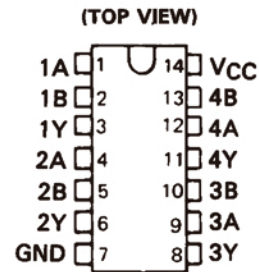


**description**

These devices contain four independent 2-input AND gates.

The XD74LS08, XL74LS08 and XD54LS08 are characterized for operation over the full military temperature range of -55°C to 125°C. The XD74LS08, XL74LS08 and XD54LS08 are characterized for operation from 0° to 70°C.

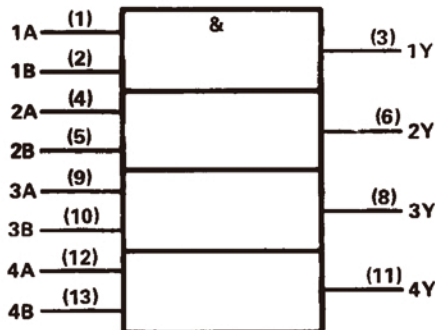
XD54LS08  
 XD74LS08  
 XL74LS08



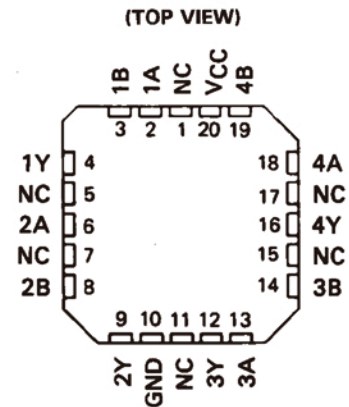
FUNCTION TABLE (each gate)

| INPUTS |   | OUTPUT |
|--------|---|--------|
| A      | B | Y      |
| H      | H | H      |
| L      | X | L      |
| X      | L | L      |

**logic symbol†**

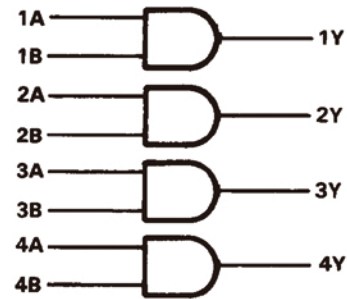


**XD74LS08, XL74LS08 . . . FK PACKAGE**



NC—No internal connection

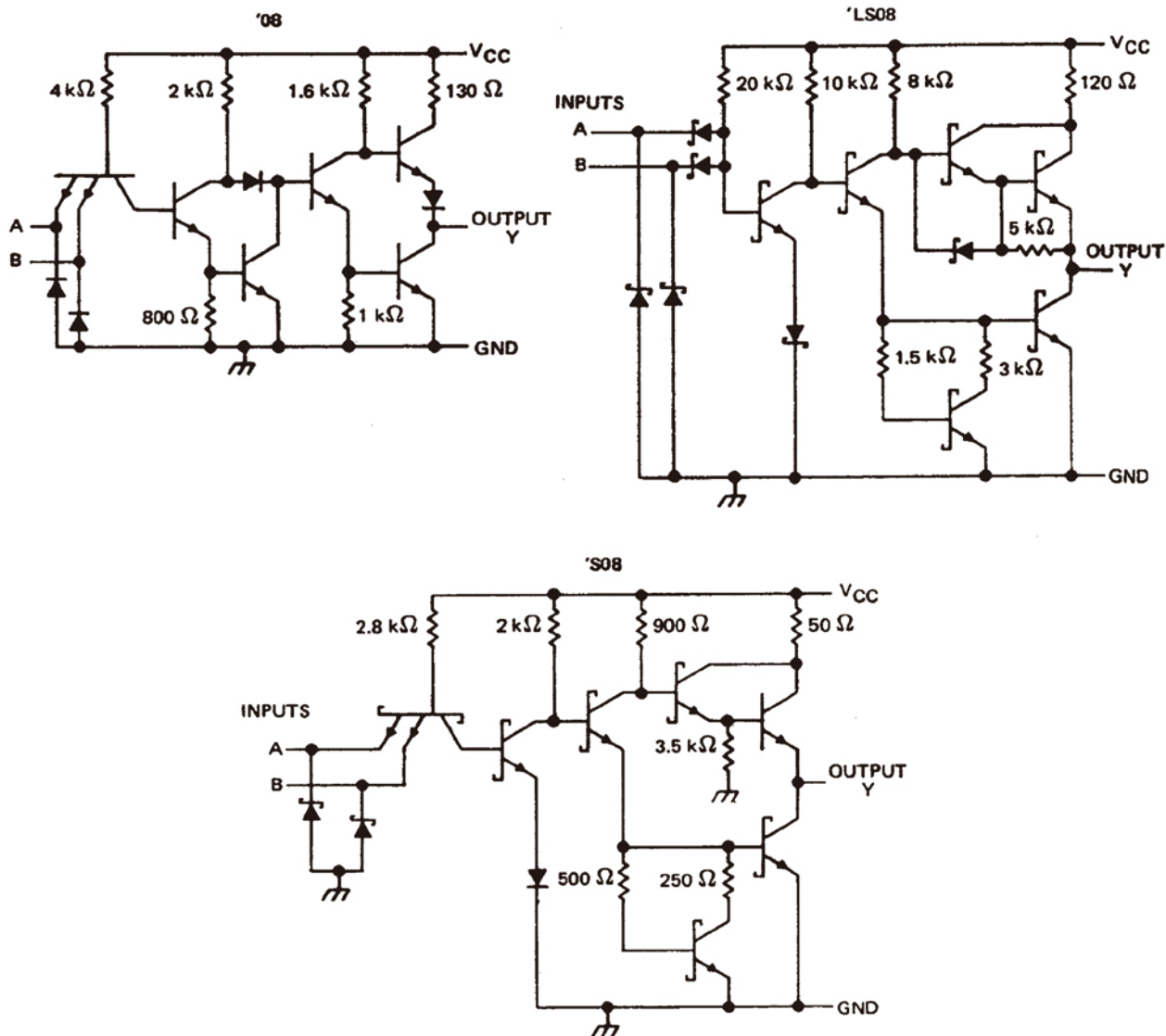
**logic diagram (positive logic)**



$Y = A \cdot B$  or  $Y = \overline{\overline{A} + \overline{B}}$

# XD74LS08 DIP14/XL74LS08 SOP14

schematics (each gate)



Resistor values are nominal.

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

|   |                |
|---|----------------|
| Supply voltage, $V_{CC}$ (see Note 1) .....       | 7 V            |
| Input voltage: '08, 'S08 .....                    | 5.5 V          |
| 'LS08 .....                                       | 7 V            |
| Operating free-air temperature range: XD54' ..... | -55°C to 125°C |
| XD74' .....                                       | 0°C to 70°C    |
| Storage temperature range .....                   | -65°C to 150°C |

# XD74LS08 DIP14/XL74LS08 SOP14

## recommended operating conditions

|   | XD74LS08 |     |      | XL74LS08 |     |      | UNIT |
|---|----------|-----|------|----------|-----|------|------|
|   | MIN      | NOM | MAX  | MIN      | NOM | MAX  |      |
| V <sub>CC</sub> Supply voltage                | 4.5      | 5   | 5.5  | 4.75     | 5   | 5.25 | V    |
| V <sub>IH</sub> High-level input voltage      | 2        |     |      | 2        |     |      | V    |
| V <sub>IL</sub> Low-level input voltage       |          |     | 0.8  |          |     | 0.8  | V    |
| I <sub>OH</sub> High-level output current     |          |     | -0.8 |          |     | -0.8 | mA   |
| I <sub>OL</sub> Low-level output current      |          |     | 16   |          |     | 16   | mA   |
| T <sub>A</sub> Operating free-air temperature | -55      |     | 125  | 0        |     | 70   | °C   |

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

| PARAMETER         | TEST CONDITIONS †   | XD74LS08 |       |      | XL74LS08 |       |      | UNIT |
|-------------------|---|----------|-------|------|----------|-------|------|------|
|                   |   | MIN      | TYP ‡ | MAX  | MIN      | TYP ‡ | MAX  |      |
| V <sub>IK</sub>   | V <sub>CC</sub> = MIN, I <sub>I</sub> = -12 mA                          |          |       | -1.5 |          |       | -1.5 | V    |
| V <sub>OH</sub>   | V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OH</sub> = -0.8 mA | 2.4      | 3.4   |      | 2.4      | 3.4   |      | V    |
| V <sub>OL</sub>   | V <sub>CC</sub> = MIN, V <sub>IL</sub> = 0.8 V, I <sub>OL</sub> = 16 mA |          | 0.2   | 0.4  |          | 0.2   | 0.4  | V    |
| I <sub>I</sub>    | V <sub>CC</sub> = MAX, V <sub>I</sub> = 5.5 V                           |          |       | 1    |          |       | 1    | mA   |
| I <sub>IH</sub>   | V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.4 V                           |          |       | 40   |          |       | 40   | μA   |
| I <sub>IL</sub>   | V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4 V                           |          |       | -1.6 |          |       | -1.6 | mA   |
| I <sub>OS</sub> § | V <sub>CC</sub> = MAX   | -20      |       | -55  | -18      |       | -55  | mA   |
| I <sub>CCH</sub>  | V <sub>CC</sub> = MAX, V <sub>I</sub> = 4.5 V                           |          | 11    | 21   |          | 11    | 21   | mA   |
| I <sub>CCL</sub>  | V <sub>CC</sub> = MAX, V <sub>I</sub> = 0 V                             |          | 20    | 33   |          | 20    | 33   | mA   |

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

‡ All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

§ Not more than one output should be shorted at a time.

## switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 2)

| PARAMETER        | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS                                | MIN | TYP  | MAX | UNIT |
|------------------|--------------|-------------|--|-----|------|-----|------|
| t <sub>PLH</sub> | A or B       | Y           | R <sub>L</sub> = 400 Ω, C <sub>L</sub> = 15 pF |     | 17.5 | 27  | ns   |
| t <sub>PHL</sub> |              |             |  |     | 12   | 19  | ns   |

# XD74LS08 DIP14/XL74LS08 SOP14

## recommended operating conditions

|   | XD74LS08 |     |      | XL74LS08 |     |      | UNIT |
|---|----------|-----|------|----------|-----|------|------|
|   | MIN      | NOM | MAX  | MIN      | NOM | MAX  |      |
| V <sub>CC</sub> Supply voltage                | 4.5      | 5   | 5.5  | 4.75     | 5   | 5.25 | V    |
| V <sub>IH</sub> High-level input voltage      | 2        |     |      | 2        |     |      | V    |
| V <sub>IL</sub> Low-level input voltage       |          |     | 0.7  |          |     | 0.8  | V    |
| I <sub>OH</sub> High-level output current     |          |     | -0.4 |          |     | -0.4 | mA   |
| I <sub>OL</sub> Low-level output current      |          |     | 4    |          |     | 8    | mA   |
| T <sub>A</sub> Operating free-air temperature | -55      |     | 125  | 0        |     | 70   | °C   |

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

| PARAMETER         | TEST CONDITIONS †   | XD74LS08 |      |      | XL74LS08 |      |      | UNIT |
|-------------------|---|----------|------|------|----------|------|------|------|
|                   |   | MIN      | TYP‡ | MAX  | MIN      | TYP‡ | MAX  |      |
| V <sub>IK</sub>   | V <sub>CC</sub> = MIN, I <sub>I</sub> = -18 mA                          |          |      | -1.5 |          |      | -1.5 | V    |
| V <sub>OH</sub>   | V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OH</sub> = -0.4 mA | 2.5      | 3.4  |      | 2.7      | 3.4  |      | V    |
| V <sub>OL</sub>   | V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX, I <sub>OL</sub> = 4 mA    | 0.25     | 0.4  |      | 0.25     | 0.4  |      | V    |
|                   | V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX, I <sub>OL</sub> = 8 mA    |          |      |      | 0.35     | 0.5  |      |      |
| I <sub>I</sub>    | V <sub>CC</sub> = MAX, V <sub>I</sub> = 7 V                             |          | 0.1  |      |          | 0.1  |      | mA   |
| I <sub>IH</sub>   | V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7 V                           |          | 20   |      |          | 20   |      | μA   |
| I <sub>IL</sub>   | V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4 V                           |          |      | -0.4 |          |      | -0.4 | mA   |
| I <sub>OS</sub> § | V <sub>CC</sub> = MAX   | -20      |      | -100 | -20      |      | -100 | mA   |
| I <sub>CCH</sub>  | V <sub>CC</sub> = MAX, V <sub>I</sub> = 4.5 V                           |          | 2.4  | 4.8  |          | 2.4  | 4.8  | mA   |
| I <sub>CCL</sub>  | V <sub>CC</sub> = MAX, V <sub>I</sub> = 0 V                             |          | 4.4  | 8.8  |          | 4.4  | 8.8  | mA   |

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

‡ All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 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.

## switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 2)

| PARAMETER        | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS                               | MIN | TYP | MAX | UNIT |
|------------------|--------------|-------------|---|-----|-----|-----|------|
| t <sub>PLH</sub> | A or B       | Y           | R <sub>L</sub> = 2 kΩ, C <sub>L</sub> = 15 pF |     | 8   | 15  | ns   |
| t <sub>PHL</sub> |              |             |   |     | 10  | 20  | ns   |

# XD74LS08 DIP14/XL74LS08 SOP14

## recommended operating conditions

|   | XD74LS08 |     |     | XL74LS08 |     |      | UNIT |
|---|----------|-----|-----|----------|-----|------|------|
|   | MIN      | NOM | MAX | MIN      | NOM | MAX  |      |
| V <sub>CC</sub> Supply voltage                | 4.5      | 5   | 5.5 | 4.75     | 5   | 5.25 | V    |
| V <sub>IH</sub> High-level input voltage      | 2        |     |     | 2        |     |      | V    |
| V <sub>IL</sub> Low-level input voltage       |          |     | 0.8 |          |     | 0.8  | V    |
| I <sub>OH</sub> High-level output current     |          |     | -1  |          |     | -1   | mA   |
| I <sub>OL</sub> Low-level output current      |          |     | 20  |          |     | 20   | mA   |
| T <sub>A</sub> Operating free-air temperature | -55      |     | 125 | 0        |     | 70   | °C   |

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

| PARAMETER         | TEST CONDITIONS †   | XD74LS08 |       |      | XL74LS08 |       |      | UNIT |
|-------------------|---|----------|-------|------|----------|-------|------|------|
|                   |   | MIN      | TYP ‡ | MAX  | MIN      | TYP ‡ | MAX  |      |
| V <sub>IK</sub>   | V <sub>CC</sub> = MIN, I <sub>I</sub> = -18 mA                          |          |       | -1.2 |          |       | -1.2 | V    |
| V <sub>OH</sub>   | V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OH</sub> = -1 mA   | 2.5      | 3.4   |      | 2.7      | 3.4   |      | V    |
| V <sub>OL</sub>   | V <sub>CC</sub> = MIN, V <sub>IL</sub> = 0.8 V, I <sub>OL</sub> = 20 mA |          |       | 0.5  |          |       | 0.5  | V    |
| I <sub>I</sub>    | V <sub>CC</sub> = MAX, V <sub>I</sub> = 5.5 V                           |          |       | 1    |          |       | 1    | mA   |
| I <sub>IH</sub>   | V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7 V                           |          |       | 50   |          |       | 50   | μA   |
| I <sub>IL</sub>   | V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.5 V                           |          |       | -2   |          |       | -2   | mA   |
| I <sub>OS</sub> § | V <sub>CC</sub> = MAX   | -40      |       | -100 | -40      |       | -100 | mA   |
| I <sub>CCH</sub>  | V <sub>CC</sub> = MAX, V <sub>I</sub> = 4.5 V                           |          | 18    | 32   |          | 18    | 32   | mA   |
| I <sub>CCL</sub>  | V <sub>CC</sub> = MAX, V <sub>I</sub> = 0 V                             |          | 32    | 57   |          | 32    | 57   | mA   |

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

‡ All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 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.

## switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 2)

| PARAMETER        | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS                                | MIN | TYP | MAX | UNIT |
|------------------|--------------|-------------|--|-----|-----|-----|------|
| t <sub>PLH</sub> | A or B       | Y           | R <sub>L</sub> = 280 Ω, C <sub>L</sub> = 15 pF | 4.5 |     | 7   | ns   |
| t <sub>PHL</sub> |              |             |  | 5   |     | 7.5 | ns   |
| t <sub>PLH</sub> |              |             | R <sub>L</sub> = 280 Ω, C <sub>L</sub> = 50 pF | 6   |     |     | ns   |
| t <sub>PHL</sub> |              |             |  | 7.5 |     |     | ns   |

以上信息仅供参考. 如需帮助联系客服人员. 谢谢 XINLUDA

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