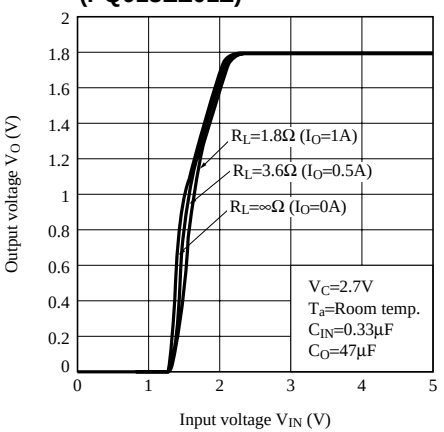


Fig.26 Output Voltage vs. Input Voltage (PQ025EZ01Z)

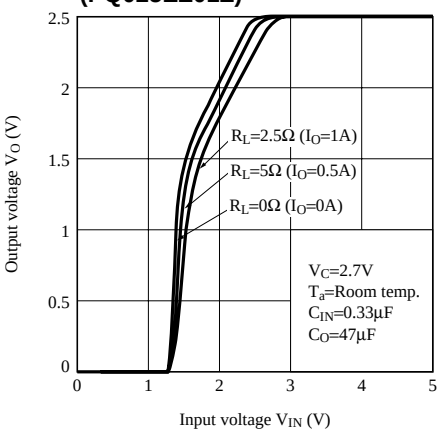


Fig.27 Output Voltage vs. Input Voltage (PQ030EZ01Z)

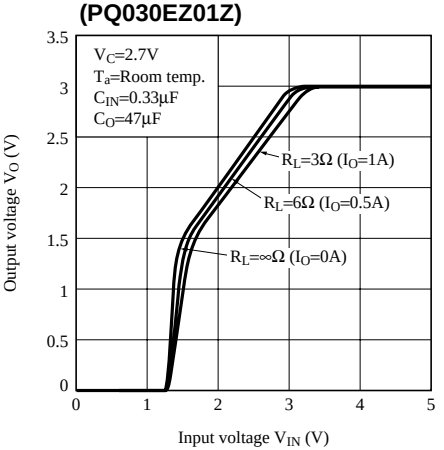


Fig.28 Output Voltage vs. Input Voltage (PQ033EZ01Z)

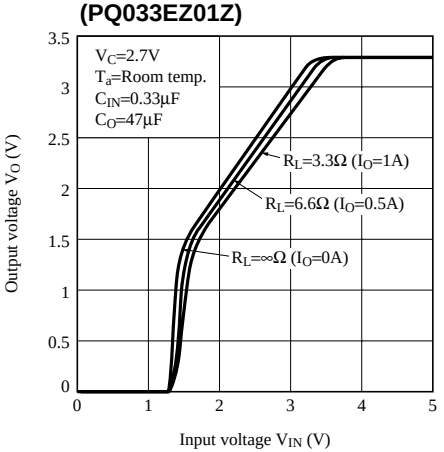


Fig.29 Circuit Operating Current vs. Input Voltage (PQ015EZ5MZ)

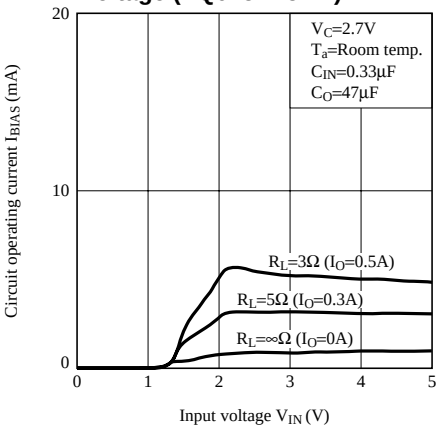


Fig.30 Circuit Operating Current vs. Input Voltage (PQ018EZ5MZ)

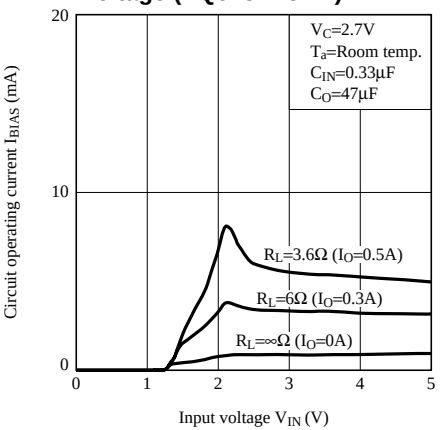


Fig.31 Circuit Operating Current vs. Input Voltage (PQ025EZ5MZ)

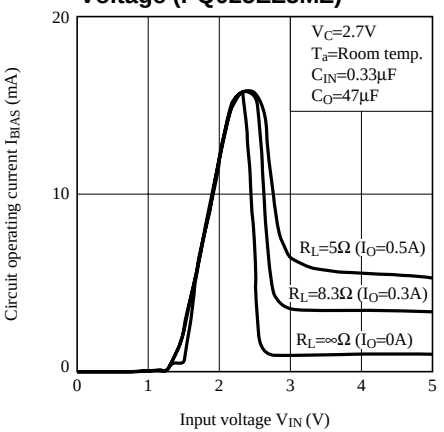


Fig.32 Circuit Operating Current vs. Input Voltage (PQ030EZ5MZ)

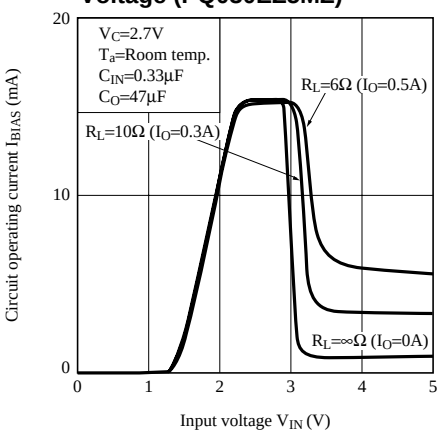


Fig.33 Circuit Operating Current vs. Input Voltage (PQ033EZ5MZ)

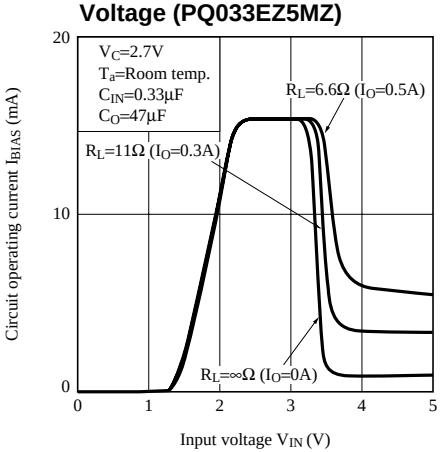


Fig.34 Circuit Operating Current vs. Input Voltage (PQ015EZ01Z)

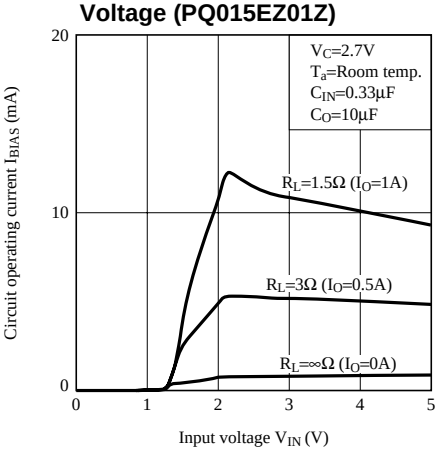


Fig.35 Circuit Operating Current vs. Input Voltage (PQ018EZ01Z)

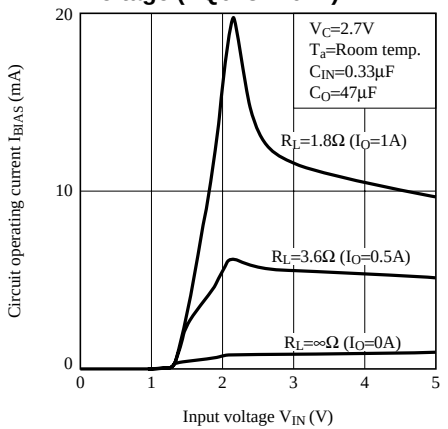


Fig.36 Circuit Operating Current vs. Input Voltage (PQ025EZ01Z)

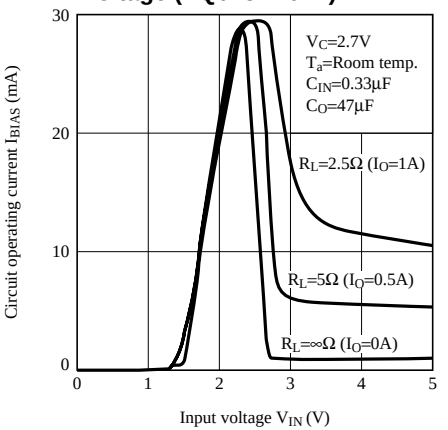


Fig.37 Circuit Operating Current vs. Input Voltage (PQ030EZ01Z)

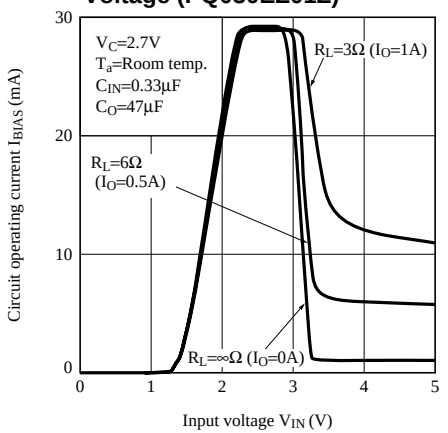


Fig.38 Circuit Operating Current vs. Input Voltage (PQ033EZ01Z)

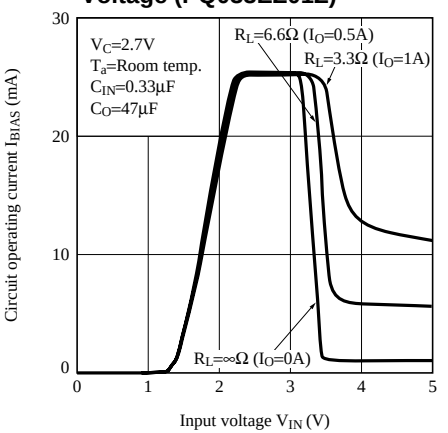


Fig.39 Quiescent Current vs. Junction Temperature

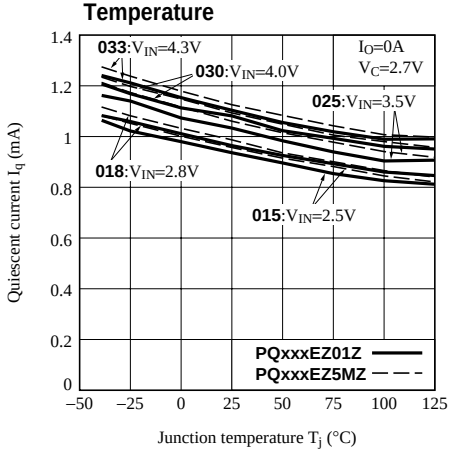


Fig.40 Dropout Voltage vs. Junction Temperature

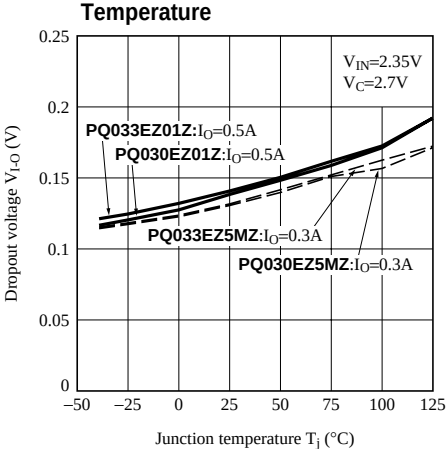


Fig.41 Ripple Rejection vs. Input Ripple Frequency

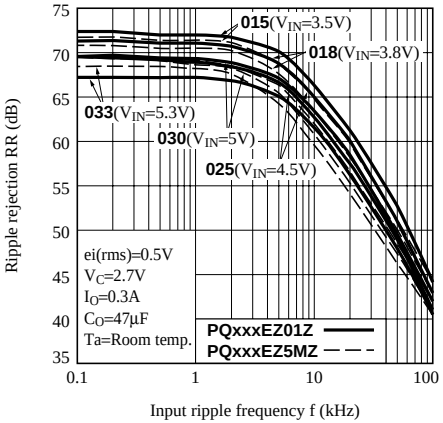


Fig.42 Ripple Rejection vs. Output Current

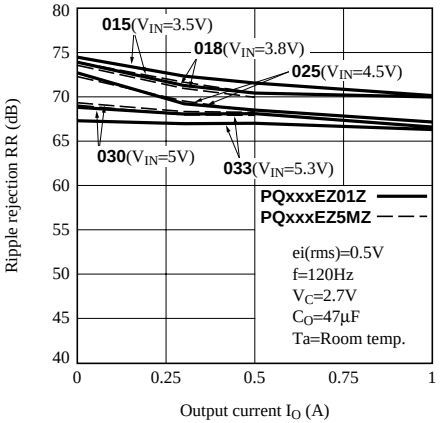


Fig.43 Typical Application

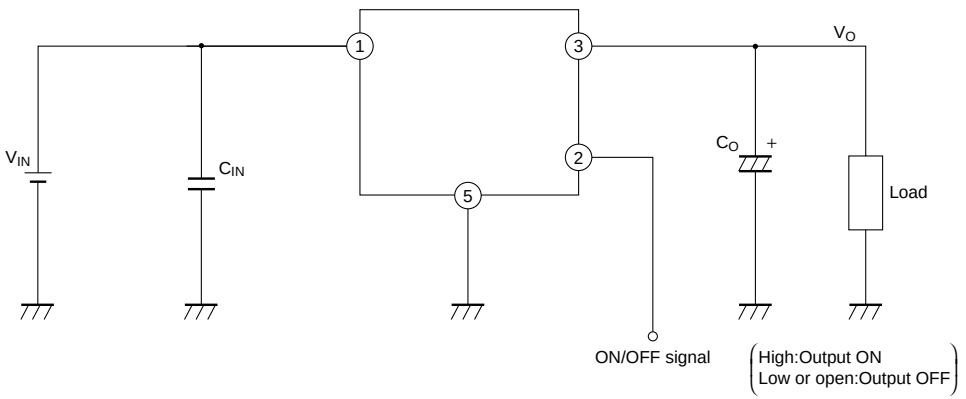
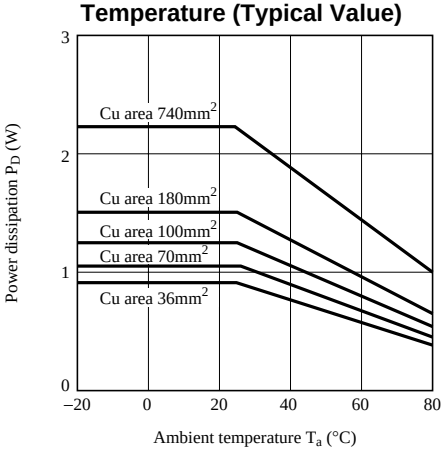
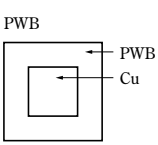


Fig.44 Power Dissipation vs. Ambient Temperature (Typical Value)





Material : Glass-cloth epoxy resin
Size : 50×50×1.6mm
Cu thickness : 35µm

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  --- Office automation equipment
  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
  --- Industrial control
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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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