sky130_osu_sc_15T_ms_tt_1P80_150C.ccs Library

Cell Groups
SKY130_OSU_SC_15T_MS__ADDFx
SKY130_OSU_SC_15T_MS__ADDHx
SKY130_OSU_SC_15T_MS__AND2x
SKY130_OSU_SC_15T_MS__AOI21
SKY130_OSU_SC_15T_MS__AOI22
SKY130_OSU_SC_15T_MS__BUFx
SKY130_OSU_SC_15T_MS__DFFRx
SKY130_OSU_SC_15T_MS__DFFSRx
SKY130_OSU_SC_15T_MS__DFFSx
SKY130_OSU_SC_15T_MS__DFFx
SKY130_OSU_SC_15T_MS__INVx
SKY130_OSU_SC_15T_MS__MUX2
SKY130_OSU_SC_15T_MS__NAND2x
SKY130_OSU_SC_15T_MS__NOR2x
SKY130_OSU_SC_15T_MS__OAI21
SKY130_OSU_SC_15T_MS__OAI22
SKY130_OSU_SC_15T_MS__OR2x
SKY130_OSU_SC_15T_MS__TBUFIx
SKY130_OSU_SC_15T_MS__TNBUFIx
SKY130_OSU_SC_15T_MS__XNOR2
SKY130_OSU_SC_15T_MS__XOR2
SKY130_OSU_SC_15T_MS_x

SKY130_OSU_SC_15T_MS__ADDFx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__addf_1	39.07200
sky130_osu_sc_15T_ms__addf_l	39.07200

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_15T_ms__addf_1	0.01633	0.01623	0.01248	2.22533	1.05515	2.18647
sky130_osu_sc_15T_ms__addf_l	0.01633	0.01621	0.01248	1.38168	1.05755	1.42257

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	210.92300	249.53600
sky130_osu_sc_15T_ms__addf_l	0.00000	162.13700	200.75100

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.15419	1.75533	27.51050
	B->CO (RR)	0.15625	1.73651	26.98500
	CI->CO (RR)	0.14553	1.79531	28.20080
	CON->CO (FR)	0.02170	0.62074	9.72889
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.15890	1.61651	21.19790
	B->CO (RR)	0.16101	1.60965	21.07650
	CI->CO (RR)	0.15023	1.65760	21.91390
	CON->CO (FR)	0.02718	0.70804	9.88338

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.17279	1.94779	30.67120
	B->CO (FF)	0.15481	1.89035	29.86960
	CI->CO (FF)	0.15235	1.97082	31.27910
	CON->CO (RF)	0.02583	0.68695	10.84660
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.16685	1.65520	21.64780
	B->CO (FF)	0.14935	1.61807	21.40400
	CI->CO (FF)	0.14638	1.67992	22.30630
	CON->CO (RF)	0.02753	0.67856	9.48623

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (FR)	0.12019	0.75411	8.60025
	B->CON (FR)	0.10402	0.74745	8.82229
	CI->CON (FR)	0.09981	0.78037	9.28611
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.11372	0.74832	8.60809
	B->CON (FR)	0.09801	0.74220	8.82944
	CI->CON (FR)	0.09330	0.77472	9.29378

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (RF)	0.11575	0.73846	8.50625
	B->CON (RF)	0.11816	0.76067	8.84839
	CI->CON (RF)	0.10711	0.78157	9.24810
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.11038	0.73390	8.51433
	B->CON (RF)	0.11302	0.75651	8.85549
	CI->CON (RF)	0.10171	0.77703	9.25607

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-R)	0.25416	1.72575	24.04600
	B->S (-R)	0.24868	1.68687	23.18540
	CI->S (-R)	0.23207	1.74573	24.66760
	CON->S (RR)	0.07925	0.60735	7.61185
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.24450	1.56565	18.78240
	B->S (-R)	0.23959	1.54841	18.48450
	CI->S (-R)	0.22218	1.58693	19.43660
	CON->S (RR)	0.08039	0.66380	7.54968

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-F)	0.25156	1.69332	22.91830
	B->S (-F)	0.24841	1.63927	22.36300
	CI->S (-F)	0.24362	1.73266	23.62220
	CON->S (FF)	0.09370	0.65356	7.82448
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.23557	1.49810	17.46480
	B->S (-F)	0.23342	1.46418	17.35430
	CI->S (-F)	0.22748	1.53789	18.18940
	CON->S (FF)	0.08889	0.64801	6.84770

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00702	0.01097	0.08785
	B	0.00786	0.01149	0.08316
	CI	0.00919	0.01331	0.08998
sky130_osu_sc_15T_ms__addf_l	A	0.00485	0.00753	0.05303
	B	0.00681	0.00899	0.05109
	CI	0.00701	0.00983	0.05519

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01796	0.02258	0.11530
	B	0.01820	0.02201	0.10559
	CI	0.01575	0.02064	0.11417
sky130_osu_sc_15T_ms__addf_l	A	0.01541	0.01861	0.07497
	B	0.01578	0.01841	0.06923
	CI	0.01320	0.01669	0.07402

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01635	0.01928	0.06858
	B	0.01639	0.01897	0.06400
	CI	0.01419	0.01738	0.06765
sky130_osu_sc_15T_ms__addf_l	A	0.01485	0.01756	0.06368
	B	0.01492	0.01735	0.05953
	CI	0.01268	0.01569	0.06274

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00565	0.00822	0.05001
	B	0.00758	0.00971	0.04943
	CI	0.00783	0.01056	0.05242
sky130_osu_sc_15T_ms__addf_l	A	0.00413	0.00643	0.04401
	B	0.00611	0.00798	0.04365
	CI	0.00630	0.00875	0.04629

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01711	0.02167	0.11247
	B	0.00888	0.00844	0.08838
	CI	0.01490	0.01974	0.11138
sky130_osu_sc_15T_ms__addf_l	A	0.00357	0.00337	0.09026
	B	0.00708	0.00688	0.08798
	CI	0.00887	0.01085	0.09077

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.03728	0.04026	0.12185
	B	0.03213	0.03549	0.11919
	CI	0.02868	0.03174	0.10748
sky130_osu_sc_15T_ms__addf_l	A	0.03403	0.03708	0.12124
	B	0.02789	0.03163	0.11802
	CI	0.02560	0.02868	0.10678

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addh_1	23.19900
sky130_osu_sc_15T_ms__addh_l	23.19900

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_15T_ms__addh_1	0.00798	0.00881	2.23047	1.12383	2.29907
sky130_osu_sc_15T_ms__addh_l	0.00798	0.00881	1.45029	1.12321	1.48667

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	221.49500	249.81600
sky130_osu_sc_15T_ms__addh_l	0.00000	160.50700	201.03500

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (RR)	0.10048	0.64132	7.71911
	B->CO (RR)	0.10459	0.62308	7.72909
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.10335	0.70237	7.76451
	B->CO (RR)	0.10747	0.68532	7.71388

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (FF)	0.07724	0.60399	7.58525
	B->CO (FF)	0.08260	0.62238	7.74428
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.07368	0.55361	5.85518
	B->CO (FF)	0.07870	0.57165	6.00794

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (RR)	B	0.13570	0.53607	4.48573
	A->CON (FR)	!B	0.06485	0.72189	9.09570
	B->CON (RR)	A	0.13861	0.51697	4.49135
	B->CON (FR)	!A	0.08131	0.70149	8.56277
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.12490	0.52135	4.50685
	A->CON (FR)	!B	0.05903	0.71598	9.08623
	B->CON (RR)	A	0.12792	0.50241	4.46198
	B->CON (FR)	!A	0.07547	0.69630	8.55322

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (FF)	B	0.13485	0.67539	6.22187
	A->CON (RF)	!B	0.06765	0.74528	9.42574
	B->CON (FF)	A	0.12864	0.70556	6.66756
	B->CON (RF)	!A	0.08423	0.74285	9.15460
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.12505	0.65602	6.14852
	A->CON (RF)	!B	0.06259	0.73972	9.41371
	B->CON (FF)	A	0.11887	0.68668	6.59279
	B->CON (RF)	!A	0.07923	0.73764	9.14642

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (RR)	!B	0.10332	1.74879	28.58930
	A->S (FR)	B	0.17189	1.67349	25.29590
	B->S (RR)	!A	0.12117	1.72354	27.76080
	B->S (FR)	A	0.16484	1.72739	26.29540
	CON->S (FR)	-	0.02381	0.64312	10.15980
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.10422	1.61312	22.59770
	A->S (FR)	B	0.16865	1.52376	19.22710
	B->S (RR)	!A	0.12265	1.59499	22.01760
	B->S (FR)	A	0.16106	1.57066	19.97810
	CON->S (FR)	-	0.02750	0.71963	10.22810

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (FF)	!B	0.10884	1.83485	30.11680
	A->S (RF)	B	0.17414	1.37659	19.85990
	B->S (FF)	!A	0.12533	1.82001	29.65100
	B->S (RF)	A	0.17705	1.35739	19.86510
	CON->S (RF)	-	0.02469	0.67995	10.87140
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.10327	1.59733	22.37840
	A->S (RF)	B	0.16364	1.23111	14.99350
	B->S (FF)	!A	0.11977	1.58111	21.87530
	B->S (RF)	A	0.16663	1.21193	14.93800
	CON->S (RF)	-	0.02624	0.68805	9.81463

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00883	0.01024	0.04361
	B	0.00000	0.00000	0.00000
	B	0.00804	0.00935	0.05000
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00746	0.00883	0.04275
	B	0.00000	0.00000	0.00000
	B	0.00666	0.00790	0.04684

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.01180	0.01428	0.06795
	B	0.00000	0.00000	0.00000
	B	0.01240	0.01568	0.07365
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.01015	0.01212	0.05495
	B	0.00000	0.00000	0.00000
	B	0.01071	0.01331	0.05872

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00792	0.00931	0.04108
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01102	0.01283	0.03822
	B	A	0.00000	0.00000	0.00000
	B	A	0.00715	0.00846	0.04743
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01219	0.01347	0.03684
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00671	0.00811	0.04132
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00898	0.01050	0.03144
	B	A	0.00000	0.00000	0.00000
	B	A	0.00594	0.00719	0.04565
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01019	0.01117	0.03002

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.01152	0.01372	0.05893
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00479	0.00652	0.03063
	B	A	0.00000	0.00000	0.00000
	B	A	0.01216	0.01502	0.06314
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00523	0.00669	0.03027
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01022	0.01215	0.05367
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00329	0.00448	0.02125
	B	A	0.00000	0.00000	0.00000
	B	A	0.01085	0.01339	0.05718
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00373	0.00463	0.02148

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.01294	0.01545	0.07017
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00713	0.00930	0.04323
	B	A	0.00000	0.00000	0.00000
	B	A	0.01377	0.01710	0.07606
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00726	0.00911	0.04082
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01099	0.01295	0.05643
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00456	0.00581	0.02335
	B	A	0.00000	0.00000	0.00000
	B	A	0.01173	0.01436	0.06037
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00482	0.00579	0.02263

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00964	0.01110	0.04434
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01253	0.01466	0.04655
	B	A	0.00000	0.00000	0.00000
	B	A	0.00884	0.01020	0.05106
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01375	0.01546	0.04585
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00766	0.00904	0.04270
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00930	0.01081	0.03155
	B	A	0.00000	0.00000	0.00000
	B	A	0.00687	0.00810	0.04679
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01052	0.01158	0.03065

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__and2_1	10.37850
sky130_osu_sc_15T_ms__and2_2	12.82050
sky130_osu_sc_15T_ms__and2_4	17.70450
sky130_osu_sc_15T_ms__and2_6	22.58850
sky130_osu_sc_15T_ms__and2_8	27.47250
sky130_osu_sc_15T_ms__and2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__and2_1	0.00429	0.00442	2.25197
sky130_osu_sc_15T_ms__and2_2	0.00429	0.00442	4.32624
sky130_osu_sc_15T_ms__and2_4	0.00429	0.00442	8.38202
sky130_osu_sc_15T_ms__and2_6	0.00433	0.00442	12.34076
sky130_osu_sc_15T_ms__and2_8	0.00430	0.00443	15.87430
sky130_osu_sc_15T_ms__and2_l	0.00323	0.00335	1.37734

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	104.08200	166.17800
sky130_osu_sc_15T_ms__and2_2	0.00000	166.22800	166.27600
sky130_osu_sc_15T_ms__and2_4	0.00000	290.79600	332.26100
sky130_osu_sc_15T_ms__and2_6	0.00000	415.36100	498.25400
sky130_osu_sc_15T_ms__and2_8	0.00000	539.91500	664.23700
sky130_osu_sc_15T_ms__and2_l	0.00000	43.11750	68.74080

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (RR)	0.07645	0.58651	7.77170
	B->Y (RR)	0.08197	0.56809	7.41814
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.08883	0.54286	7.71959
	B->Y (RR)	0.09446	0.51972	7.35507
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.12387	0.56582	7.95662
	B->Y (RR)	0.12952	0.53618	7.59156
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.16031	0.60772	8.11397
	B->Y (RR)	0.16589	0.57285	7.74442
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.19597	0.64940	8.20284
	B->Y (RR)	0.20163	0.61243	7.82056
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.08395	0.65386	7.47389
	B->Y (RR)	0.08960	0.63385	7.11113

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	**A->Y (FF)**	0.06128	0.54552	7.25649
	B->Y (FF)	0.06394	0.55907	7.37179
sky130_osu_sc_15T_ms__and2_2	**A->Y (FF)**	0.06789	0.48357	7.10120
	B->Y (FF)	0.07109	0.49667	7.23541
sky130_osu_sc_15T_ms__and2_4	**A->Y (FF)**	0.09321	0.48841	7.22925
	B->Y (FF)	0.09614	0.49886	7.36489
sky130_osu_sc_15T_ms__and2_6	**A->Y (FF)**	0.12118	0.52211	7.32811
	B->Y (FF)	0.12366	0.52891	7.45815
sky130_osu_sc_15T_ms__and2_8	**A->Y (FF)**	0.14782	0.55327	7.25156
	B->Y (FF)	0.15010	0.55947	7.37841
sky130_osu_sc_15T_ms__and2_l	**A->Y (FF)**	0.06838	0.57995	6.34062
	B->Y (FF)	0.07234	0.59682	6.48856

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00908	0.01422	0.12646
	B	0.00000	0.00000	0.00000
	B	0.00909	0.01282	0.10080
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01422	0.01889	0.13131
	B	0.00000	0.00000	0.00000
	B	0.01422	0.01754	0.10508
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02711	0.03038	0.14040
	B	0.00000	0.00000	0.00000
	B	0.02712	0.02885	0.11501
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.04379	0.04301	0.15088
	B	0.00000	0.00000	0.00000
	B	0.04402	0.04131	0.12704
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.06336	0.05745	0.16194
	B	0.00000	0.00000	0.00000
	B	0.06323	0.05451	0.13847
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00512	0.00870	0.08566
	B	0.00000	0.00000	0.00000
	B	0.00518	0.00771	0.06742

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.01391	0.02071	0.12619
	B	0.00000	0.00000	0.00000
	B	0.01543	0.02185	0.12520
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01953	0.02628	0.13066
	B	0.00000	0.00000	0.00000
	B	0.02106	0.02746	0.12983
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.03431	0.03920	0.14120
	B	0.00000	0.00000	0.00000
	B	0.03569	0.04020	0.14017
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.05077	0.05299	0.15217
	B	0.00000	0.00000	0.00000
	B	0.05206	0.05385	0.15075
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.07013	0.06738	0.16389
	B	0.00000	0.00000	0.00000
	B	0.07118	0.06772	0.16112
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00966	0.01412	0.08463
	B	0.00000	0.00000	0.00000
	B	0.01072	0.01501	0.08349

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00370	-0.00371	-0.00374
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00298	-0.00299	-0.00302
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00154	-0.00155	-0.00158
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00013	-0.00013	-0.00016
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00134	0.00134	0.00131
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00280	-0.00280	-0.00282

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00518	0.00528	0.00520
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00590	0.00592	0.00592
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00735	0.00736	0.00737
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00883	0.00892	0.00885
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.01025	0.01034	0.01027
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00342	0.00343	0.00343

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00350	-0.00351	-0.00350
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00278	-0.00280	-0.00278
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00134	-0.00136	-0.00134
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00011	0.00009	0.00010
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00155	0.00154	0.00155
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00266	-0.00267	-0.00266

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00507	0.00499	0.00496
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00579	0.00571	0.00569
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00724	0.00716	0.00713
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00869	0.00861	0.00858
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.01014	0.01006	0.01003
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00336	0.00329	0.00328

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__aoi21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__aoi21_l	0.00410	0.00424	0.00409	1.00880

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	45.78090	100.30200

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (FR)	0.06517	0.70101	8.46565
	A1->Y (FR)	0.05465	0.66503	8.14964
	B0->Y (FR)	0.04670	0.73016	9.17083

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (RF)	0.06409	0.65532	7.91575
	A1->Y (RF)	0.05903	0.68967	8.55841
	B0->Y (RF)	0.03293	0.61481	7.90576

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.01071	0.01170	0.03782
	A1	0.00000	0.00000	0.00000
	A1	0.00899	0.01002	0.03548
	B0	0.00629	0.00855	0.04240

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00470	0.00520	0.02432
	A1	0.00000	0.00000	0.00000
	A1	0.00482	0.00575	0.02573
	B0	0.00067	0.00227	0.02387

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00265	-0.00342	-0.00321
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00321	-0.00323	-0.00321
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00393	-0.00395	-0.00393

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00468	0.00473	0.00460
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00465	0.00470	0.00467
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00406	0.00398	0.00395

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00260	-0.00337	-0.00315
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00315	-0.00316	-0.00315
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00415	-0.00419	-0.00421

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00462	0.00466	0.00454
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00459	0.00463	0.00461
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00421	0.00423	0.00422

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00152	-0.00154	-0.00148

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00281	0.00281	0.00244

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__aoi22_l	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__aoi22_l	0.00409	0.00421	0.00435	0.00416	1.02242

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi22_l	0.00000	51.41390	165.68000

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (FR)	0.07904	0.70812	8.41389
	A1->Y (FR)	0.07058	0.69343	8.32540
	B0->Y (FR)	0.04722	0.71523	9.00062
	B1->Y (FR)	0.05581	0.73478	9.15134

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (RF)	0.08588	0.68151	8.01366
	A1->Y (RF)	0.08068	0.71744	8.65511
	B0->Y (RF)	0.03983	0.67524	8.61560
	B1->Y (RF)	0.04516	0.63789	7.97448

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.01324	0.01414	0.04147
	A1	0.01154	0.01237	0.03886
	B0	0.00685	0.00920	0.04262
	B1	0.00854	0.01079	0.04447

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00747	0.00795	0.02789
	A1	0.00758	0.00848	0.02926
	B0	0.00313	0.00435	0.02415
	B1	0.00309	0.00397	0.02270

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00225	-0.00315	-0.00256
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00249	-0.00252	-0.00250
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00393	-0.00396	-0.00393
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00394	-0.00396	-0.00393

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00544	0.00544	0.00519
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00537	0.00542	0.00539
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00406	0.00398	0.00395
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00406	0.00398	0.00395

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00221	-0.00310	-0.00251
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00243	-0.00244	-0.00243
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00415	-0.00418	-0.00420
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00415	-0.00418	-0.00420

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00538	0.00536	0.00513
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00531	0.00534	0.00532
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00420	0.00423	0.00421
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00420	0.00423	0.00421

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00152	-0.00154	-0.00148
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00067	-0.00069	-0.00070
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00428	-0.00430	-0.00434
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00428	-0.00431	-0.00434

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00288	0.00288	0.00247
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00246	0.00248	0.00241
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00434	0.00436	0.00435
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00435	0.00436	0.00435

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00154	-0.00155	-0.00150
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00068	-0.00070	-0.00071
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00400	-0.00401	-0.00400
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00400	-0.00401	-0.00400

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00290	0.00288	0.00248
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00248	0.00249	0.00243
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00413	0.00404	0.00402
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00413	0.00404	0.00402

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__buf_1	7.93650
sky130_osu_sc_15T_ms__buf_2	10.37850
sky130_osu_sc_15T_ms__buf_4	15.26250
sky130_osu_sc_15T_ms__buf_6	20.14650
sky130_osu_sc_15T_ms__buf_8	25.03050
sky130_osu_sc_15T_ms__buf_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__buf_1	0.00441	2.22899
sky130_osu_sc_15T_ms__buf_2	0.00444	4.29783
sky130_osu_sc_15T_ms__buf_4	0.00444	8.26090
sky130_osu_sc_15T_ms__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00445	16.30689
sky130_osu_sc_15T_ms__buf_l	0.00337	1.37092

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	83.39930	83.40550
sky130_osu_sc_15T_ms__buf_2	0.00000	124.86500	166.24000
sky130_osu_sc_15T_ms__buf_4	0.00000	208.02200	332.23400
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	374.33000	664.21100
sky130_osu_sc_15T_ms__buf_l	0.00000	34.61200	34.61370

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	A->Y (RR)	0.05632	0.53627	7.25539
sky130_osu_sc_15T_ms__buf_2	A->Y (RR)	0.06463	0.48462	7.15774
sky130_osu_sc_15T_ms__buf_4	A->Y (RR)	0.08736	0.49001	7.28775
sky130_osu_sc_15T_ms__buf_8	A->Y (RR)	0.13390	0.55384	7.71368
sky130_osu_sc_15T_ms__buf_l	A->Y (RR)	0.06280	0.59616	6.88806

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	A->Y (FF)	0.05788	0.54233	7.35844
sky130_osu_sc_15T_ms__buf_2	A->Y (FF)	0.06608	0.49584	7.48396
sky130_osu_sc_15T_ms__buf_4	A->Y (FF)	0.09164	0.50005	7.64905
sky130_osu_sc_15T_ms__buf_8	A->Y (FF)	0.14648	0.56757	8.01140
sky130_osu_sc_15T_ms__buf_l	A->Y (FF)	0.06545	0.57902	6.50301

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00647	0.01175	0.10600
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01117	0.01613	0.10840
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02244	0.02714	0.12009
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.05086	0.05212	0.14460
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00404	0.00764	0.07525

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.01337	0.02066	0.13182
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01920	0.02610	0.12820
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.03392	0.03919	0.13934
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.07038	0.06782	0.16178
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00932	0.01412	0.08891

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00077	-0.00077	-0.00074

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	0.00077	0.00077	0.00074

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__dffr_1	53.11350
sky130_osu_sc_15T_ms__dffr_l	53.11350

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_15T_ms__dffr_1	0.00421	0.00415	0.01204	2.06415	2.03759
sky130_osu_sc_15T_ms__dffr_l	0.00421	0.00415	0.01204	1.38506	1.39115

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	269.93800	447.13500
sky130_osu_sc_15T_ms__dffr_l	0.00000	221.15500	398.36000

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RR)	0.28391	1.41237	17.58380
	QN->Q (FR)	0.02742	0.73863	11.43830
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.27679	1.50009	16.64090
	QN->Q (FR)	0.03021	0.78476	10.98260

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RF)	0.28070	1.42529	18.16000
	QN->Q (RF)	0.02851	0.74009	11.44000
	RN->Q (FF)	0.20580	1.32671	17.60640
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.28426	1.53711	17.28750
	QN->Q (RF)	0.02907	0.73330	10.25720
	RN->Q (FF)	0.21046	1.43851	16.71810

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->QN (RR)	0.24454	0.75233	7.19272
	RN->QN (FR)	0.16955	0.65445	6.63529
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.24542	0.81748	7.29522
	RN->QN (FR)	0.17086	0.71954	6.73367

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	**CK->QN (RF)**	0.25052	0.80080	7.61872
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.23735	0.80305	6.97117

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.08305	-0.08093	0.09133
	setup	CK (R)	0.22703	0.24442	0.26720
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.08309	-0.08131	0.09085
	setup	CK (R)	0.22848	0.24539	0.27548

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.10089	-0.22258	-1.99884
	setup	CK (R)	0.12631	0.23379	2.04620
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.10060	-0.22176	-1.99732
	setup	CK (R)	0.12627	0.23379	2.04620

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.08305	-0.08093	0.09133
	setup	CK (R)	0.22703	0.24442	0.26720
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.08309	-0.08131	0.09085
	setup	CK (R)	0.22848	0.24539	0.27548

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.10089	-0.22258	-1.99884
	setup	CK (R)	0.12631	0.23379	2.04620
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.10060	-0.22176	-1.99732
	setup	CK (R)	0.12627	0.23379	2.04620

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.18219	0.21487	0.81155
	removal	CK (R)	-0.04757	-0.05584	-0.13623
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.18294	0.21574	0.80802
	removal	CK (R)	-0.04585	-0.05356	-0.13851

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.18219	0.21487	0.81155
	removal	CK (R)	-0.04757	-0.05584	-0.13623
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.18294	0.21574	0.80802
	removal	CK (R)	-0.04585	-0.05356	-0.13851

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	RN ()	0.11648	0.49683	13.33370
	min_pulse_width	RN ()	0.11275	0.49683	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.11275	0.49683	13.33370
	min_pulse_width	RN ()	0.11275	0.49683	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_15T_ms__dffr_1	min_pulse_width	CK ()	0.14258	0.49683	13.33370
	min_pulse_width	CK ()	0.14631	0.49683	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.13140	0.49683	13.33370
	min_pulse_width	CK ()	0.14258	0.49683	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_15T_ms__dffr_1	min_pulse_width	CK ()	0.27682	0.49683	13.33370
	min_pulse_width	CK ()	0.10529	0.49683	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.27682	0.49683	13.33370
	min_pulse_width	CK ()	0.10529	0.49683	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01826	0.02147	0.08246
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01563	0.01958	0.09561

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01881	0.01833	0.03486
	RN	-0.00142	-0.09896	-1.67186
	RN	0.03360	0.03392	0.05240
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01619	0.01733	0.06373
	RN	-0.00143	-0.07789	-1.12187
	RN	0.03113	0.03308	0.08145

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01749	0.01703	0.03365
	RN	-0.00142	-0.09819	-1.64887
	RN	0.03285	0.03321	0.05150
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01543	0.01657	0.06275
	RN	-0.00143	-0.07810	-1.12650
	RN	0.03076	0.03269	0.08036

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01650	0.01973	0.08046
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01399	0.01795	0.09367

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00038	-0.00032	-0.00001
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01756	0.02041	0.11419
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00841	0.01130	0.10124
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00004	-0.00075	-0.00044
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01714	0.01998	0.11376
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00799	0.01087	0.10082

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00781	0.00782	0.00771
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02658	0.03031	0.12520
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01243	0.01613	0.10838
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00739	0.00740	0.00729
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02616	0.02989	0.12478
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01200	0.01571	0.10795

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00670	0.01224	0.13852
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01501	0.02056	0.15231
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00627	0.01182	0.13809
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01459	0.02013	0.15188

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.01251	0.01971	0.14724
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02534	0.03212	0.16380
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.01209	0.01928	0.14681
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02491	0.03169	0.16337

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00224	0.00754	0.13387
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00878	0.01383	0.14911
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00128	0.00673	0.13246
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00182	0.00711	0.13345
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00836	0.01341	0.14869
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00086	0.00631	0.13204

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01864	0.02593	0.15373
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03853	0.04467	0.20456
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02967	0.03604	0.16895
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03772	0.05062	0.25270
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02072	0.02767	0.15464
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01822	0.02551	0.15330
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03810	0.04425	0.20414
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02924	0.03561	0.16852
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03730	0.05024	0.25228
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02030	0.02730	0.15422

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__dffsr_1	57.99750
sky130_osu_sc_15T_ms__dffsr_l	57.99750

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_15T_ms__dffsr_1	0.00417	0.00416	0.00916	0.01230	2.18721	2.18082
sky130_osu_sc_15T_ms__dffsr_l	0.00417	0.00416	0.00915	0.01230	1.37907	1.39041

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__dffsr_1	0.00000	329.26500	451.04000
sky130_osu_sc_15T_ms__dffsr_l	0.00000	280.47500	402.24800

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RR)	0.27948	1.40261	17.93230
	QN->Q (FR)	0.02404	0.67238	10.51310
	RN->Q (RR)	0.22571	1.36014	17.97190
	SN->Q (FR)	0.19212	1.29696	17.36390
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.28036	1.49615	16.54020
	QN->Q (FR)	0.03021	0.78178	10.92990
	RN->Q (RR)	0.22771	1.45635	16.57500
	SN->Q (FR)	0.19535	1.38668	15.96300

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RF)	0.33534	1.47869	18.41120
	QN->Q (RF)	0.02813	0.75780	11.92070
	RN->Q (FF)	0.21179	1.33258	17.84500
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.34412	1.60175	17.27660
	QN->Q (RF)	0.02902	0.73159	10.22050
	RN->Q (FF)	0.22036	1.45681	16.70970

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RR)	0.29845	0.79878	7.09924
	RN->QN (FR)	0.17616	0.65314	6.53147
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.30406	0.88528	7.36052
	RN->QN (FR)	0.18144	0.74021	6.79011

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RF)	0.24888	0.81071	8.07310
	RN->QN (RF)	0.19592	0.77022	8.10767
	SN->QN (FF)	0.16444	0.70606	7.50046
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.24188	0.80322	6.94508
	RN->QN (RF)	0.18946	0.76335	6.97564
	SN->QN (FF)	0.15716	0.69337	6.36815

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.08263	-0.08287	0.07852
	setup	CK (R)	0.21767	0.23812	0.34939
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.08291	-0.08595	0.07685
	setup	CK (R)	0.21681	0.23812	0.34587

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.11864	-0.24440	-2.06437
	setup	CK (R)	0.15581	0.25539	2.11684
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.12172	-0.24250	-2.06433
	setup	CK (R)	0.15781	0.25539	2.11676

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.08263	-0.08287	0.07852
	setup	CK (R)	0.21767	0.23812	0.34939
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.08291	-0.08595	0.07685
	setup	CK (R)	0.21681	0.23812	0.34587

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.11864	-0.24440	-2.06437
	setup	CK (R)	0.15581	0.25539	2.11684
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.12172	-0.24250	-2.06433
	setup	CK (R)	0.15781	0.25539	2.11676

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.15396	0.18686	0.80109
	removal	CK (R)	-0.02117	-0.02844	-0.06406
	hold	SN (R)	-0.15600	-0.29312	-1.05495
	setup	SN (R)	0.18473	0.33975	2.98581
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.15426	0.18637	0.79127
	removal	CK (R)	-0.02117	-0.02844	-0.06406
	hold	SN (R)	-0.15054	-0.28219	-1.01521
	setup	SN (R)	0.18657	0.33125	2.90738

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.15396	0.18686	0.80109
	removal	CK (R)	-0.02117	-0.02844	-0.06406
	hold	SN (R)	-0.15600	-0.29312	-1.05702
	hold	SN (R)	-0.15792	-0.29366	-1.05495
	setup	SN (R)	0.18357	0.33711	2.75111
	setup	SN (R)	0.18473	0.33975	2.98581
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.15426	0.18637	0.79127
	removal	CK (R)	-0.02117	-0.02844	-0.06406
	hold	SN (R)	-0.15054	-0.28219	-1.01521
	hold	SN (R)	-0.15137	-0.28377	-1.01526
	setup	SN (R)	0.18657	0.32719	2.65535
	setup	SN (R)	0.17797	0.33125	2.90738

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	RN ()	0.13513	0.49683	13.33370
	min_pulse_width	RN ()	0.13513	0.49683	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.13513	0.49683	13.33370
	min_pulse_width	RN ()	0.13140	0.49683	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.05314	0.08287	2.39712
	removal	CK (R)	-0.02957	-0.06389	-0.32693
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.05241	0.08556	2.33233
	removal	CK (R)	-0.02900	-0.06492	-0.32569

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.05314	0.08287	2.39712
	removal	CK (R)	-0.02957	-0.06389	-0.32693
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.05241	0.08556	2.33233
	removal	CK (R)	-0.02900	-0.06492	-0.32569

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	SN ()	0.15377	0.49683	13.33370
	min_pulse_width	SN ()	0.15377	0.49683	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.15004	0.49683	13.33370
	min_pulse_width	SN ()	0.14631	0.49683	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_15T_ms__dffsr_1	min_pulse_width	CK ()	0.13513	0.49683	13.33370
	min_pulse_width	CK ()	0.16496	0.49683	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.13140	0.49683	13.33370
	min_pulse_width	CK ()	0.16496	0.49683	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_15T_ms__dffsr_1	min_pulse_width	CK ()	0.26564	0.49683	13.33370
	min_pulse_width	CK ()	0.13886	0.49683	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.26564	0.49683	13.33370
	min_pulse_width	CK ()	0.13886	0.49683	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02114	0.02406	0.08117
	RN	0.03333	0.03448	0.07434
	SN	-0.00142	-0.10246	-1.77154
	SN	0.02938	0.03022	0.07568
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01875	0.02249	0.09884
	RN	0.03093	0.03295	0.09178
	SN	-0.00143	-0.07769	-1.11702
	SN	0.02708	0.02882	0.09194

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02382	0.02471	0.06187
	RN	-0.00142	-0.10246	-1.77152
	RN	0.03698	0.03871	0.08108
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.02089	0.02206	0.06982
	RN	-0.00143	-0.07769	-1.11701
	RN	0.03426	0.03625	0.08804

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02156	0.02245	0.05962
	RN	-0.00142	-0.10228	-1.76210
	RN	0.03530	0.03704	0.07930
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01973	0.02089	0.06716
	RN	-0.00143	-0.07807	-1.12590
	RN	0.03343	0.03542	0.08689

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01974	0.02265	0.08115
	RN	0.03190	0.03305	0.07389
	SN	-0.00142	-0.10228	-1.76619
	SN	0.02850	0.02935	0.07487
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01713	0.02089	0.09685
	RN	0.02928	0.03129	0.08991
	SN	-0.00143	-0.07807	-1.12611
	SN	0.02616	0.02784	0.09078

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00002	0.00001	0.00003
	(!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)	0.02189	0.02462	0.11926
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00977	0.01256	0.10249
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00991	0.01268	0.10219
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01048	0.01324	0.10292
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00040	-0.00041	-0.00039
	(!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)	0.02146	0.02419	0.11884
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00935	0.01214	0.10207
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00949	0.01226	0.10176
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01006	0.01282	0.10250

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00795	0.00785	0.00784
	(!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)	0.03071	0.03414	0.12879
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01406	0.01768	0.10942
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01377	0.01727	0.10924
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01419	0.01782	0.10981
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00752	0.00742	0.00741
	(!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)	0.03028	0.03371	0.12836
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01363	0.01724	0.10898
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01333	0.01684	0.10880
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01375	0.01738	0.10938

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00748	0.01288	0.13879
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01841	0.02393	0.15808
sky130_osu_sc_15T_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)	0.00705	0.01246	0.13837
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01799	0.02351	0.15766

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.01316	0.02050	0.14864
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02691	0.03369	0.16709
sky130_osu_sc_15T_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)	0.01272	0.02007	0.14820
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02647	0.03326	0.16666

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	-0.00551	-0.00558	-0.00561
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00524	-0.00677	-0.00640
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00492	-0.00570	-0.00551
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00968	0.01234	0.10069
sky130_osu_sc_15T_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)	-0.00593	-0.00601	-0.00604
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00564	-0.00717	-0.00681
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00534	-0.00612	-0.00593
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00927	0.01193	0.10028

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.01209	0.01216	0.01212
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01222	0.01230	0.01205
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01222	0.01228	0.01216
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02150	0.02408	0.11374
sky130_osu_sc_15T_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)	0.01167	0.01173	0.01170
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01177	0.01185	0.01161
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01179	0.01185	0.01173
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02106	0.02365	0.11330

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00225	0.00753	0.13392
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01027	0.01538	0.15039
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01074	0.01583	0.15080
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00267	0.00813	0.13389
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00865	0.01868	0.24352
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00182	0.00711	0.13349
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00983	0.01494	0.14996
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01031	0.01540	0.15036
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00224	0.00771	0.13346
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00822	0.01825	0.24310

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_15T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.04366	0.04990	0.20979
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01870	0.02599	0.15380
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03096	0.03731	0.16997
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03148	0.03790	0.17072
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04201	0.05436	0.25799
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02190	0.02890	0.15586
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02396	0.03668	0.26483
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.04324	0.04947	0.20937
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01828	0.02556	0.15338
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03054	0.03689	0.16955
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03106	0.03748	0.17029
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04157	0.05393	0.25755
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02147	0.02847	0.15543
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02352	0.03625	0.26440

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__dffs_1	48.22950
sky130_osu_sc_15T_ms__dffs_l	48.22950

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffs_1	0.00419	0.00718	0.01209	2.04867	2.05188
sky130_osu_sc_15T_ms__dffs_l	0.00419	0.00718	0.01209	1.39024	1.39676

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	266.20100	363.69300
sky130_osu_sc_15T_ms__dffs_l	0.00000	217.42100	314.91600

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RR)	0.23002	1.33945	17.32220
	QN->Q (FR)	0.02736	0.73419	11.31610
	SN->Q (FR)	0.16720	1.30619	17.14650
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.22797	1.44142	16.58040
	QN->Q (FR)	0.03015	0.78282	10.96490
	SN->Q (FR)	0.16563	1.40226	16.37950

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RF)	0.31671	1.46497	18.04020
	QN->Q (RF)	0.02838	0.73508	11.34560
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.31878	1.58075	17.35980
	QN->Q (RF)	0.02896	0.73170	10.25550

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->QN (RR)	0.27900	0.79876	7.26020
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.27856	0.86010	7.34686

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->QN (RF)	0.19841	0.73643	7.55476
	SN->QN (FF)	0.13566	0.70352	7.37734
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.19070	0.74538	6.89295
	SN->QN (FF)	0.12812	0.70580	6.68938

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.06794	-0.06937	0.09953
	setup	CK (R)	0.17552	0.19913	0.30148
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.06928	-0.06914	0.10034
	setup	CK (R)	0.17318	0.19971	0.31461

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.10622	-0.22482	-2.02179
	setup	CK (R)	0.13753	0.23672	2.07204
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.10548	-0.22540	-2.02280
	setup	CK (R)	0.13742	0.23672	2.07210

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.06794	-0.06937	0.09953
	setup	CK (R)	0.17552	0.19913	0.30148
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.06928	-0.06914	0.10034
	setup	CK (R)	0.17318	0.19971	0.31461

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.10622	-0.22482	-2.02179
	setup	CK (R)	0.13753	0.23672	2.07204
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.10548	-0.22540	-2.02280
	setup	CK (R)	0.13742	0.23672	2.07210

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.04591	0.07186	1.25605
	removal	CK (R)	-0.02390	-0.05135	-0.14130
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04554	0.06783	1.18019
	removal	CK (R)	-0.02390	-0.05135	-0.14130

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.04591	0.07186	1.25605
	removal	CK (R)	-0.02390	-0.05135	-0.14130
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04554	0.06783	1.18019
	removal	CK (R)	-0.02390	-0.05135	-0.14130

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	SN ()	0.11648	0.49683	13.33370
	min_pulse_width	SN ()	0.12021	0.49683	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.11648	0.49683	13.33370
	min_pulse_width	SN ()	0.11275	0.49683	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_15T_ms__dffs_1	min_pulse_width	CK ()	0.10902	0.49683	13.33370
	min_pulse_width	CK ()	0.15750	0.49683	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.10529	0.49683	13.33370
	min_pulse_width	CK ()	0.15377	0.49683	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_15T_ms__dffs_1	min_pulse_width	CK ()	0.22835	0.49683	13.33370
	min_pulse_width	CK ()	0.12394	0.49683	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.22835	0.49683	13.33370
	min_pulse_width	CK ()	0.12394	0.49683	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01654	0.01989	0.08159
	SN	-0.00142	-0.09851	-1.65934
	SN	0.02323	0.02490	0.06718
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01409	0.01811	0.09427
	SN	-0.00143	-0.07807	-1.12607
	SN	0.02086	0.02323	0.07955

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01870	0.01829	0.03652
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01608	0.01726	0.06524

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01746	0.01703	0.03490
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01533	0.01651	0.06354

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01523	0.01859	0.07968
	SN	-0.00142	-0.09860	-1.66176
	SN	0.02256	0.02424	0.06598
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01288	0.01688	0.09238
	SN	-0.00143	-0.07829	-1.13126
	SN	0.02036	0.02274	0.07855

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00131	-0.00132	-0.00130
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01589	0.01899	0.11418
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00799	0.01089	0.10126
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00173	-0.00174	-0.00172
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01546	0.01857	0.11376
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00756	0.01046	0.10083

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00672	0.00661	0.00662
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02507	0.02865	0.12350
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01280	0.01655	0.10870
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00630	0.00619	0.00619
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02464	0.02823	0.12308
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01238	0.01612	0.10827

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00375	-0.00378	-0.00379
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00741	0.00975	0.08381
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00417	-0.00420	-0.00422
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00698	0.00932	0.08338

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00891	0.00888	0.00884
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01464	0.01783	0.09378
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00849	0.00846	0.00842
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01421	0.01741	0.09335

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00149	0.00679	0.13326
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00130	0.00674	0.13262
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00679	0.01667	0.24277
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00106	0.00637	0.13283
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00088	0.00632	0.13220
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00637	0.01624	0.24234

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03772	0.04394	0.20503
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01793	0.02524	0.15313
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03654	0.04918	0.25148
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02062	0.02756	0.15468
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02259	0.03554	0.26445
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03730	0.04352	0.20460
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01751	0.02481	0.15270
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03611	0.04875	0.25105
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02020	0.02714	0.15425
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02216	0.03512	0.26402

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dff_1	40.29300
sky130_osu_sc_15T_ms__dff_l	40.29300

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_15T_ms__dff_1	0.00435	0.01203	2.19420	2.18779
sky130_osu_sc_15T_ms__dff_l	0.00435	0.01203	1.25558	1.24633

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	288.51300	363.68200
sky130_osu_sc_15T_ms__dff_l	0.00000	239.72100	314.89000

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RR)	0.19529	1.30822	17.83930
	QN->Q (FR)	0.02390	0.67103	10.49740
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.20191	1.38503	15.52150
	QN->Q (FR)	0.03393	0.83913	11.43150

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RF)	0.26692	1.39885	18.36490
	QN->Q (RF)	0.02802	0.75689	11.91990
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.27920	1.51391	16.41710
	QN->Q (RF)	0.02914	0.70589	9.62622

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RR)	0.23183	0.71903	7.02329
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.24027	0.81863	7.12394

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RF)	0.16670	0.71702	7.96635
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.16394	0.68784	6.19133

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.05676	-0.06260	0.10143
	setup	CK (R)	0.14109	0.16881	0.31446
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.05911	-0.06281	0.10159
	setup	CK (R)	0.13775	0.17140	0.31592

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.09493	-0.22969	-2.02889
	setup	CK (R)	0.11498	0.23789	2.07883
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.09402	-0.22969	-2.02957
	setup	CK (R)	0.11498	0.23789	2.07883

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	min_pulse_width	CK ()	0.09411	0.49683	13.33370
	min_pulse_width	CK ()	0.14258	0.49683	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.09038	0.49683	13.33370
	min_pulse_width	CK ()	0.13886	0.49683	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_15T_ms__dff_1	**min_pulse_width**	**CK ()**	0.19106	0.49683	13.33370
	min_pulse_width	**CK ()**	0.09411	0.49683	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.19106	0.49683	13.33370
	min_pulse_width	**CK ()**	0.09038	0.49683	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01711	0.02050	0.07945
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01479	0.01903	0.09849

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01954	0.02065	0.05953
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01664	0.01706	0.05442

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01787	0.01897	0.05758
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01599	0.01644	0.05376

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01602	0.01946	0.08006
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01344	0.01772	0.09667

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00035	-0.00104	-0.00073
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01538	0.01866	0.11691
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00077	-0.00146	-0.00115
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01496	0.01824	0.11649

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00708	0.00709	0.00697
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02618	0.02988	0.12623
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00665	0.00666	0.00655
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02576	0.02947	0.12581

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00149	0.00681	0.13328
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00158	0.00705	0.13292
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00106	0.00638	0.13286
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00115	0.00663	0.13249

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01784	0.02516	0.15307
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03719	0.04347	0.20577
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03733	0.05025	0.25626
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02078	0.02768	0.15484
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01742	0.02474	0.15264
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03677	0.04306	0.20535
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03691	0.04984	0.25585
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02035	0.02725	0.15442

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__inv_1	5.49450
sky130_osu_sc_15T_ms__inv_10	27.47250
sky130_osu_sc_15T_ms__inv_2	7.93650
sky130_osu_sc_15T_ms__inv_3	10.37850
sky130_osu_sc_15T_ms__inv_4	12.82050
sky130_osu_sc_15T_ms__inv_6	17.70450
sky130_osu_sc_15T_ms__inv_8	22.58850
sky130_osu_sc_15T_ms__inv_l	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__inv_1	0.00420	2.07845
sky130_osu_sc_15T_ms__inv_10	0.03896	18.29277
sky130_osu_sc_15T_ms__inv_2	0.00798	4.00631
sky130_osu_sc_15T_ms__inv_3	0.01188	5.93957
sky130_osu_sc_15T_ms__inv_4	0.01570	7.92213
sky130_osu_sc_15T_ms__inv_6	0.02353	11.40144
sky130_osu_sc_15T_ms__inv_8	0.03125	15.41656
sky130_osu_sc_15T_ms__inv_l	0.00312	1.17982

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	41.69650	83.16920
sky130_osu_sc_15T_ms__inv_10	0.00000	415.71200	829.82700
sky130_osu_sc_15T_ms__inv_2	0.00000	83.15550	165.99200
sky130_osu_sc_15T_ms__inv_3	0.00000	124.84100	249.13900
sky130_osu_sc_15T_ms__inv_4	0.00000	166.30000	331.96200
sky130_osu_sc_15T_ms__inv_6	0.00000	249.44200	497.92700
sky130_osu_sc_15T_ms__inv_8	0.00000	332.58300	663.88800
sky130_osu_sc_15T_ms__inv_l	0.00000	17.30340	34.36860

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (FR)**	0.02284	0.61738	9.49422
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.03180	0.37767	9.23402
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.01871	0.51897	9.29000
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.02059	0.48410	9.46693
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.02092	0.45079	9.40344
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.02370	0.41130	9.25623
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.02748	0.39368	9.41007
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.02944	0.70139	9.41599

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (RF)**	0.02560	0.66926	10.38650
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.03624	0.42026	10.01530
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.02083	0.56912	10.19040
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.02276	0.53487	10.43670
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.02256	0.49950	10.37000
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02709	0.45971	10.18980
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.03143	0.44132	10.33600
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.02715	0.64047	8.60067

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00592	0.00848	0.03647
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.05180	0.09259	0.36315
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01050	0.01670	0.07225
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01612	0.02589	0.10607
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02068	0.03460	0.14122
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.03091	0.05338	0.21406
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.04119	0.07305	0.28278
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00438	0.00595	0.02808

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00095	0.00258	0.01888
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.00453	0.02889	0.18988
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00048	0.00433	0.03709
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00159	0.00774	0.05521
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00119	0.01116	0.07322
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.00141	0.01620	0.11194
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.00273	0.02213	0.14810
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00005	0.00110	0.01570

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__mux2_1	15.26250

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**S0**	**Y**
sky130_osu_sc_15T_ms__mux2_1	0.01452	0.01436	0.00858	0.00784

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	83.57190	83.59990

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (RR)	-	0.01373	0.04051	0.06263
	A1->Y (RR)	-	0.01488	0.04107	0.06278
	S0->Y (RR)	(!A0 * A1)	0.04885	0.17055	0.56301
	S0->Y (FR)	(A0 * !A1)	0.02954	0.08796	-0.02473

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (FF)	-	0.01322	0.04267	0.06480
	A1->Y (FF)	-	0.01238	0.04224	0.06482
	S0->Y (FF)	(!A0 * A1)	0.05139	0.14363	0.10275
	S0->Y (RF)	(A0 * !A1)	0.02926	0.13487	0.59799

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00593	-0.00594	-0.00596
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00215	-0.00217	-0.00218
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00688	0.01473	0.14289
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00381	0.00242	0.12887

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00594	0.00595	0.00596
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00597	0.00598	0.00599
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00165	0.00856	0.13590
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01600	0.02331	0.15057

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00066	-0.00066	-0.00067

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00211	0.00211	0.00211

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00163	-0.00163	-0.00163

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00163	0.00163	0.00163

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00089	0.00594	0.13218
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00084	0.00562	0.13252

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.01215	0.01970	0.14704
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01079	0.01874	0.14651

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nand2_1	7.93650
sky130_osu_sc_15T_ms__nand2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nand2_1	0.00420	0.00418	1.31152
sky130_osu_sc_15T_ms__nand2_l	0.00312	0.00312	0.97476

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	41.64160	165.95200
sky130_osu_sc_15T_ms__nand2_l	0.00000	17.27560	68.49490

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (FR)	0.02357	0.52899	7.23119
	B->Y (FR)	0.02757	0.52593	7.13031
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.03027	0.65654	8.38356
	B->Y (FR)	0.03612	0.66157	8.37018

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (RF)	0.03858	0.75031	10.25070
	B->Y (RF)	0.04381	0.71489	9.65284
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.04112	0.79998	10.10620
	B->Y (RF)	0.04578	0.76271	9.45667

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00629	0.00882	0.03991
	B	0.00000	0.00000	0.00000
	B	0.00802	0.01039	0.04344
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00461	0.00626	0.02583
	B	0.00000	0.00000	0.00000
	B	0.00585	0.00727	0.02773

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00371	0.00499	0.02283
	B	0.00000	0.00000	0.00000
	B	0.00367	0.00451	0.02180
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00130	0.00223	0.01530
	B	0.00000	0.00000	0.00000
	B	0.00130	0.00191	0.01493

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00434	-0.00434	-0.00437
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00297	-0.00298	-0.00300

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00437	0.00447	0.00439
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00300	0.00307	0.00301

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00406	-0.00407	-0.00406
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00279	-0.00281	-0.00279

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00418	0.00410	0.00407
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00289	0.00282	0.00280

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nor2_1	7.93650
sky130_osu_sc_15T_ms__nor2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nor2_1	0.00418	0.00446	1.13568
sky130_osu_sc_15T_ms__nor2_l	0.00303	0.00334	0.70836

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	36.18780	83.06460
sky130_osu_sc_15T_ms__nor2_l	0.00000	15.39730	34.33980

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (FR)	0.04804	0.67788	8.69480
	B->Y (FR)	0.03573	0.70114	9.22715
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.05696	0.77503	8.67497
	B->Y (FR)	0.04591	0.80658	9.29817

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (RF)	0.03700	0.56146	7.27446
	B->Y (RF)	0.02771	0.54871	7.25220
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.03595	0.54918	6.39295
	B->Y (RF)	0.02900	0.53981	6.37149

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00877	0.01008	0.03832
	B	0.00000	0.00000	0.00000
	B	0.00644	0.00870	0.04325
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00615	0.00705	0.02911
	B	0.00000	0.00000	0.00000
	B	0.00471	0.00632	0.03160

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00210	0.00345	0.02631
	B	0.00000	0.00000	0.00000
	B	0.00063	0.00238	0.02395
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00105	0.00218	0.02101
	B	0.00000	0.00000	0.00000
	B	0.00004	0.00126	0.01905

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00281	-0.00351	-0.00319
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00196	-0.00238	-0.00228

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00467	0.00470	0.00455
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00290	0.00293	0.00286

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00160	-0.00160	-0.00156
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00105	-0.00105	-0.00104

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00225	0.00224	0.00204
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00135	0.00134	0.00125

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__oai21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__oai21_l	0.00421	0.00432	0.00353	1.07884

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	31.09730	117.38700

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (FR)	0.04993	0.71334	9.07974
	A1->Y (FR)	0.06531	0.69527	8.57299
	B0->Y (FR)	0.03469	0.65602	8.52555

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (RF)	0.05363	0.69175	8.67970
	A1->Y (RF)	0.06750	0.68469	8.42434
	B0->Y (RF)	0.04109	0.73172	9.47233

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00900	0.01066	0.03970
	A1	0.00000	0.00000	0.00000
	A1	0.01131	0.01232	0.03711
	B0	0.00519	0.00698	0.03219

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00311	0.00383	0.02107
	A1	0.00000	0.00000	0.00000
	A1	0.00430	0.00477	0.02306
	B0	0.00178	0.00280	0.01908

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00130	-0.00131	-0.00127
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00395	-0.00397	-0.00395
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00395	-0.00398	-0.00396

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00256	0.00256	0.00234
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00395	0.00399	0.00397
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00405	0.00399	0.00397

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00241	-0.00313	-0.00282
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00391	-0.00393	-0.00390
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00390	-0.00393	-0.00391

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00489	0.00489	0.00477
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00391	0.00395	0.00392
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00399	0.00394	0.00393

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00304	-0.00305	-0.00311

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00312	0.00314	0.00313

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__oai22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__oai22_1	0.00411	0.00431	0.00442	0.00433	1.11035

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	54.13840	165.75000

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (FR)	0.07057	0.69591	8.57776
	A1->Y (FR)	0.05816	0.71909	9.11760
	B0->Y (FR)	0.03886	0.70029	9.10411
	B1->Y (FR)	0.05223	0.67668	8.56522

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (RF)	0.09618	0.74985	8.96094
	A1->Y (RF)	0.07609	0.72442	8.87679
	B0->Y (RF)	0.06498	0.76864	9.69897
	B1->Y (RF)	0.08564	0.79539	9.81364

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.01487	0.01581	0.03941
	A1	0.01122	0.01322	0.04507
	B0	0.00683	0.00902	0.04027
	B1	0.00930	0.01044	0.03517

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00509	0.00548	0.02275
	A1	0.00367	0.00430	0.02081
	B0	0.00174	0.00296	0.02242
	B1	0.00309	0.00411	0.02374

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00273	-0.00344	-0.00313
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00234	-0.00305	-0.00274
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00392	-0.00394	-0.00391
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00391	-0.00394	-0.00392

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00474	0.00475	0.00462
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00513	0.00513	0.00501
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00392	0.00397	0.00393
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00402	0.00396	0.00394

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00151	-0.00152	-0.00147
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00111	-0.00113	-0.00109
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00389	-0.00390	-0.00389
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00389	-0.00391	-0.00389

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00231	0.00230	0.00210
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00270	0.00269	0.00248
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00389	0.00390	0.00390
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00399	0.00392	0.00391

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00149	-0.00150	-0.00146
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00110	-0.00112	-0.00107
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00430	-0.00433	-0.00430
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00418	-0.00422	-0.00430

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00229	0.00229	0.00208
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00267	0.00268	0.00247
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00437	0.00441	0.00434
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00432	0.00433	0.00433

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00267	-0.00338	-0.00306
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00229	-0.00299	-0.00267
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00439	-0.00441	-0.00438
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00427	-0.00429	-0.00438

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00467	0.00468	0.00456
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00506	0.00508	0.00494
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00446	0.00449	0.00442
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00439	0.00442	0.00441

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__or2_1	10.37850
sky130_osu_sc_15T_ms__or2_2	12.82050
sky130_osu_sc_15T_ms__or2_4	17.70450
sky130_osu_sc_15T_ms__or2_8	27.47250
sky130_osu_sc_15T_ms__or2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__or2_1	0.00455	0.00431	2.21822
sky130_osu_sc_15T_ms__or2_2	0.00455	0.00431	4.31166
sky130_osu_sc_15T_ms__or2_4	0.00456	0.00432	8.26183
sky130_osu_sc_15T_ms__or2_8	0.00457	0.00433	15.77265
sky130_osu_sc_15T_ms__or2_l	0.00345	0.00319	1.23982

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	57.15560	83.50060
sky130_osu_sc_15T_ms__or2_2	0.00000	77.93650	166.33600
sky130_osu_sc_15T_ms__or2_4	0.00000	119.67500	332.33200
sky130_osu_sc_15T_ms__or2_8	0.00000	203.14900	664.31000
sky130_osu_sc_15T_ms__or2_l	0.00000	24.17320	34.75450

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (RR)	0.07214	0.57247	7.16116
	B->Y (RR)	0.06002	0.53658	7.01829
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.07934	0.51653	7.11876
	B->Y (RR)	0.06713	0.48412	6.96763
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.10234	0.51805	7.26101
	B->Y (RR)	0.08994	0.49124	7.11571
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.14916	0.57451	7.53039
	B->Y (RR)	0.13641	0.55306	7.39608
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.07706	0.63755	6.65832
	B->Y (RR)	0.06615	0.60437	6.48453

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (FF)	0.10039	0.62012	7.78160
	B->Y (FF)	0.08414	0.61788	8.04457
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.11683	0.56687	7.76415
	B->Y (FF)	0.10065	0.57105	8.01958
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.16429	0.58591	7.94119
	B->Y (FF)	0.14824	0.59983	8.18713
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.26344	0.68130	8.09313
	B->Y (FF)	0.24743	0.70447	8.33616
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.11482	0.62159	6.20427
	B->Y (FF)	0.09691	0.62531	6.45617

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00809	0.01142	0.08569
	B	0.00000	0.00000	0.00000
	B	0.00693	0.01156	0.09520
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01301	0.01644	0.09138
	B	0.00000	0.00000	0.00000
	B	0.01170	0.01635	0.09940
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02457	0.02822	0.10189
	B	0.00000	0.00000	0.00000
	B	0.02301	0.02783	0.11015
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.05367	0.05315	0.12745
	B	0.00000	0.00000	0.00000
	B	0.05154	0.05324	0.13473
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00533	0.00769	0.05567
	B	0.00000	0.00000	0.00000
	B	0.00442	0.00731	0.05844

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.01648	0.02012	0.10018
	B	0.00000	0.00000	0.00000
	B	0.01384	0.02005	0.12399
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.02287	0.02587	0.10487
	B	0.00000	0.00000	0.00000
	B	0.02023	0.02557	0.12749
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.04055	0.03937	0.11527
	B	0.00000	0.00000	0.00000
	B	0.03800	0.03911	0.13612
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.08835	0.06963	0.13742
	B	0.00000	0.00000	0.00000
	B	0.08588	0.06915	0.15538
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01115	0.01343	0.07119
	B	0.00000	0.00000	0.00000
	B	0.00934	0.01316	0.08137

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00280	-0.00351	-0.00321
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00279	-0.00351	-0.00321
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00279	-0.00351	-0.00321
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00278	-0.00351	-0.00320
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00194	-0.00239	-0.00230

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00469	0.00472	0.00458
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00469	0.00472	0.00458
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00469	0.00473	0.00458
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00470	0.00474	0.00459
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00292	0.00294	0.00289

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00160	-0.00160	-0.00157
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00160	-0.00161	-0.00156
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00159	-0.00160	-0.00156
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00158	-0.00160	-0.00156
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00107	-0.00108	-0.00106

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00226	0.00228	0.00205
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00226	0.00228	0.00205
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00227	0.00228	0.00206
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00227	0.00229	0.00206
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00138	0.00139	0.00128

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tbufi_1	10.37850
sky130_osu_sc_15T_ms__tbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tbufi_1	0.00445	0.00569	1.15407
sky130_osu_sc_15T_ms__tbufi_l	0.00334	0.00432	0.70643

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	41.87880	166.20200
sky130_osu_sc_15T_ms__tbufi_l	0.00000	17.50040	68.70100

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (FR)	0.03424	0.69818	9.23639
	OE->Y (FR)	0.04117	0.36689	5.09359
	OE->Y (RR)	0.07277	0.63334	7.01855
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.04438	0.80240	9.24312
	OE->Y (FR)	0.04646	0.36670	5.09338
	OE->Y (RR)	0.08044	0.71440	6.67533

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (RF)	0.03822	0.71378	9.42280
	OE->Y (FF)	0.04203	0.36688	5.09352
	OE->Y (RF)	0.03539	0.66745	8.73126
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.04120	0.70495	8.23214
	OE->Y (FF)	0.04735	0.36669	5.09338
	OE->Y (RF)	0.03756	0.65281	7.42913

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00840	0.01025	0.03846
	OE	0.00000	0.00000	0.00000
	OE	0.00832	0.01432	0.12704
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00541	0.00672	0.02750
	OE	0.00000	0.00000	0.00000
	OE	0.00518	0.00936	0.08702

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00329	0.00466	0.02231
	OE	0.00000	0.00000	0.00000
	OE	0.00804	0.01445	0.13992
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00099	0.00195	0.01664
	OE	0.00000	0.00000	0.00000
	OE	0.00407	0.00860	0.09614

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00303	-0.00306	-0.00299
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00237	-0.00238	-0.00236
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00215	-0.00216	-0.00213
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00173	-0.00174	-0.00173

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00303	0.00306	0.00299
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00281	0.00282	0.00271
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00215	0.00216	0.00213
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00196	0.00195	0.00190

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00395	0.01064	0.13876
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00287	0.00965	0.13801
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00220	0.00687	0.09540
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00168	0.00643	0.09497

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00747	0.01506	0.14426
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00704	0.01487	0.14377
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00556	0.01076	0.09944
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00539	0.01062	0.09925

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tnbufi_1	10.37850
sky130_osu_sc_15T_ms__tnbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	**OE**	**Y**
sky130_osu_sc_15T_ms__tnbufi_1	0.00444	0.00691	1.15446
sky130_osu_sc_15T_ms__tnbufi_l	0.00333	0.00494	0.70718

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	69.53300	83.42030
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	28.87990	34.61910

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (FR)	0.03445	0.69826	9.23795
	OE->Y (RR)	0.03318	0.36773	5.09444
	OE->Y (FR)	0.04472	0.66853	8.58083
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.04469	0.80267	9.24901
	OE->Y (RR)	0.03274	0.36767	5.09444
	OE->Y (FR)	0.05405	0.76534	8.47378

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (RF)	0.03763	0.71366	9.42500
	OE->Y (RF)	0.03288	0.36772	5.09445
	OE->Y (FF)	0.05492	0.54992	6.18218
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.04049	0.70497	8.23751
	OE->Y (RF)	0.03251	0.36766	5.09437
	OE->Y (FF)	0.06165	0.57340	5.35652

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00625	0.00812	0.03657
	OE	0.00000	0.00000	0.00000
	OE	0.01539	0.02374	0.15230
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00463	0.00594	0.02682
	OE	0.00000	0.00000	0.00000
	OE	0.01099	0.01653	0.10477

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00091	0.00230	0.01998
	OE	0.00000	0.00000	0.00000
	OE	0.01519	0.02316	0.13970
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00002	0.00097	0.01565
	OE	0.00000	0.00000	0.00000
	OE	0.01008	0.01552	0.09793

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00201	-0.00202	-0.00191
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00122	-0.00124	-0.00121
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00155	-0.00156	-0.00148
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00104	-0.00106	-0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00330	0.00331	0.00326
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00312	0.00313	0.00302
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00203	0.00203	0.00200
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00186	0.00185	0.00180

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00355	0.00314	0.13237
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00413	0.00288	0.13180
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00248	0.00216	0.09117
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00278	0.00203	0.09094

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01241	0.02086	0.15064
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01143	0.02012	0.14988
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00857	0.01424	0.10355
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00814	0.01398	0.10319

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__xnor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xnor2_l	0.00883	0.00794	1.16820

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	151.39500	249.15400

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (RR)	B	0.09070	0.66174	7.09711
	A->Y (FR)	!B	0.04498	0.70674	9.23857
	B->Y (RR)	A	0.07310	0.64972	7.25170
	B->Y (FR)	!A	0.06132	0.68942	8.73328

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (FF)	B	0.10125	0.62951	6.52870
	A->Y (RF)	!B	0.05183	0.69001	8.92498
	B->Y (FF)	A	0.08295	0.61496	6.53905
	B->Y (RF)	!A	0.06710	0.70705	8.92203

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01080	0.01637	0.13091
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01505	0.02445	0.17995
	B	A	0.00000	0.00000	0.00000
	B	A	0.00617	0.01290	0.14284
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01668	0.02519	0.17363

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.02301	0.02967	0.15648
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01022	0.01717	0.15944
	B	A	0.00000	0.00000	0.00000
	B	A	0.02252	0.03021	0.15965
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01005	0.01698	0.15863

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

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_15T_ms__xor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xor2_l	0.00886	0.00799	1.15842

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	151.39000	271.76300

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (RR)	!B	0.08776	0.66279	7.28594
	A->Y (FR)	B	0.05776	0.69281	8.84357
	B->Y (RR)	!A	0.07641	0.65843	7.30866
	B->Y (FR)	A	0.06310	0.69700	8.81558

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (FF)	!B	0.08532	0.61361	6.32757
	A->Y (RF)	B	0.05830	0.73863	9.44566
	B->Y (FF)	!A	0.08106	0.61507	6.51833
	B->Y (RF)	A	0.06625	0.70514	8.87798

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.02020	0.02881	0.17834
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00522	0.01060	0.13670
	B	A	0.00000	0.00000	0.00000
	B	A	0.02079	0.02934	0.17587
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00393	0.01044	0.13963

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01039	0.01730	0.16084
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02267	0.02988	0.14495
	B	A	0.00000	0.00000	0.00000
	B	A	0.01034	0.01692	0.15662
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02079	0.02859	0.15689

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__ant	5.49450
sky130_osu_sc_15T_ms__tiehi	5.49450
sky130_osu_sc_15T_ms__tielo	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_15T_ms__ant	0.86331
sky130_osu_sc_15T_ms__tiehi	0.00000
sky130_osu_sc_15T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__ant	0.00000	314832.00000	629664.00000
sky130_osu_sc_15T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_15T_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_15T_ms__ant	0.00000	0.00000	0.00000
	-0.00118	0.10305	1.41450

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__ant	0.00000	0.00000	0.00000
	5.47879	5.21139	1.65452