S0/0

0 1

0 1

S1/0 S2/0

0 1

1 0

0 S3/1 S4/1 1

FSM model

|  |  |  |
| --- | --- | --- |
| Present State | Next State | |
| X = 0 | X = 1 |
| S0 | S1 | S2 |
| S1 | S1 | S3 |
| S2 | S4 | S2 |
| S3 | S4 | S2 |
| S4 | S1 | S3 |

S0 = 000

S1 = 001

S2 = 010

S3 = 011

S4 = 100

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Present State  Q2Q1Q0 | Next State  Q2\* Q1\* Q0\* | | Output  Z | C\_State  HEX[2:0] | N\_State  HEX[2:X] | |
| X = 0 | X = 1 | X=0 | X=1 |
| 000 | 001 | 010 | 0 | 000 | 0010 | 0100 |
| 001 | 001 | 011 | 0 | 001 | 0010 | 0110 |
| 010 | 100 | 010 | 0 | 010 | 1000 | 0100 |
| 011 | 100 | 010 | 1 | 011 | 1000 | 0100 |
| 100 | 001 | 011 | 1 | 100 | 0010 | 0110 |
| 101 | 000 | 000 | 0 | 101 | 0000 | 0000 |
| 110 | 000 | 000 | 0 | 110 | 0000 | 0000 |
| 111 | 000 | 000 | 0 | 111 | 0000 | 0000 |

5 states => 3FF

Phương trình C\_State

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q1 Q0  Q2 | 00 | 01 | 11 | 10 |
| 0 |  |  |  |  |
| 1 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q1 Q0  Q2 | 00 | 01 | 11 | 10 |
| 0 | 0 | 0 | 1 | 1 |
| 1 |  |  | 1 | 1 |

HEX[2] = Q2 HEX[1] = Q1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q1 Q0  Q2 | 00 | 01 | 11 | 10 |
| 0 |  | 1 | 1 |  |
| 1 |  | 1 | 1 |  |

HEX[0] = Q0

Phương trình N\_State

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q0 X  Q2 Q1 | 00 | 01 | 11 | 10 |
| 00 | 0 | 0 | 0 | 0 |
| 01 | 1 | 0 | 0 | 1 |
| 11 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 |

HEX[2] = Q2’Q1X’ = D2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q0 X  Q2 Q1 | 00 | 01 | 11 | 10 |
| 00 | 0 | 1 | 1 | 0 |
| 01 | 0 | 1 | 1 | 0 |
| 11 | 0 | 0 | 0 | 0 |
| 10 | 0 | 1 | 0 | 0 |

HEX[1] = Q2’X + Q1’Q0’X = D1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q0 X  Q2 Q1 | 00 | 01 | 11 | 10 |
| 00 | 1 | 0 | 1 | 1 |
| 01 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 |
| 10 | 1 | 1 | 0 | 0 |

HEX[0] = Q1’Q0’X’ + Q2Q1’Q0’ + Q2’Q1’Q0 = D0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q0 X  Q2 Q1 | 00 | 01 | 11 | 10 |
| 00 | 0 | 0 | 0 | 0 |
| 01 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 |

HEX[X]= 1

Phương trình Output Z

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q1 Q0  Q2 | 00 | 01 | 11 | 10 |
| 0 | 0 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 | 0 |

Z = Q2’Q1Q0 + Q2Q1’Q0’