sky130_osu_sc_15T_ms_ff_1P95_100C.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_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.01565	0.01554	0.01194	2.87372	1.35229	2.70303
sky130_osu_sc_15T_ms__addf_l	0.01565	0.01553	0.01193	1.81449	1.35103	1.86820

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	288.10200	361.03500
sky130_osu_sc_15T_ms__addf_l	0.00000	259.26400	332.20300

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)	0.10701	1.42064	25.62750
	B->CO (RR)	0.09082	1.36687	24.79560
	CI->CO (RR)	0.10082	1.45335	26.17880
	CON->CO (FR)	0.01696	0.56324	9.82709
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.10758	1.27586	19.31640
	B->CO (RR)	0.10707	1.25669	18.95190
	CI->CO (RR)	0.10138	1.30970	19.91010
	CON->CO (FR)	0.01957	0.60655	9.46974

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)	0.12139	1.59653	28.85850
	B->CO (FF)	0.10723	1.54599	27.91620
	CI->CO (FF)	0.10591	1.62398	29.46810
	CON->CO (RF)	0.01899	0.56988	10.14300
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.11492	1.33541	20.19360
	B->CO (FF)	0.10130	1.30584	19.86800
	CI->CO (FF)	0.09941	1.36402	20.84600
	CON->CO (RF)	0.01912	0.53964	8.44354

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)	0.09028	0.65251	8.50521
	B->CON (FR)	0.07684	0.64611	8.63006
	CI->CON (FR)	0.07479	0.68263	9.18072
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.08582	0.64785	8.49494
	B->CON (FR)	0.07279	0.64197	8.62099
	CI->CON (FR)	0.07030	0.67836	9.17057

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)	0.07837	0.57187	7.45246
	B->CON (RF)	0.07822	0.58189	7.61796
	CI->CON (RF)	0.07219	0.60795	8.10027
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.07476	0.56809	7.44503
	B->CON (RF)	0.07482	0.57855	7.60997
	CI->CON (RF)	0.06856	0.60414	8.09200

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)	0.18045	1.40886	22.63610
	B->S (-R)	0.19230	1.38890	21.59290
	CI->S (-R)	0.16352	1.43452	23.25670
	CON->S (RR)	0.05752	0.48484	7.14114
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.17167	1.29043	18.22170
	B->S (-R)	0.16294	1.25976	17.66150
	CI->S (-R)	0.15467	1.31803	18.86610
	CON->S (RR)	0.05599	0.51719	6.92961

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)	0.17066	1.34072	21.15440
	B->S (-F)	0.16404	1.29144	20.49240
	CI->S (-F)	0.16507	1.37320	21.71760
	CON->S (FF)	0.06598	0.55146	7.89491
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.15800	1.19577	16.51690
	B->S (-F)	0.15213	1.15429	16.10200
	CI->S (-F)	0.15232	1.22811	17.11770
	CON->S (FF)	0.06071	0.53861	6.95694

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	0.00902	0.01701	0.18652
	B	0.01020	0.01751	0.17381
	CI	0.01140	0.01980	0.18884
sky130_osu_sc_15T_ms__addf_l	A	0.00682	0.01288	0.12186
	B	0.00800	0.01344	0.11467
	CI	0.00919	0.01557	0.12448

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.02174	0.03221	0.25369
	B	0.02144	0.03020	0.22772
	CI	0.01931	0.03031	0.25351
sky130_osu_sc_15T_ms__addf_l	A	0.01883	0.02670	0.16866
	B	0.01880	0.02541	0.15259
	CI	0.01641	0.02499	0.16832

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01951	0.02665	0.14672
	B	0.01912	0.02537	0.13522
	CI	0.01716	0.02465	0.14759
sky130_osu_sc_15T_ms__addf_l	A	0.01805	0.02488	0.13914
	B	0.01771	0.02369	0.12862
	CI	0.01568	0.02300	0.14007

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00710	0.01263	0.10815
	B	0.00894	0.01390	0.10709
	CI	0.00953	0.01538	0.11325
sky130_osu_sc_15T_ms__addf_l	A	0.00564	0.01086	0.10046
	B	0.00756	0.01217	0.09915
	CI	0.00805	0.01357	0.10484

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00640	0.01126	0.21402
	B	0.01044	0.01529	0.20438
	CI	0.01221	0.01955	0.20665
sky130_osu_sc_15T_ms__addf_l	A	0.00461	0.00988	0.21436
	B	0.00863	0.01383	0.20449
	CI	0.01041	0.01814	0.20689

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.04374	0.05223	0.23730
	B	0.03740	0.04613	0.23416
	CI	0.03249	0.04102	0.21385
sky130_osu_sc_15T_ms__addf_l	A	0.04038	0.04923	0.23966
	B	0.03365	0.04311	0.23686
	CI	0.02950	0.03826	0.21614

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00761	0.00847	2.79193	1.46526	2.85997
sky130_osu_sc_15T_ms__addh_l	0.00761	0.00847	1.90903	1.47597	1.96069

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	316.88400	361.20200
sky130_osu_sc_15T_ms__addh_l	0.00000	280.68600	332.32700

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)	0.06958	0.50518	7.23999
	B->CO (RR)	0.07261	0.49862	7.32254
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.06911	0.54092	7.09074
	B->CO (RR)	0.07211	0.53328	7.08505

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)	0.05520	0.51124	7.69386
	B->CO (FF)	0.05972	0.52984	7.87566
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.05110	0.45952	5.97189
	B->CO (FF)	0.05528	0.47742	6.14760

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	0.09512	0.41421	4.09242
	A->CON (FR)	!B	0.04740	0.63113	8.97770
	B->CON (RR)	A	0.09721	0.40671	4.17108
	B->CON (FR)	!A	0.05998	0.61107	8.49783
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.08804	0.40520	4.16168
	A->CON (FR)	!B	0.04345	0.62864	9.01679
	B->CON (RR)	A	0.09020	0.39773	4.18027
	B->CON (FR)	!A	0.05601	0.60851	8.53784

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	0.09430	0.54113	6.04513
	A->CON (RF)	!B	0.04583	0.58679	8.33182
	B->CON (FF)	A	0.09105	0.57171	6.50965
	B->CON (RF)	!A	0.05564	0.57553	7.99893
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.08772	0.52997	6.04140
	A->CON (RF)	!B	0.04246	0.58475	8.36673
	B->CON (FF)	A	0.08447	0.56053	6.50415
	B->CON (RF)	!A	0.05233	0.57306	8.03361

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	0.07170	1.39356	25.62670
	A->S (FR)	B	0.12152	1.34333	23.24890
	B->S (RR)	!A	0.08271	1.35897	24.68520
	B->S (FR)	A	0.11751	1.39815	24.31870
	CON->S (FR)	-	0.01869	0.57916	10.06420
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.06984	1.27532	20.48170
	A->S (FR)	B	0.11676	1.21587	18.05670
	B->S (RR)	!A	0.08121	1.24809	19.79810
	B->S (FR)	A	0.11244	1.26322	18.86460
	CON->S (FR)	-	0.01999	0.61547	9.78568

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	0.07430	1.47019	27.08520
	A->S (RF)	B	0.11983	1.08036	17.96640
	B->S (FF)	!A	0.08690	1.45502	26.66860
	B->S (RF)	A	0.12192	1.07122	18.04640
	CON->S (RF)	-	0.01807	0.55789	9.85729
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.06896	1.29036	20.74680
	A->S (RF)	B	0.11165	0.96331	13.82080
	B->S (FF)	!A	0.08155	1.27353	20.29240
	B->S (RF)	A	0.11379	0.95527	13.82250
	CON->S (RF)	-	0.01814	0.54706	8.76021

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	0.01081	0.01493	0.09458
	B	0.00000	0.00000	0.00000
	B	0.00994	0.01432	0.11208
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00948	0.01366	0.09425
	B	0.00000	0.00000	0.00000
	B	0.00860	0.01289	0.10587

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	0.01367	0.01985	0.14376
	B	0.00000	0.00000	0.00000
	B	0.01461	0.02207	0.15668
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.01196	0.01749	0.12343
	B	0.00000	0.00000	0.00000
	B	0.01279	0.01935	0.13229

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	0.00955	0.01365	0.09030
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01328	0.01777	0.08447
	B	A	0.00000	0.00000	0.00000
	B	A	0.00870	0.01305	0.10603
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01457	0.01832	0.08058
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00835	0.01255	0.09172
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01165	0.01571	0.07494
	B	A	0.00000	0.00000	0.00000
	B	A	0.00749	0.01179	0.10408
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01296	0.01623	0.07122

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	0.01319	0.01880	0.12458
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00617	0.01050	0.07239
	B	A	0.00000	0.00000	0.00000
	B	A	0.01417	0.02089	0.13361
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00637	0.01025	0.07102
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01200	0.01740	0.11884
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00493	0.00855	0.06042
	B	A	0.00000	0.00000	0.00000
	B	A	0.01297	0.01936	0.12670
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00513	0.00830	0.05996

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	0.01505	0.02127	0.14666
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00925	0.01425	0.09506
	B	A	0.00000	0.00000	0.00000
	B	A	0.01637	0.02389	0.15984
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00894	0.01334	0.08873
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01323	0.01877	0.12590
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00693	0.01074	0.06576
	B	A	0.00000	0.00000	0.00000
	B	A	0.01440	0.02101	0.13511
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00682	0.01011	0.06277

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	0.01176	0.01595	0.09683
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01515	0.02003	0.10110
	B	A	0.00000	0.00000	0.00000
	B	A	0.01086	0.01529	0.11335
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01651	0.02081	0.09887
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00972	0.01386	0.09551
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01232	0.01645	0.07712
	B	A	0.00000	0.00000	0.00000
	B	A	0.00883	0.01314	0.10636
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01368	0.01711	0.07412

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00411	0.00424	2.79304
sky130_osu_sc_15T_ms__and2_2	0.00411	0.00425	5.34514
sky130_osu_sc_15T_ms__and2_4	0.00411	0.00425	10.12320
sky130_osu_sc_15T_ms__and2_6	0.00415	0.00425	14.91801
sky130_osu_sc_15T_ms__and2_8	0.00412	0.00427	19.21830
sky130_osu_sc_15T_ms__and2_l	0.00314	0.00326	1.79966

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	150.53900	240.76900
sky130_osu_sc_15T_ms__and2_2	0.00000	240.83900	240.93300
sky130_osu_sc_15T_ms__and2_4	0.00000	421.41100	481.53000
sky130_osu_sc_15T_ms__and2_6	0.00000	601.98000	722.20800
sky130_osu_sc_15T_ms__and2_8	0.00000	782.52400	962.86200
sky130_osu_sc_15T_ms__and2_l	0.00000	114.34100	182.84200

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)	0.05287	0.46766	7.31183
	B->Y (RR)	0.05679	0.45040	6.89414
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.06167	0.42063	7.23584
	B->Y (RR)	0.06568	0.40145	6.79872
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.08685	0.42435	7.29338
	B->Y (RR)	0.09091	0.40260	6.85857
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.11332	0.45060	7.41254
	B->Y (RR)	0.11730	0.42663	6.98144
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.13908	0.48067	7.48963
	B->Y (RR)	0.14315	0.45486	7.03995
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.05316	0.49583	6.83591
	B->Y (RR)	0.05706	0.47709	6.37220

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)	0.04430	0.46402	7.27179
	B->Y (FF)	0.04632	0.47557	7.36776
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.04887	0.40468	7.07579
	B->Y (FF)	0.05136	0.41713	7.20537
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.06699	0.39715	7.00051
	B->Y (FF)	0.06928	0.40713	7.14092
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.08722	0.41865	7.05284
	B->Y (FF)	0.08910	0.42638	7.19501
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.10641	0.44111	6.95722
	B->Y (FF)	0.10815	0.44768	7.09318
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.04628	0.47598	6.39726
	B->Y (FF)	0.04900	0.48967	6.50619

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	0.01142	0.02598	0.28517
	B	0.00000	0.00000	0.00000
	B	0.01139	0.02221	0.22516
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01725	0.03101	0.29203
	B	0.00000	0.00000	0.00000
	B	0.01724	0.02763	0.23528
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.03244	0.04399	0.30736
	B	0.00000	0.00000	0.00000
	B	0.03248	0.04042	0.23809
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.05384	0.06027	0.32216
	B	0.00000	0.00000	0.00000
	B	0.05391	0.05550	0.24934
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.07914	0.07849	0.34027
	B	0.00000	0.00000	0.00000
	B	0.07924	0.07255	0.26002
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00841	0.02069	0.23333
	B	0.00000	0.00000	0.00000
	B	0.00841	0.01719	0.17860

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	0.01615	0.03155	0.27059
	B	0.00000	0.00000	0.00000
	B	0.01781	0.03268	0.26250
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.02382	0.03847	0.27632
	B	0.00000	0.00000	0.00000
	B	0.02547	0.03971	0.26851
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.04458	0.05494	0.28869
	B	0.00000	0.00000	0.00000
	B	0.04602	0.05594	0.28000
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.06830	0.07321	0.30262
	B	0.00000	0.00000	0.00000
	B	0.06948	0.07401	0.29324
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.09689	0.09222	0.31663
	B	0.00000	0.00000	0.00000
	B	0.09791	0.09250	0.30597
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.01206	0.02445	0.21536
	B	0.00000	0.00000	0.00000
	B	0.01325	0.02529	0.20732

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)	-0.00383	-0.00383	-0.00386
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00278	-0.00276	-0.00281
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00069	-0.00069	-0.00072
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00137	0.00138	0.00134
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00349	0.00351	0.00346
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00263	-0.00263	-0.00265

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)	0.00595	0.00605	0.00597
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00700	0.00710	0.00702
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00910	0.00920	0.00912
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.01123	0.01133	0.01125
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.01330	0.01339	0.01331
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00424	0.00431	0.00425

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)	-0.00355	-0.00358	-0.00356
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00251	-0.00253	-0.00252
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00042	-0.00044	-0.00043
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00167	0.00167	0.00167
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00376	0.00376	0.00376
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00244	-0.00247	-0.00245

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)	0.00582	0.00572	0.00567
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00687	0.00677	0.00672
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00897	0.00887	0.00882
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.01107	0.01096	0.01092
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.01316	0.01306	0.01302
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00418	0.00413	0.00406

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00393	0.00406	0.00393	1.27599

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	61.30210	120.23300

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)	0.04899	0.61176	8.35486
	A1->Y (FR)	0.04068	0.57898	7.97768
	B0->Y (FR)	0.03479	0.64865	9.10442

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)	0.04236	0.50525	6.81968
	A1->Y (RF)	0.03855	0.53198	7.29535
	B0->Y (RF)	0.02285	0.47482	6.68686

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	0.01188	0.01554	0.08714
	A1	0.00000	0.00000	0.00000
	A1	0.00988	0.01342	0.08269
	B0	0.00678	0.01406	0.11549

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	0.00510	0.00751	0.05799
	A1	0.00000	0.00000	0.00000
	A1	0.00527	0.00854	0.06271
	B0	0.00132	0.00626	0.07233

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)	-0.00270	-0.00369	-0.00325
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00321	-0.00325	-0.00323
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00426	-0.00429	-0.00427

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)	0.00536	0.00539	0.00519
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00531	0.00536	0.00533
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00444	0.00434	0.00429

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)	-0.00263	-0.00362	-0.00318
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00315	-0.00319	-0.00316
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00455	-0.00458	-0.00460

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)	0.00528	0.00531	0.00512
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00524	0.00526	0.00526
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00461	0.00470	0.00462

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)	-0.00156	-0.00158	-0.00151

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)	0.00302	0.00302	0.00253

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__aoi22_1	0.00392	0.00404	0.00417	0.00398	1.29439

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi22_1	0.00000	68.50180	240.15600

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)	0.05921	0.61493	8.27099
	A1->Y (FR)	0.05274	0.60140	8.16276
	B0->Y (FR)	0.03514	0.62879	8.83241
	B1->Y (FR)	0.04166	0.64727	9.01620

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)	0.05585	0.52383	6.91816
	A1->Y (RF)	0.05195	0.54971	7.39009
	B0->Y (RF)	0.02666	0.52200	7.36406
	B1->Y (RF)	0.03059	0.49510	6.89078

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	0.01472	0.01830	0.09255
	A1	0.01272	0.01617	0.08789
	B0	0.00740	0.01367	0.10147
	B1	0.00936	0.01547	0.10453

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00807	0.01058	0.06398
	A1	0.00823	0.01153	0.06810
	B0	0.00447	0.00839	0.06213
	B1	0.00433	0.00736	0.05748

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)	-0.00233	-0.00341	-0.00234
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00217	-0.00220	-0.00218
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00426	-0.00428	-0.00427
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00426	-0.00429	-0.00427

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)	0.00644	0.00644	0.00602
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00635	0.00641	0.00637
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00444	0.00434	0.00429
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00444	0.00434	0.00429

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)	-0.00229	-0.00334	-0.00227
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00210	-0.00213	-0.00211
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00455	-0.00457	-0.00460
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00455	-0.00457	-0.00460

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)	0.00637	0.00634	0.00595
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00628	0.00631	0.00630
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00459	0.00469	0.00461
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00459	0.00469	0.00461

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)	-0.00156	-0.00157	-0.00152
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00051	-0.00052	-0.00054
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00471	-0.00475	-0.00476
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00471	-0.00475	-0.00476

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)	0.00308	0.00309	0.00259
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00265	0.00266	0.00259
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00476	0.00478	0.00478
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00476	0.00479	0.00478

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)	-0.00158	-0.00159	-0.00153
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00052	-0.00056	-0.00055
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00435	-0.00437	-0.00435
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00435	-0.00437	-0.00435

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)	0.00311	0.00311	0.00261
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00267	0.00268	0.00261
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00452	0.00439	0.00437
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00452	0.00439	0.00437

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00423	2.76464
sky130_osu_sc_15T_ms__buf_2	0.00427	5.29694
sky130_osu_sc_15T_ms__buf_4	0.00427	10.42615
sky130_osu_sc_15T_ms__buf_6	0.00090	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00428	19.59119
sky130_osu_sc_15T_ms__buf_l	0.00328	1.81271

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	120.51900	120.53100
sky130_osu_sc_15T_ms__buf_2	0.00000	180.77600	240.88500
sky130_osu_sc_15T_ms__buf_4	0.00000	301.27600	481.56400
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	542.26300	962.89200
sky130_osu_sc_15T_ms__buf_l	0.00000	91.67930	91.68820

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)	0.04146	0.42344	6.71923
sky130_osu_sc_15T_ms__buf_2	A->Y (RR)	0.04794	0.37222	6.57799
sky130_osu_sc_15T_ms__buf_4	A->Y (RR)	0.06568	0.37237	6.81949
sky130_osu_sc_15T_ms__buf_8	A->Y (RR)	0.10294	0.41410	6.87446
sky130_osu_sc_15T_ms__buf_l	A->Y (RR)	0.04306	0.45017	6.22327

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)	0.04170	0.46506	7.41460
sky130_osu_sc_15T_ms__buf_2	A->Y (FF)	0.04755	0.41862	7.46746
sky130_osu_sc_15T_ms__buf_4	A->Y (FF)	0.06591	0.41648	7.74374
sky130_osu_sc_15T_ms__buf_8	A->Y (FF)	0.10560	0.45627	7.66229
sky130_osu_sc_15T_ms__buf_l	A->Y (FF)	0.04402	0.48260	6.64764

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	0.00777	0.02107	0.23605
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01298	0.02566	0.23558
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02612	0.03838	0.24792
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.06299	0.07036	0.27574
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00577	0.01694	0.19752

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	0.01543	0.03157	0.27965
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.02331	0.03801	0.26209
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.04428	0.05503	0.27560
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.09667	0.09216	0.30314
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.01157	0.02477	0.22457

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
	-0.00088	-0.00088	-0.00084

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
	0.00088	0.00088	0.00084

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00404	0.00397	0.01146	2.51794	2.47196
sky130_osu_sc_15T_ms__dffr_l	0.00404	0.00397	0.01146	1.82155	1.80335

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	403.36000	614.50700
sky130_osu_sc_15T_ms__dffr_l	0.00000	374.53100	585.68800

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)	0.18787	1.09575	15.89240
	QN->Q (FR)	0.02172	0.67531	11.44750
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.17861	1.13137	14.84220
	QN->Q (FR)	0.02217	0.68692	10.78300

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)	0.19522	1.09094	15.99750
	QN->Q (RF)	0.02124	0.61868	10.50190
	RN->Q (FF)	0.14439	1.07092	16.25540
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.19257	1.14896	15.16130
	QN->Q (RF)	0.02040	0.59737	9.35157
	RN->Q (FF)	0.14201	1.12884	15.41280

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)	0.17189	0.57323	6.49046
	RN->QN (FR)	0.12098	0.55280	6.74261
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.16962	0.61435	6.51516
	RN->QN (FR)	0.11903	0.59331	6.76195

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)**	0.16339	0.58300	6.50605
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.15233	0.58030	5.94294

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)	-0.05101	-0.05008	0.03280
	setup	CK (R)	0.14930	0.17671	1.41416
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.05104	-0.05008	0.03310
	setup	CK (R)	0.15052	0.17602	1.64521

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)	-0.07132	-0.18849	0.70463
	setup	CK (R)	0.08828	0.20296	3.02591
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.07017	-0.18936	0.86734
	setup	CK (R)	0.08838	0.20296	3.02488

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)	-0.05101	-0.05008	0.03280
	setup	CK (R)	0.14930	0.17671	1.41416
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.05104	-0.05008	0.03310
	setup	CK (R)	0.15052	0.17602	1.64521

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)	-0.07132	-0.18849	0.70463
	setup	CK (R)	0.08828	0.20296	3.02591
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.07017	-0.18936	0.86734
	setup	CK (R)	0.08838	0.20296	3.02488

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)	0.12310	0.16151	1.04053
	removal	CK (R)	-0.02831	-0.03194	-0.13879
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.12620	0.16648	1.08163
	removal	CK (R)	-0.02831	-0.03194	-0.13879

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)	0.12310	0.16151	1.04053
	removal	CK (R)	-0.02831	-0.03194	-0.13879
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.12620	0.16648	1.08163
	removal	CK (R)	-0.02831	-0.03194	-0.13879

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 ()	0.07992	0.46387	13.33370
	min_pulse_width	RN ()	0.07992	0.46387	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.07643	0.46387	13.33370
	min_pulse_width	RN ()	0.07643	0.46387	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 ()	0.09388	0.46387	13.33370
	min_pulse_width	CK ()	0.10086	0.46387	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.08690	0.46387	13.33370
	min_pulse_width	CK ()	0.09737	0.46387	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 ()	0.18812	0.46387	13.33370
	min_pulse_width	CK ()	0.07294	0.46387	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.18812	0.46387	13.33370
	min_pulse_width	CK ()	0.07294	0.46387	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	0.02198	0.03188	0.18228
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01949	0.03063	0.20749

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	0.02361	0.02664	0.09841
	RN	-0.00155	-0.12679	-2.39349
	RN	0.03851	0.04256	0.12029
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.02106	0.02642	0.14600
	RN	-0.00155	-0.10441	-1.73154
	RN	0.03622	0.04260	0.16737

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	0.02179	0.02488	0.09796
	RN	-0.00155	-0.12540	-2.34902
	RN	0.03760	0.04170	0.12033
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01991	0.02528	0.14471
	RN	-0.00155	-0.10378	-1.71415
	RN	0.03568	0.04203	0.16693

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	0.01948	0.02947	0.18024
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01701	0.02813	0.20436

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	0.00136	0.00054	0.00108
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02050	0.03061	0.25833
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01034	0.02001	0.23218
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00111	0.00029	0.00083
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02025	0.03036	0.25808
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01009	0.01976	0.23193

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	0.00961	0.00961	0.00943
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03042	0.04170	0.26939
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01412	0.02486	0.23968
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00936	0.00936	0.00918
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03017	0.04145	0.26914
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01387	0.02461	0.23943

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)	0.00897	0.02471	0.31693
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01803	0.03461	0.34937
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)	0.00872	0.02446	0.31668
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01777	0.03436	0.34912

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)	0.01466	0.03178	0.32565
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02938	0.04662	0.35992
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)	0.01440	0.03152	0.32539
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02912	0.04636	0.35967

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)	0.00328	0.01876	0.31195
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01071	0.02641	0.34736
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00287	0.01809	0.31098
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00303	0.01851	0.31170
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01046	0.02615	0.34712
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00262	0.01784	0.31073

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)	0.02119	0.03862	0.33288
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.04408	0.06050	0.44846
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03391	0.05048	0.36668
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.04262	0.07393	0.53590
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02410	0.04089	0.33430
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02094	0.03837	0.33262
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.04383	0.06024	0.44820
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03366	0.05023	0.36643
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.04237	0.07368	0.53565
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02385	0.04062	0.33405

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00400	0.00398	0.00881	0.01182	2.82068	2.81757
sky130_osu_sc_15T_ms__dffsr_l	0.00400	0.00398	0.00880	0.01182	1.83348	1.80706

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__dffsr_1	0.00000	445.33900	613.87600
sky130_osu_sc_15T_ms__dffsr_l	0.00000	416.49500	585.03000

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)	0.19416	1.11865	17.02210
	QN->Q (FR)	0.01883	0.61728	10.73600
	RN->Q (RR)	0.15955	1.09978	17.20720
	SN->Q (FR)	0.13688	1.09572	17.34190
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.19006	1.14151	14.88730
	QN->Q (FR)	0.02217	0.68703	10.80400
	RN->Q (RR)	0.15607	1.12356	15.06870
	SN->Q (FR)	0.13340	1.11521	15.19300

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)	0.23292	1.15309	17.09600
	QN->Q (RF)	0.02092	0.64580	11.40210
	RN->Q (FF)	0.14438	1.09512	17.37330
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.23335	1.19901	15.30670
	QN->Q (RF)	0.02036	0.59823	9.38249
	RN->Q (FF)	0.14487	1.14133	15.58040

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)	0.20911	0.60985	6.69914
	RN->QN (FR)	0.12117	0.55159	6.97535
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.21001	0.66089	6.57664
	RN->QN (FR)	0.12184	0.60349	6.84546

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)	0.17178	0.61402	7.36076
	RN->QN (RF)	0.13736	0.59534	7.54552
	SN->QN (FF)	0.11471	0.59052	7.67701
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.16421	0.58775	5.91915
	RN->QN (RF)	0.13050	0.57105	6.09857
	SN->QN (FF)	0.10788	0.56100	6.22031

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)	-0.05315	-0.05662	0.03490
	setup	CK (R)	0.14988	0.18360	2.22901
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.05116	-0.05662	0.03513
	setup	CK (R)	0.15302	0.18315	2.25152

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)	-0.08412	-0.20686	1.36784
	setup	CK (R)	0.10909	0.21857	3.12020
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.08422	-0.20686	1.39399
	setup	CK (R)	0.10880	0.21857	3.12009

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)	-0.05315	-0.05662	0.03490
	setup	CK (R)	0.14988	0.18360	2.22901
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.05116	-0.05662	0.03513
	setup	CK (R)	0.15302	0.18315	2.25152

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)	-0.08412	-0.20686	1.36784
	setup	CK (R)	0.10909	0.21857	3.12020
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.08422	-0.20686	1.39399
	setup	CK (R)	0.10880	0.21857	3.12009

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)	0.11172	0.15407	1.37442
	removal	CK (R)	-0.01406	-0.01952	-0.08350
	hold	SN (R)	-0.11044	-0.21467	-0.88259
	setup	SN (R)	0.13416	0.26333	4.58321
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.11095	0.15209	1.50915
	removal	CK (R)	-0.01406	-0.01952	-0.07950
	hold	SN (R)	-0.10336	-0.20686	-0.86103
	setup	SN (R)	0.13170	0.25380	4.58853

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)	0.11172	0.15407	1.37442
	removal	CK (R)	-0.01406	-0.01952	-0.08350
	hold	SN (R)	-0.11044	-0.21467	-0.88649
	hold	SN (R)	-0.11148	-0.21857	-0.88259
	setup	SN (R)	0.13416	0.26240	4.32826
	setup	SN (R)	0.13072	0.26333	4.58321
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.11095	0.15209	1.50915
	removal	CK (R)	-0.01406	-0.01952	-0.07950
	hold	SN (R)	-0.10544	-0.20686	-0.86665
	hold	SN (R)	-0.10336	-0.20686	-0.86103
	setup	SN (R)	0.13170	0.24980	4.37198
	setup	SN (R)	0.12876	0.25380	4.58853

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 ()	0.09388	0.46387	13.33370
	min_pulse_width	RN ()	0.09388	0.46387	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.09388	0.46387	13.33370
	min_pulse_width	RN ()	0.09039	0.46387	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)	0.03810	0.06645	3.47802
	removal	CK (R)	-0.01786	-0.04684	-0.30643
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.03755	0.06645	3.37632
	removal	CK (R)	-0.02086	-0.04684	-0.30643

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)	0.03810	0.06645	3.47802
	removal	CK (R)	-0.01786	-0.04684	-0.30643
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.03755	0.06645	3.37632
	removal	CK (R)	-0.02086	-0.04684	-0.30643

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 ()	0.10784	0.46387	13.33370
	min_pulse_width	SN ()	0.11133	0.46387	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.10784	0.46387	13.33370
	min_pulse_width	SN ()	0.10435	0.46387	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 ()	0.09388	0.46387	13.33370
	min_pulse_width	CK ()	0.11831	0.46387	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.09039	0.46387	13.33370
	min_pulse_width	CK ()	0.11831	0.46387	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 ()	0.18812	0.46387	13.33370
	min_pulse_width	CK ()	0.09737	0.46387	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.18812	0.46387	13.33370
	min_pulse_width	CK ()	0.09737	0.46387	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	0.02546	0.03465	0.17684
	RN	0.03895	0.04484	0.16453
	SN	-0.00155	-0.13573	-2.68128
	SN	0.03425	0.03990	0.15422
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.02300	0.03363	0.20999
	RN	0.03650	0.04391	0.19705
	SN	-0.00155	-0.10482	-1.74288
	SN	0.03197	0.03920	0.18443

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	0.02829	0.03322	0.13857
	RN	-0.00155	-0.13573	-2.68126
	RN	0.04356	0.04996	0.17392
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.02513	0.03037	0.15066
	RN	-0.00155	-0.10482	-1.74288
	RN	0.04065	0.04737	0.18664

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	0.02558	0.03050	0.13555
	RN	-0.00155	-0.13564	-2.67514
	RN	0.04137	0.04776	0.17060
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.02373	0.02899	0.14934
	RN	-0.00155	-0.10391	-1.71768
	RN	0.03954	0.04630	0.18439

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	0.02347	0.03261	0.17457
	RN	0.03695	0.04286	0.16250
	SN	-0.00155	-0.13564	-2.67810
	SN	0.03300	0.03866	0.15249
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.02049	0.03115	0.20717
	RN	0.03396	0.04140	0.19428
	SN	-0.00155	-0.10391	-1.71770
	SN	0.03045	0.03770	0.18545

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	0.00101	0.00097	0.00101
	(!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)	0.02532	0.03493	0.26393
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01131	0.02075	0.23324
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01163	0.02105	0.23284
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01259	0.02202	0.23408
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00075	0.00072	0.00075
	(!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)	0.02507	0.03468	0.26368
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01106	0.02050	0.23299
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01138	0.02081	0.23259
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01234	0.02177	0.23384

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	0.00960	0.00950	0.00945
	(!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)	0.03456	0.04512	0.27193
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01612	0.02661	0.24053
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01559	0.02594	0.24023
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01649	0.02701	0.24132
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00935	0.00925	0.00920
	(!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)	0.03429	0.04486	0.27167
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01586	0.02635	0.24027
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01533	0.02567	0.23997
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01622	0.02675	0.24106

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)	0.00892	0.02452	0.31649
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02128	0.03790	0.35880
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)	0.00867	0.02427	0.31625
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02103	0.03766	0.35856

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)	0.01535	0.03269	0.32697
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03092	0.04834	0.36652
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)	0.01508	0.03242	0.32671
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03065	0.04808	0.36626

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)	-0.00529	-0.00535	-0.00539
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00494	-0.00686	-0.00607
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00441	-0.00542	-0.00499
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01137	0.02054	0.23041
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)	-0.00554	-0.00560	-0.00564
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00517	-0.00709	-0.00629
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00465	-0.00566	-0.00523
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01113	0.02029	0.23017

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)	0.01406	0.01426	0.01410
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01442	0.01450	0.01410
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01444	0.01457	0.01430
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02474	0.03337	0.24434
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)	0.01381	0.01401	0.01384
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01414	0.01422	0.01383
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01418	0.01426	0.01405
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02447	0.03306	0.24414

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)	0.00328	0.01875	0.31213
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01237	0.02807	0.34865
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01331	0.02897	0.34945
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00381	0.01902	0.31209
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01045	0.03786	0.55876
sky130_osu_sc_15T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00303	0.01849	0.31188
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01211	0.02781	0.34839
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01305	0.02870	0.34919
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00356	0.01877	0.31184
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01020	0.03761	0.55851

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)	0.04947	0.06592	0.45278
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02125	0.03868	0.33312
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03497	0.05155	0.36748
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03587	0.05249	0.36877
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04714	0.07772	0.54143
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02479	0.04157	0.33518
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02702	0.05772	0.58080
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.04922	0.06567	0.45254
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02100	0.03843	0.33287
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03472	0.05130	0.36723
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03562	0.05224	0.36852
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04688	0.07745	0.54125
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02454	0.04131	0.33492
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02675	0.05745	0.58053

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00402	0.00700	0.01160	2.53229	2.48306
sky130_osu_sc_15T_ms__dffs_l	0.00402	0.00700	0.01160	1.83234	1.81754

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	416.80500	605.98400
sky130_osu_sc_15T_ms__dffs_l	0.00000	387.98100	577.15100

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)	0.15732	1.05699	15.82740
	QN->Q (FR)	0.02166	0.67193	11.41700
	SN->Q (FR)	0.11847	1.08447	16.58360
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.15149	1.09803	14.78640
	QN->Q (FR)	0.02211	0.68515	10.76850
	SN->Q (FR)	0.11280	1.12076	15.51340

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)	0.21250	1.11460	16.07710
	QN->Q (RF)	0.02114	0.61777	10.50080
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.20859	1.17099	15.24950
	QN->Q (RF)	0.02032	0.59669	9.35822

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)	0.18870	0.59504	6.51816
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.18533	0.63455	6.56828

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)	0.13406	0.54425	6.41057
	SN->QN (FF)	0.09479	0.57159	7.15568
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.12656	0.54675	5.87532
	SN->QN (FF)	0.08744	0.56933	6.59313

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)	-0.03998	-0.04373	0.04737
	setup	CK (R)	0.11920	0.15482	3.44521
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.03929	-0.04365	0.04733
	setup	CK (R)	0.11918	0.15642	3.54138

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)	-0.07400	-0.19125	1.99686
	setup	CK (R)	0.09593	0.20296	3.07109
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.07347	-0.19125	2.35503
	setup	CK (R)	0.09593	0.20296	3.07121

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)	-0.03998	-0.04373	0.04737
	setup	CK (R)	0.11920	0.15482	3.44521
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.03929	-0.04365	0.04733
	setup	CK (R)	0.11918	0.15642	3.54138

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)	-0.07400	-0.19125	1.99686
	setup	CK (R)	0.09593	0.20296	3.07109
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.07347	-0.19125	2.35503
	setup	CK (R)	0.09593	0.20296	3.07121

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)	0.02604	0.04684	2.34810
	removal	CK (R)	-0.01526	-0.03122	-0.03765
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.02653	0.04684	2.26130
	removal	CK (R)	-0.01526	-0.03122	-0.03765

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)	0.02604	0.04684	2.34810
	removal	CK (R)	-0.01526	-0.03122	-0.03765
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.02653	0.04684	2.26130
	removal	CK (R)	-0.01526	-0.03122	-0.03765

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 ()	0.08341	0.46387	13.33370
	min_pulse_width	SN ()	0.08690	0.46387	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.08341	0.46387	13.33370
	min_pulse_width	SN ()	0.07992	0.46387	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 ()	0.07294	0.46387	13.33370
	min_pulse_width	CK ()	0.10784	0.46387	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.06945	0.46387	13.33370
	min_pulse_width	CK ()	0.10435	0.46387	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 ()	0.15671	0.46387	13.33370
	min_pulse_width	CK ()	0.07992	0.46387	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.16020	0.46387	13.33370
	min_pulse_width	CK ()	0.07992	0.46387	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	0.01958	0.02963	0.17971
	SN	-0.00155	-0.12722	-2.40715
	SN	0.02684	0.03540	0.17064
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01725	0.02840	0.20440
	SN	-0.00155	-0.10478	-1.74180
	SN	0.02463	0.03440	0.19517

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	0.02522	0.02842	0.10362
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.02254	0.02796	0.14918

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	0.02305	0.02620	0.10231
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.02117	0.02657	0.14799

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	0.01769	0.02772	0.17843
	SN	-0.00155	-0.12573	-2.36015
	SN	0.02588	0.03449	0.17095
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01541	0.02658	0.20260
	SN	-0.00155	-0.10427	-1.72767
	SN	0.02377	0.03345	0.19310

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	0.00099	0.00096	0.00099
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01939	0.03024	0.26228
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00913	0.01883	0.23207
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00074	0.00070	0.00074
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01913	0.02999	0.26203
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00888	0.01858	0.23182

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	0.00972	0.00964	0.00957
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02990	0.04094	0.26929
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01447	0.02525	0.23983
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00947	0.00939	0.00932
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02965	0.04069	0.26903
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01422	0.02500	0.23958

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)	-0.00362	-0.00367	-0.00367
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00954	0.01914	0.22913
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)	-0.00387	-0.00392	-0.00392
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00929	0.01889	0.22888

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)	0.01036	0.01029	0.01026
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01685	0.02781	0.24041
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)	0.01011	0.01004	0.01001
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01660	0.02756	0.24016

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)	0.00219	0.01770	0.31129
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00376	0.01901	0.31231
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00820	0.03610	0.55845
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00194	0.01744	0.31103
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00351	0.01876	0.31205
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00795	0.03585	0.55819

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)	0.04363	0.06029	0.45035
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02015	0.03761	0.33227
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.04181	0.07280	0.53531
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02484	0.04155	0.33548
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02525	0.05638	0.58087
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.04338	0.06004	0.45010
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01990	0.03736	0.33201
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.04156	0.07254	0.53506
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02459	0.04131	0.33523
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02500	0.05611	0.58061

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00418	0.01145	2.84199	2.82318
sky130_osu_sc_15T_ms__dff_l	0.00418	0.01145	1.61018	1.58368

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	398.44800	492.74000
sky130_osu_sc_15T_ms__dff_l	0.00000	369.59200	463.87600

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)	0.13615	1.05851	17.01850
	QN->Q (FR)	0.01872	0.61645	10.74310
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.13709	1.05439	13.59430
	QN->Q (FR)	0.02523	0.74389	11.28110

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)	0.18832	1.10403	17.15200
	QN->Q (RF)	0.02084	0.64627	11.43280
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.19203	1.12464	14.07310
	QN->Q (RF)	0.02047	0.56873	8.59629

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)	0.16519	0.55805	6.64698
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.16933	0.62218	6.33347

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)	0.11533	0.55153	7.26622
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.11144	0.50237	5.09693

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)	-0.03757	-0.03903	0.02993
	setup	CK (R)	0.09482	0.13490	4.11311
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.03774	-0.03903	0.03040
	setup	CK (R)	0.09767	0.13532	4.03136

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)	-0.06482	-0.19516	2.37472
	setup	CK (R)	0.08265	0.20686	3.06408
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.06493	-0.19516	2.53965
	setup	CK (R)	0.08265	0.20686	3.06426

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 ()	0.06596	0.46387	13.33370
	min_pulse_width	CK ()	0.10086	0.46387	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.06247	0.46387	13.33370
	min_pulse_width	CK ()	0.09737	0.46387	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 ()**	0.13576	0.46387	13.33370
	min_pulse_width	**CK ()**	0.06596	0.46387	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.13576	0.46387	13.33370
	min_pulse_width	**CK ()**	0.06596	0.46387	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	0.02021	0.03026	0.17750
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01781	0.02939	0.21291

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	0.02387	0.02923	0.13654
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.02044	0.02471	0.12817

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	0.02164	0.02704	0.13534
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01975	0.02405	0.12902

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	0.01868	0.02877	0.17526
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01574	0.02734	0.20938

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	0.00030	-0.00050	0.00003
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01777	0.02868	0.26384
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00005	-0.00076	-0.00022
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01753	0.02844	0.26360

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	0.00853	0.00854	0.00836
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02976	0.04083	0.27162
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00828	0.00829	0.00810
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02951	0.04059	0.27138

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)	0.00219	0.01772	0.31127
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00270	0.01798	0.31123
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00194	0.01747	0.31102
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00245	0.01773	0.31098

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)	0.02004	0.03752	0.33213
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.04203	0.05889	0.45314
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.04202	0.07371	0.54388
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02366	0.04047	0.33426
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01979	0.03727	0.33188
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.04179	0.05868	0.45292
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.04178	0.07347	0.54364
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02340	0.04022	0.33401

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00402	2.59185
sky130_osu_sc_15T_ms__inv_10	0.03714	22.54490
sky130_osu_sc_15T_ms__inv_2	0.00762	4.90164
sky130_osu_sc_15T_ms__inv_3	0.01134	7.09104
sky130_osu_sc_15T_ms__inv_4	0.01497	9.45410
sky130_osu_sc_15T_ms__inv_6	0.02243	13.88394
sky130_osu_sc_15T_ms__inv_8	0.02979	18.56505
sky130_osu_sc_15T_ms__inv_l	0.00303	1.47354

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	60.25270	120.34300
sky130_osu_sc_15T_ms__inv_10	0.00000	602.35000	1203.09000
sky130_osu_sc_15T_ms__inv_2	0.00000	120.49700	240.67300
sky130_osu_sc_15T_ms__inv_3	0.00000	180.72700	360.97100
sky130_osu_sc_15T_ms__inv_4	0.00000	240.97200	481.30200
sky130_osu_sc_15T_ms__inv_6	0.00000	361.44200	721.92000
sky130_osu_sc_15T_ms__inv_8	0.00000	481.90800	962.53000
sky130_osu_sc_15T_ms__inv_l	0.00000	45.82580	91.20060

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)**	0.01781	0.55469	9.39177
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.02727	0.34023	9.13816
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.01484	0.46202	9.08877
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.01651	0.42808	9.14648
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.01694	0.39790	9.07505
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.01960	0.36648	9.06356
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.02309	0.35080	9.15693
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.02144	0.59945	8.85192

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)**	0.01879	0.55138	9.45535
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.02881	0.32431	9.09763
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.01567	0.45524	9.17140
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.01733	0.42198	9.27879
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.01733	0.38979	9.21200
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02102	0.35719	9.18259
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.02465	0.33972	9.25499
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.01879	0.49503	7.31210

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	0.00637	0.01314	0.08869
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.05823	0.15196	0.86476
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01132	0.02705	0.17660
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01740	0.04182	0.25983
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02235	0.05673	0.34640
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.03369	0.08897	0.52364
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.04540	0.12108	0.68692
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00475	0.01061	0.08887

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	0.00182	0.00611	0.05137
sky130_osu_sc_15T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	0.01792	0.08183	0.51614
sky130_osu_sc_15T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	0.00213	0.01248	0.10348
sky130_osu_sc_15T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	0.00412	0.01971	0.15274
sky130_osu_sc_15T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	0.00465	0.02720	0.20450
sky130_osu_sc_15T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	0.00700	0.04519	0.30800
sky130_osu_sc_15T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	0.01136	0.06102	0.40685
sky130_osu_sc_15T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	0.00109	0.00480	0.05445

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.52495	0.52524	0.00821	0.54136

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	120.47500	120.50500

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)	-	0.00949	0.13854	1.36641
	A1->Y (RR)	-	0.01021	0.13917	1.36564
	S0->Y (RR)	(!A0 * A1)	0.03528	0.20671	1.49695
	S0->Y (FR)	(A0 * !A1)	0.02365	0.24350	2.48931

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)	-	0.00913	0.14843	1.47845
	A1->Y (FF)	-	0.00881	0.14784	1.47786
	S0->Y (FF)	(!A0 * A1)	0.03793	0.24319	1.98986
	S0->Y (RF)	(A0 * !A1)	0.02204	0.22864	2.19288

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	-	-0.00655	-0.00655	-0.00655
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00139	-0.00140	-0.00141
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00750	0.02584	0.31808
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00341	0.01307	0.30351

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	-	0.00655	0.00657	0.00655
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00715	0.00716	0.00715
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00268	0.01995	0.31112
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01754	0.03497	0.32621

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)	-0.00044	-0.00044	-0.00044

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)	0.00253	0.00253	0.00253

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)	-0.00174	-0.00174	-0.00174

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)	0.00174	0.00174	0.00174

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)	-0.00066	0.01634	0.30687
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00063	0.01641	0.30723

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)	0.01332	0.03106	0.32225
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01184	0.03023	0.32181

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00402	0.00400	1.81658
sky130_osu_sc_15T_ms__nand2_l	0.00303	0.00303	1.45947

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	60.22580	240.60200
sky130_osu_sc_15T_ms__nand2_l	0.00000	45.79630	182.34900

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)	0.01827	0.49052	7.58513
	B->Y (FR)	0.02145	0.48639	7.46069
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.02203	0.59681	8.78659
	B->Y (FR)	0.02664	0.59936	8.76851

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)	0.02606	0.60606	9.44014
	B->Y (RF)	0.02981	0.58285	9.03913
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.02550	0.61882	9.09980
	B->Y (RF)	0.02874	0.59593	8.70211

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	0.00678	0.01297	0.08992
	B	0.00000	0.00000	0.00000
	B	0.00876	0.01515	0.09676
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00504	0.00986	0.07501
	B	0.00000	0.00000	0.00000
	B	0.00652	0.01139	0.07951

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	0.00562	0.00930	0.05529
	B	0.00000	0.00000	0.00000
	B	0.00549	0.00845	0.05288
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00427	0.00703	0.04729
	B	0.00000	0.00000	0.00000
	B	0.00417	0.00670	0.04527

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)	-0.00477	-0.00480	-0.00480
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00329	-0.00331	-0.00331

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)	0.00480	0.00490	0.00482
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00330	0.00335	0.00332

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)	-0.00440	-0.00443	-0.00442
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00303	-0.00304	-0.00304

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)	0.00458	0.00448	0.00443
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00318	0.00311	0.00306

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00401	0.00428	1.46281
sky130_osu_sc_15T_ms__nor2_l	0.00293	0.00325	0.98478

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	47.17450	120.18300
sky130_osu_sc_15T_ms__nor2_l	0.00000	39.29790	91.09370

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)	0.03556	0.59318	8.58847
	B->Y (FR)	0.02614	0.61882	9.07785
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.03863	0.65496	8.49833
	B->Y (FR)	0.03100	0.68864	9.10206

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)	0.02677	0.45324	6.49871
	B->Y (RF)	0.02033	0.44296	6.47286
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.02450	0.42760	5.51435
	B->Y (RF)	0.02012	0.41903	5.48307

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	0.00962	0.01394	0.08898
	B	0.00000	0.00000	0.00000
	B	0.00697	0.01353	0.10269
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00676	0.01077	0.08339
	B	0.00000	0.00000	0.00000
	B	0.00514	0.01056	0.09075

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	0.00235	0.00635	0.06758
	B	0.00000	0.00000	0.00000
	B	0.00133	0.00576	0.06310
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00167	0.00525	0.06493
	B	0.00000	0.00000	0.00000
	B	0.00106	0.00491	0.05964

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)	-0.00297	-0.00383	-0.00323
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00208	-0.00253	-0.00205

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)	0.00533	0.00536	0.00514
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00361	0.00364	0.00350

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)	-0.00165	-0.00166	-0.00160
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00109	-0.00109	-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)	0.00238	0.00237	0.00210
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00177	0.00176	0.00154

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00403	0.00415	0.00342	1.39638

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	57.82340	211.25600

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)	0.03670	0.62809	8.96965
	A1->Y (FR)	0.04877	0.60953	8.52484
	B0->Y (FR)	0.02503	0.55642	8.03411

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)	0.03671	0.54363	7.68414
	A1->Y (RF)	0.04499	0.53630	7.44526
	B0->Y (RF)	0.02779	0.58351	8.43419

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	0.00990	0.01492	0.08833
	A1	0.00000	0.00000	0.00000
	A1	0.01253	0.01605	0.08214
	B0	0.00564	0.01102	0.08553

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	0.00523	0.00777	0.05173
	A1	0.00000	0.00000	0.00000
	A1	0.00586	0.00818	0.05524
	B0	0.00298	0.00648	0.05369

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)	-0.00086	-0.00086	-0.00082
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00427	-0.00429	-0.00428
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00430	-0.00431	-0.00430

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)	0.00318	0.00317	0.00290
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00427	0.00430	0.00429
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00444	0.00433	0.00431

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)	-0.00206	-0.00291	-0.00235
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00422	-0.00423	-0.00423
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00423	-0.00425	-0.00424

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)	0.00603	0.00604	0.00584
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00422	0.00423	0.00424
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00438	0.00427	0.00426

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)	-0.00338	-0.00338	-0.00344

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)	0.00344	0.00344	0.00346

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00394	0.00413	0.00424	0.00415	1.42824

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	70.73340	240.27500

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)	0.05227	0.60397	8.44445
	A1->Y (FR)	0.04279	0.62872	8.95105
	B0->Y (FR)	0.02851	0.61525	8.94073
	B1->Y (FR)	0.03872	0.59092	8.43670

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)	0.06426	0.58229	7.90737
	A1->Y (RF)	0.05130	0.56479	7.82585
	B0->Y (RF)	0.04342	0.60608	8.59104
	B1->Y (RF)	0.05671	0.62766	8.71612

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	0.01510	0.01874	0.08542
	A1	0.01244	0.01796	0.10046
	B0	0.00739	0.01314	0.09399
	B1	0.01023	0.01384	0.07822

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00326	0.00566	0.05464
	A1	0.00231	0.00497	0.05143
	B0	0.00246	0.00622	0.05738
	B1	0.00336	0.00644	0.05755

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)	-0.00292	-0.00379	-0.00319
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00241	-0.00328	-0.00268
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00424	-0.00426	-0.00424
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00425	-0.00427	-0.00425

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)	0.00538	0.00540	0.00518
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00588	0.00591	0.00569
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00424	0.00430	0.00425
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00441	0.00427	0.00427

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)	-0.00159	-0.00159	-0.00154
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00108	-0.00109	-0.00103
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00420	-0.00421	-0.00421
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00421	-0.00424	-0.00422

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)	0.00241	0.00240	0.00213
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00292	0.00291	0.00263
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00420	0.00421	0.00422
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00438	0.00424	0.00424

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)	-0.00156	-0.00158	-0.00153
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00105	-0.00107	-0.00102
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00472	-0.00473	-0.00471
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00462	-0.00465	-0.00472

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)	0.00238	0.00238	0.00211
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00289	0.00289	0.00262
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00478	0.00483	0.00475
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00472	0.00482	0.00474

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)	-0.00286	-0.00371	-0.00311
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00235	-0.00321	-0.00261
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00482	-0.00483	-0.00481
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00472	-0.00475	-0.00481

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)	0.00529	0.00533	0.00510
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00579	0.00584	0.00561
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00487	0.00493	0.00484
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00482	0.00492	0.00484

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00438	0.00414	2.72171
sky130_osu_sc_15T_ms__or2_2	0.00439	0.00414	5.31804
sky130_osu_sc_15T_ms__or2_4	0.00439	0.00414	10.21167
sky130_osu_sc_15T_ms__or2_8	0.00441	0.00416	19.17188
sky130_osu_sc_15T_ms__or2_l	0.00336	0.00310	1.58688

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	77.38760	120.68800
sky130_osu_sc_15T_ms__or2_2	0.00000	107.59700	241.04500
sky130_osu_sc_15T_ms__or2_4	0.00000	168.00800	481.72400
sky130_osu_sc_15T_ms__or2_8	0.00000	288.82300	963.05600
sky130_osu_sc_15T_ms__or2_l	0.00000	62.43780	92.13160

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)	0.05288	0.44145	6.46333
	B->Y (RR)	0.04438	0.41596	6.35890
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.05865	0.39004	6.44551
	B->Y (RR)	0.05003	0.36628	6.31793
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.07679	0.38689	6.56971
	B->Y (RR)	0.06795	0.36603	6.43519
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.11433	0.42749	6.67796
	B->Y (RR)	0.10523	0.41031	6.54171
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.05282	0.46704	5.70444
	B->Y (RR)	0.04574	0.44297	5.53160

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)	0.07006	0.52085	7.70830
	B->Y (FF)	0.05760	0.52694	8.10697
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.08125	0.47092	7.73116
	B->Y (FF)	0.06880	0.47902	8.11954
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.11385	0.47371	7.87744
	B->Y (FF)	0.10147	0.48780	8.24219
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.18215	0.53262	7.83043
	B->Y (FF)	0.16985	0.55380	8.17303
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.07400	0.50687	6.24905
	B->Y (FF)	0.06167	0.52054	6.66035

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	0.00879	0.01796	0.18419
	B	0.00000	0.00000	0.00000
	B	0.00829	0.01977	0.20992
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01446	0.02431	0.19279
	B	0.00000	0.00000	0.00000
	B	0.01368	0.02525	0.21615
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02809	0.03778	0.20604
	B	0.00000	0.00000	0.00000
	B	0.02692	0.03852	0.22883
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.06613	0.07076	0.23580
	B	0.00000	0.00000	0.00000
	B	0.06410	0.07149	0.25968
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00659	0.01383	0.13329
	B	0.00000	0.00000	0.00000
	B	0.00621	0.01437	0.14383

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	0.01912	0.02867	0.20528
	B	0.00000	0.00000	0.00000
	B	0.01615	0.03012	0.26485
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.02816	0.03597	0.21153
	B	0.00000	0.00000	0.00000
	B	0.02517	0.03709	0.26962
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.05364	0.05336	0.22301
	B	0.00000	0.00000	0.00000
	B	0.05072	0.05417	0.27949
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.12347	0.09334	0.24843
	B	0.00000	0.00000	0.00000
	B	0.12094	0.09514	0.30129
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01360	0.02144	0.17213
	B	0.00000	0.00000	0.00000
	B	0.01166	0.02221	0.20253

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)	-0.00296	-0.00382	-0.00326
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00295	-0.00382	-0.00325
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00296	-0.00382	-0.00325
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00295	-0.00382	-0.00325
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00204	-0.00253	-0.00207

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)	0.00536	0.00537	0.00517
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00536	0.00537	0.00517
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00536	0.00538	0.00517
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00537	0.00538	0.00518
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00365	0.00366	0.00353

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)	-0.00165	-0.00166	-0.00161
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00165	-0.00166	-0.00161
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00165	-0.00165	-0.00160
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00164	-0.00165	-0.00160
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00111	-0.00111	-0.00108

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)	0.00239	0.00239	0.00212
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00240	0.00239	0.00212
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00240	0.00240	0.00212
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00241	0.00241	0.00213
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00181	0.00181	0.00158

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00426	0.00552	1.48206
sky130_osu_sc_15T_ms__tbufi_l	0.00325	0.00427	0.97603

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	60.31630	240.46100
sky130_osu_sc_15T_ms__tbufi_l	0.00000	46.08320	182.25600

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)	0.02512	0.61283	9.03301
	OE->Y (FR)	0.03303	0.36401	5.34279
	OE->Y (RR)	0.05295	0.49681	6.39801
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.03009	0.68131	8.97825
	OE->Y (FR)	0.03514	0.36387	5.34265
	OE->Y (RR)	0.05391	0.53861	5.97986

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)	0.02583	0.55805	8.21131
	OE->Y (FF)	0.03357	0.36400	5.34279
	OE->Y (RF)	0.02444	0.52294	7.65822
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.02558	0.52407	6.86874
	OE->Y (FF)	0.03545	0.36385	5.34265
	OE->Y (RF)	0.02417	0.48529	6.23983

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	0.00986	0.01527	0.08847
	OE	0.00000	0.00000	0.00000
	OE	0.00985	0.02521	0.28216
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00737	0.01190	0.07876
	OE	0.00000	0.00000	0.00000
	OE	0.00700	0.01986	0.22977

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	0.00479	0.00837	0.05472
	OE	0.00000	0.00000	0.00000
	OE	0.00986	0.02665	0.31213
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00328	0.00646	0.05240
	OE	0.00000	0.00000	0.00000
	OE	0.00652	0.02090	0.26037

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)	-0.00325	-0.00326	-0.00321
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00255	-0.00257	-0.00253
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00243	-0.00244	-0.00239
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00188	-0.00190	-0.00187

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)	0.00325	0.00326	0.00321
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00305	0.00307	0.00291
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00243	0.00244	0.00239
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00238	0.00238	0.00225

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)	0.00485	0.02255	0.31713
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00339	0.02124	0.31611
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00333	0.01829	0.26338
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00233	0.01732	0.26274

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)	0.00817	0.02636	0.32237
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00771	0.02610	0.32171
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00615	0.02173	0.26785
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00590	0.02154	0.26736

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00426	0.00653	1.48153
sky130_osu_sc_15T_ms__tnbufi_l	0.00324	0.00472	0.97621

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	100.38800	120.47200
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	76.34760	91.56950

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)	0.02517	0.61263	9.02995
	OE->Y (RR)	0.02525	0.36485	5.34364
	OE->Y (FR)	0.03341	0.57570	8.32850
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.03015	0.67768	8.97810
	OE->Y (RR)	0.02391	0.36474	5.34358
	OE->Y (FR)	0.03726	0.63299	8.07459

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)	0.02545	0.55786	8.20991
	OE->Y (RF)	0.02499	0.36484	5.34362
	OE->Y (FF)	0.03941	0.45340	5.98119
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.02515	0.52400	6.87061
	OE->Y (RF)	0.02367	0.36474	5.34354
	OE->Y (FF)	0.04146	0.45632	5.25319

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	0.00674	0.01217	0.08587
	OE	0.00000	0.00000	0.00000
	OE	0.01694	0.03578	0.32681
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00505	0.00906	0.07678
	OE	0.00000	0.00000	0.00000
	OE	0.01218	0.02782	0.26814

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	0.00160	0.00520	0.05169
	OE	0.00000	0.00000	0.00000
	OE	0.01716	0.03462	0.29273
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00108	0.00428	0.05029
	OE	0.00000	0.00000	0.00000
	OE	0.01212	0.02705	0.24843

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)	-0.00188	-0.00192	-0.00178
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00101	-0.00103	-0.00099
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00126	-0.00127	-0.00116
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00061	-0.00062	-0.00059

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)	0.00378	0.00379	0.00374
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00362	0.00363	0.00348
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00273	0.00273	0.00268
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00270	0.00269	0.00257

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)	-0.00350	0.01433	0.31001
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00410	0.01392	0.30930
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00217	0.01307	0.25889
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00254	0.01280	0.25834

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)	0.01388	0.03325	0.32964
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01254	0.03228	0.32867
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01000	0.02614	0.27252
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00907	0.02562	0.27188

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00847	0.00759	1.52430

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	212.32700	360.77000

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	0.06591	0.52138	6.55621
	A->Y (FR)	!B	0.03250	0.61878	9.08965
	B->Y (RR)	A	0.05281	0.51690	6.76645
	B->Y (FR)	!A	0.04555	0.60109	8.64711

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	0.06913	0.51012	6.39553
	A->Y (RF)	!B	0.03504	0.54875	7.99721
	B->Y (FF)	A	0.05837	0.50206	6.42491
	B->Y (RF)	!A	0.04447	0.55852	7.97504

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	0.01337	0.02834	0.29161
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01625	0.03899	0.39923
	B	A	0.00000	0.00000	0.00000
	B	A	0.00827	0.02601	0.32639
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01812	0.03882	0.38046

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	0.02581	0.04241	0.33270
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01303	0.03208	0.36177
	B	A	0.00000	0.00000	0.00000
	B	A	0.02642	0.04438	0.34247
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01172	0.03071	0.35663

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	0.00851	0.00763	1.50818

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	212.32100	367.05100

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	0.06378	0.52438	6.77625
	A->Y (FR)	B	0.04276	0.60861	8.80884
	B->Y (RR)	!A	0.05556	0.52424	6.81767
	B->Y (FR)	A	0.04659	0.60918	8.74905

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	0.06027	0.50104	6.16305
	A->Y (RF)	B	0.03790	0.57565	8.28052
	B->Y (FF)	!A	0.05655	0.50282	6.40181
	B->Y (RF)	A	0.04447	0.55691	7.91794

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	0.02301	0.04407	0.39035
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00648	0.02186	0.31026
	B	A	0.00000	0.00000	0.00000
	B	A	0.02363	0.04425	0.37993
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00504	0.02233	0.31964

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	0.01252	0.03184	0.36421
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02619	0.04243	0.29848
	B	A	0.00000	0.00000	0.00000
	B	A	0.01238	0.03059	0.35026
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02403	0.04209	0.33686

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_ff_1P95_100C.ccs
Cell Library: Process , Voltage 1.95, Temp 100.00

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	1.11282
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	461341.00000	922682.00000
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
	-0.00065	0.14889	2.14132

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
	8.02809	7.66099	2.49030