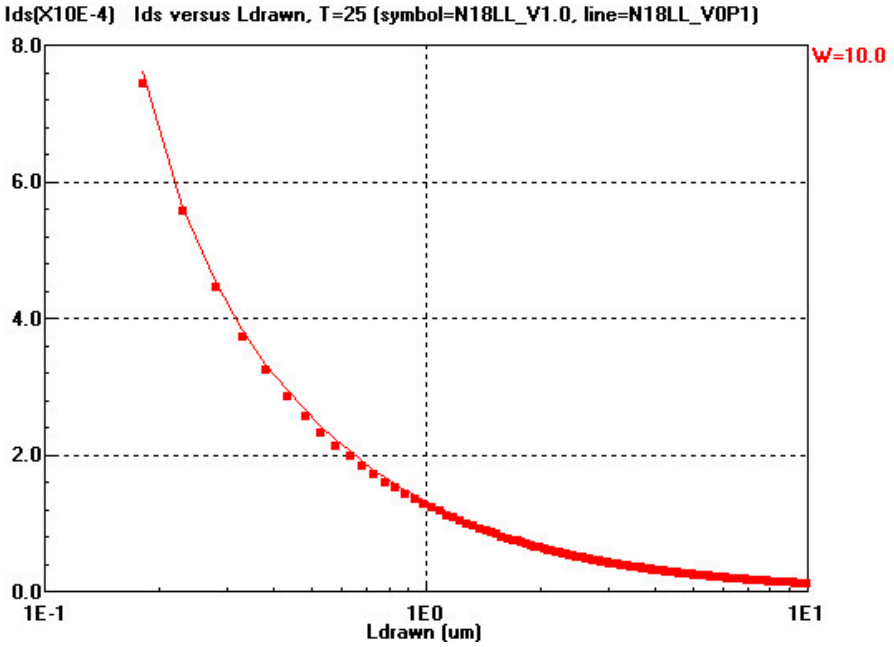

Fig.E1 Idlin versus L at Wdrawn = 10um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

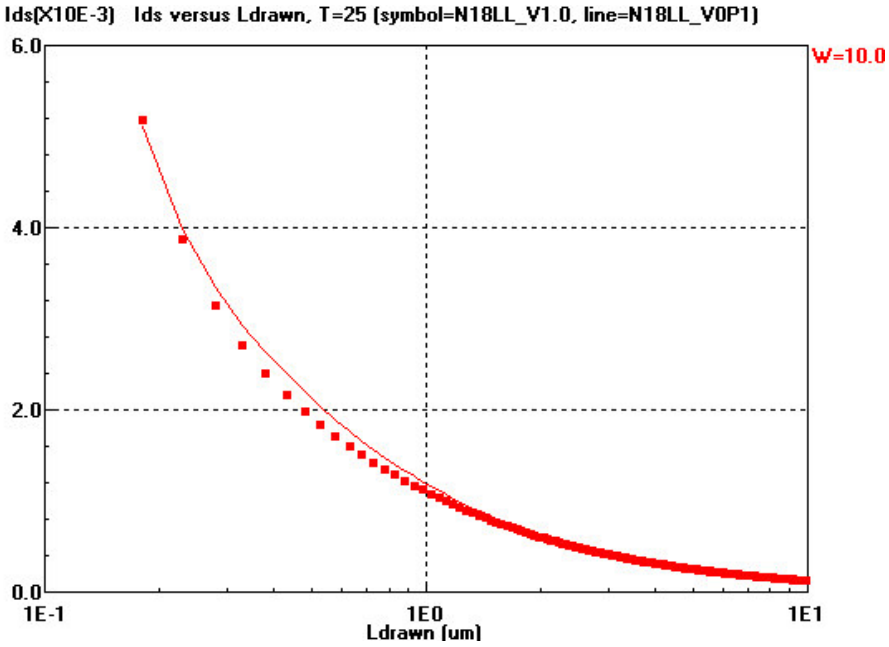

Fig.E2 Idsat versus L at Wdrawn = 10um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

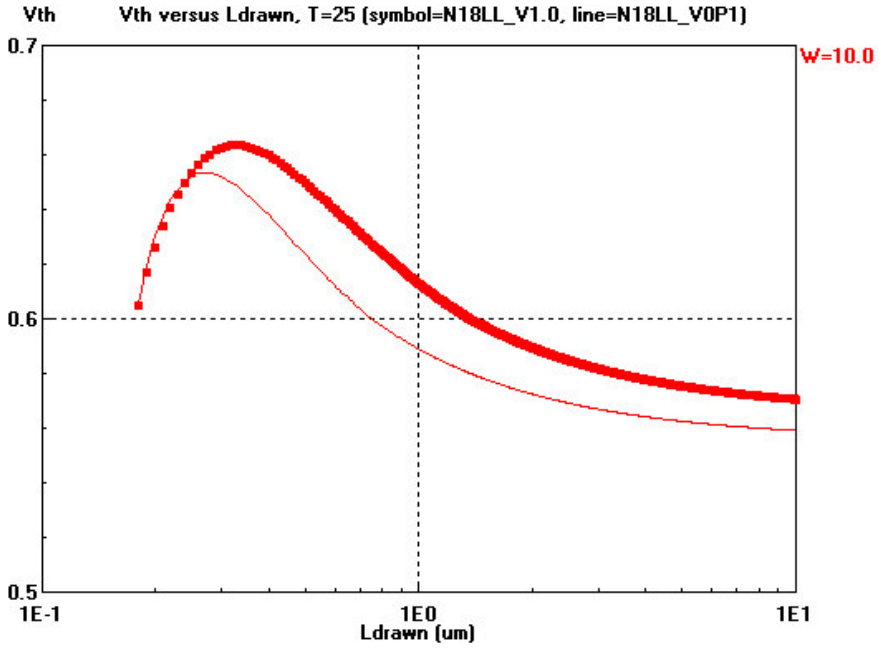

Fig.E3 Vth versus L at Wdrawn = 10um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

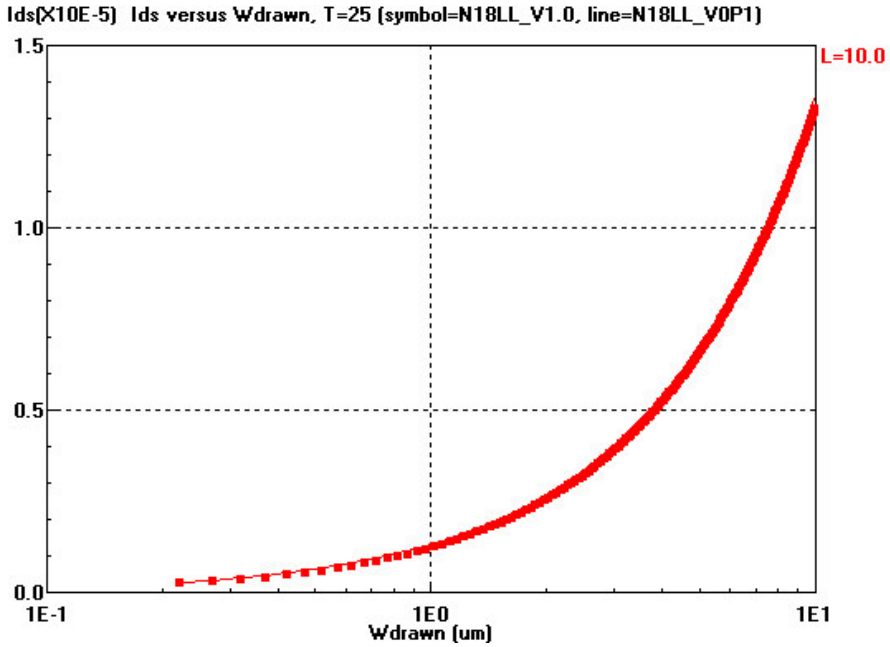

Fig.E4 Idlin versus W at Ldrawn = 10um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

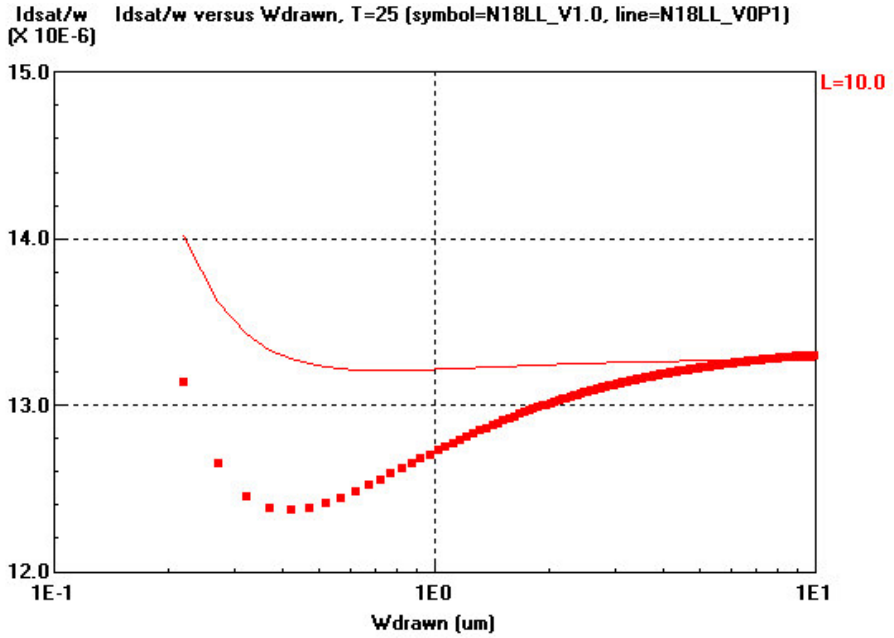

Fig.E5 Idsat/W versus W at Ldrawn = 10um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

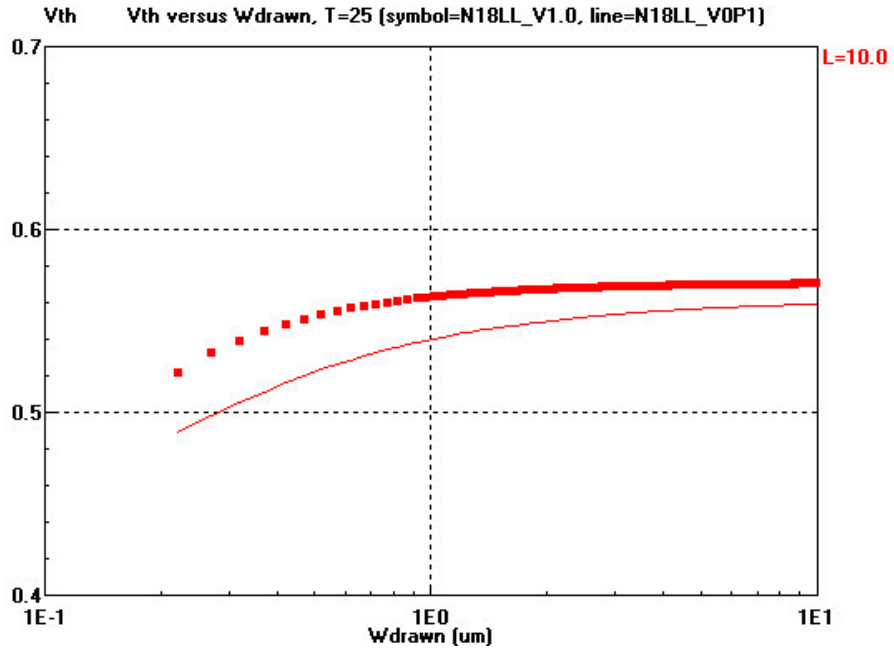

Fig.E6 Vth versus W at Ldrawn = 10um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

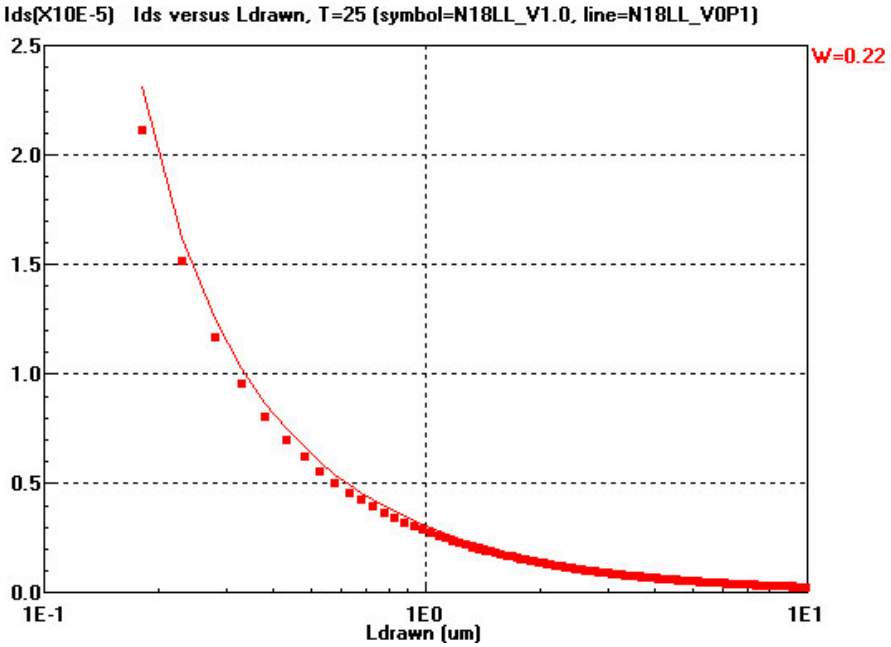

Fig.E7 Idlin versus L at Wdrawn = 0.22um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

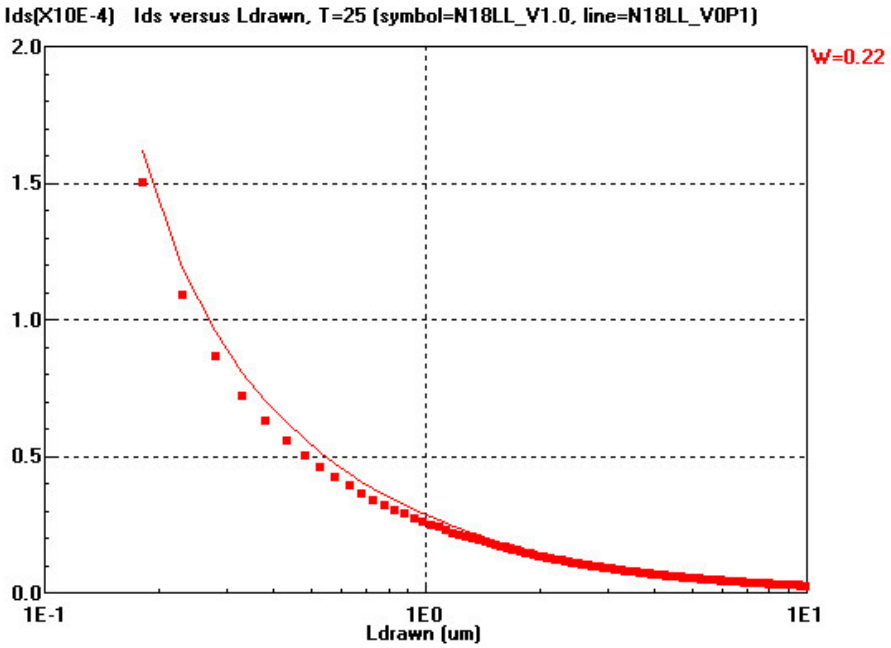

Fig.E8 Idsat versus L at Wdrawn = 0.22um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

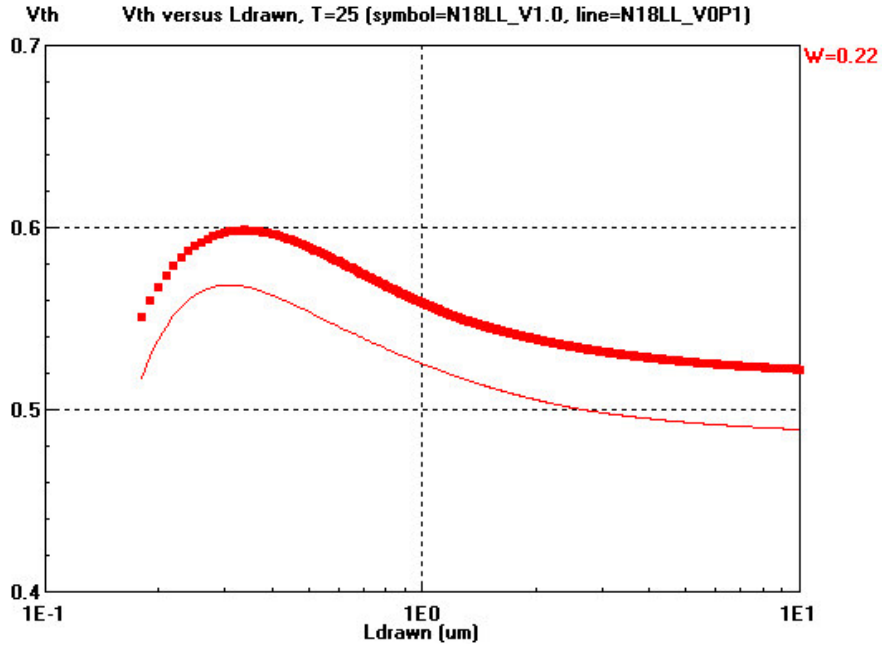

Fig.E9 Vth versus L at Wdrawn = 0.22um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

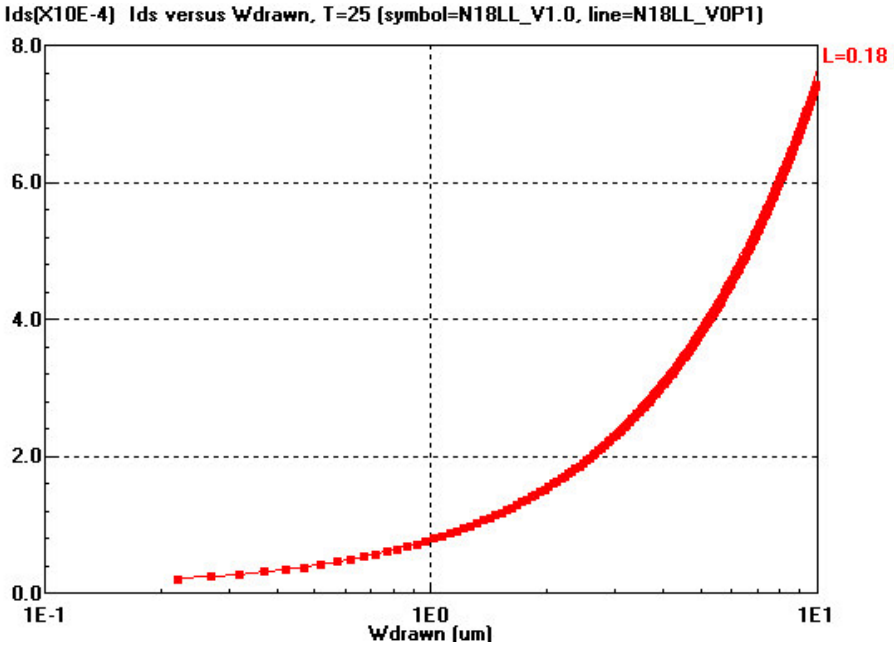

Fig.E10 Idlin versus W at Ldrawn = 0.18um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

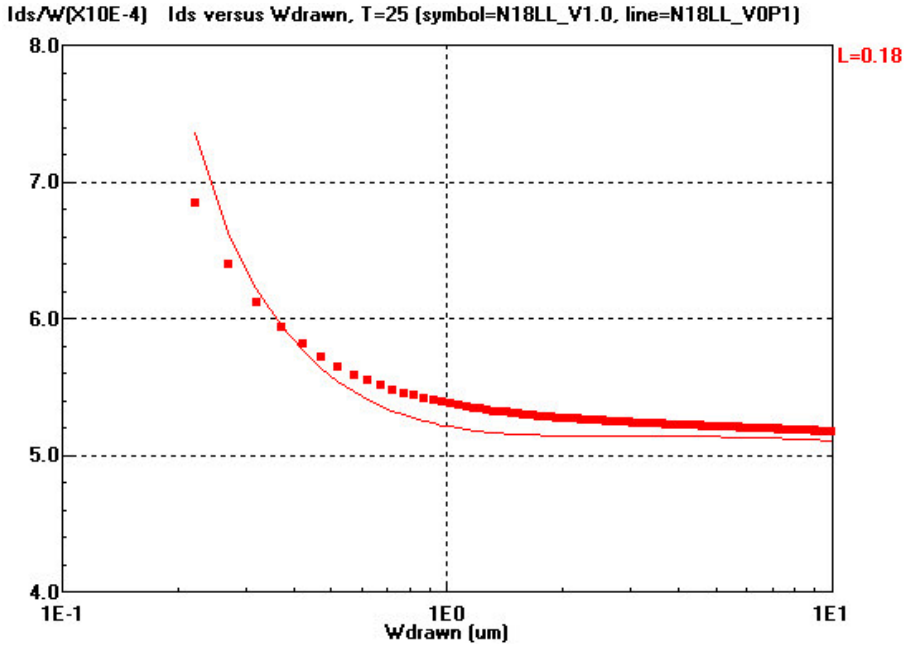

Fig.E11 Idsat/W versus W at Ldrawn = 0.18um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

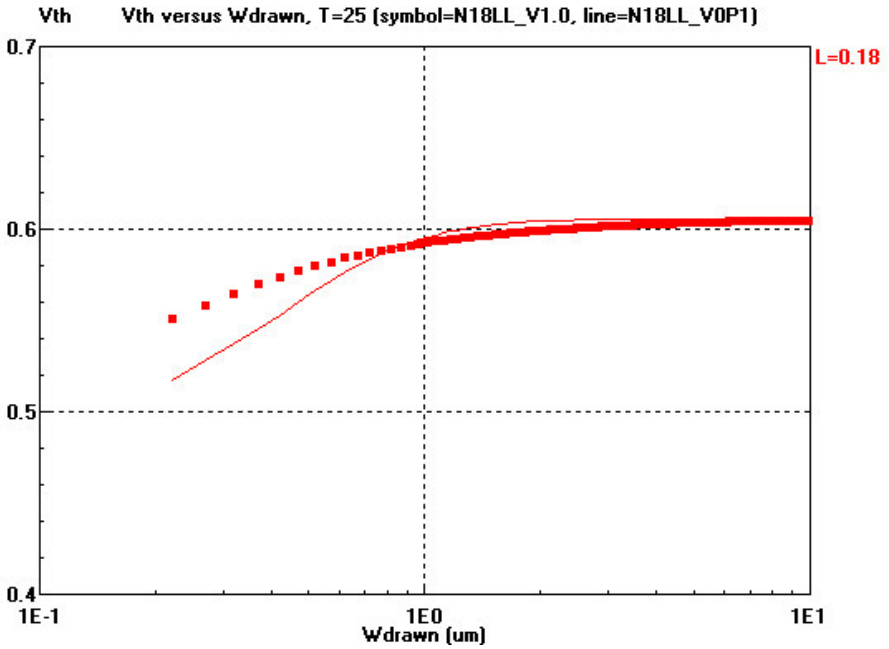

Fig.E12 Vth versus W at Ldrawn = 0.18um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

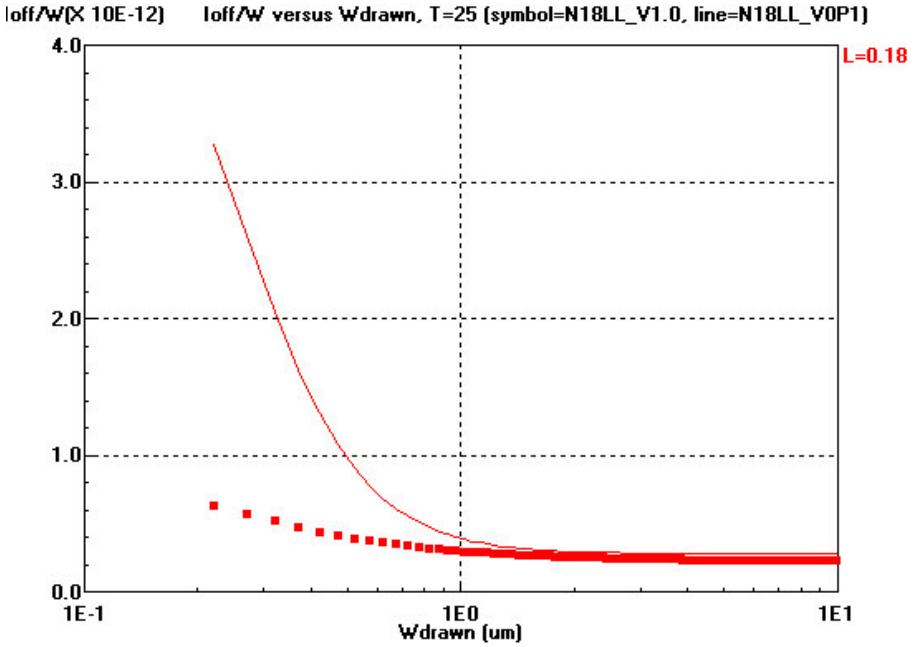

Fig.E13 Ioff/W versus W at Ldrawn = 0.18um for 1.8V NMOS; Symbol: Ver 1.3, Line: Ver 0.1

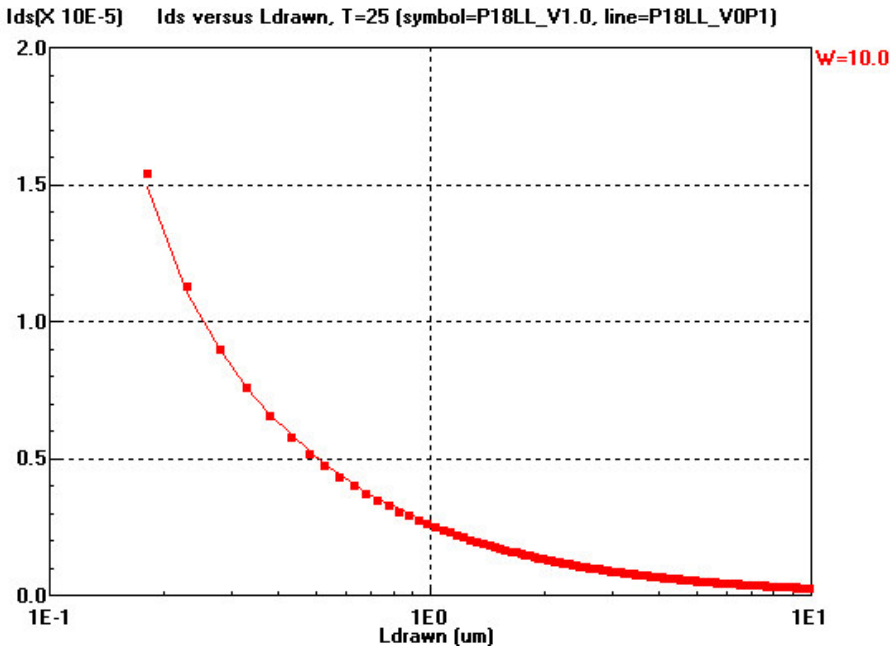

Fig.E14 Idlin versus L at Wdrawn = 10um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

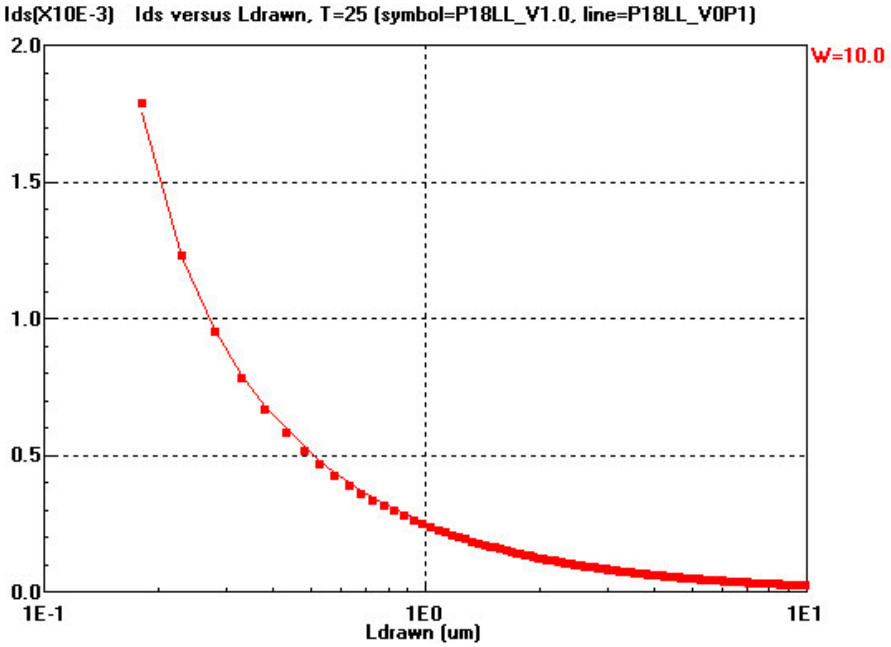

Fig.E15 Idsat versus L at Wdrawn = 10um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

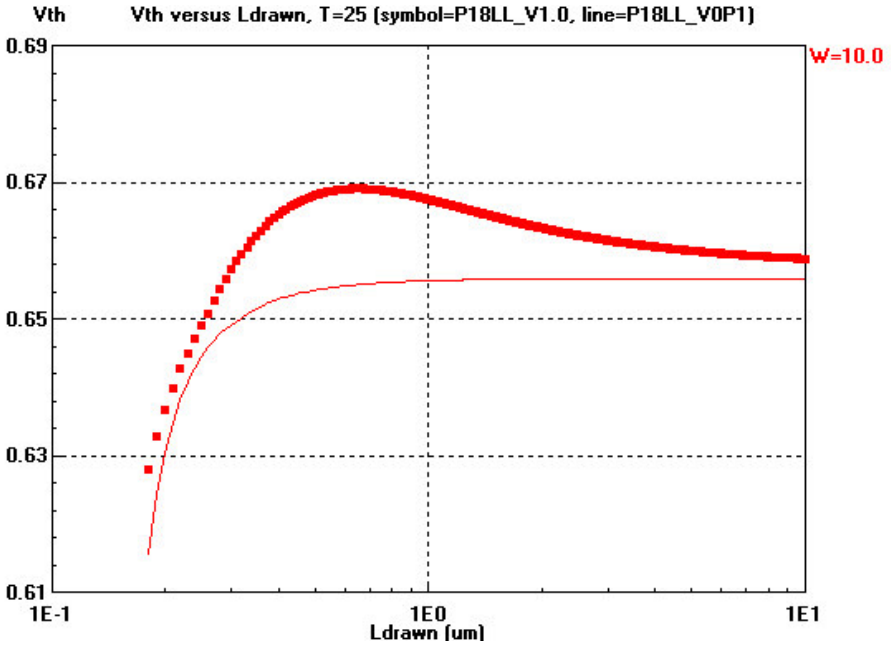

Fig.E16 Vth versus L at Wdrawn = 10um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

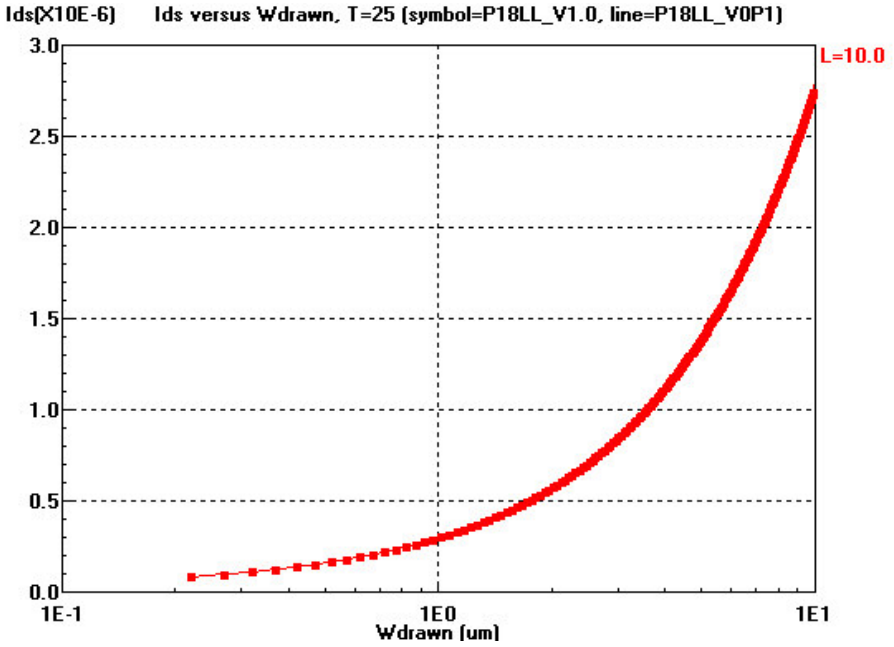

Fig.E17 Idlin versus W at Ldrawn = 10um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

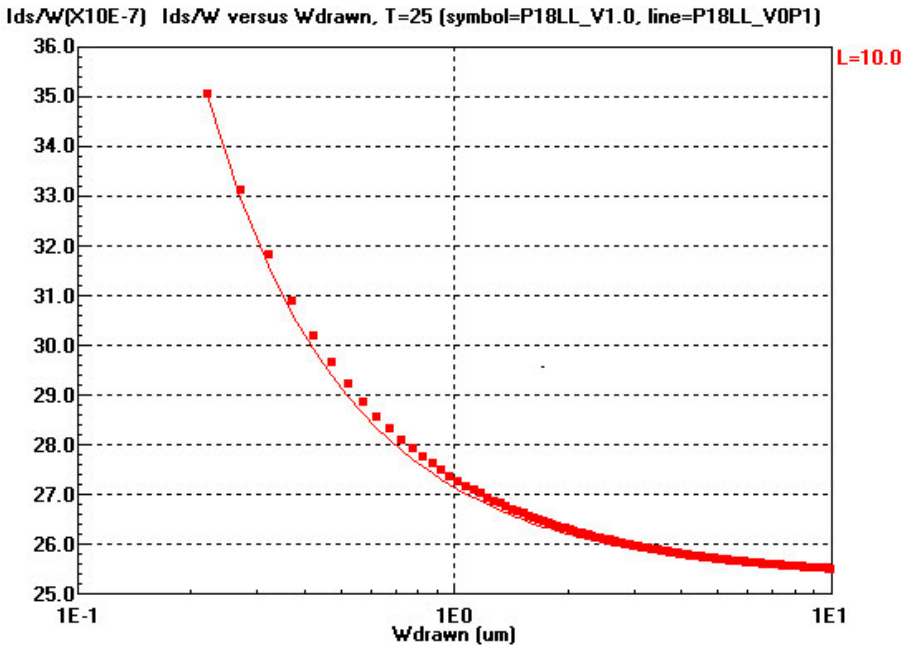

Fig.E18 Idsat/W versus W at Ldrawn = 10um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

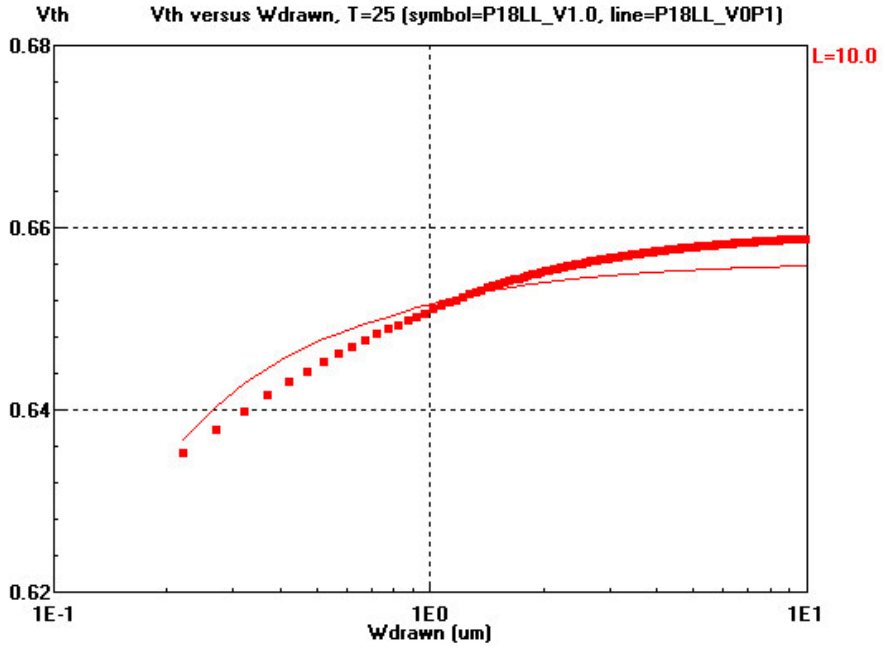

Fig.E19 Vth versus W at Ldrawn = 10um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

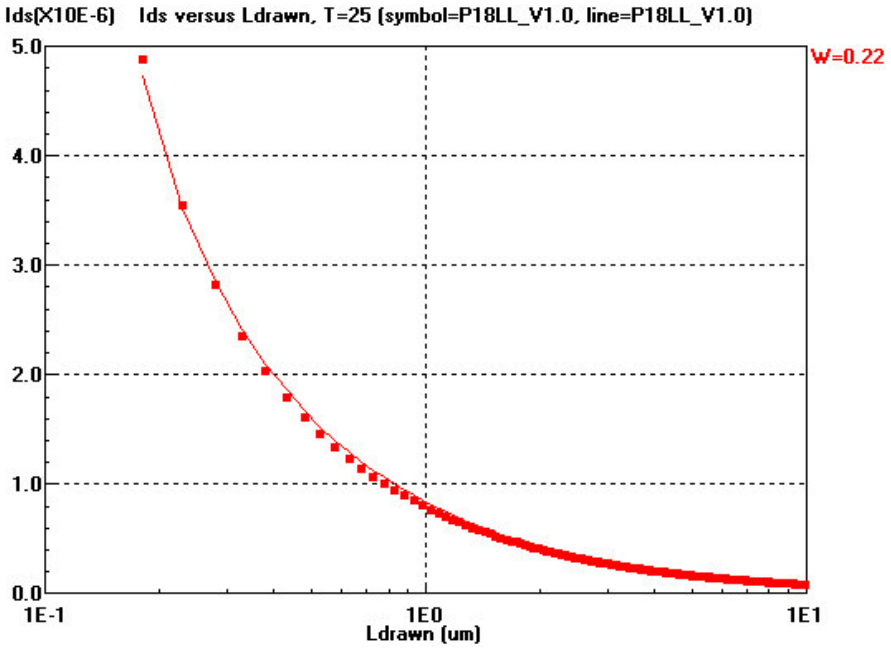

Fig.E20 Idlin versus L at Wdrawn = 0.22um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

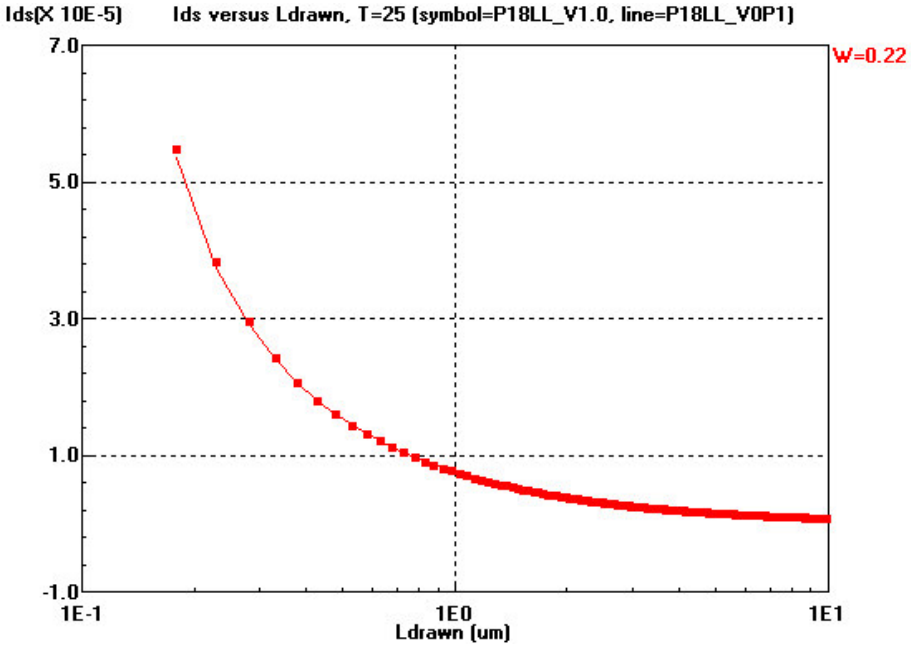

Fig.E21 Idsat versus L at Wdrawn = 0.22um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

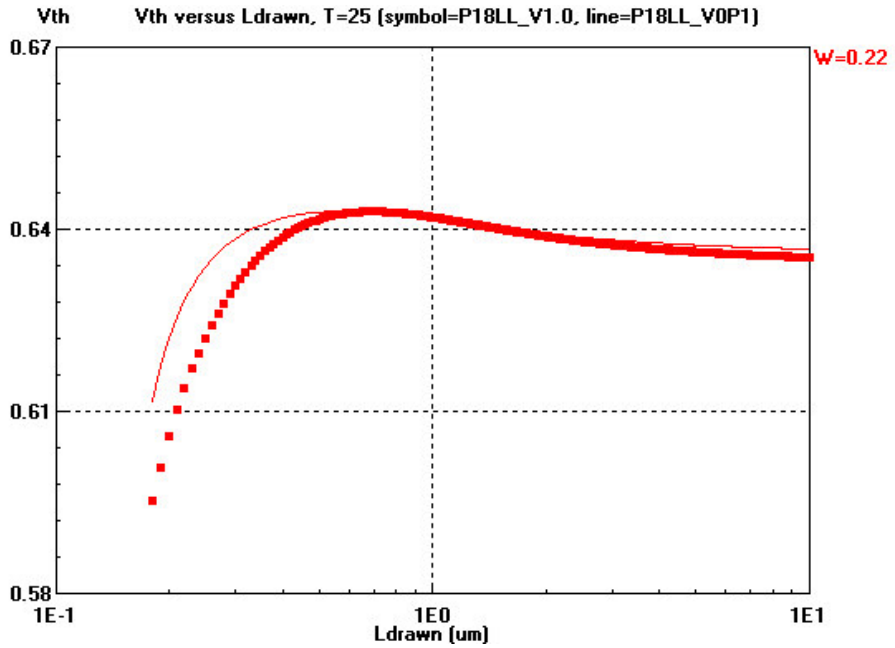

Fig.E22 Vth versus L at Wdrawn = 0.22um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

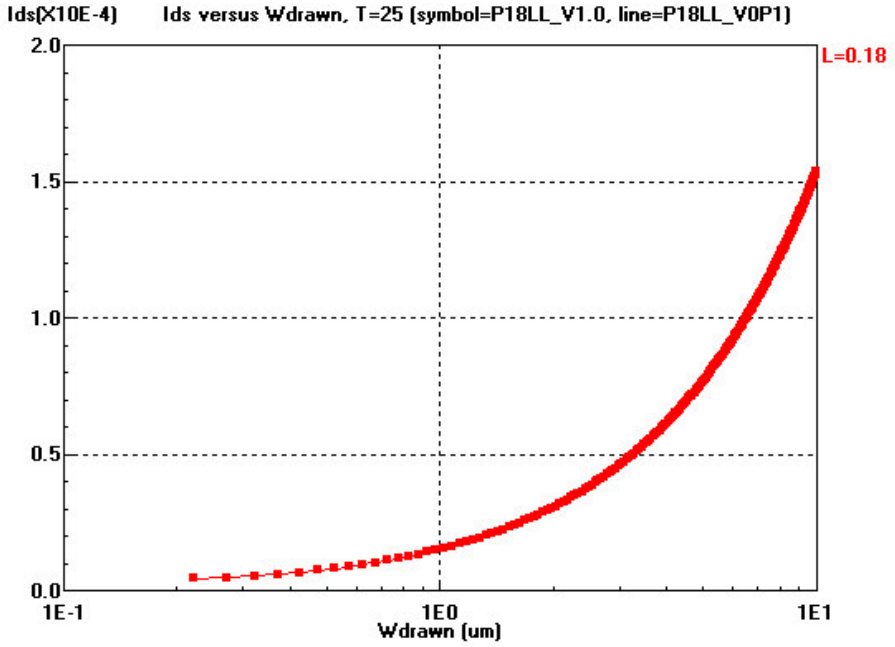

Fig.E23 Idlin versus W at Ldrawn = 0.18um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

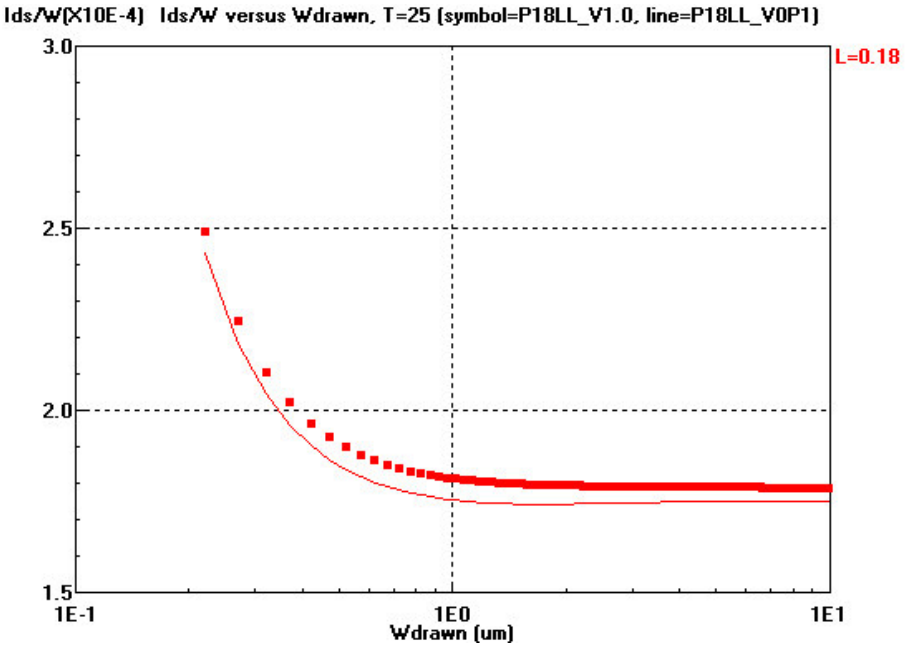

Fig.E24 Idsat/W versus W at Ldrawn = 0.18um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

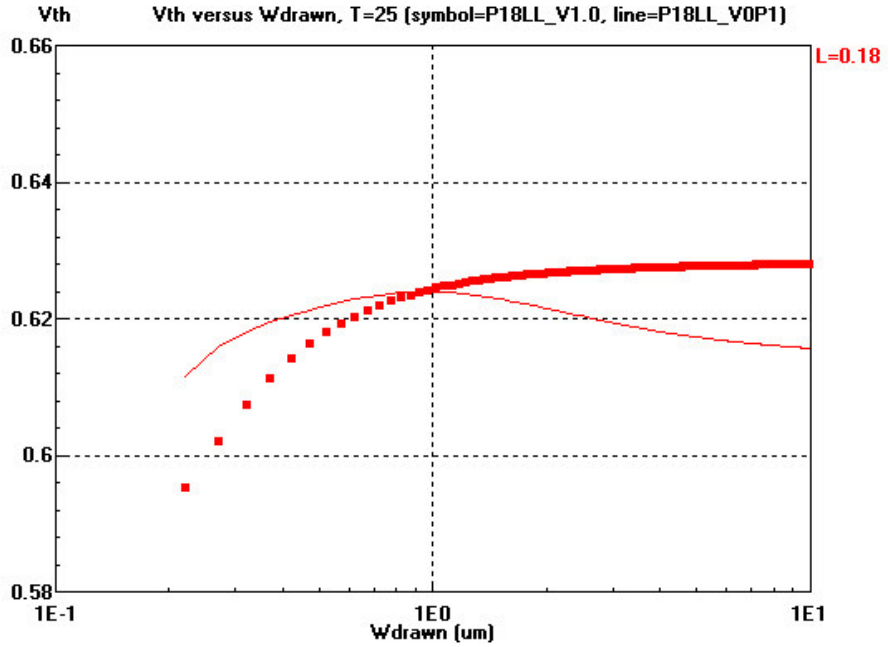

Fig.E25 Vth versus W at Ldrawn = 0.18um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

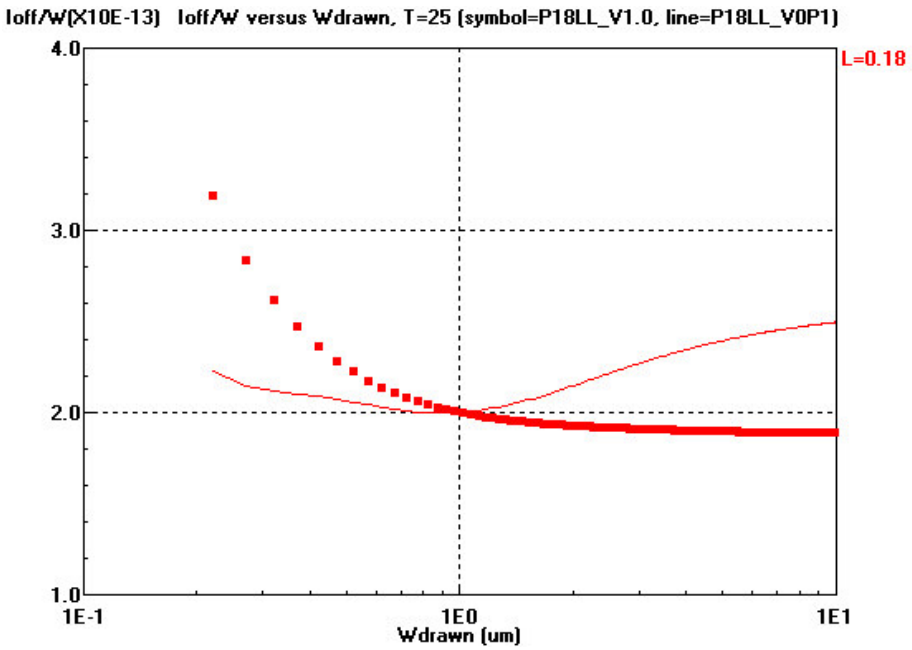

Fig.E26 Ioff/W versus W at Ldrawn = 0.18um for 1.8V PMOS; Symbol: Ver 1.3, Line: Ver 0.1

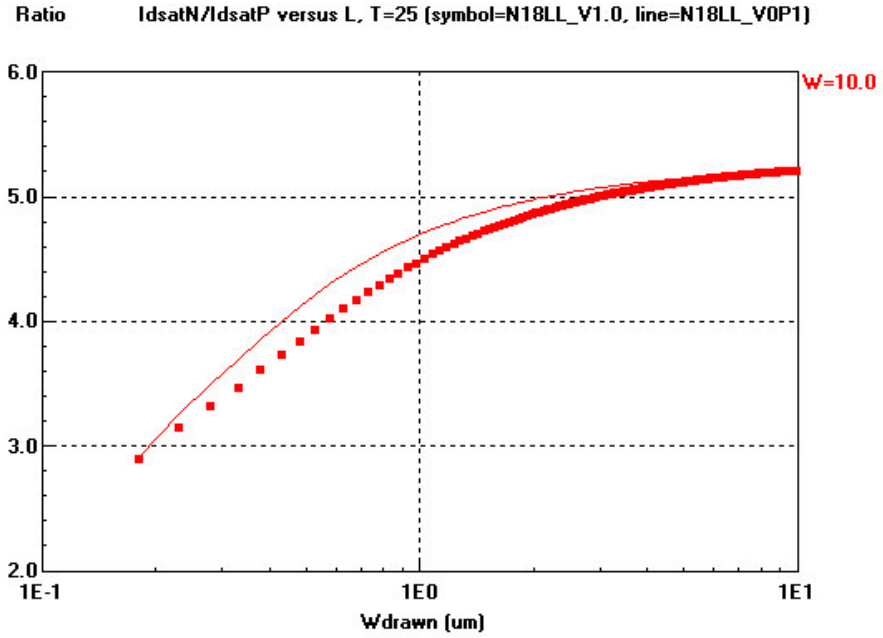

Fig.E27 IdsatN/IdsatP versus L at Wdrawn = 10um for 1.8V MOS; Symbol: Ver 1.3, Line: Ver 0.1

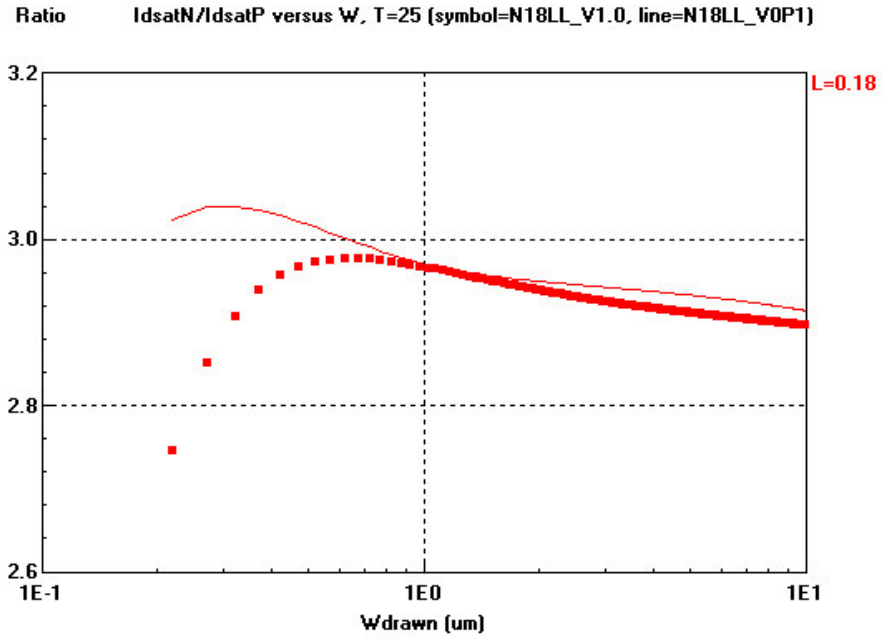

Fig.E28 IdsatN/IdsatP versus W at Ldrawn = 0.18um for 1.8V MOS; Symbol: Ver 1.3, Line: Ver 0.1

Table E1. Vth, Idsat, and Ioff of 10/0.18 for NMOS 1.8V

L018LL Version 0.1					
N18LL	TT	FF	SS	FNSP	SNFP
Tox (A)	38.5	37.4	39.6	38.5	38.5
Cgdo (fF/um)	0.345	0.3634	0.3266	0.345	0.345
Cgso (fF/um)	0.345	0.3634	0.3266	0.345	0.345
Vth (V)@10/0.18	0.605	0.506	0.698	0.528	0.677
Idsat (uA/um)@10/0.18	510.83	610.39	424.96	586.1	444.52
Ioff (pA/um)@10/0.18	0.285	6.2	0.0165	4.1	0.025
L018LL Version 1.3					
N18LL	TT	FF	SS	FNSP	SNFP
Tox (A)	38.5	37.4	39.6	38.5	38.5
Cgdo (fF/um)	0.368	0.3864	0.3496	0.368	0.368
Cgso (fF/um)	0.368	0.3864	0.3496	0.368	0.368
Vth (V)@10/0.18	0.605	0.51	0.696	0.533	0.674
Idsat (uA/um)@10/0.18	517.94	628.81	423.4	603.42	443.54
Ioff (pA/um)@10/0.18	0.23	4.55	0.0138	2.83	0.0221

Table E2. Vth, Idsat, and Ioff of 10/0.18 for PMOS 1.8V

L018LL Version 0.1					
P18LL	TT	FF	SS	FNSP	SNFP
Tox (A)	38.3	37.2	39.4	38.3	38.3
Cgdo (fF/um)	0.314	0.3308	0.2972	0.314	0.314
Cgso (fF/um)	0.314	0.3308	0.2972	0.314	0.314
Vth (V)@10/0.18	0.616	0.535	0.691	0.672	0.554
Idsat (uA/um)@10/0.18	175.29	218.85	141.43	147.55	210.91
Ioff (pA/um)@10/0.18	0.25	2.97	0.0256	0.0375	2.09
L018LL Version 1.3					
P18LL	TT	FF	SS	FNSP	SNFP
Tox (A)	38.1	37	39.2	38.1	38.1
Cgdo (fF/um)	0.335	0.3518	0.3182	0.335	0.335
Cgso (fF/um)	0.335	0.3518	0.3182	0.335	0.335
Vth (V)@10/0.18	0.628	0.545	0.705	0.681	0.571
Idsat (uA/um)@10/0.18	178.78	226.36	142.23	149.73	216.09
Ioff (pA/um)@10/0.18	0.189	2.62	0.0177	0.0303	1.52

Table E3. Ring Oscillator (inverter) Gate Delay for MOS 1.8V

Version 0.1 (Vdd=1.8V, unit:ps/stage)						
Temp	F.O.	TT	SS	FNSP	SNFP	FF
25C	1	34.64	44.04	35.57	34.19	27.50
125C	1	39.40	50.00	40.00	38.98	31.01
-40C	1	31.21	39.49	32.23	30.86	25.00
25C	3	70.20	88.53	72.31	68.72	55.69
125C	3	79.07	100.00	80.83	77.83	62.43
-40C	3	63.75	79.87	65.90	62.23	50.97
Version 1.3 (Vdd=1.8V, unit:ps/stage)						
Temp	F.O.	TT	SS	FNSP	SNFP	FF
25C	1	36.09	46.01	37.13	35.07	28.17
125C	1	40.81	52.23	41.78	39.73	31.64
-40C	1	32.56	41.23	33.55	31.66	25.65
25C	3	71.16	90.34	73.44	68.98	55.75
125C	3	80.05	101.98	82.18	77.73	62.27
-40C	3	64.52	81.32	66.68	62.57	51.04