PQ15RF15/PQ15RF16

1A Output, Low Power-Loss Voltage Regulators Considering Power Line Voltage Drop

■ Features

- Low power-loss (Dropout voltage : MAX. 0.5V)
- Compact resin full-mold package
- Conforming to the unified standard for BS converter
- Output voltage value (15.7V) with an allowance for voltage loss caused by reverse flow preventing diode
- Built-in ON/OFF control terminal corresponding to BS antenna power supply selecting switch
- High-precision output type **(PQ15RF16)** (Output voltage precision : ±2.5%)

■ Applications

- TVs and VCRs with built-in BS tuners
- BS tuners

■ Outline Dimensions

(Unit : mm)

Internal connection diagram

① DC input (V_{IN})
② DC output (V_O)
③ GND
④ ON/OFF control terminal (V_C)
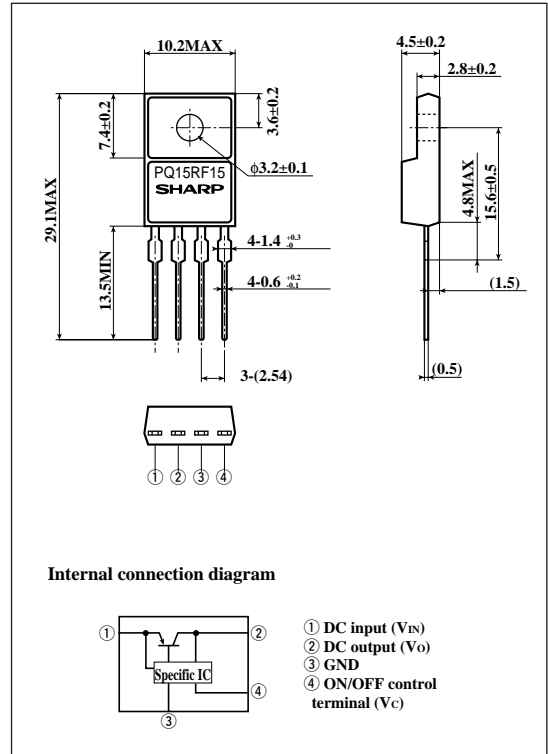
■ Absolute Maximum Ratings

($T_a=25°C$)

Parameter	Symbol	Rating	Unit
[*1] **Input voltage**	V_{IN}	35	V
[*1] **ON/OFF control terminal voltage**	V_C	35	V
Output current	I_O	1	A
Power dissipation (No heat sink)	P_{D1}	1.5	W
Power dissipation (With infinite heat sink)	P_{D2}	15	W
[*2] **Junction temperature**	T_j	150	°C
Operating temperature	T_{opr}	-20 to +80	°C
Storage temperature	T_{stg}	-40 to +150	°C
Soldering temperature	T_{sol}	260 (For 10s)	°C

[*1] All are open except GND and applicable terminals.

[*2] Overheat protection may opetate at $125<=T_j<=150°C$

■ Electrical Characteristics

(Unless otherwise specified, condition shall be V_{IN}=18V, I_0=0.5A, T_a=25˚C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output voltage	PQ15RF15	V_O		14.92	15.7	16.48	V
	PQ15RF16			15.31	15.7	16.09	
Load regulation		$R_{eg}L$	I_O=5mA to 1.0A	-	0.2	2.0	%
Line regulation		$R_{eg}I$	V_N=17 to 27V	-	0.2	2.5	%
Temperature coefficient of output voltage		T_CV_O	T_j=0 to 125˚C	-	±0.01	-	%/˚C
Ripple rejection		RR	Refer to Fig. 2	45	65	-	dB
Dropout voltage		V_{i-o}	*3 I_O=0.5A	-	0.2	0.5	V
ON-state voltage for control		$V_{C(ON)}$	*4	2.0	-	-	V
ON-state current for control		$I_{C(ON)}$	V_C=2.7V	-	-	20	μA
OFF-state voltage for control		$V_{C(OFF)}$		-	-	0.8	V
OFF-state current for control		$I_{C(OFF)}$	V_C=0.4V	-	-	-0.4	mA
Output OFF-state consumption current		I_{qs}	I_O=0A	-	6	10	mA

*3 Input voltage shall be the value when output voltage is 95% in comparison with the initial value.

*4 In case of opening control terminal ④, output voltage turns on.
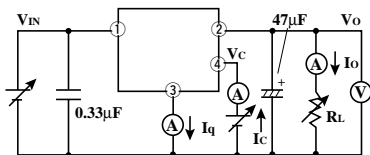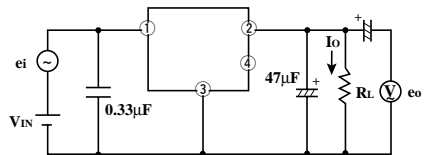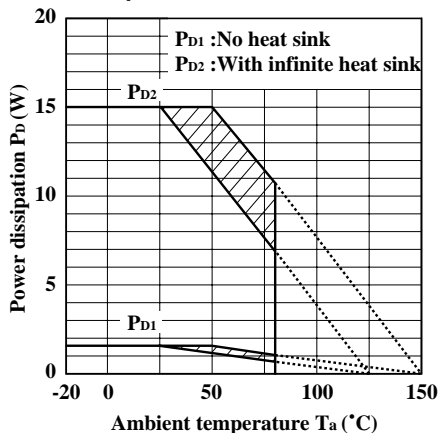
Fig.1   Test Circuit

Fig.2   Test Circuit of Ripple Rejection

f=120Hz (sine wave)
ei=0.5Vrms
RR=20 log (ei/eo)

Fig.3   Power Dissipation vs. Ambient Temperature

P_{D1} :No heat sink
P_{D2} :With infinite heat sink

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

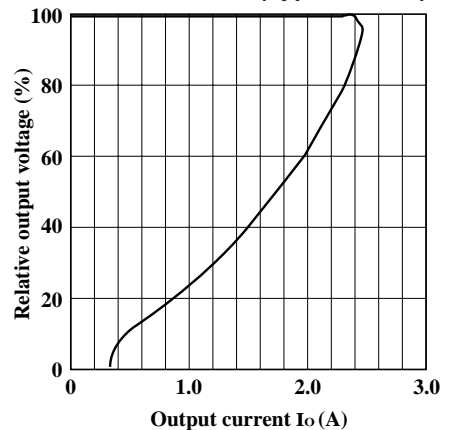### Fig.4   Overcurrent Protection Characteristics (Typical Value)

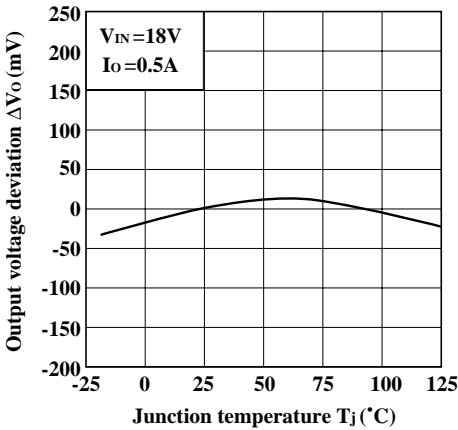

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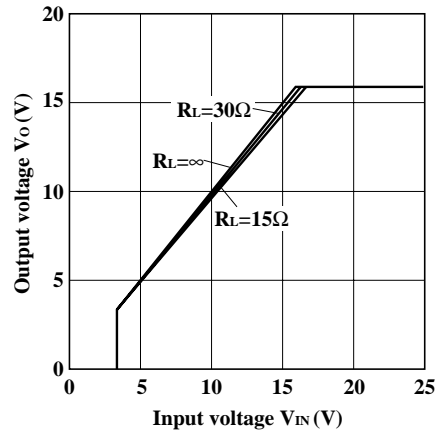**Fig.5 Output Voltage Deviation vs. Junction Temperature**

Output voltage deviation ΔV_O (mV) vs. Junction temperature T_j (°C)

$V_{IN} = 18V$
$I_O = 0.5A$

Fig.6 Output Voltage vs. Input Voltage

Output voltage V_O (V) vs. Input voltage V_{IN} (V)

$R_L = 30\Omega$
$R_L = \infty$
$R_L = 15\Omega$

Fig.7 Circuit Operating Current vs. Input Voltage

Circuit operating current I_{BIAS} (mA) vs. Input voltage V_{IN} (V)

$R_L = 10\Omega$
$R_L = 30\Omega$ $R_L = 15\Omega$
$R_L = \infty$
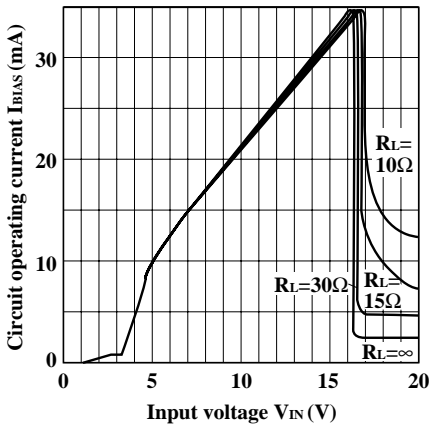
Fig.8 Dropout Voltage vs. Junction Temperature

Dropout voltage V_{i-o} (V) vs. Junction temperature T_j (°C)

$I_O = 1A$
$0.75A$
$0.5A$
$0.25A$
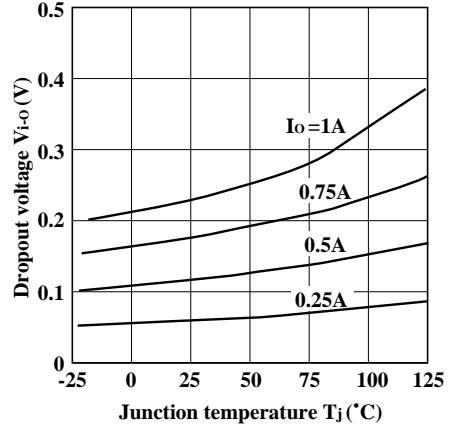
Fig.9 Quiescent Current vs. Junction Temperature

Quiescent current I_q (mA) vs. Junction temperature T_j (°C)

$V_{IN} = 35V$
$I_O = 0$
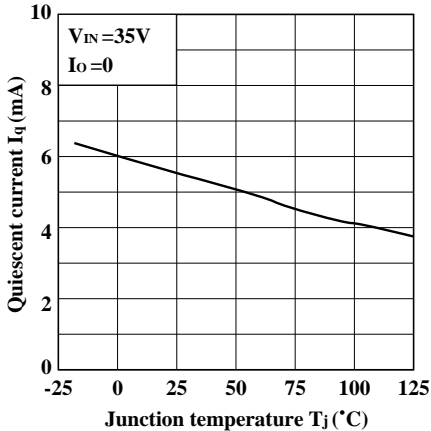
Fig.10 Ripple Rejection vs. Input Ripple Frequency

Ripple rejection RR (dB) vs. Input ripple frequency f (kHz)

$I_O = 0.5A, e_i = 0.5V_{rms},$
$T_j = 25°C$
$V_{IN} = 18V$

SHARP
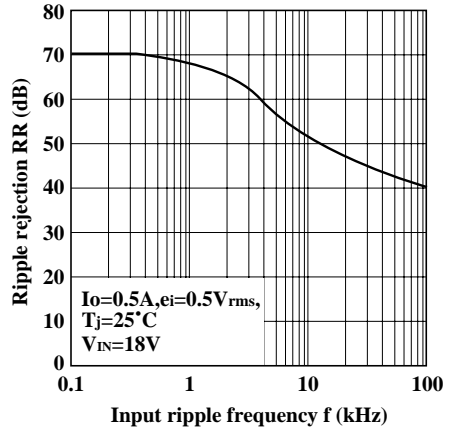
Fig.11 Ripple Rejection vs. Output Current

Ripple rejection RR (dB) vs Output current I_O (A)

$T_j=25°C$
$f=120Hz, e_i=0.5V_{rms},$
$V_{IN}=18V$
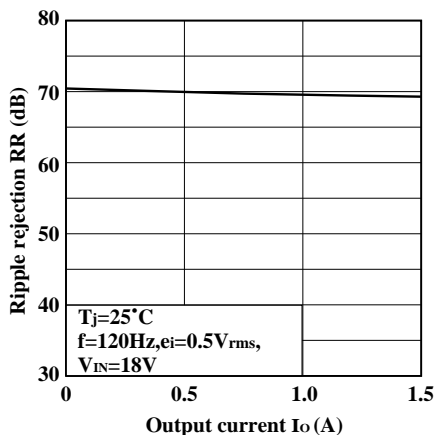
Fig.12 Output Peak Current vs. Junction Temperature

Output peak current I_{OP} (A) vs Junction temperature T_j (°C)

$V_{IN}-V_O=5V$
2V
1V
0.5V

I_{OP}: Output current when output voltage is 95% in comparison with the initial value
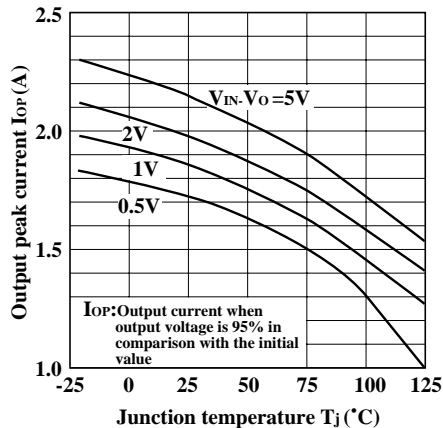
■ **Model Line-ups for Lead Forming Type**

Output voltage	15.7V output
Output voltage precision:±5%	PQ15RF1F
Output voltage precision:±2.5%	PQ15RF1G

■ **Outline Dimensions (PQ15RF1F/PQ15RF1G)**

(Unit : mm)

10.2MAX
$7.4±0.2$
$3.6±0.2$
PQ15RF15
SHARP
$\phi3.2±0.1$
(24.6)
4-1.4 $^{+0.3}_{-0}$
4-0.6 $^{+0.2}_{-0.1}$
3-(2.54)

4.5±0.2
2.8±0.2
16.4±0.7
(2.0)
(5±0.5)
(1.5)
(0.5)
(3.2)
4.4MIN
5±0.5
8.2±0.7

· (   ) : Typical value
· Radius of lead forming portion : R=0.5 to 1.5mm

① ② ③ ④

Internal connection diagram

Specific IC

① DC input (V_{IN})
② DC output (V_O)
③ GND
④ ON/OFF control terminal (V_C)
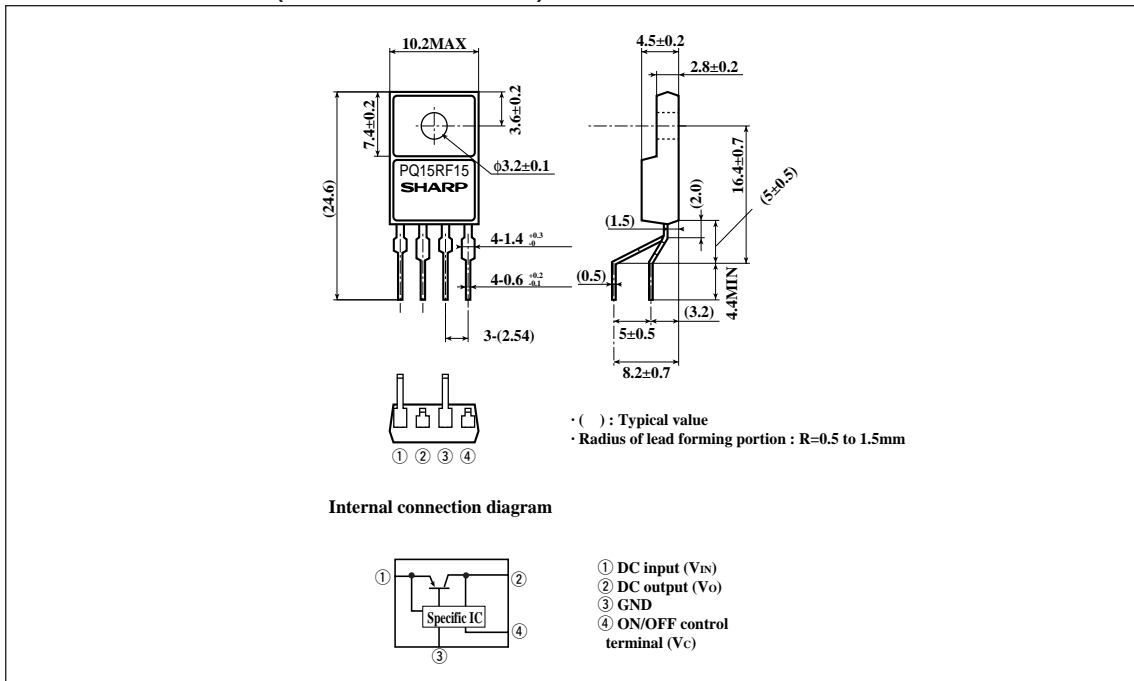
Note) The value of absolute maximum ratings and electrical characteristics is same as ones of PQ15RF15/16 series.

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— Gas leakage sensor breakers
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— Various safety devices, etc.

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