D3126, 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 $\overline{G}1$ or $\overline{G}2$ is high, all eight outputs are in the high-impedance state.

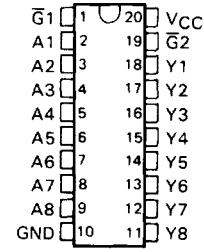
The SN54F541 is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74F541 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE

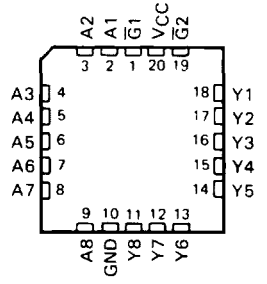
INPUTS			OUTPUT
$\overline{G}1$	$\overline{G}2$	A	Y
L	L	L	L
L	L	H	H
H	X	X	Z
X	H	X	Z

Z = High Impedance

SN54F541 . . . J PACKAGE
SN74F541 . . . DW OR N PACKAGE
(TOP VIEW)



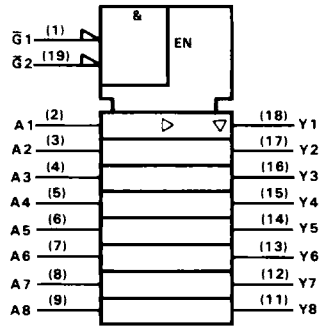
SN54F541 . . . FK PACKAGE
(TOP VIEW)



2 Data Sheets

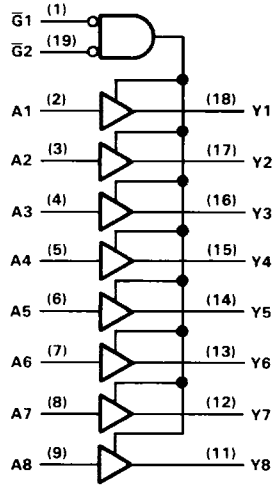
PRODUCT PREVIEW

logic symbol†



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

logic diagram (positive logic)



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: SN54F541 . . . . . 96 mA
SN74F541 . . . . . 128 mA
Operating free-air temperature range: SN54F541 . . . . . −55°C to 125°C
SN74F541 . . . . . 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

		SN54F541			SN74F541			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

TEXAS INSTRUMENTS
POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

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

PARAMETER	TEST CONDITIONS		SN54F541			SN74F541			UNIT
			MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
V_{OH}	V_{CC} = 4.5 V	I_{OH} = −3 mA	2.4	3.3		2.7	3.3		V
		I_{OH} = −12 mA	2	3.2					
		I_{OH} = −15 mA				2	3.1		
	V_{CC} = 4.75 V,	I_{OH} = −3 mA				2.7			
V_{OL}	V_{CC} = 4.5 V	I_{OL} = 48 mA		0.38	0.55				V
		I_{OL} = 64 mA					0.42	0.55	
I_{OZH}	V_{CC} = 5.5 V,	V_O = 2.7 V			50			50	μA
I_{OZL}	V_{CC} = 5.5 V,	V_O = 0.5 V			−50			−50	μA
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_{OS}‡	V_{CC} = 5.5 V,	V_O = 0	−100		−225	−100		−225	mA
I_{CC}	V_{CC} = 5.5 V	Outputs high		62	75		62	75	mA
		Outputs low		28	35		28	35	
		Outputs disabled		40	55		40	55	

switching characteristics (see Note 1)

PARAMETER	FROM (INTPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = 25°C			V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX§				UNIT
			'F541			SN54F541		SN74F541		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	Data	Y	1	2.9	5.5	1	6.5	1	6	ns
t_{PHL}	(Any A)		1	2.3	5.5	1	6.5	1	6	
t_{PZH}	$1\overline{G}$ or 2G	Y	2.2	5.4	8	1.7	10	1.7	9.5	ns
t_{PZL}			2.7	5.7	8.5	2.2	10	2.2	9.5	
t_{PHZ}	$1\overline{G}$ or 2G	Y	1	3	6	1	7	1	6.5	ns
t_{PLZ}			1	2.5	5.5	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.