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C-MOS STEP-UP SWITCHING REGULATOR

■ GENERAL DESCRIPTION

The **NJU7262 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 operating clock is prepared on-chip or is available to input from external, and 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
- External/Internal Clock Select Function
- Stand-by Function
- CR Oscillator On-chip
- Diode On-chip
- Package Outline DMP-8/SSOP-8/VSP-8
- C-MOS Technology

■ LINE-UP

Output Voltage (V)	Package		
	DMP-8	SSOP-8	VSP-8
3.0	NJU7262M30	NJU7262V30	NJU7262R30
5.0	NJU7262M50	NJU7262V50	NJU7262R50

■ TERMINAL DESCRIPTION

No.	Term. Name	I/O	FUNCTION
1	CONT	I	External Inductor Connect Terminal
2	GND	POWER	Power Source (GND)
3	NC	-	Non Connect
4	STB	I	Strobe Terminal : "H" ...Normal Operation (step-up) "L" ...Stand-By Operation
5	V_{IN}	POWER	Power Source (+)
6	SW	I	External / Internal Clock Select Terminal "H" or OPEN ...Internal Oscillation "L" ...External Clock Input (When "L" level is input, Internal oscillation is stopped)
7	CLK	I	External Clock Input Terminal
8	V_{OUT}	O	Step-up Output Terminal

■ PACKAGE OUTLINE



NJU7262MXX

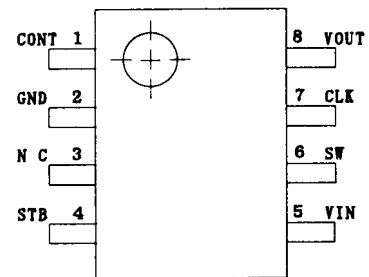


NJU7262VXX

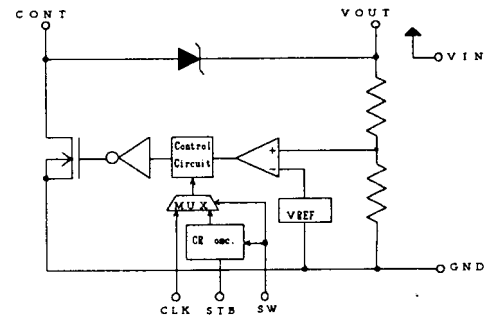


NJU7262RXX

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



NJU7262 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
STB, SW, CLK Input Voltage	V _I	GND-0.3 ≤ V _I ≤ V _{IN}	V
Output Voltage	V _{OUT}	GND-0.3 ≤ V _{OUT} ≤ 10	V
Power Dissipation	P _D	(DMP-8) 300 (SSOP-8) 250 (VSP-8) 320	mW
Operating Temperature Range	T _{opr}	-25 to +75	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

Note) Decoupling capacitor should be connected between V_{DD} and V_{SS} due to the stabilized operation for the voltage converter.

■ ELECTRICAL CHARACTERISTICS

+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	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} = V _{SW} = 1.5V V _{STB} = V _{CLK} = 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
SW Terminal Input Voltage	H level	V _{SWH}	V _{IN} = 1.5V	1.0	-	-	V	6
	L level	V _{SWL}	V _{IN} = 1.5V	-	-	0.4	V	6
CLK Terminal Input Voltage	H level	V _{CLKH}	V _{IN} = 1.5V	1.0	-	-	V	7
	L level	V _{CLKL}	V _{IN} = 1.5V	-	-	0.4	V	7
STB Terminal Input Current	H level	I _{STBH1}	V _{IN} = 1.5V, V _{STB} = 1.0V	-	15	30	μA	8
		I _{STBH2}	V _{IN} = 1.5V, V _{STB} = 1.5V	-	0.1	-	μA	8
	L level	I _{STBL1}	V _{IN} = 1.5V, V _{STB} = 0.4V	-	15	30	μA	8
		I _{STBL2}	V _{IN} = 1.5V, V _{STB} = 0V	-	0.1	-	μA	8
SW Terminal Input Current	H level	I _{SWH}	V _{IN} = 1.5V, V _{SW} = V _{IN}	-	0.1	-	μA	8
	L level	I _{SWL}	V _{IN} = 1.5V, V _{SW} = 0V	-	10	30	μA	8
CLK Terminal Input Current	H level	I _{CLKH}	V _{IN} = 1.5V, V _{CLK} = V _{IN}	-	10	30	μA	8
	L level	I _{CLKL}	V _{IN} = 1.5V, V _{CLK} = 0V	-	0.1	-	μA	8

NJU7262 Series

+5V Version

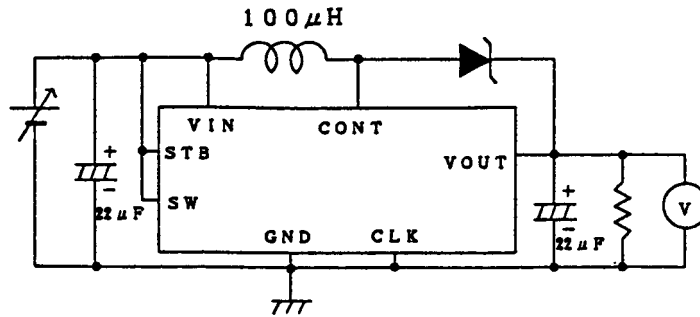
($T_a = 25^\circ\text{C}$)

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}		$V_{IN} = 3.0\text{V}$	20	30	50	kHz	2
Output Voltage	V_{OUT}		$V_{IN} = 3.0\text{V}$, $I_{OUT} = 20\text{mA}$	4.85	5.0	5.15	V	1
Input Stability	ΔV_{OUT1}		$V_{IN} = 2.0\text{V}$ to 3.0V $I_{OUT} = 20\text{mA}$	-	30	100	mV	1
Load Stability	ΔV_{OUT2}		$V_{IN} = 3.0\text{V}$ $I_{OUT} = 10\mu\text{A}$ to 25mA	-	30	100	mV	1
Operating Current	I_{SS}		$V_{IN} = V_{STB} = 3.0\text{V}$, NO LOAD	-	5	15	μA	3
Stand-by Current	I_Q		$V_{IN} = V_{SW} = 3.0\text{V}$ $V_{STB} = V_{CLK} = 0\text{V}$, NO LOAD	-	-	0.2	μA	4
Switching Current	I_{SI}		$V_{DS} = 0.2\text{V}$	-	250	-	mA	-
STB Terminal Input Voltage	H level	V_{STBH}	$V_{IN} = 3.0\text{V}$	2.4	-	-	V	5
	L level	V_{STBL}	$V_{IN} = 3.0\text{V}$	-	-	0.4	V	5
SW Terminal Input Voltage	H level	V_{SWH}	$V_{IN} = 3.0\text{V}$	2.4	-	-	V	6
	L level	V_{SWL}	$V_{IN} = 3.0\text{V}$	-	-	0.4	V	6
CLK Terminal Input Voltage	H level	V_{CLKH}	$V_{IN} = 3.0\text{V}$	2.4	-	-	V	7
	L level	V_{CLKL}	$V_{IN} = 3.0\text{V}$	-	-	0.4	V	7
STB Terminal Input Current	H level	I_{STBH1}	$V_{IN} = 3.0\text{V}$, $V_{STB} = 2.4\text{V}$	-	50	100	μA	8
		I_{STBH2}	$V_{IN} = 3.0\text{V}$, $V_{STB} = 3.0\text{V}$	-	0.1	-	μA	8
	L level	I_{STBL1}	$V_{IN} = 3.0\text{V}$, $V_{STB} = 0.4\text{V}$	-	50	100	μA	8
		I_{STBL2}	$V_{IN} = 3.0\text{V}$, $V_{STB} = 0\text{V}$	-	0.1	-	μA	8
SW Terminal Input Current	H level	I_{SWH}	$V_{IN} = 3.0\text{V}$, $V_{SW} = V_{IN}$	-	0.1	-	μA	8
	L level	I_{SWL}	$V_{IN} = 3.0\text{V}$, $V_{SW} = 0\text{V}$	-	10	30	μA	8
CLK Terminal Input Current	H level	I_{CLKH}	$V_{IN} = 3.0\text{V}$, $V_{CLK} = V_{IN}$	-	10	30	μA	8
	L level	I_{CLKL}	$V_{IN} = 3.0\text{V}$, $V_{CLK} = 0\text{V}$	-	0.1	-	μA	8

NJU7262 Series

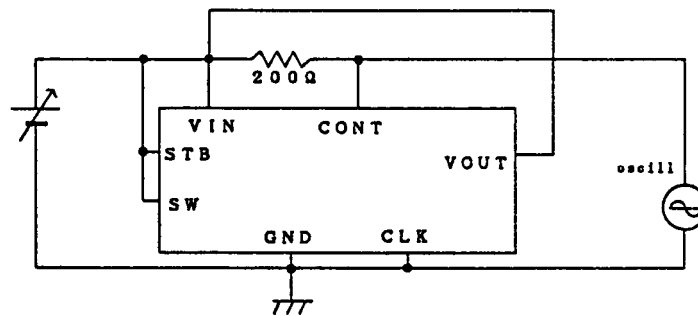
MEASUREMENT CIRCUIT

(1)

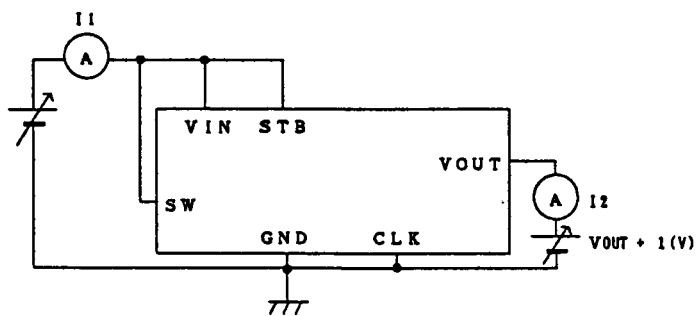


External Diode Type : "D1NS4" provided by SHINDENGEN
 ($I_F = 1A, V_F = 0.55V$)

(2)

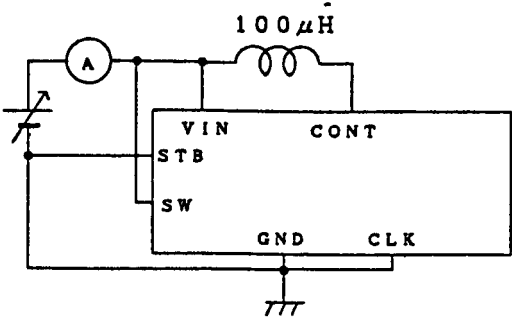


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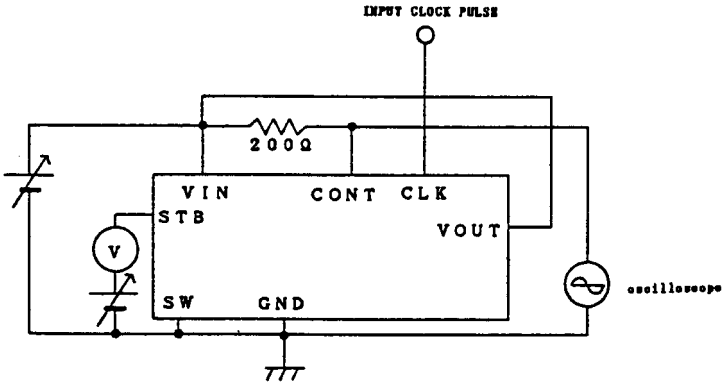


$$I_{SS} = I_1 + I_2 \times \frac{V_{OUT}}{V_{OUT} + 1}$$

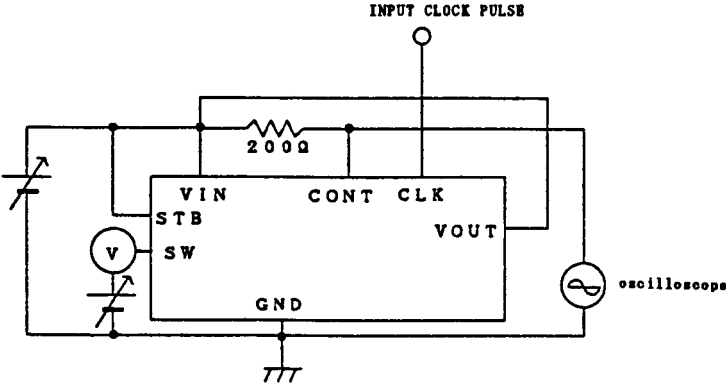
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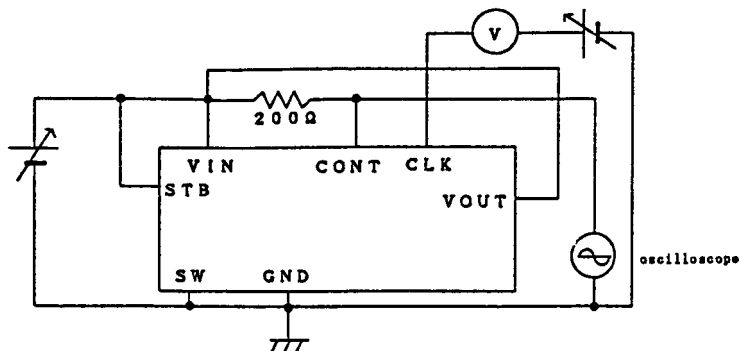


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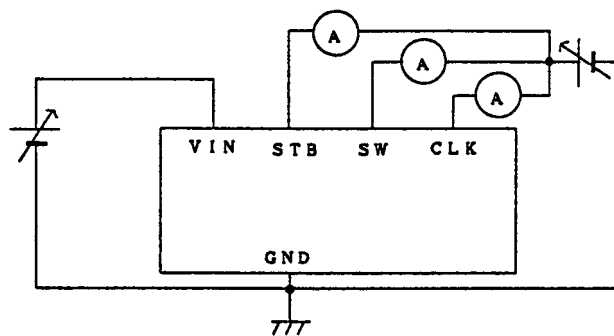


NJU7262 Series

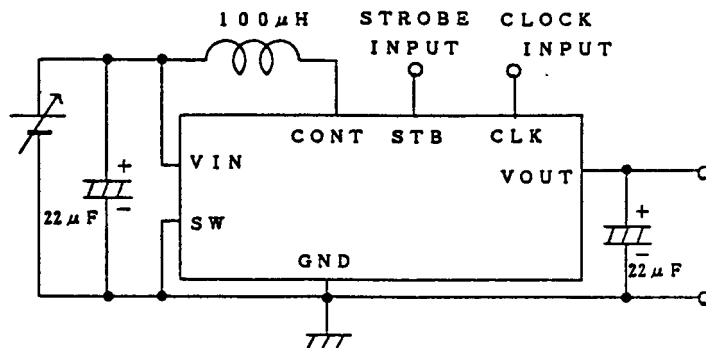
(7)



(8)



APPLICATION CIRCUIT



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