

## LOW DROPOUT VOLTAGE REGULATOR

### ■ GENERAL DISCRIPTION

NJU7751/54 is a low dropout voltage regulator with ON/OFF control and Output shunt switch.

Advanced CMOS technology achieves high ripple rejection and ultra low quiescent current.

It is suitable for reset small micro controller and other logic chips.

### ■ PACKAGE OUTLINE

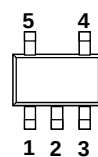


NJU7751/54F

### ■ FEATURES

- Ultra Low quiescent Current  $I_q=20\mu A$  typ. ( $I_o=0mA$ )
- Output capacitor with 1.0uF ceramic capacitor
- Output Current  $I_o(max.)=100mA$
- High Precision Output  $V_o\pm 1.0\%$
- Low Dropout Voltage 0.15V typ. ( $I_o=60mA$ ,  $V_o=3V$ )
- With ON/OFF Control (Active High)
- With Output Shunt Switch
- Internal Short Circuit Current Limit
- CMOS Technology
- Package Outline SOT-23-5

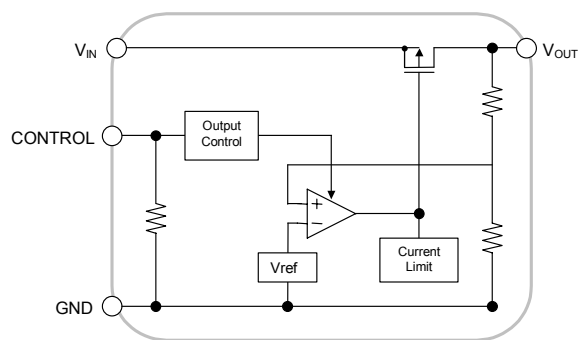
### ■ PIN CONFIGURATION



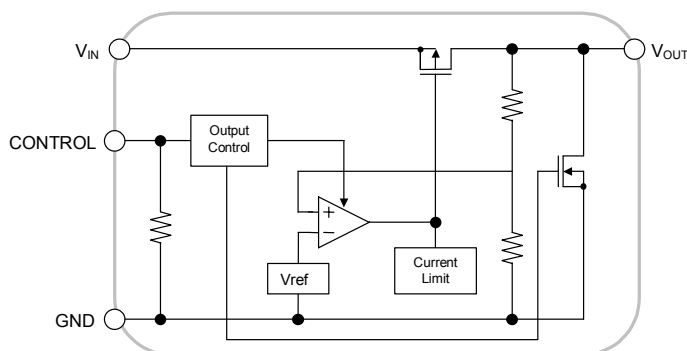
NJU7751/54F

- PIN FUNCTION
- 1.CONTROL
  - 2.GND
  - 3.N.C.
  - 4. $V_{OUT}$
  - 5. $V_{IN}$

### ■ EQUIVALENT CIRCUIT



NJU7751



NJU7754

### ■ OUTPUT VOLTAGE RANK LIST

| DEVICE NAME | $V_{OUT}$ | DEVICE NAME | $V_{OUT}$ |
|-------------|-----------|-------------|-----------|
| NJU775*F15  | 1.5V      | NJU775*F28  | 2.8V      |
| NJU775*F18  | 1.8V      | NJU775*F03  | 3.0V      |
| NJU775*F21  | 2.1V      | NJU775*F32  | 3.2V      |
| NJU775*F22  | 2.2V      | NJU775*F33  | 3.3V      |
| NJU775*F24  | 2.4V      | NJU775*F05  | 5.0V      |
| NJU775*F25  | 2.5V      |             |           |

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER                            | SYMBOL     | RATINGS                                                                                          | UNIT |
|--------------------------------------|------------|--------------------------------------------------------------------------------------------------|------|
| Input Voltage                        | $V_{IN}$   | +10                                                                                              | V    |
| Control Voltage                      | $V_{CONT}$ | +10(*1)                                                                                          | V    |
| Power Dissipation                    | $P_D$      | SOT-23-5 <span style="display: inline-block; vertical-align: middle;">350(*2)<br/>200(*3)</span> | mW   |
| Operating Temperature                | $T_{opr}$  | -40 ~ +85                                                                                        | °C   |
| Storage Temperature                  | $T_{stg}$  | -40 ~ +125                                                                                       | °C   |
| Output Sink Current at OFF-state(*4) | $I_O$      | 10                                                                                               | mA   |

(\*1) When input voltage is less than +10V, 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.

(\*4): This maximum rating is applied to NJU7754.

## ■ Operating voltage

$V_{IN}$ =+2.3 ~ +9V (In case of  $V_O$ <2.1V version)

## ■ ELECTRICAL CHARACTERISTICS

( $V_{IN}=V_O+1V$ ,  $C_{IN}=0.1\mu F$ ,  $C_O=1.0\mu F$  ( $V_O \leq 2.0V$ :  $C_O=2.2\mu F$ ),  $T_a=25^\circ C$ )

| PARAMETER                                         | SYMBOL                       | TEST CONDITION                                                                                              | MIN.                      | TYP.      | MAX.  | UNIT          |
|---------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------|-----------|-------|---------------|
| Output Voltage                                    | $V_O$                        | $I_O=30mA$                                                                                                  | -1.0%                     | —         | +1.0% | V             |
| Input Voltage                                     | $V_{IN}$                     |                                                                                                             | —                         | —         | 9     | V             |
| Quiescent Current                                 | $I_Q$                        | $I_O=0mA$ , $V_{CONT}=V_{IN}$ , Include $I_{CONT}$                                                          | —                         | 20        | 40    | $\mu A$       |
| Quiescent Current at Control OFF                  | $I_{Q(OFF)}$                 | $V_{CONT}=0V$                                                                                               | —                         | 0.1       | 1     | $\mu A$       |
| Output Current                                    | $I_O$                        | $V_O=0.3V$                                                                                                  | 100                       | —         | —     | mA            |
| Short Circuit Limit                               | $I_{LIM}$                    | $V_O=0V$                                                                                                    | —                         | 40        | —     | mA            |
| Line Regulation                                   | $\Delta V_O / \Delta V_{IN}$ | $V_{IN}=V_O+1V \sim V_O+6.0V$ ( $V_O < 3.0V$ )<br>$V_{IN}=V_O+1V \sim 9.0V$ ( $V_O \geq 3.0V$ ), $I_O=30mA$ | —                         | —         | 0.20  | %/V           |
| Load Regulation                                   | $\Delta V_O / \Delta V_O$    | $I_O=0 \sim 100mA$                                                                                          | —                         | —         | 0.03  | %/mA          |
| Dropout Voltage(*5)                               | $\Delta V_{LO}$              | $I_O=60mA$                                                                                                  | $2.1V \leq V_O \leq 2.4V$ | —         | 0.20  | 0.27 V        |
|                                                   |                              |                                                                                                             | $2.5V \leq V_O \leq 2.7V$ | —         | 0.18  | 0.25 V        |
|                                                   |                              |                                                                                                             | $2.8V \leq V_O \leq 3.3V$ | —         | 0.15  | 0.22 V        |
|                                                   |                              |                                                                                                             | $3.4V \leq V_O \leq 5.0V$ | —         | 0.12  | 0.19 V        |
| Ripple Rejection                                  | RR                           | $e_{in}=200mV_{rms}$ , $f=1kHz$ , $I_O=10mA$ ,<br>$V_O=3.0V$ Version                                        | —                         | 65        | —     | dB            |
| Average Temperature Coefficient of Output Voltage | $\Delta V_O / \Delta T_a$    | $T_a=0 \sim 85^\circ C$ , $I_O=10mA$                                                                        | —                         | $\pm 100$ | —     | ppm/°C        |
| Output Noise Voltage                              | $V_{NO}$                     | $f=10Hz \sim 80kHz$ , $I_O=10mA$ , $V_O=3.0V$ Version                                                       | —                         | 75        | —     | $\mu V_{rms}$ |
| Pull-down Resistance                              | $R_{CONT}$                   |                                                                                                             | 2                         | 5         | 10    | $M\Omega$     |
| Control Voltage for ON-State                      | $V_{CONT(ON)}$               |                                                                                                             | 1.6                       | —         | —     | V             |
| Control Voltage for OFF-State(*6)                 | $V_{CONT(OFF)}$              |                                                                                                             | —                         | —         | 0.3   | V             |
| Pull-down Resistance at OFF-state                 | $R_{O(OFF)}$                 | $V_{CONT}=0V$ ( $V_O=3.0V$ Version)                                                                         | —                         | 150       | —     | $\Omega$      |

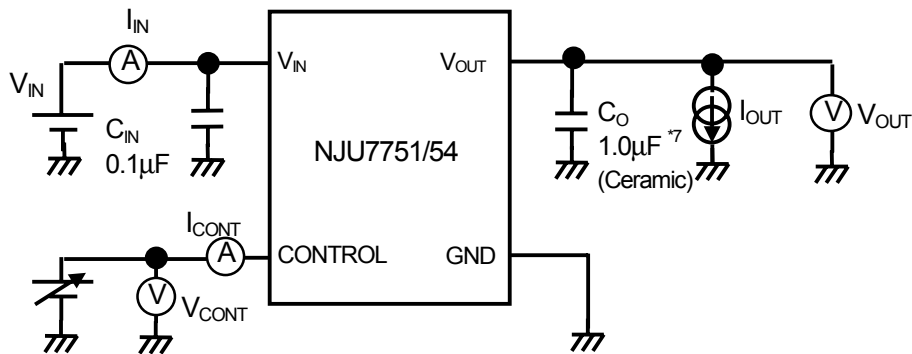
(\*5): The output voltage excludes under 2.1V.

(\*6): This electrical characteristics is applied to NJU7754.

The above specification is a common specification for all voltages.

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

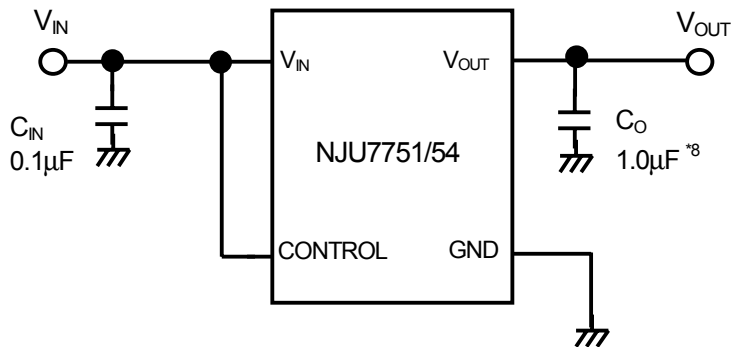
## ■ TEST CIRCUIT



\*7 :  $V_O \leq 2.0V$  version,  $C_O = 2.2\mu F$  (Ceramic)

## ■ TYPICAL APPLICATION

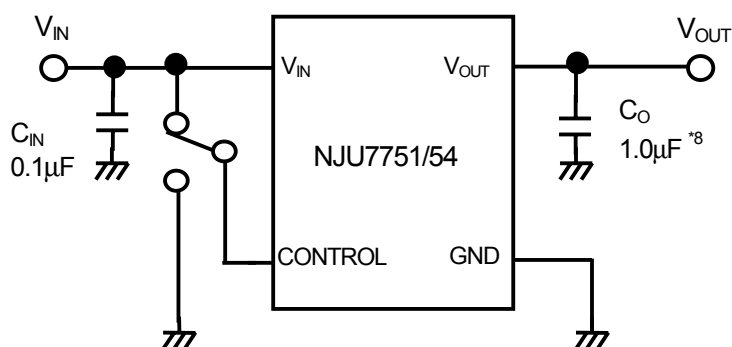
① In case that ON/OFF Control is not required:



\*8 :  $V_O \leq 2.0V$  version,  $C_O = 2.2\mu F$

Connect control terminal to  $V_{IN}$  terminal.

② In use of ON/OFF Control

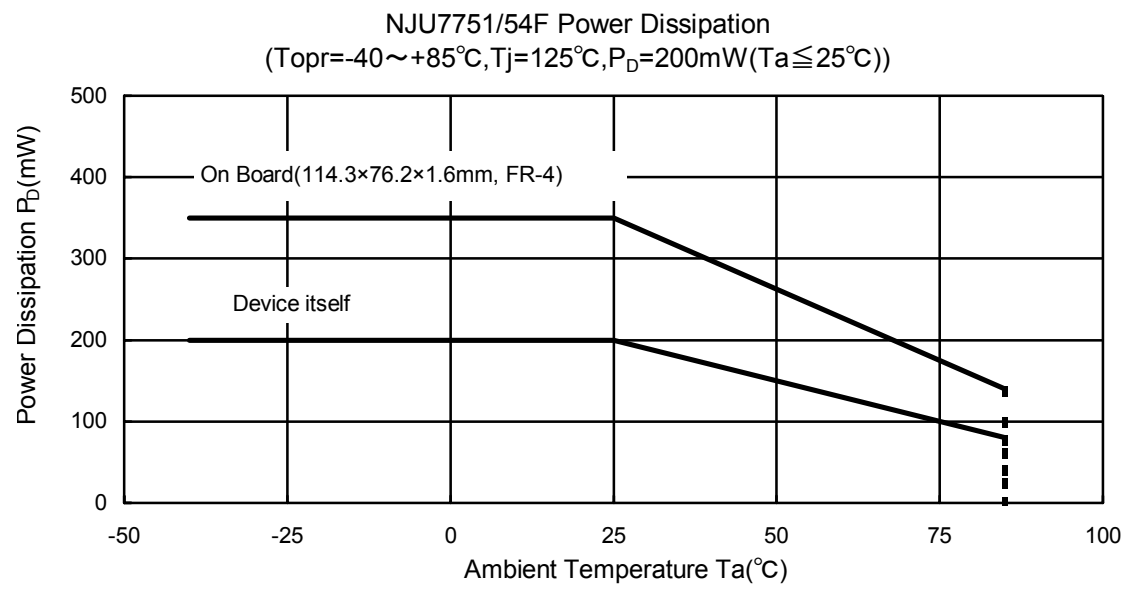


\*8 :  $V_O \leq 2.0V$  version,  $C_O = 2.2\mu F$

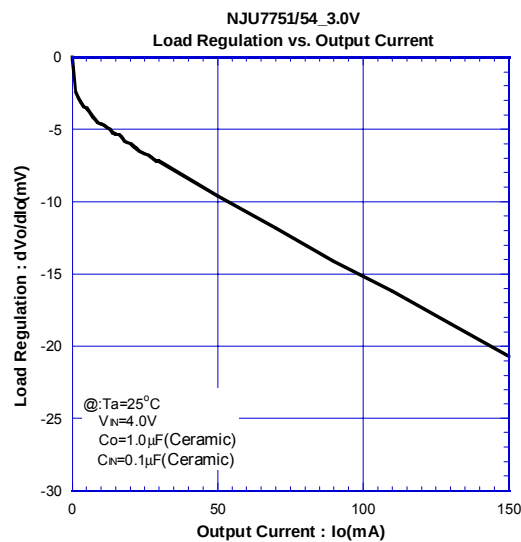
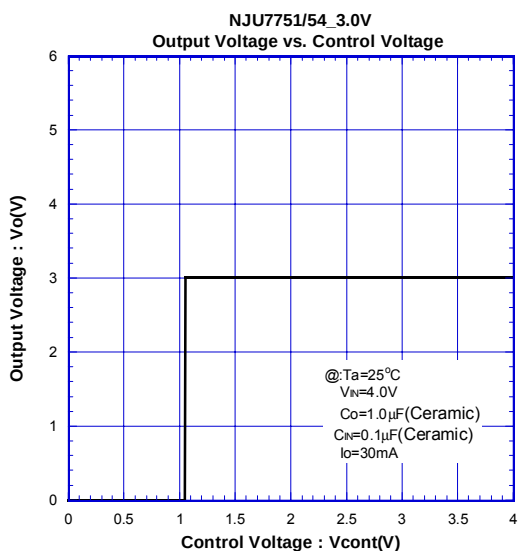
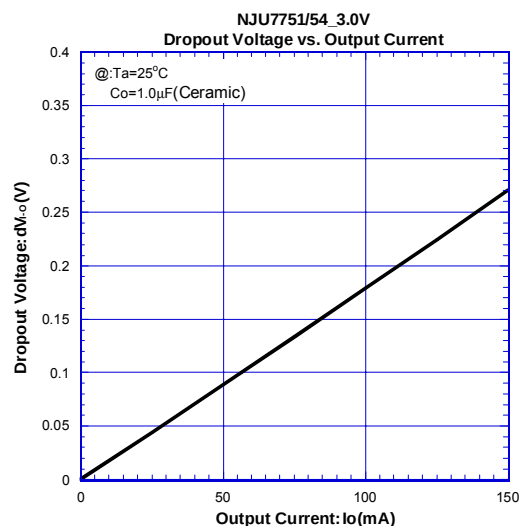
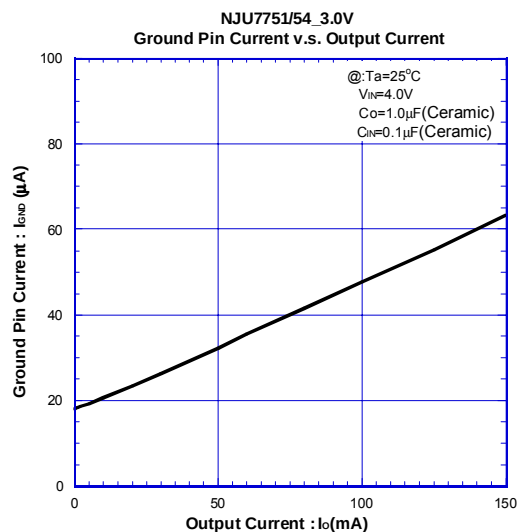
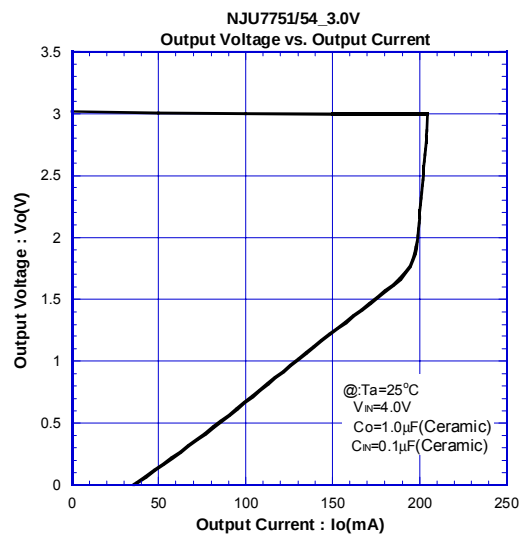
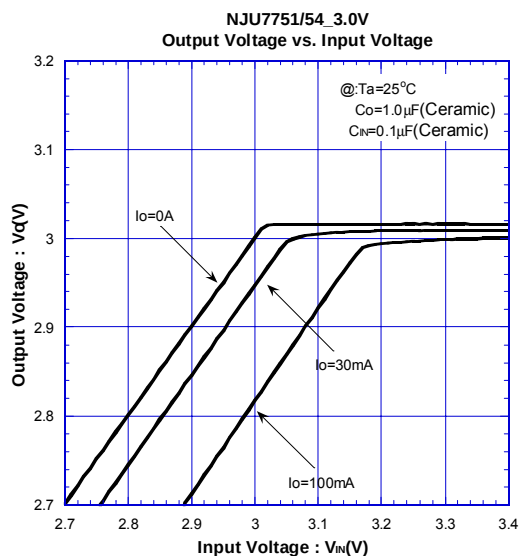
State of control terminal:

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

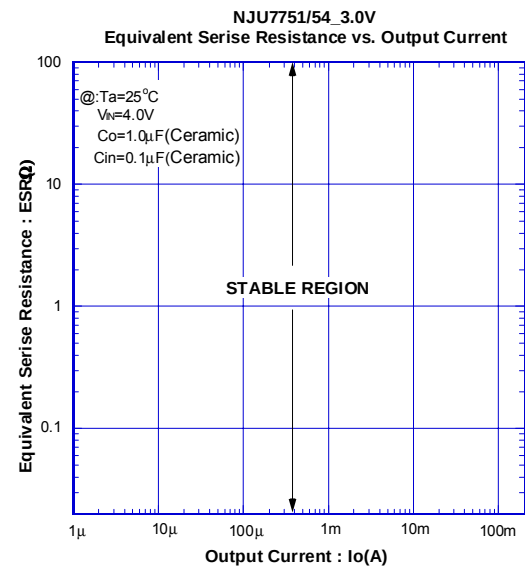
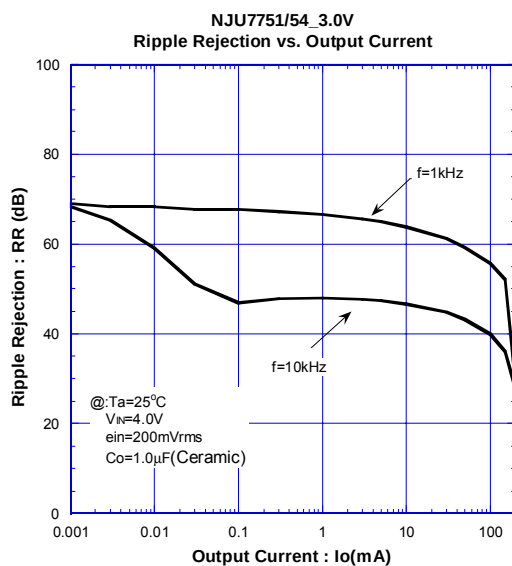
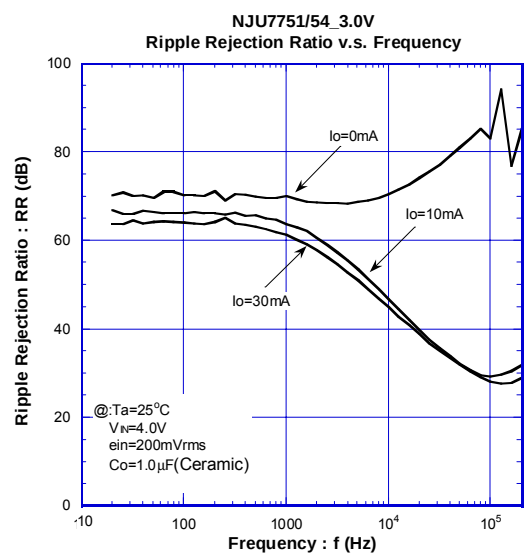
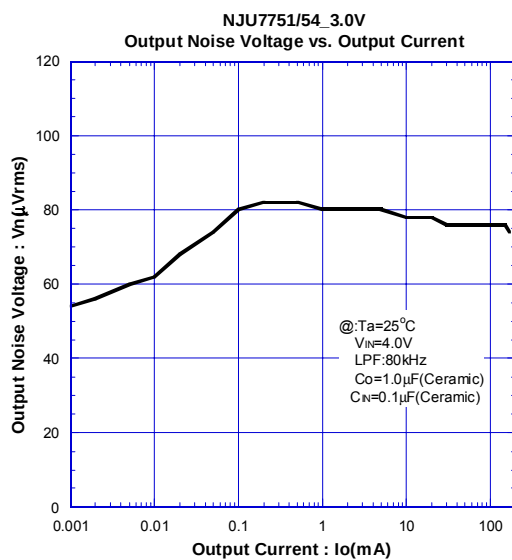
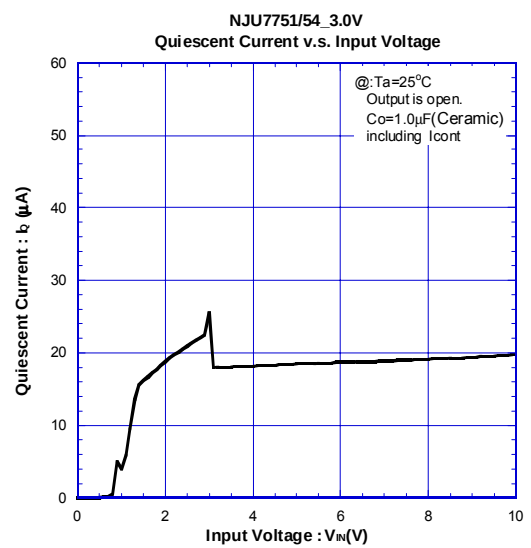
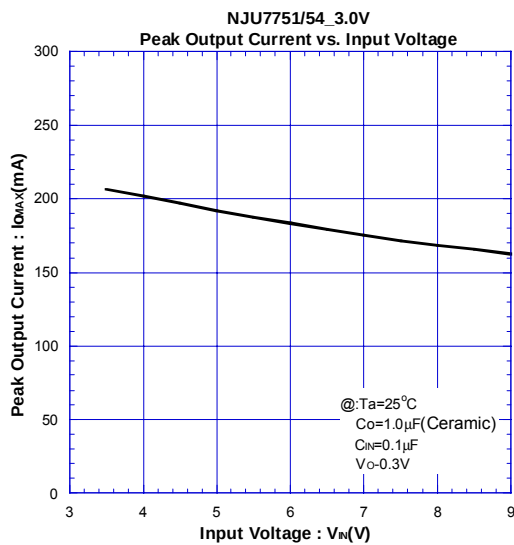
POWER DISSIPATION vs. AMBIENT TEMPERATURE



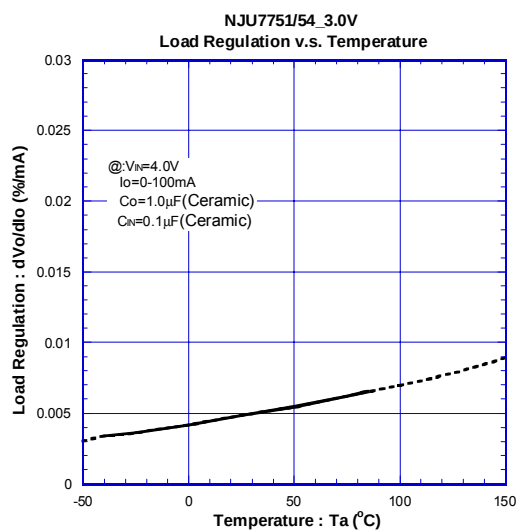
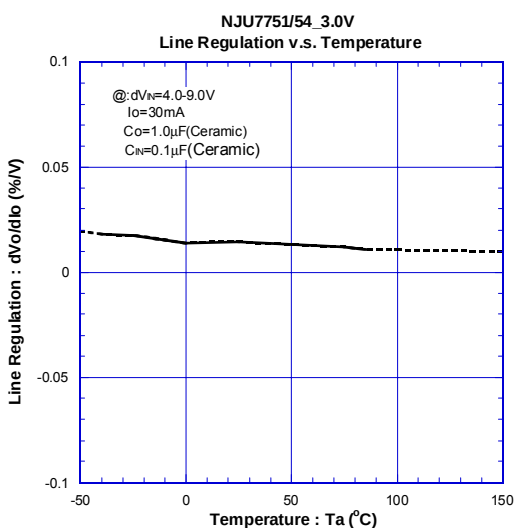
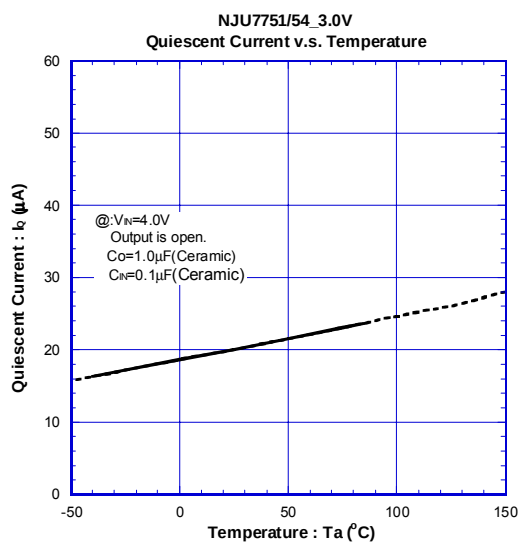
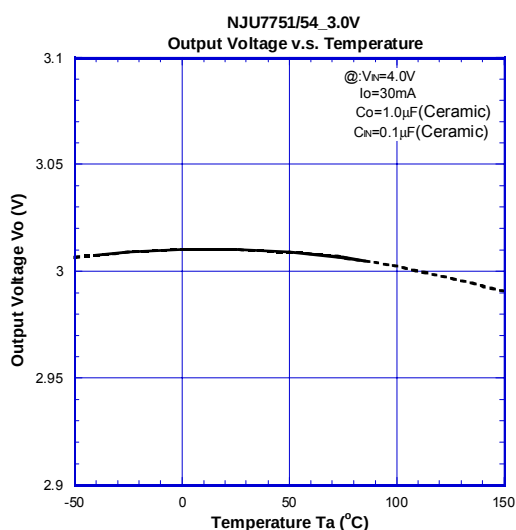
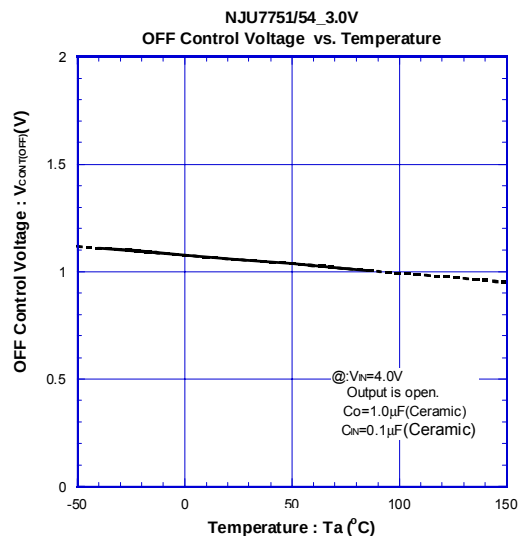
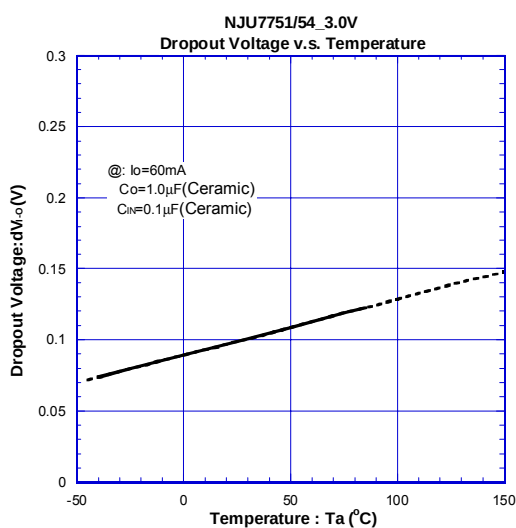
## ELECTRICAL CHARACTERISTICS



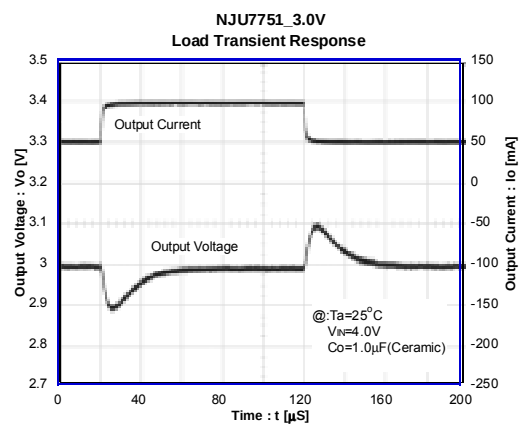
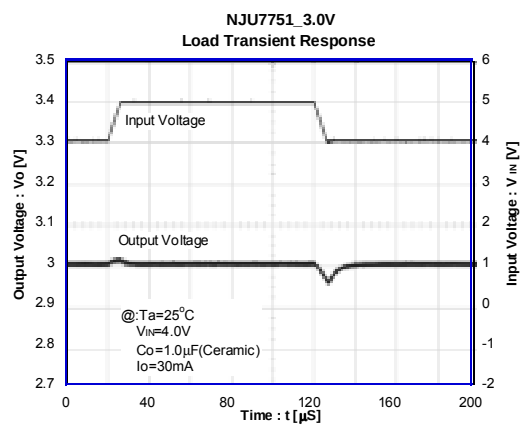
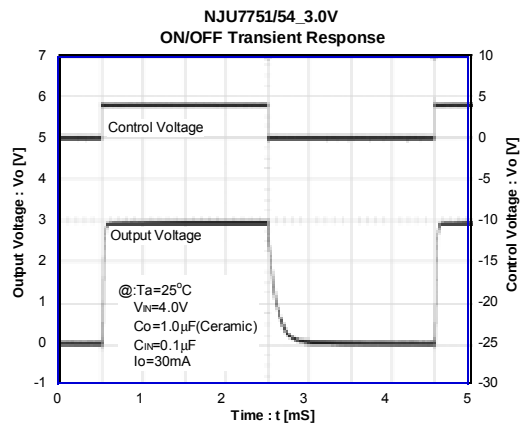
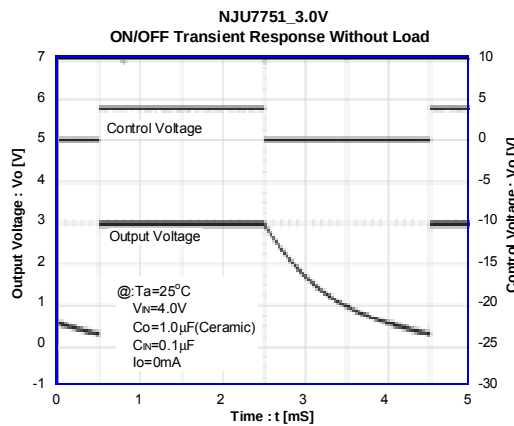
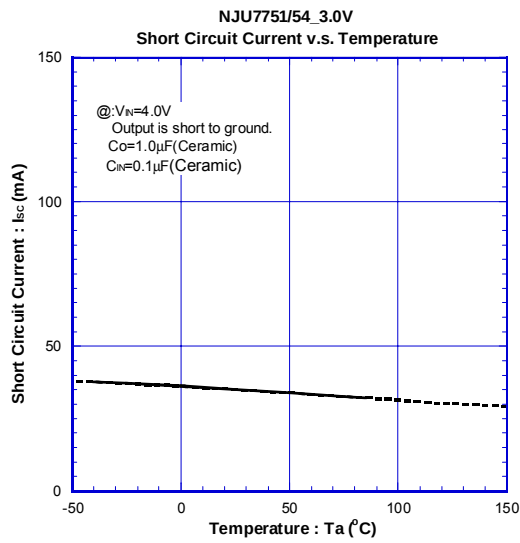
## ELECTRICAL CHARACTERISTICS



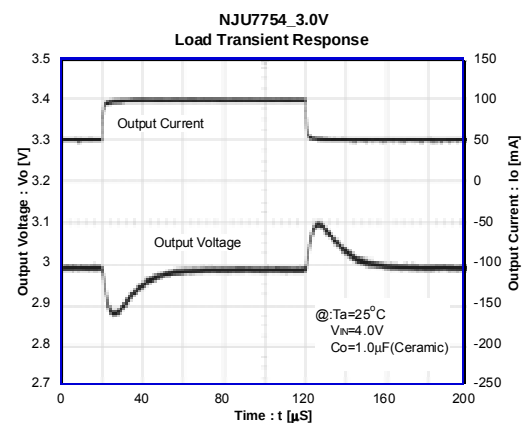
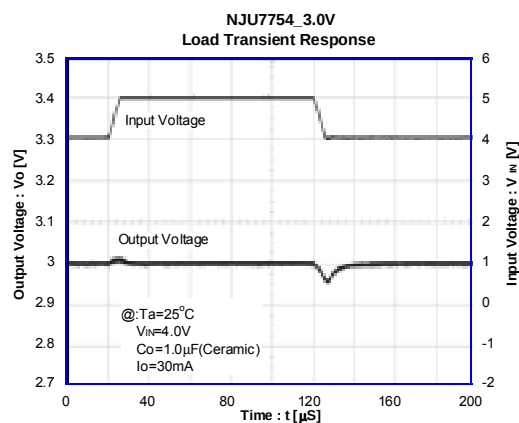
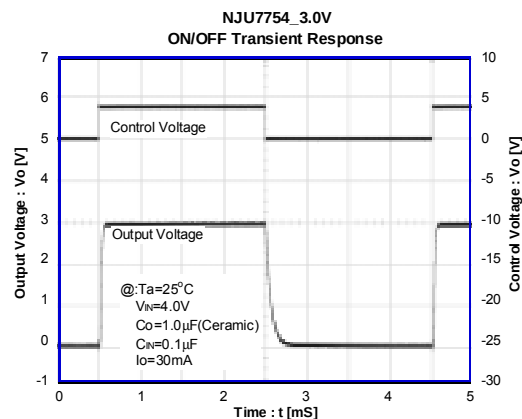
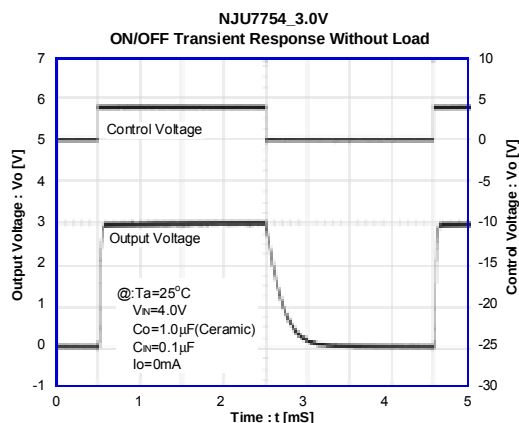
## ELECTRICAL CHARACTERISTICS



## ELECTRICAL CHARACTERISTICS



## ■ ELECTRICAL CHARACTERISTICS



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#### Как с нами связаться

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