LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

The NJM2873 is low dropout voltage regulator designed for cellular phone application.

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

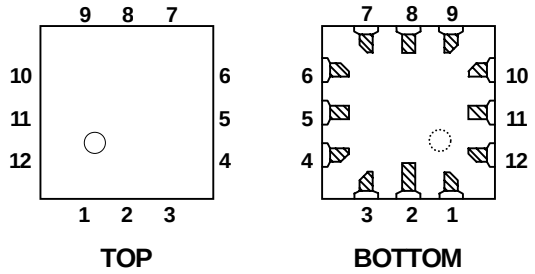
■ PACKAGE OUTLINE

NJM2873PB1

■ FEATURES

- High Ripple Rejection 70dB typ. (f=1kHz)
- Output Noise Voltage Vno=30μVrms (Cp=0.01μF)
- Output capacitor with 1.0μF ceramic capacitor (Vo≥2.7V)
- Output Current Io(max.)=150mA
- High Precision Output Vo±1%
- Low Dropout Voltage 0.10V typ. (Io=60mA)
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline FFP12-B1 (2.0×2.0×0.85mm)

■ PIN CONFIGURATION



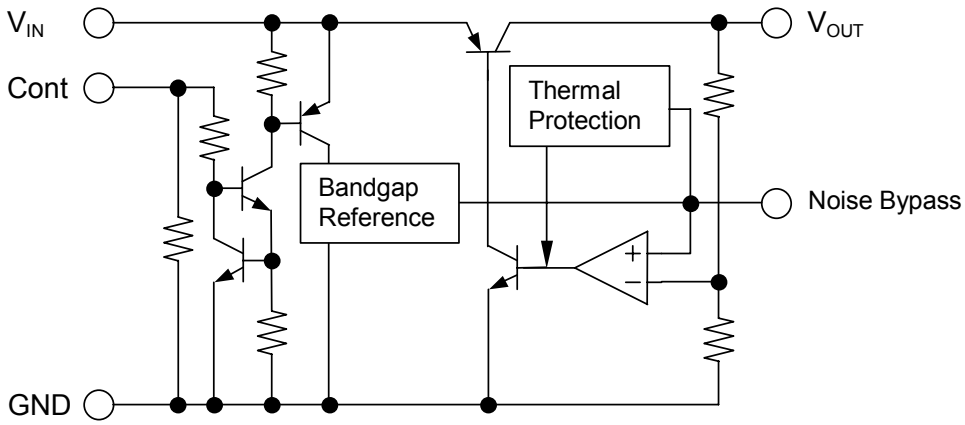
TOP **BOTTOM**

NJM2873PB1

PIN FUNCTION

1. V_{IN}	7. GND
2. V_{IN}	8. NOISE BYPASS
3. V_{IN}	9. NC
4. CONTROL	10. V_{OUT}
5. GND	11. V_{OUT}
6. GND	12. V_{OUT}

■ EQUIVALENT CIRCUIT



■ OUTPUT VOLTAGE RANK LIST

Device Name	V_{OUT}
NJM2873PB1-21	2.1V
NJM2873PB1-25	2.5V
NJM2873PB1-26	2.6V
NJM2873PB1-27	2.7V
NJM2873PB1-28	2.8V
NJM2873PB1-285	2.85V
NJM2873PB1-03	3.0V
NJM2873PB1-33	3.3V
NJM2873PB1-38	3.8V
NJM2873PB1-05	5.0V

■ 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	300(*2)	mW
Operating Temperature	Topr	–40 ~ +85	°C
Storage Temperature	Tstg	–40 ~ +125	°C

(*1): When input voltage is less than +14V, the absolute maximum control voltage is equal to the input voltage.
(*2): On board. 25mm×25mm×0.2mm

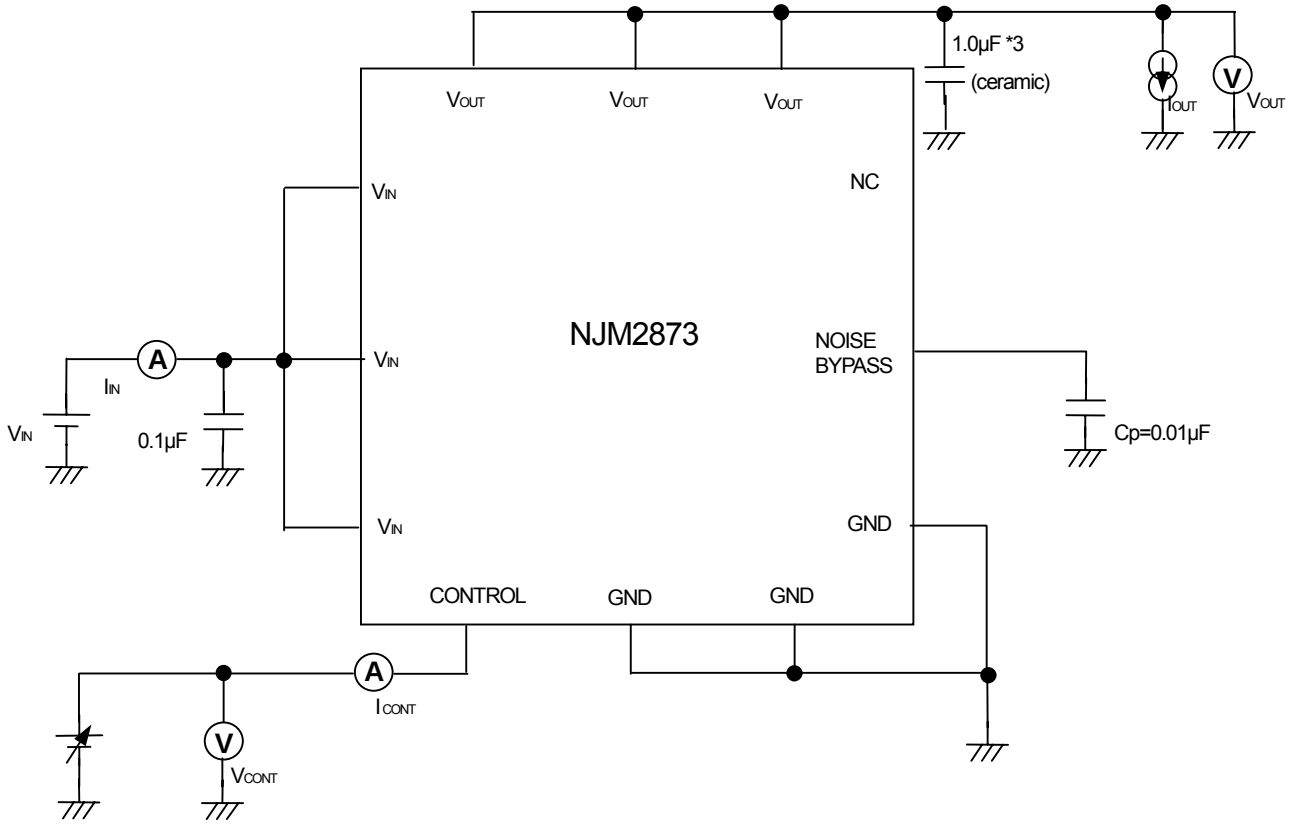
■ ELECTRICAL CHARACTERISTICS

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vo	Io=30mA	-1%	–	+1%	V
Quiescent Current	I_Q	Io=0mA, expect 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	ΔV_{I-O}	Io=60mA	–	0.10	0.18	V
Ripple Rejection	RR	ein=200mVrms,f=1kHz, Io=10mA Vo=3V Version	–	70	–	dB
Average Temperature Coefficient of Output Voltage	$\Delta Vo/\Delta Ta$	Ta=0~85°C, Io=10mA	–	±50	–	ppm/°C
Output Noise Voltage	V_{NO}	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

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.

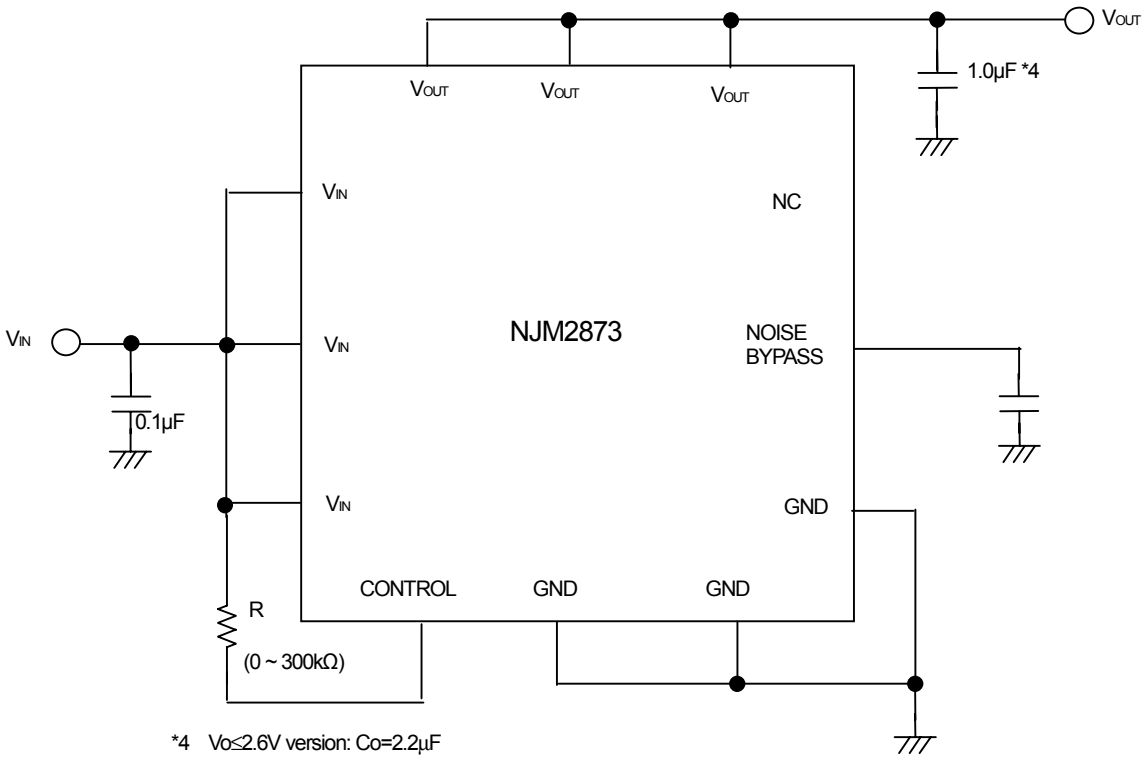
■ TEST CIRCUIT



*3 Vo≤2.6V version: Co=2.2µF(ceramic)

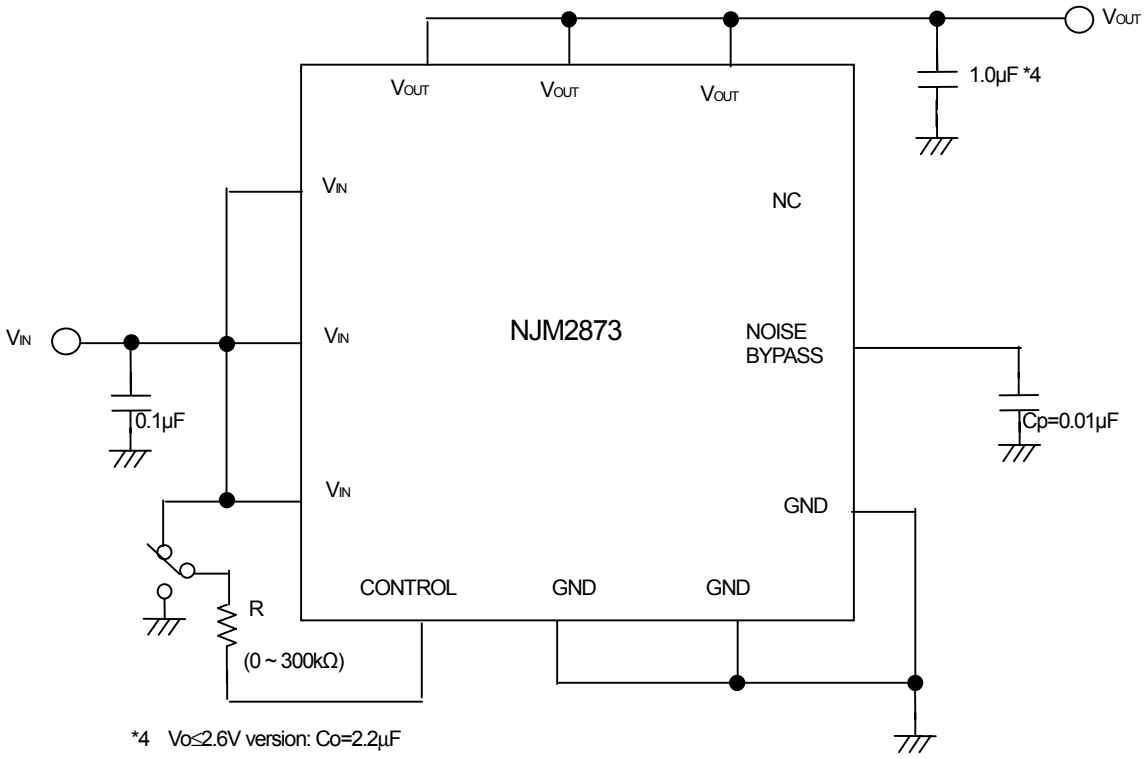
■ TYPICAL APPLICATION

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:



*4 Vo≤2.6V version: Co=2.2µF

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 0.01µF greater to avoid the problem.

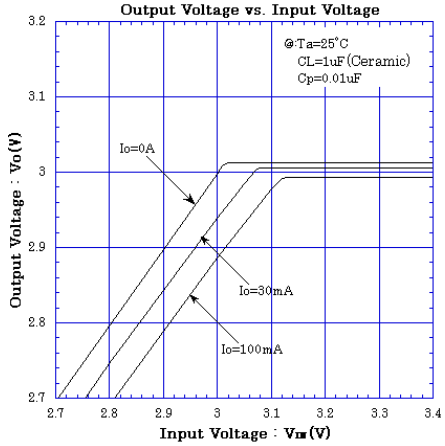
∗In the case of using a resistance "R" between V_{IN} and control.

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.

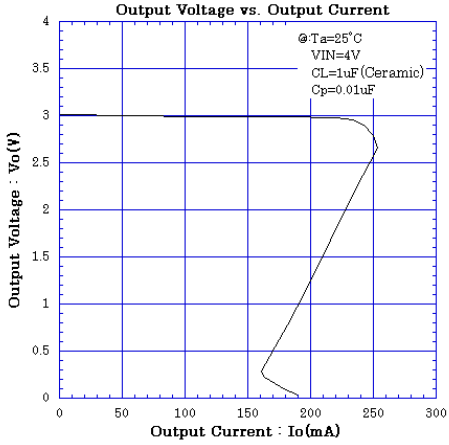
The minimum control voltage for ON state ($V_{CONT\ (ON)}$) is increased due to the voltage drop caused by I_{CONT} and the resistance "R". The I_{CONT} is temperature dependence as shown in the "Control Current vs. Temperature" characteristics. Therefore, the resistance "R" should be carefully selected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

■ ELECTRICAL CHARACTERISTICS

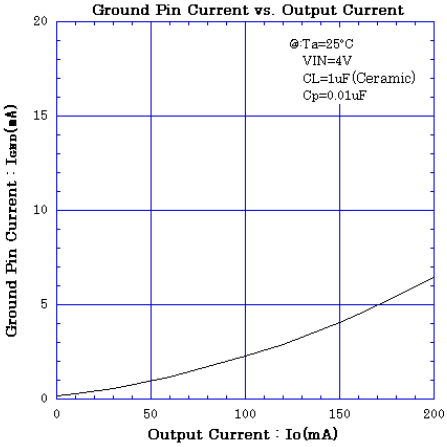
NJM2873_3.0V
Output Voltage vs. Input Voltage



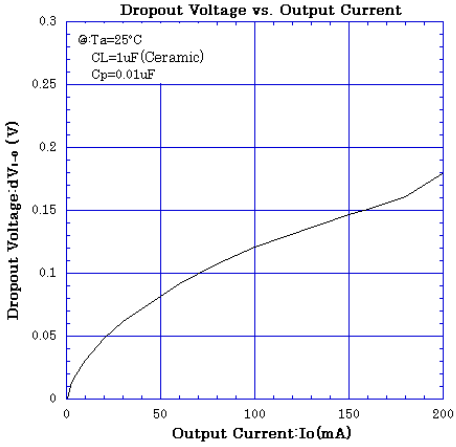
NJM2873_3.0V
Output Voltage vs. Output Current



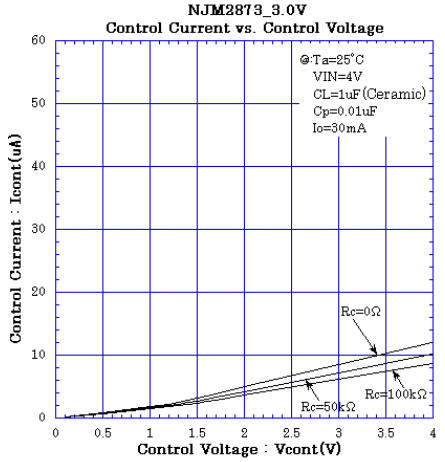
NJM2873_3.0V
Ground Pin Current vs. Output Current



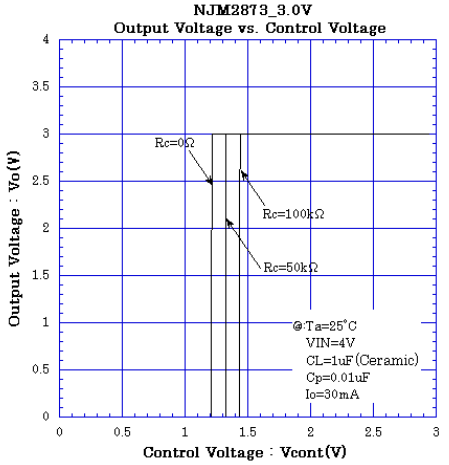
NJM2873_3.0V
Dropout Voltage vs. Output Current



NJM2873_3.0V
Control Current vs. Control Voltage



NJM2873_3.0V
Output Voltage vs. Control Voltage



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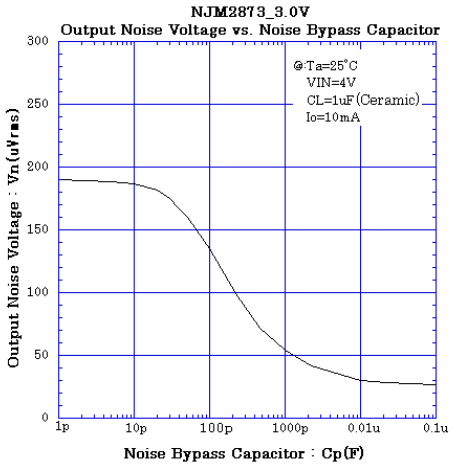

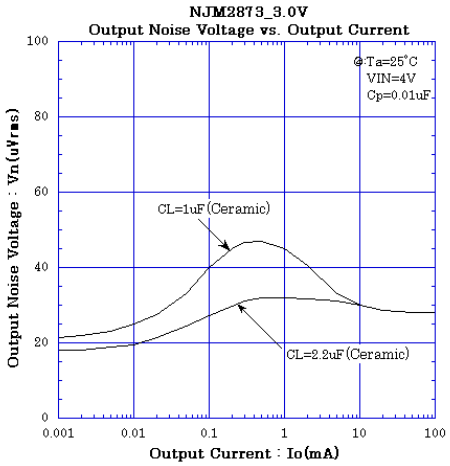

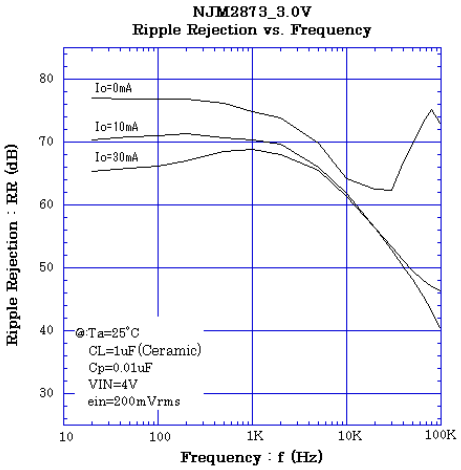

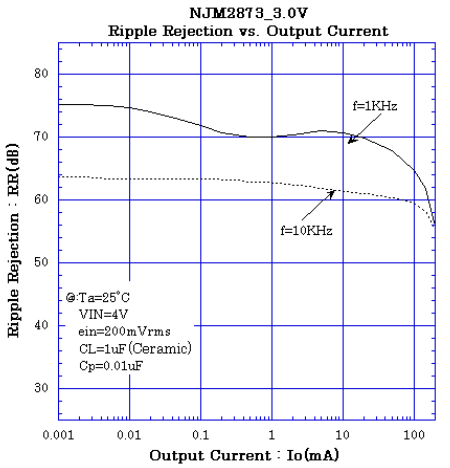

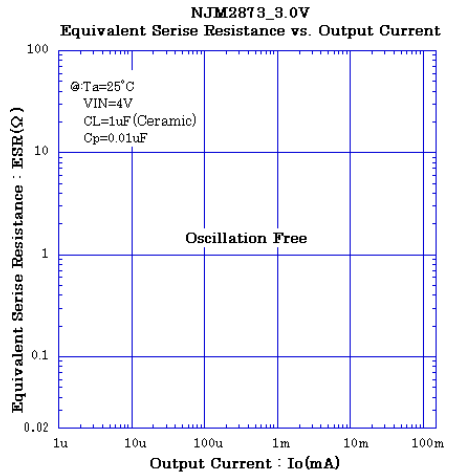

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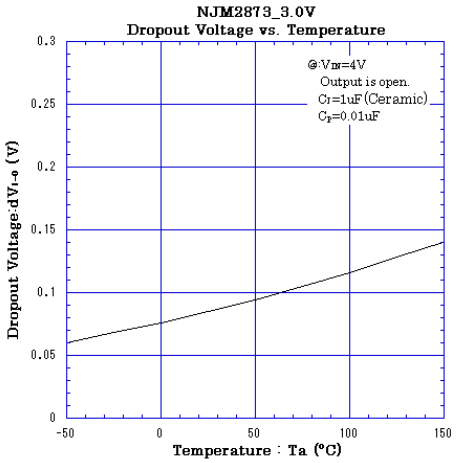

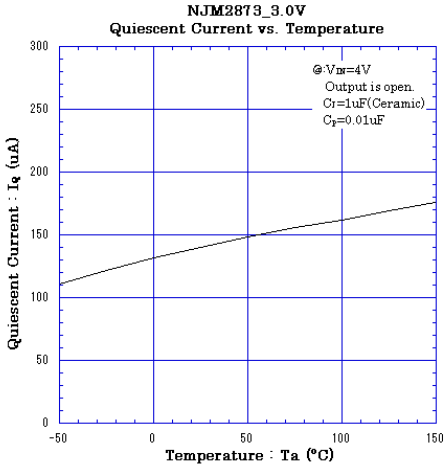

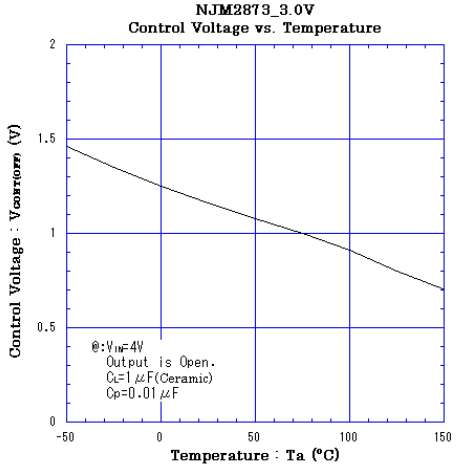

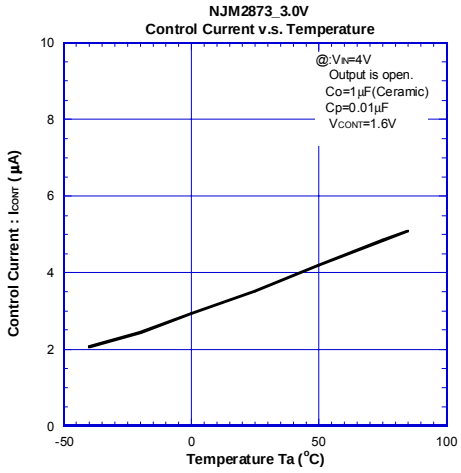

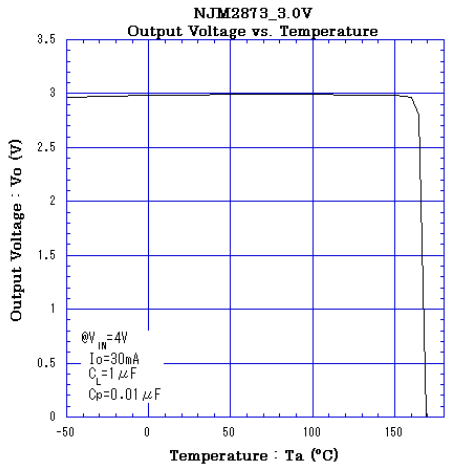

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