

C-MOS STEP-UP SWITCHING REGULATOR

■ GENERAL DESCRIPTION

The **NJU7261 series** is a C-MOS step-up switching regulator which contains accurate voltage reference, error amplifier, CR oscillator, control circuit, switching transistor, diode and resistor.

The stand-by function is effective for low power consumption.

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 portable equipment's or battery operated items because of its small packaged outline, low operating voltage and current.

■ FEATURES

- Low Operating Voltage (1.0V min.)
- Low Operating Current (5.0 μ A typ. / $V_{OUT} = 3.0V$)
- Low Stand-by Current (0.2 μ A max. / $V_{OUT} = 3.0V$)
- High Precision Output Voltage ($\pm 3\%$ max.)
- Wide Operating Voltage Range
- Stand-by Function
- CR Oscillator On-chip
- Diode On-chip
- Package Outline SOT89-5
- C-MOS Technology

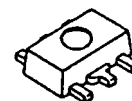
■ LINE-UP

Output Voltage (V)	Line-Up
3.0	NJU7261U30
3.3	NJU7261U33
4.5	NJU7261U45
5.0	NJU7261U50

■ TERMINAL DESCRIPTION

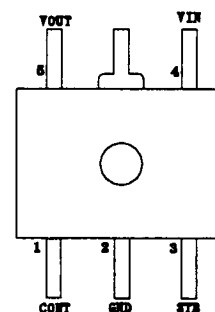
No.	Term. Name	I/O	FUNCTION
1	CONT	I	External Inductor Connect Terminal
2	GND	POWER	Power Source (GND)
3	STB	I	Strobe Terminal : "H" or OPEN...Normal Operation (step-up) " L" ...Standp-By Operation
4	V_{IN}	POWER	Power Source (+)
5	V_{OUT}	O	Step-up Output Terminal

■ PACKAGE OUTLINE

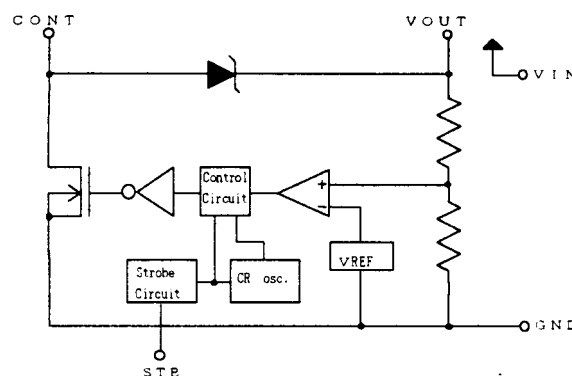


NJU7261UX

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



NJU7261 Series

■ ABSOLUTE MAXIMUM RATINGS

(T_a = 25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{IN}	10	V
CONT Input Voltage	V _{CONT}	GND-0.3 ≤ V _{CONT} ≤ 10	V
Strobe Input Voltage	V _{STB}	GND-0.3 ≤ V _{STB} ≤ V _{IN}	V
Output Voltage	V _{OUT}	GND-0.3 ≤ V _{OUT} ≤ 10	V
Power Dissipation	P _D	300	mW
Operating Temperature Range	T _{opr}	-25 to + 75	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

Note1) When a coil used. This IC of V_{CONT} possible over the absolute maximum ratings. Consequently please conduct enough to test.

Note2) The CONT input voltage (V_{CONT}) should be inspected at the real application circuit, as some kinds of coils make the CONT input voltage exceed the Absolute Maximum Rating of the V_{CONT}.

■ ELECTRICAL CHARACTERISTICS

+3.0V Version

(T_a = 25°C)

PARAMETER	SYMBOL		CONDITION	NORM			UNIT	MEASUREMENT CIRCUIT
				MIN.	TYP.	MAX.		
Input Voltage	V _{IN}			-	-	5.0	V	1
Start Voltage	V _{START}		NO LOAD	-	-	1.0	V	1
Oscillator Freq.	f _{OSC}		V _{IN} = 1.5V	20	30	50	kHz	2
Output Voltage	V _{OUT}		V _{IN} = 1.5V, I _{OUT} = 20mA	2.91	3.0	3.09	V	1
Input Stability	ΔV _{OUT1}		V _{IN} = 1.5V to 2.0V I _{OUT} = 20mA	-	30	100	mV	1
Load Stability	ΔV _{OUT2}		V _{IN} = 1.5V I _{OUT} = 10μA to 25mA	-	30	100	mV	1
Operating Current	I _{SS}		V _{IN} = V _{STB} = 1.5V, NO LOAD	-	5.0	10	μA	3
Stand-by Current	I _Q		V _{IN} = 1.5V V _{STB} = 0V, NO LOAD	-	-	0.2	μA	4
Switching Current	I _{SI}		V _{DS} = 0.2V	-	250	-	mA	-
STB Terminal Input Voltage	H level	V _{STBH}	V _{IN} = 1.5V	1.0	-	-	V	5
	L level	V _{STBL}	V _{IN} = 1.5V	-	-	0.4	V	5
STB Terminal Input Current	H level	I _{STBH1}	V _{IN} = 1.5V, V _{STB} = 1.0V	-	15	30	μA	6
		I _{STBH2}	V _{IN} = 1.5V, V _{STB} = 1.5V	-	0.1	-	μA	6
	L level	I _{STBL1}	V _{IN} = 1.5V, V _{STB} = 0.4V	-	15	30	μA	6
		I _{STBL2}	V _{IN} = 1.5V, V _{STB} = 0V	-	0.1	-	μA	6

NJU7261 Series

+3.3V Version

(T_a = 25°C)

PARAMETER	SYMBOL		CONDITION	NORM			UNIT	MEASUREMENT CIRCUIT
				MIN.	TYP.	MAX.		
Input Voltage	V _{IN}			-	-	5.0	V	1
Start Voltage	V _{START}		NO LOAD	-	-	1.0	V	1
Oscillator Freq.	f _{OSC}		V _{IN} = 1.5V	20	30	50	kHz	2
Output Voltage	V _{OUT}		V _{IN} = 1.5V, I _{OUT} = 20mA	3.20	3.30	3.40	V	1
Input Stability	ΔV _{OUT1}		V _{IN} = 1.5V to 3.0V I _{OUT} = 20mA	-	30	100	mV	1
Load Stability	ΔV _{OUT2}		V _{IN} = 1.5V I _{OUT} = 10μA to 25mA	-	30	100	mV	1
Operating Current	I _{SS}		V _{IN} = V _{STB} = 1.5V, NO LOAD	-	5	10	μA	3
Stand-by Current	I _Q		V _{IN} = 1.5V V _{STB} = 0V, NO LOAD	-	-	0.2	μA	4
Switching Current	I _{SI}		V _{DS} = 0.2V	-	250	-	mA	-
STB Terminal Input Voltage	H level	V _{STBH}	V _{IN} = 1.5V	1.0	-	-	V	5
	L level	V _{STBL}	V _{IN} = 1.5V	-	-	0.4	V	5
STB Terminal Input Current	H level	I _{STBH1}	V _{IN} = 1.5V, V _{STB} = 1.0V	-	15	30	μA	6
		I _{STBH2}	V _{IN} = 1.5V, V _{STB} = 1.5V	-	0.1	-	μA	6
	L level	I _{STBL1}	V _{IN} = 1.5V, V _{STB} = 0.4V	-	15	30	μA	6
		I _{STBL2}	V _{IN} = 1.5V, V _{STB} = 0V	-	0.1	-	μA	6

+4.5V Version

(T_a = 25°C)

PARAMETER	SYMBOL		CONDITION	NORM			UNIT	MEASUREMENT CIRCUIT
				MIN.	TYP.	MAX.		
Input Voltage	V _{IN}			-	-	4.5	V	1
Start Voltage	V _{START}		NO LOAD	-	-	1.0	V	1
Oscillator Freq.	f _{OSC}		V _{IN} = 3.0V	20	30	50	kHz	2
Output Voltage	V _{OUT}		V _{IN} = 3.0V, I _{OUT} = 20mA	4.36	4.50	4.64	V	1
Input Stability	ΔV _{OUT1}		V _{IN} = 2.0V to 3.0V I _{OUT} = 20mA	-	30	100	mV	1
Load Stability	ΔV _{OUT2}		V _{IN} = 3.0V I _{OUT} = 10μA to 25mA	-	30	100	mV	1
Operating Current	I _{SS}		V _{IN} = V _{STB} = 3.0V, NO LOAD	-	5	15	μA	3
Stand-by Current	I _Q		V _{IN} = 3.0V V _{STB} = 0V, NO LOAD	-	-	0.2	μA	4
Switching Current	I _{SI}		V _{DS} = 0.2V	-	250	-	mA	-
STB Terminal Input Voltage	H level	V _{STBH}	V _{IN} = 3.0V	2.4	-	-	V	5
	L level	V _{STBL}	V _{IN} = 3.0V	-	-	0.4	V	5
STB Terminal Input Current	H level	I _{STBH1}	V _{IN} = 3.0V, V _{STB} = 2.4V	-	50	100	μA	6
		I _{STBH2}	V _{IN} = 3.0V, V _{STB} = 3.0V	-	0.1	-	μA	6
	L level	I _{STBL1}	V _{IN} = 3.0V, V _{STB} = 0.4V	-	50	100	μA	6
		I _{STBL2}	V _{IN} = 3.0V, V _{STB} = 0V	-	0.1	-	μA	6

NJU7261 Series

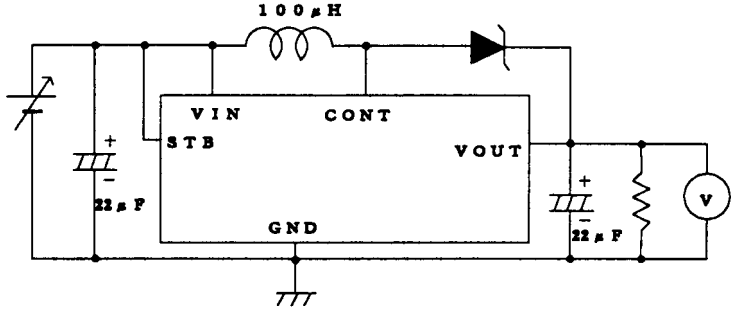
+5.0V Version

(T_a = 25°C)

PARAMETER	SYMBOL		CONDITION	NORM			UNIT	MEASUREMENT CIRCUIT
				MIN.	TYP.	MAX.		
Input Voltage	V _{IN}			-	-	5.0	V	1
Start Voltage	V _{START}		NO LOAD	-	-	1.0	V	1
Oscillator Freq.	f _{OSC}		V _{IN} = 3.0V	20	30	50	kHz	2
Output Voltage	V _{OUT}		V _{IN} = 3.0V, I _{OUT} = 20mA	4.85	5.0	5.15	V	1
Input Stability	ΔV _{OUT1}		V _{IN} = 2.0V to 3.0V I _{OUT} = 20mA	-	30	100	mV	1
Load Stability	ΔV _{OUT2}		V _{IN} = 3.0V I _{OUT} = 10μA to 25mA	-	30	100	mV	1
Operating Current	I _{SS}		V _{IN} = V _{STB} = 3.0V, NO LOAD	-	5	15	μA	3
Stand-by Current	I _Q		V _{IN} = 3.0V V _{STB} = 0V, NO LOAD	-	-	0.2	μA	4
Switching Current	I _{SI}		V _{DS} = 0.2V	-	250	-	mA	-
STB Terminal Input Voltage	H level	V _{STBH}	V _{IN} = 3.0V	2.4	-	-	V	5
	L level	V _{STBL}	V _{IN} = 3.0V	-	-	0.4	V	5
STB Terminal Input Current	H level	I _{STBH1}	V _{IN} = 3.0V, V _{STB} = 2.4V	-	50	100	μA	6
		I _{STBH2}	V _{IN} = 3.0V, V _{STB} = 3.0V	-	0.1	-	μA	6
	L level	I _{STBL1}	V _{IN} = 3.0V, V _{STB} = 0.4V	-	50	100	μA	6
		I _{STBL2}	V _{IN} = 3.0V, V _{STB} = 0V	-	0.1	-	μA	6

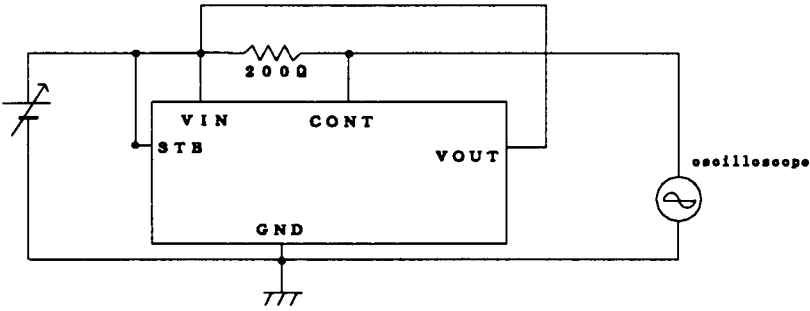
■ MEASUREMENT CIRCUIT 1

(1)

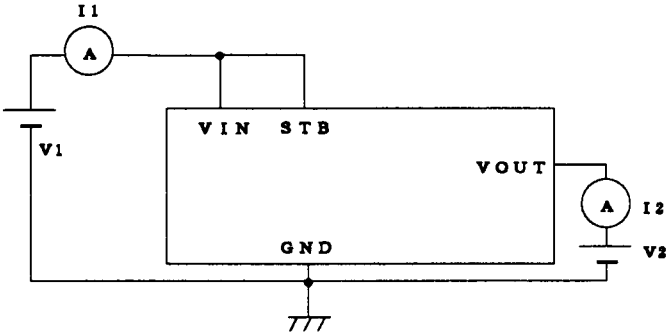


External Diode Type : "D1NS4" provided by SHINDENGEN
($I_F = 1A, V_F = 0.55V$)

(2)



(3)



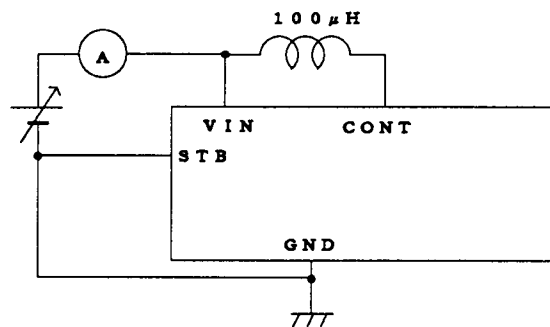
$$I_{SS} = I_1 + I_2 \times \frac{V_{OUT}}{V_2}$$

Under the condition of $V_2 = V_{OUT} + 1.0V$

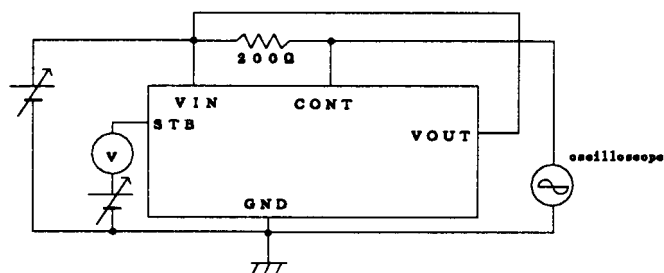
NJU7261 Series

MEASUREMENT CIRCUIT 2

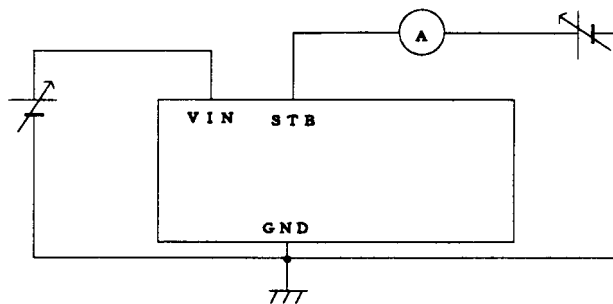
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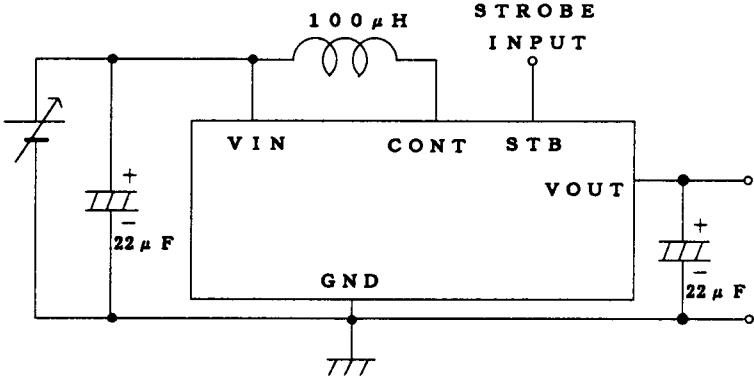
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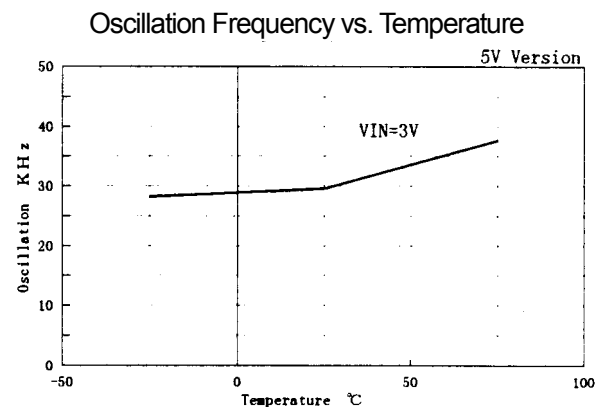
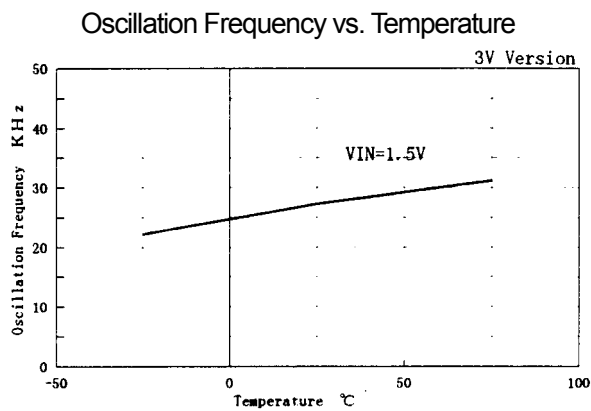
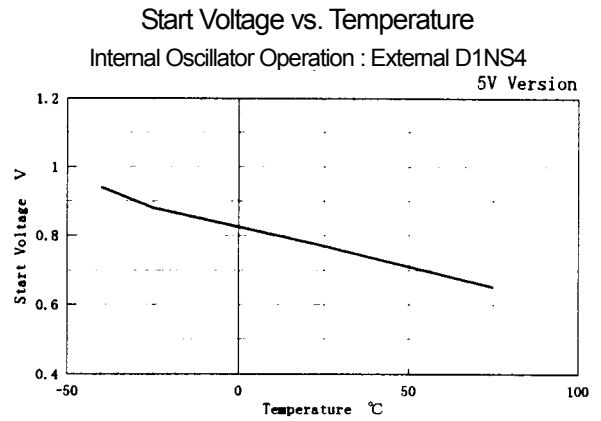
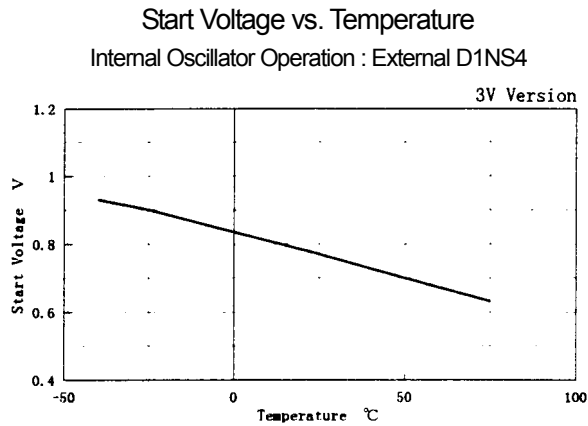


■ APPLICATION CIRCUIT



NJU7261 Series

■ TYPICAL CHARACTERISTIC



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