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Jameco Part Number 283119

SN54F38, SN74F38 QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS WITH OPEN-COLLECTOR OUTPUTS

SDFS013A – MARCH 1987 – REVISED OCTOBER 1993

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

description

These devices contain four independent 2-input NAND buffer gates with open-collector outputs. They perform the Boolean functions $Y = A \cdot B$ or $Y = \overline{A} + \overline{B}$ in positive logic.

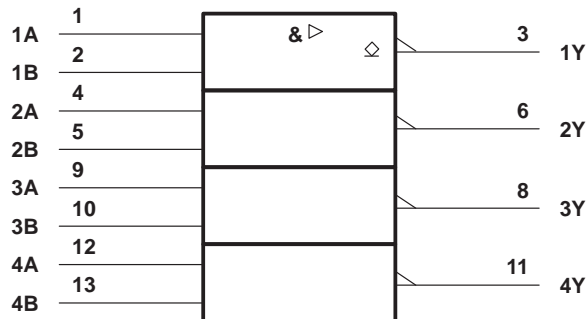
The open-collector outputs require pullup resistors to perform correctly. They may be connected to other open-collector outputs to implement active-low wired-OR or active-high wired-AND functions. Open-collector devices are often used to generate higher V_{OH} levels.

The SN54F38 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74F38 is characterized for operation from 0°C to 70°C .

FUNCTION TABLE
(each gate)

INPUTS		OUTPUT Y
A	B	
H	H	L
L	X	H
X	L	H

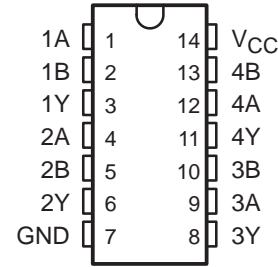
logic symbol†



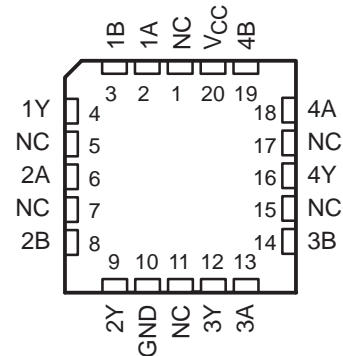
† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

SN54F38 ... J PACKAGE
SN74F38 ... D OR N PACKAGE
(TOP VIEW)

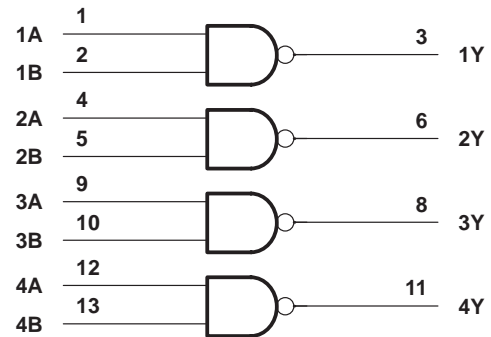


SN54F38 ... FK PACKAGE
(TOP VIEW)



NC – No internal connection

logic diagram (positive logic)



SN54F38, SN74F38

QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS

WITH OPEN-COLLECTOR OUTPUTS

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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)	–0.5 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	128 mA
Operating free-air temperature range: SN54F38	–55°C to 125°C
SN74F38	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

		SN54F38			SN74F38			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
V_{OH}	High-level output voltage			4.5			4.5	V
I_{OL}	Low-level output current			48			64	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		SN54F38			SN74F38			UNIT
			MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V _{IK}	V _{CC} = 4.5 V,	I _I = −18 mA	−0.73	−1.2			−1.2	V	
V _{OL}	V _{CC} = 4.5 V,	I _{OL} = 48 mA	0.3	0.5		0.3	0.5	V	
	V _{CC} = 4.5 V,	I _{OL} = 64 mA	0.3	0.5		0.3	0.5		
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 _{OH}	V _{CC} = 4.5 V			250			250	μA	
I _{CCH}	V _{CC} = 5.5 V,	V _I = 0	4	7		4	7	mA	
I _{CCL}	V _{CC} = 5.5 V,	V _I = 4.5 V	22	30		22	30	mA	

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



SN54F38, SN74F38
QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS
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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
			‘F38			SN54F38		SN74F38		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A or B	Y	6.7	9.6	12.5	6.2	14	6.7	13	ns
t _{PHL}			1	2.6	5	1	6.5	1	5.5	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

NOTE 2: Load circuits and waveforms are shown in Section 1.

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SN74F38, Quad 2-input positive-NAND buffers with open collector outputs

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	SN74F38
Voltage Nodes (V)	5
Vcc range (V)	4.5 to 5.5
Input Level	TTL
Output Level	TTL
Output Drive (mA)	- /64
No. of Gates	4
Static Current	18.5
tpd max (ns)	13

FEATURES

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DESCRIPTION

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TECHNICAL DOCUMENTS

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To download a document to your hard drive, right-click on the link and choose 'Save'.

DATASHEET

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Full datasheet in Acrobat PDF: [sn74f38.pdf](#) (69 KB,Rev.A) (Updated: 10/01/1993)

APPLICATION NOTES

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View Application Notes for [Digital Logic](#)

- [Bus-Interface Devices With Output-Damping Resistors Or Reduced-Drive Outputs \(Rev. A\)](#) (SCBA012A - Updated: 08/01/1997)
- [Designing With Logic \(Rev. C\)](#) (SDYA009C - Updated: 06/01/1997)
- [Evaluation of Nickel/Palladium/Gold-Finished Surface-Mount Integrated Circuits](#) (SZZA026 - Updated: 06/20/2001)
- [Input and Output Characteristics of Digital Integrated Circuits](#) (SDYA010 - Updated: 10/01/1996)

RELATED DOCUMENTS

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View Related Documentation for [Digital Logic](#)

- [Logic Reference Guide](#) (SCYB004, 1032 KB - Updated: 10/23/2001)
- [Logic Selection Guide Second Half 2002 \(Rev. R\)](#) (SDYU001R, 4274 KB - Updated: 07/19/2002)
- [Military Semiconductors Selection Guide 2002 \(Rev. B\)](#) (SGYC003B, 1648 KB - Updated: 04/22/2002)

PRICING/AVAILABILITY/PKG

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DEVICE INFORMATION

ORDERABLE DEVICE	STATUS	PACKAGE TYPE PINS	TEMP (°C)	PRODUCT CONTENT	BUDGETARY PRICING QTY \$US	STD PACK QTY
SN74F38D	ACTIVE	SOP (D) 14	0 TO 70	View Contents	1KU 0.28	50
SN74F38DR	ACTIVE	SOP (D) 14	0 TO 70	View Contents	1KU 0.28	2500
SN74F38N	ACTIVE	PDIP (N) 14	0 TO 70	View Contents	1KU 0.28	25
SN74F38NSR	ACTIVE	SOP (NS) 14		View Contents	1KU 0.29	2000

TI INVENTORY STATUS

AS OF 3:00 PM GMT, 26 Sep 2002

IN STOCK	IN PROGRESS QTY DATE	LEAD TIME
1000	750 03 Oct	5 WKS
	> 10k 07 Oct	
	> 10k 14 Oct	
N/A*	> 10k 03 Oct	5 WKS
	> 10k 10 Oct	
575	9766 19 Sep	5 WKS
	13 25 Sep	
	> 10k 07 Oct	
	> 10k 10 Oct	
N/A*	> 10k 07 Oct	5 WKS
	> 10k 14 Oct	

REPORTED DISTRIBUTOR INVENTORY

AS OF 3:00 PM GMT, 26 Sep 2002

DISTRIBUTOR COMPANY REGION	IN STOCK	PURCHASE
Avnet AMERICA	> 1k	BUY NOW
DigiKey AMERICA	> 1k	BUY NOW
Avnet AMERICA	> 1k	BUY NOW

Table Data Updated on: 9/26/2002