C-MOS STEP-UP SWITCHING REGULATOR

PRELIMINARY

■ GENERAL DESCRIPTION

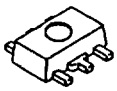
The NJU7261 series is a C-MOS step-up switching regulator which contains accurate voltage reference, error amplifier, CR oscillator, control circuit, switching transistor, diode and resistor.

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.

■ PACKAGE OUTLINE

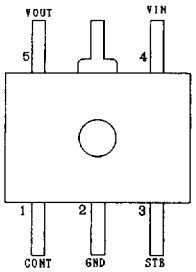


NJU7261UXX

■ FEATURES

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

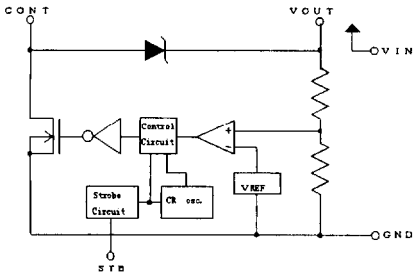
■ EQUIVALENT CIRCUIT



■ LINE-UP

Output Voltage (V)	Line-Up
3.0	NJU7261U30
5.0	NJU7261U50

■ EQUIVALENT CIRCUIT



■ TERMINAL DESCRIPTION

No.	Term. Name	I/O	F U N C T I O N
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

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■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

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	Topr	− 25～+ 75	℃
Storage Temperature Range	Tstg	− 40～+125	℃

Note) Decoupling capacitor should be connected between V_{IN} and GND due to the stabilized operation for this IC.

■ ELECTRICAL CHARACTERISTICS

+3V Version

(Ta=25℃)

PARAMETER	SYMBOL		CONDITION	NORM MIN.	NORM TYP.	NORM MAX.	UNIT	MEASUREMENT CIRCUIT
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}=1.5～2.0V I_{OUT}=20mA	—	30	100	mV	1
Load Stability	ΔV_{OUT2}		V_{IN}=1.5V I_{OUT}=10μA～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

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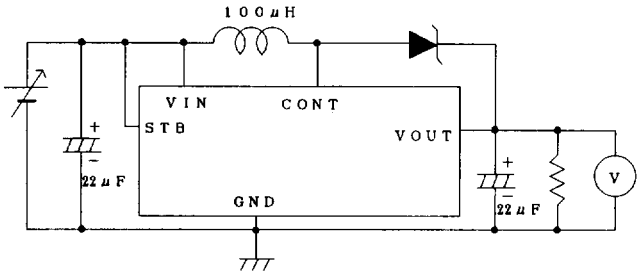
+5V VERSION (Ta=25°C)

PARAMETER	SYMBOL		CONDITION	NORM MIN.	NORM TYP.	NORM MAX.	UNIT	MEASUREMENT CIRCUIT
Input Voltage	V_{IN}			—	—	7.0	V	1
Start Voltage	V_{START}		NO LOAD	—	—	1.0	V	1
Oscillator Freq.	f_{OSC}		V_{IN}=3.0V	20	30	50	KH_Z	2
Output Voltage	V_{OUT}		V_{IN}=3.0V, I_{OUT}=20mA	4.85	5.0	5.15	V	1
Input Stability	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$		V_{IN}=2.0～3.0V I_{OUT}=20mA	—	30	100	%/V	1
Load Stability	ΔV_{OUT}		V_{IN}=3.0V I_{OUT}=10μA～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_{STBL}	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

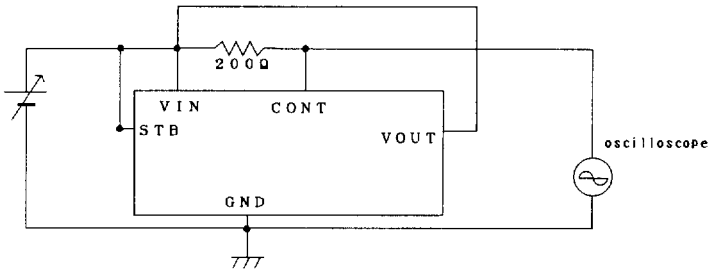
■ MEASUREMENT CIRCUIT 1

(1)



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

(2)



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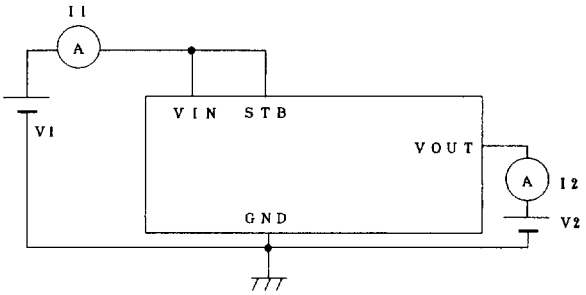
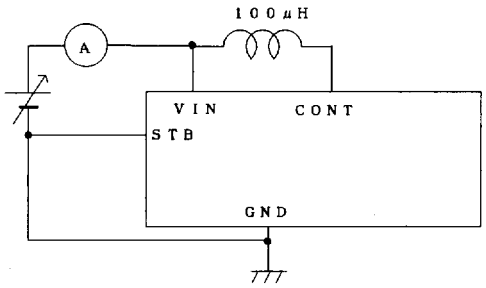


$$I_{SS} = I_1 + I_2 \times \frac{V_{OUT}}{V_2}$$

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

■ MEASUREMENT CIRCUIT 2

(4)



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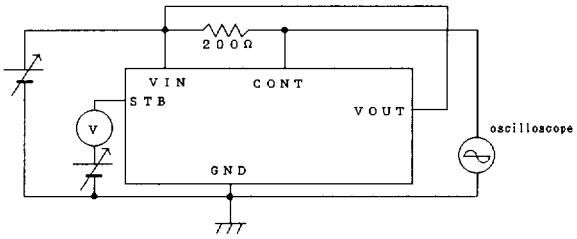

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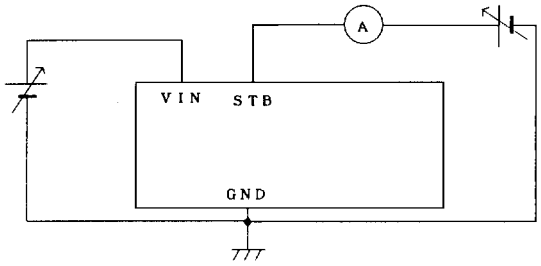
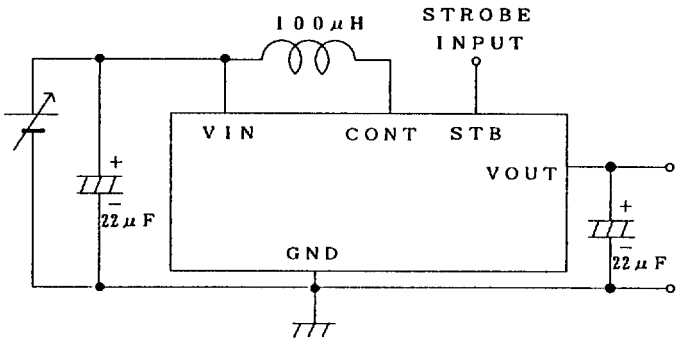


■ APPLICATION CIRCUIT



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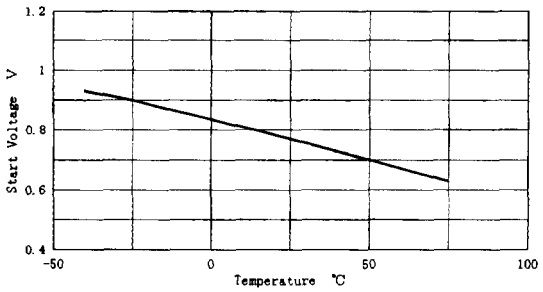
■ TYPICAL CHARACTERISTIC

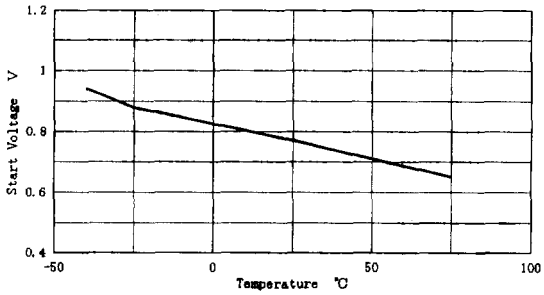
Start Voltage vs. Temperature

Internal Oscillator Operation : External D1NS4

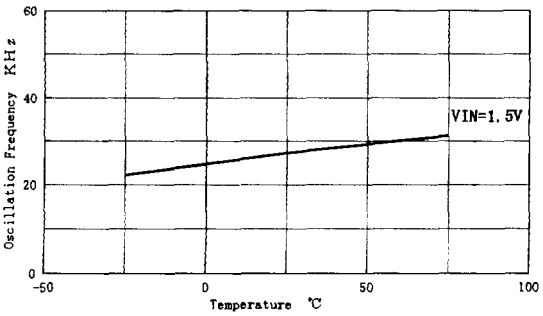


Start Voltage vs. Temperture

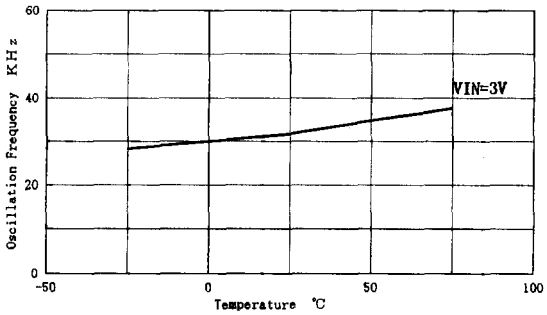
Internal Oscillator Operation : External D1NS4



Oscillation Frequency vs. Temperature



Oscillation Frequency vs. Temperature



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