



Supplementary materials for

Seyed Sajad AHMADPOUR, Nima Jafari NAVIMPOUR, Mohammad MOSLEH, Senay YALCIN, 2023. Nano-design of ultra-efficient reversible block based on quantum-dot cellular automata. *Front Inform Technol Electron Eng*, 24(3):447-456. <https://doi.org/10.1631/FITEE.2200095>

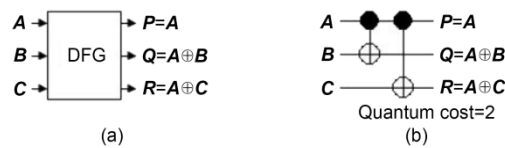


Fig. S1 Reversible DFG: (a) circuit view; (b) quantum realization

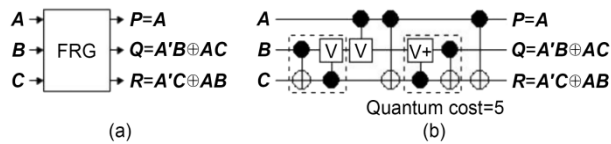


Fig. S2 Reversible FRG: (a) circuit view; (b) quantum realization

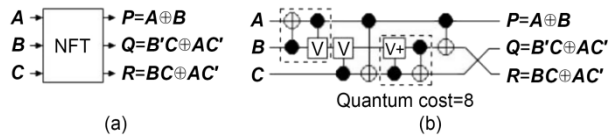


Fig. S3 Reversible NFT: (a) circuit view; (b) quantum realization

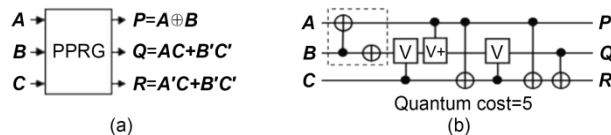


Fig. S4 Reversible PPRG: (a) circuit view; (b) quantum realization

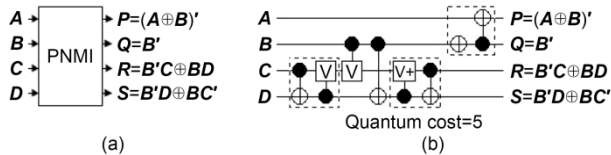


Fig. S5 Reversible PNM1: (a) circuit view; (b) quantum realization

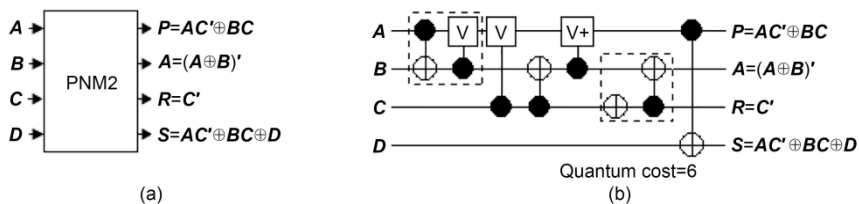


Fig. S6 Reversible PNM2: (a) circuit view; (b) quantum realization

Table S1 Truth table of the DFG

<i>A</i>	<i>B</i>	<i>C</i>	<i>P</i>	<i>Q</i>	<i>R</i>
0	0	0	0	0	0
0	0	1	0	0	1
0	1	0	0	1	0
0	1	1	0	1	1
1	0	0	1	1	1
1	0	1	1	1	0
1	1	0	1	0	1
1	1	1	1	0	0

Table S2 Truth table of the FRG

<i>A</i>	<i>B</i>	<i>C</i>	<i>P</i>	<i>Q</i>	<i>R</i>
0	0	0	0	0	0
0	0	1	0	0	1
0	1	0	0	1	0
0	1	1	0	1	1
1	0	0	1	0	0
1	0	1	1	1	0
1	1	0	1	0	1
1	1	1	1	1	1

Table S3 Truth table of the NFT

<i>A</i>	<i>B</i>	<i>C</i>	<i>P</i>	<i>Q</i>	<i>R</i>
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	1	0	0
0	1	1	1	0	1
1	0	0	1	1	1
1	0	1	1	1	0
1	1	0	0	1	1
1	1	1	0	0	1

Table S4 Truth table of the PPRG

<i>A</i>	<i>B</i>	<i>C</i>	<i>P</i>	<i>Q</i>	<i>R</i>
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	1	0	0
0	1	1	1	0	1
1	0	0	1	1	1
1	0	1	1	1	0
1	1	0	0	1	1
1	1	1	0	0	1

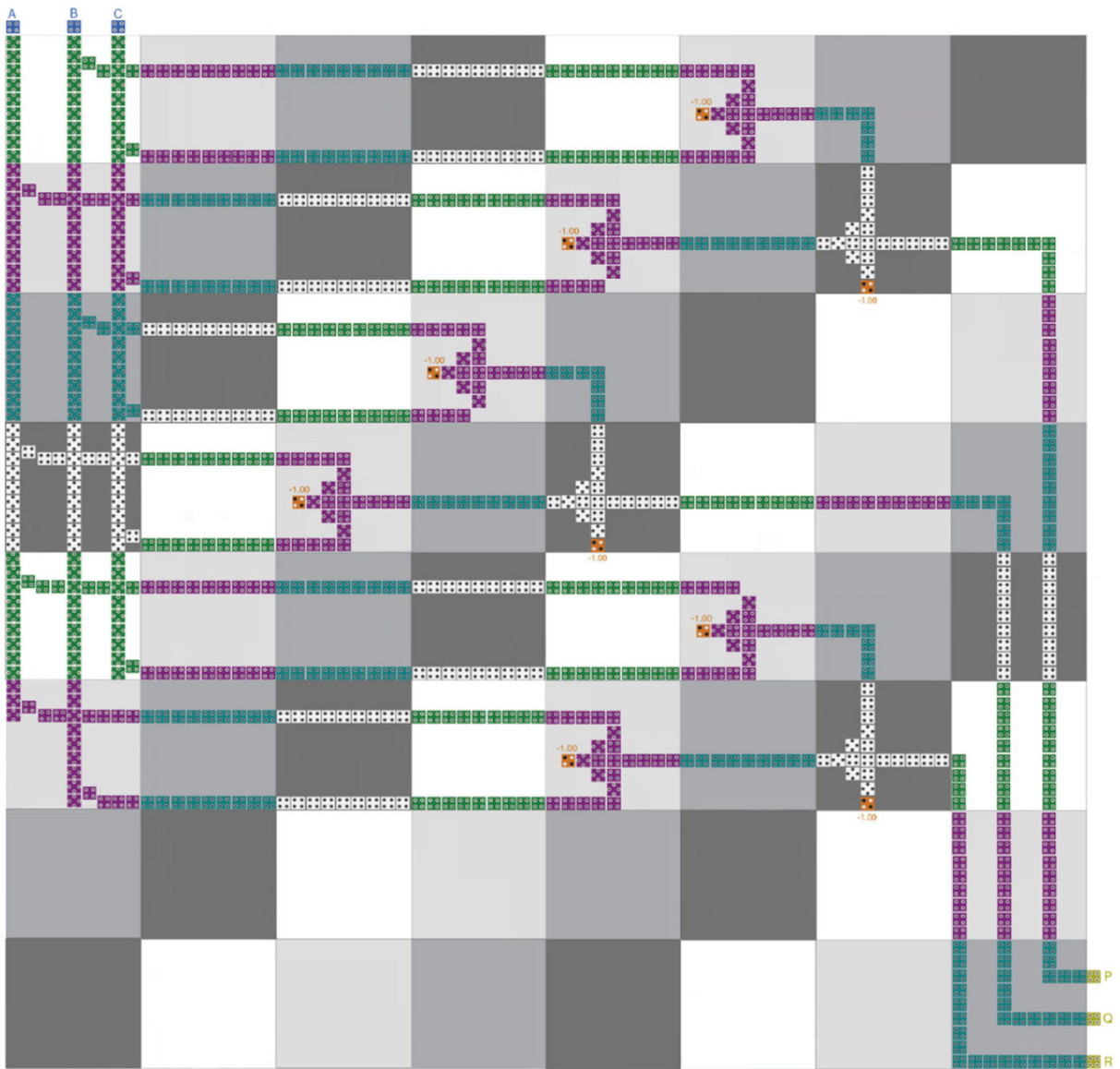


Fig. S7 Implementation of the suggested reversible gate based on 2DW clocking