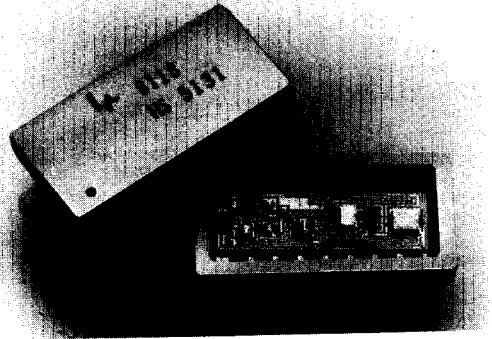


# HS 5131

## 8-Bit, 2.5 $\mu$ S ADC

### FEATURES

- 2.5 $\mu$ S Conversion Time
- Low Power . . . 680mW Typical
- Small 18-Pin DIP
- Replacement for MN5131
- Adjustment Free
- $\pm 1/2$  LSB Linearity
- Guaranteed Monotonic



### DESCRIPTION

The HS 5131 is a fast, low-power 8-Bit successive approximation A/D converter with both parallel and serial output capability. It is designed as a replacement unit for the MN5131 and maintains  $\pm 2$  LSB accuracy over the full temperature range. Conversion speed is 2.5  $\mu$  s, maximum.

Analog input range of the HS 5131 is  $\pm 5$ V and input circuits are DTL/TTL compatible.

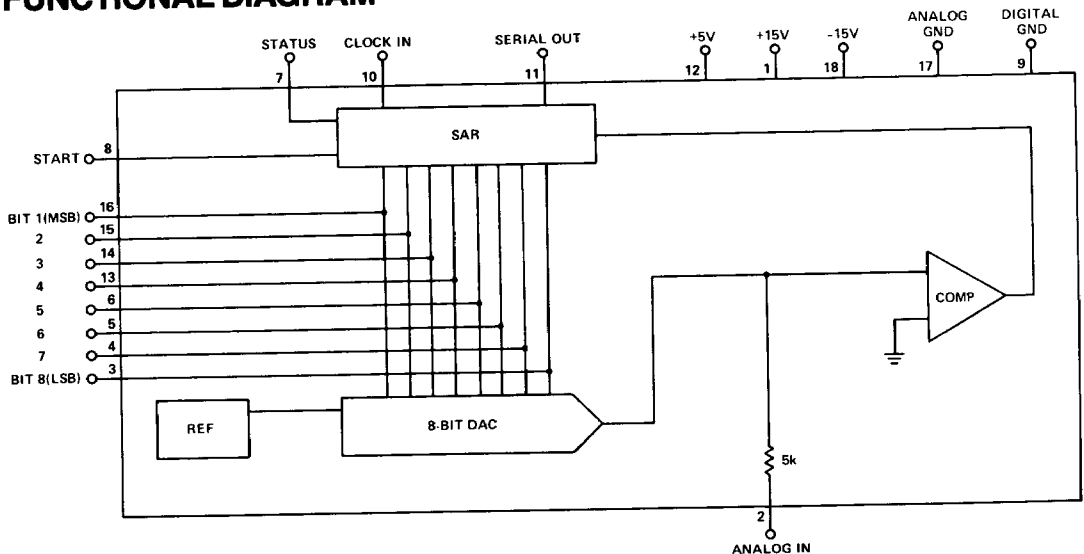
The HS 5131 is housed in a hermetically-sealed 18-pin side brazed ceramic package and incorporates preci-

sion, laser-trimmed resistors for excellent long-term stability.

Monotonicity of the HS 5131 is guaranteed over the specified temperature range.

All "B" versions of the HS 5131 are fully screened and tested to MIL-STD-883 Rev. C, Level B requirements to assure highest reliability in severe environments.

### FUNCTIONAL DIAGRAM



# SPECIFICATIONS

(Typical @ +25°C and nominal power supplies unless otherwise noted)

<b>MODEL</b>	HS 5131
<b>TYPE</b>	Successive Approximation
<b>RESOLUTION</b>	8 Bits

## ANALOG INPUT

Range	-5V to +5V
Impedance	5kΩ

## DIGITAL INPUT

Logic 1	+2.0V min
Logic 0	+0.4V max
Clock	1 TTL Load max
Pulse Width, High	25nS min
Pulse Width, Low	50nS min
Frequency	3.2 MHz max
Start, High	2 TLL Loads max
Start, Low	1 TTL Load max

## DIGITAL OUTPUTS

Logic 1	2.4V min
Logic 0	0.4V max
Fan-out High	11 TTL Loads min
Fan-out Low	5 TTL Loads min
Coding	Offset Binary
Serial Output	NRZ

## ACCURACY

Linearity <sup>1</sup>	±1/2 LSB max
Absolute Accuracy <sup>2</sup>	±1 LSB max
Absolute Accuracy <sup>1</sup>	±2 LSB max
Bipolar Offset	1 LSB max
Bipolar Offset <sup>1</sup>	2 LSB max
Conversion Time	2.5μS max

## POWER SUPPLY

Requirements	
+15V (nominal) ±3%	@ 21mA max
-15V (nominal) ±3%	@ -10mA max
+5V (nominal) ±5%	4.75 to 5.25V @ 100mA max
Rejection Ratios	
+15V Supply	+0.05%/ % max
-15V Supply	+0.01%/ % max
Total Power Consumption	965mW max

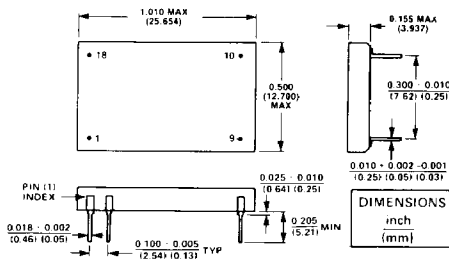
## TEMPERATURE RANGE

Operating <sup>1</sup>	
C Versions	0°C to 70°C
B Versions	-55°C to +125°C
Storage	-65°C to +150°C

## MECHANICAL

Case Style 18 Pin DIP, ceramic

Case Dimensions



## Pin Designations

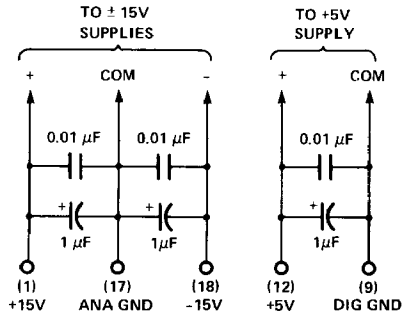
PIN	FUNCTION	PIN	FUNCTION
1	+15V	18	-15V
2	Analog In	17	Analog Gnd
3	Bit 8	16	Bit 1
4	Bit 7	15	Bit 2
5	Bit 6	14	Bit 3
6	Bit 5	13	Bit 4
7	Status	12	+5V
8	Start	11	Serial Out
9	Digital Gnd	10	Clock In

## NOTES

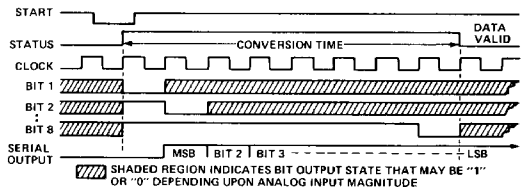
1. Specification applies for operation over the temperature range.
2. Absolute accuracy includes all errors due to gain, offset and non-linearity.

# APPLICATIONS INFORMATION

## RECOMMENDED POWER SUPPLY BYPASS CIRCUIT



## TIMING DIAGRAM



## NOTES:

1. For continuous operation connect start (Pin 8) to status (Pin 7).
2. Reset the converter by holding the start 'low' during a low to high transition of the clock. The start must be low for a minimum of 20nS prior to the clock transition. After the start is again set high the conversion will begin on the next low to high transition of the clock. The start may be set low at any time during a conversion to reset and begin again.
3. At the end of conversion the status will remain low until the converter is reset. The parallel data is valid for the entire time the status is low.
4. The serial output is non-return to zero.
5. For the user's design flexibility, digital and analog grounds are brought out separately and must be externally connected. For optimum results, this external connection should be made as close to the converter as is possible.

## TRANSFER CHARACTERISTICS

ANALOG INPUT	DIGITAL OUTPUT							
	MSB							LSB
-4.961	0	0	0	0	0	0	0	0
-0.039	0	1	1	1	1	1	1	0
0.000	0	0	0	0	0	0	0	0
4.922	1	1	1	1	1	1	1	0
4.961	1	1	1	1	1	1	1	0

\*The voltages given are the theoretical values for the transitions indicated. Ideally, with the converter continuously converting the output bits indicated as 0 will change from "1" to "0" or from "0" to "1" as the input voltage passes through the level indicated.

# ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
HS5131C	8-Bit ADC, Commercial
HS 5131B	8-Bit ADC, MIL

Specifications subject to change without notice.