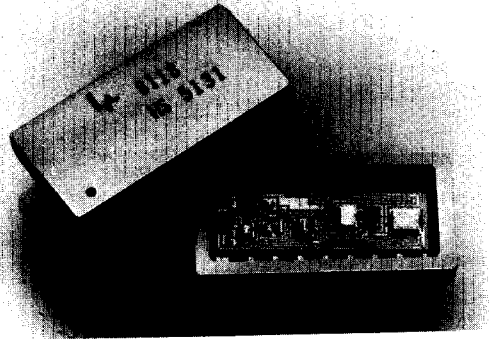**Sipex** Corporation
SIGNAL PROCESSING EXCELLENCE

HS 5131
8-Bit, 2.5µS ADC

FEATURES

- 2.5µS Conversion Time
- Low Power . . . 680mW Typical
- Small 18-Pin DIP
- Replacement for MN5131
- Adjustment Free
- ±½LSB 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 ±2 LSB accuracy over the full temperature range. Conversion speed is 2.5 µ s, maximum.

Analog input range of the HS 5131 is ±5V 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
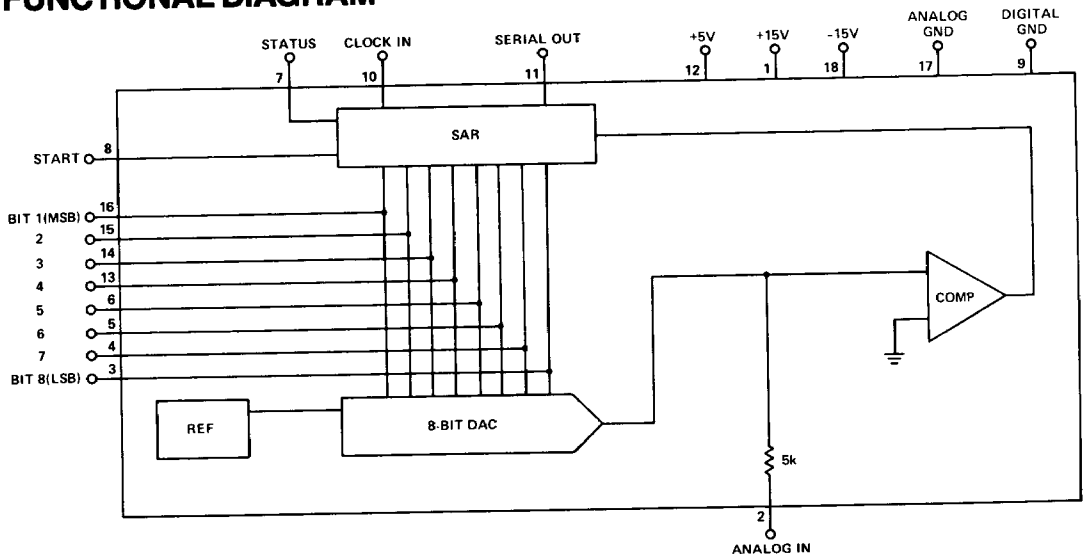
SPECIFICATIONS

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

MODEL	HS 5131
TYPE	Successive Approximation
RESOLUTION	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[1]	±1/2 LSB max
Absolute Accuracy[2]	±1 LSB max
Absolute Accuracy[1]	±2 LSB max
Bipolar Offset	1 LSB max
Bipolar Offset[1]	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[1]	
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	
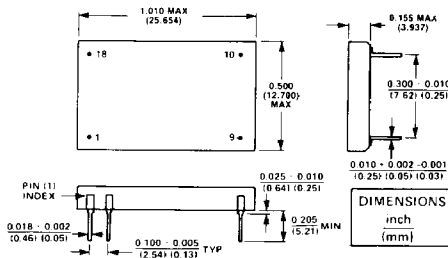
Pin Designations

| 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
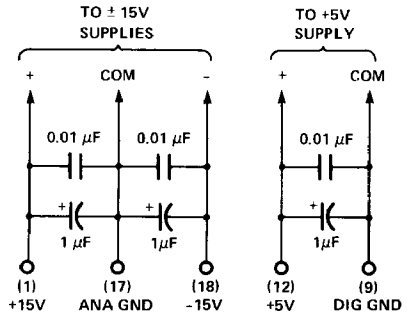
TIMING DIAGRAM
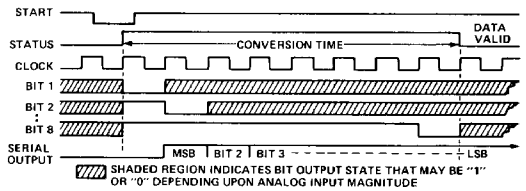
NOTES:
1. For continuous operation connect start (Pin 8) to status (Pin 7).
2. Reset the converter by holding the start 'low' during a low to high transition of the clock. The start must be low for a minimum of 20nS prior to the clock transition. After the start is again set high the conversion will 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	0	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.