

Description

The GD74F374 is a high-speed, low-power octal D-type flip-flop featuring separate D-type inputs for each flip-flop and 3-State outputs for bus-oriented applications. A buffered Clock (CK) and Output Control ($\overline{OC}$) are common to all flip-flops.

Features

- 8 D-type flip-flops in a single package
- Buffered positive edge-triggered clock
- 3-State Bus Driving outputs.

Function Table

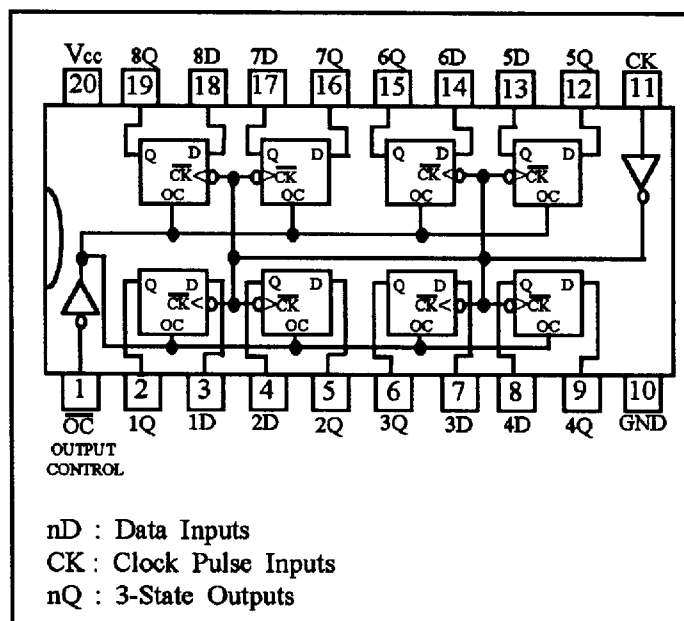
Inputs			Outputs
$\overline{OC}$	CLOCK(CK)	D	nQ
L	↑	H	H
L	↑	L	L
L	L	X	Q ₀
H	X	X	Z

↑ Low-to-High Clock Transition

X: Immaterial

Z: High Impedance

Pin Configuration



Absolute Maximum Ratings

Storage Temperature	-65 °C ~ 150 °C
Ambient Temperature Under Bias.....	-55 °C ~ 125 °C
Junction Temperature Under Bias	-0.5 °C ~ 175 °C
Vcc Voltage	-0.5 V ~ 7.0 V
Input Voltage	-0.5 V ~ 7.0 V
Input Current	-30 mA ~ 5.0 mA
Output Voltage	-0.5 V ~ 5.5 V

Note: Absolute Maximum ratings are values beyond which the device maybe damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Recommended Operating Conditions

Free Air Ambient Temperature..... : 0°C ~ 70°C

Supply Voltage : 4.5 V ~ 5.5 V

DC Electrical Characteristics over recommended operating free-air temperature range

SYMBOL	PARAMETER	Min	Typ	Max	UNIT	V _{CC}	CONDITION	TEST CIRCUIT
V _{IH}	Input High Voltage	2.0			V		-----	
V _{IL}	Input Low Voltage			0.8	V		-----	
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	I _{IN} = -18mA	See FIG. 18
V _{OH}	Output High Voltage	2.5			V	4.5	I _{OH} = -1 mA	See FIG. 19
		2.4				4.5	I _{OH} = -3 mA	
		2.7				4.75	I _{OH} = -1 mA	
		2.7				4.75	I _{OH} = -3 mA	
V _{OL}	Output Low Voltage			0.5	V	Min	I _{OL} = 24 mA	
I _I	Input High Current Breakdown Test			7.0	μA	Max	V _{IN} = 7.0 V	See FIG. 20
I _{IH}	Input High Current			5.0	μA	Max	V _{IN} = 2.7 V	
I _{IL}	Input Low Current			-0.6	μA	Max	V _{IN} = 0.5 V	
I _{ILK}	Input Leakage Circuit Current			1.9	μA	0.0	V _{IN} = 4.75 V All Other pins grounded	See FIG. 21
I _{OLK}	Output Leakage Circuit Current			3.75	μA	0.0	V _{OUT} = 150mV All Other pins grounded	See FIG. 22
I _{OZH}	Tri-State Output Off Current (High)			50	μA	Max	V _{OUT} = 2.7 V	See FIG. 23
I _{OZL}	Tri-State Output Off Current (Low)			-50	μA	Max	V _{OUT} = 0.5 V	
I _{OS}	Output Short Circuit Current	-60		-150	mA	Max	V _{OUT} = 0 V	See FIG. 24
I _{CCZ}	Supply Current		55	86	mA	Max	V _{OUT} = High Z	See FIG. 25

* For I_{OS}, Not more than one output should be shorted at a time, and duration should not exceed one second.

AC Characteristics

SYMBOL	PARAMETER	TEST CONDITION						UNIT
		T _A = 25 °C			T _A = 0 ~ 70°C			
		V _{CC} = 5.0 V			V _{CC} = 5 V±10 %			
		C _L = 50 pF			C _L = 50pF			
		Min	Typ	Max	Min	Yyp	Max	
t _{PLH}	Propagation Delay	4.0	6.5	8.5	4.0	--	10.0	ns
t _{PHL}	CK to Q	4.0	6.5	8.5	4.0	--	10.0	ns
t _{PZH}	Output Enable Time	2.0	9.0	11.5	2.0	--	12.5	ns
t _{PZL}		2.0	5.8	7.5	2.0	--	8.5	ns
t _{PHZ}	Output Disable Time	2.0	5.3	7.0	2.0	--	8.0	ns
t _{PLZ}		1.5	4.3	5.5	1.5	--	6.5	ns
f _{MAX}	Maximum clock frequency	100	140	--	70	--	--	MHz

RECOMMENDED OPERATING CONDITIONS

SYMBOL	ITEM	VALUE	UNIT
t _{S(H)} t _{S(L)}	Setup Time, High or Low Before CK ↑	2.0 (T _a = 25 °C, V _{CC} = 5V) 2.0 (T _a = 25 °C, V _{CC} = 5V)	ns
t _{H(H)} t _{H(L)}	Hold Time, High or Low After CK ↑	2.0 (T _a = 25 °C, V _{CC} = 5V) 2.0 (T _a = 25 °C, V _{CC} = 5V)	ns
t _{W(H)} t _{W(L)}	Pulse Width, CK High CK Low	7.0 (T _a = 25 °C, V _{CC} = 5V) 6.0 (T _a = 25 °C, V _{CC} = 5V)	ns

