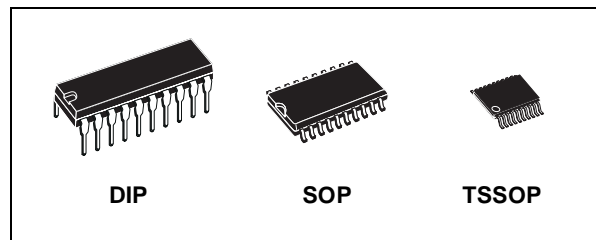




M74HC574

OCTAL D-TYPE FLIP FLOP WITH 3 STATE OUTPUT NON INVERTING

- HIGH SPEED:
 $f_{MAX} = 90\text{MHz}$ (TYP.) at $V_{CC} = 6\text{V}$
- LOW POWER DISSIPATION:
 $I_{CC} = 4\mu\text{A}$ (MAX.) at $T_A=25^\circ\text{C}$
- HIGH NOISE IMMUNITY:
 $V_{NIH} = V_{NIL} = 28\% V_{CC}$ (MIN.)
- SYMMETRICAL OUTPUT IMPEDANCE:
 $|I_{OH}| = I_{OL} = 6\text{mA}$ (MIN)
- BALANCED PROPAGATION DELAYS:
 $t_{PLH} \cong t_{PHL}$
- WIDE OPERATING VOLTAGE RANGE:
 V_{CC} (OPR) = 2V to 6V
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 574



ORDER CODES

PACKAGE	TUBE	T & R
DIP	M74HC574B1R	
SOP	M74HC574M1R	M74HC574RM13TR
TSSOP		M74HC574TTR

DESCRIPTION

The M74HC574 is an high speed CMOS OCTAL D-TYPE FLIP FLOP WITH 3-STATE OUTPUTS INVERTING fabricated with sub-micron silicon gate C²MOS technology.

This 8 bit D-TYPE FLIP FLOP is controlled by a clock input (CK) and an output enable input (\overline{OE}). On the positive transition of the clock, the Q outputs will be set to the logic state that were setup at the D inputs.

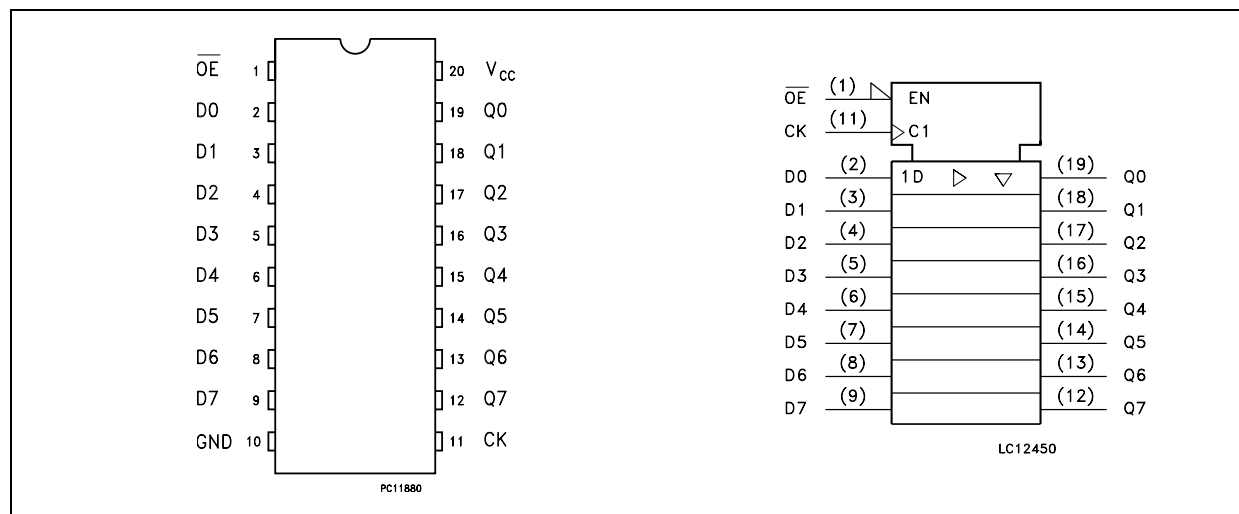
While the \overline{OE} input is at low level, the eight outputs will be in a normal logic state (high or low logic

level) and while \overline{OE} is in high level the outputs will be in a high impedance state.

The output control does not affect the internal operation of flip-flops; that is, the old data can be retained or the new data can be entered even while the outputs are off.

All inputs are equipped with protection circuits against static discharge and transient excess voltage.

PIN CONNECTION AND IEC LOGIC SYMBOLS



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	-0.5 to +7	V
V_I	DC Input Voltage	-0.5 to $V_{CC} + 0.5$	V
V_O	DC Output Voltage	-0.5 to $V_{CC} + 0.5$	V
I_{IK}	DC Input Diode Current	± 20	mA
I_{OK}	DC Output Diode Current	± 20	mA
I_O	DC Output Current	± 35	mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current	± 70	mA
P_D	Power Dissipation	500(*)	mW
T_{stg}	Storage Temperature	-65 to +150	°C
T_L	Lead Temperature (10 sec)	300	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied

(*) 500mW at 65 °C; derate to 300mW by 10mW/°C from 65°C to 85°C

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit	
V_{CC}	Supply Voltage	2 to 6	V	
V_I	Input Voltage	0 to V_{CC}	V	
V_O	Output Voltage	0 to V_{CC}	V	
T_{op}	Operating Temperature	-55 to 125	°C	
t_r, t_f	Input Rise and Fall Time	$V_{CC} = 2.0V$	0 to 1000	ns
		$V_{CC} = 4.5V$	0 to 500	ns
		$V_{CC} = 6.0V$	0 to 400	ns

DC SPECIFICATIONS

Symbol	Parameter	Test Condition		Value						Unit	
		V _{CC} (V)		T _A = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.		Max.
V _{IH}	High Level Input Voltage	2.0		1.5			1.5		1.5		V
		4.5		3.15			3.15		3.15		
		6.0		4.2			4.2		4.2		
V _{IL}	Low Level Input Voltage	2.0				0.5		0.5		0.5	V
		4.5				1.35		1.35		1.35	
		6.0				1.8		1.8		1.8	
V _{OH}	High Level Output Voltage	2.0	I _O =-20 μA	1.9	2.0		1.9		1.9		V
		4.5	I _O =-20 μA	4.4	4.5		4.4		4.4		
		6.0	I _O =-20 μA	5.9	6.0		5.9		5.9		
		4.5	I _O =-6.0 mA	4.18	4.31		4.13		4.10		
		6.0	I _O =-7.8 mA	5.68	5.8		5.63		5.60		
V _{OL}	Low Level Output Voltage	2.0	I _O =20 μA		0.0	0.1		0.1		0.1	V
		4.5	I _O =20 μA		0.0	0.1		0.1		0.1	
		6.0	I _O =20 μA		0.0	0.1		0.1		0.1	
		4.5	I _O =6.0 mA		0.17	0.26		0.33		0.40	
		6.0	I _O =7.8 mA		0.18	0.26		0.33		0.40	
I _I	Input Leakage Current	6.0	V _I = V _{CC} or GND			± 0.1		± 1		± 1	μA
I _{OZ}	High Impedance Output Leakage Current	6.0	V _I = V _{IH} or V _{IL} V _O = V _{CC} or GND			± 0.5		± 5		± 10	μA
I _{CC}	Quiescent Supply Current	6.0	V _I = V _{CC} or GND			4		40		80	μA

AC ELECTRICAL CHARACTERISTICS ($C_L = 50$ pF, Input $t_r = t_f = 6$ ns)

Symbol	Parameter	Test Condition			Value						Unit	
		V_{CC} (V)	C_L (pF)		$T_A = 25^\circ\text{C}$			-40 to 85°C		-55 to 125°C		
					Min.	Typ.	Max.	Min.	Max.	Min.		Max.
t_{TLH} t_{THL}	Output Transition Time	2.0	50			25	60		75		90	ns
		4.5			7	12		15		18		
		6.0			6	10		13		15		
t_{PLH} t_{PHL}	Propagation Delay Time (CK - Q)	2.0	50		70	150		190		225	ns	
		4.5			20	30		38		45		
		6.0			15	26		32		38		
		2.0	150		88	190		240		285	ns	
		4.5			25	38		48		57		
		6.0			19	32		41		48		
t_{PZL} t_{PZH}	High Impedance Output Enable Time	2.0	50	$R_L = 1\text{ K}\Omega$		48	125		155		190	ns
		4.5				15	25		31		38	
		6.0				12	21		26		32	
		2.0	150	$R_L = 1\text{ K}\Omega$		60	165		205		250	ns
		4.5				20	33		41		50	
		6.0				16	28		35		43	
t_{PLZ} t_{PHZ}	High Impedance Output Disable Time	2.0	50	$R_L = 1\text{ K}\Omega$		34	125		155		190	ns
		4.5				17	25		31		38	
		6.0				15	21		26		32	
f_{MAX}	Maximum Clock Frequency	2.0	50		6.2	18		5		4.2	MHz	
		4.5			31	75		25		21		
		6.0			37	90		30		25		
$t_{W(L)}$ $t_{W(H)}$	Minimum Pulse Width (CLOCK)	2.0	50			15	75		95		110	ns
		4.5			6	15		19		22		
		6.0			6	13		16		19		
t_s	Minimum Set-up Time	2.0	50			25	75		95		110	ns
		4.5			6	15		19		22		
		6.0			4	13		16		19		
t_h	Minimum Hold Time	2.0	50				0		0		0	ns
		4.5				0		0		0		
		6.0				0		0		0		

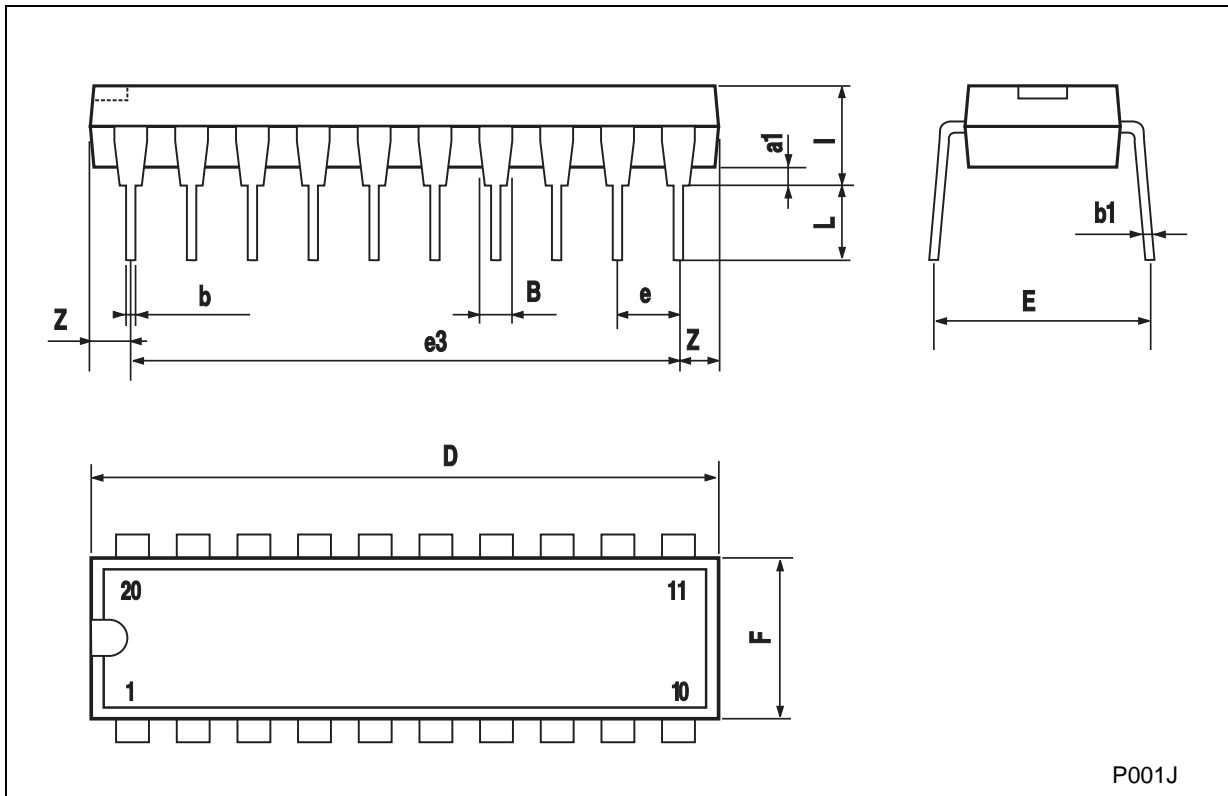
CAPACITIVE CHARACTERISTICS

Symbol	Parameter	Test Condition			Value						Unit	
		V_{CC} (V)			$T_A = 25^\circ\text{C}$			-40 to 85°C		-55 to 125°C		
					Min.	Typ.	Max.	Min.	Max.	Min.		Max.
C_{IN}	Input Capacitance					5	10		10		10	pF
C_{OUT}	Output Capacitance					10						pF
C_{PD}	Power Dissipation Capacitance (note 1)					54						pF

1) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}$

Plastic DIP-20 (0.25) MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
a1	0.254			0.010		
B	1.39		1.65	0.055		0.065
b		0.45			0.018	
b1		0.25			0.010	
D			25.4			1.000
E		8.5			0.335	
e		2.54			0.100	
e3		22.86			0.900	
F			7.1			0.280
I			3.93			0.155
L		3.3			0.130	
Z			1.34			0.053



P001J