



MILITARY DATA SHEET

MN54F174-X REV 1A0

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HEX D FLIP-FLOP WITH MASTER RESET

General Description

The F174 is a high - speed hex D flip-flop. The device is used primarily as a 6-bit edge-triggered storage register. The information on the D inputs is transferred to storage during the LOW to HIGH clock transition. The device has a Master Reset to simultaneously clear all flip-flops.

Industry Part Number

54F174

Prime Die

M174

NS Part Numbers

54F174DM
54F174DMQB
54F174FMQB
54F174LMQB

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp Description Temp (°C)

1	Static tests at	+25
2	Static tests at	+125
3	Static tests at	-55
4	Dynamic tests at	+25
5	Dynamic tests at	+125
6	Dynamic tests at	-55
7	Functional tests at	+25
8A	Functional tests at	+125
8B	Functional tests at	-55
9	Switching tests at	+25
10	Switching tests at	+125
11	Switching tests at	-55

Features

- Edge-Triggered D-Type Inputs
- Buffered Positive Edge-Triggered Clock
- Asynchronous Common Reset

(Absolute Maximum Ratings)

(Note 1)

Storage Temperature	-65 C to +150 C
Ambient Temperature under Bias	-55 C to +125 C
Junction Temperature under Bias	-55 C to +175 C
Vcc Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 2)	-0.5V to +7.0V
Input Current (Note 2)	-30 mA to +5.0mA
Voltage Applied to Output in HIGH State (with Vcc=0V)	
Standard Output	-0.5V to Vcc
TRI-STATE Output	-0.5V to +5.5V
Current Applied to Output in LOW State (Max)	twice the rated Iol(mA)
ESD Last Passing Voltage (Min)	4000V

Note 1: Absolute Maximum ratings are those values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Note 2: Either voltage limit or current limit is sufficient to protect inputs.

Recommended Operating Conditions

Free Air Ambient Temperature	
Commercial	0 C to +70 C
Military	-55 C to +125 C
Supply Voltage	
Military	+4.5V to +5.5V
Commercial	+4.5V to +5.5V

Electrical Characteristics

DC PARAMETER

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: VCC 4.5V to 5.5V, Temp range: -55C to 125C

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
IIH	Input High Current	VCC=5.5V, VM=2.7V	1, 3	INPUTS		20	uA	1, 2, 3
IBVI	Input High Current	VCC=5.5V, VM=7.0V	1, 3	INPUTS		100	uA	1, 2, 3
IIL	Input LOW Current	VCC=5.5V, VM=0.5V	1, 3	INPUTS		-0.6	mA	1, 2, 3
VOL	Output LOW Voltage	VCC=4.5V, VIL=0.8V, IOL=20mA, VINH=5.5V, VINL=0.0V	1, 3	OUTPUTS		0.5	V	1, 2, 3
VOH	Output HIGH Voltage	VCC=4.5V, VIH=2.0V, IOH=-1.0mA, VINL=0.0V, VINH=5.5V	1, 3	OUTPUTS	2.5		V	1, 2, 3
IOS	Short Circuit Current	VCC=5.5V, VINH=5.5V, VM=0.0V, VINL=0.0V	1, 3	OUTPUTS	-60	-150	mA	1, 2, 3
VCD	Input Clamp Diode Voltage	VCC=4.5V, IM=-18mA	1, 3	INPUTS		-1.2	V	1, 2, 3
ICC	Supply Current	VCC=5.5V, VINH=5.5V	1, 3	VCC		45	mA	1, 2, 3
ICEX	Output HIGH Leakage Current	VCC=5.5V, VINH=5.5V, VINL=0.0V, VM=5.5V	1, 3	OUTPUTS		250	uA	1, 2, 3

Electrical Characteristics

AC PARAMETER

(The following conditions apply to all the following parameters, unless otherwise specified.)
 AC: CL=50pf, RL=500 OHMS, TR=2.5ns, TF=2.5ns SEE AC FIGS

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tpLH(1)	Propagation Delay	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	CP to Qn	3.5	8.0	ns	9
			2, 4	CP to Qn	3.0	10.0	ns	10, 11
tpHL(1)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	CP to Qn	4.0	10.0	ns	9
			2, 4	CP to Qn	4.0	12.0	ns	10, 11
tpHL(2)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	MR to Qn	5.0	14.0	ns	9
			2, 4	MR to Qn	5.0	16.0	ns	10, 11
ts(H/L)	Setup Time	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	5	Dn to CP	4.0		ns	9
			5	Dn to CP	5.0		ns	10, 11
th(H/L)	Hold Time	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C	5	Dn to CP	0		ns	9
			5	Dn to CP	2.0		ns	10, 11
tw(H)	Pulse Width	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C, TR/TF=1.0ns	5	CP	4.0		ns	9
			5	CP	5.0		ns	10, 11
tw(L)	Pulse Width	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C, TR/TF=1.0ns	5	CP	6.0		ns	9
			5	CP	7.5		ns	10, 11
tw (L)	Pulse Width	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C, TR/TF=1.0ns	5	MR	5.0		ns	9
			5	MR	6.5		ns	10, 11
tREC	Recovery Time	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C	5	MR to CP	5.0		ns	9
			5	MR to CP	6.0		ns	10, 11
fMAX	Maximum Count Frequency	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C, TR/TF=1.0ns	5		80		MHZ	9
			5		70		MHZ	10, 11

Note 1: Screen tested 100% on each device at +25C, +125C & -55C temperature, subgroups A1, 2, 3, 7 & 8.

Note 2: Screen tested 100% on each device at +25C temperature only, subgroup A9.

Note 3: Sample tested (Method 5005, Table 1) on each MFG. lot at +25C, +125C & -55C temperature, subgroups A1, 2, 3, 7 & 8.

Note 4: Sample tested (Method 5005, Table 1) on each MFG. lot at +25C subgroup A9, and periodically at +125C & -55C temperature, subgroups 10 & 11.

Note 5: GUARANTEED BUT NOT TESTED. (Design Characterization data)