6.2

4.2 가의 논리식은 다음과 같다.

$F_2 = \overline{A_2}B_2 + (A_2B_2 + \overline{A_2}\,\overline{B_2})\overline{A_1}B_1 + (A_2B_2 + \overline{A_2}\,\overline{B_2})(A_1B_1 + \overline{A_1}\,\overline{B_1})\overline{A_0}B_0$

$F_1 = (A_2B_2 + \overline{A_2}\,\overline{B_2})(A_1B_1 + \overline{A_1}\,\overline{B_1})(A_0B_0 + \overline{A_0}\,\overline{B_0})$

$F_0 = A_2\overline{B_2} + (A_2B_2 + \overline{A_2}\,\overline{B_2})A_1\overline{B_1} + (A_2B_2 + \overline{A_2}\,\overline{B_2})(A_1B_1 + \overline{A_1}\,\overline{B_1})A_0\overline{B_0}$

이 논리식을 breadboard에 구성한 회로는 그림1과 같다. 각 스위치를 조작하여 확인한 truth table은 표1과 같다.

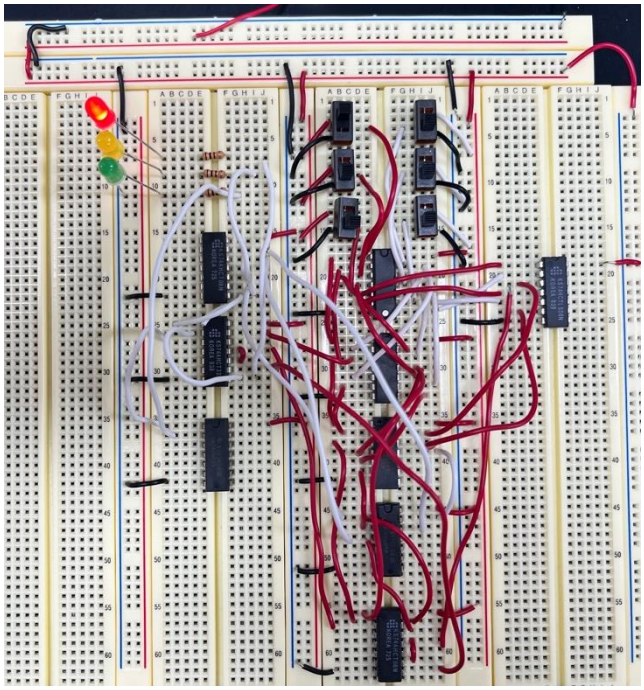

Figure 1. 3-bit Comparator 회로

Table 1. Truth Table for 3-bit Comparator

A2	A1	A0	B2	B1	B0	F2	F1	F0
0	0	0	0	0	0	0	1	0
0	0	0	0	0	1	1	0	0
0	0	0	0	1	0	1	0	0
0	0	0	0	1	1	1	0	0
0	0	0	1	0	0	1	0	0
0	0	0	1	0	1	1	0	0
0	0	0	1	1	0	1	0	0
0	0	0	1	1	1	1	0	0
0	0	1	0	0	0	0	0	1

0	0	1	0	0	1	1	0	0
0	0	1	0	1	0	1	0	0
0	0	1	0	1	1	1	0	0
0	0	1	1	0	0	1	0	0
0	0	1	1	0	1	1	0	0
0	0	1	1	1	0	1	0	0
0	0	1	1	1	1	1	0	0
0	1	0	0	0	0	0	0	1
0	1	0	0	0	1	0	0	1
0	1	0	0	1	0	0	1	0
0	1	0	0	1	1	1	0	0
0	1	0	1	0	0	1	0	0
0	1	0	1	0	1	1	0	0
0	1	0	1	1	0	1	0	0
0	1	0	1	1	1	1	0	0
0	1	1	0	0	0	0	0	1
0	1	1	0	0	1	0	0	1
0	1	1	0	1	0	0	0	1
0	1	1	0	1	1	0	1	0
0	1	1	1	0	0	1	0	0
0	1	1	1	0	1	1	0	0
0	1	1	1	1	0	1	0	0
0	1	1	1	1	1	1	0	0
1	0	0	0	0	0	0	0	1
1	0	0	0	0	1	0	0	1
1	0	0	0	1	0	0	0	1
1	0	0	0	1	1	0	0	1
1	0	0	1	0	0	0	1	0
1	0	0	1	0	1	1	0	0
1	0	0	1	1	0	1	0	0
1	0	0	1	1	1	1	0	0
1	0	1	0	0	0	0	0	1
1	0	1	0	0	1	0	0	1
1	0	1	0	1	0	0	0	1
1	0	1	0	1	1	0	0	1
1	0	1	1	0	0	0	0	1
1	0	1	1	0	1	0	1	0
1	0	1	1	1	0	1	0	0
1	0	1	1	1	1	1	0	0
1	1	0	0	0	0	0	0	1
1	1	0	0	0	1	0	0	1
1	1	0	0	1	0	0	0	1

1	1	0	0	1	1	0	0	1
1	1	0	1	0	0	0	0	1
1	1	0	1	0	1	0	0	1
1	1	0	1	1	0	0	1	0
1	1	0	1	1	1	1	0	0
1	1	1	0	0	0	0	0	1
1	1	1	0	0	1	0	0	1
1	1	1	0	1	0	0	0	1
1	1	1	0	1	1	0	0	1
1	1	1	1	0	0	0	0	1
1	1	1	1	0	1	0	0	1
1	1	1	1	1	0	0	0	1
1	1	1	1	1	1	0	1	0

6.3

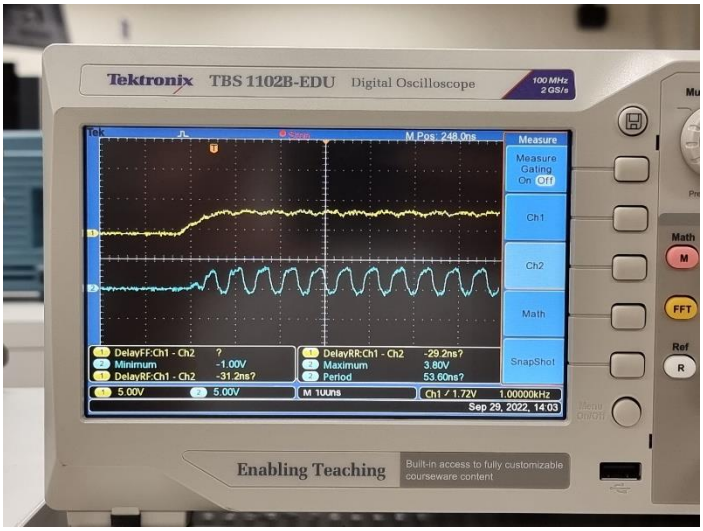

Figure 2. Waveforms of Signal A (CH1) and B (CH2)

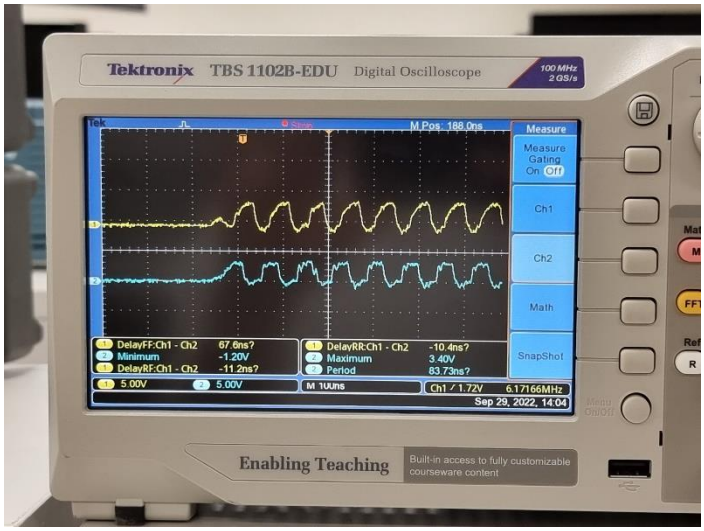

Figure 2. Waveforms of Signal B (CH1) and C (CH2)

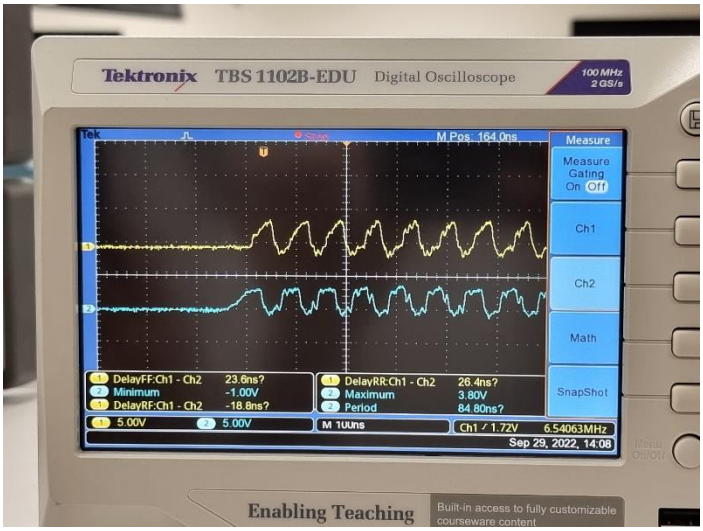

Figure 4. Waveforms of Signal C (CH1) and D (CH2)

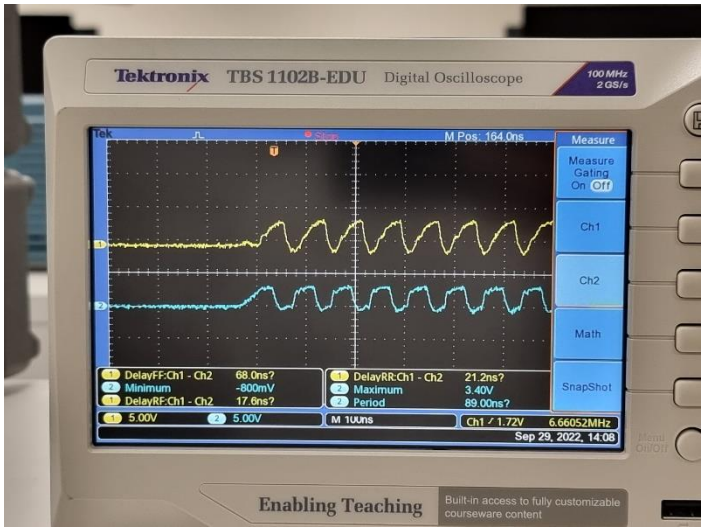

Figure 5. Waveforms of Signal D (CH1) and B (CH2)

CH1	CH2	CH1 – CH2 Delay (ns)	CH2 Max V (V)	CH2 Min V (V)	CH2 Period (ns)
A	B	-	3.80	-1.00	53.60
B	C	-10.4	3.40	-1.20	83.73
C	D	26.4	3.80	-1.00	84.80
D	B	21.2	3.40	-0.800	89.00