

$$R_{eq1} = \frac{1}{\frac{NR}{R_{ON} + R4} + \frac{24 - NR}{R4 + R4}} \quad (1)$$

$$R_{low\ comb} = \frac{1}{\frac{1}{R_{eq1}} + \frac{1}{R2 + R3}} \quad (2)$$

$$V_{R2} = \frac{V_{R1} \cdot R_{low\ comb}}{R1 + R_{low\ comb}} \quad (3)$$

$$V_{R3} = \frac{V_{R2} \cdot R3}{R2 + R3} \quad (4)$$

$$1) \rightarrow V_{R2} = \frac{V_{R3} \cdot (R_2 + R_3)}{R_3}$$

$$3) \rightarrow V_{R2} \cdot R_1 + V_{R2} \cdot R_{low\ comb} = V_{R1} \cdot R_{low\ comb} \rightarrow V_{R2} \cdot R_1 = R_{low\ comb} (V_{R1} - V_{R2})$$

$$R_{low\ comb} = \frac{V_{R2} \cdot R_1}{V_{R1} - V_{R2}}$$

from (2):

$$\frac{1}{R_{ext}} + \frac{1}{R_2 + R_3} = \frac{1}{R_{low\ comb}}$$

$$R_{ext} = \frac{1}{\frac{1}{R_{low\ comb}} - \frac{1}{R_2 + R_3}}$$

$$(1) \rightarrow \frac{N_R (R_{odd} + R_1) + (24 - N_R) \cdot (R_{on} + R_4)}{(R_{on} + R_1) \cdot (R_{odd} + R_1)} = \frac{1}{R_{ext}}$$

$$N_R (R_{odd} + R_1) + 24 (R_{on} + R_1) - N_R (R_{on} + R_4) = \frac{(R_{on} + R_4) \cdot (R_{odd} + R_1)}{R_{ext}}$$

$$N_R = \frac{(R_{on} + R_1) (R_{odd} + R_1) - 24 \cdot (R_{on} + R_1)}{R_{odd} - R_{on}}$$