sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Library

Cell Groups
ADDFx
ADDHx
AND2x
ANT
AOI21
BUFx
DFFSRx
DFFx
INVx
NAND2x
NOR2x
OAI21
OR2x
TBUFIx
TIEHI
TIELO
TNBUFIx
XNOR2
XOR2

ADDFx

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT			OUTPUT		
A	B	CI	CO	CON	S
0	0	0	0	1	0
0	0	1	0	1	1
0	1	0	0	1	1
0	1	1	1	0	0
1	0	0	0	1	1
1	0	1	1	0	0
1	1	0	1	0	0
1	1	1	1	0	1

Footprint

Cell Name	Area
ADDFX1	46.88640
ADDFXL	46.88640

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
ADDFX1	0.02103	0.02095	0.01602	0.20714	0.08870	0.20587
ADDFXL	0.02100	0.02092	0.01603	0.14330	0.08986	0.14508

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
ADDFX1	0.00000	0.61322	0.82681
ADDFXL	0.00000	0.51524	0.72883

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
ADDFX1	A->CO (RR)	0.13473	0.44978	1.80982
	B->CO (RR)	0.12764	0.42705	1.71745
	CI->CO (RR)	0.12912	0.45364	1.85607
	CON->CO (FR)	0.02984	0.17528	0.81409
ADDFXL	A->CO (RR)	0.13818	0.42690	1.50292
	B->CO (RR)	0.13095	0.40817	1.44806
	CI->CO (RR)	0.13253	0.43087	1.55106
	CON->CO (FR)	0.03452	0.19147	0.81629

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
ADDFX1	A->CO (FF)	0.17554	0.55649	2.19041
	B->CO (FF)	0.15562	0.51785	2.09477
	CI->CO (FF)	0.15254	0.53172	2.17536
	CON->CO (RF)	0.02387	0.13640	0.63173
ADDFXL	A->CO (FF)	0.17427	0.51056	1.75991
	B->CO (FF)	0.15449	0.47432	1.68843
	CI->CO (FF)	0.15124	0.48569	1.74682
	CON->CO (RF)	0.02593	0.14057	0.60077

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
ADDFX1	A->CON (FR)	0.13557	0.28556	0.79049
	B->CON (FR)	0.11635	0.25639	0.75550
	CI->CON (FR)	0.11256	0.26084	0.78162
ADDFXL	A->CON (FR)	0.12873	0.27992	0.78937
	B->CON (FR)	0.11005	0.25101	0.75436
	CI->CON (FR)	0.10570	0.25514	0.78051

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
ADDFX1	A->CON (RF)	0.08172	0.17529	0.48847
	B->CON (RF)	0.07713	0.17286	0.50496
	CI->CON (RF)	0.07611	0.17960	0.54057
ADDFXL	A->CON (RF)	0.07876	0.17287	0.48892
	B->CON (RF)	0.07449	0.17039	0.50536
	CI->CON (RF)	0.07313	0.17721	0.54101

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
ADDFX1	A->S (-R)	0.25174	0.59928	1.98578
	B->S (-R)	0.25847	0.60541	1.95845
	CI->S (-R)	0.22676	0.57178	1.96649
	CON->S (RR)	0.07612	0.20626	0.64296
ADDFXL	A->S (-R)	0.24333	0.55646	1.67449
	B->S (-R)	0.25070	0.56499	1.66760
	CI->S (-R)	0.21829	0.52916	1.65773
	CON->S (RR)	0.07767	0.21444	0.62693

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
ADDFX1	A->S (-F)	0.20867	0.49684	1.57462
	B->S (-F)	0.20614	0.47446	1.50423
	CI->S (-F)	0.20241	0.49900	1.61834
	CON->S (FF)	0.08790	0.22750	0.69282
ADDFXL	A->S (-F)	0.19994	0.45454	1.29874
	B->S (-F)	0.19729	0.43449	1.25024
	CI->S (-F)	0.19356	0.45662	1.34407
	CON->S (FF)	0.08608	0.22529	0.65182

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
ADDFX1	A	0.00404	0.00424	0.00591
	B	0.00626	0.00622	0.00744
	CI	0.00660	0.00690	0.00866
ADDFXL	A	0.00358	0.00331	0.00403
	B	0.00520	0.00506	0.00578
	CI	0.00553	0.00570	0.00678

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
ADDFX1	A	0.01754	0.01793	0.02030
	B	0.01845	0.01893	0.02056
	CI	0.01618	0.01689	0.01878
ADDFXL	A	0.01759	0.01761	0.01836
	B	0.01735	0.01770	0.01856
	CI	0.01508	0.01564	0.01684

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
ADDFX1	A	0.01859	0.01861	0.01901
	B	0.01840	0.01864	0.01907
	CI	0.01614	0.01656	0.01741
ADDFXL	A	0.01754	0.01753	0.01789
	B	0.01733	0.01755	0.01793
	CI	0.01506	0.01546	0.01627

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
ADDFX1	A	0.00455	0.00427	0.00471
	B	0.00617	0.00601	0.00641
	CI	0.00657	0.00671	0.00748
ADDFXL	A	0.00350	0.00322	0.00361
	B	0.00513	0.00495	0.00529
	CI	0.00549	0.00564	0.00633

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
ADDFX1	A	0.01755	0.01793	0.02026
	B	0.01845	0.01892	0.02051
	CI	0.01618	0.01689	0.01869
ADDFXL	A	0.01757	0.01761	0.01838
	B	0.01735	0.01771	0.01857
	CI	0.01508	0.01565	0.01684

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
ADDFX1	A	0.03925	0.03919	0.03982
	B	0.03461	0.03397	0.03648
	CI	0.03162	0.03119	0.03201
ADDFXL	A	0.03781	0.03761	0.03815
	B	0.03320	0.03253	0.03516
	CI	0.03020	0.02984	0.03072

ADDHx

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT		OUTPUT		
A	B	CO	CON	S
0	0	0	1	0
0	1	0	0	1
1	0	0	0	1
1	1	1	1	0

Footprint

Cell Name	Area
ADDHX1	27.83880
ADDHXL	27.83880

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
ADDHX1	0.01022	0.01124	0.21513	0.09900	0.22002
ADDHXL	0.01022	0.01124	0.12748	0.10142	0.12985

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
ADDHX1	0.00000	0.70979	0.81980
ADDHXL	0.00000	0.48792	0.64349

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
ADDHX1	A->CO (RR)	0.08747	0.21800	0.65753
	B->CO (RR)	0.09059	0.21558	0.65061
ADDHXL	A->CO (RR)	0.09012	0.23057	0.63402
	B->CO (RR)	0.09326	0.22829	0.62857

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
ADDHX1	A->CO (FF)	0.07588	0.20790	0.67087
	B->CO (FF)	0.08142	0.21487	0.68424
ADDHXL	A->CO (FF)	0.07641	0.21022	0.61803
	B->CO (FF)	0.08175	0.21697	0.63154

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
ADDHX1	A->CON (RR)	B	0.11954	0.20823	0.42042
	A->CON (FR)	!B	0.07716	0.22648	0.76479
	B->CON (RR)	A	0.12247	0.20543	0.41274
	B->CON (FR)	!A	0.09569	0.24732	0.77965
ADDHXL	A->CON (RR)	B	0.10739	0.19489	0.40269
	A->CON (FR)	!B	0.06892	0.21901	0.76655
	B->CON (RR)	A	0.11038	0.19234	0.39689
	B->CON (FR)	!A	0.08743	0.24035	0.78138

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
ADDHX1	A->CON (FF)	B	0.11327	0.22958	0.56565
	A->CON (RF)	!B	0.04976	0.15446	0.52907
	B->CON (FF)	A	0.11242	0.23643	0.59580
	B->CON (RF)	!A	0.05782	0.15790	0.51345
ADDHXL	A->CON (FF)	B	0.10289	0.21709	0.54559
	A->CON (RF)	!B	0.04620	0.15162	0.53198
	B->CON (FF)	A	0.10220	0.22432	0.57662
	B->CON (RF)	!A	0.05435	0.15529	0.51620

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
ADDHX1	A->S (RR)	!B	0.09711	0.41522	1.83676
	A->S (FR)	B	0.16081	0.48435	1.84464
	B->S (RR)	!A	0.10505	0.40739	1.75512
	B->S (FR)	A	0.16076	0.50271	1.94187
	CON->S (FR)	-	0.03161	0.17778	0.83144
ADDHXL	A->S (RR)	!B	0.09897	0.37890	1.40677
	A->S (FR)	B	0.15607	0.44083	1.40324
	B->S (RR)	!A	0.10710	0.37500	1.35766
	B->S (FR)	A	0.15602	0.45548	1.46888
	CON->S (FR)	-	0.03710	0.19839	0.82232

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
ADDHX1	A->S (FF)	!B	0.11269	0.47752	2.11665
	A->S (RF)	B	0.15218	0.39969	1.40013
	B->S (FF)	!A	0.13126	0.49869	2.13812
	B->S (RF)	A	0.15509	0.39679	1.39261
	CON->S (RF)	-	0.02225	0.13447	0.63608
ADDHXL	A->S (FF)	!B	0.10983	0.41540	1.54911
	A->S (RF)	B	0.14388	0.35592	1.02646
	B->S (FF)	!A	0.12832	0.43625	1.56617
	B->S (RF)	A	0.14684	0.35324	1.02046
	CON->S (RF)	-	0.02561	0.14275	0.59714

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
ADDHX1	A	0.00000	0.00000	0.00000
	A	0.00788	0.00766	0.00816
	B	0.00000	0.00000	0.00000
	B	0.00703	0.00675	0.00707
ADDHXL	A	0.00000	0.00000	0.00000
	A	0.00640	0.00611	0.00675
	B	0.00000	0.00000	0.00000
	B	0.00555	0.00518	0.00566

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
ADDHX1	A	0.00000	0.00000	0.00000
	A	0.01245	0.01220	0.01349
	B	0.00000	0.00000	0.00000
	B	0.01299	0.01322	0.01481
ADDHXL	A	0.00000	0.00000	0.00000
	A	0.01097	0.01068	0.01184
	B	0.00000	0.00000	0.00000
	B	0.01151	0.01160	0.01299

Internal switching power(pJ) to CON rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
ADDHX1	A	B	0.00000	0.00000	0.00000
	A	B	0.00788	0.00764	0.00826
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01101	0.01105	0.01170
	B	A	0.00000	0.00000	0.00000
	B	A	0.00703	0.00673	0.00719
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01241	0.01234	0.01257
ADDHXL	A	B	0.00000	0.00000	0.00000
	A	B	0.00639	0.00608	0.00672
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00999	0.00995	0.01053
	B	A	0.00000	0.00000	0.00000
	B	A	0.00555	0.00516	0.00565
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01139	0.01129	0.01142

Internal switching power(pJ) to CON falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
ADDHX1	A	B	0.00000	0.00000	0.00000
	A	B	0.01245	0.01221	0.01339
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00158	0.00164	0.00206
	B	A	0.00000	0.00000	0.00000
	B	A	0.01299	0.01314	0.01461
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00281	0.00274	0.00307
ADDHXL	A	B	0.00000	0.00000	0.00000
	A	B	0.01097	0.01068	0.01184
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00034	0.00035	0.00059
	B	A	0.00000	0.00000	0.00000
	B	A	0.01152	0.01159	0.01297
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00157	0.00144	0.00164

Internal switching power(pJ) to S rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
ADDHX1	A	B	0.00000	0.00000	0.00000
	A	B	0.01246	0.01222	0.01362
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00161	0.00176	0.00250
	B	A	0.00000	0.00000	0.00000
	B	A	0.01300	0.01324	0.01505
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00284	0.00287	0.00344
ADDHXL	A	B	0.00000	0.00000	0.00000
	A	B	0.01099	0.01069	0.01190
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00036	0.00036	0.00066
	B	A	0.00000	0.00000	0.00000
	B	A	0.01152	0.01161	0.01306
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00159	0.00149	0.00174

Internal switching power(pJ) to S falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
ADDHX1	A	B	0.00000	0.00000	0.00000
	A	B	0.00789	0.00766	0.00818
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01103	0.01118	0.01186
	B	A	0.00000	0.00000	0.00000
	B	A	0.00703	0.00675	0.00707
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01243	0.01249	0.01289
ADDHXL	A	B	0.00000	0.00000	0.00000
	A	B	0.00641	0.00609	0.00674
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01000	0.01002	0.01053
	B	A	0.00000	0.00000	0.00000
	B	A	0.00556	0.00517	0.00567
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01141	0.01132	0.01148

AND2x

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Truth Table

INPUT		OUTPUT
A	B	Y
0	x	0
1	0	0
1	1	1

Footprint

Cell Name	Area
AND2X1	12.45420
AND2X2	15.38460
AND2X4	21.24540
AND2X6	27.10620
AND2X8	32.96700
AND2XL	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
AND2X1	0.00553	0.00565	0.21489
AND2X2	0.00554	0.00566	0.40494
AND2X4	0.00556	0.00568	0.73894
AND2X6	0.00561	0.00570	1.02063
AND2X8	0.00560	0.00573	1.28454
AND2XL	0.00427	0.00439	0.14698

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
AND2X1	0.00000	0.34131	0.54504
AND2X2	0.00000	0.54480	0.55227
AND2X4	0.00000	0.95176	1.08283
AND2X6	0.00000	1.35873	1.62063
AND2X8	0.00000	1.76569	2.15842
AND2XL	0.00000	0.21889	0.34890

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
AND2X1	**A->Y (RR)**	0.06730	0.18512	0.59193
	B->Y (RR)	0.07130	0.18468	0.58696
AND2X2	**A->Y (RR)**	0.07580	0.18804	0.62999
	B->Y (RR)	0.07980	0.18604	0.62135
AND2X4	**A->Y (RR)**	0.10211	0.21718	0.71274
	B->Y (RR)	0.10610	0.21414	0.69864
AND2X6	**A->Y (RR)**	0.12828	0.24488	0.77439
	B->Y (RR)	0.13217	0.24199	0.75478
AND2X8	**A->Y (RR)**	0.15479	0.27304	0.83089
	B->Y (RR)	0.15876	0.27049	0.80750
AND2XL	**A->Y (RR)**	0.07495	0.20419	0.59666
	B->Y (RR)	0.07906	0.20322	0.59062

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
AND2X1	**A->Y (FF)**	0.05913	0.17904	0.59709
	B->Y (FF)	0.06330	0.18493	0.61196
AND2X2	**A->Y (FF)**	0.06571	0.17984	0.62348
	B->Y (FF)	0.07003	0.18510	0.63503
AND2X4	**A->Y (FF)**	0.08751	0.20097	0.67893
	B->Y (FF)	0.09173	0.20500	0.68837
AND2X6	**A->Y (FF)**	0.11321	0.22660	0.72107
	B->Y (FF)	0.11708	0.23066	0.72865
AND2X8	**A->Y (FF)**	0.13680	0.25033	0.75867
	B->Y (FF)	0.14070	0.25424	0.76527
AND2XL	**A->Y (FF)**	0.06483	0.19163	0.58863
	B->Y (FF)	0.06973	0.19815	0.60432

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
AND2X1	A	0.00000	0.00000	0.00000
	A	0.00574	0.00542	0.00846
	B	0.00000	0.00000	0.00000
	B	0.00583	0.00514	0.00699
AND2X2	A	0.00000	0.00000	0.00000
	A	0.01187	0.01179	0.01434
	B	0.00000	0.00000	0.00000
	B	0.01197	0.01166	0.01319
AND2X4	A	0.00000	0.00000	0.00000
	A	0.02533	0.02548	0.02781
	B	0.00000	0.00000	0.00000
	B	0.02541	0.02514	0.02714
AND2X6	A	0.00000	0.00000	0.00000
	A	0.04037	0.03935	0.04190
	B	0.00000	0.00000	0.00000
	B	0.04049	0.03931	0.04124
AND2X8	A	0.00000	0.00000	0.00000
	A	0.05638	0.05332	0.05604
	B	0.00000	0.00000	0.00000
	B	0.05652	0.05331	0.05527
AND2XL	A	0.00000	0.00000	0.00000
	A	0.00421	0.00390	0.00572
	B	0.00000	0.00000	0.00000
	B	0.00431	0.00372	0.00489

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
AND2X1	A	0.00000	0.00000	0.00000
	A	0.01507	0.01552	0.01979
	B	0.00000	0.00000	0.00000
	B	0.01676	0.01697	0.02086
AND2X2	A	0.00000	0.00000	0.00000
	A	0.01939	0.02041	0.02435
	B	0.00000	0.00000	0.00000
	B	0.02111	0.02149	0.02529
AND2X4	A	0.00000	0.00000	0.00000
	A	0.03125	0.03188	0.03623
	B	0.00000	0.00000	0.00000
	B	0.03279	0.03295	0.03635
AND2X6	A	0.00000	0.00000	0.00000
	A	0.04333	0.04370	0.04851
	B	0.00000	0.00000	0.00000
	B	0.04471	0.04395	0.04781
AND2X8	A	0.00000	0.00000	0.00000
	A	0.05850	0.05509	0.06079
	B	0.00000	0.00000	0.00000
	B	0.05965	0.05524	0.05921
AND2XL	A	0.00000	0.00000	0.00000
	A	0.01166	0.01183	0.01442
	B	0.00000	0.00000	0.00000
	B	0.01294	0.01295	0.01540

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AND2X1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00586	-0.00585	-0.00586
AND2X2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00585	-0.00585	-0.00586
AND2X4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00585	-0.00585	-0.00586
AND2X6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00588	-0.00588	-0.00588
AND2X8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00585	-0.00585	-0.00585
AND2XL	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00431	-0.00434	-0.00431

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AND2X1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00586	0.00589	0.00586
AND2X2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00585	0.00589	0.00586
AND2X4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00585	0.00589	0.00586
AND2X6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00588	0.00592	0.00588
AND2X8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00585	0.00589	0.00585
AND2XL	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00431	0.00434	0.00431

Passive power(pJ) for B rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AND2X1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00553	-0.00555	-0.00553
AND2X2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00553	-0.00555	-0.00553
AND2X4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00553	-0.00555	-0.00553
AND2X6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00553	-0.00555	-0.00553
AND2X8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00553	-0.00555	-0.00553
AND2XL	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00408	-0.00409	-0.00408

Passive power(pJ) for B falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AND2X1	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00555	0.00556	0.00554
AND2X2	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00555	0.00556	0.00554
AND2X4	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00555	0.00556	0.00554
AND2X6	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00555	0.00556	0.00554
AND2X8	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00555	0.00556	0.00553
AND2XL	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00410	0.00410	0.00408

ANT

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
ANT	6.59340

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
ANT	0.07064

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
ANT	0.00000	411233.00000	822466.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
ANT	0.00000	0.00000	0.00000
	-0.00210	0.01903	0.10740

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
ANT	0.00000	0.00000	0.00000
	0.53534	0.46357	0.15420

AOI21

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	B0	Y
0	x	0	1
x	x	1	0
1	0	0	1
1	1	x	0

Footprint

Cell Name	Area
AOI21XL	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
AOI21XL	0.00527	0.00544	0.00528	0.09827

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
AOI21XL	0.00000	0.12797	0.26890

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
AOI21XL	A0->Y (FR)	0.07572	0.23362	0.77687
	A1->Y (FR)	0.06595	0.21632	0.74180
	B0->Y (FR)	0.05575	0.21066	0.76935

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
AOI21XL	A0->Y (RF)	0.04615	0.14027	0.46247
	A1->Y (RF)	0.04226	0.14245	0.49521
	B0->Y (RF)	0.03017	0.13024	0.48669

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
AOI21XL	A0	0.00000	0.00000	0.00000
	A0	0.01348	0.01334	0.01349
	A1	0.00000	0.00000	0.00000
	A1	0.01146	0.01128	0.01141
	B0	0.01029	0.01010	0.01101

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
AOI21XL	A0	0.00000	0.00000	0.00000
	A0	0.00259	0.00221	0.00232
	A1	0.00000	0.00000	0.00000
	A1	0.00265	0.00230	0.00257
	B0	-0.00144	-0.00149	-0.00123

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AOI21XL	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00484	-0.00511	-0.00515
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00523	-0.00525	-0.00524
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00523	-0.00525	-0.00523

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AOI21XL	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00515	0.00519	0.00515
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00524	0.00527	0.00524
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00526	0.00527	0.00523

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AOI21XL	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00479	-0.00505	-0.00510
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00518	-0.00519	-0.00518
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00560	-0.00561	-0.00561

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AOI21XL	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00510	0.00513	0.00510
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00518	0.00521	0.00519
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00560	0.00564	0.00561

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AOI21XL	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00242	-0.00244	-0.00242

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
AOI21XL	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00247	0.00248	0.00245

BUFx

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
BUFX1	9.52380
BUFX2	12.45420
BUFX4	18.31500
BUFX6	24.17580
BUFX8	30.03660
BUFXL	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
BUFX1	0.00562	0.21617
BUFX2	0.00563	0.41640
BUFX4	0.00565	0.77020
BUFX6	0.00566	1.08806
BUFX8	0.00569	1.35608
BUFXL	0.00440	0.14976

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
BUFX1	0.00000	0.27614	0.27614
BUFX2	0.00000	0.41420	0.54504
BUFX4	0.00000	0.69034	1.08283
BUFX6	0.00000	0.96647	1.62063
BUFX8	0.00000	1.24261	2.15843
BUFXL	0.00000	0.17817	0.17817

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
BUFX1	**A->Y (RR)**	0.05391	0.16631	0.55716
BUFX2	**A->Y (RR)**	0.05873	0.16437	0.59291
BUFX4	**A->Y (RR)**	0.07765	0.18536	0.66494
BUFX6	**A->Y (RR)**	0.09555	0.20502	0.71907
BUFX8	**A->Y (RR)**	0.11451	0.22604	0.76496
BUFXL	**A->Y (RR)**	0.06071	0.18546	0.56627

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
BUFX1	**A->Y (FF)**	0.05668	0.17570	0.59480
BUFX2	**A->Y (FF)**	0.06361	0.17813	0.63010
BUFX4	**A->Y (FF)**	0.08553	0.19973	0.68938
BUFX6	**A->Y (FF)**	0.11048	0.22515	0.73661
BUFX8	**A->Y (FF)**	0.13451	0.24886	0.77241
BUFXL	**A->Y (FF)**	0.06296	0.18978	0.59178

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
BUFX1	A	0.00000	0.00000	0.00000
	A	0.00534	0.00500	0.00799
BUFX2	A	0.00000	0.00000	0.00000
	A	0.01141	0.01140	0.01400
BUFX4	A	0.00000	0.00000	0.00000
	A	0.02454	0.02515	0.02760
BUFX6	A	0.00000	0.00000	0.00000
	A	0.03838	0.03887	0.04151
BUFX8	A	0.00000	0.00000	0.00000
	A	0.05285	0.05246	0.05562
BUFXL	A	0.00000	0.00000	0.00000
	A	0.00403	0.00367	0.00555

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
BUFX1	**A**	0.00000	0.00000	0.00000
	A	0.01435	0.01476	0.01911
BUFX2	**A**	0.00000	0.00000	0.00000
	A	0.01866	0.01933	0.02339
BUFX4	**A**	0.00000	0.00000	0.00000
	A	0.03033	0.03076	0.03468
BUFX6	**A**	0.00000	0.00000	0.00000
	A	0.04240	0.04192	0.04629
BUFX8	**A**	0.00000	0.00000	0.00000
	A	0.05752	0.05338	0.05813
BUFXL	**A**	0.00000	0.00000	0.00000
	A	0.01123	0.01134	0.01406

DFFSRx

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library:
Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT				OUTPUT	
D	RN	SN	CK	Q	QN
0	1	1	R	0	1
1	1	1	R	1	0
x	0	x	x	0	1
x	1	0	x	1	0
x	1	1	x	IQ	IQN

Footprint

Cell Name	Area
DFFSRX1	69.59700
DFFSRXL	69.59700

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	RN	SN	CK	Q	QN
DFFSRX1	0.00539	0.00539	0.01144	0.01577	0.20813	0.20126
DFFSRXL	0.00539	0.00538	0.01143	0.01577	0.14406	0.13887

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
DFFSRX1	0.00000	0.93911	1.30165
DFFSRXL	0.00000	0.84114	1.20368

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
DFFSRX1	CK->Q (RR)	0.25835	0.50091	1.39249
	QN->Q (FR)	0.03409	0.19967	0.92988
	RN->Q (RR)	0.20857	0.45487	1.35341
	SN->Q (FR)	0.19609	0.45816	1.49199
DFFSRXL	CK->Q (RR)	0.26457	0.52432	1.36165
	QN->Q (FR)	0.03849	0.21291	0.90685
	RN->Q (RR)	0.21548	0.47924	1.32315
	SN->Q (FR)	0.20276	0.48210	1.45867

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
DFFSRX1	CK->Q (RF)	0.28194	0.51562	1.41243
	QN->Q (RF)	0.02532	0.14983	0.69669
	RN->Q (FF)	0.19547	0.45311	1.47194
DFFSRXL	CK->Q (RF)	0.29204	0.54829	1.40297
	QN->Q (RF)	0.02871	0.16083	0.68734
	RN->Q (FF)	0.20540	0.48594	1.46190

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
DFFSRX1	CK->QN (RR)	0.25155	0.37392	0.76762
	RN->QN (FR)	0.16535	0.31174	0.82741
DFFSRXL	CK->QN (RR)	0.25606	0.38735	0.76324
	RN->QN (FR)	0.16971	0.32546	0.82283

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
DFFSRX1	CK->QN (RF)	0.21731	0.32981	0.63573
	RN->QN (RF)	0.16735	0.28394	0.59692
	SN->QN (FF)	0.15491	0.28711	0.73532
DFFSRXL	CK->QN (RF)	0.21671	0.33151	0.61245
	RN->QN (RF)	0.16724	0.28649	0.57500
	SN->QN (FF)	0.15457	0.28935	0.70885

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	hold	CK (R)	-0.06005	-0.06025	-0.07965
	setup	CK (R)	0.18764	0.18085	0.27008
DFFSRXL	hold	CK (R)	-0.06141	-0.06000	-0.08048
	setup	CK (R)	0.18701	0.18015	0.26870

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	hold	CK (R)	-0.11089	-0.16708	-0.48460
	setup	CK (R)	0.13884	0.18155	0.50084
DFFSRXL	hold	CK (R)	-0.11409	-0.16798	-0.48505
	setup	CK (R)	0.13904	0.17930	0.49908

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	hold	CK (R)	-0.06005	-0.06025	-0.07965
	setup	CK (R)	0.18764	0.18085	0.27008
DFFSRXL	hold	CK (R)	-0.06141	-0.06000	-0.08048
	setup	CK (R)	0.18701	0.18015	0.26870

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	hold	CK (R)	-0.11089	-0.16708	-0.48460
	setup	CK (R)	0.13884	0.18155	0.50084
DFFSRXL	hold	CK (R)	-0.11409	-0.16798	-0.48505
	setup	CK (R)	0.13904	0.17930	0.49908

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	recovery	CK (R)	0.13754	0.13601	0.22497
	removal	CK (R)	-0.01711	-0.01928	-0.02501
	hold	SN (R)	-0.14216	-0.17775	-0.36283
	setup	SN (R)	0.16162	0.19487	0.49527
DFFSRXL	recovery	CK (R)	0.13600	0.13533	0.22360
	removal	CK (R)	-0.01711	-0.01928	-0.02501
	hold	SN (R)	-0.14233	-0.17520	-0.35516
	setup	SN (R)	0.16162	0.19487	0.48270

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	recovery	CK (R)	0.13754	0.13601	0.22497
	removal	CK (R)	-0.01711	-0.01928	-0.02501
	hold	SN (R)	-0.14216	-0.17782	-0.36283
	hold	SN (R)	-0.14575	-0.17775	-0.36669
	setup	SN (R)	0.16162	0.19487	0.49257
	setup	SN (R)	0.16097	0.19225	0.49527
DFFSRXL	recovery	CK (R)	0.13600	0.13533	0.22360
	removal	CK (R)	-0.01711	-0.01928	-0.02501
	hold	SN (R)	-0.14233	-0.17538	-0.35516
	hold	SN (R)	-0.14344	-0.17520	-0.35807
	setup	SN (R)	0.16162	0.19487	0.47708
	setup	SN (R)	0.15062	0.18719	0.48270

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	min_pulse_width	RN ()	0.12279	0.15721	0.97290
	min_pulse_width	RN ()	0.12494	0.15721	0.97290
DFFSRXL	min_pulse_width	RN ()	0.12279	0.15721	0.97290
	min_pulse_width	RN ()	0.12033	0.15393	0.97290

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	recovery	CK (R)	0.03764	0.04677	0.13100
	removal	CK (R)	-0.01796	-0.02944	-0.07858
DFFSRXL	recovery	CK (R)	0.03364	0.04362	0.12466
	removal	CK (R)	-0.01479	-0.03000	-0.07866

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	recovery	CK (R)	0.03764	0.04677	0.13100
	removal	CK (R)	-0.01796	-0.02944	-0.07858
DFFSRXL	recovery	CK (R)	0.03364	0.04362	0.12466
	removal	CK (R)	-0.01479	-0.03000	-0.07866

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	min_pulse_width	SN ()	0.14736	0.18997	0.97290
	min_pulse_width	SN ()	0.14490	0.18669	0.97290
DFFSRXL	min_pulse_width	SN ()	0.14736	0.18997	0.97290
	min_pulse_width	SN ()	0.13988	0.18341	0.97290

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	min_pulse_width	CK ()	0.11276	0.13428	0.97290
	min_pulse_width	CK ()	0.13903	0.13428	0.97290
DFFSRXL	min_pulse_width	CK ()	0.10918	0.13428	0.97290
	min_pulse_width	CK ()	0.13665	0.13428	0.97290

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFSRX1	min_pulse_width	CK ()	0.24130	0.25221	0.97290
	min_pulse_width	CK ()	0.11823	0.15393	0.97290
DFFSRXL	min_pulse_width	CK ()	0.24130	0.25221	0.97290
	min_pulse_width	CK ()	0.11823	0.15393	0.97290

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
DFFSRX1	CK	0.00000	0.00000	0.00000
	CK	0.01803	0.01687	0.01595
	RN	0.03327	0.03241	0.03019
	SN	-0.00295	-0.03342	-0.16859
	SN	0.03742	0.03641	0.03326
DFFSRXL	CK	0.00000	0.00000	0.00000
	CK	0.01650	0.01526	0.01502
	RN	0.03173	0.03080	0.02925
	SN	-0.00295	-0.02680	-0.11669
	SN	0.03587	0.03481	0.03231

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
DFFSRX1	CK	0.00000	0.00000	0.00000
	CK	0.01907	0.01787	0.01510
	RN	-0.00295	-0.03342	-0.16859
	RN	0.03919	0.03824	0.03577
DFFSRXL	CK	0.00000	0.00000	0.00000
	CK	0.01758	0.01670	0.01581
	RN	-0.00295	-0.02680	-0.11669
	RN	0.03769	0.03706	0.03669

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
DFFSRX1	CK	0.00000	0.00000	0.00000
	CK	0.01906	0.01788	0.01526
	RN	-0.00295	-0.03275	-0.16302
	RN	0.03917	0.03825	0.03587
DFFSRXL	CK	0.00000	0.00000	0.00000
	CK	0.01757	0.01670	0.01596
	RN	-0.00295	-0.02621	-0.11248
	RN	0.03768	0.03707	0.03659

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
DFFSRX1	CK	0.00000	0.00000	0.00000
	CK	0.01796	0.01681	0.01583
	RN	0.03319	0.03236	0.03021
	SN	-0.00295	-0.03275	-0.16298
	SN	0.03735	0.03637	0.03326
DFFSRXL	CK	0.00000	0.00000	0.00000
	CK	0.01642	0.01521	0.01497
	RN	0.03166	0.03075	0.02932
	SN	-0.00295	-0.02621	-0.11245
	SN	0.03580	0.03476	0.03230

Passive power(pJ) for D rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFSRX1	CK	0.00000	0.00000	0.00000
	CK	-0.00492	-0.00510	-0.00511
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.02269	0.02207	0.02291
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00909	0.00853	0.00951
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00908	0.00852	0.00951
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00915	0.00859	0.00957
DFFSRXL	CK	0.00000	0.00000	0.00000
	CK	-0.00492	-0.00510	-0.00511
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.02269	0.02207	0.02291
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00909	0.00852	0.00951
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00908	0.00852	0.00951
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00915	0.00859	0.00957

Passive power(pJ) for D falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFSRX1	CK	0.00000	0.00000	0.00000
	CK	0.00512	0.00512	0.00511
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.03421	0.03384	0.03457
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01468	0.01442	0.01552
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01473	0.01446	0.01556
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01461	0.01435	0.01546
DFFSRXL	CK	0.00000	0.00000	0.00000
	CK	0.00512	0.00512	0.00511
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.03420	0.03383	0.03456
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01467	0.01441	0.01551
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01472	0.01445	0.01555
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01460	0.01434	0.01544

Passive power(pJ) for RN rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFSRX1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00413	0.00371	0.00671
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01809	0.01739	0.02013
DFFSRXL	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00414	0.00371	0.00672
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01809	0.01740	0.02013

Passive power(pJ) for RN falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFSRX1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.01417	0.01426	0.01886
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03058	0.03029	0.03437
DFFSRXL	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.01417	0.01425	0.01886
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03058	0.03029	0.03437

Passive power(pJ) for SN rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFSRX1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.01163	-0.01163	-0.01162
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.01159	-0.01188	-0.01191
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.01132	-0.01150	-0.01148
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00751	0.00701	0.00804
DFFSRXL	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.01163	-0.01163	-0.01162
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.01157	-0.01186	-0.01189
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.01131	-0.01150	-0.01147
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00752	0.00702	0.00805

Passive power(pJ) for SN falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFSRX1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.01163	0.01169	0.01162
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01191	0.01199	0.01192
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01148	0.01155	0.01148
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02351	0.02309	0.02372
DFFSRXL	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.01163	0.01169	0.01162
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01190	0.01197	0.01190
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01147	0.01155	0.01148
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02350	0.02309	0.02372

Passive power(pJ) for CK rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFSRX1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00140	-0.00190	0.00095
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00927	0.00810	0.01048
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00917	0.00801	0.01039
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00164	-0.00214	0.00080
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00619	0.00507	0.01041
DFFSRXL	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00140	-0.00190	0.00095
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00926	0.00809	0.01047
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00916	0.00799	0.01038
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00164	-0.00214	0.00080
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00619	0.00507	0.01041

Passive power(pJ) for CK falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFSRX1	(D * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.05048	0.04984	0.05318
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02048	0.02056	0.02509
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03557	0.03534	0.03924
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03564	0.03543	0.03924
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04834	0.04799	0.05558
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02332	0.02337	0.02754
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02713	0.02702	0.03510
DFFSRXL	(D * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.05048	0.04985	0.05317
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02048	0.02056	0.02509
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03557	0.03534	0.03924
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03564	0.03543	0.03924
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04833	0.04798	0.05558
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02332	0.02337	0.02754
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02711	0.02701	0.03509

DFFx

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT		OUTPUT	
D	CK	Q	QN
0	R	0	1
1	R	1	0
x	x	IQ	IQN

Footprint

Cell Name	Area
DFFX1	48.35160
DFFXL	48.35160

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
DFFX1	0.00557	0.01534	0.20918	0.20182
DFFXL	0.00557	0.01532	0.14089	0.13671

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
DFFX1	0.00000	0.86271	1.10200
DFFXL	0.00000	0.76474	1.00402

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
DFFX1	CK->Q (RR)	0.17393	0.40456	1.29734
	QN->Q (FR)	0.03386	0.19930	0.93098
DFFXL	CK->Q (RR)	0.18243	0.42976	1.24969
	QN->Q (FR)	0.03916	0.21426	0.90870

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
DFFX1	CK->Q (RF)	0.23648	0.46656	1.36560
	QN->Q (RF)	0.02521	0.14935	0.69595
DFFXL	CK->Q (RF)	0.24776	0.49935	1.33822
	QN->Q (RF)	0.02866	0.15910	0.67676

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
DFFX1	CK->QN (RR)	0.20670	0.32498	0.71793
DFFXL	CK->QN (RR)	0.21225	0.34053	0.71364

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
DFFX1	CK->QN (RF)	0.13628	0.23608	0.53877
DFFXL	CK->QN (RF)	0.13753	0.24024	0.51382

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFX1	hold	CK (R)	-0.03476	-0.03836	-0.05349
	setup	CK (R)	0.10641	0.10750	0.20693
DFFXL	hold	CK (R)	-0.03713	-0.03836	-0.05349
	setup	CK (R)	0.10504	0.10648	0.20644

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFX1	hold	CK (R)	-0.09356	-0.15677	-0.46450
	setup	CK (R)	0.11352	0.16520	0.47898
DFFXL	hold	CK (R)	-0.09158	-0.15470	-0.46424
	setup	CK (R)	0.11352	0.16520	0.47898

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFX1	min_pulse_width	CK ()	0.07332	0.13428	0.97290
	min_pulse_width	CK ()	0.11635	0.13428	0.97290
DFFXL	min_pulse_width	CK ()	0.06973	0.13428	0.97290
	min_pulse_width	CK ()	0.11635	0.13428	0.97290

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
DFFX1	min_pulse_width	CK ()	0.16257	0.18014	0.97290
	min_pulse_width	CK ()	0.08766	0.13428	0.97290
DFFXL	min_pulse_width	CK ()	0.16211	0.17686	0.97290
	min_pulse_width	CK ()	0.08766	0.13428	0.97290

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
DFFX1	CK	0.00000	0.00000	0.00000
	CK	0.01498	0.01376	0.01310
DFFXL	CK	0.00000	0.00000	0.00000
	CK	0.01348	0.01220	0.01244

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
DFFX1	CK	0.00000	0.00000	0.00000
	CK	0.01667	0.01546	0.01275
DFFXL	CK	0.00000	0.00000	0.00000
	CK	0.01523	0.01429	0.01349

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
DFFX1	CK	0.00000	0.00000	0.00000
	CK	0.01666	0.01548	0.01307
DFFXL	CK	0.00000	0.00000	0.00000
	CK	0.01522	0.01430	0.01358

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
DFFX1	CK	0.00000	0.00000	0.00000
	CK	0.01493	0.01371	0.01313
DFFXL	CK	0.00000	0.00000	0.00000
	CK	0.01341	0.01214	0.01222

Passive power(pJ) for D rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFX1	CK	0.00000	0.00000	0.00000
	CK	-0.00459	-0.00507	-0.00511
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01560	0.01507	0.01622
DFFXL	CK	0.00000	0.00000	0.00000
	CK	-0.00459	-0.00507	-0.00511
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01561	0.01508	0.01623

Passive power(pJ) for D falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFX1	CK	0.00000	0.00000	0.00000
	CK	0.00512	0.00516	0.00512
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.03008	0.02967	0.03083
DFFXL	CK	0.00000	0.00000	0.00000
	CK	0.00512	0.00516	0.00512
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.03008	0.02968	0.03084

Passive power(pJ) for CK rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFX1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00144	-0.00193	0.00094
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00177	-0.00226	0.00070
DFFXL	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00144	-0.00193	0.00094
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00177	-0.00226	0.00070

Passive power(pJ) for CK falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
DFFX1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02033	0.02045	0.02499
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.04344	0.04278	0.04628
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.04395	0.04361	0.05192
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02330	0.02336	0.02754
DFFXL	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02033	0.02045	0.02499
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.04345	0.04279	0.04629
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.04396	0.04362	0.05193
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02330	0.02336	0.02754

INVx

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
INVX1	6.59340
INVX10	32.96700
INVX2	9.52380
INVX3	12.45420
INVX4	15.38460
INVX6	21.24540
INVX8	27.10620
INVXL	6.59340

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
INVX1	0.00541	0.20944
INVX10	0.05069	1.61470
INVX2	0.01041	0.40624
INVX3	0.01552	0.57956
INVX4	0.02055	0.75827
INVX6	0.03075	1.07089
INVX8	0.04077	1.35745
INVXL	0.00417	0.14208

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
INVX1	0.00000	0.13807	0.26890
INVX10	0.00000	1.38067	2.68898
INVX2	0.00000	0.27614	0.53780
INVX3	0.00000	0.41420	0.80670
INVX4	0.00000	0.55227	1.07559
INVX6	0.00000	0.82840	1.61339
INVX8	0.00000	1.10454	2.15119
INVXL	0.00000	0.08908	0.17073

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
INVX1	**A->Y (FR)**	0.02902	0.16864	0.78475
INVX10	**A->Y (FR)**	0.04372	0.13990	0.79797
INVX2	**A->Y (FR)**	0.02369	0.14585	0.77741
INVX3	**A->Y (FR)**	0.02611	0.14071	0.78645
INVX4	**A->Y (FR)**	0.02731	0.13589	0.78252
INVX6	**A->Y (FR)**	0.03138	0.13351	0.78482
INVX8	**A->Y (FR)**	0.03722	0.13544	0.79290
INVXL	**A->Y (FR)**	0.03374	0.18501	0.78728

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
INVX1	**A->Y (RF)**	0.02216	0.13150	0.61302
INVX10	**A->Y (RF)**	0.03501	0.10157	0.56859
INVX2	**A->Y (RF)**	0.01838	0.11192	0.60461
INVX3	**A->Y (RF)**	0.01993	0.10630	0.60557
INVX4	**A->Y (RF)**	0.02015	0.10019	0.59684
INVX6	**A->Y (RF)**	0.02543	0.09765	0.58645
INVX8	**A->Y (RF)**	0.03005	0.09850	0.57761
INVXL	**A->Y (RF)**	0.02512	0.13956	0.59533

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
INVX1	**A**	0.00000	0.00000	0.00000
	A	0.00755	0.00783	0.00868
INVX10	**A**	0.00000	0.00000	0.00000
	A	0.06639	0.07036	0.08076
INVX2	**A**	0.00000	0.00000	0.00000
	A	0.01358	0.01436	0.01630
INVX3	**A**	0.00000	0.00000	0.00000
	A	0.02069	0.02159	0.02480
INVX4	**A**	0.00000	0.00000	0.00000
	A	0.02676	0.02804	0.03228
INVX6	**A**	0.00000	0.00000	0.00000
	A	0.03960	0.04221	0.04849
INVX8	**A**	0.00000	0.00000	0.00000
	A	0.05268	0.05577	0.06454
INVXL	**A**	0.00000	0.00000	0.00000
	A	0.00585	0.00594	0.00647

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
INVX1	**A**	0.00000	0.00000	0.00000
	A	-0.00172	-0.00164	-0.00124
INVX10	**A**	0.00000	0.00000	0.00000
	A	-0.02215	-0.02411	-0.01775
INVX2	**A**	0.00000	0.00000	0.00000
	A	-0.00534	-0.00497	-0.00404
INVX3	**A**	0.00000	0.00000	0.00000
	A	-0.00712	-0.00664	-0.00502
INVX4	**A**	0.00000	0.00000	0.00000
	A	-0.01063	-0.00995	-0.00774
INVX6	**A**	0.00000	0.00000	0.00000
	A	-0.01615	-0.01504	-0.01139
INVX8	**A**	0.00000	0.00000	0.00000
	A	-0.02036	-0.01986	-0.01473
INVXL	**A**	0.00000	0.00000	0.00000
	A	-0.00122	-0.00117	-0.00098

NAND2x

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library:
Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	x	1
1	0	1
1	1	0

Footprint

Cell Name	Area
NAND2X1	9.52380
NAND2XL	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
NAND2X1	0.00543	0.00542	0.19418
NAND2XL	0.00418	0.00417	0.13987

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
NAND2X1	0.00000	0.13783	0.53780
NAND2XL	0.00000	0.08898	0.34147

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
NAND2X1	A->Y (FR)	0.02931	0.16515	0.75259
	B->Y (FR)	0.03447	0.17096	0.76216
NAND2XL	A->Y (FR)	0.03399	0.18455	0.78096
	B->Y (FR)	0.04009	0.19107	0.79239

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
NAND2X1	A->Y (RF)	0.03041	0.16198	0.73235
	B->Y (RF)	0.03417	0.16026	0.70253
NAND2XL	A->Y (RF)	0.03456	0.17714	0.73603
	B->Y (RF)	0.03800	0.17432	0.70191

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
NAND2X1	A	0.00000	0.00000	0.00000
	A	0.00807	0.00827	0.00914
	B	0.00000	0.00000	0.00000
	B	0.01010	0.01021	0.01102
NAND2XL	A	0.00000	0.00000	0.00000
	A	0.00619	0.00625	0.00674
	B	0.00000	0.00000	0.00000
	B	0.00768	0.00756	0.00814

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
NAND2X1	A	0.00000	0.00000	0.00000
	A	-0.00124	-0.00120	-0.00089
	B	0.00000	0.00000	0.00000
	B	-0.00115	-0.00124	-0.00100
NAND2XL	A	0.00000	0.00000	0.00000
	A	-0.00093	-0.00096	-0.00076
	B	0.00000	0.00000	0.00000
	B	-0.00088	-0.00095	-0.00081

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
NAND2X1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00577	-0.00576	-0.00576
NAND2XL	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00421	-0.00423	-0.00421

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
NAND2X1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00577	0.00580	0.00576
NAND2XL	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00421	0.00424	0.00421

Passive power(pJ) for B rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
NAND2X1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00535	-0.00538	-0.00536
NAND2XL	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00391	-0.00392	-0.00391

Passive power(pJ) for B falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
NAND2X1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00538	0.00539	0.00537
NAND2XL	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00393	0.00394	0.00392

NOR2x

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	1
x	1	0
1	x	0

Footprint

Cell Name	Area
NOR2X1	9.52380
NOR2XL	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
NOR2X1	0.00541	0.00573	0.10845
NOR2XL	0.00409	0.00444	0.07457

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
NOR2X1	0.00000	0.09537	0.26890
NOR2XL	0.00000	0.06565	0.17073

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
NOR2X1	A->Y (FR)	0.05878	0.21500	0.77810
	B->Y (FR)	0.04513	0.19938	0.76853
NOR2XL	A->Y (FR)	0.06735	0.23581	0.77612
	B->Y (FR)	0.05537	0.22193	0.77782

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
NOR2X1	A->Y (RF)	0.02935	0.11599	0.42298
	B->Y (RF)	0.02348	0.10779	0.41118
NOR2XL	A->Y (RF)	0.03178	0.12212	0.41427
	B->Y (RF)	0.02643	0.11489	0.40349

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
NOR2X1	A	0.00000	0.00000	0.00000
	A	0.01105	0.01094	0.01122
	B	0.00000	0.00000	0.00000
	B	0.00816	0.00822	0.00939
NOR2XL	A	0.00000	0.00000	0.00000
	A	0.00807	0.00798	0.00813
	B	0.00000	0.00000	0.00000
	B	0.00623	0.00606	0.00686

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
NOR2X1	A	0.00000	0.00000	0.00000
	A	0.00102	0.00082	0.00114
	B	0.00000	0.00000	0.00000
	B	-0.00129	-0.00126	-0.00085
NOR2XL	A	0.00000	0.00000	0.00000
	A	0.00066	0.00049	0.00073
	B	0.00000	0.00000	0.00000
	B	-0.00087	-0.00087	-0.00063

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
NOR2X1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00462	-0.00508	-0.00514
NOR2XL	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00333	-0.00361	-0.00365

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
NOR2X1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00514	0.00518	0.00514
NOR2XL	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00365	0.00368	0.00365

Passive power(pJ) for B rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
NOR2X1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00242	-0.00244	-0.00242
NOR2XL	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00180	-0.00182	-0.00180

Passive power(pJ) for B falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
NOR2X1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00246	0.00247	0.00245
NOR2XL	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00183	0.00184	0.00182

OAI21

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	B0	Y
0	0	x	1
x	1	0	1
x	1	1	0
1	x	0	1
1	x	1	0

Footprint

Cell Name	Area
OAI21XL	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
OAI21XL	0.00550	0.00556	0.00463	0.10696

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
OAI21XL	0.00000	0.11412	0.43963

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
OAI21XL	A0->Y (FR)	0.05841	0.21306	0.78025
	A1->Y (FR)	0.07591	0.23263	0.79417
	B0->Y (FR)	0.04146	0.17617	0.68287

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
OAI21XL	A0->Y (RF)	0.04256	0.14382	0.50183
	A1->Y (RF)	0.05003	0.15013	0.50319
	B0->Y (RF)	0.03368	0.14386	0.55080

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
OAI21XL	A0	0.00000	0.00000	0.00000
	A0	0.01113	0.01106	0.01200
	A1	0.00000	0.00000	0.00000
	A1	0.01404	0.01385	0.01404
	B0	0.00964	0.00964	0.01038

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
OAI21XL	A0	0.00000	0.00000	0.00000
	A0	0.00027	0.00007	0.00026
	A1	0.00000	0.00000	0.00000
	A1	0.00261	0.00225	0.00237
	B0	0.00362	0.00355	0.00381

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OAI21XL	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00243	-0.00245	-0.00243
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00495	-0.00514	-0.00515
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00526	-0.00526	-0.00526

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OAI21XL	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00247	0.00248	0.00245
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00515	0.00519	0.00515
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00526	0.00529	0.00526

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OAI21XL	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00455	-0.00500	-0.00506
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00495	-0.00510	-0.00513
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00521	-0.00522	-0.00521

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OAI21XL	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00507	0.00510	0.00508
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00513	0.00516	0.00513
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00521	0.00524	0.00522

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OAI21XL	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00434	-0.00433	-0.00434

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OAI21XL	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00434	0.00436	0.00434

OR2x

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	0
x	1	1
1	x	1

Footprint

Cell Name	Area
OR2X1	12.45420
OR2X2	15.38460
OR2X4	21.24540
OR2X8	32.96700
OR2XL	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
OR2X1	0.00573	0.00556	0.21563
OR2X2	0.00574	0.00557	0.40513
OR2X4	0.00576	0.00559	0.74440
OR2X8	0.00581	0.00564	1.32253
OR2XL	0.00448	0.00426	0.14509

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
OR2X1	0.00000	0.16802	0.28337
OR2X2	0.00000	0.24067	0.55227
OR2X4	0.00000	0.38597	1.09007
OR2X8	0.00000	0.67658	2.16566
OR2XL	0.00000	0.11391	0.18560

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
OR2X1	A->Y (RR)	0.06340	0.18425	0.59282
	B->Y (RR)	0.05580	0.17071	0.56454
OR2X2	A->Y (RR)	0.06879	0.17957	0.61824
	B->Y (RR)	0.06073	0.16784	0.59253
OR2X4	A->Y (RR)	0.08811	0.19822	0.68704
	B->Y (RR)	0.07981	0.18854	0.66548
OR2X8	A->Y (RR)	0.12499	0.23726	0.78777
	B->Y (RR)	0.11649	0.22879	0.77131
OR2XL	A->Y (RR)	0.07021	0.20202	0.59273
	B->Y (RR)	0.06325	0.19012	0.56612

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
OR2X1	A->Y (FF)	0.09777	0.22363	0.66600
	B->Y (FF)	0.07946	0.20622	0.64572
OR2X2	A->Y (FF)	0.11331	0.23448	0.70067
	B->Y (FF)	0.09518	0.21665	0.68564
OR2X4	A->Y (FF)	0.15547	0.27729	0.77780
	B->Y (FF)	0.13741	0.25809	0.76997
OR2X8	A->Y (FF)	0.24576	0.36920	0.90351
	B->Y (FF)	0.22782	0.34928	0.90107
OR2XL	A->Y (FF)	0.10805	0.23820	0.64985
	B->Y (FF)	0.09013	0.22262	0.63756

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
OR2X1	A	0.00000	0.00000	0.00000
	A	0.00812	0.00754	0.00918
	B	0.00000	0.00000	0.00000
	B	0.00600	0.00587	0.00854
OR2X2	A	0.00000	0.00000	0.00000
	A	0.01425	0.01402	0.01557
	B	0.00000	0.00000	0.00000
	B	0.01198	0.01237	0.01481
OR2X4	A	0.00000	0.00000	0.00000
	A	0.02738	0.02782	0.02955
	B	0.00000	0.00000	0.00000
	B	0.02509	0.02631	0.02890
OR2X8	A	0.00000	0.00000	0.00000
	A	0.05584	0.05504	0.05778
	B	0.00000	0.00000	0.00000
	B	0.05351	0.05361	0.05776
OR2XL	A	0.00000	0.00000	0.00000
	A	0.00598	0.00543	0.00648
	B	0.00000	0.00000	0.00000
	B	0.00464	0.00446	0.00610

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
OR2X1	A	0.00000	0.00000	0.00000
	A	0.01785	0.01746	0.01880
	B	0.00000	0.00000	0.00000
	B	0.01460	0.01503	0.01868
OR2X2	A	0.00000	0.00000	0.00000
	A	0.02230	0.02217	0.02336
	B	0.00000	0.00000	0.00000
	B	0.01899	0.01969	0.02302
OR2X4	A	0.00000	0.00000	0.00000
	A	0.03538	0.03348	0.03491
	B	0.00000	0.00000	0.00000
	B	0.03212	0.03062	0.03417
OR2X8	A	0.00000	0.00000	0.00000
	A	0.07022	0.05792	0.05840
	B	0.00000	0.00000	0.00000
	B	0.06706	0.05473	0.05722
OR2XL	A	0.00000	0.00000	0.00000
	A	0.01354	0.01319	0.01405
	B	0.00000	0.00000	0.00000
	B	0.01128	0.01148	0.01372

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OR2X1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00466	-0.00510	-0.00516
OR2X2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00466	-0.00510	-0.00516
OR2X4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00467	-0.00510	-0.00516
OR2X8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00467	-0.00510	-0.00516
OR2XL	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00335	-0.00363	-0.00367

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OR2X1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00516	0.00520	0.00517
OR2X2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00516	0.00520	0.00517
OR2X4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00516	0.00520	0.00517
OR2X8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00516	0.00520	0.00517
OR2XL	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00367	0.00370	0.00367

Passive power(pJ) for B rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OR2X1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00245	-0.00245	-0.00243
OR2X2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00245	-0.00245	-0.00243
OR2X4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00245	-0.00245	-0.00243
OR2X8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00245	-0.00245	-0.00244
OR2XL	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00185	-0.00185	-0.00183

Passive power(pJ) for B falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
OR2X1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00247	0.00249	0.00246
OR2X2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00247	0.00249	0.00246
OR2X4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00247	0.00249	0.00246
OR2X8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00247	0.00249	0.00246
OR2XL	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00186	0.00187	0.00185

TBUFIx

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT		OUTPUT
A	OE	Y
-	0	HiZ
0	1	1
1	1	0

Footprint

Cell Name	Area
TBUFIX1	12.45420
TBUFIXL	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
TBUFIX1	0.00573	0.00724	0.10993
TBUFIXL	0.00445	0.00564	0.07547

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
TBUFIX1	0.00000	0.14110	0.53780
TBUFIXL	0.00000	0.09246	0.34147

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
TBUFIX1	A->Y (FR)	0.04369	0.19805	0.76880
	OE->Y (FR)	0.04484	0.09276	0.37291
	OE->Y (RR)	0.07557	0.20319	0.55248
TBUFIXL	A->Y (FR)	0.05379	0.22037	0.78021
	OE->Y (FR)	0.04816	0.09850	0.37272
	OE->Y (RR)	0.08501	0.22770	0.56431

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
TBUFIX1	A->Y (RF)	0.03003	0.13278	0.51159
	OE->Y (FF)	0.04535	0.09341	0.37293
	OE->Y (RF)	0.02849	0.12608	0.47365
TBUFIXL	A->Y (RF)	0.03442	0.14152	0.50038
	OE->Y (FF)	0.04875	0.09853	0.37272
	OE->Y (RF)	0.03337	0.13507	0.45951

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
TBUFIX1	A	0.00000	0.00000	0.00000
	A	0.00775	0.00781	0.00881
	OE	0.00000	0.00000	0.00000
	OE	0.00789	0.00768	0.01141
TBUFIXL	A	0.00000	0.00000	0.00000
	A	0.00594	0.00565	0.00646
	OE	0.00000	0.00000	0.00000
	OE	0.00562	0.00540	0.00772

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
TBUFIX1	A	0.00000	0.00000	0.00000
	A	-0.00131	-0.00131	-0.00095
	OE	0.00000	0.00000	0.00000
	OE	0.00528	0.00500	0.00915
TBUFIXL	A	0.00000	0.00000	0.00000
	A	-0.00088	-0.00090	-0.00070
	OE	0.00000	0.00000	0.00000
	OE	0.00369	0.00342	0.00591

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
TBUFIX1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00402	-0.00405	-0.00402
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00353	-0.00356	-0.00354
TBUFIXL	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00308	-0.00310	-0.00308
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00276	-0.00279	-0.00276

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
TBUFIX1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00402	0.00405	0.00402
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00357	0.00360	0.00357
TBUFIXL	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00308	0.00310	0.00308
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00278	0.00280	0.00278

Passive power(pJ) for OE rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
TBUFIX1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00319	0.00297	0.00718
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00283	0.00260	0.00684
TBUFIXL	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00217	0.00195	0.00449
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00193	0.00170	0.00424

Passive power(pJ) for OE falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
TBUFIX1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00871	0.00869	0.01354
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00885	0.00894	0.01380
TBUFIXL	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00688	0.00671	0.00967
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00701	0.00690	0.00984

TIEHI

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Footprint

Cell Name	Area
TIEHI	6.59340

Pin Capacitance Information

Cell Name	Max Cap(pf)
	Y
TIEHI	0.51657

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
TIEHI	0.00000	0.00000	0.00000

TIELO

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Footprint

Cell Name	Area
TIELO	6.59340

Pin Capacitance Information

Cell Name	Max Cap(pf)
	Y
TIELO	0.83146

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
TIELO	0.00000	0.00000	0.00000

TNBUFIx

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library:
Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT		OUTPUT
A	OE	Y
0	0	1
1	0	0
-	1	HiZ

Footprint

Cell Name	Area
TNBUFIX1	12.45420
TNBUFIXL	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
TNBUFIX1	0.00573	0.00900	0.10997
TNBUFIXL	0.00444	0.00675	0.07556

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
TNBUFIX1	0.00000	0.22832	0.27614
TNBUFIXL	0.00000	0.14689	0.17816

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
TNBUFIX1	A->Y (FR)	0.04387	0.19815	0.76896
	OE->Y (RR)	0.02537	0.07865	0.37405
	OE->Y (FR)	0.05584	0.21299	0.77737
TNBUFIXL	A->Y (FR)	0.05414	0.22048	0.78072
	OE->Y (RR)	0.02632	0.07892	0.37433
	OE->Y (FR)	0.06458	0.23459	0.77806

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
TNBUFIX1	A->Y (RF)	0.02969	0.13265	0.51156
	OE->Y (RF)	0.02520	0.07859	0.37403
	OE->Y (FF)	0.04978	0.15251	0.45491
TNBUFIXL	A->Y (RF)	0.03401	0.14139	0.50059
	OE->Y (RF)	0.02614	0.07890	0.37433
	OE->Y (FF)	0.05683	0.16574	0.44962

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
TNBUFIX1	A	0.00000	0.00000	0.00000
	A	0.00793	0.00799	0.00899
	OE	0.00000	0.00000	0.00000
	OE	0.01942	0.02004	0.02565
TNBUFIXL	A	0.00000	0.00000	0.00000
	A	0.00613	0.00583	0.00665
	OE	0.00000	0.00000	0.00000
	OE	0.01446	0.01472	0.01813

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
TNBUFIX1	A	0.00000	0.00000	0.00000
	A	-0.00156	-0.00154	-0.00118
	OE	0.00000	0.00000	0.00000
	OE	0.01713	0.01782	0.02301
TNBUFIXL	A	0.00000	0.00000	0.00000
	A	-0.00112	-0.00113	-0.00094
	OE	0.00000	0.00000	0.00000
	OE	0.01277	0.01314	0.01623

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
TNBUFIX1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00346	-0.00349	-0.00347
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00303	-0.00305	-0.00303
TNBUFIXL	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00255	-0.00257	-0.00255
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00227	-0.00229	-0.00227

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
TNBUFIX1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00346	0.00349	0.00347
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00306	0.00308	0.00306
TNBUFIXL	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00255	0.00257	0.00255
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00229	0.00230	0.00229

Passive power(pJ) for OE rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
TNBUFIX1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00634	-0.00704	-0.00237
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00622	-0.00686	-0.00228
TNBUFIXL	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00450	-0.00500	-0.00221
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00440	-0.00487	-0.00217

Passive power(pJ) for OE falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
TNBUFIX1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01466	0.01539	0.02090
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01446	0.01515	0.02069
TNBUFIXL	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01099	0.01128	0.01465
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01084	0.01115	0.01447

XNOR2

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

Footprint

Cell Name	Area
XNOR2XL	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
XNOR2XL	0.01135	0.01039	0.10699

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
XNOR2XL	0.00000	0.46432	0.81393

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
XNOR2XL	A->Y (RR)	B	0.09380	0.22362	0.57017
	A->Y (FR)	!B	0.05519	0.20843	0.77199
	B->Y (RR)	A	0.07517	0.20568	0.55154
	B->Y (FR)	!A	0.07605	0.23177	0.79032

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
XNOR2XL	A->Y (FF)	B	0.08543	0.19842	0.52390
	A->Y (RF)	!B	0.04215	0.14020	0.49213
	B->Y (FF)	A	0.07749	0.19096	0.51768
	B->Y (RF)	!A	0.05206	0.15146	0.50548

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
XNOR2XL	A	B	0.00000	0.00000	0.00000
	A	B	0.00763	0.00721	0.01050
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01839	0.01842	0.02405
	B	A	0.00000	0.00000	0.00000
	B	A	0.00234	0.00217	0.00596
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02063	0.02061	0.02558

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
XNOR2XL	A	B	0.00000	0.00000	0.00000
	A	B	0.02336	0.02290	0.02725
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00529	0.00480	0.00865
	B	A	0.00000	0.00000	0.00000
	B	A	0.02160	0.02189	0.02658
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00667	0.00597	0.00978

XOR2

sky130_osu_sc_18T_hs_TT_1P8_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

Footprint

Cell Name	Area
XOR2XL	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
XOR2XL	0.01130	0.01043	0.10688

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
XOR2XL	0.00000	0.46432	0.72699

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
XOR2XL	A->Y (RR)	!B	0.08856	0.21591	0.56736
	A->Y (FR)	B	0.06794	0.22152	0.77640
	B->Y (RR)	!A	0.07789	0.20767	0.55369
	B->Y (FR)	A	0.07412	0.23052	0.79220

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
XOR2XL	A->Y (FF)	!B	0.07410	0.18614	0.50390
	A->Y (RF)	B	0.04051	0.14514	0.52004
	B->Y (FF)	!A	0.07154	0.18435	0.50444
	B->Y (RF)	A	0.04872	0.14671	0.49026

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
XOR2XL	A	B	0.00000	0.00000	0.00000
	A	B	0.02221	0.02239	0.02775
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00323	0.00201	0.00547
	B	A	0.00000	0.00000	0.00000
	B	A	0.02262	0.02290	0.02811
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00194	0.00167	0.00544

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
XOR2XL	A	B	0.00000	0.00000	0.00000
	A	B	0.00409	0.00340	0.00743
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02432	0.02477	0.02941
	B	A	0.00000	0.00000	0.00000
	B	A	0.00424	0.00347	0.00738
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02194	0.02254	0.02736