

SN54F518, SN54F519, SN74F518, SN74F519 8-BIT IDENTITY COMPARATORS WITH OPEN-COLLECTOR OUTPUTS

D2932, MARCH 1987

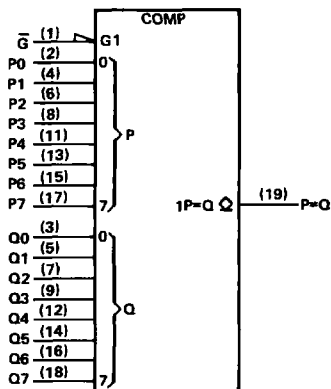
- Compares Two 8-Bit Words
- 'F518 Has 20-k Ω Pull-up Resistors on Q Inputs
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

description

These identity comparators perform comparisons on two eight-bit binary or BCD words. The 'F518 and F519 provide P = Q open-collector outputs. The 'F518 devices feature 20-k Ω pull-up termination resistors on the Q inputs for analog or switch data.

The SN54F518 and SN54F519 are characterized for operation over the full military temperature range of -55 $^{\circ}$ C to 125 $^{\circ}$ C. The SN74F518 and SN74F519 are characterized for operation from 0 $^{\circ}$ C to 70 $^{\circ}$ C.

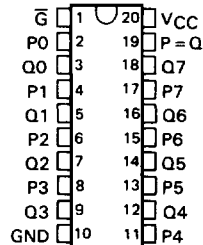
logic symbol†



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

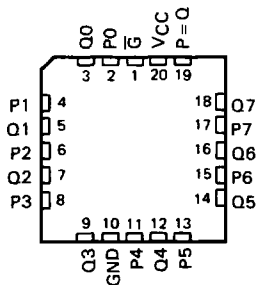
SN54F518, SN54F519 . . . J PACKAGE
SN74F518, SN74F519 . . . DW OR N PACKAGE

(TOP VIEW)



SN54F518, SN54F519 . . . FK PACKAGE

(TOP VIEW)



FUNCTION TABLE

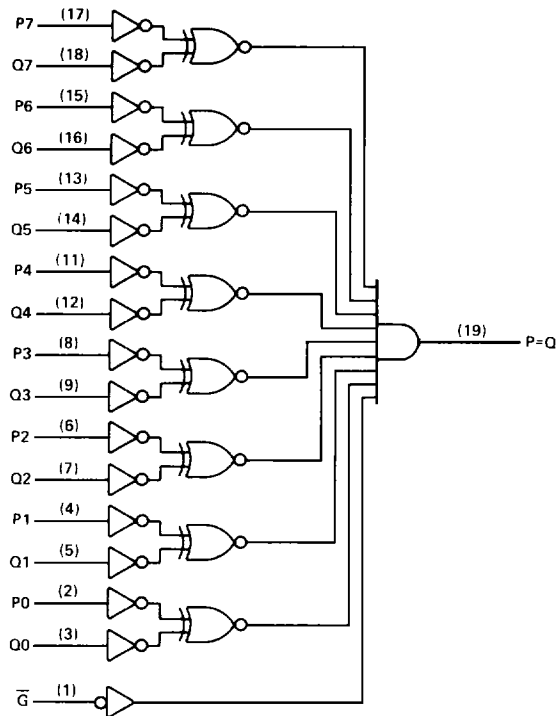
INPUTS		OUTPUT P = Q
DATA P, Q	ENABLE G-bar	
P = Q	L	H
P \neq Q	X	L
X	H	L

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Data Sheets

SN54F518, SN54F519, SN74F518, SN74F519
8-BIT IDENTITY COMPARATORS WITH OPEN-COLLECTOR OUTPUTS

logic diagram (positive logic)



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Data Sheets

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

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 high state	-0.5 V to 5.5 V
Current into any output in the low state	40 mA
Operating free-air temperature range: SN54F518, SN54F519	-55 °C to 125 °C
SN74F518, SN74F519	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.

SN54F518, SN74F518 8-BIT IDENTITY COMPARATORS WITH OPEN-COLLECTOR OUTPUTS

recommended operating conditions

	SN54F518			SN74F518			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
V _{OH} High-level output voltage			5.5			5.5	V
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	SN54F518			SN74F518			UNIT
		MIN	TYP†	MAX	MIN	TYP†	MAX	
V _{IK}	V _{CC} = 4.5 V, I _I = -18 mA			-1.2			-1.2	V
I _{OH}	V _{CC} = 4.5 V, V _{OH} = 5.5 V			0.1			0.1	mA
V _{OL}	V _{CC} = 4.5 V, I _{OL} = 20 mA		0.30	0.5		0.30	0.5	V
I _I	\bar{G} and P inputs			0.1			0.1	mA
	Q inputs	V _{CC} = 5.5 V, V _I = 5.5 V		0.1			0.1	mA
I _{IH}	\bar{G} and P inputs			20			20	μA
	Q inputs	V _{CC} = 5.5 V, V _I = 2.7 V		-0.3			-0.3	mA
I _{IL}	\bar{G} and P inputs			-0.6			-0.6	mA
	Q inputs	V _{CC} = 5.5 V, V _I = 0.5 V		-1			-1	mA
I _{CC}	V _{CC} = 5.5 V, See Note 1		24	39		24	39	mA

switching characteristics (see Note 2)

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
			'F518			SN54F518		SN74F518		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	P or Q	P = Q	4	11.5	14.5	4	15.5	4	15	ns
t _{PHL}			2	6.2	9	2	11.5	2	10	
t _{PLH}	\bar{G}	P = Q	4.5	11.5	14	4.5	15.5	4.5	14.5	ns
t _{PHL}			2	5.1	6.5	2	9.5	2	7.5	

† 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.

NOTES 1. I_{CC} is measured with all inputs at 4.5 V.

2. See General Information for load circuits and waveforms.

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Data Sheets

SN54F519, SN74F519

8-BIT IDENTITY COMPARATORS WITH OPEN-COLLECTOR OUTPUTS

recommended operating conditions

	SN54F519			SN74F519			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
V _{OH} High-level output voltage			5.5			5.5	V
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	SN54F519		SN74F519		UNIT	
		MIN	TYP†	MAX	MIN		TYP†
V _{IK}	V _{CC} = 4.5 V, I _I = -18 mA			-1.2		-1.2	V
I _{OH}	V _{CC} = 4.5 V, V _{OH} = 5.5 V			0.1		0.1	mA
V _{OL}	V _{CC} = 4.5 V, I _{OL} = 20 mA	0.30		0.5	0.30	0.5	V
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 _{CC}	V _{CC} = 5.5 V, See Note 1	24	39		24	39	mA

switching characteristics (see Note 2)

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
			F519			SN54F519		SN74F519		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	P or Q	P = Q	4	11.5	14.5	4	15.5	4	15	ns
t _{PHL}			2	6.2	9	2	11.5	2	10	
t _{PLH}	Q	P = Q	4.5	11.5	14	4.5	15.5	4.5	14.5	ns
t _{PHL}			2	5.1	6.5	2	9.5	2	7.5	

† 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.

NOTES: 1. I_{CC} is measured with all inputs at 4.5 V.

2. See General Information for load circuits and waveforms.