

SN54F540, SN74F540 OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

D3215, JANUARY 1989

- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Data Flow-Through Pinout (All Inputs on Opposite Side from Outputs)
- 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 octal buffers and line drivers are designed to have the performance of the popular SN54F240/SN74F240 series and, at the same time, offer a pinout with inputs and outputs on opposite sides of the package. This arrangement greatly enhances printed circuit board layout.

The three-state control gate is a 2-input NOR gate so that if either $\bar{G}1$ or $\bar{G}2$ is high, all eight outputs are in the high-impedance state.

The SN54F540 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74F540 is characterized for operation from 0°C to 70°C .

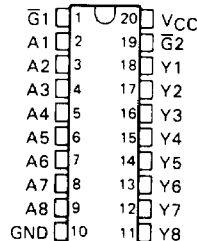
FUNCTION TABLE

INPUTS			OUTPUT
$\bar{G}1$	$\bar{G}2$	A	Y
L	L	L	H
L	L	H	L
H	X	X	Z
X	H	X	Z

Z = High Impedance

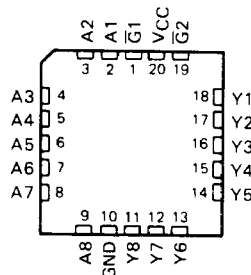
SN54F540 . . . J PACKAGE
SN74F540 . . . DW OR N PACKAGE

(TOP VIEW)



SN54F540 . . . FK PACKAGE

(TOP VIEW)



2

Data Sheets

PRODUCT PREVIEW

PRODUCT PREVIEW documents contain information on products in the formative or design phase of development. Characteristic data and other specifications are design goals. Texas Instruments reserves the right to change or discontinue these products without notice.

TEXAS
INSTRUMENTS

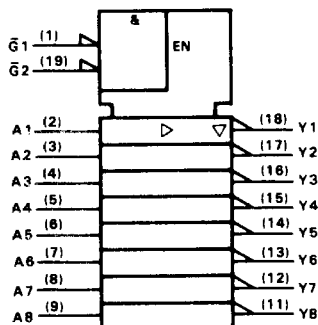
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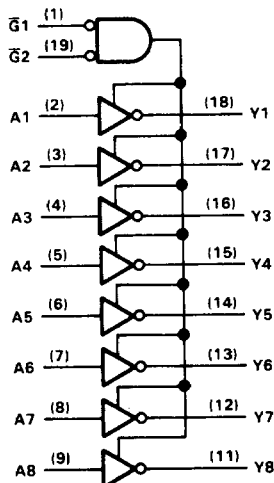
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SN54F540, SN74F540 OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

logic symbol†



logic diagram (positive logic)



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

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 disabled or power-off state	–0.5 V to 5.5 V
Voltage applied to any output in the high state	–0.5 V to V_{CC}
Current into any output in the low state: SN54F540	96 mA
SN74F540	128 mA
Operating free-air temperature range: SN54F540	–55°C to 125°C
SN74F540	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

	SN54F540			SN74F540			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			–12			–15	mA
I_{OL} Low-level output current			48			64	mA
T_A Operating free-air temperature	–55		125	0		70	°C

SN54F540, SN74F540

OCTAL BUFFERS AND LINE DRIVERS

WITH 3-STATE OUTPUTS

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

PARAMETER	TEST CONDITIONS		SN54F540			SN74F540			UNIT
			MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	$V_{CC} = 4.5 \text{ V}$, $I_I = -18 \text{ mA}$				-1.2			-1.2	V
V_{OH}	$V_{CC} = 4.5 \text{ V}$	$I_{OH} = -3 \text{ mA}$	2.4	3.3		2.4	3.3		V
		$I_{OH} = -12 \text{ mA}$	2	3.2					
		$I_{OH} = -15 \text{ mA}$				2	3.1		
	$V_{CC} = 4.75 \text{ V}$, $I_{OH} = -3 \text{ mA}$					2.7			
V_{OL}	$V_{CC} = 4.5 \text{ V}$	$I_{OL} = 48 \text{ mA}$		0.38	0.55				V
		$I_{OL} = 64 \text{ mA}$				0.42	0.55		
I_{OZH}	$V_{CC} = 5.5 \text{ V}$, $V_O = 2.7 \text{ V}$				50			50	μA
I_{OZL}	$V_{CC} = 5.5 \text{ V}$, $V_O = 0.5 \text{ V}$				-50			-50	μA
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_{IL}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0.5 \text{ V}$				-0.6			-0.6	mA
$I_{OS}^\ddagger$	$V_{CC} = 5.5 \text{ V}$, $V_O = 0$		-100		-225	-100		-225	mA
I_{CC}	$V_{CC} = 5.5 \text{ V}$	Outputs high		59	75		59	75	mA
		Outputs low		12	20		12	20	
		Outputs disabled		35	45		35	45	

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = 25°C			V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = MIN to MAX [§]				UNIT
			'F540			SN54F540		SN74F540		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	Data	Y	1	2.6	5	1	6	1	5.5	ns
t _{PHL}	(Any A)		1	1.6	4	1	4.5	1	4	
t _{PZH}	G	Y	1.7	4.5	8	1.7	9	1.7	8.5	ns
t _{PZL}			2.7	5.4	10	2.7	11	2.7	10.5	
t _{PHZ}	G	Y	1	3	6	1	7	1	6.5	ns
t _{PLZ}			1	2.1	5.6	1	7.5	1	6	

† 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.

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

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