0.4-V Logic Library Friendly SRAM Array Using Rectangular-Diffusion Cell and Delta-Boosted-Array-Voltage Scheme

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We designed a logic library friendly SRAM array. The array uses rectangular-diffusion cell (RD-cell) and delta-boosted-array-voltage scheme (DBA-scheme). In the RD-cell, the cell ratio is 1.0, and it reduces the imbalance of the cell ratio. A low supply voltage deteriorates the static noise margin, however, the DBA-scheme compensates it. Using the combination of RD-cell and DBA-scheme, a 32-kB test chip achieves 0.4-V operation at 4.5-MHz frequency and 140-μW power dissipation and 0.9-μA standby current.