When A\_B\_DataIN\_Test = ‘10’, the value of D\_Test is the input into the registers, the value of DR\_Test inputted into the decoder chooses which register D\_Test is written into, and when RW is ‘1’ the value is written into the register

|  |  |
| --- | --- |
| Input (DR\_Test) | Output (value written in reg0-31) |
| 00000 | D\_Test in reg 0 |
| 00001 | D\_Test in reg 1 |
| 00010 | D\_Test in reg 2 |
| 00011 | D\_Test in reg 3 |
| 00100 | D\_Test in reg 4 |
| 00101 | D\_Test in reg 5 |
| 00110 | D\_Test in reg 6 |
| 00111 | D\_Test in reg 7 |
| 01000 | D\_Test in reg 8 |
| 01001 | D\_Test in reg 9 |
| 01010 | D\_Test in reg 10 |
| 01011 | D\_Test in reg 11 |
| 01100 | D\_Test in reg 12 |
| 01101 | D\_Test in reg 13 |
| 01110 | D\_Test in reg 14 |
| 01111 | D\_Test in reg 15 |
| 10000 | D\_Test in reg 16 |
| 10001 | D\_Test in reg 17 |
| 10010 | D\_Test in reg 18 |
| 10011 | D\_Test in reg 19 |
| 10100 | D\_Test in reg 20 |
| 10101 | D\_Test in reg 21 |
| 10110 | D\_Test in reg 22 |
| 10111 | D\_Test in reg 23 |
| 11000 | D\_Test in reg 24 |
| 11001 | D\_Test in reg 25 |
| 11010 | D\_Test in reg 26 |
| 11011 | D\_Test in reg 27 |
| 11100 | D\_Test in reg 28 |
| 11101 | D\_Test in reg 29 |
| 11110 | D\_Test in reg 30 |
| 11111 | D\_Test in reg 31 |

The same is true for changing the value of TD\_Test, which chooses which of the 15 temp registers are written into.

The value of a register can be read using the SA, SB, TA and TB signals. These all correspond to a multiplexer, with Mux32A and Mux32B using the values of SA and SB to choose which register has its output as the first input for Mux16A and Mux16B. If TA is 0 then the output A is whichever register was read from in the output of Mux32A, and the same for if TB is 0, the output B is the output of Mux32B. If TA and TB are any other value, then one of the 15 temp registers is read from instead.

The data from one register can be written into another register using the 3 to 32 multiplexer connected to the register file. The 3 inputs for this multiplexer are D\_Test and the outputs from the A and B ports of the register file. If A\_B\_DataIN\_Test = ‘10’, the value of D\_Test is the output of the multiplexer, which is then the input for the register file. If A\_B\_DataIN\_Test = ‘00’, the value of the A port is inputted into the register file, and if it is ‘01’, the value of the B port is inputted. Using this, the value of one register can be written into another.