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.

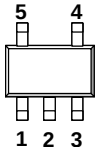
■ PACKAGE OUTLINE

NJM2871BF/72BF

■ FEATURES

- High Ripple Rejection 75dB typ. (f=1kHz)
- Output Noise Voltage Vno=30μVrms typ.
- Output capacitor with 1.0uF ceramic capacitor(Vo>2.6V: Version)
- Output Current Io(max.)=150mA
- High Precision Output Vo ±1.0%
- Low Dropout Voltage 0.10V typ. (Io=60mA)
- Input Voltage Range +2.3 ~ +14V(Vo≤2.0V version)
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline SOT-23-5 (MTP5)

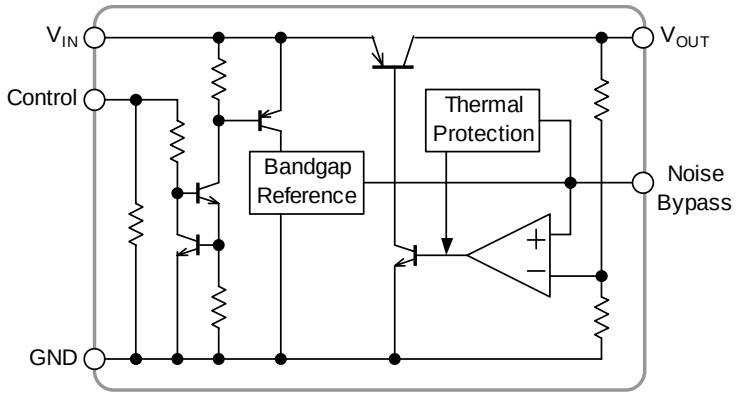
■ PIN CONFIGURATION



PIN FUNCTION

NJM2871B	NJM2872B
1.CONTROL (Active High)	1.V_{IN}
2.GND	2.GND
3.NOISE BYPASS	3.CONTROL (Active High)
4.V_{OUT}	4.NOISE BYPASS
5.V_{IN}	5.V_{OUT}

■ EQUIVALENT CIRCUIT



■ OUTPUT VOLTAGE RANK LIST

Device Name	V_{OUT}
NJM287*BF21	2.1V
NJM287*BF28	2.8V
NJM287*BF03	3.0V
NJM287*BF05	5.0V

✱From 1.5V to 5.0V serialization is possible with 0.1V step.

If you have any questions or requests, please contact to our business section.

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	+14	V
Control Voltage	V_{CONT}	+14(*note 1)	V
Power Dissipation	P_D	200	mW
Operating Temperature	Topr	–40 ~ +85	°C
Storage Temperature	Tstg	–40 ~ +125	°C

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

■ ELECTRICAL CHARACTERISTICS

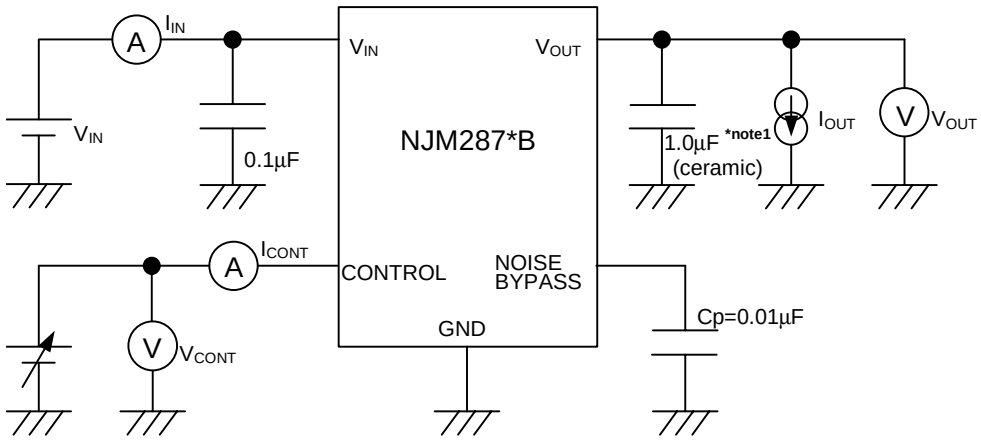
(V_{IN}=Vo+1V, C_{IN}=0.1µF, Co=1.0µF: Vo≥2.7V (Co=2.2µF : Vo≤2.6V), Cp=0.01µF, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vo	Io=30mA	-1.0%	–	+1.0%	V
Quiescent Current	I_Q	Io=0mA, except Icont	–	120	180	µA
Quiescent Current at Control OFF	$I_{Q(OFF)}$	V_{CONT}=0V	–	–	100	nA
Output Current	Io	Vo-0.3V	150	200	–	mA
Line Regulation	$\Delta Vo/\Delta V_{IN}$	V_{IN}=Vo+1V ~ Vo+6V, Io=30mA	–	–	0.10	%/V
Load Regulation	$\Delta Vo/\Delta Io$	Io=0 ~ 100mA	–	–	0.03	%/mA
Dropout Voltage(* note2)	ΔV_{I-O}	Io=60mA	–	0.10	0.18	V
Ripple Rejection	RR	ein=200mVrms,f=1kHz, Io=10mA, Vo=3V Version	–	75	–	dB
Average Temperature Coefficient of Output Voltage	$\Delta Vo/\Delta Ta$	Ta=0~85°C, Io=10mA	–	±50	–	ppm/°C
Output Noise Voltage	V_{NO1}	f=10Hz~80kHz, Io=10mA, Vo=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

(*note 2): The output voltage excludes under 2.1V.

(*note 3): 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.

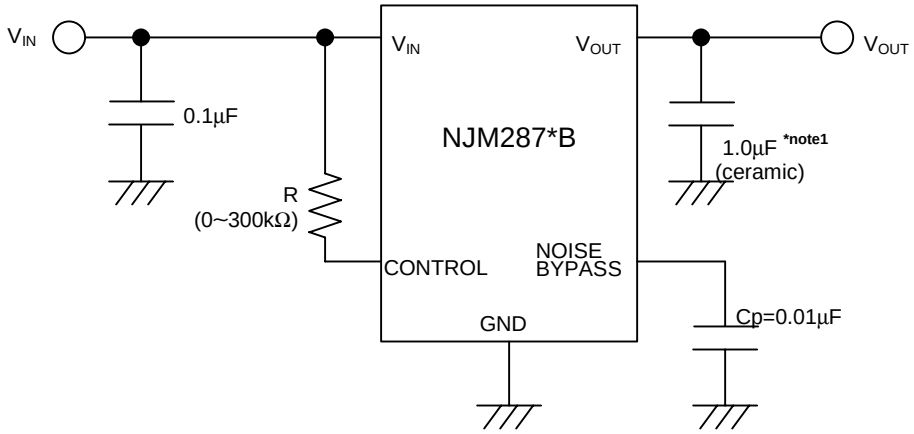
■ TEST CIRCUIT



*note1 Vo ≤ 2.6V version : Co=2.2µF(ceramic)

■ TYPICAL APPLICATION

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

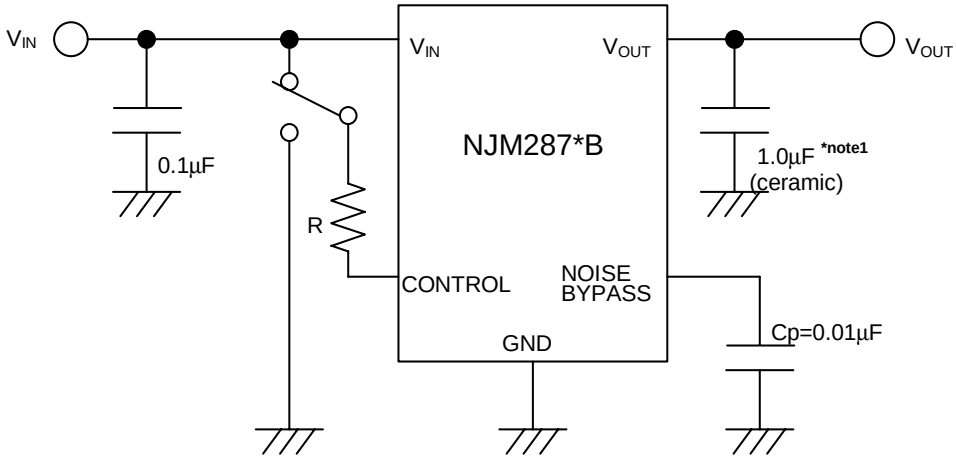


*note1 Vo ≤ 2.6V version : Co=2.2μF(ceramic)

Connect control terminal to V_{IN} terminal

The quiescent current can be reduced by using a resistance "R". Instead, it increases the minimum operating voltage. For further information, please refer to Figure "Output Voltage vs. Control Voltage".

② In use of ON/OFF CONTROL:



*note1 Vo ≤ 2.6V version : Co=2.2μF(ceramic)

State of control terminal:

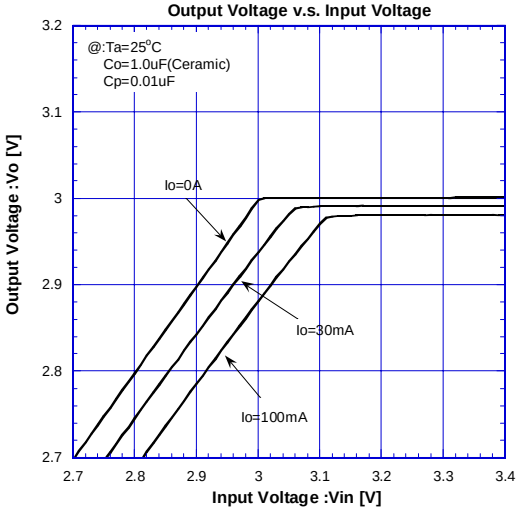
- "H"→ output is enabled.
- "L" or "open" → output is disabled.

✱Noise bypass Capacitance Cp

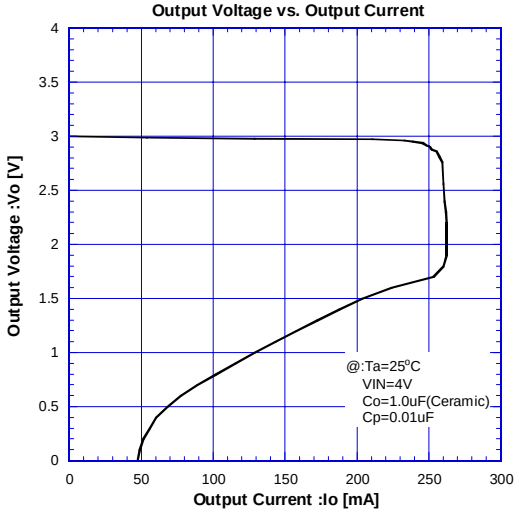
Noise bypass capacitance Cp reduces noise generated by band-gap reference circuit.
Noise level and ripple rejection will be improved when larger Cp is used.
Use of smaller Cp value may cause oscillation.
Use the Cp value of 0.01uF greater to avoid the problem.

■ ELECTRICAL CHARACTERISTICS

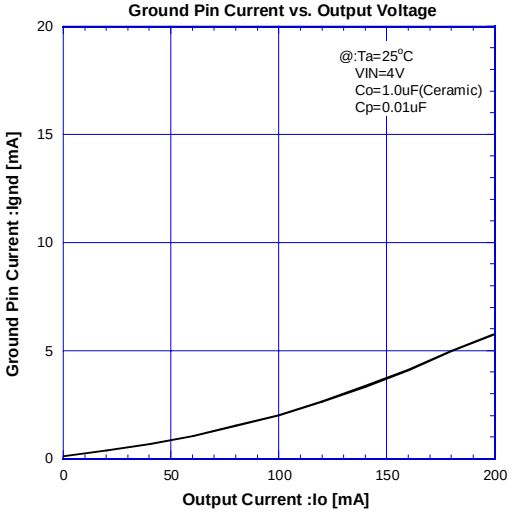
NJM2871B_3V
Output Voltage v.s. Input Voltage



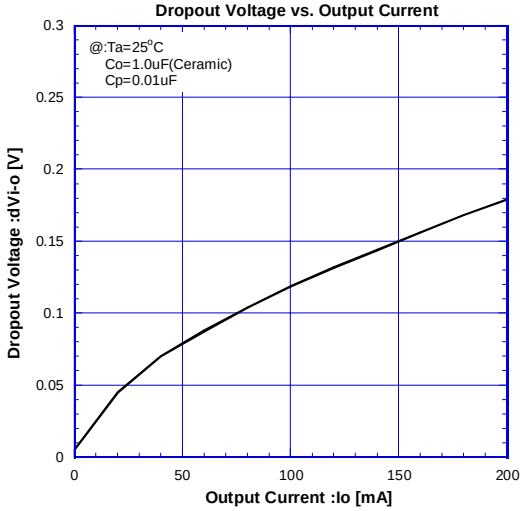
NJM2871B_3V
Output Voltage vs. Output Current



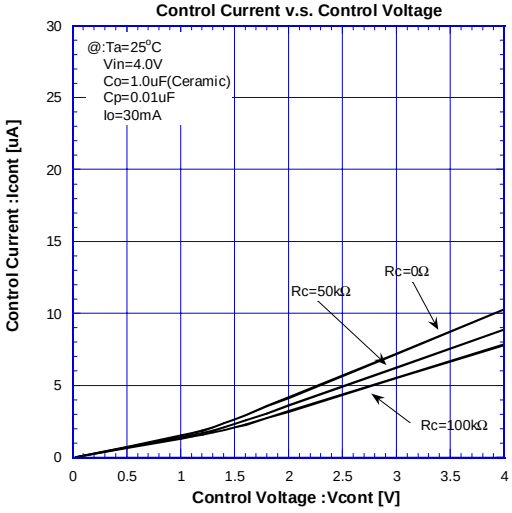
NJM2871B_3V
Ground Pin Current vs. Output Voltage



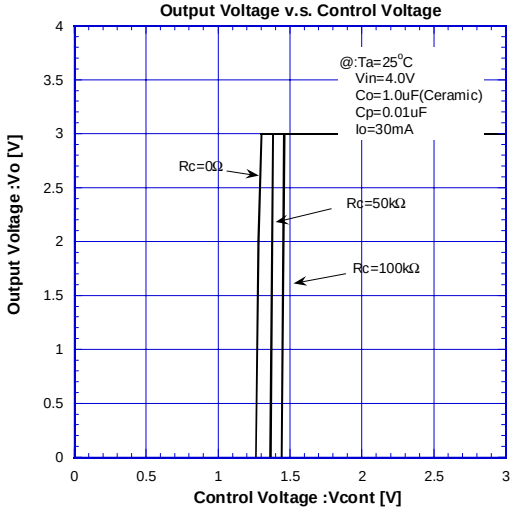
NJM2871B_3.0V
Dropout Voltage vs. Output Current



NJM2871B_3.0V
Control Current v.s. Control Voltage

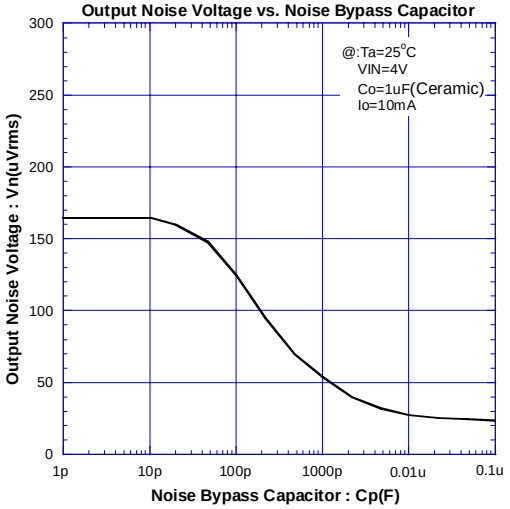


NJM2871B_3.0V
Output Voltage v.s. Control Voltage

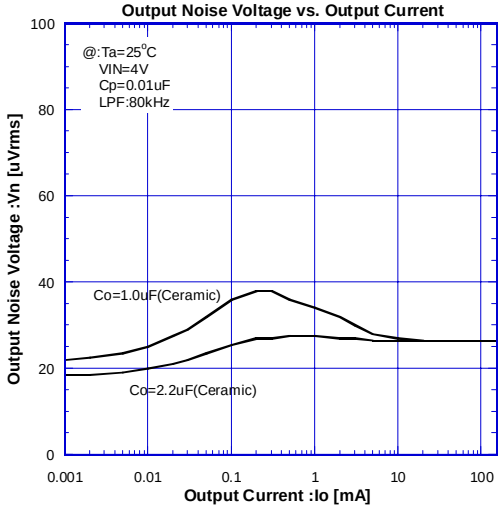


■ ELECTRICAL CHARACTERISTICS

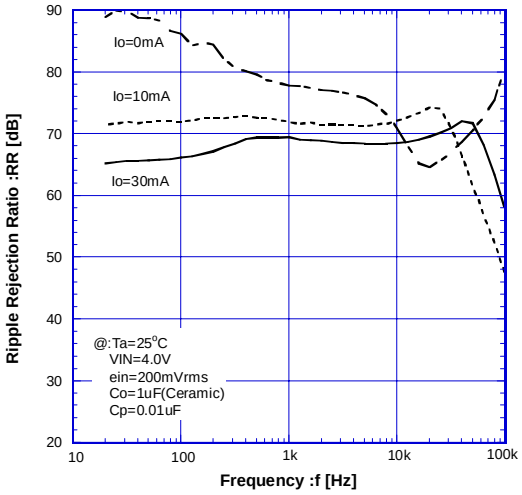
NJM2871B_3.0V
Output Noise Voltage vs. Noise Bypass Capacitor



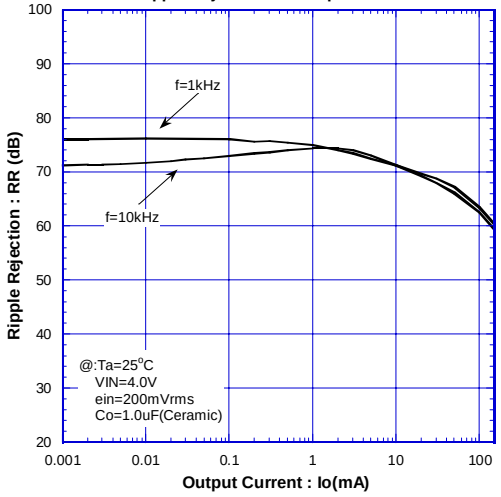
NJM2871B_3.0V
Output Noise Voltage vs. Output Current



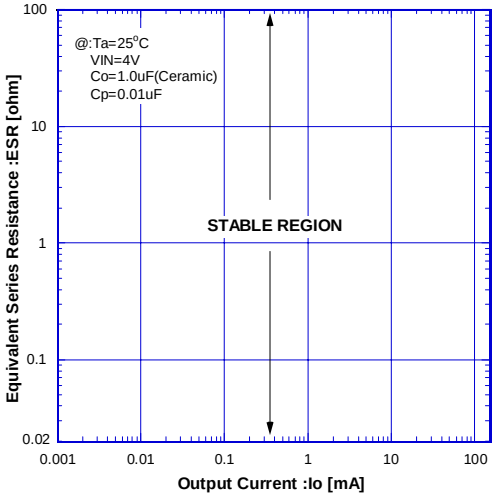
NJM2871B_3.0V
Ripple Rejection Ratio v.s. Frequency



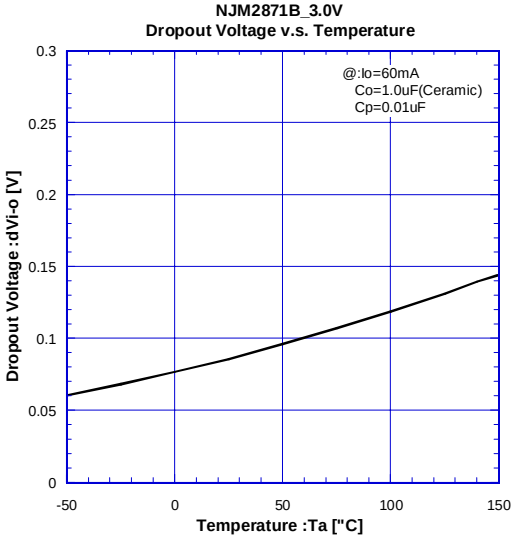
NJM2871B_3.0V
Ripple Rejection vs. Output Current

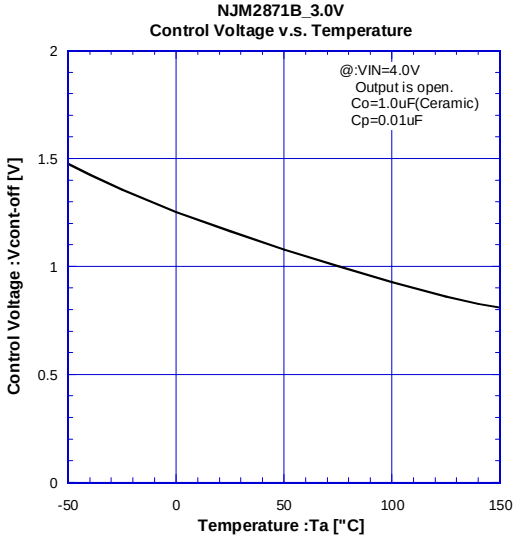


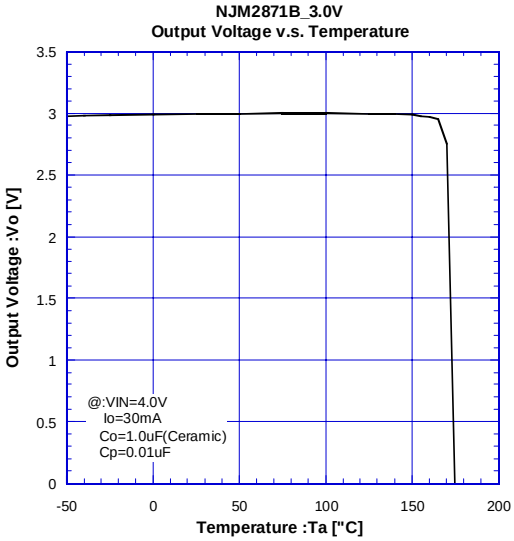
NJM2871B_3.0V
Equivalent Series Resistance vs. Output Current

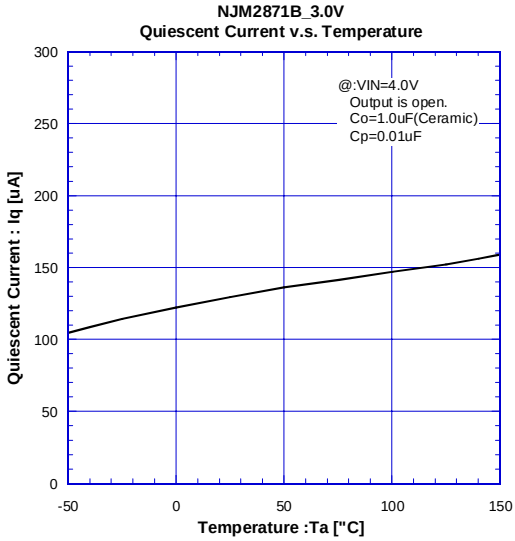


■ ELECTRICAL CHARACTERISTICS









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