Rochester Electronics

Datasheet

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

    - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

National Semiconductor

MICROCIRCUIT DATA SHEET

MNMM54C175-X REV 1A0

Original Creation Date: 10/18/95
Last Update Date: 05/19/97
Last Major Revision Date: 04/02/97

QUAD D FLIP-FLOP

General Description

The MM54C175 consists of four positive-edge triggered D type flip-flops implemented with monolithic CMOS technology. Both are true and complemented outputs from each flip-flop are externally available. All four flip-flops are controlled by a common clock and a common clear. Information at the D inputs meeting the set-up time requirements is transferred to the Q outputs on the positive-going edge of the clock pulse. The clearing operation, enabled by a negative pulse at Clear input, clears all four Q outputs to logical "0" and Q's to logical "1".

All inputs are protected from static discharge by diode clamps to Vcc and Gnd.

Industry Part Number

MM54C175

NS Part Numbers

MM54C175J/883
MM54C175W/883

Prime Die

MM54C175

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (^{O}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

- Wide supply voltage range	3V to 15V
- Guaranteed noise margin	1.0V
- High noise immunity	0.45 Vcc (typ.)
- Low power TTL compatibility	Fan out of 2 driving 74L

(Absolute Maximum Ratings)

(Note 1)

Voltage at Any Pin	-0.3V to Vcc +0.3V
Operating Temperature Range	-55 C to +125 C
Storage Temperature Range	-65 C to +150 C
Power Dissipation (Pd)	
Dual-In-Line	700mW
Small Outline	500mW
Operating Vcc Range	3V to 15V
Absolute Maximum Vcc	18V
Lead Temperature (Soldering, 10 seconds)	260 C

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual device operation.

Electrical Characteristics

DC PARAMETERS:

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Voh	Logical "1" Output Voltage	Vcc = 5V, Iout = -10uA			4.5		V	1, 2, 3
		Vcc = 4.5V, Iout = -360uA			2.4		V	1, 2, 3
		Vcc = 10V, Iout = -10uA			9		V	1, 2, 3
Vol	Logical "0" Output Voltage	Vcc = 5V, Iout = 10uA				0.5	V	1, 2, 3
		Vcc = 4.5V, Iout = 360uA				0.4	V	1, 2, 3
		Vcc = 10V, Iout = 10uA				1	V	1, 2, 3
Iih	Logical "1" Input Current	Vcc = 15V, Vin = 15V				150	nA	1, 3
						1000	nA	2
Iil	Logical "0" Input Current	Vcc = 15V, Vin = 0V			-150		nA	1, 3
					-1000		nA	2
Isource	Output Source Current	Vcc = 5V, Vout = 0V			-1.75		mA	1, 3
					-1.2		mA	2
		Vcc = 10V, Vout = 0V			-8		mA	1, 3
					-5.6		mA	2
Isink	Output Sink Current	Vcc = 5V, Vout = 5V			1.75		mA	1, 3
					1.2		mA	2
		Vcc = 10V, Vout = 10V			8		mA	1, 3
					5.6		mA	2
		Vcc = 4.5V, Vout = 0.4V			360		uA	1, 2, 3
Icc	Supply Current	Vcc = 15V				10	uA	1, 3
						300	uA	2
Vih	Logical "1" Input Voltage	Vcc = 5V	1		3.5		V	1, 2, 3
		Vcc = 10V	1		8		V	1, 2, 3
		Vcc = 4.5V	1		3		V	1, 2, 3

Electrical Characteristics

DC PARAMETERS:(Continued)

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Vil	Logical "0" Input Voltage	Vcc = 5V	1			1.5	V	1, 2, 3
		Vcc = 10V	1			2	V	1, 2, 3
		Vcc = 4.5V	1			0.8	V	1, 2, 3

AC PARAMETERS: PROPAGATION DELAY TIME:

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: Cl = 50pF

tPHL	Clock	Vcc = 5V	3			300	nS	9
			3			420	nS	10
			3			240	nS	11
		Vcc = 10V	2			110	nS	9
			2			155	nS	10
			2			90	nS	11
tPLH	Clock	Vcc = 5V	3			300	nS	9
			3			420	nS	10
			3			240	nS	11
		Vcc = 10V	2			110	nS	9
			2			155	nS	10
			2			90	nS	11
tPHL	Clear	Vcc = 5V	3			300	nS	9
			3			420	nS	10
			3			240	nS	11
		Vcc = 10V	2			110	nS	9
			2			155	nS	10
			2			90	nS	11
tPLH	Clear	Vcc = 5V	3			400	nS	9
			3			560	nS	10
			3			320	nS	11
		Vcc = 10V	2			150	nS	9
			2			210	nS	10
			2			120	nS	11

Electrical Characteristics

AC PARAMETERS:

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: Cl = 50pF

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tSETUP	Setup Time	Vcc = 5V	1		100		nS	9
		Vcc = 10V	2		40		nS	9
tHOLD	Hold Time	Vcc = 5V	1		0		nS	9
		Vcc = 10V	2		8		nS	9
tPW	Pulse Width	Vcc = 5V, Clock/Clear	1			250	nS	9
		Vcc = 10V, Clock/Clear	2			100	nS	9
tr,tf	Clock Rise and Fall Time	Vcc = 5V	2		15		nS	9
		Vcc = 10V	2		5		nS	9
fMAX	Maximum Clock Frequency	Vcc = 5V	1		2		MHz	9
		Vcc = 10V			5		MHz	9

Note 1: Parameter tested go-no-go only.
Note 2: Guaranteed parameter not tested.
Note 3: Tested at 25 C; guaranteed, but not tested at +125 C and -55 C.