

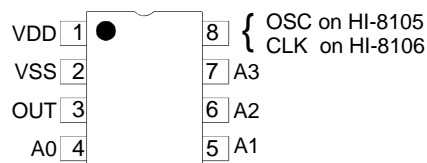
### DESCRIPTION

The HI-8105 & HI-8106 are silicon gate CMOS devices designed for 'glue' logic applications. They are simple 16 stage dividers with programmable division. The HI-8105 has a one pin oscillator while the HI-8106 receives a clock input. The one pin oscillator frequency is set by a resistor to VDD and the capacitance to AC ground at the pin.

The wafer processing enables operation to 1 volt guaranteed. The chip is designed for low power performance. As a result the maximum output frequency is 5 MHz while the internal logic will run considerably higher.

A companion version, HI-8107, features a crystal oscillator circuit and a 8 stage programmable divider.

### PIN CONFIGURATION



### SUPPLY VOLTAGES

VDD = 1V to 5V

### FUNCTION TABLE

A3	A2	A1	A0	OUT
0	0	0	0	DIV by 2
0	0	0	1	4
0	0	1	0	8
0	0	1	1	16
0	1	0	0	32
0	1	0	1	64
0	1	1	0	128
0	1	1	1	256
1	0	0	0	512
1	0	0	1	1024
1	0	1	0	2048
1	0	1	1	4096
1	1	0	0	8192
1	1	0	1	16384
1	1	1	0	32768
1	1	1	1	65536

### PIN DESCRIPTION TABLE

PIN	SYMBOL	FUNCTION	DESCRIPTION
1	VDD	SUPPLY	POSITIVE SUPPLY, 1V TO 5V
2	VSS	SUPPLY	GROUND
3	OUT	LOGIC OUTPUT	CMOS
4	A0	LOGIC INPUT	CMOS
5	A1	LOGIC INPUT	CMOS
6	A2	LOGIC INPUT	CMOS
7	A3	LOGIC INPUT	CMOS
8	OSC (8105)	INPUT/OUTPUT	RC - CONNECT TO VDD
8	CLK (8106)	LOGIC INPUT	CMOS

### FEATURES

- 1V TO 5V Low Power Operation
- 5MHz Operation
- 30MHz division at 5V
- 5MHz division at 1V
- 8 Pin SOIC package

## FUNCTIONAL DESCRIPTION

The HI8105 and HI-8106 are 16 stage serial counters. Each stage's Q is input to a 1 of 16 decoder. A 4 bit code at pins 4 through 7 selects which stage is routed to the output at pin 3. The counter clocks on the negative transition of pin 8.

Figure 1 shows the oscillator circuit of the HI-8105. The charging time is controlled by a delay circuit and the hysteresis window. The window is typically 0.6V wide at VDD=5.0V.

Figure 2 shows the bonding option which omits the N device pulldown and thereby allows the simple clock input of the HI-8106.

## APPLICATION INFORMATION

The HI-8105 oscillator frequency is set by selecting a resistor and capacitor to apply at pin 8. Typical parameters at room temperature are:

### OSCILLATOR FREQUENCY DATA

Ro	Co = 100pF		Co = 1nF	
	VDD=5V	VDD=1V	VDD=5V	VDD=1V
1KΩ	7.80MHz	-	2.12MHz	-
3KΩ	4.22MHz	914KHz	1.10MHz	231KHz
10KΩ	1.46MHz	464KHz	359KHz	100KHz
100KΩ	165KHz	64KHz	39.6KHz	12KHz

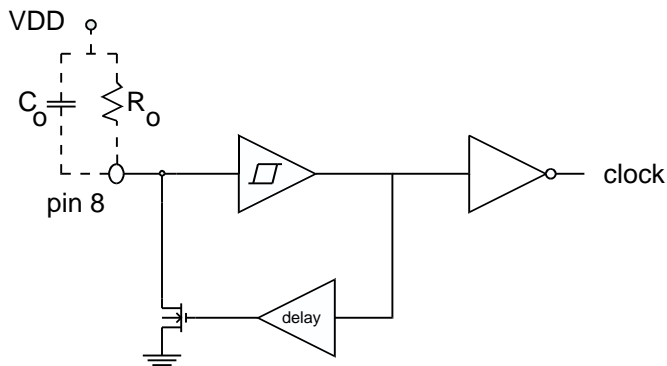


FIGURE 1 - HI-8105 Oscillator

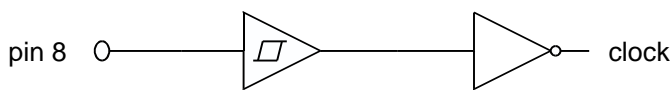


FIGURE 2 - HI-8106 Clock Input

## ORDERING INFORMATION

PART NUMBER	PACKAGE DESCRIPTION	TEMPERATURE RANGE	FLOW	BURN IN	LEAD FINISH
HI-8105PDI	8 PIN PLASTIC DIP	-40°C TO +85°C	I	NO	SOLDER
HI-8105PDT	8 PIN PLASTIC DIP	-55°C TO +125°C	T	NO	SOLDER
HI-8105PSI	8 PIN PLASTIC NARROW BODY SOIC	-40°C TO +85°C	I	NO	SOLDER
HI-8105PST	8 PIN PLASTIC NARROW BODY SOIC	-55°C TO +125°C	T	NO	SOLDER
HI-8105CDI	8 PIN CERAMIC SIDE BRAZED DIP	-40°C TO +85°C	I	NO	GOLD
HI-8105CDT	8 PIN CERAMIC SIDE BRAZED DIP	-55°C TO +125°C	T	NO	GOLD
HI-8105CDM	8 PIN CERAMIC SIDE BRAZED DIP	-55°C TO +125°C	M	YES	SOLDER
HI-8105CRI	8 PIN CERDIP	-40°C TO +85°C	I	NO	SOLDER
HI-8105CRT	8 PIN CERDIP	-55°C TO +125°C	T	NO	SOLDER
HI-8105CRM	8 PIN CERDIP	-55°C TO +125°C	M	YES	SOLDER

Note: The HI-8106 is available in the same options

**ABSOLUTE MAXIMUM RATINGS**

Voltages referenced to Ground

Supply voltages VCC.....7V
DC current per input pin..... ±10mA
Power dissipation at 25°C.....500mW
Solder Temperature .....275°C for 10 sec
Storage Temperature.....-65°C to +150°C

**RECOMMENDED OPERATING CONDITIONS**

Supply Voltages VCC.....1V to 5.25V
Temperature Range Industrial Screening.....-40°C to +85°C Hi-Temp Screening.....-55°C to +125°C Military Screening.....-55°C to +125°C

*NOTE: Stresses above absolute maximum ratings or outside recommended operating conditions may cause permanent damage to the device. These are stress ratings only. Operation at the limits is not recommended.*

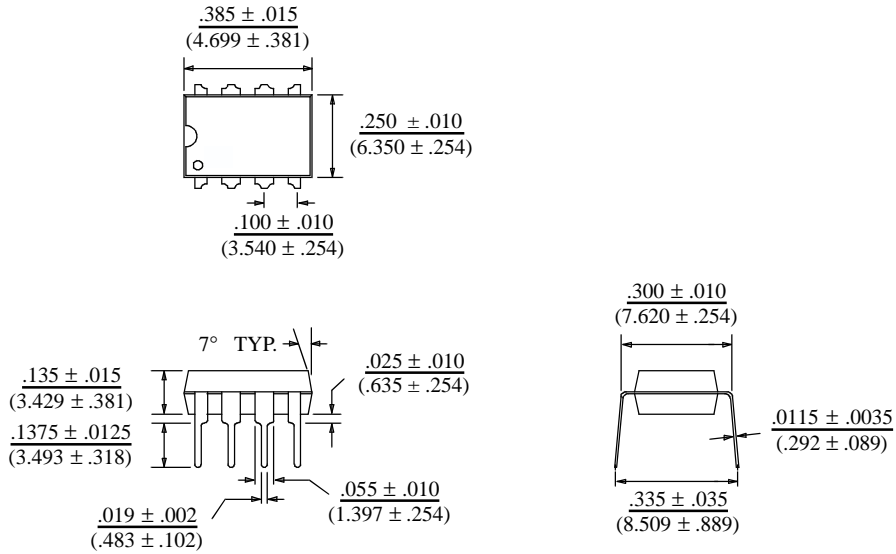
**DC ELECTRICAL CHARACTERISTICS**

VDD-VSS=5V and T<sub>A</sub>=25°C unless otherwise noted

PARAMETERS	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
operating voltage	VDD-VSS		1.0		5.0	volts
logic input voltage high low	V <sub>IH</sub> V <sub>IL</sub>	pins 4,5,6,7	3.5	2.5 2.5	1.5	volts volts
logic input current high low	I <sub>IH</sub> I <sub>IL</sub>	pins 4,5,6,7	-1.0		1.0	μA μA
logic output drive current one zero	I <sub>OH</sub> I <sub>OL</sub>	pins 3 Vout=3.5V Vout=0.8V	1.7	-2.4 2.8	-1.6	mA mA
Current drain no load not clocking HI-8105 operating HI-8106 operating	IDD <sub>1</sub> IDD <sub>2</sub> IDD <sub>3</sub>	pins 4,5,6,7 all at VSS and pin 8 = VSS Ro=1KΩ and Co=100pF clocking pin 8 at 10MHz		0.5 0.6	1.0 1.0	μA mA mA
Current drain no load at 1.0 V HI-8105	IDD <sub>4</sub>	pins 4,5,6,7 all at VSS and Ro=10KΩ and Co=100pF		38	70	μA

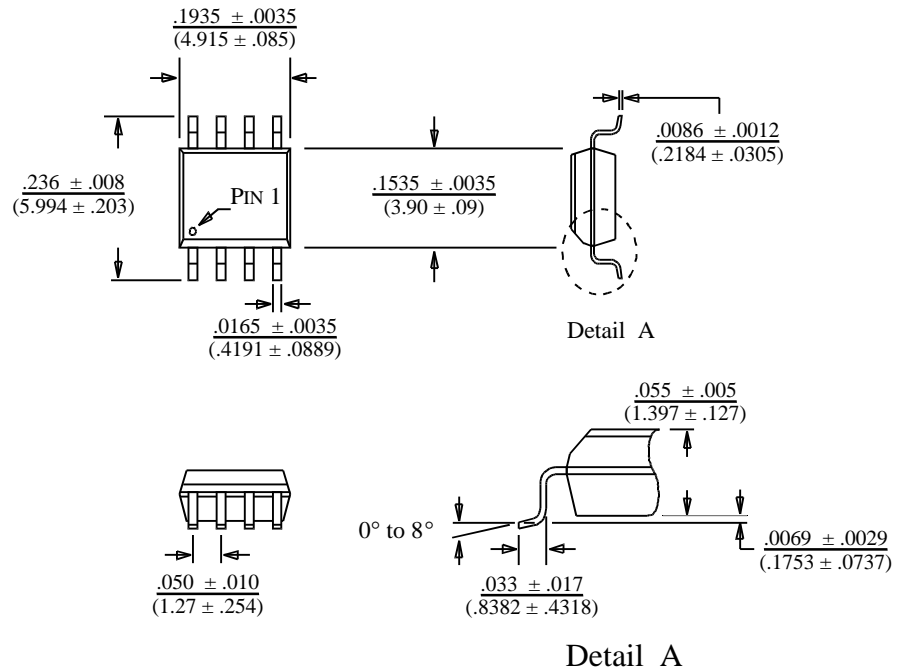
**8-PIN PLASTIC DIP**

Package Type: 8P



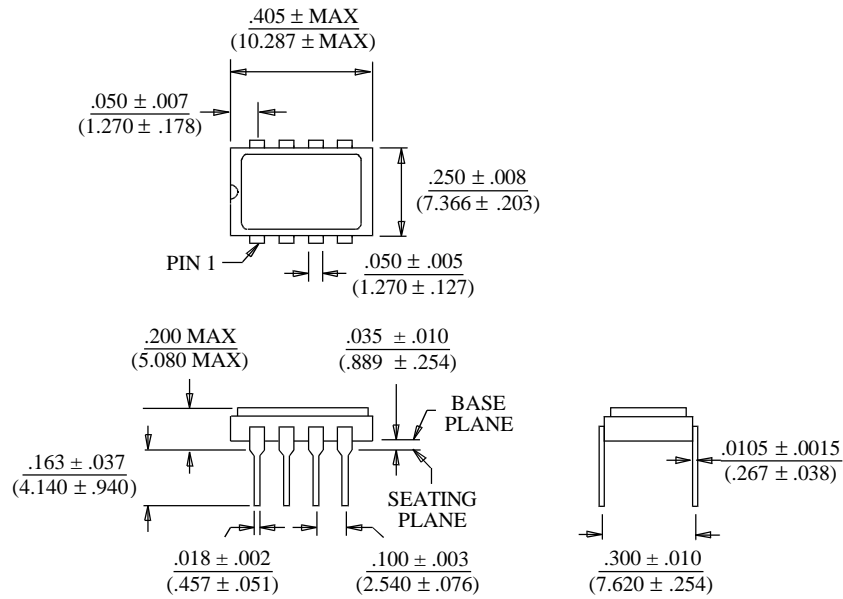
**8-PIN PLASTIC SMALL OUTLINE (SOIC) - NB**  
(Narrow Body)

Package Type: 8HN



**8-PIN CERAMIC SIDE-BRAZED DIP**

Package Type: 8C



**8-PIN CERDIP**

Package Type: 8D

