

## 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

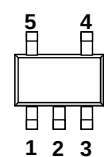


NJM2861F/62F

### ■ FEATURES

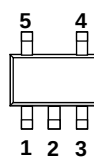
- High Ripple Rejection      70dB typ. (f=1kHz, V<sub>o</sub>=3V Version)
- Output Noise Voltage      V<sub>no</sub>=30μV<sub>rms</sub> typ. (C<sub>p</sub>=0.01μF)
- Output capacitor with 1.0μF ceramic capacitor (V<sub>o</sub>≥2.7V)
- Output Current      I<sub>o</sub>(max.)=100mA
- High Precision Output      V<sub>o</sub>±1%
- Low Dropout Voltage      0.10V typ. (I<sub>o</sub>=60mA)
- ON/OFF Control      (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline      SOT-23-5

### ■ PIN CONFIGURATION



NJM2861F

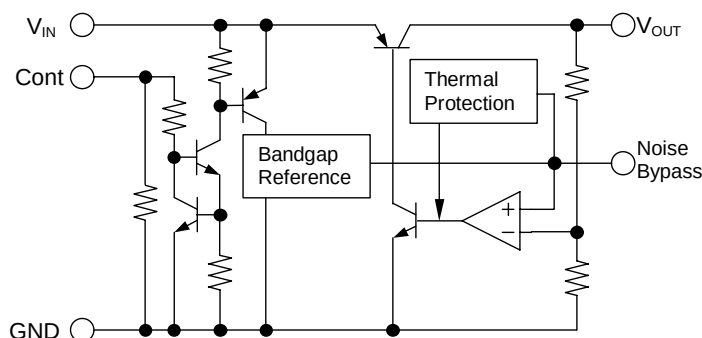
1. CONTROL (Active High)
2. GND
3. NOISE BYPASS
4. V<sub>OUT</sub>
5. V<sub>IN</sub>



NJM2862F

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

### ■ EQUIVALENT CIRCUIT



# NJM2861/62

## ■ 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<br>350(*2)<br>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

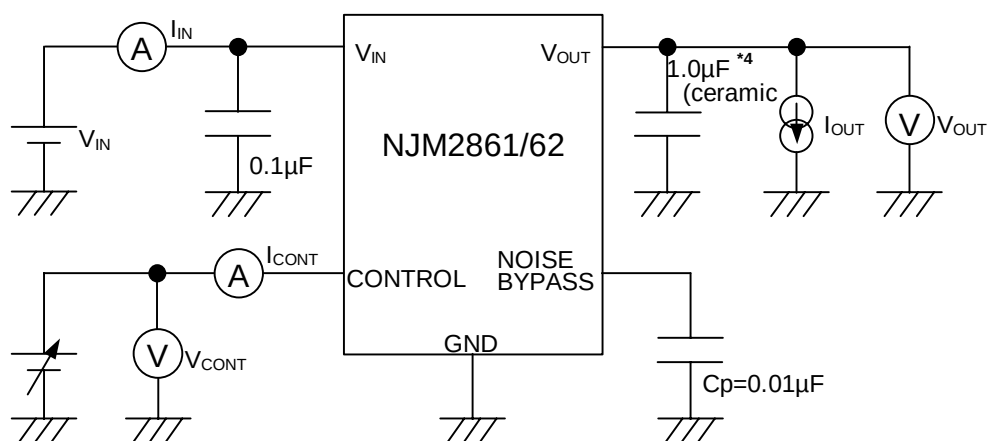
(V<sub>IN</sub>=V<sub>O</sub>+1V, C<sub>IN</sub>=0.1μF, C<sub>O</sub>=1.0μF: V<sub>O</sub>≥2.7V (C<sub>O</sub>=2.2μF: V<sub>O</sub>≤2.6V), C<sub>p</sub>=0.01μF, Ta=25°C)

| 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<br>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,<br>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

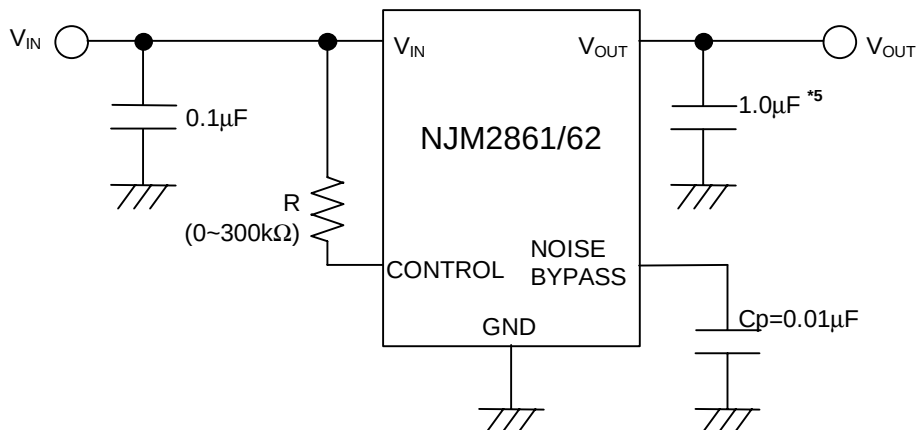


\*4  $V_o \leq 2.6V$  version:  $C_o = 2.2\mu F$  (ceramic)

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## ■ TYPICAL APPLICATION

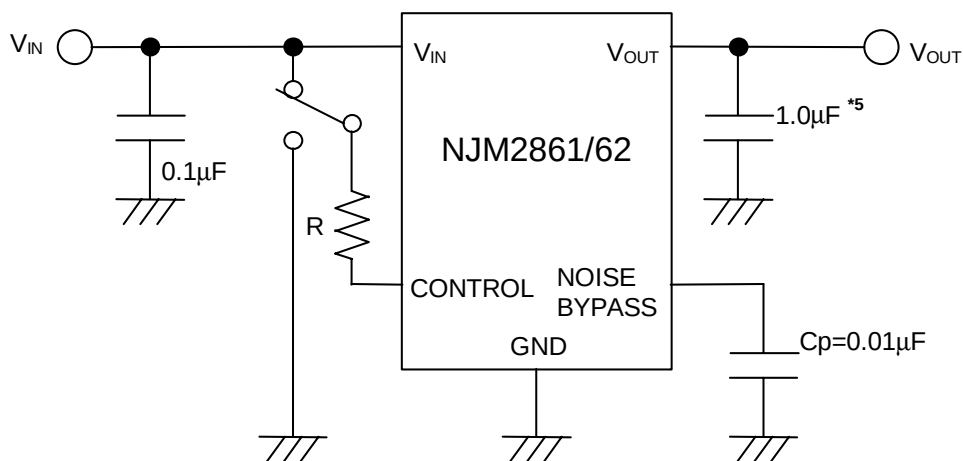
① In case that ON/OFF Control is not required:



\*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 $C_p$

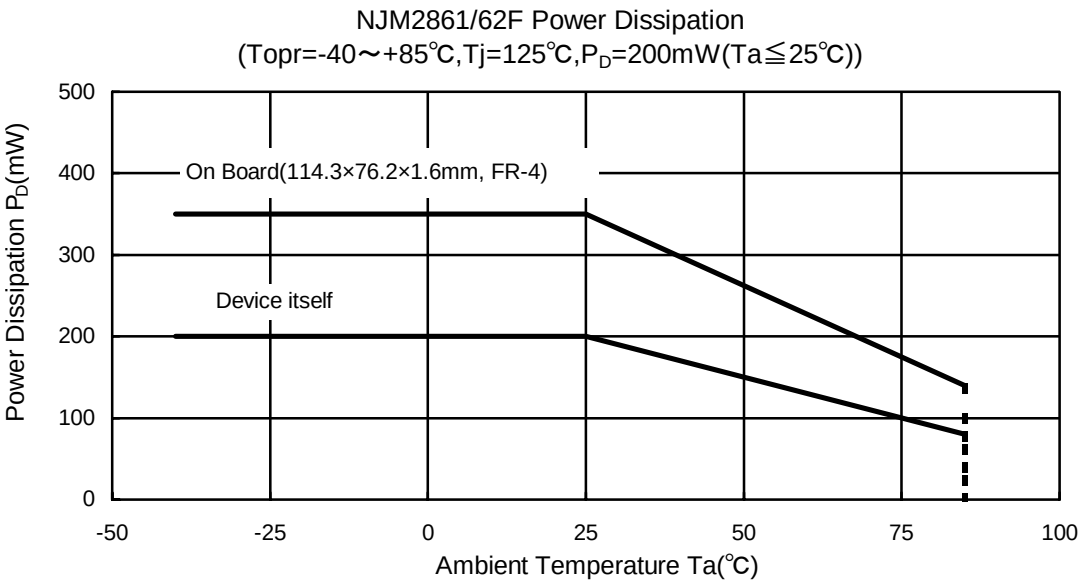
Noise bypass capacitance  $C_p$  reduces noise generated by band-gap reference circuit. Noise level and ripple rejection will be improved when larger  $C_p$  is used. Use of smaller  $C_p$  value may cause oscillation. Use the  $C_p$  value of  $0.01\mu F$  greater to avoid the problem.

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

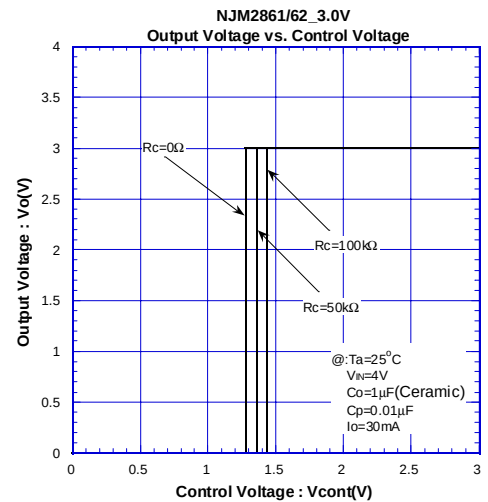
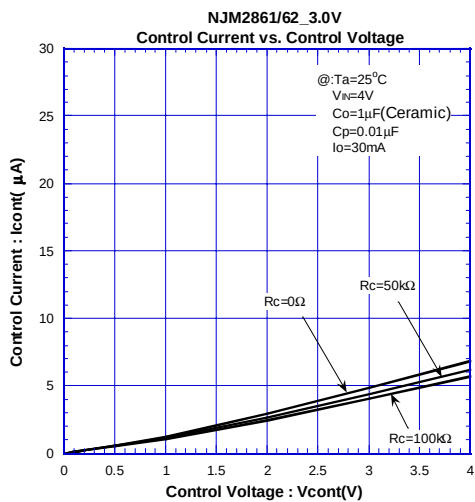
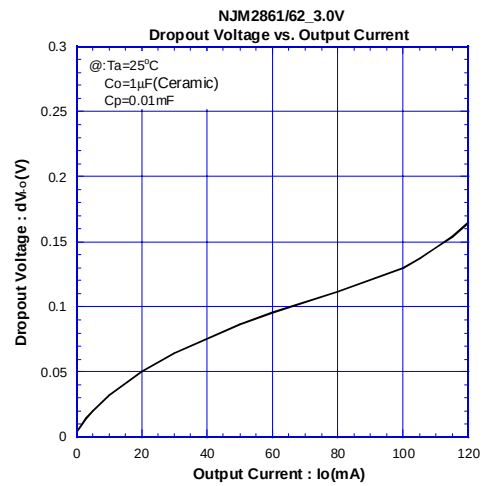
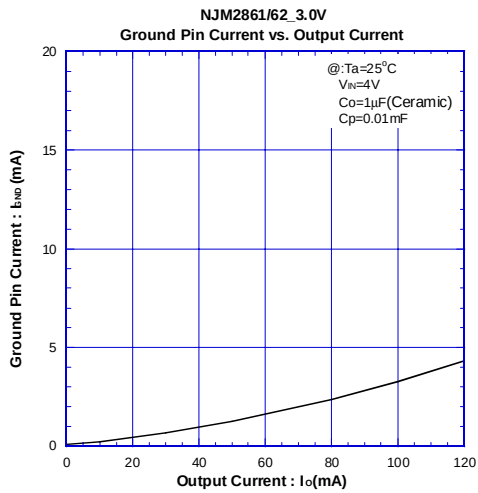
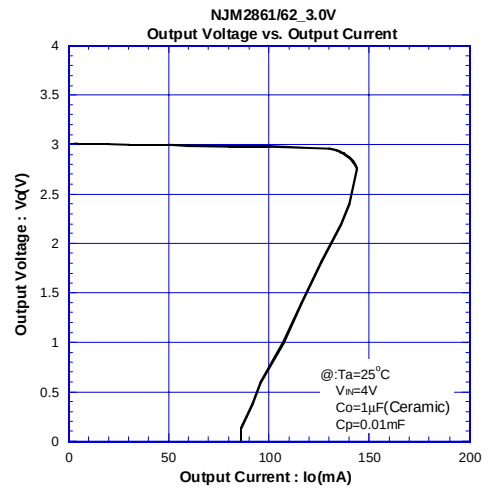
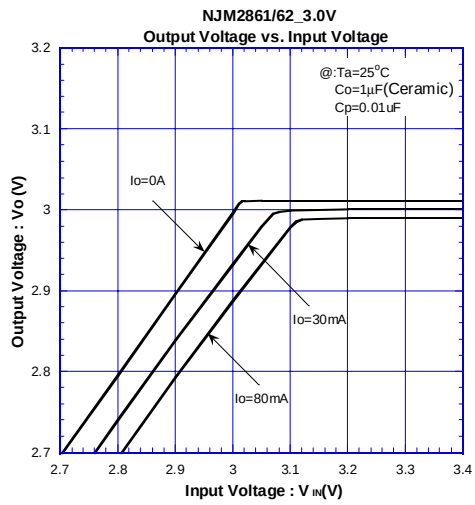
The current flow into the control terminal while the IC is ON state ( $I_{CONT}$ ) can be reduced when a pull up resistance "R" is inserted between  $V_{IN}$  and the control terminal.

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.

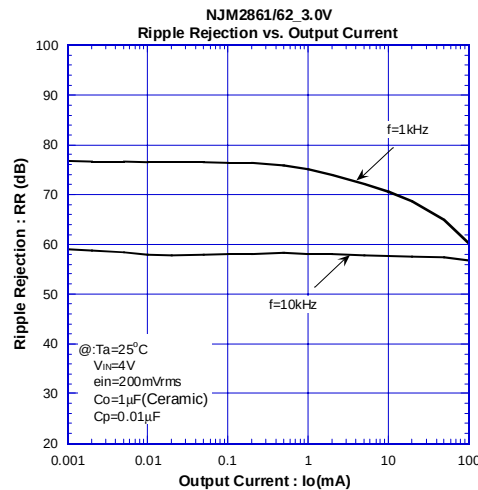
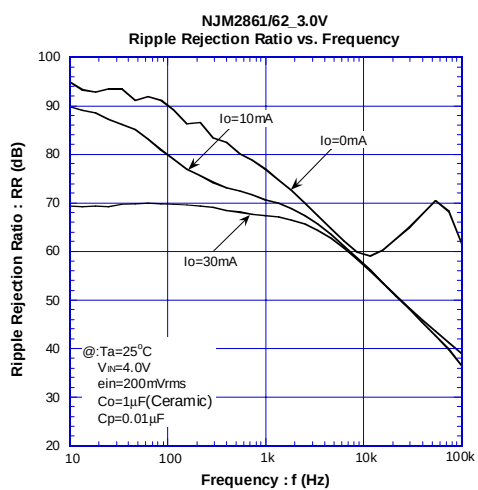
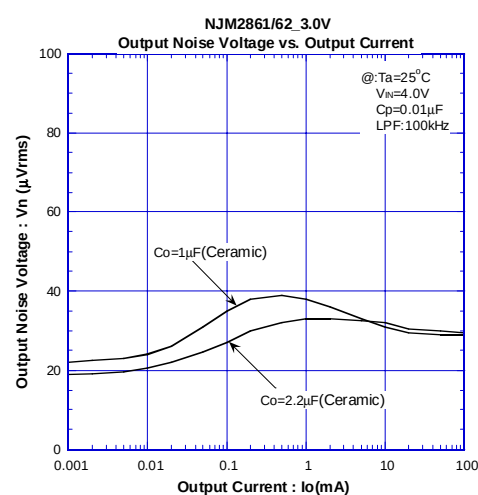
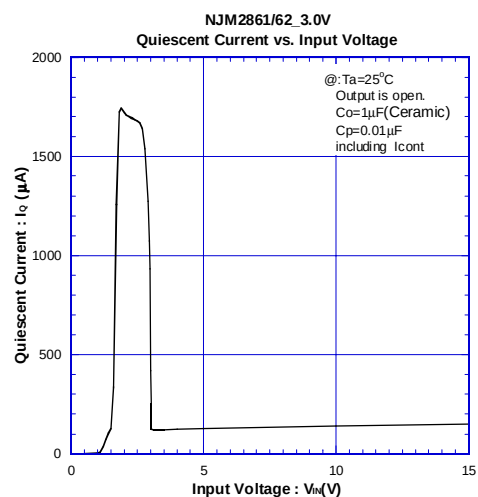
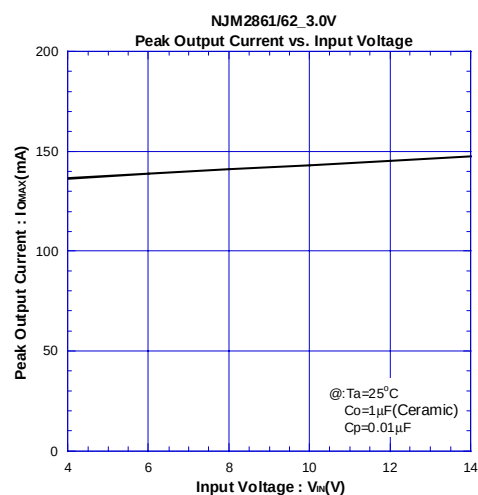
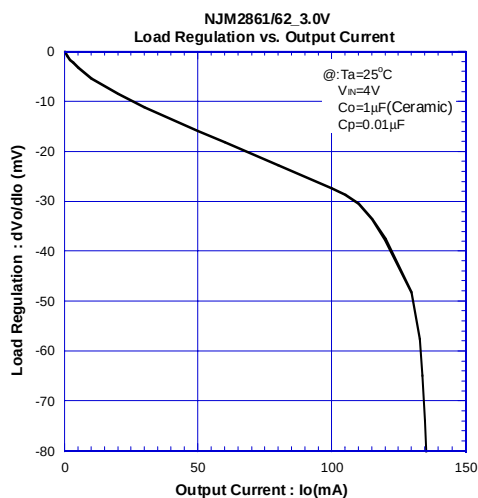
POWER DISSIPATION vs. AMBIENT TEMPERATURE



## ELECTRICAL CHARACTERISTICS

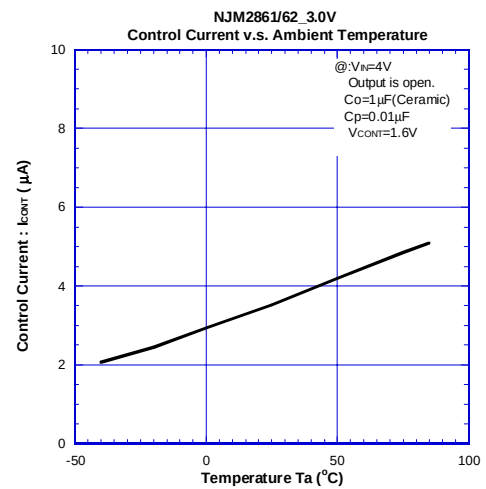
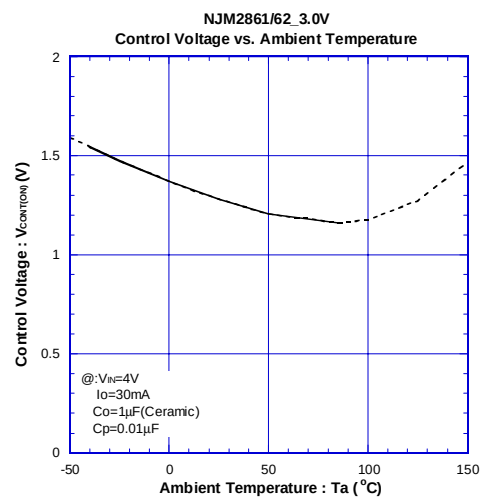
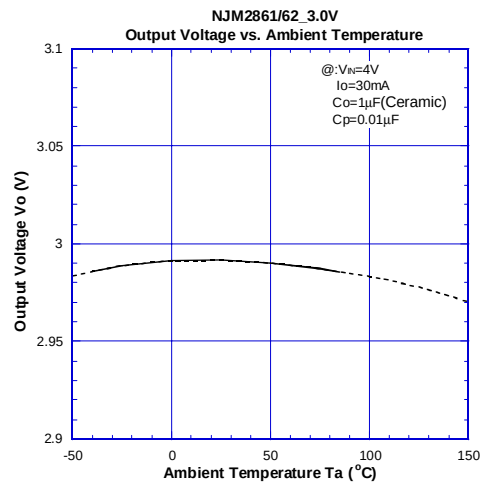
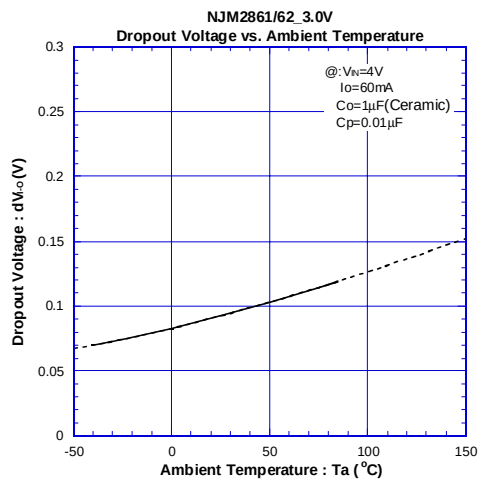
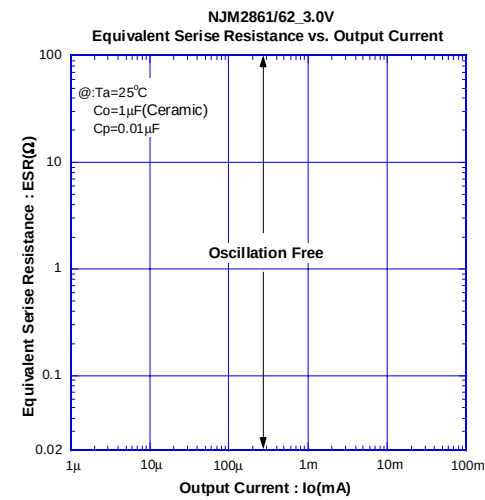


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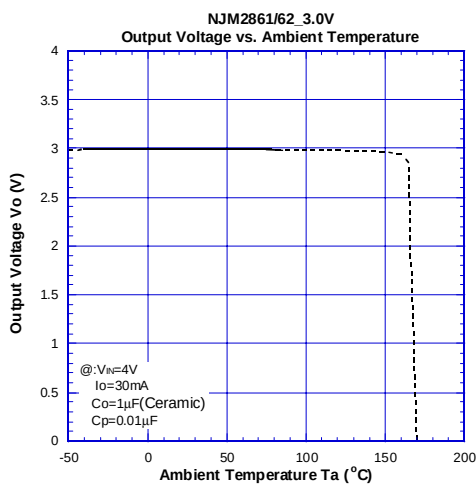
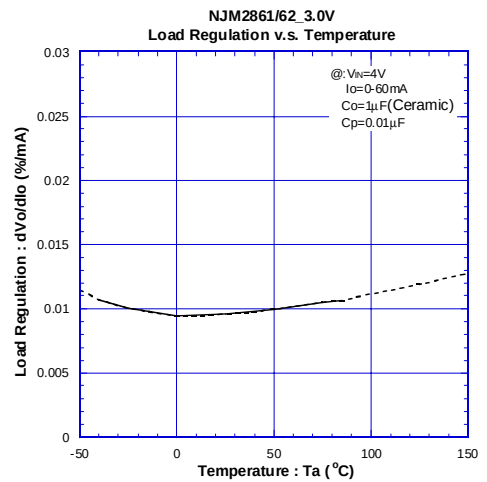
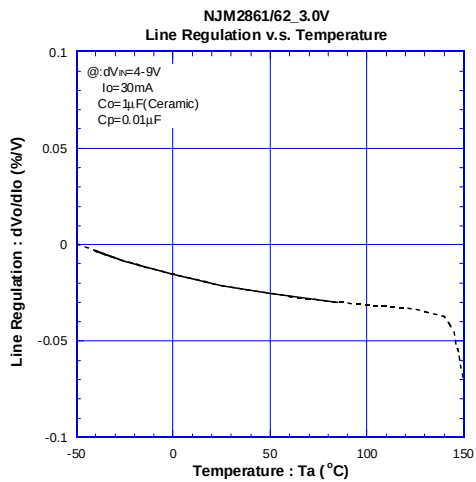
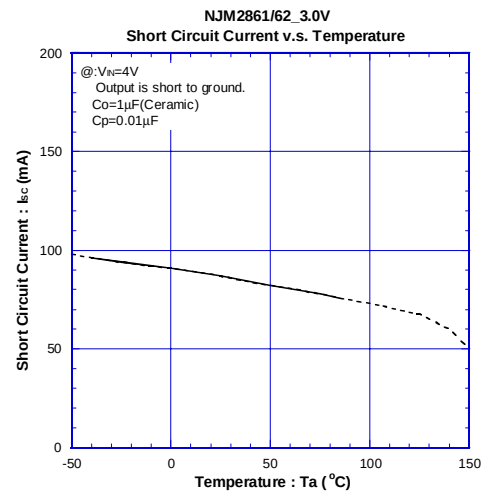
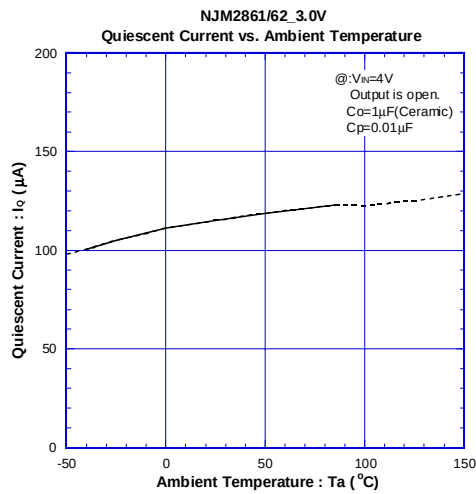


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## ■ ELECTRICAL CHARACTERISTICS

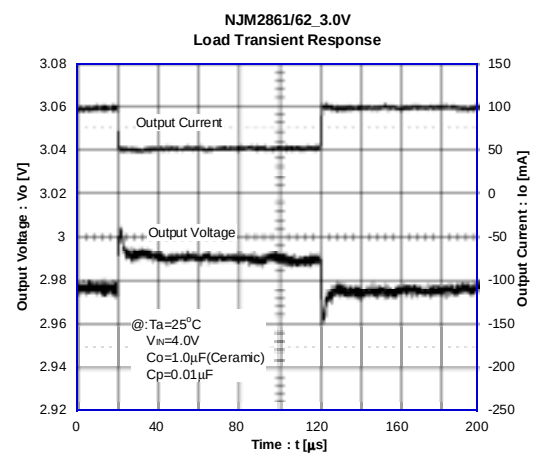
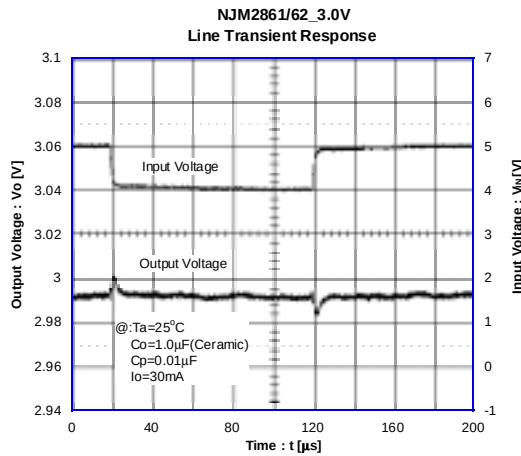
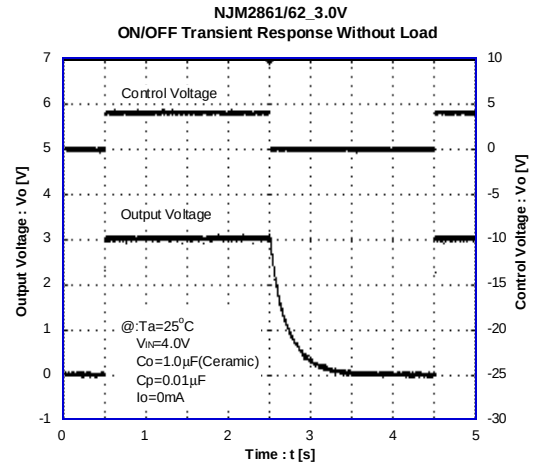
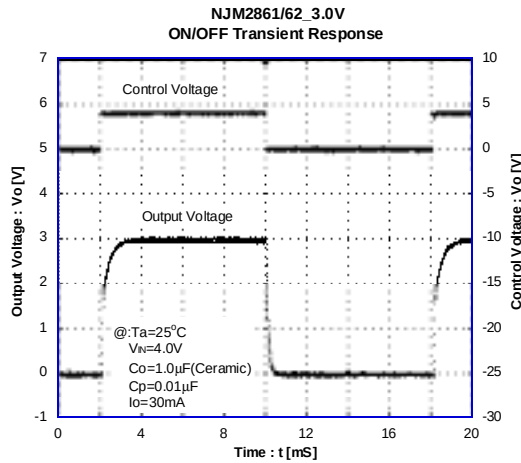


## ELECTRICAL CHARACTERISTICS



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## ELECTRICAL CHARACTERISTICS



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| <u><a href="#">NJM2862F05-TE1</a></u>  | <u><a href="#">NJM2861F05-TE1</a></u>  | <u><a href="#">NJM2861F38-TE1</a></u> | <u><a href="#">NJM2862F38-TE1</a></u> | <u><a href="#">NJM2861F28-TE1</a></u> | <u><a href="#">NJM2862F28-TE1</a></u> |
| <u><a href="#">NJM2861F285-TE1</a></u> | <u><a href="#">NJM2862F27-TE1</a></u>  | <u><a href="#">NJM2861F27-TE1</a></u> | <u><a href="#">NJM2862F33-TE1</a></u> | <u><a href="#">NJM2861F33-TE1</a></u> | <u><a href="#">NJM2862F03-TE1</a></u> |
| <u><a href="#">NJM2861F03-TE1</a></u>  | <u><a href="#">NJM2862F285-TE1</a></u> | <u><a href="#">NJM2862F04-TE1</a></u> | <u><a href="#">NJM2861F31-TE1</a></u> | <u><a href="#">NJM2861F46-TE1</a></u> | <u><a href="#">NJM2861F35-TE1</a></u> |



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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.