

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

SDFS090 – MARCH 1987 – REVISED OCTOBER 1993

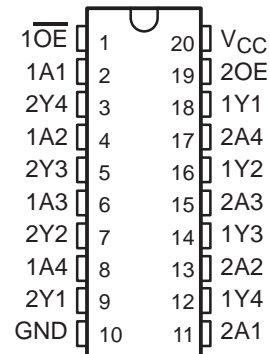
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Plastic and Ceramic DIPs

description

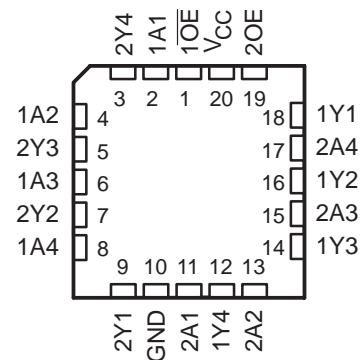
These octal buffers and line drivers are designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. Taken together with the 'F240 and 'F244, these devices provide the choice of selected combinations 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

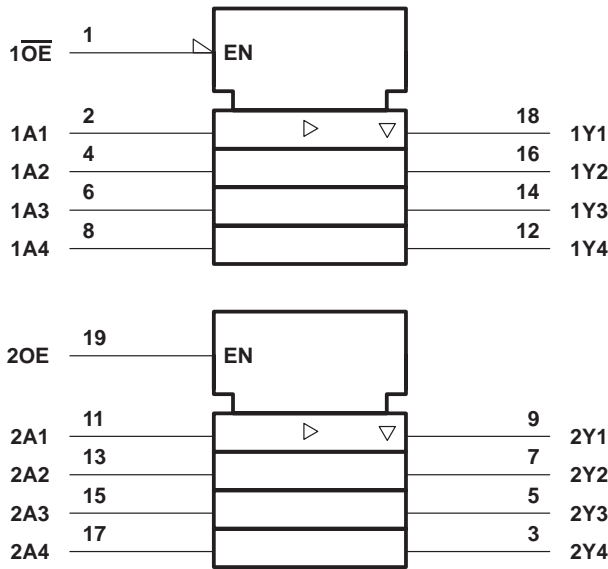
| INPUTS | | OUTPUT |
|------------------|----|--------|
| $\overline{1OE}$ | 1A | 1Y |
| H | X | Z |
| L | H | H |
| L | L | L |

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

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

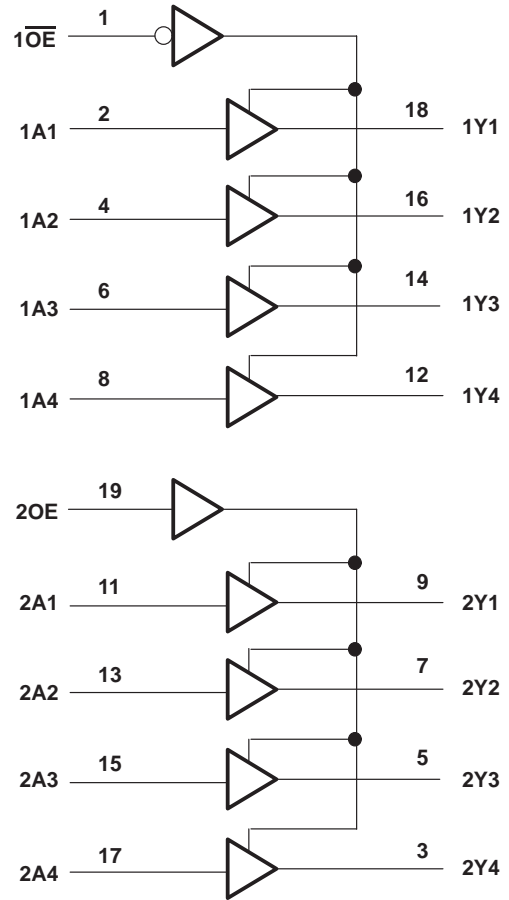
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logic symbol†



† 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

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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 $\overline{\text{OE}}$ | $V_{CC} = 5.5\text{ V}$, | $V_I = 0.5\text{ V}$ | | | -1 | | | -1 | mA |
| | Any A | | | | | -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
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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 |
|------------------|------------------------------|----------------|-------------------------------------------------------------------------------------------------------|-----|-----|-------------------------------------------------------------------------------------------------------------------------|-----|----------|-----|------|
| | | | '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.

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SN74F241, Octal Buffers/Drivers With 3-State Outputs

DEVICE STATUS: **ACTIVE**

| PARAMETER NAME | SN54F241 | SN74F241 |
|-------------------|------------|------------|
| Voltage Nodes (V) | 5 | 5 |
| Vcc range (V) | 4.5 to 5.5 | 4.5 to 5.5 |
| Input Level | TTL | TTL |
| Output Level | TTL | TTL |
| Output Drive (mA) | | -15/64 |
| tpd max (ns) | | 6.5 |
| Static Current | | 75 |

FEATURES

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- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
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DESCRIPTION

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TECHNICAL DOCUMENTS

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DATASHEET

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Full datasheet in Acrobat PDF: [sn74f241.pdf](#) (72 KB) (Updated: 10/01/1993)

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)
- [Timing Differences of 10-pF Versus 50pF Loading](#) (SCEA004 - Updated: 11/01/1996)

RELATED DOCUMENTS

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- [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 | | | | | | | TI INVENTORY STATUS AS OF 3:00 PM GMT, 26 Sep 2002 | | | REPORTED DISTRIBUTOR INVENTORY AS OF 3:00 PM GMT, 26 Sep 2002 | | |
|---------------------|--------|-----------------------------------|-----------|-------------------------------|------------------------------------|--------------------|-------------------------------------------------------|-------------------------|-----------|------------------------------------------------------------------|----------|----------|
| ORDERABLE DEVICE | STATUS | PACKAGE TYPE PINS | TEMP (°C) | PRODUCT CONTENT | BUDGETARY PRICING QTY \$US | STD PACK QTY | IN STOCK | IN PROGRESS QTY DATE | LEAD TIME | DISTRIBUTOR COMPANY REGION | IN STOCK | PURCHASE |
| SN74F241DW | ACTIVE | SOP (DW) 20 | 0 TO 70 | View Contents | 1KU 0.27 | 25 | N/A* | 819 30 Sep | 5 WKS | | | |
| | | | | | | | | 9614 04 Oct | | | | |
| | | | | | | | | >10k 11 Oct | | | | |
| SN74F241DWR | ACTIVE | SOP (DW) 20 | 0 TO 70 | View Contents | 1KU 0.27 | 2000 | N/A* | 9614 04 Oct | 5 WKS | | | |
| | | | | | | | | >10k 11 Oct | | | | |
| SN74F241N | ACTIVE | PDIP (N) 20 | 0 TO 70 | View Contents | 1KU 0.27 | 20 | N/A* | 9614 07 Oct | 5 WKS | | | |
| | | | | | | | | >10k 14 Oct | | | | |
| | | | | | | | | 7800 21 Oct | | | | |
| SN74F241NSR | ACTIVE | SOP (NS) 20 | | View Contents | 1KU 0.78 | 2000 | N/A* | >10k 14 Oct | 5 WKS | | | |

Table Data Updated on: 9/26/2002