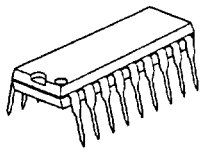
2-DIGIT SINGLE CHIP A/D CONVERTER

■ GENERAL DESCRIPTION

The NJU9252 is a low operating current, high performance 2-digit single chip A/D converter containing a sample/hold circuit, an oscillator, a 7-segment decoder, LED display driver and a control circuit.

The NJU9252 realizes to apply with few external components, therefore it is most suited for digital meters, digital thermometers and the others.

■ PACKAGE OUTLINE



NJU9252D

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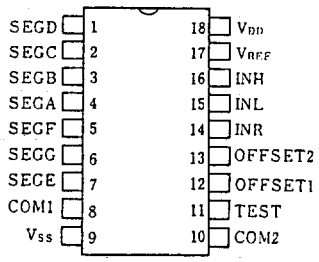
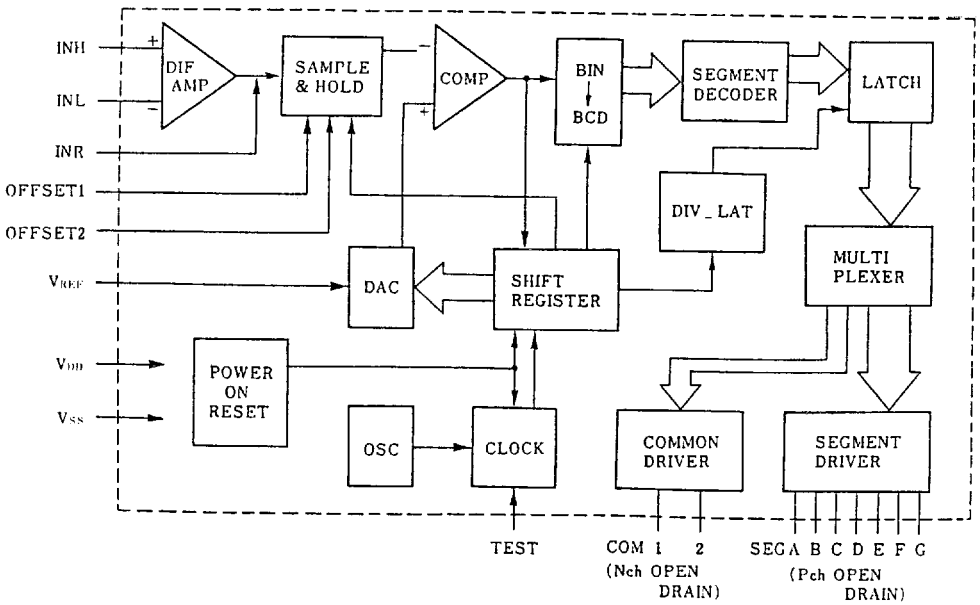
■ FEATURES

- 8-bit Resolution, Successive Approximation Method
- Low Input Current -- 1μA typ.
- Dynamic LED direct driving
- Sample/Hold Circuit On-Chip
- CR Oscillation Circuit On-Chip
- Power-on Initialization
- Offset Adjustment Terminal
- Low operating current
- Package Outline -- DIP 18
- C-MOS Technology

■ PIN CONFIGURATION



■ BLOCK DIAGRAM



■ TERMINAL DESCRIPTION

NO.	SYMBOL	F U N C T I O N
1	SEGD	LED segment Driver output D (Pch open-drain)
2	SEGC	LED segment Driver output C (Pch open-drain)
3	SEGB	LED segment Driver output B (Pch open-drain)
4	SEGA	LED segment Driver output A (Pch open-drain)
5	SEGF	LED segment Driver output F (Pch open-drain)
6	SEGG	LED segment Driver output G (Pch open-drain)
7	SEGE	LED segment Driver output E (Pch open-drain)
8	COM1	LED common Driver output 1 (Nch open-drain)
9	V_{SS}	GND terminal
10	COM2	LED common Driver output 2 (Nch open-drain)
11	TEST	Test terminal
12	OFFSET1	Offset Adjustment terminal 1
13	OFFSET2	Offset Adjustment terminal 2
14	INR	Input Gain setup Resistor Connecting Terminal
15	INL	Analog Differential input (Lo)
16	INH	Analog Differential input (Hi)
17	V_{REF}	Reference Voltage
18	V_{DD}	Supply Voltage (5V)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	-0.3~+7.0	V
Analog Input Voltage	V_{IN}	GND ~ V_{REF}	V
Reference Input Voltage	V_{REF}	GND ~ V_{DD}	V
Power Dissipation	P_D	500	mW
Operating Temperature Range	T_{opr}	-20 ~ + 75	℃
Storage Temperature Range	T_{stg}	-40 ~ +125	℃

Note 1) The input current is limited to ±100uA when the input voltage is more than supply voltage.

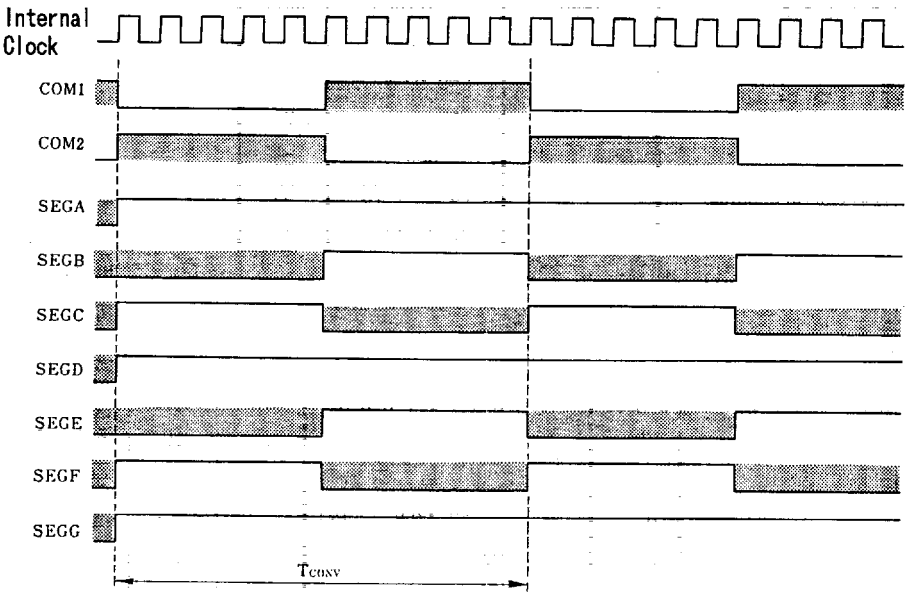
■ ELECTRICAL CHARACTERISTICS ($Ta=25℃, V_{DD}=5V$)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		4.5	5.0	5.5	V
Ratiometric Reading	N99	V_{IN}=2.475V , V_{REF}=3.2V	98	98/99	99	Counts
Linearity	D_L	Full Scale=2.475V (2)		±0.5	±2	LSB
OFFSET	E_{OFF}	V_{REF}=3.2V		±1	±2	LSB
Noise(P-P Value)	V_{NI}	V_{IN}=0.0V, (3) Full Scale=2.475V		30		μV
Leakage Current	I_L	V_{IN}=0.0V		1	5	μA
Zero Reading Drift	Z_D	V_{IN}=0.0V, -20<Ta<75℃		0.2	1	μV/℃
Scale Factor Temperature Coefficient	Ftemp	V_{IN}=2.475V, -20<Ta<75℃ (Ext.ref, 0 ppm/℃)		1	5	ppm/℃
Sampling-rate	T_S			1		time/s
Operating Current	I_{DD}	V_{IN}=0.0V		0.8	1.8	mA
Segment Sink Current	I_{S1}	Segment Voltage=3V SEGA~SEGF Terminals	10	14		mA
Segment Sink Current	I_{S2}	Segment Voltage=3V COM1,COM2 Terminals	70	98		mA

Note 2) Linearity indicates an error of the input-output linearity characteristics getting with the two read data of zero and full scale input values.

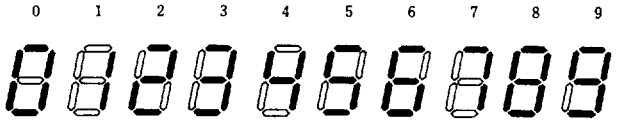
3) The peak value of noise must be kept within this value during 95% period in the measurement time.

■ TIMING CHART

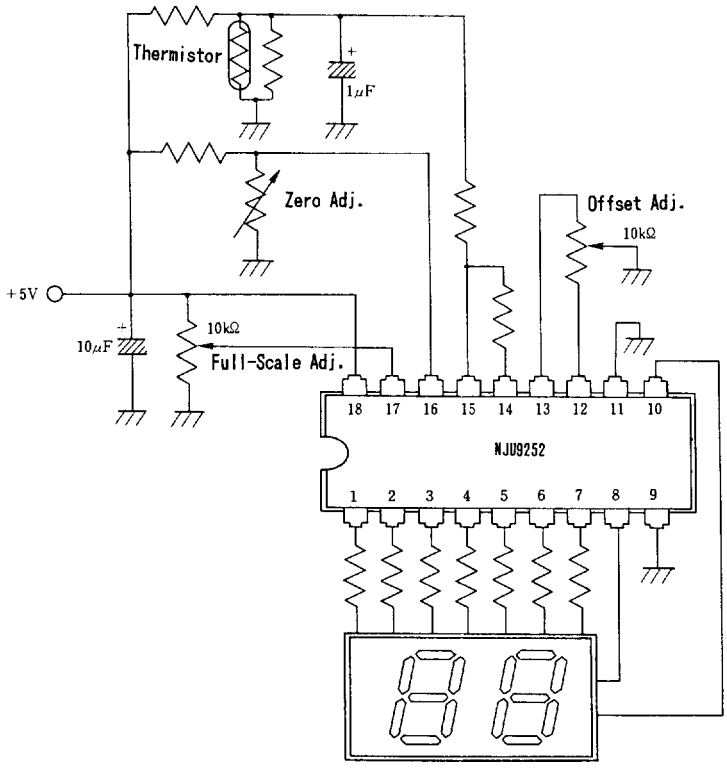


Note 4) SEGA~SEGG are an example to display "25".
The duty of COM1 and COM2 are 50% respectively.
COM1 and COM2 are Nch-FET open-drain type, SEGA ~ SEGG are Pch-FET open-drain type.
▒ :: The state of Output terminal is high impedance.

■ DISPLAY PATTERN



■ APPLICATION CIRCUIT (Thermometer)



LED
(CATHODE COMMON)