sky130_osu_sc_15T_ms_tt_1P62_25C.ccs Library

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

SKY130_OSU_SC_15T_MS__ADDFx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01516	0.01518	0.01168	1.74735	0.80101	1.67044
sky130_osu_sc_15T_ms__addf_l	0.01516	0.01517	0.01170	1.06096	0.79959	1.07342

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.23306	0.30277
sky130_osu_sc_15T_ms__addf_l	0.00000	0.14787	0.21757

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)	0.16499	1.86898	26.83720
	B->CO (RR)	0.14599	1.79723	25.95330
	CI->CO (RR)	0.15601	1.88745	27.25310
	CON->CO (FR)	0.02818	0.77294	11.43040
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.17115	1.72560	20.74750
	B->CO (RR)	0.16517	1.67637	20.26580
	CI->CO (RR)	0.16215	1.74495	21.20130
	CON->CO (FR)	0.03620	0.88144	11.58100

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)	0.23037	2.38496	33.97270
	B->CO (FF)	0.20594	2.28424	32.65820
	CI->CO (FF)	0.20369	2.35494	34.01660
	CON->CO (RF)	0.02528	0.66085	9.74892
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.22256	1.99608	23.64850
	B->CO (FF)	0.19888	1.91763	22.86680
	CI->CO (FF)	0.19575	1.96561	23.73590
	CON->CO (RF)	0.02712	0.65034	8.60836

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)	0.16653	1.03659	11.06630
	B->CON (FR)	0.14219	0.97916	10.70970
	CI->CON (FR)	0.13997	1.00782	11.17360
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.15772	1.02568	11.04580
	B->CON (FR)	0.13405	0.97031	10.68910
	CI->CON (FR)	0.13111	0.99845	11.15320

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)	0.10403	0.70791	7.78552
	B->CON (RF)	0.10015	0.70405	7.90668
	CI->CON (RF)	0.09497	0.72940	8.27854
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.09957	0.70308	7.77301
	B->CON (RF)	0.09597	0.69964	7.89518
	CI->CON (RF)	0.09049	0.72459	8.26648

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)	0.33225	2.16903	26.15040
	B->S (-R)	0.34043	2.15787	25.40780
	CI->S (-R)	0.30339	2.13371	26.19540
	CON->S (RR)	0.09008	0.71020	7.55039
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.32006	1.97662	20.82440
	B->S (-R)	0.32832	1.97615	20.43190
	CI->S (-R)	0.29099	1.94133	20.89720
	CON->S (RR)	0.09272	0.78264	7.49429

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)	0.27592	1.70166	19.44470
	B->S (-F)	0.27719	1.64746	18.88130
	CI->S (-F)	0.26610	1.71514	19.86160
	CON->S (FF)	0.11244	0.72560	6.90508
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.25797	1.49787	15.03270
	B->S (-F)	0.25184	1.44025	14.77380
	CI->S (-F)	0.24806	1.51360	15.48250
	CON->S (FF)	0.10605	0.71257	6.11396

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	0.00258	0.00280	0.00746
	B	0.00394	0.00399	0.00789
	CI	0.00394	0.00423	0.00908
sky130_osu_sc_15T_ms__addf_l	A	0.00191	0.00197	0.00460
	B	0.00327	0.00317	0.00538
	CI	0.00326	0.00340	0.00607

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01006	0.01035	0.01801
	B	0.01062	0.01093	0.01737
	CI	0.00851	0.00881	0.01682
sky130_osu_sc_15T_ms__addf_l	A	0.00943	0.00958	0.01401
	B	0.00998	0.01017	0.01357
	CI	0.00871	0.00907	0.01283

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01005	0.01017	0.01325
	B	0.01059	0.01079	0.01314
	CI	0.00934	0.00971	0.01244
sky130_osu_sc_15T_ms__addf_l	A	0.00942	0.00947	0.01261
	B	0.00996	0.01012	0.01248
	CI	0.00870	0.00905	0.01178

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00310	0.00297	0.00467
	B	0.00390	0.00384	0.00564
	CI	0.00392	0.00409	0.00629
sky130_osu_sc_15T_ms__addf_l	A	0.00244	0.00222	0.00385
	B	0.00324	0.00311	0.00484
	CI	0.00325	0.00336	0.00545

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01006	0.01034	0.01765
	B	0.01061	0.01091	0.01699
	CI	0.00851	0.00880	0.01637
sky130_osu_sc_15T_ms__addf_l	A	0.00943	0.00959	0.01402
	B	0.00998	0.01018	0.01365
	CI	0.00787	0.00807	0.01286

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.02225	0.02243	0.02642
	B	0.02008	0.01995	0.02820
	CI	0.01821	0.01816	0.02223
sky130_osu_sc_15T_ms__addf_l	A	0.02134	0.02135	0.02539
	B	0.01918	0.01908	0.02755
	CI	0.01732	0.01717	0.02146

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
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	0.00746	0.00824	1.72606	0.85413	1.74244
sky130_osu_sc_15T_ms__addh_l	0.00746	0.00824	1.09671	0.85698	1.11027

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.26354	0.30258
sky130_osu_sc_15T_ms__addh_l	0.00000	0.15701	0.21739

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)	0.11137	0.73514	7.52947
	B->CO (RR)	0.11534	0.73503	7.61658
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.11580	0.81146	7.47833
	B->CO (RR)	0.11977	0.81179	7.55368

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)	0.09388	0.69190	6.91677
	B->CO (FF)	0.09982	0.70575	6.94847
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.08907	0.63754	5.43736
	B->CO (FF)	0.09467	0.65150	5.47128

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	0.15163	0.61189	4.05324
	A->CON (FR)	!B	0.09200	0.93741	11.02310
	B->CON (RR)	A	0.15531	0.60974	4.13801
	B->CON (FR)	!A	0.11241	0.96313	11.01610
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.13959	0.59317	4.01613
	A->CON (FR)	!B	0.08383	0.93003	11.03640
	B->CON (RR)	A	0.14336	0.59310	4.09179
	B->CON (FR)	!A	0.10422	0.95576	11.03030

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	0.14613	0.74899	5.85046
	A->CON (RF)	!B	0.06163	0.69484	8.38381
	B->CON (FF)	A	0.14426	0.77692	6.13222
	B->CON (RF)	!A	0.07447	0.69132	8.14504
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.13583	0.72877	5.77971
	A->CON (RF)	!B	0.05742	0.69099	8.39384
	B->CON (FF)	A	0.13390	0.75746	6.06072
	B->CON (RF)	!A	0.07035	0.68767	8.15485

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	0.11543	1.80505	26.70750
	A->S (FR)	B	0.20066	1.84298	23.94930
	B->S (RR)	!A	0.12849	1.76581	25.79270
	B->S (FR)	A	0.19923	1.90783	24.89380
	CON->S (FR)	-	0.03053	0.78511	11.63780
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.11778	1.67399	21.28900
	A->S (FR)	B	0.19693	1.69929	18.49290
	B->S (RR)	!A	0.13087	1.64625	20.66760
	B->S (FR)	A	0.19521	1.75392	19.14870
	CON->S (FR)	-	0.03640	0.88624	11.76610

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	0.14479	2.15334	31.82760
	A->S (RF)	B	0.19437	1.46227	18.07340
	B->S (FF)	!A	0.16522	2.18158	31.88400
	B->S (RF)	A	0.19804	1.46071	18.15760
	CON->S (RF)	-	0.02390	0.64799	9.54948
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.13688	1.83814	23.26070
	A->S (RF)	B	0.18274	1.27900	12.98960
	B->S (FF)	!A	0.15724	1.86884	23.27980
	B->S (RF)	A	0.18646	1.27726	13.06460
	CON->S (RF)	-	0.02567	0.65132	8.71215

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	0.00477	0.00456	0.00627
	B	0.00000	0.00000	0.00000
	B	0.00434	0.00410	0.00599
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00414	0.00388	0.00636
	B	0.00000	0.00000	0.00000
	B	0.00370	0.00342	0.00573

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	0.00732	0.00710	0.01058
	B	0.00000	0.00000	0.00000
	B	0.00759	0.00776	0.01134
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00670	0.00646	0.00983
	B	0.00000	0.00000	0.00000
	B	0.00697	0.00706	0.01043

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	0.00478	0.00456	0.00671
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00644	0.00651	0.00743
	B	A	0.00000	0.00000	0.00000
	B	A	0.00434	0.00410	0.00622
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00717	0.00715	0.00755
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00414	0.00388	0.00656
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00601	0.00605	0.00690
	B	A	0.00000	0.00000	0.00000
	B	A	0.00370	0.00345	0.00577
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00674	0.00669	0.00701

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	0.00732	0.00712	0.01037
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00101	0.00104	0.00160
	B	A	0.00000	0.00000	0.00000
	B	A	0.00759	0.00773	0.01122
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00179	0.00172	0.00213
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00670	0.00647	0.00987
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00043	0.00044	0.00079
	B	A	0.00000	0.00000	0.00000
	B	A	0.00697	0.00706	0.01045
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00121	0.00111	0.00139

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	0.00733	0.00713	0.01069
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00103	0.00109	0.00182
	B	A	0.00000	0.00000	0.00000
	B	A	0.00759	0.00777	0.01147
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00181	0.00176	0.00239
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00671	0.00648	0.00981
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00044	0.00044	0.00077
	B	A	0.00000	0.00000	0.00000
	B	A	0.00698	0.00707	0.01046
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00122	0.00112	0.00144

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	0.00478	0.00456	0.00644
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00645	0.00656	0.00750
	B	A	0.00000	0.00000	0.00000
	B	A	0.00434	0.00410	0.00585
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00718	0.00724	0.00778
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00414	0.00389	0.00646
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00602	0.00606	0.00688
	B	A	0.00000	0.00000	0.00000
	B	A	0.00370	0.00343	0.00583
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00675	0.00673	0.00704

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00400	0.00411	1.72718
sky130_osu_sc_15T_ms__and2_2	0.00400	0.00411	3.35990
sky130_osu_sc_15T_ms__and2_4	0.00401	0.00411	6.46292
sky130_osu_sc_15T_ms__and2_6	0.00404	0.00410	9.49120
sky130_osu_sc_15T_ms__and2_8	0.00401	0.00412	12.32002
sky130_osu_sc_15T_ms__and2_l	0.00304	0.00315	1.04797

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.12605	0.20162
sky130_osu_sc_15T_ms__and2_2	0.00000	0.20163	0.20181
sky130_osu_sc_15T_ms__and2_4	0.00000	0.35280	0.40305
sky130_osu_sc_15T_ms__and2_6	0.00000	0.50396	0.60447
sky130_osu_sc_15T_ms__and2_8	0.00000	0.65513	0.80590
sky130_osu_sc_15T_ms__and2_l	0.00000	0.01952	0.03115

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)	0.08455	0.66404	7.27019
	B->Y (RR)	0.09012	0.67199	7.28149
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.09794	0.61480	7.35485
	B->Y (RR)	0.10349	0.61599	7.36971
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.13550	0.63711	7.71060
	B->Y (RR)	0.14106	0.62894	7.72316
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.17209	0.67957	7.97094
	B->Y (RR)	0.17750	0.66440	7.98376
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.20772	0.72208	8.21595
	B->Y (RR)	0.21325	0.70510	8.21713
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.09538	0.75609	7.10565
	B->Y (RR)	0.10108	0.76191	7.12171

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)	0.07233	0.61730	6.45946
	B->Y (FF)	0.07636	0.63300	6.50361
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.08332	0.58719	6.54595
	B->Y (FF)	0.08768	0.60035	6.59817
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.11616	0.61331	6.83300
	B->Y (FF)	0.12012	0.62393	6.88728
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.15112	0.65709	7.07171
	B->Y (FF)	0.15450	0.66457	7.12287
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.18350	0.69669	7.19940
	B->Y (FF)	0.18667	0.70119	7.24530
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.08265	0.65438	5.83120
	B->Y (FF)	0.08869	0.67423	5.89693

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	0.00355	0.00327	0.01351
	B	0.00000	0.00000	0.00000
	B	0.00362	0.00313	0.00917
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00693	0.00689	0.01627
	B	0.00000	0.00000	0.00000
	B	0.00700	0.00683	0.01235
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01443	0.01488	0.02399
	B	0.00000	0.00000	0.00000
	B	0.01454	0.01493	0.02087
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02211	0.02275	0.03110
	B	0.00000	0.00000	0.00000
	B	0.02218	0.02286	0.02845
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02992	0.03054	0.03826
	B	0.00000	0.00000	0.00000
	B	0.03008	0.03063	0.03567
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00257	0.00236	0.00940
	B	0.00000	0.00000	0.00000
	B	0.00263	0.00226	0.00649

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	0.00892	0.00924	0.01983
	B	0.00000	0.00000	0.00000
	B	0.01008	0.01037	0.02004
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01121	0.01205	0.02234
	B	0.00000	0.00000	0.00000
	B	0.01240	0.01305	0.02261
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01693	0.01870	0.02863
	B	0.00000	0.00000	0.00000
	B	0.01817	0.01951	0.02887
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02286	0.02546	0.03551
	B	0.00000	0.00000	0.00000
	B	0.02396	0.02610	0.03540
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02864	0.03176	0.04224
	B	0.00000	0.00000	0.00000
	B	0.02989	0.03230	0.04171
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00679	0.00703	0.01373
	B	0.00000	0.00000	0.00000
	B	0.00761	0.00769	0.01393

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)	-0.00325	-0.00326	-0.00327
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00324	-0.00326	-0.00327
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00324	-0.00326	-0.00327
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00326	-0.00327	-0.00329
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00324	-0.00325	-0.00327
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00229	-0.00230	-0.00231

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)	0.00326	0.00334	0.00328
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00327	0.00334	0.00328
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00327	0.00334	0.00329
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00329	0.00337	0.00331
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00327	0.00334	0.00329
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00231	0.00231	0.00232

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)	-0.00307	-0.00309	-0.00308
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00307	-0.00309	-0.00308
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00307	-0.00309	-0.00308
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00307	-0.00309	-0.00308
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00307	-0.00308	-0.00308
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00218	-0.00220	-0.00218

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)	0.00310	0.00314	0.00309
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00310	0.00314	0.00309
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00310	0.00314	0.00309
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00310	0.00314	0.00310
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00311	0.00314	0.00310
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00220	0.00221	0.00219

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00378	0.00395	0.00382	0.76862

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.04903	0.10071

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)	0.08956	0.96293	10.91770
	A1->Y (FR)	0.07504	0.91299	10.54080
	B0->Y (FR)	0.06597	0.93788	11.03070

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)	0.05593	0.63117	7.32520
	A1->Y (RF)	0.05084	0.64579	7.69775
	B0->Y (RF)	0.03215	0.59465	7.31944

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	0.00776	0.00768	0.00812
	A1	0.00000	0.00000	0.00000
	A1	0.00652	0.00642	0.00688
	B0	0.00616	0.00612	0.00767

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	0.00169	0.00140	0.00175
	A1	0.00000	0.00000	0.00000
	A1	0.00172	0.00145	0.00201
	B0	-0.00076	-0.00078	-0.00017

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)	-0.00244	-0.00279	-0.00281
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00284	-0.00287	-0.00285
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00284	-0.00286	-0.00285

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)	0.00280	0.00282	0.00281
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00284	0.00289	0.00286
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00287	0.00289	0.00286

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)	-0.00242	-0.00275	-0.00277
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00279	-0.00281	-0.00280
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00304	-0.00306	-0.00307

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)	0.00275	0.00277	0.00277
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00280	0.00282	0.00281
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00306	0.00309	0.00308

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)	-0.00140	-0.00140	-0.00140

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)	0.00154	0.00154	0.00144

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi22_l	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_15T_ms__aoi22_l	0.00377	0.00392	0.00406	0.00386	0.79416

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.05455	0.20142

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)	0.10984	0.98598	11.00760
	A1->Y (FR)	0.09783	0.96391	10.91120
	B0->Y (FR)	0.06715	0.92775	10.99070
	B1->Y (FR)	0.07931	0.95033	11.14240

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)	0.07331	0.65659	7.47978
	A1->Y (RF)	0.06816	0.67124	7.84944
	B0->Y (RF)	0.03799	0.63666	7.81883
	B1->Y (RF)	0.04313	0.62156	7.44908

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	0.00940	0.00931	0.00969
	A1	0.00816	0.00804	0.00838
	B0	0.00661	0.00652	0.00810
	B1	0.00778	0.00750	0.00930

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00345	0.00317	0.00349
	A1	0.00348	0.00321	0.00373
	B0	-0.00050	-0.00057	0.00003
	B1	-0.00044	-0.00057	-0.00016

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)	-0.00248	-0.00279	-0.00281
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00284	-0.00287	-0.00285
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00285	-0.00286	-0.00285
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00285	-0.00287	-0.00285

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)	0.00280	0.00281	0.00281
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00284	0.00287	0.00286
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00287	0.00289	0.00286
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00287	0.00289	0.00286

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)	-0.00245	-0.00274	-0.00276
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00279	-0.00282	-0.00280
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00304	-0.00306	-0.00306
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00304	-0.00306	-0.00306

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)	0.00274	0.00278	0.00276
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00280	0.00282	0.00281
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00306	0.00307	0.00307
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00306	0.00307	0.00307

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)	-0.00141	-0.00141	-0.00141
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00140	-0.00142	-0.00141
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00315	-0.00315	-0.00317
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00315	-0.00316	-0.00317

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)	0.00161	0.00161	0.00146
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00140	0.00142	0.00141
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00317	0.00319	0.00318
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00317	0.00319	0.00318

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)	-0.00142	-0.00145	-0.00142
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00141	-0.00142	-0.00142
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00290	-0.00291	-0.00291
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00290	-0.00292	-0.00291

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)	0.00162	0.00162	0.00147
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00142	0.00142	0.00142
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00293	0.00291	0.00291
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00293	0.00293	0.00291

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

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	0.00410	1.68720
sky130_osu_sc_15T_ms__buf_2	0.00414	3.34730
sky130_osu_sc_15T_ms__buf_4	0.00414	6.49505
sky130_osu_sc_15T_ms__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00414	12.55007
sky130_osu_sc_15T_ms__buf_l	0.00317	1.04854

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.10091	0.10091
sky130_osu_sc_15T_ms__buf_2	0.00000	0.15136	0.20162
sky130_osu_sc_15T_ms__buf_4	0.00000	0.25227	0.40304
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.45408	0.80589
sky130_osu_sc_15T_ms__buf_l	0.00000	0.01572	0.01572

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)	0.06310	0.62748	7.08406
sky130_osu_sc_15T_ms__buf_2	A->Y (RR)	0.07234	0.57225	7.21722
sky130_osu_sc_15T_ms__buf_4	A->Y (RR)	0.09826	0.57689	7.56102
sky130_osu_sc_15T_ms__buf_8	A->Y (RR)	0.14800	0.63846	8.04606
sky130_osu_sc_15T_ms__buf_l	A->Y (RR)	0.07233	0.71615	6.94271

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)	0.06868	0.60319	6.31048
sky130_osu_sc_15T_ms__buf_2	A->Y (FF)	0.08124	0.59436	6.77776
sky130_osu_sc_15T_ms__buf_4	A->Y (FF)	0.11438	0.62207	7.19949
sky130_osu_sc_15T_ms__buf_8	A->Y (FF)	0.18194	0.70635	7.67773
sky130_osu_sc_15T_ms__buf_l	A->Y (FF)	0.07964	0.64689	5.80427

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	0.00336	0.00301	0.01075
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00671	0.00650	0.01375
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01417	0.01446	0.02077
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02936	0.03030	0.03742
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00251	0.00221	0.00791

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	0.00863	0.00886	0.01923
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01100	0.01165	0.02135
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01678	0.01822	0.02776
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02854	0.03111	0.04092
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00662	0.00676	0.01341

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
	-0.00058	-0.00059	-0.00058

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
	0.00058	0.00059	0.00058

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00388	0.00386	0.01151	1.57651	1.57609
sky130_osu_sc_15T_ms__dffr_l	0.00388	0.00386	0.01150	1.05299	1.04870

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.28893	0.49679
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.20374	0.41160

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)	0.35937	1.53594	16.06340
	QN->Q (FR)	0.03533	0.89388	12.91690
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.34929	1.63220	15.30850
	QN->Q (FR)	0.04003	0.95864	12.59220

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)	0.33361	1.57145	17.15640
	QN->Q (RF)	0.02838	0.71408	10.28160
	RN->Q (FF)	0.24138	1.55474	17.91170
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.34082	1.71370	16.53770
	QN->Q (RF)	0.02900	0.70372	9.30442
	RN->Q (FF)	0.24911	1.69591	17.28100

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)	0.29297	0.89642	7.32563
	RN->QN (FR)	0.20056	0.87926	8.07668
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.29599	0.97835	7.39971
	RN->QN (FR)	0.20393	0.96093	8.14211

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)**	0.30830	0.81978	5.70453
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.29083	0.80909	5.10252

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)	-0.07839	-0.09927	-0.31228
	setup	CK (R)	0.28521	0.31100	1.08734
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.07733	-0.09874	-0.31110
	setup	CK (R)	0.28760	0.31270	1.09859

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)	-0.12660	-0.38233	-3.00008
	setup	CK (R)	0.15782	0.39419	3.04480
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.12548	-0.37945	-2.99978
	setup	CK (R)	0.15766	0.39419	3.04480

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)	-0.07839	-0.09927	-0.31228
	setup	CK (R)	0.28521	0.31100	1.08734
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.07733	-0.09874	-0.31110
	setup	CK (R)	0.28760	0.31270	1.09859

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)	-0.12660	-0.38233	-3.00008
	setup	CK (R)	0.15782	0.39419	3.04480
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.12548	-0.37945	-2.99978
	setup	CK (R)	0.15766	0.39419	3.04480

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)	0.24101	0.26970	1.15701
	removal	CK (R)	-0.05191	-0.06417	-0.15690
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.24109	0.27027	1.16337
	removal	CK (R)	-0.05433	-0.06176	-0.15931

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)	0.24101	0.26970	1.15701
	removal	CK (R)	-0.05191	-0.06417	-0.15690
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.24109	0.27027	1.16337
	removal	CK (R)	-0.05433	-0.06176	-0.15931

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 ()	0.13979	0.48950	13.33370
	min_pulse_width	RN ()	0.13979	0.48950	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.13979	0.48950	13.33370
	min_pulse_width	RN ()	0.13979	0.48950	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 ()	0.16924	0.48950	13.33370
	min_pulse_width	CK ()	0.17660	0.48950	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.15451	0.48950	13.33370
	min_pulse_width	CK ()	0.17292	0.48950	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 ()	0.35330	0.48950	13.33370
	min_pulse_width	CK ()	0.12875	0.48950	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.35330	0.48950	13.33370
	min_pulse_width	CK ()	0.12875	0.48950	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	0.00881	0.00685	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00776	0.00632	0.00272

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	0.00987	0.00792	0.00000
	RN	-0.00116	-0.06822	-1.03435
	RN	0.02273	0.02097	0.00305
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00881	0.00760	0.00177
	RN	-0.00116	-0.05355	-0.69087
	RN	0.02166	0.02062	0.01537

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	0.00986	0.00794	0.00000
	RN	-0.00116	-0.06821	-1.03406
	RN	0.02272	0.02095	0.00275
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00881	0.00760	0.00186
	RN	-0.00116	-0.05342	-0.68805
	RN	0.02166	0.02061	0.01537

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	0.00876	0.00681	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00771	0.00626	0.00253

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	-0.00234	-0.00276	-0.00279
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01067	0.01006	0.01449
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00452	0.00399	0.00859
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00234	-0.00276	-0.00279
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01067	0.01006	0.01449
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00452	0.00398	0.00859

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	0.00277	0.00281	0.00280
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01719	0.01685	0.02181
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00826	0.00800	0.01295
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00277	0.00281	0.00280
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01719	0.01685	0.02181
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00826	0.00800	0.01295

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)	0.00321	0.00274	0.01258
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00960	0.00888	0.01867
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)	0.00321	0.00274	0.01258
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00960	0.00888	0.01867

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)	0.00831	0.00834	0.01961
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01717	0.01691	0.02801
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)	0.00831	0.00834	0.01961
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01716	0.01690	0.02800

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)	-0.00063	-0.00123	0.00837
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00517	0.00399	0.01368
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00096	-0.00154	0.00802
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00063	-0.00124	0.00837
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00517	0.00399	0.01368
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00096	-0.00154	0.00802

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)	0.01283	0.01282	0.02411
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02705	0.02625	0.03775
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02046	0.02012	0.03083
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02655	0.02628	0.04689
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01426	0.01416	0.02516
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01283	0.01282	0.02411
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02705	0.02625	0.03775
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02046	0.02012	0.03083
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02655	0.02630	0.04689
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01426	0.01416	0.02516

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00384	0.00387	0.00855	0.01173	1.75260	1.75589
sky130_osu_sc_15T_ms__dffsr_l	0.00384	0.00387	0.00854	0.01173	1.05444	1.04936

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.35808	0.49662
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.27289	0.41143

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)	0.34684	1.55587	17.18410
	QN->Q (FR)	0.03094	0.83356	12.36990
	RN->Q (RR)	0.28018	1.50464	17.22060
	SN->Q (FR)	0.25329	1.56285	18.32640
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.34758	1.63747	15.35070
	QN->Q (FR)	0.04005	0.95728	12.58150
	RN->Q (RR)	0.28151	1.58761	15.37110
	SN->Q (FR)	0.25441	1.64213	16.45210

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)	0.38652	1.64273	18.09290
	QN->Q (RF)	0.02805	0.74056	10.94900
	RN->Q (FF)	0.25119	1.58624	18.84630
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.39990	1.77906	16.62820
	QN->Q (RF)	0.02894	0.70336	9.30296
	RN->Q (FF)	0.26471	1.72153	17.37470

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)	0.34576	0.94642	7.51606
	RN->QN (FR)	0.21129	0.89021	8.26734
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.35394	1.04280	7.47780
	RN->QN (FR)	0.21939	0.98674	8.22148

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)	0.30083	0.83907	6.31417
	RN->QN (RF)	0.23447	0.78854	6.33892
	SN->QN (FF)	0.20768	0.84664	7.44630
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.29175	0.81503	5.13911
	RN->QN (RF)	0.22586	0.76540	5.15856
	SN->QN (FF)	0.19894	0.82017	6.24373

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)	-0.07903	-0.10502	-0.37131
	setup	CK (R)	0.26706	0.28973	1.13220
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.07783	-0.10586	-0.37171
	setup	CK (R)	0.26655	0.28983	1.13611

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)	-0.15131	-0.40599	-3.14740
	setup	CK (R)	0.19064	0.41708	3.18643
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.15056	-0.40528	-3.14814
	setup	CK (R)	0.19069	0.41708	3.18612

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)	-0.07903	-0.10502	-0.37131
	setup	CK (R)	0.26706	0.28973	1.13220
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.07783	-0.10586	-0.37171
	setup	CK (R)	0.26655	0.28983	1.13611

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)	-0.15131	-0.40599	-3.14740
	setup	CK (R)	0.19064	0.41708	3.18643
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.15056	-0.40528	-3.14814
	setup	CK (R)	0.19069	0.41708	3.18612

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)	0.20289	0.22684	1.09005
	removal	CK (R)	-0.02550	-0.03275	-0.09966
	hold	SN (R)	-0.20505	-0.40263	-1.94410
	setup	SN (R)	0.22930	0.45091	4.59565
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.20076	0.22670	1.09218
	removal	CK (R)	-0.02736	-0.03285	-0.09975
	hold	SN (R)	-0.19646	-0.39275	-1.87363
	setup	SN (R)	0.22674	0.44500	4.47162

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)	0.20289	0.22684	1.09005
	removal	CK (R)	-0.02550	-0.03275	-0.09966
	hold	SN (R)	-0.20509	-0.40263	-1.94410
	hold	SN (R)	-0.20505	-0.40488	-1.95072
	setup	SN (R)	0.22930	0.45076	4.37671
	setup	SN (R)	0.22728	0.45091	4.59565
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.20076	0.22670	1.09218
	removal	CK (R)	-0.02736	-0.03285	-0.09975
	hold	SN (R)	-0.19712	-0.39364	-1.87363
	hold	SN (R)	-0.19646	-0.39275	-1.88243
	setup	SN (R)	0.22674	0.44258	4.21485
	setup	SN (R)	0.21812	0.44500	4.47162

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 ()	0.16188	0.48950	13.33370
	min_pulse_width	RN ()	0.16556	0.48950	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.16188	0.48950	13.33370
	min_pulse_width	RN ()	0.15820	0.48950	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)	0.04929	0.08925	3.59861
	removal	CK (R)	-0.01846	-0.06472	-0.38709
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04932	0.08879	3.49207
	removal	CK (R)	-0.01846	-0.06472	-0.38709

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)	0.04929	0.08925	3.59861
	removal	CK (R)	-0.01846	-0.06472	-0.38709
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04932	0.08879	3.49207
	removal	CK (R)	-0.01846	-0.06472	-0.38709

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 ()	0.19869	0.48950	13.33370
	min_pulse_width	SN ()	0.20237	0.48950	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.19869	0.48950	13.33370
	min_pulse_width	SN ()	0.19133	0.48950	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 ()	0.15820	0.48950	13.33370
	min_pulse_width	CK ()	0.19869	0.48950	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.15083	0.48950	13.33370
	min_pulse_width	CK ()	0.19501	0.48950	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 ()	0.33489	0.48950	13.33370
	min_pulse_width	CK ()	0.16924	0.48950	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.33121	0.48950	13.33370
	min_pulse_width	CK ()	0.16556	0.48950	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	0.01096	0.00886	0.00000
	RN	0.02004	0.01812	-0.00324
	SN	-0.00116	-0.07269	-1.14988
	SN	0.02215	0.02015	-0.00279
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01003	0.00860	0.00491
	RN	0.01909	0.01784	0.01075
	SN	-0.00116	-0.05359	-0.69182
	SN	0.02120	0.01988	0.01204

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	0.01150	0.01031	0.00000
	RN	-0.00116	-0.07269	-1.14988
	RN	0.02369	0.02248	0.01243
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01052	0.00940	0.00370
	RN	-0.00116	-0.05359	-0.69182
	RN	0.02268	0.02155	0.01652

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	0.01149	0.01031	0.00000
	RN	-0.00116	-0.07277	-1.15197
	RN	0.02368	0.02246	0.01244
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01052	0.00941	0.00379
	RN	-0.00116	-0.05344	-0.68849
	RN	0.02268	0.02156	0.01664

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	0.01092	0.00885	0.00000
	RN	0.02000	0.01809	-0.00372
	SN	-0.00116	-0.07277	-1.15198
	SN	0.02210	0.02012	-0.00238
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00998	0.00855	0.00475
	RN	0.01905	0.01780	0.01082
	SN	-0.00116	-0.05344	-0.68846
	SN	0.02115	0.01983	0.01196

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	-0.00273	-0.00279	-0.00278
	(!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)	0.01372	0.01315	0.01752
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00515	0.00464	0.00912
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00514	0.00463	0.00914
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00519	0.00469	0.00916
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00273	-0.00279	-0.00278
	(!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)	0.01372	0.01315	0.01752
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00515	0.00464	0.00912
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00514	0.00463	0.00914
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00519	0.00469	0.00916

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	0.00279	0.00279	0.00278
	(!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)	0.01985	0.01951	0.02413
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00881	0.00860	0.01345
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00889	0.00864	0.01346
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00876	0.00855	0.01341
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00279	0.00279	0.00278
	(!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)	0.01984	0.01950	0.02410
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00880	0.00859	0.01344
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00888	0.00863	0.01345
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00875	0.00854	0.01340

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)	0.00294	0.00247	0.01204
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01177	0.01101	0.02059
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)	0.00295	0.00247	0.01204
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01178	0.01101	0.02060

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)	0.00897	0.00907	0.02041
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01819	0.01786	0.02902
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)	0.00895	0.00906	0.02040
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01817	0.01785	0.02901

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)	-0.00644	-0.00648	-0.00648
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00622	-0.00682	-0.00685
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00619	-0.00653	-0.00650
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00422	0.00368	0.00892
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)	-0.00644	-0.00648	-0.00648
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00621	-0.00680	-0.00683
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00618	-0.00653	-0.00650
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00423	0.00369	0.00893

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)	0.00648	0.00652	0.00651
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00684	0.00688	0.00687
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00648	0.00656	0.00652
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01415	0.01375	0.01822
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)	0.00648	0.00652	0.00651
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00683	0.00686	0.00685
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00648	0.00655	0.00652
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01413	0.01377	0.01822

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)	-0.00063	-0.00124	0.00836
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00596	0.00485	0.01448
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00584	0.00472	0.01443
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00079	-0.00137	0.00818
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00369	0.00259	0.02158
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00063	-0.00124	0.00836
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00595	0.00484	0.01447
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00583	0.00471	0.01442
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00079	-0.00137	0.00818
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00369	0.00259	0.02158

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)	0.03030	0.02955	0.04099
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01287	0.01287	0.02415
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02089	0.02059	0.03133
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02092	0.02063	0.03136
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02916	0.02878	0.04921
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01414	0.01409	0.02504
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01714	0.01705	0.03867
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03030	0.02956	0.04099
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01287	0.01287	0.02415
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02089	0.02059	0.03132
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02092	0.02063	0.03136
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02915	0.02876	0.04920
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01413	0.01409	0.02504
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01712	0.01704	0.03867

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00386	0.00679	0.01151	1.58283	1.59044
sky130_osu_sc_15T_ms__dffs_l	0.00386	0.00679	0.01151	1.06164	1.05154

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.25618	0.39550
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.17099	0.31031

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)	0.27158	1.43371	15.97950
	QN->Q (FR)	0.03532	0.89182	12.88410
	SN->Q (FR)	0.21138	1.51534	17.23480
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.26949	1.54471	15.30380
	QN->Q (FR)	0.03999	0.95784	12.61040
	SN->Q (FR)	0.20883	1.61967	16.51450

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)	0.37215	1.61651	17.21840
	QN->Q (RF)	0.02822	0.71200	10.26810
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.37763	1.75801	16.67700
	QN->Q (RF)	0.02888	0.70363	9.31997

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)	0.32966	0.94133	7.40338
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.33124	1.01868	7.43940

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)	0.22570	0.72160	5.63563
	SN->QN (FF)	0.16517	0.80429	6.88526
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.21636	0.71973	5.01235
	SN->QN (FF)	0.15512	0.79462	6.22205

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)	-0.06171	-0.08604	-0.28621
	setup	CK (R)	0.19995	0.23579	1.06982
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.06172	-0.08657	-0.28699
	setup	CK (R)	0.20050	0.23601	1.08181

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)	-0.13095	-0.38587	-3.02432
	setup	CK (R)	0.17666	0.39835	3.07349
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.13286	-0.38572	-3.02129
	setup	CK (R)	0.17656	0.39835	3.07337

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)	-0.06171	-0.08604	-0.28621
	setup	CK (R)	0.19995	0.23579	1.06982
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.06172	-0.08657	-0.28699
	setup	CK (R)	0.20050	0.23601	1.08181

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)	-0.13095	-0.38587	-3.02432
	setup	CK (R)	0.17666	0.39835	3.07349
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.13286	-0.38572	-3.02129
	setup	CK (R)	0.17656	0.39835	3.07337

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)	0.05092	0.07999	2.58068
	removal	CK (R)	-0.02083	-0.05461	-0.19887
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04772	0.07986	2.47552
	removal	CK (R)	-0.01799	-0.05461	-0.19887

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)	0.05092	0.07999	2.58068
	removal	CK (R)	-0.02083	-0.05461	-0.19887
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04772	0.07986	2.47552
	removal	CK (R)	-0.01799	-0.05461	-0.19887

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 ()	0.14715	0.48950	13.33370
	min_pulse_width	SN ()	0.15451	0.48950	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.14715	0.48950	13.33370
	min_pulse_width	SN ()	0.14347	0.48950	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 ()	0.11770	0.48950	13.33370
	min_pulse_width	CK ()	0.18765	0.48950	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.11402	0.48950	13.33370
	min_pulse_width	CK ()	0.18396	0.48950	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 ()	0.26863	0.48950	13.33370
	min_pulse_width	CK ()	0.15083	0.48950	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.26863	0.48950	13.33370
	min_pulse_width	CK ()	0.15083	0.48950	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	0.00881	0.00685	0.00000
	SN	-0.00116	-0.06838	-1.03850
	SN	0.01879	0.01697	-0.00004
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00775	0.00628	0.00284
	SN	-0.00116	-0.05381	-0.69654
	SN	0.01773	0.01643	0.01065

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	0.00980	0.00794	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00875	0.00759	0.00203

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	0.00980	0.00794	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00875	0.00759	0.00212

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	0.00877	0.00681	0.00000
	SN	-0.00116	-0.06858	-1.04343
	SN	0.01875	0.01693	-0.00022
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00771	0.00625	0.00261
	SN	-0.00116	-0.05350	-0.68988
	SN	0.01768	0.01638	0.01048

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	-0.00278	-0.00283	-0.00283
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01032	0.00967	0.01420
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00442	0.00388	0.00847
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00278	-0.00283	-0.00283
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01032	0.00967	0.01420
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00442	0.00388	0.00847

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	0.00283	0.00284	0.00283
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01687	0.01648	0.02137
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00839	0.00814	0.01314
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00283	0.00284	0.00283
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01687	0.01648	0.02137
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00839	0.00814	0.01314

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)	-0.00463	-0.00467	-0.00467
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00352	0.00317	0.00870
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)	-0.00463	-0.00467	-0.00467
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00352	0.00316	0.00870

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)	0.00469	0.00473	0.00468
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00987	0.00953	0.01594
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)	0.00469	0.00473	0.00468
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00987	0.00953	0.01594

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)	-0.00066	-0.00126	0.00835
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00092	-0.00150	0.00807
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00292	0.00184	0.02118
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00066	-0.00126	0.00835
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00092	-0.00150	0.00807
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00292	0.00184	0.02118

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)	0.02685	0.02610	0.03772
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01284	0.01284	0.02413
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02614	0.02575	0.04633
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01420	0.01416	0.02512
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01664	0.01662	0.03846
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02684	0.02608	0.03772
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01284	0.01284	0.02413
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02614	0.02575	0.04633
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01420	0.01416	0.02512
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01664	0.01662	0.03846

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
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	0.00402	0.01141	1.75790	1.76607
sky130_osu_sc_15T_ms__dff_l	0.00402	0.01140	0.96052	0.95795

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.32452	0.40370
sky130_osu_sc_15T_ms__dff_l	0.00000	0.23933	0.31850

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)	0.22348	1.41234	17.01860
	QN->Q (FR)	0.03074	0.83196	12.35180
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.23253	1.48006	14.34960
	QN->Q (FR)	0.04487	1.02023	13.02850

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)	0.31808	1.56742	18.02240
	QN->Q (RF)	0.02793	0.73924	10.94300
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.33706	1.69995	15.87010
	QN->Q (RF)	0.02899	0.68190	8.85325

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)	0.27904	0.87145	7.45071
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.29135	0.98559	7.31211

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)	0.18265	0.69698	6.15041
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.17944	0.66178	4.56113

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)	-0.05598	-0.08131	-0.29041
	setup	CK (R)	0.15087	0.19188	1.08944
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.05520	-0.08062	-0.29054
	setup	CK (R)	0.15304	0.19111	1.09855

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)	-0.12224	-0.38721	-3.05978
	setup	CK (R)	0.15285	0.39920	3.11596
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.12351	-0.38737	-3.05959
	setup	CK (R)	0.14885	0.39920	3.11787

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 ()	0.09930	0.48950	13.33370
	min_pulse_width	CK ()	0.17660	0.48950	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.09562	0.48950	13.33370
	min_pulse_width	CK ()	0.16924	0.48950	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 ()**	0.22078	0.48950	13.33370
	min_pulse_width	**CK ()**	0.12138	0.48950	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.21709	0.48950	13.33370
	min_pulse_width	**CK ()**	0.12138	0.48950	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	0.00932	0.00712	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00840	0.00693	0.00475

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	0.00998	0.00877	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00899	0.00744	-0.00229

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	0.00998	0.00877	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00899	0.00743	-0.00221

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	0.00929	0.00710	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00835	0.00690	0.00432

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	-0.00233	-0.00275	-0.00278
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00970	0.00916	0.01373
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00233	-0.00275	-0.00279
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00970	0.00917	0.01373

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	0.00276	0.00280	0.00279
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01747	0.01704	0.02196
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00276	0.00280	0.00279
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01747	0.01704	0.02196

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)	-0.00066	-0.00126	0.00837
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00090	-0.00148	0.00811
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00066	-0.00126	0.00837
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00090	-0.00148	0.00810

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)	0.01277	0.01277	0.02407
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02623	0.02555	0.03736
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02655	0.02612	0.04694
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01412	0.01402	0.02504
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01277	0.01277	0.02407
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02623	0.02555	0.03736
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02655	0.02614	0.04694
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01412	0.01402	0.02504

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

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	0.00391	1.63697
sky130_osu_sc_15T_ms__inv_10	0.03609	14.93769
sky130_osu_sc_15T_ms__inv_2	0.00741	3.24523
sky130_osu_sc_15T_ms__inv_3	0.01102	4.67166
sky130_osu_sc_15T_ms__inv_4	0.01455	6.28257
sky130_osu_sc_15T_ms__inv_6	0.02180	9.27190
sky130_osu_sc_15T_ms__inv_8	0.02895	12.33405
sky130_osu_sc_15T_ms__inv_l	0.00293	0.93331

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.05045	0.10071
sky130_osu_sc_15T_ms__inv_10	0.00000	0.50453	1.00712
sky130_osu_sc_15T_ms__inv_2	0.00000	0.10091	0.20142
sky130_osu_sc_15T_ms__inv_3	0.00000	0.15136	0.30214
sky130_osu_sc_15T_ms__inv_4	0.00000	0.20181	0.40285
sky130_osu_sc_15T_ms__inv_6	0.00000	0.30272	0.60427
sky130_osu_sc_15T_ms__inv_8	0.00000	0.40363	0.80570
sky130_osu_sc_15T_ms__inv_l	0.00000	0.00786	0.01544

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)**	0.02945	0.76658	11.17580
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.04086	0.52597	11.12060
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.02365	0.66260	11.12540
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.02600	0.62279	11.13850
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.02644	0.59173	11.12770
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.02990	0.55896	11.12950
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.03500	0.53979	11.17120
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.03909	0.88249	11.23300

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)**	0.02498	0.64744	9.41341
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.03596	0.43468	9.36583
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.02044	0.56315	9.40821
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.02232	0.53035	9.47757
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.02219	0.50298	9.45761
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02680	0.46959	9.47435
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.03131	0.45174	9.49022
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.02662	0.62336	8.05392

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	0.00450	0.00415	0.00278
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.03803	0.04223	0.04455
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00792	0.00813	0.00746
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01217	0.01288	0.01175
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01560	0.01707	0.02195
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02311	0.02476	0.03287
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.03058	0.03256	0.01905
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00336	0.00338	0.00419

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	-0.00091	-0.00090	-0.00045
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01547	-0.01437	-0.00807
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00290	-0.00272	-0.00175
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00386	-0.00345	-0.00206
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00596	-0.00544	-0.00335
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00910	-0.00844	-0.00494
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01235	-0.01151	-0.00650
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00055	-0.00058	-0.00015

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.29999	0.29998	0.00800	0.30095

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.10108	0.10120

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)	-	0.01680	0.33097	3.49230
	A1->Y (RR)	-	0.01858	0.33390	3.49782
	S0->Y (RR)	(!A0 * A1)	0.05453	0.33152	1.53529
	S0->Y (FR)	(A0 * !A1)	0.03730	0.42518	3.47959

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)	-	0.01703	0.31615	3.23650
	A1->Y (FF)	-	0.01571	0.31391	3.22958
	S0->Y (FF)	(!A0 * A1)	0.06735	0.38950	2.15680
	S0->Y (RF)	(A0 * !A1)	0.02828	0.35845	2.84990

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	-	-0.00457	-0.00458	-0.00458
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00311	-0.00311	-0.00311
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00560	0.00575	0.01787
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00306	-0.00350	0.00719

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	-	0.00457	0.00458	0.00459
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00311	0.00311	0.00311
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00086	0.00048	0.01155
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01210	0.01219	0.02384

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)	-0.00113	-0.00113	-0.00113

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)	0.00113	0.00113	0.00113

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)	-0.00134	-0.00134	-0.00134

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)	0.00134	0.00134	0.00134

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)	-0.00113	-0.00149	0.00940
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00109	-0.00146	0.00947

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)	0.00922	0.00936	0.02104
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00849	0.00869	0.02068

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00392	0.00389	1.42521
sky130_osu_sc_15T_ms__nand2_l	0.00293	0.00292	0.92672

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.05047	0.20142
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.00787	0.03087

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)	0.03045	0.74065	10.40730
	B->Y (FR)	0.03584	0.73582	10.26210
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.04014	0.88448	11.22300
	B->Y (FR)	0.04789	0.88920	11.20090

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)	0.03679	0.78766	11.11520
	B->Y (RF)	0.04206	0.77817	10.82050
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.03948	0.80124	10.12160
	B->Y (RF)	0.04416	0.78725	9.77010

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	0.00478	0.00488	0.00620
	B	0.00000	0.00000	0.00000
	B	0.00603	0.00604	0.00740
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00353	0.00356	0.00429
	B	0.00000	0.00000	0.00000
	B	0.00442	0.00439	0.00511

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	-0.00060	-0.00067	-0.00023
	B	0.00000	0.00000	0.00000
	B	-0.00056	-0.00066	-0.00038
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00038	-0.00043	-0.00005
	B	0.00000	0.00000	0.00000
	B	-0.00036	-0.00044	-0.00018

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)	-0.00318	-0.00319	-0.00320
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00220	-0.00220	-0.00221

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)	0.00319	0.00327	0.00321
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00222	0.00226	0.00222

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)	-0.00294	-0.00297	-0.00295
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00204	-0.00205	-0.00204

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)	0.00297	0.00299	0.00296
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00206	0.00207	0.00205

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00389	0.00418	0.84639
sky130_osu_sc_15T_ms__nor2_l	0.00283	0.00315	0.52837

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.03709	0.10071
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.00615	0.01544

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)	0.06501	0.91849	10.98260
	B->Y (FR)	0.05071	0.89805	10.98740
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.07929	1.04926	11.02040
	B->Y (FR)	0.06649	1.03516	11.15630

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)	0.03373	0.54727	6.76050
	B->Y (RF)	0.02660	0.53521	6.74265
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.03331	0.53662	6.03791
	B->Y (RF)	0.02808	0.52788	6.02302

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	0.00633	0.00626	0.00675
	B	0.00000	0.00000	0.00000
	B	0.00493	0.00494	0.00659
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00448	0.00440	0.00482
	B	0.00000	0.00000	0.00000
	B	0.00362	0.00347	0.00473

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	0.00072	0.00052	0.00110
	B	0.00000	0.00000	0.00000
	B	-0.00072	-0.00071	-0.00013
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00044	0.00031	0.00090
	B	0.00000	0.00000	0.00000
	B	-0.00040	-0.00041	0.00015

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)	-0.00237	-0.00278	-0.00280
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00161	-0.00185	-0.00186

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)	0.00279	0.00282	0.00280
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00184	0.00186	0.00186

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)	-0.00141	-0.00141	-0.00141
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00091	-0.00094	-0.00092

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)	0.00149	0.00149	0.00144
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00096	0.00097	0.00094

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00391	0.00400	0.00333	0.83783

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.02441	0.11615

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)	0.07074	0.92969	11.13120
	A1->Y (FR)	0.08908	0.95771	11.14380
	B0->Y (FR)	0.04732	0.82220	10.17140

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)	0.05107	0.67082	8.01903
	A1->Y (RF)	0.06069	0.66292	7.81916
	B0->Y (RF)	0.03991	0.69365	8.58179

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	0.00671	0.00644	0.00813
	A1	0.00000	0.00000	0.00000
	A1	0.00814	0.00802	0.00845
	B0	0.00542	0.00536	0.00640

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	0.00019	0.00007	0.00042
	A1	0.00000	0.00000	0.00000
	A1	0.00162	0.00136	0.00169
	B0	0.00224	0.00215	0.00254

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)	-0.00142	-0.00145	-0.00142
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00278	-0.00282	-0.00282
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00286	-0.00288	-0.00287

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)	0.00150	0.00151	0.00144
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00280	0.00282	0.00282
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00286	0.00288	0.00288

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)	-0.00228	-0.00271	-0.00274
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00274	-0.00279	-0.00279
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00282	-0.00283	-0.00283

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)	0.00272	0.00275	0.00274
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00277	0.00280	0.00279
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00282	0.00288	0.00284

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)	-0.00226	-0.00227	-0.00231

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)	0.00230	0.00232	0.00232

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00378	0.00401	0.00413	0.00404	0.83978

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.05564	0.20142

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)	0.09034	0.94566	10.97750
	A1->Y (FR)	0.08183	0.92933	10.98370
	B0->Y (FR)	0.05644	0.90374	10.96850
	B1->Y (FR)	0.07241	0.92592	10.96640

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)	0.08526	0.71647	8.11536
	A1->Y (RF)	0.06883	0.69371	8.05062
	B0->Y (RF)	0.05810	0.71513	8.61360
	B1->Y (RF)	0.07528	0.74082	8.71132

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	0.01053	0.01042	0.01085
	A1	0.00906	0.00899	0.01043
	B0	0.00666	0.00665	0.00810
	B1	0.00819	0.00810	0.00854

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00265	0.00239	0.00269
	A1	0.00135	0.00119	0.00148
	B0	-0.00028	-0.00032	0.00024
	B1	0.00267	0.00242	0.00293

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)	-0.00236	-0.00278	-0.00280
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00236	-0.00278	-0.00280
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00276	-0.00281	-0.00279
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00283	-0.00285	-0.00284

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)	0.00278	0.00282	0.00280
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00278	0.00282	0.00280
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00278	0.00281	0.00279
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00283	0.00286	0.00285

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)	-0.00140	-0.00140	-0.00140
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00140	-0.00140	-0.00140
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00273	-0.00276	-0.00276
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00281	-0.00283	-0.00282

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)	0.00147	0.00148	0.00143
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00147	0.00148	0.00143
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00276	0.00276	0.00276
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00282	0.00284	0.00283

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)	-0.00139	-0.00139	-0.00139
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00139	-0.00140	-0.00139
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00307	-0.00310	-0.00310
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00307	-0.00310	-0.00315

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)	0.00146	0.00147	0.00142
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00146	0.00147	0.00142
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00310	0.00311	0.00310
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00314	0.00316	0.00316

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)	-0.00231	-0.00272	-0.00275
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00231	-0.00272	-0.00275
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00314	-0.00319	-0.00318
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00314	-0.00315	-0.00321

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)	0.00273	0.00277	0.00275
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00273	0.00276	0.00275
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00317	0.00320	0.00318
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00321	0.00324	0.00323

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00425	0.00401	1.68950
sky130_osu_sc_15T_ms__or2_2	0.00425	0.00401	3.32639
sky130_osu_sc_15T_ms__or2_4	0.00425	0.00401	6.42030
sky130_osu_sc_15T_ms__or2_8	0.00425	0.00402	12.37332
sky130_osu_sc_15T_ms__or2_l	0.00324	0.00299	0.95642

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.06242	0.10110
sky130_osu_sc_15T_ms__or2_2	0.00000	0.08774	0.20181
sky130_osu_sc_15T_ms__or2_4	0.00000	0.13839	0.40324
sky130_osu_sc_15T_ms__or2_8	0.00000	0.23968	0.80609
sky130_osu_sc_15T_ms__or2_l	0.00000	0.01022	0.01600

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)	0.07655	0.67055	7.17635
	B->Y (RR)	0.06702	0.63760	7.09018
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.08449	0.60501	7.26843
	B->Y (RR)	0.07465	0.57776	7.18185
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.11070	0.60471	7.60361
	B->Y (RR)	0.10072	0.58171	7.52612
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.16037	0.65663	8.11334
	B->Y (RR)	0.15029	0.64064	8.03605
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.08472	0.76680	6.95760
	B->Y (RR)	0.07598	0.73855	6.86177

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)	0.12801	0.72224	6.93817
	B->Y (FF)	0.10826	0.68413	6.76569
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.15320	0.70294	7.16112
	B->Y (FF)	0.13358	0.67510	6.96587
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.21690	0.75563	7.63588
	B->Y (FF)	0.19722	0.73629	7.42599
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.34470	0.89182	8.16768
	B->Y (FF)	0.32508	0.87042	7.98720
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.15061	0.73349	5.78971
	B->Y (FF)	0.12814	0.70387	5.65873

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	0.00495	0.00443	0.00950
	B	0.00000	0.00000	0.00000
	B	0.00362	0.00333	0.01083
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00836	0.00797	0.01329
	B	0.00000	0.00000	0.00000
	B	0.00697	0.00701	0.01431
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01582	0.01598	0.02209
	B	0.00000	0.00000	0.00000
	B	0.01444	0.01515	0.02178
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03101	0.03190	0.03761
	B	0.00000	0.00000	0.00000
	B	0.02950	0.03128	0.03885
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00356	0.00322	0.00710
	B	0.00000	0.00000	0.00000
	B	0.00270	0.00252	0.00741

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	0.01049	0.01033	0.01473
	B	0.00000	0.00000	0.00000
	B	0.00878	0.00918	0.01932
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01281	0.01311	0.01735
	B	0.00000	0.00000	0.00000
	B	0.01111	0.01185	0.02156
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01860	0.01971	0.02388
	B	0.00000	0.00000	0.00000
	B	0.01707	0.01827	0.02749
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03130	0.03249	0.03710
	B	0.00000	0.00000	0.00000
	B	0.03021	0.03096	0.04037
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00777	0.00747	0.01085
	B	0.00000	0.00000	0.00000
	B	0.00658	0.00675	0.01318

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)	-0.00237	-0.00279	-0.00282
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00236	-0.00279	-0.00282
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00236	-0.00279	-0.00282
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00236	-0.00279	-0.00282
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00162	-0.00187	-0.00188

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)	0.00280	0.00284	0.00282
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00280	0.00283	0.00282
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00280	0.00283	0.00282
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00280	0.00283	0.00282
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00186	0.00188	0.00188

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)	-0.00142	-0.00145	-0.00142
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00142	-0.00145	-0.00142
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00142	-0.00145	-0.00142
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00142	-0.00145	-0.00142
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00094	-0.00096	-0.00094

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)	0.00150	0.00152	0.00144
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00150	0.00152	0.00144
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00150	0.00152	0.00144
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00150	0.00152	0.00145
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00099	0.00100	0.00096

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00416	0.00535	0.85246
sky130_osu_sc_15T_ms__tbufi_l	0.00315	0.00410	0.52716

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.05060	0.20143
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.00806	0.03087

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)	0.04779	0.89382	10.97940
	OE->Y (FR)	0.04783	0.33715	4.73345
	OE->Y (RR)	0.08789	0.77268	7.12324
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.06382	1.03222	11.14700
	OE->Y (FR)	0.05582	0.33711	4.73329
	OE->Y (RR)	0.10034	0.89532	7.02379

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)	0.03586	0.65760	8.23654
	OE->Y (FF)	0.04867	0.33714	4.73349
	OE->Y (RF)	0.03523	0.64063	7.88625
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.03914	0.65587	7.37565
	OE->Y (FF)	0.05662	0.33712	4.73321
	OE->Y (RF)	0.03746	0.63289	6.96648

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	0.00460	0.00462	0.00611
	OE	0.00000	0.00000	0.00000
	OE	0.00446	0.00414	0.01399
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00339	0.00321	0.00437
	OE	0.00000	0.00000	0.00000
	OE	0.00315	0.00292	0.00962

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	-0.00072	-0.00073	-0.00018
	OE	0.00000	0.00000	0.00000
	OE	0.00293	0.00258	0.01379
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00040	-0.00042	0.00009
	OE	0.00000	0.00000	0.00000
	OE	0.00198	0.00172	0.00943

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)	-0.00229	-0.00233	-0.00230
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00206	-0.00207	-0.00206
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00164	-0.00165	-0.00165
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00148	-0.00149	-0.00148

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)	0.00229	0.00233	0.00230
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00211	0.00212	0.00208
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00164	0.00165	0.00165
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00151	0.00151	0.00149

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)	0.00172	0.00140	0.01279
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00154	0.00122	0.01256
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00113	0.00095	0.00866
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00101	0.00091	0.00852

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)	0.00544	0.00540	0.01734
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00545	0.00547	0.01742
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00414	0.00404	0.01197
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00419	0.00410	0.01206

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00415	0.00636	0.85804
sky130_osu_sc_15T_ms__tnbufi_l	0.00314	0.00458	0.52880

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.08411	0.10091
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.01311	0.01572

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)	0.04835	0.89608	11.02380
	OE->Y (RR)	0.03109	0.33762	4.73399
	OE->Y (FR)	0.06035	0.91422	11.01650
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.06433	1.03351	11.16800
	OE->Y (RR)	0.03112	0.33755	4.73396
	OE->Y (FR)	0.07476	1.04261	11.03410

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)	0.03525	0.65882	8.26475
	OE->Y (RF)	0.03083	0.33760	4.73402
	OE->Y (FF)	0.06212	0.58134	5.31337
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.03837	0.65616	7.38772
	OE->Y (RF)	0.03089	0.33754	4.73396
	OE->Y (FF)	0.07138	0.61011	4.76614

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	0.00473	0.00475	0.00623
	OE	0.00000	0.00000	0.00000
	OE	0.01137	0.01176	0.02435
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00353	0.00335	0.00452
	OE	0.00000	0.00000	0.00000
	OE	0.00819	0.00813	0.01673

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	-0.00090	-0.00089	-0.00035
	OE	0.00000	0.00000	0.00000
	OE	0.01001	0.01050	0.02161
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00058	-0.00058	-0.00008
	OE	0.00000	0.00000	0.00000
	OE	0.00715	0.00739	0.01497

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)	-0.00195	-0.00198	-0.00196
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00173	-0.00175	-0.00173
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00131	-0.00132	-0.00132
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00117	-0.00117	-0.00117

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)	0.00195	0.00198	0.00196
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00178	0.00178	0.00176
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00131	0.00132	0.00132
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00120	0.00119	0.00117

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)	-0.00322	-0.00385	0.00794
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00324	-0.00388	0.00797
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00208	-0.00250	0.00550
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00207	-0.00249	0.00551

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)	0.00862	0.00909	0.02155
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00848	0.00904	0.02143
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00617	0.00641	0.01470
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00608	0.00635	0.01461

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00824	0.00733	0.89717

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.17414	0.30233

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_1	A->Y (RR)	B	0.11101	0.82703	7.52552
	A->Y (FR)	!B	0.06384	0.92552	11.28130
	B->Y (RR)	A	0.08946	0.80289	7.50954
	B->Y (FR)	!A	0.08377	0.94801	11.28770

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_1	A->Y (FF)	B	0.10596	0.67824	5.74102
	A->Y (RF)	!B	0.04996	0.66312	8.12132
	B->Y (FF)	A	0.09192	0.66423	5.72848
	B->Y (RF)	!A	0.06176	0.67720	8.13068

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	0.00449	0.00402	0.01339
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01142	0.01150	0.02448
	B	A	0.00000	0.00000	0.00000
	B	A	0.00173	0.00152	0.01262
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01229	0.01239	0.02478

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	0.01396	0.01366	0.02517
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00301	0.00251	0.01368
	B	A	0.00000	0.00000	0.00000
	B	A	0.01249	0.01281	0.02479
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00410	0.00354	0.01467

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00828	0.00737	0.87476

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.17414	0.29215

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	0.11037	0.81790	7.45821
	A->Y (FR)	B	0.07825	0.94139	11.24430
	B->Y (RR)	!A	0.09409	0.80895	7.46421
	B->Y (FR)	A	0.08572	0.95001	11.23740

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	0.09626	0.66572	5.60549
	A->Y (RF)	B	0.05136	0.68803	8.35760
	B->Y (FF)	!A	0.08989	0.65986	5.63098
	B->Y (RF)	A	0.06085	0.67399	8.02565

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	0.01327	0.01337	0.02586
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00251	0.00151	0.01219
	B	A	0.00000	0.00000	0.00000
	B	A	0.01359	0.01373	0.02607
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00160	0.00131	0.01237

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	0.00272	0.00202	0.01340
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01424	0.01441	0.02526
	B	A	0.00000	0.00000	0.00000
	B	A	0.00274	0.00211	0.01318
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01270	0.01311	0.02506

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_1P62_25C.ccs
Cell Library: Process , Voltage 1.62,
Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__ant	5.49450
sky130_osu_sc_15T_ms__tiehi	5.49450
sky130_osu_sc_15T_ms__tielo	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_15T_ms__ant	0.46779
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	187645.00000	375291.00000
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
	-0.00177	0.04477	0.62574

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
	3.26597	3.09474	0.77026