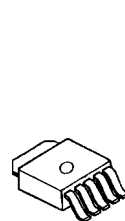


LOW DROPOUT VOLTAGE REGULATOR WITH ON/OFF CONTROL

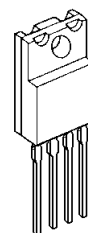
■ GENERAL DESCRIPTION

The NJM2388 is low dropout voltage regulator with ON/OFF control.
The output current is up to 1.0A and dropout voltage is 0.2V typ. at $I_o=0.5A$.
The NJM2388 is suitable for power module, TV, Display, car stereo and low power applications.

■ PACKAGE OUTLINE



NJM2386DL2

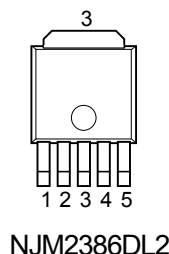


NJM2388F

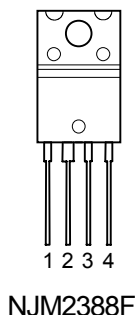
■ FEATURE

- Low Dropout Voltage 0.2V typ. at $I_o=0.5A$
- Output Current $I_o(max.)=1.0A$
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-5(NJM2386), TO-220F-4(NJM2388)

■ PIN CONFIGURATION

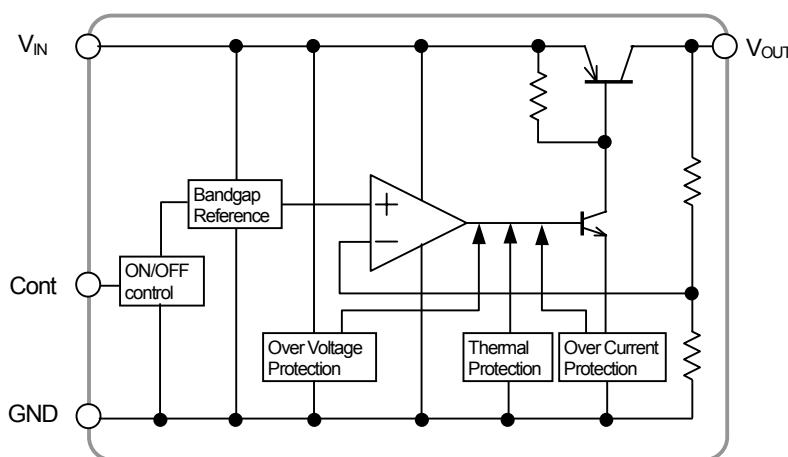


PIN FUNCTION
 1. V_{IN}
 2. ON/OFF CONTROL
 3. V_{OUT}
 4. N.C.
 5. GND



PIN FUNCTION
 1. V_{IN}
 2. V_{OUT}
 3. GND
 4. ON/OFF CONTROL

■ EQUIVALENT CIRCUIT



NJM2386/88

■ OUTPUT VOLTAGE RANK LIST

| Device Name | V _{OUT} |
|---------------|------------------|
| NJM2386DL2-33 | 3.3V |
| NJM2386DL2-05 | 5.0V |
| NJM2386DL2-63 | 6.3V |
| NJM2386DL2-08 | 8.0V |
| NJM2386DL2-09 | 9.0V |
| NJM2386DL2-12 | 12.0V |

| Device Name | V _{OUT} |
|-------------|------------------|
| NJM2388F33 | 3.3V |
| NJM2388F05 | 5.0V |
| NJM2388F63 | 6.3V |
| NJM2388F08 | 8.0V |
| NJM2388F84 | 8.4V |
| NJM2388F09 | 9.0V |
| NJM2388F12 | 12.0V |

■ 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 | NJM2386 | 10(Tc≤25°C) / 1(Ta≤25°C) | W |
| | | NJM2388 | 18(Tc≤50°C) | |
| 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, Ta=25°C)

Measurement is to be conducted is pulse testing.

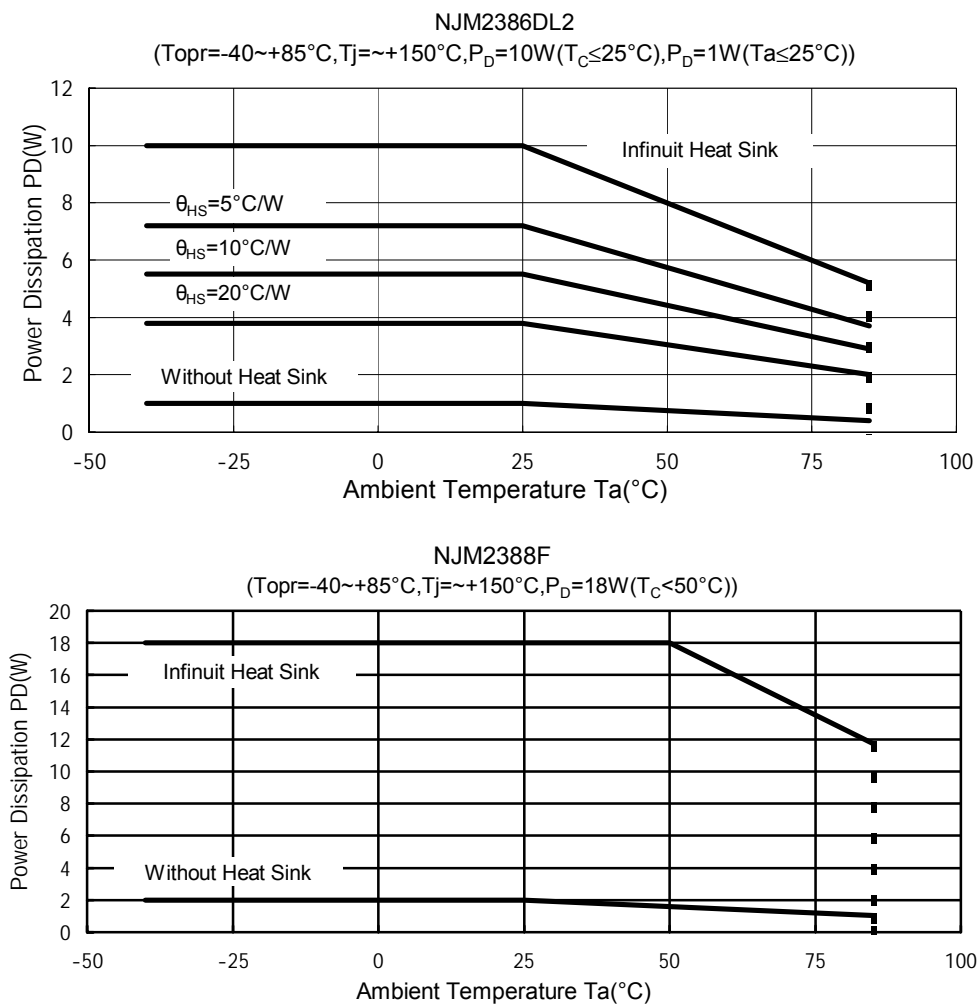
| PARAMETER | | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|------------|----------------------------------|---|---------|--------|------|------|
| Output Voltage | | V _O | V _{IN} =V _O +1V | -2% | - | +2% | V |
| Line Regulation | | ΔV _O -V _{IN} | V _{IN} =V _O +1V ~ V _O +17V | - | 0.04 | 0.16 | %/V |
| Load Regulation | | ΔV _O -I _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 | - | - | 5 | mA |
| Dropout Voltage | | ΔV _{I-O} | I _O =0.5A | - | 0.2 | 0.5 | V |
| Ripple Rejection | NJM238**33 | RR | V _{IN} =V _O +2V, e _{in} =0.5Vrms, f=120Hz | 54 | 67 | - | dB |
| | NJM238**05 | | | 54 | 67 | - | |
| | NJM238**63 | | | 54 | 67 | - | |
| | NJM238**08 | | | 52 | 65 | - | |
| | NJM238**84 | | | 52 | 65 | - | |
| | NJM238**09 | | | 52 | 65 | - | |
| | NJM238**12 | | | 50 | 63 | - | |
| ON Control Voltage | | V _{CONT(ON)} | | 2.0(*2) | - | - | V |
| OFF Control Voltage | | V _{CONT(OFF)} | | - | - | 0.4 | V |
| ON Control Current | | I _{CONT(ON)} | V _C =2.7V | - | - | 20 | μA |
| OFF Control Current | | I _{CONT(OFF)} | V _C =0.4V | - | - | -20 | μA |

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

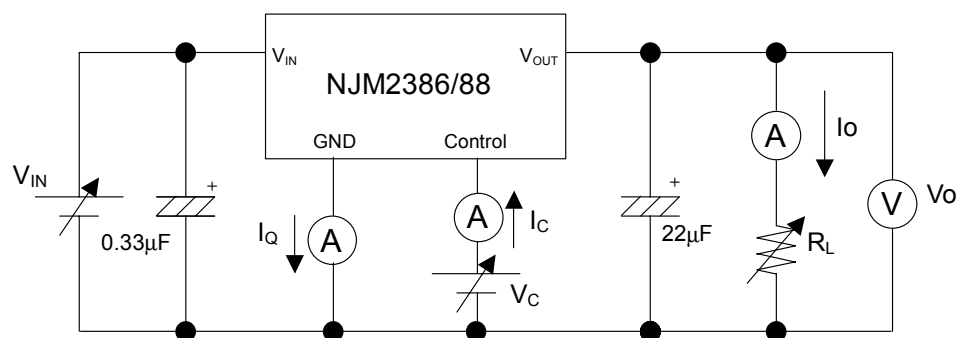
■ THERMAL CHARACTERISTICS

| | | | NJM2386 (TO-252-5) | NJM2388 (TO-220F-4) | °C/W |
|--------------------|---------------------------------|---------------|-----------------------|------------------------|------|
| Thermal Resistance | Junction-to-Ambient Temperature | θ_{ja} | 125 | 60 | |
| | Junction to case | θ_{jc} | 12.5 | 5 | |

■ POWER DISSIPATION vs. AMBIENT TEMPERATURE



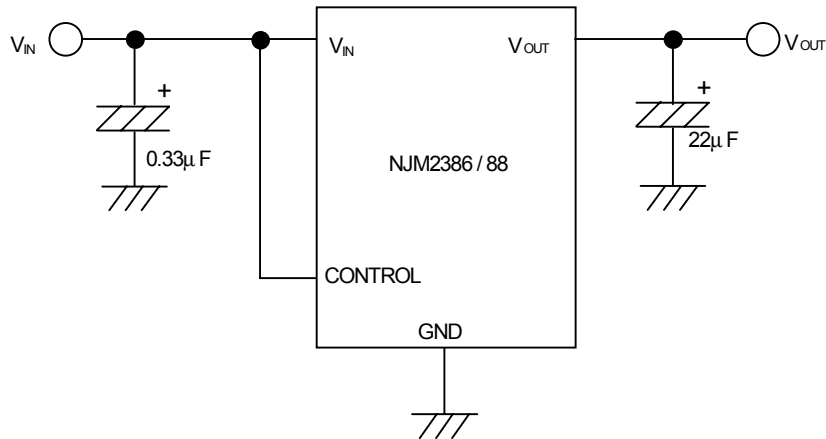
■ TEST CIRCUIT



NJM2386/88

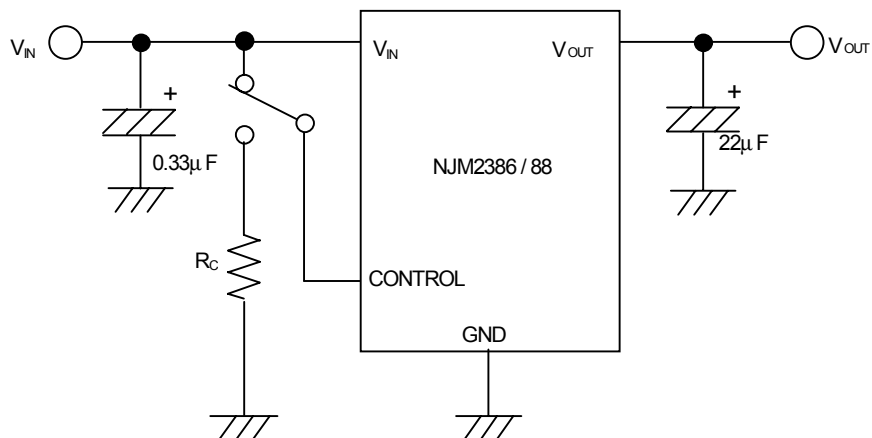
■ TYPICAL APPLICATION

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



Connect control terminal to V_{IN} terminal or open.

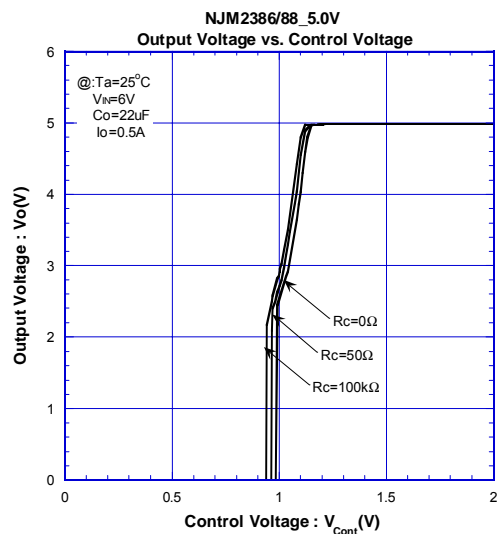
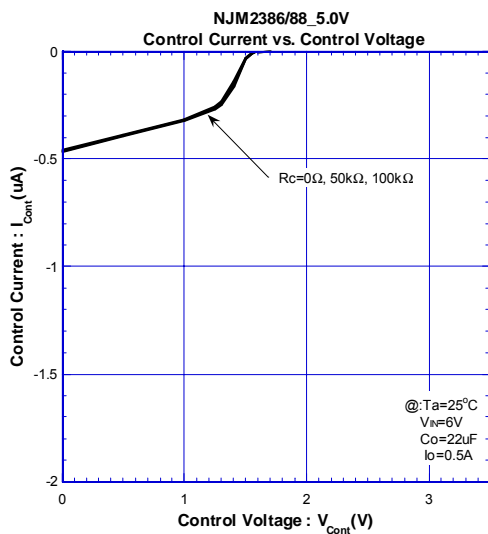
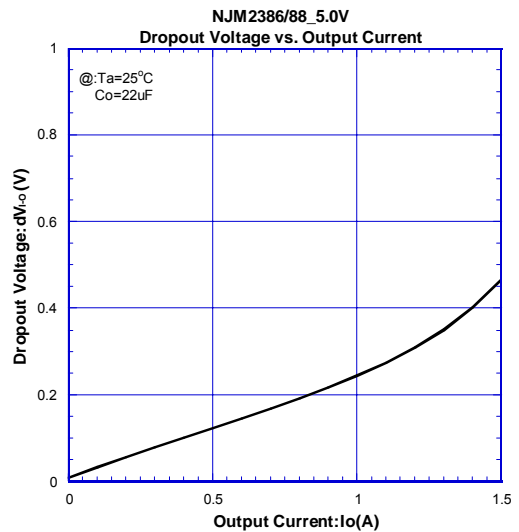
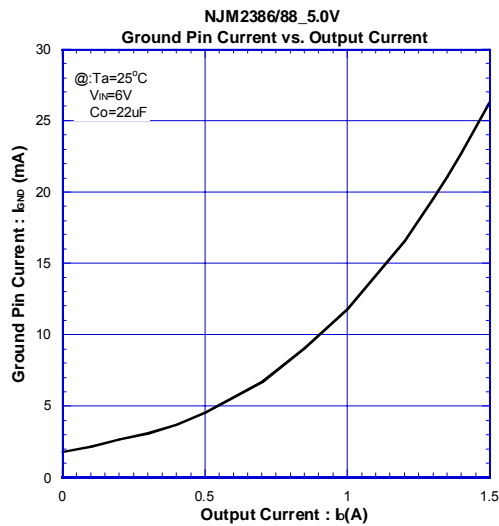
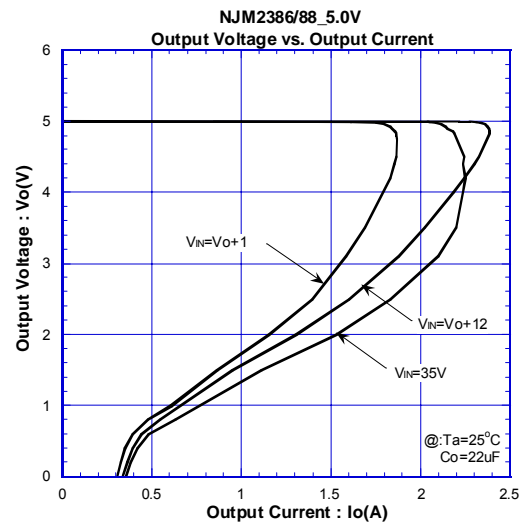
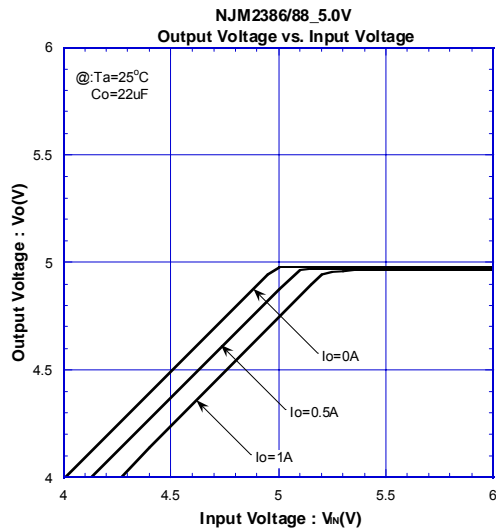
② In use of ON/OFF CONTROL:



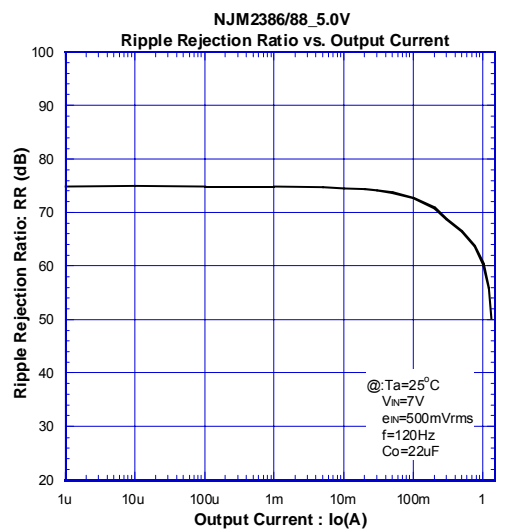
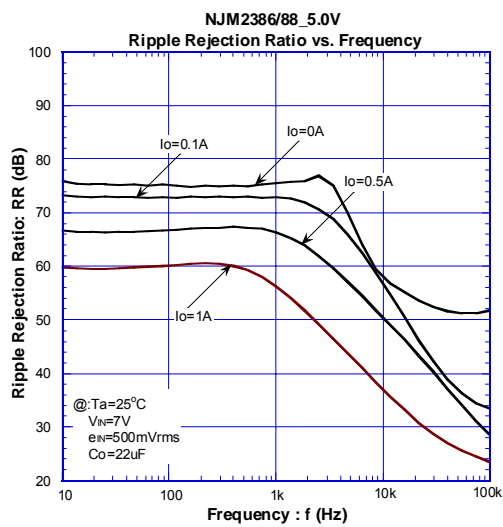
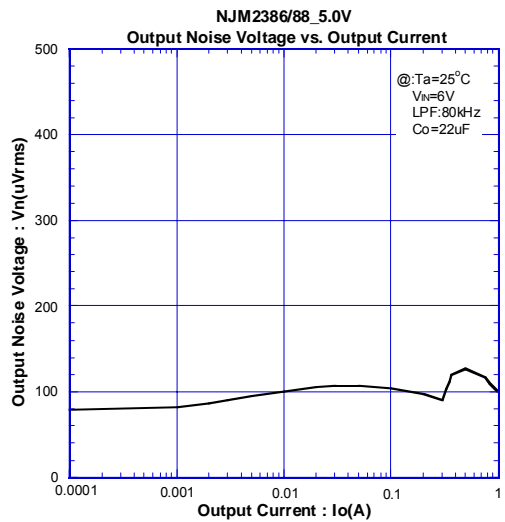
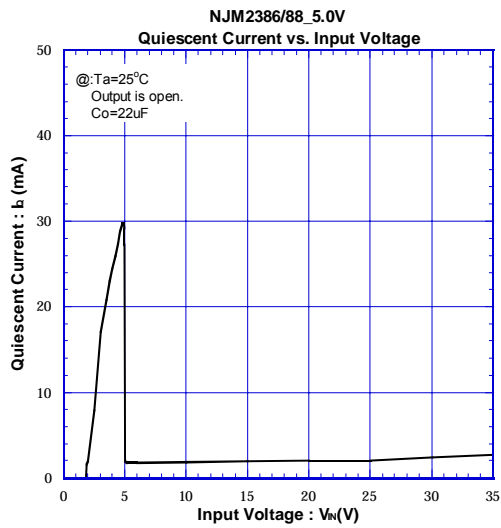
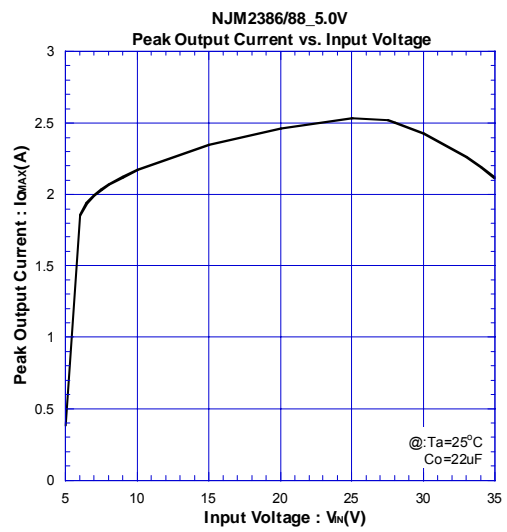
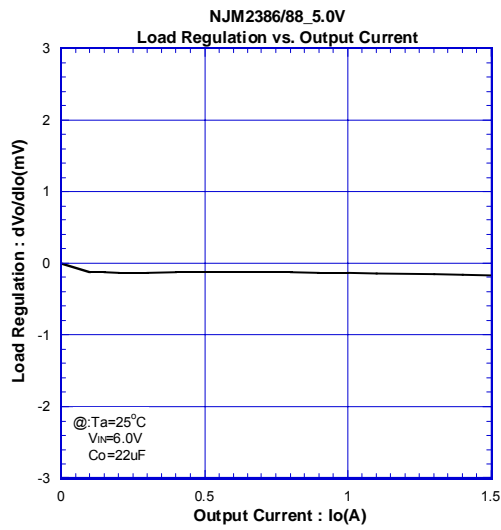
State of control terminal:

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

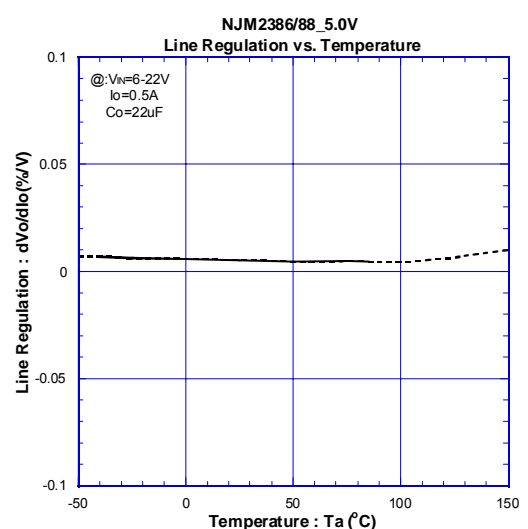
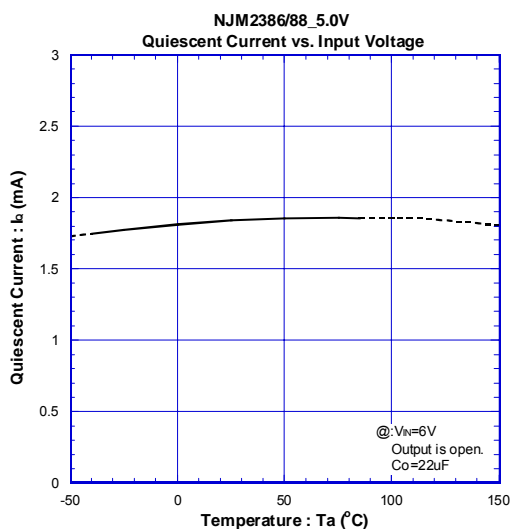
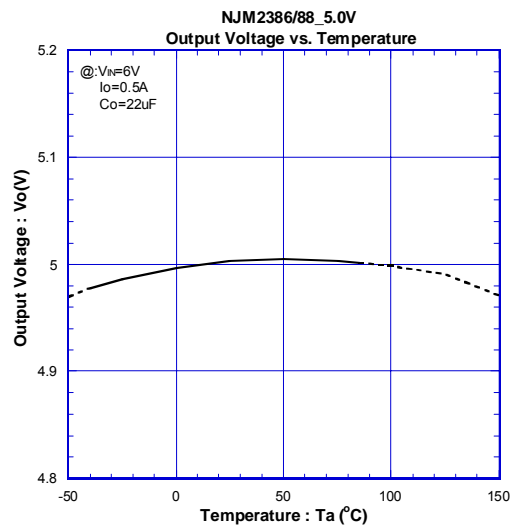
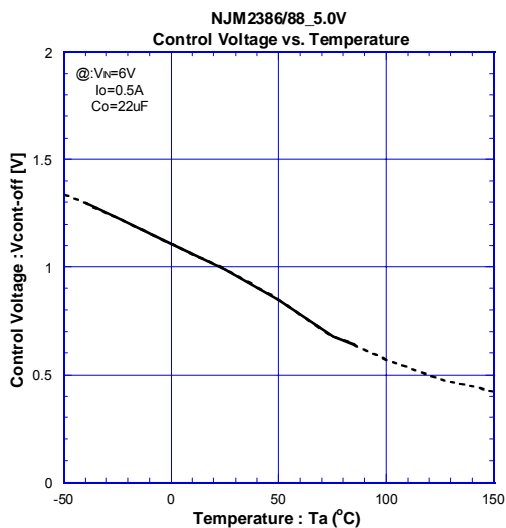
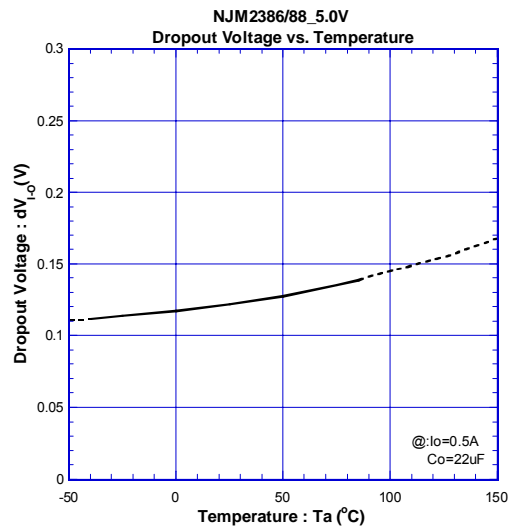
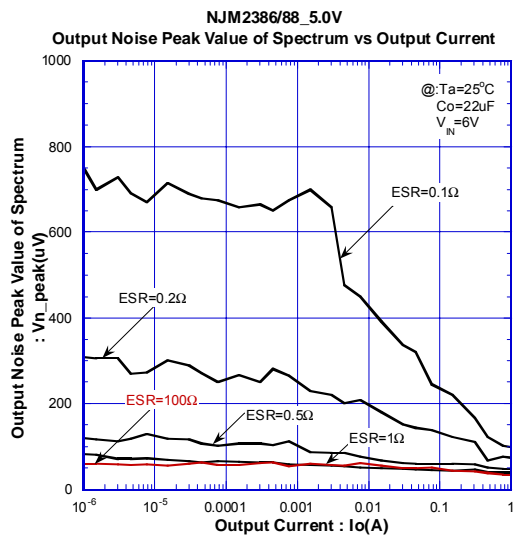
■ TYPICAL CHARACTERISTICS



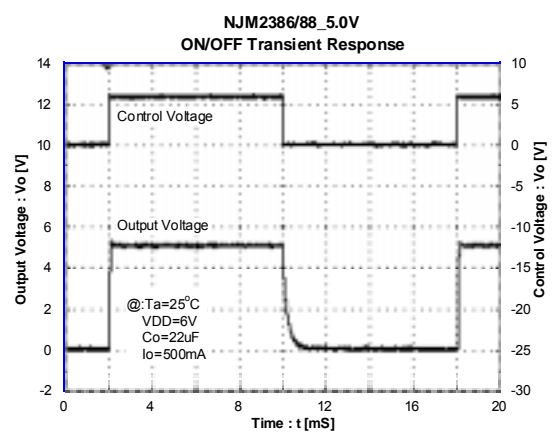
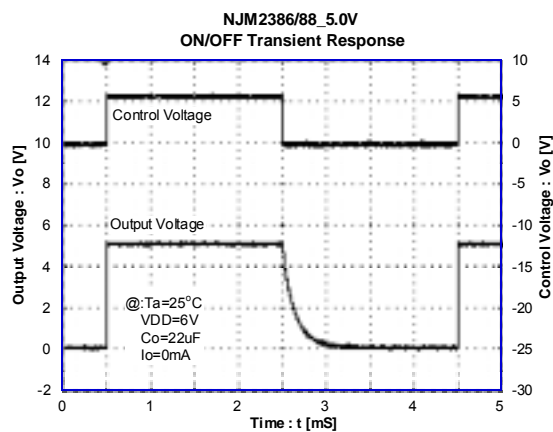
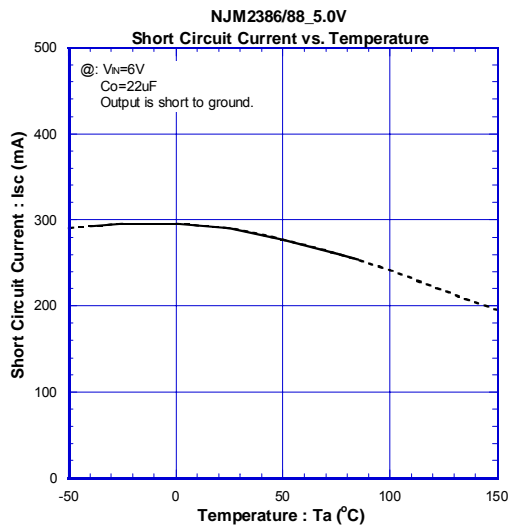
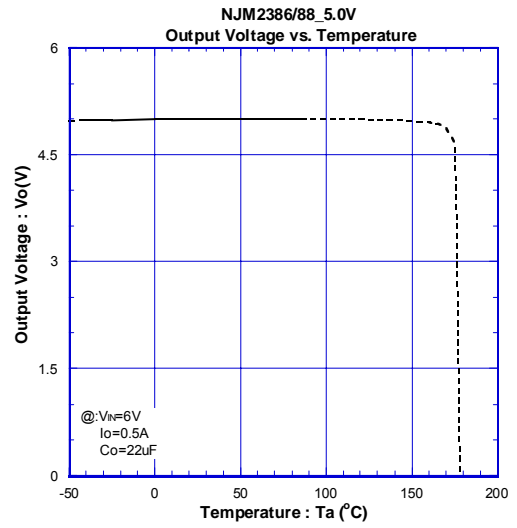
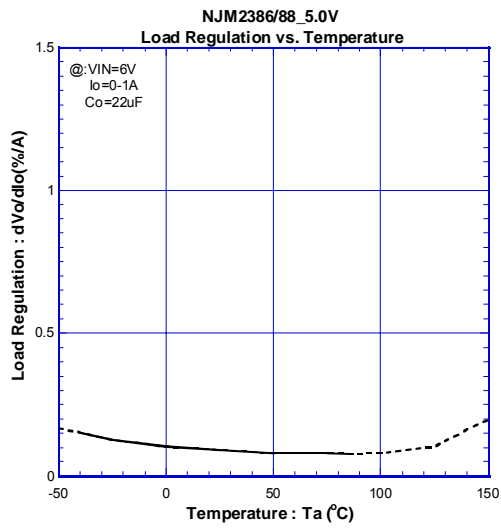
TYPICAL CHARACTERISTICS



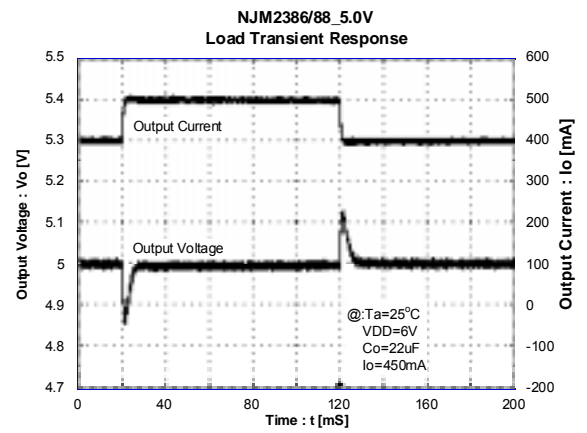
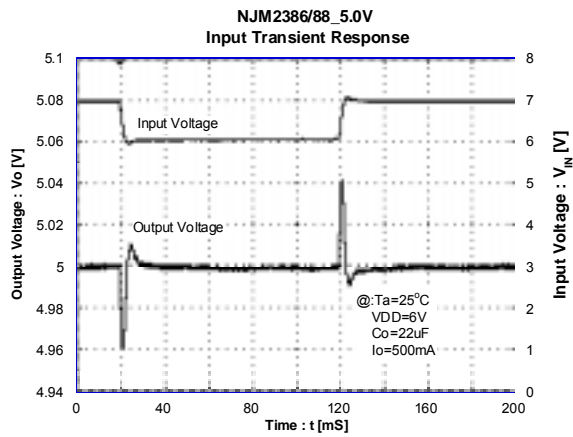
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



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