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.

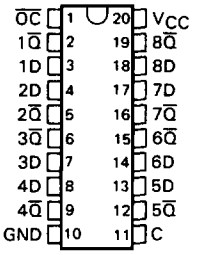
The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for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

SN54F533, SN74F533
OCTAL D-TYPE TRANSPARENT LATCHES WITH 3-STATE OUTPUTS

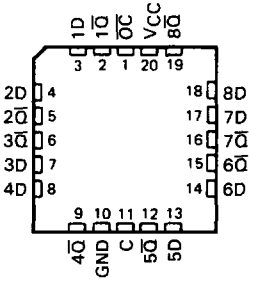
D2932, MARCH 1987

- 8-Latches in a Single Package
- 3-State Bus-Driving Inverting Outputs
- Full Parallel Access for Loading
- Buffered Control Inputs
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

SN54F533 . . . J PACKAGE
SN74F533 . . . DW OR N PACKAGE
(TOP VIEW)



SN54F533 . . . FK PACKAGE
(TOP VIEW)



description

These 8-bit latches feature three-state outputs designed specifically for driving highly capacitive or relatively low-impedance loads. They are particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

The eight latches of the 'F533 are transparent D-type latches. While the enable (C) is high, the $\overline{Q}$ outputs will follow the complements of the D inputs. When the enable is taken low, the $\overline{Q}$ outputs will be latched at the inverses of the levels that were set up at the D inputs. The 'F533 is functionally equivalent to the 'F373 except for having inverted outputs.

A buffered output-control ($\overline{OC}$) input can be used to place the eight outputs in either a normal logic state (high or low logic levels) or a high-impedance state. In the high-impedance state the outputs neither load nor drive the bus lines significantly. The high-impedance third state and increased drive provide the capability to drive the bus lines in a bus-organized system without need for interface or pull-up components.

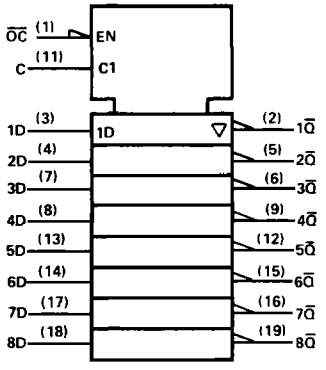
The output control does not affect the internal operations of the latches. Old data can be retained or new data can be entered while the outputs are off.

The SN54F533 is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74F533 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE (EACH LATCH)

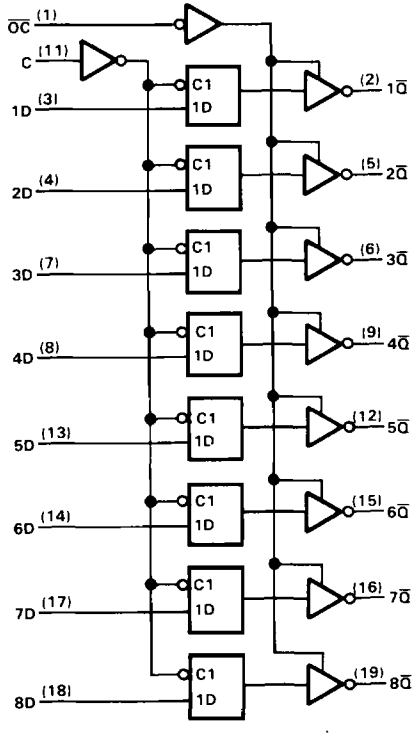
INPUTS			OUTPUT
$\overline{OC}$	ENABLE C	D	$\overline{Q}$
L	H	H	L
L	H	L	H
L	L	X	$\overline{Q}_0$
H	X	X	Z

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



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absolute maximum ratings over operating free-air temperature range

Supply voltage, V_{CC} . . . . . −0.5 V to 7 V
Input voltage† . . . . . −1.2 V to 7 V
Input current . . . . . −30 mA to 5 mA
Voltage applied to any output in the disabled or power-off state . . . . . −0.5 V to 5.5 V
Voltage applied to any output in the high state . . . . . −0.5 to V_{CC}
Current into any output in the low state: SN54F533 . . . . . 40 mA
SN74F533 . . . . . 48 mA
Operating free-air temperature range: SN54F533 . . . . . −55°C to 125°C
SN74F533 . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

†The input voltage ratings may be exceeded provided the input current ratings are observed.

recommended operating conditions

		SN54F533			SN74F533			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
I_{IK}	Input clamp current			−18			−18	mA
I_{OH}	High-level output current			−3			−3	mA
I_{OL}	Low-level output current			20			24	mA
T_A	Operating free-air temperature	−55		125	0		70	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS		SN54F533			SN74F533			UNIT
			MIN	TYP§	MAX	MIN	TYP§	MAX	
V_{IK}	V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
V_{OH}#	V_{CC} = 4.5 V	I_{OH} = −1 mA	2.5	3.4		2.5	3.4		V
		I_{OH} = −3 mA	2.4	3.3		2.4	3.3		
V_{OL}	V_{CC} = 4.5 V	I_{OL} = 20 mA		0.30	0.5				V
		I_{OL} = 24 mA					0.35	0.5	
I_{OZH}	V_{CC} = 5.5 V,	V_O = 2.7 V			50			50	μA
I_{OZL}	V_{CC} = 5.5 V,	V_O = 0.5 V			−50			−50	μA
I_I	V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}	V_{CC} = 5.5 V,	V_I = 2.7 V			20			20	μA
I_{IL}	V_{CC} = 5.5 V,	V_I = 0.5 V			−0.6			−0.6	mA
I_{OS}¶	V_{CC} = 5.5 V,	V_O = 0	−60		−150	−60		−150	mA
I_{CCZ}	V_{CC} = 5.5 V,	See Note 1		41	61		41	61	mA

For conditions shown as MIN or MAX, use the appropriate value specified under Recommended Operating Conditions.
§ All typical values are at V_{CC} = 5 V, T_A = 25°C.
¶ Not more than one output should be shorted at a time and the duration of the short circuit should not exceed one second.
# For the SN74F533 at V_{CC} = 4.75 V and I_{OH} = −1 mA to −3 mA, V_{OH} min = 2.7 V.
NOTE 1: I_{CC} is measured with $\overline{OC}$ at 4.5 V, all other inputs grounded.

timing requirements

			V_{CC} = 5 V, T_A = 25°C		V_{CC} = 4.5 V to 5.5 V, T_A = MIN to MAX†				UNIT
			'F533		SN54F533		SN74F533		
			MIN	MAX	MIN	MAX	MIN	MAX	
t_{su}	Setup time before enable C↓	Data high or low	2		2		2		ns
t_h	Hold time after enable C↓	Data high or low	3		3		3		ns
t_w	Pulse duration	Enable C high	6		6		6		ns

switching characteristics (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = 25°C			V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX†				UNIT
			'F533			SN54F533		SN74F533		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	D	Any $\overline{Q}$	3.2	6.5	9	3.2	12	3.2	10	ns
t_{PHL}			2.2	4.8	7	2.2	9	2.2	8	
t_{PLH}	C	Any $\overline{Q}$	4.2	8.1	11	4.2	14	4.2	13	ns
t_{PHL}			2.2	5.2	7	2.2	9	2.2	8	
t_{PZH}	$\overline{OC}$	Any $\overline{Q}$	1.2	7.3	10	1.2	12.5	1.2	11	ns
t_{PZL}			1.2	4.7	6.5	1.2	9	1.2	7.5	
t_{PHZ}	$\overline{OC}$	Any $\overline{Q}$	1.2	4.3	6	1.2	8.5	1.2	7	ns
t_{PLZ}			1.2	3.7	5.5	1.2	7.5	1.2	6.5	

† For conditions shown as MIN or MAX, use the appropriate value specified under Recommended Operating Conditions.

NOTE 2: See General Information for load circuits and waveforms.

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