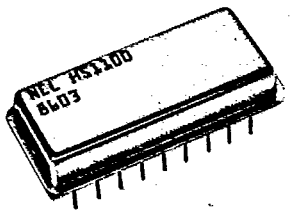
Crystal Clock Oscillators

T-75-33-09

DUAL BAUD RATE GENERATORS

Crystal Controlled Programmable Divider HS-1100 Series



HS-1100 Series

Description

The HS-1100 Series of dual baud rate generators provides sixteen asynchronous/synchronous data communications frequencies. Quartz crystal control of the reference frequency to ±0.01% is two orders of magnitude better than that required by most UARTs and USRTs.

Output $f_o/4$ on Pin 10 is used as a system clock. The HS-1100B has an output (f_o) on Pin 1 capable of driving two TTL loads. The HS-1100C offers a 0% error at 19,200 baud and an f_o output on Pin 1. All three models have an $f_o/4$ output on Pin 10.

The HS-1100 Series has full duplex communications capabilities and is pin compatible with the SMC 5036/8136 and G.I. A4-5-8136.

All units are resistance welded in an all metal package, offering RFI shielding, and are designed to survive standard wave soldering without damage. Insulated standoffs to enhance board cleaning are standard.

Suggested Applications

Serial data exchange over modems, teletypes and cassette recorders can be accomplished manually or under software control using HS-1100 generators for rates from 50 to 19,200 baud.

Specifications

General Characteristics	
Supply voltage (V_{CC})	5.0 V ± 5%
Breakdown voltage (V_{CC})	8.0 V Min.
Supply current (I_{CC})	65 mA Max.
Operating temperature (T_A)	0° to 70° C
Storage temperature (T_S)	–55° to + 125° C
DC Characteristics	
Input voltage levels	
Low-level (V_{IL})	0.8 V Max.
High-Level (V_{IH})	2.0 V Min.
Output voltage levels	
f_r, f_t: Low-level (V_{OL})	0.5 V Max. (I_{OL} = 3.2 mA)
f_r, f_t: High-level (V_{OH})	V_{CC} –1.5V Min., 4.0 V Typ. (I_{OH} = 100 µA)
$f_o/4$: Low-level (V_{OL})	0.4 Max. (I_{OL} = 1.6 mA)
$f_o/4$: High-level (V_{OH})	V_{CC} –1.5 V Min., 4.0 V Typ. (I_{OH} = 100 µA)
f_o: Low-level (V_{OL})	0.5 V Max. (I_{OL} = 3.2mA)
f_o: High-level (V_{OH})	2.7 V Min. (I_{OH} = 100 µA)
Input current	
Low-level (I_{IL})	0.3 mA (V_I = gnd)
Input capacitance	
All inputs (C_I)	10 pf Max. (V_I = gnd)
AC Characteristics	
Pulse width[1]	150 ns Min.
Input setup time, address[1]	50 ns Min.
Input hold time, address	50 ns Min.
Strobe to new frequency delay	3.5 µs Max.
Output Characteristics	
Frequency	
HS-1100A	$f_o/4$ = 1.2672 MHz
HS-1100B	$f_o/4$ = 1.2672 MHz; f_o = 5.0688 MHz
HS-1100C	$f_o/4$ = 1.2288 MHz; f_o = 4.9152 MHz
Frequency stability	±0.01% (including calibration tolerance at 25° C, temperature drift, input voltage variation, load range, and aging)

1. Input setup time can be decreased to 0 ns by increasing the minimum strobe width by 50 ns to a total of 200 ns.

(Cont. on next page)

Crystal Clock Oscillators

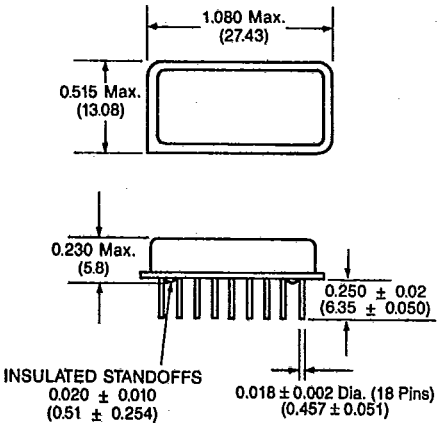
NEL

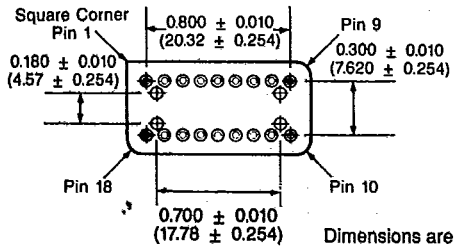
HS-1100 Series

(Continued)

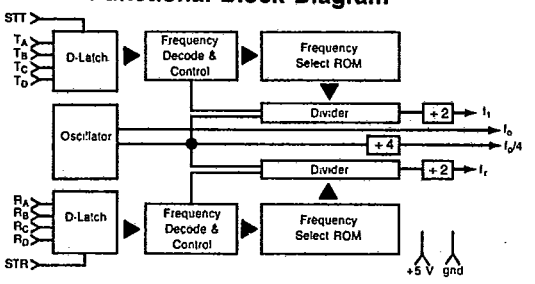
Baud Rate Generator Output Frequencies

Transmit/ Receive Address D C B A	Baud Rate	Theoretical Frequency 16X Clock	HS-1100A/HS-1100B (5.0688 MHz) Actual Frequency 16X Clock	Error (%)	Duty Cycle (%)	Divisor	HS-1100C (4.9152 MHz) Actual Frequency 16X Clock	Error (%)	Duty Cycle (%)	Divisor
0 0 0 0	50	0.8 kHz	0.8 kHz	—	50/50	6336	0.8 kHz	—	50/50	6144
0 0 0 1	75	1.2	1.2	—	50/50	4224	1.2	—	50/50	4096
0 0 1 0	110	1.76	1.76	—	50/50	2880	1.7589	−0.01	•	2793
0 0 1 1	134.5	2.152	2.1523	0.016	50/50	2355	2.152	—	50/50	2284
0 1 0 0	150	2.4	2.4	—	50/50	2112	2.4	—	50/50	2048
0 1 0 1	300	4.8	4.8	—	50/50	1056	4.8	—	50/50	1024
0 1 1 0	600	9.6	9.6	—	50/50	528	9.6	—	50/50	512
0 1 1 1	1200	19.2	19.2	—	50/50	264	19.2	—	50/50	256
1 0 0 0	1800	28.8	28.8	—	50/50	176	28.7438	−0.19	•	171
1 0 0 1	2000	32.0	32.081	0.253	50/50	158	31.9168	−0.26	50/50	154
1 0 1 0	2400	38.4	38.4	—	50/50	132	38.4	—	50/50	128
1 0 1 1	3600	57.6	57.6	—	50/50	88	57.8258	0.39	•	85
1 1 0 0	4800	76.8	76.8	—	50/50	66	76.8	—	50/50	64
1 1 0 1	7200	115.2	115.2	—	50/50	44	114.306	−0.77	•	43
1 1 1 0	9600	153.6	153.6	—	48/52	33	153.6	—	50/50	32
1 1 1 1	19,200	307.2	316.8	3.125	50/50	16	307.2	—	50/50	16





Functional Block Diagram



Pin	Connection	Pin	Connection
1	NC — HS-1100A f_o — HS-1100B HS-1100C	9	NC
		10	$f_o/4$
		11	grd
		12	STT
2	V_{CC}	13-16	T_D, T_C, T_B, T_A,
3	f_r	17	f_t
4-7	R_A, R_B, R_C, R_D	18	NC
8	STR		

Dimensions are for reference only, inches (mm).

NEW PRODUCTS

In our continued effort to provide quality products to meet the needs of the changing electronics market, NEL is in the process of developing several new products.

Among these are:

TTL/CMOS Oscillator

Frequency range 70 to100 MHz. User tolerance available from ± .005%.

3-State CMOS/TTL

Frequency range extended to 80MHz. User tolerance available from ± .005%.

Z80/8000/80A/80B Oscillator

Frequency range on HS-380/2890 Series extended to 40.0MHz. User tolerance available from ± .0025%.

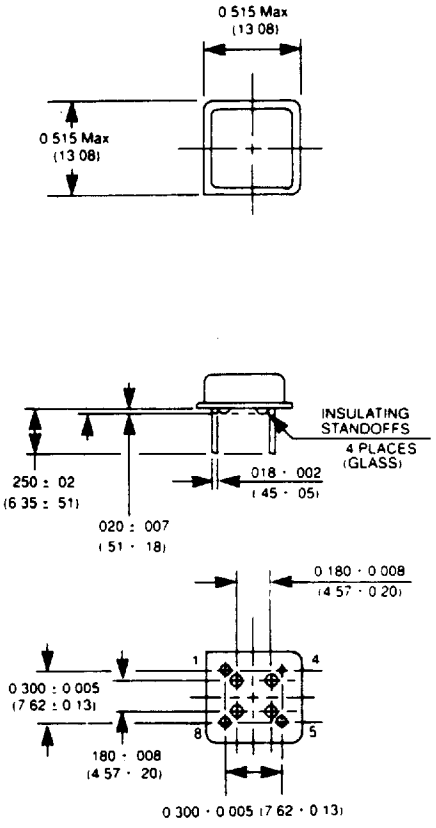
Programmable Video Clock Generator

For use in the computer graphics, disk drive (zone locator) and fiber optics markets.

This product simplifies operations by using phase-locked loop techniques to generate, from the crystal oscillator, all the necessary clocks used in a typical graphics system.

OSCILLATOR METAL HALF PACK AND SURFACE MOUNT DIMENSIONS

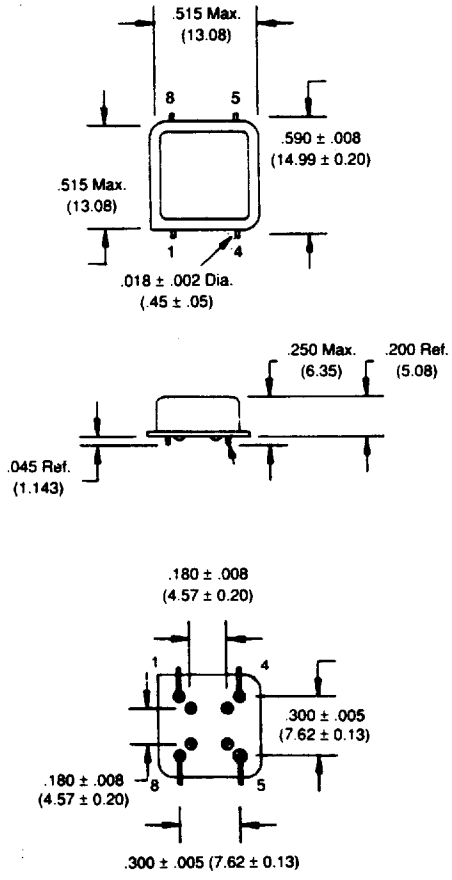
HA Series



Pin number 4 connected to case.

The metal half pack oscillator is available in TTL, CMOS, and Z80 logics. See options on pages 17, 20, 29, and 33 for details.

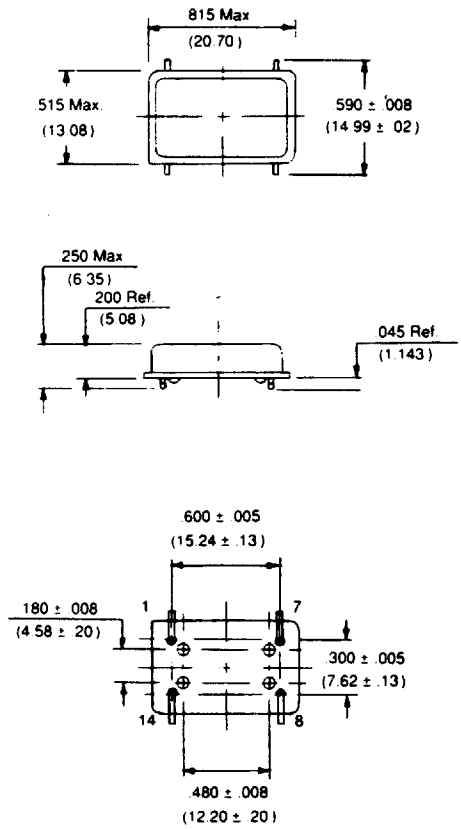
SA Series



Pin number 4 connected to case.

Seating plane = .005 Max. (.127) Wire leads to be formed to a 90° angle.

SM Series



Pin number 7 connected to case.

Seating plane = .005 Max. (.127) Wire leads to be formed to a 90° angle.

Dimensions are for reference only, inches (mm).