

5. Circuitos digitales básicos: puertas lógicas

Tal y como se ha mencionado anteriormente, las puertas lógicas constituyen los circuitos digitales básicos y se utilizan para implementar las expresiones lógicas básicas. Estas se resumen en la Tabla 13 junto con la Tabla de Verdad correspondiente.

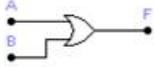
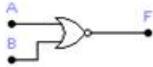
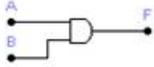
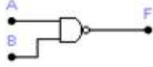
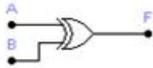
<p>$F = A + B$</p> <table border="1" data-bbox="405 501 577 743"> <thead> <tr> <th>A</th> <th>B</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>  <p style="text-align: center;">Puerta OR</p>	A	B	F	0	0	0	0	1	1	1	0	1	1	1	1	<p>$F = \overline{A + B}$</p> <table border="1" data-bbox="932 510 1104 752"> <thead> <tr> <th>A</th> <th>B</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table>  <p style="text-align: center;">Puerta NOR</p>	A	B	F	0	0	1	0	1	0	1	0	0	1	1	0
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<p>$F = \overline{A}$</p> <table border="1" data-bbox="520 1438 635 1581"> <thead> <tr> <th>A</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> </tr> </tbody> </table>  <p style="text-align: center;">Puerta NOT</p>	A	F	0	1	1	0	<p>$F = A \oplus B = \overline{A}B + A\overline{B}$</p> <table border="1" data-bbox="932 1438 1104 1680"> <thead> <tr> <th>A</th> <th>B</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table>  <p style="text-align: center;">Puerta EXOR</p>	A	B	F	0	0	0	0	1	1	1	0	1	1	1	0									
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Tabla 13

A partir de estos circuitos básicos se pueden implementar circuitos que representen expresiones lógicas más complejas. Supongamos la siguiente expresión:

$$F(B, A) = \bar{B}A + BA = \sum(1,3)$$

El circuito correspondiente será el representado en la Figura 12

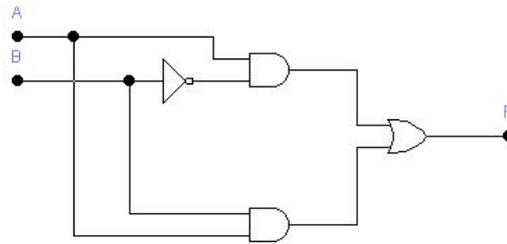


Figura 22