sky130_osu_sc_12T_ms_ff_1P76_-40C.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__DFFNRx
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_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.01050	0.01055	0.00818	1.56951	0.68818	1.35594
sky130_osu_sc_12T_ms__addf_l	0.01051	0.01055	0.00818	1.04748	0.68746	1.35596

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.06233	0.08171
sky130_osu_sc_12T_ms__addf_l	0.00000	0.28457	0.52616

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)	0.09595	1.28700	21.28360
	B->CO (RR)	0.09063	1.22715	20.35590
	CI->CO (RR)	0.08972	1.30045	21.65990
	CON->CO (FR)	0.01863	0.64009	11.05680
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.09505	1.17121	16.78260
	B->CO (RR)	0.08995	1.13001	16.34290
	CI->CO (RR)	0.08875	1.18713	17.22650
	CON->CO (FR)	0.02186	0.66833	10.43030

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)	0.15341	1.80336	29.51250
	B->CO (FF)	0.13382	1.71151	28.15540
	CI->CO (FF)	0.13453	1.78484	29.61000
	CON->CO (RF)	0.01465	0.44470	7.67596
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.15019	1.58399	22.42360
	B->CO (FF)	0.13104	1.50854	21.52700
	CI->CO (FF)	0.13128	1.56704	22.55770
	CON->CO (RF)	0.01601	0.45325	7.05770

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)	0.12962	0.86577	10.66440
	B->CON (FR)	0.10931	0.81135	10.24830
	CI->CON (FR)	0.11071	0.85149	10.84310
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.12349	0.86049	10.65140
	B->CON (FR)	0.10378	0.80564	10.23920
	CI->CON (FR)	0.10457	0.84534	10.83090

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)	0.05866	0.43535	5.37226
	B->CON (RF)	0.05473	0.42938	5.34414
	CI->CON (RF)	0.05238	0.45420	5.77313
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.05706	0.43363	5.36646
	B->CON (RF)	0.05323	0.42762	5.33890
	CI->CON (RF)	0.05077	0.45244	5.76675

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)	0.22353	1.63207	22.97060
	B->S (-R)	0.21943	1.59471	22.09360
	CI->S (-R)	0.20325	1.61217	23.08400
	CON->S (RR)	0.05747	0.52144	6.44448
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.21586	1.62652	22.96600
	B->S (-R)	0.21202	1.58958	22.08880
	CI->S (-R)	0.19562	1.60667	23.07950
	CON->S (RR)	0.05749	0.52142	6.44418

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)	0.16373	1.08475	14.16910
	B->S (-F)	0.16998	1.05410	13.73880
	CI->S (-F)	0.15704	1.09647	14.56590
	CON->S (FF)	0.07252	0.52458	6.03432
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.16028	1.08227	14.16660
	B->S (-F)	0.16675	1.05163	13.73640
	CI->S (-F)	0.15355	1.09408	14.56380
	CON->S (FF)	0.07253	0.52482	6.03421

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	0.00228	0.00269	0.01301
	B	0.00325	0.00348	0.01204
	CI	0.00323	0.00370	0.01401
sky130_osu_sc_12T_ms__addf_l	A	0.00207	0.00244	0.01053
	B	0.00245	0.00277	0.01021
	CI	0.00301	0.00349	0.01200

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00795	0.00887	0.03341
	B	0.00825	0.00896	0.03040
	CI	0.00680	0.00787	0.03305
sky130_osu_sc_12T_ms__addf_l	A	0.00777	0.00836	0.02429
	B	0.00805	0.00853	0.02236
	CI	0.00661	0.00736	0.02435

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00794	0.00836	0.01916
	B	0.00824	0.00856	0.01803
	CI	0.00679	0.00739	0.01939
sky130_osu_sc_12T_ms__addf_l	A	0.00776	0.00815	0.01876
	B	0.00805	0.00835	0.01768
	CI	0.00661	0.00716	0.01898

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00270	0.00271	0.00748
	B	0.00266	0.00283	0.00773
	CI	0.00322	0.00353	0.00978
sky130_osu_sc_12T_ms__addf_l	A	0.00249	0.00251	0.00788
	B	0.00244	0.00265	0.00821
	CI	0.00300	0.00337	0.01038

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00795	0.00873	0.02991
	B	0.00825	0.00890	0.02719
	CI	0.00680	0.00774	0.02969
sky130_osu_sc_12T_ms__addf_l	A	0.00777	0.00851	0.02933
	B	0.00806	0.00865	0.02666
	CI	0.00662	0.00752	0.02910

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01723	0.01724	0.03153
	B	0.01570	0.01581	0.03759
	CI	0.01416	0.01399	0.02793
sky130_osu_sc_12T_ms__addf_l	A	0.01725	0.01724	0.03153
	B	0.01573	0.01582	0.03760
	CI	0.01417	0.01400	0.02793

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00515	0.00545	1.50939	1.54346	1.56260
sky130_osu_sc_12T_ms__addh_l	0.00514	0.00546	1.04884	1.54545	1.07466

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.07625	0.08164
sky130_osu_sc_12T_ms__addh_l	0.00000	0.52029	0.52602

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)	0.06498	0.50475	6.21798
	B->CO (RR)	0.06755	0.50926	6.34764
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.06409	0.54392	6.06182
	B->CO (RR)	0.06662	0.54974	6.16282

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)	0.05996	0.51204	6.45227
	B->CO (FF)	0.06395	0.52438	6.47157
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.05938	0.52181	6.05422
	B->CO (FF)	0.06329	0.53462	6.08040

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)	0.09383	0.51694	6.12991
	B->CON (RR)	0.09627	0.52037	6.25968
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.08765	0.50610	6.12712
	B->CON (RR)	0.09010	0.51035	6.24112

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)	0.08166	0.52753	6.51330
	B->CON (FF)	0.08105	0.53529	6.52015
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.07639	0.51287	6.41530
	B->CON (FF)	0.07586	0.52110	6.42133

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)	0.11429	1.12172	16.63740
	B->S (FR)	0.11393	1.13179	16.69850
	CON->S (FR)	0.02015	0.65036	11.21410
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.10948	1.05241	13.69250
	B->S (FR)	0.10917	1.06274	13.70590
	CON->S (FR)	0.02258	0.67731	10.64350

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)	0.11619	0.99348	14.30630
	B->S (RF)	0.11862	0.99608	14.42070
	CON->S (RF)	0.01425	0.44472	7.69113
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.11176	0.89358	10.86840
	B->S (RF)	0.11418	0.89773	10.97910
	CON->S (RF)	0.01558	0.45860	7.21672

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	0.00415	0.00416	0.01192
	B	0.00000	0.00000	0.00000
	B	0.00384	0.00374	0.01372
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00372	0.00367	0.01254
	B	0.00000	0.00000	0.00000
	B	0.00340	0.00326	0.01369

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	0.00570	0.00589	0.01665
	B	0.00000	0.00000	0.00000
	B	0.00603	0.00644	0.01758
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00525	0.00549	0.01682
	B	0.00000	0.00000	0.00000
	B	0.00559	0.00599	0.01750

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	0.00416	0.00416	0.01197
	B	0.00000	0.00000	0.00000
	B	0.00383	0.00374	0.01376
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00372	0.00368	0.01231
	B	0.00000	0.00000	0.00000
	B	0.00340	0.00327	0.01353

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	0.00569	0.00589	0.01660
	B	0.00000	0.00000	0.00000
	B	0.00603	0.00644	0.01754
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00525	0.00549	0.01697
	B	0.00000	0.00000	0.00000
	B	0.00559	0.00600	0.01772

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	0.00570	0.00590	0.01687
	B	0.00000	0.00000	0.00000
	B	0.00603	0.00645	0.01772
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00526	0.00548	0.01711
	B	0.00000	0.00000	0.00000
	B	0.00560	0.00600	0.01765

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	0.00415	0.00416	0.01184
	B	0.00000	0.00000	0.00000
	B	0.00383	0.00374	0.01513
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00372	0.00368	0.01234
	B	0.00000	0.00000	0.00000
	B	0.00340	0.00327	0.01351

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)	1.70394	1.63639	0.51438
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	1.70401	1.63645	0.51445

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)	1.70371	1.63480	0.51098
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	1.70378	1.63487	0.51105

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00277	0.00287	1.50541
sky130_osu_sc_12T_ms__and2_2	0.00277	0.00287	2.96391
sky130_osu_sc_12T_ms__and2_4	0.00277	0.00288	5.74933
sky130_osu_sc_12T_ms__and2_6	0.00280	0.00288	8.44777
sky130_osu_sc_12T_ms__and2_8	0.00277	0.00288	10.99415
sky130_osu_sc_12T_ms__and2_l	0.00216	0.00223	1.04539

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.03398	0.05430
sky130_osu_sc_12T_ms__and2_2	0.00000	0.05432	0.05442
sky130_osu_sc_12T_ms__and2_4	0.00000	0.09502	0.10852
sky130_osu_sc_12T_ms__and2_6	0.00000	0.13572	0.16270
sky130_osu_sc_12T_ms__and2_8	0.00000	0.17642	0.21688
sky130_osu_sc_12T_ms__and2_l	0.00000	0.58958	0.94327

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)	0.04951	0.45588	6.13474
	B->Y (RR)	0.05322	0.46309	5.98998
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.05561	0.39659	6.11636
	B->Y (RR)	0.05929	0.40174	5.98691
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.07612	0.39340	6.30243
	B->Y (RR)	0.07980	0.39533	6.20193
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.09670	0.41339	6.41112
	B->Y (RR)	0.10028	0.41226	6.32752
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.11676	0.43848	6.53129
	B->Y (RR)	0.12040	0.43579	6.45176
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.05268	0.50900	6.28891
	B->Y (RR)	0.05626	0.51060	6.08685

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)	0.04810	0.45607	5.87407
	B->Y (FF)	0.04962	0.46457	5.87603
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.05503	0.43225	5.94409
	B->Y (FF)	0.05616	0.43789	5.95282
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.07636	0.45281	6.15624
	B->Y (FF)	0.07559	0.45212	6.16362
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.09938	0.48399	6.29146
	B->Y (FF)	0.09661	0.47977	6.29373
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.12096	0.51242	6.35652
	B->Y (FF)	0.11646	0.50540	6.35275
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.04824	0.44921	5.40606
	B->Y (FF)	0.05268	0.46217	5.42013

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	0.00268	0.00308	0.03692
	B	0.00000	0.00000	0.00000
	B	0.00273	0.00260	0.02293
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00510	0.00552	0.03909
	B	0.00000	0.00000	0.00000
	B	0.00515	0.00521	0.02550
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01072	0.01144	0.04301
	B	0.00000	0.00000	0.00000
	B	0.01075	0.01109	0.03082
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01667	0.01726	0.04744
	B	0.00000	0.00000	0.00000
	B	0.01680	0.01721	0.03577
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02299	0.02304	0.05196
	B	0.00000	0.00000	0.00000
	B	0.02297	0.02342	0.04106
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00213	0.00330	0.05131
	B	0.00000	0.00000	0.00000
	B	0.00217	0.00261	0.03874

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	0.00714	0.00850	0.03641
	B	0.00000	0.00000	0.00000
	B	0.00814	0.00918	0.03547
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00913	0.01070	0.03856
	B	0.00000	0.00000	0.00000
	B	0.01018	0.01131	0.03777
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01431	0.01607	0.04367
	B	0.00000	0.00000	0.00000
	B	0.01531	0.01654	0.04286
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01997	0.02179	0.04911
	B	0.00000	0.00000	0.00000
	B	0.02080	0.02258	0.04810
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02630	0.02706	0.05444
	B	0.00000	0.00000	0.00000
	B	0.02698	0.02792	0.05307
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00552	0.00758	0.05055
	B	0.00000	0.00000	0.00000
	B	0.00627	0.00812	0.04926

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)	-0.00240	-0.00242	-0.00242
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00240	-0.00242	-0.00242
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00240	-0.00242	-0.00242
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00242	-0.00244	-0.00245
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00240	-0.00242	-0.00242
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00172	-0.00173	-0.00173

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)	0.00242	0.00245	0.00243
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00242	0.00245	0.00243
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00242	0.00245	0.00243
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00244	0.00247	0.00246
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00242	0.00244	0.00243
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00173	0.00175	0.00174

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)	-0.00225	-0.00227	-0.00226
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00225	-0.00228	-0.00226
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00225	-0.00228	-0.00226
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00225	-0.00227	-0.00226
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00225	-0.00226	-0.00226
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00161	-0.00162	-0.00162

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)	0.00229	0.00229	0.00227
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00229	0.00228	0.00227
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00229	0.00228	0.00227
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00229	0.00228	0.00227
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00230	0.00228	0.00227
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00166	0.00164	0.00163

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00252	0.00271	0.00267	0.63452

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.01304	0.02709

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)	0.06651	0.80827	10.39990
	A1->Y (FR)	0.05112	0.73238	9.70068
	B0->Y (FR)	0.05134	0.80389	10.72560

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)	0.02909	0.38800	4.98017
	A1->Y (RF)	0.02601	0.38858	5.03376
	B0->Y (RF)	0.01916	0.38179	5.06407

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	0.00600	0.00592	0.00885
	A1	0.00000	0.00000	0.00000
	A1	0.00494	0.00484	0.00781
	B0	0.00369	0.00421	0.01139

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	0.00118	0.00104	0.00327
	A1	0.00000	0.00000	0.00000
	A1	0.00122	0.00114	0.00420
	B0	-0.00048	-0.00038	0.00294

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)	-0.00170	-0.00192	-0.00192
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00194	-0.00196	-0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00194	-0.00196	-0.00195

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)	0.00190	0.00193	0.00192
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00194	0.00196	0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00198	0.00196	0.00195

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)	-0.00169	-0.00192	-0.00192
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00194	-0.00194	-0.00195
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00218	-0.00219	-0.00220

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)	0.00191	0.00193	0.00192
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00194	0.00197	0.00196
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00219	0.00222	0.00220

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)	-0.00092	-0.00093	-0.00092

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)	0.00100	0.00100	0.00094

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00252	0.00270	0.00283	0.00264	0.62079

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_l	0.00000	0.01465	0.05418

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)	0.08602	0.82808	10.33550
	A1->Y (FR)	0.07566	0.81234	10.27440
	B0->Y (FR)	0.05399	0.80117	10.60020
	B1->Y (FR)	0.06472	0.81733	10.68020

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)	0.03710	0.39531	4.91942
	A1->Y (RF)	0.03398	0.39593	4.97131
	B0->Y (RF)	0.02074	0.37778	4.95186
	B1->Y (RF)	0.02418	0.37788	4.90201

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	0.00719	0.00709	0.01016
	A1	0.00615	0.00601	0.00897
	B0	0.00400	0.00445	0.01199
	B1	0.00509	0.00548	0.01264

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00238	0.00223	0.00455
	A1	0.00242	0.00231	0.00547
	B0	-0.00030	-0.00022	0.00294
	B1	-0.00025	-0.00027	0.00205

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)	-0.00174	-0.00193	-0.00191
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00194	-0.00195	-0.00194
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00194	-0.00196	-0.00194
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00194	-0.00195	-0.00194

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)	0.00190	0.00194	0.00191
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00194	0.00196	0.00195
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00198	0.00196	0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00198	0.00196	0.00195

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)	-0.00174	-0.00192	-0.00192
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00194	-0.00196	-0.00195
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00217	-0.00217	-0.00219
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00217	-0.00217	-0.00219

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)	0.00191	0.00193	0.00192
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00194	0.00197	0.00196
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00218	0.00221	0.00220
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00218	0.00221	0.00220

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)	-0.00091	-0.00092	-0.00092
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00091	-0.00092	-0.00092
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00228	-0.00230	-0.00230
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00228	-0.00230	-0.00230

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)	0.00103	0.00104	0.00094
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00091	0.00092	0.00092
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00229	0.00230	0.00231
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00229	0.00230	0.00231

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)	-0.00093	-0.00094	-0.00093
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00093	-0.00093	-0.00093
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00206	-0.00208	-0.00207
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00206	-0.00207	-0.00207

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)	0.00104	0.00105	0.00096
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00093	0.00093	0.00093
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00210	0.00208	0.00207
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00210	0.00208	0.00207

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00288	1.38807
sky130_osu_sc_12T_ms__buf_2	0.00289	2.85969
sky130_osu_sc_12T_ms__buf_4	0.00288	5.65857
sky130_osu_sc_12T_ms__buf_6	0.00082	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00289	11.14309
sky130_osu_sc_12T_ms__buf_l	0.00220	1.05696

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.02721	0.02721
sky130_osu_sc_12T_ms__buf_2	0.00000	0.04082	0.05430
sky130_osu_sc_12T_ms__buf_4	0.00000	0.06803	0.10849
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.12245	0.21685
sky130_osu_sc_12T_ms__buf_l	0.00000	0.47169	0.47169

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)**	0.04148	0.45098	5.87869
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.04420	0.37577	5.84289
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.05957	0.36106	6.02668
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.08988	0.39315	6.35039
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.04288	0.48790	6.06479

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)**	0.04483	0.43641	5.53085
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.05187	0.42202	5.81120
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.07294	0.44506	6.09770
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.11668	0.50707	6.42193
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.04662	0.44797	5.49334

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	0.00256	0.00280	0.02162
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00492	0.00529	0.02426
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01043	0.01109	0.03191
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02196	0.02290	0.04339
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00203	0.00309	0.04352

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	0.00685	0.00790	0.03392
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00884	0.00995	0.03607
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01398	0.01517	0.04096
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02589	0.02663	0.05083
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00541	0.00750	0.05126

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
	-0.00063	-0.00064	-0.00061

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
	0.00063	0.00064	0.00061

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffnr_1	42.49080
sky130_osu_sc_12T_ms__dffnr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffnr_1	0.00264	0.00263	0.00847	1.50046	1.49590
sky130_osu_sc_12T_ms__dffnr_l	0.00264	0.00263	0.00847	1.04996	1.04865

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.32044	0.69693
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.76492	1.14141

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->Q (FR)	0.25412	1.22375	15.39450
	QN->Q (FR)	0.02218	0.72437	12.39460
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.25061	1.27469	14.48270
	QN->Q (FR)	0.02389	0.72387	11.31740

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->Q (FF)	0.16597	1.13303	15.85260
	QN->Q (RF)	0.01614	0.49285	8.42471
	RN->Q (FF)	0.15847	1.14755	15.89650
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.16770	1.22203	15.35120
	QN->Q (RF)	0.01707	0.49507	7.79702
	RN->Q (FF)	0.16023	1.23598	15.39780

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->QN (FR)	0.14542	0.68261	8.22695
	RN->QN (FR)	0.13787	0.69709	8.27220
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.14450	0.72924	8.11607
	RN->QN (FR)	0.13698	0.74329	8.15913

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	**CK->QN (FF)**	0.22135	0.66879	6.03707
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.21665	0.67676	5.72479

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__dffnr_1	hold	CK (F)	-0.06263	-0.12770	0.74374
	setup	CK (F)	0.11989	0.13817	-0.69446
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.06288	-0.12770	0.74366
	setup	CK (F)	0.12042	0.14188	-0.69512

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	hold	CK (F)	-0.05366	-0.07680	-0.35177
	setup	CK (F)	0.12580	0.16171	0.42309
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.05520	-0.07674	-0.35197
	setup	CK (F)	0.12768	0.16361	0.42282

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__dffnr_1	hold	CK (F)	-0.06263	-0.12770	0.74374
	setup	CK (F)	0.11989	0.13817	-0.69446
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.06288	-0.12770	0.74366
	setup	CK (F)	0.12042	0.14188	-0.69512

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__dffnr_1	hold	CK (F)	-0.05366	-0.07680	-0.35177
	setup	CK (F)	0.12580	0.16171	0.42309
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.05520	-0.07674	-0.35197
	setup	CK (F)	0.12768	0.16361	0.42282

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	recovery	CK (F)	0.10338	0.06241	-1.99527
	removal	CK (F)	-0.06693	-0.04334	2.00757
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.10354	0.06254	-1.99505
	removal	CK (F)	-0.06693	-0.04334	2.00757

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__dffnr_1	recovery	CK (F)	0.10338	0.06241	-1.99527
	removal	CK (F)	-0.06693	-0.04334	2.00757
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.10354	0.06254	-1.99505
	removal	CK (F)	-0.06693	-0.04334	2.00757

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__dffnr_1	min_pulse_width	RN ()	0.10086	0.38208	13.33370
	min_pulse_width	RN ()	0.09796	0.38208	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.09796	0.38208	13.33370
	min_pulse_width	RN ()	0.09796	0.38208	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__dffnr_1	min_pulse_width	CK ()	0.11536	0.38208	13.33370
	min_pulse_width	CK ()	0.15305	0.38208	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.11826	0.38208	13.33370
	min_pulse_width	CK ()	0.15305	0.38208	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__dffnr_1	min_pulse_width	CK ()	0.10666	0.38208	13.33370
	min_pulse_width	CK ()	0.08636	0.38208	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.10086	0.38208	13.33370
	min_pulse_width	CK ()	0.08347	0.38208	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.01349	0.01221	-0.00193
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01285	0.01227	0.01447

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.01330	0.01283	0.01787
	RN	-0.00091	-0.06650	-1.16195
	RN	0.01762	0.01648	0.01079
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01264	0.01279	0.03078
	RN	-0.00091	-0.05368	-0.81309
	RN	0.01695	0.01641	0.02369

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.01330	0.01284	0.01802
	RN	-0.00091	-0.06638	-1.15842
	RN	0.01762	0.01649	0.01099
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01264	0.01279	0.03063
	RN	-0.00091	-0.05364	-0.81208
	RN	0.01695	0.01641	0.02360

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.01346	0.01219	-0.00206
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01282	0.01222	0.01466

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00887	0.00865	0.02752
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00275	0.00264	0.02131
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00188	-0.00216	-0.00217
sky130_osu_sc_12T_ms__dffnr_l	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00887	0.00865	0.02752
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00275	0.00264	0.02131
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00188	-0.00216	-0.00216

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.01342	0.01338	0.03289
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00740	0.00735	0.02586
	!CK	0.00000	0.00000	0.00000
	!CK	0.00216	0.00216	0.00217
sky130_osu_sc_12T_ms__dffnr_l	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.01342	0.01338	0.03290
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00740	0.00736	0.02586
	!CK	0.00000	0.00000	0.00000
	!CK	0.00216	0.00217	0.00218

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00902	0.00917	0.04688
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00276	0.00306	0.03844
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00903	0.00917	0.04688
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00276	0.00307	0.03844

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01360	0.01439	0.05173
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00731	0.00827	0.04376
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01360	0.01439	0.05174
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00731	0.00828	0.04376

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00033	-0.00036	0.03543
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00967	0.00967	0.06118
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00252	0.00288	0.06928
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01134	0.01079	0.06255
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00026	-0.00001	0.03545
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00033	-0.00035	0.03543
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00967	0.00966	0.06118
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00252	0.00289	0.06928
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01134	0.01079	0.06255
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00025	-0.00001	0.03546

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01115	0.01195	0.04815
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01426	0.01585	0.08231
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01171	0.01238	0.04822
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01116	0.01195	0.04815
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01426	0.01585	0.08231
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01171	0.01238	0.04822

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00264	0.00263	0.00836	1.49121	1.49993
sky130_osu_sc_12T_ms__dffr_l	0.00264	0.00263	0.00835	1.05039	1.04819

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.32044	0.69699
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.76492	1.14147

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)	0.20523	1.02373	12.93050
	QN->Q (FR)	0.02218	0.72303	12.34720
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.20154	1.07701	12.11450
	QN->Q (FR)	0.02388	0.72407	11.32030

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)	0.21210	1.05550	13.55530
	QN->Q (RF)	0.01614	0.49184	8.39484
	RN->Q (FF)	0.15866	1.14499	15.80200
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.21369	1.14823	13.15890
	QN->Q (RF)	0.01707	0.49515	7.79889
	RN->Q (FF)	0.16042	1.23670	15.40540

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)	0.19154	0.60833	6.03778
	RN->QN (FR)	0.13805	0.69819	8.29157
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.19050	0.65507	5.91607
	RN->QN (FR)	0.13717	0.74365	8.15758

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)**	0.17235	0.47174	3.66370
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.16757	0.47912	3.33338

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)	-0.03319	-0.05310	-0.10174
	setup	CK (R)	0.15985	0.19394	0.48605
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.03312	-0.05317	-0.09804
	setup	CK (R)	0.16200	0.19290	0.48599

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)	-0.08937	-0.27633	-4.00410
	setup	CK (R)	0.10844	0.28500	4.04460
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.08641	-0.27465	-4.00502
	setup	CK (R)	0.10833	0.28500	4.04460

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)	-0.03319	-0.05310	-0.10174
	setup	CK (R)	0.15985	0.19394	0.48605
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.03312	-0.05317	-0.09804
	setup	CK (R)	0.16200	0.19290	0.48599

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)	-0.08937	-0.27633	-4.00410
	setup	CK (R)	0.10844	0.28500	4.04460
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.08641	-0.27465	-4.00502
	setup	CK (R)	0.10833	0.28500	4.04460

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)	0.14377	0.17333	0.72728
	removal	CK (R)	-0.02447	-0.03234	-0.04870
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.14407	0.17420	0.72773
	removal	CK (R)	-0.02447	-0.03234	-0.04870

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)	0.14377	0.17333	0.72728
	removal	CK (R)	-0.02447	-0.03234	-0.04870
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.14407	0.17420	0.72773
	removal	CK (R)	-0.02447	-0.03234	-0.04870

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 ()	0.09796	0.38208	13.33370
	min_pulse_width	RN ()	0.10086	0.38208	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.09796	0.38208	13.33370
	min_pulse_width	RN ()	0.09796	0.38208	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 ()	0.08926	0.38208	13.33370
	min_pulse_width	CK ()	0.10956	0.38208	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.08347	0.38208	13.33370
	min_pulse_width	CK ()	0.10666	0.38208	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 ()	0.20813	0.38208	13.33370
	min_pulse_width	CK ()	0.08636	0.38208	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.20813	0.38208	13.33370
	min_pulse_width	CK ()	0.08636	0.38208	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	0.00719	0.00548	-0.00041
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00654	0.00555	0.01564

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	0.00809	0.00656	0.00041
	RN	-0.00091	-0.06626	-1.15480
	RN	0.01844	0.01730	0.01216
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00743	0.00649	0.01304
	RN	-0.00091	-0.05369	-0.81342
	RN	0.01777	0.01723	0.02446

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	0.00809	0.00656	0.00048
	RN	-0.00091	-0.06649	-1.16155
	RN	0.01844	0.01729	0.01169
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00743	0.00649	0.01307
	RN	-0.00091	-0.05363	-0.81172
	RN	0.01778	0.01722	0.02440

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	0.00716	0.00549	-0.00048
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00650	0.00556	0.01537

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	-0.00164	-0.00193	-0.00194
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00913	0.00890	0.02778
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00354	0.00342	0.02206
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00163	-0.00193	-0.00194
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00913	0.00890	0.02778
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00354	0.00342	0.02206

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	0.00193	0.00193	0.00194
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01317	0.01311	0.03255
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00661	0.00659	0.02508
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00193	0.00193	0.00194
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01317	0.01311	0.03255
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00662	0.00659	0.02509

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)	0.00276	0.00306	0.03844
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00855	0.00870	0.04641
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)	0.00276	0.00307	0.03844
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00855	0.00870	0.04641

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)	0.00731	0.00827	0.04375
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01407	0.01486	0.05221
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)	0.00731	0.00827	0.04376
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01408	0.01487	0.05221

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)	-0.00052	-0.00044	0.03544
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00477	0.00415	0.04156
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00054	-0.00046	0.03536
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00052	-0.00043	0.03544
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00478	0.00415	0.04154
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00054	-0.00046	0.03536

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)	0.01092	0.01191	0.04808
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02218	0.02258	0.06712
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01642	0.01691	0.05439
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02147	0.02317	0.08376
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01158	0.01247	0.04826
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01092	0.01190	0.04808
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02218	0.02259	0.06712
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01642	0.01691	0.05440
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02147	0.02316	0.08376
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01159	0.01247	0.04827

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00260	0.00265	0.00620	0.00849	1.56478	1.57821
sky130_osu_sc_12T_ms__dffsr_l	0.00260	0.00265	0.00620	0.00849	1.03851	1.05010

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.09583	0.13287
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.54031	0.57735

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)	0.22310	1.05855	13.38730
	QN->Q (FR)	0.02065	0.69384	11.99240
	RN->Q (RR)	0.18048	1.02668	13.46280
	SN->Q (FR)	0.16895	1.16010	15.89480
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.22263	1.10316	12.06270
	QN->Q (FR)	0.02382	0.72173	11.23760
	RN->Q (RR)	0.18111	1.07521	12.15040
	SN->Q (FR)	0.16841	1.20315	14.54590

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)	0.24033	1.09008	13.92530
	QN->Q (RF)	0.01601	0.49843	8.62420
	RN->Q (FF)	0.16699	1.16302	16.17590
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.24338	1.17406	13.03920
	QN->Q (RF)	0.01696	0.49246	7.73675
	RN->Q (FF)	0.16995	1.24546	15.27130

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)	0.21969	0.63432	6.11403
	RN->QN (FR)	0.14649	0.70751	8.37912
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.22010	0.68782	5.97080
	RN->QN (FR)	0.14679	0.75986	8.20369

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)	0.19174	0.50867	3.97550
	RN->QN (RF)	0.15052	0.47958	4.06321
	SN->QN (FF)	0.13792	0.60991	6.49336
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.18916	0.51152	3.42992
	RN->QN (RF)	0.14813	0.48315	3.51515
	SN->QN (FF)	0.13550	0.61112	5.94126

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)	-0.04075	-0.06290	-0.14840
	setup	CK (R)	0.17349	0.20249	0.56060
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.04069	-0.06301	-0.14516
	setup	CK (R)	0.17339	0.20248	0.56140

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)	-0.10091	-0.29080	-4.05549
	setup	CK (R)	0.12273	0.30143	4.09238
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.10168	-0.28839	-4.05607
	setup	CK (R)	0.12350	0.30143	4.09238

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)	-0.04075	-0.06290	-0.14840
	setup	CK (R)	0.17349	0.20249	0.56060
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.04069	-0.06301	-0.14516
	setup	CK (R)	0.17339	0.20248	0.56140

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)	-0.10091	-0.29080	-4.05549
	setup	CK (R)	0.12273	0.30143	4.09238
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.10168	-0.28839	-4.05607
	setup	CK (R)	0.12350	0.30143	4.09238

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)	0.14278	0.16863	0.76879
	removal	CK (R)	-0.02303	-0.02759	-0.06902
	hold	SN (R)	-0.13267	-0.24973	-1.18194
	setup	SN (R)	0.15297	0.28778	3.13295
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.14256	0.16909	0.77057
	removal	CK (R)	-0.02303	-0.02759	-0.06902
	hold	SN (R)	-0.12801	-0.24521	-1.16174
	setup	SN (R)	0.15452	0.28115	3.00574

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)	0.14278	0.16863	0.76879
	removal	CK (R)	-0.02303	-0.02759	-0.06902
	hold	SN (R)	-0.13335	-0.24973	-1.18194
	hold	SN (R)	-0.13267	-0.25231	-1.19038
	setup	SN (R)	0.15297	0.28778	2.88880
	setup	SN (R)	0.15225	0.28688	3.13295
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.14256	0.16909	0.77057
	removal	CK (R)	-0.02303	-0.02759	-0.06902
	hold	SN (R)	-0.12801	-0.24521	-1.16174
	hold	SN (R)	-0.12910	-0.24521	-1.16466
	setup	SN (R)	0.15452	0.28079	2.78475
	setup	SN (R)	0.14585	0.28115	3.00574

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 ()	0.11246	0.38208	13.33370
	min_pulse_width	RN ()	0.11826	0.38208	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.11246	0.38208	13.33370
	min_pulse_width	RN ()	0.11536	0.38208	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)	0.02467	0.05366	3.00336
	removal	CK (R)	-0.01157	-0.04025	-0.20769
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.02429	0.05366	2.84481
	removal	CK (R)	-0.01157	-0.04025	-0.20769

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)	0.02467	0.05366	3.00336
	removal	CK (R)	-0.01157	-0.04025	-0.20769
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.02429	0.05366	2.84481
	removal	CK (R)	-0.01157	-0.04025	-0.20769

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 ()	0.13565	0.38208	13.33370
	min_pulse_width	SN ()	0.13855	0.38208	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.13565	0.38208	13.33370
	min_pulse_width	SN ()	0.13275	0.38208	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 ()	0.09796	0.38208	13.33370
	min_pulse_width	CK ()	0.12695	0.38208	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.09506	0.38208	13.33370
	min_pulse_width	CK ()	0.12405	0.38208	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 ()	0.22263	0.38208	13.33370
	min_pulse_width	CK ()	0.10376	0.38208	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.22263	0.38208	13.33370
	min_pulse_width	CK ()	0.10376	0.38208	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	0.00889	0.00710	-0.00118
	RN	0.01609	0.01425	-0.00051
	SN	-0.00091	-0.06820	-1.21177
	SN	0.01568	0.01351	-0.00439
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00829	0.00725	0.01671
	RN	0.01547	0.01440	0.01731
	SN	-0.00091	-0.05333	-0.80422
	SN	0.01730	0.01584	0.01253

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	0.00934	0.00824	0.00792
	RN	-0.00091	-0.06820	-1.21177
	RN	0.01945	0.01870	0.01890
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00869	0.00780	0.01465
	RN	-0.00091	-0.05333	-0.80422
	RN	0.01880	0.01826	0.02584

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	0.00934	0.00823	0.00785
	RN	-0.00091	-0.06855	-1.22216
	RN	0.01945	0.01869	0.01865
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00869	0.00781	0.01454
	RN	-0.00091	-0.05369	-0.81320
	RN	0.01880	0.01826	0.02541

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	0.00886	0.00707	-0.00182
	RN	0.01606	0.01421	-0.00098
	SN	-0.00091	-0.06855	-1.22214
	SN	0.01566	0.01349	-0.00489
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00826	0.00723	0.01629
	RN	0.01544	0.01437	0.01715
	SN	-0.00091	-0.05369	-0.81318
	SN	0.01726	0.01580	0.01334

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	-0.00191	-0.00195	-0.00196
	(!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)	0.01139	0.01117	0.02960
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00379	0.00367	0.02214
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00377	0.00365	0.02211
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00381	0.00369	0.02216
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00190	-0.00195	-0.00196
	(!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)	0.01140	0.01118	0.02960
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00379	0.00367	0.02214
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00377	0.00365	0.02212
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00381	0.00370	0.02216

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	0.00198	0.00195	0.00196
	(!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)	0.01517	0.01504	0.03351
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00722	0.00721	0.02554
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00727	0.00725	0.02555
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00719	0.00719	0.02551
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00199	0.00196	0.00196
	(!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)	0.01518	0.01505	0.03351
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00722	0.00722	0.02554
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00727	0.00725	0.02555
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00720	0.00719	0.02552

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)	0.00213	0.00239	0.03766
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01005	0.01002	0.04651
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)	0.00214	0.00239	0.03766
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01005	0.01003	0.04651

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)	0.00795	0.00902	0.04458
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01489	0.01567	0.05207
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)	0.00795	0.00902	0.04458
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01489	0.01568	0.05207

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)	-0.00512	-0.00514	-0.00515
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00508	-0.00555	-0.00555
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00490	-0.00514	-0.00513
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00231	0.00240	0.02219
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)	-0.00512	-0.00514	-0.00514
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00508	-0.00555	-0.00555
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00489	-0.00514	-0.00512
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00231	0.00239	0.02219

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)	0.00514	0.00521	0.00516
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00554	0.00562	0.00556
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00510	0.00517	0.00514
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01219	0.01193	0.03017
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)	0.00514	0.00522	0.00517
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00555	0.00563	0.00556
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00511	0.00517	0.00514
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01220	0.01194	0.03017

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)	-0.00059	-0.00052	0.03533
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00559	0.00499	0.04228
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00552	0.00495	0.04223
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00041	-0.00035	0.03544
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00245	0.00276	0.06895
sky130_osu_sc_12T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00059	-0.00048	0.03533
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00559	0.00499	0.04228
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00553	0.00495	0.04223
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00041	-0.00035	0.03545
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00245	0.00276	0.06896

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)	0.02475	0.02521	0.06930
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01113	0.01215	0.04825
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01660	0.01718	0.05438
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01665	0.01722	0.05437
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02357	0.02517	0.08524
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01159	0.01245	0.04823
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01488	0.01670	0.08290
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02476	0.02521	0.06931
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01114	0.01214	0.04825
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01661	0.01716	0.05439
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01665	0.01723	0.05437
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02357	0.02517	0.08524
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01159	0.01247	0.04824
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01488	0.01670	0.08291

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00262	0.00520	0.00834	1.49054	1.50648
sky130_osu_sc_12T_ms__dffs_l	0.00262	0.00520	0.00834	1.05822	1.05058

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.69220	1.94112
sky130_osu_sc_12T_ms__dffs_l	0.00000	1.13668	2.38560

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)	0.15547	0.96217	12.80980
	QN->Q (FR)	0.02214	0.71976	12.28700
	SN->Q (FR)	0.12654	1.08293	14.99510
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.15535	1.02447	12.09610
	QN->Q (FR)	0.02383	0.72520	11.33530
	SN->Q (FR)	0.12651	1.14164	14.27140

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)	0.22832	1.07275	13.53450
	QN->Q (RF)	0.01607	0.48964	8.36363
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.22845	1.16791	13.25550
	QN->Q (RF)	0.01701	0.49450	7.81037

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)	0.20742	0.62745	6.06458
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.20496	0.67160	5.93392

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)	0.12633	0.41468	3.59232
	SN->QN (FF)	0.09712	0.53422	5.78225
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.12452	0.42642	3.25862
	SN->QN (FF)	0.09538	0.54224	5.43507

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)	-0.02312	-0.04029	-0.08200
	setup	CK (R)	0.11475	0.15583	0.44762
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.02321	-0.04029	-0.08306
	setup	CK (R)	0.11483	0.15563	0.44468

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)	-0.08893	-0.27777	-4.03491
	setup	CK (R)	0.11833	0.29001	4.07356
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.09008	-0.27777	-4.03516
	setup	CK (R)	0.11832	0.29002	4.07356

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)	-0.02312	-0.04029	-0.08200
	setup	CK (R)	0.11475	0.15583	0.44762
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.02321	-0.04029	-0.08306
	setup	CK (R)	0.11483	0.15563	0.44468

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)	-0.08893	-0.27777	-4.03491
	setup	CK (R)	0.11833	0.29001	4.07356
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.09008	-0.27777	-4.03516
	setup	CK (R)	0.11832	0.29002	4.07356

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)	0.02838	0.05366	2.27866
	removal	CK (R)	-0.01299	-0.04025	-0.42352
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.02840	0.05366	2.11395
	removal	CK (R)	-0.01299	-0.04025	-0.42352

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)	0.02838	0.05366	2.27866
	removal	CK (R)	-0.01299	-0.04025	-0.42352
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.02840	0.05366	2.11395
	removal	CK (R)	-0.01299	-0.04025	-0.42352

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 ()	0.08926	0.38208	13.33370
	min_pulse_width	SN ()	0.09216	0.38208	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.08636	0.38208	13.33370
	min_pulse_width	SN ()	0.08636	0.38208	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 ()	0.06027	0.38208	13.33370
	min_pulse_width	CK ()	0.11536	0.38208	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.06027	0.38208	13.33370
	min_pulse_width	CK ()	0.11246	0.38208	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 ()	0.16174	0.38208	13.33370
	min_pulse_width	CK ()	0.09796	0.38208	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.16174	0.38208	13.33370
	min_pulse_width	CK ()	0.09796	0.38208	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	0.00717	0.00553	0.00012
	SN	-0.00091	-0.06624	-1.15427
	SN	0.01309	0.01262	0.02390
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00651	0.00552	0.01576
	SN	-0.00091	-0.05393	-0.81948
	SN	0.01243	0.01269	0.03927

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	0.00805	0.00660	0.00142
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00740	0.00650	0.01337

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	0.00805	0.00658	0.00115
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00740	0.00651	0.01352

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	0.00714	0.00549	-0.00047
	SN	-0.00091	-0.06666	-1.16659
	SN	0.01306	0.01259	0.02284
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00647	0.00532	0.01572
	SN	-0.00091	-0.05370	-0.81355
	SN	0.01239	0.01268	0.03925

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	-0.00193	-0.00197	-0.00198
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00898	0.00883	0.02909
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00351	0.00339	0.02203
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00192	-0.00197	-0.00197
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00898	0.00884	0.02909
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00351	0.00339	0.02203

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	0.00203	0.00200	0.00200
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01307	0.01294	0.03212
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00663	0.00663	0.02520
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00203	0.00201	0.00201
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01308	0.01293	0.03212
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00663	0.00664	0.02520

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)	-0.00382	-0.00385	-0.00384
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00241	0.00270	0.04794
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)	-0.00381	-0.00385	-0.00384
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00241	0.00269	0.04795

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)	0.00386	0.00388	0.00385
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00862	0.01002	0.05622
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)	0.00387	0.00389	0.00385
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00862	0.01002	0.05623

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)	-0.00052	-0.00044	0.03546
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00046	-0.00038	0.03548
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00224	0.00260	0.06922
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00052	-0.00044	0.03547
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00045	-0.00038	0.03548
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00224	0.00261	0.06923

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)	0.02215	0.02261	0.06777
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01093	0.01193	0.04811
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02124	0.02280	0.08357
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01152	0.01242	0.04823
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01406	0.01614	0.08257
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02216	0.02261	0.06777
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01093	0.01194	0.04812
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02125	0.02281	0.08358
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01153	0.01242	0.04824
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01406	0.01614	0.08257

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00277	0.00814	1.32284
sky130_osu_sc_12T_ms__dff_l	0.00277	0.00812	0.96963

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.08737	0.10896
sky130_osu_sc_12T_ms__dff_l	0.00000	0.53185	0.55344

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)**	0.13092	0.55127	5.75208
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.13060	0.59855	5.71355

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)**	0.19788	0.47002	3.27583
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.19793	0.49225	3.16707

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)	-0.02399	-0.04025	-0.10376
	setup	CK (R)	0.09124	0.13688	0.42463
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.02400	-0.04025	-0.10381
	setup	CK (R)	0.09066	0.13720	0.42471

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)	-0.07976	-0.27435	-4.03446
	setup	CK (R)	0.10205	0.28459	4.06767
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.08023	-0.27435	-4.03478
	setup	CK (R)	0.10205	0.28459	4.06767

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 ()	0.05447	0.38208	13.33370
	min_pulse_width	CK ()	0.10666	0.38208	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.05157	0.38208	13.33370
	min_pulse_width	CK ()	0.10376	0.38208	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 ()**	0.13855	0.38208	13.33370
	min_pulse_width	**CK ()**	0.07767	0.38208	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.13855	0.38208	13.33370
	min_pulse_width	**CK ()**	0.07767	0.38208	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	0.01498	0.01493	0.06703
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01362	0.01366	0.06576

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	0.01631	0.01585	0.05327
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01502	0.01461	0.05216

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	-0.00163	-0.00192	-0.00193
	!CK	0.00000	0.00000	0.00000
	!CK	0.00787	0.00774	0.02687
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00162	-0.00191	-0.00193
	!CK	0.00000	0.00000	0.00000
	!CK	0.00788	0.00774	0.02688

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	0.00191	0.00192	0.00193
	!CK	0.00000	0.00000	0.00000
	!CK	0.01344	0.01332	0.03278
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00192	0.00193	0.00193
	!CK	0.00000	0.00000	0.00000
	!CK	0.01344	0.01334	0.03278

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)	-0.00056	-0.00046	0.03546
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00047	-0.00038	0.03549
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00056	-0.00046	0.03544
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00046	-0.00038	0.03549

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)	0.01089	0.01202	0.04810
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02106	0.02157	0.06688
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02151	0.02338	0.08422
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01144	0.01239	0.04817
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.01090	0.01202	0.04810
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02106	0.02158	0.06689
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02152	0.02339	0.08423
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01144	0.01239	0.04817

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__inv_1	0.00267	1.32866
sky130_osu_sc_12T_ms__inv_10	0.02374	13.29811
sky130_osu_sc_12T_ms__inv_2	0.00494	2.79247
sky130_osu_sc_12T_ms__inv_3	0.00731	4.14046
sky130_osu_sc_12T_ms__inv_4	0.00962	5.51884
sky130_osu_sc_12T_ms__inv_6	0.01440	8.20714
sky130_osu_sc_12T_ms__inv_8	0.01907	10.67848
sky130_osu_sc_12T_ms__inv_l	0.00216	0.91095

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.01361	0.02709
sky130_osu_sc_12T_ms__inv_10	0.00000	0.13606	0.27092
sky130_osu_sc_12T_ms__inv_2	0.00000	0.02721	0.05418
sky130_osu_sc_12T_ms__inv_3	0.00000	0.04082	0.08128
sky130_osu_sc_12T_ms__inv_4	0.00000	0.05442	0.10837
sky130_osu_sc_12T_ms__inv_6	0.00000	0.08163	0.16255
sky130_osu_sc_12T_ms__inv_8	0.00000	0.10884	0.21674
sky130_osu_sc_12T_ms__inv_l	0.00000	0.23584	0.47159

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)**	0.02112	0.64641	10.77660
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.02633	0.42467	10.77160
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.01576	0.54960	10.79160
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.01711	0.51654	10.91780
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.01707	0.48525	10.79180
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.01938	0.45484	10.79350
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.02258	0.43483	10.68700
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.02391	0.66231	9.99699

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)**	0.01453	0.41785	6.89394
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.01974	0.25099	7.22755
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.01168	0.35881	7.15424
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.01273	0.33368	7.32599
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.01263	0.30698	7.27809
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.01503	0.28085	7.30658
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.01735	0.26203	7.23044
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.01599	0.43007	6.43690

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	0.00341	0.00365	0.00945
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02773	0.03547	0.08782
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00580	0.00667	0.01754
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00895	0.01058	0.02656
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01137	0.01358	0.03470
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01683	0.02245	0.05198
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02224	0.02863	0.07049
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00274	0.00359	0.01644

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	-0.00058	-0.00048	0.00182
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00997	-0.00761	0.01503
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00193	-0.00160	0.00287
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00252	-0.00194	0.00467
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00395	-0.00307	0.00583
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00604	-0.00458	0.00880
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00810	-0.00578	0.01191
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00043	-0.00035	0.00210

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.32053	0.32056	0.00552	0.32189

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.02801	0.03004

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)	-	0.00840	0.17915	1.89214
	A1->Y (RR)	-	0.00974	0.18102	1.88241
	S0->Y (RR)	(!A0 * A1)	0.03123	0.18801	0.71555
	S0->Y (FR)	(A0 * !A1)	0.02339	0.31651	3.32186

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)	-	0.00998	0.19483	2.11876
	A1->Y (FF)	-	0.00920	0.19282	2.10838
	S0->Y (FF)	(!A0 * A1)	0.04348	0.29490	2.58373
	S0->Y (RF)	(A0 * !A1)	0.01637	0.19756	1.53459

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	-	-0.00346	-0.00347	-0.00347
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00213	-0.00213	-0.00213
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00467	0.00608	0.04268
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00212	-0.00167	0.03469

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	-	0.00346	0.00347	0.00347
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00213	0.00213	0.00213
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00052	0.00110	0.03787
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00937	0.01062	0.04669

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)	-0.00080	-0.00080	-0.00080

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)	0.00080	0.00080	0.00080

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)	-0.00097	-0.00097	-0.00097

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)	0.00097	0.00097	0.00097

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)	-0.00083	-0.00026	0.03629
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00079	-0.00030	0.03629

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)	0.00724	0.00834	0.04469
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00679	0.00801	0.04460

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nand2_1	0.00266	0.00265	1.31665
sky130_osu_sc_12T_ms__nand2_l	0.00211	0.00214	0.90642

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.01363	0.05418
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.23587	0.94317

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)	0.02196	0.64964	10.76400
	B->Y (FR)	0.02532	0.62012	10.21190
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.02406	0.66363	9.98087
	B->Y (FR)	0.02955	0.66585	9.96231

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)	0.01948	0.49781	8.17400
	B->Y (RF)	0.02277	0.49830	8.09881
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.02159	0.52304	7.78851
	B->Y (RF)	0.02465	0.51735	7.58238

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	0.00361	0.00415	0.00911
	B	0.00000	0.00000	0.00000
	B	0.00473	0.00523	0.01058
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00278	0.00341	0.01467
	B	0.00000	0.00000	0.00000
	B	0.00360	0.00431	0.01575

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	-0.00036	-0.00033	0.00176
	B	0.00000	0.00000	0.00000
	B	-0.00036	-0.00039	0.00113
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00023	-0.00020	0.00194
	B	0.00000	0.00000	0.00000
	B	-0.00023	-0.00024	0.00138

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)	-0.00230	-0.00232	-0.00232
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00166	-0.00167	-0.00167

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)	0.00232	0.00234	0.00233
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00167	0.00169	0.00168

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)	-0.00211	-0.00211	-0.00211
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00153	-0.00155	-0.00154

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)	0.00214	0.00213	0.00211
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00156	0.00155	0.00154

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00262	0.00289	0.74376
sky130_osu_sc_12T_ms__nor2_l	0.00203	0.00224	0.53150

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.01002	0.02709
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.15419	0.47158

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)	0.04537	0.77018	10.67470
	B->Y (FR)	0.03584	0.75681	10.68960
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.04775	0.80025	10.09810
	B->Y (FR)	0.04019	0.78017	9.96722

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)	0.01898	0.34319	4.69125
	B->Y (RF)	0.01549	0.33642	4.67829
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.01960	0.35716	4.45606
	B->Y (RF)	0.01682	0.35144	4.44450

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	0.00479	0.00474	0.00774
	B	0.00000	0.00000	0.00000
	B	0.00378	0.00429	0.01111
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00355	0.00361	0.00960
	B	0.00000	0.00000	0.00000
	B	0.00290	0.00349	0.01808

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	0.00049	0.00046	0.00357
	B	0.00000	0.00000	0.00000
	B	-0.00045	-0.00031	0.00273
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00036	0.00037	0.00375
	B	0.00000	0.00000	0.00000
	B	-0.00029	-0.00016	0.00307

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)	-0.00162	-0.00194	-0.00195
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00107	-0.00132	-0.00134

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)	0.00193	0.00195	0.00195
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00135	0.00137	0.00136

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)	-0.00093	-0.00093	-0.00093
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00066	-0.00067	-0.00066

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)	0.00096	0.00097	0.00094
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00069	0.00069	0.00067

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00266	0.00276	0.00239	0.73948

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.18191	0.49868

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)	0.05208	0.77501	10.71610
	A1->Y (FR)	0.06396	0.79115	10.69750
	B0->Y (FR)	0.02943	0.61420	8.83626

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)	0.02771	0.41314	5.60613
	A1->Y (RF)	0.03181	0.41182	5.52735
	B0->Y (RF)	0.02126	0.43000	6.01490

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	0.00537	0.00570	0.01177
	A1	0.00000	0.00000	0.00000
	A1	0.00642	0.00631	0.00909
	B0	0.00316	0.00419	0.01957

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	0.00021	0.00223
	A1	0.00000	0.00000	0.00000
	A1	0.00120	0.00105	0.00308
	B0	0.00051	0.00057	0.00342

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)	-0.00092	-0.00093	-0.00093
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00195	-0.00199	-0.00199
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00201	-0.00203	-0.00202

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)	0.00097	0.00098	0.00095
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00197	0.00199	0.00199
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00202	0.00203	0.00202

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)	-0.00156	-0.00186	-0.00187
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00192	-0.00196	-0.00196
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00198	-0.00199	-0.00199

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)	0.00187	0.00189	0.00188
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00195	0.00197	0.00196
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00199	0.00200	0.00199

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)	-0.00176	-0.00177	-0.00179

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)	0.00179	0.00181	0.00180

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00249	0.00261	0.00280	0.00277	0.78019

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.01505	0.05418

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)	0.06714	0.78112	10.65770
	A1->Y (FR)	0.05826	0.76854	10.70140
	B0->Y (FR)	0.03670	0.74764	10.68810
	B1->Y (FR)	0.04798	0.76223	10.64840

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)	0.04291	0.44252	5.84998
	A1->Y (RF)	0.03553	0.43196	5.81937
	B0->Y (RF)	0.02945	0.44884	6.24055
	B1->Y (RF)	0.03726	0.46154	6.31627

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	0.00816	0.00807	0.01070
	A1	0.00711	0.00747	0.01343
	B0	0.00396	0.00443	0.01079
	B1	0.00617	0.00608	0.00869

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00179	0.00165	0.00363
	A1	-0.00010	-0.00013	0.00189
	B0	-0.00015	-0.00006	0.00275
	B1	0.00077	0.00069	0.00345

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)	-0.00160	-0.00190	-0.00190
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00160	-0.00190	-0.00190
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00186	-0.00190	-0.00190
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00191	-0.00192	-0.00192

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)	0.00188	0.00190	0.00190
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00188	0.00190	0.00190
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00188	0.00191	0.00190
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00193	0.00193	0.00193

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)	-0.00090	-0.00090	-0.00090
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00090	-0.00090	-0.00090
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00184	-0.00189	-0.00189
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00191	-0.00192	-0.00192

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)	0.00094	0.00095	0.00091
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00094	0.00095	0.00091
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00188	0.00189	0.00189
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00191	0.00193	0.00192

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)	-0.00091	-0.00092	-0.00091
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00091	-0.00092	-0.00091
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00223	-0.00229	-0.00228
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00225	-0.00225	-0.00230

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)	0.00095	0.00096	0.00093
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00095	0.00096	0.00093
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00230	0.00232	0.00228
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00229	0.00232	0.00231

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)	-0.00158	-0.00188	-0.00188
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00158	-0.00188	-0.00188
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00228	-0.00233	-0.00233
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00229	-0.00231	-0.00234

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)	0.00187	0.00189	0.00188
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00187	0.00189	0.00188
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00234	0.00236	0.00233
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00235	0.00237	0.00235

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00298	0.00274	1.37913
sky130_osu_sc_12T_ms__or2_2	0.00298	0.00274	2.84464
sky130_osu_sc_12T_ms__or2_4	0.00298	0.00274	5.59989
sky130_osu_sc_12T_ms__or2_8	0.00298	0.00275	10.88329
sky130_osu_sc_12T_ms__or2_l	0.00228	0.00214	0.96265

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.01688	0.02733
sky130_osu_sc_12T_ms__or2_2	0.00000	0.02375	0.05442
sky130_osu_sc_12T_ms__or2_4	0.00000	0.03747	0.10861
sky130_osu_sc_12T_ms__or2_8	0.00000	0.06492	0.21697
sky130_osu_sc_12T_ms__or2_l	0.00000	0.27216	0.47179

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)	0.04788	0.47100	5.75967
	B->Y (RR)	0.04251	0.45404	5.75377
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.05116	0.39548	5.76372
	B->Y (RR)	0.04554	0.37986	5.74509
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.06669	0.37771	5.95821
	B->Y (RR)	0.06097	0.36459	5.92096
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.09693	0.40591	6.25118
	B->Y (RR)	0.09127	0.39610	6.21995
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.04981	0.51172	5.58443
	B->Y (RR)	0.04523	0.49766	5.67979

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)	0.08114	0.49915	5.77276
	B->Y (FF)	0.06720	0.48128	5.85330
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.09579	0.49298	6.05770
	B->Y (FF)	0.08204	0.47942	6.12327
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.13445	0.53028	6.40159
	B->Y (FF)	0.12074	0.52213	6.39468
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.21442	0.62076	6.72528
	B->Y (FF)	0.20073	0.61459	6.69631
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.08543	0.50217	5.41785
	B->Y (FF)	0.07277	0.48604	5.53929

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	0.00363	0.00348	0.01697
	B	0.00000	0.00000	0.00000
	B	0.00275	0.00318	0.02107
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00605	0.00616	0.02016
	B	0.00000	0.00000	0.00000
	B	0.00512	0.00582	0.02378
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01159	0.01204	0.02825
	B	0.00000	0.00000	0.00000
	B	0.01062	0.01179	0.03146
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02320	0.02395	0.04177
	B	0.00000	0.00000	0.00000
	B	0.02225	0.02364	0.04489
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00282	0.00310	0.02076
	B	0.00000	0.00000	0.00000
	B	0.00221	0.00302	0.03223

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	0.00829	0.00808	0.02201
	B	0.00000	0.00000	0.00000
	B	0.00697	0.00823	0.03594
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01039	0.01028	0.02393
	B	0.00000	0.00000	0.00000
	B	0.00907	0.01037	0.03725
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01609	0.01570	0.02883
	B	0.00000	0.00000	0.00000
	B	0.01474	0.01578	0.04068
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03128	0.02635	0.03869
	B	0.00000	0.00000	0.00000
	B	0.02992	0.02623	0.04886
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00630	0.00659	0.02677
	B	0.00000	0.00000	0.00000
	B	0.00538	0.00702	0.04640

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)	-0.00166	-0.00196	-0.00197
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00166	-0.00196	-0.00197
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00166	-0.00196	-0.00197
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00166	-0.00196	-0.00197
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00106	-0.00133	-0.00135

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)	0.00195	0.00197	0.00197
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00195	0.00197	0.00197
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00196	0.00198	0.00197
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00196	0.00198	0.00197
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00136	0.00137	0.00137

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)	-0.00093	-0.00094	-0.00093
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00094	-0.00093
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00094	-0.00093
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00094	-0.00093
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00065	-0.00065	-0.00065

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)	0.00097	0.00098	0.00094
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00097	0.00098	0.00094
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00097	0.00098	0.00094
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00097	0.00098	0.00094
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00068	0.00068	0.00066

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00287	0.00383	0.79039
sky130_osu_sc_12T_ms__tbufi_l	0.00225	0.00300	0.53056

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.01370	0.05418
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.23594	0.94317

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)	0.03269	0.74833	10.76790
	OE->Y (FR)	0.03378	0.29312	5.01951
	OE->Y (RR)	0.05460	0.55497	6.06789
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.03851	0.77757	9.94060
	OE->Y (FR)	0.03437	0.29310	5.01952
	OE->Y (RR)	0.05873	0.61455	5.96600

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)	0.01900	0.41106	5.84586
	OE->Y (FF)	0.03430	0.29312	5.01955
	OE->Y (RF)	0.01909	0.40714	5.76830
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.02133	0.42661	5.43462
	OE->Y (FF)	0.03484	0.29309	5.01954
	OE->Y (RF)	0.02097	0.41580	5.26148

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	0.00348	0.00395	0.00993
	OE	0.00000	0.00000	0.00000
	OE	0.00336	0.00401	0.03510
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00271	0.00326	0.01607
	OE	0.00000	0.00000	0.00000
	OE	0.00250	0.00393	0.05065

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	-0.00045	-0.00036	0.00231
	OE	0.00000	0.00000	0.00000
	OE	0.00205	0.00273	0.03977
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00027	-0.00018	0.00263
	OE	0.00000	0.00000	0.00000
	OE	0.00147	0.00301	0.05432

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)	-0.00166	-0.00167	-0.00166
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00149	-0.00150	-0.00149
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00122	-0.00123	-0.00122
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00109	-0.00111	-0.00110

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)	0.00166	0.00167	0.00166
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00152	0.00153	0.00150
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00122	0.00123	0.00122
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00112	0.00112	0.00110

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)	0.00119	0.00206	0.03985
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00106	0.00188	0.03971
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00087	0.00266	0.05485
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00074	0.00251	0.05474

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)	0.00423	0.00578	0.04302
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00428	0.00589	0.04309
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00330	0.00552	0.05771
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00329	0.00547	0.05775

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00286	0.00415	0.78119
sky130_osu_sc_12T_ms__tnbufi_l	0.00215	0.00322	0.53092

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.02269	0.02721
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.39310	0.47172

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)	0.03290	0.74463	10.69000
	OE->Y (RR)	0.01947	0.29330	5.01975
	OE->Y (FR)	0.04075	0.75590	10.64440
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.03774	0.77538	9.94099
	OE->Y (RR)	0.02098	0.29312	5.01951
	OE->Y (FR)	0.04412	0.79655	10.03060

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)	0.01856	0.40881	5.79959
	OE->Y (RF)	0.01921	0.29329	5.01973
	OE->Y (FF)	0.03884	0.40040	4.61596
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.02024	0.42611	5.43641
	OE->Y (RF)	0.02085	0.29309	5.01955
	OE->Y (FF)	0.04235	0.40622	4.29925

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	0.00362	0.00409	0.01013
	OE	0.00000	0.00000	0.00000
	OE	0.00873	0.01021	0.04799
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00277	0.00340	0.01614
	OE	0.00000	0.00000	0.00000
	OE	0.00677	0.00922	0.06133

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	-0.00064	-0.00053	0.00216
	OE	0.00000	0.00000	0.00000
	OE	0.00758	0.00920	0.04095
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00047	-0.00037	0.00244
	OE	0.00000	0.00000	0.00000
	OE	0.00589	0.00834	0.05601

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)	-0.00134	-0.00135	-0.00134
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00118	-0.00119	-0.00119
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00094	-0.00095	-0.00094
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00082	-0.00082	-0.00082

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)	0.00134	0.00135	0.00134
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00121	0.00122	0.00119
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00094	0.00095	0.00094
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00085	0.00085	0.00084

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)	-0.00215	-0.00156	0.03655
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00214	-0.00153	0.03656
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00145	0.00002	0.05240
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00151	0.00000	0.05241

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)	0.00656	0.00824	0.04624
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00647	0.00801	0.04615
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00517	0.00773	0.06012
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00511	0.00762	0.06008

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xnor2_l	0.00573	0.00486	0.83145

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.04646	0.08139

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	0.06989	0.58709	6.32149
	A->Y (FR)	!B	0.04419	0.76367	10.95500
	B->Y (RR)	A	0.05722	0.57490	6.36836
	B->Y (FR)	!A	0.05589	0.77680	10.92040

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	0.06064	0.45046	4.98111
	A->Y (RF)	!B	0.02646	0.42204	5.98354
	B->Y (FF)	A	0.05464	0.44495	4.98501
	B->Y (RF)	!A	0.03116	0.42868	5.98309

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	0.00364	0.00408	0.03708
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00895	0.01071	0.05396
	B	A	0.00000	0.00000	0.00000
	B	A	0.00167	0.00248	0.04104
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00939	0.01054	0.04988

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	0.01055	0.01172	0.04825
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00240	0.00296	0.04189
	B	A	0.00000	0.00000	0.00000
	B	A	0.00961	0.01110	0.04884
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00316	0.00369	0.04230

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

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	0.00576	0.00490	0.77135

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.04646	0.07646

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	0.07593	0.59842	6.33766
	A->Y (FR)	B	0.05774	0.79358	10.97100
	B->Y (RR)	!A	0.06140	0.59366	6.35172
	B->Y (FR)	A	0.06390	0.79933	10.95770

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	0.06157	0.44958	4.68887
	A->Y (RF)	B	0.02589	0.41861	5.75338
	B->Y (FF)	!A	0.05659	0.44145	4.77442
	B->Y (RF)	A	0.03098	0.41845	5.68920

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	0.01044	0.01150	0.04992
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00240	0.00216	0.03851
	B	A	0.00000	0.00000	0.00000
	B	A	0.01060	0.01171	0.04934
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00161	0.00228	0.03973

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	0.00194	0.00229	0.04072
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01117	0.01266	0.04325
	B	A	0.00000	0.00000	0.00000
	B	A	0.00198	0.00235	0.03934
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00972	0.01136	0.04777

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, Temp -40.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__ant	4.39560
sky130_osu_sc_12T_ms__tiehi	4.39560
sky130_osu_sc_12T_ms__tielo	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_12T_ms__ant	0.45976
sky130_osu_sc_12T_ms__tiehi	0.00000
sky130_osu_sc_12T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__ant	0.00000	206882.00000	413763.00000
sky130_osu_sc_12T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__tielo	0.00000	0.00000	0.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	-0.00128	0.04314	0.72693

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	3.60129	3.44929	0.88428