

3·1/2 DIGIT SINGLE CHIP A/D CONVERTER

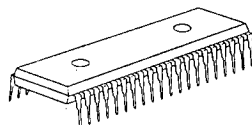
GENERAL DESCRIPTION

The NJU9201B/9202B are low-power-consumption, high-performance 3·1/2 digit single chip A/D converters containing a voltage reference, oscillator, 3·1/2 digit A/D converter, 7-segment decoder, display driver and control circuits.

The NJU9201B is designed for direct LCD driving and the NJU9202B for direct LED driving.

The NJU9201B/9202B can be operated on simple application circuits as they require only few external components, therefore they are most suited for digital multimeters, digital thermometers and other likes.

PACKAGE OUTLINE

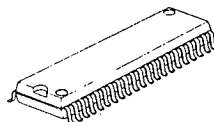


NJU9201BD/9202BD

5

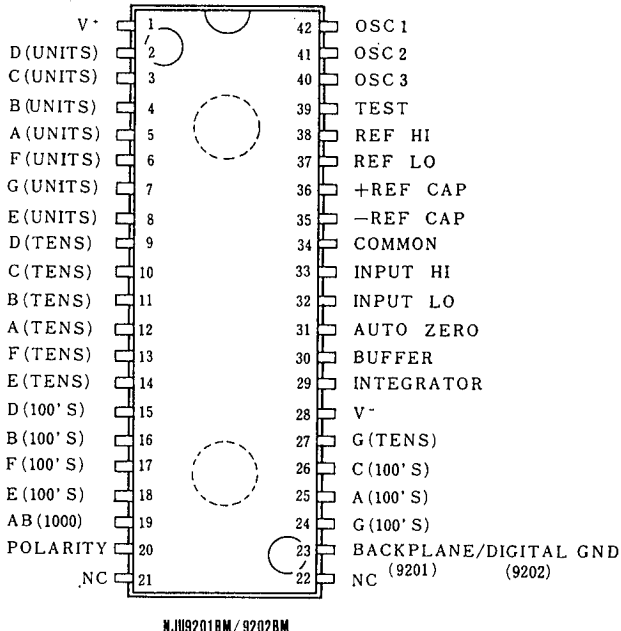
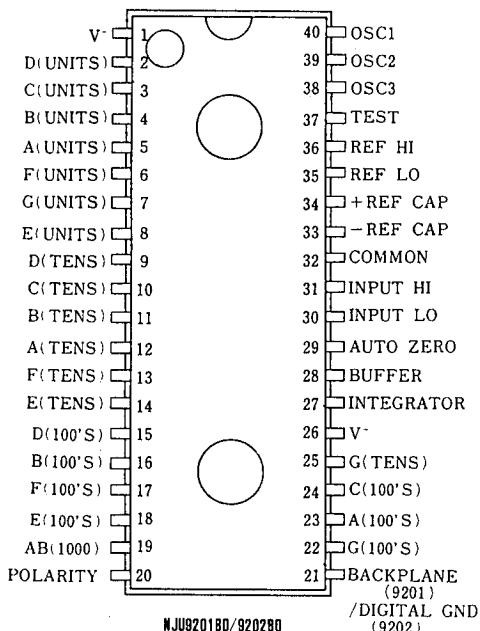
FEATURES

- Guaranteed 0 Reading for 0 input on all scales
- Polarity detection at 0 point
using a high-accuracy null-detection
- Low Input Current -- 1pA typ.
- True differential input and reference
- Display device direct driving
NJU9201B -- LCD
NJU9202B -- LED
- Reference and Oscillation Circuits incorporated
- Low power consumption
- No external active components required
- Package Outline -- DIP 40 /DMP 42
- C-MOS Technology



NJU9201BM/9202BM

PIN CONFIGURATION



ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	DEVICE	SYMBOL	RATINGS	UNIT
Supply Voltage	9201B Only	$V^+ - V^-$	15	V
	9202B Only	V^+	+6	
	9202B Only	V^-	-9	
Analog Input Voltage	9201B/9202B	V_{IN}	$V^+ \sim V^-$	V
Reference Input Voltage	9201B/9202B	V_{ref}	$V^+ \sim V^-$	V
Clock Input	9201B Only	V_{CLK}	Test $\sim V^+$	V
	9202B Only		GND $\sim V^+$	
Power Dissipation	9201B/9202B	P_D	300 / 800	mW
Operating Temperature Range	9201B/9202B	T_{OPR}	0 $\sim$ +75	°C
Storage Temperature Range	9201B/9202B	T_{STG}	-40 $\sim$ +125	°C

Note 1) The input current is limit by $\pm 100\mu A$ when the input voltage is over supply voltage.

ELECTRICAL CHARACTERISTICS

(Ta=25°C, $f_{clock}=48kHz$)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Zero Input Reading	No	$V_{IN}=0.0V, FS=200.0mV$	-000.0	± 000.0	+000.0	Counts
Ratiometric Reading	N1000	$V_{IN}=V_{ref}, V_{ref}=100mV$	999	999/1000	1000	
Rollover Error	Err	$-V_{IN}=+V_{IN}-200.0mV$ (2)	-2	± 0.5	+2	Counts
Linearity	Lin	Full Scale=200mV (3)	-2	± 0.5	+2	Counts
Common Mode Rejection Ratio	$CMRR$	$V_{cm}=\pm 1V, V_{IN}=0V,$ Full Scale=200.0mV		50		$\mu V/V$
Noise(P-P Value)	V_{NI}	$V_{IN}=0V, FS=200.0mV$ (4)		30		μV
Leakage Current	I_L	$V_{IN}=0V$		1	10	pA
Zero Reading Drift	Z_D	$V_{IN}=0V, 0 < Ta < 75^\circ C$		0.2	1	$\mu V/^\circ C$
Scale Factor Temp. Coeff.	F_{temp}	$V_{IN}=199.0mV, 0 < Ta < 75^\circ C$		1	5	ppm/°C
Operating Current	I_{DD}	$V_{IN}=0V, No Load$		0.8	1.8	mA
Analog Common Voltage		25k Ω Between Common and	2.4	3.0	3.2	V
Temp. Coeff.of Analog Common		Positive Supply		80		
Seg. Drive Voltage (9201B)		$V_{DD}=9V$	4	5	6	V
BackPlane Drive Volt.(9201B)		$V_{DD}=9V$	4	5	6	
Seg. Sinking Current (9202B)		$V_{DD}=5V,$ Except Term.19	5.0	8.0		mA
Seg. Sinking Current (9202B)		Seg.V=3V Term.19 only	10	16		

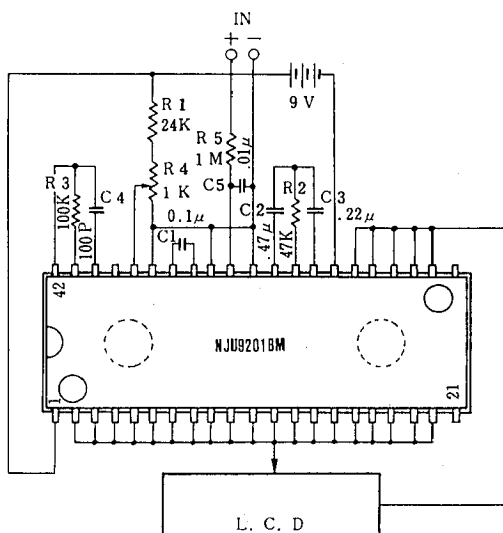
Note 2) Differential read out value of positive and negative voltage input.

3) Error from the input-output linear characteristics getting from positive and negative full-scale input read out.

4) The peak value of noise must be not over 95% period in the measurement time.

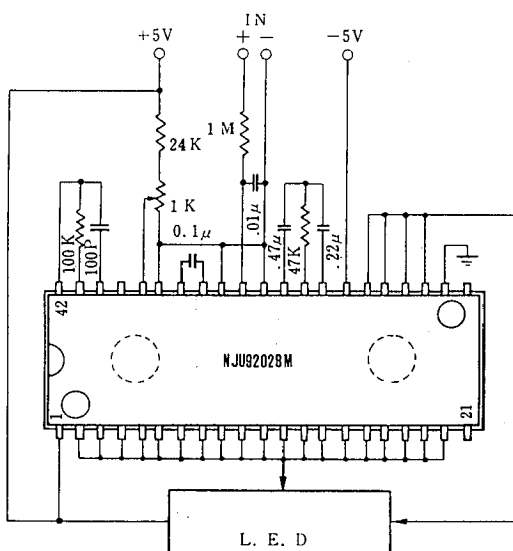
APPLICATION CIRCUITS

NJU9201B



5

NJU9202B



MEMO

[CAUTION]

The specifications on this databook are only given for information , without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.