

LOW DROPOUT VOLTAGE REGULATOR WITH ON/OFF CONTROL

■ GENERAL DESCRIPTION

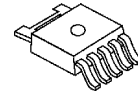
The NJM2386A is a general purpose low dropout voltage regulators with ON/OFF control.

The output current is up to 1.0A and dropout voltage is up 0.2V typical at 500mA load.

It features high maximum input voltage of 30V for a wide application range including TV, home appliance and power modules.

Compared with the NJM2386, Off control quiescent current is significantly reduces for current sensitive applications.

■ PACKAGE OUTLINE

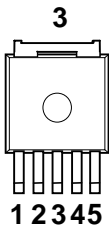


NJM2386ADL3

■ FEATURES

- High Maximum Input Voltage Up to 30V
- Low Dropout Voltage 0.2V typ. at $I_o=0.5A$
- Output Current $I_o(max.)=1.0A$
- ON/OFF Control (Active High)
- OFF Control Quiescent Current
- Internal Short Circuit Current Limit
- Internal Overvoltage Protection
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-5

■ PIN CONFIGURATION

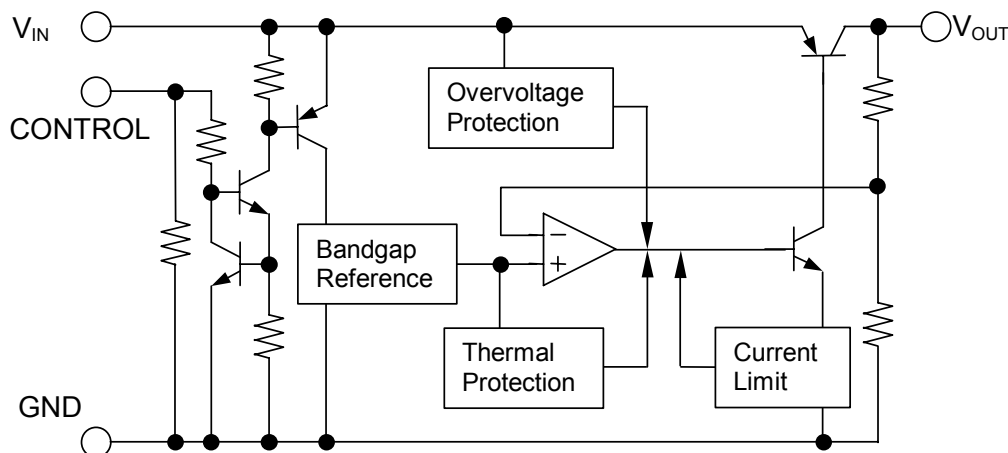


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PIN FUNCTION

1. V_{IN}
2. ON/OFF CONTROL
3. V_{OUT}
4. N.C.
5. GND

■ EQUIVALENT CIRCUIT



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■ OUTPUT VOLTAGE RANK LIST

| Device Name | V _{OUT} | Device Name | V _{OUT} |
|----------------|------------------|----------------|------------------|
| NJM2386ADL3-33 | 3.3V | NJM2386ADL3-10 | 10.0V |
| NJM2386ADL3-05 | 5.0V | NJM2386ADL3-12 | 12.0V |
| NJM2386ADL3-06 | 6.0V | | |
| NJM2386ADL3-08 | 8.0V | | |
| NJM2386ADL3-09 | 9.0V | | |

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|--------------------------------------|-------------------|--------------------------|------|
| Input Voltage | V _{IN} | +35 | V |
| Control Voltage | V _{CONT} | +35(*1) | V |
| Output Current | I _o | 1.0 | A |
| Power Dissipation | P _D | 10(Tc≤25°C) / 1(Ta≤25°C) | W |
| Operating Junction Temperature Range | T _j | -40 ~ +150 | °C |
| Operating Temperature Range | T _{opr} | -40 ~ +85 | °C |
| Storage Temperature Range | T _{stg} | -50 ~ +150 | °C |

(*1): When input voltage is less than +35V, the absolute maximum control voltage is equal to the input voltage.

■ ELECTRICAL CHARACTERISTICS (V_{IN}=V_O+1V, I_o=0.5A, C_{IN}=0.33μF, C_o=22μF, T_j=25°C)

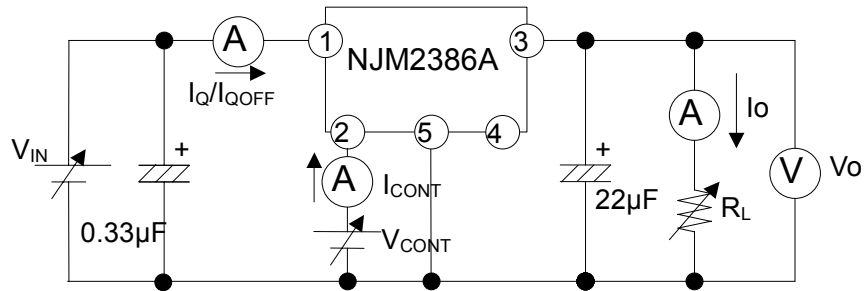
Measurement is conducted by pulse testing.

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|-----------------------------------|---|---------|--------|------|------|
| Input Voltage | V _{IN} | | - | - | 30 | V |
| Output Voltage | V _o | V _{IN} =V _O +1V | -2% | - | +2% | V |
| Line Regulation | ΔV _o /ΔV _{IN} | V _{IN} =V _O +1V ~ V _O +17V | - | 0.04 | 0.16 | %/V |
| Load Regulation | ΔV _o /ΔI _o | V _{IN} =V _O +2V, I _o =0A ~ 1.0A | - | 0.2 | 1.4 | %/A |
| Average Temperature Coefficient of Output Voltage | ΔV _o /ΔT | T _j =0 ~ +125°C | - | ± 0.02 | - | %/°C |
| Quiescent Current | I _Q | I _o =0A, V _{CONT} =2.7V Except I _{CONT} | - | - | 5 | mA |
| OFF Control Quiescent Current | I _{Q(OFF)} | V _{CONT} =0V | - | - | 1 | μA |
| Dropout Voltage | ΔV _{I-O} | I _o =0.5A | - | 0.2 | 0.5 | V |
| Ripple Rejection | NJM2386ADL3-33 | V _{IN} =V _O +2V, e _{in} =0.5Vrms, f=120Hz | 54 | 67 | - | dB |
| | NJM2386ADL3-05 | | 54 | 67 | - | |
| | NJM2386ADL3-06 | | 54 | 67 | - | |
| | NJM2386ADL3-08 | | 52 | 65 | - | |
| | NJM2386ADL3-09 | | 52 | 65 | - | |
| | NJM2386ADL3-10 | | 50 | 63 | - | |
| | NJM2386ADL3-12 | | 50 | 63 | - | |
| ON Control Voltage | V _{CONT(ON)} | | 2.0(*2) | | | |
| OFF Control Voltage | V _{CONT(OFF)} | | - | - | 0.4 | V |
| ON Control Current | I _{CONT(ON)} | V _C =2.7V | 10 | 30 | 50 | μA |
| OFF Control Current | I _{CONT(OFF)} | V _C =0.4V | 1 | 3 | 5 | μA |

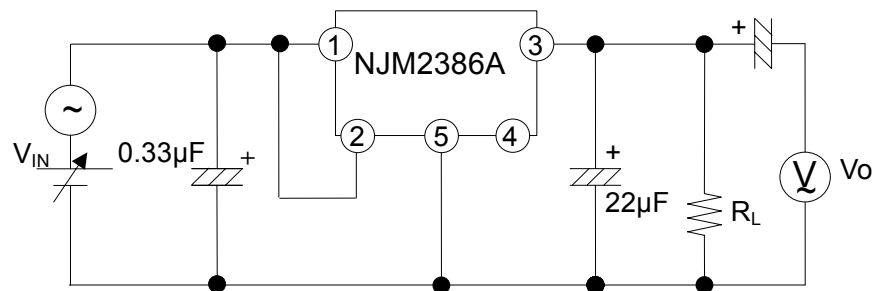
(*2): When ON/OFF CONTROL Terminal is open, Output Voltage is OFF.

TEST CIRCUIT

● Standard Test Circuit



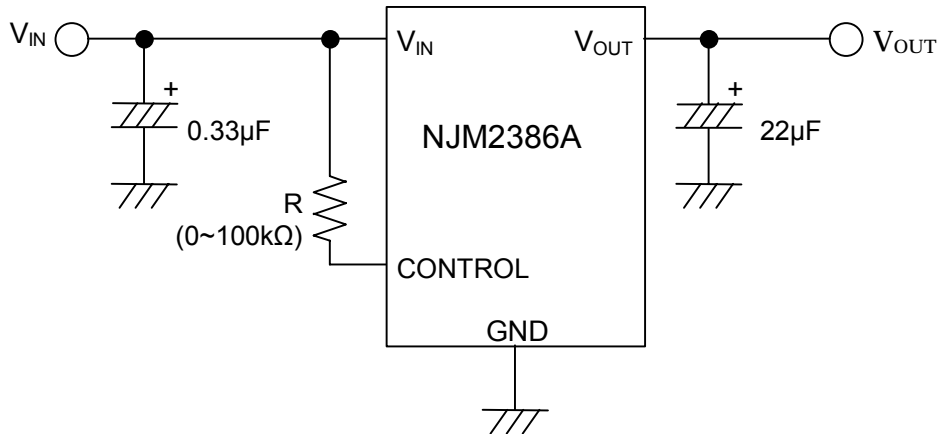
● Ripple Rejection Test Circuit



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■ TYPICAL APPLICATION

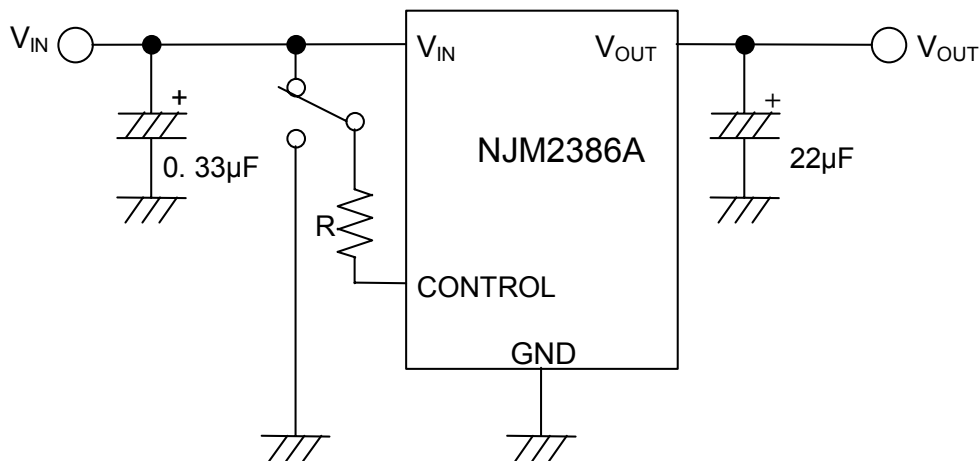
① In the case where ON/OFF Control is not required:



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".

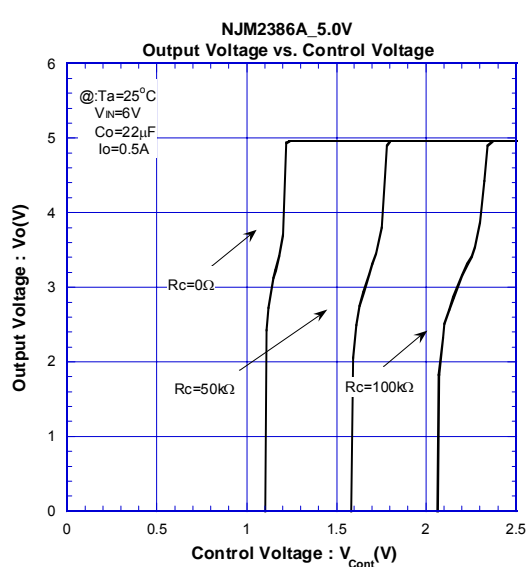
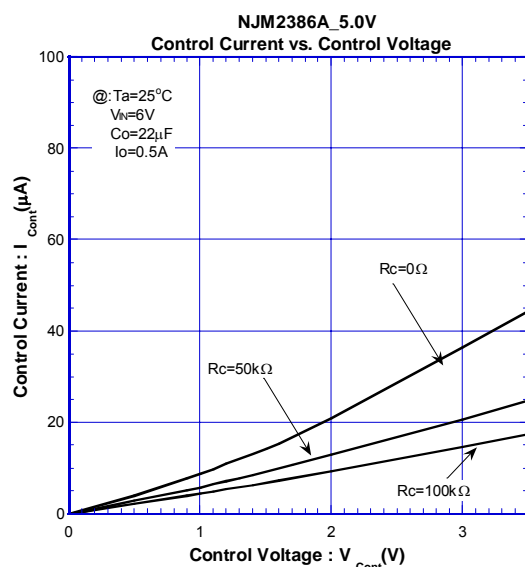
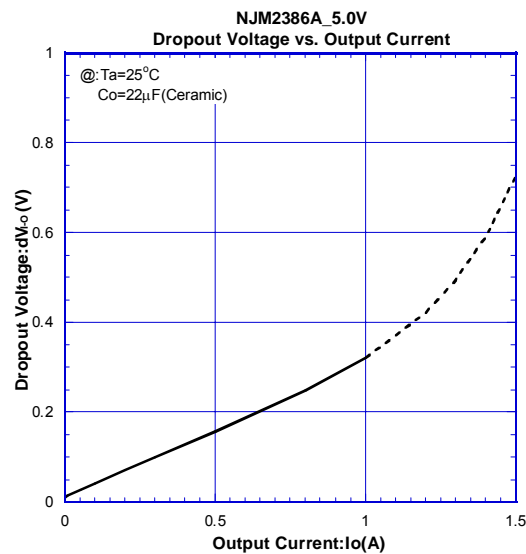
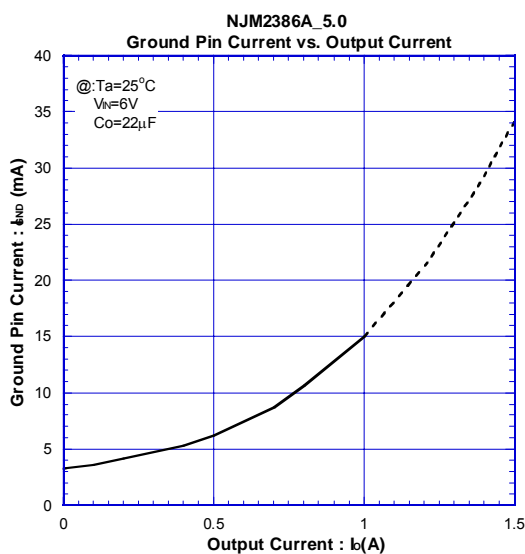
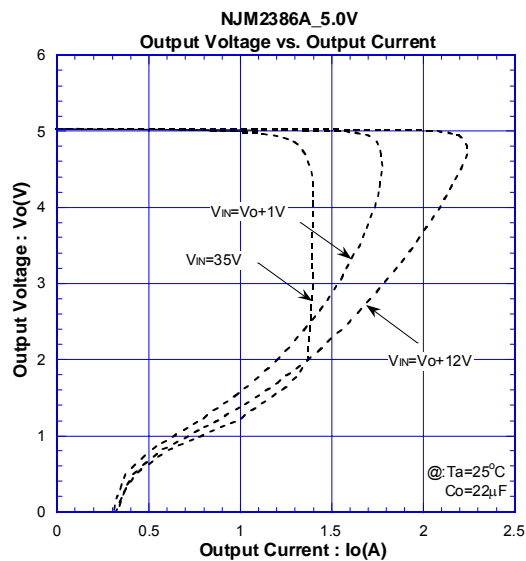
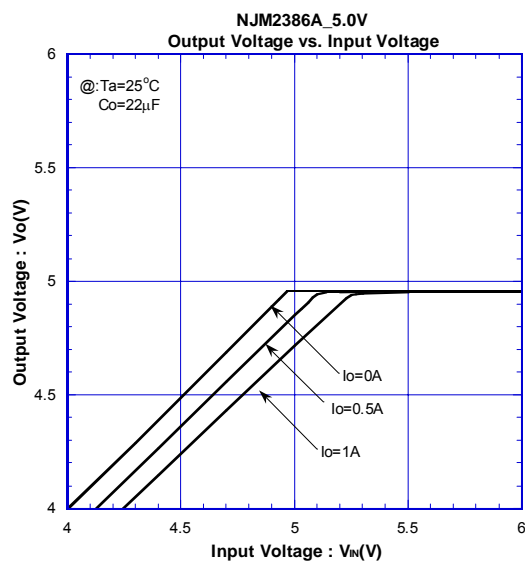
② In use of ON/OFF CONTROL:



State of control terminal:

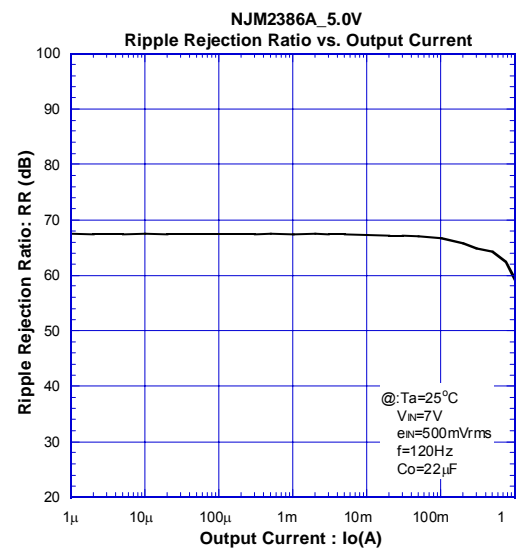
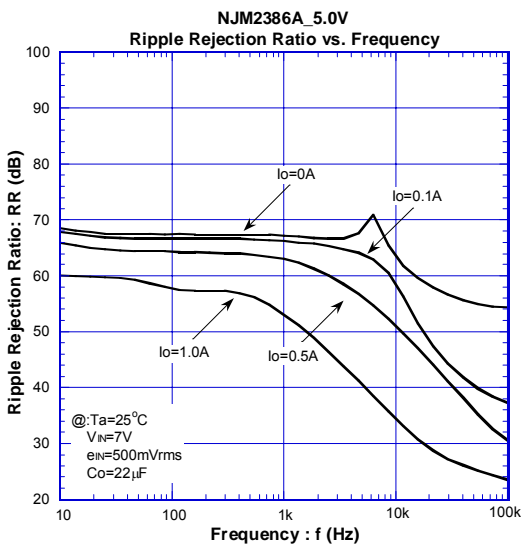
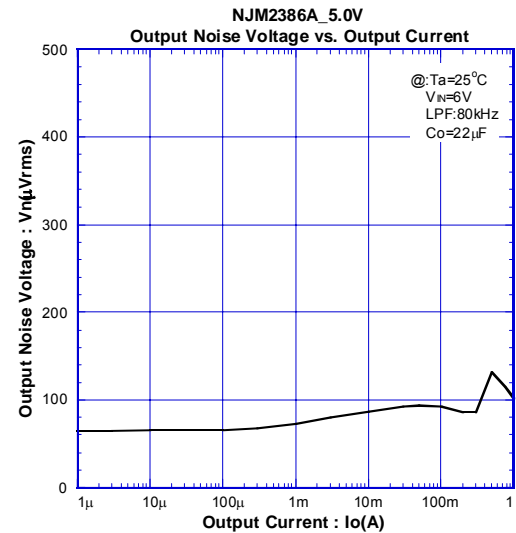
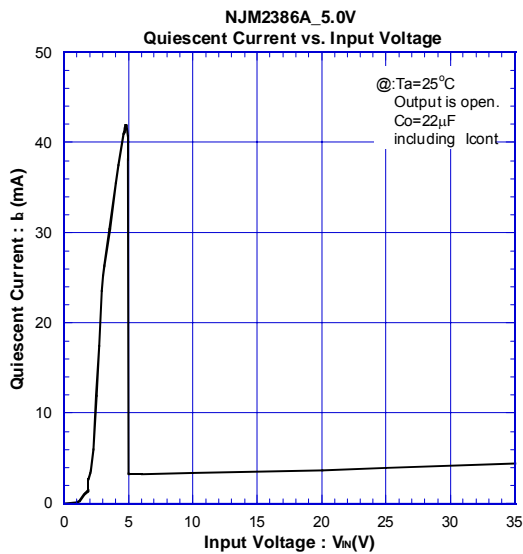
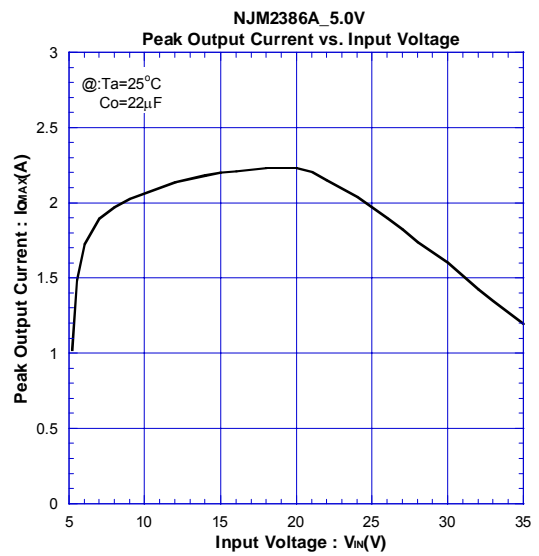
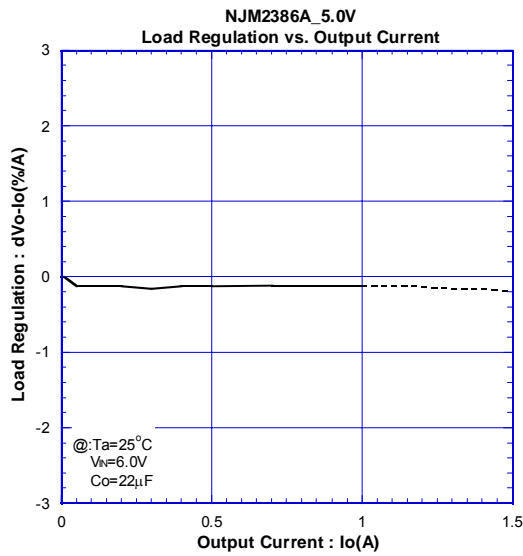
- "H" → output is enabled.
- "L" or "open" → output is disabled.

TYPICAL CHARACTERISTICS

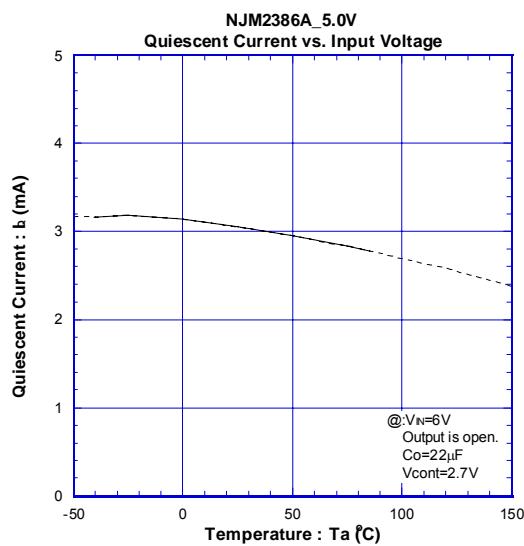
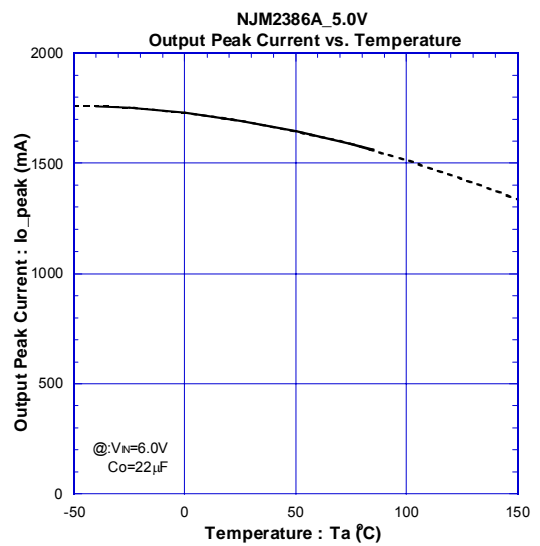
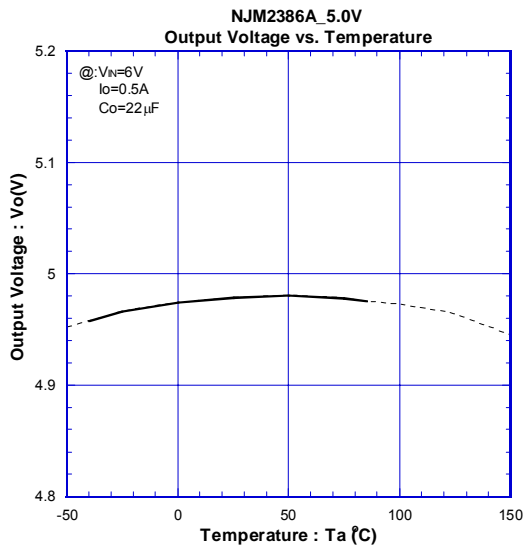
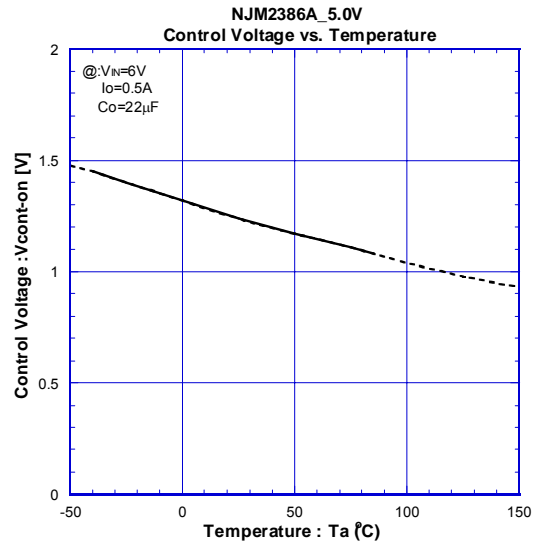
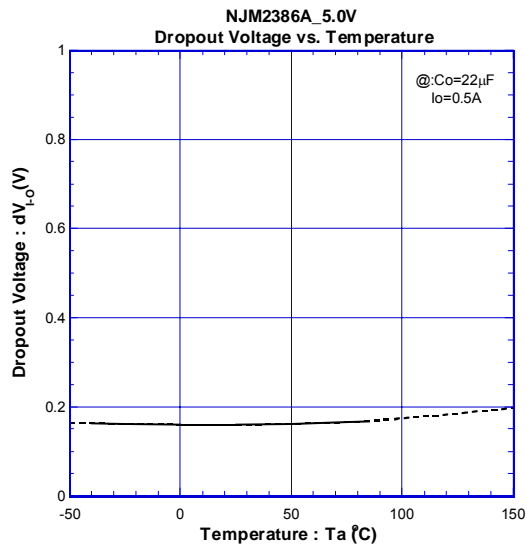


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TYPICAL CHARACTERISTICS

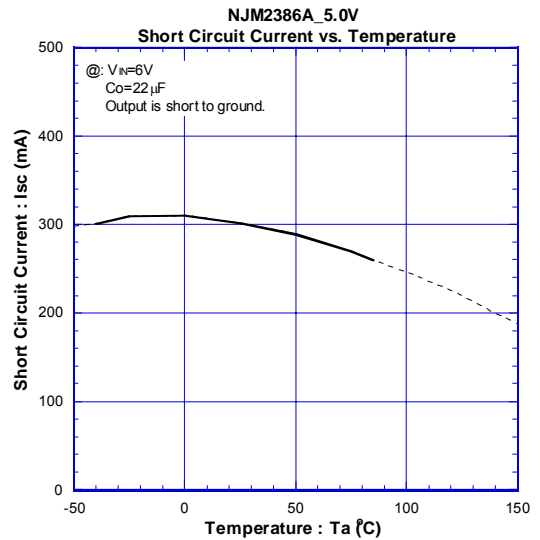
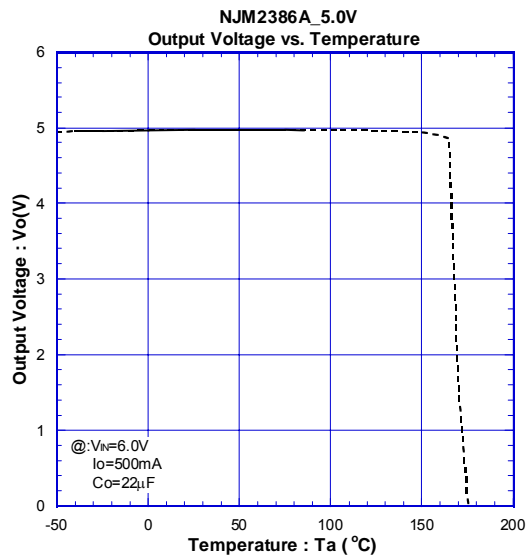
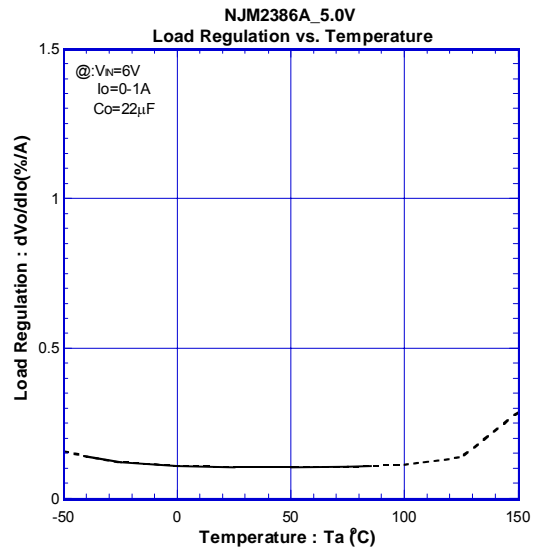
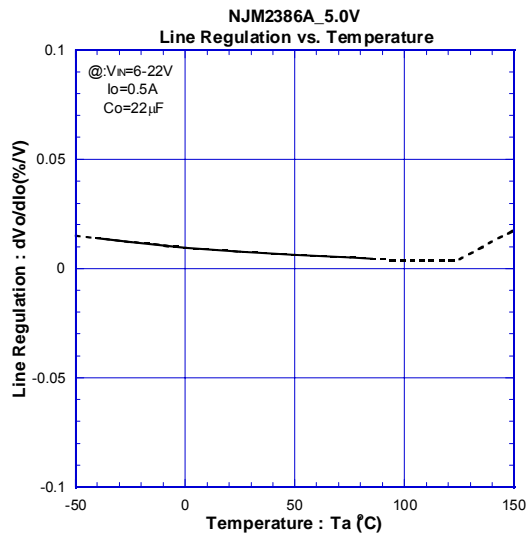


TYPICAL CHARACTERISTICS

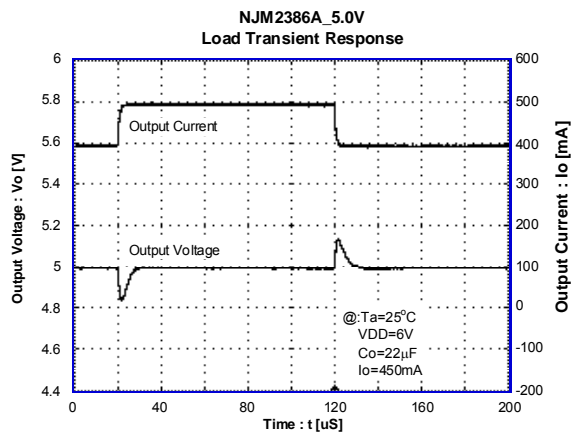
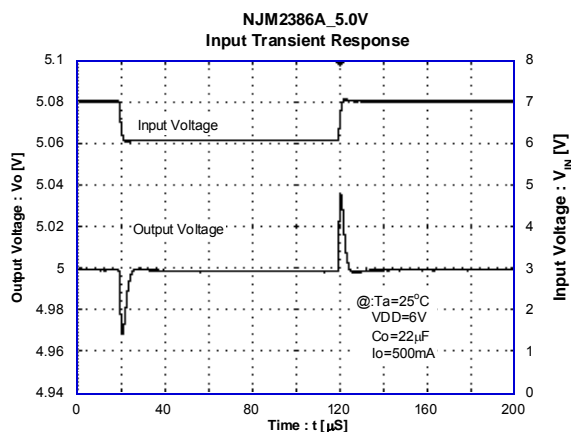
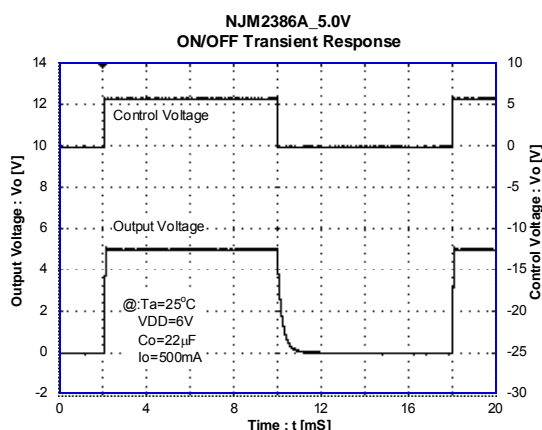
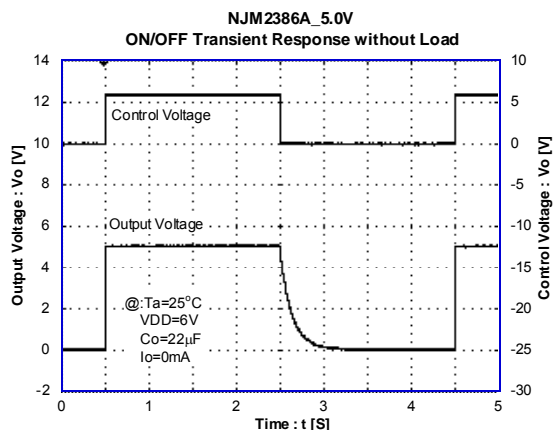


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TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



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