

## LOW DROPOUT VOLTAGE REGULATOR

### ■ GENERAL DESCRIPTION

The NJM2861/62 is a low dropout voltage regulator. Advanced Bipolar technology achieves low noise, high ripple rejection and low quiescent current.

### ■ PACKAGE OUTLINE

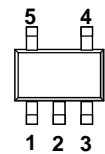


NJM2861F/62F

### ■ FEATURES

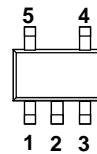
- High Ripple Rejection      70dB typ. (f=1kHz,Vo=3V Version)
- Output Noise Voltage       $V_{no}=30\mu V_{rms}$  typ.(Cp=0.01 $\mu F$ )
- Output capacitor with 1.0 $\mu F$  ceramic capacitor (Vo $\geq$ 2.7V)
- Output Current              Io(max.)=100mA
- High Precision Output      Vo $\pm$ 1%
- Low 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              SOT-23-5

### ■ PIN CONFIGURATION



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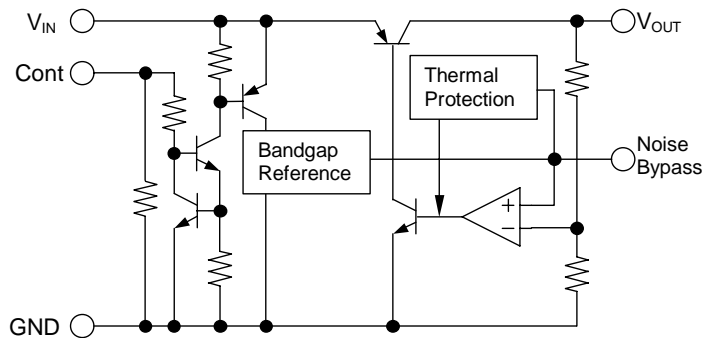
1. CONTROL (Active High)
2. GND
3. NOISE BYPASS
4. V<sub>OUT</sub>
5. V<sub>IN</sub>



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- 1.V<sub>IN</sub>
- 2.GND
- 3.CONTROL (Active High)
- 4.NOISE BYPASS
- 5.V<sub>OUT</sub>

### ■ EQUIVALENT CIRCUIT



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## ■ OUTPUT VOLTAGE RANK LIST

Device Name	V <sub>OUT</sub>	Device Name	V <sub>OUT</sub>	Device Name	V <sub>OUT</sub>
NJM286×F21	2.1V	NJM286×F285	2.85V	NJM286×F38	3.8V
NJM286×F25	2.5V	NJM286×F03	3.0V	NJM286×F04	4.0V
NJM286×F26	2.6V	NJM286×F31	3.1V	NJM286×F46	4.6V
NJM286×F27	2.7V	NJM286×F33	3.3V	NJM286×F47	4.7V
NJM286×F28	2.8V	NJM286×F35	3.5V	NJM286×F05	5.0V

## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	+14	V
Control Voltage	V <sub>CONT</sub>	+14(*1)	V
Power Dissipation	P <sub>D</sub>	SOT-23-5 350(*2) 200(*3)	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): Mounted on glass epoxy board based on EIA/JEDEC. (114.3x76.2x1.6mm: 2Layers)

(\*3): Device itself

## ■ ELECTRICAL CHARACTERISTICS

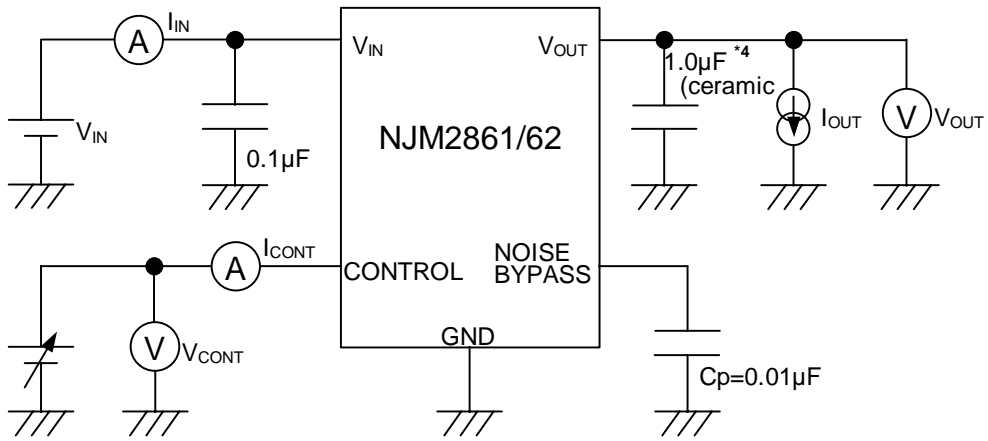
(V<sub>IN</sub>=V<sub>O</sub>+1V, C<sub>IN</sub>=0.1μF, C<sub>O</sub>=1.0μF: V<sub>O</sub>≥2.7V (C<sub>O</sub>=2.2μF: V<sub>O</sub>≤2.6V), C<sub>p</sub>=0.01μF, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V <sub>O</sub>	I <sub>O</sub> =30mA	-1%	-	+1%	V
Quiescent Current	I <sub>Q</sub>	I <sub>O</sub> =0mA, expect I <sub>cont</sub>	-	120	180	μA
Quiescent Current at Control OFF	I <sub>Q(OFF)</sub>	V <sub>CONT</sub> =0V	-	-	100	nA
Output Current	I <sub>O</sub>	V <sub>O</sub> =0.3V	100	130	-	mA
Line Regulation	ΔV <sub>O</sub> /ΔV <sub>IN</sub>	V <sub>IN</sub> =V <sub>O</sub> +1V ~ V <sub>O</sub> +6V, I <sub>O</sub> =30mA	-	-	0.10	%/V
Load Regulation	ΔV <sub>O</sub> /ΔI <sub>O</sub>	I <sub>O</sub> =0 ~ 60mA	-	-	0.03	%/mA
Dropout Voltage	ΔV <sub>I-O</sub>	I <sub>O</sub> =60mA	-	0.10	0.18	V
Ripple Rejection	RR	e <sub>in</sub> =200mVrms, f=1kHz, I <sub>O</sub> =10mA V <sub>IN</sub> =V <sub>O</sub> +1V, V <sub>O</sub> =3V Version	-	70	-	dB
Average Temperature Coefficient of Output Voltage	ΔV <sub>O</sub> /ΔTa	Ta=0~85°C, I <sub>O</sub> =10mA	-	±50	-	ppm/°C
Output Noise Voltage	V <sub>NO</sub>	f=10Hz~80kHz, I <sub>O</sub> =10mA, V <sub>O</sub> =3V Version	-	30	-	μVrms
Control Voltage for ON-state	V <sub>CONT(ON)</sub>		1.6	-	-	V
Control Voltage for OFF-state	V <sub>CONT(OFF)</sub>		-	-	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

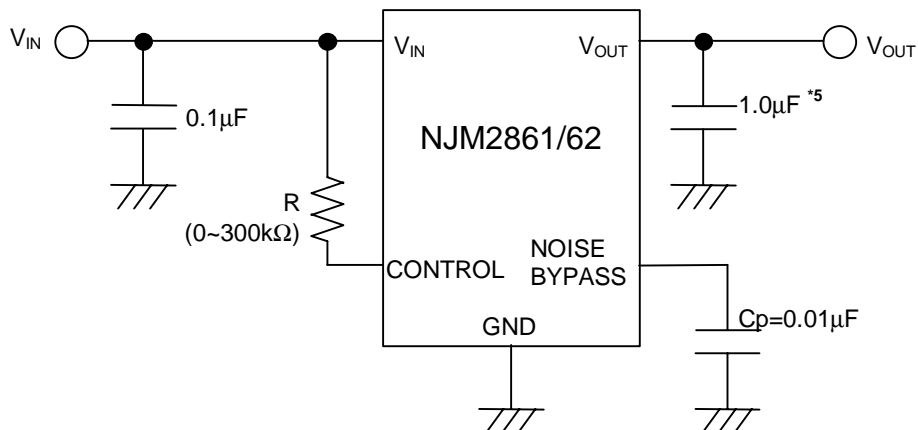


\*4  $V_o \leq 2.6V$  version:  $C_o = 2.2\mu F$  (ceramic)

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## ■ TYPICAL APPLICATION

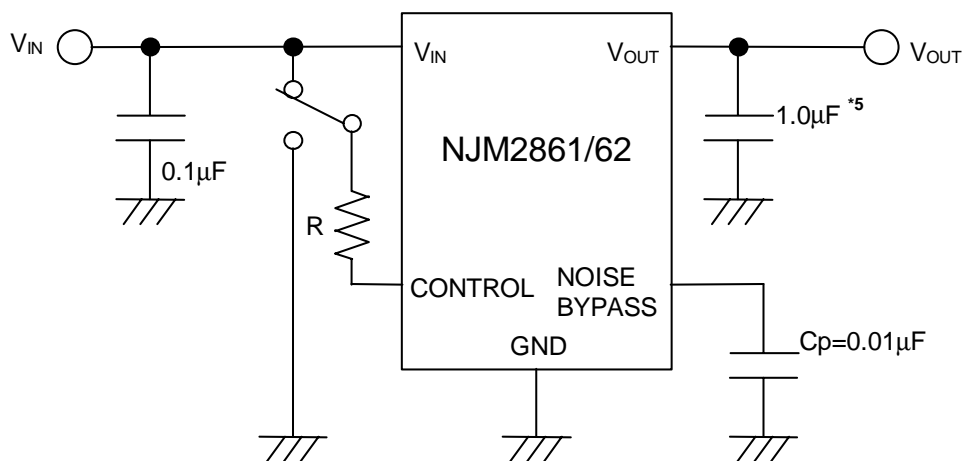
① In case that ON/OFF Control is not required:



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

Connect control terminal to  $V_{IN}$  terminal

② In use of ON/OFF CONTROL:



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

State of control terminal:

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

### \*Noise bypass Capacitance $C_p$

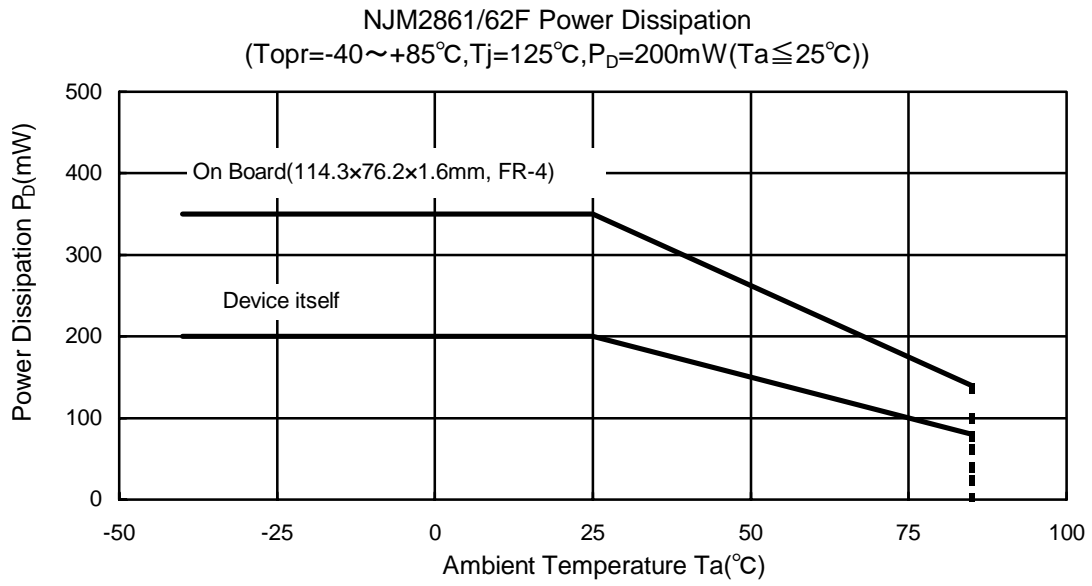
Noise bypass capacitance  $C_p$  reduces noise generated by band-gap reference circuit. Noise level and ripple rejection will be improved when larger  $C_p$  is used. Use of smaller  $C_p$  value may cause oscillation. Use the  $C_p$  value of  $0.01\mu F$  greater to avoid the problem.

### \*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.

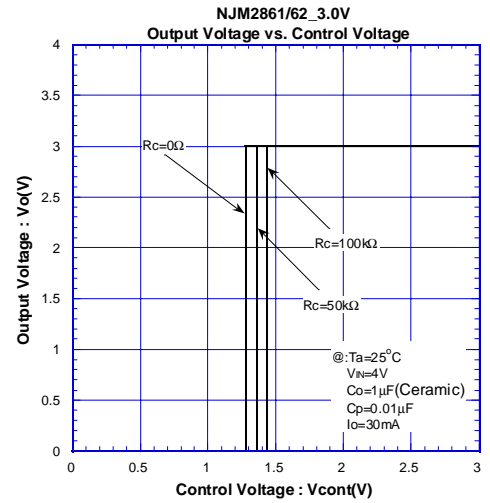
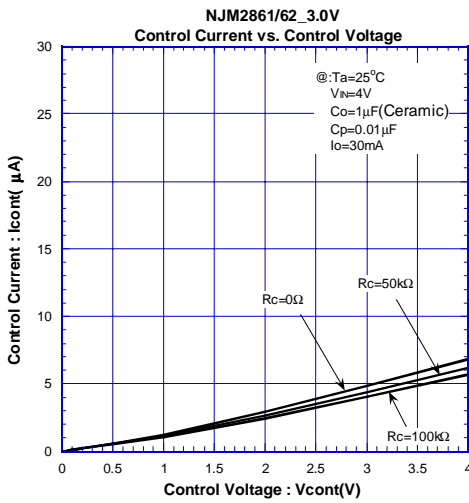
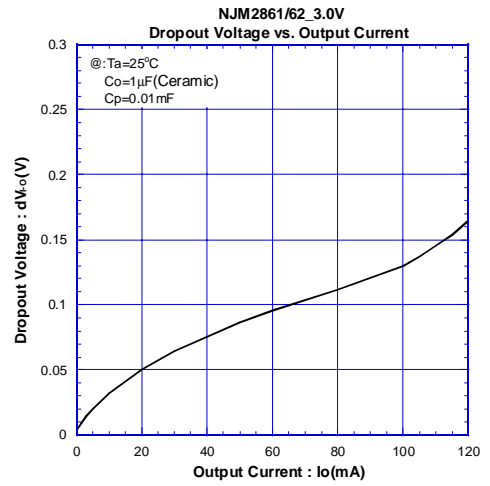
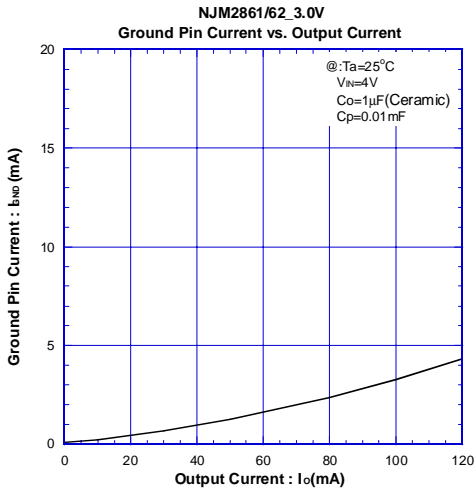
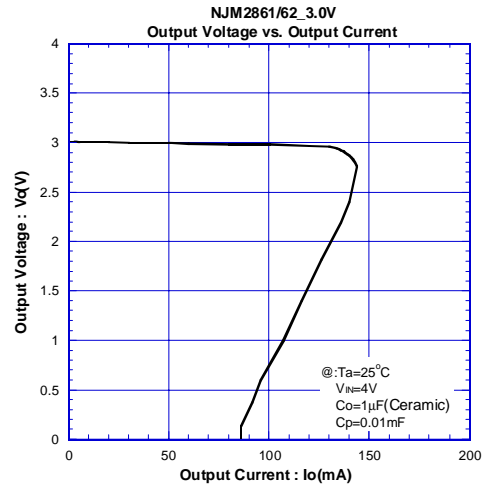
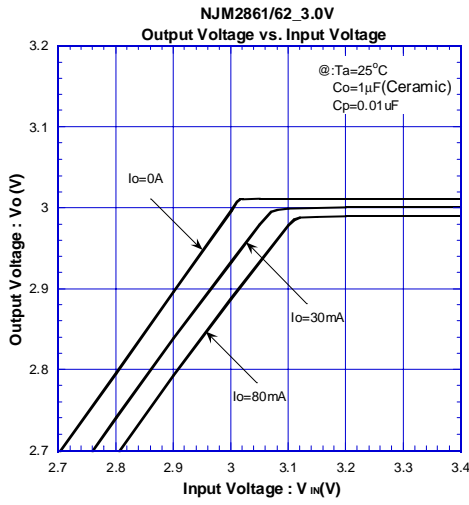
The minimum control voltage for ON state ( $V_{CONT(ON)}$ ) is increased due to the voltage drop caused by  $I_{CONT}$  and the resistance "R". The  $I_{CONT}$  is temperature dependence as shown in the "Control Current vs. Temperature" characteristics. Therefore, the resistance "R" should be carefully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

## POWER DISSIPATION vs. AMBIENT TEMPERATURE

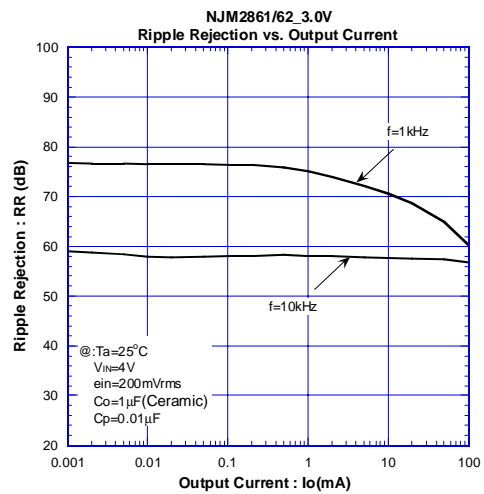
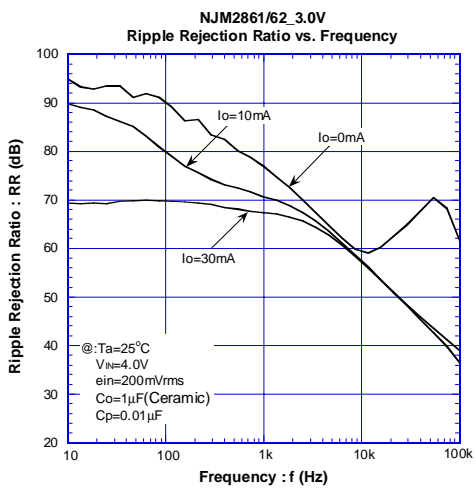
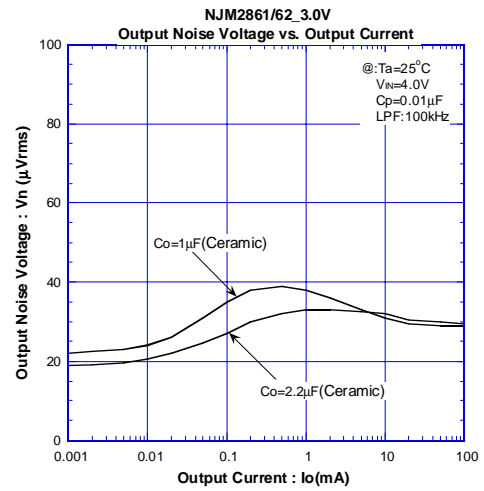
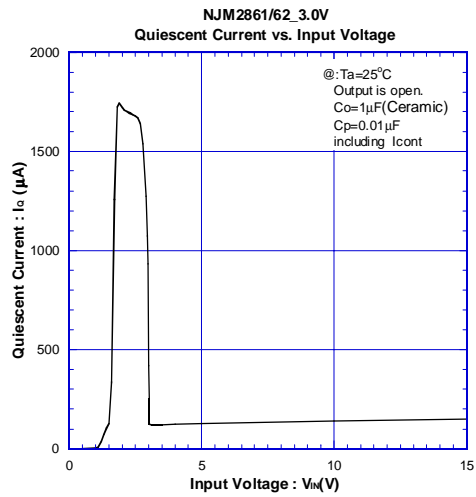
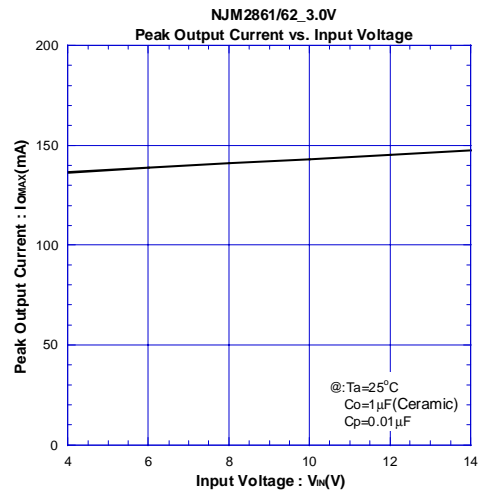
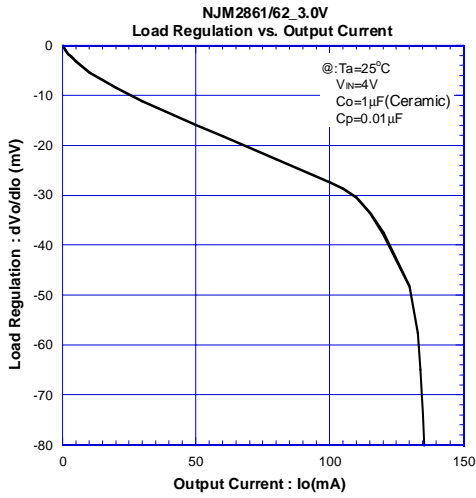


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## ELECTRICAL CHARACTERISTICS

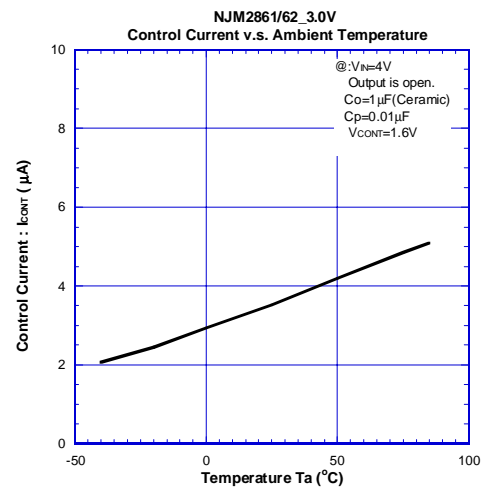
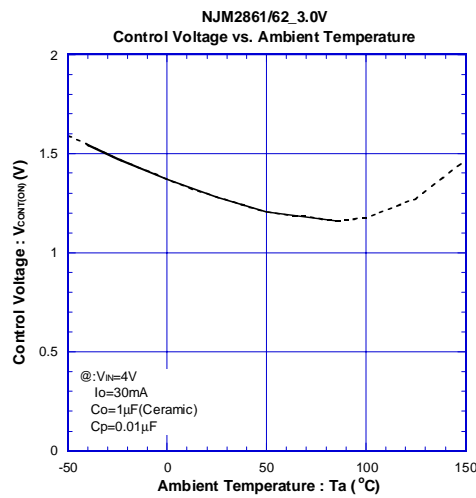
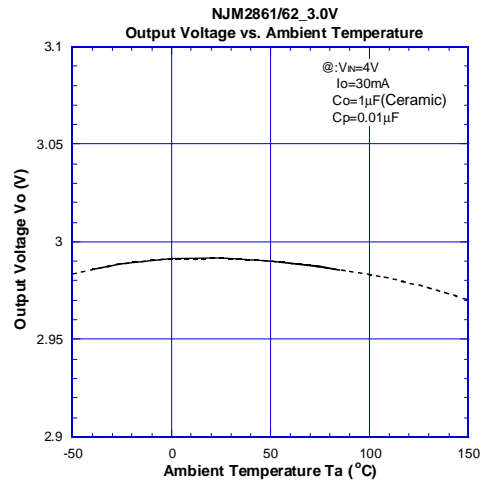
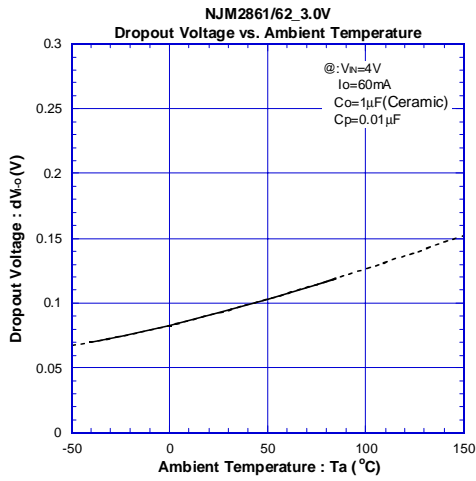
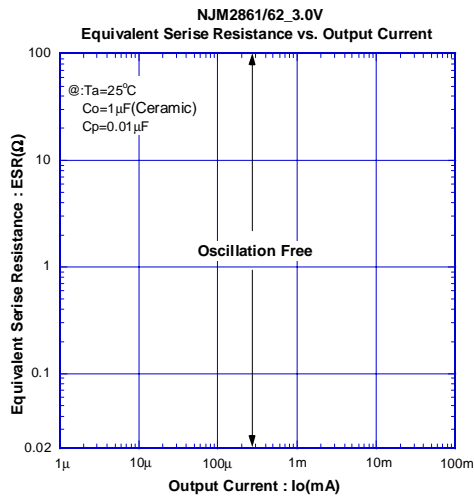


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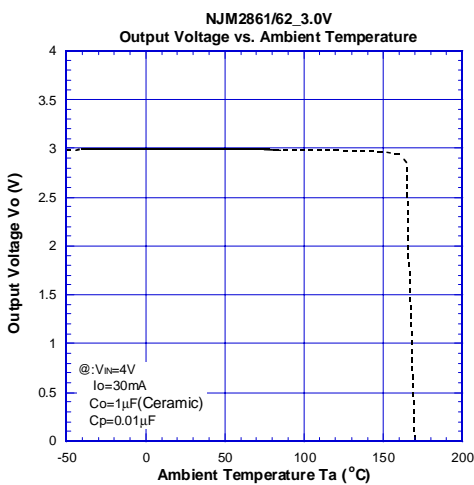
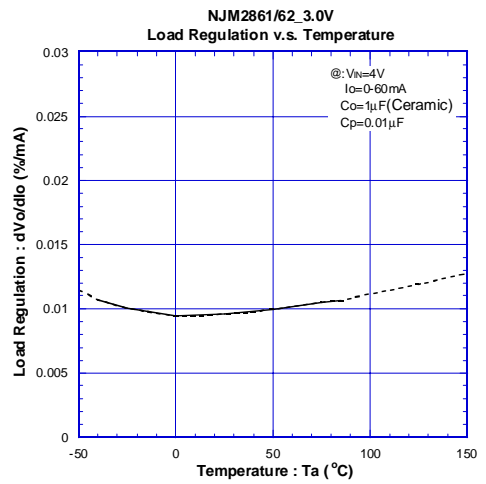
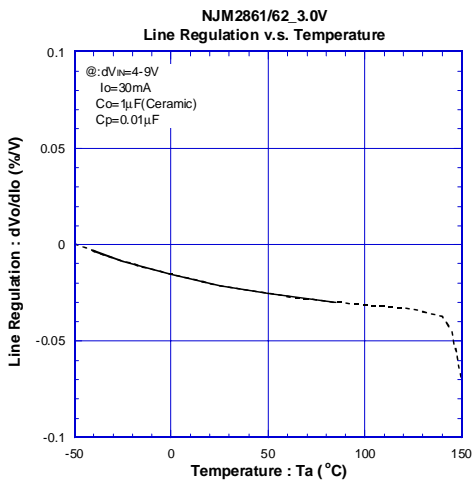
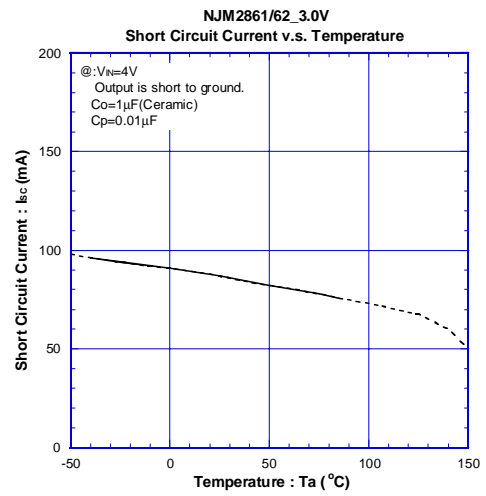
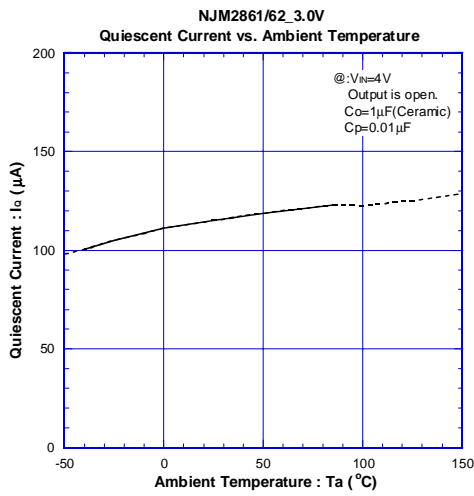
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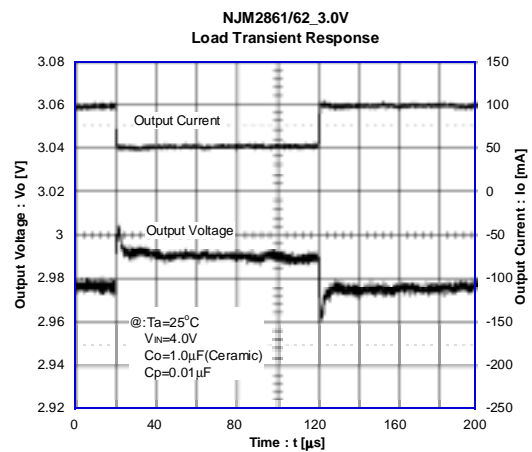
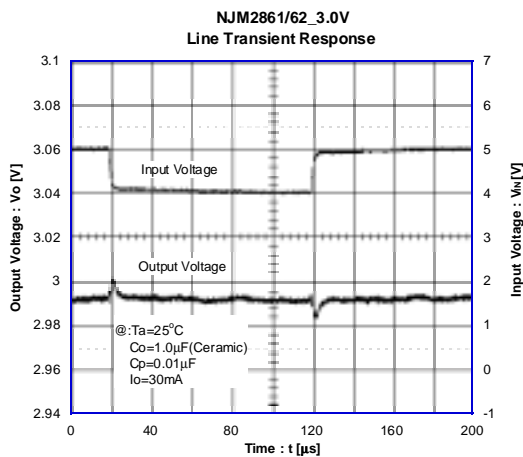
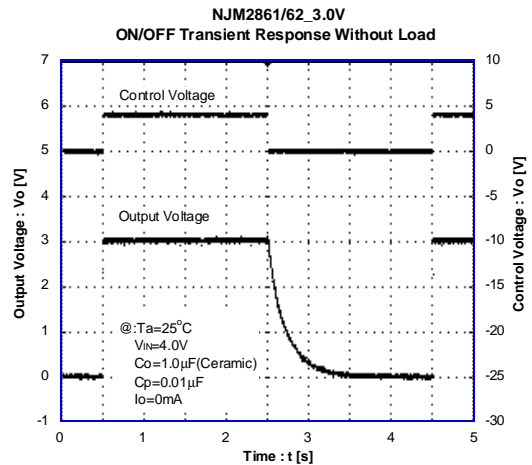
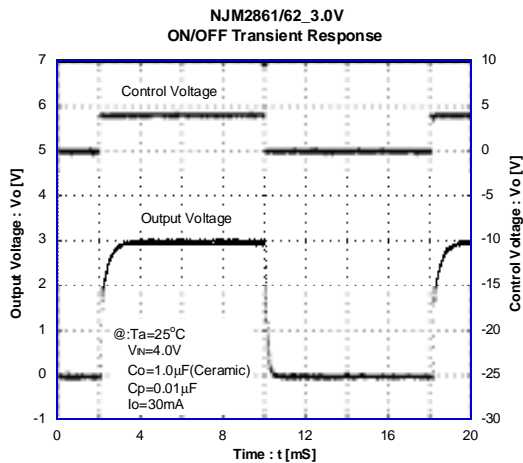


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