

TC40H273P/F

C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

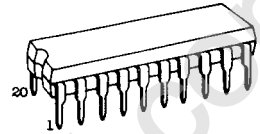
TC40H273 OCTAL D-TYPE FLIP-FLOP

The TC40H273 is octal D-type flip-flop having common CLOCK terminal and CLEAR terminal.

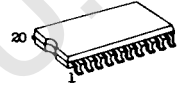
CLEAR input is active at "L" level, and all outputs at this time go to "L" level regardless of the other inputs.

When CLEAR input is at "H" level, DATA is transmitted to the output as it is, at the rising edge of CLOCK.

The function and pin assignment of this flip-flop are the same as those of the 74LS273.



DIP20(3D20A-P)



MFP20(F20GA-P)

MAXIMUM RATINGS

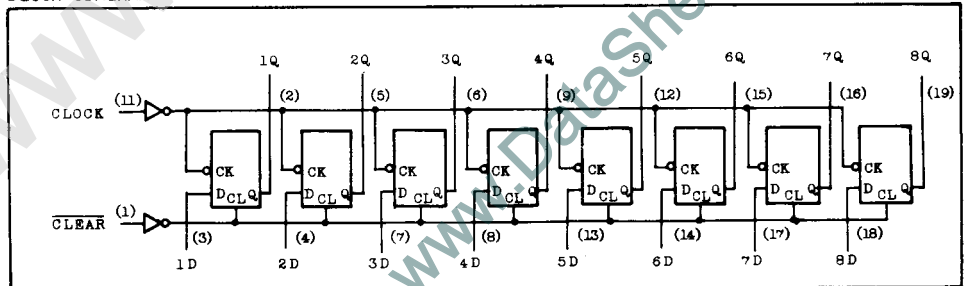
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{DD}	V _{SS} -0.5 ~ V _{SS} +10	V
Input Voltage	V _{IN}	V _{SS} -0.5 ~ V _{DD} +0.5	V
Output Voltage	V _{OUT}	V _{SS} -0.5 ~ V _{DD} +0.5	V
Input Current	I _{IN}	+10	mA
Power Dissipation	P _D	300(DIP)/180(MFP)	mW
Storage Temperature	T _{stg}	-65 ~ 150	°C
Lead Temp./Time	T _{sol}	260°C · 10 sec	

TRUTH TABLE

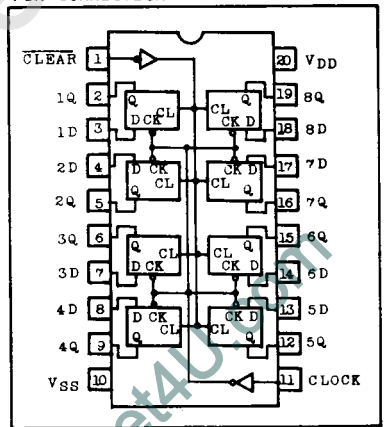
INPUTS			OUTPUT
CLEAR	CLOCK	DATA	Q
L	*	*	L
H	↑	H	H
H	↑	L	L
H	L	*	Q ₀

*=Don't Care

BLOCK DIAGRAM



PIN CONNECTION



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RECOMMENDED OPERATING CONDITIONS ($V_{SS}=0.0V$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}	-	2.0	-	8.0	V
Input Voltage	V_{IN}	-	0	-	V_{DD}	V
Operating Temperature	T_{opr}	-	-40	-	85	°C

ELECTRICAL CHARACTERISTICS ($V_{SS}=0.0V$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{DD} (V)	-40°C		25°C			85°C		UNIT
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
High Level Output Voltage	V_{OH}	$ I_{OUT} < 1\mu A$ $V_{IN}=V_{SS}, V_{DD}$	5	4.95	-	4.95	5.0	-	4.95	-	V
Low Level Output Voltage	V_{OL}	$ I_{OUT} < 1\mu A$ $V_{IN}=V_{SS}, V_{DD}$	5	-	0.05	-	0.0	0.05	-	0.05	V
High Level Output Current	I_{OH}	$V_{OH}=4.6V$ $V_{IN}=V_{SS}, V_{DD}$	5	-0.52	-	-0.44	-	-	-0.36	-	mA
Low Level Output Current	I_{OL}	$V_{OL}=0.4V$ $V_{IN}=V_{SS}, V_{DD}$	5	1.4	-	1.1	-	-	0.8	-	mA
Input Voltage	"H" Level V_{IH}	$ I_{OUT} < 1\mu A$ $V_{OUT}=0.5V$ $V_{OUT}=4.5V$	5	4.0	-	4.0	-	-	4.0	-	V
	"L" Level V_{IL}		5	-	1.0	-	-	1.0	-	1.0	V
Input Current	"H" Level I_{IH}	$V_{IH}=8.0V$	8	-	0.3	-	10^{-5}	0.3	-	1.0	μA
	"L" Level I_{IL}	$V_{IL}=0.0V$	8	-	-0.3	-	-10^{-5}	-0.3	-	-1.0	μA
Quiescent Supply Current	I_{DD}	$*V_{IN}=V_{SS}, V_{DD}$	5	-	12.5	-	10^{-3}	12.5	-	75	μA

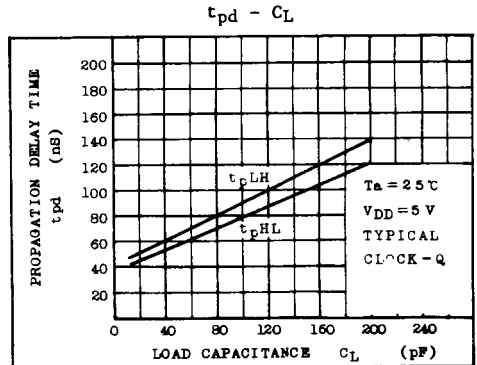
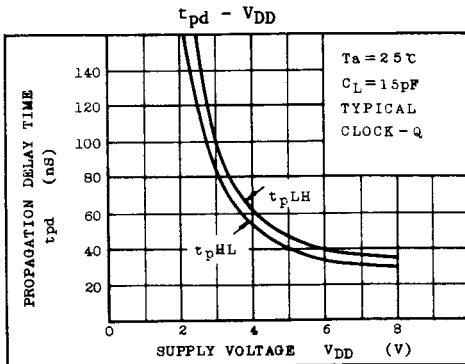
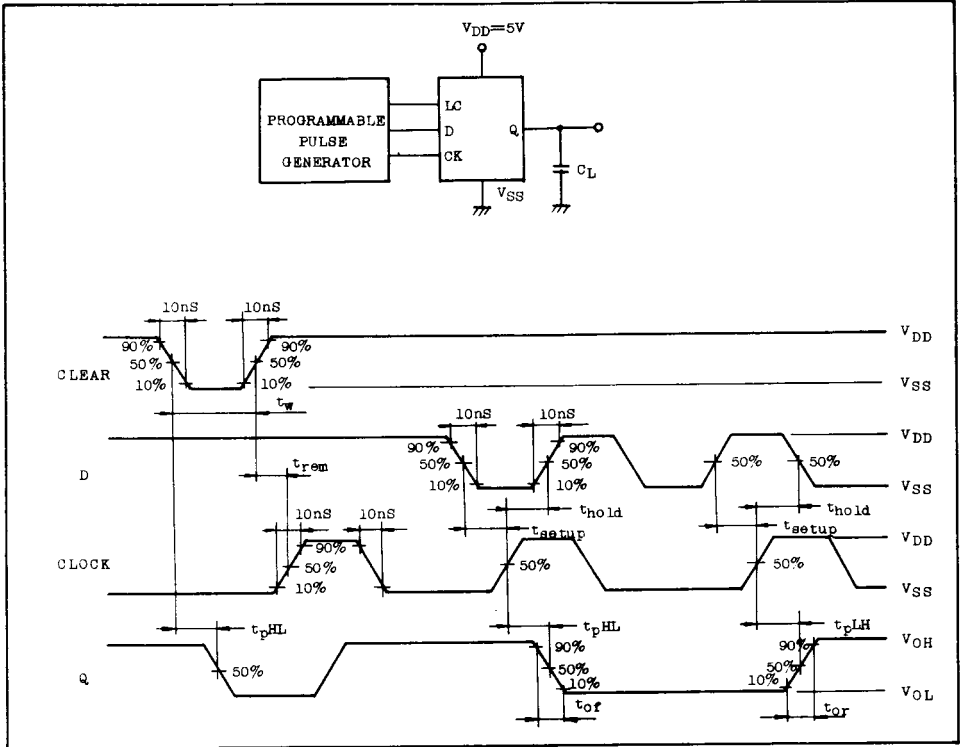
* All valid input combinations.

SWITCHING CHARACTERISTICS ($T_a=25^\circ C$, $V_{SS}=0V$, $V_{DD}=5V$, $C_L=15pF$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Rise Time	t_{or}	CLOCK-Q	-	20	35	ns
Output Fall Time	t_{of}		-	15	30	
Propagation Delay Time	Low-High t_{pLH}	CLOCK-Q	-	45	68	ns
	High-Low t_{pHL}	CLOCK-Q	-	40	60	
	High-Low t_{pHL}	CLEAR-Q	-	48	72	
Maximum Clock Frequency	$f_{max\phi}$		10	20	-	MHz
Minimum Clear Pulse Width	t_w	CLEAR	-	25	44	ns
Maximum Clock Rise/Fall Time	$t_{r\phi}, t_{f\phi}$		1	-	-	μs
Minimum Data Set up Time	t_{set-up}		-	-	25	ns
Minimum Data Hold Time	t_{hold}		-	-	15	ns
Minimum Clear Remove Time	t_{rem}		-	13	25	ns
Input Capacitance	C_{IN}		-	5	-	pF

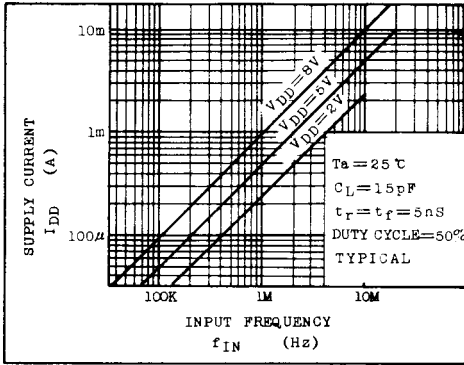
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SWITCHING TIME TEST WAVEFORM

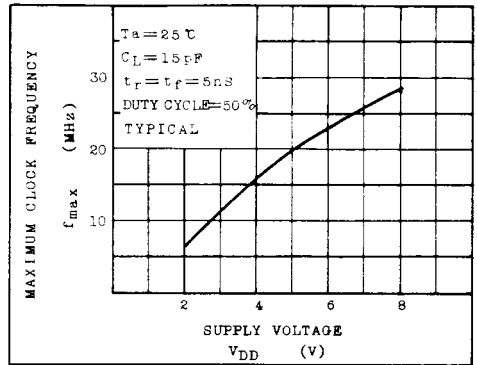


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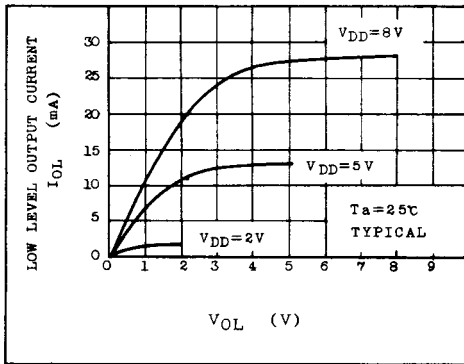
$I_{DD} - f_{IN}$



$f_{max} - V_{DD}$



$I_{OL} - V_{OL}$



$I_{OH} - (V_{DD} - V_{OH})$

