

## AC LINE FREQUENCY DIVIDERS

July 2000

### RED SERIES

RED 5/6	Divide by 5 or 6
RED 50/60	Divide by 50 or 60
RED 100/120	Divide by 100 or 120
RED 300/360	Divide by 300 or 360
RED 500/600	Divide by 500 or 600
RED 3000/3600	Divide by 3000 or 3600

### FEATURES:

- Clock input pulse shaper accepts 50Hz/60Hz sine wave directly
- Fully static counter operation
- +4.5V to +15V operation ( $V_{DD} - V_{SS}$ )
- Low power dissipation
- High noise immunity
- Reset
- Input Enable
- 50Hz/60Hz division select input
- Output low power TTL compatible at +4.5V operation
- Square Wave Output (except for ÷ 5)
- RED x/y (DIP); RED x/y-S (SOIC) See Figure 1

### APPLICATION:

Time base generator from either 50Hz or 60Hz line frequency to produce:

10 pulses per second	(RED 5/6)
1 pulse per second	(RED 50/60)
1 pulse per 2 seconds	(RED 100/120)
1 pulse per .1 minute	(RED 300/360)
1 pulse per 10 seconds	(RED 500/600)
1 pulse per minute	(RED 3000/3600)

### DESCRIPTION OF OPERATION:

The counter advances by one on each negative transition of the input clock pulse as long as the Enable signal is High and the Reset signal is Low. When the Enable signal is Low the input clock pulses will be inhibited and the counter will be held at the state it was in prior to bringing the Enable Low. A High Reset signal clears the counter to zero count.

Depending on the device used, a Low on the Division Select input will cause a Divide by 6, 60, 120, 360, 600 or 3600. A High on the Division Select will cause a Divide by 5, 50, 100, 300, 500 or 3000.

All outputs are 50% duty cycle except RED 5, where output is low for two clocks and high for three clocks.

### CLOCK INPUT

If input signals are less than the  $V_{SS}$  or greater than  $V_{DD}$ , a series input resistor should be used to limit the maximum input current to 2 mA.

### PIN ASSIGNMENT - TOP VIEW

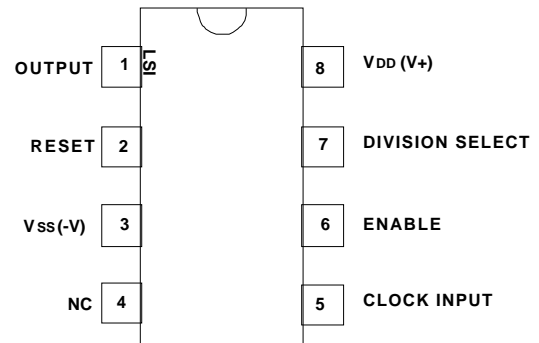


FIGURE 1

### MARKING AS FOLLOWS:

PART	MARKING
RED 5/6	RED 6
RED 50/60	RED 60
RED 100/120	RED 120
RED 300/360	RED 360
RED 500/600	RED 600
RED 3000/3600	RED 3600

### MAXIMUM RATINGS:

PARAMETER	SYMBOL	VALUE	UNIT
Storage Temperature	T <sub>STG</sub>	-65 to +150	°C
Operating Temperature	T <sub>A</sub>	-40 to +85	°C
DC Supply Voltage	( $V_{DD}-V_{SS}$ )	+18	V
Voltage at any input	V <sub>IN</sub>	$V_{SS} - .3$ to $V_{DD} + .3$	V

### ENABLE SIGNAL TIMING

If the Enable signal switches Low during a positive clock phase and then switches High during a negative clock phase, a false count will be registered. To prevent this from happening, the Enable signal should not switch Low during a positive clock phase unless the switch to High also occurs during a positive clock phase. The Enable signal should normally be switched during a negative clock phase.

The information included herein is believed to be accurate and reliable. However, LSI Computer Systems, Inc. assumes no responsibilities for inaccuracies, nor for any infringements of patent rights of others which may result from its use.

**ELECTRICAL CHARACTERISTICS:** (TA = 25° unless otherwise specified)

**TEST CONDITIONS:** Vss = 0V

Output Capacitance Load = 15 pF

Input Rise and Fall times = 20 ns,

except clock Rise and Fall times

Input Capacitance = 5pF max (any input)

	VDD	Min	Max	Units
Quiescent Device Current	5V	-	10	uA
	10V	-	20	uA
Output Voltage, Low Level	5V	-	0.0	V
	10V	-	0.0	V
High Level	5V	4.99	-	V
	10V	9.99	-	V
Clock Input Voltage, Low Level	5V	-	1	V
	10V	-	2	V
High Level	5V	4	-	V
	10V	8	-	V
Input Noise Immunity (except clock) (Low and High)	5V	1.5	-	V
	10V	3.0	-	V
Output Drive Current				
Full N Channel Sink Current Temp. Range (Vout - Vss +.4v)	4.5V	0.18	-	mA
	10V	0.45	-	mA
P Channel Sink Current (Vout - VDD -1)	4.5V	0.3	-	mA
	10V	0.75	-	mA

Clock Rise and Fall Time:

VDD	MIN	MAX	UNITS
5V	No Maximum Limit	-	-
10V	No Maximum Limit	-	-
Clock Frequency	5V	DC	600 kHz
	10V	DC	1200 kHz

Clock Frequency

Input Clock Pulse Width

5V	800	-	ns
10V	400	-	ns

Output Rise and Fall Time

5V	-	225	ns
10V	-	150	ns

Propagation Delay to Output

5V	-	1500	ns
10V	-	750	ns

Enable Set-up Time

5V	-	300	ns
10V	-	150	ns

Reset Pulse Width

5V	800	-	ns
10V	400	-	ns

Reset Removal Time

5V	-	1200	ns
10V	-	600	ns

Reset Propagation Delay to Output

5V	-	1400	ns
10V	-	700	ns

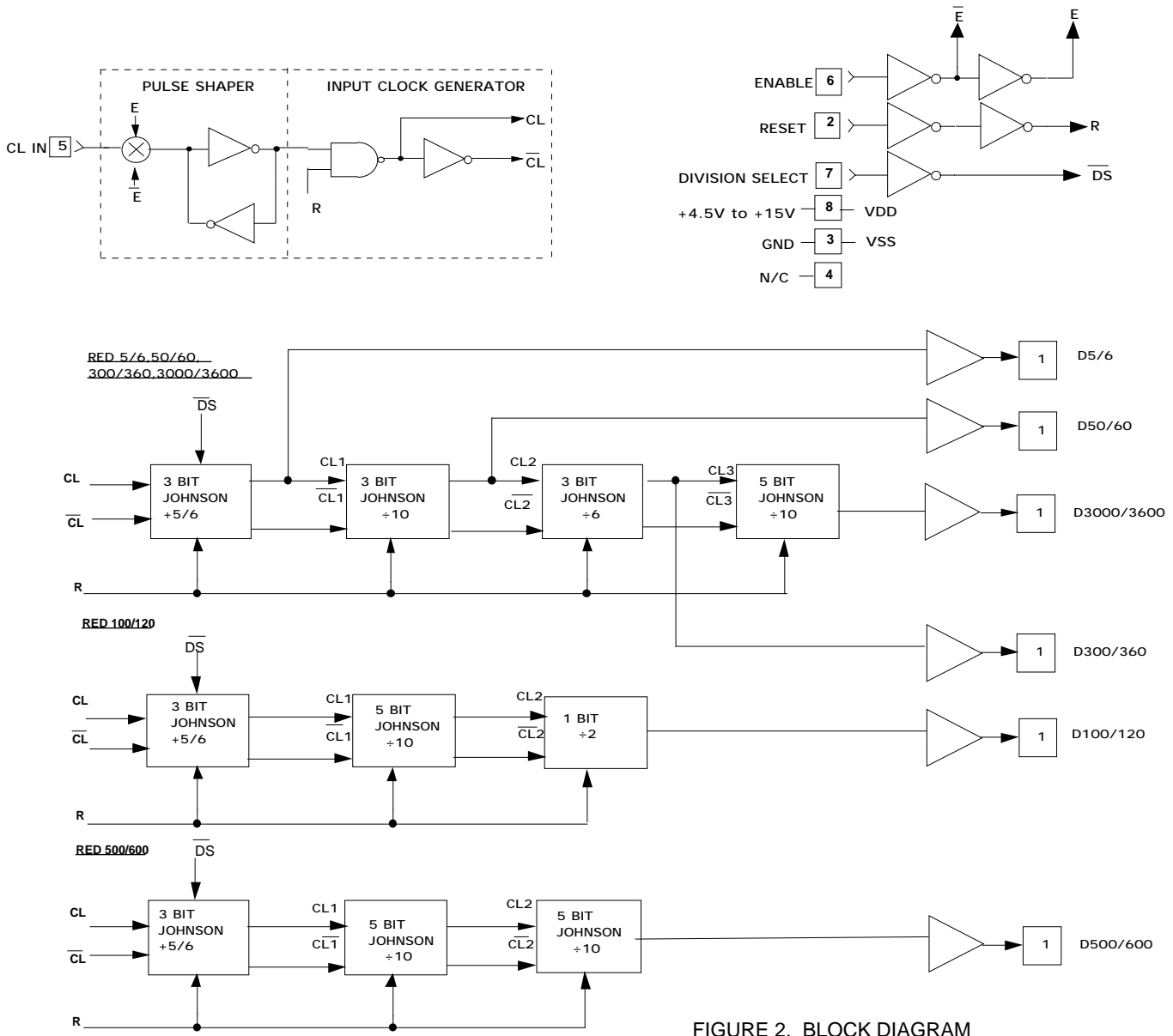


FIGURE 2. BLOCK DIAGRAM