LP SRAM SINGLE PORT HVT MODELS (NHVTPDSP, NHVTPGSP, PHVTPUSP)

1. CONDITIONS OF EXTRACTION

- Maturity: Pre production
- Geometrical extraction domain:
- Density 1.15µm^2
  - Pull Down Transistor : W=0.18µm, L=0.1µm
  - Pass Gate Transistor : W=0.12µm, L=0.115µm
  - Pull Up Transistor : W=0.11µm, L=0.1µm
- Temperature extraction domain:
  - -40 ˚C to 150 ˚C
- Bias extraction domain:
  - Gate bias: 0 ≤ |VGS| ≤ 1.32 V (Vdd + 10%)
  - Drain bias: 0 ≤ |VDS| ≤ 1.32 V (Vdd + 10%)
  - Bulk bias: 0 ≤ |VBS| ≤ 1.32 V (Vdd + 10%)

2. CONDITIONS OF SIMULATION

- Temperature:

  25C
- Threshold Voltages:

  VTLIN = Vgs for Ids = 40nA x (Wdrawn/Ldrawn) at Vds = 25 mV and Vbs = 0 V.

  VTSAT = Vgs for Ids = 40nA x (Wdrawn/Ldrawn) at Vds = 1.2 V and Vbs = 0 V
- Currents:

  ION = Ids at Vgs = 1.2 V, Vds = 1.2 V and Vbs = 0 V.

  IOFF = Ids at Vgs = 0 V, Vds = 1.2 V and Vbs = 0 V.

  IG_ON = Igs at Vgs = 1.2 V, Vds = 1.2 V and Vbs = 0 V.

  IG_OFF = Igs at Vgs = 0 V, Vds = 1.2 V and Vbs = 0 V.
- SRAM Figures of Merit:

  Read current (ICell)

  Stand-By Current (Isb)

  Write Margin (WM)

  Static Noise Margin (SNM)

3. MAIN ELECTRICAL CHARACTERISTICS OF NHVTPDSP TRANSISTORS

W=0.18µm, L=0.1µm

PARAMETERS	SS	SF	TT	FS	FF	Units
VTLIN	573	583	514	444	452	mV
ION	44.05	47.8	57.3	66.4	74.6	µA
IOFF	0.48	1.32	2.28	6.76	15.5	pA
IG_ON	0.23	0.45	0.49	0.53	1.02	pA
IG_OFF	-63.6	131.7	-131.7	-131.7	-272.3	fA

4. MAIN ELECTRICAL CHARACTERISTICS OF NHVTPGSP TRANSISTORS

W=0.12µm, L=0.115µm

PARAMETERS	SS	SF	TT	FS	FF	Units
VTLIN	521	533	465	394	407	mV
ION	31.8	36.2	43.7	51.8	59.8	µA
IOFF	0.37	0.85	1.89	8.04	12.48	pA
IG_ON	0.18	0.35	0.38	0.42	0.83	pA
IG_OFF	-39.5	-84.8	-84.8	-84.8	-181	fA

5. MAIN ELECTRICAL CHARACTERISTICS OF PHVTPUSP TRANSISTORS

W=0.11µm, L=0.1µm

PARAMETERS	SS	SF	TT	FS	FF	Units
VTLIN	604	521	557	601	520	mV
ION	10.43	17.7	15.3	13	21.9	µA
IOFF	23	2110	297	66	4801	fA
IG_ON	51.2	117.7	114.3	108.9	24.6	fA
IG_OFF	-2.84	-5.66	-5.66	-5.66	-11.08	fA

6. MAIN ELECTRICAL CHARACTERISTICS OF SINGLE PORT SRAMS

1.15µm^2

PARAMETERS	SS	SF	TT	FS	FF	Units
Isb per Cell	1.32	5.97	6.19	16.6	44.6	pA
ICell	19.98	22.65	28.09	34.02	39.34	µA
WM	398.1	348.1	431.1	525.1	475.1	mV
SNM	257.9	271.1	235.1	190.0	203.9	mV

7. COMPARISON VERSUS PREVIOUS RELEASE

$1.15\mu m^2$

SRAM Single Port 1.15µm²		**V1.4.x**
ICell (µA)	TT 1.2V 25C	28
	SS 1.08V 125C	12.2
Isby (pA/cell)	TT 1.2V 25C	6.2
	FF 1.32V 25C	56.1
SNM (mV)	TT 1.2V 25C	235
	FS 1.08V 125C	156
WM (mV)	TT 1.2V 25C	431.1
	SF 1.08V -40C	275.1

8. MISMATCH PARAMETERS CHANGE

AVT (mV.µm)	**V1.4.x**
Pass Gate	5.15
Pull Down	6.07
Pull Up	5.04