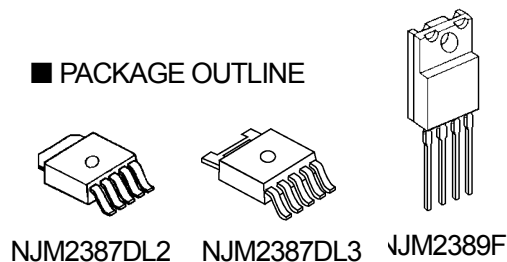


## ADJUSTABLE LOW DROPOUT VOLTAGE REGULATOR

### ■ GENERAL DESCRIPTION

The NJM2387/89 are adjustable low dropout voltage regulators .  
 The output current is up to 1.0A and dropout voltage is 0.2V typ. at  $I_o=0.5A$ . NJM2387 has ON/OFF control circuit and enable to reduce quiescent current.  
 The NJM2387/89 is suitable for power module, TV, Display, car stereo and low power applications.

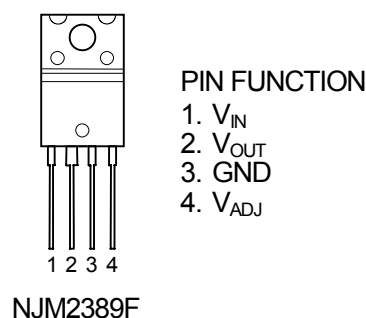
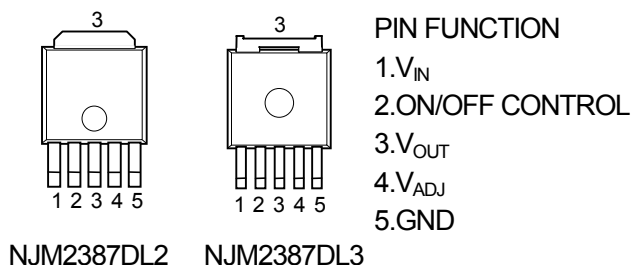
### ■ PACKAGE OUTLINE



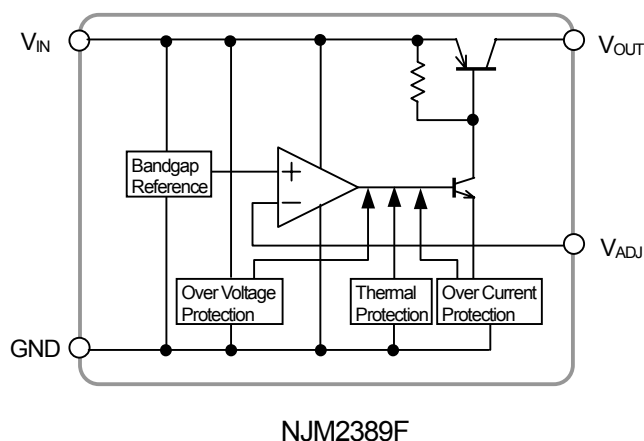
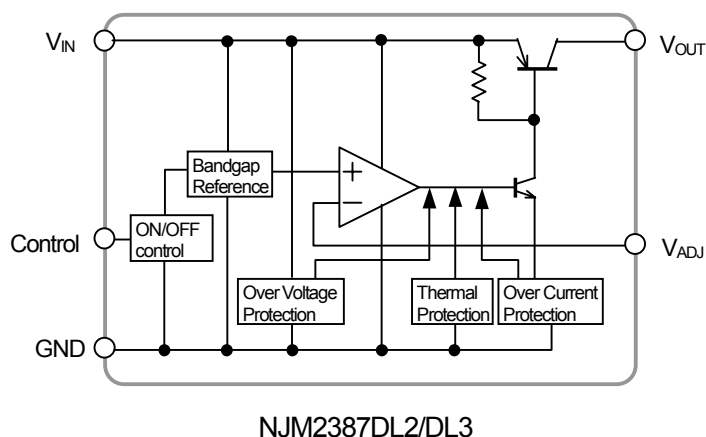
### ■ FEATURE

- Low Dropout Voltage       $\Delta V_{I-O}=0.2V$  typ. at  $I_o=0.5A$
- Output Current               $I_o(max.)=1.0A$
- Reference Voltage           $V_{ref}=1.26V \pm 2\%$
- ON/OFF Control              (Active High : Only NJM2387)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline              TO-252-5(NJM2387), TO-220F-4(NJM2389)

### ■ PIN CONFIGURATION



### ■ EQUIVALENT CIRCUIT



# NJM2387/89

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER                            | SYMBOL            | RATINGS    |                                                    | UNIT |
|--------------------------------------|-------------------|------------|----------------------------------------------------|------|
| Input Voltage                        | V <sub>IN</sub>   | +35        |                                                    | V    |
| Control Voltage                      | V <sub>CONT</sub> | +35(*1)    |                                                    | V    |
| Adjust Terminal Voltage              | V <sub>ADJ</sub>  | +6         |                                                    | V    |
| Output Current                       | I <sub>O</sub>    | 1.0        |                                                    | A    |
| Power Dissipation                    | P <sub>D</sub>    | NJM2387    | 10(T <sub>C</sub> ≤25°C) / 1(T <sub>a</sub> ≤25°C) | W    |
|                                      |                   | NJM2389    | 18(T <sub>C</sub> <50°C)                           |      |
| Operating Junction Temperature Range | T <sub>J</sub>    | -40 ~ +150 |                                                    | °C   |
| Operating Temperature Range          | T <sub>opr</sub>  | -40 ~ +85  |                                                    | °C   |
| Storage Temperature Range            | T <sub>stg</sub>  | -50 ~ +150 |                                                    | °C   |

(\*1): This applies for NJM2387. When input voltage is less than +35V, the absolute maximum control voltage is equal to the input voltage.

## ■ NJM2387

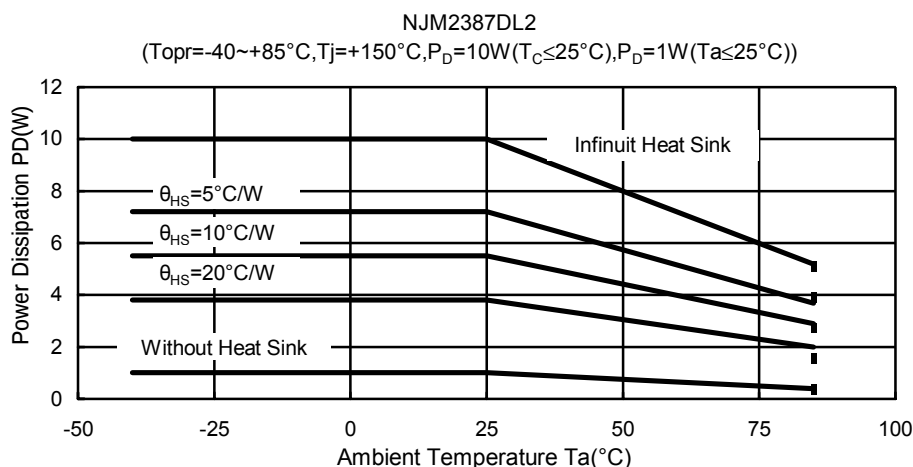
## ■ ELECTRICAL CHARACTERISTICS (V<sub>IN</sub>=15V, V<sub>O</sub>=10V, I<sub>O</sub>=0.5A, R<sub>1</sub>=1kΩ, C<sub>IN</sub>=0.33μF, C<sub>O</sub>=22μF, Ta=25°C)

Measurement is to be conducted is pulse testing.

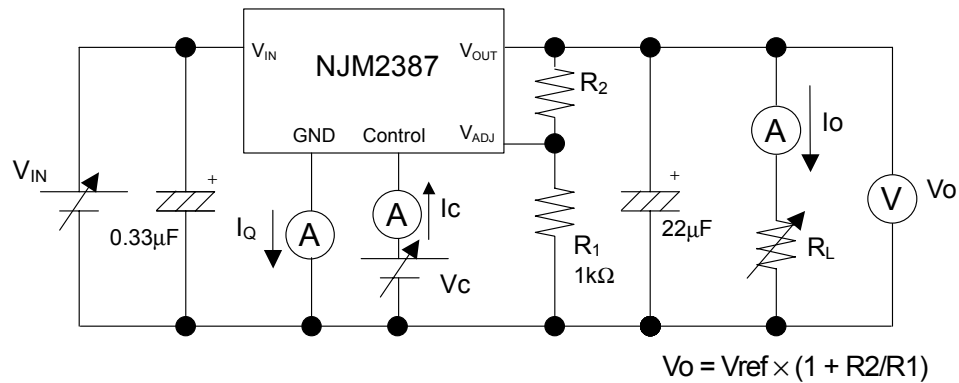
| PARAMETER                                         | SYMBOL                            | CONDITIONS                                                                                         | MIN.    | TYP.  | MAX.  | UNIT |
|---------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------|---------|-------|-------|------|
| Input Voltage                                     | V <sub>IN</sub>                   | -                                                                                                  | 3.8     | -     | 35    | V    |
| Output Voltage                                    | V <sub>OUT</sub>                  | -                                                                                                  | 1.5     | -     | 20    | V    |
| Reference Voltage                                 | V <sub>ref</sub>                  | -                                                                                                  | 1.235   | 1.26  | 1.285 | V    |
| Line Regulation                                   | ΔV <sub>O</sub> /ΔV <sub>IN</sub> | V <sub>IN</sub> =V <sub>O</sub> +1V ~ V <sub>O</sub> +17V                                          | -       | 0.04  | 0.16  | %/V  |
| Load Regulation                                   | ΔV <sub>O</sub> /ΔI <sub>O</sub>  | V <sub>IN</sub> =V <sub>O</sub> +2V, I <sub>O</sub> =0A ~ 1.0A                                     | -       | 0.2   | 1.4   | %/A  |
| Average Temperature Coefficient of Output Voltage | ΔV <sub>O</sub> /ΔT               | T <sub>J</sub> =0 ~ +125°C                                                                         | -       | ±0.02 | -     | %/°C |
| Quiescent Current                                 | I <sub>Q</sub>                    | I <sub>O</sub> =0A                                                                                 | -       | -     | 5     | mA   |
| Dropout Voltage                                   | ΔV <sub>LO</sub>                  | I <sub>O</sub> =0.5A                                                                               | -       | 0.2   | 0.5   | V    |
| Ripple Rejection                                  | RR                                | V <sub>in</sub> =V <sub>O</sub> +2V, e <sub>in</sub> =0.5Vrms<br>e <sub>in</sub> =0.5Vrms, f=120Hz | 52      | 65    | -     | dB   |
| ON Control Voltage                                | V <sub>CONT(ON)</sub>             |                                                                                                    | 2.0(*2) | -     | -     | V    |
| OFF Control Voltage                               | V <sub>CONT(OFF)</sub>            |                                                                                                    | -       | -     | 0.4   | V    |
| ON Control Current                                | I <sub>CONT(ON)</sub>             | V <sub>C</sub> =2.7V                                                                               | -       | -     | 20    | μA   |
| OFF Control Current                               | I <sub>CONT(OFF)</sub>            | V <sub>C</sub> =0.4V                                                                               | -       | -     | -20   | μA   |

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

## ■ POWER DISSIPATION vs. AMBIENT TEMPERATURE

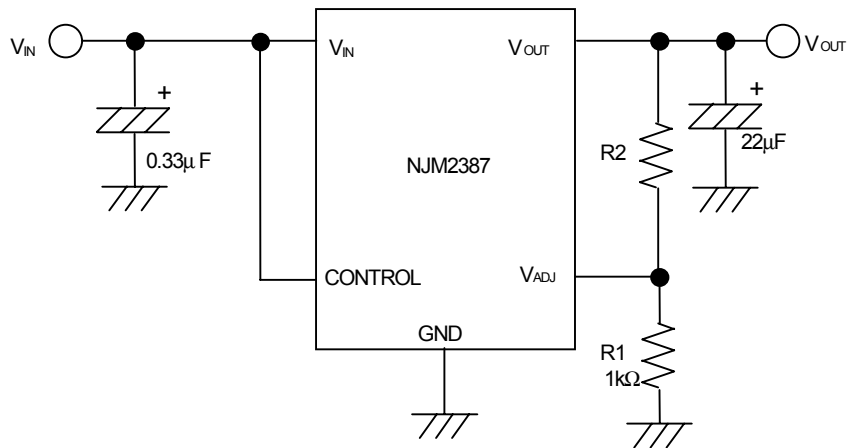


## ■ TEST CIRCUIT



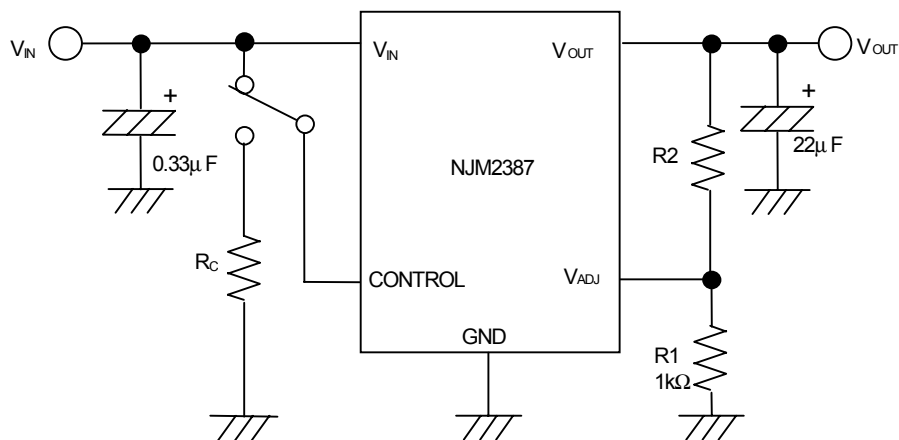
## ■ TYPICAL APPLICATION

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.

# NJM2387/89

## ■ NJM2389

### ■ ELECTRICAL CHARACTERISTICS ( $V_{IN}=15V$ , $V_O=10V$ , $I_O=0.5A$ , $R_1=1k\Omega$ , $C_{IN}=0.33\mu F$ , $C_O=22\mu F$ , $T_a=25^\circ C$ )

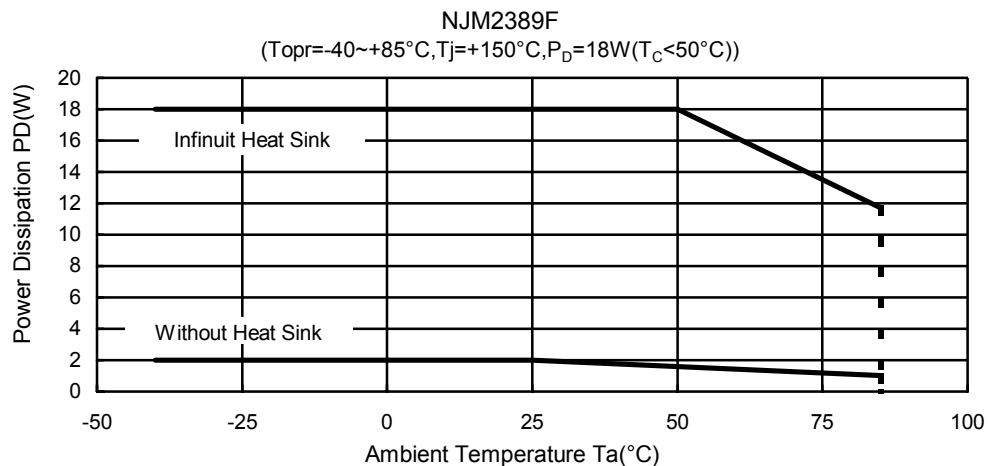
Measurement is to be conducted is pulse testing.

| PARAMETER                                         | SYMBOL                     | CONDITIONS                                                               | MIN.  | TYP.       | MAX.  | UNIT |
|---------------------------------------------------|----------------------------|--------------------------------------------------------------------------|-------|------------|-------|------|
| Input Voltage                                     | $V_{IN}$                   | -                                                                        | 3.8   | -          | 35    | V    |
| Output Voltage                                    | $V_{OUT}$                  | -                                                                        | 1.5   | -          | 20    | V    |
| Reference Voltage                                 | $V_{ref}$                  | -                                                                        | 1.235 | 1.26       | 1.285 | V    |
| Line Regulation                                   | $\Delta V_O/\Delta V_{IN}$ | $V_{IN}=V_O+1V \sim V_O+17V$                                             | -     | 0.04       | 0.16  | %/V  |
| Load Regulation                                   | $\Delta V_O/\Delta I_O$    | $V_{IN}=V_O+2V, I_O=0A \sim 1.0A$                                        | -     | 0.2        | 1.4   | %/A  |
| Average Temperature Coefficient of Output Voltage | $\Delta V_O/\Delta T$      | $T_J=0 \sim +125^\circ C$                                                | -     | $\pm 0.02$ | -     | %/°C |
| Quiescent Current                                 | $I_Q$                      | $I_O=0A$                                                                 | -     | -          | 5     | mA   |
| Dropout Voltage                                   | $\Delta V_{I-O}$           | $I_O=0.5A$                                                               | -     | 0.2        | 0.5   | V    |
| Ripple Rejection                                  | RR                         | $V_{in}=V_O+2V$ , $e_{in}=0.5V_{rms}$<br>$e_{in}=0.5V_{rms}$ , $f=120Hz$ | 52    | 65         | -     | dB   |

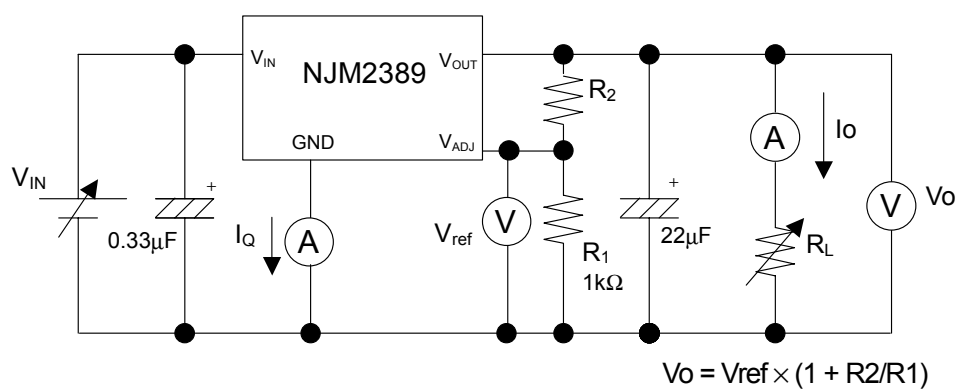
## ■ THERMAL CHARACTERISTICS

|                    |                                 |               |    |      |
|--------------------|---------------------------------|---------------|----|------|
| Thermal Resistance | Junction-to-Ambient Temperature | $\theta_{ja}$ | 60 | °C/W |
|                    | Junction to case                | $\theta_{jc}$ | 5  |      |

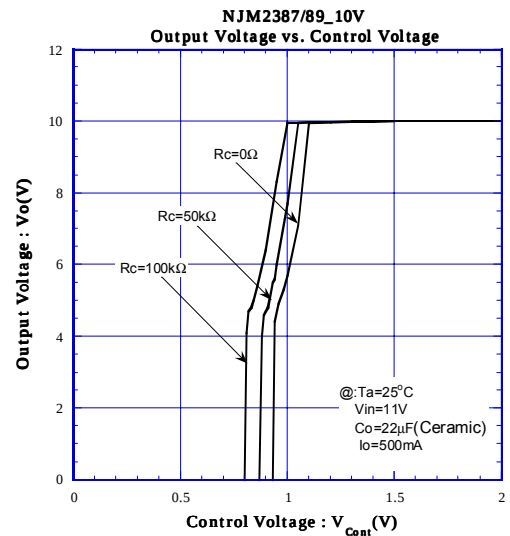
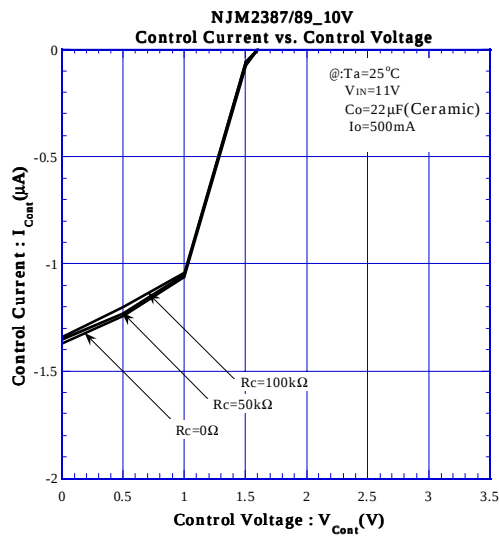
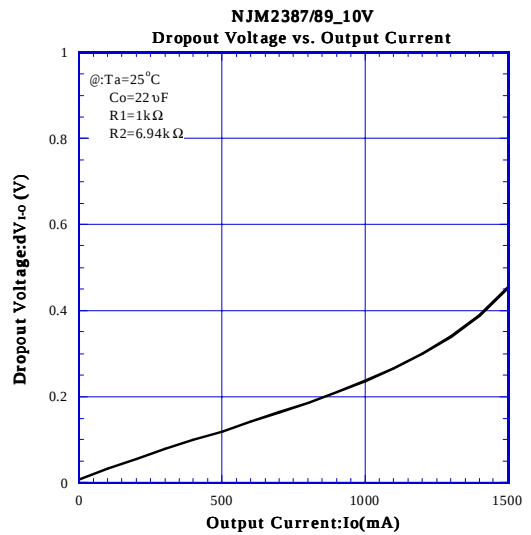
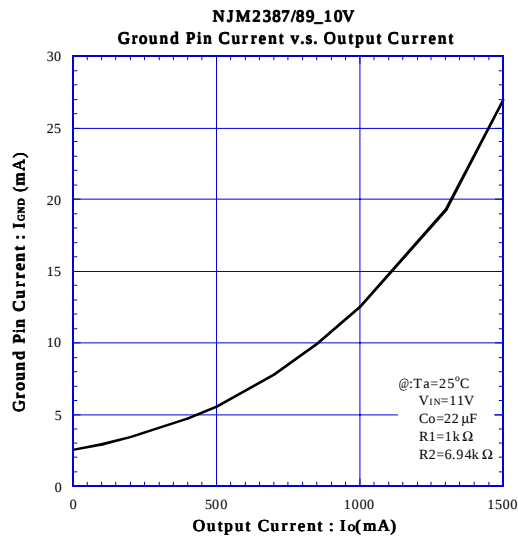
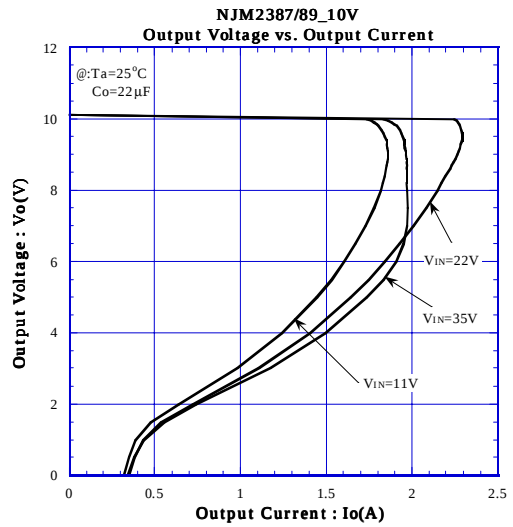
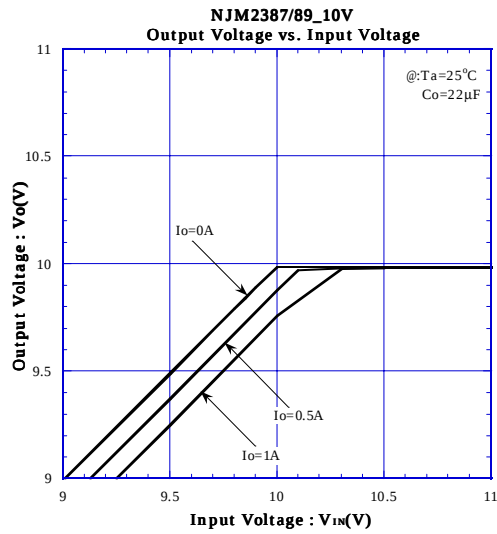
## ■ POWER DISSIPATION vs. AMBIENT TEMPERATURE



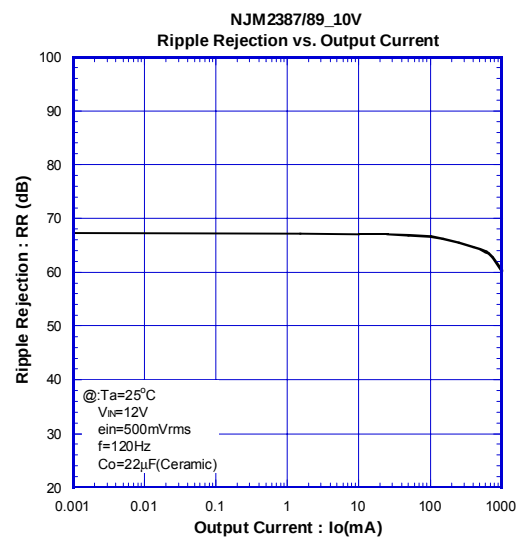
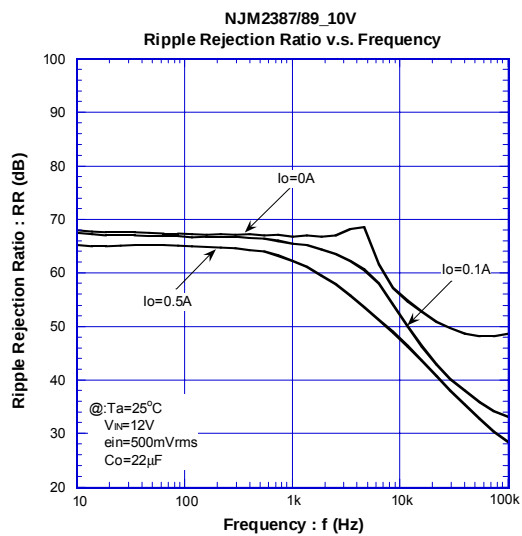
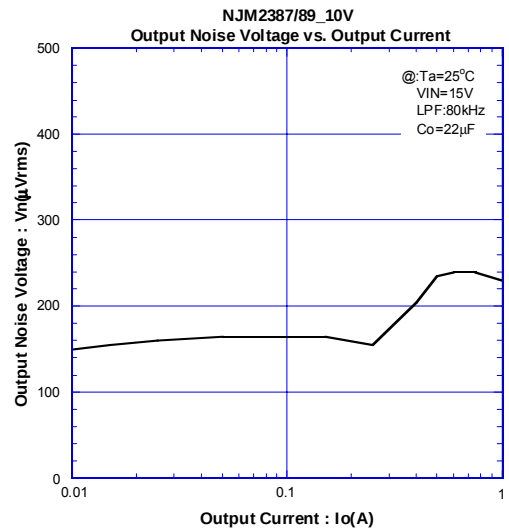
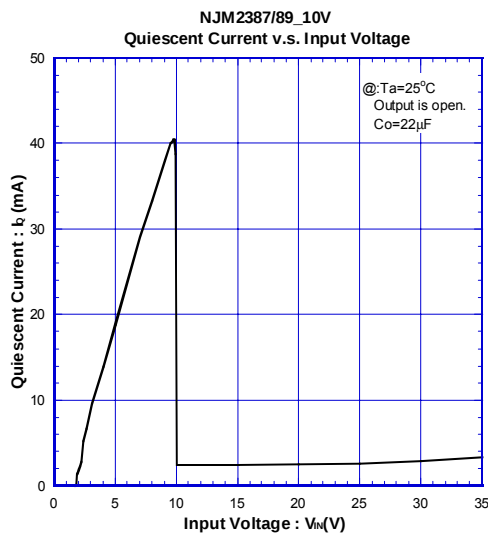
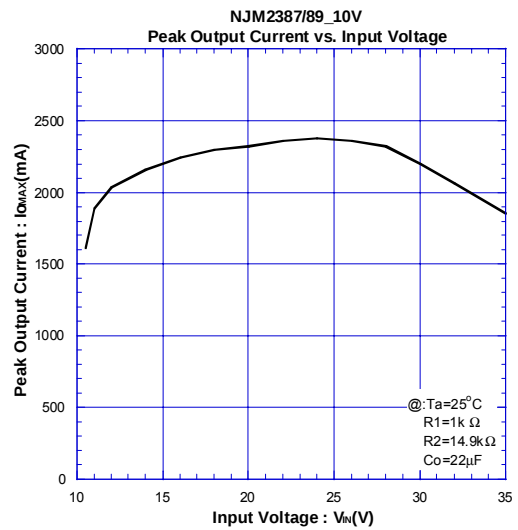
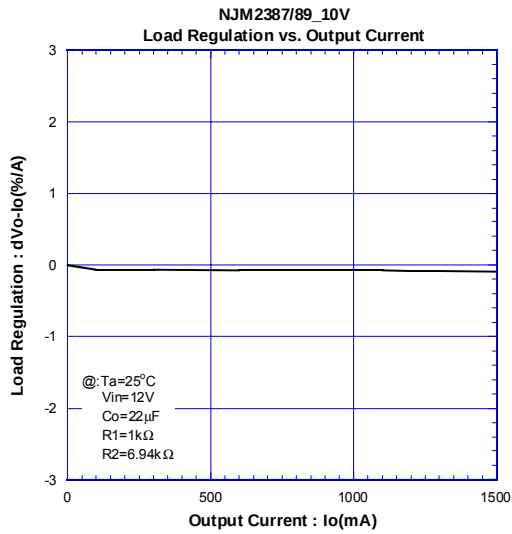
## ■ TEST CIRCUIT



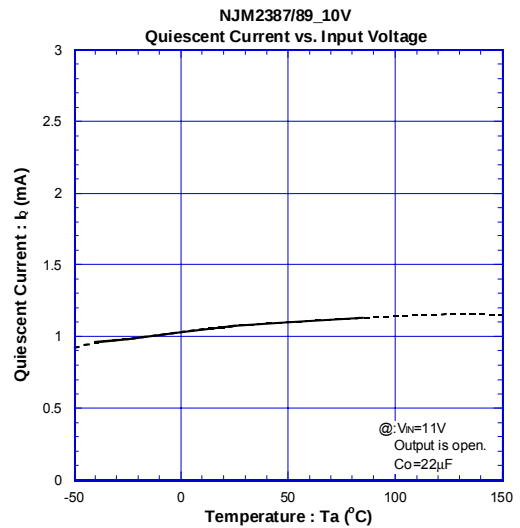
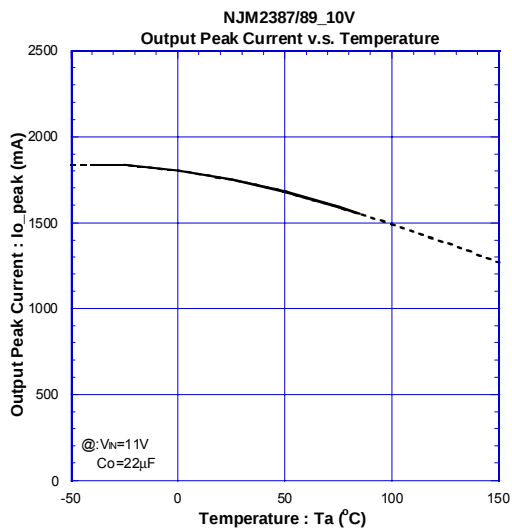
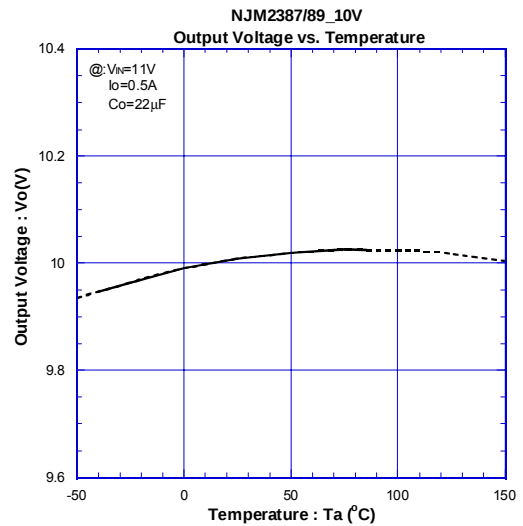
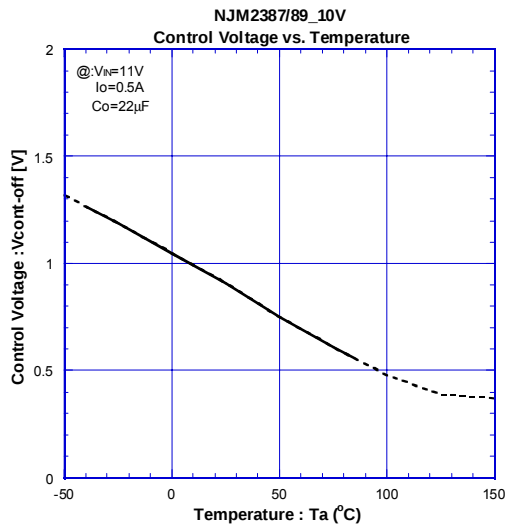
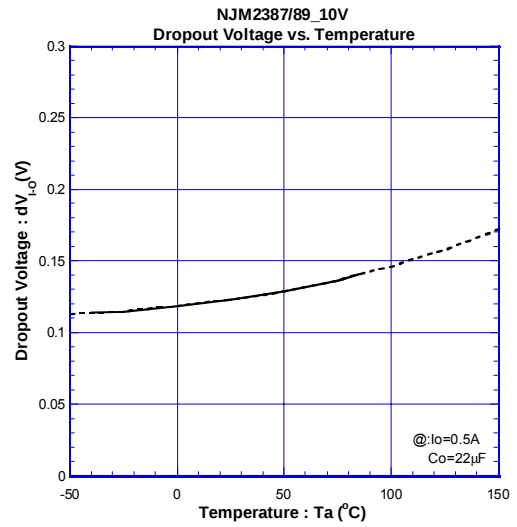
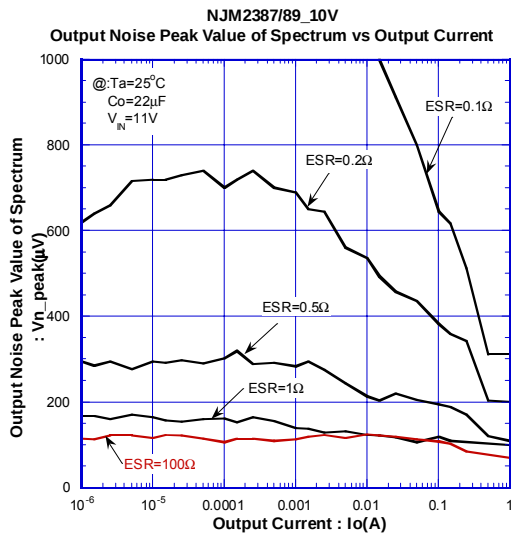
## ■ TYPICAL CHARACTERISTICS



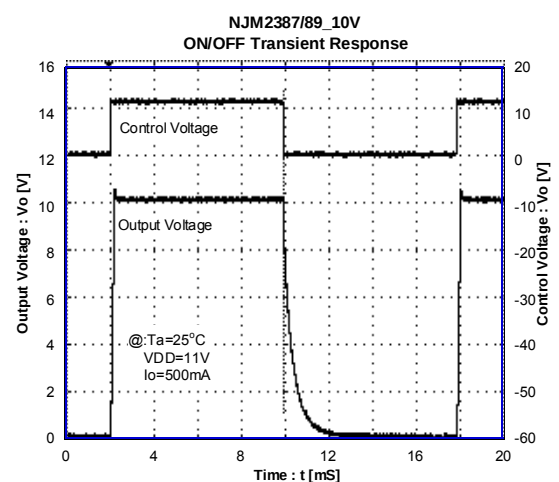
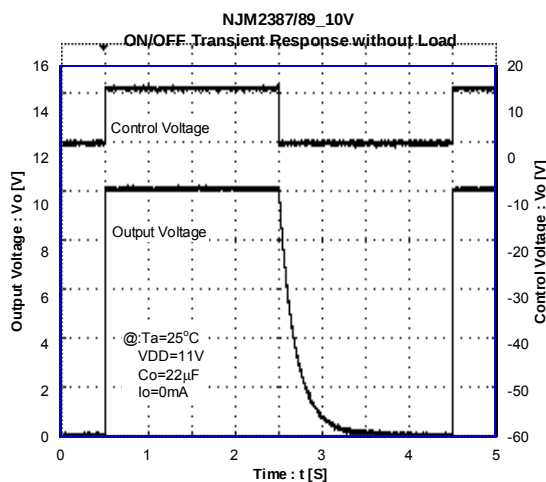
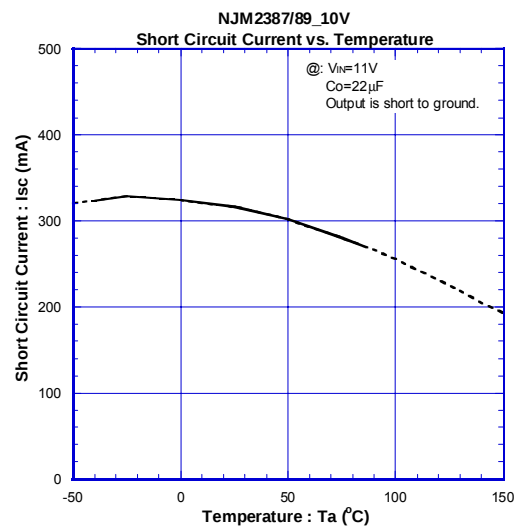
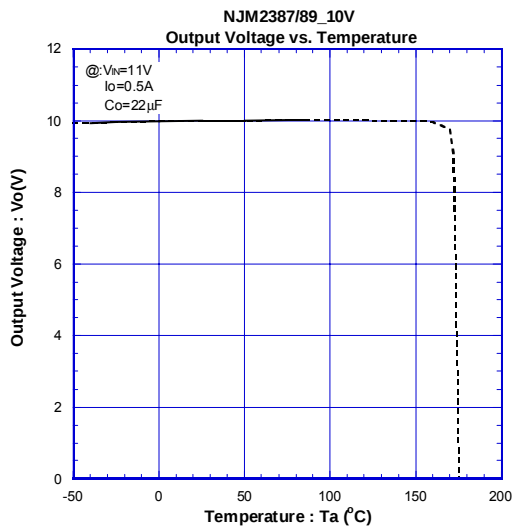
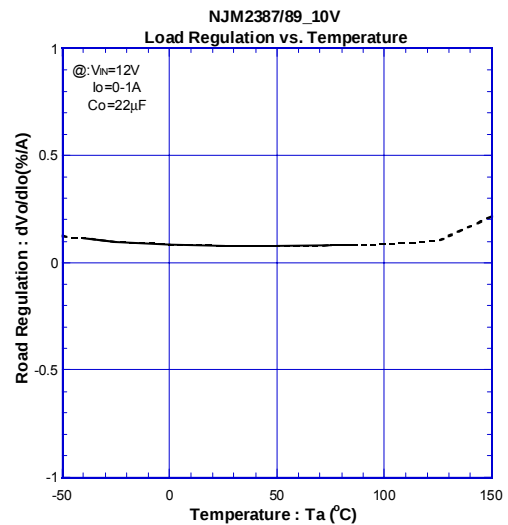
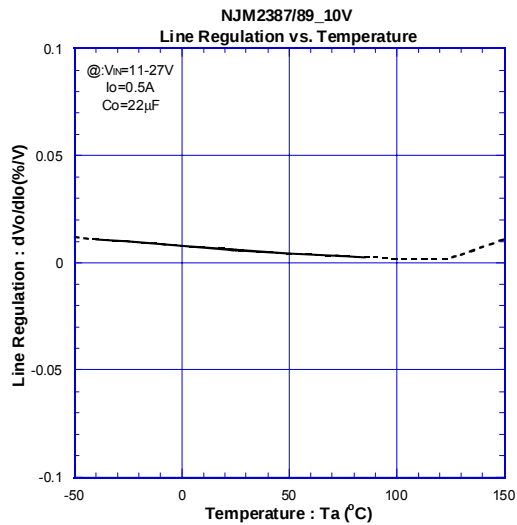
## TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS

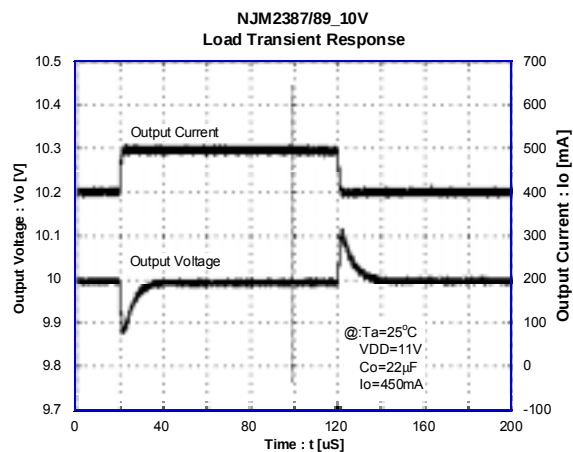
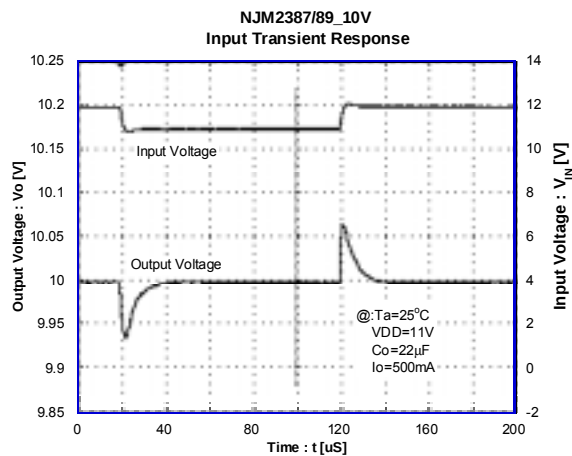


## ■ TYPICAL CHARACTERISTICS



# NJM2387/89

## TYPICAL CHARACTERISTICS



### [CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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