sky130_osu_sc_12T_ms_TT_1P8_25C.ccs Library

Cell Groups
SKY130_OSU_SC_12T_MS__ADDFx
SKY130_OSU_SC_12T_MS__ADDHx
SKY130_OSU_SC_12T_MS__AND2x
SKY130_OSU_SC_12T_MS__AOI21
SKY130_OSU_SC_12T_MS__AOI22
SKY130_OSU_SC_12T_MS__BUFx
SKY130_OSU_SC_12T_MS__DFFRx
SKY130_OSU_SC_12T_MS__DFFSRx
SKY130_OSU_SC_12T_MS__DFFSx
SKY130_OSU_SC_12T_MS__DFFx
SKY130_OSU_SC_12T_MS__INVx
SKY130_OSU_SC_12T_MS__MUX2
SKY130_OSU_SC_12T_MS__NAND2x
SKY130_OSU_SC_12T_MS__NOR2x
SKY130_OSU_SC_12T_MS__OAI21
SKY130_OSU_SC_12T_MS__OAI22
SKY130_OSU_SC_12T_MS__OR2x
SKY130_OSU_SC_12T_MS__TBUFIx
SKY130_OSU_SC_12T_MS__TNBUFIx
SKY130_OSU_SC_12T_MS__XNOR2
SKY130_OSU_SC_12T_MS__XOR2
SKY130_OSU_SC_12T_MS_x

SKY130_OSU_SC_12T_MS__ADDFx

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__addf_1	31.25760
sky130_osu_sc_12T_ms__addf_l	31.25760

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_12T_ms__addf_1	0.01105	0.01111	0.00850	1.32001	0.58123	1.17762
sky130_osu_sc_12T_ms__addf_l	0.01105	0.01111	0.00852	0.89570	0.58229	1.17764

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.06294	0.07972
sky130_osu_sc_12T_ms__addf_l	0.00000	0.27156	0.49711

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.13840	1.60313	23.99890
	B->CO (RR)	0.13459	1.56841	23.50530
	CI->CO (RR)	0.13007	1.63214	24.62240
	CON->CO (FR)	0.02360	0.69889	11.08620
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.13684	1.46525	19.09580
	B->CO (RR)	0.13315	1.44449	18.97920
	CI->CO (RR)	0.12854	1.49486	19.74350
	CON->CO (FR)	0.02756	0.74116	10.65030

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.20561	2.12569	31.44390
	B->CO (FF)	0.18269	2.02984	30.15870
	CI->CO (FF)	0.18149	2.11595	31.78310
	CON->CO (RF)	0.01996	0.54770	8.66609
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.20141	1.89043	24.25270
	B->CO (FF)	0.17945	1.81113	23.38210
	CI->CO (FF)	0.17727	1.88042	24.61390
	CON->CO (RF)	0.02241	0.57349	8.29557

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CON (FR)	0.16004	0.94247	10.37280
	B->CON (FR)	0.13695	0.87673	10.07480
	CI->CON (FR)	0.13591	0.93332	10.77620
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.15201	0.93520	10.37650
	B->CON (FR)	0.12982	0.87029	10.07950
	CI->CON (FR)	0.12787	0.92600	10.78060

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CON (RF)	0.08783	0.56562	6.40596
	B->CON (RF)	0.08515	0.57910	6.77950
	CI->CON (RF)	0.07948	0.59675	7.10527
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.08500	0.56310	6.41013
	B->CON (RF)	0.08246	0.57678	6.78359
	CI->CON (RF)	0.07662	0.59416	7.10945

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->S (-R)	0.29841	1.92941	24.25810
	B->S (-R)	0.30489	1.91201	23.49400
	CI->S (-R)	0.27238	1.91580	24.59960
	CON->S (RR)	0.07787	0.63752	7.13695
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.28751	1.92100	24.25040
	B->S (-R)	0.29401	1.90412	23.48920
	CI->S (-R)	0.26148	1.90769	24.59210
	CON->S (RR)	0.07791	0.63751	7.13660

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->S (-F)	0.23654	1.39711	16.37080
	B->S (-F)	0.23100	1.34772	16.12210
	CI->S (-F)	0.22767	1.42326	17.00510
	CON->S (FF)	0.09914	0.62042	6.17671
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.23083	1.39368	16.36680
	B->S (-F)	0.22549	1.34397	16.11880
	CI->S (-F)	0.22191	1.41914	16.99990
	CON->S (FF)	0.09915	0.62037	6.17726

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00246	0.00288	0.01204
	B	0.00358	0.00383	0.01186
	CI	0.00358	0.00410	0.01339
sky130_osu_sc_12T_ms__addf_l	A	0.00218	0.00249	0.00938
	B	0.00330	0.00346	0.00964
	CI	0.00331	0.00372	0.01059

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00889	0.00972	0.02816
	B	0.00931	0.00998	0.02626
	CI	0.00754	0.00841	0.02726
sky130_osu_sc_12T_ms__addf_l	A	0.00866	0.00920	0.02121
	B	0.00906	0.00954	0.01991
	CI	0.00731	0.00794	0.02049

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00888	0.00924	0.01742
	B	0.00922	0.00950	0.01665
	CI	0.00753	0.00798	0.01686
sky130_osu_sc_12T_ms__addf_l	A	0.00865	0.00898	0.01687
	B	0.00899	0.00924	0.01617
	CI	0.00731	0.00771	0.01632

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00291	0.00289	0.00703
	B	0.00354	0.00363	0.00818
	CI	0.00357	0.00390	0.00896
sky130_osu_sc_12T_ms__addf_l	A	0.00264	0.00261	0.00698
	B	0.00327	0.00336	0.00819
	CI	0.00330	0.00362	0.00897

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00889	0.00962	0.02600
	B	0.00931	0.00993	0.02426
	CI	0.00753	0.00834	0.02514
sky130_osu_sc_12T_ms__addf_l	A	0.00866	0.00934	0.02511
	B	0.00908	0.00966	0.02346
	CI	0.00731	0.00806	0.02425

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01937	0.01938	0.03218
	B	0.01767	0.01766	0.03402
	CI	0.01592	0.01572	0.02776
sky130_osu_sc_12T_ms__addf_l	A	0.01935	0.01939	0.03218
	B	0.01766	0.01767	0.03403
	CI	0.01594	0.01572	0.02777

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_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	0	0
0	1	0	0	1
1	0	0	0	1
1	1	1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__addh_1	18.55920
sky130_osu_sc_12T_ms__addh_l	18.55920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_12T_ms__addh_1	0.00543	0.00572	1.27030	1.30490	1.32360
sky130_osu_sc_12T_ms__addh_l	0.00542	0.00571	0.88754	1.30763	0.91260

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.07478	0.07947
sky130_osu_sc_12T_ms__addh_l	0.00000	0.49195	0.49656

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CO (RR)	0.09340	0.63730	6.95009
	B->CO (RR)	0.09640	0.63095	7.01924
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.09169	0.67919	6.80712
	B->CO (RR)	0.09465	0.67451	6.85921

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CO (FF)	0.08100	0.59717	6.47297
	B->CO (FF)	0.08568	0.61090	6.52623
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.08031	0.62304	6.26472
	B->CO (FF)	0.08487	0.63881	6.32907

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CON (RR)	0.13158	0.65649	6.92436
	B->CON (RR)	0.13417	0.64931	6.99518
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.12210	0.64229	6.91092
	B->CON (RR)	0.12475	0.63612	6.97067

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CON (FF)	0.11020	0.61997	6.58649
	B->CON (FF)	0.10851	0.62791	6.62362
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.10241	0.60034	6.46590
	B->CON (FF)	0.10082	0.60995	6.50667

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->S (FR)	0.15231	1.30977	17.25800
	B->S (FR)	0.15063	1.31911	17.36050
	CON->S (FR)	0.02519	0.70940	11.26030
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.14546	1.22670	14.08260
	B->S (FR)	0.14388	1.23609	14.14690
	CON->S (FR)	0.02824	0.74820	10.81580

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->S (RF)	0.16696	1.26959	16.45220
	B->S (RF)	0.16956	1.26240	16.51420
	CON->S (RF)	0.01956	0.54743	8.71404
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.15968	1.16152	12.86380
	B->S (RF)	0.16229	1.15395	12.91750
	CON->S (RF)	0.02191	0.57695	8.41923

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00453	0.00450	0.01043
	B	0.00000	0.00000	0.00000
	B	0.00414	0.00403	0.01103
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00400	0.00392	0.01037
	B	0.00000	0.00000	0.00000
	B	0.00362	0.00345	0.01051

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00637	0.00636	0.01408
	B	0.00000	0.00000	0.00000
	B	0.00669	0.00706	0.01492
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00584	0.00583	0.01389
	B	0.00000	0.00000	0.00000
	B	0.00616	0.00648	0.01456

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00454	0.00450	0.01044
	B	0.00000	0.00000	0.00000
	B	0.00414	0.00403	0.01097
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00401	0.00392	0.01029
	B	0.00000	0.00000	0.00000
	B	0.00362	0.00345	0.01049

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00637	0.00636	0.01404
	B	0.00000	0.00000	0.00000
	B	0.00670	0.00707	0.01489
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00584	0.00582	0.01389
	B	0.00000	0.00000	0.00000
	B	0.00616	0.00648	0.01457

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00638	0.00636	0.01373
	B	0.00000	0.00000	0.00000
	B	0.00670	0.00708	0.01522
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00584	0.00585	0.01390
	B	0.00000	0.00000	0.00000
	B	0.00616	0.00649	0.01462

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00454	0.00450	0.01062
	B	0.00000	0.00000	0.00000
	B	0.00414	0.00403	0.01114
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00401	0.00392	0.01070
	B	0.00000	0.00000	0.00000
	B	0.00362	0.00347	0.01090

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	1.44304	1.38203	0.44214
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	1.44314	1.38214	0.44223

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	1.44292	1.38221	0.46265
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	1.44301	1.38231	0.46276

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__and2_1	8.30280
sky130_osu_sc_12T_ms__and2_2	10.25640
sky130_osu_sc_12T_ms__and2_4	14.16360
sky130_osu_sc_12T_ms__and2_6	18.07080
sky130_osu_sc_12T_ms__and2_8	21.97800
sky130_osu_sc_12T_ms__and2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__and2_1	0.00290	0.00301	1.28433
sky130_osu_sc_12T_ms__and2_2	0.00290	0.00301	2.52311
sky130_osu_sc_12T_ms__and2_4	0.00290	0.00301	4.87767
sky130_osu_sc_12T_ms__and2_6	0.00180	0.00181	1.80000
sky130_osu_sc_12T_ms__and2_8	0.00290	0.00301	9.43273
sky130_osu_sc_12T_ms__and2_l	0.00220	0.00228	0.89452

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.03304	0.05277
sky130_osu_sc_12T_ms__and2_2	0.00000	0.05278	0.05313
sky130_osu_sc_12T_ms__and2_4	0.00000	0.09227	0.10518
sky130_osu_sc_12T_ms__and2_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__and2_8	0.00000	0.17124	0.20999
sky130_osu_sc_12T_ms__and2_l	0.00000	0.55470	0.88744

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__and2_1	A->Y (RR)	0.07110	0.57941	6.88927
	B->Y (RR)	0.07575	0.58022	6.78243
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.08024	0.51950	6.88403
	B->Y (RR)	0.08487	0.51496	6.78716
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.10972	0.52708	7.09887
	B->Y (RR)	0.11432	0.51399	7.00552
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.16812	0.59372	7.47133
	B->Y (RR)	0.17272	0.57303	7.37546
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.07510	0.63637	6.98257
	B->Y (RR)	0.07969	0.63280	6.82307

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__and2_1	A->Y (FF)	0.06460	0.53143	5.98113
	B->Y (FF)	0.06631	0.54287	6.02107
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.07409	0.50427	6.06416
	B->Y (FF)	0.07549	0.51183	6.11025
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.10337	0.53116	6.31572
	B->Y (FF)	0.10267	0.53178	6.35442
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.16390	0.60642	6.65974
	B->Y (FF)	0.15893	0.60017	6.67105
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.06505	0.54411	5.65035
	B->Y (FF)	0.07004	0.55992	5.69933

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00306	0.00321	0.02692
	B	0.00000	0.00000	0.00000
	B	0.00311	0.00290	0.01839
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00583	0.00611	0.02896
	B	0.00000	0.00000	0.00000
	B	0.00588	0.00589	0.02631
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01230	0.01285	0.03477
	B	0.00000	0.00000	0.00000
	B	0.01235	0.01274	0.02686
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02649	0.02641	0.04771
	B	0.00000	0.00000	0.00000
	B	0.02642	0.02628	0.04054
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00237	0.00278	0.03101
	B	0.00000	0.00000	0.00000
	B	0.00242	0.00248	0.02372

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00792	0.00881	0.03006
	B	0.00000	0.00000	0.00000
	B	0.00898	0.00979	0.02979
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00999	0.01124	0.03230
	B	0.00000	0.00000	0.00000
	B	0.01109	0.01208	0.03217
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01538	0.01696	0.03784
	B	0.00000	0.00000	0.00000
	B	0.01639	0.01777	0.03771
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02772	0.02909	0.04985
	B	0.00000	0.00000	0.00000
	B	0.02831	0.02950	0.04933
sky130_osu_sc_12T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00600	0.00721	0.03369
	B	0.00000	0.00000	0.00000
	B	0.00674	0.00781	0.03337

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00274	-0.00276	-0.00277
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00274	-0.00276	-0.00277
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00274	-0.00276	-0.00277
sky130_osu_sc_12T_ms__and2_6	B	0.00000	0.00000	0.00000
	B	-0.00043	-0.00043	-0.00043
	!B	0.00000	0.00000	0.00000
	!B	-0.00036	-0.00037	-0.00037
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00274	-0.00276	-0.00277
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00193	-0.00193	-0.00194

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00277	0.00280	0.00278
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00277	0.00280	0.00278
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00277	0.00280	0.00278
sky130_osu_sc_12T_ms__and2_6	B	0.00000	0.00000	0.00000
	B	0.00043	0.00043	0.00043
	!B	0.00000	0.00000	0.00000
	!B	0.00036	0.00037	0.00037
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00277	0.00280	0.00278
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00195	0.00197	0.00195

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00261	-0.00263	-0.00262
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00262	-0.00263	-0.00262
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00262	-0.00263	-0.00262
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	-0.00042	-0.00042	-0.00042
	!A	0.00000	0.00000	0.00000
	!A	-0.00036	-0.00037	-0.00036
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00261	-0.00263	-0.00262
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00184	-0.00185	-0.00184

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00265	0.00266	0.00262
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00266	0.00266	0.00263
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00266	0.00266	0.00263
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.00042	0.00042	0.00042
	!A	0.00000	0.00000	0.00000
	!A	0.00036	0.00037	0.00036
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00266	0.00264	0.00263
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00188	0.00187	0.00185

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__aoi21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__aoi21_l	0.00266	0.00284	0.00279	0.54135

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.01323	0.02620

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi21_l	A0->Y (FR)	0.08266	0.86967	10.10370
	A1->Y (FR)	0.06532	0.79407	9.51221
	B0->Y (FR)	0.06299	0.87162	10.63110

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi21_l	A0->Y (RF)	0.04470	0.50102	5.99623
	A1->Y (RF)	0.04108	0.52060	6.46217
	B0->Y (RF)	0.02722	0.49036	6.23477

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00676	0.00668	0.00933
	A1	0.00000	0.00000	0.00000
	A1	0.00568	0.00557	0.00823
	B0	0.00418	0.00429	0.00934

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00139	0.00118	0.00340
	A1	0.00000	0.00000	0.00000
	A1	0.00143	0.00132	0.00411
	B0	-0.00058	-0.00039	0.00223

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00194	-0.00227	-0.00226
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00228	-0.00230	-0.00229
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00229	-0.00230	-0.00229

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00224	0.00227	0.00226
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00228	0.00231	0.00229
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00233	0.00231	0.00229

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00193	-0.00227	-0.00226
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00229	-0.00230	-0.00229
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00252	-0.00253	-0.00254

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00225	0.00228	0.00226
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00229	0.00232	0.00230
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00253	0.00259	0.00254

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00105	-0.00106	-0.00106

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00115	0.00116	0.00108

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

INPUT				OUTPUT
A0	**A1**	**B0**	**B1**	**Y**
0	**x**	**0**	**x**	**1**
0	**x**	**1**	**0**	**1**
x	**x**	**1**	**1**	**0**
1	**0**	**0**	**x**	**1**
1	**0**	**1**	**0**	**1**
1	**1**	**x**	**x**	**0**

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi22_l	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_12T_ms__aoi22_l	0.00266	0.00284	0.00296	0.00278	0.53299

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_l	0.00000	0.01505	0.05241

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi22_l	A0->Y (FR)	0.10601	0.89545	10.07160
	A1->Y (FR)	0.09407	0.87821	10.02010
	B0->Y (FR)	0.06646	0.87098	10.54430
	B1->Y (FR)	0.07881	0.89011	10.61690

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi22_l	A0->Y (RF)	0.05847	0.51401	5.95735
	A1->Y (RF)	0.05477	0.53537	6.42241
	B0->Y (RF)	0.03117	0.50867	6.39040
	B1->Y (RF)	0.03533	0.48647	5.92880

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00818	0.00809	0.01074
	A1	0.00711	0.00696	0.00964
	B0	0.00454	0.00451	0.01007
	B1	0.00567	0.00572	0.01094

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00282	0.00261	0.00488
	A1	0.00285	0.00278	0.00559
	B0	-0.00038	-0.00032	0.00259
	B1	-0.00032	-0.00038	0.00191

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00196	-0.00226	-0.00225
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00228	-0.00229	-0.00229
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00228	-0.00230	-0.00229
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00228	-0.00230	-0.00229

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00224	0.00226	0.00225
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00228	0.00231	0.00229
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00233	0.00231	0.00229
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00233	0.00231	0.00229

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00196	-0.00226	-0.00226
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00229	-0.00231	-0.00229
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00251	-0.00252	-0.00253
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00251	-0.00252	-0.00253

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00224	0.00226	0.00226
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00229	0.00232	0.00230
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00252	0.00258	0.00253
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00252	0.00258	0.00253

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00105	-0.00106	-0.00105
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00104	-0.00106	-0.00105
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00262	-0.00264	-0.00264
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00262	-0.00264	-0.00264

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00120	0.00120	0.00109
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00104	0.00106	0.00105
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00264	0.00266	0.00265
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00264	0.00265	0.00265

Passive power(pJ) for B1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00107	-0.00107	-0.00107
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00106	-0.00106	-0.00106
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00241	-0.00243	-0.00241
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00241	-0.00243	-0.00241

Passive power(pJ) for B1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00121	0.00121	0.00110
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00106	0.00107	0.00106
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00245	0.00243	0.00242
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00245	0.00243	0.00242

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__buf_1	6.34920
sky130_osu_sc_12T_ms__buf_2	8.30280
sky130_osu_sc_12T_ms__buf_4	12.21000
sky130_osu_sc_12T_ms__buf_6	16.11720
sky130_osu_sc_12T_ms__buf_8	20.02440
sky130_osu_sc_12T_ms__buf_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__buf_1	0.00302	1.18635
sky130_osu_sc_12T_ms__buf_2	0.00302	2.44310
sky130_osu_sc_12T_ms__buf_4	0.00302	4.82216
sky130_osu_sc_12T_ms__buf_6	0.00083	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00302	9.47354
sky130_osu_sc_12T_ms__buf_l	0.00225	0.89738

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.02657	0.02657
sky130_osu_sc_12T_ms__buf_2	0.00000	0.03985	0.05277
sky130_osu_sc_12T_ms__buf_4	0.00000	0.06642	0.10518
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.11955	0.20999
sky130_osu_sc_12T_ms__buf_l	0.00000	0.44381	0.44381

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__buf_1	**A->Y (RR)**	0.05528	0.55890	6.59691
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.05897	0.48211	6.61305
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.07888	0.47129	6.82106
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.11829	0.51469	7.20264
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.05777	0.60231	6.71864

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__buf_1	**A->Y (FF)**	0.06044	0.50834	5.61766
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.07019	0.49312	5.94319
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.09932	0.52311	6.28278
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.15906	0.59990	6.69664
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.06297	0.54056	5.71346

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00293	0.00303	0.01882
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00566	0.00594	0.02177
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01194	0.01257	0.03767
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02518	0.02610	0.04308
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00227	0.00266	0.02718

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00764	0.00865	0.02873
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00971	0.01087	0.03081
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01507	0.01636	0.03619
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02727	0.02873	0.04727
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00589	0.00711	0.03449

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00067	-0.00068	-0.00065

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
	0.00067	0.00068	0.00065

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffr_1	42.49080
sky130_osu_sc_12T_ms__dffr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffr_1	0.00277	0.00277	0.00870	1.26469	1.26917
sky130_osu_sc_12T_ms__dffr_l	0.00277	0.00277	0.00869	0.89656	0.89699

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.30900	0.66778
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.72624	1.08502

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	CK->Q (RR)	0.28329	1.30120	14.75420
	QN->Q (FR)	0.02749	0.77567	12.18180
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.27828	1.38722	14.26640
	QN->Q (FR)	0.02978	0.79509	11.42440

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	CK->Q (RF)	0.29003	1.35204	15.67390
	QN->Q (RF)	0.02172	0.59009	9.26101
	RN->Q (FF)	0.21556	1.37114	16.90810
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.29230	1.47878	15.49920
	QN->Q (RF)	0.02360	0.61157	8.86896
	RN->Q (FF)	0.21768	1.49778	16.73010

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	CK->QN (RR)	0.25890	0.77568	6.84052
	RN->QN (FR)	0.18391	0.79542	8.07862
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.25672	0.82843	6.78384
	RN->QN (FR)	0.18200	0.84743	8.01083

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	**CK->QN (RF)**	0.24176	0.65536	4.87995
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.23453	0.67776	4.76658

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.05724	-0.07069	-0.05314
	setup	CK (R)	0.21715	0.24327	1.12652
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.05730	-0.07087	-0.05384
	setup	CK (R)	0.21740	0.24333	1.15619

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.11773	-0.30851	-1.99528
	setup	CK (R)	0.14279	0.31856	3.20648
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.11650	-0.30568	-1.89883
	setup	CK (R)	0.14279	0.31856	3.20648

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.05724	-0.07069	-0.05314
	setup	CK (R)	0.21715	0.24327	1.12652
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.05730	-0.07087	-0.05384
	setup	CK (R)	0.21740	0.24333	1.15619

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.11773	-0.30851	-1.99528
	setup	CK (R)	0.14279	0.31856	3.20648
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.11650	-0.30568	-1.89883
	setup	CK (R)	0.14279	0.31856	3.20648

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	recovery	CK (R)	0.18682	0.21625	1.25789
	removal	CK (R)	-0.03666	-0.04350	-0.07298
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.18652	0.21728	1.28098
	removal	CK (R)	-0.03666	-0.04350	-0.07298

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	recovery	CK (R)	0.18682	0.21625	1.25789
	removal	CK (R)	-0.03666	-0.04350	-0.07298
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.18652	0.21728	1.28098
	removal	CK (R)	-0.03666	-0.04350	-0.07298

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	min_pulse_width	RN ()	0.13302	0.41626	13.33370
	min_pulse_width	RN ()	0.13302	0.41626	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.12987	0.41626	13.33370
	min_pulse_width	RN ()	0.12987	0.41626	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	min_pulse_width	CK ()	0.12987	0.41626	13.33370
	min_pulse_width	CK ()	0.15190	0.41626	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.12043	0.41626	13.33370
	min_pulse_width	CK ()	0.14875	0.41626	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	min_pulse_width	CK ()	0.28093	0.41626	13.33370
	min_pulse_width	CK ()	0.11728	0.41626	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.28093	0.41626	13.33370
	min_pulse_width	CK ()	0.11728	0.41626	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00784	0.00660	0.00595
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00704	0.00627	0.01572

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00891	0.00757	0.00140
	RN	-0.00101	-0.06426	-1.02440
	RN	0.02040	0.01933	0.01359
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00810	0.00724	0.01090
	RN	-0.00101	-0.05227	-0.72621
	RN	0.01959	0.01901	0.02308

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00891	0.00756	0.00121
	RN	-0.00101	-0.06439	-1.02802
	RN	0.02040	0.01933	0.01353
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00810	0.00725	0.01148
	RN	-0.00101	-0.05229	-0.72656
	RN	0.01959	0.01901	0.02294

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00781	0.00659	0.00565
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00701	0.00625	0.01544

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00188	-0.00226	-0.00228
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00987	0.00952	0.02480
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00391	0.00365	0.01895
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00188	-0.00226	-0.00228
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00987	0.00952	0.02480
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00391	0.00366	0.01895

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00226	0.00229	0.00228
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01494	0.01480	0.03062
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00743	0.00732	0.02274
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00227	0.00229	0.00229
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01494	0.01480	0.03063
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00743	0.00732	0.02275

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00301	0.00303	0.02812
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00919	0.00903	0.03527
sky130_osu_sc_12T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00302	0.00304	0.02812
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00919	0.00903	0.03527

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00789	0.00842	0.03393
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01556	0.01590	0.04177
sky130_osu_sc_12T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00790	0.00843	0.03394
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01556	0.01591	0.04177

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00062	-0.00083	0.02442
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00505	0.00430	0.03032
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00065	-0.00066	0.02432
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00062	-0.00083	0.02443
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00505	0.00431	0.03032
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00065	-0.00066	0.02433

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01195	0.01248	0.03835
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02459	0.02453	0.05425
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01838	0.01853	0.04448
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02396	0.02481	0.06880
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01299	0.01344	0.03886
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01195	0.01248	0.03835
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02459	0.02451	0.05425
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01839	0.01855	0.04448
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02396	0.02481	0.06880
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01300	0.01345	0.03887

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__dffsr_1	46.39800
sky130_osu_sc_12T_ms__dffsr_l	46.39800

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	RN	SN	CK	Q	QN
sky130_osu_sc_12T_ms__dffsr_1	0.00274	0.00278	0.00647	0.00879	1.32303	1.32505
sky130_osu_sc_12T_ms__dffsr_l	0.00274	0.00278	0.00648	0.00879	0.89079	0.89811

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.09686	0.13290
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.51410	0.55014

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->Q (RR)	0.30428	1.34256	15.23970
	QN->Q (FR)	0.02579	0.75013	11.91450
	RN->Q (RR)	0.24506	1.29574	15.27820
	SN->Q (FR)	0.22486	1.36301	16.67330
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.30379	1.42078	14.25630
	QN->Q (FR)	0.02971	0.79279	11.37240
	RN->Q (RR)	0.24530	1.37618	14.29750
	SN->Q (FR)	0.22631	1.43794	15.67610

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->Q (RF)	0.33368	1.40655	16.08430
	QN->Q (RF)	0.02155	0.59727	9.49657
	RN->Q (FF)	0.22634	1.39647	17.32260
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.33756	1.52394	15.45590
	QN->Q (RF)	0.02346	0.60954	8.82987
	RN->Q (FF)	0.23070	1.51410	16.67700

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->QN (RR)	0.30201	0.82018	6.93153
	RN->QN (FR)	0.19516	0.81025	8.16100
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.30136	0.87889	6.85346
	RN->QN (FR)	0.19480	0.86886	8.07208

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->QN (RF)	0.26449	0.69657	5.16172
	RN->QN (RF)	0.20633	0.65120	5.20889
	SN->QN (FF)	0.18737	0.71609	6.59458
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.26071	0.71576	4.84994
	RN->QN (RF)	0.20272	0.67159	4.89369
	SN->QN (FF)	0.18373	0.73366	6.27066

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-0.06434	-0.08100	-0.12873
	setup	CK (R)	0.23151	0.25262	1.09811
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.06451	-0.08281	-0.12691
	setup	CK (R)	0.23130	0.25278	1.10574

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-0.13216	-0.32635	-2.77863
	setup	CK (R)	0.16611	0.33688	3.26737
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.13259	-0.32381	-2.71433
	setup	CK (R)	0.16563	0.33688	3.26734

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-0.06434	-0.08100	-0.12873
	setup	CK (R)	0.23151	0.25262	1.09811
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.06451	-0.08281	-0.12691
	setup	CK (R)	0.23130	0.25278	1.10574

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-0.13216	-0.32635	-2.77863
	setup	CK (R)	0.16611	0.33688	3.26737
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.13259	-0.32381	-2.71433
	setup	CK (R)	0.16563	0.33688	3.26734

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	0.18314	0.20491	1.16907
	removal	CK (R)	-0.02971	-0.03441	-0.07673
	hold	SN (R)	-0.18011	-0.32112	-1.38424
	setup	SN (R)	0.20684	0.35893	5.68649
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.18363	0.20444	1.16743
	removal	CK (R)	-0.02971	-0.03441	-0.07673
	hold	SN (R)	-0.17444	-0.31313	-1.35150
	setup	SN (R)	0.20288	0.35058	5.62284

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	0.18314	0.20491	1.16907
	removal	CK (R)	-0.02971	-0.03441	-0.07673
	hold	SN (R)	-0.18011	-0.32122	-1.38424
	hold	SN (R)	-0.18199	-0.32112	-1.39222
	setup	SN (R)	0.20279	0.35689	5.53601
	setup	SN (R)	0.20684	0.35893	5.68649
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.18363	0.20444	1.16743
	removal	CK (R)	-0.02971	-0.03441	-0.07673
	hold	SN (R)	-0.17444	-0.31313	-1.35150
	hold	SN (R)	-0.17444	-0.31313	-1.35630
	setup	SN (R)	0.20288	0.34861	5.45787
	setup	SN (R)	0.19403	0.35058	5.62284

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	RN ()	0.15190	0.41626	13.33370
	min_pulse_width	RN ()	0.15505	0.41626	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.15190	0.41626	13.33370
	min_pulse_width	RN ()	0.15190	0.41626	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	0.04082	0.06954	5.25976
	removal	CK (R)	-0.01637	-0.05392	-0.29508
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.03700	0.06926	5.11915
	removal	CK (R)	-0.01900	-0.05392	-0.29508

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	0.04082	0.06954	5.25976
	removal	CK (R)	-0.01637	-0.05392	-0.29508
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.03700	0.06926	5.11915
	removal	CK (R)	-0.01900	-0.05392	-0.29508

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	SN ()	0.18022	0.41626	13.33370
	min_pulse_width	SN ()	0.18652	0.41626	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.18022	0.41626	13.33370
	min_pulse_width	SN ()	0.17708	0.41626	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	CK ()	0.13617	0.41626	13.33370
	min_pulse_width	CK ()	0.17078	0.41626	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.12987	0.41626	13.33370
	min_pulse_width	CK ()	0.16764	0.41626	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	CK ()	0.29667	0.41626	13.33370
	min_pulse_width	CK ()	0.14246	0.41626	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.29667	0.41626	13.33370
	min_pulse_width	CK ()	0.14246	0.41626	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00978	0.00851	0.00690
	RN	0.01783	0.01654	0.00851
	SN	-0.00101	-0.06602	-1.07165
	SN	0.01996	0.01831	0.00757
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00904	0.00827	0.01732
	RN	0.01707	0.01628	0.01925
	SN	-0.00101	-0.05207	-0.72154
	SN	0.01921	0.01807	0.02005

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01038	0.00943	0.00833
	RN	-0.00101	-0.06602	-1.07165
	RN	0.02150	0.02075	0.01992
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00959	0.00879	0.01253
	RN	-0.00101	-0.05207	-0.72154
	RN	0.02069	0.02010	0.02413

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01037	0.00942	0.00778
	RN	-0.00101	-0.06608	-1.07328
	RN	0.02150	0.02073	0.01965
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00959	0.00877	0.01219
	RN	-0.00101	-0.05233	-0.72747
	RN	0.02069	0.02008	0.02406

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00975	0.00847	0.00603
	RN	0.01780	0.01651	0.00806
	SN	-0.00101	-0.06608	-1.07324
	SN	0.01993	0.01828	0.00892
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00900	0.00821	0.01698
	RN	0.01704	0.01624	0.01907
	SN	-0.00101	-0.05233	-0.72745
	SN	0.01917	0.01802	0.02008

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00225	-0.00229	-0.00229
	(!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)	0.01244	0.01211	0.02713
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00428	0.00402	0.01910
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00426	0.00400	0.01910
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00430	0.00405	0.01913
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00225	-0.00229	-0.00230
	(!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)	0.01244	0.01211	0.02713
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00428	0.00403	0.01910
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00426	0.00401	0.01910
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00430	0.00405	0.01914

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00232	0.00231	0.00229
	(!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)	0.01724	0.01704	0.03233
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00807	0.00800	0.02328
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00814	0.00804	0.02330
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00804	0.00797	0.02325
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00233	0.00231	0.00230
	(!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)	0.01725	0.01704	0.03233
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00807	0.00800	0.02328
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00814	0.00804	0.02331
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00805	0.00798	0.02325

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00238	0.00236	0.02732
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01085	0.01055	0.03602
sky130_osu_sc_12T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00238	0.00236	0.02732
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01085	0.01055	0.03603

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00855	0.00916	0.03481
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01645	0.01674	0.04244
sky130_osu_sc_12T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00855	0.00916	0.03482
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01646	0.01675	0.04244

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00583	-0.00585	-0.00586
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00564	-0.00634	-0.00632
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00554	-0.00586	-0.00587
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00283	0.00264	0.01876
sky130_osu_sc_12T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00582	-0.00585	-0.00586
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00564	-0.00634	-0.00631
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00553	-0.00585	-0.00587
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00283	0.00263	0.01877

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00585	0.00598	0.00588
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00630	0.00637	0.00632
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00584	0.00588	0.00588
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01347	0.01317	0.02803
sky130_osu_sc_12T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00585	0.00598	0.00588
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00630	0.00637	0.00632
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00585	0.00589	0.00588
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01347	0.01317	0.02803

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00069	-0.00090	0.02431
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00593	0.00521	0.03118
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00583	0.00512	0.03112
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00051	-0.00050	0.02442
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00282	0.00258	0.04954
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00068	-0.00090	0.02431
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00593	0.00521	0.03118
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00584	0.00514	0.03112
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00051	-0.00050	0.02442
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00283	0.00258	0.04955

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_12T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02748	0.02744	0.05690
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01218	0.01268	0.03854
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01868	0.01888	0.04474
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01874	0.01895	0.04501
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02635	0.02702	0.07081
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01300	0.01343	0.03883
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01638	0.01725	0.06499
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02749	0.02744	0.05690
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01218	0.01268	0.03854
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01869	0.01888	0.04474
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01875	0.01897	0.04502
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02636	0.02702	0.07082
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01300	0.01343	0.03884
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01638	0.01726	0.06499

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffs_1	38.58360
sky130_osu_sc_12T_ms__dffs_l	38.58360

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_12T_ms__dffs_1	0.00275	0.00531	0.00866	1.27524	1.27105
sky130_osu_sc_12T_ms__dffs_l	0.00275	0.00531	0.00866	0.89517	0.89832

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.65585	1.82842
sky130_osu_sc_12T_ms__dffs_l	0.00000	1.07309	2.24567

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->Q (RR)	0.21429	1.22245	14.75060
	QN->Q (FR)	0.02746	0.77473	12.19650
	SN->Q (FR)	0.16681	1.28639	15.93860
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.21441	1.31124	14.13850
	QN->Q (FR)	0.02974	0.79257	11.38110
	SN->Q (FR)	0.16680	1.37030	15.29860

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->Q (RF)	0.32078	1.39173	15.80030
	QN->Q (RF)	0.02162	0.58927	9.27799
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.32052	1.50860	15.48630
	QN->Q (RF)	0.02352	0.60952	8.84239

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->QN (RR)	0.28852	0.81142	6.86797
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.28394	0.86044	6.81355

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->QN (RF)	0.17713	0.57518	4.78365
	SN->QN (FF)	0.12893	0.63973	5.96760
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.17447	0.60513	4.67880
	SN->QN (FF)	0.12665	0.66394	5.83921

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.04431	-0.05758	-0.03602
	setup	CK (R)	0.15648	0.18804	1.91208
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.04556	-0.05944	-0.03469
	setup	CK (R)	0.15521	0.18919	8.23450

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.12209	-0.30878	-0.60029
	setup	CK (R)	0.15411	0.32286	3.23059
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11988	-0.31073	-0.60076
	setup	CK (R)	0.15410	0.32286	3.23058

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.04431	-0.05758	-0.03602
	setup	CK (R)	0.15648	0.18804	1.91208
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.04556	-0.05944	-0.03469
	setup	CK (R)	0.15521	0.18919	8.23450

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.12209	-0.30878	-0.60029
	setup	CK (R)	0.15411	0.32286	3.23059
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11988	-0.31073	-0.60076
	setup	CK (R)	0.15410	0.32286	3.23058

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	recovery	CK (R)	0.04459	0.06986	3.98219
	removal	CK (R)	-0.02407	-0.05392	-0.42955
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.04451	0.06993	3.85944
	removal	CK (R)	-0.02407	-0.05392	-0.42955

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	recovery	CK (R)	0.04459	0.06986	3.98219
	removal	CK (R)	-0.02407	-0.05392	-0.42955
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.04451	0.06993	3.85944
	removal	CK (R)	-0.02407	-0.05392	-0.42955

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	min_pulse_width	SN ()	0.11414	0.41626	13.33370
	min_pulse_width	SN ()	0.11728	0.41626	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.11099	0.41626	13.33370
	min_pulse_width	SN ()	0.11099	0.41626	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	min_pulse_width	CK ()	0.09211	0.41626	13.33370
	min_pulse_width	CK ()	0.16134	0.41626	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.08581	0.41626	13.33370
	min_pulse_width	CK ()	0.15505	0.41626	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	min_pulse_width	CK ()	0.21799	0.41626	13.33370
	min_pulse_width	CK ()	0.13302	0.41626	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.21799	0.41626	13.33370
	min_pulse_width	CK ()	0.13302	0.41626	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00783	0.00664	0.00621
	SN	-0.00101	-0.06458	-1.03294
	SN	0.01691	0.01610	0.02029
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00703	0.00628	0.01593
	SN	-0.00101	-0.05222	-0.72508
	SN	0.01610	0.01577	0.03004

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00885	0.00759	0.00196
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00806	0.00725	0.01111

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00885	0.00758	0.00174
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00806	0.00724	0.01090

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00780	0.00661	0.00603
	SN	-0.00101	-0.06445	-1.02950
	SN	0.01688	0.01606	0.01971
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00700	0.00629	0.01557
	SN	-0.00101	-0.05233	-0.72762
	SN	0.01606	0.01573	0.02949

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00231	-0.00232
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00958	0.00929	0.02539
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00388	0.00363	0.01888
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00230	-0.00232
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00958	0.00929	0.02539
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00388	0.00363	0.01889

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00237	0.00235	0.00234
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01474	0.01451	0.03019
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00743	0.00736	0.02285
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00237	0.00236	0.00234
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01475	0.01451	0.03020
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00744	0.00736	0.02285

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00428	-0.00430	-0.00429
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00282	0.00267	0.02836
sky130_osu_sc_12T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00428	-0.00430	-0.00429
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00283	0.00267	0.02837

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00432	0.00432	0.00431
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00934	0.00981	0.03717
sky130_osu_sc_12T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00432	0.00433	0.00431
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00934	0.00982	0.03717

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00062	-0.00083	0.02441
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00056	-0.00056	0.02442
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00249	0.00232	0.04967
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00062	-0.00083	0.02442
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00056	-0.00056	0.02443
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00250	0.00233	0.04967

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02444	0.02439	0.05463
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01196	0.01249	0.03837
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02362	0.02430	0.06826
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01293	0.01338	0.03881
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01550	0.01651	0.06453
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02444	0.02440	0.05464
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01196	0.01250	0.03838
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02362	0.02430	0.06827
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01294	0.01338	0.03882
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01550	0.01651	0.06454

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dff_1	32.23440
sky130_osu_sc_12T_ms__dff_l	32.23440

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	D	CK	Q
sky130_osu_sc_12T_ms__dff_1	0.00291	0.00854	1.14066
sky130_osu_sc_12T_ms__dff_l	0.00291	0.00853	0.84118

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.08726	0.10640
sky130_osu_sc_12T_ms__dff_l	0.00000	0.50450	0.52364

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dff_1	**CK->Q (RR)**	0.18294	0.70059	6.59531
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.18240	0.75612	6.62985

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dff_1	**CK->Q (RF)**	0.26981	0.65104	4.47325
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.26987	0.69248	4.56911

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dff_1	hold	CK (R)	-0.04290	-0.05780	-0.06536
	setup	CK (R)	0.12552	0.16442	1.71405
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.04173	-0.05990	-0.06293
	setup	CK (R)	0.12684	0.16466	1.84001

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dff_1	hold	CK (R)	-0.11057	-0.30973	-0.29232
	setup	CK (R)	0.13200	0.32022	3.23162
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.10873	-0.30974	-0.31620
	setup	CK (R)	0.13200	0.32022	3.23096

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dff_1	min_pulse_width	CK ()	0.07952	0.41626	13.33370
	min_pulse_width	CK ()	0.14561	0.41626	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.07952	0.41626	13.33370
	min_pulse_width	CK ()	0.14246	0.41626	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dff_1	**min_pulse_width**	**CK ()**	0.18967	0.41626	13.33370
	min_pulse_width	**CK ()**	0.10469	0.41626	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.18967	0.41626	13.33370
	min_pulse_width	**CK ()**	0.10469	0.41626	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01648	0.01615	0.05509
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01483	0.01454	0.05364

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01804	0.01753	0.04336
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01645	0.01596	0.04189

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00187	-0.00224	-0.00227
	!CK	0.00000	0.00000	0.00000
	!CK	0.00868	0.00842	0.02385
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00187	-0.00224	-0.00227
	!CK	0.00000	0.00000	0.00000
	!CK	0.00868	0.00842	0.02385

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00225	0.00228	0.00227
	!CK	0.00000	0.00000	0.00000
	!CK	0.01522	0.01504	0.03086
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00225	0.00228	0.00227
	!CK	0.00000	0.00000	0.00000
	!CK	0.01523	0.01504	0.03086

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00066	-0.00086	0.02440
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00057	-0.00055	0.02444
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00066	-0.00086	0.02441
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00057	-0.00057	0.02444

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.01192	0.01247	0.03836
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02353	0.02355	0.05394
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02396	0.02474	0.06910
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01284	0.01331	0.03874
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.01193	0.01248	0.03836
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02353	0.02355	0.05395
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02396	0.02475	0.06910
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01285	0.01332	0.03874

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__inv_1	4.39560
sky130_osu_sc_12T_ms__inv_10	21.97800
sky130_osu_sc_12T_ms__inv_2	6.34920
sky130_osu_sc_12T_ms__inv_3	8.30280
sky130_osu_sc_12T_ms__inv_4	10.25640
sky130_osu_sc_12T_ms__inv_6	14.16360
sky130_osu_sc_12T_ms__inv_8	18.07080
sky130_osu_sc_12T_ms__inv_l	4.38570

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__inv_1	0.00281	1.14004
sky130_osu_sc_12T_ms__inv_10	0.02508	11.54760
sky130_osu_sc_12T_ms__inv_2	0.00521	2.35875
sky130_osu_sc_12T_ms__inv_3	0.00771	3.48431
sky130_osu_sc_12T_ms__inv_4	0.01015	4.69723
sky130_osu_sc_12T_ms__inv_6	0.01520	6.97155
sky130_osu_sc_12T_ms__inv_8	0.02014	9.18016
sky130_osu_sc_12T_ms__inv_l	0.00221	0.80090

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.01328	0.02620
sky130_osu_sc_12T_ms__inv_10	0.00000	0.13283	0.26203
sky130_osu_sc_12T_ms__inv_2	0.00000	0.02657	0.05241
sky130_osu_sc_12T_ms__inv_3	0.00000	0.03985	0.07861
sky130_osu_sc_12T_ms__inv_4	0.00000	0.05313	0.10481
sky130_osu_sc_12T_ms__inv_6	0.00000	0.07970	0.15722
sky130_osu_sc_12T_ms__inv_8	0.00000	0.10627	0.20962
sky130_osu_sc_12T_ms__inv_l	0.00000	0.22190	0.44364

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__inv_1	**A->Y (FR)**	0.02643	0.70325	10.81580
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.03031	0.45817	10.87210
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.01949	0.59520	10.76240
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.02091	0.55680	10.83800
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.02061	0.52312	10.79970
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.02291	0.48939	10.77950
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.02631	0.46907	10.74010
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.02980	0.73438	10.31020

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__inv_1	**A->Y (RF)**	0.01991	0.51838	7.97644
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.02537	0.33553	8.31281
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.01571	0.45222	8.15365
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.01693	0.42149	8.27753
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.01660	0.39676	8.28638
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.01949	0.36647	8.29635
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.02237	0.34697	8.27101
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.02250	0.54721	7.78079

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00391	0.00399	0.00807
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.03186	0.03794	0.07412
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00669	0.00731	0.01502
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01030	0.01157	0.02272
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01308	0.01412	0.02971
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01939	0.02386	0.04458
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02563	0.03023	0.05982
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00306	0.00330	0.01019

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__inv_1	**A**	0.00000	0.00000	0.00000
	A	-0.00070	-0.00049	0.00152
sky130_osu_sc_12T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.01205	-0.00946	0.01178
sky130_osu_sc_12T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00228	-0.00180	0.00224
sky130_osu_sc_12T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00300	-0.00234	0.00384
sky130_osu_sc_12T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00469	-0.00385	0.00459
sky130_osu_sc_12T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.00714	-0.00564	0.00698
sky130_osu_sc_12T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.00965	-0.00734	0.00937
sky130_osu_sc_12T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00049	-0.00033	0.00141

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	S0	Y
0	0	x	0
0	1	0	0
x	1	1	1
1	x	0	1
1	0	1	0

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__mux2_1	12.21000

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_12T_ms__mux2_1	0.28821	0.28823	0.00578	0.29182

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.02733	0.02900

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__mux2_1	A0->Y (RR)	-	0.01200	0.24752	2.63722
	A1->Y (RR)	-	0.01400	0.24995	2.63965
	S0->Y (RR)	(!A0 * A1)	0.04309	0.27384	1.40638
	S0->Y (FR)	(A0 * !A1)	0.02874	0.36685	3.39545

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__mux2_1	A0->Y (FF)	-	0.01362	0.25061	2.66859
	A1->Y (FF)	-	0.01219	0.24819	2.66305
	S0->Y (FF)	(!A0 * A1)	0.05730	0.33771	2.32187
	S0->Y (RF)	(A0 * !A1)	0.02195	0.28441	2.41935

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00381	-0.00381	-0.00382
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00246	-0.00246	-0.00246
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00516	0.00599	0.03269
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00247	-0.00231	0.02375

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00381	0.00381	0.00382
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00246	0.00246	0.00246
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00062	0.00091	0.02732
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01054	0.01138	0.03737

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00090	-0.00090	-0.00090

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00090	0.00090	0.00090

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00108	-0.00108	-0.00108

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00108	0.00108	0.00108

Passive power(pJ) for S0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00094	-0.00075	0.02551
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00091	-0.00077	0.02559

Passive power(pJ) for S0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00816	0.00886	0.03511
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00753	0.00833	0.03489

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__nand2_1	6.34920
sky130_osu_sc_12T_ms__nand2_1	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nand2_1	0.00279	0.00279	1.13171
sky130_osu_sc_12T_ms__nand2_1	0.00216	0.00219	0.79285

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.01329	0.05241
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.22192	0.88727

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nand2_1	A->Y (FR)	0.02751	0.70456	10.80600
	B->Y (FR)	0.03144	0.67737	10.32470
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.03009	0.73487	10.26090
	B->Y (FR)	0.03622	0.73727	10.24530

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nand2_1	A->Y (RF)	0.02922	0.65837	10.02960
	B->Y (RF)	0.03328	0.64229	9.59443
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.03263	0.71002	9.76414
	B->Y (RF)	0.03650	0.68627	9.27384

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00414	0.00416	0.00783
	B	0.00000	0.00000	0.00000
	B	0.00530	0.00520	0.00917
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00311	0.00321	0.00918
	B	0.00000	0.00000	0.00000
	B	0.00391	0.00404	0.01007

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00047	-0.00032	0.00144
	B	0.00000	0.00000	0.00000
	B	-0.00045	-0.00051	0.00099
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00028	-0.00028	0.00135
	B	0.00000	0.00000	0.00000
	B	-0.00027	-0.00031	0.00097

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00264	-0.00265	-0.00267
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00186	-0.00187	-0.00188

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00266	0.00269	0.00267
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00188	0.00190	0.00189

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00246	-0.00246	-0.00246
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00176	-0.00176	-0.00176

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00249	0.00248	0.00246
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00178	0.00178	0.00176

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__nor2_1	6.34920
sky130_osu_sc_12T_ms__nor2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nor2_1	0.00276	0.00303	0.62091
sky130_osu_sc_12T_ms__nor2_l	0.00208	0.00229	0.44712

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.01030	0.02620
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.14747	0.44363

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nor2_1	A->Y (FR)	0.05807	0.82899	10.36220
	B->Y (FR)	0.04580	0.82679	10.63010
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.06092	0.87562	9.98184
	B->Y (FR)	0.05120	0.86744	10.10370

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nor2_1	A->Y (RF)	0.02660	0.43598	5.65966
	B->Y (RF)	0.02125	0.42723	5.64453
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.02816	0.46197	5.56095
	B->Y (RF)	0.02362	0.45310	5.54765

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00550	0.00544	0.00826
	B	0.00000	0.00000	0.00000
	B	0.00430	0.00460	0.00950
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00398	0.00398	0.00788
	B	0.00000	0.00000	0.00000
	B	0.00321	0.00350	0.01167

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00059	0.00062	0.00346
	B	0.00000	0.00000	0.00000
	B	-0.00054	-0.00028	0.00246
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00042	0.00040	0.00301
	B	0.00000	0.00000	0.00000
	B	-0.00032	-0.00014	0.00228

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00188	-0.00227	-0.00229
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00122	-0.00153	-0.00155

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00228	0.00228	0.00229
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00156	0.00158	0.00157

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00106	-0.00107	-0.00106
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00074	-0.00075	-0.00074

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00111	0.00112	0.00107
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00078	0.00078	0.00076

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__oai21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__oai21_l	0.00279	0.00289	0.00246	0.61686

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.17165	0.46984

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai21_l	A0->Y (FR)	0.06546	0.84686	10.63730
	A1->Y (FR)	0.08050	0.85333	10.36990
	B0->Y (FR)	0.03708	0.67234	8.85710

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai21_l	A0->Y (RF)	0.04050	0.52875	6.59966
	A1->Y (RF)	0.04827	0.52687	6.49702
	B0->Y (RF)	0.03145	0.55534	7.29738

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00598	0.00618	0.01048
	A1	0.00000	0.00000	0.00000
	A1	0.00724	0.00713	0.00966
	B0	0.00483	0.00536	0.01345

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00024	0.00018	0.00217
	A1	0.00000	0.00000	0.00000
	A1	0.00138	0.00117	0.00318
	B0	0.00057	0.00070	0.00310

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00106	-0.00107	-0.00106
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00230	-0.00233	-0.00232
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00236	-0.00237	-0.00236

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00112	0.00113	0.00109
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00231	0.00233	0.00232
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00237	0.00238	0.00237

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00180	-0.00222	-0.00221
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00227	-0.00231	-0.00230
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00232	-0.00234	-0.00233

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00220	0.00222	0.00221
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00228	0.00231	0.00230
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00233	0.00236	0.00234

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00196	-0.00197	-0.00201

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00200	0.00205	0.00201

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

INPUT				OUTPUT
A0	A1	B0	B1	Y
0	0	x	x	1
x	1	0	0	1
x	1	x	1	0
x	1	1	x	0
1	x	0	0	1
1	x	x	1	0
1	x	1	x	0

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__oai22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ms__oai22_1	0.00263	0.00275	0.00293	0.00290	0.65138

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.01545	0.05241

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai22_l	A0->Y (FR)	0.08515	0.84959	10.41250
	A1->Y (FR)	0.07339	0.84716	10.70340
	B0->Y (FR)	0.04887	0.82306	10.68550
	B1->Y (FR)	0.06187	0.82664	10.39860

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai22_l	A0->Y (RF)	0.06569	0.57126	6.88475
	A1->Y (RF)	0.05340	0.55576	6.84239
	B0->Y (RF)	0.04520	0.58093	7.54766
	B1->Y (RF)	0.05805	0.59644	7.61430

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00924	0.00915	0.01159
	A1	0.00799	0.00820	0.01239
	B0	0.00578	0.00608	0.01017
	B1	0.00711	0.00703	0.00946

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00212	0.00193	0.00387
	A1	-0.00015	-0.00021	0.00178
	B0	-0.00020	-0.00004	0.00249
	B1	0.00090	0.00091	0.00340

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00184	-0.00224	-0.00224
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00184	-0.00224	-0.00224
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00219	-0.00224	-0.00223
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00225	-0.00227	-0.00226

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00223	0.00224	0.00224
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00223	0.00224	0.00224
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00223	0.00224	0.00223
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00226	0.00228	0.00227

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00103	-0.00104	-0.00103
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00103	-0.00104	-0.00103
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00219	-0.00222	-0.00222
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00225	-0.00226	-0.00226

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00108	0.00109	0.00105
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00108	0.00109	0.00105
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00221	0.00222	0.00222
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00225	0.00228	0.00226

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00104	-0.00105	-0.00105
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00104	-0.00106	-0.00105
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00258	-0.00261	-0.00261
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00258	-0.00259	-0.00264

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00109	0.00110	0.00106
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00109	0.00111	0.00106
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00261	0.00263	0.00261
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00263	0.00269	0.00265

Passive power(pJ) for B1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00182	-0.00222	-0.00222
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00182	-0.00222	-0.00222
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00262	-0.00269	-0.00267
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00261	-0.00263	-0.00269

Passive power(pJ) for B1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00220	0.00223	0.00222
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00220	0.00223	0.00222
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00267	0.00269	0.00267
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00269	0.00272	0.00270

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__or2_1	8.30280
sky130_osu_sc_12T_ms__or2_2	10.25640
sky130_osu_sc_12T_ms__or2_4	14.16360
sky130_osu_sc_12T_ms__or2_8	21.97800
sky130_osu_sc_12T_ms__or2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__or2_1	0.00311	0.00287	1.18212
sky130_osu_sc_12T_ms__or2_2	0.00311	0.00287	2.45312
sky130_osu_sc_12T_ms__or2_4	0.00311	0.00288	4.80991
sky130_osu_sc_12T_ms__or2_8	0.00311	0.00288	9.37832
sky130_osu_sc_12T_ms__or2_l	0.00233	0.00219	0.83130

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.01713	0.02693
sky130_osu_sc_12T_ms__or2_2	0.00000	0.02395	0.05313
sky130_osu_sc_12T_ms__or2_4	0.00000	0.03760	0.10554
sky130_osu_sc_12T_ms__or2_8	0.00000	0.06489	0.21035
sky130_osu_sc_12T_ms__or2_l	0.00000	0.25851	0.44398

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__or2_1	A->Y (RR)	0.06479	0.58955	6.58863
	B->Y (RR)	0.05657	0.56345	6.49769
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.06908	0.51153	6.67951
	B->Y (RR)	0.06060	0.48791	6.59017
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.08923	0.49519	6.87488
	B->Y (RR)	0.08055	0.47588	6.77374
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.12855	0.53079	7.22157
	B->Y (RR)	0.11974	0.51833	7.14673
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.06790	0.63829	6.47258
	B->Y (RR)	0.06045	0.61416	6.45048

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__or2_1	A->Y (FF)	0.11063	0.58216	5.87584
	B->Y (FF)	0.09267	0.56790	5.91692
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.13115	0.57451	6.24736
	B->Y (FF)	0.11350	0.56888	6.27373
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.18493	0.62376	6.60490
	B->Y (FF)	0.16734	0.62355	6.62479
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.29538	0.74531	7.02391
	B->Y (FF)	0.27788	0.74477	7.07159
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.11573	0.60464	5.66836
	B->Y (FF)	0.09936	0.58973	5.71225

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00422	0.00403	0.01670
	B	0.00000	0.00000	0.00000
	B	0.00314	0.00341	0.01827
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00699	0.00703	0.01994
	B	0.00000	0.00000	0.00000
	B	0.00586	0.00640	0.02133
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01334	0.01387	0.02717
	B	0.00000	0.00000	0.00000
	B	0.01216	0.01324	0.02767
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02652	0.02758	0.04218
	B	0.00000	0.00000	0.00000
	B	0.02535	0.02687	0.04236
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00320	0.00324	0.01649
	B	0.00000	0.00000	0.00000
	B	0.00246	0.00285	0.02165

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00927	0.00901	0.02200
	B	0.00000	0.00000	0.00000
	B	0.00772	0.00846	0.02934
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01146	0.01150	0.02411
	B	0.00000	0.00000	0.00000
	B	0.00986	0.01071	0.03088
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01728	0.01716	0.02941
	B	0.00000	0.00000	0.00000
	B	0.01571	0.01658	0.03524
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03249	0.02902	0.04065
	B	0.00000	0.00000	0.00000
	B	0.03121	0.02808	0.04540
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00689	0.00694	0.02180
	B	0.00000	0.00000	0.00000
	B	0.00583	0.00686	0.03156

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00190	-0.00230	-0.00231
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00190	-0.00232	-0.00231
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00190	-0.00232	-0.00231
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00190	-0.00231	-0.00231
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00121	-0.00155	-0.00156

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00229	0.00232	0.00231
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00229	0.00232	0.00231
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00229	0.00232	0.00231
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00229	0.00231	0.00231
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00157	0.00158	0.00158

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00106	-0.00107	-0.00106
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00106	-0.00107	-0.00106
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00106	-0.00107	-0.00106
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00106	-0.00107	-0.00106
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00073	-0.00073	-0.00073

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00112	0.00113	0.00108
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00112	0.00113	0.00108
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00112	0.00113	0.00108
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00112	0.00113	0.00108
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00076	0.00077	0.00074

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__tbufi_1	8.30280
sky130_osu_sc_12T_ms__tbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tbufi_1	0.00300	0.00394	0.64890
sky130_osu_sc_12T_ms__tbufi_l	0.00230	0.00301	0.44856

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.01353	0.05241
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.22204	0.88726

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tbufi_1	A->Y (FR)	0.04221	0.81626	10.65100
	OE->Y (FR)	0.04319	0.31868	5.09323
	OE->Y (RR)	0.07299	0.67394	6.59513
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.04931	0.86371	10.11190
	OE->Y (FR)	0.04363	0.31864	5.09318
	OE->Y (RR)	0.07842	0.74728	6.61156

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tbufi_1	A->Y (RF)	0.02869	0.53933	7.17586
	OE->Y (FF)	0.04378	0.31868	5.09322
	OE->Y (RF)	0.02715	0.51344	6.67853
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.03245	0.56888	6.92559
	OE->Y (FF)	0.04418	0.31865	5.09319
	OE->Y (RF)	0.03020	0.54038	6.38036

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00400	0.00427	0.00858
	OE	0.00000	0.00000	0.00000
	OE	0.00389	0.00419	0.02718
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00303	0.00315	0.01028
	OE	0.00000	0.00000	0.00000
	OE	0.00284	0.00341	0.03167

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00054	-0.00036	0.00205
	OE	0.00000	0.00000	0.00000
	OE	0.00237	0.00270	0.02955
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00031	-0.00018	0.00192
	OE	0.00000	0.00000	0.00000
	OE	0.00168	0.00230	0.03342

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00187	-0.00188	-0.00187
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00165	-0.00166	-0.00165
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00135	-0.00135	-0.00135
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00119	-0.00121	-0.00119

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00187	0.00188	0.00187
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00168	0.00170	0.00166
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00135	0.00135	0.00135
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00122	0.00122	0.00120

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00141	0.00178	0.02887
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00123	0.00161	0.02868
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00101	0.00169	0.03314
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00085	0.00153	0.03294

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00482	0.00569	0.03252
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00487	0.00569	0.03259
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00367	0.00483	0.03636
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00366	0.00487	0.03643

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__tnbufi_1	8.30280
sky130_osu_sc_12T_ms__tnbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tnbufi_1	0.00299	0.00444	0.64907
sky130_osu_sc_12T_ms__tnbufi_l	0.00220	0.00336	0.45160

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.02214	0.02657
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.36987	0.44383

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tnbufi_1	A->Y (FR)	0.04255	0.81622	10.65260
	OE->Y (RR)	0.02609	0.31891	5.09346
	OE->Y (FR)	0.05189	0.81519	10.34490
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.04839	0.86605	10.15230
	OE->Y (RR)	0.02839	0.31868	5.09322
	OE->Y (FR)	0.05617	0.87552	9.99772

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tnbufi_1	A->Y (RF)	0.02809	0.53870	7.17709
	OE->Y (RF)	0.02563	0.31890	5.09347
	OE->Y (FF)	0.05207	0.48249	4.80710
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.03096	0.56852	6.95247
	OE->Y (RF)	0.02826	0.31868	5.09323
	OE->Y (FF)	0.05679	0.50565	4.54788

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00415	0.00442	0.00872
	OE	0.00000	0.00000	0.00000
	OE	0.00992	0.01098	0.03835
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00310	0.00344	0.01036
	OE	0.00000	0.00000	0.00000
	OE	0.00750	0.00894	0.04059

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00073	-0.00053	0.00186
	OE	0.00000	0.00000	0.00000
	OE	0.00857	0.00984	0.03392
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00052	-0.00036	0.00172
	OE	0.00000	0.00000	0.00000
	OE	0.00649	0.00815	0.03754

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00153	-0.00154	-0.00153
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00133	-0.00134	-0.00133
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00105	-0.00106	-0.00105
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00090	-0.00092	-0.00091

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00153	0.00154	0.00153
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00136	0.00137	0.00134
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00105	0.00106	0.00105
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00094	0.00094	0.00092

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00251	-0.00245	0.02500
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00253	-0.00241	0.02502
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00167	-0.00126	0.03037
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00175	-0.00126	0.03036

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00744	0.00864	0.03612
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00734	0.00883	0.03601
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00569	0.00733	0.03901
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00562	0.00713	0.03895

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__xnor2_1	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xnor2_1	0.00600	0.00513	0.67490

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_1	0.00000	0.04624	0.07897

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xnor2_l	A->Y (RR)	B	0.09296	0.71152	6.81471
	A->Y (FR)	!B	0.05700	0.83500	10.79860
	B->Y (RR)	A	0.07606	0.69577	6.85310
	B->Y (FR)	!A	0.07115	0.83605	10.51070

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xnor2_l	A->Y (FF)	B	0.08756	0.55812	5.16926
	A->Y (RF)	!B	0.03914	0.53095	6.86888
	B->Y (FF)	A	0.07642	0.54768	5.16468
	B->Y (RF)	!A	0.04789	0.54198	6.87464

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00415	0.00425	0.02839
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01017	0.01121	0.04258
	B	A	0.00000	0.00000	0.00000
	B	A	0.00177	0.00221	0.02924
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01076	0.01151	0.04060

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01192	0.01243	0.03876
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00262	0.00281	0.03134
	B	A	0.00000	0.00000	0.00000
	B	A	0.01079	0.01190	0.03889
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00345	0.00359	0.03199

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_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
sky130_osu_sc_12T_ms__xor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xor2_l	0.00603	0.00517	0.62963

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.04624	0.07727

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xor2_l	A->Y (RR)	!B	0.09784	0.71974	6.79885
	A->Y (FR)	B	0.07317	0.84778	10.49420
	B->Y (RR)	!A	0.08056	0.71114	6.80322
	B->Y (FR)	A	0.08049	0.85551	10.48720

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xor2_l	A->Y (FF)	!B	0.08355	0.54558	4.85798
	A->Y (RF)	B	0.04088	0.55213	7.06196
	B->Y (FF)	!A	0.07913	0.54231	4.93433
	B->Y (RF)	A	0.04677	0.52986	6.58287

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01179	0.01247	0.04103
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00252	0.00213	0.02792
	B	A	0.00000	0.00000	0.00000
	B	A	0.01199	0.01274	0.04097
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00171	0.00202	0.02848

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00223	0.00223	0.03040
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01244	0.01336	0.03678
	B	A	0.00000	0.00000	0.00000
	B	A	0.00225	0.00227	0.02979
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01092	0.01206	0.03850

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tiehi	4.39560
sky130_osu_sc_12T_ms__tielo	4.39560

Pin Capacitance Information

Cell Name	Max Cap(pf)
	Y
sky130_osu_sc_12T_ms__tiehi	2.94347
sky130_osu_sc_12T_ms__tielo	5.71378

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__tielo	0.00000	0.00000	0.00000