

SN54F241, SN74F241 OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS

SDFS090 – MARCH 1987 – REVISED OCTOBER 1993

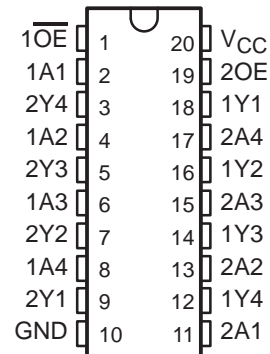
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Plastic and Ceramic DIPs

description

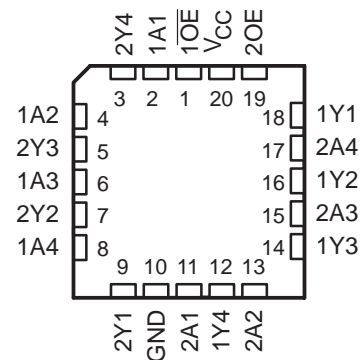
These octal buffers and line drivers are designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. Taken together with the 'F240 and 'F244, these devices provide the choice of selected combinations of inverting and noninverting outputs, symmetrical \overline{OE} (active-low output-enable) inputs, and complementary OE and \overline{OE} inputs.

The SN54F241 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74F241 is characterized for operation from 0°C to 70°C .

SN54F241 . . . J PACKAGE
SN74F241 . . . DW OR N PACKAGE
(TOP VIEW)



SN54F241 . . . FK PACKAGE
(TOP VIEW)



FUNCTION TABLES

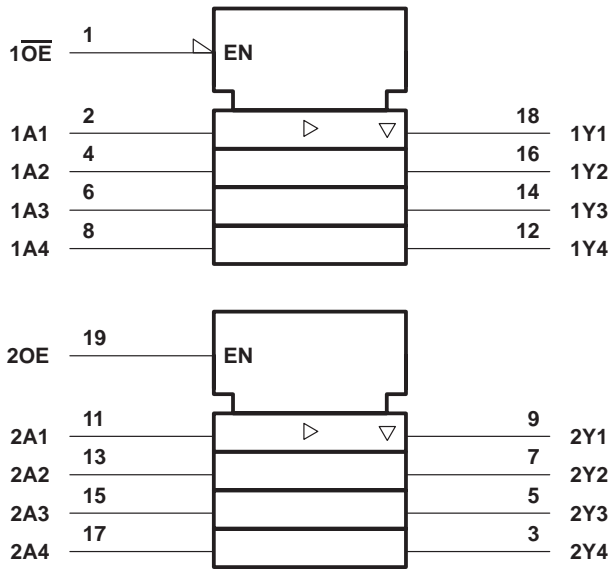
INPUTS		OUTPUT
$\overline{1OE}$	1A	1Y
H	X	Z
L	H	H
L	L	L

INPUTS		OUTPUT
2OE	2A	2Y
H	H	H
H	L	L
L	X	Z

SN54F241, SN74F241 OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS

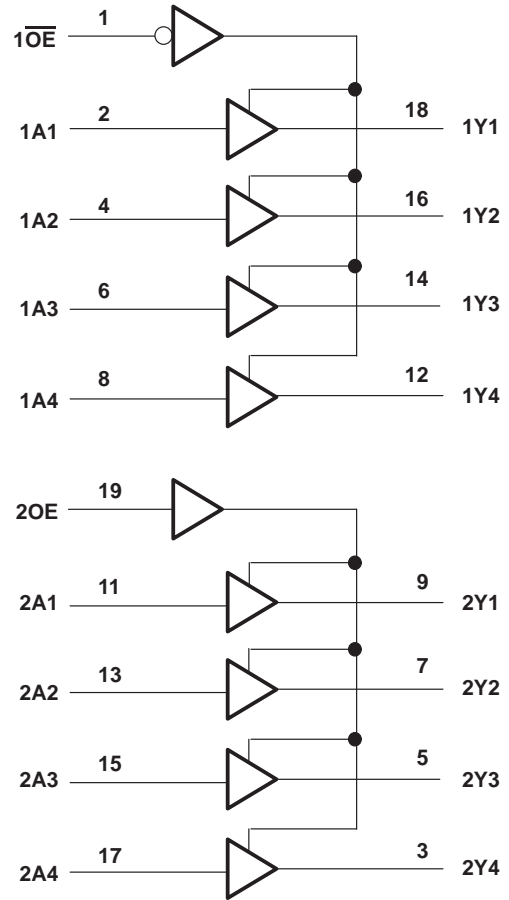
SDFS090 – MARCH 1987 – REVISED OCTOBER 1993

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 range, V_{CC}	-0.5 V to 7 V
Input voltage range, V_I (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 disabled or power-off state	-0.5 V to 5.5 V
Voltage range applied to any output in the high state	-0.5 V to V_{CC}
Current into any output in the low state: SN54F241	96 mA
SN74F241	128 mA
Operating free-air temperature range: SN54F241	-55°C to 125°C
SN74F241	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.

SN54F241, SN74F241 OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS

SDFS090 – MARCH 1987 – REVISED OCTOBER 1993

recommended operating conditions

		SN54F241			SN74F241			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

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

PARAMETER	TEST CONDITIONS	SN54F241			SN74F241			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}	OE or \overline{OE} Any A	$V_{CC} = 5.5\text{ V}$, $V_I = 0.5\text{ V}$			-1			-1	mA
					-1.6			-1.6	
$I_{OS}‡$	$V_{CC} = 5.5\text{ V}$, $V_O = 0$	-100		-225	-100		-225	mA	
I_{CC}	$V_{CC} = 5.5\text{ V}$	Outputs high	40	60	40	60		mA	
		Outputs low	60	90	60	90			
		Outputs disabled	60	90	60	90			

† 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.

SN54F241, SN74F241
OCTAL BUFFERS/DRIVERS
WITH 3-STATE OUTPUTS

SDFS090 – MARCH 1987 – REVISED OCTOBER 1993

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
			'F241			SN54F241		SN74F241		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	Any A	Y	1.7	3.6	5.2	1.2	6.5	1.7	6.2	ns
t _{PHL}			1.7	3.6	5.2	1.2	7	1.7	6.5	
t _{PZH}	$\overline{\text{OE}}$ or OE	Y	1.2	3.9	5.7	1.2	7	1.2	6.7	ns
t _{PZL}			1.2	5	7	1.2	8.5	1.2	8	
t _{PHZ}	$\overline{\text{OE}}$ or OE	Y	1.2	4.1	6	1.2	7	1.2	7	ns
t _{PLZ}			1.2	4.1	6	1.2	7.5	1.2	7	

† 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.



PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
5962-86874012A	ACTIVE	LCCC	FK	20	1	None	Call TI	Level-NC-NC-NC
5962-8687401RA	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
5962-8687401SA	ACTIVE	CFP	W	20	1	None	Call TI	Level-NC-NC-NC
JM38510/33202B2A	ACTIVE	LCCC	FK	20	1	None	Call TI	Level-NC-NC-NC
JM38510/33202BRA	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
JM38510/33202BSA	ACTIVE	CFP	W	20	1	None	Call TI	Level-NC-NC-NC
SN54F241J	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
SN74F241DW	ACTIVE	SOIC	DW	20	25	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74F241DWR	ACTIVE	SOIC	DW	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74F241N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74F241NSR	ACTIVE	SO	NS	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
SNJ54F241FK	ACTIVE	LCCC	FK	20	1	None	Call TI	Level-NC-NC-NC
SNJ54F241J	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
SNJ54F241W	ACTIVE	CFP	W	20	1	None	Call TI	Level-NC-NC-NC

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - May not be currently available - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

None: Not yet available Lead (Pb-Free).

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Green (RoHS & no Sb/Br): TI defines "Green" to mean "Pb-Free" and in addition, uses package materials that do not contain halogens, including bromine (Br) or antimony (Sb) above 0.1% of total product weight.

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
		Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments
Post Office Box 655303 Dallas, Texas 75265