

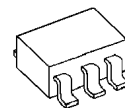
Low Dropout Voltage Regulator

■ GENERAL DESCRIPTION

The NJM2871B/72B are low dropout voltage regulator designed for cellular phone applications.

Advanced Bipolar technology achieves low noise, high ripple rejection and low quiescent current.

■ PACKAGE OUTLINE

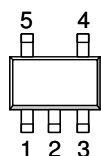


NJM2871BF/72BF

■ FEATURES

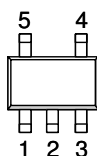
- High Ripple Rejection 75dB typ. ($f=1\text{kHz}$ $V_o=3\text{V}$ version)
- Output Noise Voltage $V_{no}=30\mu\text{V}_{rms}$ typ. ($C_p=0.01\mu\text{F}$)
- Output capacitor with $1.0\mu\text{F}$ ceramic capacitor ($V_o \geq 2.7\text{V}$: Version)
- Output Current $I_o(\text{max.})=150\text{mA}$
- High Precision Output $V_o \pm 1.0\%$
- Low Dropout Voltage 0.10V typ. ($I_o=60\text{mA}$)
- Input Voltage Range $+2.3 \sim +14\text{V}$ ($V_o \leq 2.0\text{V}$ version)
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline SOT-23-5 (MTP5)

■ PIN CONFIGURATION



NJM2871BF

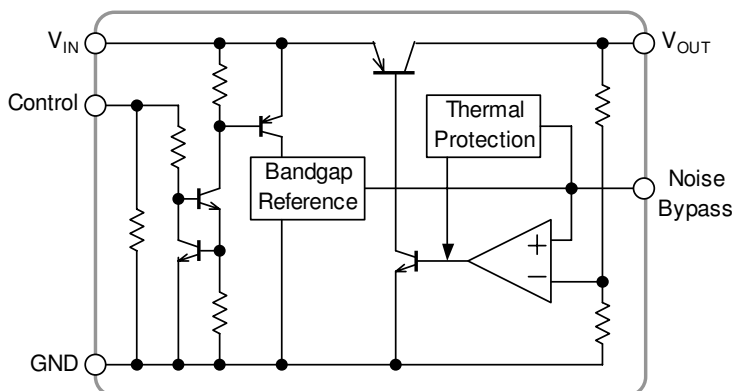
1. CONTROL (Active High)
2. GND
3. NOISE BYPASS
4. V_{OUT}
5. V_{IN}



NJM2872BF

1. V_{IN}
2. GND
3. CONTROL (Active High)
4. NOISE BYPASS
5. V_{OUT}

■ EQUIVALENT CIRCUIT



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■ OUTPUT VOLTAGE RANK LIST

Device Name	V _{OUT}	Device Name	V _{OUT}	Device Name	V _{OUT}
NJM287*BF15	1.5V	NJM287*BF26	2.6V	NJM287*BF34	3.4V
NJM287*BF18	1.8V	NJM287*BF27	2.7V	NJM287*BF35	3.5V
NJM287*BF19	1.9V	NJM287*BF28	2.8V	NJM287*BF38	3.8V
NJM287*BF02	2.0V	NJM287*BF29	2.9V	NJM287*BF04	4.0V
NJM287*BF21	2.1V	NJM287*BF03	3.0V	NJM287*BF48	4.8V
NJM287*BF23	2.3V	NJM287*BF31	3.1V	NJM287*BF05	5.0V
NJM287*BF24	2.4V	NJM287*BF32	3.2V		
NJM287*BF25	2.5V	NJM287*BF33	3.3V		

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{IN}	+14	V
Control Voltage	V _{CONT}	+14(*1)	V
Power Dissipation	P _D	SOT-23-5 350(*2) 200(*3)	mW
Operating Temperature	T _{opr}	-40 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +125	°C

(*1) : When input voltage is less than +14V, the absolute maximum control voltage is equal to the input voltage.

(*2) : Mounted on glass epoxy board based on EIA/JEDEC. (114.3x76.2x1.6mm: 2Layers)

(*3) : Device itself

■ Operating voltage

V_{IN}=+2.3 ~ +14V (In case of Vo<2.1V version)

■ ELECTRICAL CHARACTERISTICS

(V_{IN}=Vo+1V, C_{IN}=0.1μF, Co=1.0μF: Vo≥2.7V (Co=2.2μF : 1.8V<Vo≤2.6V, Co=4.7μF : Vo≤1.8V), Cp=0.01μF, Ta=25°C)

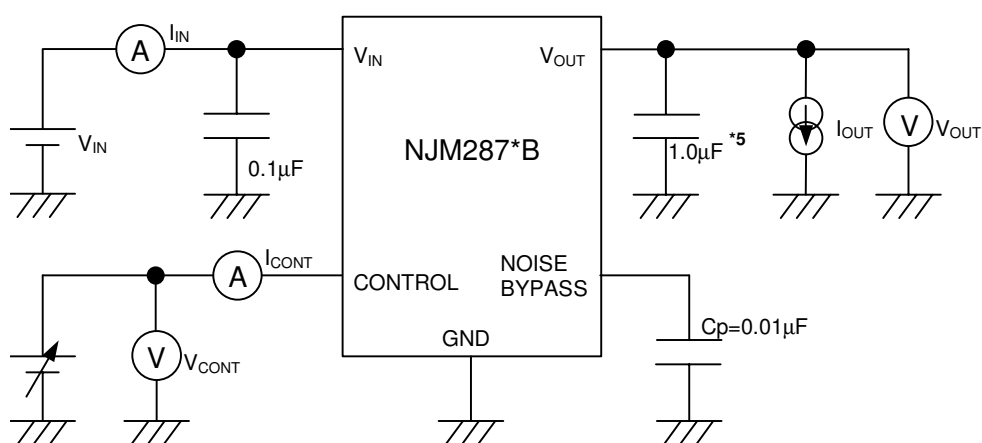
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _O	I _O =30mA	-1.0%	—	+1.0%	V
Quiescent Current	I _Q	I _O =0mA, except I _{cont}	—	120	180	μA
Quiescent Current at Control OFF	I _{Q(OFF)}	V _{CONT} =0V	—	—	100	nA
Output Current	I _O	V _O =0.3V	150	200	—	mA
Line Regulation	ΔV _O /ΔV _{IN}	V _{IN} =Vo+1V ~ Vo+6V, I _O =30mA	—	—	0.10	%/V
Load Regulation	ΔV _O /ΔI _O	I _O =0 ~ 100mA	—	—	0.03	%/mA
Dropout Voltage (*4)	ΔV _{L.O}	I _O =60mA	—	0.10	0.18	V
Ripple Rejection	RR	e _{in} =200mVrms, f=1kHz, I _O =10mA, V _O =3V version	—	75	—	dB
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔTa	Ta=0 ~ +85°C, I _O =10mA	—	± 50	—	ppm/°C
Output Noise Voltage	V _{NO1}	f=10Hz~80kHz, I _O =10mA, V _O =3V Version	—	30	—	μVrms
Control Voltage for ON-state	V _{CONT(ON)}		1.6	—	—	V
Control Voltage for OFF-state	V _{CONT(OFF)}		—	—	0.6	V

(*4): The output voltage excludes under 2.1V.

The above specification is a common specification for all output voltages.

Therefore, it may be different from the individual specification for a specific output voltage.

■ TEST CIRCUIT

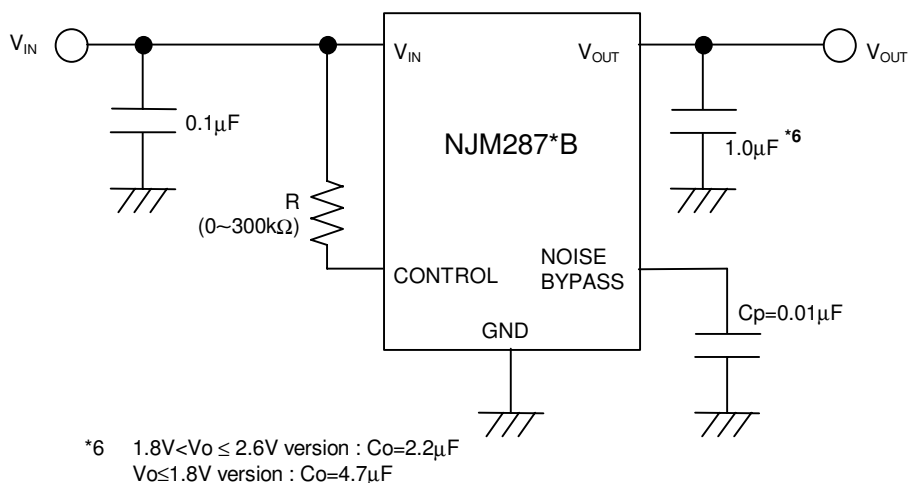


*5 $1.8V < V_o \leq 2.6V$ version : $C_o = 2.2\mu F$
 $V_o \leq 1.8V$ version : $C_o = 4.7\mu F$

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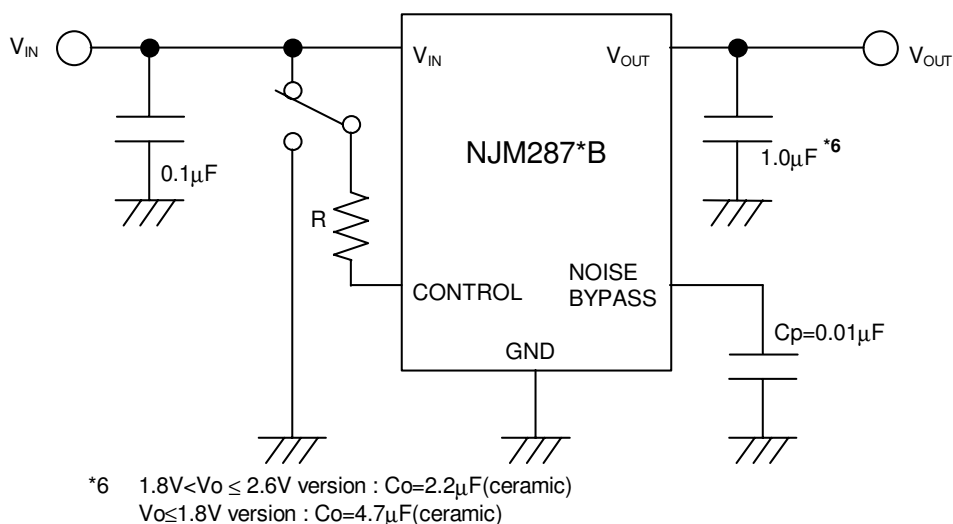
■ TYPICAL APPLICATION

① In the case where ON/OFF Control is not required:



Connect control terminal to V_{IN} terminal

② In use of ON/OFF CONTROL:



State of control terminal:

- "H" → output is enabled.
- "L" or "open" → output is disabled.

*Noise bypass Capacitance C_p

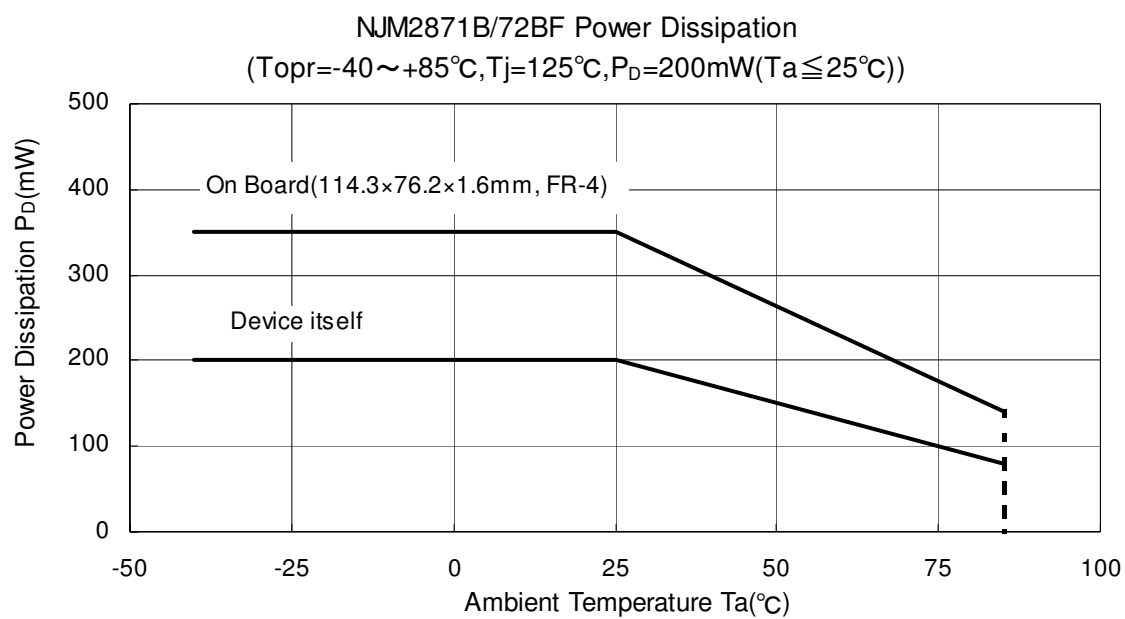
Noise bypass capacitance C_p reduces noise generated by band-gap reference circuit. Noise level and ripple rejection will be improved when larger C_p is used. Use of smaller C_p value may cause oscillation. Use the C_p value of $0.01\mu\text{F}$ greater to avoid the problem.

*In the case of using a resistance "R" between V_{IN} and control.

The current flow into the control terminal while the IC is ON state (I_{CONT}) can be reduced when a pull up resistance "R" is inserted between V_{IN} and the control terminal.

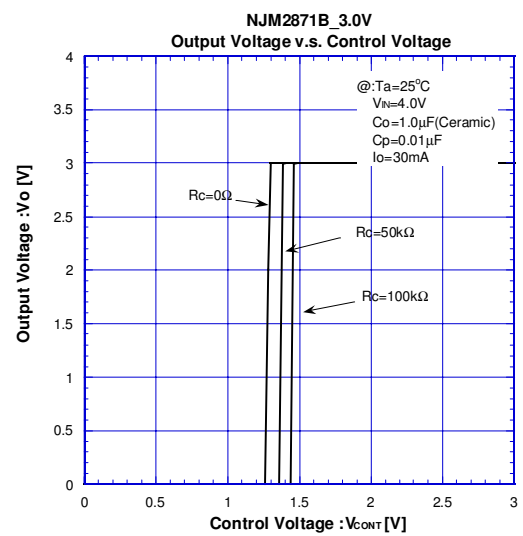
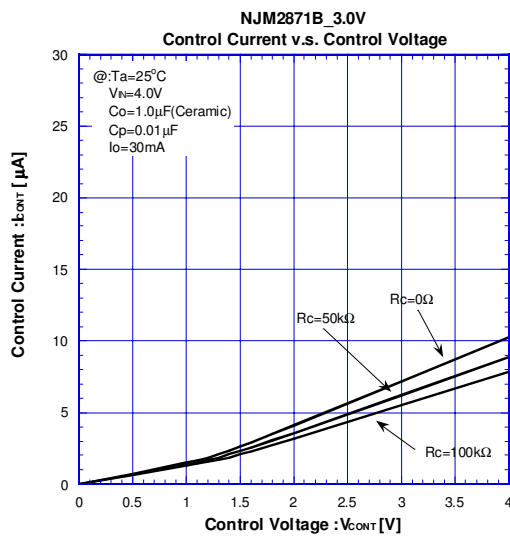
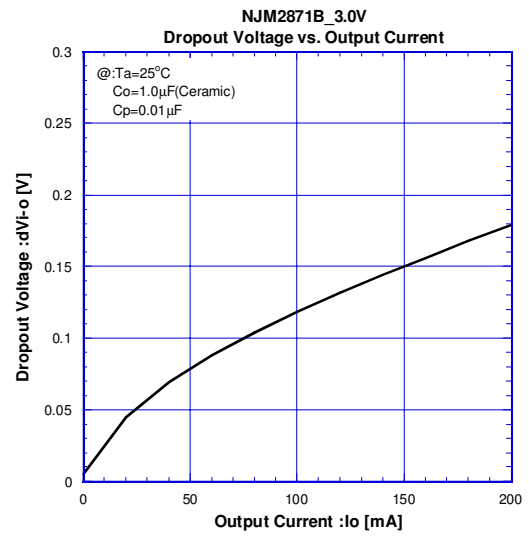
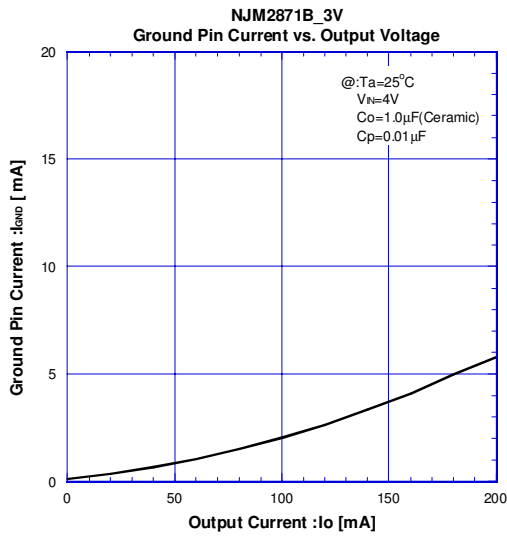
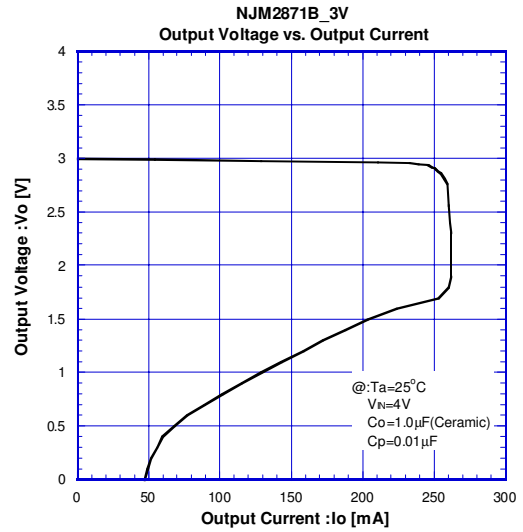
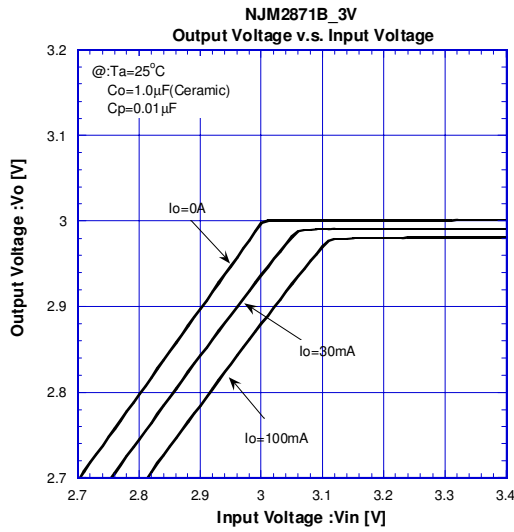
The minimum control voltage for ON state ($V_{CONT(ON)}$) is increased due to the voltage drop caused by I_{CONT} and the resistance "R". The I_{CONT} is temperature dependence as shown in the "Control Current vs. Temperature" characteristics. Therefore, the resistance "R" should be carefully selected to ensure the control voltage exceeds the $V_{CONT(ON)}$ over the required temperature range.

■ POWER DISSIPATION vs. AMBIENT TEMPERATURE

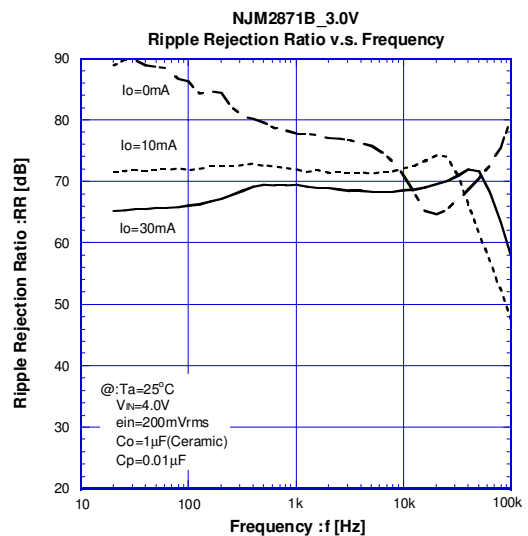
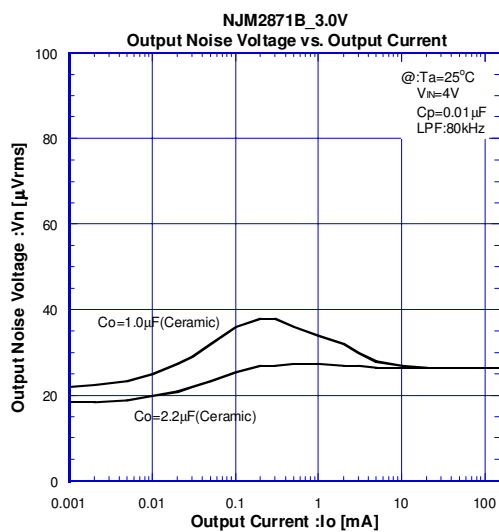
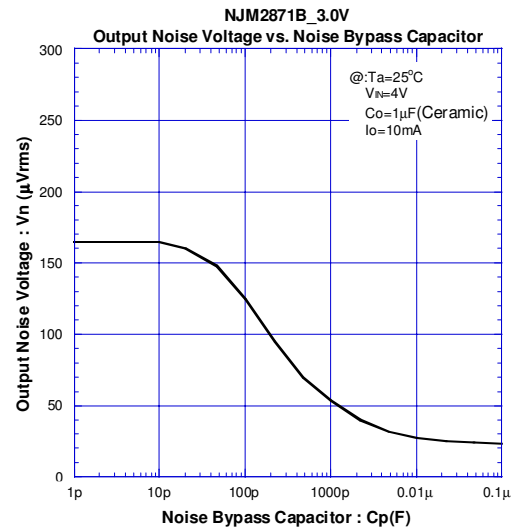
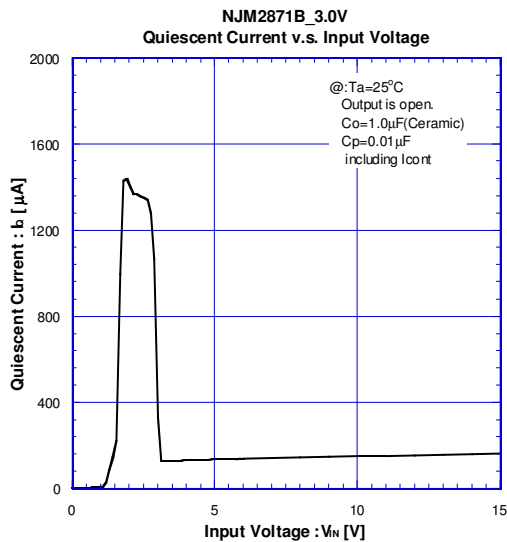
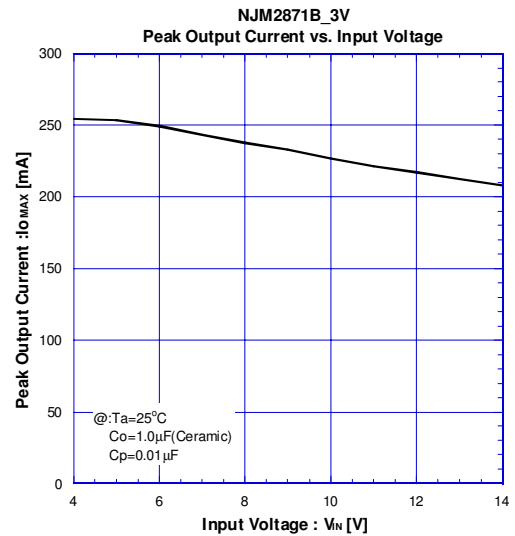
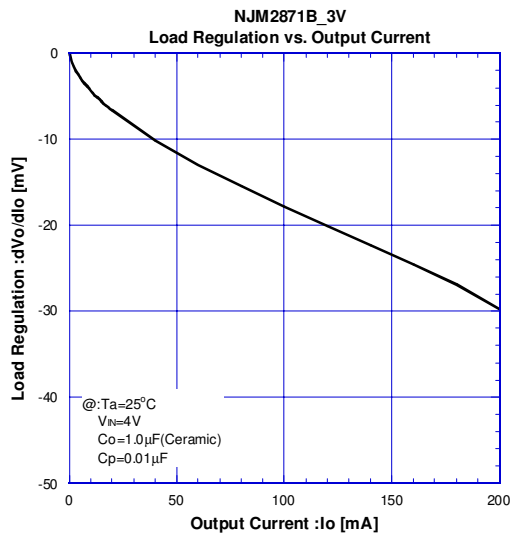


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■ ELECTRICAL CHARACTERISTICS

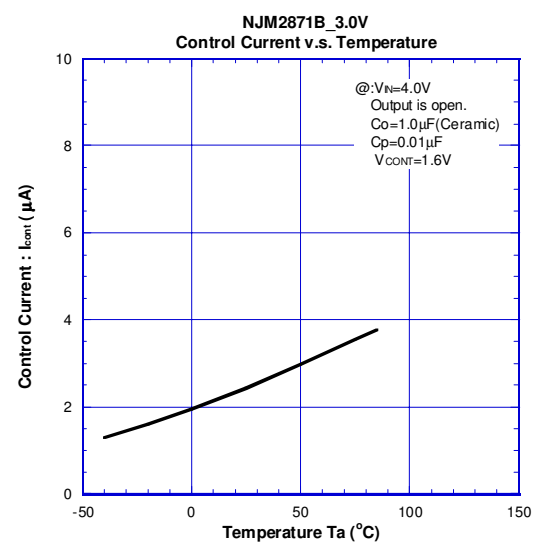
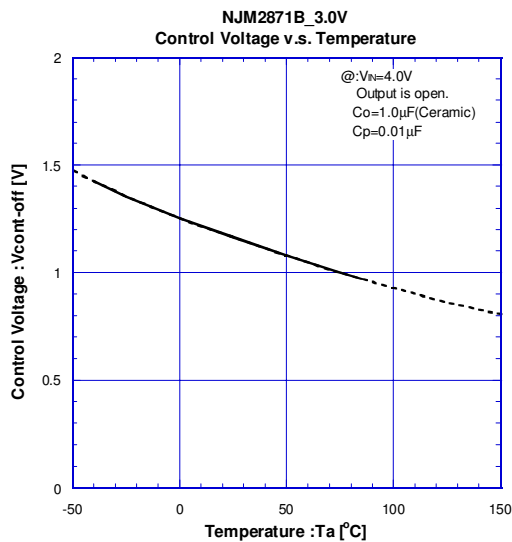
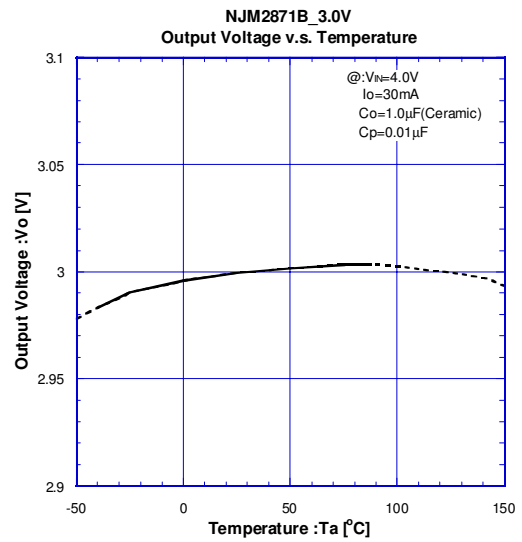
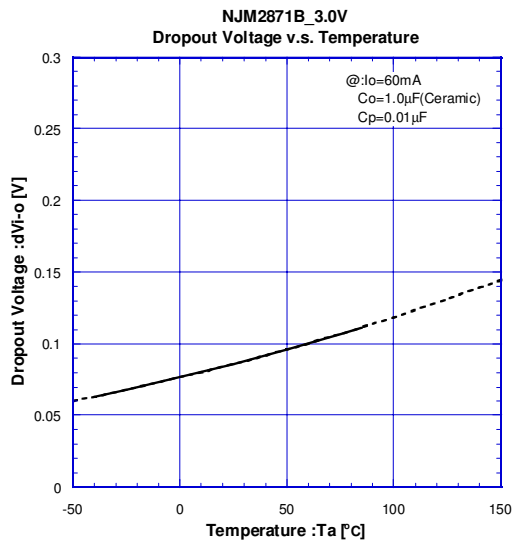
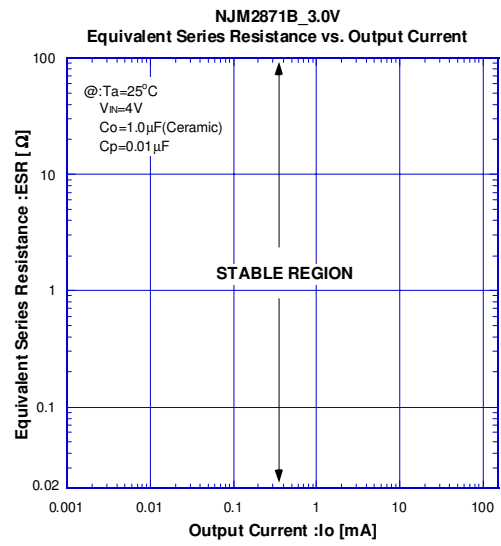
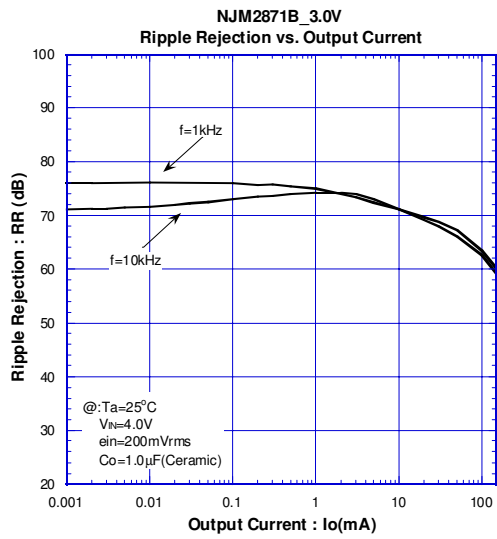


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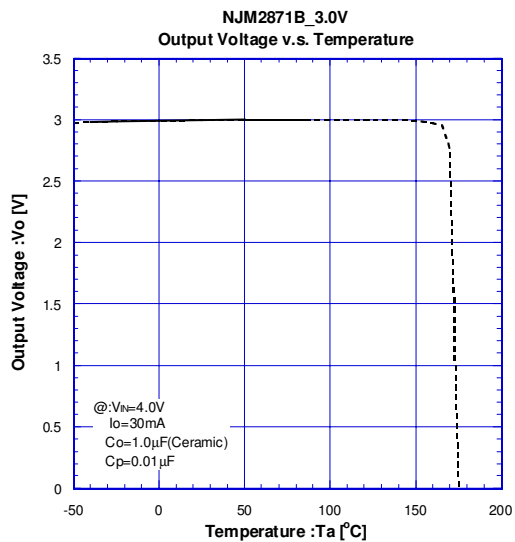
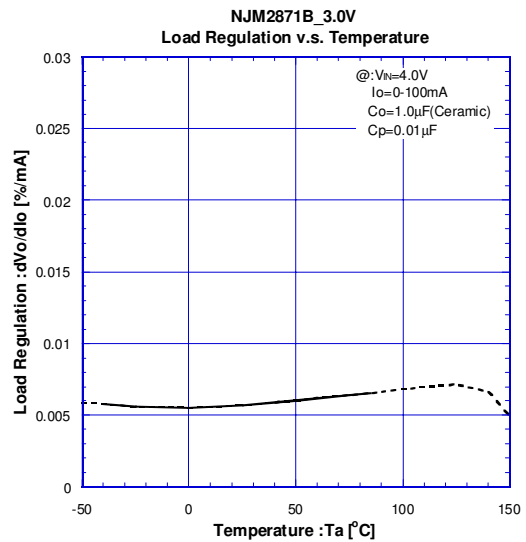
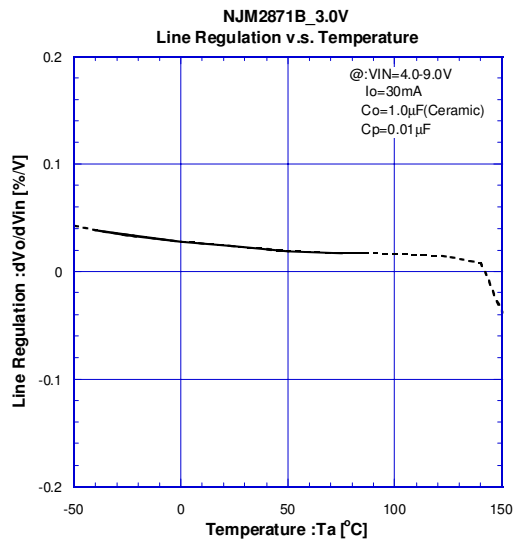
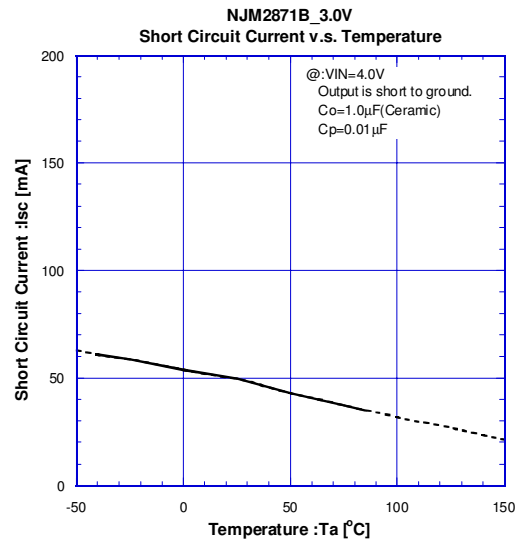
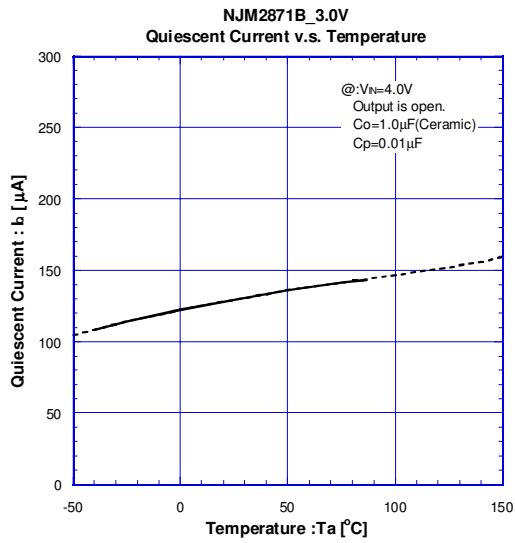


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■ ELECTRICAL CHARACTERISTICS

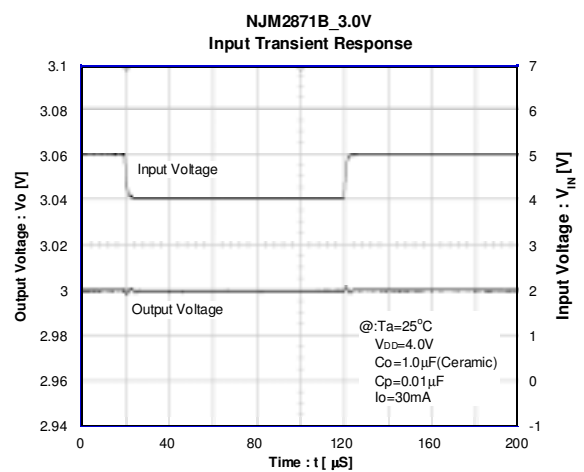
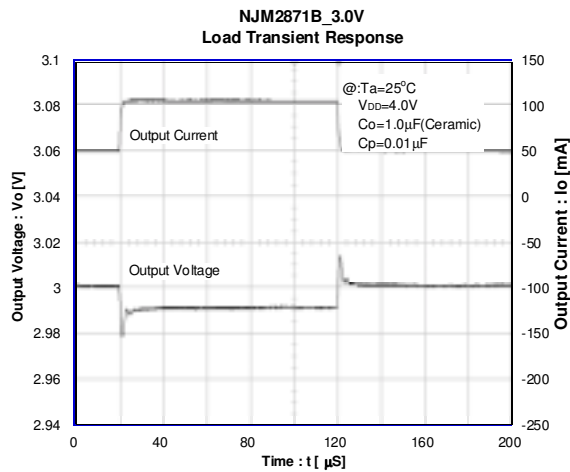
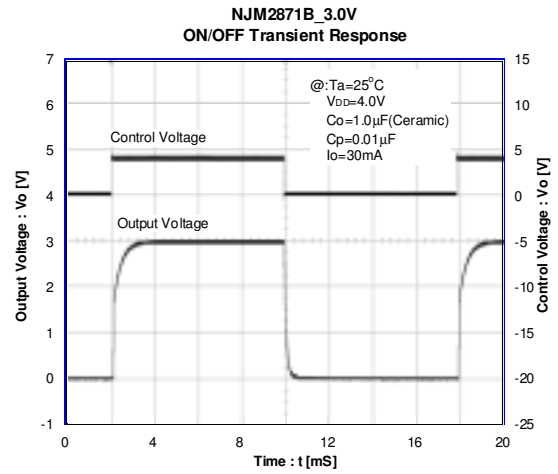
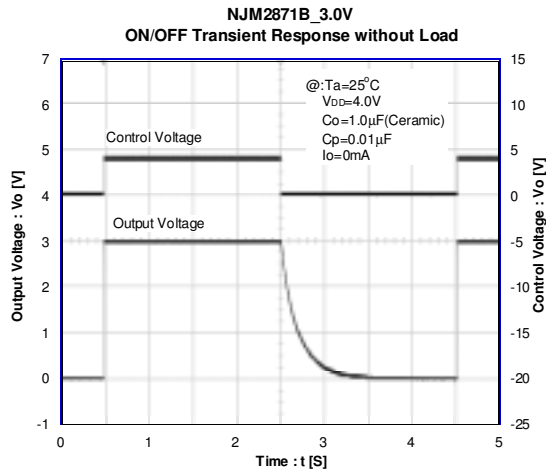


ELECTRICAL CHARACTERISTICS



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■ ELECTRICAL CHARACTERISTICS



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