C-MOS 3-TERMINAL NEGATIVE VOLTAGE REGULATOR

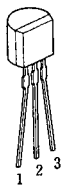
■ GENERAL DESCRIPTION

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.

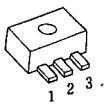
The regulation voltage is fixed by internal circuits and the following line-up of different output voltages version are available.

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

■ PACKAGE OUTLINE



NJU7211L



NJU7211U

■ FEATURES

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

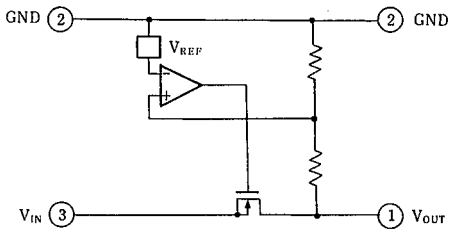
■ TERMINAL DESCRIPTION

NO	DESCRIPTION
1	OUTPUT
2	GND
3	INPUT

■ OUTPUT VOLTAGE LINE−UP

OUTPUT VOLTAGE	TO−92 TYPE	SOT−89 TYPE
−2.0V	7211L20	7211U20
−3.0V	7211L30	7211U30
−4.0V	7211L40	7211U40
−5.0V	7211L50	7211U50

■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

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

■ ELECTRICAL CHARACTERISTICS

• −2.0V VERSION

(C_{IN}=C_O=0.1 μF, Ta=25℃)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=−4.0V, I_{OUT}=10mA	−2.10	−2.00	−1.90	V
Dropout Voltage	$\triangle V_{IO}$	I_{OUT}=20mA		0.2	0.6	V
Input Voltage	V_{IN}		−12			V
Operating Current	I_Q	V_{IN}=−4.0V		19	30	μA
Load Regulation	$\triangle V_{OUT}$ / $\triangle I_{OUT}$	V_{IN}=−4.0V, I_{OUT}=1～20mA		80	120	mA
Line Regulation	$\triangle V_{OUT}$ / ($\triangle V_{IN}$ · V_{OUT})	V_{IN}=−3.0～12V		0.1		%/V

• −3.0V VERSION

(C_{IN}=C_O=0.1 μF, Ta=25℃)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=−5.0V, I_{OUT}=10mA	−3.15	−3.0	−2.85	V
Dropout Voltage	$\triangle V_{IO}$	I_{OUT}=20mA		0.2	0.6	V
Input Voltage	V_{IN}		−12			V
Operating Current	I_Q	V_{IN}=−5.0V		19	30	μA
Load Regulation	$\triangle V_{OUT}$ / $\triangle I_{OUT}$	V_{IN}=−5.0V, I_{OUT}=1～20mA		80	120	mV
Line Regulation	$\triangle V_{OUT}$ / ($\triangle V_{IN}$ · V_{OUT})	V_{IN}=−4～12V		0.1		%/V

• −4.0V VERSION

(C_{IN}=C_O=0.1 μF, Ta=25℃)

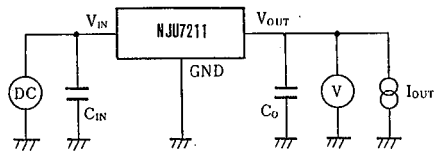
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=−6V, I_{OUT}=30mA	−4.20	−4.00	−3.80	V
Dropout Voltage	$\triangle V_{IO}$	I_{OUT}=40mA		0.3	0.6	V
Input Voltage	V_{IN}		−12			V
Operating Current	I_Q	V_{IN}=−6.0V		19	30	μA
Load Regulation	$\triangle V_{OUT}$ / $\triangle I_{OUT}$	V_{IN}=−6.0V, I_{OUT}=1～40mA		80	120	mV
Line Regulation	$\triangle V_{OUT}$ / ($\triangle V_{IN}$ · V_{OUT})	V_{IN}=−5.0～12V		0.1		%/V

• −5.0V VERSION

(C_{IN}=C_O=0.1 μF, Ta=25℃)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=−7V, I_{OUT}=30mA	−5.25	−5.0	−4.75	V
Dropout Voltage	$\triangle V_{IO}$	I_{OUT}=40mA		0.3	0.6	V
Input Voltage	V_{IN}		−12			V
Operating Current	I_Q	V_{IN}=−7V		19	30	μA
Load Regulation	$\triangle V_{OUT} / \triangle I_{OUT}$	V_{IN}=−7V, I_{OUT}=1～40mA		80	120	mV
Line Regulation	$\triangle V_{OUT} / (\triangle V_{IN} \cdot V_{OUT})$	V_{IN}=−6～12V		0.1		%/V

■ MEASUREMENT CIRCUIT



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