# C-MOS 3-TERMINAL NEGATIVE VOLTAGE REGULATOR

## ■ GENERAL DESCRIPTION

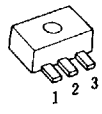
The NJU7211 series is a C-MOS 3-terminal negative voltage regulator which contains internal precision voltage reference, error amplifier, control transistor and output voltage setting resistor.

The regulation voltage is fixed by internal circuits and the following line-up of different output voltages version are available.

This series is suitable for battery operated items and battery back-up systems because of low current consumption and low dropout voltage.

## ■ PACKAGE OUTLINE / PIN CONFIGURATION


NJU7211L




NJU7211U

## ■ FEATURES

- Low Current consumption (19μA typ)
- Wide Operating Voltage Range
- Low Dropout Voltage
  ($\Delta V_{IO}$<0.6V -- -3.0V output, $I_{OUT}$=20mA)
  ($\Delta V_{IO}$<0.6V -- -5.0V output, $I_{OUT}$=40mA)
- Small Temperature Coefficient of Output Voltage
- Package Outline TO-92/SOT-89
- C-MOS Technology

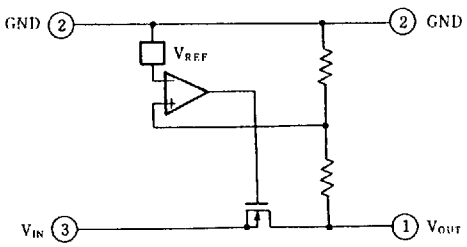
## ■ TERMINAL DESCRIPTION

| No. | DESCRIPTION |
|---|---|
| 1 | OUTPUT |
| 2 | GND |
| 3 | INPUT |

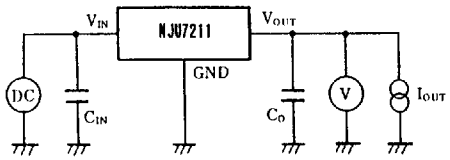
## ■ OUTPUT VOLTAGE LINE-UP

| OUTPUT VOLTAGE | TO-92 TYPE | SOT-89 TYPE |
|---|---|---|
| -3.0V | 7211L30 | 7211U30 |
| -5.0V | 7211L50 | 7211U50 |

## ■ EQUIVALENT CIRCUIT




## ■ MEASUREMENT CIRCUIT



## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Input Voltage | $V_{IN}$ | - 14 | V |
| Output Voltage | $V_{OUT}$ | $V_{IN}$-0.3～$V_{SS}$+0.3 | V |
| Output Current | $I_{OUT}$ | 100 | mA |
| Power dissipation | $P_D$ | (TO-92) 500<br>(SOT-89) 300 | mW |
| Operating Temperature | Topr | - 25～ +75 | ℃ |
| Storage Temperature | Tstg | - 40～+125 | ℃ |
| Soldering Temperature | Tsold | 260 | ℃ |
| Soldering Time | tsold | 10 | sec |

## ■ ELECTRICAL CHARACTERISTICS

● -3.0V VERSION

($C_{IN}$=$C_O$=0.1μF, Ta=25℃)

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$ | $V_{IN}$=-5V, $I_{OUT}$=10 mA | -3.15 | -3.00 | -2.85 | V |
| Dropout Voltage | $\Delta V_{IO}$ | $I_{OUT}$=20mA | | 0.20 | 0.60 | V |
| Input Voltage | $V_{IN}$ | | -12 | | | V |
| Current Consumption | $I_Q$ | $V_{IN}$=-5V | | 19 | 30 | μA |
| Load Regulation | $\Delta V_{OUT}/\Delta I_{OUT}$ | $V_{IN}$=-5V, $I_{OUT}$=1～20mA | | 80 | 120 | mV |
| Line Regulation | $\Delta V_{OUT}/(\Delta V_{IN}\cdot V_{OUT})$ | $V_{IN}$=-4V～-12V | | 0.10 | | %/V |

● -5.0V VERSION

($C_{IN}$=$C_O$=0.1μF, Ta=25℃)

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$ | $V_{IN}$=-7V, $I_{OUT}$=30 mA | -5.25 | -5.00 | -4.75 | V |
| Dropout Voltage | $\Delta V_{IO}$ | $I_{OUT}$=40mA | | 0.30 | 0.60 | V |
| Input Voltage | $V_{IN}$ | | -12 | | | V |
| Current Consumption | $I_Q$ | $V_{IN}$=-7V | | 19 | 30 | μA |
| Load Regulation | $\Delta V_{OUT}/\Delta I_{OUT}$ | $V_{IN}$=-7V, $I_{OUT}$=1～40mA | | 80 | 120 | mV |
| Line Regulation | $\Delta V_{OUT}/(\Delta V_{IN}\cdot V_{OUT})$ | $V_{IN}$=-6V～-12V | | 0.10 | | %/V |