

SN54F64, SN74F64 4-2-3-2 INPUT AND-OR-INVERT GATES

D3178, AUGUST 1988—REVISED JANUARY 1989

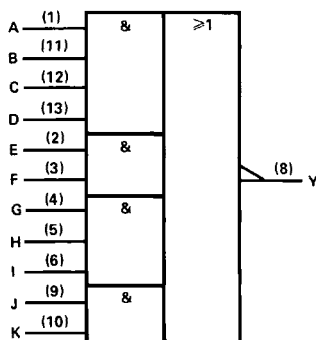
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

description

These devices contain 4-2-3-2 input AND-OR-INVERT gates. They perform the Boolean function $Y = \overline{ABCD + EF + GHI + JK}$. The 'F64 has totem-pole outputs.

The SN54F64 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74F64 is characterized for operation from 0°C to 70°C .

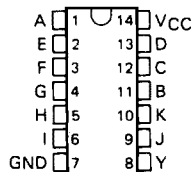
logic symbol†



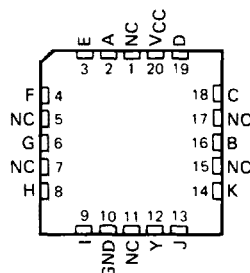
†This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

SN54F64 . . . J PACKAGE
SN74F64 . . . D OR N PACKAGE
(TOP VIEW)

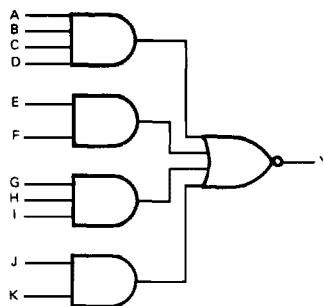


SN54F64 . . . FK PACKAGE
(TOP VIEW)



NC—No internal connection

logic diagram (each device) (positive logic)



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Data Sheets

PRODUCTION DATA documents contain information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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INSTRUMENTS

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SN54F64, SN74F64

4-2-3-2 INPUT AND-OR-INVERT GATES

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 V_{CC}
Current into any output in the low state	40 mA
Operating free-air temperature range: SN54F64	-55°C to 125°C
SN74F64	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

	SN54F64			SN74F64			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	SN54F64		SN74F64		UNIT	
		MIN	TYP‡	MAX	MIN		TYP‡
V_{IK}	$V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$			-1.2		-1.2	V
V_{OH}	$V_{CC} = 4.5\text{ V}$, $I_{OH} = -1\text{ mA}$	2.4	3.4	2.5	3.4		V
	$V_{CC} = 4.75\text{ V}$, $I_{OH} = -1\text{ mA}$			2.7			
V_{OL}	$V_{CC} = 4.5\text{ V}$, $I_{OL} = 20\text{ mA}$		0.30	0.5	0.30	0.5	V
I_I	$V_{CC} = 5.5\text{ V}$, $V_I = 7\text{ V}$			0.1		0.1	mA
I_{IH}	$V_{CC} = 5.5\text{ V}$, $V_I = 2.7\text{ V}$			20		20	μA
I_L	$V_{CC} = 5.5\text{ V}$, $V_I = 0.5\text{ V}$			-0.6		-0.6	mA
I_{OS}^{\S}	$V_{CC} = 5.5\text{ V}$, $V_O = 0$	-60		-150	-60	-150	mA
I_{CCH}	$V_{CC} = 5.5\text{ V}$, $V_I = 0$		1.9	2.8	1.9	2.8	mA
I_{CCL}	$V_{CC} = 5.5\text{ V}$, See Note 1		3.1	4.7	3.1	4.7	mA

switching characteristics (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5\text{ V}$, $C_L = 50\text{ pF}$, $R_L = 500\ \Omega$, $T_A = 25^\circ\text{C}$						UNIT	
			$V_{CC} = 4.5\text{ V to }5.5\text{ V}$, $C_L = 50\text{ pF}$, $R_L = 500\ \Omega$, $T_A = \text{MIN to MAX}^{\dagger}$							
			F64		SN54F64		SN74F64			
	MIN	TYP†	MAX	MIN	MAX	MIN	MAX			
t_{PLH}	Any	Y	1.7	4.6	6	1.7	8.5	1.7	7	ns
t_{PHL}			1.2	3.2	4.5	1.2	6.5	1.2	5.5	

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

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

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

NOTES: 1. I_{CCL} is measured with one input per gate at 4.5 V and all others grounded.

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

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Data Sheets