

# WESTERN DIGITAL

C O R P O R A T I O N

## WD2143-03 Four Phase Clock Generator

WD2143-03

### FEATURES

- IMPROVED VERSION OF WD2143-01
- TRUE AND INVERTED OUTPUTS
- SINGLE 5 VOLT SUPPLY
- TTL COMPATIBLE
- ON CHIP OSCILLATOR
- TTL CLOCK INPUT
- TTL CLOCK OUTPUT
- PROGRAMMABLE PULSE WIDTHS
- PROGRAMMABLE PHASE WIDTHS
- NO EXTERNAL CAPACITOR

### GENERAL DESCRIPTION

The WD2143-03 Four-Phase Clock Generator is a MOS/LSI device capable of generating four phase clocks. The output pulse widths are controlled by tying an external resistor to the proper control inputs. All pulse widths may be set to the same width by tying the  $\phi PW$  line through an external resistor. Each pulse width can also be individually programmed by tying a resistor through the appropriate  $\phi 1PW$ - $\phi 4PW$  control inputs.

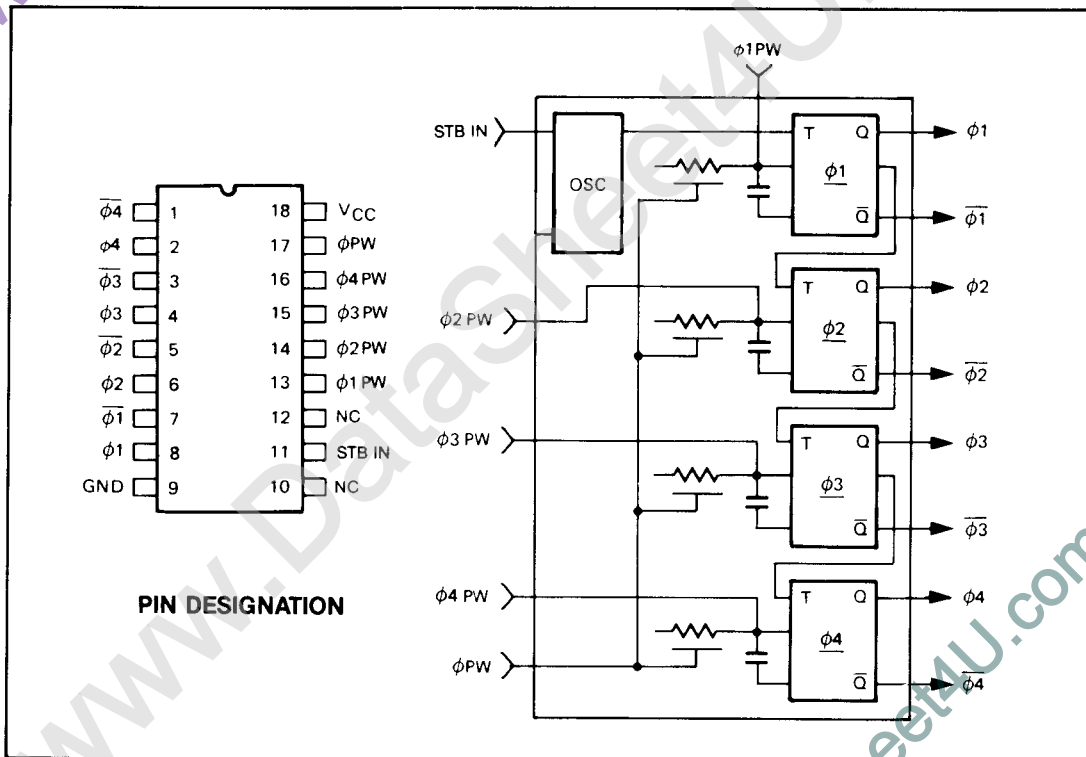


Figure 1. WD2143-03 BLOCK DIAGRAM

### DEVICE OPERATION

Each of the phase outputs can be controlled individually by tying an external resistor from  $\phi 1PW$ - $\phi 4PW$  to a +5V supply. When it is desired to have  $\phi 1$  through  $\phi 4$  outputs the same width, the  $\phi 1PW$ - $\phi 4PW$  inputs should be left open and an external

resistor tied from the  $\phi PW$  (Pin 17) input to +12V. STROBE IN (pin 11) is driven by a TTL square wave. Each of the four phase outputs provide both true and inverted signals, capable of driving 1 TTL load each.

PIN NUMBER	SYMBOL	DESCRIPTION
1,3,5,7	$\overline{\phi 1-\phi 4}$	Four phase clock outputs. These outputs are inverted (active low).
2,4,6,8	$\phi 1-\phi 4$	Four Phase clock outputs. These outputs are true (active high).
9	GND	Ground.
10	NC	No connection.
11	STB IN	Input signal to initiate four-phase clock outputs.
12	NC	No connection.
13-16	$\phi 1PW-\phi 4PW$	External resistor inputs to control the individual pulse widths of each output. These pins can be left open if $\phi PW$ is used.
17	$\phi PW$	External resistor input to control all phase outputs to the same pulse widths.
18	$V_{CC}$	+5V $\pm$ 5% power supply input.

Table 1. PIN DESCRIPTIONS

TYPICAL APPLICATIONS

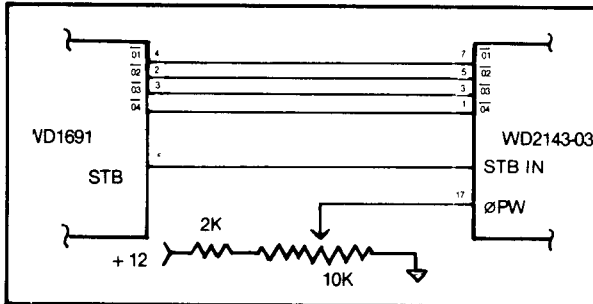


Figure 2. WRITE PRECOMP OPERATION WITH F.S.L. WD1691

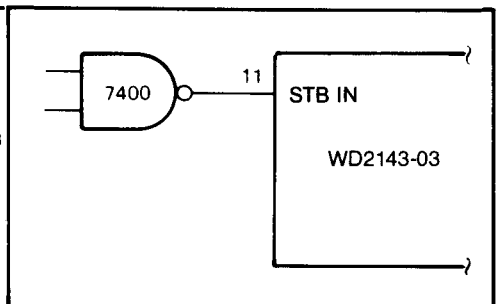


Figure 3. TTL SQUARE WAVE OPERATION

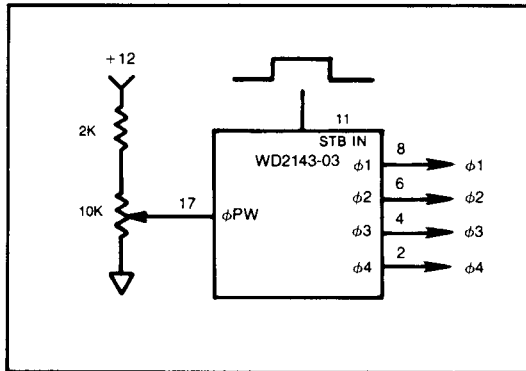


Figure 4. EQUAL PULSE WIDTH OUTPUTS

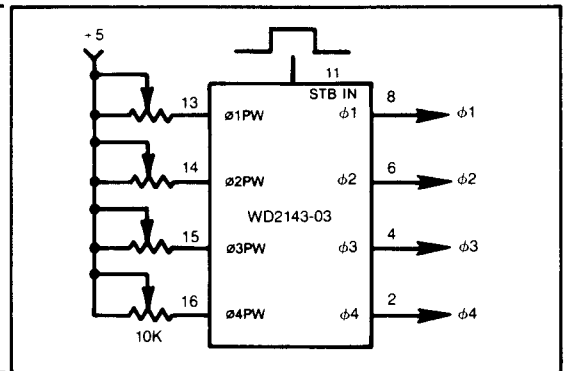


Figure 5. INDIVIDUAL PULSE WIDTH OUTPUTS

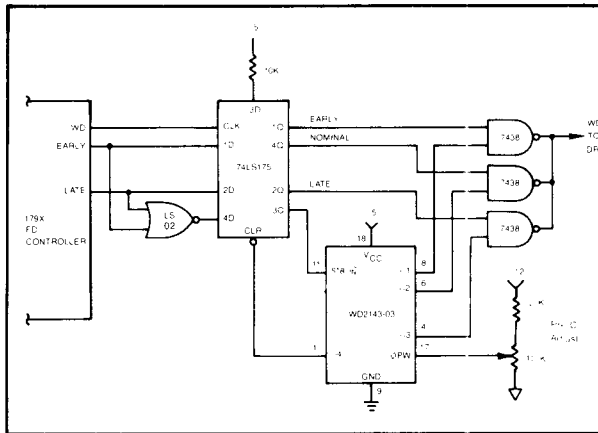


Figure 6. WRITE PRECOMP FOR FLOPPY DISK

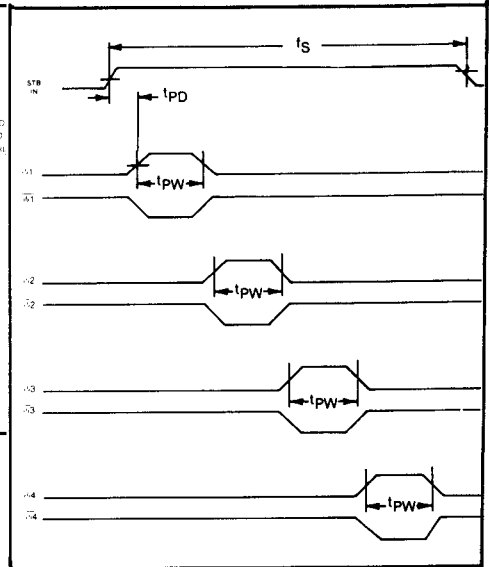


Figure 7. WD2143-03 TIMING DIAGRAM

**SPECIFICATIONS**

Absolute Maximum Ratings  
Operating

Temperature . . . . . 0°C (32°F) to +70°C (158°F)

Voltage on any pin with respect to Ground\* -0.5 to +7V

Power Dissipation 1 Watt

Storage Temperature

plastic . . . . . -55°C (-67°F) to +125°C (257°F)

ceramic . . . . . -65°C (-85°F) to +150°C (302°F)

**DC ELECTRICAL CHARACTERISTICS**

V<sub>CC</sub> = 5V ± 5%, GND = 0V, T<sub>A</sub> = 0°C (32°F) to 70°C (158°F).

Note: Maximum ratings indicate limits beyond which permanent damage may occur. Continuous operation at these limits is not intended and should be limited to the DC electrical characteristics specified.

\*Pin 27 = -0.5V to +12V. Increasing voltage on Pin 17 will decrease T<sub>pw</sub>.

SYMBOL	PARAMETER	MIN	MAX	UNITS	CONDITIONS
V <sub>OL</sub>	TTL low level output		0.4	V	I <sub>OL</sub> = 1.6 mA
V <sub>OH</sub>	TTL high level output	2.0		V	I <sub>OH</sub> = -100μ A
V <sub>IL</sub>	STB in low voltage		0.8	V	
V <sub>IH</sub>	STB in high voltage	2.4		V	
I <sub>CC</sub>	Supply Current		80	mA	All outputs open

Table 2. DC ELECTRICAL CHARACTERISTICS

**SWITCHING CHARACTERISTICS**

$V_{CC} = 5V \pm 5\%$ ,  $GND = 0V$ ,  $T_A = 0^\circ C (32^\circ F)$  to  $70^\circ C (158^\circ F)$

SYMBOL	CHARACTERISTIC	MIN.	MAX.	UNITS	CONDITIONS
$t_{PD}$	STB IN to $\phi 1$		140	ns	
$t_{pw}$	Pulse Width (any output)	100	300	ns	CL = 30pf
$t_{PR}$	Rise Time (any output)		30	ns	CL = 30pf
$t_{PF}$	Fall Time (any output)		25	ns	CL = 30pf
$f_s$	STROBE PULSE WIDTH		1.0	ns	combined $t_{pw} = 400$ ns
$t_{DWP}$	Pulse Width Differential		$\pm 10$	%	Referenced to $\phi 1$ , 100-300 ns

Table 3. SWITCHING CHARACTERISTICS

Note:  $T_{PW}$  measured at 50%  $V_{OH}$  Point;  $V_{OL} = 0.8V$ ,  $V_{OH} = 2.0V$ .