Hamming encoder algorithm

06 October 2014 01:44

Truth table

Number	D3	D2	D1	D0	B0	B2	B4	B6
0	0	0	0	0	1	1	1	0
1	0	0	0	1	0	0	0	0
2	0	0	1	0	1	0	0	1
3	0	0	1	1	0	1	1	1
4	0	1	0	0	0	1	0	1
5	0	1	0	1	1	0	1	1
6	0	1	1	0	0	0	1	0
7	0	1	1	1	1	1	0	0
8	1	0	0	0	0	0	1	1
9	1	0	0	1	1	1	0	1
10	1	0	1	0	0	1	0	0
11	1	0	1	1	1	0	1	0
12	1	1	0	0	1	0	0	0
13	1	1	0	1	0	1	1	0
14	1	1	1	0	1	1	1	1
15	1	1	1	1	0	0	0	1

B0

D1D0\D3D2	00	01	11	10
00	1		1	
01		1		1
11		1		1
10	1		1	

Function

$out = \overline{D3} \cdot \overline{D2} \cdot \overline{D0} + \overline{D3} \cdot D2 \cdot D0 + D3 \cdot D2 \cdot \overline{D0} + D3 \cdot \overline{D2} \cdot D0$

$out = \overline{D3} \cdot (\overline{D2} \cdot D0 + D2 \cdot \overline{D0}) + D3 \cdot (D2 \cdot D0 + \overline{D2} \cdot \overline{D0})$

$out = \overline{D3} \cdot \overline{(D2 \oplus D0)} + D3 \cdot (D2 \oplus D0)$

$out = \overline{D0 \oplus D2 \oplus D3}$

B2

D1D0\D3D2	00	01	11	10
00	1	1		
01			1	1
11	1	1		
10			1	1

Function

$out = \overline{D0 \oplus D1 \oplus D3}$

B4

D1D0\D3D2	00	01	11	10
00	1			1
01		1	1	
11	1			1
10		1	1	

Function

$out = \overline{D0 \oplus D1 \oplus D2}$

B6

D1D0\D3D2	00	01	11	10
00		1		1
01		1		1
11	1		1	
10	1		1	

Function

$out = D1 \oplus D2 \oplus D3$

Summary

B7	D3
B6	$D1 \oplus D2 \oplus D3$
B5	D2
B4	$\overline{D0 \oplus D1 \oplus D2}$
B3	D1
B2	$\overline{D0 \oplus D1 \oplus D3}$
B1	D0
B0	$\overline{D0 \oplus D2 \oplus D3}$