

## Serial Shift Register

256-Bit

The TRW TDC1006 is a positive-edge-triggered serial shift register which operates at 25MHz. This device is cascadable in the number of words and the word size.

Complementary TTL outputs Q and  $\bar{Q}$  are provided. Two data inputs, D0 and D1, are controlled by a data select input, DS. This provides on-chip recirculate gating when the true output is hard-wired to one of the inputs.

### Features

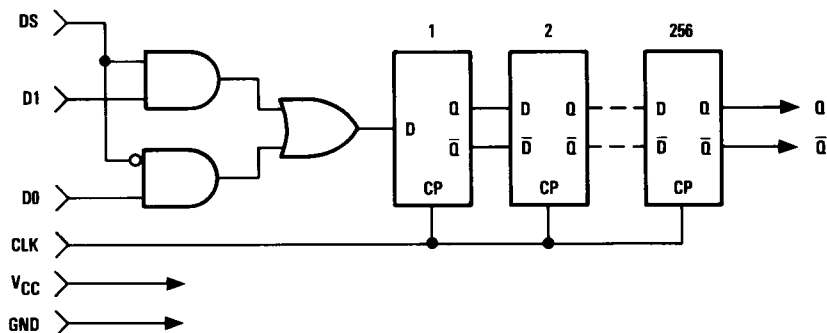
- 25MHz Guaranteed Clock Frequency
- Fully TTL Compatible
- True and Complementary Outputs

- Proven High-Reliability Radiation Hard Bipolar Process
- Single +5V Power Supply
- Available In A 16 Pin CERDIP
- Horizontal And Vertical Cascadability

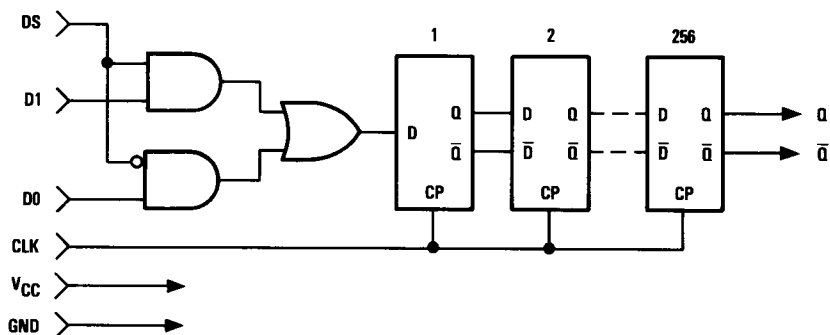
### Applications

- High-Speed Data Acquisition
- First-In First-Out Data Buffers
- Coefficient Storage For FIR Filters
- Digital Delay Lines
- Local Storage Registers

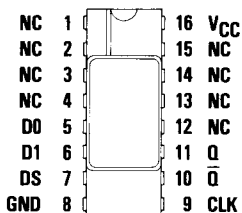
### Functional Block Diagram



## Functional Block Diagram



## Pin Assignments



16 Pin CERDIP – B9 Package

## Functional Description

### General Information

The TDC1006 is a 256-bit positive-edge-triggered serial shift register. One of two data inputs (D0 and D1) is selected by

the Data Select control DS. Complementary outputs Q and  $\bar{Q}$  are available.

### Power

The TDC1006 operates from a single +5 Volt power supply.

Name	Function	Value	J9 Package
V <sub>CC</sub>	Positive Supply Voltage	+5.0V	Pin 16
GND	Ground	0.0V	Pin 8

## Data Inputs

The TDC1006 is a single 256-bit shift register with two data inputs D0 and D1.

Name	Function	Value	J9 Package
D0	Data Input 0	TTL	Pin 5
D1	Data Input 1	TTL	Pin 6

## Data Select

The TDC1006 has one data select control (DS) to select between inputs D0 and D1. Input D1 is selected when DS is HIGH, D0 is selected when DS is LOW.

Name	Function	Value	J9 Package
DS	Data Select	TTL	Pin 7

## Data Outputs

Complementary outputs Q and  $\bar{Q}$  are provided for the TDC1006.

Name	Function	Value	J9 Package
Q	Data Output	TTL	Pin 11
$\bar{Q}$	Data Output Inverted	TTL	Pin 10

## Clocks

The TDC1006 has one clock signal, CLK.

Name	Function	Value	J9 Package
CLK	Clock	TTL	Pin 9

## No Connects

There are several pins on the TDC1006 which are not connected internally. These pins may be left unconnected.

Name	Function	Value	J9 Package
NC	No Connect	Open	Pins 1-4, 12-15



Figure 1. Timing Diagram

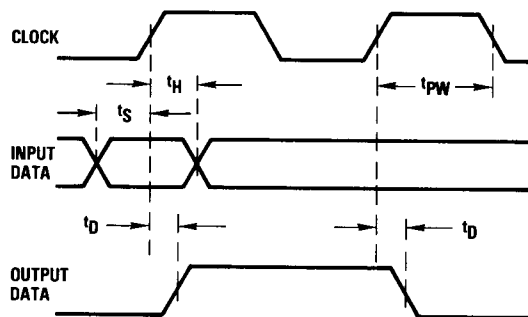


Figure 2. Equivalent Input/Output Schematics

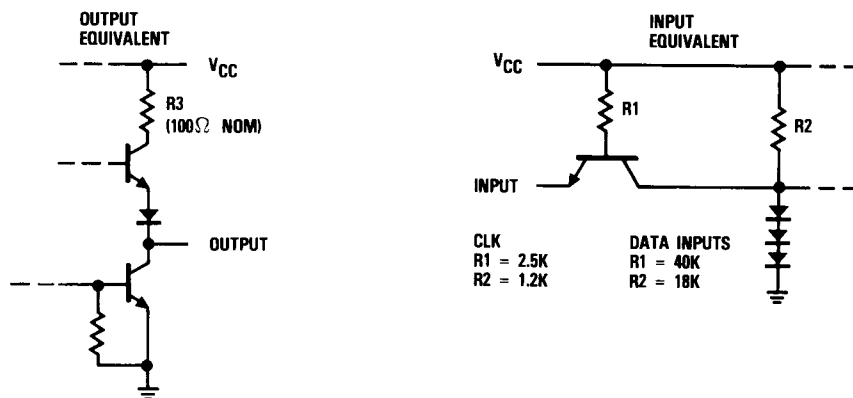
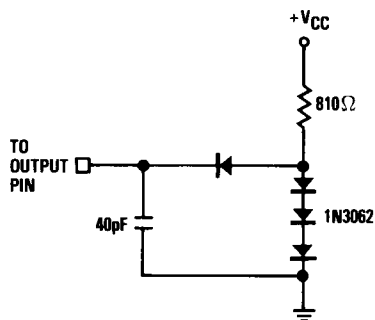


Figure 3. Test Load



## Absolute maximum ratings (beyond which the device may be damaged)<sup>1</sup>

Supply Voltage .....	-0.5 to +7.0 V
Input Voltage .....	0 to +5.5V
<b>Output</b>	
Applied voltage (measured to GND) .....	0 to +5.5V <sup>2</sup>
Applied current, externally forced .....	-1.0 to +6.0mA <sup>3,4</sup>
Short circuit duration (single output in high state to ground) .....	1 sec
<b>Temperature</b>	
Operating, ambient .....	-55 to +150°C
junction .....	+175°C
Lead, soldering (10 sec.) .....	+300°C
Storage .....	-65 to +160°C

Notes:

1. Absolute maximum ratings are limiting values applied individually while all other parameters are within specified operating conditions. Functional operation under any of these conditions is NOT implied.
2. Applied voltage must be current limited to specified range.
3. Forcing voltage must be limited to specified range.
4. Current is specified as conventional current flowing into the device.

## Operating conditions

Parameter		Temperature Range						Units
		Standard			Extended			
		Min	Nom	Max	Min	Nom	Max	
V <sub>CC</sub>	Supply Voltage	4.75	5.0	5.25	4.5	5.0	5.5	V
t <sub>PW</sub>	Clock Pulse Width	15			15			ns
t <sub>S</sub>	Input Register Setup Time	7			7			ns
t <sub>H</sub>	Input Register Hold Time	10			10			ns
V <sub>IL</sub>	Input Voltage, Logic LOW			0.8			0.8	V
V <sub>IH</sub>	Input Voltage, Logic HIGH	2.0			2.0			V
I <sub>OL</sub>	Output Current, Logic LOW			4.0			4.0	mA
I <sub>OH</sub>	Output Current, Logic HIGH			-400			-400	μA
T <sub>A</sub>	Ambient Temperature, Still Air	0		70				°C
T <sub>C</sub>	Case Temperature				-55		125	°C



## Electrical characteristics within specified operating conditions

Parameter	Test Conditions	Temperature Range				Units
		Standard		Extended		
		Min	Max	Min	Max	
$I_{CC}$ Supply Current	$V_{CC} = \text{Max}$		135		155	mA
$V_{OL}$ Output Voltage, Logic LOW	$V_{CC} = \text{Min}, I_{OL} = \text{Max}$		0.5		0.5	V
$V_{OH}$ Output Voltage, Logic HIGH	$V_{CC} = \text{Min}, I_{OH} = \text{Max}$	2.4		2.4		V
$I_{IL}$ Input Current, Logic LOW <sup>1</sup>	$V_{CC} = \text{Max}, V_{IL} = 0.4V$		-0.5		-0.8	mA/Load
$I_{IH}$ Input Current, Logic HIGH <sup>1</sup>	$V_{CC} = \text{Max}, V_{IH} = 2.4V$		20		50	$\mu\text{A}/\text{Load}$

Note: 1. CLK: Sixteen equivalent loads.

## Switching characteristics within specified operating conditions

Parameter	Test Conditions	Temperature Range				Units
		Standard		Extended		
		Min	Max	Min	Max	
$F_C$ Clock Frequency	See Figure 1	25		24		MHz
$t_D$ Output Delay	See Figure 1		32		35	ns

## Ordering Information

Product Number	Temperature Range	Screening	Package	Package Marking
TDC1006B9C	STD - $T_A = 0^\circ\text{C}$ to $70^\circ\text{C}$	Commercial	16 Pin CERDIP	1006B9C
TDC1006B9A	EXT - $T_C = -55^\circ\text{C}$ to $125^\circ\text{C}$	High Reliability	16 Pin CERDIP	1006B9A

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