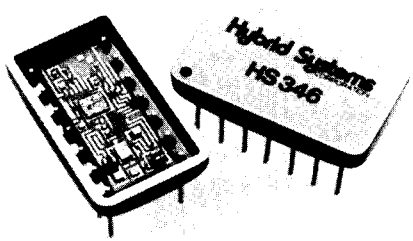
HS 346
High Speed Sample/Hold

FEATURES

- **Acquisition Time, 2.0 μs**
- **Linearity 0.01%**
- **Low Droop 0.5 mV/ms**
- **Internal Hold Capacitor**
- **−55°C to +125°C Operation**
- **Small Size, 14 pin DIP**



DESCRIPTION

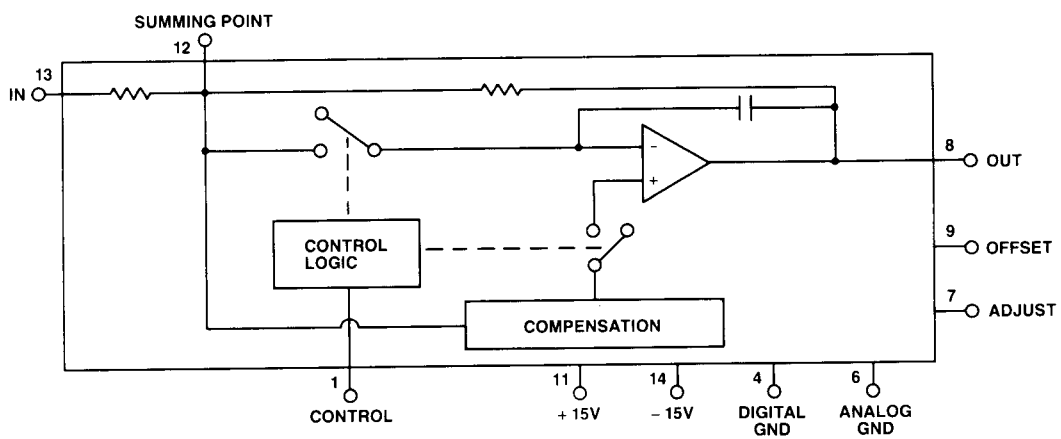
The HS 346 is a high speed, high accuracy sample/hold amplifier in a 14 pin DIP. It is pretrimmed to a max of 0.02% gain error with a low sample to hold offset of less than 4mV. The HS 346 is specially built for military applications in the −55°C to +125°C temperature range and features precision laser trimmed thin film resistors, carefully selected active chips and is processed to the requirements of MIL-STD-883 Rev. C, Level B (HS 346B). HS 346 is a superior replacement of the MN346. Product highlights include:

LOW GAIN ERROR — the gain of the HS 346 is laser-trimmed to an accuracy of ±0.02% max at room temperature. It will stay within ±0.05% max over the full −55°C to +125°C temperature range.

FAST SIGNAL ACQUISITION — a small internal holding capacitor is combined with a high slew rate output amplifier for a fast signal acquisition time of 2 μs max.

HIGH-REL PROCESSING — HS 346 is specified for the full −55°C to +125°C temperature range and is processed according to the requirements of MIL-STD-883 Rev. C, Level B.

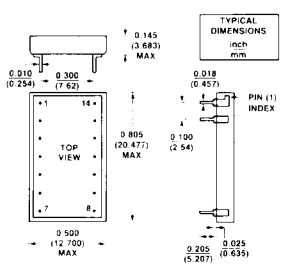
FUNCTIONAL DIAGRAM



SPECIFICATIONS

(Typical @ +25°C, rated supply unless otherwise noted)

MODEL	HS 346
SAMPLE/HOLD CHARACTERISTICS	
Acquisition Time	
to 0.01%, 10V step	1.0μs (typ), 2.0μs (max)
to 0.01%, 20V step	1.6μs (typ), 2.5μs (max)
Aperture Delay	60ns (max)
Aperture Uncertainty	6ns
Settling Time ($10V_{pp}$, Sample Mode)	2.0μs (max)
Droop Rate[1]	
@ +25°C	0.5mV/ms (max)
@ +125°C[2]	200mV/ms (typ), 700mV/ms (max)
Sample to Hold Offset	2mV (typ), 4mV (max)
@ −55°C to +125°C[2]	10mV (typ), 20mV (max)
Feedthrough (Hold Mode)	
@ 1 kHz	0.02% (max)
TRANSFER CHARACTERISTICS	
Gain	−1.00
Gain Accuracy	
@ −55°C to +125°C[2]	±0.05% (max)
Full Power Bandwidth	1.4 MHz
Output Slew Rate	50 V/μs
ANALOG INPUT CHARACTERISTICS	
Voltage Range	±10V
Absolute Max Input Voltage	±V supply
Offset Voltage[3]	±3mV (max)
−55°C to +125°C[2]	±6mV (typ), ±20mV (max)
DIGITAL INPUT CHARACTERISTICS	
Input Voltage	
Hold Mode	<+0.8 Volt
Sample Mode[4]	>+2.0 Volt
Input Current "0"	50μA (max)
Input Current "1"	1.0μA (max)
POWER REQUIREMENTS	
Supply Voltage[5]	±15V, ±3%
Supply Currents $+V_S$	28mA
Supply Currents $-V_S$	−25mA
PSRR (both supplies)	0.001%/V
Consumption	795mW (max)
TEMPERATURE RANGE	
Operating	
HS 346C	0°C to +70°C
HS 346B	−55°C to +125°C
Storage	−65°C to +150°C
MECHANICAL	
Case Style	14 pin DIP



PIN	FUNCTION
1	DIGITAL INPUT
2	N/C
3	N/C
4	DIGITAL GND
5	N/C
6	ANALOG GND
7	OFFSET ADJUST
8	ANALOG OUTPUT
9	OFFSET ADJUST
10	N/C
11	+15V
12	SUMMING POINT
13	ANALOG INPUT
14	−15V

NOTES:
1. The output droop in hold mode doubles every 10°C temperature rise.
2. For HS 346B version only.
3. Can be adjusted to zero.
4. Maximum digital input voltage is 5.5 Volt.
5. Maximum output swing is 4 Volts less than the supply voltage.

APPLICATION NOTES

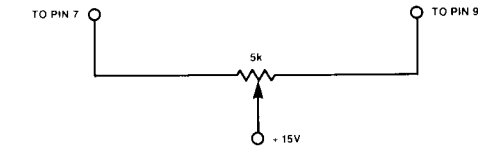
POWER SUPPLY BYPASS

For optimum performance, the +15V and −15V supplies should be bypassed to ground with a 0.01μF ceramic capacitor as close to the pins as possible.

GROUNDING

Analog ground and digital ground are not connected internally. They must be tied together as close to the package as possible.

OFFSET ADJUST

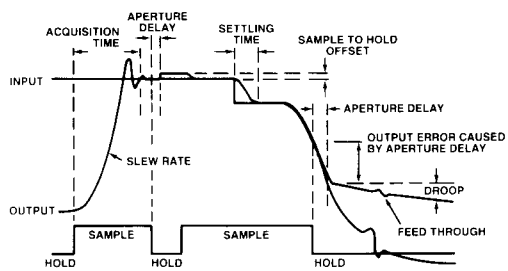


Connect the input (pin 13) to ground and adjust the output to read zero volt, while HS 346 is in sample mode (pin 1 at +5V).

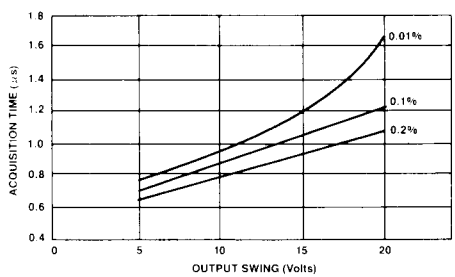
GAIN ERROR/SAMPLE TO HOLD OFFSET ERROR

These errors are intrinsic with the HS 346 and cannot be adjusted directly at the unit. However, since the HS 346 is most likely used in front of an ADC, the system's gain error and sample to hold error can be adjusted using the trim circuitry of the ADC.

TIMING DIAGRAM (not to scale)



HS 346 ACQUISITION TIME vs OUTPUT SWING



ORDERING INFORMATION

MODEL	DESCRIPTION
HS 346C	High Speed S/H, Commercial
HS 346B	High Speed S/H, MIL-STD-883 Rev. C, Level B

Specifications subject to change without notice.