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 buf fered Clock (CK) and Output Control ($\overline{OC}$) are common to all flip-flops.

Features

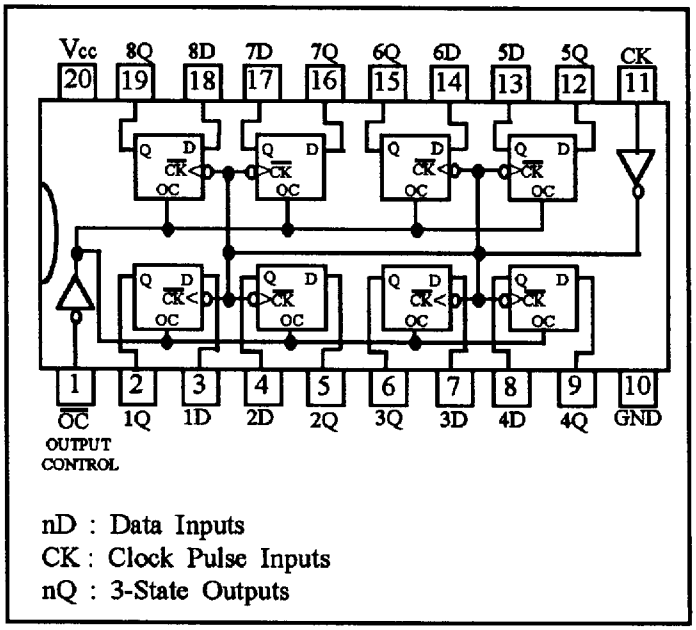
- 8 D-type flip-flops in a single package
- Buffered positive edge-triggered clock
- 3-State Bus Driving outputs.

Function Table

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

↑ Low-to-High Clock Transition
X : Immaterial
Z : High Impedance

Pin Configuration



nD : Data Inputs
CK : Clock Pulse Inputs
nQ : 3-State Outputs

Absolute Maximum Ratings

Storage Temperature	-65 ℃ ~ 150 ℃
Ambient Temperature Under Bias	-55 ℃ ~ 125 ℃
Junction Temperature Under Bias	-0.5 ℃ ~ 175 ℃
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	Vcc	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 2.4 2.7 2.7			V	4.5 4.5 4.75 4.75	I_{OH} = - 1 mA I_{OH} = - 3 mA I_{OH} = - 1 mA I_{OH} = - 3 mA	See FIG. 19
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

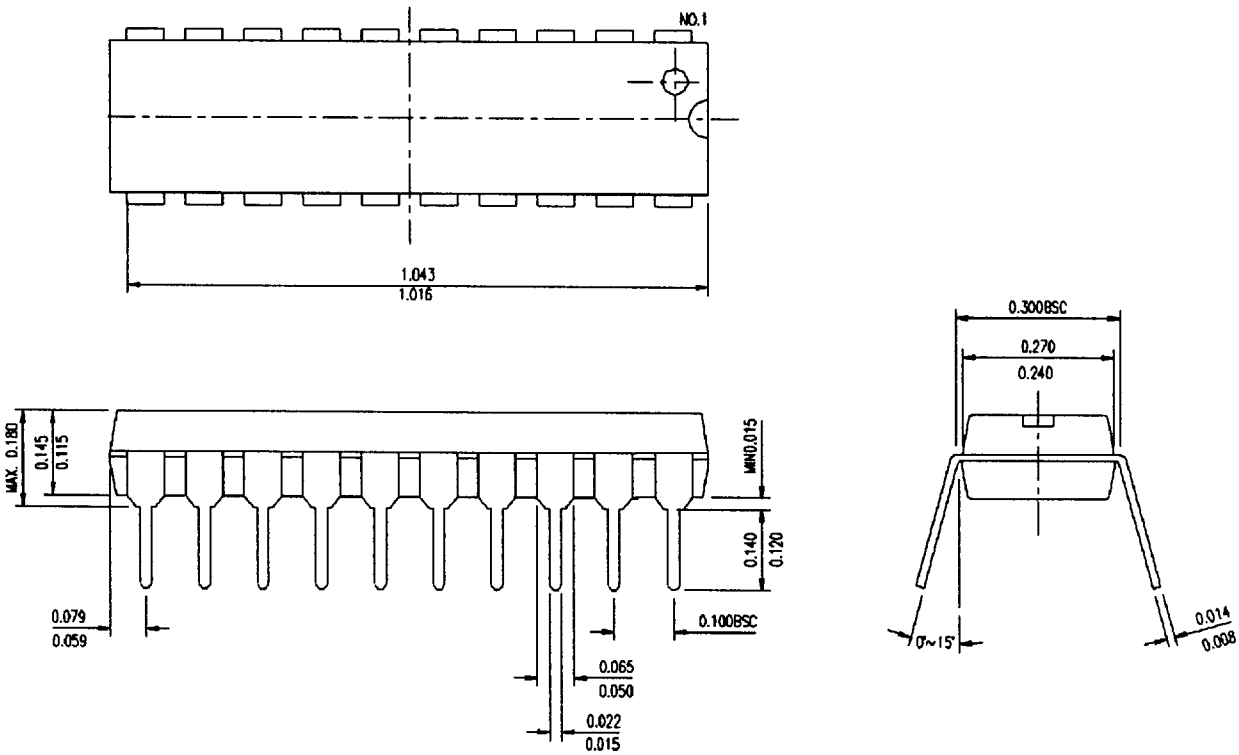
* For Ios, Not more than one output should be shorted at a time, and duration should not exceed one second.

AC Characteristics

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

RECOMMENDED OPERATING CONDITIONS

SYMBOL	ITEM	VALUE	UNIT
tS(H) tS(L)	Setup Time, High or Low Before CK ↑	2.0 (Ta = 25 ℃, Vcc = 5V) 2.0 (Ta = 25 ℃, Vcc = 5V)	ns
tH(H) tH(L)	Hold Time, High or Low After CK ↑	2.0 (Ta = 25 ℃, Vcc = 5V) 2.0 (Ta = 25 ℃, Vcc = 5V)	ns
tW(H) tW(L)	Pulse Width, CK High CK Low	7.0 (Ta = 25 ℃, Vcc = 5V) 6.0 (Ta = 25 ℃, Vcc = 5V)	ns


NO.1
1.043
1.016
MAX. 0.180
0.145
0.115
MIN0.015
0.140
0.120
0.079
0.059
0.100BSC
0.065
0.050
0.022
0.015
0.300BSC
0.270
0.240
0~15°
0.014
0.008