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.

- **Compares Two 8-Bit Words**
- **20-kΩ Pullup Resistors on Q Inputs**
- **Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs**
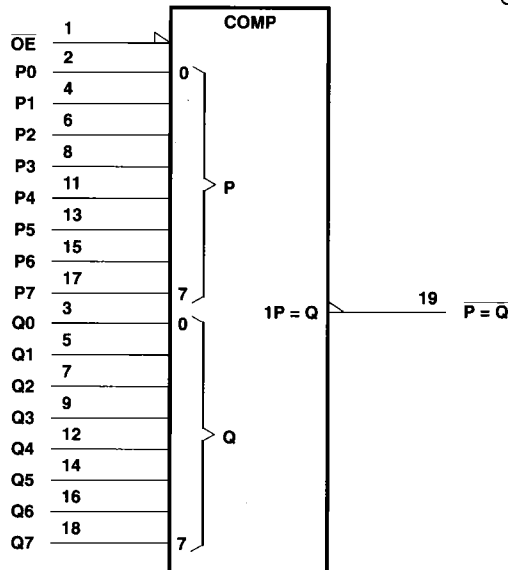
description

These identity comparators perform comparisons on two 8-bit binary or BCD words. They provide $\overline{P = Q}$ outputs. The 'F520 features 20-kΩ pullup termination resistors on the Q inputs for analog or switch data.

The SN54F520 is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74F520 is characterized for operation from 0°C to 70°C.

SN54F520 . . . J PACKAGE
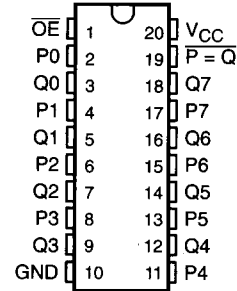**SN74F520 . . . DW OR N PACKAGE**
(TOP VIEW)

```
        ___
OE  [ 1      20 ]  VCC
P0  [ 2      19 ]  P = Q
Q0  [ 3      18 ]  Q7
P1  [ 4      17 ]  P7
Q1  [ 5      16 ]  Q6
P2  [ 6      15 ]  P6
Q2  [ 7      14 ]  Q5
P3  [ 8      13 ]  P5
Q3  [ 9      12 ]  Q4
GND [ 10     11 ]  P4
```

SN54F520 . . . FK PACKAGE
(TOP VIEW)
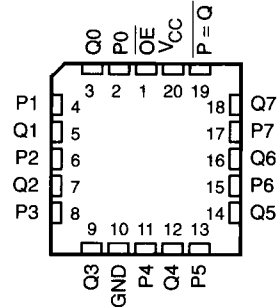
```
        Q0  P0  OE  VCC  P = Q
         3   2   1   20   19
P1  [ 4                      18 ]  Q7
Q1  [ 5                      17 ]  P7
P2  [ 6                      16 ]  Q6
Q2  [ 7                      15 ]  P6
P3  [ 8                      14 ]  Q5
         9  10  11  12  13
        Q3  GND  P4  Q4  P5
```

FUNCTION TABLE

INPUTS		OUTPUT
P, Q	$\overline{OE}$	$\overline{P = Q}$
P = Q	L	L
P ≠ Q	X	H
X	H	H

logic symbol†

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

TEXAS INSTRUMENTS

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SN54F520, SN74F520
8-BIT IDENTITY COMPARATORS

logic diagram (positive logic)
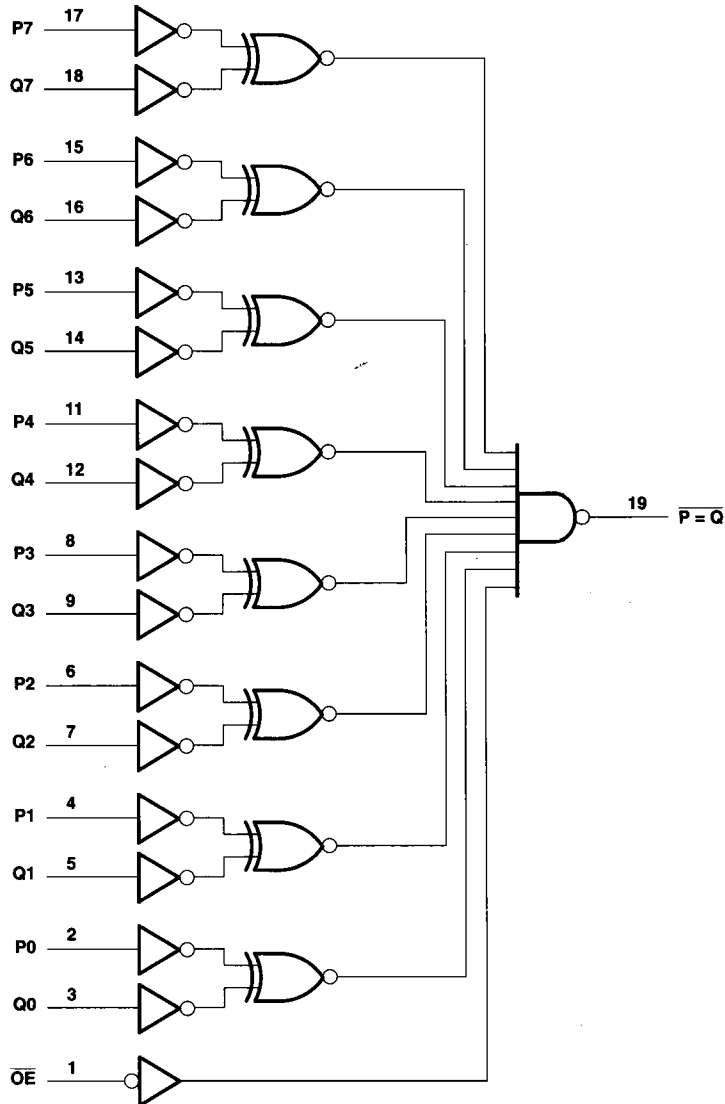
NOTE: 20-kΩ pullup resistors are on the Q inputs.

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V_{CC} .... −0.5 V to 7 V
Input voltage range, V_I (see Note 1) .... −1.2 V to 7 V
Input current range .... −30 mA to 5 mA
Voltage range applied to any output in the high state .... −0.5 V to V_{CC}
Current into any output in the low state .... 40 mA
Operating free-air temperature range: SN54F520 .... −55°C to 125°C
SN74F520 .... 0°C to 70°C
Storage temperature range .... −65°C to 150°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
NOTE 1: The input voltage ratings may be exceeded provided the input current ratings are observed.

recommended operating conditions

		SN54F520			SN74F520			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			−1			−1	mA
I_{OL}	Low-level output current			20			20	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		SN54F520			SN74F520			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
		V_{CC} = 4.75 V,	I_{OH} = −1 mA					2.7		
V_{OL}		V_{CC} = 4.5 V,	I_{OL} = 20 mA		0.3	0.5		0.3	0.5	V
I_I	$\overline{OE}$ and P inputs	V_{CC} = 5.5 V	V_I = 7 V			0.1			0.1	mA
	Q inputs		V_I = 5.5 V			0.1			0.1	
I_{IH}	$\overline{OE}$ and P inputs	V_{CC} = 5.5 V,	V_I = 2.7 V			20			20	μA
	Q inputs					−0.3			−0.3	mA
I_{IL}	$\overline{OE}$ and P inputs	V_{CC} = 5.5 V,	V_I = 0.5 V			−0.6			−0.6	mA
	Q inputs					−1			−1	
I_{OS}§		V_{CC} = 5.5 V,	V_O = 0	−60		−150	−60		−150	mA
I_{CC}		V_{CC} = 5.5 V,	See Note 2		21	32		21	32	mA

‡ 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.
NOTE 2: I_{CC} is measured with all inputs at 4.5 V.

SN54F520, SN74F520
8-BIT IDENTITY COMPARATORS

switching characteristics (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R_L = 500 Ω, T_A = 25°C			V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX†				UNIT
			'F520			SN54F520		SN74F520		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	P or Q	$\overline{P = Q}$	3.9	5.7	7.7	3.7	10.2	3.7	8.7	ns
t_{PHL}			4.7	7	9.3	4.4	11.3	4.4	10.3	
t_{PLH}	$\overline{OE}$	$\overline{P = Q}$	3.5	4.6	5.8	3.4	7	3.4	6.4	ns
t_{PHL}			5.2	7.5	9.5	4.9	11.2	4.9	10.4	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
NOTE 3: Load circuits and waveforms are shown in Section 1.

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