TTL MSI

## DM5475/DM7475 (SN5475/SN7475) quad latch

general description

The DM5475/DM7475 is a four-bit storage element utilizing latch-connected gates to perform the memory function. TTL circuitry is employed providing fast speed and high noise immunity.

The information bits to be stored are applied to the D inputs. If the CLOCK input is in the logical 1 state, the Q output will follow the information applied to the corresponding D input. When the CLOCK is taken to the logical 0 state, whatever binary state was present on the D input at the time of this transition will be stored on the Q output. $\bar{Q}$ is also provided for added flexibility.

Two separate clock input lines are provided, each controlling two latches, so that other applications—such as a two-phase flip-flop—can be performed.
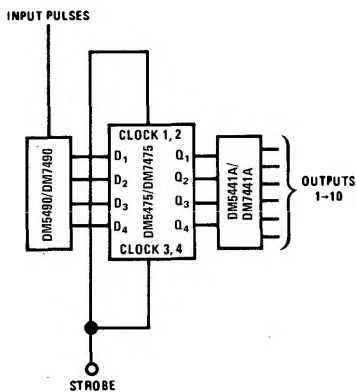
logic and connection diagram
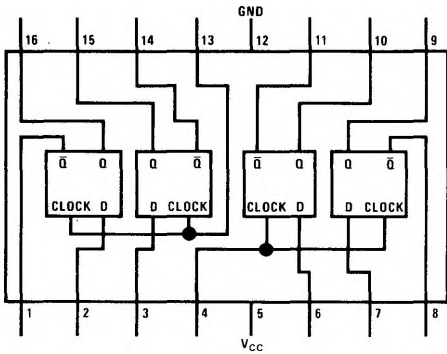
truth table

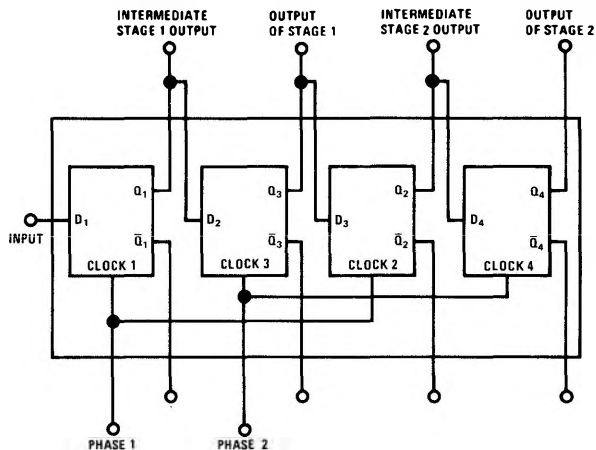| t_n	t_{n+1}	
D	Q	$\bar{Q}$
1	1	0
0	0	1

t_n = time previous to negative-going clock transition

t_{n+1} = time after negative-going clock transition

typical applications

Buffer Storage for Indicators

Dual Rank Shift Register

absolute maximum ratings

Supply Voltage	+7V
Input Voltage	5.5V
Fanout	10
Storage Temperature Range	$-65°C$ to $+150°C$
Operating Temperature Range DM5475	$-55°C$ to $+125°C$
DM7475	$0°C$ to $+70°C$
Lead Temperature (Soldering, 10 sec)	$300°C$

electrical characteristics (Note 1)

PARAMETER		CONDITIONS		MIN	TYP	MAX	UNITS
Input Diode Clamp Voltage		$V_{CC} = 5.0V$ $I_{OUT} = -12$ mA $T_A = 25°C$			$-.95$	-1.5	V
Logical "1" Input Voltage	DM5475	$V_{CC} = 4.5V$		2.0			V
	DM7475	$V_{CC} = 4.75V$					
Logical "0" Input Voltage	DM5475	$V_{CC} = 4.5V$				0.8	V
	DM7475	$V_{CC} = 4.75V$					
Logical "1" Output Voltage	DM5475	$V_{CC} = 4.5V$	$I_{OUT} = -400 \mu A$	2.4			V
	DM7475	$V_{CC} = 4.75V$					
Logical "0" Output Voltage	DM5475	$V_{CC} = 4.5V$	$I_{OUT} = 16$ mA			0.4	V
	DM7475	$V_{CC} = 4.75V$					
Logical "1" Input Current	DM5475	$V_{CC} = 5.5V$	$V_{IN} = 2.4V$ D			80	μA
	DM7475	$V_{CC} = 5.25V$	CLOCK			80	μA
Logical "1" Input Current	DM5475	$V_{CC} = 5.5V$	$V_{IN} = 5.5V$			1	mA
	DM7475	$V_{CC} = 5.25V$					
Logical "0" Input Current	DM5475	$V_{CC} = 5.5V$	$V_{IN} = 0.4V$ D		-2.1	-3.2	mA
	DM7475	$V_{CC} = 5.25V$	CLOCK		-2.1	-3.2	mA
Output Short Current (Note 2)	DM5475	$V_{CC} = 5.5V$	$V_{OUT} = 0V$	-20	-32	-55	mA
	DM7475	$V_{CC} = 5.25V$		-18			
Supply Current	DM5475	$V_{CC} = 5.5V$			32	46	mA
	DM7475	$V_{CC} = 5.25V$				50	mA
Propagation Delay Time to a Logical "0" from Clock, t_{pd0}		$V_{CC} = 5.0V$ $T_A = 25°C$		3	7	15	ns
Propagation Delay Time to a Logical "1" from Clock, t_{pd1}		$V_{CC} = 5.0V$ $T_A = 25°C$		10	21	40	ns
Setup Time for a Logical "1", t_{S1}		$V_{CC} = 5.0V$ $T_A = 25°C$			10	20	ns
Setup Time for a Logical "0", t_{S0}		$V_{CC} = 5.0V$ $T_A = 25°C$			12	25	ns

Note 1: These specifications apply across the $-55°C$ to $+125°C$ temperature range for the DM5475 and the $0°C$ to $+70°C$ temperature range for the DM7475 unless otherwise specified. Typicals apply only to $25°C$ @ $V_{CC} = 5.0V$.
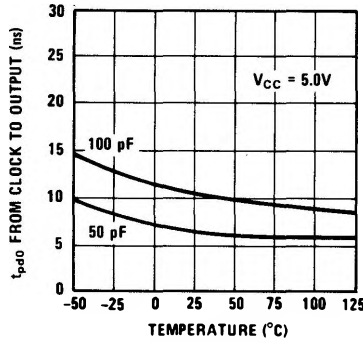
Note 2: Only one output should be shorted at a time.
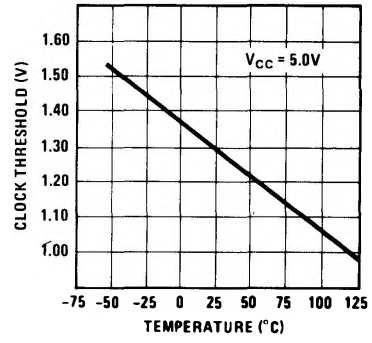
typical performance characteristics

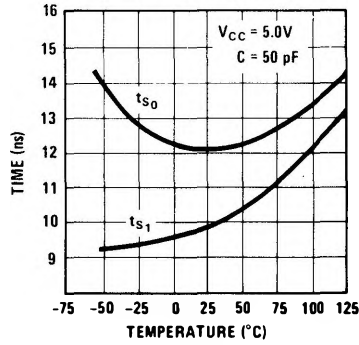### Transition Time to Logical "1" (t_{pd1}) vs Temperature
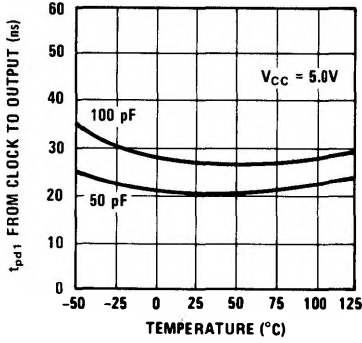
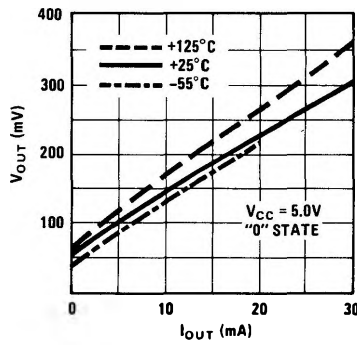### Transition Time to Logical "0" (t_{pd0}) vs Temperature

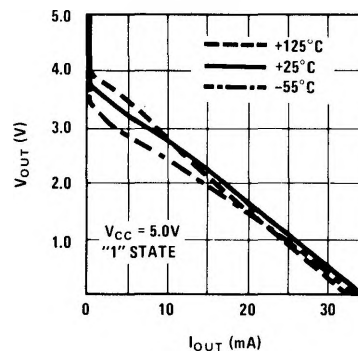### Clock Threshold vs Temperature

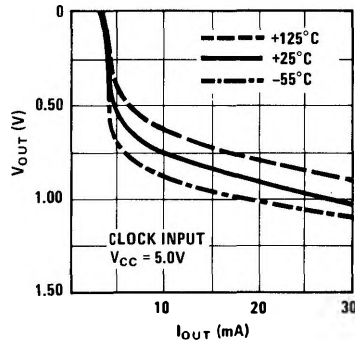

Setup Time vs Temperature

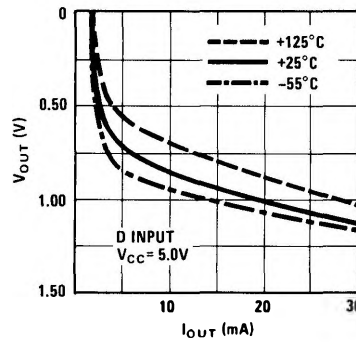### Logical "0" Output Voltage vs Sink Current

Logical "1" Output Voltage vs Source Current
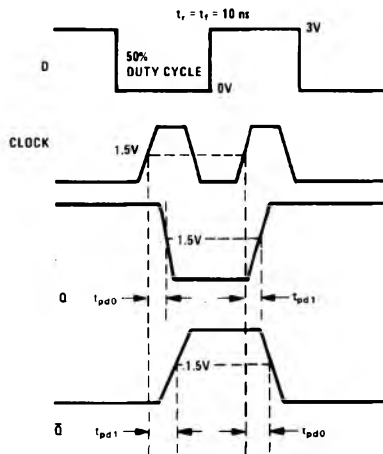

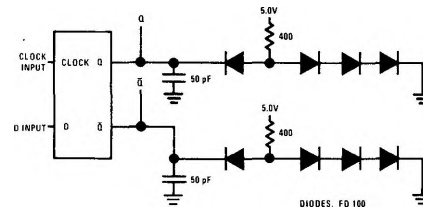### Input Clamp Diode Characteristics

Input Clamp Diode Characteristics

switching time waveforms

ac test circuit

timing requirements