SN54F158A, SN74F158A QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

SDFS054A - D2932, MARCH 1987 - REVISED OCTOBER 1993

- Buffered Inputs and Outputs
- Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs

description

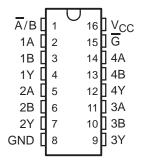
The 'F158A is a quadruple 2-input data selector/multiplexer featuring a direct strobe (\overline{G}) input. When the strobe is high, all outputs are high. When the strobe is low, a 4-bit word is selected from one of two sources and is routed to the four outputs. The 'F158A provides inverted data.

The SN54F158A is characterized for operation over the full military temperature range of -55°C to 125°C. The SN74F158A is characterized for operation from 0°C to 70°C.

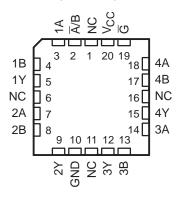
FUNCTION TABLE

	INPU	OUTPUT		
G	A/B	Α	В	Υ
Н	Χ	Χ	Х	Н
L	L	L	X	Н
L	L	Н	X	L
L	Н	Χ	L	Н
L	Н	Χ	Н	L

SN54F158A . . . J PACKAGE SN74F158A . . . D OR N PACKAGE (TOP VIEW)



SN54F158A . . . FK PACKAGE (TOP VIEW)

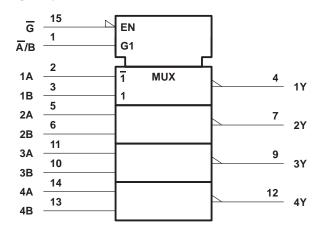


NC - No internal connection

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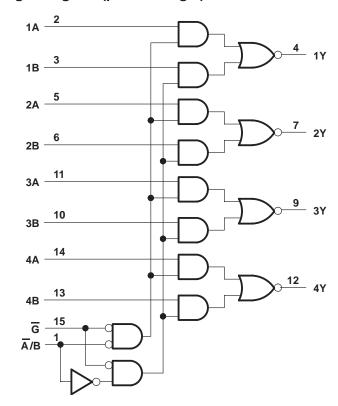
logic symbol†



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

Pin numbers shown are for the D, J, and N packages.

logic diagram (positive logic)



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 (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: SN54F158A	55°C to 125°C
SN74F158A	. 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 rating may be exceeded provided that the input current rating is observed.

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recommended operating conditions

		SN54F158A		SN74F158A				
		MIN	NOM	MAX	MIN	NOM	MAX	UNIT
VCC	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
VIH	High-level input voltage	2			2			V
V _{IL}	Low-level input voltage			8.0			0.8	V
liK	Input clamp current			-18			-18	mA
IOH	High-level output current			- 1			- 1	mA
lOL	Low-level output current			20			20	mA
TA	Operating free-air temperature	-55	•	125	0		70	°C

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

PARAMETER	TEST CONDITIONS		SI	SN54F158A			SN74F158A		
			MIN	TYP [†]	MAX	MIN	TYP [†]	MAX	UNIT
VIK	V _{CC} = 4.5 V,	I _I = –18 mA			-1.2			-1.2	V
V	$V_{CC} = 4.5 \text{ V},$	$I_{OH} = -1 \text{ mA}$	2.5	3.4		2.5	3.4		V
VOH	$V_{CC} = 4.75 \text{ V},$	$I_{OH} = -1 \text{ mA}$				2.7			
V _{OL}	$V_{CC} = 4.5 \text{ V},$	$I_{OL} = 20 \text{ mA}$		0.3	0.5		0.3	0.5	V
lį	V _C C = 5.5 V,	V _I = 7 V			0.1			0.1	mA
lіН	V _C C = 5.5 V,	V _I = 2.7 V			20			20	μΑ
I _{IL}	V _C C = 5.5 V,	V _I = 0.5 V			- 0.6			- 0.6	mA
los [‡]	V _{CC} = 5.5 V,	V _O = 0	-60		-150	-60		-150	mA
Icc	$V_{CC} = 5.5 \text{ V},$	V _I = 4.5 V		10	15		10	15	mA

[†] All typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25^{\circ}\text{C}$.

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
				′F158A		SN54F158A		SN74F158A		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
^t PLH	Ā/B	Υ	2.2	5.1	8.5	2.2	10.5	2.2	9.5	ns
^t PHL			1.7	4.1	6.5	1.7	8	1.7	7	
^t PLH	G	Y	1.7	4.1	6	1.7	8	1.7	7	
^t PHL			1.2	3.6	6	1.2	7	1.2	6.5	ns
t _{PLH}	A or B	Υ	1.7	3.6	5.9	1.7	8.5	1.7	7	ns
t _{PHL}		AUID	1	2.1	4	1	5	1	4.5	110

[§] For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions. NOTE 2: Load circuits and voltage waveforms are shown in Section 1.



[‡] Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

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