

SN5446A, '47A, '48, SN54LS47, 'LS48, 'LS49  
 SN7446A, '47A, '48, SN74LS47, 'LS48, 'LS49  
 BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS

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'46A, '47A, 'LS47  
 feature

- Open-Collector Outputs Drive Indicators Directly
- Lamp-Test Provision
- Leading/Trailing Zero Suppression

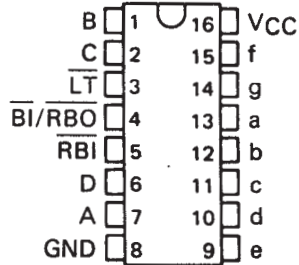
'48, 'LS48  
 feature

- Internal Pull-Ups Eliminate Need for External Resistors
- Lamp-Test Provision
- Leading/Trailing Zero Suppression

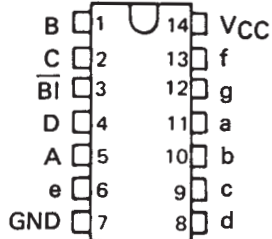
'LS49  
 feature

- Open-Collector Outputs
- Blanking Input

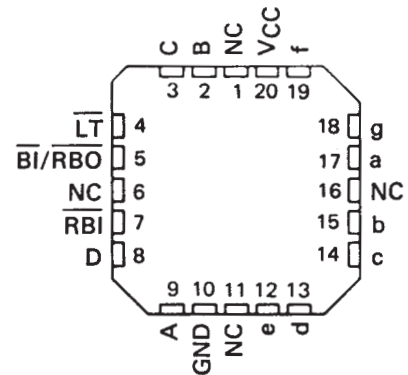
SN5446A, SN5447A, SN54LS47, SN5448,  
 SN54LS48 . . . J PACKAGE  
 SN7446A, SN7447A,  
 SN7448 . . . N PACKAGE  
 SN74LS47, SN74LS48 . . . D OR N PACKAGE  
 (TOP VIEW)



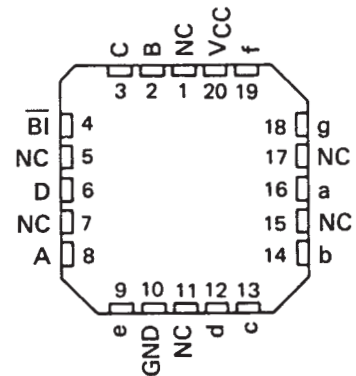
SN54LS49 . . . J OR W PACKAGE  
 SN74LS49 . . . D OR N PACKAGE  
 (TOP VIEW)



SN54LS47, SN54LS48 . . . FK PACKAGE  
 (TOP VIEW)



SN54LS49 . . . FK PACKAGE  
 (TOP VIEW)



NC — No internal connection

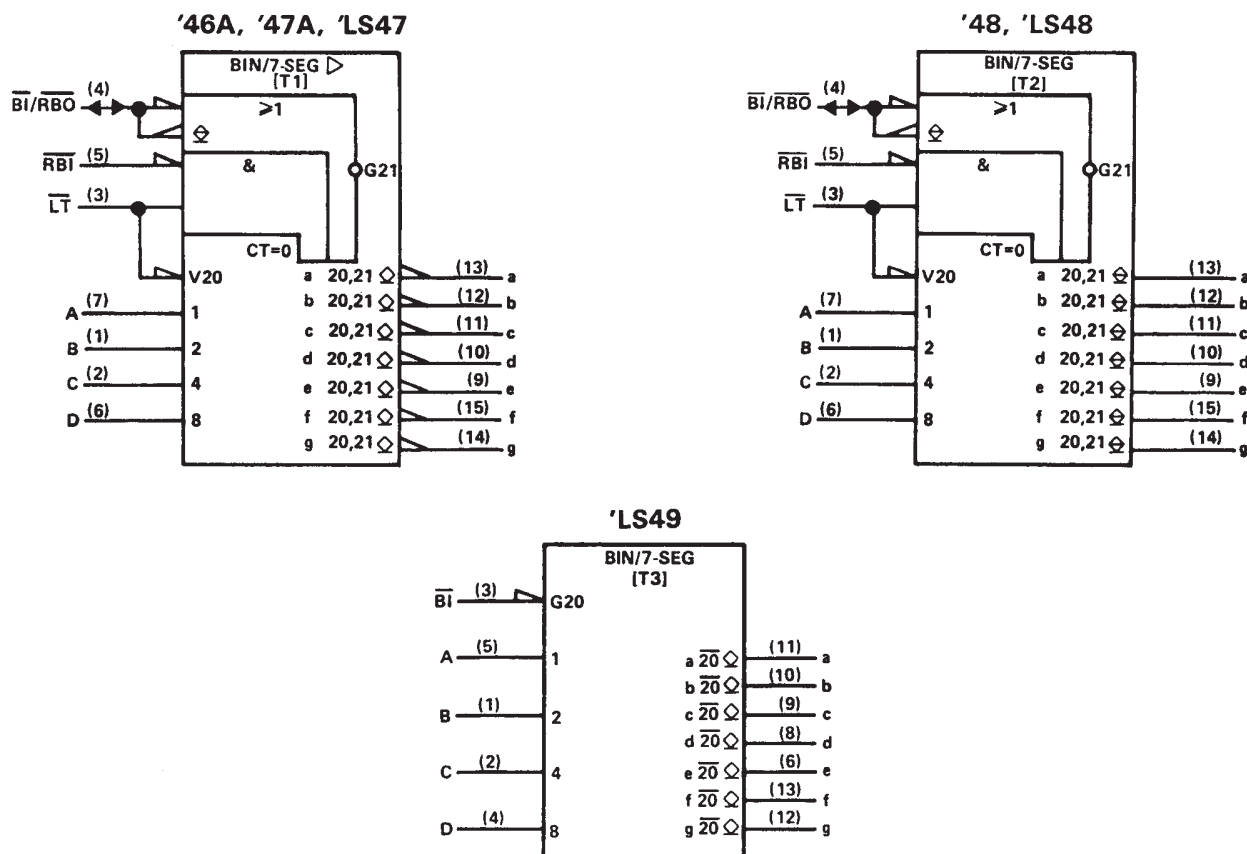
SN5446A, '47A, '48, SN54LS47, 'LS48, 'LS49  
 SN7446A, '47A, '48, SN74LS47, 'LS48, 'LS49  
 BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS

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- All Circuit Types Feature Lamp Intensity Modulation Capability

| TYPE     | DRIVER OUTPUTS  |                         |                 |                | TYPICAL<br>POWER<br>DISSIPATION | PACKAGES |
|----------|-----------------|-------------------------|-----------------|----------------|---------------------------------|----------|
|          | ACTIVE<br>LEVEL | OUTPUT<br>CONFIGURATION | SINK<br>CURRENT | MAX<br>VOLTAGE |                                 |          |
| SN5446A  | low             | open-collector          | 40 mA           | 30 V           | 320 mW                          | J, W     |
| SN5447A  | low             | open-collector          | 40 mA           | 15 V           | 320 mW                          | J, W     |
| SN5448   | high            | 2-k $\Omega$ pull-up    | 6.4 mA          | 5.5 V          | 265 mW                          | J, W     |
| SN54LS47 | low             | open-collector          | 12 mA           | 15 V           | 35 mW                           | J, W     |
| SN54LS48 | high            | 2-k $\Omega$ pull-up    | 2 mA            | 5.5 V          | 125 mW                          | J, W     |
| SN54LS49 | high            | open-collector          | 4 mA            | 5.5 V          | 40 mW                           | J, W     |
| SN7446A  | low             | open-collector          | 40 mA           | 30 V           | 320 mW                          | J, N     |
| SN7447A  | low             | open-collector          | 40 mA           | 15 V           | 320 mW                          | J, N     |
| SN7448   | high            | 2-k $\Omega$ pull-up    | 6.4 mA          | 5.5 V          | 265 mW                          | J, N     |
| SN74LS47 | low             | open-collector          | 24 mA           | 15 V           | 35 mW                           | J, N     |
| SN74LS48 | high            | 2-k $\Omega$ pull-up    | 6 mA            | 5.5 V          | 125 mW                          | J, N     |
| SN74LS49 | high            | open-collector          | 8 mA            | 5.5 V          | 40 mW                           | J, N     |

logic symbols†



†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.  
 Pin numbers shown are for D, J, N, and W packages.

SN5446A, '47A, '48, SN54LS47, 'LS48, 'LS49  
SN7446A, '47A, '48, SN74LS47, 'LS48, 'LS49  
BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS

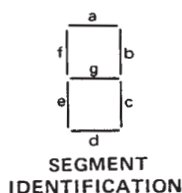
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## description

The '46A, '47A, and 'LS47 feature active-low outputs designed for driving common-anode LEDs or incandescent indicators directly. The '48, 'LS48, and 'LS49 feature active-high outputs for driving lamp buffers or common-cathode LEDs. All of the circuits except 'LS49 have full ripple-blanking input/output controls and a lamp test input. The 'LS49 circuit incorporates a direct blanking input. Segment identification and resultant displays are shown below. Display patterns for BCD input counts above 9 are unique symbols to authenticate input conditions.

The '46A, '47A, '48, 'LS47, and 'LS48 circuits incorporate automatic leading and/or trailing-edge zero-blanking control ( $\overline{\text{RBI}}$  and  $\overline{\text{RBO}}$ ). Lamp test ( $\overline{\text{LT}}$ ) of these types may be performed at any time when the  $\overline{\text{BI/RBO}}$  node is at a high level. All types (including the '49 and 'LS49) contain an overriding blanking input ( $\overline{\text{BI}}$ ), which can be used to control the lamp intensity by pulsing or to inhibit the outputs. Inputs and outputs are entirely compatible for use with TTL logic outputs.

The SN54246/SN74246 and '247 and the SN54LS247/SN74LS247 and 'LS248 compose the  and the  with tails and were designed to offer the designer a choice between two indicator fonts.



'46A, '47A, 'LS47 FUNCTION TABLE (T1)

| DECIMAL<br>OR<br>FUNCTION | INPUTS                 |                         |   |   |   |   | $\overline{\text{BI/RBO}}^\dagger$ | OUTPUTS |     |     |     |     |     |     | NOTE |
|---------------------------|------------------------|-------------------------|---|---|---|---|------------------------------------|---------|-----|-----|-----|-----|-----|-----|------|
|                           | $\overline{\text{LT}}$ | $\overline{\text{RBI}}$ | D | C | B | A |                                    | a       | b   | c   | d   | e   | f   | g   |      |
| 0                         | H                      | H                       | L | L | L | L | H                                  | ON      | ON  | ON  | ON  | ON  | ON  | OFF | 1    |
| 1                         | H                      | X                       | L | L | L | H | H                                  | OFF     | ON  | ON  | OFF | OFF | OFF | OFF |      |
| 2                         | H                      | X                       | L | L | H | L | H                                  | ON      | ON  | OFF | ON  | ON  | OFF | ON  |      |
| 3                         | H                      | X                       | L | L | H | H | H                                  | ON      | ON  | ON  | ON  | OFF | OFF | ON  |      |
| 4                         | H                      | X                       | L | H | L | L | H                                  | OFF     | ON  | ON  | OFF | OFF | ON  | ON  |      |
| 5                         | H                      | X                       | L | H | L | H | H                                  | ON      | OFF | ON  | ON  | OFF | ON  | ON  |      |
| 6                         | H                      | X                       | L | H | H | L | H                                  | OFF     | OFF | ON  | ON  | ON  | ON  | ON  |      |
| 7                         | H                      | X                       | L | H | H | H | H                                  | ON      | ON  | ON  | OFF | OFF | OFF | OFF |      |
| 8                         | H                      | X                       | H | L | L | L | H                                  | ON      | ON  | ON  | ON  | ON  | ON  | ON  |      |
| 9                         | H                      | X                       | H | L | L | H | H                                  | ON      | ON  | ON  | OFF | OFF | ON  | ON  |      |
| 10                        | H                      | X                       | H | L | H | L | H                                  | OFF     | OFF | OFF | ON  | ON  | OFF | ON  |      |
| 11                        | H                      | X                       | H | L | H | H | H                                  | OFF     | OFF | ON  | ON  | OFF | OFF | ON  |      |
| 12                        | H                      | X                       | H | H | L | L | H                                  | OFF     | ON  | OFF | OFF | OFF | ON  | ON  |      |
| 13                        | H                      | X                       | H | H | L | H | H                                  | ON      | OFF | OFF | ON  | OFF | ON  | ON  |      |
| 14                        | H                      | X                       | H | H | H | L | H                                  | OFF     | OFF | OFF | ON  | ON  | ON  | ON  |      |
| 15                        | H                      | X                       | H | H | H | H | H                                  | OFF     | OFF | OFF | OFF | OFF | OFF | OFF |      |
| BI                        | X                      | X                       | X | X | X | X | L                                  | OFF     | OFF | OFF | OFF | OFF | OFF | OFF | 2    |
| RBI                       | H                      | L                       | L | L | L | L | L                                  | OFF     | OFF | OFF | OFF | OFF | OFF | OFF | 3    |
| LT                        | L                      | X                       | X | X | X | X | H                                  | ON      | ON  | ON  | ON  | ON  | ON  | ON  | 4    |

H = high level, L = low level, X = irrelevant

NOTES: 1. The blanking input ( $\overline{\text{BI}}$ ) must be open or held at a high logic level when output functions 0 through 15 are desired. The ripple-blanking input ( $\overline{\text{RBI}}$ ) must be open or high if blanking of a decimal zero is not desired.

2. When a low logic level is applied directly to the blanking input ( $\overline{\text{BI}}$ ), all segment outputs are off regardless of the level of any other input.

3. When ripple-blanking input ( $\overline{\text{RBI}}$ ) and inputs A, B, C, and D are at a low level with the lamp test input high, all segment outputs go off and the ripple-blanking output ( $\overline{\text{RBO}}$ ) goes to a low level (response condition).

4. When the blanking input/ripple blanking output ( $\overline{\text{BI/RBO}}$ ) is open or held high and a low is applied to the lamp-test input, all segment outputs are on.

$^\dagger \overline{\text{BI/RBO}}$  is wire AND logic serving as blanking input ( $\overline{\text{BI}}$ ) and/or ripple-blanking output ( $\overline{\text{RBO}}$ ).

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'48, 'LS48  
 FUNCTION TABLE (T2)

| DECIMAL<br>OR<br>FUNCTION | INPUTS          |                  |   |   |   |   | $\overline{BI}/\overline{RBO}^\dagger$ | OUTPUTS |   |   |   |   |   |   | NOTE |
|---------------------------|-----------------|------------------|---|---|---|---|----------------------------------------|---------|---|---|---|---|---|---|------|
|                           | $\overline{LT}$ | $\overline{RBI}$ | D | C | B | A |                                        | a       | b | c | d | e | f | g |      |
| 0                         | H               | H                | L | L | L | L | H                                      | H       | H | H | H | H | H | L | 1    |
| 1                         | H               | X                | L | L | L | H | H                                      | L       | H | H | L | L | L | L |      |
| 2                         | H               | X                | L | L | H | L | H                                      | H       | H | L | H | H | L | H |      |
| 3                         | H               | X                | L | L | H | H | H                                      | H       | H | H | L | L | L | H |      |
| 4                         | H               | X                | L | H | L | L | H                                      | L       | H | H | L | L | H | H |      |
| 5                         | H               | X                | L | H | L | H | H                                      | H       | L | H | H | L | H | H |      |
| 6                         | H               | X                | L | H | H | L | H                                      | L       | L | H | H | H | H | H |      |
| 7                         | H               | X                | L | H | H | H | H                                      | H       | H | H | L | L | L | L |      |
| 8                         | H               | X                | H | L | L | L | H                                      | H       | H | H | H | H | H | H |      |
| 9                         | H               | X                | H | L | L | H | H                                      | H       | H | L | L | L | H | H |      |
| 10                        | H               | X                | H | L | H | L | H                                      | L       | L | L | H | H | L | H |      |
| 11                        | H               | X                | H | L | H | H | H                                      | L       | L | H | H | L | L | H |      |
| 12                        | H               | X                | H | H | L | L | H                                      | L       | H | L | L | L | H | H |      |
| 13                        | H               | X                | H | H | L | H | H                                      | H       | L | L | L | H | L | H |      |
| 14                        | H               | X                | H | H | H | L | H                                      | L       | L | L | H | H | H | H |      |
| 15                        | H               | X                | H | H | H | H | H                                      | L       | L | L | L | L | L | L |      |
| BI                        | X               | X                | X | X | X | X | L                                      | L       | L | L | L | L | L | L | 2    |
| RBI                       | L               | L                | L | L | L | L | L                                      | L       | L | L | L | L | L | L | 3    |
| LT                        | L               | X                | X | X | X | X | H                                      | H       | H | H | H | H | H | H | 4    |

H = high level, L = low level, X = irrelevant

- NOTES: 1. The blanking input ( $\overline{BI}$ ) must be open or held at a high logic level when output functions 0 through 15 are desired. The ripple-blanking input ( $\overline{RBI}$ ) must be open or high, if blanking of a decimal zero is not desired.
2. When a low logic level is applied directly to the blanking input ( $\overline{BI}$ ), all segment outputs are low regardless of the level of any other input.
3. When ripple-blanking input ( $\overline{RBI}$ ) and inputs A, B, C, and D are at a low level with the lamp-test input high, all segment outputs go low and the ripple-blanking output ( $\overline{RBO}$ ) goes to a low level (response condition).
4. When the blanking input/ripple-blanking output ( $\overline{BI}/\overline{RBO}$ ) is open or held high and a low is applied to the lamp-test input, all segment outputs are high.

$^\dagger \overline{BI}/\overline{RBO}$  is wire-AND logic serving as blanking input ( $\overline{BI}$ ) and/or ripple-blanking output ( $\overline{RBO}$ ).

'LS49  
 FUNCTION TABLE (T3)

| DECIMAL<br>OR<br>FUNCTION | INPUTS |   |   |   |                 |  | OUTPUTS |   |   |   |   |   |   | NOTE |
|---------------------------|--------|---|---|---|-----------------|--|---------|---|---|---|---|---|---|------|
|                           | D      | C | B | A | $\overline{BI}$ |  | a       | b | c | d | e | f | g |      |
| 0                         | L      | L | L | L | H               |  | H       | H | H | H | H | H | L | 1    |
| 1                         | L      | L | L | H | H               |  | L       | H | H | L | L | L | L |      |
| 2                         | L      | L | H | L | H               |  | H       | H | L | H | H | L | H |      |
| 3                         | L      | L | H | H | H               |  | H       | H | H | H | L | L | H |      |
| 4                         | L      | H | L | L | H               |  | L       | H | H | L | L | H | H |      |
| 5                         | L      | H | L | H | H               |  | H       | L | H | H | L | H | H |      |
| 6                         | L      | H | H | L | H               |  | L       | L | H | H | H | H | H |      |
| 7                         | L      | H | H | H | H               |  | H       | H | H | L | L | L | L |      |
| 8                         | H      | L | L | L | H               |  | H       | H | H | H | H | H | H |      |
| 9                         | H      | L | L | H | H               |  | H       | H | H | L | L | H | H |      |
| 10                        | H      | L | H | L | H               |  | L       | L | L | H | H | L | H |      |
| 11                        | H      | L | H | H | H               |  | L       | L | H | H | L | L | H |      |
| 12                        | H      | H | L | L | H               |  | L       | H | L | L | L | H | H |      |
| 13                        | H      | H | L | H | H               |  | H       | L | L | L | H | L | H |      |
| 14                        | H      | H | H | L | H               |  | L       | L | L | H | H | H | H |      |
| 15                        | H      | H | H | H | H               |  | L       | L | L | L | L | L | L |      |
| BI                        | X      | X | X | X | L               |  | L       | L | L | L | L | L | L | 2    |

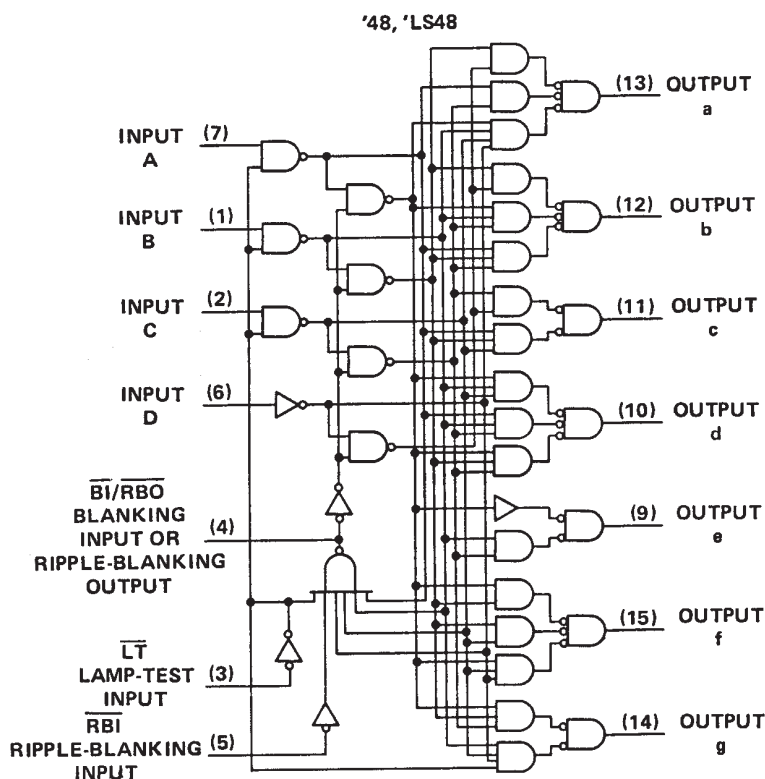
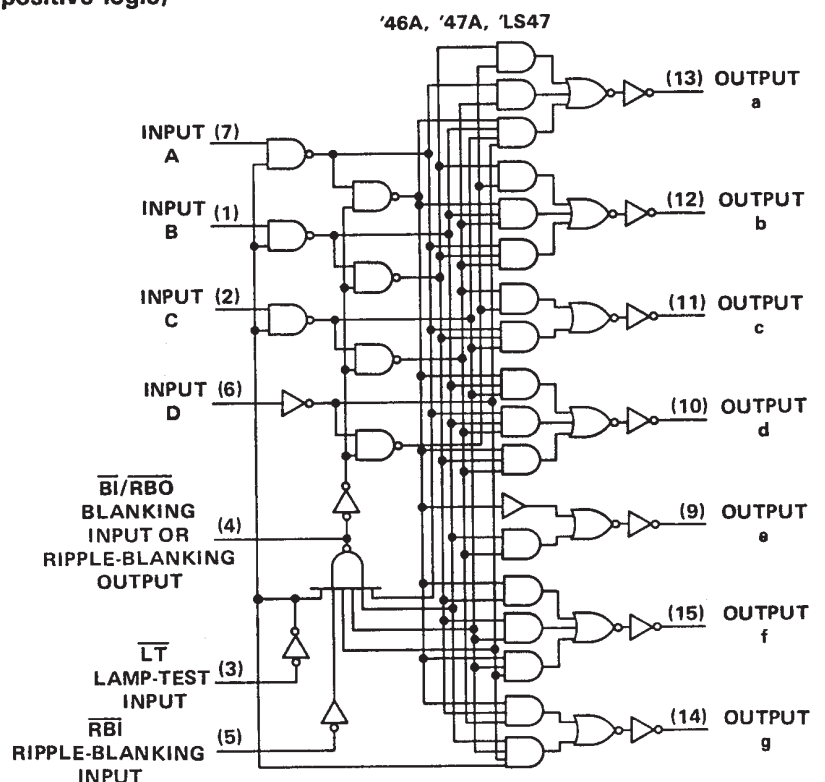
H = high level, L = low level, X = irrelevant

- NOTES: 1. The blanking input ( $\overline{BI}$ ) must be open or held at a high logic level when output functions 0 through 15 are desired.
2. When a low logic level is applied directly to the blanking input ( $\overline{BI}$ ), all segment outputs are low regardless of the level of any other input.

SN5446A, '47A, '48, SN54LS47, 'LS48, 'LS49  
SN7446A, '47A, '48, SN74LS47, 'LS48, 'LS49  
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logic diagrams (positive logic)



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

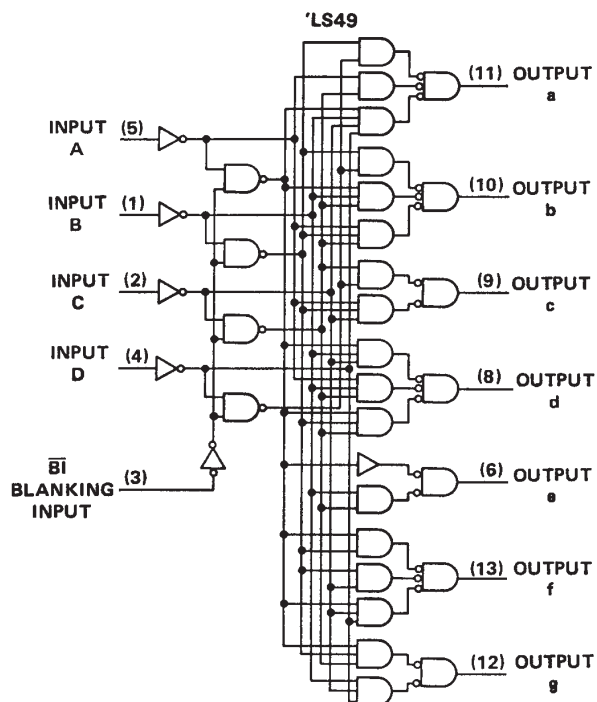


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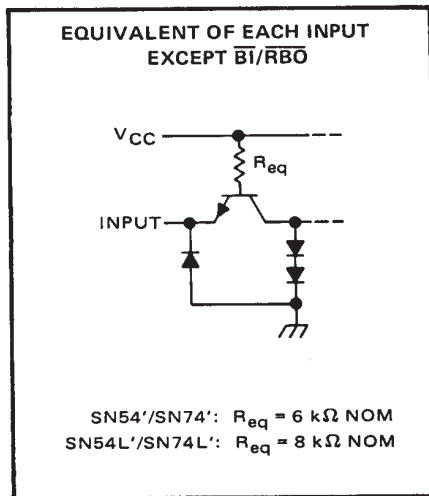
logic diagrams (continued)



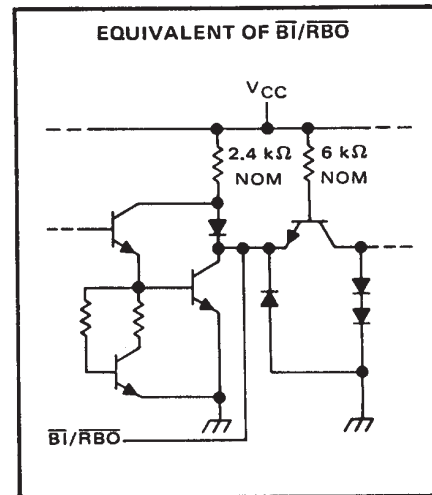
Pin numbers shown are for D, J, N, and W packages.

## schematics of inputs and outputs

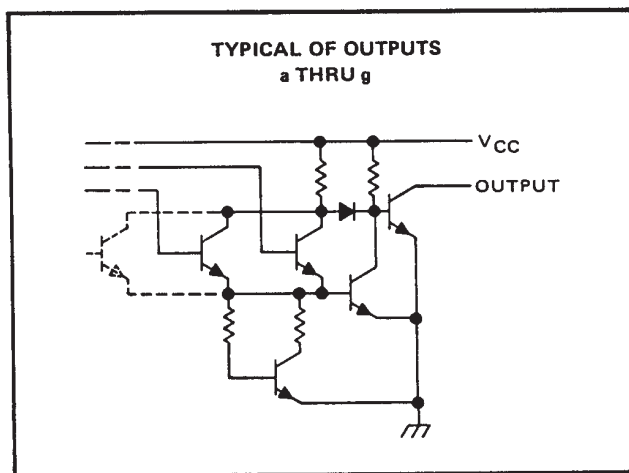
'46A, '47A, '48



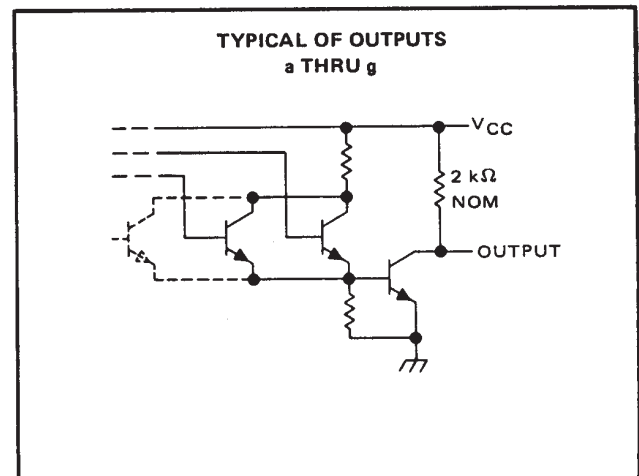
'46A, '47A, '48



'46A, '47A



'48



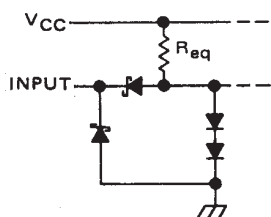
SN5446A, '47A, '48, SN54LS47, 'LS48, 'LS49  
 SN7446A, '47A, '48, SN74LS47, 'LS48, 'LS49  
 BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS

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schematics of inputs and outputs

'LS47, 'LS48, 'LS49

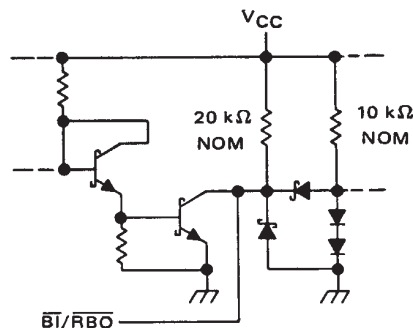
EQUIVALENT OF EACH INPUT  
 EXCEPT  $\overline{\text{BI}}/\overline{\text{RBO}}$



$\overline{\text{LT}}$  and  $\overline{\text{RB}}\overline{\text{I}}$  ('LS47, 'LS48):  $R_{eq} = 20 \text{ k}\Omega \text{ NOM}$   
 $\overline{\text{BI}}$  ('LS49):  $R_{eq} = 20 \text{ k}\Omega \text{ NOM}$   
 A, B, C, and D:  $R_{eq} = 25 \text{ k}\Omega \text{ NOM}$

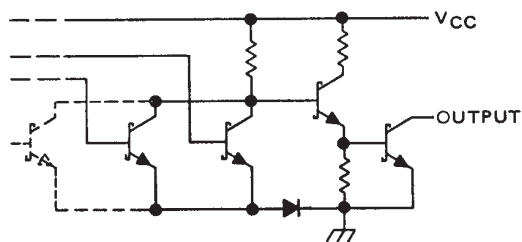
'LS47, 'LS48, 'LS49

EQUIVALENT OF  $\overline{\text{BI}}/\overline{\text{RBO}}$



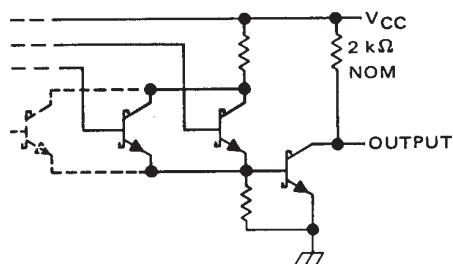
'LS47

TYPICAL OF OUTPUTS  
 a THRU g



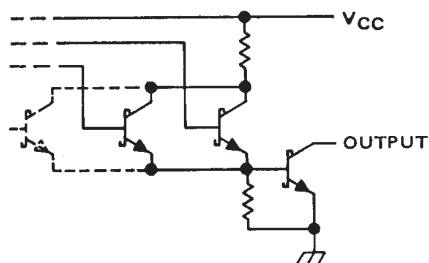
'LS48

TYPICAL OF OUTPUTS  
 a THRU g



'LS49

TYPICAL OF OUTPUTS  
 a THRU g



SN5446A, '47A, '48, SN54LS47, 'LS48, 'LS49  
SN7446A, '47A, '48, SN74LS47, 'LS48, 'LS49  
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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

|                                                        |                |
|--------------------------------------------------------|----------------|
| Supply voltage, $V_{CC}$ (see Note 1)                  | 7 V            |
| Input voltage                                          | 5.5 V          |
| Current forced into any output in the off state        | 1 mA           |
| Operating free-air temperature range: SN5446A, SN5447A | –55°C to 125°C |
| SN7446A, SN7447A                                       | 0°C to 70°C    |
| Storage temperature range                              | –65°C to 150°C |

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

|                                        |                                | SN5446A |     |      | SN5447A |     |      | SN7446A |     |      | SN7447A |     |      | UNIT |
|----------------------------------------|--------------------------------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|------|
|                                        |                                | MIN     | NOM | MAX  | MIN     | NOM | MAX  | MIN     | NOM | MAX  | MIN     | NOM | MAX  |      |
| Supply voltage, $V_{CC}$               |                                | 4.5     | 5   | 5.5  | 4.5     | 5   | 5.5  | 4.75    | 5   | 5.25 | 4.75    | 5   | 5.25 | V    |
| Off-state output voltage, $V_{O(off)}$ | a thru g                       |         |     | 30   |         |     | 15   |         |     | 30   |         |     | 15   | V    |
| On-state output current, $I_{O(on)}$   | a thru g                       |         |     | 40   |         |     | 40   |         |     | 40   |         |     | 40   | mA   |
| High-level output current, $I_{OH}$    | $\overline{BI}/\overline{RBO}$ |         |     | –200 |         |     | –200 |         |     | –200 |         |     | –200 | μA   |
| Low-level output current, $I_{OL}$     | $\overline{BI}/\overline{RBO}$ |         |     | 8    |         |     | 8    |         |     | 8    |         |     | 8    | mA   |
| Operating free-air temperature, $T_A$  |                                | –55     |     | 125  | –55     |     | 125  | 0       |     | 70   | 0       |     | 70   | °C   |

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

| PARAMETER    |                                        | TEST CONDITIONS†                                                                                                                     |       | MIN | TYP‡ | MAX  | UNIT |
|--------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------|-----|------|------|------|
| $V_{IH}$     | High-level input voltage               |                                                                                                                                      |       | 2   |      |      | V    |
| $V_{IL}$     | Low-level input voltage                |                                                                                                                                      |       |     |      | 0.8  | V    |
| $V_{IK}$     | Input clamp voltage                    | $V_{CC} = \text{MIN}, I_I = -12 \text{ mA}$                                                                                          |       |     |      | –1.5 | V    |
| $V_{OH}$     | High-level output voltage              | $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$<br>$V_{IL} = 0.8 \text{ V}, I_{OH} = -200 \text{ μA}$ |       | 2.4 | 3.7  |      | V    |
| $V_{OL}$     | Low-level output voltage               | $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$<br>$V_{IL} = 0.8 \text{ V}, I_{OL} = 8 \text{ mA}$    |       |     | 0.27 | 0.4  | V    |
| $I_{O(off)}$ | Off-state output current               | a thru g<br>$V_{CC} = \text{MAX}, V_{IH} = 2 \text{ V},$<br>$V_{IL} = 0.8 \text{ V}, V_{O(off)} = \text{MAX}$                        |       |     |      | 250  | μA   |
| $V_{O(on)}$  | On-state output voltage                | a thru g<br>$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$<br>$V_{IL} = 0.8 \text{ V}, I_{O(on)} = 40 \text{ mA}$                      |       |     | 0.3  | 0.4  | V    |
| $I_I$        | Input current at maximum input voltage | Any input except $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$                                        |       |     |      | 1    | mA   |
| $I_{IH}$     | High-level input current               | Any input except $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MAX}, V_I = 2.4 \text{ V}$                                        |       |     |      | 40   | μA   |
| $I_{IL}$     | Low-level input current                | Any input except $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$                                        |       |     |      | –1.6 | mA   |
|              |                                        | $\overline{BI}/\overline{RBO}$                                                                                                       |       |     |      | –4   |      |
| $I_{OS}$     | Short-circuit output current           | $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MAX}$                                                                              |       |     |      | –4   | mA   |
| $I_{CC}$     | Supply current                         | $V_{CC} = \text{MAX},$<br>See Note 2                                                                                                 | SN54' |     |      | 64   | mA   |
|              |                                        |                                                                                                                                      | SN74' |     |      | 64   |      |

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

NOTE 2:  $I_{CC}$  is measured with all outputs open and all inputs at 4.5 V.

switching characteristics,  $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$

| PARAMETER |                                           | TEST CONDITIONS                                        |  | MIN | TYP | MAX | UNIT |
|-----------|-------------------------------------------|--------------------------------------------------------|--|-----|-----|-----|------|
| $t_{off}$ | Turn-off time from A input                | $C_L = 15 \text{ pF}, R_L = 120 \Omega,$<br>See Note 3 |  |     |     | 100 | ns   |
| $t_{on}$  | Turn-on time from A input                 |                                                        |  |     |     | 100 |      |
| $t_{off}$ | Turn-off time from $\overline{RBI}$ input |                                                        |  |     |     | 100 | ns   |
| $t_{on}$  | Turn-on time from $\overline{RBI}$ input  |                                                        |  |     |     | 100 |      |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



**SN5446A, '47A, '48, SN54LS47, 'LS48, 'LS49  
SN7446A, '47A, '48, SN74LS47, 'LS48, 'LS49  
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**absolute maximum ratings over operating free-air temperature range (unless otherwise noted)**

|                                              |                |
|----------------------------------------------|----------------|
| Supply voltage, $V_{CC}$ (see Note 1)        | 7 V            |
| Input voltage                                | 5.5 V          |
| Operating free-air temperature range: SN5448 | –55°C to 125°C |
| SN7448                                       | 0°C to 70°C    |
| Storage temperature range                    | –65°C to 150°C |

NOTE 1: Voltage values are with respect to network ground terminal.

**recommended operating conditions**

|                                                |                                | SN5448 |     |     | SN7448 |     |      | UNIT  |
|------------------------------------------------|--------------------------------|--------|-----|-----|--------|-----|------|-------|
|                                                |                                | MIN    | NOM | MAX | MIN    | NOM | MAX  |       |
| Supply voltage, V <sub>CC</sub>                |                                | 4.5    | 5   | 5.5 | 4.75   | 5   | 5.25 | V     |
| High-level output current, I <sub>OH</sub>     | a thru g                       | —400   |     |     | —400   |     |      | μA    |
|                                                | $\overline{BI}/\overline{RBO}$ | —200   |     |     | —200   |     |      |       |
| Low-level output current, I <sub>OL</sub>      | a thru g                       | 6.4    |     |     | 6.4    |     |      | mA    |
|                                                | $\overline{BI}/\overline{RBO}$ | 8      |     |     | 8      |     |      |       |
| Operating free-air temperature, T <sub>A</sub> |                                | —55    |     |     | 0      |     |      | 70 °C |

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

| PARAMETER |                                        | TEST CONDITIONS†                                | MIN                                           | TYP‡ | MAX  | UNIT    |
|-----------|----------------------------------------|-------------------------------------------------|-----------------------------------------------|------|------|---------|
| $V_{IH}$  | High-level input voltage               |                                                 | 2                                             |      |      | V       |
| $V_{IL}$  | Low-level input voltage                |                                                 |                                               |      | 0.8  | V       |
| $V_{IK}$  | Input clamp voltage                    | $V_{CC} = \text{MIN}, I_I = -12 \text{ mA}$     |                                               |      | –1.5 | V       |
| $V_{OH}$  | High-level output voltage              | a thru g                                        | $V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$  |      | 2.4  | V       |
|           |                                        | $\overline{BI}/\overline{RBO}$                  | $V_{IL} = 0.8 \text{ V}, I_{OH} = \text{MAX}$ |      | 4.2  |         |
|           |                                        |                                                 |                                               |      | 2.4  |         |
|           |                                        |                                                 |                                               |      | 3.7  |         |
| $I_O$     | Output current                         | a thru g                                        | $V_{CC} = \text{MIN}, V_O = 0.85 \text{ V},$  |      | –1.3 | mA      |
|           |                                        |                                                 | Input conditions as for $V_{OH}$              |      | –2   |         |
| $V_{OL}$  | Low-level output voltage               |                                                 | $V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$  |      | 0.27 | V       |
|           |                                        |                                                 | $V_{IL} = 0.8 \text{ V}, I_{OL} = \text{MAX}$ |      | 0.4  |         |
| $I_I$     | Input current at maximum input voltage | Any input except $\overline{BI}/\overline{RBO}$ | $V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$    |      | 1    | mA      |
|           |                                        |                                                 |                                               |      |      |         |
| $I_{IH}$  | High-level input current               | Any input except $\overline{BI}/\overline{RBO}$ | $V_{CC} = \text{MAX}, V_I = 2.4 \text{ V}$    |      | 40   | $\mu$ A |
|           |                                        |                                                 |                                               |      |      |         |
| $I_{IL}$  | Low-level input current                | Any input except $\overline{BI}/\overline{RBO}$ | $V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$    |      | –1.6 | mA      |
|           |                                        | $\overline{BI}/\overline{RBO}$                  |                                               |      | –4   |         |
| $I_{OS}$  | Short-circuit output current           | $\overline{BI}/\overline{RBO}$                  | $V_{CC} = \text{MAX}$                         |      | –4   | mA      |
|           |                                        |                                                 |                                               |      |      |         |
| $I_{CC}$  | Supply current                         | $V_{CC} = \text{MAX},$                          | SN5448                                        | 53   | 76   | mA      |
|           |                                        | See Note 2                                      | SN7448                                        | 53   | 90   |         |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

NOTE 2:  $I_{CC}$  is measured with all outputs open and all inputs at 4.5 V.

**switching characteristics,  $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$**

| PARAMETER                                                                              | TEST CONDITIONS                                              | MIN | TYP | MAX | UNIT |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------|-----|-----|-----|------|
| $t_{PHL}$ Propagation delay time, high-to-low-level output from A input                | $C_L = 15 \text{ pF}, R_L = 1 \text{ k}\Omega$<br>See Note 3 |     |     | 100 | ns   |
| $t_{PLH}$ Propagation delay time, low-to-high-level output from A input                |                                                              |     |     | 100 |      |
| $t_{PHL}$ Propagation delay time, high-to-low-level output from $\overline{RBI}$ input |                                                              |     |     | 100 | ns   |
| $t_{PLH}$ Propagation delay time, low-to-high-level output from $\overline{RBI}$ input |                                                              |     |     | 100 |      |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



SN5446A, '47A, '48, SN54LS47, 'LS48, 'LS49  
SN7446A, '47A, '48, SN74LS47, 'LS48, 'LS49  
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**absolute maximum ratings over operating free-air temperature range (unless otherwise noted)**

|                                                                 |                                                |
|-----------------------------------------------------------------|------------------------------------------------|
| Supply voltage, $V_{CC}$ (see Note 1)                           | 7 V                                            |
| Input voltage                                                   | 7 V                                            |
| Peak output current ( $t_W \leq 1$ ms, duty cycle $\leq 10\%$ ) | 200 mA                                         |
| Current forced into any output in the off state                 | 1 mA                                           |
| Operating free-air temperature range: SN54LS47                  | $-55^{\circ}\text{C}$ to $125^{\circ}\text{C}$ |
| SN74LS47                                                        | $0^{\circ}\text{C}$ to $70^{\circ}\text{C}$    |
| Storage temperature range                                       | $-65^{\circ}\text{C}$ to $150^{\circ}\text{C}$ |

NOTE 1: Voltage values are with respect to network ground terminal.

**recommended operating conditions**

|                                        |                                | SN54LS47 |     |     | SN74LS47 |     |      | UNIT               |
|----------------------------------------|--------------------------------|----------|-----|-----|----------|-----|------|--------------------|
|                                        |                                | MIN      | NOM | MAX | MIN      | NOM | MAX  |                    |
| Supply voltage, $V_{CC}$               |                                | 4.5      | 5   | 5.5 | 4.75     | 5   | 5.25 | V                  |
| Off-state output voltage, $V_{O(off)}$ | a thru g                       |          |     | 15  |          |     | 15   | V                  |
| On-state output current, $I_{O(on)}$   | a thru g                       |          |     | 12  |          |     | 24   | mA                 |
| High-level output current, $I_{OH}$    | $\overline{BI}/\overline{RBO}$ |          |     | -50 |          |     | -50  | $\mu\text{A}$      |
| Low-level output current, $I_{OL}$     | $\overline{BI}/\overline{RBO}$ |          |     | 1.6 |          |     | 3.2  | mA                 |
| Operating free-air temperature, $T_A$  |                                | -55      |     | 125 | 0        |     | 70   | $^{\circ}\text{C}$ |

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

| PARAMETER    |                                        | TEST CONDITIONS†                                                                                                                      | SN54LS47 |      |      | SN74LS47 |      |      | UNIT          |
|--------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------|------|------|----------|------|------|---------------|
|              |                                        |                                                                                                                                       | MIN      | TYP‡ | MAX  | MIN      | TYP‡ | MAX  |               |
| $V_{IH}$     | High-level input voltage               |                                                                                                                                       | 2        |      |      | 2        |      |      | V             |
| $V_{IL}$     | Low-level input voltage                |                                                                                                                                       |          |      | 0.7  |          |      | 0.8  | V             |
| $V_{IK}$     | Input clamp voltage                    | $V_{CC} = \text{MIN}$ , $I_I = -18$ mA                                                                                                |          |      | -1.5 |          |      | -1.5 | V             |
| $V_{OH}$     | High-level output voltage              | $\overline{BI}/\overline{RBO}$ , $V_{CC} = \text{MIN}$ , $V_{IH} = 2$ V, $V_{IL} = V_{IL \text{ max}}$ , $I_{OH} = -50$ $\mu\text{A}$ | 2.4      | 4.2  |      | 2.4      | 4.2  |      | V             |
| $V_{OL}$     | Low-level output voltage               | $\overline{BI}/\overline{RBO}$ , $V_{CC} = \text{MIN}$ , $V_{IH} = 2$ V, $V_{IL} = V_{IL \text{ max}}$ , $I_{OL} = 1.6$ mA            | 0.25     | 0.4  |      | 0.25     | 0.4  |      | V             |
|              |                                        | $I_{OL} = 3.2$ mA                                                                                                                     |          |      |      | 0.35     | 0.5  |      |               |
| $I_{O(off)}$ | Off-state output current               | a thru g, $V_{CC} = \text{MAX}$ , $V_{IH} = 2$ V, $V_{IL} = V_{IL \text{ max}}$ , $V_{O(off)} = 15$ V                                 |          |      | 250  |          |      | 250  | $\mu\text{A}$ |
| $V_{O(on)}$  | On-state output voltage                | a thru g, $V_{CC} = \text{MIN}$ , $V_{IH} = 2$ V, $V_{IL} = V_{IL \text{ max}}$ , $I_{O(on)} = 12$ mA                                 | 0.25     | 0.4  |      | 0.25     | 0.4  |      | V             |
|              |                                        | $I_{O(on)} = 24$ mA                                                                                                                   |          |      |      | 0.35     | 0.5  |      |               |
| $I_I$        | Input current at maximum input voltage | $V_{CC} = \text{MAX}$ , $V_I = 7$ V                                                                                                   |          |      | 0.1  |          |      | 0.1  | mA            |
| $I_{IH}$     | High-level input current               | $V_{CC} = \text{MAX}$ , $V_I = 2.7$ V                                                                                                 |          |      | 20   |          |      | 20   | $\mu\text{A}$ |
| $I_{IL}$     | Low-level input current                | Any input except $\overline{BI}/\overline{RBO}$ , $V_{CC} = \text{MAX}$ , $V_I = 0.4$ V                                               |          |      | -0.4 |          |      | -0.4 | mA            |
|              |                                        | $\overline{BI}/\overline{RBO}$                                                                                                        |          |      | -1.2 |          |      | -1.2 |               |
| $I_{OS}$     | Short-circuit output current           | $\overline{BI}/\overline{RBO}$ , $V_{CC} = \text{MAX}$                                                                                | -0.3     |      | -2   | -0.3     |      | -2   | mA            |
| $I_{CC}$     | Supply current                         | $V_{CC} = \text{MAX}$ , See Note 2                                                                                                    | 7        |      | 13   | 7        |      | 13   | mA            |

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

NOTE 2:  $I_{CC}$  is measured with all outputs open and all inputs at 4.5 V.

**switching characteristics,  $V_{CC} = 5$  V,  $T_A = 25^{\circ}\text{C}$**

| PARAMETER | TEST CONDITIONS                                               | MIN | TYP | MAX | UNIT |
|-----------|---------------------------------------------------------------|-----|-----|-----|------|
| $t_{off}$ | Turn-off time from A input                                    |     |     | 100 | ns   |
| $t_{on}$  | Turn-on time from A input                                     |     |     | 100 |      |
| $t_{off}$ | Turn-off time from $\overline{RBI}$ input, outputs (a-f) only |     |     | 100 | ns   |
| $t_{on}$  | Turn-on time from $\overline{RBI}$ input, outputs (a-f) only  |     |     | 100 |      |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



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**SN5446A, '47A, '48, SN54LS47, 'LS48, 'LS49  
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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

|                                                |                |
|------------------------------------------------|----------------|
| Supply voltage, $V_{CC}$ (see Note 1)          | 7 V            |
| Input voltage                                  | 7 V            |
| Operating free-air temperature range: SN54LS48 | –55°C to 125°C |
| SN74LS48                                       | 0°C to 70°C    |
| Storage temperature range                      | –65°C to 150°C |

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

|                                                |                                | SN54LS48 |     |     | SN74LS48 |     |      | UNIT  |
|------------------------------------------------|--------------------------------|----------|-----|-----|----------|-----|------|-------|
|                                                |                                | MIN      | NOM | MAX | MIN      | NOM | MAX  |       |
| Supply voltage, V <sub>CC</sub>                |                                | 4.5      | 5   | 5.5 | 4.75     | 5   | 5.25 | V     |
| High-level output current, I <sub>OH</sub>     | a thru g                       | −100     |     |     | −100     |     |      | μA    |
|                                                | $\overline{BI}/\overline{RBO}$ | −50      |     |     | −50      |     |      |       |
| Low-level output current, I <sub>OL</sub>      | a thru g                       | 2        |     |     | 6        |     |      | mA    |
|                                                | $\overline{BI}/\overline{RBO}$ | 1.6      |     |     | 3.2      |     |      |       |
| Operating free-air temperature, T <sub>A</sub> |                                | −55      |     |     | 0        |     |      | 70 °C |

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

| PARAMETER |                                        | TEST CONDITIONS†                                                                                                                             | SN54LS48 |      |      | SN74LS48 |      |      | UNIT    |
|-----------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------|------|------|----------|------|------|---------|
|           |                                        |                                                                                                                                              | MIN      | TYP‡ | MAX  | MIN      | TYP‡ | MAX  |         |
| $V_{IH}$  | High-level input voltage               |                                                                                                                                              | 2        |      |      | 2        |      |      | V       |
| $V_{IL}$  | Low-level input voltage                |                                                                                                                                              |          |      | 0.7  |          |      | 0.8  | V       |
| $V_{IK}$  | Input clamp voltage                    | $V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$                                                                                                  |          |      | –1.5 |          |      | –1.5 | V       |
| $V_{OH}$  | High-level output voltage              | a thru g and $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, I_{OH} = \text{MAX}$ | 2.4      | 4.2  |      | 2.4      | 4.2  |      | V       |
| $I_O$     | Output current                         | a thru g<br>$V_{CC} = \text{MIN}, V_O = 0.85 \text{ V},$<br>Input conditions as for $V_{OH}$                                                 | –1.3     | –2   |      | –1.3     | –2   |      | mA      |
| $V_{OL}$  | Low-level output voltage               | a thru g<br>$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, I_{OL} = 2 \text{ mA}$                                  |          | 0.25 | 0.4  |          | 0.25 | 0.4  | V       |
|           |                                        | $I_{OL} = 6 \text{ mA}$                                                                                                                      |          |      |      |          | 0.35 | 0.5  |         |
|           | $\overline{BI}/\overline{RBO}$         | $V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, I_{OL} = 1.6 \text{ mA}$                                            |          | 0.25 | 0.4  |          | 0.25 | 0.4  | V       |
|           |                                        | $I_{OL} = 3.2 \text{ mA}$                                                                                                                    |          |      |      |          | 0.35 | 0.5  |         |
| $I_I$     | Input current at maximum input voltage | Any input except $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MAX}, V_I = 7 \text{ V}$                                                  |          |      | 0.1  |          |      | 0.1  | mA      |
| $I_{IH}$  | High-level input current               | Any input except $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MAX}, V_I = 2.7 \text{ V}$                                                |          |      | 20   |          |      | 20   | $\mu$ A |
| $I_{IL}$  | Low-level input current                | Any input except $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$                                                |          |      | –0.4 |          |      | –0.4 | mA      |
|           |                                        | $\overline{BI}/\overline{RBO}$                                                                                                               |          |      | –1.2 |          |      | –1.2 |         |
| $I_{OS}$  | Short-circuit output current           | $\overline{BI}/\overline{RBO}$<br>$V_{CC} = \text{MAX}$                                                                                      | –0.3     |      | –2   | –0.3     |      | –2   | mA      |
| $I_{CC}$  | Supply current                         | $V_{CC} = \text{MAX},$ See Note 2                                                                                                            |          | 25   | 38   |          | 25   | 38   | mA      |

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

NOTE 2:  $I_{CC}$  is measured with all outputs open and all inputs at 4.5 V.

switching characteristics,  $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$

| PARAMETER                                                                                         | TEST CONDITIONS                                 | MIN | TYP | MAX | UNIT |
|---------------------------------------------------------------------------------------------------|-------------------------------------------------|-----|-----|-----|------|
| $t_{PHL}$ Propagation delay time, high-to-low-level output from A input                           | $C_L = 15 \text{ pF}, R_L = 4 \text{ k}\Omega,$ |     | 100 |     | ns   |
| $t_{PLH}$ Propagation delay time, low-to-high-level output from A input                           | See Note 3                                      |     | 100 |     |      |
| $t_{PHL}$ Propagation delay time, high-to-low-level output (a-f only) from $\overline{RBI}$ input | $C_L = 15 \text{ pF}, R_L = 6 \text{ k}\Omega,$ |     | 100 |     | ns   |
| $t_{PLH}$ Propagation delay time, low-to-high-level output (a-f only) from $\overline{RBI}$ input | See Note 3                                      |     | 100 |     |      |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

|                                                 |                |
|-------------------------------------------------|----------------|
| Supply voltage, $V_{CC}$ (see Note 1)           | 7 V            |
| Input voltage                                   | 7 V            |
| Current forced into any output in the off state | 1 mA           |
| Operating free-air temperature range: SN54LS49  | –55°C to 125°C |
| SN74LS49                                        | 0°C to 70°C    |
| Storage temperature range                       | –65°C to 150°C |

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

|                                       | SN54LS49 |     |     | SN74LS49 |     |      | UNIT |
|---------------------------------------|----------|-----|-----|----------|-----|------|------|
|                                       | MIN      | NOM | MAX | MIN      | NOM | MAX  |      |
| Supply voltage, $V_{CC}$              | 4.5      | 5   | 5.5 | 4.75     | 5   | 5.25 | V    |
| High-level output voltage, $V_{OH}$   |          |     | 5.5 |          |     | 5.5  | V    |
| Low-level output current, $I_{OL}$    |          |     | 4   |          |     | 8    | mA   |
| Operating free-air temperature, $T_A$ | –55      |     | 125 | 0        |     | 70   | °C   |

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

| PARAMETER                                    | TEST CONDITIONS†                                                                                 | SN54LS49 |      |      | SN74LS49 |      |      | UNIT |
|----------------------------------------------|--------------------------------------------------------------------------------------------------|----------|------|------|----------|------|------|------|
|                                              |                                                                                                  | MIN      | TYP‡ | MAX  | MIN      | TYP‡ | MAX  |      |
| $V_{IH}$ High-level input voltage            |                                                                                                  | 2        |      |      | 2        |      |      | V    |
| $V_{IL}$ Low-level input voltage             |                                                                                                  |          |      | 0.7  |          |      | 0.8  | V    |
| $V_{IK}$ Input clamp voltage                 | $V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$                                                      |          |      | –1.5 |          |      | –1.5 | V    |
| $I_{OH}$ High-level output current           | $V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, V_{OH} = 5.5 \text{ V}$ |          |      | 250  |          |      | 250  | µA   |
| $V_{OL}$ Low-level output voltage            | $V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, I_{OL} = 4 \text{ mA}$  |          | 0.25 | 0.4  |          | 0.25 | 0.4  | V    |
|                                              | $I_{OL} = 8 \text{ mA}$                                                                          |          |      |      |          | 0.35 | 0.5  |      |
| $I_I$ Input current at maximum input voltage | $V_{CC} = \text{MAX}, V_I = 7 \text{ V}$                                                         |          |      | 0.1  |          |      | 0.1  | mA   |
| $I_{IH}$ High-level input current            | $V_{CC} = \text{MAX}, V_I = 2.7 \text{ V}$                                                       |          |      | 20   |          |      | 20   | µA   |
| $I_{IL}$ Low-level input current             | $V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$                                                       |          |      | –0.4 |          |      | –0.4 | mA   |
| $I_{CC}$ Supply current                      | $V_{CC} = \text{MAX}, \text{ See Note 2}$                                                        | 8        |      | 15   | 8        |      | 15   | mA   |

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

NOTE 2:  $I_{CC}$  is measured with all outputs open and all inputs at 4.5 V.

switching characteristics,  $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$

| PARAMETER                                                                                         | TEST CONDITIONS                                | MIN | TYP | MAX | UNIT |
|---------------------------------------------------------------------------------------------------|------------------------------------------------|-----|-----|-----|------|
| $t_{PHL}$ Propagation delay time, high-to-low-level output from A input                           | $C_L = 15 \text{ pF}, R_L = 4 \text{ k}\Omega$ |     |     | 100 | ns   |
| $t_{PLH}$ Propagation delay time, low-to-high-level output from A input                           | See Note 3                                     |     |     | 100 |      |
| $t_{PHL}$ Propagation delay time, high-to-low-level output (a-f only) from $\overline{RBI}$ input | $C_L = 15 \text{ pF}, R_L = 6 \text{ k}\Omega$ |     |     | 100 | ns   |
| $t_{PLH}$ Propagation delay time, low-to-high-level output (a-f only) from $\overline{RBI}$ input | See Note 3                                     |     |     | 100 |      |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

**TAPE AND REEL INFORMATION**



\*All dimensions are nominal

| Device      | Package Type | Package Drawing | Pins | SPQ  | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|-------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LS47NSR | SO           | NS              | 16   | 2000 | 330.0              | 16.4               | 8.2     | 10.5    | 2.5     | 12.0    | 16.0   | Q1            |

## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

| Device      | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|-------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LS47NSR | SO           | NS              | 16   | 2000 | 346.0       | 346.0      | 33.0        |

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