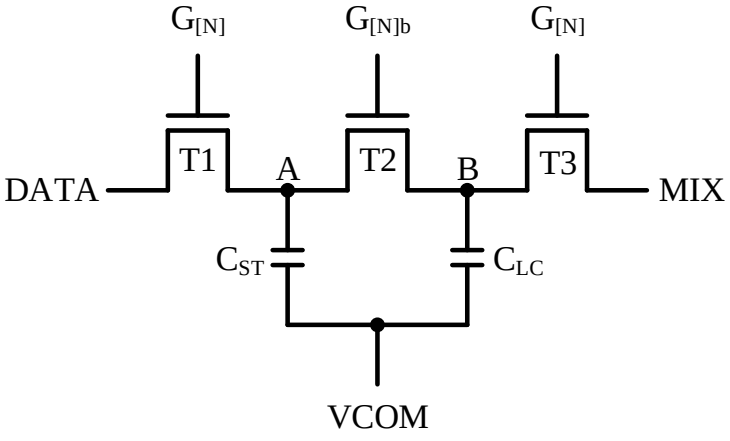
BPLC Simulation (1)

- BPLC pixel circuit ***(IEEE/OSA JDT 2015)***



$$V_A = V_{LC} = \frac{1}{2}\left(V_{DATA} + V_{MIX}\right)$$

※ Simulate three conditions and save your waveforms of node A and node B. Please explain the voltage change of node A and B.

=> Enlarge V_{LC} from ±15 V to ±20 V

Simulated parameter:

C_{LC} = 6 pF

C_{ST} = 6 pF

$M_{T1,T2}$ = 100

M_{T3} = 300

VCOM = 0 V

Initial $V_A = V_B$ = 0 V

Simulated condition:

(1) For MIX = 0 V

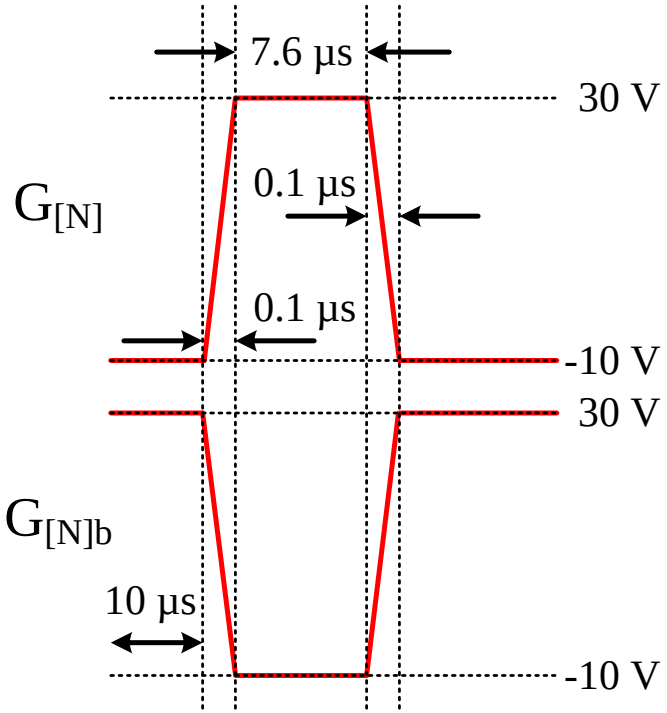
V_{DATA} = 0 V

(2) For MIX = 10 V

V_{DATA} = 7.5 V

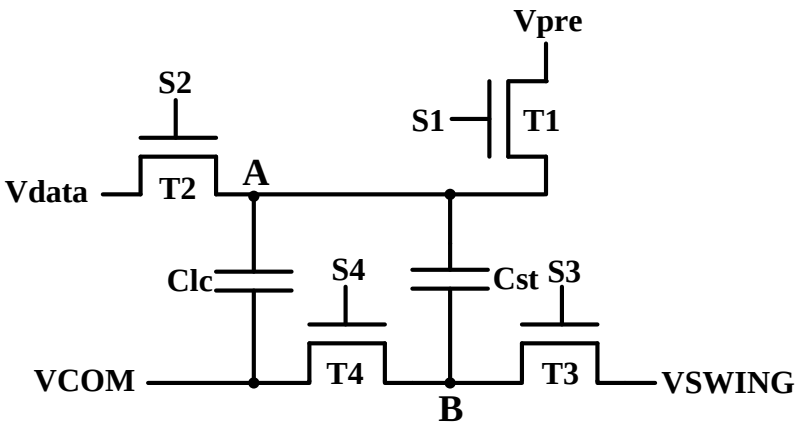
(3) For MIX = 25 V

V_{DATA} = 15 V



BPLC Simulation (2)

- BPLC pixel circuit *(IDW 2013)* => **Enlarge V_{LC} from ±15 V to ± 20 V**



※ Simulate normal mode and coupling mode under positive polarity, and save your waveforms of node A and node B. Please explain the voltage change of node A and B.

Simulated parameter:

C_{LC} = 6 pF

C_{ST} = 6 pF

$M_{T1,T2,T3,T4}$ = 100

Vpre = 7.5 V

Initial $V_A = V_B$ = 0 V

Simulated condition:

(1) For VCOM = 0 V

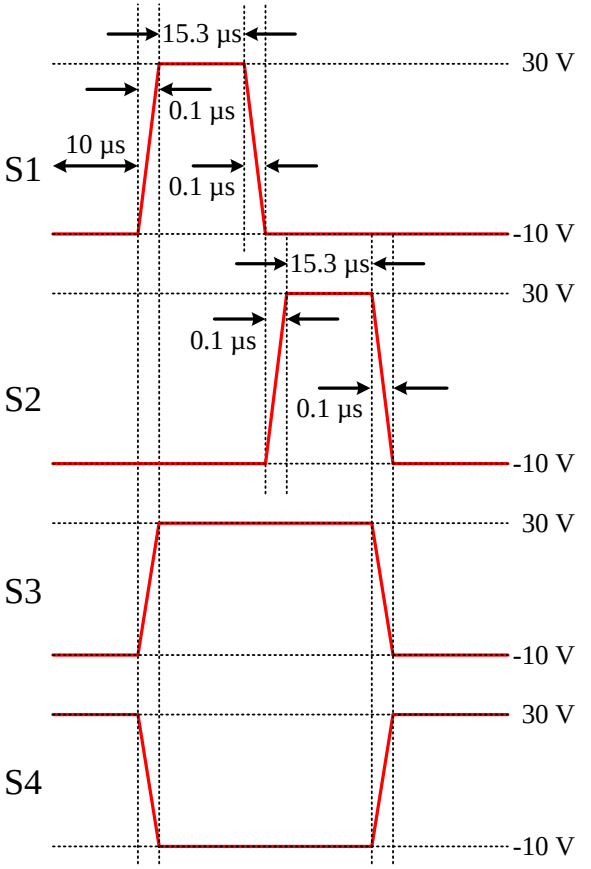
VSWING = 0 V

V_{DATA} = 15 V

(2) For VCOM = 0 V

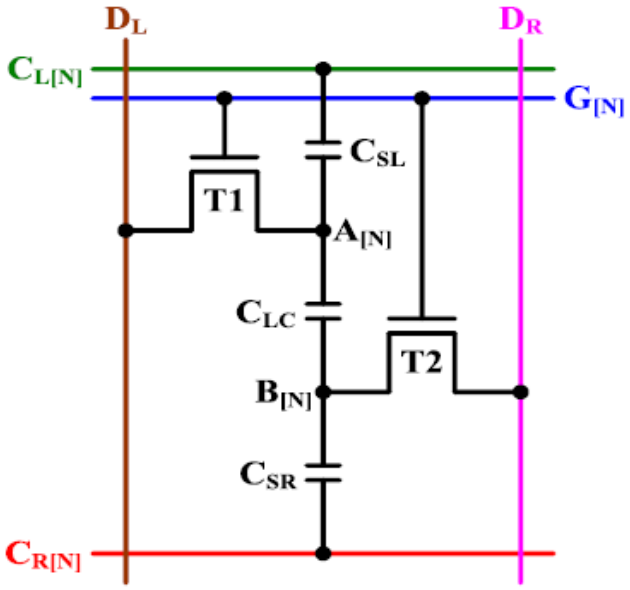
VSWING = -10 V

V_{DATA} = 15 V



BPLC Simulation (3)

- BPLC pixel circuit ***(IEEE EDL 2015 & SID 2015* distinguished paper)**



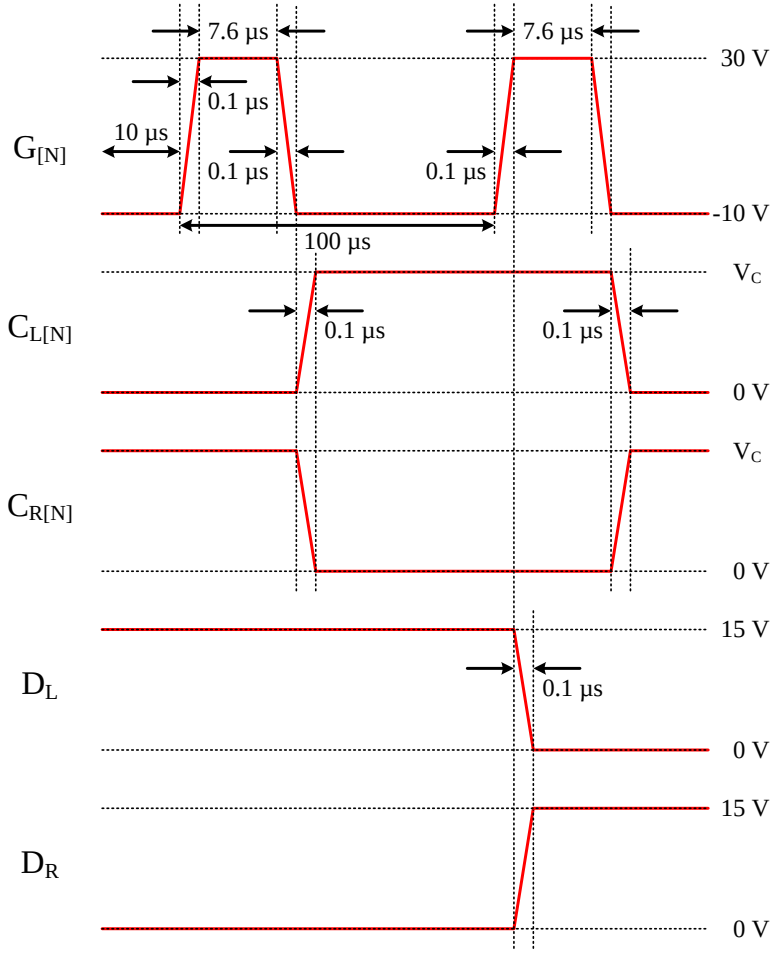
Simulated parameter:

C_{LC} = 6 pF

C_{SL}, C_{SR} = 6 pF

M_{T1}, M_{T2} = 300

Initial $V_A = V_B$ = 0 V



BPLC Simulation (3)

- i. Please design the value of V_C to achieve the maximum V_{LC} ($A_{[N]}$ - $B_{[N]}$) of 25 V and -25 V.

- ii. If the pulse-width of $G_{[N]}$ is shortened from 7.6 μs to 3.3 μs, please explain what you observe from the waveforms of V_A and V_B.