



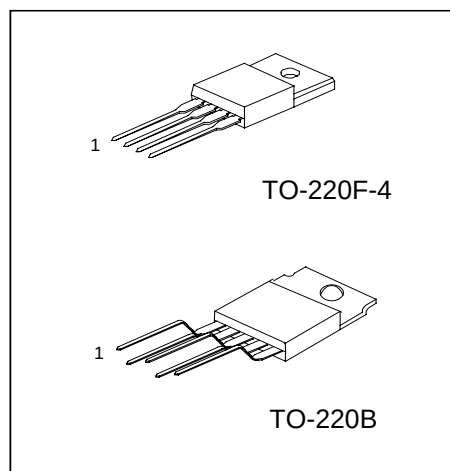
RXXLD20

Linear Integrated Circuit

2A OUTPUT TYPE LOW POWER-LOSS VOLTAGE REGULATOR

FEATURES

- *Low power-loss(Dropout voltage: 0.5V(max) at $I_o=2.0A$)
- *2.0A output type
- *Output voltage precision: $\pm 3.0\%$
- *Built-in ON/OFF control function and over-current protection circuit.
- *Thermal shutdown protection.



*Pb-free plating product number:RXXLD20L

PIN DESCRIPTION

PIN NO.		PIN NAME
TO-220F-4	TO-220B	
	1	NC
1	2	INPUT
2	3	OUTPUT
3	4	GND
4	5	ON/OFF

ORDERING INFORMATION

Order Number		Package	Packing
Normal	Lead Free Plating		
RXXLD20-TF4-T	RXXLD20L-TF4-T	TO-220F-4	Tube
RXXLD20-TB5-T	RXXLD20L-TB5-T	TO-220B	Tube

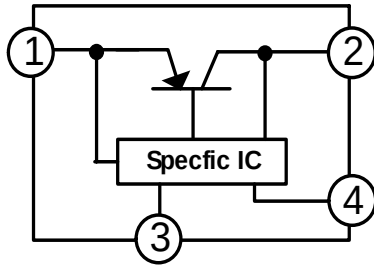
Note: xx: Output Voltage, refer to Marking Information.

MARKING INFORMATION

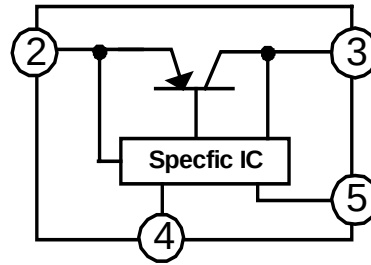
PACKAGE	VOLTAGE CODE	MARKING
TO-220F-4 TO-220B	33 :3.3V 05 :5.0V 09 :9.0V 12 :12 V	Space :Pb/Sn L: Pb-free DATE CODE

■ BLOCK DIAGRAM

TO-220F-4



TO-220B



■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		V_{IN}	20	V
ON/OFF Control Terminal Voltage		V_C	20	V
Output Current		I_{OUT}	2.0	A
Power Dissipation	No Heat Sink	P_D	1.4	W
	With Heat Sink		15	W
Junction Temperature		T_J	125	°C
Operating Temperature		T_{OPR}	-20 ~ +85	°C
Storage Temperature		T_{STG}	-40 ~ +150	°C

Note: The device is guaranteed to meet performance specification within 0°C~70°C operating temperature range and assured by design from -20°C~85°C, characteristic and correlation with static process control.

■ ELECTRICAL CHARACTERISTICS (Refer to the test circuits, unless otherwise specified, Ta=25°C)

For R33LD20(3.3V)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	$V_{IN}=5V, I_{OUT}=1A$	3.201	3.3	3.399	V
Line Regulation		ΔV_{OUT}	$V_{IN}=4 \sim 10V, I_{OUT}=5mA$		0.1	2.5	%
Load Regulation		ΔV_{OUT}	$V_{IN}=5V, I_{OUT}=5mA \sim 2.0A$		0.1	2.0	%
Temperature Coefficient of Output Voltage		$TcVo$	$T_J=0 \sim 125^\circ C, I_{OUT}=5mA$		± 0.02		%/°C
Ripple Rejection		RR	Refer to Fig.2	45	55		dB
Dropout Voltage		V_D	(Note1), $I_{OUT}=2A$			0.5	V
Voltage for Control(Note2)	ON	$V_{C(ON)}$	$V_{IN}=5V$	2.0			V
	OFF	$V_{C(OFF)}$	$V_{IN}=5V$			0.8	V
Current for Control	ON	$I_{C(ON)}$	$V_C=2.7V, V_{IN}=5V$			20	μA
	OFF	$I_{C(OFF)}$	$V_C=0.4V, V_{IN}=5V$			-0.4	mA
Quiescent Current		I_D	$I_{OUT}=0A, V_{IN}=5V$			10	mA

For R05LD20(5V)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	$V_{IN}=7V, I_{OUT}=2.1A$	4.85	5.0	5.15	V
Line Regulation		ΔV_{OUT}	$V_{IN}=6 \sim 12V, I_{OUT}=5mA$		0.5	2.5	%
Load Regulation		ΔV_{OUT}	$V_{IN}=7V, I_{OUT}=5mA \sim 2.0A$		0.1	2.0	%
Temperature Coefficient of Output Voltage		$TcVo$	$T_J=0 \sim 125^\circ C, I_{OUT}=5mA$		± 0.02		%/°C
Ripple Rejection		RR	Refer to Fig.2	45	55		dB
Dropout Voltage		V_D	(Note1), $I_{OUT}=2A$			0.5	V
Voltage for Control(Note2)	ON	$V_{C(ON)}$	$V_{IN}=7V$	2.0			V
	OFF	$V_{C(OFF)}$	$V_{IN}=7V$			0.8	V
Current for Control	ON	$I_{C(ON)}$	$V_C=2.7V, V_{IN}=7V$			20	μA
	OFF	$I_{C(OFF)}$	$V_C=0.4V, V_{IN}=7V$			-0.4	mA
Quiescent Current		I_D	$I_{OUT}=0A, V_{IN}=7V$			10	mA

For R09LD20(9V)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=11V, I_{OUT}=1A$	8.73	9.0	9.27	V
Line Regulation	ΔV_{OUT}	$V_{IN}=10 \sim 16V, I_{OUT}=5mA$		0.5	2.5	%
Load Regulation	ΔV_{OUT}	$V_{IN}=11V, I_{OUT}=5mA \sim 2.0A$		0.1	2.0	%
Temperature Coefficient of Output Voltage	$TcVo$	$T_J=0 \sim 125^{\circ}C, I_{OUT}=5mA$		± 0.02		%/ $^{\circ}C$
Ripple Rejection	RR	Refer to Fig.2	45	55		dB
Dropout Voltage	V_D	(Note1), $I_{OUT}=2A$			0.5	V
Voltage for Control(Note2)	ON	$V_{C(ON)}$ $V_{IN}=11V$	2.0			V
	OFF	$V_{C(OFF)}$ $V_{IN}=11V$			0.8	V
Current for Control	ON	$I_{C(ON)}$ $V_C=2.7V, V_{IN}=11V$			20	μA
	OFF	$I_{C(OFF)}$ $V_C=0.4V, V_{IN}=11V$			-0.4	mA
Quiescent Current	I_D	$I_{OUT}=0A, V_{IN}=11V$			10	mA

For R12LD20(12V)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=14V, I_{OUT}=1A$	11.64	12.0	12.36	V
Line Regulation	ΔV_{OUT}	$V_{IN}=13 \sim 19V, I_{OUT}=5mA$		0.5	2.5	%
Load Regulation	ΔV_{OUT}	$V_{IN}=14V, I_{OUT}=5mA \sim 2.0A$		0.1	2.0	%
Temperature Coefficient of Output Voltage	$TcVo$	$T_J=0 \sim 125^{\circ}C, I_{OUT}=5mA$		± 0.02		%/ $^{\circ}C$
Ripple Rejection	RR	Refer to Fig.2	45	55		dB
Dropout Voltage	V_D	(Note1), $I_{OUT}=2A$			0.5	V
Voltage for Control(Note2)	ON	$V_{C(ON)}$ $V_{IN}=14V$	2.0			V
	OFF	$V_{C(OFF)}$ $V_{IN}=14V$			0.8	V
Current for Control	ON	$I_{C(ON)}$ $V_C=2.7V, V_{IN}=14V$			20	μA
	OFF	$I_{C(OFF)}$ $V_C=0.4V, V_{IN}=14V$			-0.4	mA
Quiescent Current	I_D	$I_{OUT}=0A, V_{IN}=14V$			10	mA

Note: 1. Input voltage shall be the value when output voltage is 95% in comparison with the initial value.

2. In case of opening control terminal(pin 5 of TO-220B, pin 4 of TO-220F-4), output voltage turns on.

TEST CIRCUIT

Note : ○: TO-220F-4, (): TO-220B

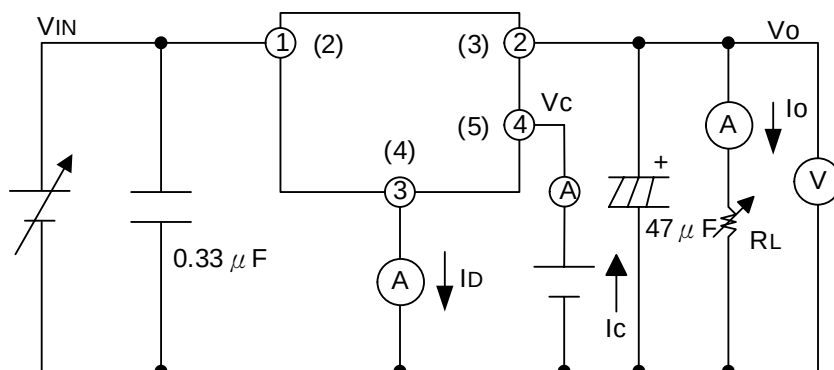
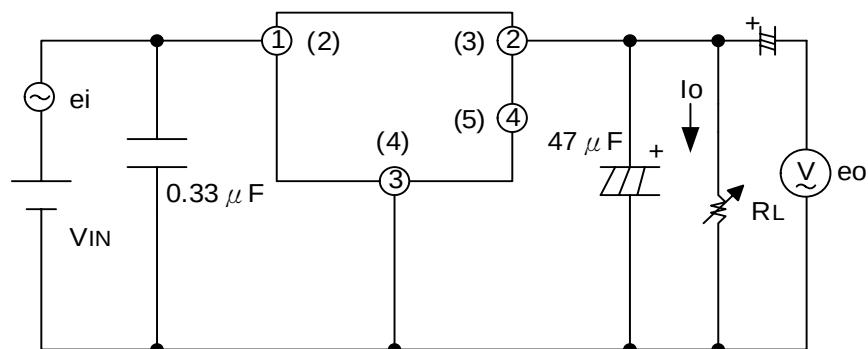


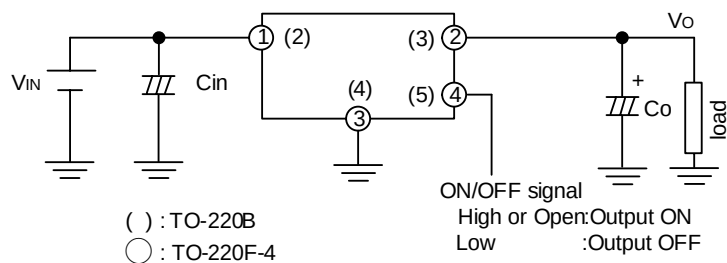
Fig.1



$V_{IN}=5V(R33LD30)$ $f=120Hz$
 $7V(R05LD30)$ $e_i=0.5V_{rms}$
 $11V(R09LD30)$ $I_o=0.5A$
 $14V(R12LD30)$ $RR=20\log(e_i/e_o)$

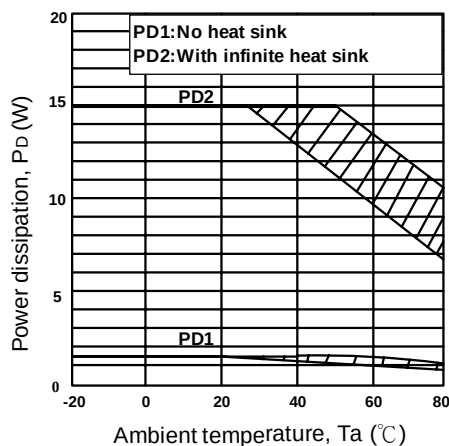
Fig.2 For Ripple Rejection

TYPICAL APPLICATION



■ TYPICAL CHARACTERISTICS

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) (R33LD20)

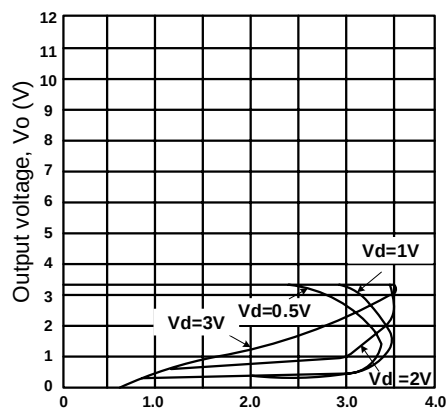


Fig.5 Overcurrent Protection Characteristics (Typical Value)(R05LD20)

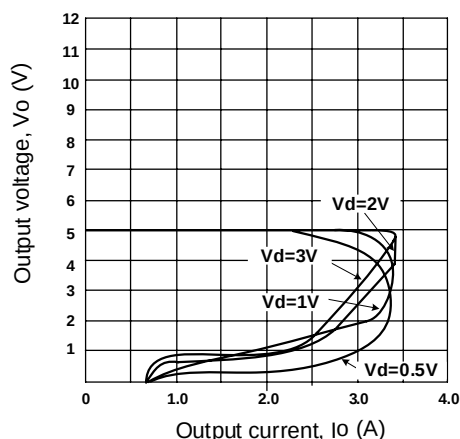


Fig.6 Overcurrent Protection Characteristics (Typical Value)(R09LD20)

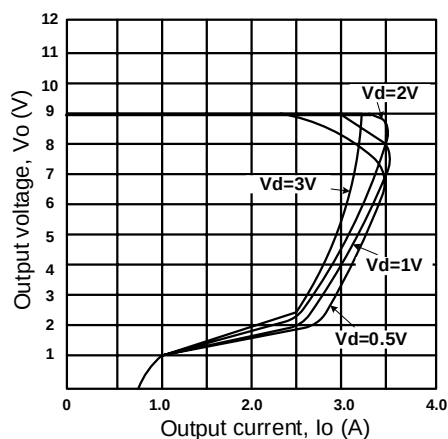


Fig.7 Overcurrent Protection Characteristics (Typical Value)(R12LD20)

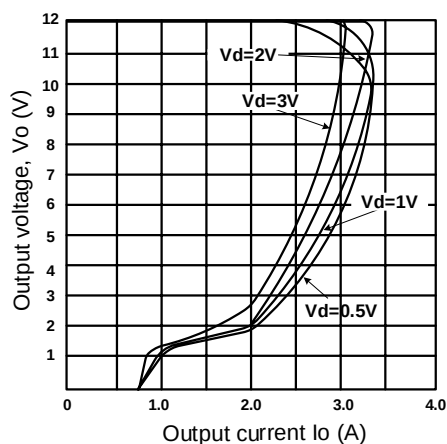
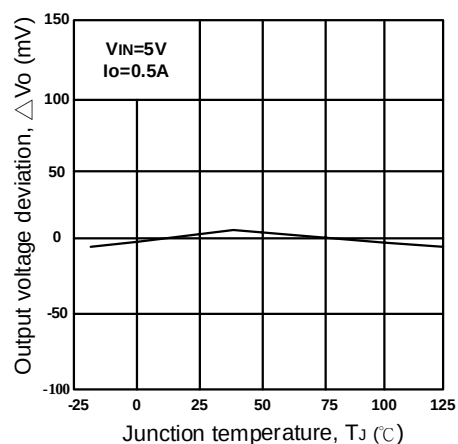


Fig.8 Output Voltage Deviation vs .Junction Temperature (R03LD20)



■ TYPICAL CHARACTERISTICS(cont.)

Fig.9 Output Voltage Deviation vs .Junction Temperature (R05LD20)

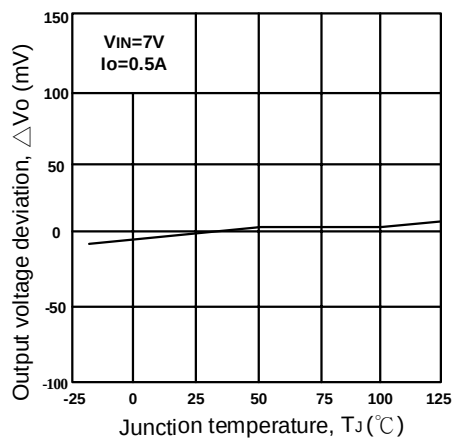


Fig.10 Output Voltage Deviation vs .Junction Temperature (R09LD20)

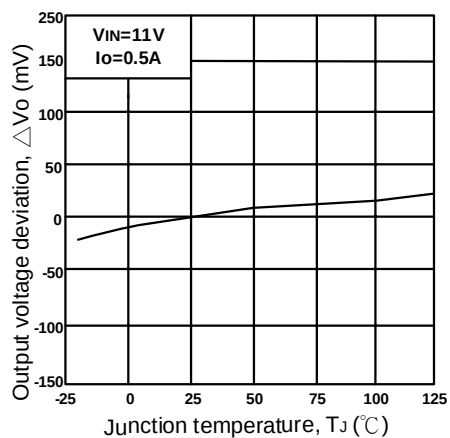


Fig.11 Output Voltage Deviation vs .Junction Temperature (R12LD20)

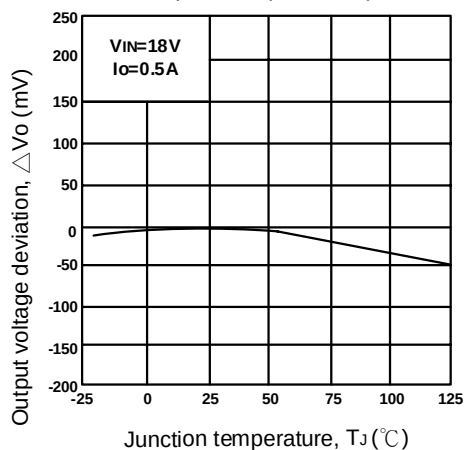


Fig.12 Output Voltage vs .Input Voltage (R33LD20)

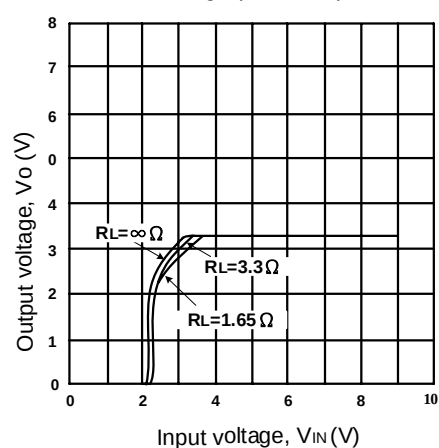


Fig.13 Output Voltage vs .Input Voltage (R05LD20)

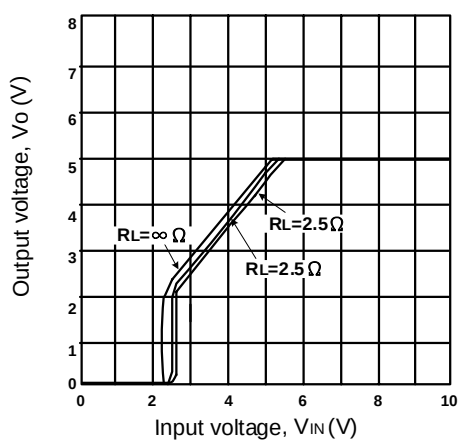
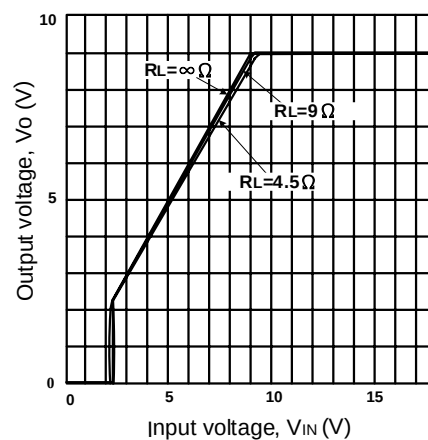


Fig.14 Output Voltage vs .Input Voltage (R09LD20)



■ TYPICAL CHARACTERISTICS(cont.)

Fig.15 Output Voltage vs .Input Voltage (R12LD30)

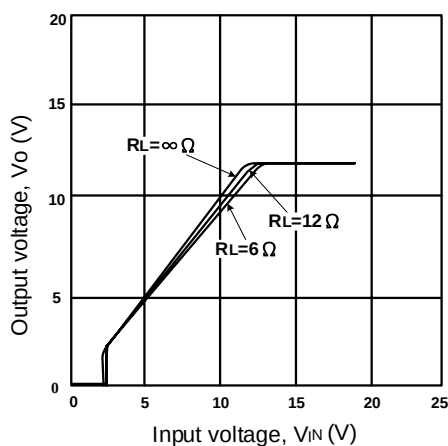


Fig.16 Circuit Operating Current vs .Input Voltage (R33LD30)

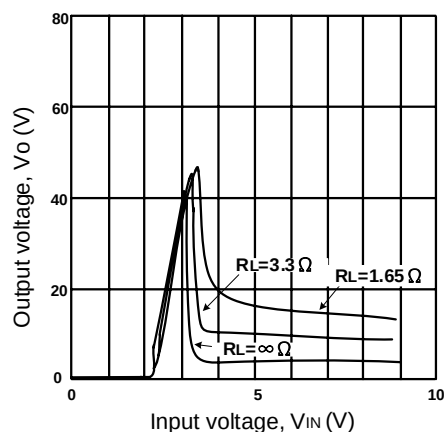


Fig.17 Circuit Operating Current vs .Input Voltage (R05LD30)

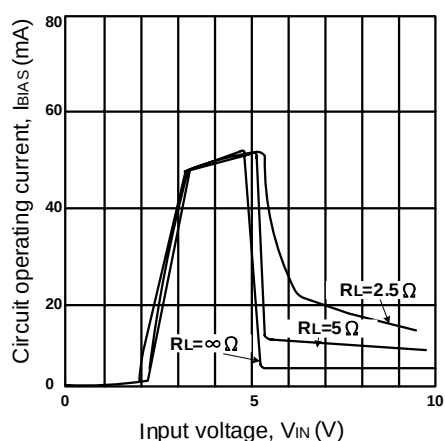


Fig.18 Circuit Operating Current vs .Input Voltage (R09LD30)

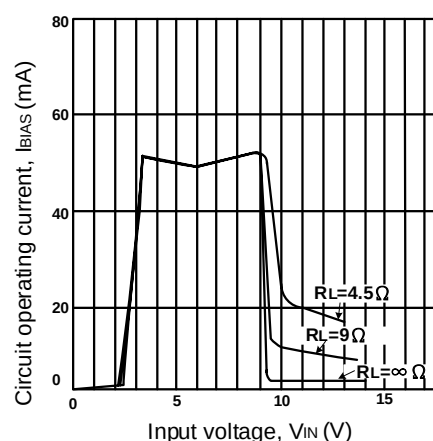


Fig.19 Circuit Operating Current vs .Input Voltage (R12LD30)

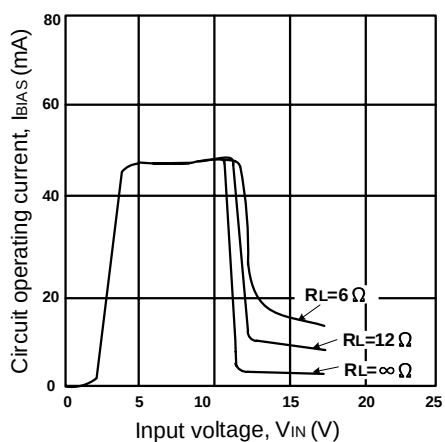
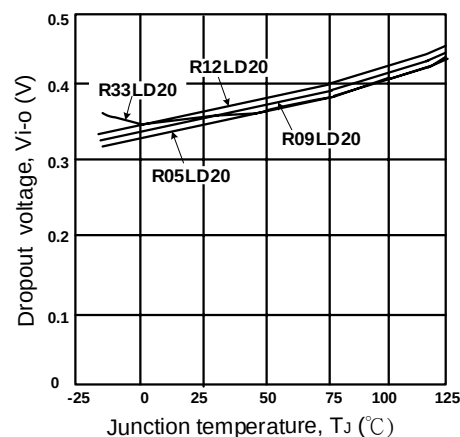


Fig.20 Dropout Voltage vs .Junction Temperature



■ TYPICAL CHARACTERISTICS(cont.)

Fig.21 Quiescent Current vs .Junction Temperature

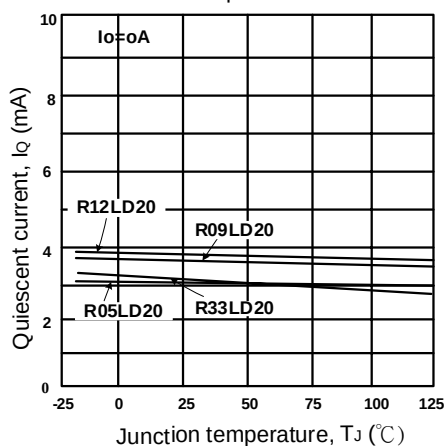
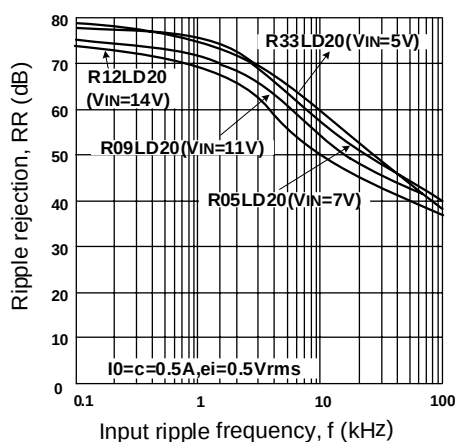


Fig.22 Ripple Rejection vs .Input Ripple Frequency



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